

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: 55C0371

Bridge Name: Santa Ana River Channel

Year Built: 1974

Facility Carried: Segerstrom-Slater

The Santa Ana River Channel Bridge at Segerstrom-Slater Avenue is a continuous 5 span cast-in-place reinforced concrete T-Beam Bridge with pier wall and open-end diaphragm abutments supported on concrete piles.

Caltrans BIR recommendations:

- Repair vertical offset of sidewalk at northeast and southwest approaches.
- Repair spalls on inside face of bridge rails.

Field Inspection Observations

- Exposed rebar in barrier at several locations. (photo 6) Recommend patching spalled concrete.
- Torn joint seal (photo 5).
- Uneven sidewalk at bridge approach (photo 7).
- Bridge deck appears to be treated.
- Efflorescence on bridge soffit. OCPW stated the bridge deck has been treated.

Maintenance Needs Assessment

BPMP Assessment

- Replace torn joint seal.

General Maintenance – Non-BPMP

- Repair uneven sidewalk approach. Appears to be a result of sidewalk settling. Investigate cause of settling to ensure water is not removing fines under sidewalk.
- Monitor efflorescence on bridge soffit to determine if water is continuing to seep through deck.

Proposed BPMP Construction Costs

- Replace Joint seal ≈ \$40,000 (with engineering, traffic control, mobilization and contingency)

Construction Items Not Funded by BPMP

- Repair barrier spalls ≈ \$50,000 (includes engineering, traffic control, mobilization and contingency)

APPENDIX A

Photos and BIR



Photo 1:



Photo 2:



Photo 3:



Photo 4:



Failed Joint Seal

Photo 5: Failed Joint Seal



Exposed Rebar

Photo 6: Barrier



Photo 7: Sidewalk



Efflorescence

Photo 8:



DEPARTMENT OF TRANSPORTATION
Structure Maintenance & Investigations

Bridge Number : 55C0371
Facility Carried: SEGERSTROM-SLATER
Location : 0.3 MI. W/O HARBOR BLVD.
City :
Inspection Date : 10/24/2014

Bridge Inspection Report

Inspection Type
Routine FC Underwater Special Other

☒

STRUCTURE NAME: SANTA ANA RIVER CHANNEL (SEGERSTROM-SLATER)

CONSTRUCTION INFORMATION

Year Built : 1974 Skew (degrees): 13
Year Widened: 1982 No. of Joints : 2
Length (m) : 100 No. of Hinges : 0

Structure Description: Continuous 5-span CIP/RC T-beam (10 each) with RC pier walls and RC open end seat abutments, all supported upon concrete piles.

Span Configuration : (W) 16.5 m, 3 @ 21.9 m, 16.5 m (E) c/c

SAFE LOAD CAPACITY AND RATINGS

Design Live Load: MS-18 OR HS-20
Inventory Rating: RF=1.82 =>59.0 metric tons Calculation Method: LOAD FACTOR
Operating Rating: RF=3.03 =>98.2 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, 1.5 m sw, 19.5 m, 1.5 m sw, 0.1 m br (N)

Total Width: 23.2 m Net Width: 19.5 m No. of Lanes: 4 Speed: 45 mph

Min. Vertical Clearance: Unimpaired

Rail Code: 1000

Rail Type	Location	Length (ft)	Rail Modifications
Type 11	Right/Left	660	

DESCRIPTION UNDER STRUCTURE

Channel Description: RC trapezoidal.

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 river was dry at inspection time. All elements were visually inspected.

REVISIONS

The bridge name was revised to include the road carried name.

Old name: SANTA ANA RIVER CHANNEL.

New name: SANTA ANA RIVER CHANNEL (SEGERSTROM-SLATER).

INSPECTION COMMENTARY

DECK AND ROADWAY

The approach sidewalks at the two corners northeast and southwest are vertically offset up to 2".

SAFE LOAD CAPACITY

A load Rating Summary sheet was in BIRIS. The current load rating was based on calculations dated 10/22/1982.

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
16			Top Flange-RC	2	2320	sq.m	2260	60	0	0	0
	1120		Efflorescence/Rust Staining	2	60		0	60	0	0	0
(16-1120)											
There are about 24 transverse cracks with white efflorescence in every span.											
110			Girder/Beam-RC	2	1000	m	999	1	0	0	0
	1080		Delamination/Spall/Patched Area	2	1		0	1	0	0	0
(110-1080)											
There is a spall (4" x 3" x 1") in girder 1 (north) of span 2 at bottom near pier wall 3.											
210			Pier Wall-RC	2	96	m	96	0	0	0	0
(210)											
There were no significant defects noted.											
215			Abutment-RC	2	48	m	48	0	0	0	0
(215)											
There were no significant defects noted.											
227			Pile-RC	2	1	ea.	1	0	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	0
(256)											
There were no significant defects noted.											
302			Joint-Compression Seal	2	40	m	40	0	0	0	0
(302)											
There were no significant defects noted.											
312			Bearing-Enclosed	2	2	each	2	0	0	0	0
(312)											
There were no significant defects noted.											
333			Railing-Other	2	200	m	190	10	0	0	0
	1080		Delamination/Spall/Patched Area	2	10		0	10	0	0	0
(333-1080)											
There are 2 spalls (200 mm x100 mm x 20 mm) with exposed rebars at the inside face of south rail 15 m											

