

Orange County Bridge Review Summary

Dokken Engineering performed a field review of the Orange County bridge listed below in April 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: 55C0017

Bridge Name: Santa Ana River Channel

Year Built: 1970

Facility Carried: Lincoln Avenue

The Santa Ana River Channel at Lincoln Avenue is a continuous six span cast-in-place reinforced concrete T-beam with pier wall and open end diaphragm abutments supported on steel piles.

Caltrans BIR recommendations:

- Seal the deck cracks with methacrylate. However, OCPW stated the deck was sealed when the bridge was widened.

Field Inspection Observations

- Concrete at joint is spalling and small portion of joint seal bulging (photo 1). No action required at this time.
- Some efflorescence visible on soffit (photo 2). Deck appeared to be treated. No immediate action required. But the bridge soffit should continue to be monitored to determine if water is seeping through the bridge deck.

Maintenance Needs Assessment

BPMP Assessment

- N/A – No confirmed eligible maintenance activities

General Maintenance – Non-BPMP

- No recommendations.

Proposed BPMP Construction Costs

- N/A

Construction Items Not Funded by BPMP

- N/A

APPENDIX A

Photos and BIR



Photo 1:



Photo 2:

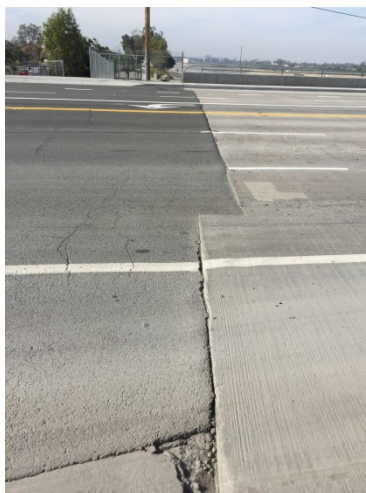


Photo 3:



Photo 4:

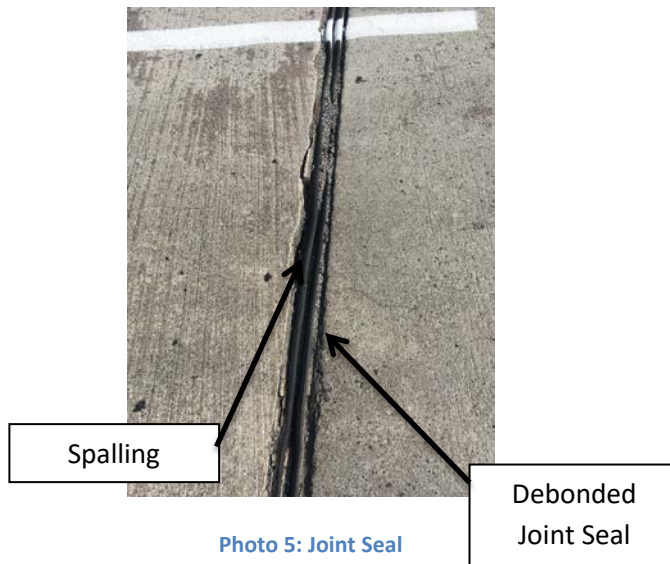


Photo 5: Joint Seal

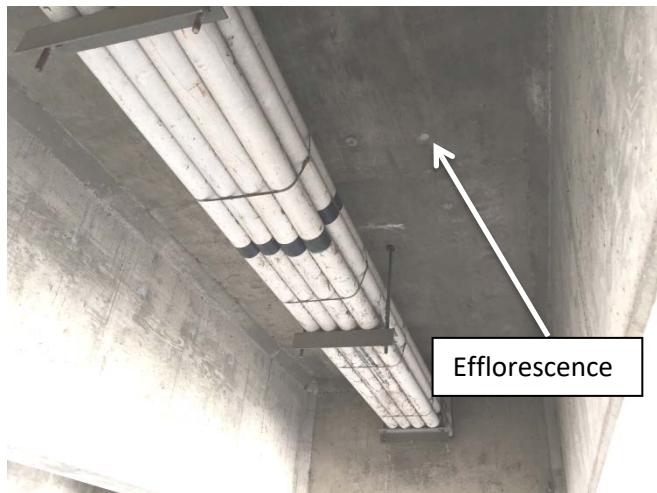


Photo 6: Bridge Soffit



Bridge Number : 55C0017
Facility Carried: LINCOLN AVENUE
Location : 0.7 MI E/O ROUTE 57 FWY.
City :
Inspection Date : 12/21/2013

Bridge Inspection Report

Inspection Type
Routine FC Underwater Special Other
☒

STRUCTURE NAME: SANTA ANA RIVER CHANNEL

CONSTRUCTION INFORMATION

Year Built : 1970
Year Widened: N/A
Length (m) : 130.1
Skew (degrees): 8
No. of Joints : 1
No. of Hinges : 1

Structure Description: Continuous six span CIP/RC T-beam (8 each) with RC piers and RC open end diaphragm abutments, all supported upon steel piles.

Span Configuration : (W) 17.4 m, 4 @ 23.8 m, 17.4 m (E) c/c

SAFE LOAD CAPACITY AND RATINGS

Design Live Load: MS-18 OR HS-20
Inventory Rating: RF=1.71 =>55.4 metric tons
Operating Rating: RF=2.84 =>92.0 metric tons
Permit Rating : PPPPP
Posting Load : Type 3: Legal Type 3S2: Legal Type 3-3: Legal
Calculation Method: LOAD FACTOR
Calculation Method: LOAD FACTOR

DESCRIPTION ON STRUCTURE

Deck X-Section: (S) 0.1 m br, 9.6 m, 1.2 m cu med, 9.6 m, 0.1 m br (N)
Total Width: 20.4 m Net Width: 19.1 m No. of Lanes: 4 Speed: 45 mph
Min. Vertical Clearance: Unimpaired
Rail Code: 1000 Rail Description: MBGR. with CLF on top.

DESCRIPTION UNDER STRUCTURE

Channel Description: Natural earth trapezoidal with rock slope protection, grouted through the site.

INSPECTION COMMENTARY

HISTORY

The bridge currently is widening.

The previous condition was as follows

SCOPE AND ACCESS

There is 1 m of water in spans #2 down to 0.5 m in span #5.

MISCELLANEOUS

Photos of widening construction from both sides of this structure was taken and is included with this report.

DECK AND ROADWAY

There is a spall 150 mm x 50 mm x 15 mm with exposed steel bar in the deck at middle of the bridge on W/B lane #2.

INSPECTION COMMENTARY

There unsealed deck cracks 2 mm wide and 150 mm spacing and some of them developed small spall with steel bar exposed.

There are transverse crack in the soffit with whit efflorescence.

SUPERSTRUCTURE

There are shear cracks in the girder 0.5 mm wide near the supports.

SUBSTRUCTURE

No significant defects were found during this inspection.

SAFE LOAD CAPACITY

This rating summary is based on load ratings calculations performed by SMI Ratings Section on 11/20/1979. This summary does not include a check of that analysis.

<u>ELEMENT INSPECTION RATINGS</u>									
Elem	Total		Qty in each Condition State						
No.	Element Description	Env	Qty	Units	St. 1	St. 2	St. 3	St. 4	St. 5
12	Concrete Deck - Bare	2	2490	sq.m.	0	2490	0	0	0
110	Reinforced Conc Open Girder/Beam	2	1040	m.	980	60	0	0	
210	Reinforced Conc Pier Wall	2	105	m.	105	0	0	0	0
215	Reinforced Conc Abutment	2	42	m.	42	0	0	0	0
256	Slope Protection	2	2	ea.	2	0	0	0	0
302	Compression Joint Seal	2	21	m.	21	0	0	0	0
312	Enclosed/Concealed Bearing	2	1	ea.	1	0	0	0	0
337	Metal Railing (W6X25 Posts)	2	280	m.	280	0	0	0	0
358	Deck Cracking	2	1	ea.	0	0	0	1	
359	Soffit of Concrete Deck or Slab	2	1	ea.	0	1	0	0	0

WORK RECOMMENDATIONS

RecDate: 05/30/2007

Action : Deck-Methacrylate

Work By: LOCAL AGENCY

Status : PROPOSED

EstCost:

StrTarget: 2 YEARS

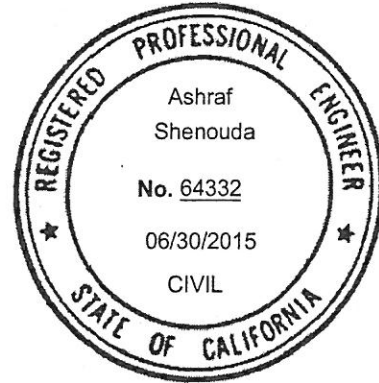
DistTarget:

EA:

Seal the deck cracks with methacrylate.

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

Ashraf Shenouda 2/16/14
Ashraf Shenouda (Registered Civil Engineer) (Date)



STRUCTURE INVENTORY AND APPRAISAL REPORT

***** IDENTIFICATION *****

(1) STATE NAME- CALIFORNIA 069
 (8) STRUCTURE NUMBER 55C0017
 (5) INVENTORY ROUTE (ON/UNDER)- ON 140000000
 (2) HIGHWAY AGENCY DISTRICT 12
 (3) COUNTY CODE 059 (4) PLACE CODE 00000
 (6) FEATURE INTERSECTED- SANTA ANA RIVER CHANNEL
 (7) FACILITY CARRIED- LINCOLN AVENUE
 (9) LOCATION- 0.7 MI E/O ROUTE 57 FWY.
 (11) MILEPOINT/KILOMETERPOINT 0
 (12) BASE HIGHWAY NETWORK- PART OF NET 1
 (13) LRS INVENTORY ROUTE & SUBROUTE 000000L03100
 (16) LATITUDE 33 DEG 50 MIN 07.64 SEC
 (17) LONGITUDE 117 DEG 51 MIN 47.36 SEC
 (98) BORDER BRIDGE STATE CODE % SHARE %
 (99) BORDER BRIDGE STRUCTURE NUMBER

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

(43) STRUCTURE TYPE MAIN:MATERIAL- CONCRETE
 TYPE- TEE BEAM CODE 104
 (44) STRUCTURE TYPE APPR:MATERIAL- OTHER/NA
 TYPE- OTHER/NA CODE 000
 (45) NUMBER OF SPANS IN MAIN UNIT 6
 (46) NUMBER OF APPROACH SPANS 0
 (107) DECK STRUCTURE TYPE- CIP CONCRETE CODE 1
 (108) WEARING SURFACE / PROTECTIVE SYSTEM:
 A) TYPE OF WEARING SURFACE- NONE CODE 0
 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 04 UNDER STRUCTURE 00
 (29) AVERAGE DAILY TRAFFIC 28000
 (30) YEAR OF ADT 2009 (109) TRUCK ADT 4 %
 (19) BYPASS, DETOUR LENGTH 5 KM

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

(48) LENGTH OF MAXIMUM SPAN 23.8 M
 (49) STRUCTURE LENGTH 130.1 M
 (50) CURB OR SIDEWALK: LEFT 0.0 M RIGHT 0.0 M
 (51) BRIDGE ROADWAY WIDTH CURB TO CURB 19.1 M
 (52) DECK WIDTH OUT TO OUT 20.4 M
 (32) APPROACH ROADWAY WIDTH (W/SHOULDERS) 21.6 M
 (33) BRIDGE MEDIAN- NO MEDIAN 0
 (34) SKEW 8 DEG (35) STRUCTURE FLARED NO
 (10) INVENTORY ROUTE MIN VERT CLEAR 99.99 M
 (47) INVENTORY ROUTE TOTAL HORIZ CLEAR 9.6 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 = 80.6
 STATUS STRUCTURALLY DEFICIENT
 HEALTH INDEX 93.6
 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 3
 (59) SUPERSTRUCTURE 6
 (60) SUBSTRUCTURE 7
 (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- LOAD FACTOR 1
 (64) OPERATING RATING- 92.0
 (65) INVENTORY RATING METHOD- LOAD FACTOR 1
 (66) INVENTORY RATING- 55.4
 (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 6
 (69) UNDERCLEARANCES, VERTICAL & HORIZONTAL N
 (71) WATER ADEQUACY 9
 (72) APPROACH ROADWAY ALIGNMENT 8
 (36) TRAFFIC SAFETY FEATURES 1000
 (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 78311
 (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)

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: 55C0038

Bridge Name: Santiago Creek

Year Built: 1963

Facility Carried: Santiago Canyon Road

The Santiago Creek Bridge at Santiago Canyon Road is a continuous four span cast-in-place reinforced concrete T-beam on seat abutments supported on spread footings.

Caltrans BIR recommendations:

- None

Field Inspection Observations

- Minor cracks are visible on the bridge deck. Some efflorescence visible on soffit. Note, Caltrans inspection report does not classify cracking as condition state 2, so deck does not qualify for treatment.
- Minor spalling on the northeast corner of deck. (photo 4)
- Pier footings are exposed and scour mitigation measures have been implemented. Difficult to assess effectiveness of scour measures and condition should be monitored. Caltrans report does not note scour recommendations. Appraisal report code indicates foundations determined to be stable for calculated scour.
- Vertical crack at abutment above outlet.
- Minor spalling at joint causing joint seal to debond. Recommend monitoring joints.

Maintenance Needs Assessment

BPMP Assessment

- N/A – No eligible maintenance activities

General Maintenance – Non-BPMP

- Monitor joint seal spalling. Discuss condition with Caltrans inspector if condition worsens. Review BIRs for joint seal recommendations and deck treatment condition states. No immediate actions required since not a high priority.
- Efflorescence likely from water penetrating through deck. Not significant problem at this time.
- Monitor scour mitigation. Footing on spread footing so undermining could become an issue.

Proposed BPMP Construction Costs

- N/A

Construction Items not Funded by BPMP

- N/A

APPENDIX A

Photos and BIR



Photo 1:



Photo 2:



Deck Cracks

Photo 3: Deck

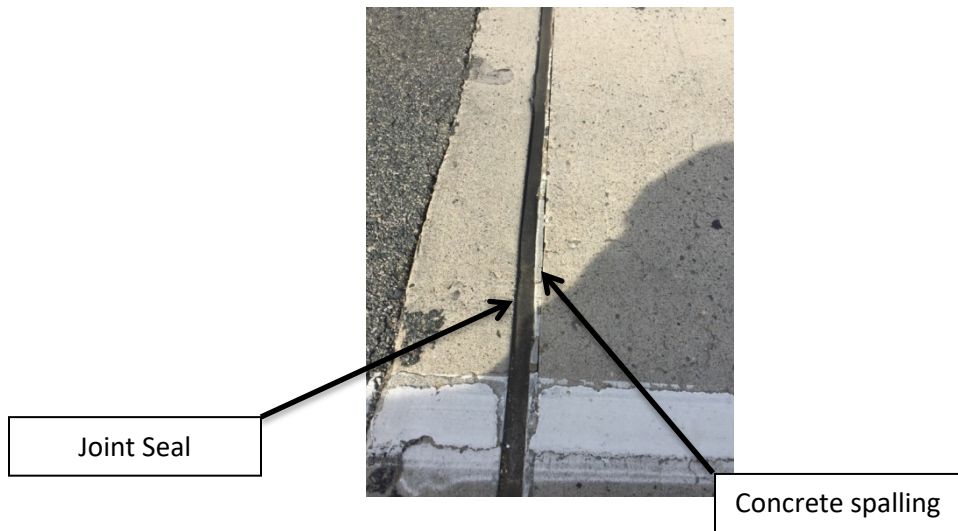


Photo 4: Joint Seal



Photo 5:



Photo 6:

Footing



Photo 7:



DEPARTMENT OF TRANSPORTATION
Structure Maintenance & Investigations

Bridge Number : 55C0038
Facility Carried: SANTIAGO CNYN ROAD
Location : 0.2 MI W/O SILVERADO CYN
City :
Inspection Date : 08/13/2015

Bridge Inspection Report

Inspection Type

Routine FC Underwater Special Other

☒

STRUCTURE NAME: SANTIAGO CREEK

CONSTRUCTION INFORMATION

Year Built : 1963 Skew (degrees): 0
Year Widened: N/A No. of Joints : 2
Length (m) : 69.5 No. of Hinges : 0

Structure Description: Continuous four span CIP/RC T-beam (5 each) with RC single column bents and RC open end seat abutments, all supported upon spread footings.

Span Configuration : (W) 14.9 m, 2 @ 19.2 m, 14.9 m (E) c/c

SAFE LOAD CAPACITY AND RATINGS

Design Live Load: MS-18 OR HS-20
Inventory Rating: 40.8 metric tons Calculation Method: LOAD FACTOR
Operating Rating: 68.9 metric tons Calculation Method: LOAD FACTOR
Permit Rating : PPPPP
Posting Load : Type 3: Legal Type 3S2: Legal Type 3-3: Legal

DESCRIPTION ON STRUCTURE

Deck X-Section: (S) 0.5 m br, 8.4 m, 0.5 m br (N)
Total Width: 9.3 m Net Width: 8.5 m No. of Lanes: 2 Speed: 55 mph
Min. Vertical Clearance: Unimpaired Overlay Thickness: 0.0 Inches
Rail Code: 0111

Rail Type	Location	Length (ft)	Rail Modifications
Type 8	Right/Left	492	

DESCRIPTION UNDER STRUCTURE

Channel Description: Natural earth trapezoidal with a cobbled bottom.

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

SCOPE AND ACCESS

The channel was dry at the time of the inspection, and all substructure elements were visually inspected.

SAFE LOAD CAPACITY

The load rating for this structure is being reviewed by SMI Ratings Branch. An updated

INSPECTION COMMENTARY

Load Rating Summary will be archived when this review is complete.

ELEMENT INSPECTION RATINGS AND NOTES

Elem No.	Defect /Prot	Element Description	Env	Total Qty	Units	Qty in each Condition	State		
						St. 1	St. 2	St. 3	St. 4
16		Top Flange-RC	2	646	sq.m	636	10	0	0
	1120	Efflorescence/Rust Staining	2	10		0	10	0	0
	521	Concrete Coat. (Meth/Paint/Seal)	2	584	sq.m	584	0	0	0
(16)									
There were no significant defects noted.									
(16-1120)									
There are few short 2 ft long transverse cracks 0.5 mm wide with light white efflorescence at the soffit in all spans.									
(16-521)									
There were no significant defects noted.									
110		Girder/Beam-RC	2	348	m	347	1	0	0
	1080	Delamination/Spall/Patched Area	2	1		0	1	0	0
(110-1080)									
There is a spall 6" x 3" x 1" in the north exterior girder in span #3									
215		Abutment-RC	2	28	m	28	0	0	0
(215)									
There were no significant defects noted.									
234		Pier Cap-RC	2	27	m	27	0	0	0
(234)									
There were no significant defects noted.									
254		Column Shell-Full Ht	2	3	ea.	3	0	0	0
	515	Steel Coating-Paint	2	105	sq.m	105	0	0	0
(254)									
The footings top are exposed 2' x 10' at bent #2 and #3. According to the hydraulic report it is within the limits									
(254-515)									
There were no significant defects noted.									
256		Slope Protection	2	2	ea.	2	0	0	0
(256)									
There were no significant defects noted.									
301		Joint-Pourable Seal	2	20	m	20	0	0	0
(301)									
There were no significant defects noted.									
311		Bearing-Moveable	2	10	each	10	0	0	0
	515	Steel Coating-Paint	2	10	sq.m	10	0	0	0
(311)									
There were no significant defects noted.									
(311-515)									

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

There were no significant defects noted.

330			Railing-Metal	2	139	m	139	0	0	0
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(330)


There were no significant defects noted.

WORK RECOMMENDATIONS - NONE

Team Leader : Mikhael T. Zaarour

Report Author : Mikhael T. Zaarour

Inspected By : MT.Zaarour/KD.Henderson

 9/23/15
 Mikhael T. Zaarour (Registered Civil Engineer) (Date)



STRUCTURE INVENTORY AND APPRAISAL REPORT

***** IDENTIFICATION *****

(1) STATE NAME- CALIFORNIA 069
 (8) STRUCTURE NUMBER 55C0038
 (5) INVENTORY ROUTE(ON/UNDER)- ON 140000000
 (2) HIGHWAY AGENCY DISTRICT 12
 (3) COUNTY CODE 059 (4) PLACE CODE 00000
 (6) FEATURE INTERSECTED- SANTIAGO CREEK
 (7) FACILITY CARRIED- SANTIAGO CNYN ROAD
 (9) LOCATION- 0.2 MI W/O SILVERADO CYN
 (11) MILEPOINT/KILOMETERPOINT 0
 (12) BASE HIGHWAY NETWORK- PART OF NET 1
 (13) LRS INVENTORY ROUTE & SUBROUTE 000000000000
 (16) LATITUDE 33 DEG 44 MIN 51.58 SEC
 (17) LONGITUDE 117 DEG 40 MIN 33.96 SEC
 (98) BORDER BRIDGE STATE CODE % SHARE %
 (99) BORDER BRIDGE STRUCTURE NUMBER

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

(43) STRUCTURE TYPE MAIN:MATERIAL- CONCRETE CONT
 TYPE- TEE BEAM CODE 204
 (44) STRUCTURE TYPE APPR:MATERIAL- OTHER/NA
 TYPE- OTHER/NA CODE 000
 (45) NUMBER OF SPANS IN MAIN UNIT 4
 (46) NUMBER OF APPROACH SPANS 0
 (107) DECK STRUCTURE TYPE- CIP CONCRETE CODE 1
 (108) WEARING SURFACE / PROTECTIVE SYSTEM:
 A) TYPE OF WEARING SURFACE- NONE CODE 0
 B) TYPE OF MEMBRANE- NONE CODE 0
 C) TYPE OF DECK PROTECTION- NONE CODE 0

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

(27) YEAR BUILT 1963
 (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 7000
 (30) YEAR OF ADT 2012 (109) TRUCK ADT 5 %
 (19) BYPASS, DETOUR LENGTH 22 KM

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

(48) LENGTH OF MAXIMUM SPAN 19.2 M
 (49) STRUCTURE LENGTH 69.5 M
 (50) CURB OR SIDEWALK: LEFT 0.0 M RIGHT 0.0 M
 (51) BRIDGE ROADWAY WIDTH CURB TO CURB 8.5 M
 (52) DECK WIDTH OUT TO OUT 9.3 M
 (32) APPROACH ROADWAY WIDTH (W/SHOULDERS) 12.2 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 8.5 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 = 74.0
 STATUS
 HEALTH INDEX 99.7
 PAINT CONDITION INDEX = 100.0

***** 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 8
 (59) SUPERSTRUCTURE 8
 (60) SUBSTRUCTURE 8
 (61) CHANNEL & CHANNEL PROTECTION 4
 (62) CULVERTS N

***** LOAD RATING AND POSTING ***** CODE

(31) DESIGN LOAD- MS-18 OR HS-20 5
 (63) OPERATING RATING METHOD- LOAD FACTOR 1
 (64) OPERATING RATING- 68.9
 (65) INVENTORY RATING METHOD- LOAD FACTOR 1
 (66) INVENTORY RATING- 40.8
 (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 8
 (68) DECK GEOMETRY 4
 (69) UNDERCLEARANCES, VERTICAL & HORIZONTAL N
 (71) WATER ADEQUACY 9
 (72) APPROACH ROADWAY ALIGNMENT 6
 (36) TRAFFIC SAFETY FEATURES 0111
 (113) SCOUR CRITICAL BRIDGES 5

***** 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 9619
 (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)

Orange County Bridge Review Summary

Dokken Engineering performed a field review of the Orange County bridge listed below in April 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: 55C0049

Bridge Name: Santiago Creek

Year Built: 1967

Facility Carried: Santiago Canyon Road

The Santiago Creek Bridge at Santiago Canyon Rd is a continuous three span cast-in-place reinforced concrete T-beam with reinforced concrete single column bents and reinforced concrete open end seat abutments all supported on spread footings. OCPW noted the existing deck has been treated.

Caltrans BIR recommendations:

- Replace joint seal at abutment 4.

Field Inspection Observations

- Efflorescence is visible on the bridge soffit (photo 3). No immediate action is required but the bridge soffit should continue to be monitored to determine if water is continuing to seep through the bridge deck.
- Confirmed joint seal is in need of replacement. Portions of the joint seal are missing (photo 5).
- No approach slab. It appears there is some AC settlement behind the abutments (photo 2). No immediate action is required but the approach should continue to be monitored.

Maintenance Needs Assessment

BPMP Assessment

- Repair Abutment 4 joint seal. This is a pourable seal so less extensive work than other joint seal systems.

General Maintenance – Non-BPMP

- None

Proposed BPMP Construction Costs

- Estimated Total Construction Cost ≈ \$20,000 (with engineering, traffic control, mobilization and contingency)

Construction Items Not Funded by BPMP

- N/A

Appendix A

Photos and BIR



Photo 1:



Photo 2:



Efflorescence

Photo 3: Bridge Soffit



Photo 4:

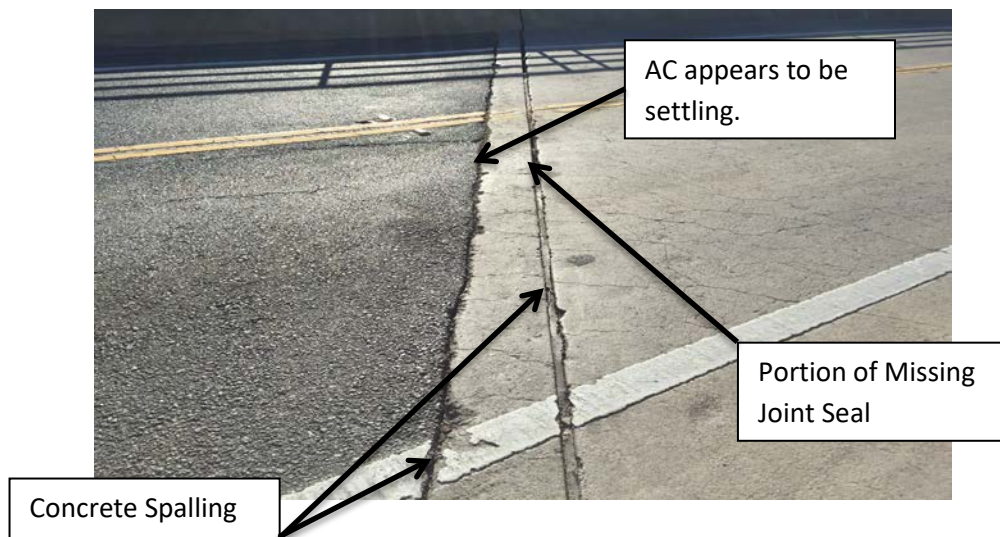


Photo 5: Joint Seal



DEPARTMENT OF TRANSPORTATION
Structure Maintenance & Investigations

Bridge Number : 55C0049
Facility Carried: SANTIAGO CANYON RD
Location : 0.3 MI S/O MODJESKA RD
City :
Inspection Date : 08/13/2015
Inspection Type
Routine FC Underwater Special Other

Bridge Inspection Report

☒

STRUCTURE NAME: SANTIAGO CREEK

CONSTRUCTION INFORMATION

Year Built : 1967
Year Widened: N/A
Length (m) : 60
Skew (degrees): 18
No. of Joints : 1
No. of Hinges : 0

Structure Description: Continuous three span CIP/RC T-beam (5 each) with RC single column bents and RC open end seat abutments, all supported upon spread footings.

