DEPARTMENT OF TRANSPORTATION
Structure Maintenance & Investigations

Bridge Number : 24C0053
Facility Carried: TWIN CITIES ROAD
Location : 2.0 MI EAST OF RIVER RD
City :
Inspection Date : 02/10/2010

Bridge Inspection Report

Inspection Type

Routine	FC	Underwater	Special	Other
X				

STRUCTURE NAME: SNODGRASS SLOUGH

CONSTRUCTION INFORMATION

Year Built : 1931
Year Widened: 1965
Length (m) : 316.4

Skew (degrees): 0
No. of Joints : 4
No. of Hinges : 1

Structure Description: Main Span: Corrugated metal deck on steel swing truss with RC pivot piers, and RC seat abutments (hand operated). Rest and pivot Piers founded on 3'-6" diameter steel shells on timber piles.

Approach Spans: RC slab continuous on RC (3) pile bents with diaphragm abutments.

Span Configuration : 9 @ 9.1 m, 24.4 m, 7.2 m, 24.4 m, 19 @ 9.1 m

LOAD CAPACITY AND RATINGS

Design Live Load: OTHER OR UNKNOWN
Inventory Rating: 14.3 metric tonnes Calculation Method: LOAD FACTOR
Operating Rating: 23.7 metric tonnes Calculation Method: LOAD FACTOR
Permit Rating : XXXXX
Posting Load : Type 3: Legal Type 3S2: Legal Type 3-3: Legal

DESCRIPTION ON STRUCTURE

Deck X-Section: Approach: 0.1 m r, 8.5 m, 0.1 m r
Truss: 0.2 m cu, 6.4 m, 0.2 m cu

Total Width: 6.8 m Net Width: 6.4 m No. of Lanes: 2
Rail Description: Appr: metal beam on steel posts Truss: steel lattice Rail Code : 0000

Min. Vertical Clearance: 4.110

DESCRIPTION UNDER STRUCTURE

Channel Description: Earth and tule lined

CONDITION TEXT

REVISIONS

The following revisions have been made to the database to reflect the observed field conditions:

ELI Element 30 - Corrugated Steel Deck - a quantity of 380 sq. m. has been upgraded in the ELEMENT INSPECTION RATINGS Table from condition state 5 to condition state 1.

ELI Element 227 - Reinforced Concrete Submerged Pile - has been added to the ELEMENT INSPECTION RATINGS Table and placed in Condition State 1.

ELI Element 330 - Metal Bridge Railing - coated or uncoated - a quantity of 2 m. has been upgraded in the ELEMENT INSPECTION RATINGS Table from Condition States 2 and 3 and placed in Condition State 1.

ELI Element 362 - Traffic Impact Smart Flag - a quantity of 4 ea has been added to the ELEMENT INSPECTION RATINGS Table and placed in Condition State 1.

CONDITION TEXT

NBI Item #41, Structure Open, has been revised from Posting Recommended to Open - No Restrictions.

NBI Item #64, Operating Rating, has been revised from 12 metric tonnes to 23.7 metric tonnes.

NBI Item #66, Inventory Rating, has been revised from 7 metric tonnes to 14.3 metric tonnes.

NBI Item #70, Bridge Posting, has been revised from Below 39.9% of Legal Loads to Above Legal Loads.

WORK DONE

The corrugated steel deck has been completely replaced with a new AC overlay on the deck and approaches, new bridge rail has been installed, and fractured truss member U6-L7 (due to traffic impact) has been replaced with a new built-up truss member.

SCOPE OF INVESTIGATION

The inspection of this structure was done in two parts. The first inspection was conducted on 2/10/2010 in response to a fractured diagonal member of the truss. The bridge was closed to traffic until the member was replaced. The second part of the inspection was performed on 4/28/2010 after repairs were completed on the truss member and the deck replacement was completed.

This inspection and report was limited to the structural aspects of this structure excluding "Fracture Critical" and "Special Features." A separate inspection and report is prepared by the Office of Structure Maintenance and Investigations Fracture Critical Section and Engineering Services Electrical and Mechanical Section.

The water depth was greater than 6 feet and flowing through Spans 6 through 31 at the time of this inspection. The left and right trusses and bottom chords were inspected from the deck. A complete inspection of the soffit, superstructure and substructure elements was performed on Spans 1 through 6 and Span 31. Spans 7 through 30 were inspected underneath at a distance from the riverbanks.

