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: 55C0188

Bridge Name: Silverado Canyon Creek Year Built: 1965

Facility Carried: Thisa Way

The Silverado Canyon Creek Bridge at Thisa Way is a single reinforced concrete box culvert.

Caltrans BIR recommendations:

- Construct a scour mitigation device downstream of the structure to prevent further streambed degradation.

Field Inspection Observations

- Retaining walls at the southwest end of bridge have been undermined. Rip rap is fully grouted and is failing. The northeast embankment is eroding. Recommend repairing erosions measures. (photo 5 and 6).
- Minor efflorescence visible on soffit (photo 4).
- Vegetation growth at abutments (photo 7).

Maintenance Needs Assessment

BPMP Assessment

- Repair scour countermeasures.

General Maintenance – Non-BPMP

- 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

- Repair scour mitigation measure ≈ $50,000 (with engineering, mobilization and contingency)

Construction Items Not Funded by BPMP

- N/A

APPENDIX A

Photos and BIR

Photo 1: Silverado Canyon Creek Bridge

Photo 2:

Photo 3:

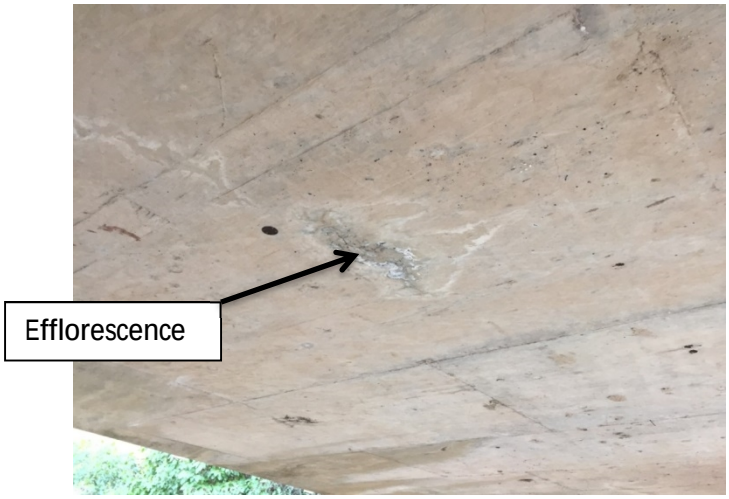

Photo 4: Bridge Soffit

Photo 5:

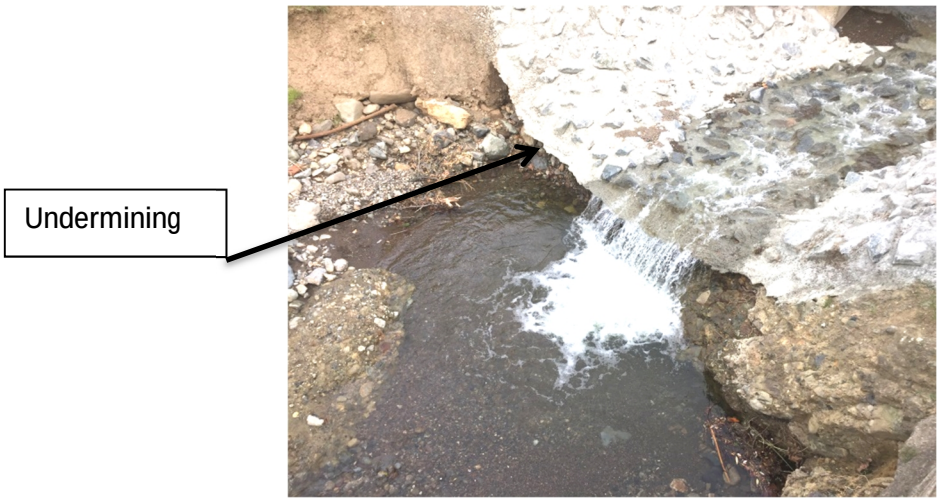

Photo 6: Slope Protection

Photo 7: Embankment Erosion

Photo 8:

DEPARTMENT OF TRANSPORTATION
Structure Maintenance & Investigations

Bridge Number : 55C0188
Facility Carried: THISA WAY
Location : 200' S/O SILVERADO CYN R
City :
Inspection Date : 12/14/2013

Bridge Inspection Report

Inspection Type

Routine	FC	Underwater	Special	Other
X				

STRUCTURE NAME: SILVERADO CANYON CREEK

CONSTRUCTION INFORMATION

Year Built : 1965
Year Widened: N/A
Length (m) : 7.9

Skew (degrees): 9
No. of Joints : 0
No. of Hinges : 0

Structure Description: Single 7.3 m W x 2.7 m H x 7.4 m L RC box culvert (grade top). Vehicular traffic ride upon an AC overlay upon the RC culvert top slab.