Span Configuration : (S) 18.0 m, 24.8 m, 18.0 m (N) c/c

SAFE LOAD CAPACITY AND RATINGS

Design Live Load: MS-18 OR HS-20
Inventory Rating: 40.8 metric tons
Operating Rating: 68.0 metric tons
Permit Rating : PPPPP
Posting Load : Type 3: Legal
Calculation Method: LOAD FACTOR
Calculation Method: LOAD FACTOR
Type 3S2: Legal
Type 3-3: Legal

DESCRIPTION ON STRUCTURE

Deck X-Section: (W) 0.5 m br, 9.0 m, 0.5 m br (E)
Total Width: 10.1 m Net Width: 9.0 m No. of Lanes: 2 Speed: 55 mph
Min. Vertical Clearance: Unimpaired Overlay Thickness: 0.0 Inches
Rail Code: 1111

Rail Type	Location	Length (ft)	Rail Modifications
Type 25	Right/Left	480	Hand rail

DESCRIPTION UNDER STRUCTURE

Channel Description: Natural earth trapezoida with a cobbled bottom.

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.

SAFE LOAD CAPACITY

The load rating for this structure is being reviewed by SM&I Ratings Branch. An updated Load Rating Summary Sheet will be archived when this review is complete. The current rating is based on BDS computer output dated 6/14/1979.

ELEMENT INSPECTION RATINGS AND NOTES

Elem No.	Defect /Prot	Defect	Element Description	Env	Total Qty	Units	Qty in each St. 1	St. 2	St. 3	Condition State St. 4
16			Top Flange-RC	2	600	sq.m	580	20	0	0
1120			Efflorescence/Rust Staining	2	20		0	20	0	0
1130			Cracking (RC and Other)	2	580		580	0	0	0
521			Concrete Coat. (Meth/Paint/Seal)	2	600	sq.m	600	0	0	0
(16-1120) There are short transverse crack in the soffit 0.5 mm wide by 2 ft long and longitudinal hairline cracks 3ft long with white efflorescence.										
(16-1130) The cracks have been sealed with methacrylate										
(16-521) There were no significant defects noted.										
110			Girder/Beam-RC	2	300	m	300	0	0	0
(110) There were no significant defects noted.										
205			Column-RC	2	2	each	2	0	0	0
(205) There were no significant defects noted.										
215			Abutment-RC	2	34	m	34	0	0	0
(215) There were no significant defects noted.										
234			Pier Cap-RC	2	18	m	18	0	0	0
(234) There were no significant defects noted.										
301			Joint-Pourable Seal	2	12	m	0	0	12	0
2310			Leakage (Joints)	2	6		0	0	6	0
2330			Seal Damage (Joints)	2	6		0	0	6	0
(301-2310) There are water stain at the abutment wall #4 (north)										
(301-2330) There are missing dry and section of the seal										
312			Bearing-Enclosed	2	2	each	2	0	0	0
(312) The bearing element is included to indicate the presence of bearings on this structure. The bearings were not exposed for visual inspection. No indication of bearing distress was noted in any substructure element.										
331			Railing-RC	2	120	m	120	0	0	0
(331) There were no significant defects noted.										

WORK RECOMMENDATIONS

WORK RECOMMENDATIONS

RecDate: 05/13/2011
 Action : Joints-Replace
 Work By: LOCAL AGENCY
 Status : PROPOSED

EstCost:
 StrTarget: 2 YEARS
 DistTarget:
 EA:

Replace the joint seal at Abutment 4
 (north) which is dry and 3 m is missing.

CHANNEL X-SECTION

Side : Upstream

X-Section Date: 08/13/2015

Measured From : Soffit of east girder

Location	Horiz (m)	Vert (m)	Comments
Abut 1	0.00	2.16	face of abut wall
	2.10	2.56	top of slope
Bent 2	-3.40	7.78	toe of slope
	0.00	7.76	CL of bent 2
	5.55	7.15	
	13.05	6.30	
	17.70	6.73	
	20.50	6.95	thalweg
Bent 3	0.00	6.35	CL of bent 3
	1.84	5.90	toe of slope
	7.30	3.40	break point
	12.95	1.43	top of slope
Abut 4	0.00	1.20	face of abut wall

Team Leader : Mikhael T. Zaarour

Report Author : Mikhael T. Zaarour

Inspected By : MT.Zaarour/KD.Henderson

*Mikhael**9/23/15*

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

CC:



STRUCTURE INVENTORY AND APPRAISAL REPORT

***** IDENTIFICATION *****

(1) STATE NAME- CALIFORNIA 069
 (8) STRUCTURE NUMBER 55C0049
 (5) INVENTORY ROUTE(ON/UNDER)- ON 140000000
 (2) HIGHWAY AGENCY DISTRICT 12
 (3) COUNTY CODE 059 (4) PLACE CODE 00000
 (6) FEATURE INTERSECTED- SANTIAGO CREEK
 (7) FACILITY CARRIED- SANTIAGO CANYON RD
 (9) LOCATION- 0.3 MI S/O MODJESKA RD
 (11) MILEPOINT/KILOMETERPOINT 0
 (12) BASE HIGHWAY NETWORK- PART OF NET 1
 (13) LRS INVENTORY ROUTE & SUBROUTE 000000000000
 (16) LATITUDE 33 DEG 42 MIN 44.92 SEC
 (17) LONGITUDE 117 DEG 38 MIN 42.4 SEC
 (98) BORDER BRIDGE STATE CODE % SHARE %
 (99) BORDER BRIDGE STRUCTURE NUMBER

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

(43) STRUCTURE TYPE MAIN:MATERIAL- CONCRETE CONT
 TYPE- TEE BEAM CODE 204
 (44) STRUCTURE TYPE APPR:MATERIAL- OTHER/NA
 TYPE- OTHER/NA CODE 000
 (45) NUMBER OF SPANS IN MAIN UNIT 3
 (46) NUMBER OF APPROACH SPANS 0
 (107) DECK STRUCTURE TYPE- CIP CONCRETE CODE 1
 (108) WEARING SURFACE / PROTECTIVE SYSTEM:
 A) TYPE OF WEARING SURFACE- NONE CODE 0
 B) TYPE OF MEMBRANE- NONE CODE 0
 C) TYPE OF DECK PROTECTION- NONE CODE 0

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

(27) YEAR BUILT 1967
 (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 8000
 (30) YEAR OF ADT 2012 (109) TRUCK ADT 3 %
 (19) BYPASS, DETOUR LENGTH 2 KM

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

(48) LENGTH OF MAXIMUM SPAN 23.8 M
 (49) STRUCTURE LENGTH 60.0 M
 (50) CURB OR SIDEWALK: LEFT 0.0 M RIGHT 0.0 M
 (51) BRIDGE ROADWAY WIDTH CURB TO CURB 9.0 M
 (52) DECK WIDTH OUT TO OUT 10.1 M
 (32) APPROACH ROADWAY WIDTH (W/SHOULDERS) 12.5 M
 (33) BRIDGE MEDIAN- NO MEDIAN 0
 (34) SKEW 18 DEG (35) STRUCTURE FLARED NO
 (10) INVENTORY ROUTE MIN VERT CLEAR 99.99 M
 (47) INVENTORY ROUTE TOTAL HORIZ CLEAR 9.0 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 = 80.0

STATUS

HEALTH INDEX 99.5

PAINT CONDITION INDEX = N/A

***** CLASSIFICATION *****

(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 *****

(58) DECK 7
 (59) SUPERSTRUCTURE 8
 (60) SUBSTRUCTURE 8
 (61) CHANNEL & CHANNEL PROTECTION 8
 (62) CULVERTS N

***** LOAD RATING AND POSTING *****

(31) DESIGN LOAD- MS-18 OR HS-20 5
 (63) OPERATING RATING METHOD- LOAD FACTOR 1
 (64) OPERATING RATING- 68.0
 (65) INVENTORY RATING METHOD- LOAD FACTOR 1
 (66) INVENTORY RATING- 40.8
 (70) BRIDGE POSTING- EQUAL TO OR ABOVE LEGAL LOADS 5
 (41) STRUCTURE OPEN, POSTED OR CLOSED- A
 DESCRIPTION- OPEN, NO RESTRICTION

***** APPRAISAL *****

(67) STRUCTURAL EVALUATION 8
 (68) DECK GEOMETRY 2
 (69) UNDERCLEARANCES, VERTICAL & HORIZONTAL N
 (71) WATER ADEQUACY 9
 (72) APPROACH ROADWAY ALIGNMENT 8
 (36) TRAFFIC SAFETY FEATURES 1111
 (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 12365
 (115) YEAR OF FUTURE ADT 2035

***** INSPECTIONS *****

(90) INSPECTION DATE 08/15 (91) FREQUENCY 48 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)

Orange County Bridge Review Summary

Dokken Engineering performed a field review of the Orange County bridge listed below in April 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: 55C0059

Bridge Name: William Canyon Creek

Year Built: 1970

Facility Carried: Santiago Canyon Road

The William Canyon Creek Bridge at Santiago Canyon Rd is a single span cast-in-place reinforced concrete ridged frame deck slab supported upon spread footings. The bridge spans over a natural earth trapezoidal creek with a cobble bottom. The bridge was widened in 1983.

Caltrans BIR recommendations:

- Fill sinkhole at southeast corner.
- Address southeast slope degradation.

Field Inspection Observations

- Little to no efflorescence in bridge soffit (photo 2).
- Deep rutting in deck (photo 3).
- Erosion of embankment by the wing walls (photo 4).

Maintenance Needs Assessment

BPMP Assessment

- Deep rutting in deck may be eligible for deck treatment, such as polyester concrete, since classified as condition state 2.
- Address erosion with fill material and divert water to suitable collection system.

General Maintenance – Non-BPMP

- None.

Proposed BPMP Construction Costs

- Polyester Concrete Overlay Estimated Total Construction Cost ≈ \$40,000 (with engineering, traffic control, mobilization and contingency)
- Address erosion ≈ \$6,000

Construction Items Not Funded by BPMP

- N/A

APPENDIX A

Photos and BIR



Photo 1: Williams Canyon Creek Bridge



Photo 2: Bridge Soffit



Photo 3: Bridge Deck

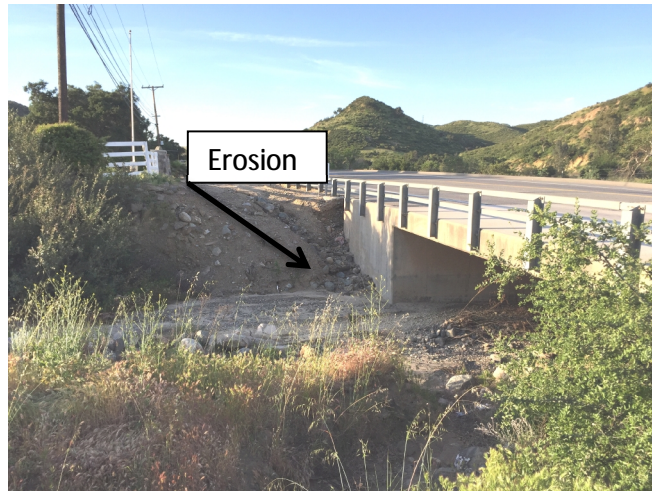


Photo 4: Abutment walls



DEPARTMENT OF TRANSPORTATION
Structure Maintenance & Investigations

Bridge Number : 55C0059
Facility Carried: SANTIAGO CANYON RD
Location : 0.8 MI N/O MODJESKA RD
City :
Inspection Date : 08/13/2015

Bridge Inspection Report

Inspection Type
Routine FC Underwater Special Other

☒

STRUCTURE NAME: WILLIAMS CANYON CREEK

CONSTRUCTION INFORMATION

Year Built : 1970 Skew (degrees): 0
Year Widened: 1983 No. of Joints : 0
Length (m) : 10.7 No. of Hinges : 0

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

Span Configuration : (S) 1 @ 10.1 m (N) c/c

SAFE LOAD CAPACITY AND RATINGS

Design Live Load: MS-18 OR HS-20
Inventory Rating: 32.6 metric tons Calculation Method: LOAD FACTOR
Operating Rating: 53.5 metric tons Calculation Method: LOAD FACTOR
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, 15.92 m, 0.2 m br (E)
Total Width: 16.2 m Net Width: 15.9 m No. of Lanes: 2 Speed: 55 mph
Min. Vertical Clearance: Unimpaired Overlay Thickness: 0.0 Inches
Rail Code: 0000

Rail Type	Location	Length (ft)	Rail Modifications
Type 15	Right/Left	138	

DESCRIPTION UNDER STRUCTURE

Channel Description: Natural earth trapezoidal with a cobbled bottom and with rock slopes upstream.

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.

SAFE LOAD CAPACITY

The load rating for this structure is being reviewed by SM&I Ratings Branch. An updated Load Rating Summary Sheet will be archived when this review is complete. The current

INSPECTION COMMENTARY

rating is based on BDS computer output dated 10/10/1979.

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
38		Slab-RC	2	160	sq.m	80	80	0	0
	1190	Abrasion (PS Conc./RC)	2	80		0	80	0	0
(38-1190)									
There are wearing surface of the deck around the tires line									
215		Abutment-RC	2	48	m	47	0	1	0
	6000	Scour	2	1		0	0	1	0
(215)									
There were no significant defects noted.									
(215-6000)									
There is gully erosion at the southeast wing wall caused by runoff water. The water caused sinkhole 5' x 4' x 3' at the end of the wing wall in the roadway.									
330		Railing-Metal	2	20	m	20	0	0	0
(330)									
There were no significant defects noted.									

WORK RECOMMENDATIONS

RecDate: 08/13/2015	EstCost:	Provide suitable material for the
Action : Appr. Roadway-Repair	StrTarget: 2 YEARS	sinkhole 5' x 4' x 3' at the southeast
Work By: LOCAL AGENCY	DistTarget:	corner of the roadway.
Status : PROPOSED	EA:	
RecDate: 05/13/2011	EstCost:	Provide suitable material at the
Action : Drainage Issue	StrTarget: 2 YEARS	southeast slope next to the winwall to
Work By: LOCAL AGENCY	DistTarget:	prevent future degradation from runoff
Status : PROPOSED	EA:	water.

CHANNEL X-SECTION

Side : Upstream			X-Section Date: 08/13/2015
Measured From : Soffit of slab (E)			
Location	Horiz (m)	Vert (m)	Comments
Abut 1	0.00	2.30	face of abut wall
	4.30	2.20	
Abut 2	0.00	1.89	face of abut wall

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 55C0059
 (5) INVENTORY ROUTE (ON/UNDER) - ON 140000000
 (2) HIGHWAY AGENCY DISTRICT 12
 (3) COUNTY CODE 059 (4) PLACE CODE 00000
 (6) FEATURE INTERSECTED- WILLIAMS CANYON CREEK
 (7) FACILITY CARRIED- SANTIAGO CANYON RD
 (9) LOCATION- 0.8 MI N/O MODJESKA RD
 (11) MILEPOINT/KILOMETERPOINT 0
 (12) BASE HIGHWAY NETWORK- PART OF NET 1
 (13) LRS INVENTORY ROUTE & SUBROUTE 000000000000
 (16) LATITUDE 33 DEG 43 MIN 43.55 SEC
 (17) LONGITUDE 117 DEG 39 MIN 01.01 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- NONE CODE 0
 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 02 UNDER STRUCTURE 00
 (29) AVERAGE DAILY TRAFFIC 8000
 (30) YEAR OF ADT 2012 (109) TRUCK ADT 3 %
 (19) BYPASS, DETOUR LENGTH 22 KM

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

(48) LENGTH OF MAXIMUM SPAN 10.1 M
 (49) STRUCTURE LENGTH 10.7 M
 (50) CURB OR SIDEWALK: LEFT 0.0 M RIGHT 0.0 M
 (51) BRIDGE ROADWAY WIDTH CURB TO CURB 15.9 M
 (52) DECK WIDTH OUT TO OUT 16.2 M
 (32) APPROACH ROADWAY WIDTH (W/SHOULDERS) 15.9 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 15.9 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 = 88.7

STATUS

HEALTH INDEX 88.3

PAINT CONDITION INDEX = N/A

***** CLASSIFICATION *****

(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 *****

(58) DECK 7
 (59) SUPERSTRUCTURE 7
 (60) SUBSTRUCTURE 7
 (61) CHANNEL & CHANNEL PROTECTION 8
 (62) CULVERTS N

***** LOAD RATING AND POSTING *****

(31) DESIGN LOAD- MS-18 OR HS-20 5
 (63) OPERATING RATING METHOD- LOAD FACTOR 1
 (64) OPERATING RATING- 53.5
 (65) INVENTORY RATING METHOD- LOAD FACTOR 1
 (66) INVENTORY RATING- 32.6
 (70) BRIDGE POSTING- EQUAL TO OR ABOVE LEGAL LOADS 5
 (41) STRUCTURE OPEN, POSTED OR CLOSED- A
 DESCRIPTION- OPEN, NO RESTRICTION

***** APPRAISAL *****

(67) STRUCTURAL EVALUATION 7
 (68) DECK GEOMETRY 9
 (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 12365
 (115) YEAR OF FUTURE ADT 2035

***** INSPECTIONS *****

(90) INSPECTION DATE 08/15 (91) FREQUENCY 48 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)

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

☒

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
-----	--	--	---------------	---	----	---	----	---	---	---

(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)

Orange County Bridge Review Summary

Dokken Engineering performed a field review of the Orange County bridge listed below in April 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: 55C0097

Bridge Name: Santa Ana River Channel

Year Built: 1983

Facility Carried: Talbert/MacArthur

The Santa Ana River Channel at Talbert MacArthur is a continuous 4 span cast-in-place reinforced concrete box girder with pier wall and open end diaphragm abutments supported on concrete piles.

Caltrans BIR recommendations:

- None

Field Inspection Observations

- Very minor spall on concrete railing, exposing rebar, and spalled sidewalk concrete (photos 1 & 5).
- Bridge deck appears to be treated (photo 2).

Maintenance Needs Assessment

BPMP Assessment

- N/A – No eligible maintenance activities

General Maintenance – Non-BPMP

- Monitor existing spalls. Currently very minor, no action needed at this time.

Proposed BPMP Construction Costs

- N/A

Construction Items Not Funded by BPMP

- N/A

APPENDIX A

Photos and BIR



Photo 1:

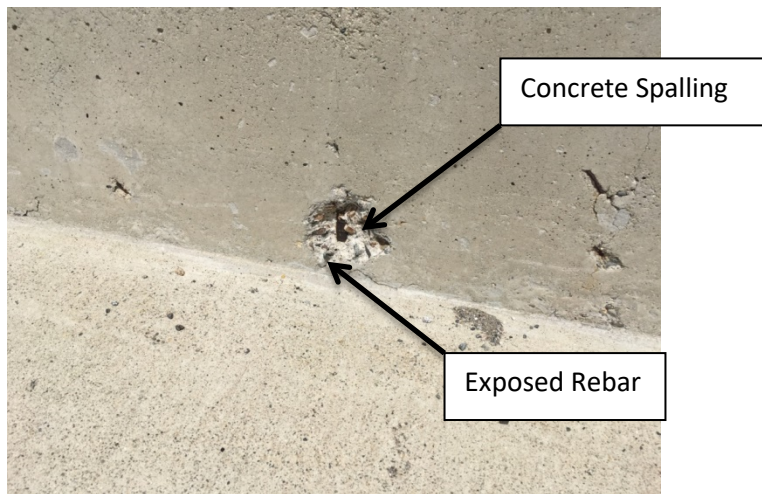


Photo 2: Barrier

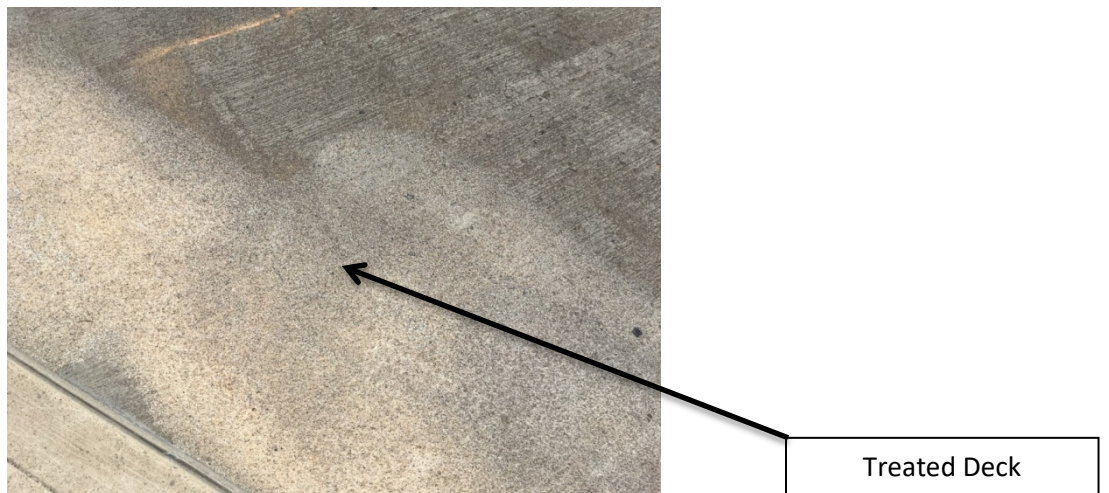


Photo 3: Bridge Deck

Joint Seal

Spalled Concrete on
Sidewalk



Photo 4: Bridge Deck

Spalled Concrete



Photo 5: Sidewalk



DEPARTMENT OF TRANSPORTATION
Structure Maintenance & Investigations

Bridge Number : 55C0097
Facility Carried: TALBERT/MACARTHUR
Location : 0.6 MI W/O HARBOR BLVD.
City :
Inspection Date : 10/24/2014
Inspection Type
Routine FC Underwater Special Other
☒

Bridge Inspection Report

STRUCTURE NAME: SANTA ANA RIVER CHANNEL (TALBERT/MACARTHUR)

CONSTRUCTION INFORMATION

Year Built : 1983 Skew (degrees): 30
Year Widened: N/A No. of Joints : 2
Length (m) : 110 No. of Hinges : 0

Structure Description: Continuous 4 span CIP/RC box girder (8 cells) with RC pier walls and RC open end seat abutments, all supported upon concrete piles.

Span Configuration : (W) 24.4 m, 2 @ 29.9 m, 24.4 m (E) c/c

SAFE LOAD CAPACITY AND RATINGS

Design Live Load: MS-18 OR HS-20
Inventory Rating: RF=1.00 =>32.4 metric tons Calculation Method: ASSIGNED (LFD)
Operating Rating: RF=1.67 =>54.1 metric tons Calculation Method: ASSIGNED (LFD)
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 br, 1.5 m sw, 20.8m, 1.5 m sw, 0.3 m br (N)

Total Width: 24.4 m Net Width: 20.7 m No. of Lanes: 4 Speed: 45 mph

Min. Vertical Clearance: Unimpaired

Rail Code: 1000

Rail Type	Location	Length (ft)	Rail Modifications
Type 26	Right/Left	722	

DESCRIPTION UNDER STRUCTURE

Channel Description: RC 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

SCOPE AND ACCESS

The river was dry at inspection time. All elements were visually inspected.

REVISIONS

The bridge name was revised to include the road carried name.

Old name: SANTA ANA RIVER CHANNEL.

New name: SANTA ANA RIVER CHANNEL (TALBERT/MACARTHUR).

INSPECTION COMMENTARY

SAFE LOAD CAPACITY

A load Rating Summary sheet was in BIRIS. This load rating was assigned in accordance with current SM&I procedures.

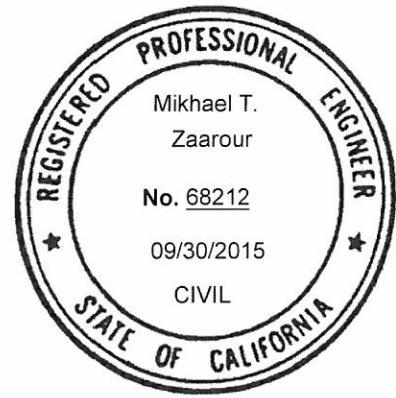
ELEMENT INSPECTION RATINGS AND COMMENTARY

Elem No.	Defect /Prot	Element Description	Env	Total Qty	Units	Qty in each St. 1	St. 2	Condition St. 3	State St. 4
16		Top Flange-RC	2	2682	sq.m	2682	0	0	0
	1130	Cracking (RC and Other)	2	2280		2280	0	0	0
	521	Concrete Coat. (Meth/Paint/Seal)	2	2280	sq.m	2280	0	0	0
(16-1130) The cracks were sealed by methacrylate in 2014									
(16-521) There were no significant defects noted.									
105		Box Girder-RC	2	110	m	110	0	0	0
(105) There were no significant defects noted.									
210		Pier Wall-RC	2	84	m	84	0	0	0
(210) There were no significant defects noted.									
215		Abutment-RC	2	56	m	56	0	0	0
(215) There were no significant defects noted.									
256		Slope Protection	2	2	ea.	2	0	0	0
(256) There were no significant defects noted.									
302		Joint-Compression Seal	2	48	m	32	16	0	0
	2350	Debris Impaction (Joints)	2	16		0	16	0	0
(302-2350) The joint seal gaps were partially filled with dirt and debris.									
312		Bearing-Enclosed	2	2	each	2	0	0	0
(312) There were no significant defects noted.									
331		Railing-RC	2	220	m	189	30	1	0
	1080	Delamination/Spall/Patched Area	2	31		0	30	1	0
(331-1080) There is a triangular spall 12" x 8" x 4" with rebar exposed in the curb at the southwest corner. Also there are many small spalls 2" x 2" x 0.5" in the inside face of the concrete rail.									

WORK RECOMMENDATIONS - NONE

Team Leader : Mikhael T. Zaarour
Report Author : Mikhael T. Zaarour
Inspected By : MT.Zaarour/KD.Henderson

 11/13/14
Mikhael T. Zaarour (Registered Civil Engineer) (Date)



STRUCTURE INVENTORY AND APPRAISAL REPORT

***** IDENTIFICATION *****

(1) STATE NAME- CALIFORNIA 069
 (8) STRUCTURE NUMBER 55C0097
 (5) INVENTORY ROUTE(ON/UNDER)- ON 140000000
 (2) HIGHWAY AGENCY DISTRICT 12
 (3) COUNTY CODE 059 (4) PLACE CODE 00000
 (6) FEATURE INTERSECTED- SANTA ANA RIVER CHANNEL
 (7) FACILITY CARRIED- TALBERT/MACARTHUR
 (9) LOCATION- 0.6 MI W/O HARBOR BLVD.
 (11) MILEPOINT/KILOMETERPOINT 0
 (12) BASE HIGHWAY NETWORK- PART OF NET 1
 (13) LRS INVENTORY ROUTE & SUBROUTE 000000000000
 (16) LATITUDE 33 DEG 42 MIN 07 SEC
 (17) LONGITUDE 117 DEG 55 MIN 48 SEC
 (98) BORDER BRIDGE STATE CODE % SHARE %
 (99) BORDER BRIDGE STRUCTURE NUMBER

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

(43) STRUCTURE TYPE MAIN:MATERIAL- CONCRETE CONT
 TYPE- BOX BEAM OR GIRDER - MULTI CODE 205
 (44) STRUCTURE TYPE APPR:MATERIAL- OTHER/NA
 TYPE- OTHER/NA CODE 000
 (45) NUMBER OF SPANS IN MAIN UNIT 4
 (46) NUMBER OF APPROACH SPANS 0
 (107) DECK STRUCTURE TYPE- CIP CONCRETE CODE 1
 (108) WEARING SURFACE / PROTECTIVE SYSTEM:
 A) TYPE OF WEARING SURFACE- NONE CODE 0
 B) TYPE OF MEMBRANE- NONE CODE 0
 C) TYPE OF DECK PROTECTION- NONE CODE 0

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

(27) YEAR BUILT 1983
 (106) YEAR RECONSTRUCTED 0000
 (42) TYPE OF SERVICE: ON- HIGHWAY-PEDESTRIAN 5
 UNDER- WATERWAY 5
 (28) LANES:ON STRUCTURE 04 UNDER STRUCTURE 00
 (29) AVERAGE DAILY TRAFFIC 26000
 (30) YEAR OF ADT 2012 (109) TRUCK ADT 1 %
 (19) BYPASS, DETOUR LENGTH 2 KM

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

(48) LENGTH OF MAXIMUM SPAN 29.9 M
 (49) STRUCTURE LENGTH 110.0 M
 (50) CURB OR SIDEWALK: LEFT 1.5 M RIGHT 1.5 M
 (51) BRIDGE ROADWAY WIDTH CURB TO CURB 20.7 M
 (52) DECK WIDTH OUT TO OUT 24.4 M
 (32) APPROACH ROADWAY WIDTH (W/SHOULDERS) 20.7 M
 (33) BRIDGE MEDIAN- NO MEDIAN 0
 (34) SKEW 30 DEG (35) STRUCTURE FLARED NO
 (10) INVENTORY ROUTE MIN VERT CLEAR 99.99 M
 (47) INVENTORY ROUTE TOTAL HORIZ CLEAR 20.7 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 = 95.6
 STATUS
 HEALTH INDEX 99.8
 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 8
 (59) SUPERSTRUCTURE 8
 (60) SUBSTRUCTURE 8
 (61) CHANNEL & CHANNEL PROTECTION 9
 (62) CULVERTS N

***** LOAD RATING AND POSTING ***** CODE

(31) DESIGN LOAD- MS-18 OR HS-20 5
 (63) OPERATING RATING METHOD- ASSIGNED (LFD) A
 (64) OPERATING RATING- 54.1
 (65) INVENTORY RATING METHOD- ASSIGNED (LFD) A
 (66) INVENTORY RATING- 32.4
 (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 8
 (68) DECK GEOMETRY 9
 (69) UNDERCLEARANCES, VERTICAL & HORIZONTAL N
 (71) WATER ADEQUACY 9
 (72) APPROACH ROADWAY ALIGNMENT 8
 (36) TRAFFIC SAFETY FEATURES 1000
 (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 53226
 (115) YEAR OF FUTURE ADT 2031

***** INSPECTIONS *****

(90) INSPECTION DATE 10/14 (91) FREQUENCY 48 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)

Orange County Bridge Review Summary

Dokken Engineering performed a field review of the Orange County bridge listed below in April 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: 55C0103

Bridge Name: Santa Ana River

Year Built: 1979

Facility Carried: Mailton-Victoria

The Santa Ana River Channel Bridge at Hamilton Victoria is a continuous 7 span cast-in-place reinforced concrete box girder bridge with pier wall and open end diaphragm abutments supported on concrete piles.

