

DEPARTMENT OF TRANSPORTATION

DIVISION OF MAINTENANCE
STRUCTURE MAINTENANCE & INVESTIGATIONS
100 South Main Street, 3rd Floor
LOS ANGELES, CA 90012
PHONE (213) 897-2004
FAX (213) 897-2033



*Making Conservation
a California Way of Life.*

April 16, 2019

Mr. Shane Silsby
Director of Public Works
County of Orange
P O Box 4048
Santa Ana, CA 92702-4048

Dear Mr. Silsby:

In accordance with Title 23 of the Code of Federal Regulations (Federal Highway Act) and the National Bridge Inspection Standards (NBIS), Caltrans Structure Maintenance and Investigations performed an inspection of 2 bridges under your jurisdiction. The type of inspection is indicated on the bridge report transmittal sheet. The bridges have been rated to indicate their deficiencies, structural adequacy, safe load carrying capacity and overall general condition.

Enclosed are copies of the Bridge Inspection Reports for the structures noted on the attached transmittal sheet. These reports contain descriptions of physical changes to the structures since the last inspection, recommendations for work to be done, and additional information not recorded in the previous Bridge Reports.

Your attention is directed to the requirements of Title 23, Part 650 of the Code of Federal Regulations, where newly completed structures or any modification of existing structures shall be entered in the inventory within 90 days. Please notify this office of any newly constructed bridge or culvert within your jurisdiction, more than 20 feet measured along the center of the roadway and carrying public vehicular traffic or over a public roadway, in order that it may be entered in the inventory of bridge structures in compliance with Federal requirements.

Should you have any questions regarding the enclosed Bridge Inspection Reports, please contact Bing Wu @ (213) 897-0874.

Sincerely,

Ching Chao

Sc
CHING CHAO
Office Chief
Structure Maintenance & Investigations - (Investigations-South)

Enclosures

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Bridge Report Transmittal Sheet

Batch 46626

County of Orange

Bridge #	Bridge Name	Location	Inspection		Outstanding	
			Date	Type	Work	Cost
55C0606	ARROYO TRABUCO	0.6 MI E/O FELIPE ROAD	08/31/2018	Routine	Y	\$
55C0637	ARROYO TRABUCO	0.5 MI E/O MARGUERITE PWY	08/31/2018	Routine	Y	\$

2 Bridge(s) in this Transmittal

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WEB SITES:

The National Bridge Inspection Standards (NBIS) Recording and Coding Guide for the Structure Inventory and Appraisal of the Nation's Bridges, Element Level Inspection, Structure Maintenance and Investigations Manuals, Local Assistance Program Guidelines and other related information are posted on Division of Maintenance, Structure Maintenance and Investigations; Division of Local Assistance, Local Highway Bridge Program (HBP) and FHWA websites.

The websites can be accessed at:

1. "Caltrans Structure Maintenance and Investigations" <http://www.dot.ca.gov/hq/structur/strmaint/>
2. "Caltrans Division of Local Assistance"
<http://www.dot.ca.gov/hq/LocalPrograms/hbrr99/hbrr99a.htm>
3. "FHWA" <http://www.fhwa.dot.gov/BRIDGE/mtguide.pdf>

Inspection Type Definitions**Routine Inspection:**

Routine Inspections consist of both the initial Inventory Inspection (the first inspection of the bridge that places it in the bridge inventory or when there has been a change in the configuration of the structure) and subsequent regularly scheduled inspections. The initial inspection provides all the Structural Inventory & Appraisal (SI&A) data required by federal and state regulations, determines the baseline structural conditions, lists any existing problems, and establishes the load capacity of the structure. Subsequent inspections consist of observations, measurements needed to determine the physical and functional condition of the bridge, to identify any changes from the previously recorded conditions, and verification of its load capacity. These inspections are generally conducted from the deck, ground and/or water level, and from permanent work platforms and walkways, if present. Inspection of underwater portions of the substructure is limited to observations during low-flow periods and/or probing for signs of undermining. Special equipment should be utilized in circumstances where its use provides the only practical access to areas of the structure.

