

## **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:** 55C0176

**Bridge Name:** Silverado Canyon Creek

**Year Built:** 1970

**Facility Carried:** Kitterman Drive

The Silverado Canyon Creek Bridge at Kettleman Drive is a simply supported single span treated timber stringer supported by masonry rock abutments. The bridge spans over a trapezoidal channel with a cobble bottom and fully grouted rock slopes.

### **Caltrans BIR recommendations:**

- None

### **Field Inspection Observations**

- Deck appears to have 4 inches of AC at mid-span. The AC deck has transverse cracks at about one-third spans (photo 1). Timber railing is substandard but appears to be in good shape. Recommend no additional AC lifts be placed on the bridge.
- Caltrans Inspection commentary noted there is a longitudinal split on the west exterior girder. This appears to be superficial (photo 2). No immediate action is required but the timber stringers condition on the exterior girder should continue to be monitored.
- The retaining wall at the downstream of the bridge has been undermined. The fully grouted rock slope protection is being undermined and it appears to be failing. Because failure of the wall at this location will not adversely impact the bridge, it is not eligible for BPMP funding.

### **Maintenance Needs Assessment**

#### **BPMP Assessment**

- N/A – No eligible maintenance activities

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

- Monitor rock slope protection. Consider removing existing and replacing with partially grouted RSP.

### **Proposed BPMP Construction Costs**

- N/A

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

- Repair erosion control at downstream retaining wall. Estimated Total Construction Cost (with engineering, mobilization and contingency) ≈ \$30,000

# **APPENDIX A**

## **Photos and BIR**



Photo 1: AC Deck



Photo 2: Exterior Stringer with longitudinal split



Photo 3:



Photo 4:



Photo 5:



Photo 6:



DEPARTMENT OF TRANSPORTATION  
Structure Maintenance & Investigations

Bridge Number : 55C0176  
Facility Carried: KITTERMAN DRIVE  
Location : 0.1 MI. S/O SLVRDO CYN R  
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 : 1970

Skew (degrees): 0

Year Widened: 1983

No. of Joints : 0

Length (m) : 9.1

No. of Hinges : 0

Structure Description: Simply supported single span treated timber stringers (8 each) with a timber deck, all supported by masonry rock abutments.

Span Configuration : (S) 1 @ 8.8 m (N) c/c

### SAFE LOAD CAPACITY AND RATINGS

Design Live Load: MS-18 OR HS-20

Inventory Rating: 19.9 metric tons

Calculation Method: ALLOWABLE STRESS

Operating Rating: 29.0 metric tons

Calculation Method: ALLOWABLE STRESS

Permit Rating : PPPPP

Posting Load : Type 3: Legal

Type 3S2: Legal

Type 3-3: Legal

### DESCRIPTION ON STRUCTURE

Deck X-Section: (W) 0.2 m br, 3.8 m, 0.2 m br (E)

Total Width: 4.3 m Net Width: 3.8 m No. of Lanes: 1 Speed: 25 mph

Min. Vertical Clearance: Unimpaired

Rail Code: 0000 Rail Description: Timber

### DESCRIPTION UNDER STRUCTURE

Channel Description: Natural earth trapezoidal with a cobbled bottom, grouted rock slopes through the site.

### INSPECTION COMMENTARY

#### SCOPE AND ACCESS

The channel was dry, so all substructure elements were visually inspected. Pedestrian access is from any quadrant.

#### REVISIONS

ELI #111 (Timber girders): a quantity of 9 m was moved from state 2 to state 3.

Element #215(RC Abutment): 4 m was moved from state 1 to state 2.

Scour flag #361 was removed from ELI list.

#### MISCELLANEOUS

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

#### DECK AND ROADWAY

AC exhibits transverse cracks full width and 1" wide.

INSPECTION COMMENTARY

## SUPERSTRUCTURE

There is a longitudinal horizontal split up to 3 mm wide in the westerly face of the west exterior girder.

## SUBSTRUCTURE

No significant defects were found during this inspection.