Caltrans BIR recommendations:

- None

Field Inspection Observations

- None

Maintenance Needs Assessment

BPMP Assessment

- N/A – No eligible maintenance activities

General Maintenance – Non-BPMP

- None

Proposed BPMP Construction Costs

- N/A

Construction Items Not Funded by BPMP

- N/A

APPENDIX A

BIR



DEPARTMENT OF TRANSPORTATION
Structure Maintenance & Investigations

Bridge Number : 55C0103
Facility Carried: HAMILTON-VICTORIA
Location : 0.15 MI E/O BROOKHURST S
City :
Inspection Date : 12/09/2014
Inspection Type
Routine FC Underwater Special Other
☒

Bridge Inspection Report

STRUCTURE NAME: SANTA ANA RIVER (HAMILTON AVE)

CONSTRUCTION INFORMATION

Year Built : 1979 Skew (degrees): 16
Year Widened: 1992 No. of Joints : 3
Length (m) : 194 No. of Hinges : 1

Structure Description: Continuous 7 span CIP/RC box girder (9 cells) with RC piers and RC open end diaphragm abutments, all supported upon concrete piles.

Span Configuration : (W) 24.4 m, 3 @ 28.8 m, 24.8 m, 28.6 m, 28.2 m (E)

SAFE LOAD CAPACITY AND RATINGS

Design Live Load: MS-18+MOD OR HS-20+MOD
Inventory Rating: RF=1.00 =>32.4 metric tons Calculation Method: ASSIGNED (LFD)
Operating Rating: RF=1.67 =>54.1 metric tons Calculation Method: ASSIGNED (LFD)
Permit Rating : P P P P P
Posting Load : Type 3: Legal Type 3S2: Legal Type 3-3: Legal

DESCRIPTION ON STRUCTURE

Deck X-Section: (N) 0.3 m br, 1.5 m sw, 23.8 m, 1.5 m sw, 0.3 m br (S)

Total Width: 27.4 m Net Width: 23.8 m No. of Lanes: 4 Speed: 45 mph
Min. Vertical Clearance: Unimpaired

Rail Code: 1000

Rail Type	Location	Length (ft)	Rail Modifications
Type 11	Right	448	
Type 26	Right/Left	828	

DESCRIPTION UNDER STRUCTURE

Channel Description: Santa Ana River: Sandy bottom with grouted rock slopes through the site.
Greenville-Banning: Sandy bottom with RC vertical walls.

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

SCOPE AND ACCESS

The was 3 ft of deep water in the river under span #2 to span #5, these spans were inspected from the side. All other element were visually inspected.

INSPECTION COMMENTARY**REVISIONS**

The bridge name was revised to include the road carried name.

Old name: SANTA ANA RIVER.

New name: SANTA ANA RIVER (HAMILTON AVE).

SAFE LOAD CAPACITY

A load Rating Summary sheet was in BIRIS. This load rating was assigned in accordance with current SM&I procedures.

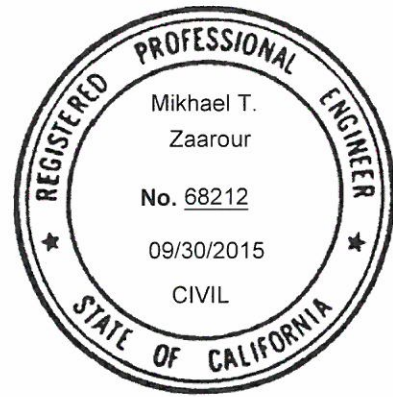
ELEMENT INSPECTION RATINGS AND COMMENTARY

Elem No.	Defect /Prot	Element Description	Env	Total Qty	Units	Qty in each Condition	State		
						St. 1	St. 2	St. 3	St. 4
16		Top Flange-RC	2	5335	sq.m	5335	0	0	0
	521	Concrete Coat. (Meth/Paint/Seal)	2	2450	sq.m	2450	0	0	0
(16)									
There were no significant defects noted.									
(16-521)									
There were no significant defects noted.									
105		Box Girder-RC	2	390	m	390	0	0	0
(105)									
There were no significant defects noted.									
210		Pier Wall-RC	2	180	m	180	0	0	0
(210)									
There were no significant defects noted.									
215		Abutment-RC	2	60	m	60	0	0	0
(215)									
There were no significant defects noted.									
227		Pile-RC	2	1	ea.	1	0	0	0
(227)									
The pile element is included to indicate the presence of piles on this structure. The piles were not exposed for visual inspection. No indication of pile distress was noted in any substructure element.									
302		Joint-Compression Seal	2	87	m	27	60	0	0
	2320	Seal Adhesion (Joints)	2	60		0	60	0	0
(302-2320)									
The joint seals are lost adhesion and dirt were filled in between the rubber and the concrete.									
331		Railing-RC	2	252	m	252	0	0	0
(331)									
There were no significant defects noted.									
333		Railing-Other	2	136	m	136	0	0	0
(333)									
There were no significant defects noted.									

WORK RECOMMENDATIONS - NONE

Team Leader : Mikhael T. Zaarour
Report Author : Mikhael T. Zaarour
Inspected By : MT.Zaarour/KD.Henderson

Mikhael T. Zaarour 12/15/14
Mikhael T. Zaarour (Registered Civil Engineer) (Date)



STRUCTURE INVENTORY AND APPRAISAL REPORT

***** IDENTIFICATION *****

(1) STATE NAME- CALIFORNIA 069
 (8) STRUCTURE NUMBER 55C0103
 (5) INVENTORY ROUTE(ON/UNDER)- ON 140000000
 (2) HIGHWAY AGENCY DISTRICT 12
 (3) COUNTY CODE 059 (4) PLACE CODE 00000
 (6) FEATURE INTERSECTED- SANTA ANA RIVER
 (7) FACILITY CARRIED- HAMILTON-VICTORIA
 (9) LOCATION- 0.15 MI E/O BROOKHURST ST
 (11) MILEPOINT/KILOMETERPOINT 0
 (12) BASE HIGHWAY NETWORK- NOT ON NET 0
 (13) LRS INVENTORY ROUTE & SUBROUTE
 (16) LATITUDE 33 DEG 39 MIN 02.35 SEC
 (17) LONGITUDE 117 DEG 57 MIN 05.81 SEC
 (98) BORDER BRIDGE STATE CODE % SHARE %
 (99) BORDER BRIDGE STRUCTURE NUMBER

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

(43) STRUCTURE TYPE MAIN:MATERIAL- CONCRETE CONT
 TYPE- TEE BEAM CODE 204
 (44) STRUCTURE TYPE APPR:MATERIAL- OTHER/NA
 TYPE- OTHER/NA CODE 000
 (45) NUMBER OF SPANS IN MAIN UNIT 7
 (46) NUMBER OF APPROACH SPANS 0
 (107) DECK STRUCTURE TYPE- CIP CONCRETE CODE 1
 (108) WEARING SURFACE / PROTECTIVE SYSTEM:
 A) TYPE OF WEARING SURFACE- NONE CODE 0
 B) TYPE OF MEMBRANE- NONE CODE 0
 C) TYPE OF DECK PROTECTION- NONE CODE 0

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

(27) YEAR BUILT 1979
 (106) YEAR RECONSTRUCTED 1992
 (42) TYPE OF SERVICE: ON- HIGHWAY-PEDESTRIAN 5
 UNDER- WATERWAY 5
 (28) LANES:ON STRUCTURE 04 UNDER STRUCTURE 00
 (29) AVERAGE DAILY TRAFFIC 30000
 (30) YEAR OF ADT 2010 (109) TRUCK ADT 2 %
 (19) BYPASS, DETOUR LENGTH 5 KM

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

(48) LENGTH OF MAXIMUM SPAN 28.8 M
 (49) STRUCTURE LENGTH 194.0 M
 (50) CURB OR SIDEWALK: LEFT 1.5 M RIGHT 1.5 M
 (51) BRIDGE ROADWAY WIDTH CURB TO CURB 23.8 M
 (52) DECK WIDTH OUT TO OUT 27.4 M
 (32) APPROACH ROADWAY WIDTH (W/SHOULDERS) 24.0 M
 (33) BRIDGE MEDIAN- NO MEDIAN 0
 (34) SKEW 16 DEG (35) STRUCTURE FLARED NO
 (10) INVENTORY ROUTE MIN VERT CLEAR 99.99 M
 (47) INVENTORY ROUTE TOTAL HORIZ CLEAR 23.8 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 = 91.0
 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- MINOR ARTERIAL URBAN 16
 (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 - PART OF NET 1
 (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 8
 (59) SUPERSTRUCTURE 8
 (60) SUBSTRUCTURE 8
 (61) CHANNEL & CHANNEL PROTECTION 9
 (62) CULVERTS N

***** LOAD RATING AND POSTING ***** CODE

(31) DESIGN LOAD- MS-18+MOD OR HS-20+MOD 6
 (63) OPERATING RATING METHOD- ASSIGNED (LFD) A
 (64) OPERATING RATING- 54.1
 (65) INVENTORY RATING METHOD- ASSIGNED (LFD) A
 (66) INVENTORY RATING- 32.4
 (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 8
 (68) DECK GEOMETRY 9
 (69) UNDERCLEARANCES, VERTICAL & HORIZONTAL N
 (71) WATER ADEQUACY 9
 (72) APPROACH ROADWAY ALIGNMENT 8
 (36) TRAFFIC SAFETY FEATURES 1000
 (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 49459
 (115) YEAR OF FUTURE ADT 2031

***** INSPECTIONS *****

(90) INSPECTION DATE 12/14 (91) FREQUENCY 48 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)

Orange County Bridge Review Summary

Dokken Engineering performed a field review of the Orange County bridge listed below in April 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: 55C0119

Bridge Name: Brea Canyon Channel

Year Built: 1971

Facility Carried: Tonner Canyon Road

The Brea Canyon Channel at Tonner Canyon Road is a triple reinforced concrete box culvert.

Caltrans BIR recommendations:

- Clearing and grubbing channel bed.

Field Inspection Observations

- Horizontal cracks on culvert walls. (photo 2)
- Confirmed that the channel bed is over grown with vegetation. (photo 3) Recommend clearing and grubbing channel bed to allow water to flow properly.

Maintenance Needs Assessment

BPMP Assessment

- N/A – No eligible maintenance activities

General Maintenance – Non-BPMP

- Recommend monitoring cracks on culvert walls. Seal if further deterioration is observed.
Existing cracks do not currently pose major maintenance issue.

Proposed BPMP Construction Costs

- N/A

Construction Items Not Funded by BPMP

- Clearing and Grubbing

APPENDIX A

Photos and BIR



Photo 1:



Culvert Wall Cracks

Photo 2: Culvert Wall



Culvert headwall

Overgrown Vegetation

Photo 3: Brea Canyon Channel



Photo 4:



Photo 5:



DEPARTMENT OF TRANSPORTATION
Structure Maintenance & Investigations

Bridge Number : 55C0119
Facility Carried: TONNER CANYON ROAD
Location : 400' S/O BREA CANYON BLV
City :
Inspection Date : 10/02/2015

Bridge Inspection Report

Inspection Type

Routine FC Underwater Special Other

☒

STRUCTURE NAME: BREA CANYON CHANNEL

CONSTRUCTION INFORMATION

Year Built : 1971 Skew (degrees): 0
Year Widened: N/A No. of Joints : 0
Length (m) : 11.9 No. of Hinges : 0

Structure Description: Triple 3.7 m W x 3.0 m H x 39.6 m L RC box culvert (non-grade top)
beneath 2.1 m of earth fill.

Span Configuration : (W) 3 @ 3.7 m (E) clear, normal

SAFE LOAD CAPACITY AND RATINGS

Design Live Load: UNKNOWN
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) 4.4 m ea, MBGR, 8.0 m ea, 14.6 m, 8.0 m ea, CL fence, 1.8 m ea (N)
Total Width: .0 m Net Width: .0 m No. of Lanes: 4 Speed: 45 mph
Min. Vertical Clearance: Unimpaired Overlay Thickness: 0.0 Inches
Rail Code: NNNN

Rail Type	Location	Length (ft)	Rail Modifications
MBGR on Fill	Right	100	
Pedestrian	Left	100	CLF

DESCRIPTION UNDER STRUCTURE

Channel Description: RC rectangular upstream, natural earth trapezoidal downstream with heavy bushes and trees in the channel.

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

SCOPE AND ACCESS

The inspection was performed by walking on the deck and inside the culvert. All elements were visually inspected. Access the the culvert from southwest quadrant.
There are bushes and trees down stream obstructed the water flow.

INSPECTION COMMENTARY

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	120	m	111	0	9	0
	1080		Delamination/Spall/Patched Area	2	3		0	0	3	0
	1090		Exposed Rebar (PS Conc./RC)	2	3		0	0	3	0
	1130		Cracking (RC and Other)	2	3		0	0	3	0

(241-1080)

There are spalls at the following locations:

Eight ft of south end of wall #1, size was 12" x 12" x 1".

North bottom nose of wall #2, size was 12" x 6" x 2".

South end of wall #3, size was 18" x 15" x 2".

(241-1090)

There were 6 exposed rebars in the invert of barrel #1 and 1 exposed 2' rebar at the bottom of wall #4.

(241-1130)

There is horizontal crack 2 mm wide 6 ft long at the south end of wall #1.

WORK RECOMMENDATIONS

RecDate: 06/05/2001

Action : Remove Vegetation

Work By: LOCAL AGENCY

Status : PROPOSED

EstCost:

StrTarget: 2 YEARS

DistTarget:

EA:

Remove the bushes and trees from the channel bed within 30 meters of the bridge to allow the water to flow properly.

It is growing back.

Team Leader : Mikhael T. Zaarour

Report Author : Mikhael T. Zaarour

Inspected By : MT.Zaarour / DH.Kim

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



STRUCTURE INVENTORY AND APPRAISAL REPORT

***** IDENTIFICATION *****

(1) STATE NAME- CALIFORNIA 069
 (8) STRUCTURE NUMBER 55C0119
 (5) INVENTORY ROUTE(ON/UNDER)- ON 140000000
 (2) HIGHWAY AGENCY DISTRICT 12
 (3) COUNTY CODE 059 (4) PLACE CODE 00000
 (6) FEATURE INTERSECTED- BREA CANYON CHANNEL
 (7) FACILITY CARRIED- TONNER CANYON ROAD
 (9) LOCATION- 400' S/O BREA CANYON BLVD
 (11) MILEPOINT/KILOMETERPOINT 0
 (12) BASE HIGHWAY NETWORK- NOT ON NET 0
 (13) LRS INVENTORY ROUTE & SUBROUTE
 (16) LATITUDE 33 DEG 56 MIN 21.19 SEC
 (17) LONGITUDE 117 DEG 52 MIN 39.33 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 3
 (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 1971
 (106) YEAR RECONSTRUCTED 0000
 (42) TYPE OF SERVICE: ON- HIGHWAY 1
 UNDER- WATERWAY 5
 (28) LANES:ON STRUCTURE 04 UNDER STRUCTURE 00
 (29) AVERAGE DAILY TRAFFIC 2000
 (30) YEAR OF ADT 2009 (109) TRUCK ADT 3 %
 (19) BYPASS, DETOUR LENGTH 19 KM

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

(48) LENGTH OF MAXIMUM SPAN 3.7 M
 (49) STRUCTURE LENGTH 11.9 M
 (50) CURB OR SIDEWALK: LEFT 0.0 M RIGHT 0.0 M
 (51) BRIDGE ROADWAY WIDTH CURB TO CURB 0.0 M
 (52) DECK WIDTH OUT TO OUT 0.0 M
 (32) APPROACH ROADWAY WIDTH (W/SHOULDERS) 14.6 M
 (33) BRIDGE MEDIAN- CLOSED (NO BARRIER) 2
 (34) SKEW 0 DEG (35) STRUCTURE FLARED NO
 (10) INVENTORY ROUTE MIN VERT CLEAR 99.99 M
 (47) INVENTORY ROUTE TOTAL HORIZ CLEAR 14.6 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 = 75.1
 STATUS
 HEALTH INDEX 95.0
 PAINT CONDITION INDEX = N/A

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

(112) NBIS BRIDGE LENGTH- YES Y
 (104) HIGHWAY SYSTEM- NOT ON NHS 0
 (26) FUNCTIONAL CLASS- MINOR ARTERIAL URBAN 16
 (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 9
 (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- 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 N
 (69) UNDERCLEARANCES, VERTICAL & HORIZONTAL N
 (71) WATER ADEQUACY 9
 (72) APPROACH ROADWAY ALIGNMENT 7
 (36) TRAFFIC SAFETY FEATURES NNNN
 (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 3544
 (115) YEAR OF FUTURE ADT 2035

***** INSPECTIONS *****

(90) INSPECTION DATE 10/15 (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)

Orange County Bridge Review Summary

Dokken Engineering performed a field review of the Orange County bridge listed below in April 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: 55C0121

Bridge Name: Brea Canyon Channel

Year Built: 1920

Facility Carried: Brea Canyon BLVD

The Brea Canyon Channel at Brea Canyon Boulevard is a continuous 2-span cast-in-place reinforced concrete deck slab supported by strutted abutments, on unknown foundation type.

Caltrans BIR recommendations:

- Repair spall and delamination at north side of pier wall, west face of wall.
- Clearing and grubbing channel bed.

Field Inspection Observations

- There was limited access to the substructure.
- Exposed rebar on pier wall (photo 2).
- Confirmed vegetation overgrowth in channel. Recommend clearing and grubbing the channel.
- Portion of road is being undermined. Recommend removing portion of AC and filling and reconstructing the eroded slope. Investigate if roadside drainage pattern is causing erosion.
- Rutting at power pole. Recommend filling eroded slope. (photo 3)

Maintenance Needs Assessment

BPMP Assessment

- N/A – No eligible maintenance activities

General Maintenance – Non-BPMP

- Repair spalled pier wall. This should be performed soon to prevent additional corrosion of reinforcement.

BPMP Assessment

- Recommend patching spalled concrete on pier wall.

Proposed BPMP Construction Costs

- N/A

Construction Items Not Funded by BPMP

- Repair Spalls < \$10,000 (includes engineering, mobilization and contingency)
- Clearing and Grubbing
- Bank erosion repair

APPENDIX A

Photos and BIR



Photo 1: Edge of Pavement



Photo 2: Bridge Pier



Photo 3:



Photo 4: Pier Wall



Photo 5:



Photo 6:



DEPARTMENT OF TRANSPORTATION
Structure Maintenance & Investigations

Bridge Number : 55C0121
Facility Carried: BREA CANYON BLVD.
Location : 0.4 MI N/O CENTRAL AVENUE
City :
Inspection Date : 10/02/2015

Bridge Inspection Report

Inspection Type
Routine FC Underwater Special Other
☒

STRUCTURE NAME: BREA CANYON CHANNEL

CONSTRUCTION INFORMATION

Year Built : 1920 Skew (degrees): 32
Year Widened: 1929 No. of Joints : 0
Length (m) : 9.1 No. of Hinges : 0

Structure Description: Continuous 2-span CIP/RC deck slab under 1.5 m of fill with an RC pier and RC closed end backfilled strutted abutments. Foundation type is unknown.

Span Configuration : (S) 2 @ 4.1 m (N) c/c

SAFE LOAD CAPACITY AND RATINGS

Design Live Load: UNKNOWN
Inventory Rating: RF=1.00 =>32.4 metric tons Calculation Method: LOAD FACTOR
Operating Rating: RF=1.67 =>54.1 metric tons Calculation Method: LOAD FACTOR
Permit Rating : PPPPP
Posting Load : Type 3: Legal Type 3S2: Legal Type 3-3: Legal

DESCRIPTION ON STRUCTURE

Deck X-Section: (W) 3.4 m ea, 11 m, 0.9 m ea (E)
Total Width: 17.1 m Net Width: 11.3 m No. of Lanes: 2 Speed: 55 mph
Min. Vertical Clearance: Unimpaired Overlay Thickness: 6.0 Inches
Rail Code: 0000

Rail Type	Location	Length (ft)	Rail Modifications
MBGR on	Right	30	
Fill			
None	Left		

DESCRIPTION UNDER STRUCTURE

Channel Description: Natural earth trapezoidal with heavy bushes and trees in the channel bed.

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

SCOPE AND ACCESS

The inspection was performed by walking on and under the bridge. There was 2' of stagnant water in span #1 (south) and there was 2.5' of dirt accumulated in span #2 (north); all elements were Visually inspected. Access the under the bridge is from northeast quadrant.

INSPECTION COMMENTARY**SAFE LOAD CAPACITY**

The load rating for this structure is being reviewed by SM&I Rating Branch. An updated Load Rating Summary Sheet will be archived when this review is completed. The current load rating is based on BDS computer output dated 11/21/1979.

ELEMENT INSPECTION RATINGS AND NOTES

Elem No.	Defect /Prot	Defect	Element Description	Env	Total Qty	Units	Qty in each State	Condition	State
							St. 1	St. 2	St. 3 St. 4
38			Slab-RC	2	156	sq.m	156	0	0 0
	510		Deck Wearing Surface-Asphalt	2	110	sq.m	110	0	0 0
(38)									
There were no significant defects noted. (under 4ft of fill)									
(38-510)									
There were no significant defects noted. (above 4 ft of fill)									
210			Pier Wall-RC	2	17	m	11	3	3 0
	1080		Delamination/Spall/Patched Area	2	6		0	3	3 0
(210-1080)									
There is 10' x 2' x 2" spall in the west side at the north end with exposed rebars and delamination in the east side of the northend of the peirwall #2									
215			Abutment-RC	2	34	m	34	0	0 0
(215)									
There were no significant defects noted.									
313			Bearing-Fixed	2	21	each	21	0	0 0
(313)									
There were no significant defects noted.									
330			Railing-Metal	2	10	m	10	0	0 0
(330)									
There were no significant defects noted.									

WORK RECOMMENDATIONS

RecDate: 05/18/2012

Action : Sub-Patch spalls

Work By: LOCAL AGENCY

Status : PROPOSED

EstCost:

StrTarget: 2 YEARS

DistTarget:

EA:

Repair the spall and delamination at the north side of the pier wall west face of the wall 3 m x 0.6 m x 50 mm spall and at the east face of the wall the delamination area 3 m x 0.5 m.

RecDate: 06/05/2001

Action : Remove Vegetation

Work By: LOCAL AGENCY

Status : PROPOSED

EstCost:

StrTarget: 2 YEARS

DistTarget:

EA:

Clean the channel to improve the water flow. Remove the bushes and the trees in the channel bed within 30 meters of the bridge.

Team Leader : Mikhael T. Zaarour
Report Author : Mikhael T. Zaarour
Inspected By : MT.Zaarour / DH.Kim

Mikhael T. Zaarour *2/24/16*
Mikhael T. Zaarour (Registered Civil Engineer) (Date)



STRUCTURE INVENTORY AND APPRAISAL REPORT

***** IDENTIFICATION *****

(1) STATE NAME- CALIFORNIA 069
 (8) STRUCTURE NUMBER 55C0121
 (5) INVENTORY ROUTE(ON/UNDER)- ON 140000000
 (2) HIGHWAY AGENCY DISTRICT 12
 (3) COUNTY CODE 059 (4) PLACE CODE 00000
 (6) FEATURE INTERSECTED- BREA CANYON CHANNEL
 (7) FACILITY CARRIED- BREA CANYON BLVD.
 (9) LOCATION- 0.4 MI N/O CENTRAL AVENUE
 (11) MILEPOINT/KILOMETERPOINT 0
 (12) BASE HIGHWAY NETWORK- NOT ON NET 0
 (13) LRS INVENTORY ROUTE & SUBROUTE
 (16) LATITUDE 33 DEG 56 MIN 16.26 SEC
 (17) LONGITUDE 117 DEG 53 MIN 29.83 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 2
 (46) NUMBER OF APPROACH SPANS 0
 (107) DECK STRUCTURE TYPE- CIP CONCRETE CODE 1
 (108) WEARING SURFACE / PROTECTIVE SYSTEM:
 A) TYPE OF WEARING SURFACE- GRAVEL CODE 8
 B) TYPE OF MEMBRANE- NONE CODE 0
 C) TYPE OF DECK PROTECTION- NONE CODE 0

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

(27) YEAR BUILT 1920
 (106) YEAR RECONSTRUCTED 1929
 (42) TYPE OF SERVICE: ON- HIGHWAY 1
 UNDER- WATERWAY 5
 (28) LANES:ON STRUCTURE 02 UNDER STRUCTURE 00
 (29) AVERAGE DAILY TRAFFIC 19000
 (30) YEAR OF ADT 2009 (109) TRUCK ADT 2 %
 (19) BYPASS, DETOUR LENGTH 2 KM

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

(48) LENGTH OF MAXIMUM SPAN 4.3 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 11.3 M
 (52) DECK WIDTH OUT TO OUT 17.1 M
 (32) APPROACH ROADWAY WIDTH (W/SHOULDERS) 11.0 M
 (33) BRIDGE MEDIAN- NO MEDIAN 0
 (34) SKEW 32 DEG (35) STRUCTURE FLARED NO
 (10) INVENTORY ROUTE MIN VERT CLEAR 99.99 M
 (47) INVENTORY ROUTE TOTAL HORIZ CLEAR 8.5 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 = 93.2
 STATUS
 HEALTH INDEX 98.4
 PAINT CONDITION INDEX = N/A

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

(112) NBIS BRIDGE LENGTH- YES Y
 (104) HIGHWAY SYSTEM- NOT ON NHS 0
 (26) FUNCTIONAL CLASS- MINOR ARTERIAL URBAN 16
 (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 8
 (59) SUPERSTRUCTURE 8
 (60) SUBSTRUCTURE 7
 (61) CHANNEL & CHANNEL PROTECTION 8
 (62) CULVERTS N

***** LOAD RATING AND POSTING ***** CODE

(31) DESIGN LOAD- UNKNOWN 0
 (63) OPERATING RATING METHOD- LOAD FACTOR 1
 (64) OPERATING RATING- 54.1
 (65) INVENTORY RATING METHOD- LOAD FACTOR 1
 (66) INVENTORY RATING- 32.4
 (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 7
 (68) DECK GEOMETRY 4
 (69) UNDERCLEARANCES, VERTICAL & HORIZONTAL N
 (71) WATER ADEQUACY 9
 (72) APPROACH ROADWAY ALIGNMENT 8
 (36) TRAFFIC SAFETY FEATURES 0000
 (113) SCOUR CRITICAL BRIDGES U

***** 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 41217
 (115) YEAR OF FUTURE ADT 2035

***** INSPECTIONS *****

(90) INSPECTION DATE 10/15 (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)

Orange County Bridge Review Summary

Dokken Engineering performed a field review of the Orange County bridge listed below in April 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: 55C0122

Bridge Name: Brea Canyon Channel

Year Built: 1930

Facility Carried: Brea Canyon BLVD

The Brea Canyon Channel at Brea Canyon Boulevard is a continuous 2-span cast-in-place reinforced concrete deck slab supported by strutted abutments supported by pile foundations.

