

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: 55C0205

Bridge Name: Santa Ana Delhi Channel

Year Built: 1960

Facility Carried: Santa Ana Avenue

The Santa Ana-Delhi Channel Bridge at Santa Ana Avenue is a single span precast prestress concrete voided deck slab with reinforced concrete pile bent abutments with sheathings walls. The bridge spans over a concrete lined channel. The bridge was widened in 1973.

Caltrans BIR recommendations:

- Remove the vegetation growing at abutment 1.

Field Inspection Observations

- Efflorescence and water stains are visible on bridge soffit. The bridge deck has several inches of AC therefore the condition of the bridge deck cannot be assessed.
- Confirmed that there is vegetation growing at abutment 1 (photo 3).
- There appears to be 8-10" of asphalt concrete. Recommend that no additional AC be placed on the bridge deck, and consider removing some of existing AC.
- Concrete spalling on exterior girder (photo 4).
- There is exposed sheathing at abut face (photo 5).

Maintenance Needs Assessment

BPMP Assessment

- N/A – No known eligible maintenance activities. Need to coordinate with Caltrans to determine if AC removal is a participating BPMP work.
- Recommend treating deck or placing impermeable water barrier on deck prior to AC resurfacing.

General Maintenance – Non-BPMP

- Remove vegetation at abutment 1.

Proposed BPMP Construction Costs

- Unknown until consult with Caltrans about AC removal.

Construction Items Not Funded by BPMP

- Remove vegetation < \$2,000.

APPENDIX A

Photos and BIR



Photo 1:



Photo 2:

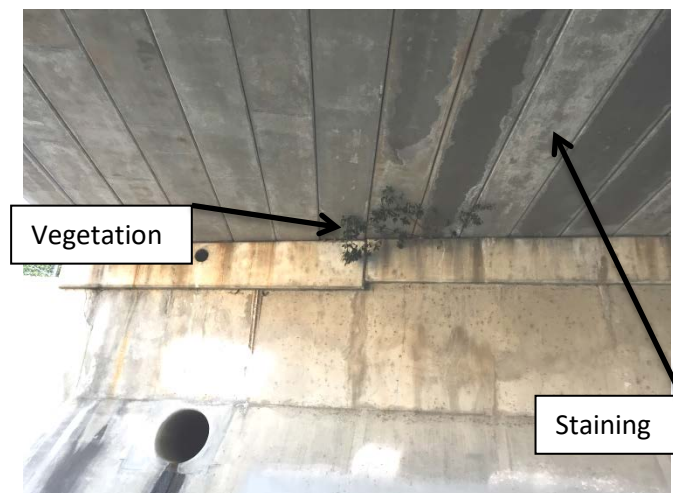


Photo 3: Abut 1



Photo 4: Elevation View

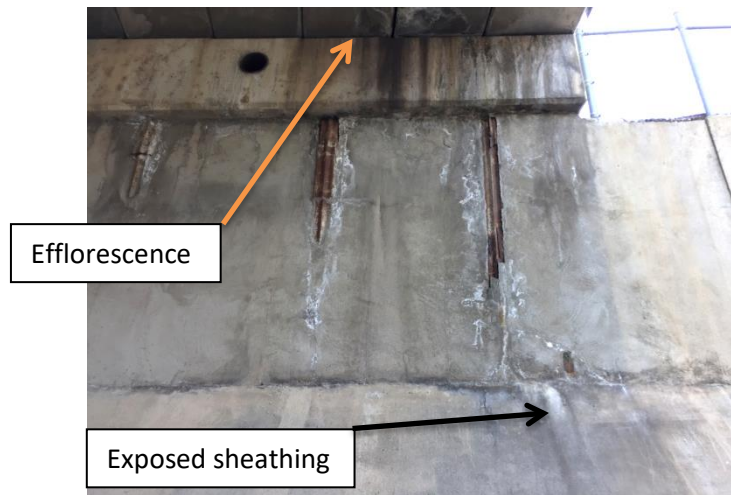


Photo 5: Exposed Sheathing



Photo 6 and 7:



DEPARTMENT OF TRANSPORTATION
Structure Maintenance & Investigations

Bridge Number : 55C0205
Facility Carried: SANTA ANA AVENUE
Location : 0.1 MI S/O BRISTOL STREE
City :
Inspection Date : 01/27/2017
Inspection Type
Routine FC Underwater Special Other
☒

Bridge Inspection Report

STRUCTURE NAME: SANTA ANA-DELHI CHANNEL

CONSTRUCTION INFORMATION

Year Built : 1960 Skew (degrees): 10
Year Modified: 1973 No. of Joints : 0
Length (m) : 16.5 No. of Hinges : 0

Structure Description: Single span PC/PS concrete beam units (22 units) on RC pile bent cap with monolithic wingwalls with sheathing walls.

