## Orange County Bridge Review Summary

Dokken Engineering performed a field review of the Orange County bridge listed below in April 2017 to identify maintenance activities eligible for Caltrans' Bridge Preventive Maintenance Program (BPMP), dated December 2015, funding. Additional maintenance activities, if present, not eligible for BPMP funding were also noted. Maintenance recommendations, if noted in the most recent Caltrans Bridge Inspection Report (BIR), were confirmed.

**Bridge Number:** 55C0344

**Bridge Name:** Santa Ana River (Adams Ave) **Year Built:** 1977

**Facility Carried:** Hamilton-Victoria

The Santa Ana River Channel Bridge at Adams Avenue is a continuous 5 span cast-in-place reinforced concrete Box Girder Bridge with pier wall and open end diaphragm abutments supported on concrete piles.

### Caltrans BIR recommendations:

- None.

### Field Inspection Observations

- There was no access to the substructure. The piers were visually inspected from the access road (photo 1).
- Bridge deck appears to have been treated.
- Exposed reinforcement in concrete barrier.
- Debris build up on pier nosing.

### Maintenance Needs Assessment

#### BPMP Assessment

- N/A – No eligible maintenance activities

#### General Maintenance – Non-BPMP

- Small spall around reinforcement bar on barrier. Not structural and no action needed at this time.

### Proposed BPMP Construction Costs

- N/A

### Construction Items Not Funded by BPMP

- N/A

# APPENDIX A

## Photos and BIR

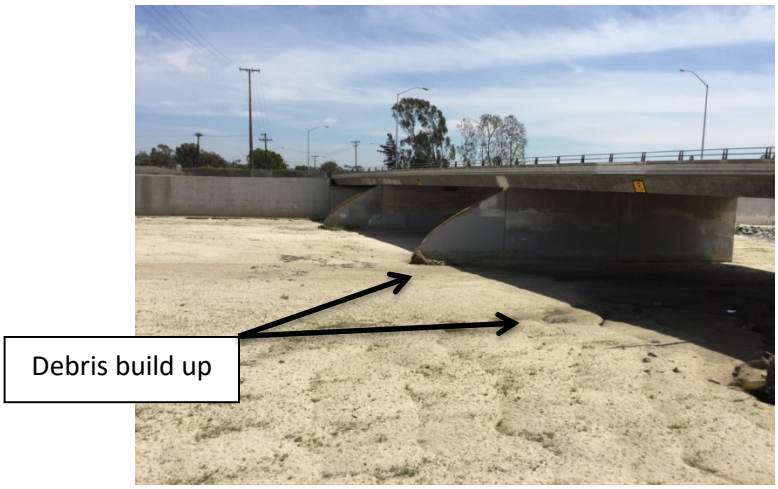


Photo 1: Elevation View


Photo 2: Barrier

Photo 3: Bridge Deck

**Photo 4:**

**Photo 5:**

DEPARTMENT OF TRANSPORTATION
Structure Maintenance & Investigations

Bridge Number : 55C0344
Facility Carried: ADAMS AVENUE
Location : 0.5 MI E/O BROOKHURST ST
City :
Inspection Date : 01/27/2017

# Bridge Inspection Report

Inspection Type

| Routine | FC | Underwater | Special | Other |
|---|---|---|---|---|
| X | | | | |

**STRUCTURE NAME: SANTA ANA RIVER (ADAMS AVE)**

## CONSTRUCTION INFORMATION

Year Built : 1977
Year Modified: N/A
Length (m) : 164.6

Skew (degrees): 14
No. of Joints : 2
No. of Hinges : 0

Structure Description: Continuous 5-span CIP/PS concrete box girder (10 cells) with RC pier walls and RC open end seat abutments with monolithic wingwalls, all supported upon concrete piles.

Span Configuration : (W) 89.75 ft, 3 @ 118.00 ft, 89.75 ft c/c (E)

## SAFE LOAD CAPACITY AND RATINGS

Design Live Load: MS-18 OR HS-20
Inventory Rating: RF=1.00 =>32.4 metric tons Calculation Method: LOAD FACTOR
Operating Rating: RF=2.19 =>71.0 metric tons Calculation Method: LOAD FACTOR
Permit Rating : PPPPP
Posting Load : Type 3: Legal Type 3S2: Legal Type 3-3: Legal

## DESCRIPTION ON STRUCTURE

Deck X-Section: (S) 1.00 ft br, 4.00 ft sw, 40.00 ft, 4.00 ft cu. med, 40.00 ft, 4.00 ft sw, 1.00 ft br (N).

Total Width: 28.7 m Net Width: 24.4 m No. of Lanes: 6 Speed: 45 mph
Min. Vertical Clearance: Unimpaired Overlay Thickness: 0.0 Inches

Rail Code: 1000

| Rail Type | Location | Length (ft) | Rail Modifications |
|---|---|---|---|
| Type 11 | Right/Left | 1120 | |

## DESCRIPTION UNDER STRUCTURE

Channel Description: RC vertical walls with sandy earth bottoms.