Caltrans BIR recommendations:

- Repair Spalls
- Repair damaged rail.
- Remove overgrown vegetation.

Field Inspection Observations

- Confirmed that the concrete railing has been damaged (photo 1).
- Soffit efflorescence visible. This is indicative of water seepage through deck cracks (photo 2).
- Excessive AC on deck, which will reduce load capacity and long-term bridge health. Recommend no additional AC overlay, and County may consider removing some of the AC.
- Exposed rebar on girder soffit (photo 2).
- Vegetation overgrowth in channel and on Pier 2.
- Bird nests visible on bridge overhang (photo 3 and 4). Work may need to take place outside the bird-nesting season.

Maintenance Need Assessment

BPMP Assessment

- N/A – No eligible maintenance activities

General Maintenance – Non-BPMP

- Recommend patching spalls in concrete baluster railings.
- Efflorescence likely from water penetrating through deck. Recommend sealing deck. Not significant problem at this time. To repair will require deck AC removal, deck treatment, and grinding approach AC to conform to lower deck elevation.
- Recommend patching spalled concrete for exposed rebar on girder soffit.
- Recommend clearing and grubbing overgrown vegetation in channel and Pier 2.

Proposed BPMP Construction Costs

- N/A

Construction Items Not Funded by BPMP

- Bridge barrier repair likely not eligible for BPMP funding since the repair work will not bring railing up to current standards. Cost to repair delaminated barrier and soffit concrete and patch ≈\$35,000 (includes engineering, traffic control, mobilization and contingency)
- Clearing and Grubbing
- Deck sealing not critical at this time.

APPENDIX A

Photos and BIR



Photo 1:



Damaged Railing

Photo 2: Barrier



Eroded Rebar

Photo 3: Bridge Soffit

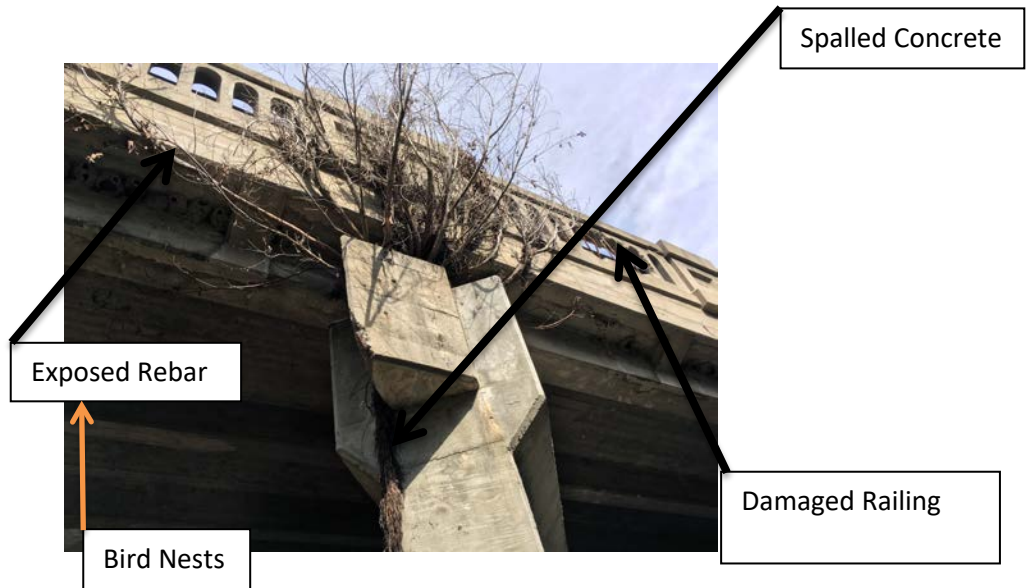


Photo 4:

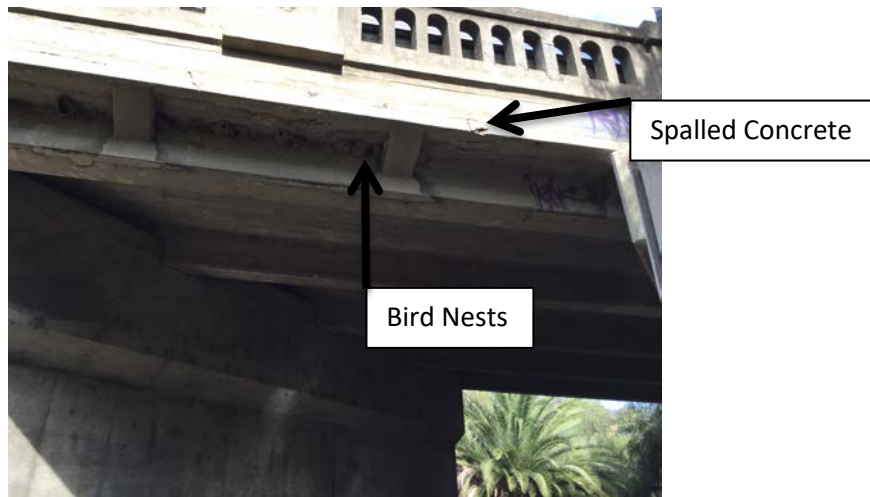


Photo 5:



Photo 6:



Photo 7:



Photo 8:



DEPARTMENT OF TRANSPORTATION
Structure Maintenance & Investigations

Bridge Number : 55C0122
Facility Carried: BREA CANYON BLVD.
Location : 0.6 MI N/O CENTRAL AVENUE
City :
Inspection Date : 10/02/2015

Bridge Inspection Report

Inspection Type
Routine FC Underwater Special Other

☒

STRUCTURE NAME: BREA CANYON CHANNEL

CONSTRUCTION INFORMATION

Year Built : 1930 Skew (degrees): 45
Year Widened: N/A No. of Joints : 0
Length (m) : 18.9 No. of Hinges : 0

Structure Description: Simply supported 2-span CIP/RC T-beam (5 each) with an RC pier wall and with RC open end diaphragm abutments, all supported upon concrete piles.

Span Configuration : (W) 2 @ 9.1 m (E) c/c

SAFE LOAD CAPACITY AND RATINGS

Design Live Load: M-13.5 OR H-15
Inventory Rating: RF= 0.64 Calculation Method: (LRFR) LD & RES FACT RATING
Operating Rating: RF= 0.83 Calculation Method: (LRFR) LD & RES FACT RATING
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 br, 0.2 m cu, 9.2 m, 0.2 m cu, 0.3 m br (N)
Total Width: 10.1 m Net Width: 9.1 m No. of Lanes: 2 Speed: 55 mph
Min. Vertical Clearance: Unimpaired Overlay Thickness: 3.0 Inches
Rail Code: 0000

Rail Type	Location	Length (ft)	Rail Modifications
Concrete	Right/Left	190	
Baluster			

DESCRIPTION UNDER STRUCTURE

Channel Description: Natural earth trapezoidal, RC rectangular through the site.

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

SCOPE AND ACCESS

The inspection was performed by walking on and under the bridge. There was about 1' of water in both spans; all elements were visually inspected. There is no shoulder and access to under the bridge was from northwest quadrant.

INSPECTION COMMENTARY

SUBSTRUCTURE

There was a tree growing at the top of the southside pier wall. And there was three vertical cracks in the wall.

SAFE LOAD CAPACITY

Load Rating Summary Sheet dated 8/28/2015 is on file for this structure. While this report does not include a check of that analysis, it does verify that the structural conditions observed during this inspection are consistent with those assumed in that analysis. The current rating is based on LRFR calculation.

ELEMENT INSPECTION RATINGS AND NOTES

Elem No.	Defect /Prot	Element Description	Env	Total Qty	Units	Qty in each St. 1	St. 2	St. 3	State St. 4
16		Top Flange-RC	2	190	sq.m	190	0	0	0
	510	Deck Wearing Surface-Asphalt	2	174	sq.m	124	0	50	0
	3220	Cracking-AC (WS)	2	50		0	0	50	0

(16)

There were no significant defects noted.

(16-510-3220)

There are 5 transverse cracks 0.5" wide and across the roadway.

110		Girder/Beam-RC	2	95	m	95	0	0	0
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(110)

There were no significant defects noted.

210		Pier Wall-RC	2	14	m	14	0	0	0
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(210)

There were no significant defects noted.

215		Abutment-RC	2	36	m	36	0	0	0
-----	--	-------------	---	----	---	----	---	---	---

(215)

There were no significant defects noted.

227		Pile-RC	2	1	ea.	1	0	0	0
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(227)

The pile element is included to indicate the presence of piles on this structure. The piles were not exposed for visual inspection. No indication of pile distress was noted in any substructure element.

256		Slope Protection	2	2	ea.	2	0	0	0
-----	--	------------------	---	---	-----	---	---	---	---

(256)

There were no significant defects noted.

331		Railing-RC	2	29	m	9	15	4	1
	1080	Delamination/Spall/Patched Area	2	20		0	15	4	1

(331-1080)

Most rail balusters have been cracked or spalled in both rail side. the end concrete rail post at the northwest quadrant is broken.

WORK RECOMMENDATIONS

WORK RECOMMENDATIONS

RecDate: 05/06/2010	EstCost:	Repair the spalls (100 mm x 75 mm x 20
Action : Railing-Repair	StrTarget: 2 YEARS	mm) in both side of concrete baluster
Work By: LOCAL AGENCY	DistTarget:	railings.
Status : PROPOSED	EA:	

RecDate: 05/30/2007	EstCost:	Repair the damaged rail.
Action : Railing-Repair	StrTarget: 2 YEARS	The west end post of north is damaged;
Work By: LOCAL AGENCY	DistTarget:	there was 1" wide vertical cracks from
Status : PROPOSED	EA:	top to the bottom of footing. It may
		cause by vehicular hit.
		There are about 56 cracks or spalls in
		the concrete baluster railings.

Team Leader : Mikhael T. Zaarour _____

Report Author : Mikhael T. Zaarour _____

Inspected By : MT.Zaarour / DH.Kim _____

Mikhael T. Zaarour 2/24/16

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



STRUCTURE INVENTORY AND APPRAISAL REPORT

***** IDENTIFICATION *****

(1) STATE NAME- CALIFORNIA 069
 (8) STRUCTURE NUMBER 55C0122
 (5) INVENTORY ROUTE(ON/UNDER)- ON 140000000
 (2) HIGHWAY AGENCY DISTRICT 12
 (3) COUNTY CODE 059 (4) PLACE CODE 00000
 (6) FEATURE INTERSECTED- BREA CANYON CHANNEL
 (7) FACILITY CARRIED- BREA CANYON BLVD.
 (9) LOCATION- 0.6 MI N/O CENTRAL AVENUE
 (11) MILEPOINT/KILOMETERPOINT 0
 (12) BASE HIGHWAY NETWORK- NOT ON NET 0
 (13) LRS INVENTORY ROUTE & SUBROUTE
 (16) LATITUDE 33 DEG 56 MIN 23.13 SEC
 (17) LONGITUDE 117 DEG 53 MIN 26.05 SEC
 (98) BORDER BRIDGE STATE CODE % SHARE %
 (99) BORDER BRIDGE STRUCTURE NUMBER

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

(43) STRUCTURE TYPE MAIN:MATERIAL- CONCRETE
 TYPE- TEE BEAM CODE 104
 (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- 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 1930
 (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 19000
 (30) YEAR OF ADT 2009 (109) TRUCK ADT 2 %
 (19) BYPASS, DETOUR LENGTH 2 KM

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

(48) LENGTH OF MAXIMUM SPAN 9.1 M
 (49) STRUCTURE LENGTH 18.9 M
 (50) CURB OR SIDEWALK: LEFT 0.2 M RIGHT 0.2 M
 (51) BRIDGE ROADWAY WIDTH CURB TO CURB 9.1 M
 (52) DECK WIDTH OUT TO OUT 10.1 M
 (32) APPROACH ROADWAY WIDTH (W/SHOULDERS) 9.1 M
 (33) BRIDGE MEDIAN- NO MEDIAN 0
 (34) SKEW 45 DEG (35) STRUCTURE FLARED NO
 (10) INVENTORY ROUTE MIN VERT CLEAR 99.99 M
 (47) INVENTORY ROUTE TOTAL HORIZ CLEAR 9.1 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

SUFFICIENCY RATING = 61.1
 STATUS
 HEALTH INDEX 99.0
 PAINT CONDITION INDEX = N/A

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

(112) NBIS BRIDGE LENGTH- YES Y
 (104) HIGHWAY SYSTEM- NOT ON NHS 0
 (26) FUNCTIONAL CLASS- MINOR ARTERIAL URBAN 16
 (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 8
 (59) SUPERSTRUCTURE 8
 (60) SUBSTRUCTURE 8
 (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- (LRFR) LD & RES FA 8
 (64) OPERATING RATING- RF= 0.83
 (65) INVENTORY RATING METHOD- (LRFR) LD & RES FA 8
 (66) INVENTORY RATING- RF= 0.64
 (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 3
 (69) UNDERCLEARANCES, VERTICAL & HORIZONTAL N
 (71) WATER ADEQUACY 9
 (72) APPROACH ROADWAY ALIGNMENT 8
 (36) TRAFFIC SAFETY FEATURES 0000
 (113) SCOUR CRITICAL BRIDGES 8

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

(75) TYPE OF WORK- MISC STRUCTURAL WORK CODE 38
 (76) LENGTH OF STRUCTURE IMPROVEMENT 18.9 M
 (94) BRIDGE IMPROVEMENT COST \$184,000
 (95) ROADWAY IMPROVEMENT COST \$36,800
 (96) TOTAL PROJECT COST \$309,120
 (97) YEAR OF IMPROVEMENT COST ESTIMATE 2010
 (114) FUTURE ADT 41217
 (115) YEAR OF FUTURE ADT 2035

***** INSPECTIONS *****

(90) INSPECTION DATE 10/15 (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)

Orange County Bridge Review Summary

Dokken Engineering performed a field review of the Orange County bridge listed below in April 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: 55C0123

Bridge Name: Brea Canyon Channel

Year Built: 1939

Facility Carried: Brea Canyon BLVD

The Brea Canyon Channel at Brea Canyon Boulevard is a 3-span, simply supported, cast-in-place reinforced concrete T-beam with open end diaphragm abutments supported on concrete piles.

Caltrans BIR recommendations:

- Repair spalls in concrete baluster railings
- Repair wingwall and girder concrete spalls.
- Remove overgrown vegetation.

Field Inspection Observations

- Confirmed that the concrete railing has been damaged (photo 1), exposed reinforcement on concrete barrier.
- Missing P-markers at ends of bridge (photo 2). Recommend replacing P-markers .
- Longitudinal soffit cracks (photo 4), although no efflorescence visible. Monitor condition and consider sealing deck to prevent water from seeping through cracks if condition worsens.
- Exposed rebar on girder soffit (photo 5).
- Excessive AC on deck, which will reduce load capacity and long-term bridge health. (photo 6 & 7). Recommend no additional AC overlay, and County may consider removing some of the AC.

Maintenance Needs Assessment

BPMP Assessment

- N/A – No eligible maintenance activities

General Maintenance – Non-BPMP

- Recommend patching spalls in concrete baluster railings.
- Recommend patching spalled concrete for exposed rebar on girder soffit.
- Replace missing P-Markers.

Proposed BPMP Construction Costs

- N/A

Construction Items Not Funded by BPMP

- Bridge barrier repair likely not eligible for BPMP funding since the repair work will not bring railing up to current standards. Cost to repair delaminated barrier and soffit concrete and patch ≈\$35,000 (includes engineering, traffic control, mobilization and contingency)
- Deck sealing not critical at this time.

APPENDIX A

Photos and BIR



Damaged Barrier

Photo 1: Barrier



Missing P-marker

Photo 2: Bridge



Photo 3:

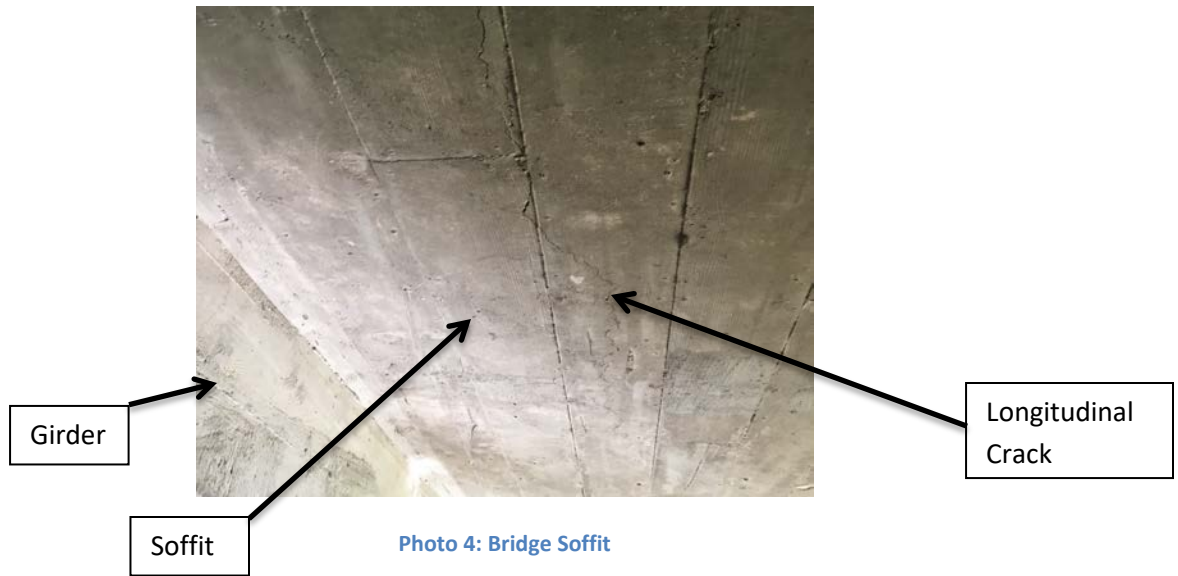




Photo 7:



Photo 8:



Photo 9:



Photo 10:



Photo 11:



Photo 12:



Photo 13:



DEPARTMENT OF TRANSPORTATION
Structure Maintenance & Investigations

Bridge Number : 55C0123
Facility Carried: BREA CANYON BLVD.
Location : 0.8 MI N/O CENTRAL AVENUE
City :
Inspection Date : 10/02/2015

Bridge Inspection Report

Inspection Type

Routine FC Underwater Special Other

☒

STRUCTURE NAME: BREA CANYON CHANNEL

CONSTRUCTION INFORMATION

Year Built : 1939 Skew (degrees): 60
Year Widened: N/A No. of Joints : 0
Length (m) : 28 No. of Hinges : 0

Structure Description: Simply supported 3-span CIP/RC T-beam (5 each) with RC pier walls and with RC open end diaphragm abutments, all supported upon concrete piles.

Span Configuration : (W) 3 @ 9.1 m (E) c/c

SAFE LOAD CAPACITY AND RATINGS

Design Live Load: UNKNOWN

Inventory Rating: RF= 0.69

Operating Rating: RF= 0.89

Permit Rating : P P P P P

Posting Load : Type 3: Legal

Calculation Method: (LRFR) LD & RES FACT RATING

Calculation Method: (LRFR) LD & RES FACT RATING

Type 3S2: Legal

Type 3-3: Legal

DESCRIPTION ON STRUCTURE

Deck X-Section: (S) 0.3 m br, 0.2 m cu, 9.2 m, 0.2 m cu, 0.3 m br (N)

Total Width: 10.1 m Net Width: 9.1 m No. of Lanes: 2 Speed: 55 mph

Min. Vertical Clearance: Unimpaired

Overlay Thickness: 3.0 Inches

Rail Code: 0000

Rail Type	Location	Length (ft)	Rail Modifications
Concrete	Right/Left	242	
Baluster			

DESCRIPTION UNDER STRUCTURE

Channel Description: Natural earth trapezoidal, RC rectangular through the site.

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

SCOPE AND ACCESS

The inspection was performed by walking on and under the bridge. There was about 2" of water in both spans; all elements were visually inspected. There is no shoulder and access to under the bridge was from northwest quadrant.

INSPECTION COMMENTARY

SAFE LOAD CAPACITY

Load Rating Summary Sheet dated 8/28/2015 is on file for this structure. While this report does not include a check of that analysis, it does verify that the structural conditions observed during this inspection are consistent with those assumed in that analysis. The current rating is based on LRFR calculation.

ELEMENT INSPECTION RATINGS AND NOTES

Elem No.	Defect /Prot	Element Description	Env	Total Qty	Units	Qty in each Condition	State		
						St. 1	St. 2	St. 3	St. 4
16		Top Flange-RC	2	283	sq.m	273	0	10	0
1080		Delamination/Spall/Patched Area	2	10		0	0	10	0
510		Deck Wearing Surface-Asphalt	2	255	sq.m	255	0	0	0
(16-1080)									
There are 10 spalls at the north edge of the deck with exposed rusted rebars, the average size was 6" x 6" x 1".									
(16-510)									
There were no significant defects noted.									
110		Girder/Beam-RC	2	140	m	136	0	4	0
1080		Delamination/Spall/Patched Area	2	4		0	0	4	0
(110-1080)									
There was 4 spalls (1' x 8" x 0.5") with exposed rebars at the bottom of in both exterior girders in spans #1 and #3.									
210		Pier Wall-RC	2	40	m	37	2	1	0
1080		Delamination/Spall/Patched Area	2	3		0	2	1	0
(210)									
There were no significant defects noted.									
(210-1080)									
There were 3 spalls (1 - 12" x 3" x 0.75" and 2 - 6" x 3" x 0.75") with exposed rebars at the northwest wing wall.									
215		Abutment-RC	2	52	m	52	0	0	0
(215)									
There were no significant defects noted.									
227		Pile-RC	2	1	ea.	1	0	0	0
(227)									
The pile element is included to indicate the presence of piles on this structure. The piles were not exposed for visual inspection. No indication of pile distress was noted in any substructure element.									
331		Railing-RC	2	56	m	28	28	0	0
1080		Delamination/Spall/Patched Area	2	28		0	28	0	0
(331-1080)									
Most rail balusters have been cracked or spalled in both rail side. the end concrete rail post at the northwest quadrant is broken.									

WORK RECOMMENDATIONS

WORK RECOMMENDATIONS

RecDate: 05/06/2010	EstCost:	Repair the 3 spalls (1 - 300 mm x 75 mm x 20 mm and 2 - 150 mm x 75 mm x 20 mm)
Action : Sub-Patch spalls	StrTarget: 2 YEARS	with exposed rebars at the northwest wing wall.
Work By: LOCAL AGENCY	DistTarget:	
Status : PROPOSED	EA:	
 RecDate: 05/06/2010	 EstCost:	 Repair the spalls (100 mm x 50mm x 20 mm0 at the baluster of both rails
Action : Railing-Repair	StrTarget: 2 YEARS	
Work By: LOCAL AGENCY	DistTarget:	
Status : PROPOSED	EA:	
 RecDate: 05/30/2007	 EstCost:	 Repair the 4 spalls (300mm x 200mm x 15mm) with exposed rebars at the bottom of in both exterior girders in spans #1 and #3.
Action : Super-Patch spalls	StrTarget: 2 YEARS	
Work By: LOCAL AGENCY	DistTarget:	
Status : PROPOSED	EA:	

Team Leader : Mikhael T. Zaarour

Report Author : Mikhael T. Zaarour

Inspected By : MT.Zaarour / DH.Kim

 2/24/16

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



STRUCTURE INVENTORY AND APPRAISAL REPORT

***** IDENTIFICATION *****

(1) STATE NAME- CALIFORNIA 069
 (8) STRUCTURE NUMBER 55C0123
 (5) INVENTORY ROUTE(ON/UNDER)- ON 140000000
 (2) HIGHWAY AGENCY DISTRICT 12
 (3) COUNTY CODE 059 (4) PLACE CODE 00000
 (6) FEATURE INTERSECTED- BREA CANYON CHANNEL
 (7) FACILITY CARRIED- BREA CANYON BLVD.
 (9) LOCATION- 0.8 MI N/O CENTRAL AVENUE
 (11) MILEPOINT/KILOMETERPOINT 0
 (12) BASE HIGHWAY NETWORK- NOT ON NET 0
 (13) LRS INVENTORY ROUTE & SUBROUTE
 (16) LATITUDE 33 DEG 56 MIN 27.32 SEC
 (17) LONGITUDE 117 DEG 53 MIN 15.24 SEC
 (98) BORDER BRIDGE STATE CODE % SHARE %
 (99) BORDER BRIDGE STRUCTURE NUMBER

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

(43) STRUCTURE TYPE MAIN:MATERIAL- CONCRETE
 TYPE- STRINGER/MULTI-BEAM OR GDR CODE 102
 (44) STRUCTURE TYPE APPR:MATERIAL- OTHER/NA
 TYPE- OTHER/NA CODE 000
 (45) NUMBER OF SPANS IN MAIN UNIT 3
 (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 1939
 (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 19000
 (30) YEAR OF ADT 2009 (109) TRUCK ADT 2 %
 (19) BYPASS, DETOUR LENGTH 2 KM

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

(48) LENGTH OF MAXIMUM SPAN 9.1 M
 (49) STRUCTURE LENGTH 28.0 M
 (50) CURB OR SIDEWALK: LEFT 0.2 M RIGHT 0.2 M
 (51) BRIDGE ROADWAY WIDTH CURB TO CURB 9.1 M
 (52) DECK WIDTH OUT TO OUT 10.1 M
 (32) APPROACH ROADWAY WIDTH (W/SHOULDERS) 8.2 M
 (33) BRIDGE MEDIAN- NO MEDIAN 0
 (34) SKEW 60 DEG (35) STRUCTURE FLARED NO
 (10) INVENTORY ROUTE MIN VERT CLEAR 99.99 M
 (47) INVENTORY ROUTE TOTAL HORIZ CLEAR 9.1 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

SUFFICIENCY RATING = 63.9
 STATUS
 HEALTH INDEX 97.4
 PAINT CONDITION INDEX = N/A

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

(112) NBIS BRIDGE LENGTH- YES Y
 (104) HIGHWAY SYSTEM- NOT ON NHS 0
 (26) FUNCTIONAL CLASS- MINOR ARTERIAL URBAN 16
 (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 7
 (59) SUPERSTRUCTURE 7
 (60) SUBSTRUCTURE 7
 (61) CHANNEL & CHANNEL PROTECTION 8
 (62) CULVERTS N

***** LOAD RATING AND POSTING ***** CODE

(31) DESIGN LOAD- UNKNOWN 0
 (63) OPERATING RATING METHOD- (LRFR) LD & RES FA 8
 (64) OPERATING RATING- RF= 0.89
 (65) INVENTORY RATING METHOD- (LRFR) LD & RES FA 8
 (66) INVENTORY RATING- RF= 0.69
 (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 3
 (69) UNDERCLEARANCES, VERTICAL & HORIZONTAL N
 (71) WATER ADEQUACY 9
 (72) APPROACH ROADWAY ALIGNMENT 8
 (36) TRAFFIC SAFETY FEATURES 0000
 (113) SCOUR CRITICAL BRIDGES 8

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

(75) TYPE OF WORK- MISC STRUCTURAL WORK CODE 38
 (76) LENGTH OF STRUCTURE IMPROVEMENT 28 M
 (94) BRIDGE IMPROVEMENT COST \$282,000
 (95) ROADWAY IMPROVEMENT COST \$56,400
 (96) TOTAL PROJECT COST \$473,760
 (97) YEAR OF IMPROVEMENT COST ESTIMATE 2010
 (114) FUTURE ADT 41217
 (115) YEAR OF FUTURE ADT 2035

***** INSPECTIONS *****

(90) INSPECTION DATE 10/15 (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)

Orange County Bridge Review Summary

Dokken Engineering performed a field review of the Orange County bridge listed below in April 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: 55C0148

Bridge Name: Santa Ana River Channel (Warner Ave)

Year Built: 1961

Facility Carried: Warner Avenue

The Santa Ana River Channel Bridge at Warner Avenue is a continuous six span cast-in-place reinforced concrete T-beam Bridge with pier wall and open-end diaphragm abutments supported on concrete piles. OCPW noted that the existing deck was treated during the widening.

