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: 55C0168

Bridge Name: Handy Creek **Year Built:** 1937

Facility Carried: Amapola Avenue

The Handy Creek Bridge at Amapola Avenue is a simply supported two span timber stringers and timber deck with a timber treated post bent and a treated timber post abutment. All timber is treated Douglas fir.

Caltrans BIR recommendations:

- Replace the deteriorated timber planks.

Field Inspection Observations

- There is excessive AC on the bridge about 4"-6" thick. Recommend no additional AC overlay.
- Missing P-markers at the southeast end of bridge (photo).
- Debris builds up on pier. Recommend clearing debris from pier.
- There was limited access to the substructure due to 2-4ft of standing water.
- Unable to confirm if timber planks are deteriorating.

Maintenance Needs Assessment

BPMP Assessment

- Repair timber planks

General Maintenance – Non-BPMP

- Recommend additional AC thickness not increased. If new pavement is needed, existing pavement should be removed.

Proposed BPMP Construction Costs

- Replace timber planks ≈$25,000, will require existing AC to be removed and replaced (includes engineering, mobilization and contingency)

Construction Items Not Funded by BPMP

- Replace P-marker

APPENDIX A

Photos and BIR

Photo 1:

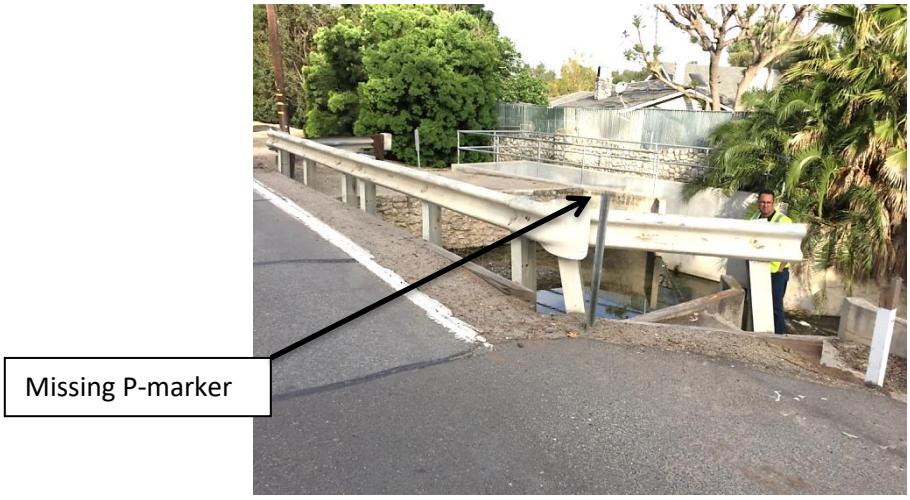

Photo 2: Bridge

Photo 3: Debris build up on timber columns

Photo 4:

DEPARTMENT OF TRANSPORTATION
Structure Maintenance & Investigations

Bridge Number : 55C0168
Facility Carried: AMAPOLA AVENUE
Location : 0.2 MI E/O ORANGE PK BLV
City :
Inspection Date : 08/07/2015

Bridge Inspection Report

Inspection Type
Routine FC Underwater Special Other
X

STRUCTURE NAME: HANDY CREEK

CONSTRUCTION INFORMATION

Year Built : 1937
Year Widened: N/A
Length (m) : 8.5
Skew (degrees): 0
No. of Joints : 0
No. of Hinges : 0

Structure Description: Simply supported two span timber stringers (19 each) and timber deck with a timber treated timber post (6 each) bent and a treated timber post (6 each) abutments, all supported upon treated timber sills. All timber treated Douglas Fir.

Span Configuration : (W) 2 @ 4.0 m (E) c/c

SAFE LOAD CAPACITY AND RATINGS

Design Live Load: UNKNOWN
Inventory Rating: RF=0.54 =>17.5 metric tons Calculation Method: ALLOWABLE STRESS
Operating Rating: RF=0.77 =>24.9 metric tons Calculation Method: ALLOWABLE STRESS
Permit Rating : OOOOO
Posting Load : Type 3: Legal Type 3S2: Legal Type 3-3: Legal

DESCRIPTION ON STRUCTURE

Deck X-Section: (S) 0.1 m br, 7.2 m, 0.1 m br (N)
Total Width: 7.3 m Net Width: 7.1 m No. of Lanes: 2 Speed: 25 mph
Min. Vertical Clearance: Unimpaired Overlay Thickness: 5.0 Inches
Rail Code: 0000

Rail Type	Location	Length (ft)	Rail Modifications
MBBR	Right/Left	56	

DESCRIPTION UNDER STRUCTURE

Channel Description: Natural earth trapezoidal upstream, RC rectangular with a check dam downstream.

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
There was about 2' deep stagnate water in the creek. All elements were visually inspected.

INSPECTION COMMENTARY

DECK AND ROADWAY
There was a (OM 3R) narrow sign road at the southwest corner and a (OM 1-3) road sign at the northeast corner.
There rail post were connected by 2 bolts one on each side.

SAFE LOAD CAPACITY
A load Rating Summary sheet was in BIRIS. The current load rating was based on calculations dated 5/25/2010.