## 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

SCOPE AND ACCESS

This inspection was performed by walking on the bridge sidewalks, and under spans 1 and 4 of the superstructure. The water in the channel is about 2-2.5 feet deep and the channel bed is not firm spans 2 to 5, except the bike path under span 4. The substructure and the superstructure elements were not inspected in spans 2, 3 and 5. Access into the channel

## INSPECTION COMMENTARY

is from the north-west quadrant. All elements were visually inspected in span 1.

REVISIONS

RC-pile #227 ( 1 each) is added to the element table.

DECK AND ROADWAY

The curb of the southerly sidewalk exhibits few spalls with eba exposed and rusted

SAFE LOAD CAPACITY

A Structure Rating Summary Sheet, dated 05/10/2010, is on-file for this structure. The current rating is based on a BDS computer output, dated 11/30/1979 with zero AC overlay. While this report does not include a check of that analysis, it does verify that the structural conditions observed during this inspection are consistent with those assumed in that analysis.

## ELEMENT INSPECTION RATINGS AND NOTES

| Elem No. | Defect /Prot | Defect | Element Description | Env | Total Qty | Units | Qty in each Condition State St. 1 | St. 2 | St. 3 | St. 4 |
|---|---|---|---|---|---|---|---|---|---|---|
| 16 | | | Top Flange-RC | 2 | 4724 | sq.m | 4704 | 20 | 0 | 0 |
| | 1080 | | Delamination/Spall/Patched Area | 2 | 5 | | 0 | 5 | 0 | 0 |
| | 1120 | | Efflorescence/Rust Staining | 2 | 15 | | 0 | 15 | 0 | 0 |
| | 521 | | Concrete Coat.(Meth/Paint/Seal) | 2 | 4016 | sq.m | 4016 | 0 | 0 | 0 |
| (16-1080) There are few scattered sound patched areas 1 foot X 1 foot in many locations. | | | | | | | | | | |
| (16-1120) The soffit at the closure pour between the two box girders exhibits few transverse cracks with white efflorescence at span 4. | | | | | | | | | | |
| (16-521) There were no significant defects noted. | | | | | | | | | | |
| 104 | | | Box Girder-PS Conc. | 2 | 329 | m | 329 | 0 | 0 | 0 |
| (104) There were no significant defects noted. | | | | | | | | | | |
| 210 | | | Pier Wall-RC | 2 | 118 | m | 116 | 2 | 0 | 0 |
| | 1130 | | Cracking (RC and Other) | 2 | 2 | | 0 | 2 | 0 | 0 |
| (210-1130) Pier wall 4 exhibits few vertical cracks up to 0.05 inches wide. | | | | | | | | | | |
| 215 | | | Abutment-RC | 2 | 74 | m | 74 | 0 | 0 | 0 |
| (215) Monolithic wingwalls are included in the total quantity. | | | | | | | | | | |
| 227 | | | Pile-RC | 2 | 1 | ea. | 1 | 0 | 0 | 0 |
| (227) | | | | | | | | | | |

## ELEMENT INSPECTION RATINGS AND NOTES

| Elem No. | Defect /Prot | Defect | Element Description | Env | Total Qty | Units | Qty in each Condition State St. 1 | St. 2 | St. 3 | St. 4 |
|---|---|---|---|---|---|---|---|---|---|---|
| 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. | | | | | | | | | | |
| 303 | | | Joint-Assembly w/ Seal | 2 | 58 | m | 57 | 0 | 0 | 1 |
| | 2370 | | Metal Deter./Damage (Joints) | 2 | 1 | | 0 | 0 | 0 | 1 |
| (303-2370) The east joint at eastbound lane 1 is missing a section 2 feet long and 3 inches wide. | | | | | | | | | | |
| 312 | | | Bearing-Enclosed | 2 | 2 | each | 2 | 0 | 0 | 0 |
| (312) The bearing element is included to indicate the presence of bearings on this structure. The bearings were not exposed for visual inspection. No indication of bearing distress was noted in any substructure element. | | | | | | | | | | |
| 333 | | | Railing-Other | 2 | 330 | m | 320 | 9 | 1 | 0 |
| | 1080 | | Delamination/Spall/Patched Area | 2 | 5 | | 0 | 4 | 1 | 0 |
| | 1130 | | Cracking (RC and Other) | 2 | 5 | | 0 | 5 | 0 | 0 |

(333-1080)
The concrete portion of the south rail exhibits two spalls +/- 12 inches X 10 inches X 1.5 inches with rebar exposed and rusted at 10 feet east of the west end at span 1.

The concrete portion of the north rail exhibits few spalls and unsound spalls +/- 5 inches X 5 inches in many locations especially at spans 1 & 2.

(333-1130)
The concrete portion of the rails exhibits few vertical cracks up to 0.05 inches wide.

## WORK RECOMMENDATIONS

RecDate: 01/27/2017
Action : Joints-Repair/Clean
Work By: LOCAL AGENCY
Status : PROPOSED

EstCost:
StrTarget: 1 YEAR
DistTarget:
EA:

The east joint at eastbound lane 1 is missing a section 2 feet long and 3 inches wide.