Caltrans BIR recommendations:

- Repair pothole in the AC westbound departure lane

Field Inspection Observations

- Deck appears to have been treated, likely to address severe efflorescence in several bays (photo 1). No immediate action is required but the bridge soffit should continue to be monitored to determine if water is continuing to seep through the bridge deck.
- Pot hole in the approach (photo 2 & 3). Recommend covering utility opening, back filling the pothole, and replacing the AC.

Maintenance Needs Assessment

BPMP Assessment

- N/A – No eligible maintenance activities

General Maintenance – Non-BPMP

- Repair pot hole at abutment.

Proposed BPMP Construction Costs

- N/A

Construction Items Not Funded by BPMP

- AC pot hole in approach repair ≈\$15,000, includes traffic control

APPENDIX A

Field Review Notes, Photos, and BIR



Photo 1:



Photo 2:



Photo 3:

Efflorescence

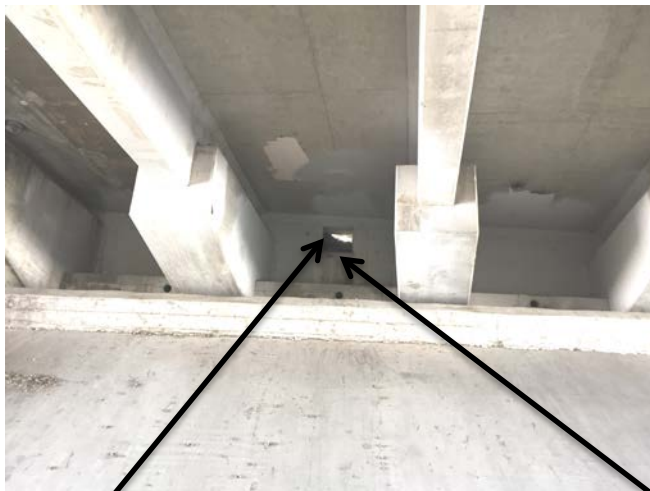


Photo 4: Bridge Soffit



Pothole

Photo 5: Bridge Approach



Future Utility
Opening

Photo 6: Abutment Elevation

Eroded Backfill



DEPARTMENT OF TRANSPORTATION
Structure Maintenance & Investigations

Bridge Number : 55C0148
Facility Carried: WARNER AVENUE
Location : 0.1 MI W/O HARBOR BLVD
City :
Inspection Date : 10/24/2014

Bridge Inspection Report

Inspection Type

Routine FC Underwater Special Other

☒

STRUCTURE NAME: SANTA ANA RIVER CHANNEL (WARNER AVE)

CONSTRUCTION INFORMATION

Year Built : 1961 Skew (degrees): 9
Year Widened: 1969 No. of Joints : 2
Length (m) : 77.4 No. of Hinges : 2

Structure Description: Continuous six span CIP/RC T-beam (9 each) and widened 3 girders N and 2 girders S with RC pier walls and RC open end diaphragm abutments, all supported upon concrete piles. Wi

Span Configuration : (W) 10.4 m, 4 @ 14.0 m, 10.4 m (E) c/c

SAFE LOAD CAPACITY AND RATINGS

Design Live Load: MS-18 OR HS-20
Inventory Rating: RF=1.00 =>32.4 metric tons Calculation Method: ASSIGNED (LFD)
Operating Rating: RF=1.67 =>54.1 metric tons Calculation Method: ASSIGNED (LFD)
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 br, 1.5 m sw, 13.4 m, 2.4 m med, 12.3 m, 1.5 m sw, 0.3 m br (N)
Total Width: 31.6 m Net Width: 24.5 m No. of Lanes: 6 Speed: 45 mph
Min. Vertical Clearance: Unimpaired

Rail Code: 1111

Rail Type	Location	Length (ft)	Rail Modifications
Type 26	Right/Left	525	

DESCRIPTION UNDER STRUCTURE

Channel Description: RC 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

SCOPE AND ACCESS

The river was dry at inspection time. All elements were visually inspected.

DECK AND ROADWAY

There is a hole (18" x 8" x 12") in the AC westbound departure lane #1.

INSPECTION COMMENTARY**REVISIONS**

The bridge name was revised to include the road carried name.

Old name: SANTA ANA RIVER CHANNEL.

New name: SANTA ANA RIVER CHANNEL (WARNER AVE).

SAFE LOAD CAPACITY

A load Rating Summary sheet is included with this bridge inspection report. This load rating was assigned in accordance with current SM&I procedures.

ELEMENT INSPECTION RATINGS AND COMMENTARY

Elem No.	Defect /Prot	Defect	Element Description	Env	Total Qty	Units	Qty in each Condition	State		
							St. 1	St. 2	St. 3	St. 4
12			Deck-RC	2	688	sq.m	688	0	0	0
(12)										
There were no significant defects noted.										
16			Top Flange-RC	2	1757	sq.m	1757	0	0	0
511			Deck Wearing Surface-Concrete	2	1571	sq.m	1571	0	0	0
(16)										
There were no significant defects noted.										
(16-511)										
There were no significant defects noted.										
109			Girder/Beam-PS Conc.	2	387	m	387	0	0	0
(109)										
There were no significant defects noted.										
110			Girder/Beam-RC	2	697	m	697	0	0	0
(110)										
There were no significant defects noted.										
182			EQ Restrainer Cable-Other	2	18	ea.	18	0	0	0
(182)										
There were no significant defects noted.										
210			Pier Wall-RC	2	155	m	155	0	0	0
(210)										
There were no significant defects noted.										
215			Abutment-RC	2	64	m	64	0	0	0
(215)										
There were no significant defects noted.										
256			Slope Protection	2	2	ea.	2	0	0	0
(256)										
There were no significant defects noted.										
302			Joint-Compression Seal	2	56	m	56	0	0	0
(302)										
There were no significant defects noted.										
312			Bearing-Enclosed	2	2	each	2	0	0	0

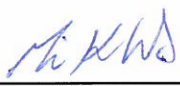
ELEMENT INSPECTION RATINGS AND COMMENTARY

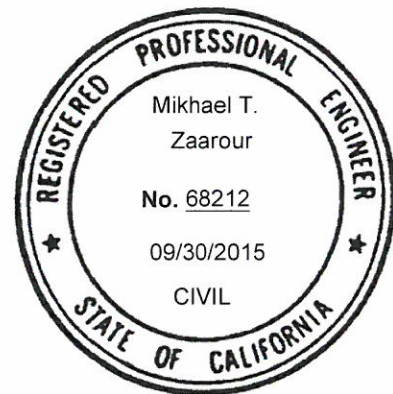
Elem No.	Defect /Prot	Defect	Element Description	Env	Total Qty	Units	Qty in each Condition	State		
							St. 1	St. 2	St. 3	St. 4
(312)										
There were no significant defects noted.										
331			Railing-RC	2	155	m	155	0	0	0
(331)										
There were no significant defects noted.										

WORK RECOMMENDATIONS

RecDate: 10/24/2014 EstCost: Repair the hole (18" x 8" x 12") in the
 Action : Appr. Roadway-Repair StrTarget: 2 YEARS AC westbound departure (west) lane #1.
 Work By: LOCAL AGENCY DistTarget:
 Status : PROPOSED EA:

Team Leader : Mikhael T. Zaarour
 Report Author : Mikhael T. Zaarour
 Inspected By : MT.Zaarour/KD.Henderson

 11/13/14
 Mikhael T. Zaarour (Registered Civil Engineer) (Date)



STRUCTURE INVENTORY AND APPRAISAL REPORT

***** IDENTIFICATION *****

(1) STATE NAME- CALIFORNIA 069
 (8) STRUCTURE NUMBER 55C0148
 (5) INVENTORY ROUTE(ON/UNDER)- ON 140000000
 (2) HIGHWAY AGENCY DISTRICT 12
 (3) COUNTY CODE 059 (4) PLACE CODE 00000
 (6) FEATURE INTERSECTED- SANTA ANA RIVER CHANNEL
 (7) FACILITY CARRIED- WARNER AVENUE
 (9) LOCATION- 0.1 MI W/O HARBOR BLVD
 (11) MILEPOINT/KILOMETERPOINT 0
 (12) BASE HIGHWAY NETWORK- PART OF NET 1
 (13) LRS INVENTORY ROUTE & SUBROUTE 000000000000
 (16) LATITUDE 33 DEG 42 MIN 51.96 SEC
 (17) LONGITUDE 117 DEG 55 MIN 18.68 SEC
 (98) BORDER BRIDGE STATE CODE % SHARE %
 (99) BORDER BRIDGE STRUCTURE NUMBER

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

(43) STRUCTURE TYPE MAIN:MATERIAL- CONCRETE CONT
 TYPE- TEE BEAM CODE 204
 (44) STRUCTURE TYPE APPR:MATERIAL- OTHER/NA
 TYPE- OTHER/NA CODE 000
 (45) NUMBER OF SPANS IN MAIN UNIT 6
 (46) NUMBER OF APPROACH SPANS 0
 (107) DECK STRUCTURE TYPE- CIP CONCRETE CODE 1
 (108) WEARING SURFACE / PROTECTIVE SYSTEM:
 A) TYPE OF WEARING SURFACE- CONCRETE CODE 1
 B) TYPE OF MEMBRANE- NONE CODE 0
 C) TYPE OF DECK PROTECTION- NONE CODE 0

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

(27) YEAR BUILT 1961
 (106) YEAR RECONSTRUCTED 1969
 (42) TYPE OF SERVICE: ON- HIGHWAY 1
 UNDER- WATERWAY 5
 (28) LANES:ON STRUCTURE 06 UNDER STRUCTURE 00
 (29) AVERAGE DAILY TRAFFIC 25000
 (30) YEAR OF ADT 2008 (109) TRUCK ADT 1 %
 (19) BYPASS, DETOUR LENGTH 2 KM

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

(48) LENGTH OF MAXIMUM SPAN 14.0 M
 (49) STRUCTURE LENGTH 77.4 M
 (50) CURB OR SIDEWALK: LEFT 0.0 M RIGHT 1.5 M
 (51) BRIDGE ROADWAY WIDTH CURB TO CURB 24.5 M
 (52) DECK WIDTH OUT TO OUT 31.6 M
 (32) APPROACH ROADWAY WIDTH (W/SHOULDERS) 25.7 M
 (33) BRIDGE MEDIAN- CLOSED (NO BARRIER) 2
 (34) SKEW 9 DEG (35) STRUCTURE FLARED NO
 (10) INVENTORY ROUTE MIN VERT CLEAR 99.99 M
 (47) INVENTORY ROUTE TOTAL HORIZ CLEAR 13.4 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 = 91.5
 STATUS
 HEALTH INDEX 100.0
 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 8
 (59) SUPERSTRUCTURE 8
 (60) SUBSTRUCTURE 8
 (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- ASSIGNED (LFD) A
 (64) OPERATING RATING- 54.1
 (65) INVENTORY RATING METHOD- ASSIGNED (LFD) A
 (66) INVENTORY RATING- 32.4
 (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 8
 (68) DECK GEOMETRY 5
 (69) UNDERCLEARANCES, VERTICAL & HORIZONTAL N
 (71) WATER ADEQUACY 9
 (72) APPROACH ROADWAY ALIGNMENT 7
 (36) TRAFFIC SAFETY FEATURES 1111
 (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 57703
 (115) YEAR OF FUTURE ADT 2031

***** INSPECTIONS *****

(90) INSPECTION DATE 10/14 (91) FREQUENCY 48 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)

Orange County Bridge Review Summary

Dokken Engineering performed a field review of the Orange County bridge listed below in April 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: 55C0154

Bridge Name: Santa Ana River Channel

Year Built: 1959

Facility Carried: Edinger Avenue

The Santa Ana River Channel at Edinger Avenue is a continuous 7 span cast-in-place reinforced concrete T-beam Bridge with pier wall and open-end diaphragm abutments supported on concrete piles. Bridge was widened in 2014.

Caltrans BIR recommendations:

- None

Field Inspection Observations

- Efflorescence visible on the bridge soffit (photo 1). OCPW states bridge deck was treated when the bridge was widened.

Maintenance Needs Assessment

BPMP Assessment

- N/A – No eligible maintenance activities

General Maintenance – Non-BPMP

- Clean out down drains.

Proposed BPMP Construction Costs

- N/A

Construction Items Not Funded by BPMP

- N/A

APPENDIX A

Photos and BIR



Photo 1:



Photo 2:



Photo 3:

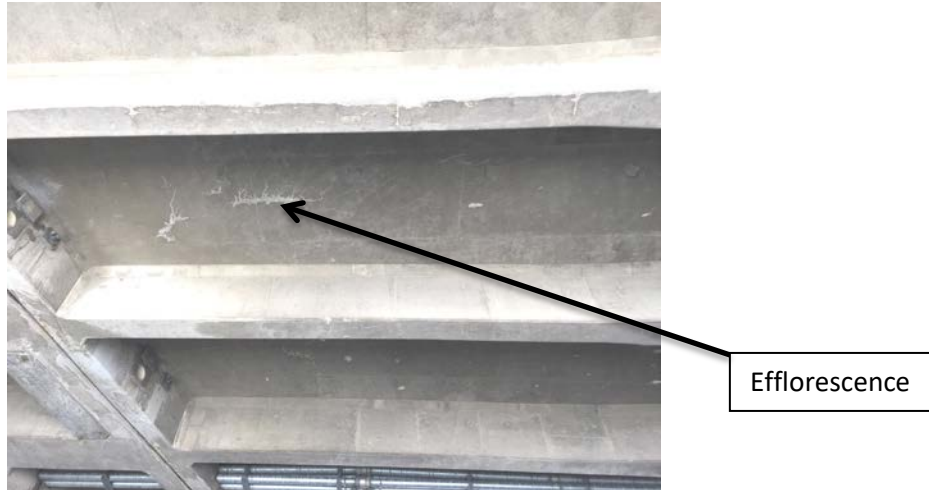


Photo 4:



Photo 5: Joint Seal



DEPARTMENT OF TRANSPORTATION
Structure Maintenance & Investigations

Bridge Number : 55C0154
Facility Carried: EDINGER AVENUE
Location : 0.3 MI. E/O HARBOR BLVD
City :
Inspection Date : 10/24/2014

Bridge Inspection Report

Inspection Type
Routine ☒ FC Underwater ☐ Special ☐ Other ☐

STRUCTURE NAME: SANTA ANA RIVER CHANNEL (EDINGER AVE)

CONSTRUCTION INFORMATION

Year Built : 1959 Skew (degrees): 16
Year Widened: 2014 No. of Joints : 2
Length (m) : 91.4 No. of Hinges : 2

Structure Description: Continuous seven span CIP/RC T-beam (6 each) and widened 3 girders N and 3 girders S with RC pier walls and RC open end diaphragm abutments, all supported upon concrete piles.

Span Configuration : (W) 10.4 m, 5 @ 14.0 m, 10.4 m (E) c/c

SAFE LOAD CAPACITY AND RATINGS

Design Live Load: MS-18 OR HS-20
Inventory Rating: RF=1.56 =>50.5 metric tons Calculation Method: LOAD FACTOR
Operating Rating: RF=2.60 =>84.2 metric tons Calculation Method: LOAD FACTOR
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 br, 1.6 m sw, 29.2 m, 1.6 m sw, 0.3 m br (N)

Total Width: 33.0 m Net Width: 29.2 m No. of Lanes: 4 Speed: 45 mph

Min. Vertical Clearance: Unimpaired

Rail Code: 1000

Rail Type	Location	Length (ft)	Rail Modifications
Type 26	Right/Left	600	

DESCRIPTION UNDER STRUCTURE

Channel Description: RC 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

SCOPE AND ACCESS

The river was dry at inspection time. All elements were visually inspected.

REVISIONS

The bridge name was revised to include the road carried name.

Old name: SANTA ANA RIVER CHANNEL.

New name: SANTA ANA RIVER CHANNEL (EDINGER AVE).

INSPECTION COMMENTARY

Items numbers 32, 47, 50, 51, and 52 were revised to reflect the new widened.

SAFE LOAD CAPACITY


A load Rating Summary sheet was in BIRIS. The current load rating was based on calculations dated 11/19/1975.

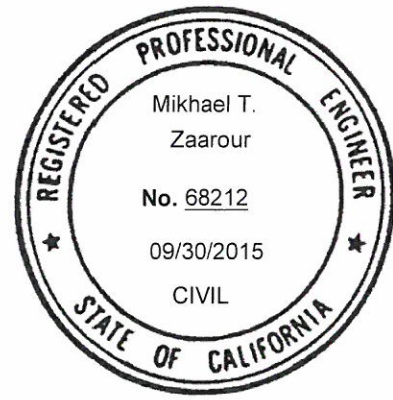
ELEMENT INSPECTION RATINGS AND COMMENTARY

Elem No.	Defect /Prot	Defect	Element Description	Env	Total Qty	Units	Qty in each Condition State	St. 1	St. 2	St. 3	St. 4
12			Deck-RC	2	1572	sq.m	1572	0	0	0	0
(12)			There were no significant defects noted.								
16			Top Flange-RC	2	1444	sq.m	1444	0	0	0	0
(16)			There were no significant defects noted.								
109			Girder/Beam-PS Conc.	2	546	m	546	0	0	0	0
(109)			There were no significant defects noted.								
110			Girder/Beam-RC	2	546	m	546	0	0	0	0
(110)			There were no significant defects noted.								
182			EQ Restrainer Cable-Other	2	8	ea.	8	0	0	0	0
(182)			There were no significant defects noted.								
210			Pier Wall-RC	2	165	m	165	0	0	0	0
(210)			There were no significant defects noted.								
215			Abutment-RC	2	66	m	66	0	0	0	0
(215)			There were no significant defects noted.								
301			Joint-Pourable Seal	2	60	m	60	0	0	0	0
(301)			There were no significant defects noted.								
312			Bearing-Enclosed	2	2	each	2	0	0	0	0
(312)			There were no significant defects noted.								
331			Railing-RC	2	182	m	182	0	0	0	0
(331)			There were no significant defects noted.								

WORK RECOMMENDATIONS - NONE

Team Leader : Mikhael T. Zaarour
Report Author : Mikhael T. Zaarour
Inspected By : MT.Zaarour/KD.Henderson

 11/13/14
Mikhael T. Zaarour (Registered Civil Engineer) (Date)



STRUCTURE INVENTORY AND APPRAISAL REPORT

***** IDENTIFICATION *****

(1) STATE NAME- CALIFORNIA 069
 (8) STRUCTURE NUMBER 55C0154
 (5) INVENTORY ROUTE(ON/UNDER)- ON 140000000
 (2) HIGHWAY AGENCY DISTRICT 12
 (3) COUNTY CODE 059 (4) PLACE CODE 00000
 (6) FEATURE INTERSECTED- SANTA ANA RIVER CHANNEL
 (7) FACILITY CARRIED- EDINGER AVENUE
 (9) LOCATION- 0.3 MI. E/O HARBOR BLVD
 (11) MILEPOINT/KILOMETERPOINT 0
 (12) BASE HIGHWAY NETWORK- PART OF NET 1
 (13) LRS INVENTORY ROUTE & SUBROUTE 000000000000
 (16) LATITUDE 33 DEG 43 MIN 38.7 SEC
 (17) LONGITUDE 117 DEG 54 MIN 55 SEC
 (98) BORDER BRIDGE STATE CODE % SHARE %
 (99) BORDER BRIDGE STRUCTURE NUMBER

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

(43) STRUCTURE TYPE MAIN:MATERIAL- CONCRETE CONT
 TYPE- TEE BEAM CODE 204
 (44) STRUCTURE TYPE APPR:MATERIAL- OTHER/NA
 TYPE- OTHER/NA CODE 000
 (45) NUMBER OF SPANS IN MAIN UNIT 7
 (46) NUMBER OF APPROACH SPANS 0
 (107) DECK STRUCTURE TYPE- CIP CONCRETE CODE 1
 (108) WEARING SURFACE / PROTECTIVE SYSTEM:
 A) TYPE OF WEARING SURFACE- NONE CODE 0
 B) TYPE OF MEMBRANE- NONE CODE 0
 C) TYPE OF DECK PROTECTION- NONE CODE 0

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

(27) YEAR BUILT 1959
 (106) YEAR RECONSTRUCTED 2014
 (42) TYPE OF SERVICE: ON- HIGHWAY 1
 UNDER- WATERWAY 5
 (28) LANES:ON STRUCTURE 04 UNDER STRUCTURE 00
 (29) AVERAGE DAILY TRAFFIC 31000
 (30) YEAR OF ADT 2007 (109) TRUCK ADT 1 %
 (19) BYPASS, DETOUR LENGTH 3 KM

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

(48) LENGTH OF MAXIMUM SPAN 14.0 M
 (49) STRUCTURE LENGTH 91.4 M
 (50) CURB OR SIDEWALK: LEFT 1.6 M RIGHT 1.6 M
 (51) BRIDGE ROADWAY WIDTH CURB TO CURB 29.2 M
 (52) DECK WIDTH OUT TO OUT 33.0 M
 (32) APPROACH ROADWAY WIDTH (W/SHOULDERS) 29.2 M
 (33) BRIDGE MEDIAN- NO MEDIAN 0
 (34) SKEW 16 DEG (35) STRUCTURE FLARED NO
 (10) INVENTORY ROUTE MIN VERT CLEAR 99.99 M
 (47) INVENTORY ROUTE TOTAL HORIZ CLEAR 29.2 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

SUFFICIENCY RATING = 93.6
 STATUS
 HEALTH INDEX 100.0
 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 8
 (59) SUPERSTRUCTURE 8
 (60) SUBSTRUCTURE 8
 (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- LOAD FACTOR 1
 (64) OPERATING RATING- 84.2
 (65) INVENTORY RATING METHOD- LOAD FACTOR 1
 (66) INVENTORY RATING- 50.5
 (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 8
 (68) DECK GEOMETRY 9
 (69) UNDERCLEARANCES, VERTICAL & HORIZONTAL N
 (71) WATER ADEQUACY 9
 (72) APPROACH ROADWAY ALIGNMENT 8
 (36) TRAFFIC SAFETY FEATURES 1000
 (113) SCOUR CRITICAL BRIDGES 7

***** 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 51520
 (115) YEAR OF FUTURE ADT 2031

***** INSPECTIONS *****

(90) INSPECTION DATE 10/14 (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)

Orange County Bridge Review Summary

Dokken Engineering performed a field review of the Orange County bridge listed below in April 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: 55C0168

Bridge Name: Handy Creek

Year Built: 1937

Facility Carried: Amapola Avenue

The Handy Creek Bridge at Amapola Avenue is a simply supported two span timber stringers and timber deck with a timber treated post bent and a treated timber post abutment. All timber is treated Douglas fir.

Caltrans BIR recommendations:

- Replace the deteriorated timber planks.

Field Inspection Observations

- There is excessive AC on the bridge about 4"-6" thick. Recommend no additional AC overlay.
- Missing P-markers at the southeast end of bridge (photo).
- Debris builds up on pier. Recommend clearing debris from pier.
- There was limited access to the substructure due to 2-4ft of standing water.
- Unable to confirm if timber planks are deteriorating.

Maintenance Needs Assessment

BPMP Assessment

- Repair timber planks

General Maintenance – Non-BPMP

- Recommend additional AC thickness not increased. If new pavement is needed, existing pavement should be removed.

Proposed BPMP Construction Costs

- Replace timber planks ≈\$25,000, will require existing AC to be removed and replaced (includes engineering, mobilization and contingency)

Construction Items Not Funded by BPMP

- Replace P-marker

APPENDIX A

Photos and BIR



Photo 1:



Photo 2: Bridge



Photo 3: Debris build up on timber columns



Photo 4:



DEPARTMENT OF TRANSPORTATION
Structure Maintenance & Investigations

Bridge Number : 55C0168
Facility Carried: AMAPOLA AVENUE
Location : 0.2 MI E/O ORANGE PK BLV
City :
Inspection Date : 08/07/2015

Bridge Inspection Report

Inspection Type

Routine FC Underwater Special Other

☒

STRUCTURE NAME: HANDY CREEK

CONSTRUCTION INFORMATION

Year Built : 1937 Skew (degrees): 0
Year Widened: N/A No. of Joints : 0
Length (m) : 8.5 No. of Hinges : 0

Structure Description: Simply supported two span timber stringers (19 each) and timber deck with a timber treated timber post (6 each) bent and a treated timber post (6 each) abutments, all supported upon treated timber sills. All timber treated Douglas Fir.

Span Configuration : (W) 2 @ 4.0 m (B) c/c

SAFE LOAD CAPACITY AND RATINGS

Design Live Load: UNKNOWN
Inventory Rating: RF=0.54 =>17.5 metric tons Calculation Method: ALLOWABLE STRESS
Operating Rating: RF=0.77 =>24.9 metric tons Calculation Method: ALLOWABLE STRESS
Permit Rating : 00000
Posting Load : Type 3: Legal Type 3S2: Legal Type 3-3: Legal

DESCRIPTION ON STRUCTURE

Deck X-Section: (S) 0.1 m br, 7.2 m, 0.1 m br (N)
Total Width: 7.3 m Net Width: 7.1 m No. of Lanes: 2 Speed: 25 mph
Min. Vertical Clearance: Unimpaired Overlay Thickness: 5.0 Inches
Rail Code: 0000

Rail Type	Location	Length (ft)	Rail Modifications
MBBR	Right/Left	56	

DESCRIPTION UNDER STRUCTURE

Channel Description: Natural earth trapezoidal upstream, RC rectangular with a check dam downstream.

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

SCOPE AND ACCESS

There was about 2' deep stagnate water in the creek. All elements were visually inspected.

INSPECTION COMMENTARY**DECK AND ROADWAY**

There was a (OM 3R) narrow sign road at the southwest corner and a (OM 1-3) road sign at the northeast corner.

There rail post were connected by 2 bolts one on each side.

SAFE LOAD CAPACITY

A load Rating Summary sheet was in BIRIS. The current load rating was based on calculations dated 5/25/2010.