Fracture Critical, Special Feature & Underwater Inspections:

Fracture Critical, Special Feature, and Underwater Inspections are up close, hands-on inspections of one or more members above or below the water level to identify any deficiencies not readily detectable using Routine Inspection procedures. These inspections generally require special equipment such as under-bridge inspection equipment, manlifts, boats, traffic control, and railroad flagging. Personnel with special skills such as divers or structural steel inspectors trained in non-destructive testing techniques may be required.

Other Inspections:

Other Inspections are conducted on damaged structures, structures that have developed specific problems, or structures suspected of developing problems. The scope of these investigations should be sufficient to determine the need for emergency load restrictions or closure of the structure, monitor a changing condition, and to assess the level of effort necessary to effect a repair.



DEPARTMENT OF TRANSPORTATION
Structure Maintenance & Investigations

Bridge Number : 55C0606
Facility Carried: OSO PARKWAY
Location : 0.6 MI E/O FELIPE ROAD
City :
Inspection Date : 08/31/2018

Bridge Inspection Report

Inspection Type

Routine	FC	Underwater	Special	Other
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

STRUCTURE NAME: ARROYO TRABUCO

CONSTRUCTION INFORMATION

Year Built : 1991	Skew (degrees): 99
Year Modified: N/A	No. of Joints : 3
Length (m) : 202.7	No. of Hinges : 1

Structure Description: Continuous 5 span CIP/PS concrete box girder (11 cells) with RC 2-column bents and RC open end seat abutments with monolithic wingwalls., all supported upon concrete piles , except Abutment 1 is on steel piles.

Span Configuration : (W) 150.00 feet, 3 @ 120.67 feet, 150.00 feet (E)

SAFE LOAD CAPACITY AND RATINGS

Design Live Load: MS-18+MOD OR HS-20+MOD		
Inventory Rating: RF=1.00 =>32.4 metric tons	Calculation Method: ASSIGNED (LFD)	
Operating Rating: RF=1.67 =>54.1 metric tons	Calculation Method: ASSIGNED (LFD)	
Permit Rating : P P P P P		
Posting Load : Type 3: <u>Legal</u>	Type 3S2: <u>Legal</u>	Type 3-3: <u>Legal</u>

DESCRIPTION ON STRUCTURE

Deck X-Section: (S) 1.00 foot br, 5.00 feet sw, 44.00 feet, 4.00 feet cu med, 44.00 feet, 5.00 feet sw, 1.00 foot br (N)

Total Width: 31.7 m	Net Width: 26.8 m	No. of Lanes: 6	Speed: 55 mph
Min. Vertical Clearance: Unimpaired			Overlay Thickness: 0.0 inches
Rail Code: 0110			

DESCRIPTION UNDER STRUCTURE

Channel Description: Natural earth open wash with a cobbled streambed.

NOTICE

The bridge inspection condition assessment used for this inspection is based on the American Association of State Highway and Transportation Officials (AASHTO) Bridge Element Inspection Manual 2013 as defined in Moving Ahead for Progress in the 21st Century (MAP-21) federal law. The new element inspection methodology may result in changes to related condition and appraisal ratings on the bridge without significant physical changes at the bridge.

The element condition information contained in this report represents the current condition of the bridge based on the most recent routine and special inspections. Some of the notes presented below may be from an inspection that occurred prior to the date noted in this report. Refer to the Scope and Access section of this inspection report for a description of which portions of the bridge were inspected on this date.

INSPECTION COMMENTARY

REVISIONS

As mentioned in the previous bridge inspection report, the RC abutments ELI #215 is modified from 88 m to 102 m because the wingwalls are monolithic with both abutments.

Element 312 (Bearing enclosed): the entire quantity is modified from 2 each to 3 each.

INSPECTION COMMENTARY

SCOPE AND ACCESS

A complete routine inspection was performed by walking on and around the bridge to inspect all visible elements of the bridge structure. Bridge deck was inspected by walking on shoulder and median area. Soffit and all substructure were inspected by walking underneath the bridge.

The channel is dry and with thick vegetation from span #2 through #4 at the time of inspection.

There is no need of a special equipment to inspect this structure.

DECK AND ROADWAY

There are longitudinal and transverse deck cracks (less than 0.02 inches wide, 2.0 feet in spacing) but the deck There has been treated with Methacrylate.

