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: 55C0572

Bridge Name: Santa Ana Delhi Channel **Year Built:** 1988

Facility Carried: Irvine Avenue

The Santa Ana Delhi Channel Bridge at Irvine Avenue is a reinforced concrete triple box culvert.

Caltrans BIR recommendations:

- None

Field Inspection Observations

- Diagonal cracks on pier nosing.
- Efflorescence visible on bridge soffit (photo 4). Difficult to determine source of water due to cover and AC on deck.

Maintenance Needs Assessment

BPMP Assessment

- Efflorescence likely from water penetrating through deck. Not significant problem at this time and no action recommended. To repair will require deck AC and fill removal, deck treatment, and replacing fill and AC. Condition of soffit should be monitored for continued deterioration.

General Maintenance – Non-BPMP

- Monitor cracks on pier nose. Epoxy seal if condition worsens.

Proposed BPMP Construction Costs

- If deck seal project initiated, cost likely exceeds $200,000.

Construction Items Not Funded by BPMP

- N/A

APPENDIX A

Photos and BIR

Photo 1:

Photo 2:

Photo 3:

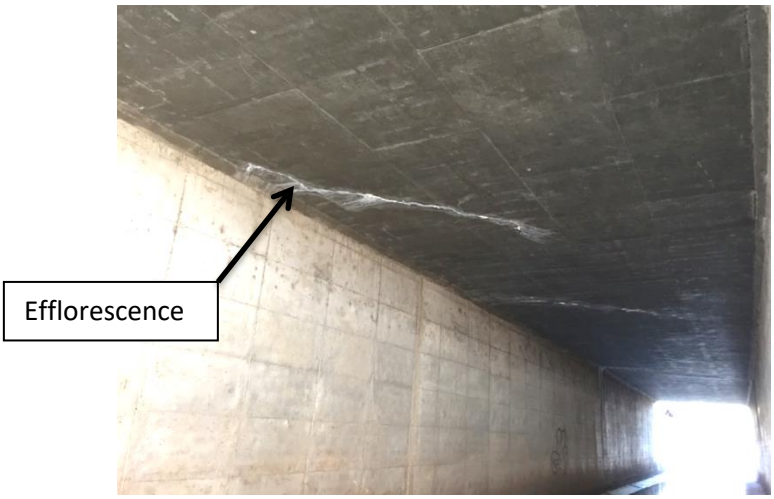

Photo 4: Bridge Soffit

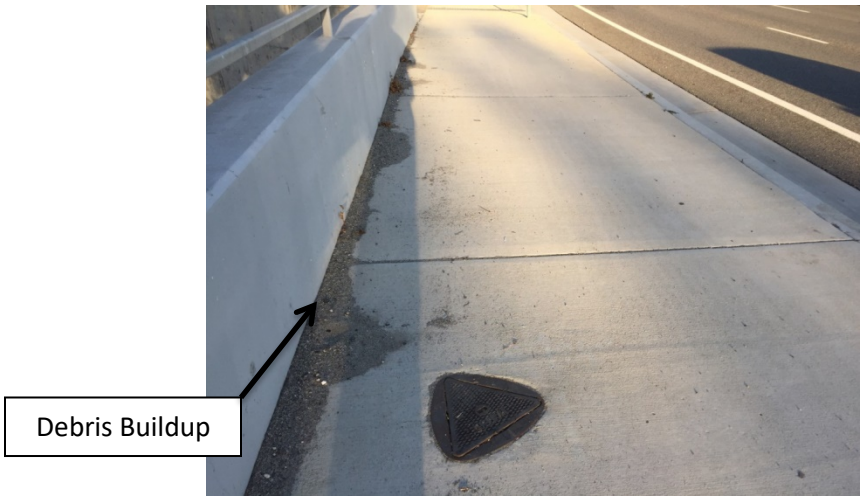

Photo 5: Sidewalk

Photo 6:

DEPARTMENT OF TRANSPORTATION
Structure Maintenance & Investigations

Bridge Number : 55C0572
Facility Carried: IRVINE AVENUE
Location : 0.4 MI SW/O BRISTOL ST.
City :
Inspection Date : 12/09/2014

Bridge Inspection Report

Inspection Type

Routine	FC	Underwater	Special	Other
X				

STRUCTURE NAME: SANTA ANA DELHI CHANNEL

CONSTRUCTION INFORMATION

Year Built : 1988
Year Widened: N/A
Length (m) : 22.3

Skew (degrees): 38
No. of Joints : 0
No. of Hinges : 0

Structure Description: Triple 5.5 m W x 4.6 m H x 45.7 m L RC box culvert (grade top) beneath 1.5 m of earth fill.

Span Configuration : (W) 3 @ 5.5 m (E) clear, normal

SAFE LOAD CAPACITY AND RATINGS

Design Live Load: UNKNOWN
Inventory Rating: RF=1.00 =>32.4 metric tons Calculation Method: FIELD EVAL/ENG JUDGMENT
Operating Rating: RF=1.67 =>54.1 metric tons Calculation Method: FIELD EVAL/ENG JUDGMENT
Permit Rating : PPPPP
Posting Load : Type 3: Legal Type 3S2: Legal Type 3-3: Legal

DESCRIPTION ON STRUCTURE

Deck X-Section: (S) 0.3 m br, 2.8 m sw, 11.6 m, 3.75 m med, 11.5 m, 2.9 m sw, 0.3 m br (N)

Total Width: 45.1 m Net Width: 30.3 m No. of Lanes: 6 Speed: 50 mph
Min. Vertical Clearance: Unimpaired

Rail Code: 0000 Rail Description: Concrete type 26 mod.