Span Configuration : (S) 1 @ 7.3 m (N) c/c

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: (W) 0.1 m br, 7.2 m, 0.1 m br (E)
Total Width: 7.6 m Net Width: 7.2 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	59	

DESCRIPTION UNDER STRUCTURE

Channel Description: Natural earth trapezoidal with cobbled bottom.

INSPECTION COMMENTARY

SCOPE AND ACCESS

There was 4" water running through the mid-span, so all substructure elements were visually inspected. Pedestrian access is from NW corner.

MISCELLANEOUS

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

DECK AND ROADWAY

AC exhibits transverse cracks full width and 12 mm wide at both ends.

There was stain of debris on the rail, it maybe cause by water overtopping the bridge deck.

SCOUR

INSPECTION COMMENTARY

The streambed has degraded 6 ft immediately downstream of the concrete culvert cut off wall at the thalweg. The cut off wall is protected at the downstream banks with grouted rock rip rap. The grouted rock rip rap at the northwesterly quadrant has been undermined up to 3 ft at its downstream terminus. It seems there is no change in the downstream condition since 1999

CULVERT

No significant defects were visually seen during this inspection.

SAFE LOAD CAPACITY

The current rating has been assigned in accordance with SMI procedures for culverts. Based on the field conditions and load history, the culvert is adequate to carry legal loads.

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
241	Reinforced Concrete Culvert	2	8	m.	8	0	0	0	0
337	Metal Railing (W6X25 Posts)	2	18	m.	18	0	0	0	0
361	Scour	2	1	ea.	0	1	0	0	0

WORK RECOMMENDATIONS

RecDate: 01/28/1999
Action : Sub-Scour Mitigate
Work By: LOCAL AGENCY
Status : PROPOSED

EstCost:
StrTarget: 2 YEARS
DistTarget:
EA:

Construct a scour mitigation device downstream of the structure to prevent further degradation of the streambed.

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 55C0188
(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- THISA WAY
(9) LOCATION- 200' S/O SILVERADO 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 49.56 SEC
(17) LONGITUDE 117 DEG 38 MIN 22.62 SEC
(98) BORDER BRIDGE STATE CODE % SHARE %
(99) BORDER BRIDGE STRUCTURE NUMBER

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

(43) STRUCTURE TYPE MAIN:MATERIAL- CONCRETE
TYPE- CULVERT CODE 119
(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- NOT APPLICABLE CODE N
(108) WEARING SURFACE / PROTECTIVE SYSTEM:
A) TYPE OF WEARING SURFACE- BITUMINOUS CODE 6
B) TYPE OF MEMBRANE- NOT APPLICABLE CODE N
C) TYPE OF DECK PROTECTION- NOT APPLICABLE CODE N

********** AGE AND SERVICE **********

(27) YEAR BUILT 1965
(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 200
(30) YEAR OF ADT 2009 (109) TRUCK ADT 1 %
(19) BYPASS, DETOUR LENGTH 2 KM

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

(48) LENGTH OF MAXIMUM SPAN 7.3 M
(49) STRUCTURE LENGTH 7.9 M
(50) CURB OR SIDEWALK: LEFT 0.0 M RIGHT 0.0 M
(51) BRIDGE ROADWAY WIDTH CURB TO CURB 7.2 M
(52) DECK WIDTH OUT TO OUT 7.6 M
(32) APPROACH ROADWAY WIDTH (W/SHOULDERS) 7.3 M
(33) BRIDGE MEDIAN- NO MEDIAN 0
(34) SKEW 9 DEG (35) STRUCTURE FLARED NO
(10) INVENTORY ROUTE MIN VERT CLEAR 99.99 M
(47) INVENTORY ROUTE TOTAL HORIZ CLEAR 7.2 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 = 82.5
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- LOCAL RURAL 09
(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 N
(59) SUPERSTRUCTURE N
(60) SUBSTRUCTURE N
(61) CHANNEL & CHANNEL PROTECTION 8
(62) CULVERTS 7

********* 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 4
(69) UNDERCLEARANCES, VERTICAL & HORIZONTAL N
(71) WATER ADEQUACY 6
(72) APPROACH ROADWAY ALIGNMENT 6
(36) TRAFFIC SAFETY FEATURES 1000
(113) SCOUR CRITICAL BRIDGES 3

********** 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 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)