CONDITION OF STRUCTURE

The left bridge rail in Span 10 and the 3rd vertical member (L3-U3) has been damaged by vehicular impact. Approximately 3' of the rail is bent and the vertical member's interior flange has been bent inwards approximately 2" over a length of 2 feet.

The diagonal member U6-L7 on the right side of Span 13 had been damaged in two locations by vehicular impact. The member's exterior channel had been completely fractured approximately 3' below the top of deck and there was a fracture in the interior channel approximately 3.5" long at the connection to the lower gusset plate (see Photo's 3 and 4). The damaged member has been replaced with a new steel built-up channel section diagonal member.

The following conditions have been noted in previous inspections and have not changed significantly:

The 1st vertical from the west (L1-U1) in Span 11, south side, has been damaged by vehicular impact and approximately 3" area of the flange has curled from impact. A

CONDITION TEXT

similar condition exists at L0-U1.

The northeast king post at Pier 13 has been damaged by vehicular impact on the inside face 3'above the deck. Three vertical post (L1-U1, L2-U2, L3-U3) on the north side also have minor damage resulting from vehicular impact. Damage to the east portal has been repaired with new steel channel sections.

PAINT CONDITION

The painted surfaces of all of the steel members is dirty. Light freckled rust is forming on the webs, flanges, and edges of the steel members.

FRACTURE CRITICAL INVESTIGATION

A hands on visual inspection on the tension members of the left and right steel truss and the steel floor beams in Spans 10 through 12 was performed on 04/11/08. No cracks were found. The pins were tested ultrasonically and no defects were observed.

UNDERWATER INVESTIGATION

The precast reinforced concrete piles of Piers 6 through 10, Piers 14 through 20 and Piers 26 through 30 were given a 100% hands on inspection on 10/18/2005. The remaining Piers were on dry land. No structural defects were noted on the concrete piles.

The steel shell piles of the swing span at Piers 11, 12 and 13 were also given a 100% hands on inspection. There is surface corrosion on all steel shells. When this corrosion is scraped off, there is a smooth shiny surface with no major pitting.

Due to the depth of water, this structure will remain on the Underwater Inspection Team's inventory.

SAFE LOAD CAPACITY

Due to the replacement of the corrugated steel deck, the Load Rating Section of Caltrans Structure Maintenance and Investigations reviewed the Inventory and Operating Rating and Load Capacity for this structure on 4/20/2010 and determined that it is capable of carrying most combinations of legal loads and all California permit loads. The Type 3 rated slightly deficient for legal but was administratively upgraded to allow the full 25 tons.

SIGNS

There are "10 TON" postings at each approach to the structure.

There are "NARROW BRIDGE" postings at each approach to the structure.

The minimum vertical clearance is posted at both truss portals at 13' 5".

EXISTING POSTING

This structure is currently signed for 10 tons due to the deterioration of the corrugated steel deck, but no formal hearing was performed to establish a legal posting. The deck

CONDITION TEXT

has since been replaced with a new corrugated steel deck.

RECOMMENDED POSTING

Remove the signs from the bridge approaches.

ELEMENT INSPECTION RATINGS

F#	Elem	Element Description	Env	Total Qty	Units	Qty in each Condition State St. 1	St. 2	St. 3	St. 4	St. 5
101	30	Steel Deck - Corrugated/Orthotropic/Etc.	2	380	sq.m.	380	0	0	0	0
101	39	Concrete Slab - Unprotected w/ AC Overlay	2	2165	sq.m.	2165	0	0	0	0
101	121	Painted Steel Bottom Chord Thru Truss	2	56	m.	0	56	0	0	0
101	126	Painted Steel Thru Truss (excl. bottom chord)	2	115	m.	0	115	0	0	0
101	152	Painted Steel Floor Beam	2	73	m.	0	73	0	0	0
101	205	Reinforced Conc Column or Pile Extension	2	78	ea.	78	0	0	0	
101	210	Reinforced Conc Pier Wall	2	27	m.	27	0	0	0	
101	215	Reinforced Conc Abutment	2	13	m.	13	0	0	0	
101	227	Reinforced Conc Submerged Pile	2	1	ea.	1	0	0	0	0
101	228	Timber Submerged Pile	2	1	ea.	1	0	0	0	0
101	251	Steel Shell Foundation Pile Filled w/conc	3	10	ea.	0	10	0	0	0
101	304	Open Expansion Joint	2	16	m.	16	0	0	0	0
101	312	Enclosed/Concealed Bearing	2	1	ea.	0	1	0	0	0
101	330	Metal Bridge Railing - coated or uncoated	2	634	m.	2	632	0	0	
101	362	Traffic Impact	2	4	ea.	4	0	0	0	0

