

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: 55C0065

Bridge Name: Limestone Canyon

Year Built: 1931

Facility Carried: Santiago Canyon Road

The Limestone Canyon culvert at Santiago Canyon Road is a reinforced concrete double box culvert. The culvert appears to have been maintained. The walls appear to have been painted. Erosion measures appear to be in good shape.

Caltrans BIR recommendations:

- Repair the northeast wingwall that is separated from structure.

Field Inspection Observations

- Cracks and efflorescence visible on soffit (photo 3).
- There appears to be excessive AC overly. Recommend no addition AC lifts on structure.
- Culvert walls appear to be painted (photo 4).
- Confirmed wingwall has separated from structure (photo 6).

Maintenance Needs Assessment

BPMP Assessment

- N/A – No eligible maintenance activities

General Maintenance – Non-BPMP

- Monitor gap between wingwall and structure. If increases, initiate repair.
- Efflorescence likely from water penetrating through deck. May become more significant over time. To repair will require deck AC removal, deck treatment, and grinding approach AC to conform to lower deck elevation.
- No additional AC should be applied to the deck.

Proposed BPMP Construction Costs

- N/A

Construction Items Not Funded by BPMP

- Reconnect Wingwall ≈\$30,000 (includes engineering, mobilization and contingency)

APPENDIX A

Photos and BIR



Photo 1:



Photo 2:



Photo 3: Bridge Soffit

Efflorescence

Soffit Crack



Photo 4:



Photo 5:



Photo 6:



DEPARTMENT OF TRANSPORTATION
Structure Maintenance & Investigations

Bridge Number : 55C0065
Facility Carried: SANTIAGO CNYN ROAD
Location : 4.4 mi se/o JAMBOREE RD.
City :
Inspection Date : 08/13/2015

Bridge Inspection Report

Inspection Type

Routine FC Underwater Special Other

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STRUCTURE NAME: LIMESTONE CANYON

CONSTRUCTION INFORMATION

Year Built : 1931 Skew (degrees): 0
Year Widened: 1955 No. of Joints : 0
Length (m) : 7.9 No. of Hinges : 0

Structure Description: Double 3.7 m x 3.0 m x 12.8 m RC box culvert (grade top) beneath 0.3 m of earth fill.

Span Configuration : (W) 2 @ 3.7 m (E) clear, normal

SAFE LOAD CAPACITY AND RATINGS

Design Live Load: UNKNOWN
Inventory Rating: RF=0.50 =>16.2 metric tons Calculation Method: FIELD EVAL/ENG JUDGMENT
Operating Rating: RF=0.84 =>27.2 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) 0.2 m br, 12.4 m, 0.2 m br (N)

Total Width: 12.8 m Net Width: 12.5 m No. of Lanes: 2 Speed: 55 mph
Min. Vertical Clearance: Unimpaired Overlay Thickness: 5.0 Inches

Rail Code: 0000

Rail Type	Location	Length (ft)	Rail Modifications
MBBR	Right/Left	60	

DESCRIPTION UNDER STRUCTURE

Channel Description: Natural earth trapezoidal.

NOTICE

The bridge inspection condition assessment used for this inspection is based on the American Association of State Highway and Transportation Officials (AASHTO) Bridge Element Inspection Manual 2013 as defined in Moving Ahead for Progress in the 21st Century (MAP-21) federal law. The new element inspection methodology may result in changes to related condition and appraisal ratings on the bridge without significant physical changes at the bridge.

The element condition information contained in this report represents the current condition of the bridge based on the most recent routine and special inspections. Some of the notes presented below may be from an inspection that occurred prior to the date noted in this report. Refer to the Scope and Access section of this inspection report for a description of which portions of the bridge were inspected on this date.

INSPECTION COMMENTARY

CONDITION OF STRUCTURE

The channel was dry at time of inspection; all elements were visually inspection.

There is 0.25" wide diagonal crack at southwest wingwall and at the end there is 8" x 8" x 3" spall with exposed rebar.

The northeast wingwall is separated from structure, horizontal movement of 6" at the top and 2" at the bottom, it caused erosion behind the culvert wall and depression in the

INSPECTION COMMENTARY

roadway corner.

