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: 55C0182

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:

- Replace missing timber post and nuts on additional posts.

Field Inspection Observations

- Bottom of retaining wall is exposed due to erosion and lower portion of wingwall is broken (photo 4 and 5).
- Minor efflorescence visible on vertical cracks along walls (photo 2) and soffit.
- Rock pocket above wall drain (photo 6). Recommend Patching
- Confirmed missing timber posts. Top of railing post are rotting. Recommend replacing missing and rotting posts. Note this work is not eligible for BPMP reimbursement.

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 Road Bridge

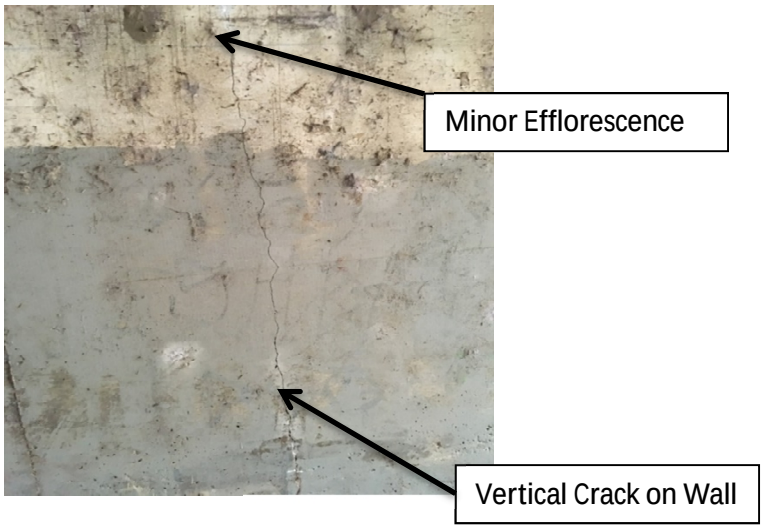

Photo 2:

Photo 3:

Photo 4:

Photo 5:

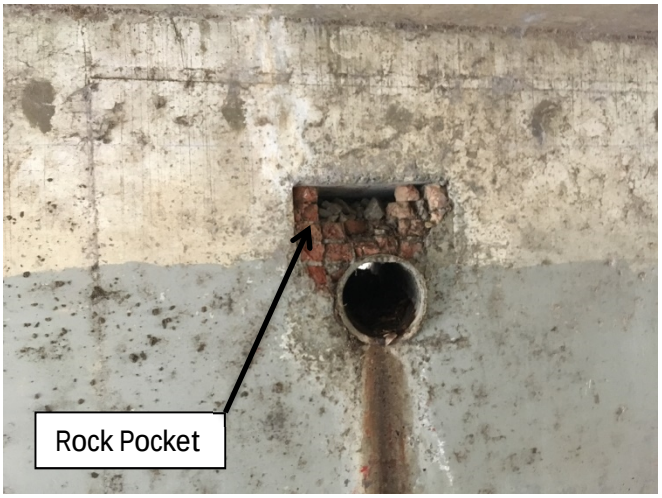

Photo 6:

DEPARTMENT OF TRANSPORTATION
Structure Maintenance & Investigations

Bridge Number : 55C0182
Facility Carried: SILVERADO CNYN RD.
Location : 3.6 MI. E/O SANTIAGO ROA
City :
Inspection Date : 12/14/2013
Inspection Type
Routine FC Underwater Special Other
X

Bridge Inspection Report

STRUCTURE NAME: SILVERADO CANYON CREEK

CONSTRUCTION INFORMATION

Year Built : 1970
Year Widened: N/A
Length (m) : 13.1
Skew (degrees): 53
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 @ 6.7 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 : PPPPP
Posting Load : Type 3: Legal Type 3S2: Legal Type 3-3: Legal

DESCRIPTION ON STRUCTURE

Deck X-Section: (S) 0.3 m min deck, 0.3 m br, 6.0 m, 0.3 m br, 0.3 m min deck (N)
Total Width: 6.7 m Net Width: 6.1 m No. of Lanes: 2 Speed: 25 mph
Min. Vertical Clearance: Unimpaired
Rail Code: 1000

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 type was changed from MBBR to MBGR, therefore the rail code was modified from 1000 to 0000, because the current rail doesn't meet the standards.

Element 215 (RC abutment): a quantity of 2 m is moved to state 2.

Element 333: The quantities were modified as follows: from [St. 1 = 38] to [St. 1 = 24, St. 2 = 10, St. 3 = 4].