There is an offset approximately 0.5 inches between the bridge and sidewalk at southwest corner of the easterly abutment.

Some of the deck drains are partially filled with debris.

There are longitudinal and transverse cracks scattering on both sides of the sidewalk; and also, numerous small spalls with exposed rebars due to thin concrete cover.

The entire type B seal is debonded on both directions at the westerly abutment with 2.5 inches to 3.0 inches gap at 80.5 F degree at the time of inspection.

SUPERSTRUCTURE

Here are the locations of soffit cracks as follows:

Span #1 has few longitudinal cracks with white and brown efflorescence; and brown spots are noticed at 10.0 feet west of hinge #1 (only 01 hinge) at 8.0 feet from south edge. (see photo 7)

Span #2 with two longitudinal cracks with white and brown efflorescence 10.0 feet long at 15.0 feet from bent #3 southerly end; a longitudinal crack with white efflorescence 12.0 feet long at 2.0 feet from north edge.

Span #3 with a longitudinal crack with white efflorescence 20.0 feet long at mid-span #3.

SUBSTRUCTURE

As mentioned in the previous bridge inspection report, there are vertical cracks 0.04 inches wide 20 feet high on all columns; and these cracks are insignificant at this time and no need to downgrade the element.

Scour is initiated 14.0 feet high around the south side of north column in bent #3. it is still there, there is no sign of changing from two years ago.

There are 2 minor erosion gullies at (2.0 feet wide x 2.0 feet deep and 1.0 foot wide x 2.0 feet deep) through the entire natural slope protection at the westerly abutment (see photo 6).

There are graffities on the face of the easterly abutment.

SAFE LOAD CAPACITY

A Load Rating Summary Sheet dated 05/27/2014 is on file for this structure. The current rating has been assigned in accordance with SM&I procedures.

ELEMENT INSPECTION RATINGS AND COMMENTARY

Elem No.	Defect /Prot	Element Description	Env	Total Qty	Units	Qty in St. 1	St. 2	St. 3	St. 4	Condition State
16		Top Flange-RC	2	6410	sq.m	5860	370	180	0	
	1130	Cracking (RC and Other)	2	500		0	320	180	0	
	1190	Abrasion (PS Conc./RC)	2	50		0	50	0	0	
	521	Concrete Coat. (Meth/Paint/Seal)	2	5419	sq.m	5219	200	0	0	
	3540	Effectiveness- (Concrete PC)	2	200		0	200	0	0	

(16)

There were no significant defects noted.

(16-1130)

Some cracks started to open up again, cracks are up to 0.06 inches wide in many locations. Cracks have been treated with Methacrylate.

(16-1190)

Abrasion is noticed at eastbound lanes.

(16-521)

There were no significant defects noted.

(16-521-3540)

There are a few of locations of deck crack gaps where are treated with Methacrylate, they slowly open up gain.

104		Box Girder-PS Conc.	2	203	m	173	28	2	0	
	1120	Efflorescence/Rust Staining	2	30		0	28	2	0	

(104)

There were no significant defects noted.

(104-1120)

Here are the locations of soffit cracks as follows:

Span #1 has few longitudinal cracks with white and brown efflorescence; and brown spots are noticed at 10.0 feet west of hinge #1 (only 01 hinge) at 8.0 feet from south edge. (see photo 7)

Span #2 with two longitudinal cracks with white and brown efflorescence 10.0 feet long at 15.0 feet from bent #3 southerly end; a longitudinal crack with white efflorescence 12.0 feet long at 2.0 feet from north edge.

Span #3 with a longitudinal crack with white efflorescence 20.0 feet long at mid-span #3.

205		Column-RC	2	8	each	8	0	0	0	
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(205)

there are vertical cracks 0.04 inches wide 20 feet high on all columns; and these cracks are insignificant at this time and no need to downgrade the element. There were no significant defects noted.

215		Abutment-RC	2	102	m	102	0	0	0	
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(215)

There were no significant defects noted.

225		Pile-Steel	2	1	ea.	1	0	0	0	
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(225)

The pile element is included to indicate the presence of piles on this structure. The piles were not exposed for visual inspection. No indication of pile distress was noted in any substructure element.