WORK RECOMMENDATIONS

RecDate: 02/10/2010
Action : Bridge-Misc
Work By: LOCAL AGENCY
Status : PROPOSED

EstCost:
StrTarget: 6 MONTHS
DistTarget:
EA:

Remove the "10 tons" posting signs from the bridge approaches.

Inspected By : WL.Peterson/MW.Johnson

Registered Civil Engineer

STRUCTURE INVENTORY AND APPRAISAL REPORT

********** IDENTIFICATION **********

(1) STATE NAME- CALIFORNIA 069
(8) STRUCTURE NUMBER 24C0053
(5) INVENTORY ROUTE(ON/UNDER)- ON 1400V5620
(2) HIGHWAY AGENCY DISTRICT 03
(3) COUNTY CODE 067 (4) PLACE CODE 00000
(6) FEATURE INTERSECTED- SNODGRASS SLOUGH
(7) FACILITY CARRIED- TWIN CITIES ROAD
(9) LOCATION- 2.0 MI EAST OF RIVER RD
(11) MILEPOINT/KILOMETERPOINT 0
(12) BASE HIGHWAY NETWORK- PART OF NET 1
(13) LRS INVENTORY ROUTE & SUBROUTE 000000V56200
(16) LATITUDE 38 DEG 16 MIN 37 SEC
(17) LONGITUDE 121 DEG 29 MIN 52 SEC
(98) BORDER BRIDGE STATE CODE % SHARE %
(99) BORDER BRIDGE STRUCTURE NUMBER

******** STRUCTURE TYPE AND MATERIAL *********

(43) STRUCTURE TYPE MAIN:MATERIAL- STEEL
TYPE- MOVABLE - SWING CODE 317
(44) STRUCTURE TYPE APPR:MATERIAL- CONCRETE CONT
TYPE- SLAB CODE 201
(45) NUMBER OF SPANS IN MAIN UNIT 1
(46) NUMBER OF APPROACH SPANS 30
(107) DECK STRUCTURE TYPE- CIP CONCRETE CODE 1
(108) WEARING SURFACE / PROTECTIVE SYSTEM:
A) TYPE OF WEARING SURFACE- BITUMINOUS CODE 6
B) TYPE OF MEMBRANE- NONE CODE 0
C) TYPE OF DECK PROTECTION- NONE CODE 0

********** AGE AND SERVICE **********

(27) YEAR BUILT 1931
(106) YEAR RECONSTRUCTED 1965
(42) TYPE OF SERVICE: ON- HIGHWAY 1
UNDER- WATERWAY 5
(28) LANES:ON STRUCTURE 02 UNDER STRUCTURE 00
(29) AVERAGE DAILY TRAFFIC 4890
(30) YEAR OF ADT 1991 (109) TRUCK ADT 10 %
(19) BYPASS, DETOUR LENGTH 27 KM

********** GEOMETRIC DATA **********

(48) LENGTH OF MAXIMUM SPAN 56.1 M
(49) STRUCTURE LENGTH 316.4 M
(50) CURB OR SIDEWALK: LEFT 0.2 M RIGHT 0.2 M
(51) BRIDGE ROADWAY WIDTH CURB TO CURB 6.4 M
(52) DECK WIDTH OUT TO OUT 6.8 M
(32) APPROACH ROADWAY WIDTH (W/SHOULDERS) 7.0 M
(33) BRIDGE MEDIAN- NO MEDIAN 0
(34) SKEW 0 DEG (35) STRUCTURE FLARED NO
(10) INVENTORY ROUTE MIN VERT CLEAR 4.11 M
(47) INVENTORY ROUTE TOTAL HORIZ CLEAR 6.4 M
(53) MIN VERT CLEAR OVER BRIDGE RDWY 4.11 M
(54) MIN VERT UNDERCLEAR REF- NOT H/RR 0.00 M
(55) MIN LAT UNDERCLEAR RT REF- NOT H/RR 0.0 M
(56) MIN LAT UNDERCLEAR LT 0.0 M