DESCRIPTION UNDER STRUCTURE

Channel Description: RC rectangular.

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
Access into the channel in from northwest quadrant the channel was dry at time of inspection. All elements were inspected.

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
241			Culvert-RC	2	138	m	126	6	6	0
	1120		Efflorescence/Rust Staining	2	6		0	0	6	0
	1130		Cracking (RC and Other)	2	6		0	6	0	0

(241-1120)
There are 2 longitudinal cracks in the soffit of every barrel with light brown efflorescence.

(241-1130)
There are 1 mm wide vertical cracks in the walls as fallow 1 crack in wall # 1, 3 cracks in wall # 3, and 6 cracks in wall #3.

331			Railing-RC	2	45	m	39	6	0	0

(331)
There were no significant defects noted.

WORK RECOMMENDATIONS - NONE

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Inspected By : MT.Zaarour/KD.Henderson

Mikhael T. Zaarour (Registered Civil Engineer) 12/15/14 (Date)

STRUCTURE INVENTORY AND APPRAISAL REPORT

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

(1) STATE NAME- CALIFORNIA 069
(8) STRUCTURE NUMBER **55C0572**
(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 DELHI CHANNEL
(7) FACILITY CARRIED- IRVINE AVENUE
(9) LOCATION- 0.4 MI SW/O BRISTOL ST.
(11) MILEPOINT/KILOMETERPOINT 0
(12) BASE HIGHWAY NETWORK- NOT ON NET 0
(13) LRS INVENTORY ROUTE & SUBROUTE
(16) LATITUDE 33 DEG 39 MIN 35.67 SEC
(17) LONGITUDE 117 DEG 52 MIN 52.73 SEC
(98) BORDER BRIDGE STATE CODE % SHARE %
(99) BORDER BRIDGE STRUCTURE NUMBER

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

(43) STRUCTURE TYPE MAIN:MATERIAL- CONCRETE
TYPE- CULVERT CODE 119
(44) STRUCTURE TYPE APPR:MATERIAL- OTHER/NA
TYPE- OTHER/NA CODE 000
(45) NUMBER OF SPANS IN MAIN UNIT 3
(46) NUMBER OF APPROACH SPANS 0
(107) DECK STRUCTURE TYPE- NOT APPLICABLE CODE N
(108) WEARING SURFACE / PROTECTIVE SYSTEM:
A) TYPE OF WEARING SURFACE- NOT APPLICABLE CODE N
B) TYPE OF MEMBRANE- NOT APPLICABLE CODE N
C) TYPE OF DECK PROTECTION- NOT APPLICABLE CODE N

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

(27) YEAR BUILT 1988
(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 18000
(30) YEAR OF ADT 2009 (109) TRUCK ADT 1 %
(19) BYPASS, DETOUR LENGTH 2 KM

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

(48) LENGTH OF MAXIMUM SPAN 5.5 M
(49) STRUCTURE LENGTH 22.3 M
(50) CURB OR SIDEWALK: LEFT 2.4 M RIGHT 0.0 M
(51) BRIDGE ROADWAY WIDTH CURB TO CURB 30.3 M
(52) DECK WIDTH OUT TO OUT 45.1 M
(32) APPROACH ROADWAY WIDTH (W/SHOULDERS) 30.3 M
(33) BRIDGE MEDIAN- CLOSED (NO BARRIER) 2
(34) SKEW 38 DEG (35) STRUCTURE FLARED NO
(10) INVENTORY ROUTE MIN VERT CLEAR 99.99 M
(47) INVENTORY ROUTE TOTAL HORIZ CLEAR 30.3 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

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SUFFICIENCY RATING = 95.3
STATUS
HEALTH INDEX 95.6
PAINT CONDITION INDEX = N/A

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

(112) NBIS BRIDGE LENGTH- YES Y
(104) HIGHWAY SYSTEM- NOT ON NHS 0
(26) FUNCTIONAL CLASS- MINOR ARTERIAL URBAN 16
(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 N
(59) SUPERSTRUCTURE N
(60) SUBSTRUCTURE N
(61) CHANNEL & CHANNEL PROTECTION 9
(62) CULVERTS 7

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

(31) DESIGN LOAD- UNKNOWN 0
(63) OPERATING RATING METHOD- FIELD EVAL/ENG JUD 0
(64) OPERATING RATING- 54.1
(65) INVENTORY RATING METHOD- FIELD EVAL/ENG JUD 0
(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 9
(69) UNDERCLEARANCES, VERTICAL & HORIZONTAL N
(71) WATER ADEQUACY 9
(72) APPROACH ROADWAY ALIGNMENT 7
(36) TRAFFIC SAFETY FEATURES 0000
(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 26553
(115) YEAR OF FUTURE ADT 2031

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

(90) INSPECTION DATE 12/14 (91) FREQUENCY 48 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)