ELEMENT INSPECTION RATINGS AND COMMENTARY

Elem No.	Defect /Prot	Defect	Element Description	Env	Total Qty	Units	Qty in each Condition State			
							St. 1	St. 2	St. 3	St. 4

227			File-RC	2	1	ea.	1	0	0	0
-----	--	--	---------	---	---	-----	---	---	---	---

(227)

The pile element is included to indicate the presence of piles on this structure. The piles were not exposed for visual inspection. No indication of pile distress was noted in any substructure element.

300			Joint-Strip Seal Exp	2	80	m	55	25	0	0
	2310		Leakage (Joints)	2	5		0	5	0	0
	2350		Debris Impaction (Joints)	2	20		0	20	0	0

(300)

There were no significant defects noted.

(300-2310)

Leakage is noticed underneath at east abutment.

(300-2350)

Debris is noticed at east abutment joint.

302			Joint-Compression Seal	2	40	m	10	20	10	0
	2320		Seal Adhesion (Joints)	2	30		0	20	10	0

(302)

There were no significant defects noted.

(302-2320)

Type B seal lost adhesion in many locations, and water stain is noticed underneath at the westerly abutment on both directions.

312			Bearing-Enclosed	2	3	each	3	0	0	0
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(312)

There were no significant defects noted.

321			Approach Slab-RC	2	264	sq.m	144	50	70	0
	1130		Cracking (RC and Other)	2	120		0	50	70	0

(321)

There were no significant defects noted.

(321-1130)

The approach and departure slabs in all lanes exhibit up to 6.0 longitudinal and diagonal cracks about 10.0 feet long and 0.10 inches wide. (see photo 5)

331			Railing-RC	2	406	m	396	10	0	0
	1080		Delamination/Spall/Patched Area	2	10		0	10	0	0

(331)

There were no significant defects noted.

(331-1080)

North and south rails exhibit several unsound concrete areas at (2.0 inches X 2.0 inches) scattering through the bridge railings, mainly between the vertical concrete rail and the surface of the sidewalk due to concrete cover (thin concrete cover).

WORK RECOMMENDATIONS

WORK RECOMMENDATIONS

RecDate: 08/31/2018
 Action : Joints-Replace
 Work By: LOCAL AGENCY
 Status : PROPOSED

EstCost:
 StrTarget: 2 YEARS
 DistTarget:
 EA:

Replace entire type B seal at the westerly abutment. In addition, clean out all debris inside the strip seals at hinge and easterly abutment joint at 2.5 inches to 3.0 inches gap at 85.0 F degree.

RecDate: 08/31/2018
 Action : Sub-Misc.
 Work By: LOCAL AGENCY
 Status : PROPOSED

EstCost:
 StrTarget: 2 YEARS
 DistTarget:
 EA:

Level the sidewalk to match with the concrete bridge sidewalk at the southwest corner of the easterly abutment.

CHANNEL X-SECTION

Side : Upstream

X-Section Date: 08/31/2018

Measured From : Top of bridge railing

Location	Horiz (m)	Vert (m)	Comments
Abutment #1	0.00	0.50	Face of abutment
Bent #2	7.50	14.48	toe of slope
	0.00	14.85	Center line
	16.00	19.97	Toe of 2nd slope
	32.00	20.35	top of cliff
Bent #3	0.00	24.50	Center line
Bent #4	0.00	24.80	Center line
	3.00	25.50	top of surface (wet surface)
	5.00	25.80	Deepest point (thawleg)
	17.00	25.30	Top of surface
Bent #5	0.00	23.80	Center line
	11.00	24.10	Toe of cliff
Abutment #6	0.00	2.40	Top of cliff

Team Leader : Edwin Mah

Report Author : Nelson N. Vo

Inspected By : E.Mah/NN.Vo



[Handwritten Signature]

4/9/2019

Edwin Mah (Registered Civil Engineer) (Date)

