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: 55C0122

Bridge Name: Brea Canyon Channel **Year Built:** 1930

Facility Carried: Brea Canyon BLVD

The Brea Canyon Channel at Brea Canyon Boulevard is a continuous 2-span cast-in-place reinforced concrete deck slab supported by strutted abutments supported by pile foundations.

Caltrans BIR recommendations:

- Repair Spalls
- Repair damaged rail.
- Remove overgrown vegetation.

Field Inspection Observations

- Confirmed that the concrete railing has been damaged (photo 1).
- Soffit efflorescence visible. This is indicative of water seepage through deck cracks (photo 2).
- Excessive AC on deck, which will reduce load capacity and long-term bridge health. Recommend no additional AC overlay, and County may consider removing some of the AC.
- Exposed rebar on girder soffit (photo 2).
- Vegetation overgrowth in channel and on Pier 2.
- Bird nests visible on bridge overhang (photo 3 and 4). Work may need to take place outside the bird-nesting season.

Maintenance Need Assessment

BPMP Assessment

- N/A – No eligible maintenance activities

General Maintenance – Non-BPMP

- Recommend patching spalls in concrete baluster railings.
- Efflorescence likely from water penetrating through deck. Recommend sealing deck. Not significant problem at this time. To repair will require deck AC removal, deck treatment, and grinding approach AC to conform to lower deck elevation.
- Recommend patching spalled concrete for exposed rebar on girder soffit.
- Recommend clearing and grubbing overgrown vegetation in channel and Pier 2.

Proposed BPMP Construction Costs

- N/A

Construction Items Not Funded by BPMP

- Bridge barrier repair likely not eligible for BPMP funding since the repair work will not bring railing up to current standards. Cost to repair delaminated barrier and soffit concrete and patch ≈$35,000 (includes engineering, traffic control, mobilization and contingency)
- Clearing and Grubbing
- Deck sealing not critical at this time.

APPENDIX A

Photos and BIR

Photo 1:

Photo 2: Barrier

Photo 3: Bridge Soffit

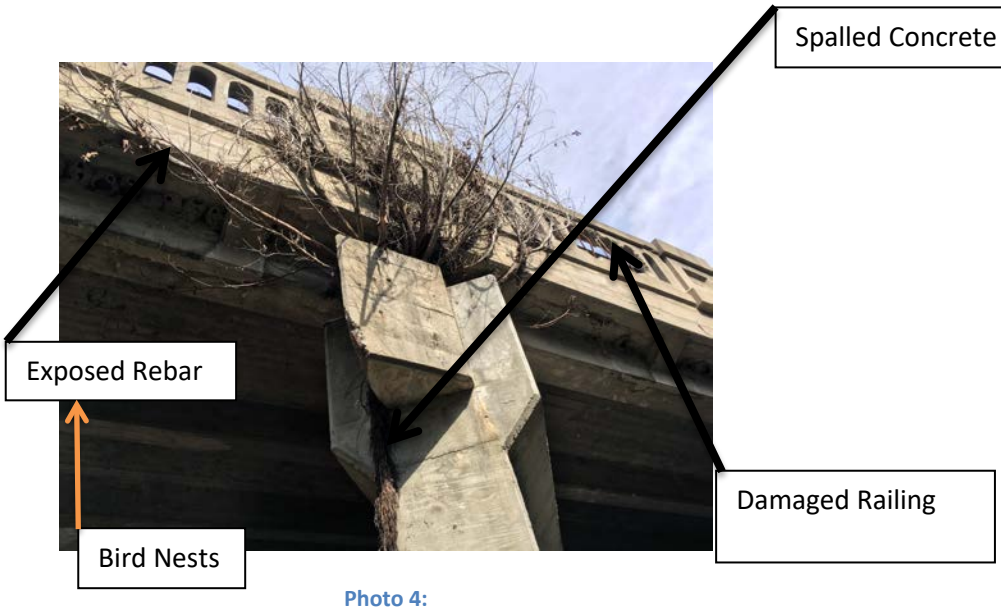

Photo 4:

