

Orange County Bridge Review Summary

Dokken Engineering performed a field review of the Orange County bridge listed below in February 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: 55C0181

Bridge Name: Silverado Canyon Creek

Year Built: 1970

Facility Carried: Silverado Canyon Road

The Silverado Canyon Creek Bridge at Silverado Canyon Rd is a single span cast-in-place reinforced concrete rigid frame slab supported on spread footings. The bridge spans over a natural earth trapezoidal creek with a cobble bottom.

Caltrans BIR recommendations:

- None

Field Inspection Observations

- Minor efflorescence visible on soffit, this is indicative of water seepage through deck cracks (photo 2). There were no visible deck cracks. The deck has a few inches of AC overlay.
- Exposed retaining wall and bridge footing (photo 3). Caltrans BIR indicates the scour is not an issue and scour mediation not needed.
- There are several railing timber post missing (photo 4). Top of timber posts appear to be rotting. Recommend replacing the missing posts. Note that this work is not eligible for BPMP reimbursement since the barrier does not meet current barrier rail standards.

Maintenance Needs Assessment

BPMP Assessment

- N/A – No eligible maintenance activities

General Maintenance – Non-BPMP

- Replace railing timber posts.
- Efflorescence likely from water penetrating through deck. Not significant problem at this time. Condition must worsen to be eligible for BPMP funding. To repair will require deck AC removal, deck treatment, and grinding approach AC to conform to lower deck elevation.

Proposed BPMP Construction Costs

- N/A

Construction Items Not Funded by BPMP

- Replace Railing Timber Posts Repair Spalls < \$10,000 (includes engineering, traffic control, mobilization and contingency)

APPENDIX A

Photos and BIR



Photo 1: Silverado Canyon Creek Bridge



Photo 2: Bridge Soffit



Photo 3: Exposed footing



Missing Posts

Photo 4: Missing post



Rotting Posts

Photo 5: Rotting post



DEPARTMENT OF TRANSPORTATION
Structure Maintenance & Investigations

Bridge Number : 55C0181
Facility Carried: SILVERADO CANYON RD.
Location : 3.1 MI E/O SANTIAGO ROAD
City :
Inspection Date : 12/14/2013

Bridge Inspection Report

Inspection Type

Routine FC Underwater Special Other

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STRUCTURE NAME: SILVERADO CANYON CREEK

CONSTRUCTION INFORMATION

Year Built : 1970

Skew (degrees): 59

Year Widened: N/A

No. of Joints : 0

Length (m) : 14

No. of Hinges : 0

Structure Description: Single span CIP/RC rigid frame slab, all supported upon spread footings.

Span Configuration : (W) 1 @ 6.1 m (E) clear, normal

SAFE LOAD CAPACITY AND RATINGS

Design Live Load: M-13.5 OR H-15

Inventory Rating: RF=0.75 =>24.3 metric tons

Calculation Method: FIELD EVAL/ENG JUDGMENT

Operating Rating: RF=1.25 =>40.5 metric tons

Calculation Method: FIELD EVAL/ENG JUDGMENT

Permit Rating : P P P P P

Posting Load : Type 3: Legal

Type 3S2: Legal

Type 3-3: Legal

DESCRIPTION ON STRUCTURE

Deck X-Section: (S) 0.6 m min deck, 0.3 m br, 2 @ 4.1 m, 0.3 m br, 0.6 m min deck (N)

Total Width: 8.2 m Net Width: 7.3 m No. of Lanes: 2 Speed: 25 mph

Min. Vertical Clearance: Unimpaired

Rail Code: 0000

Rail Type	Location	Length (ft)	Rail Modifications
Miscellaneous	Right/Left	124	

DESCRIPTION UNDER STRUCTURE

Channel Description: Natural earth trapezoidal with a cobbled bottom.

INSPECTION COMMENTARY

SCOPE AND ACCESS

The water in the channel is 8" deep, so all substructure elements were visually inspected.

REVISIONS

The rail code was modified from 1000 to 0000, because the current rail doesn't meet the standards.

Element 215 (RC abutment): The quantities were modified as follows: from [St. 1 = 38, St. 2 = 2] to [St. 1 = 32, St. 2 = 8].

Element 333 (other rails): The quantities were modified as follows: from [St. 1 = 38] to [St. 1 = 28, St. 2 = 2, St. 3 = 8].

Smart flag 359 (Soffit) was added to ELI list (State 2).

INSPECTION COMMENTARY

Smart flag 361 (Scour) was upgraded from state 2 to state 1.

The inspection frequency was modified from 24 months to 48 months.

MISCELLANEOUS

Photo underside of this structure was taken and is included with this report.