********** NAVIGATION DATA **********

(38) NAVIGATION CONTROL- BR PERMIT REQ CODE 1
(111) PIER PROTECTION- FUNCTIONING CODE 2
(39) NAVIGATION VERTICAL CLEARANCE 1.0 M
(116) VERT-LIFT BRIDGE NAV MIN VERT CLEAR M
(40) NAVIGATION HORIZONTAL CLEARANCE 24.4 M

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SUFFICIENCY RATING = 37.7
STATUS FUNCTIONALLY OBSOLETE
HEALTH INDEX 91.9
PAINT CONDITION INDEX = 75.0

********** CLASSIFICATION ********** CODE

(112) NBIS BRIDGE LENGTH- YES Y
(104) HIGHWAY SYSTEM- NOT ON NHS 0
(26) FUNCTIONAL CLASS- MINOR ARTERIAL RURAL 06
(100) DEFENSE HIGHWAY- NOT STRAHNET 0
(101) PARALLEL STRUCTURE- NONE EXISTS N
(102) DIRECTION OF TRAFFIC- 2 WAY 2
(103) TEMPORARY STRUCTURE-
(105) FED.LANDS HWY- NOT APPLICABLE 0
(110) DESIGNATED NATIONAL NETWORK - NOT ON NET 0
(20) TOLL- ON FREE ROAD 3
(21) MAINTAIN- COUNTY HIGHWAY AGENCY 02
(22) OWNER- COUNTY HIGHWAY AGENCY 02
(37) HISTORICAL SIGNIFICANCE- NOT ELIGIBLE 5

********** CONDITION ********** CODE

(58) DECK 7
(59) SUPERSTRUCTURE 7
(60) SUBSTRUCTURE 7
(61) CHANNEL & CHANNEL PROTECTION 7
(62) CULVERTS N

********* LOAD RATING AND POSTING ********* CODE

(31) DESIGN LOAD- OTHER OR UNKNOWN 0
(63) OPERATING RATING METHOD- LOAD FACTOR 1
(64) OPERATING RATING- 23.7
(65) INVENTORY RATING METHOD- LOAD FACTOR 1
(66) INVENTORY RATING- 14.3
(70) BRIDGE POSTING- EQUAL TO OR ABOVE LEGAL LOADS 5
(41) STRUCTURE OPEN, POSTED OR CLOSED- A
DESCRIPTION- OPEN, NO RESTRICTION

********** APPRAISAL ********** CODE

(67) STRUCTURAL EVALUATION 4
(68) DECK GEOMETRY 2
(69) UNDERCLEARANCES, VERTICAL & HORIZONTAL N
(71) WATER ADEQUACY 8
(72) APPROACH ROADWAY ALIGNMENT 8
(36) TRAFFIC SAFETY FEATURES 0000
(113) SCOUR CRITICAL BRIDGES U

********** PROPOSED IMPROVEMENTS **********

(75) TYPE OF WORK- REPLACE FOR DEFICIENC CODE 31
(76) LENGTH OF STRUCTURE IMPROVEMENT 316.4 M
(94) BRIDGE IMPROVEMENT COST $5,853,500
(95) ROADWAY IMPROVEMENT COST $1,170,700
(96) TOTAL PROJECT COST $9,833,880
(97) YEAR OF IMPROVEMENT COST ESTIMATE 2010
(114) FUTURE ADT 9131
(115) YEAR OF FUTURE ADT 2029

********** INSPECTIONS **********

(90) INSPECTION DATE 02/10 (91) FREQUENCY 24 MO
(92) CRITICAL FEATURE INSPECTION: (93) CFI DATE
A) FRACTURE CRIT DETAIL- YES 24 MO A) 04/08
B) UNDERWATER INSP- YES 60 MO B) 10/05
C) OTHER SPECIAL INSP- NO MO C)

SNODGRASS SLOUGH

2.0 MI EAST OF RIVER RD | 02/10/2010 [AAAI] | 24C0053

100 - PHOTO-ROADWAY VIEW

Photo No. 1

Roadway view looking east.

101 - PHOTO-ROUTINE ELEVATION

Photo No. 2

Routine elevation looking southeast.