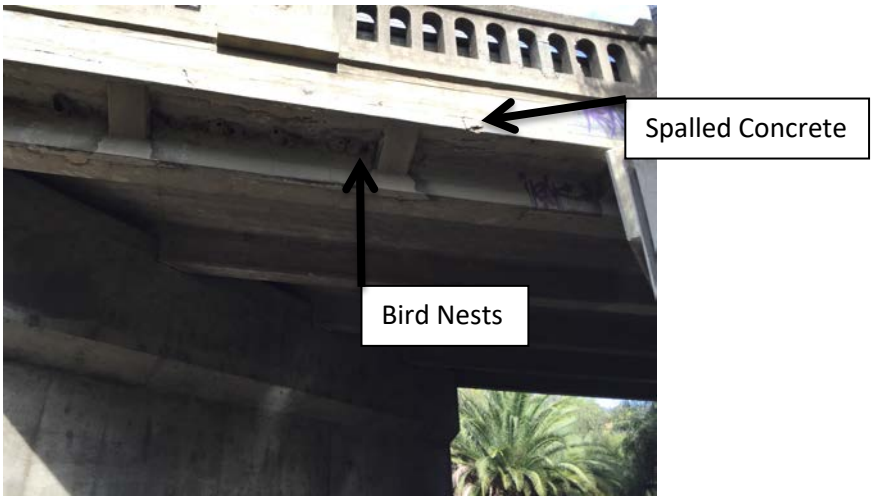

Photo 5:

Photo 6:

Photo 7:

Photo 8:

DEPARTMENT OF TRANSPORTATION
Structure Maintenance & Investigations

Bridge Number : 55C0122
Facility Carried: BREA CANYON BLVD.
Location : 0.6 MI N/O CENTRAL AVENU
City :
Inspection Date : 10/02/2015

Inspection Type

Routine	FC	Underwater	Special	Other
X				

Bridge Inspection Report

STRUCTURE NAME: BREA CANYON CHANNEL

CONSTRUCTION INFORMATION

Year Built : 1930
Year Widened: N/A
Length (m) : 18.9

Skew (degrees): 45
No. of Joints : 0
No. of Hinges : 0

Structure Description: Simply supported 2-span CIP/RC T-beam (5 each) with an RC pier wall and with RC open end diaphragm abutments, all supported upon concrete piles.

Span Configuration : (W) 2 @ 9.1 m (E) c/c

SAFE LOAD CAPACITY AND RATINGS

Design Live Load: M-13.5 OR H-15
Inventory Rating: RF= 0.64 Calculation Method: (LRFR) LD & RES FACT RATING
Operating Rating: RF= 0.83 Calculation Method: (LRFR) LD & RES FACT RATING
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, 0.2 m cu, 9.2 m, 0.2 m cu, 0.3 m br (N)
Total Width: 10.1 m Net Width: 9.1 m No. of Lanes: 2 Speed: 55 mph
Min. Vertical Clearance: Unimpaired Overlay Thickness: 3.0 Inches

Rail Code: 0000

Rail Type	Location	Length (ft)	Rail Modifications
Concrete Baluster	Right/Left	190	

DESCRIPTION UNDER STRUCTURE

Channel Description: Natural earth trapezoidal, RC rectangular through the site.

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
The inspection was performed by walking on and under the bridge. There was about 1' of water in both spans; all elements were visually inspected. There is no shoulder and access to under the bridge was from northwest quadrant.

INSPECTION COMMENTARY

SUBSTRUCTURE

There was a tree growing at the top of the southside pier wall. And there was three vertical cracks in the wall.

SAFE LOAD CAPACITYA

Load Rating Summary Sheet dated 8/28/2015 is on file for this structure. 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. The current rating is based on LRFR calculation.

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	190	sq.m	190	0	0	0
	510		Deck Wearing Surface-Asphalt	2	174	sq.m	124	0	50	0
		3220	Cracking-AC (WS)	2	50		0	0	50	0

(16)
There were no significant defects noted.

(16-510-3220)
There are 5 transverse cracks 0.5" wide and across the roadway.

110			Girder/Beam-RC	2	95	m	95	0	0	0

(110)
There were no significant defects noted.

210			Pier Wall-RC	2	14	m	14	0	0	0

(210)
There were no significant defects noted.

215			Abutment-RC	2	36	m	36	0	0	0

(215)
There were no significant defects noted.

227			Pile-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.

256			Slope Protection	2	2	ea.	2	0	0	0

(256)
There were no significant defects noted.

331			Railing-RC	2	29	m	9	15	4	1
	1080		Delamination/Spall/Patched Area	2	20		0	15	4	1

(331-1080)
Most rail balusters have been cracked or spalled in both rail side. the end concrete rail post at the northwest quadrant is broken.

WORK RECOMMENDATIONS

WORK RECOMMENDATIONS

RecDate: 05/06/2010 Action : Railing-Repair Work By: LOCAL AGENCY Status : PROPOSED	EstCost: StrTarget: 2 YEARS DistTarget: EA:		Repair the spalls (100 mm x 75 mm x 20 mm) in both side of concrete baluster railings.
RecDate: 05/30/2007 Action : Railing-Repair Work By: LOCAL AGENCY Status : PROPOSED	EstCost: StrTarget: 2 YEARS DistTarget: EA:		Repair the damaged rail. The west end post of north is damaged; there was 1" wide vertical cracks from top to the bottom of footing. It may cause by vehicular hit. There are about 56 cracks or spalls in the concrete baluster railings.

