

## **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:** 55C0180

**Bridge Name:** Silverado Canyon Creek

**Year Built:** 1971

**Facility Carried:** Silverado Canyon Road

The Silverado Canyon Road Bridge at Santiago Road is a single span cast-in-place reinforced concrete rigid frame slab supported on spread footings.

### **Caltrans BIR recommendations:**

- None

### **Field Inspection Observations**

- Minor spalling/delaminated on wingwall at the northeast side.
- Deck is covered by 4" of AC.
- Minor efflorescence on soffit.

### **Maintenance Needs Assessment**

#### **BPMP Assessment**

- N/A – No eligible maintenance activities

#### **General Maintenance – Non-BPMP**

- Repair wingwall spall. Not a high priority

### **Proposed BPMP Construction Costs**

- N/A

### **Construction Items Not Funded by BPMP**

- Repair spalled concrete estimated Total Construction Cost ≈ \$3,000 (with engineering, mobilization and contingency)

# **APPENDIX A**

## **Photos and BIR**



Photo 1: Silverado Canyon Creek Bridge



Photo 2: Bridge



Photo 3:

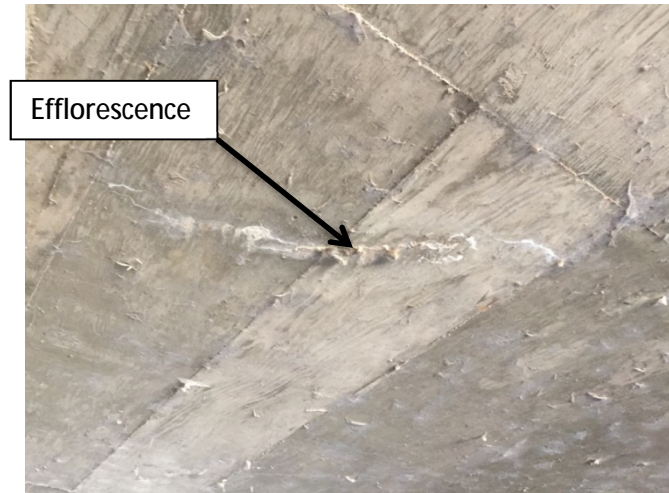


Photo 4: Bridge Soffit



DEPARTMENT OF TRANSPORTATION  
Structure Maintenance & Investigations

Bridge Number : 55C0180  
Facility Carried: SILVERADO CANYON RD  
Location : 2.7 MI E/O SANTIAGO ROAD  
City :  
Inspection Date : 12/14/2013

## Bridge Inspection Report

Inspection Type  
Routine FC Underwater Special Other  
☒

STRUCTURE NAME: SILVERADO CANYON CREEK

### CONSTRUCTION INFORMATION

Year Built : 1971  
Year Widened: N/A  
Length (m) : 16.2  
Skew (degrees): 64  
No. of Joints : 0  
No. of Hinges : 0

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

Span Configuration : (W) 1 @ 7.3 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  
Operating Rating: RF=1.25 =>40.5 metric tons  
Permit Rating : PPPPP  
Posting Load : Type 3: Legal  
Calculation Method: FIELD EVAL/ENG JUDGMENT  
Calculation Method: FIELD EVAL/ENG JUDGMENT  
Type 3S2: Legal  
Type 3-3: Legal

### DESCRIPTION ON STRUCTURE

Deck X-Section: (S) 1.2 m min deck, 0.3 m br, 2 @ 3.8 m, 0.3 m br, 1.5 m min deck (N)  
Total Width: 11.0 m Net Width: 7.6 m No. of Lanes: 2 Speed: 25 mph  
Min. Vertical Clearance: Unimpaired  
Rail Code: 1000

Rail Type	Location	Length (ft)	Rail Modifications
MBBR	Right/Left	111	

### DESCRIPTION UNDER STRUCTURE

Channel Description: Natural earth trapezoidal with a cobbled bottom.

### INSPECTION COMMENTARY

#### SCOPE AND ACCESS

The water in the channel is 10" deep, so all substructure elements were visually inspected.

#### REVISIONS

Element type #330 was replaced by element type #337 with the same quantity.

#### 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.

#### DECK AND ROADWAY

INSPECTION COMMENTARY

Rail and deck have no significant defects during this inspection.

SUPERSTRUCTURE

There are 3 longitudinal and 2 diagonal cracks in the soffit near east abutment up to 8 ft long with light brown efflorescence.

There are 2 small spalls 8" X 1" X 1" in the soffit at the construction joint at the middle of the bridge.

SUBSTRUCTURE

East and west abutments, each has 3 vertical cracks 1.0 mm wide.

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	60	sq.m.	60	0	0	0	0
215	Reinforced Conc Abutment	3	44	m.	44	0	0	0	0
330	Metal Bridge Railing - coated or uncoated	2	34	m.	34	0	0	0	0
359	Soffit of Concrete Deck or Slab	2	1	ea.	0	0	1	0	0

WORK RECOMMENDATIONS - NONECHANNEL X-SECTION

Side : Upstream

X-Section Date: 12/14/2013

Measured From : Top of slab (North)

Location	Horiz (m)	Vert (m)	Comments
West abutment	0.00	3.30	face of west abutment
	2.10	3.47	west edge of water
	4.10	3.60	Thawleg
	6.10	3.41	east edge of water
East abutment	7.40	3.28	face of east abutment

Team Leader : Ashraf Shenouda  
Report Author : Ashraf Shenouda  
Inspected By : A. Shenouda/KD. Henderson

Ashraf Shenouda 2/10/14  
Ashraf Shenouda (Registered Civil Engineer) (Date)



STRUCTURE INVENTORY AND APPRAISAL REPORT

## \*\*\*\*\* IDENTIFICATION \*\*\*\*\*

(1) STATE NAME- CALIFORNIA 069  
 (8) STRUCTURE NUMBER 55C0180  
 (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 CANYON RD  
 (9) LOCATION- 2.7 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 48.67 SEC  
 (17) LONGITUDE 117 DEG 37 MIN 52.2 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 1971  
 (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 7.3 M  
 (49) STRUCTURE LENGTH 16.2 M  
 (50) CURB OR SIDEWALK: LEFT 0.0 M RIGHT 0.0 M  
 (51) BRIDGE ROADWAY WIDTH CURB TO CURB 7.6 M  
 (52) DECK WIDTH OUT TO OUT 11.0 M  
 (32) APPROACH ROADWAY WIDTH (W/SHOULDERS) 7.0 M  
 (33) BRIDGE MEDIAN- NO MEDIAN 0  
 (34) SKEW 64 DEG (35) STRUCTURE FLARED NO  
 (10) INVENTORY ROUTE MIN VERT CLEAR 99.99 M  
 (47) INVENTORY ROUTE TOTAL HORIZ CLEAR 7.6 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 \*\*\*\*\*

SUFFICIENCY RATING = 53.7

## STATUS

HEALTH INDEX 100.0

PAINT CONDITION INDEX = N/A

## \*\*\*\*\* CLASSIFICATION \*\*\*\*\* CODE

(112) NBIS BRIDGE LENGTH- YES Y  
 (104) HIGHWAY SYSTEM- NOT ON NHS 0  
 (26) FUNCTIONAL CLASS- MAJOR COLLECTOR RURAL 07  
 (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 5  
 (59) SUPERSTRUCTURE 7  
 (60) SUBSTRUCTURE 7  
 (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 6  
 (36) TRAFFIC SAFETY FEATURES 1.000  
 (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 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)