ELEMENT INSPECTION RATINGS AND COMMENTARY

Elem No.	Defect /Prot	Defect	Element Description	Env Qty	Total Qty	Units Qty in each Condition State			
						St. 1	St. 2	St. 3	St. 4
			and 21 m from west end and many small spalls at the inside face of both rails.						

WORK RECOMMENDATIONS

RecDate: 10/24/2014
 Action : Railing-Misc.
 Work By: LOCAL AGENCY
 Status : PROPOSED

EstCost:
 StrTarget: 2 YEARS
 DistTarget:
 EA:

Repair the approach sidewalks at the two corners northeast and southwest are vertically offset up to 2".

RecDate: 05/16/2012
 Action : Railing-Repair
 Work By: LOCAL AGENCY
 Status : PROPOSED

EstCost:
 StrTarget: 2 YEARS
 DistTarget:
 EA:

Repair the 2 spalls (200 mm x100 mm x 20 mm) with exposed rebars at the inside face of south rail 15 m and 21 m from west end and many small spalls at the inside face of both rails.

Team Leader : Mikhael T. Zaarour
 Report Author : Mikhael T. Zaarour
 Inspected By : MT.Zaarour/KD.Henderson



Mikhael T. Zaarour
 Mikhael T. Zaarour (Registered Civil Engineer) (Date) 11/13/14

STRUCTURE INVENTORY AND APPRAISAL REPORT

***** IDENTIFICATION *****

(1) STATE NAME- CALIFORNIA 069
 (8) STRUCTURE NUMBER 55C0371
 (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- SEGERSTROM-SLATER
 (9) LOCATION- 0.3 MI. W/O HARBOR BLVD.
 (11) MILEPOINT/KILOMETERPOINT 0
 (12) BASE HIGHWAY NETWORK- NOT ON NET 0
 (13) LRS INVENTORY ROUTE & SUBROUTE
 (16) LATITUDE 33 DEG 42 MIN 32.3 SEC
 (17) LONGITUDE 117 DEG 55 MIN 32 SEC
 (98) BORDER BRIDGE STATE CODE % SHARE %
 (99) BORDER BRIDGE STRUCTURE NUMBER

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

(43) STRUCTURE TYPE MAIN:MATERIAL- CONCRETE CONT
 TYPE- TEE BEAM CODE 204
 (44) STRUCTURE TYPE APPR:MATERIAL- OTHER/NA
 TYPE- OTHER/NA CODE 000
 (45) NUMBER OF SPANS IN MAIN UNIT 5
 (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 1974
 (106) YEAR RECONSTRUCTED 1982
 (42) TYPE OF SERVICE: ON- HIGHWAY-PEDESTRIAN 5
 UNDER- WATERWAY 5
 (28) LANES:ON STRUCTURE 04 UNDER STRUCTURE 00
 (29) AVERAGE DAILY TRAFFIC 30000
 (30) YEAR OF ADT 2012 (109) TRUCK ADT 1 %
 (19) BYPASS, DETOUR LENGTH 2 KM

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

(48) LENGTH OF MAXIMUM SPAN 21.9 M
 (49) STRUCTURE LENGTH 100.0 M
 (50) CURB OR SIDEWALK: LEFT 1.5 M RIGHT 1.5 M
 (51) BRIDGE ROADWAY WIDTH CURB TO CURB 19.5 M
 (52) DECK WIDTH OUT TO OUT 23.2 M
 (32) APPROACH ROADWAY WIDTH (W/SHOULDERS) 20.1 M
 (33) BRIDGE MEDIAN- NO MEDIAN 0
 (34) SKEW 13 DEG (35) STRUCTURE FLARED NO
 (10) INVENTORY ROUTE MIN VERT CLEAR 99.99 M
 (47) INVENTORY ROUTE TOTAL HORIZ CLEAR 19.5 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 *****

SUFFICIENCY RATING = 95.2
 STATUS
 HEALTH INDEX 99.5
 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 9
 (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- 98.2
 (65) INVENTORY RATING METHOD- LOAD FACTOR 1
 (66) INVENTORY RATING- 59.0
 (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 8
 (68) DECK GEOMETRY 7
 (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 47242
 (115) YEAR OF FUTURE ADT 2031

***** INSPECTIONS *****

(90) INSPECTION DATE 10/14 (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)