ELEMENT INSPECTION RATINGS AND NOTES

Elem No.	Defect /Prot	Element Description	Env	Total Qty	Units	Qty in each State	St. 1	St. 2	St. 3	St. 4
31		Deck-Timber	2	60	sq.m	60	0	0	0	0
	510	Deck Wearing Surface-Asphalt	2	60	sq.m	50	0	10	0	0
	3220	Cracking-AC (WS)	2	10		0	0	10	0	0

(31)

There were no significant defects noted.

(31-510-3220)

There was 2 tranverse and 1 longitudinal cracks in the AC overlay 0.5" wide.

111		Girder/Beam-Timber	2	162	m	162	0	0	0
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(111)

There were no significant defects noted.

206		Column-Timber	3	18	each	0	18	0	0
	1180	Abrasion (Timber)	3	18		0	18	0	0

(206-1180)

There was shrinkage in the columns section due to the weather.

216		Abutment-Timber	3	16	m	0	15	1	0
	1180	Abrasion (Timber)	3	16		0	15	1	0

(216-1180)

There was shrinkage in the columns section due to the weather.

At the east abutment north side there was a tree growing in between the timber planks.

235		Pier Cap-Timber	2	21	m	0	21	0	0
	1180	Abrasion (Timber)	2	21		0	21	0	0

(235-1180)

There was shrinkage in the columns section due to the weather.

330		Railing-Metal	2	17	m	17	0	0	0
-----	--	---------------	---	----	---	----	---	---	---

(330)

There were no significant defects noted.

WORK RECOMMENDATIONS

RecDate: 05/18/2012

Action : Sub-Patch spalls

Work By: LOCAL AGENCY

Status : PROPOSED

EstCost:

StrTarget: 2 YEARS

DistTarget:

EA:

Replace the deteriorated timber plank at 200 mm from the bottom and remove the tree at the north side of the abutment between timber planks.

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 55C0168
 (5) INVENTORY ROUTE (ON/UNDER)- ON 140000000
 (2) HIGHWAY AGENCY DISTRICT 12
 (3) COUNTY CODE 059 (4) PLACE CODE 00000
 (6) FEATURE INTERSECTED- HANDY CREEK
 (7) FACILITY CARRIED- AMAPOLA AVENUE
 (9) LOCATION- 0.2 MI E/O ORANGE PK BLVD
 (11) MILEPOINT/KILOMETERPOINT 0
 (12) BASE HIGHWAY NETWORK- NOT ON NET 0
 (13) LRS INVENTORY ROUTE & SUBROUTE
 (16) LATITUDE 33 DEG 48 MIN 08.93 SEC
 (17) LONGITUDE 117 DEG 46 MIN 46.19 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 2
 (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 1937
 (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 1000
 (30) YEAR OF ADT 2009 (109) TRUCK ADT 1 %
 (19) BYPASS, DETOUR LENGTH 2 KM

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

(48) LENGTH OF MAXIMUM SPAN 4.0 M
 (49) STRUCTURE LENGTH 8.5 M
 (50) CURB OR SIDEWALK: LEFT 0.0 M RIGHT 0.0 M
 (51) BRIDGE ROADWAY WIDTH CURB TO CURB 7.1 M
 (52) DECK WIDTH OUT TO OUT 7.3 M
 (32) APPROACH ROADWAY WIDTH (W/SHOULDERS) 6.7 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 6.7 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 = 58.1

STATUS

HEALTH INDEX 91.9

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 8
 (59) SUPERSTRUCTURE 8
 (60) SUBSTRUCTURE 6
 (61) CHANNEL & CHANNEL PROTECTION 8
 (62) CULVERTS N

***** LOAD RATING AND POSTING ***** CODE

(31) DESIGN LOAD- UNKNOWN 0
 (63) OPERATING RATING METHOD- ALLOWABLE STRESS 2
 (64) OPERATING RATING- 24.9
 (65) INVENTORY RATING METHOD- ALLOWABLE STRESS 2
 (66) INVENTORY RATING- 17.5
 (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 4
 (69) UNDERCLEARANCES, VERTICAL & HORIZONTAL N
 (71) WATER ADEQUACY 5
 (72) APPROACH ROADWAY ALIGNMENT 6
 (36) TRAFFIC SAFETY FEATURES 0000
 (113) SCOUR CRITICAL BRIDGES 5

***** 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 2061
 (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)

Orange County Bridge Review Summary

Dokken Engineering performed a field review of the Orange County bridge listed below in April 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: 55C0173

Bridge Name: Santiago Creek

Year Built: 1947

Facility Carried: Modjeska Canyon Rd

The Santiago Creek Bridge at Modjeska Canyon Road is a simply supported single span steel girder with reinforced concrete open end seat abutments supported on timber piles.

Caltrans BIR recommendations:

- Repair spalls and seal deck with methacrylate.

Field Inspection Observations

- Chained deck to check for delamination. Minor delamination found, recommend repairing.
- Light rust (mill scale) on girders. Recommend monitoring. No work necessary at this time.
- Drainage from the southeast house by the bridge is causing erosion issues. Recommend relocating drain.
- Concrete spall at abutment

Maintenance Needs Assessment

BPMP Assessment

- Perform deck treatment per Caltrans BIR recommendation. Cracks are condition state 2, therefore eligible for funding.
- Relocate residential drain or provide minor rock protection.

General Maintenance – Non-BPMP

- Monitor rust on girders. Not a critical issue in foreseeable future.

Proposed BPMP Construction Costs

- Repair spalled concrete
- Estimated Total deck treatment Construction Cost ≈ \$30,000 (with engineering, traffic control, mobilization and contingency)

Construction Costs Not Funded by BPMP

- N/A

APPENDIX A

Photos and BIR



Photo 1: Santiago Creek Bridge



Photo 2:



Photo 3:



Photo 4: Abutment View



Photo 5: Bridge Girder



DEPARTMENT OF TRANSPORTATION
Structure Maintenance & Investigations

Bridge Number : 55C0173
Facility Carried: MODJESKA CANYON RD
Location : .4 MI. E/O MODJESKA G RD
City :
Inspection Date : 09/18/2015

Bridge Inspection Report

Inspection Type
Routine FC Underwater Special Other

☒

STRUCTURE NAME: SANTIAGO CREEK

CONSTRUCTION INFORMATION

Year Built : 1947 Skew (degrees): 0
Year Widened: N/A No. of Joints : 0
Length (m) : 17.1 No. of Hinges : 0

Structure Description: Simply supported single span steel girders (4 each) with RC open end seat abutments, all supported upon timber piles.

Span Configuration : (W) 1 @ 16.8 m (E) c/c

SAFE LOAD CAPACITY AND RATINGS

Design Live Load: M-13.5 OR H-15
Inventory Rating: RF=0.61 =>19.8 metric tons Calculation Method: LOAD FACTOR
Operating Rating: RF=1.02 =>33.0 metric tons Calculation Method: LOAD FACTOR
Permit Rating : 00000
Posting Load : Type 3: Legal Type 3S2: Legal Type 3-3: Legal

DESCRIPTION ON STRUCTURE

Deck X-Section: (S) 0.1 m br, 0.9 m cu, 7.3 m, 0.5 m cu, 0.1 m br (N)
Total Width: 8.8 m Net Width: 7.3 m No. of Lanes: 2 Speed: 25 mph
Min. Vertical Clearance: Unimpaired Overlay Thickness: 0.0 Inches
Rail Code: 0000 Rail Description: Timber

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

SCOPE AND ACCESS

There was 3" deep and 2 ft wide running water in the channel; all elements were visually inspection by walking on the deck and under the bridge.

SAFE LOAD CAPACITY

A Load Rating Summary Sheet dated 10/30/2012 is on file for this structure. While this report does not include a check of that analysis, it does verify that the structural conditions observed during this inspection are consistent with those assumed in that analysis. The current rating is based on LF calculation.

ELEMENT INSPECTION RATINGS AND NOTES

Elem No.	Defect /Prot	Element Description	Env	Total Qty	Units	Qty in each Condition	State		
						St. 1	St. 2	St. 3	St. 4
12		Deck-RC	2	150	sq.m	30	120	0	0
	1080	Delamination/Spall/Patched Area	2	1		0	1	0	0
	1130	Cracking (RC and Other)	2	59		0	59	0	0
	1190	Abrasion (PS Conc./RC)	2	60		0	60	0	0

(12-1080)

There are 2 small 6" X 4" X 1/2" spalls in the deck at west end.

(12-1130)

The concrete deck exhibits few transverse cracks throughout deck, 1 mm wide and 3 ft spacing apart.

(12-1190)

There are abrasion and wearing of 75 % of the deck, the aggregate were exposed but remains secure in the concrete.

107		Girder/Beam-Steel	2	68	m	68	0	0	0
	515	Steel Coating-Paint	2	175	sq.m	0	90	85	0
	3410	Chalking (Steel PC)	2	175		0	90	85	0

(107)

There were no significant defects noted.

(107-515-3410)

The paints are chalking and lost pigments at the edges.

215		Abutment-RC	2	18	m	18	0	0	0
-----	--	-------------	---	----	---	----	---	---	---

(215)

There were no significant defects noted.

228		Pile-Timber	2	1	ea.	1	0	0	0
-----	--	-------------	---	---	-----	---	---	---	---

(228)

The pile element is included to indicate the presence of piles on this structure. The piles were not exposed for visual inspection. No indication of pile distress was noted in any substructure element.

332		Railing-Timber	2	36	m	36	0	0	0
-----	--	----------------	---	----	---	----	---	---	---

(332)

There were no significant defects noted.

WORK RECOMMENDATIONS

RecDate: 05/12/2011

Action : Deck-Methacrylate

Work By: LOCAL AGENCY

Status : PROPOSED

EstCost:

StrTarget: 2 YEARS

DistTarget:

EA:

Repair the spalls and provide deck

sealing with methacrylate or equivalent material

CHANNEL X-SECTION


Side : Upstream

X-Section Date: 09/18/2015

Measured From :to bottom of beam

Location	Horiz (m)	Vert (m)	Comments
Abut 1	0.00	2.30	face of abut wall
	6.70	3.00	thalweg
Abut 2	0.00	1.45	face of abut wall.

Team Leader : Mikhael T. Zaarour
Report Author : Mikhael T. Zaarour
Inspected By : MT.Zaarour/DH.Kim

 10/21/15
Mikhael T. Zaarour (Registered Civil Engineer) (Date)



STRUCTURE INVENTORY AND APPRAISAL REPORT

***** IDENTIFICATION *****

(1) STATE NAME- CALIFORNIA 069
 (8) STRUCTURE NUMBER 55C0173
 (5) INVENTORY ROUTE(ON/UNDER) - ON 140000000
 (2) HIGHWAY AGENCY DISTRICT 12
 (3) COUNTY CODE 059 (4) PLACE CODE 00000
 (6) FEATURE INTERSECTED- SANTIAGO CREEK
 (7) FACILITY CARRIED- MODJESKA CANYON RD
 (9) LOCATION- .4 MI. E/O MODJESKA G RD
 (11) MILEPOINT/KILOMETERPOINT 0
 (12) BASE HIGHWAY NETWORK- NOT ON NET 0
 (13) LRS INVENTORY ROUTE & SUBROUTE
 (16) LATITUDE 33 DEG 42 MIN 28.85 SEC
 (17) LONGITUDE 117 DEG 37 MIN 43.93 SEC
 (98) BORDER BRIDGE STATE CODE % SHARE %
 (99) BORDER BRIDGE STRUCTURE NUMBER

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

(43) STRUCTURE TYPE MAIN:MATERIAL- STEEL
 TYPE- STRINGER/MULTI-BEAM OR GDR CODE 302
 (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- NONE CODE 0
 B) TYPE OF MEMBRANE- NONE CODE 0
 C) TYPE OF DECK PROTECTION- NONE CODE 0

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

(27) YEAR BUILT 1947
 (106) YEAR RECONSTRUCTED 0000
 (42) TYPE OF SERVICE: ON- HIGHWAY-PEDESTRIAN 5
 UNDER- WATERWAY 5
 (28) LANES:ON STRUCTURE 02 UNDER STRUCTURE 00
 (29) AVERAGE DAILY TRAFFIC 1000
 (30) YEAR OF ADT 2009 (109) TRUCK ADT 1 %
 (19) BYPASS, DETOUR LENGTH 199 KM

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

(48) LENGTH OF MAXIMUM SPAN 16.8 M
 (49) STRUCTURE LENGTH 17.1 M
 (50) CURB OR SIDEWALK: LEFT 0.9 M RIGHT 0.5 M
 (51) BRIDGE ROADWAY WIDTH CURB TO CURB 7.3 M
 (52) DECK WIDTH OUT TO OUT 8.8 M
 (32) APPROACH ROADWAY WIDTH (W/SHOULDERS) 7.3 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 7.3 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- NO CONTROL CODE 0
 (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 = 44.4
 STATUS
 HEALTH INDEX 87.1
 PAINT CONDITION INDEX = 50.5

***** 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 6
 (59) SUPERSTRUCTURE 8
 (60) SUBSTRUCTURE 8
 (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- LOAD FACTOR 1
 (64) OPERATING RATING- 33.0
 (65) INVENTORY RATING METHOD- LOAD FACTOR 1
 (66) INVENTORY RATING- 19.8
 (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 4
 (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- 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 1052
 (115) YEAR OF FUTURE ADT 2035

***** INSPECTIONS *****

(90) INSPECTION DATE 09/15 (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)

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	Env	Total		Qty in each Condition State				
			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 = 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)

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: 55C0178

Bridge Name: Silverado Canyon Creek

Year Built: 1947

Facility Carried: Silverado Canyon Road

Simply supported single span steel girders (4 each) with Reinforced Concrete open-end seat abutments, all supported upon spread footings.

Caltrans BIR recommendations:

- Seal deck cracks with methacrylate

Field Inspection Observations

- Steel girder paint appears to be in good condition.
- Minor to moderate deck cracking was observed during the field inspection.
- Bearing pads are encased in concrete. There appears to be asbestos in front of bearing pad.

Maintenance Needs Assessment

BPMP Assessment

- N/A – No eligible maintenance activities

General Maintenance – Non-BPMP

- Although Caltrans BIR recommends deck treatment, the deck cracks are coded condition state 1. Therefore, the work is not eligible for BPMP funding. Recommend monitoring future BIRs and taking no action unless condition upgraded to state 2. No immediate actions required since not a high priority.

Proposed BPMP Construction Costs

- N/A

Construction Items Not Funded by BPMP

- N/A

APPENDIX A

Photos and BIR



Photo 1: Silverado Canyon Creek Bridge



Photo 2: Silverado Canyon Creek Bridge



Photo 3:



Photo 4:



Photo 5:



Photo 6:



DEPARTMENT OF TRANSPORTATION
Structure Maintenance & Investigations

Bridge Number : 55C0178
Facility Carried: SILVERADO CANYN RD
Location : 4.9 MI. E/O SANTIAGO ROA
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 : 1947 Skew (degrees): 45
Year Widened: N/A No. of Joints : 0
Length (m) : 12.8 No. of Hinges : 0

Structure Description: Simply supported single span steel girders (4 each) with RC open end seat abutments, all supported upon spread footings.

Span Configuration : (W) 1 @ 12.5 m (E) c/c

SAFE LOAD CAPACITY AND RATINGS

Design Live Load: M-13.5 OR H-15
Inventory Rating: 25.4 metric tons Calculation Method: NO RATING ANALYSIS
Operating Rating: 40.8 metric tons Calculation Method: NO RATING ANALYSIS
Permit Rating : PGGGG
Posting Load : Type 3: Legal Type 3S2: Legal Type 3-3: Legal

DESCRIPTION ON STRUCTURE

Deck X-Section: (S) 0.5 m br, 7.2 m, 0.5 m br (N)
Total Width: 8.2 m Net Width: 7.3 m No. of Lanes: 2 Speed: 25 mph
Min. Vertical Clearance: Unimpaired
Rail Code: 1000 Rail Description: MBBR

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

Smart flag 358 (Deck cracking) was added (State 2).
Smart flag 359 (Soffit) was added (State 2).

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

The concrete deck surface exhibits 60% light scaling due to weather and aging, and unsealed transverse cracks 0.5 mm wide, 12" spaced apart and 4 ft long.

INSPECTION COMMENTARY

The soffit exhibits two transverse cracks 4 ft long in the soffit with white light efflorescence in every bay.

SUPERSTRUCTURE

The steel girders are in good condition, no significant defects were visually seen during this inspection.

SUBSTRUCTURE

West abutment exhibits a vertical crack 1.0 mm wide under girder #3.

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
12	Concrete Deck - Bare	2	90 sq.m.	90	0	0	0	0
107	Painted Steel Open Girder/Beam	2	52 m.	52	0	0	0	0
215	Reinforced Conc Abutment	2	24 m.	24	0	0	0	0
337	Metal Railing (W6X25 Posts)	2	26 m.	26	0	0	0	0
358	Deck Cracking	2	1 ea.	0	1	0	0	0
359	Soffit of Concrete Deck or Slab	2	1 ea.	0	1	0	0	0

WORK RECOMMENDATIONS

RecDate: 07/12/2011	EstCost:	Seal the deck cracks with methacrylate.
Action : Deck-Methacrylate	StrTarget: 2 YEARS	
Work By: LOCAL AGENCY	DistTarget:	
Status : PROPOSED	EA:	

CHANNEL X-SECTION

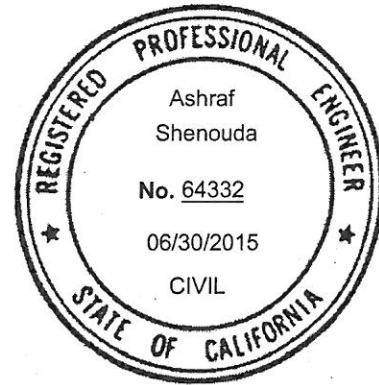
Side : Upstream
Measured From : Top of rail. (North) H=1.04m

X-Section Date: 12/14/2013

Location	Horiz (m)	Vert (m)	Comments
Abutment 1	0.00	3.30	Face of the west abutment
	1.80	3.45	toe of rock
	2.00	2.95	top of rock
	4.15	2.80	top of slope
	6.55	3.57	west edge of water
	7.45	3.75	Thalweg
	8.45	3.55	east edge of water
	10.20	3.40	
Abutment 2	12.00	3.30	Face of the east abutment.

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

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



STRUCTURE INVENTORY AND APPRAISAL REPORT

***** IDENTIFICATION *****

(1) STATE NAME- CALIFORNIA 069
 (8) STRUCTURE NUMBER 55C0178
 (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 CANYN RD
 (9) LOCATION- 4.9 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 45.99 SEC
 (17) LONGITUDE 117 DEG 36 MIN 20.71 SEC
 (98) BORDER BRIDGE STATE CODE % SHARE %
 (99) BORDER BRIDGE STRUCTURE NUMBER

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

(43) STRUCTURE TYPE MAIN:MATERIAL- STEEL
 TYPE- STRINGER/MULTI-BEAM OR GDR CODE 302
 (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- NONE CODE 0
 B) TYPE OF MEMBRANE- NONE CODE 0
 C) TYPE OF DECK PROTECTION- NONE CODE 0

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

(27) YEAR BUILT 1947
 (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 12.5 M
 (49) STRUCTURE LENGTH 12.8 M
 (50) CURB OR SIDEWALK: LEFT 0.0 M RIGHT 0.0 M
 (51) BRIDGE ROADWAY WIDTH CURB TO CURB 7.3 M
 (52) DECK WIDTH OUT TO OUT 8.2 M
 (32) APPROACH ROADWAY WIDTH (W/SHOULDERS) 6.4 M
 (33) BRIDGE MEDIAN- NO MEDIAN 0
 (34) SKEW 45 DEG (35) STRUCTURE FLARED NO
 (10) INVENTORY ROUTE MIN VERT CLEAR 99.99 M
 (47) INVENTORY ROUTE TOTAL HORIZ CLEAR 7.3 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 = 54.0
 STATUS
 HEALTH INDEX 100.0
 PAINT CONDITION INDEX = 100.0

***** 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 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- NO RATING ANALYSIS 5
 (64) OPERATING RATING- 40.8
 (65) INVENTORY RATING METHOD- NO RATING ANALYSIS 5
 (66) INVENTORY RATING- 25.4
 (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 1000
 (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)

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: 55C0179

Bridge Name: Silverado Canyon Creek

Year Built: 1947

Facility Carried: Silverado Canyon Road

The Silverado Canyon Creek Bridge at Silverado Canyon Road is a simply supported single span steel girder bridge with reinforced concrete open-end seat abutments supported on spread footings.

Caltrans BIR recommendations:

- Remove and replace broken wingwall on the north east corner.
- Replace missing metal most and two damaged metal posts on southern bridge railing.

Field Inspection Observations

- Minor delamination at the north end of bridge (photo 1).
- Efflorescence visible on soffit this is indicative of water seepage through deck cracks (photo 2). Recommend sealing deck.
- Minor delamination on top of the southeast wingwall (photo 4).
- Paint on steel girder flanges is chipping (photo 3).
- Northeast wingwall is broken (photo 6).
- Barrier on the south end have damaged metal post (photo 5).

Maintenance Needs Assessment

BPMP Assessment

- Because bridge railing does not meet current standards it is not eligible for funding. Caltrans can be contacted to determine if barrier upgrade can be performed, though typically also not eligible.
- Though not specifically covered in BPMP, petition Caltrans to fund broken wingwall repair.
- Spot paint steel girders.

General Maintenance – Non-BPMP

- Deck cracking condition is coded condition state 1, so deck treatment not eligible for BPMP funding.
- Repair damaged barrier posts.
- Remove and patch delaminated concrete at bridge north end. Considered low priority, and patch spalled concrete at the southeast wingwall.

Proposed BPMP Construction Costs

- Remove delaminated concrete and patch ≈ \$15,000.
- Repair broken wingwall ≈ \$25,000.
- Spot Paint girders ≈ \$25,000. Possibly much higher if existing paint contains lead.

Construction Costs Not Funded by BPMP

- Repair Damaged Railing ≈ \$15,000.

APPENDIX A

Photos and BIR



Photo 1: Silverado Canyon Creek Bridge



Photo 2: Concrete Delamination on bridge deck



Photo 3: Efflorescence on Bridge Soffit



Chipped Paint

Photo 4: Paint chipping on grinder flange



Spalled Concrete

Photo 5: Concrete spalling on wingwall



Damaged Wingwall

Photo 6: Broken Wingwall



Damaged Post

Photo 7: Damaged Metal Post



Photo 8: Broken Post



DEPARTMENT OF TRANSPORTATION
Structure Maintenance & Investigations

Bridge Number : 55C0179
Facility Carried: SILVERADO CANYN RD
Location : 5.4 MI E/O SANTIAGO CYN
City :
Inspection Date : 12/14/2013
Inspection Type
Routine FC Underwater Special Other
☒

Bridge Inspection Report

STRUCTURE NAME: SILVERADO CANYON CREEK

CONSTRUCTION INFORMATION

Year Built : 1947 Skew (degrees): 45
Year Widened: N/A No. of Joints : 0
Length (m) : 12.2 No. of Hinges : 0

Structure Description: Simply supported single span steel girders (4 each) with RC open end seat abutments, all supported upon spread footings.

Span Configuration : (W) 1 @ 11.9 m (E) c/c

SAFE LOAD CAPACITY AND RATINGS

Design Live Load: M-13.5 OR H-15
Inventory Rating: 20.8 metric tons Calculation Method: NO RATING ANALYSIS
Operating Rating: 33.5 metric tons Calculation Method: NO RATING ANALYSIS
Permit Rating : G0000
Posting Load : Type 3: Legal Type 3S2: Legal Type 3-3: Legal

DESCRIPTION ON STRUCTURE

Deck X-Section: (S) 0.5 m br, 7.2 m, 0.5 m br (N)
Total Width: 8.2 m Net Width: 7.3 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	78	

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

ELI #215 (RC Concrete Abutment): a quantity of 2 m was moved to state 2.

Element 337 (W6X25 steel posts): The quantities were modified as follows: from [St. 1 = 18, St. 2 = 6] to [St. 1 = 12, St. 2 = 6, St. 3 = 6].

Smart flag 358 (Deck cracking) was added (State 2).

S

mart flag 359 (Soffit) was added (State 2).

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.

DECK AND ROADWAY

There is missing a metal post and two damaged metal posts in the southerly bridge railing.

The concrete deck exhibits:

- * 90% light scaling due to weather and aging.
- * two areas of unsound concrete +/- 1 ft X 1 ft at the north shoulder at 10 ft and 20 ft from the east end.
- * few transverse cracks up to 1.5 mm wide and up to 10 ft long in both lanes.

There were transverse cracks with white efflorescence, 2 cracks in every bay of the soffit.

SUPERSTRUCTURE

Freckled rust is forming on the steel girders without corrosion.

In steel girder #4 (south), the bottom flange is damaged and bent at three different locations at mid-span, the total length of this deterioration is 18" total.

SUBSTRUCTURE

The wing wall adjacent to the north end of the east abutment has broken off at the base and tilted, this condition is old condition and does not appear to have any effect on the structure.

The west abutment exhibits:

- * a vertical crack 0.5 mm wide under girder #3.
- * few spots of abrasion at 1 ft from the ground, mostly at the southern half of the abutment.

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
12	Concrete Deck - Bare	2	60	sq.m.	60	0	0	0	0
107	Painted Steel Open Girder/Beam	2	48	m.	0	0	48	0	0
215	Reinforced Conc Abutment	2	24	m.	22	2	0	0	
337	Metal Railing (W6X25 Posts)	2	24	m.	12	6	6	0	
358	Deck Cracking	2	1	ea.	0	1	0	0	0
359	Soffit of Concrete Deck or Slab	2	1	ea.	0	1	0	0	0

WORK RECOMMENDATIONS

RecDate: 05/18/2009

Action : Sub-Misc.

Work By: LOCAL AGENCY

Status : PROPOSED

EstCost:

StrTarget: 2 YEARS

DistTarget:

EA:

Remove the broken wing wall at the north east corner and replace it within kind.

WORK RECOMMENDATIONS

RecDate: 02/09/2005
 Action : Railing-Repair
 Work By: LOCAL AGENCY
 Status : PROPOSED

EstCost:
 StrTarget: 2 YEARS
 DistTarget:
 EA:

Replace the missing metal post and the
 two damaged metal posts in the southerly
 bridge railing.

