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: 55C0017

Bridge Name: Santa Ana River Channel **Year Built:** 1970

Facility Carried: Lincoln Avenue

The Santa Ana River Channel at Lincoln Avenue is a continuous six span cast-in-place reinforced concrete T-beam with pier wall and open end diaphragm abutments supported on steel piles.

Caltrans BIR recommendations:

- Seal the deck cracks with methacrylate. However, OCPW stated the deck was sealed when the bridge was widened.

Field Inspection Observations

- Concrete at joint is spalling and small portion of joint seal bulging (photo 1). No action required at this time.
- Some efflorescence visible on soffit (photo 2). Deck appeared to be treated. No immediate action required. But the bridge soffit should continue to be monitored to determine if water is seeping through the bridge deck.

Maintenance Needs Assessment

BPMP Assessment

- N/A – No confirmed eligible maintenance activities

General Maintenance – Non-BPMP

- No recommendations.

Proposed BPMP Construction Costs

- N/A

Construction Items Not Funded by BPMP

- N/A

APPENDIX A

Photos and BIR

Photo 1:

Photo 2:

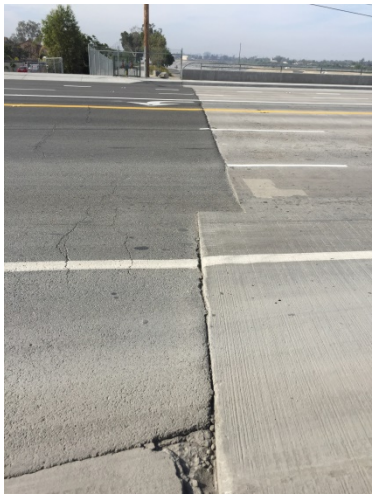

Photo 3:

Photo 4:

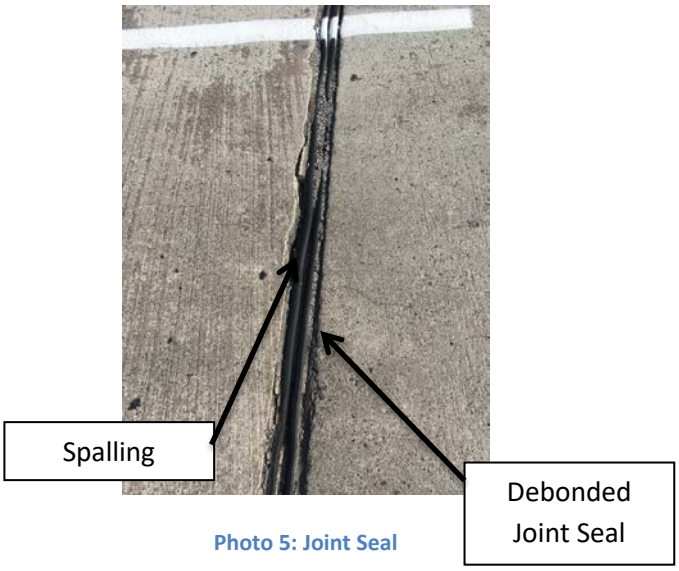

Photo 5: Joint Seal

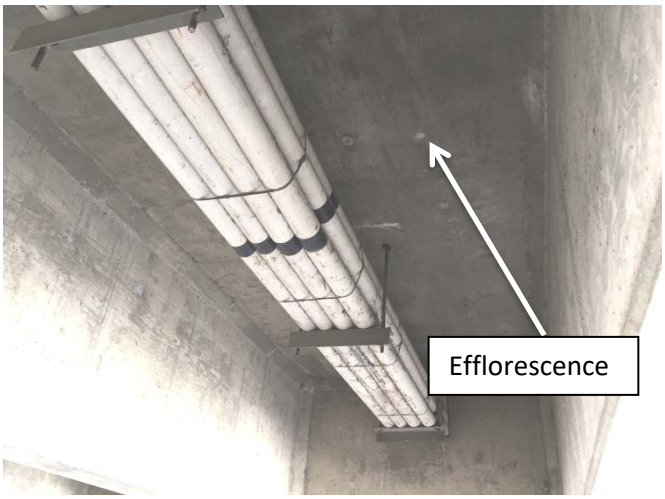

Photo 6: Bridge Soffit

DEPARTMENT OF TRANSPORTATION
Structure Maintenance & Investigations

Bridge Number : 55C0017
Facility Carried: LINCOLN AVENUE
Location : 0.7 MI E/O ROUTE 57 FWY.
City :
Inspection Date : 12/21/2013
Inspection Type
Routine FC Underwater Special Other
X

Bridge Inspection Report

STRUCTURE NAME: SANTA ANA RIVER CHANNEL

CONSTRUCTION INFORMATION

Year Built : 1970
Year Widened: N/A
Length (m) : 130.1
Skew (degrees): 8
No. of Joints : 1
No. of Hinges : 1

Structure Description: Continuous six span CIP/RC T-beam (8 each) with RC piers and RC open end diaphragm abutments, all supported upon steel piles.

Span Configuration : (W) 17.4 m, 4 @ 23.8 m, 17.4 m (E) c/c

SAFE LOAD CAPACITY AND RATINGS

Design Live Load: MS-18 OR HS-20
Inventory Rating: RF=1.71 =>55.4 metric tons Calculation Method: LOAD FACTOR
Operating Rating: RF=2.84 =>92.0 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) 0.1 m br, 9.6 m, 1.2 m cu med, 9.6 m, 0.1 m br (N)
Total Width: 20.4 m Net Width: 19.1 m No. of Lanes: 4 Speed: 45 mph
Min. Vertical Clearance: Unimpaired
Rail Code: 1000 Rail Description: MBGR. with CLF on top.