Team Leader : Ashraf Shenouda

Report Author : Ashraf Shenouda

Inspected By : A.Shenouda/KD.Henderson

7-25-17

Ashraf Shenouda (Registered Civil Engineer) (Date)

# STRUCTURE INVENTORY AND APPRAISAL REPORT

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

(1) STATE NAME- CALIFORNIA 069
(8) STRUCTURE NUMBER **55C0344**
(5) INVENTORY ROUTE(ON/UNDER)- ON 140000000
(2) HIGHWAY AGENCY DISTRICT 12
(3) COUNTY CODE 059 (4) PLACE CODE 00000
(6) FEATURE INTERSECTED- SANTA ANA RIVER CHANNEL
(7) FACILITY CARRIED- ADAMS AVENUE
(9) LOCATION- 0.5 MI E/O BROOKHURST ST
(11) MILEPOINT/KILOMETERPOINT 0
(12) BASE HIGHWAY NETWORK- PART OF NET 1
(13) LRS INVENTORY ROUTE & SUBROUTE 000000000000
(16) LATITUDE 33 DEG 40 MIN 20.34 SEC
(17) LONGITUDE 117 DEG 56 MIN 45.94 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 1977
(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 39000
(30) YEAR OF ADT 2010 (109) TRUCK ADT 2 %
(19) BYPASS, DETOUR LENGTH 3 KM

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

(48) LENGTH OF MAXIMUM SPAN 36.0 M
(49) STRUCTURE LENGTH 164.6 M
(50) CURB OR SIDEWALK: LEFT 1.2 M RIGHT 1.2 M
(51) BRIDGE ROADWAY WIDTH CURB TO CURB 24.4 M
(52) DECK WIDTH OUT TO OUT 28.7 M
(32) APPROACH ROADWAY WIDTH (W/SHOULDERS) 24.4 M
(33) BRIDGE MEDIAN- CLOSED NON-MOUNTABLE 3
(34) SKEW 14 DEG (35) STRUCTURE FLARED NO
(10) INVENTORY ROUTE MIN VERT CLEAR 99.99 M
(47) INVENTORY ROUTE TOTAL HORIZ CLEAR 12.2 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 = 91.5
STATUS
HEALTH INDEX 99.8
PAINT CONDITION INDEX = N/A

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

(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 - PART OF NET 1
(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 8
(62) CULVERTS N

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

(31) DESIGN LOAD- MS-18 OR HS-20 5
(63) OPERATING RATING METHOD- LOAD FACTOR 1
(64) OPERATING RATING- 71.0
(65) INVENTORY RATING METHOD- LOAD FACTOR 1
(66) INVENTORY RATING- 32.4
(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 7
(68) DECK GEOMETRY 5
(69) UNDERCLEARANCES, VERTICAL & HORIZONTAL N
(71) WATER ADEQUACY 8
(72) APPROACH ROADWAY ALIGNMENT 8
(36) TRAFFIC SAFETY FEATURES 1000
(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 90704
(115) YEAR OF FUTURE ADT 2038

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

(90) INSPECTION DATE 01/17 (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)

# SANTA ANA-DELHI CHANNEL

0.1 MI S/O BRISTOL STREET 01/27/2017 [AAAH] 55C0205

103 - PHOTO-Deck-Details

Photo No. 1

Ac thickness at the west sdie is almost 9 inches.

103 - PHOTO-Deck-Details

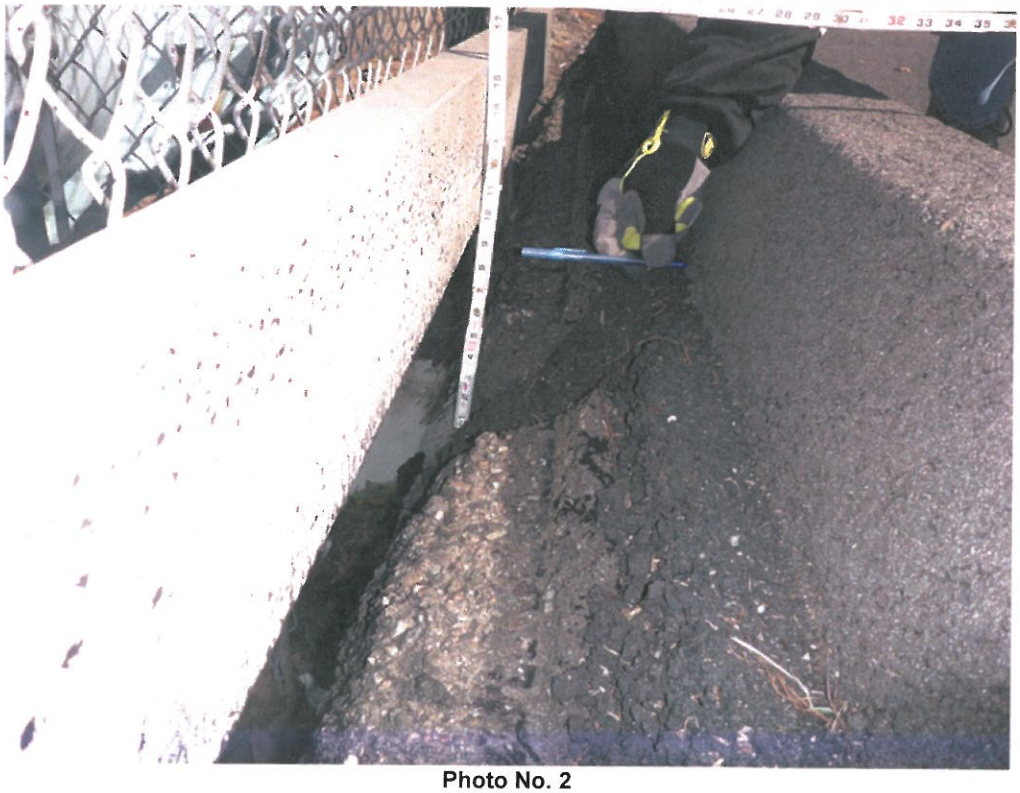

Photo No. 2

Ac thickness at the west sdie is almost 9 inches.