<u>ELEMENT INSPECTION RATINGS</u>									
Elem No.	Element Description	Total		Qty in each Condition State					
		Env	Qty	Units	St. 1	St. 2	St. 3	St. 4	St. 5
32	Timber Deck - w/ AC Overlay	2	40	sq.m.	40	0	0	0	
111	Timber Open Girder/Beam	2	70	m.	61	0	9	0	
215	Reinforced Conc Abutment	2	9	m.	5	4	0	0	0
256	Slope Protection	2	2	ea.	0	2	0		
332	Timber Bridge Railing	2	18	m.	18	0	0	0	0

WORK RECOMMENDATIONS - NONE

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 55C0176  
 (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- KITTERMAN DRIVE  
 (9) LOCATION- 0.1 MI. S/O SLVRDO CYN RD  
 (11) MILEPOINT/KILOMETERPOINT 0  
 (12) BASE HIGHWAY NETWORK- NOT ON NET 0  
 (13) LRS INVENTORY ROUTE & SUBROUTE  
 (16) LATITUDE 33 DEG 44 MIN 48.22 SEC  
 (17) LONGITUDE 117 DEG 38 MIN 15.5 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 1  
 (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 1970  
 (106) YEAR RECONSTRUCTED 1983  
 (42) TYPE OF SERVICE: ON- HIGHWAY 1  
 UNDER- WATERWAY 5  
 (28) LANES:ON STRUCTURE 01 UNDER STRUCTURE 00  
 (29) AVERAGE DAILY TRAFFIC 200  
 (30) YEAR OF ADT 2009 (109) TRUCK ADT 1 %  
 (19) BYPASS, DETOUR LENGTH 2 KM

## \*\*\*\*\* GEOMETRIC DATA \*\*\*\*\*

(48) LENGTH OF MAXIMUM SPAN 9.1 M  
 (49) STRUCTURE LENGTH 9.1 M  
 (50) CURB OR SIDEWALK: LEFT 0.0 M RIGHT 0.0 M  
 (51) BRIDGE ROADWAY WIDTH CURB TO CURB 3.8 M  
 (52) DECK WIDTH OUT TO OUT 4.3 M  
 (32) APPROACH ROADWAY WIDTH (W/SHOULDERS) 3.8 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 3.8 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 = 52.6  
 STATUS FUNCTIONALLY OBSOLETE  
 HEALTH INDEX 90.7  
 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- 1 LANE, 2 WAY 3  
 (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 6  
 (61) CHANNEL & CHANNEL PROTECTION 8  
 (62) CULVERTS N

## \*\*\*\*\* LOAD RATING AND POSTING \*\*\*\*\* CODE

(31) DESIGN LOAD- MS-18 OR HS-20 5  
 (63) OPERATING RATING METHOD- ALLOWABLE STRESS 2  
 (64) OPERATING RATING- 29.0  
 (65) INVENTORY RATING METHOD- ALLOWABLE STRESS 2  
 (66) INVENTORY RATING- 19.9  
 (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 5  
 (68) DECK GEOMETRY 2  
 (69) UNDERCLEARANCES, VERTICAL & HORIZONTAL N  
 (71) WATER ADEQUACY 9  
 (72) APPROACH ROADWAY ALIGNMENT 6  
 (36) TRAFFIC SAFETY FEATURES 0000  
 (113) SCOUR CRITICAL BRIDGES 8

## \*\*\*\*\* PROPOSED IMPROVEMENTS \*\*\*\*\*

(75) TYPE OF WORK- SUP/SUB REHAB CODE 35  
 (76) LENGTH OF STRUCTURE IMPROVEMENT 9.1 M  
 (94) BRIDGE IMPROVEMENT COST \$38,000  
 (95) ROADWAY IMPROVEMENT COST \$7,600  
 (96) TOTAL PROJECT COST \$63,840  
 (97) YEAR OF IMPROVEMENT COST ESTIMATE 2013  
 (114) FUTURE ADT 206  
 (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)