Span Configuration : (S) 54.00 ft (N)

SAFE LOAD CAPACITY AND RATINGS

Design Live Load: UNKNOWN
Inventory Rating: RF=0.52 =>16.8 metric tons Calculation Method: FIELD EVAL/ENG JUDGMENT
Operating Rating: RF=0.87 =>28.2 metric tons Calculation Method: FIELD EVAL/ENG JUDGMENT
Permit Rating : XXXXX
Posting Load : Type 3: Legal Type 3S2: Legal Type 3-3: Legal

DESCRIPTION ON STRUCTURE

Deck X-Section: (W) 0.67 ft br, 1.33 ft AC dike, 61.42 ft, 4.50 ft sw, 0.67 m br (E)
Total Width: 20.4 m Net Width: 18.7 m No. of Lanes: 4 Speed: 45 mph
Min. Vertical Clearance: Unimpaired Overlay Thickness: 6.5 Inches
Rail Code: 1000

Rail Type	Location	Length (ft)	Rail Modifications
MBBR		108	

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

This inspection was performed by walking on the bridge sidewalks, and under the span of the superstructure. The water in the channel is about 3 inches through a small ditch 5 feet wide in the middle of the channel. All visible substructure elements were inspected.

Pedestrian access under the bridge is from a ramp at the north-west quadrant.

INSPECTION COMMENTARY

REVISIONS

AC thickness overlay is changed from 3 inches to be 9 inches at the west side and 4 inches at the east side. The average AC thickness is about 6.5 inches. (see the attached photos 1 & 2)

Element 15 (Prestressed top flange-RC) is replaced Element 16 (Top flange-RC) with the same quantity.

The substructure element is revised to be Bent cap 20 m; and piles #251 (2 each) instead of element #215 RC Abutment.

DECK AND ROADWAY

AC overlay exhibits two transverse cracks above both abutments, 20 feet long and 0.2 inches wide.

SUBSTRUCTURE

There is a tree growing at the seat of Abutment 1 under slab unit 9 (counting from east).

SAFE LOAD CAPACITY

The load rating for this structure is being reviewed by SMI Ratings Branch. A request #7766 was sent the load rating department on 07/14/2017. An updated Load Rating Summary will be archived when this review is complete. Load Rating Summary Sheet is archived on 12/12/2014 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.

ELEMENT INSPECTION RATINGS AND NOTES									
Elem No.	Defect /Prot	Element Description	Env	Total Qty	Units	Qty in St. 1	each St. 2	Condition St. 3	State St. 4
15		Top Flange-PS Conc.	2	336	sq.m	336	0	0	0
	510	Deck Wearing Surface-Asphalt	2	308	sq.m	308	0	0	0
(15)									
There were no significant defects noted.									
(15-510)									
There were no significant defects noted.									
104		Box Girder-PS Conc.	2	17	m	14	2	1	0
	1080	Delamination/Spall/Patched Area	2	1		0	0	1	0
	1120	Efflorescence/Rust Staining	2	2		0	2	0	0
(104-1080)									
The westerly face of the westerly box girder unit exhibits a spall 12 inches X 8 inches X 1.5 inch at									

ELEMENT INSPECTION RATINGS AND NOTES

Elem No.	Defect /Prot	Element Description	Env	Total Qty	Units	Qty in each Condition State			
						St. 1	St. 2	St. 3	St. 4
the mid-span. (see the attached photos 4 & 5)									
(104-1120)									
There was water stain in soffit generated in between the bog girders units.									
215		Abutment-RC	2	10	m	10	0	0	0
(215)									
Monolithic wingwalls (with the RC bent cap) are included in the total quantity.									
234		Pier Cap-RC	2	40	m	40	0	0	0
(234)									
There were no significant defects noted.									
251		Pile-CISS	2	2	ea.	0	2	0	0
1000		Corrosion	2	2		0	2	0	0
(251)									
There are only two piles that are visbile at the north Abutment at the east side.									
(251-1000)									
The exterior steel shells of the north piles (east side) is rusted. (see the attached photo 9)									
330		Railing-Metal	2	33	m	33	0	0	0
(330)									
There were no significant defects noted.									