# SANTA ANA-DELHI CHANNEL

0.1 MI S/O BRISTOL STREET 01/27/2017 [AAAH] 55C0205

114 - PHOTO-Sub-Details

Photo No. 3

Spall 12" X8" X 1.5 at teh west face of the bog girder at mid-span.

107 - PHOTO-Super-Damage/Deteroration

Photo No. 4

Spall 12" X8" X 1.5 at teh west face of the bog girder at mid-span.

# SANTA ANA-DELHI CHANNEL

0.1 MI S/O BRISTOL STREET 01/27/2017 [AAAH] 55C0205

107 - PHOTO-Super-Damage/Deteroration

Photo No. 5

135 - PHOTO-Routine-Underside View

Photo No. 6

Underside View looking South

# SANTA ANA-DELHI CHANNEL

0.1 MI S/O BRISTOL STREET 01/27/2017 [AAAH] 55C0205

135 - PHOTO-Routine-Underside View

Photo No. 7

Underside View looking South

135 - PHOTO-Routine-Underside View

Photo No. 8

Underside View looking South

# SANTA ANA-DELHI CHANNEL

0.1 MI S/O BRISTOL STREET 01/27/2017 [AAAH] 55C0205

114 - PHOTO-Sub-Details

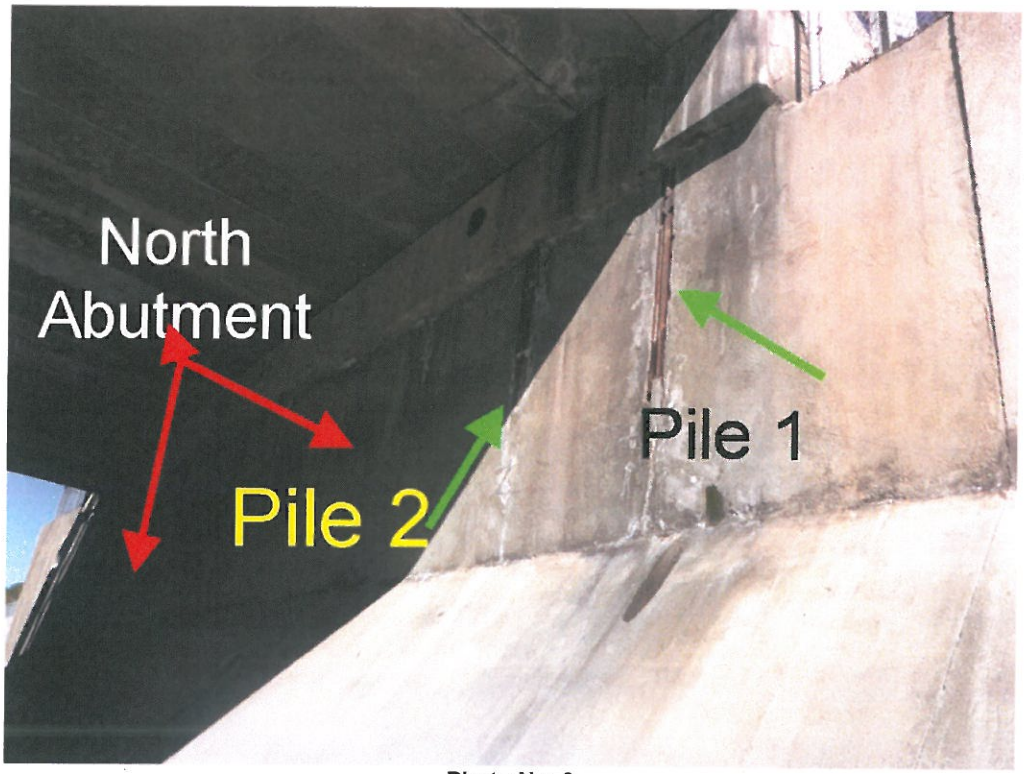


Photo No. 9

North Abutment has two piles are visible at the east side.