MISCELLANEOUS

INSPECTION COMMENTARY

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.

Caltrans currently does not have a set of AS-Built plans for this structure. The county should provide As-Built Plans.

DECK AND ROADWAY

AC overlay exhibits random cracks 3 mm wide and up to 4 ft long.

Timber post #4 (counting from west) is missing from the north rail; Post #8 is missing a nut; and post #10 is missing bolt and nut at the north rail.
Few timber posts are lightly decayed.

SUPERSTRUCTURE

The soffit exhibits two full length longitudinal cracks 1.5 mm wide with light brown efflorescence; and a crack 8 ft long and 1.5 mm wide with white efflorescence.

SUBSTRUCTURE

There are vertical cracks 5 cracks 0.5 mm wide in the east abutment wall.
The west abutment exhibits 4 vertical cracks up to 1.5 mm wide; and a void 18" X 15" X 10" behind the abutment at south end at 2 ft above the ground level.

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	Units	Qty in each Condition State St. 1	St. 2	St. 3	St. 4	St. 5
39	Concrete Slab - Unprotected w/ AC Overlay	2	40	sq.m.	40	0	0	0	0
215	Reinforced Conc Abutment	3	22	m.	20	2	0	0	
333	Other Bridge Railing	2	38	m.	24	10	4		
359	Soffit of Concrete Deck or Slab	2	1	ea.	0	0	1	0	0

WORK RECOMMENDATIONS

RecDate: 12/14/2013
Action : Railing-Repair
Work By: LOCAL AGENCY
Status : PROPOSED

EstCost:
StrTarget: 2 YEARS
DistTarget:
EA:

Replace the missing timber post #4 (counting from west); Post #8 is missing a nut; and post #10 is missing bolt and nut at the north rail.

CHANNEL X-SECTION

Side : Upstream
X-Section Date: 12/14/2013
Measured From : Top of concrete deck (North)

CHANNEL X-SECTION

Side : Upstream

X-Section Date: 12/14/2013

Measured From : Top of concrete deck (North)

Location	Horiz (m)	Vert (m)	Comments
Abutment 1	0.00	2.87	Face of the west abutment
	2.40	3.15	west edge of water
	3.75	3.25	Thalweg
	5.65	3.10	east edge of water
Abutment 2	6.95	2.85	Face of the east abutment

Team Leader : Ashraf Shenouda

Report Author : Ashraf Shenouda

Inspected By : A.Shenouda/KD.Henderson

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

STRUCTURE INVENTORY AND APPRAISAL REPORT

********** IDENTIFICATION **********

(1)	STATE NAME- CALIFORNIA	069
(8)	STRUCTURE NUMBER	55C0182
(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-	3.6 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 48.61 SEC
(17)	LONGITUDE	117 DEG 37 MIN 08.19 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	6.7 M
(49)	STRUCTURE LENGTH	13.1 M
(50)	CURB OR SIDEWALK: LEFT 0.0 M	RIGHT 0.0 M
(51)	BRIDGE ROADWAY WIDTH CURB TO CURB	6.1 M
(52)	DECK WIDTH OUT TO OUT	6.7 M
(32)	APPROACH ROADWAY WIDTH (W/SHOULDERS)	6.1 M
(33)	BRIDGE MEDIAN- NO MEDIAN	0
(34)	SKEW 53 DEG (35) STRUCTURE FLARED	NO
(10)	INVENTORY ROUTE MIN VERT CLEAR	99.99 M
(47)	INVENTORY ROUTE TOTAL HORIZ CLEAR	6.1 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

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SUFFICIENCY RATING =	50.5
STATUS	FUNCTIONALLY OBSOLETE
HEALTH INDEX	95.8
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	5
(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 JUD	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	2
(69)	UNDERCLEARANCES, VERTICAL & HORIZONTAL	N
(71)	WATER ADEQUACY	9
(72)	APPROACH ROADWAY ALIGNMENT	6
(36)	TRAFFIC SAFETY FEATURES	1000
(113)	SCOUR CRITICAL BRIDGES	8

********** PROPOSED IMPROVEMENTS **********

(75)	TYPE OF WORK- MISC STRUCTURAL WORK	CODE 38
(76)	LENGTH OF STRUCTURE IMPROVEMENT	13.1 M
(94)	BRIDGE IMPROVEMENT COST	$88,000
(95)	ROADWAY IMPROVEMENT COST	$17,600
(96)	TOTAL PROJECT COST	$147,840
(97)	YEAR OF IMPROVEMENT COST ESTIMATE	2010
(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)	