WORK RECOMMENDATIONS

RecDate: 06/08/2011

EstCost:

Remove the small tree that are growing in
Abutment 1 seat.

Action : Sub-Misc.

StrTarget: 2 YEARS

Work By: LOCAL AGENCY

DistTarget:

Status : PROPOSED

EA:

Team Leader : Ashraf Shenouda

Report Author : Ashraf Shenouda

Inspected By : A.Shenouda/KD.Henderson



Ashraf Shenouda (Registered Civil Engineer) (Date)

7-25-17



STRUCTURE INVENTORY AND APPRAISAL REPORT

***** IDENTIFICATION *****

(1) STATE NAME- CALIFORNIA 069
 (8) STRUCTURE NUMBER 55C0205
 (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- SANTA ANA AVENUE
 (9) LOCATION- 0.1 MI S/O BRISTOL STREET
 (11) MILEPOINT/KILOMETERPOINT 0
 (12) BASE HIGHWAY NETWORK- NOT ON NET 0
 (13) LRS INVENTORY ROUTE & SUBROUTE
 (16) LATITUDE 33 DEG 39 MIN 55.22 SEC
 (17) LONGITUDE 117 DEG 52 MIN 59.41 SEC
 (98) BORDER BRIDGE STATE CODE % SHARE %
 (99) BORDER BRIDGE STRUCTURE NUMBER

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

(43) STRUCTURE TYPE MAIN:MATERIAL- PRESTRESS CONC
 TYPE- BOX BEAM OR GIRDER - MULTI CODE 505
 (44) STRUCTURE TYPE APPR:MATERIAL- OTHER/NA
 TYPE- OTHER/NA CODE 000
 (45) NUMBER OF SPANS IN MAIN UNIT 1
 (46) NUMBER OF APPROACH SPANS 0
 (107) DECK STRUCTURE TYPE- PRECAST CONC. PA CODE 2
 (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 1960
 (106) YEAR RECONSTRUCTED 1973
 (42) TYPE OF SERVICE: ON- HIGHWAY-PEDESTRIAN 5
 UNDER- WATERWAY 5
 (28) LANES:ON STRUCTURE 04 UNDER STRUCTURE 00
 (29) AVERAGE DAILY TRAFFIC 11000
 (30) YEAR OF ADT 2008 (109) TRUCK ADT 1 %
 (19) BYPASS, DETOUR LENGTH 2 KM

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

(48) LENGTH OF MAXIMUM SPAN 16.2 M
 (49) STRUCTURE LENGTH 16.5 M
 (50) CURB OR SIDEWALK: LEFT 0.0 M RIGHT 1.4 M
 (51) BRIDGE ROADWAY WIDTH CURB TO CURB 18.7 M
 (52) DECK WIDTH OUT TO OUT 20.4 M
 (32) APPROACH ROADWAY WIDTH (W/SHOULDERS) 17.1 M
 (33) BRIDGE MEDIAN- NO MEDIAN 0
 (34) SKEW 10 DEG (35) STRUCTURE FLARED NO
 (10) INVENTORY ROUTE MIN VERT CLEAR 99.99 M
 (47) INVENTORY ROUTE TOTAL HORIZ CLEAR 18.7 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- NO CONTROL CODE 0
 (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 *****

SUFFICIENCY RATING = 64.3

STATUS

HEALTH INDEX 99.4

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 7
 (59) SUPERSTRUCTURE 5
 (60) SUBSTRUCTURE 7
 (61) CHANNEL & CHANNEL PROTECTION 8
 (62) CULVERTS N

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

(31) DESIGN LOAD- UNKNOWN 0
 (63) OPERATING RATING METHOD- FIELD EVAL/ENG JUD 0
 (64) OPERATING RATING- 28.2
 (65) INVENTORY RATING METHOD- FIELD EVAL/ENG JUD 0
 (66) INVENTORY RATING- 16.8
 (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 6
 (69) UNDERCLEARANCES, VERTICAL & HORIZONTAL N
 (71) WATER ADEQUACY 8
 (72) APPROACH ROADWAY ALIGNMENT 8
 (36) TRAFFIC SAFETY FEATURES 1000
 (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 18984
 (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)