107 - PHOTO-SUPER DAMAGE/DETERIORATION

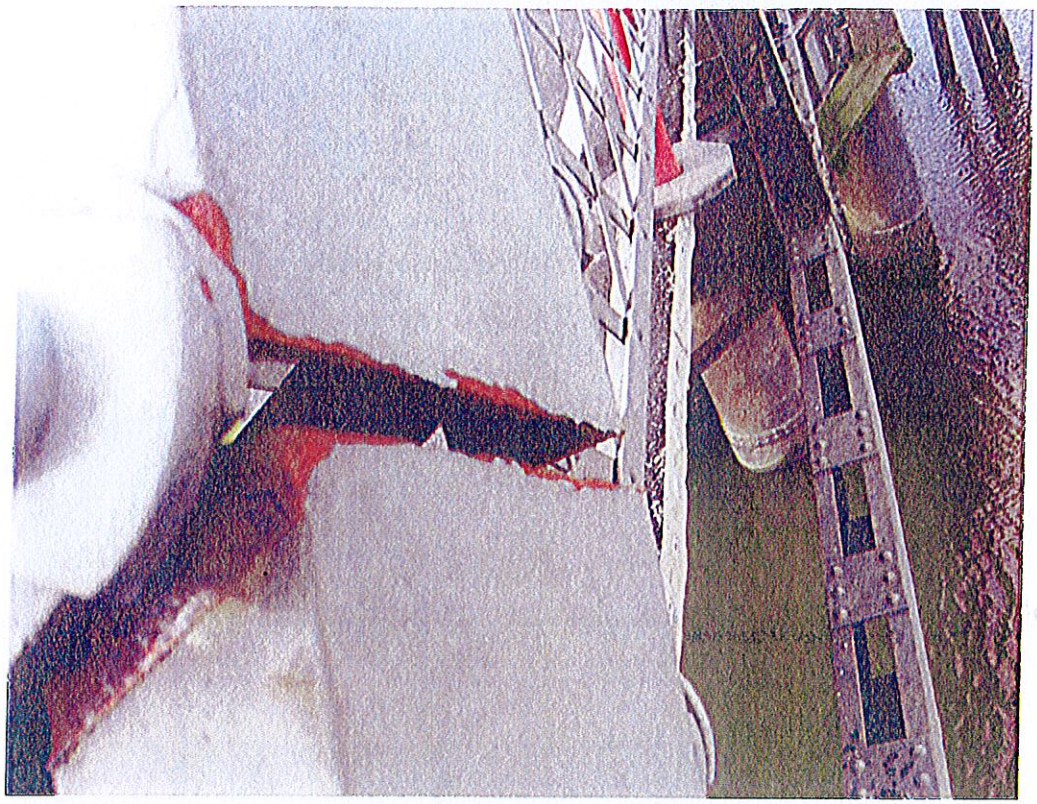

Photo No. 3

Complete fracture of the exterior channel of diagonal member U6-L7 in Span 13.