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
31			Deck-Timber	2	60	sq.m	60	0	0	0
	510		Deck Wearing Surface-Asphalt	2	60	sq.m	50	0	10	0
		3220	Cracking-AC (WS)	2	10		0	0	10	0
(31) There were no significant defects noted.										
(31-510-3220) There was 2 tranverse and 1 longitudinal cracks in the AC ovelay 0.5" wide.										
111			Girder/Beam-Timber	2	162	m	162	0	0	0
(111) There were no significant defects noted.										
206			Column-Timber	3	18	each	0	18	0	0
	1180		Abrasion (Timber)	3	18		0	18	0	0
(206-1180) There was shrinkage in the columns section due to the weather.										
216			Abutment-Timber	3	16	m	0	15	1	0
	1180		Abrasion (Timber)	3	16		0	15	1	0
(216-1180) There was shrinkage in the columns section due to the weather. At the east abutment north side there was a tree growing in between the timber planks.										
235			Pier Cap-Timber	2	21	m	0	21	0	0
	1180		Abrasion (Timber)	2	21		0	21	0	0
(235-1180) There was shrinkage in the columns section due to the weather.										
330			Railing-Metal	2	17	m	17	0	0	0
(330) There were no significant defects noted.										

WORK RECOMMENDATIONS

RecDate: 05/18/2012
Action : Sub-Patch spalls
Work By: LOCAL AGENCY
Status : PROPOSED

EstCost:
StrTarget: 2 YEARS
DistTarget:
EA:

Replace the deteriorated timber plank at 200 mm from the bottom and remove the tree at the north side of the abutment between timber planks.

Team Leader : Mikhael T. Zaarour

Report Author : Mikhael T. Zaarour

Inspected By : MT.Zaarour/KD.Henderson

9/23/15

Mikhael T. Zaarour (Registered Civil Engineer) (Date)

STRUCTURE INVENTORY AND APPRAISAL REPORT

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

(1) STATE NAME- CALIFORNIA 069
(8) STRUCTURE NUMBER **55C0168**
(5) INVENTORY ROUTE(ON/UNDER)- ON 140000000
(2) HIGHWAY AGENCY DISTRICT 12
(3) COUNTY CODE 059 (4) PLACE CODE 00000
(6) FEATURE INTERSECTED- HANDY CREEK
(7) FACILITY CARRIED- AMAPOLA AVENUE
(9) LOCATION- 0.2 MI E/O ORANGE PK BLVD
(11) MILEPOINT/KILOMETERPOINT 0
(12) BASE HIGHWAY NETWORK- NOT ON NET 0
(13) LRS INVENTORY ROUTE & SUBROUTE
(16) LATITUDE 33 DEG 48 MIN 08.93 SEC
(17) LONGITUDE 117 DEG 46 MIN 46.19 SEC
(98) BORDER BRIDGE STATE CODE % SHARE %
(99) BORDER BRIDGE STRUCTURE NUMBER

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

(43) STRUCTURE TYPE MAIN:MATERIAL- WOOD OR TIMBER
TYPE- STRINGER/MULTI-BEAM OR GDR CODE 702
(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- TIMBER CODE 8
(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 1937
(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 1000
(30) YEAR OF ADT 2009 (109) TRUCK ADT 1 %
(19) BYPASS, DETOUR LENGTH 2 KM

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

(48) LENGTH OF MAXIMUM SPAN 4.0 M
(49) STRUCTURE LENGTH 8.5 M
(50) CURB OR SIDEWALK: LEFT 0.0 M RIGHT 0.0 M
(51) BRIDGE ROADWAY WIDTH CURB TO CURB 7.1 M
(52) DECK WIDTH OUT TO OUT 7.3 M
(32) APPROACH ROADWAY WIDTH (W/SHOULDERS) 6.7 M
(33) BRIDGE MEDIAN- NO MEDIAN 0
(34) SKEW 0 DEG (35) STRUCTURE FLARED NO
(10) INVENTORY ROUTE MIN VERT CLEAR 99.99 M
(47) INVENTORY ROUTE TOTAL HORIZ CLEAR 6.7 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 = 58.1
STATUS
HEALTH INDEX 91.9
PAINT CONDITION INDEX = N/A

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

(112) NBIS BRIDGE LENGTH- YES Y
(104) HIGHWAY SYSTEM- NOT ON NHS 0
(26) FUNCTIONAL CLASS- COLLECTOR URBAN 17
(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 6
(61) CHANNEL & CHANNEL PROTECTION 8
(62) CULVERTS N

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

(31) DESIGN LOAD- UNKNOWN 0
(63) OPERATING RATING METHOD- ALLOWABLE STRESS 2
(64) OPERATING RATING- 24.9
(65) INVENTORY RATING METHOD- ALLOWABLE STRESS 2
(66) INVENTORY RATING- 17.5
(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 4
(68) DECK GEOMETRY 4
(69) UNDERCLEARANCES, VERTICAL & HORIZONTAL N
(71) WATER ADEQUACY 5
(72) APPROACH ROADWAY ALIGNMENT 6
(36) TRAFFIC SAFETY FEATURES 0000
(113) SCOUR CRITICAL BRIDGES 5

********** 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 2061
(115) YEAR OF FUTURE ADT 2035

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

(90) INSPECTION DATE 08/15 (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)