# SANTA ANA RIVER (ADAMS AVE)

0.5 MI E/O BROOKHURST ST 01/27/2017 [AAAJ] 55C0344

101 - PHOTO-Routine-Elevation View

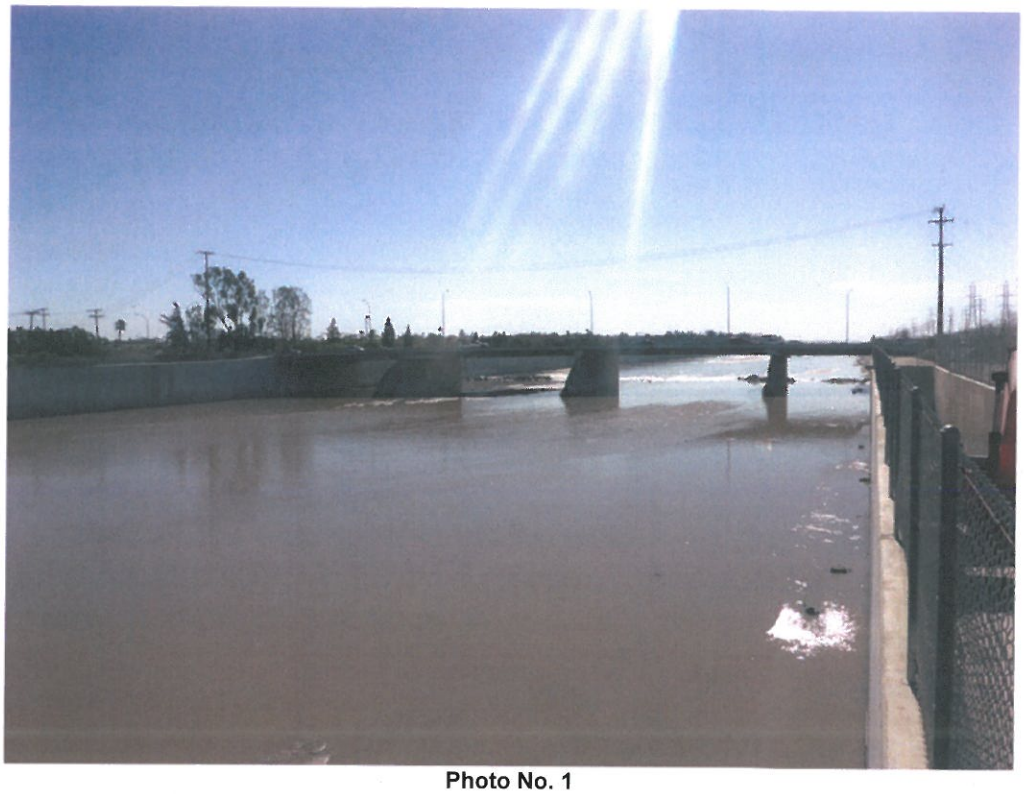

Photo No. 1

Elevation View looking South

101 - PHOTO-Routine-Elevation View

Photo No. 2

Elevation View looking North-East

# SANTA ANA RIVER (ADAMS AVE)

0.5 MI E/O BROOKHURST ST 01/27/2017 [AAAJ] 55C0344

119 - PHOTO-Rail-Damage/Deterioration


Photo No. 3

South rail has 2 spalls 12"X10"X 1.5 at 10 ft from the west end.

119 - PHOTO-Rail-Damage/Deterioration

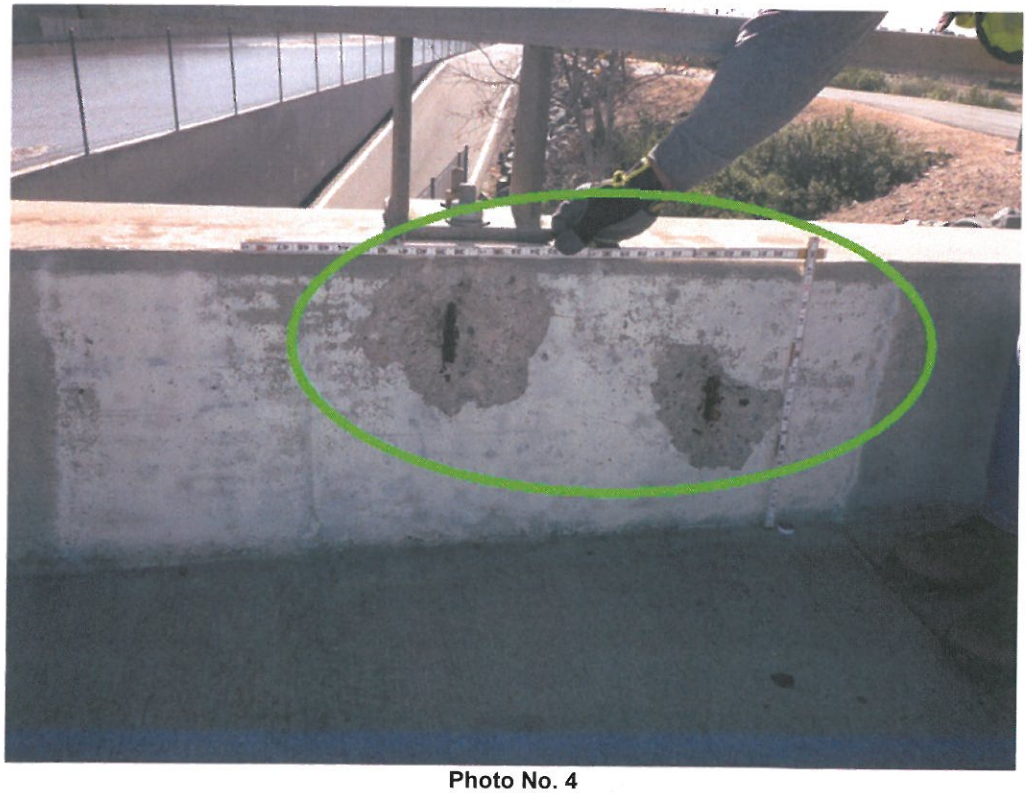

Photo No. 4

South rail has 2 spalls 12"X10"X 1.5 at 10 ft from the west end.