CHANNEL X-SECTION

Side : Upstream

X-Section Date: 12/14/2013

Measured From : Top of rail (south). H=0.88 m

Location	Horiz (m)	Vert (m)	Comments
Abutment #1	0.00	4.15	face W. abutment, thalweg, w. edge water
	2.55	3.90	mid-span
	4.25	3.80	east edge of water
	7.10	3.30	toe of slope
	9.10	2.80	top of slope
Abutment #2	11.65	2.75	Face of the 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 55C0179
 (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 CANYN RD
 (9) LOCATION- 5.4 MI E/O SANTIAGO CYN
 (11) MILEPOINT/KILOMETERPOINT 0
 (12) BASE HIGHWAY NETWORK- NOT ON NET 0
 (13) LRS INVENTORY ROUTE & SUBROUTE
 (16) LATITUDE 33 DEG 44 MIN 45.52 SEC
 (17) LONGITUDE 117 DEG 35 MIN 54.75 SEC
 (98) BORDER BRIDGE STATE CODE % SHARE %
 (99) BORDER BRIDGE STRUCTURE NUMBER

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

(43) STRUCTURE TYPE MAIN:MATERIAL- STEEL
 TYPE- STRINGER/MULTI-BEAM OR GDR CODE 302
 (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- NONE CODE 0
 B) TYPE OF MEMBRANE- NONE CODE 0
 C) TYPE OF DECK PROTECTION- NONE CODE 0

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

(27) YEAR BUILT 1947
 (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 11.9 M
 (49) STRUCTURE LENGTH 12.2 M
 (50) CURB OR SIDEWALK: LEFT 0.0 M RIGHT 0.0 M
 (51) BRIDGE ROADWAY WIDTH CURB TO CURB 7.3 M
 (52) DECK WIDTH OUT TO OUT 8.2 M
 (32) APPROACH ROADWAY WIDTH (W/SHOULDERS) 6.4 M
 (33) BRIDGE MEDIAN- NO MEDIAN 0
 (34) SKEW 45 DEG (35) STRUCTURE FLARED NO
 (10) INVENTORY ROUTE MIN VERT CLEAR 99.99 M
 (47) INVENTORY ROUTE TOTAL HORIZ CLEAR 7.3 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 = 43.1
 STATUS
 HEALTH INDEX 80.1
 PAINT CONDITION INDEX = 50.0

***** 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 5
 (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- NO RATING ANALYSIS 5
 (64) OPERATING RATING- 33.5
 (65) INVENTORY RATING METHOD- NO RATING ANALYSIS 5
 (66) INVENTORY RATING- 20.8
 (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 4
 (69) UNDERCLEARANCES, VERTICAL & HORIZONTAL N
 (71) WATER ADEQUACY 9
 (72) APPROACH ROADWAY ALIGNMENT 8
 (36) TRAFFIC SAFETY FEATURES 1000
 (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)

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:

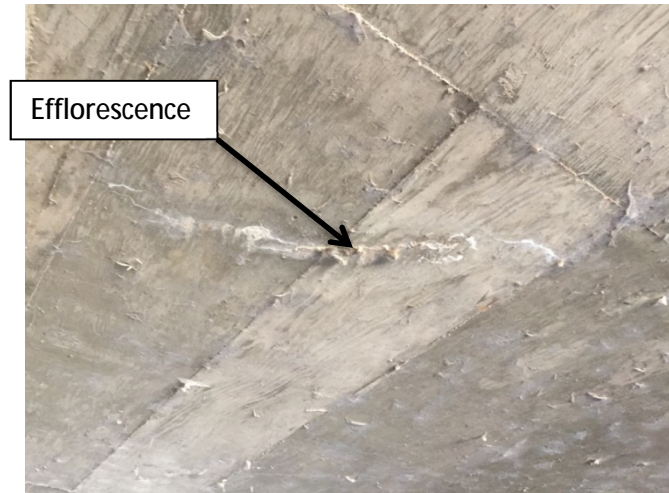


Photo 4: Bridge Soffit



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

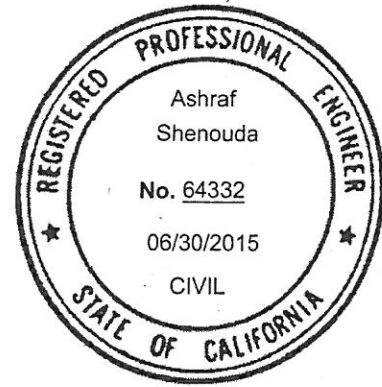
X-Section Date: 12/14/2013

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)

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: 55C0181

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:

- None

Field Inspection Observations

- Minor efflorescence visible on soffit, this is indicative of water seepage through deck cracks (photo 2). There were no visible deck cracks. The deck has a few inches of AC overlay.
- Exposed retaining wall and bridge footing (photo 3). Caltrans BIR indicates the scour is not an issue and scour mediation not needed.
- There are several railing timber post missing (photo 4). Top of timber posts appear to be rotting. Recommend replacing the missing posts. Note that this work is not eligible for BPMP reimbursement since the barrier does not meet current barrier rail standards.

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 Bridge



Photo 2: Bridge Soffit



Photo 3: Exposed footing



Missing Posts

Photo 4: Missing post



Rotting Posts

Photo 5: Rotting post



DEPARTMENT OF TRANSPORTATION
Structure Maintenance & Investigations

Bridge Number : 55C0181
Facility Carried: SILVERADO CANYON RD.
Location : 3.1 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 : 1970

Skew (degrees): 59

Year Widened: N/A

No. of Joints : 0

Length (m) : 14

No. of Hinges : 0

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

Span Configuration : (W) 1 @ 6.1 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 : P P P P P

Posting Load : Type 3: Legal

Type 3S2: Legal

Type 3-3: Legal

DESCRIPTION ON STRUCTURE

Deck X-Section: (S) 0.6 m min deck, 0.3 m br, 2 @ 4.1 m, 0.3 m br, 0.6 m min deck (N)

Total Width: 8.2 m Net Width: 7.3 m No. of Lanes: 2 Speed: 25 mph

Min. Vertical Clearance: Unimpaired

Rail Code: 0000

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 code was modified from 1000 to 0000, because the current rail doesn't meet the standards.

Element 215 (RC abutment): The quantities were modified as follows: from [St. 1 = 38, St. 2 = 2] to [St. 1 = 32, St. 2 = 8].

Element 333 (other rails): The quantities were modified as follows: from [St. 1 = 38] to [St. 1 = 28, St. 2 = 2, St. 3 = 8].

Smart flag 359 (Soffit) was added to ELI list (State 2).

INSPECTION COMMENTARY

Smart flag 361 (Scour) was upgraded from state 2 to state 1.

The inspection frequency was modified from 24 months to 48 months.

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. Compared to the previous stream section, taken on 01/15/2003, there are no significant changes to the last measurements.

DECK AND ROADWAY

South rail is missing two timber posts #3 and #7 (counting from west); and post #8 (from west) has decay and section loss.

At north rail, posts 3,4,6 and 7 (counting from west) are decayed from to the top.

SUPERSTRUCTURE

The soffit exhibits 5 longitudinal cracks full length from abutment to abutment with white and brown efflorescence.

SUBSTRUCTURE

There are 10 vertical cracks at each abutment wall up to 1.5 mm wide.

Scour

The bottom of the westerly spread footing is exposed at its northerly terminus.

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	115	sq.m.	115	0	0	0	0
215	Reinforced Conc Abutment	3	40	m.	32	8	0	0	
333	Other Bridge Railing	2	38	m.	28	2	8		
359	Soffit of Concrete Deck or Slab	2	1	ea.	0	1	0	0	0
361	Scour	2	1	ea.	1	0	0		

WORK RECOMMENDATIONS - NONECHANNEL X-SECTION

CHANNEL X-SECTION

Side : Upstream

X-Section Date: 12/14/2013

Measured From : Top of concrete deck (South)

Location	Horiz (m)	Vert (m)	Comments
South abutment	0.00	3.20	face of south abutment, top of footing
	2.00	3.47	south edge of water
	2.50	3.60	Thalweg
	4.00	3.60	
	5.05	3.57	north edge of water
North abutment	6.10	3.40	face of north abutment

Team Leader : Ashraf Shenouda

Report Author : Ashraf Shenouda

Inspected By : A. Shenouda/KD. Henderson

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



STRUCTURE INVENTORY AND APPRAISAL REPORT

***** IDENTIFICATION *****

(1) STATE NAME- CALIFORNIA 069
 (8) STRUCTURE NUMBER 55C0181
 (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- 3.1 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 49.92 SEC
 (17) LONGITUDE 117 DEG 37 MIN 23.19 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 6.1 M
 (49) STRUCTURE LENGTH 14.0 M
 (50) CURB OR SIDEWALK: LEFT 0.0 M RIGHT 0.0 M
 (51) BRIDGE ROADWAY WIDTH CURB TO CURB 7.3 M
 (52) DECK WIDTH OUT TO OUT 8.2 M
 (32) APPROACH ROADWAY WIDTH (W/SHOULDERS) 8.2 M
 (33) BRIDGE MEDIAN- NO MEDIAN 0
 (34) SKEW 59 DEG (35) STRUCTURE FLARED NO
 (10) INVENTORY ROUTE MIN VERT CLEAR 99.99 M
 (47) INVENTORY ROUTE TOTAL HORIZ CLEAR 7.3 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 = 52.5

STATUS

HEALTH INDEX 93.1

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 6
 (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 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 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 4121
 (115) YEAR OF FUTURE ADT 2029

***** INSPECTIONS *****

(90) INSPECTION DATE 12/13 (91) FREQUENCY 48 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)

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

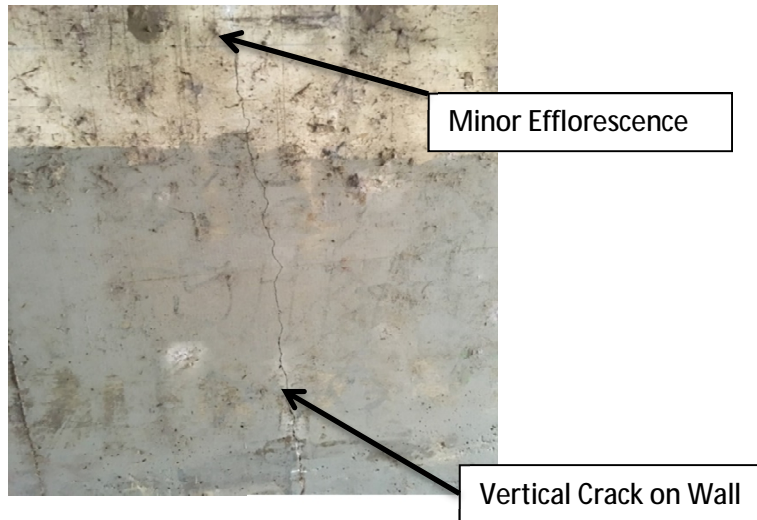


Photo 2:



Photo 3:



Photo 4:



Photo 5:

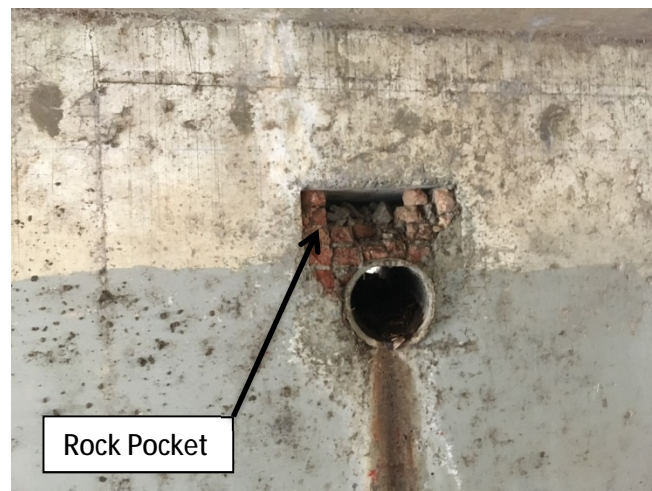


Photo 6:



DEPARTMENT OF TRANSPORTATION
Structure Maintenance & Investigations

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

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
Operating Rating: RF=1.25 =>40.5 metric tons
Permit Rating : P P P P P
Posting Load : Type 3: Legal Type 3S2: Legal Type 3-3: Legal
Calculation Method: FIELD EVAL/ENG JUDGMENT
Calculation Method: FIELD EVAL/ENG JUDGMENT

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 in each Condition State				
			Qty	Units	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	EstCost:	Replace the missing timber post #4
Action : Railing-Repair	StrTarget: 2 YEARS	(counting from west); Post #8 is missing
Work By: LOCAL AGENCY	DistTarget:	a nut; and post #10 is missing bolt and
Status : PROPOSED	EA:	nut at the north rail.

CHANNEL X-SECTION

Side : Upstream
Measured From : Top of concrete deck (North)

X-Section Date: 12/14/2013

CHANNEL X-SECTION

Side : Upstream

X-Section Date: 12/14/2013

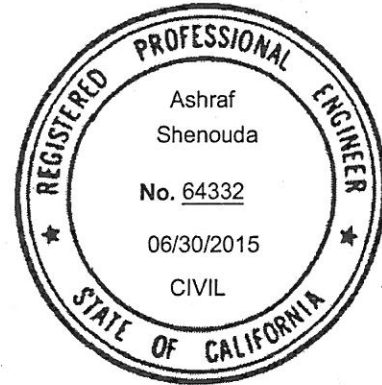
Measured From : Top of concrete deck (North)

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

***** SUFFICIENCY RATING *****

SUFFICIENCY RATING = 50.5
 STATUS FUNCTIONALLY OBSOLETE
 HEALTH INDEX 95.8
 PAINT CONDITION INDEX = N/A

***** CLASSIFICATION *****

(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 *****

(58) DECK 5
 (59) SUPERSTRUCTURE 7
 (60) SUBSTRUCTURE 6
 (61) CHANNEL & CHANNEL PROTECTION 8
 (62) CULVERTS N

***** LOAD RATING AND POSTING *****

(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 *****

(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)

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: 55C0183

Bridge Name: Silverado Canyon Creek

Year Built: 1963

Facility Carried: Belha Way

The Silverado Canyon Creek Bridge at Belha way is a single span precast pre-stressed concrete cored slab units with reinforced concrete opened end seat abutments supported on spread footing. Concrete lined channel.

Caltrans BIR recommendations:

- None.

Field Inspection Observations

- There is minor damage to thrie-beam and railing post at the east end of the bridge.

Maintenance Needs Assessment

BPMP Assessment

- N/A – No eligible maintenance activities

General Maintenance – Non-BPMP

- Repair bridge railing, not a high priority.

Proposed BPMP Construction Costs

- N/A

Construction Items Not Funded by BPMP

- Repair bridge railing < \$2,000

APPENDIX A

Photos and BIR



Photo 1: Silverado Canyon Creek Bridge



Photo 2:



Photo 3:

Damaged Post



Photo 4: Railing

Water Stains



Photo 5:



DEPARTMENT OF TRANSPORTATION
Structure Maintenance & Investigations

Bridge Number : 55C0183
Facility Carried: BELHA WAY
Location : 50' N/O SILVERADO CYN RD
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 : 1963 Skew (degrees): 21
Year Widened: N/A No. of Joints : 0
Length (m) : 7 No. of Hinges : 0

Structure Description: Single span PC/PS concrete cored slab units (3 each) with RC open end seat abutments, all supported upon spread footings.

Span Configuration : (S) 1 @ 6.4 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) 0.2 m br, 3.5 m, 0.2 m br (E)
Total Width: 3.9 m Net Width: 3.5 m No. of Lanes: 1 Speed: 25 mph
Min. Vertical Clearance: Unimpaired

Rail Code: 1000

Rail Type	Location	Length (ft)	Rail Modifications
MBBR	Right/Left	46	

DESCRIPTION UNDER STRUCTURE

Channel Description: Natural earth trapezoidal with a cobbled bottom and with a concreted bottom through the site.

INSPECTION COMMENTARY

SCOPE AND ACCESS

The water in the channel is 8" deep, so all substructure elements were visually inspected.

REVISIONS

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

MISCELLANEOUS

Ten-year bridge roadway, elevation and underside photos were taken during this inspection.

DECK AND ROADWAY

Rail and deck have no significant defects during this inspection.

INSPECTION COMMENTARY

SUPERSTRUCTURE

There is growing vegetation at the west abutment wall and soffit between the slab units.

SUBSTRUCTURE

No significant defects were visually seen during this inspection.

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
61	PS Conc Slab - Unprotected w/ AC Overlay	2	25	sq.m.	25	0	0	0	0
215	Reinforced Conc Abutment	2	8	m.	8	0	0	0	0
337	Metal Railing (W6X25 Posts)	2	14	m.	14	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 55C0183
 (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- BELHA WAY
 (9) LOCATION- 50' N/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 45.64 SEC
 (17) LONGITUDE 117 DEG 35 MIN 23.22 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- PRECAST CONC. PA CODE 2
 (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 1963
 (106) YEAR RECONSTRUCTED 0000
 (42) TYPE OF SERVICE: ON- HIGHWAY 1
 UNDER- WATERWAY 5
 (28) LANES:ON STRUCTURE 01 UNDER STRUCTURE 00
 (29) AVERAGE DAILY TRAFFIC 100
 (30) YEAR OF ADT 2009 (109) TRUCK ADT 1 %
 (19) BYPASS, DETOUR LENGTH 199 KM

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

(48) LENGTH OF MAXIMUM SPAN 6.4 M
 (49) STRUCTURE LENGTH 7.0 M
 (50) CURB OR SIDEWALK: LEFT 0.0 M RIGHT 0.0 M
 (51) BRIDGE ROADWAY WIDTH CURB TO CURB 3.5 M
 (52) DECK WIDTH OUT TO OUT 3.9 M
 (32) APPROACH ROADWAY WIDTH (W/SHOULDERS) 3.7 M
 (33) BRIDGE MEDIAN- NO MEDIAN 0
 (34) SKEW 21 DEG (35) STRUCTURE FLARED NO
 (10) INVENTORY ROUTE MIN VERT CLEAR 99.99 M
 (47) INVENTORY ROUTE TOTAL HORIZ CLEAR 3.5 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 = 65.1
 STATUS FUNCTIONALLY OBSOLETE
 HEALTH INDEX 100.0
 PAINT CONDITION INDEX = N/A

***** CLASSIFICATION *****

(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- 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 *****

(58) DECK 7
 (59) SUPERSTRUCTURE 7
 (60) SUBSTRUCTURE 7
 (61) CHANNEL & CHANNEL PROTECTION 8
 (62) CULVERTS N

***** LOAD RATING AND POSTING *****

(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 *****

(67) STRUCTURAL EVALUATION 6
 (68) DECK GEOMETRY 3
 (69) UNDERCLEARANCES, VERTICAL & HORIZONTAL N
 (71) WATER ADEQUACY 9
 (72) APPROACH ROADWAY ALIGNMENT 6
 (36) TRAFFIC SAFETY FEATURES 1000
 (113) SCOUR CRITICAL BRIDGES 5

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

(75) TYPE OF WORK- MISC STRUCTURAL WORK CODE 38
 (76) LENGTH OF STRUCTURE IMPROVEMENT 7 M
 (94) BRIDGE IMPROVEMENT COST \$26,000
 (95) ROADWAY IMPROVEMENT COST \$5,200
 (96) TOTAL PROJECT COST \$43,680
 (97) YEAR OF IMPROVEMENT COST ESTIMATE 2010
 (114) FUTURE ADT 103
 (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)

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:

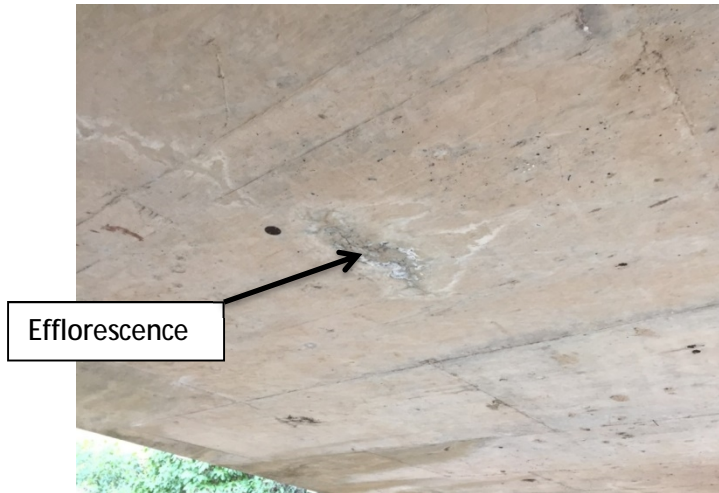


Photo 4: Bridge Soffit



Photo 5:



Photo 6: Slope Protection

Vegetation growth
at abutment



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

☒

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
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: (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.

<u>ELEMENT INSPECTION RATINGS</u>									
Elem	Total			Qty in each Condition State					
No. Element Description	Env	Qty	Units	St. 1	St. 2	St. 3	St. 4	St. 5	
241 Reinforced Concrete Culvert	2	8	m.	8	0	0	0	0	0
337 Metal Railing (W6X25 Posts)	2	18	m.	18	0	0	0	0	0
361 Scour	2	1	ea.	0	1	0	0	0	0

WORK RECOMMENDATIONS

RecDate: 01/28/1999	EstCost:	Construct a scour mitigation device
Action : Sub-Scour Mitigate	StrTarget: 2 YEARS	downstream of the structure to prevent
Work By: LOCAL AGENCY	DistTarget:	further degradation of the streambed.
Status : PROPOSED	EA:	

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 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

***** SUFFICIENCY RATING *****

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 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 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)

Orange County Bridge Review Summary

Dokken Engineering performed a field review of the Orange County bridge listed below in April 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: 55C0205

Bridge Name: Santa Ana Delhi Channel

Year Built: 1960

Facility Carried: Santa Ana Avenue

The Santa Ana-Delhi Channel Bridge at Santa Ana Avenue is a single span precast prestress concrete voided deck slab with reinforced concrete pile bent abutments with sheathings walls. The bridge spans over a concrete lined channel. The bridge was widened in 1973.

Caltrans BIR recommendations:

- Remove the vegetation growing at abutment 1.

Field Inspection Observations

- Efflorescence and water stains are visible on bridge soffit. The bridge deck has several inches of AC therefore the condition of the bridge deck cannot be assessed.
- Confirmed that there is vegetation growing at abutment 1 (photo 3).
- There appears to be 8-10" of asphalt concrete. Recommend that no additional AC be placed on the bridge deck, and consider removing some of existing AC.
- Concrete spalling on exterior girder (photo 4).
- There is exposed sheathing at abut face (photo 5).

Maintenance Needs Assessment

BPMP Assessment

- N/A – No known eligible maintenance activities. Need to coordinate with Caltrans to determine if AC removal is a participating BPMP work.
- Recommend treating deck or placing impermeable water barrier on deck prior to AC resurfacing.

General Maintenance – Non-BPMP

- Remove vegetation at abutment 1.

Proposed BPMP Construction Costs

- Unknown until consult with Caltrans about AC removal.

Construction Items Not Funded by BPMP

- Remove vegetation < \$2,000.

APPENDIX A

Photos and BIR



Photo 1:



Photo 2:

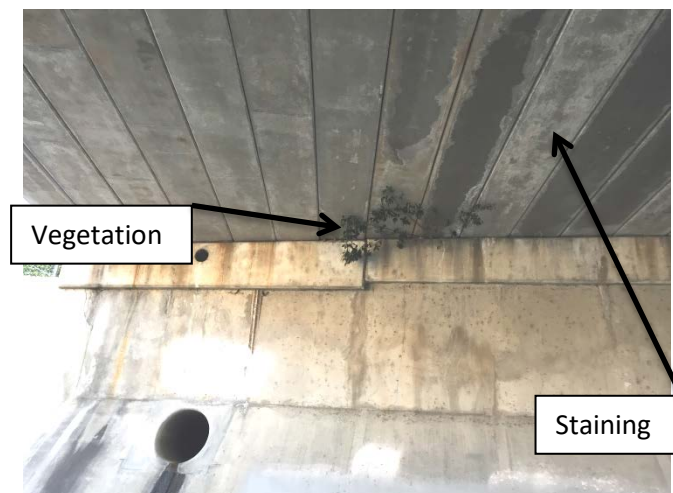


Photo 3: Abut 1



Photo 4: Elevation View

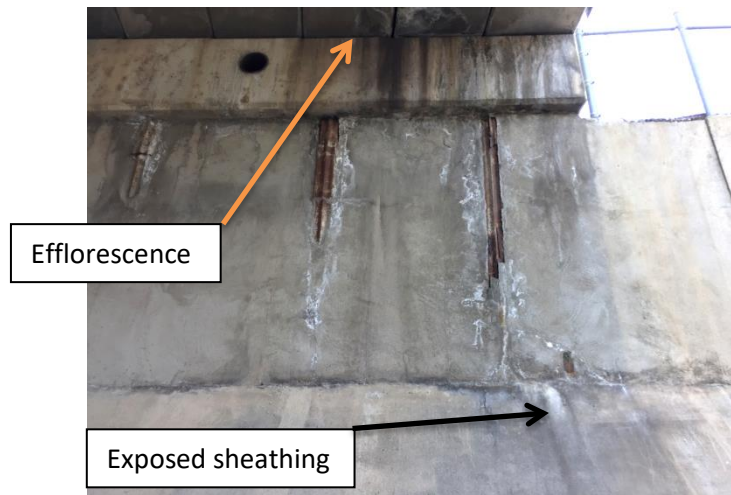


Photo 5: Exposed Sheathing



Photo 6 and 7:



DEPARTMENT OF TRANSPORTATION
Structure Maintenance & Investigations

Bridge Number : 55C0205
Facility Carried: SANTA ANA AVENUE
Location : 0.1 MI S/O BRISTOL STREE
City :
Inspection Date : 01/27/2017
Inspection Type
Routine FC Underwater Special Other
☒

Bridge Inspection Report

STRUCTURE NAME: SANTA ANA-DELHI CHANNEL

CONSTRUCTION INFORMATION

Year Built : 1960 Skew (degrees): 10
Year Modified: 1973 No. of Joints : 0
Length (m) : 16.5 No. of Hinges : 0

Structure Description: Single span PC/PS concrete beam units (22 units) on RC pile bent cap with monolithic wingwalls with sheathing walls.

Span Configuration : (S) 54.00 ft (N)

SAFE LOAD CAPACITY AND RATINGS

Design Live Load: UNKNOWN
Inventory Rating: RF=0.52 =>16.8 metric tons Calculation Method: FIELD EVAL/ENG JUDGMENT
Operating Rating: RF=0.87 =>28.2 metric tons Calculation Method: FIELD EVAL/ENG JUDGMENT
Permit Rating : XXXXX
Posting Load : Type 3: Legal Type 3S2: Legal Type 3-3: Legal

DESCRIPTION ON STRUCTURE

Deck X-Section: (W) 0.67 ft br, 1.33 ft AC dike, 61.42 ft, 4.50 ft sw, 0.67 m br (E)
Total Width: 20.4 m Net Width: 18.7 m No. of Lanes: 4 Speed: 45 mph
Min. Vertical Clearance: Unimpaired Overlay Thickness: 6.5 Inches
Rail Code: 1000

Rail Type	Location	Length (ft)	Rail Modifications
MBBR		108	

DESCRIPTION UNDER STRUCTURE

Channel Description: RC rectangular.

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

SCOPE AND ACCESS

This inspection was performed by walking on the bridge sidewalks, and under the span of the superstructure. The water in the channel is about 3 inches through a small ditch 5 feet wide in the middle of the channel. All visible substructure elements were inspected.

Pedestrian access under the bridge is from a ramp at the north-west quadrant.

INSPECTION COMMENTARY

REVISIONS

AC thickness overlay is changed from 3 inches to be 9 inches at the west side and 4 inches at the east side. The average AC thickness is about 6.5 inches. (see the attached photos 1 & 2)

Element 15 (Prestressed top flange-RC) is replaced Element 16 (Top flange-RC) with the same quantity.

The substructure element is revised to be Bent cap 20 m; and piles #251 (2 each) instead of element #215 RC Abutment.

DECK AND ROADWAY

AC overlay exhibits two transverse cracks above both abutments, 20 feet long and 0.2 inches wide.

SUBSTRUCTURE

There is a tree growing at the seat of Abutment 1 under slab unit 9 (counting from east).

SAFE LOAD CAPACITY

The load rating for this structure is being reviewed by SMI Ratings Branch. A request #7766 was sent the load rating department on 07/14/2017. An updated Load Rating Summary will be archived when this review is complete. Load Rating Summary Sheet is archived on 12/12/2014 for this structure. While this report does not include a check of that analysis, it does verify that the structural conditions observed during this inspection are consistent with those assumed in that analysis.