STRUCTURE INVENTORY AND APPRAISAL REPORT

***** IDENTIFICATION *****

(1) STATE NAME- CALIFORNIA 069
 (8) STRUCTURE NUMBER 55C0606
 (5) INVENTORY ROUTE(ON/UNDER)- ON 140000000
 (2) HIGHWAY AGENCY DISTRICT 12
 (3) COUNTY CODE 059 (4) PLACE CODE 00000
 (6) FEATURE INTERSECTED- ARROYO TRABUCO
 (7) FACILITY CARRIED- OSO PARKWAY
 (9) LOCATION- 0.6 MI E/O FELIPE ROAD
 (11) MILEPOINT/KILOMETERPOINT 0
 (12) BASE HIGHWAY NETWORK- PART OF NET 1
 (13) LRS INVENTORY ROUTE & SUBROUTE 000000000000
 (16) LATITUDE 33 DEG 35 MIN 04.43 SEC
 (17) LONGITUDE 117 DEG 38 MIN 04.21 SEC
 (98) BORDER BRIDGE STATE CODE % SHARE %
 (99) BORDER BRIDGE STRUCTURE NUMBER

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

(43) STRUCTURE TYPE MAIN:MATERIAL- PRSTR CONC CONT
 TYPE- BOX BEAM OR GIRDER - MULTI CODE 605
 (44) STRUCTURE TYPE APPR:MATERIAL- OTHER/NA
 TYPE- OTHER/NA CODE 000
 (45) NUMBER OF SPANS IN MAIN UNIT 5
 (46) NUMBER OF APPROACH SPANS 0
 (107) DECK STRUCTURE TYPE- CIP CONCRETE CODE 1
 (108) WEARING SURFACE / PROTECTIVE SYSTEM:
 A) TYPE OF WEARING SURFACE- NONE CODE 0
 B) TYPE OF MEMBRANE- NONE CODE 0
 C) TYPE OF DECK PROTECTION- NONE CODE 0

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

(27) YEAR BUILT 1991
 (106) YEAR RECONSTRUCTED 0000
 (42) TYPE OF SERVICE: ON- HIGHWAY-PEDESTRIAN 5
 UNDER- WATERWAY 5
 (28) LANES:ON STRUCTURE 06 UNDER STRUCTURE 00
 (29) AVERAGE DAILY TRAFFIC 27000
 (30) YEAR OF ADT 2017 (109) TRUCK ADT 1 %
 (19) BYPASS, DETOUR LENGTH 11 KM

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

(48) LENGTH OF MAXIMUM SPAN 45.7 M
 (49) STRUCTURE LENGTH 202.7 M
 (50) CURB OR SIDEWALK: LEFT 1.5 M RIGHT 1.5 M
 (51) BRIDGE ROADWAY WIDTH CURB TO CURB 26.8 M
 (52) DECK WIDTH OUT TO OUT 31.7 M
 (32) APPROACH ROADWAY WIDTH (W/SHOULDERS) 26.8 M
 (33) BRIDGE MEDIAN- CLOSED NON-MOUNTABLE 3
 (34) SKEW 99 DEG (35) STRUCTURE FLARED NO
 (10) INVENTORY ROUTE MIN VERT CLEAR 99.99 M
 (47) INVENTORY ROUTE TOTAL HORIZ CLEAR 13.4 M
 (53) MIN VERT CLEAR OVER BRIDGE RDWY 99.99 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- NOT APPLICABLE CODE N
 (111) PIER PROTECTION- CODE
 (39) NAVIGATION VERTICAL CLEARANCE 0.0 M
 (116) VERT-LIFT BRIDGE NAV MIN VERT CLEAR M
 (40) NAVIGATION HORIZONTAL CLEARANCE 0.0 M

SUFFICIENCY RATING = 85.1
 STATUS
 HEALTH INDEX 96.3
 PAINT CONDITION INDEX = N/A

***** CLASSIFICATION *****

(112) NBIS BRIDGE LENGTH- YES	Y
(104) HIGHWAY SYSTEM- ROUTE ON NHS	1
(26) FUNCTIONAL CLASS- OTHER PRIN ART URBAN	14
(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 *****