A new stream section was performed at this time and is included in this report. Compared to the previous stream section, taken on 01/15/2003, there are no significant changes to the last measurements.

DECK AND ROADWAY

South rail is missing two timber posts #3 and #7 (counting from west); and post #8 (from west) has decay and section loss.

At north rail, posts 3,4,6 and 7 (counting from west) are decayed from to the top.

SUPERSTRUCTURE

The soffit exhibits 5 longitudinal cracks full length from abutment to abutment with white and brown efflorescence.

SUBSTRUCTURE

There are 10 vertical cracks at each abutment wall up to 1.5 mm wide.

Scour

The bottom of the westerly spread footing is exposed at its northerly terminus.

SAFE LOAD CAPACITY

A Load Rating Summary Sheet is included with this bridge inspection report. The current rating has been assigned in accordance with SMi procedures.

ELEMENT INSPECTION RATINGS

Elem No.	Element Description	Env	Total		Qty in each Condition State				
			Qty	Units	St. 1	St. 2	St. 3	St. 4	St. 5
39	Concrete Slab - Unprotected w/ AC Overlay	2	115	sq.m.	115	0	0	0	0
215	Reinforced Conc Abutment	3	40	m.	32	8	0	0	
333	Other Bridge Railing	2	38	m.	28	2	8		
359	Soffit of Concrete Deck or Slab	2	1	ea.	0	1	0	0	0
361	Scour	2	1	ea.	1	0	0		

WORK RECOMMENDATIONS - NONECHANNEL X-SECTION

CHANNEL X-SECTION

Side : Upstream

X-Section Date: 12/14/2013

Measured From : Top of concrete deck (South)

Location	Horiz (m)	Vert (m)	Comments
South abutment	0.00	3.20	face of south abutment, top of footing
	2.00	3.47	south edge of water
	2.50	3.60	Thalweg
	4.00	3.60	
	5.05	3.57	north edge of water
North abutment	6.10	3.40	face of north abutment

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 55C0181
 (5) INVENTORY ROUTE(ON/UNDER)- ON 140000000
 (2) HIGHWAY AGENCY DISTRICT 12
 (3) COUNTY CODE 059 (4) PLACE CODE 00000
 (6) FEATURE INTERSECTED- SILVERADO CANYON CREEK
 (7) FACILITY CARRIED- SILVERADO CNYN RD.
 (9) LOCATION- 3.1 MI E/O SANTIAGO ROAD
 (11) MILEPOINT/KILOMETERPOINT 0
 (12) BASE HIGHWAY NETWORK- NOT ON NET 0
 (13) LRS INVENTORY ROUTE & SUBROUTE
 (16) LATITUDE 33 DEG 44 MIN 49.92 SEC
 (17) LONGITUDE 117 DEG 37 MIN 23.19 SEC
 (98) BORDER BRIDGE STATE CODE % SHARE %
 (99) BORDER BRIDGE STRUCTURE NUMBER

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

(43) STRUCTURE TYPE MAIN:MATERIAL- CONCRETE
 TYPE- SLAB CODE 101
 (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- 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 1970
 (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 2000
 (30) YEAR OF ADT 2009 (109) TRUCK ADT 1 %
 (19) BYPASS, DETOUR LENGTH 199 KM

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

(48) LENGTH OF MAXIMUM SPAN 6.1 M
 (49) STRUCTURE LENGTH 14.0 M
 (50) CURB OR SIDEWALK: LEFT 0.0 M RIGHT 0.0 M
 (51) BRIDGE ROADWAY WIDTH CURB TO CURB 7.3 M
 (52) DECK WIDTH OUT TO OUT 8.2 M
 (32) APPROACH ROADWAY WIDTH (W/SHOULDERS) 8.2 M
 (33) BRIDGE MEDIAN- NO MEDIAN 0
 (34) SKEW 59 DEG (35) STRUCTURE FLARED NO
 (10) INVENTORY ROUTE MIN VERT CLEAR 99.99 M
 (47) INVENTORY ROUTE TOTAL HORIZ CLEAR 7.3 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 = 52.5

STATUS

HEALTH INDEX 93.1

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 6
 (59) SUPERSTRUCTURE 7
 (60) SUBSTRUCTURE 6
 (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- FIELD EVAL/ENG JUD 0
 (64) OPERATING RATING- 40.5
 (65) INVENTORY RATING METHOD- FIELD EVAL/ENG JUL 0
 (66) INVENTORY RATING- 24.3
 (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 4
 (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- 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 4121
 (115) YEAR OF FUTURE ADT 2029

***** INSPECTIONS *****

(90) INSPECTION DATE 12/13 (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)