107 - PHOTO-SUPER DAMAGE/DETERIORATION

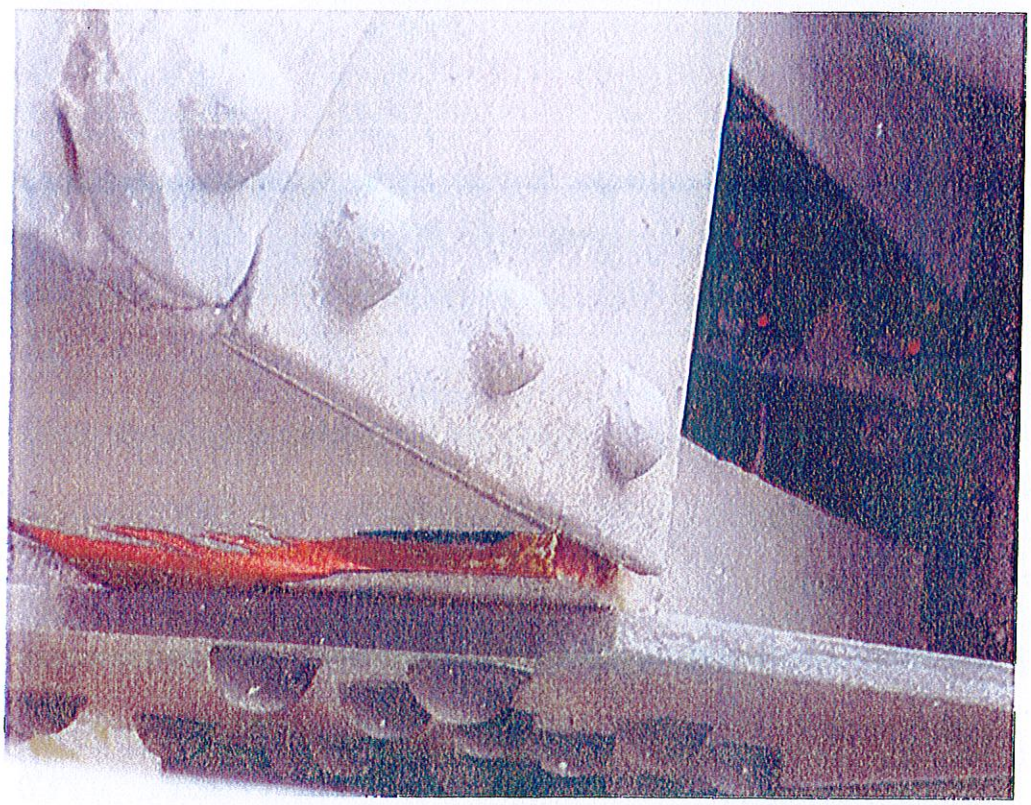

Photo No. 4

Tear in the interior channel of diagonal member U6-L7 in Span 13 at the lower gusset plate

107 - PHOTO-SUPER DAMAGE/DETERIORATION

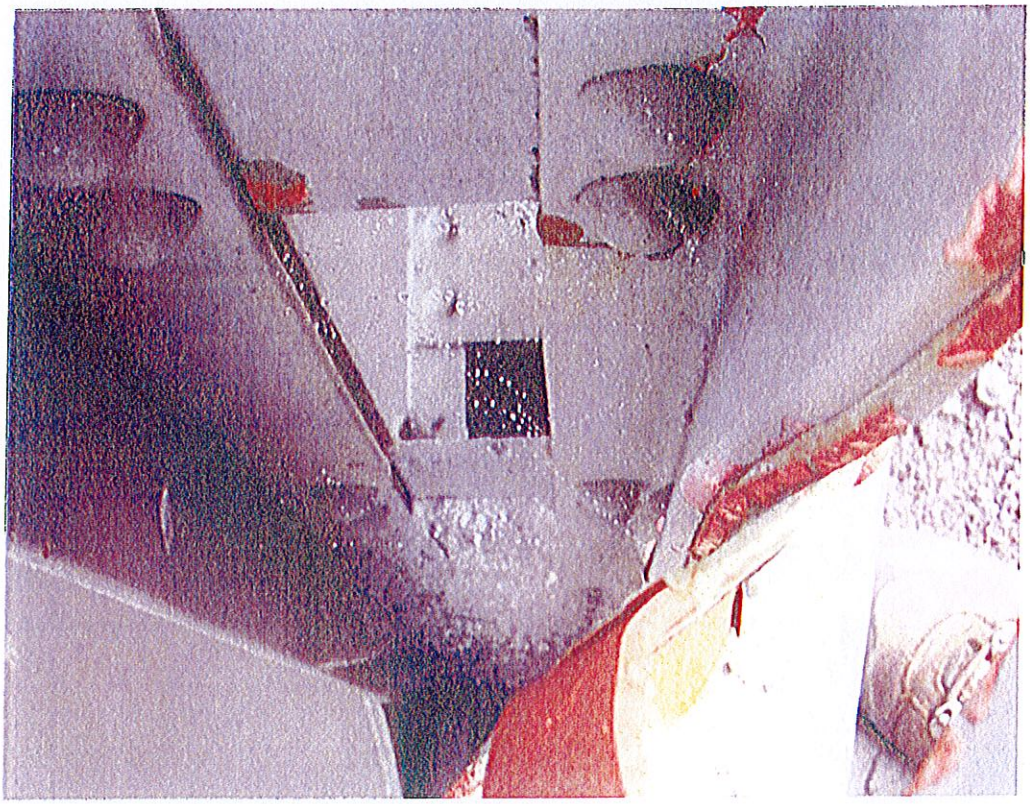

Photo No. 5

Bent flange of vertical member L3-U3 in Span 10 due to vehicular impact.

119 - PHOTO-RAIL DAMAGE/DETERIORATION

Photo No. 6

Damaged bridge rail and vertical member L3-U3 in the left truss in Span 10.