# SANTA ANA RIVER (ADAMS AVE)

0.5 MI E/O BROOKHURST ST 01/27/2017 [AAAJ] 55C0344

124 - PHOTO-Joint-Damage/Deterioration

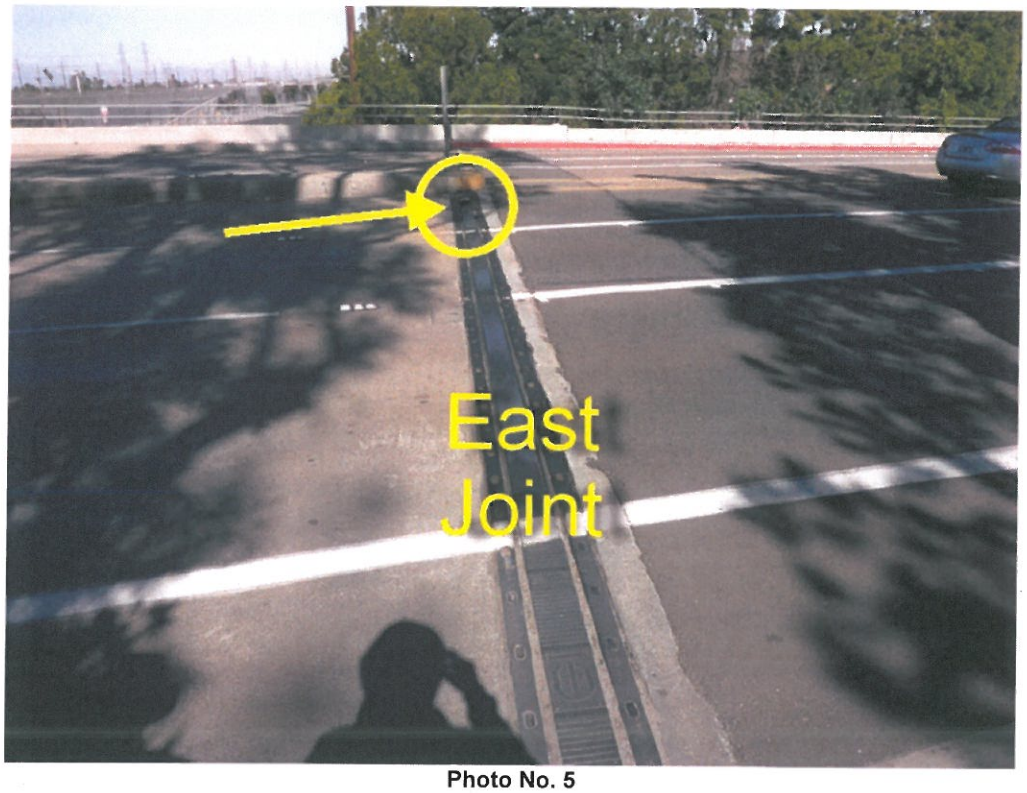


Photo No. 5

East joint is missing 2 feet section at EB lane 1.

124 - PHOTO-Joint-Damage/Deterioration


Photo No. 6

East joint is missing 2 feet section at EB lane 1.