DESCRIPTION UNDER STRUCTURE

Channel Description: Natural earth trapezoidal with rock slope protection, grouted through the site.

INSPECTION COMMENTARY

HISTORY

The bridge currently is widening.

The previous condition was as follows

SCOPE AND ACCESS

There is 1 m of water in spans #2 down to 0.5 m in span #5.

MISCELLANEOUS

Photos of widening construction from both sides of this structure was taken and is included with this report.

DECK AND ROADWAY

There is a spall 150 mm x 50 mm x 15 mm with exposed steel bar in the deck at middle of the bridge on W/B lane #2.

INSPECTION COMMENTARY

There unsealed deck cracks 2 mm wide and 150 mm spacing and some of them developed small spall with steel bar exposed.

There are transverse crack in the soffit with whit efflorescence.

SUPERSTRUCTURE

There are shear cracks in the girder 0.5 mm wide near the supports.

SUBSTRUCTURE

No significant defects were found during this inspection.

SAFE LOAD CAPACITY

This rating summary is based on load ratings calculations performed by SMI Ratings Section on 11/20/1979. This summary does not include a check of that analysis.

ELEMENT INSPECTION RATINGS

Elem No.	Element Description	Env	Total Qty	Units	Qty in each Condition State St. 1	St. 2	St. 3	St. 4	St. 5
12	Concrete Deck - Bare	2	2490	sq.m.	0	2490	0	0	0
110	Reinforced Conc Open Girder/Beam	2	1040	m.	980	60	0	0	
210	Reinforced Conc Pier Wall	2	105	m.	105	0	0	0	0
215	Reinforced Conc Abutment	2	42	m.	42	0	0	0	0
256	Slope Protection	2	2	ea.	2	0	0	0	0
302	Compression Joint Seal	2	21	m.	21	0	0	0	0
312	Enclosed/Concealed Bearing	2	1	ea.	1	0	0	0	0
337	Metal Railing (W6X25 Posts)	2	280	m.	280	0	0	0	0
358	Deck Cracking	2	1	ea.	0	0	0	1	
359	Soffit of Concrete Deck or Slab	2	1	ea.	0	1	0	0	0

WORK RECOMMENDATIONS

RecDate: 05/30/2007
Action : Deck-Methacrylate
Work By: LOCAL AGENCY
Status : PROPOSED

EstCost:
StrTarget: 2 YEARS
DistTarget:
EA:

Seal the deck cracks with methacrylate.

Team Leader : Ashraf Shenouda

Report Author : Ashraf Shenouda

Inspected By : A.Shenouda/KD.Henderson

2/10/14

Ashraf Shenouda (Registered Civil Engineer) (Date)

STRUCTURE INVENTORY AND APPRAISAL REPORT

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

(1) STATE NAME- CALIFORNIA 069
(8) STRUCTURE NUMBER 55C0017
(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- LINCOLN AVENUE
(9) LOCATION- 0.7 MI E/O ROUTE 57 FWY.
(11) MILEPOINT/KILOMETERPOINT 0
(12) BASE HIGHWAY NETWORK- PART OF NET 1
(13) LRS INVENTORY ROUTE & SUBROUTE 000000L03100
(16) LATITUDE 33 DEG 50 MIN 07.64 SEC
(17) LONGITUDE 117 DEG 51 MIN 47.36 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 6
(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 1970
(106) YEAR RECONSTRUCTED 0000
(42) TYPE OF SERVICE: ON- HIGHWAY 1
UNDER- WATERWAY 5
(28) LANES:ON STRUCTURE 04 UNDER STRUCTURE 00
(29) AVERAGE DAILY TRAFFIC 28000
(30) YEAR OF ADT 2009 (109) TRUCK ADT 4 %
(19) BYPASS, DETOUR LENGTH 5 KM

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

(48) LENGTH OF MAXIMUM SPAN 23.8 M
(49) STRUCTURE LENGTH 130.1 M
(50) CURB OR SIDEWALK: LEFT 0.0 M RIGHT 0.0 M
(51) BRIDGE ROADWAY WIDTH CURB TO CURB 19.1 M
(52) DECK WIDTH OUT TO OUT 20.4 M
(32) APPROACH ROADWAY WIDTH (W/SHOULDERS) 21.6 M
(33) BRIDGE MEDIAN- NO MEDIAN 0
(34) SKEW 8 DEG (35) STRUCTURE FLARED NO
(10) INVENTORY ROUTE MIN VERT CLEAR 99.99 M
(47) INVENTORY ROUTE TOTAL HORIZ CLEAR 9.6 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 = 80.6
STATUS STRUCTURALLY DEFICIENT
HEALTH INDEX 93.6
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 - 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 3
(59) SUPERSTRUCTURE 6
(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- 92.0
(65) INVENTORY RATING METHOD- LOAD FACTOR 1
(66) INVENTORY RATING- 55.4
(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 6
(68) DECK GEOMETRY 6
(69) UNDERCLEARANCES, VERTICAL & HORIZONTAL N
(71) WATER ADEQUACY 9
(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 78311
(115) YEAR OF FUTURE ADT 2029

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

(90) INSPECTION DATE 12/13 (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)