Team Leader : Mikhael T. Zaarour

Report Author : Mikhael T. Zaarour

Inspected By : MT.Zaarour / DH.Kim

Mikhael T. Zaarour (Registered Civil Engineer) 2/24/16 (Date)

STRUCTURE INVENTORY AND APPRAISAL REPORT

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

(1) STATE NAME- CALIFORNIA 069
(8) STRUCTURE NUMBER **55C0122**
(5) INVENTORY ROUTE(ON/UNDER)- ON 140000000
(2) HIGHWAY AGENCY DISTRICT 12
(3) COUNTY CODE 059 (4) PLACE CODE 00000
(6) FEATURE INTERSECTED- BREA CANYON CHANNEL
(7) FACILITY CARRIED- BREA CANYON BLVD.
(9) LOCATION- 0.6 MI N/O CENTRAL AVENUE
(11) MILEPOINT/KILOMETERPOINT 0
(12) BASE HIGHWAY NETWORK- NOT ON NET 0
(13) LRS INVENTORY ROUTE & SUBROUTE
(16) LATITUDE 33 DEG 56 MIN 23.13 SEC
(17) LONGITUDE 117 DEG 53 MIN 26.05 SEC
(98) BORDER BRIDGE STATE CODE % SHARE %
(99) BORDER BRIDGE STRUCTURE NUMBER

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

(43) STRUCTURE TYPE MAIN:MATERIAL- CONCRETE
TYPE- TEE BEAM CODE 104
(44) STRUCTURE TYPE APPR:MATERIAL- OTHER/NA
TYPE- OTHER/NA CODE 000
(45) NUMBER OF SPANS IN MAIN UNIT 2
(46) NUMBER OF APPROACH SPANS 0
(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 1930
(106) YEAR RECONSTRUCTED 0000
(42) TYPE OF SERVICE: ON- HIGHWAY 1
UNDER- WATERWAY 5
(28) LANES:ON STRUCTURE 02 UNDER STRUCTURE 00
(29) AVERAGE DAILY TRAFFIC 19000
(30) YEAR OF ADT 2009 (109) TRUCK ADT 2 %
(19) BYPASS, DETOUR LENGTH 2 KM

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

(48) LENGTH OF MAXIMUM SPAN 9.1 M
(49) STRUCTURE LENGTH 18.9 M
(50) CURB OR SIDEWALK: LEFT 0.2 M RIGHT 0.2 M
(51) BRIDGE ROADWAY WIDTH CURB TO CURB 9.1 M
(52) DECK WIDTH OUT TO OUT 10.1 M
(32) APPROACH ROADWAY WIDTH (W/SHOULDERS) 9.1 M
(33) BRIDGE MEDIAN- NO MEDIAN 0
(34) SKEW 45 DEG (35) STRUCTURE FLARED NO
(10) INVENTORY ROUTE MIN VERT CLEAR 99.99 M
(47) INVENTORY ROUTE TOTAL HORIZ CLEAR 9.1 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 = 61.1
STATUS
HEALTH INDEX 99.0
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 8
(59) SUPERSTRUCTURE 8
(60) SUBSTRUCTURE 8
(61) CHANNEL & CHANNEL PROTECTION 8
(62) CULVERTS N

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

(31) DESIGN LOAD- M-13.5 OR H-15 2
(63) OPERATING RATING METHOD- (LRFR) LD & RES FA 8
(64) OPERATING RATING- RF= 0.83
(65) INVENTORY RATING METHOD- (LRFR) LD & RES FA 8
(66) INVENTORY RATING- RF= 0.64
(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 5
(68) DECK GEOMETRY 3
(69) UNDERCLEARANCES, VERTICAL & HORIZONTAL N
(71) WATER ADEQUACY 9
(72) APPROACH ROADWAY ALIGNMENT 8
(36) TRAFFIC SAFETY FEATURES 0000
(113) SCOUR CRITICAL BRIDGES 8

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

(75) TYPE OF WORK- MISC STRUCTURAL WORK CODE 38
(76) LENGTH OF STRUCTURE IMPROVEMENT 18.9 M
(94) BRIDGE IMPROVEMENT COST $184,000
(95) ROADWAY IMPROVEMENT COST $36,800
(96) TOTAL PROJECT COST $309,120
(97) YEAR OF IMPROVEMENT COST ESTIMATE 2010
(114) FUTURE ADT 41217
(115) YEAR OF FUTURE ADT 2035

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

(90) INSPECTION DATE 10/15 (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)