# SANTA ANA RIVER (ADAMS AVE)

0.5 MI E/O BROOKHURST ST 01/27/2017 [AAAJ] 55C0344

124 - PHOTO-Joint-Damage/Deterioration

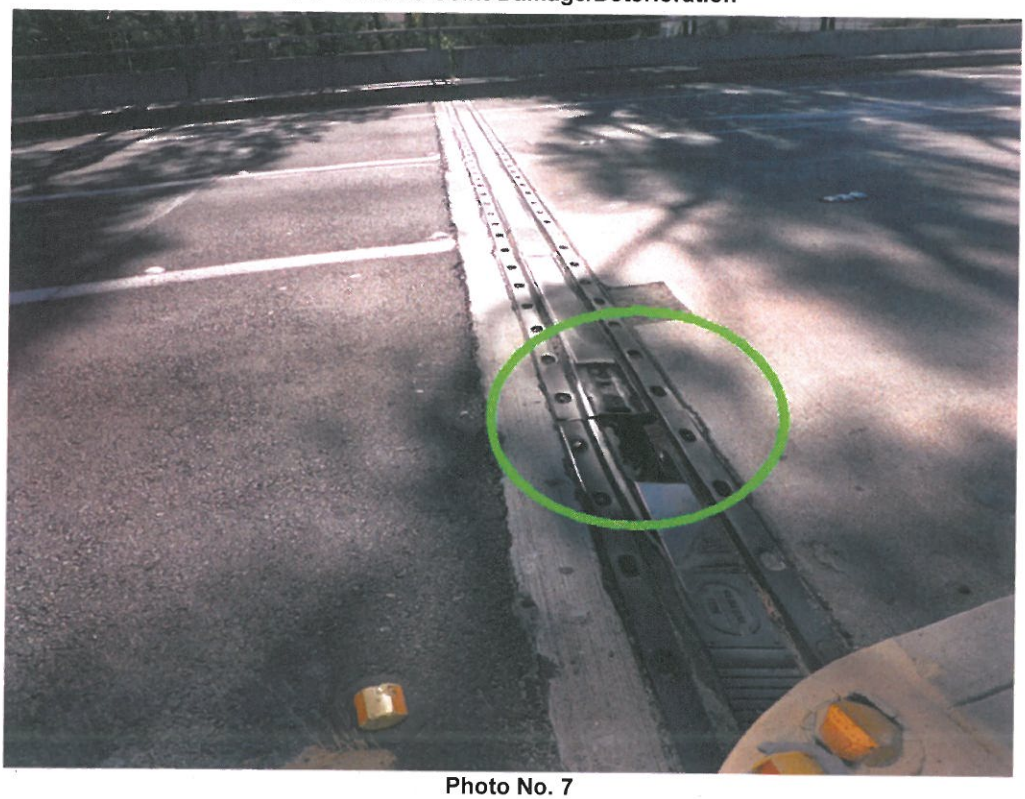

Photo No. 7

East joint is missing 2 feet section at EB lane 1.

102 - PHOTO-Deck-Damage/Deterioration

Photo No. 8

Soffit between the 2 box girders has transvsre cracks with white efflorescence at span 4.