SAFE LOAD CAPACITY

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

ELEMENT INSPECTION RATINGS AND NOTES

Elem No.	Defect /Prot	Defect	Element Description	Env	Total Qty	Units	Qty in each Condition	State		
							St. 1	St. 2	St. 3	St. 4
241			Culvert-RC	2	26	m	24	2	0	0
	1130		Cracking (RC and Other)	2	2		0	2	0	0

(241-1130)

There are 2 vertical cracks in interior wall of both barrels.

330			Railing-Metal	2	16	m	16	0	0	0
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(330)

There were no significant defects noted.

WORK RECOMMENDATIONS

RecDate: 08/13/2015

Action : Sub-Misc.

Work By: LOCAL AGENCY

Status : PROPOSED

EstCost:

StrTarget: 2 YEARS

DistTarget:

EA:

Repair the northeast wingwall that is separated from structure, horizontal movement of 6" at the top and 2" at the bottom, it caused erosion behind the culvert wall and depression in the roadway corner.

Team Leader : Mikhael T. Zaarour

Report Author : Mikhael T. Zaarour

Inspected By : MT.Zaarour/KD.Henderson

Mikhael T. Zaarour

9/23/15

Mikhael T. Zaarour (Registered Civil Engineer) (Date)



STRUCTURE INVENTORY AND APPRAISAL REPORT

***** IDENTIFICATION *****

(1) STATE NAME- CALIFORNIA 069
 (8) STRUCTURE NUMBER 55C0065
 (5) INVENTORY ROUTE(ON/UNDER)- ON 140000000
 (2) HIGHWAY AGENCY DISTRICT 12
 (3) COUNTY CODE 059 (4) PLACE CODE 00000
 (6) FEATURE INTERSECTED- LIMESTONE CANYON
 (7) FACILITY CARRIED- SANTIAGO CNYN ROAD
 (9) LOCATION- 4.4 mi se/o JAMBOREE RD.
 (11) MILEPOINT/KILOMETERPOINT 0
 (12) BASE HIGHWAY NETWORK- PART OF NET 1
 (13) LRS INVENTORY ROUTE & SUBROUTE 000000000000
 (16) LATITUDE 33 DEG 45 MIN 36.09 SEC
 (17) LONGITUDE 117 DEG 42 MIN 12.47 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 2
 (46) NUMBER OF APPROACH SPANS 0
 (107) DECK STRUCTURE TYPE- NOT APPLICABLE CODE N
 (108) WEARING SURFACE / PROTECTIVE SYSTEM:
 A) TYPE OF WEARING SURFACE- NOT APPLICABLE CODE N
 B) TYPE OF MEMBRANE- NOT APPLICABLE CODE N
 C) TYPE OF DECK PROTECTION- NOT APPLICABLE CODE N

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

(27) YEAR BUILT 1931
 (106) YEAR RECONSTRUCTED 1955
 (42) TYPE OF SERVICE: ON- HIGHWAY 1
 UNDER- WATERWAY 5
 (28) LANES:ON STRUCTURE 02 UNDER STRUCTURE 00
 (29) AVERAGE DAILY TRAFFIC 8000
 (30) YEAR OF ADT 2012 (109) TRUCK ADT 3 %
 (19) BYPASS, DETOUR LENGTH 23 KM

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

(48) LENGTH OF MAXIMUM SPAN 3.7 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 12.5 M
 (52) DECK WIDTH OUT TO OUT 12.8 M
 (32) APPROACH ROADWAY WIDTH (W/SHOULDERS) 12.5 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 12.5 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 = 60.7
 STATUS
 HEALTH INDEX 98.2
 PAINT CONDITION INDEX = N/A

***** CLASSIFICATION ***** CODE

(112) NBIS BRIDGE LENGTH- YES Y
 (104) HIGHWAY SYSTEM- ROUTE ON NHS 1
 (26) FUNCTIONAL CLASS- OTHER PRIN ART URBAN 14
 (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- UNKNOWN 0
 (63) OPERATING RATING METHOD- FIELD EVAL/ENG JUD 0
 (64) OPERATING RATING- 27.2
 (65) INVENTORY RATING METHOD- FIELD EVAL/ENG JUL 0
 (66) INVENTORY RATING- 16.2
 (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 4
 (68) DECK GEOMETRY 5
 (69) UNDERCLEARANCES, VERTICAL & HORIZONTAL N
 (71) WATER ADEQUACY 8
 (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 12426
 (115) YEAR OF FUTURE ADT 2035

***** INSPECTIONS *****

(90) INSPECTION DATE 08/15 (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)