(58) DECK	7
(59) SUPERSTRUCTURE	7
(60) SUBSTRUCTURE	7
(61) CHANNEL & CHANNEL PROTECTION	5
(62) CULVERTS	N

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

(31) DESIGN LOAD- MS-18+MOD OR HS-20+MOD	6
(63) OPERATING RATING METHOD- ASSIGNED (LFD)	A
(64) OPERATING RATING-	54.1
(65) INVENTORY RATING METHOD- ASSIGNED (LFD)	A
(66) INVENTORY RATING-	32.4
(70) BRIDGE POSTING- EQUAL TO OR ABOVE LEGAL LOADS	5
(41) STRUCTURE OPEN, POSTED OR CLOSED- DESCRIPTION- OPEN, NO RESTRICTION	A

***** APPRAISAL *****

(67) STRUCTURAL EVALUATION	7
(68) DECK GEOMETRY	7
(69) UNDERCLEARANCES, VERTICAL & HORIZONTAL	N
(71) WATER ADEQUACY	8
(72) APPROACH ROADWAY ALIGNMENT	8
(36) TRAFFIC SAFETY FEATURES	0110
(113) SCOUR CRITICAL BRIDGES	8

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

(75) TYPE OF WORK-	CODE
(76) LENGTH OF STRUCTURE IMPROVEMENT	M
(94) BRIDGE IMPROVEMENT COST	
(95) ROADWAY IMPROVEMENT COST	
(96) TOTAL PROJECT COST	
(97) YEAR OF IMPROVEMENT COST ESTIMATE	
(114) FUTURE ADT	56200
(115) YEAR OF FUTURE ADT	2035

***** INSPECTIONS *****

(90) INSPECTION DATE 08/18	(91) FREQUENCY 24 MO
(92) CRITICAL FEATURE INSPECTION:	(93) CFI DATE
A) FRACTURE CRIT DETAIL-	NO MO A)
B) UNDERWATER INSP-	NO MO B)
C) OTHER SPECIAL INSP-	NO MO C)

100 - PHOTO-Routine-Roadway View



Photo No. 1

Deckview looking east

100 - PHOTO-Routine-Roadway View



Photo No. 1

Deckview looking west

101 - PHOTO-Routine-Elevation View



Photo No. 1

Elevation looking southeast

101 - PHOTO-Routine-Elevation View



Photo No. 1

Elevation looking northwest

101 - PHOTO-Routine-Elevation View



Photo No. 1

Elevation looking west

103 - PHOTO-Deck-Details



Photo No. 1

Type B Seal at Westerly Abutment.

103 - PHOTO-Deck-Details



Photo No. 1

Sign of Methacrylate sealed deck cracks

114 - PHOTO-Sub-Details



Photo No. 1

125 - PHOTO-Joint-Details



Photo No. 1

Easterly Abutment with Strip Seal

125 - PHOTO-Joint-Details

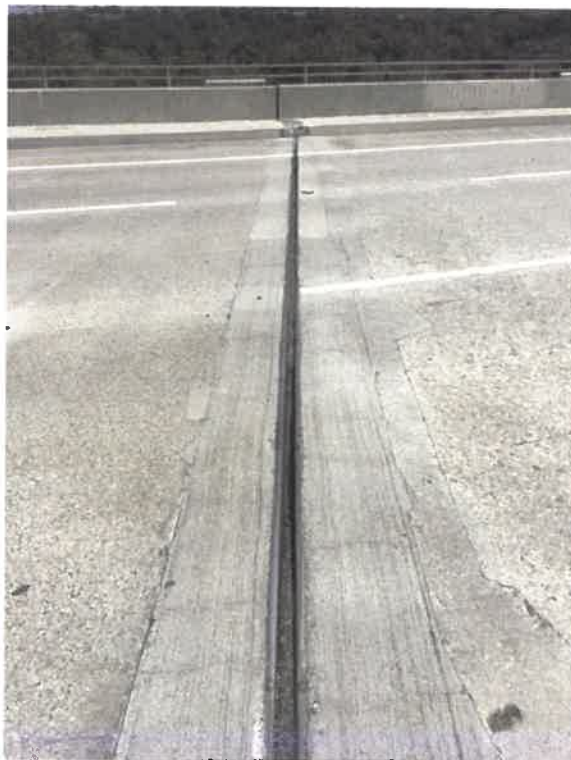


Photo No. 1

Strip seals at hinge (only 01 hinge on this structure).



Photo No. 1