# SANTA ANA RIVER (ADAMS AVE)

0.5 MI E/O BROOKHURST ST 01/27/2017 [AAAJ] 55C0344

135 - PHOTO-Routine-Underside View

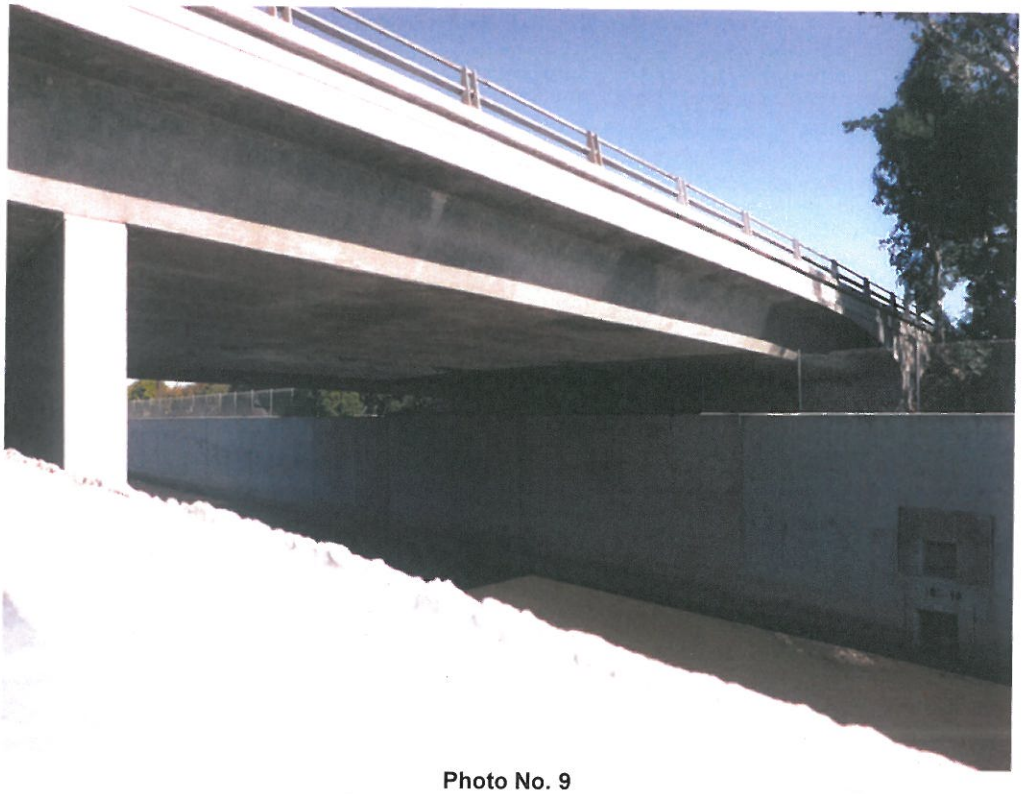

Photo No. 9
Underside View looking East

102 - PHOTO-Deck-Damage/Deterioration

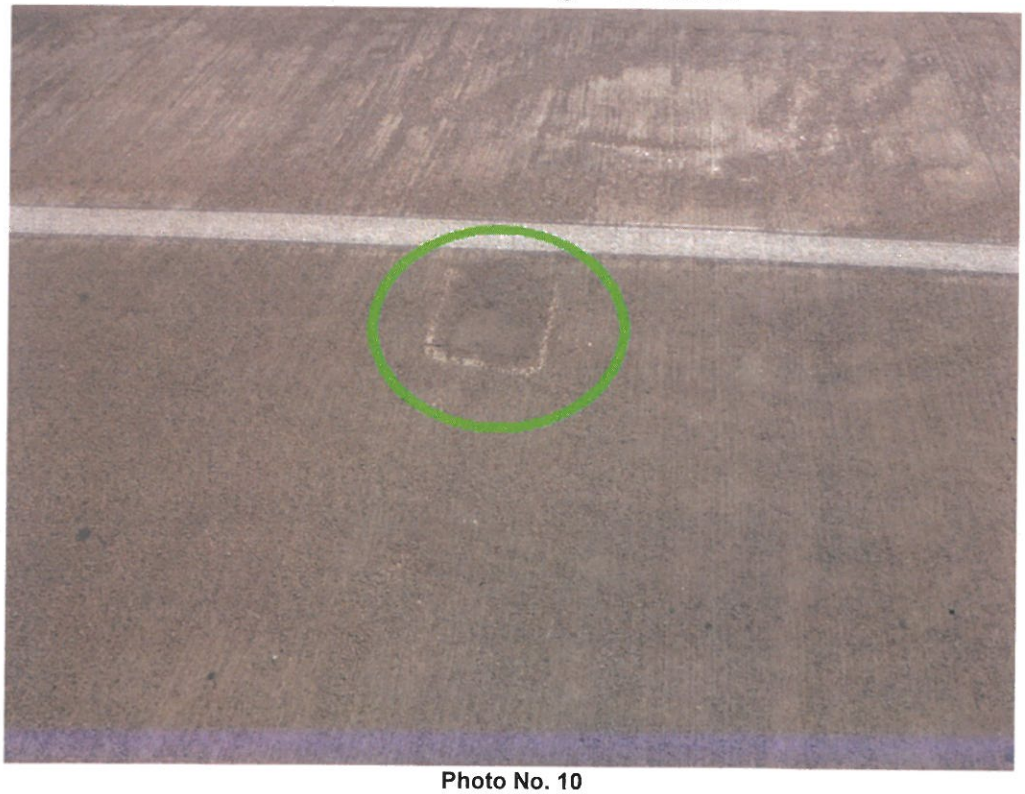

Photo No. 10
Sound patched spalls 1 ft X 1 ft in many locations.

# SANTA ANA RIVER (ADAMS AVE)

0.5 MI E/O BROOKHURST ST 01/27/2017 [AAAJ] 55C0344

119 - PHOTO-Rail-Damage/Deterioration

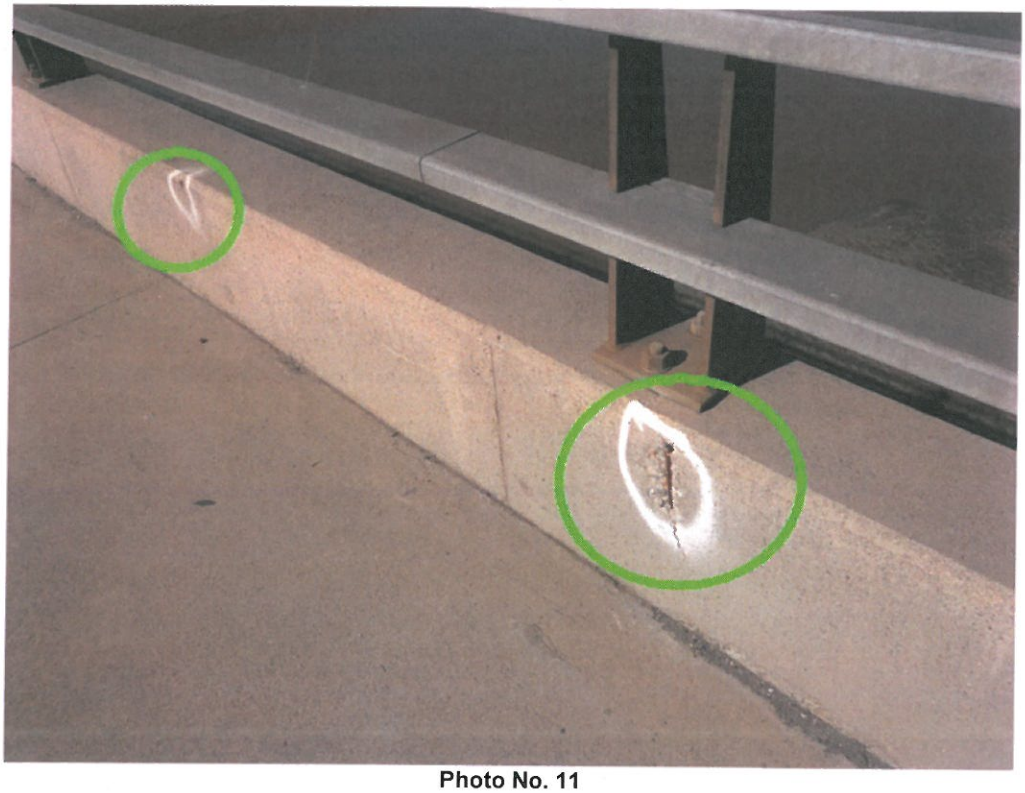

Photo No. 11

The north rail exhibits few spalls 5 inches 5 inches X 1 inches in many locations.