ELEMENT INSPECTION RATINGS AND NOTES										
Elem No.	Defect /Prot	Element Description	Env	Total Qty	Units	Qty in each State	St. 1	St. 2	St. 3	St. 4
15		Top Flange-PS Conc.	2	336	sq.m	336	0	0	0	0
	510	Deck Wearing Surface-Asphalt	2	308	sq.m	308	0	0	0	0
(15)										
There were no significant defects noted.										
(15-510)										
There were no significant defects noted.										
104		Box Girder-PS Conc.	2	17	m	14	2	1	0	0
	1080	Delamination/Spall/Patched Area	2	1		0	0	1	0	0
	1120	Efflorescence/Rust Staining	2	2		0	2	0	0	0
(104-1080)										
The westerly face of the westerly box girder unit exhibits a spall 12 inches X 8 inches X 1.5 inch at										

ELEMENT INSPECTION RATINGS AND NOTES

Elem No.	Defect /Prot	Element Description	Env	Total Qty	Units	Qty in each Condition State			
						St. 1	St. 2	St. 3	St. 4
the mid-span. (see the attached photos 4 & 5)									
(104-1120)									
There was water stain in soffit generated in between the bog girders units.									
215		Abutment-RC	2	10	m	10	0	0	0
(215)									
Monolithic wingwalls (with the RC bent cap) are included in the total quantity.									
234		Pier Cap-RC	2	40	m	40	0	0	0
(234)									
There were no significant defects noted.									
251		Pile-CISS	2	2	ea.	0	2	0	0
1000		Corrosion	2	2		0	2	0	0
(251)									
There are only two piles that are visbile at the north Abutment at the east side.									
(251-1000)									
The exterior steel shells of the north piles (east side) is rusted. (see the attached photo 9)									
330		Railing-Metal	2	33	m	33	0	0	0
(330)									
There were no significant defects noted.									

WORK RECOMMENDATIONS

RecDate: 06/08/2011

EstCost:

Remove the small tree that are growing in
Abutment 1 seat.

Action : Sub-Misc.

StrTarget: 2 YEARS

Work By: LOCAL AGENCY

DistTarget:

Status : PROPOSED

EA:

Team Leader : Ashraf Shenouda

Report Author : Ashraf Shenouda

Inspected By : A.Shenouda/KD.Henderson



Ashraf Shenouda (Registered Civil Engineer) (Date)

7-25-17



STRUCTURE INVENTORY AND APPRAISAL REPORT

***** IDENTIFICATION *****

(1) STATE NAME- CALIFORNIA 069
 (8) STRUCTURE NUMBER 55C0205
 (5) INVENTORY ROUTE (ON/UNDER)- ON 140000000
 (2) HIGHWAY AGENCY DISTRICT 12
 (3) COUNTY CODE 059 (4) PLACE CODE 00000
 (6) FEATURE INTERSECTED- SANTA ANA DELHI CHANNEL
 (7) FACILITY CARRIED- SANTA ANA AVENUE
 (9) LOCATION- 0.1 MI S/O BRISTOL STREET
 (11) MILEPOINT/KILOMETERPOINT 0
 (12) BASE HIGHWAY NETWORK- NOT ON NET 0
 (13) LRS INVENTORY ROUTE & SUBROUTE
 (16) LATITUDE 33 DEG 39 MIN 55.22 SEC
 (17) LONGITUDE 117 DEG 52 MIN 59.41 SEC
 (98) BORDER BRIDGE STATE CODE % SHARE %
 (99) BORDER BRIDGE STRUCTURE NUMBER

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

(43) STRUCTURE TYPE MAIN:MATERIAL- PRESTRESS CONC
 TYPE- BOX BEAM OR GIRDER - MULTI CODE 505
 (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- PRECAST CONC. PA CODE 2
 (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 1960
 (106) YEAR RECONSTRUCTED 1973
 (42) TYPE OF SERVICE: ON- HIGHWAY-PEDESTRIAN 5
 UNDER- WATERWAY 5
 (28) LANES:ON STRUCTURE 04 UNDER STRUCTURE 00
 (29) AVERAGE DAILY TRAFFIC 11000
 (30) YEAR OF ADT 2008 (109) TRUCK ADT 1 %
 (19) BYPASS, DETOUR LENGTH 2 KM

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

(48) LENGTH OF MAXIMUM SPAN 16.2 M
 (49) STRUCTURE LENGTH 16.5 M
 (50) CURB OR SIDEWALK: LEFT 0.0 M RIGHT 1.4 M
 (51) BRIDGE ROADWAY WIDTH CURB TO CURB 18.7 M
 (52) DECK WIDTH OUT TO OUT 20.4 M
 (32) APPROACH ROADWAY WIDTH (W/SHOULDERS) 17.1 M
 (33) BRIDGE MEDIAN- NO MEDIAN 0
 (34) SKEW 10 DEG (35) STRUCTURE FLARED NO
 (10) INVENTORY ROUTE MIN VERT CLEAR 99.99 M
 (47) INVENTORY ROUTE TOTAL HORIZ CLEAR 18.7 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- NO CONTROL CODE 0
 (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 = 64.3

STATUS

HEALTH INDEX 99.4

PAINT CONDITION INDEX = N/A

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

(112) NBIS BRIDGE LENGTH- YES Y
 (104) HIGHWAY SYSTEM- NOT ON NHS 0
 (26) FUNCTIONAL CLASS- MINOR ARTERIAL URBAN 16
 (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 7
 (59) SUPERSTRUCTURE 5
 (60) SUBSTRUCTURE 7
 (61) CHANNEL & CHANNEL PROTECTION 8
 (62) CULVERTS N

***** LOAD RATING AND POSTING ***** CODE

(31) DESIGN LOAD- UNKNOWN 0
 (63) OPERATING RATING METHOD- FIELD EVAL/ENG JUD 0
 (64) OPERATING RATING- 28.2
 (65) INVENTORY RATING METHOD- FIELD EVAL/ENG JUD 0
 (66) INVENTORY RATING- 16.8
 (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 6
 (69) UNDERCLEARANCES, VERTICAL & HORIZONTAL N
 (71) WATER ADEQUACY 8
 (72) APPROACH ROADWAY ALIGNMENT 8
 (36) TRAFFIC SAFETY FEATURES 1000
 (113) SCOUR CRITICAL BRIDGES 5

***** 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 18984
 (115) YEAR OF FUTURE ADT 2038

***** INSPECTIONS *****

(90) INSPECTION DATE 01/17 (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)

Orange County Bridge Review Summary

Dokken Engineering performed a field review of the Orange County bridge listed below in April 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: 55C0283

Bridge Name: Sunset Channel

Year Built: 1959

Facility Carried: Broadway

This bridge does not have a bridge inspection report therefore some general information is unknown. The Sunset channel bridge at Broadway appears to be a CIP/RC slab supported on concrete pile extensions and on seat abutments with unknown foundations.

Caltrans BIR recommendations:

- N/A. Note at the time of inspection the BIR was not available.

Field Inspection Observations

- No access to substructure (photo 1)
- After chaining the deck and sidewalk, some areas of the deck and sidewalk sounded like there may be some minor delamination.
- Spalling at the abutment back wall (photo 2).

Maintenance Needs Assessment

BPMP Assessment

- N/A – No eligible maintenance activities

General Maintenance – Non-BPMP

- Remove and patch delaminated concrete at bridge. Low priority.
- Monitor abutment back wall. Currently not a significant problem.

Proposed BPMP Construction Costs

- N/A

Construction Items Not Funded by BPMP

- N/A

APPENDIX A

Photos



Photo 1:



Photo 2:

Orange County Bridge Review Summary

Dokken Engineering performed a field review of the Orange County bridge listed below in April 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: 55C0344

Bridge Name: Santa Ana River (Adams Ave)

Year Built: 1977

Facility Carried: Hamilton-Victoria

The Santa Ana River Channel Bridge at Adams Avenue is a continuous 5 span cast-in-place reinforced concrete Box Girder Bridge with pier wall and open end diaphragm abutments supported on concrete piles.

Caltrans BIR recommendations:

- None.

Field Inspection Observations

- There was no access to the substructure. The piers were visually inspected from the access road (photo 1).
- Bridge deck appears to have been treated.
- Exposed reinforcement in concrete barrier.
- Debris build up on pier nosing.

Maintenance Needs Assessment

BPMP Assessment

- N/A – No eligible maintenance activities

General Maintenance – Non-BPMP

- Small spall around reinforcement bar on barrier. Not structural and no action needed at this time.

Proposed BPMP Construction Costs

- N/A

Construction Items Not Funded by BPMP

- N/A

APPENDIX A

Photos and BIR



Photo 1: Elevation View



Photo 2: Barrier



Photo 3: Bridge Deck



Photo 4:



Photo 5:



DEPARTMENT OF TRANSPORTATION
Structure Maintenance & Investigations

Bridge Number : 55C0344
Facility Carried: ADAMS AVENUE
Location : 0.5 MI E/O BROOKHURST ST
City :
Inspection Date : 01/27/2017

Bridge Inspection Report

Inspection Type

Routine FC Underwater Special Other

☒

STRUCTURE NAME: SANTA ANA RIVER (ADAMS AVE)

CONSTRUCTION INFORMATION

Year Built : 1977
Year Modified: N/A
Length (m) : 164.6
Skew (degrees): 14
No. of Joints : 2
No. of Hinges : 0

Structure Description: Continuous 5-span CIP/PS concrete box girder (10 cells) with RC pier walls and RC open end seat abutments with monolithic wingwalls, all supported upon concrete piles.

Span Configuration : (W) 89.75 ft, 3 @ 118.00 ft, 89.75 ft c/c (E)

SAFE LOAD CAPACITY AND RATINGS

Design Live Load: MS-18 OR HS-20
Inventory Rating: RF=1.00 =>32.4 metric tons
Operating Rating: RF=2.19 =>71.0 metric tons
Permit Rating : PPPPP
Posting Load : Type 3: Legal
Calculation Method: LOAD FACTOR
Calculation Method: LOAD FACTOR
Type 3S2: Legal
Type 3-3: Legal

DESCRIPTION ON STRUCTURE

Deck X-Section: (S) 1.00 ft br, 4.00 ft sw, 40.00 ft, 4.00 ft cu. med, 40.00 ft, 4.00 ft sw, 1.00 ft br (N).

Total Width: 28.7 m Net Width: 24.4 m No. of Lanes: 6 Speed: 45 mph
Min. Vertical Clearance: Unimpaired Overlay Thickness: 0.0 Inches

Rail Code: 1000

Rail Type	Location	Length (ft)	Rail Modifications
Type 11	Right/Left	1120	

DESCRIPTION UNDER STRUCTURE

Channel Description: RC vertical walls with sandy earth bottoms.

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

SCOPE AND ACCESS

This inspection was performed by walking on the bridge sidewalks, and under spans 1 and 4 of the superstructure. The water in the channel is about 2-2.5 feet deep and the channel bed is not firm spans 2 to 5, except the bike path under span 4. The substructure and the superstructure elements were not inspected in spans 2, 3 and 5. Access into the channel

INSPECTION COMMENTARY

is from the north-west quadrant. All elements were visually inspected in span 1.

REVISIONS

RC-pile #227 (1 each) is added to the element table.

DECK AND ROADWAY

The curb of the southerly sidewalk exhibits few spalls with eba exposed and rusted

SAFE LOAD CAPACITY

A Structure Rating Summary Sheet, dated 05/10/2010, is on-file for this structure. The current rating is based on a BDS computer output, dated 11/30/1979 with zero AC overlay. While this report does not include a check of that analysis, it does verify that the structural conditions observed during this inspection are consistent with those assumed in that analysis.

ELEMENT INSPECTION RATINGS AND NOTES

Elem No.	Defect /Prot	Defect	Element Description	Env	Total Qty	Units	Qty in each State	Condition	State
							St. 1	St. 2	St. 3 St. 4
16			Top Flange-RC	2	4724	sq.m	4704	20	0 0
	1080		Delamination/Spall/Patched Area	2	5		0	5	0 0
	1120		Efflorescence/Rust Staining	2	15		0	15	0 0
	521		Concrete Coat.(Meth/Paint/Seal)	2	4016	sq.m	4016	0	0 0

(16-1080)

There are few scattered sound patched areas 1 foot X 1 foot in many locations.

(16-1120)

The soffit at the closure pour between the two box girders exhibits few transverse cracks with white efflorescence at span 4.

(16-521)

There were no significant defects noted.

104			Box Girder-PS Conc.	2	329	m	329	0	0 0
-----	--	--	---------------------	---	-----	---	-----	---	-----

(104)

There were no significant defects noted.

210			Pier Wall-RC	2	118	m	116	2	0 0
	1130		Cracking (RC and Other)	2	2		0	2	0 0

(210-1130)

Pier wall 4 exhibits few vertical cracks up to 0.05 inches wide.

215			Abutment-RC	2	74	m	74	0	0 0
-----	--	--	-------------	---	----	---	----	---	-----

(215)

Monolithic wingwalls are included in the total quantity.

227			Pile-RC	2	1	ea.	1	0	0 0
-----	--	--	---------	---	---	-----	---	---	-----

(227)

ELEMENT INSPECTION RATINGS AND NOTES

Elem No.	Defect /Prot	Element Description	Env	Total Qty	Units	Qty in each Condition State			
						St. 1	St. 2	St. 3	St. 4
The pile element is included to indicate the presence of piles on this structure. The piles were not exposed for visual inspection. No indication of pile distress was noted in any substructure element.									
303		Joint-Assembly w/ Seal	2	58	m	57	0	0	1
	2370	Metal Deter./Damage (Joints)	2	1		0	0	0	1
(303-2370)									
The east joint at eastbound lane 1 is missing a section 2 feet long and 3 inches wide.									
312		Bearing-Enclosed	2	2	each	2	0	0	0
(312)									
The bearing element is included to indicate the presence of bearings on this structure. The bearings were not exposed for visual inspection. No indication of bearing distress was noted in any substructure element.									
333		Railing-Other	2	330	m	320	9	1	0
	1080	Delamination/Spall/Patched Area	2	5		0	4	1	0
	1130	Cracking (RC and Other)	2	5		0	5	0	0
(333-1080)									
The concrete portion of the south rail exhibits two spalls +/- 12 inches X 10 inches X 1.5 inches with rebar exposed and rusted at 10 feet east of the west end at span 1.									
The concrete portion of the north rail exhibits few spalls and unsound spalls +/- 5 inches X 5 inches in many locations especially at spans 1 & 2.									
(333-1130)									
The concrete portion of the rails exhibits few vertical cracks up to 0.05 inches wide.									

WORK RECOMMENDATIONS

RecDate: 01/27/2017

EstCost:

Action : Joints-Repair/Clean

StrTarget: 1 YEAR

The east joint at eastbound lane 1 is missing a section 2 feet long and 3 inches wide.

Work By: LOCAL AGENCY

DistTarget:

Status : PROPOSED

EA:

Team Leader : Ashraf Shenouda

Report Author : Ashraf Shenouda

Inspected By : A.Shenouda/KD.Henderson


 Ashraf Shenouda (Registered Civil Engineer) (Date) 7-25-17


STRUCTURE INVENTORY AND APPRAISAL REPORT

***** IDENTIFICATION *****

(1) STATE NAME- CALIFORNIA 069
 (8) STRUCTURE NUMBER 55C0344
 (5) INVENTORY ROUTE(ON/UNDER)- ON 140000000
 (2) HIGHWAY AGENCY DISTRICT 12
 (3) COUNTY CODE 059 (4) PLACE CODE 00000
 (6) FEATURE INTERSECTED- SANTA ANA RIVER CHANNEL
 (7) FACILITY CARRIED- ADAMS AVENUE
 (9) LOCATION- 0.5 MI E/O BROOKHURST ST
 (11) MILEPOINT/KILOMETERPOINT 0
 (12) BASE HIGHWAY NETWORK- PART OF NET 1
 (13) LRS INVENTORY ROUTE & SUBROUTE 000000000000
 (16) LATITUDE 33 DEG 40 MIN 20.34 SEC
 (17) LONGITUDE 117 DEG 56 MIN 45.94 SEC
 (98) BORDER BRIDGE STATE CODE % SHARE %
 (99) BORDER BRIDGE STRUCTURE NUMBER

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

(43) STRUCTURE TYPE MAIN:MATERIAL- PRSTR CONC CONT
 TYPE- BOX BEAM OR GIRDER - MULTI CODE 605
 (44) STRUCTURE TYPE APPR:MATERIAL- OTHER/NA
 TYPE- OTHER/NA CODE 000
 (45) NUMBER OF SPANS IN MAIN UNIT 5
 (46) NUMBER OF APPROACH SPANS 0
 (107) DECK STRUCTURE TYPE- CIP CONCRETE CODE 1
 (108) WEARING SURFACE / PROTECTIVE SYSTEM:
 A) TYPE OF WEARING SURFACE- NONE CODE 0
 B) TYPE OF MEMBRANE- NONE CODE 0
 C) TYPE OF DECK PROTECTION- NONE CODE 0

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

(27) YEAR BUILT 1977
 (106) YEAR RECONSTRUCTED 0000
 (42) TYPE OF SERVICE: ON- HIGHWAY-PEDESTRIAN 5
 UNDER- WATERWAY 5
 (28) LANES:ON STRUCTURE 06 UNDER STRUCTURE 00
 (29) AVERAGE DAILY TRAFFIC 39000
 (30) YEAR OF ADT 2010 (109) TRUCK ADT 2 %
 (19) BYPASS, DETOUR LENGTH 3 KM

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

(48) LENGTH OF MAXIMUM SPAN 36.0 M
 (49) STRUCTURE LENGTH 164.6 M
 (50) CURB OR SIDEWALK: LEFT 1.2 M RIGHT 1.2 M
 (51) BRIDGE ROADWAY WIDTH CURB TO CURB 24.4 M
 (52) DECK WIDTH OUT TO OUT 28.7 M
 (32) APPROACH ROADWAY WIDTH (W/SHOULDERS) 24.4 M
 (33) BRIDGE MEDIAN- CLOSED NON-MOUNTABLE 3
 (34) SKEW 14 DEG (35) STRUCTURE FLARED NO
 (10) INVENTORY ROUTE MIN VERT CLEAR 99.99 M
 (47) INVENTORY ROUTE TOTAL HORIZ CLEAR 12.2 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

***** SUFFICIENCY RATING *****

SUFFICIENCY RATING = 91.5
 STATUS
 HEALTH INDEX 99.8
 PAINT CONDITION INDEX = N/A

***** CLASSIFICATION *****

(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 - PART OF NET 1
 (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 *****

(58) DECK 7
 (59) SUPERSTRUCTURE 7
 (60) SUBSTRUCTURE 7
 (61) CHANNEL & CHANNEL PROTECTION 8
 (62) CULVERTS N

***** LOAD RATING AND POSTING *****

(31) DESIGN LOAD- MS-18 OR HS-20 5
 (63) OPERATING RATING METHOD- LOAD FACTOR 1
 (64) OPERATING RATING- 71.0
 (65) INVENTORY RATING METHOD- LOAD FACTOR 1
 (66) INVENTORY RATING- 32.4
 (70) BRIDGE POSTING- EQUAL TO OR ABOVE LEGAL LOADS 5
 (41) STRUCTURE OPEN, POSTED OR CLOSED- A
 DESCRIPTION- OPEN, NO RESTRICTION

***** APPRAISAL *****

(67) STRUCTURAL EVALUATION 7
 (68) DECK GEOMETRY 5
 (69) UNDERCLEARANCES, VERTICAL & HORIZONTAL N
 (71) WATER ADEQUACY 8
 (72) APPROACH ROADWAY ALIGNMENT 8
 (36) TRAFFIC SAFETY FEATURES 1000
 (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 90704
 (115) YEAR OF FUTURE ADT 2038

***** INSPECTIONS *****

(90) INSPECTION DATE 01/17 (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)

SANTA ANA-DELHI CHANNEL

0.1 MI S/O BRISTOL STREET

01/27/2017 [AAAH]

55C0205

103 - PHOTO-Deck-Details



Photo No. 1

Ac thickness at the west side is almost 9 inches.

103 - PHOTO-Deck-Details



Photo No. 2

Ac thickness at the west side is almost 9 inches.

SANTA ANA-DELHI CHANNEL

0.1 MI S/O BRISTOL STREET

01/27/2017 [AAAH]

55C0205

114 - PHOTO-Sub-Details



Photo No. 3

Spall 12" X8" X 1.5 at teh west face of the bog girder at mid-span.

107 - PHOTO-Super-Damage/Deteroration



Photo No. 4

Spall 12" X8" X 1.5 at teh west face of the bog girder at mid-span.

SANTA ANA-DELHI CHANNEL

0.1 MI S/O BRISTOL STREET

01/27/2017 [AAAH]

55C0205

107 - PHOTO-Super-Damage/Deterioration



Photo No. 5

135 - PHOTO-Routine-Underside View



Photo No. 6

Underside View looking South

SANTA ANA-DELHI CHANNEL

0.1 MI S/O BRISTOL STREET

01/27/2017 [AAAH]

55C0205

135 - PHOTO-Routine-Underside View



Photo No. 7

Underside View looking South

135 - PHOTO-Routine-Underside View



Photo No. 8

Underside View looking South

SANTA ANA-DELHI CHANNEL

0.1 MI S/O BRISTOL STREET

01/27/2017 [AAAH]

55C0205

114 - PHOTO-Sub-Details

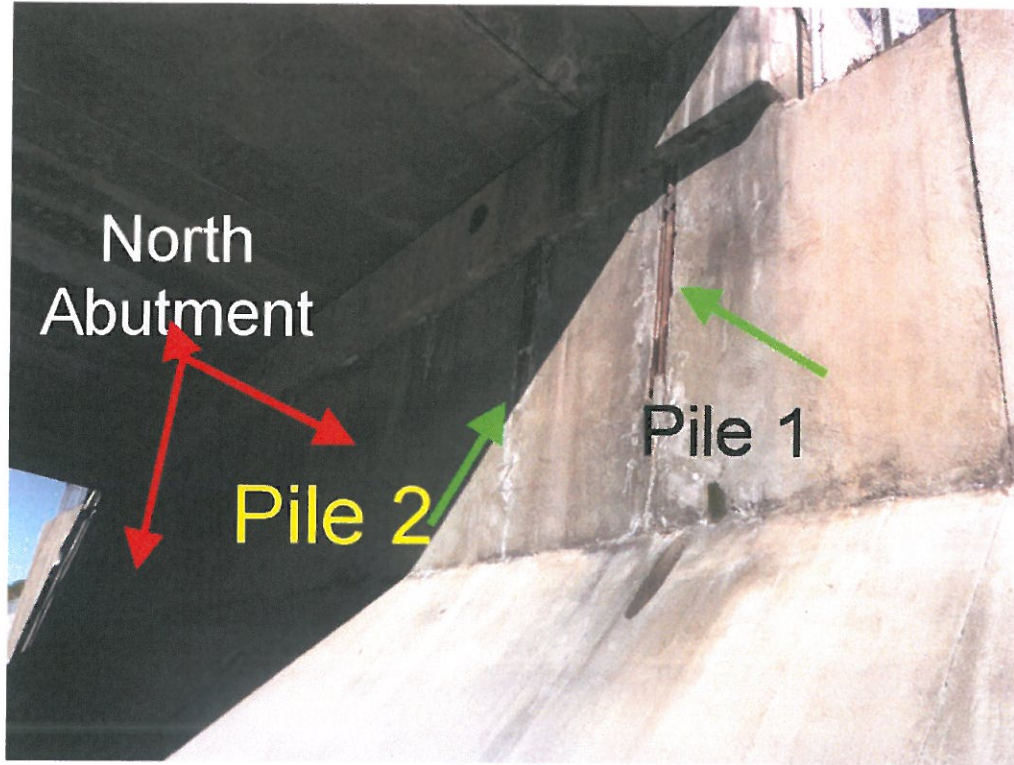


Photo No. 9

North Abutment has two piles are visible at the east side.

SANTA ANA RIVER (ADAMS AVE)

0.5 MI E/O BROOKHURST ST

01/27/2017 [AAAJ]

55C0344

101 - PHOTO-Routine-Elevation View



Photo No. 1

Elevation View looking South

101 - PHOTO-Routine-Elevation View



Photo No. 2

Elevation View looking North-East

SANTA ANA RIVER (ADAMS AVE)

0.5 MI E/O BROOKHURST ST

01/27/2017 [AAAJ]

55C0344

119 - PHOTO-Rail-Damage/Deterioration



Photo No. 3

South rail has 2 spalls 12"X10"X 1.5 at 10 ft from the west end.

119 - PHOTO-Rail-Damage/Deterioration



Photo No. 4

South rail has 2 spalls 12"X10"X 1.5 at 10 ft from the west end.

SANTA ANA RIVER (ADAMS AVE)

0.5 MI E/O BROOKHURST ST

01/27/2017 [AAAJ]

55C0344

124 - PHOTO-Joint-Damage/Deterioration

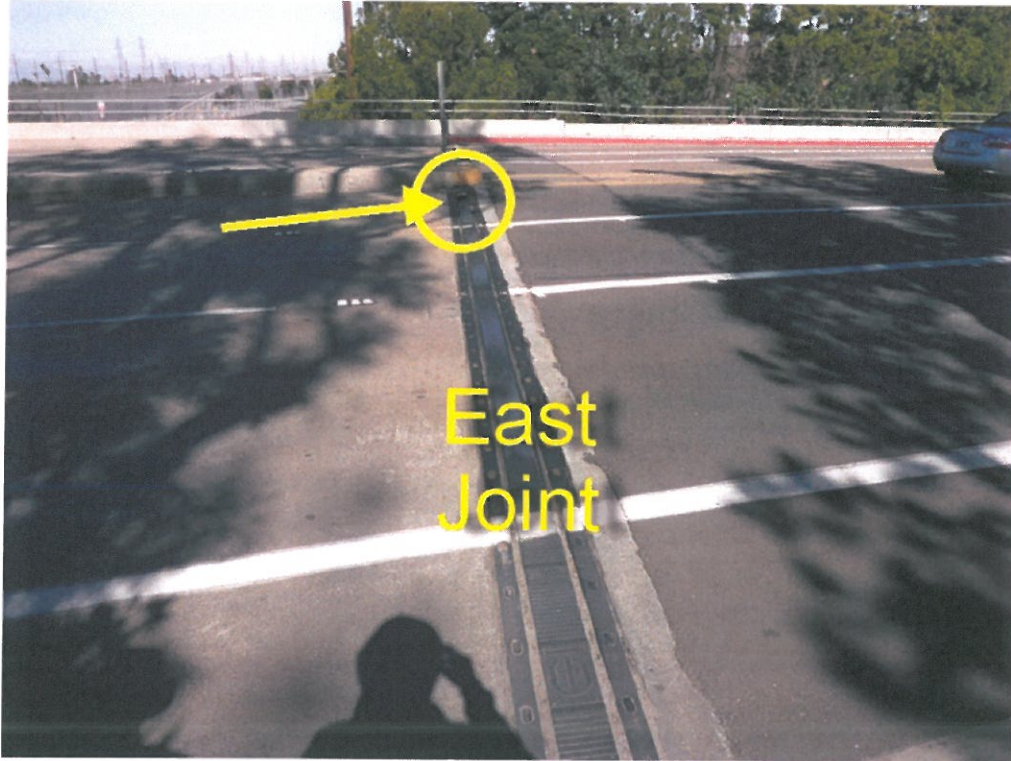


Photo No. 5

East joint is missing 2 feet section at EB lane 1.

124 - PHOTO-Joint-Damage/Deterioration



Photo No. 6

East joint is missing 2 feet section at EB lane 1.

SANTA ANA RIVER (ADAMS AVE)

0.5 MI E/O BROOKHURST ST

01/27/2017 [AAAJ]

55C0344

124 - PHOTO-Joint-Damage/Deterioration



Photo No. 7

East joint is missing 2 feet section at EB lane 1.

102 - PHOTO-Deck-Damage/Deterioration



Photo No. 8

Soffit between the 2 box girders has transvrs cracks with white efflorescence at span 4.

SANTA ANA RIVER (ADAMS AVE)

0.5 MI E/O BROOKHURST ST

01/27/2017 [AAAJ]

55C0344

135 - PHOTO-Routine-Underside View

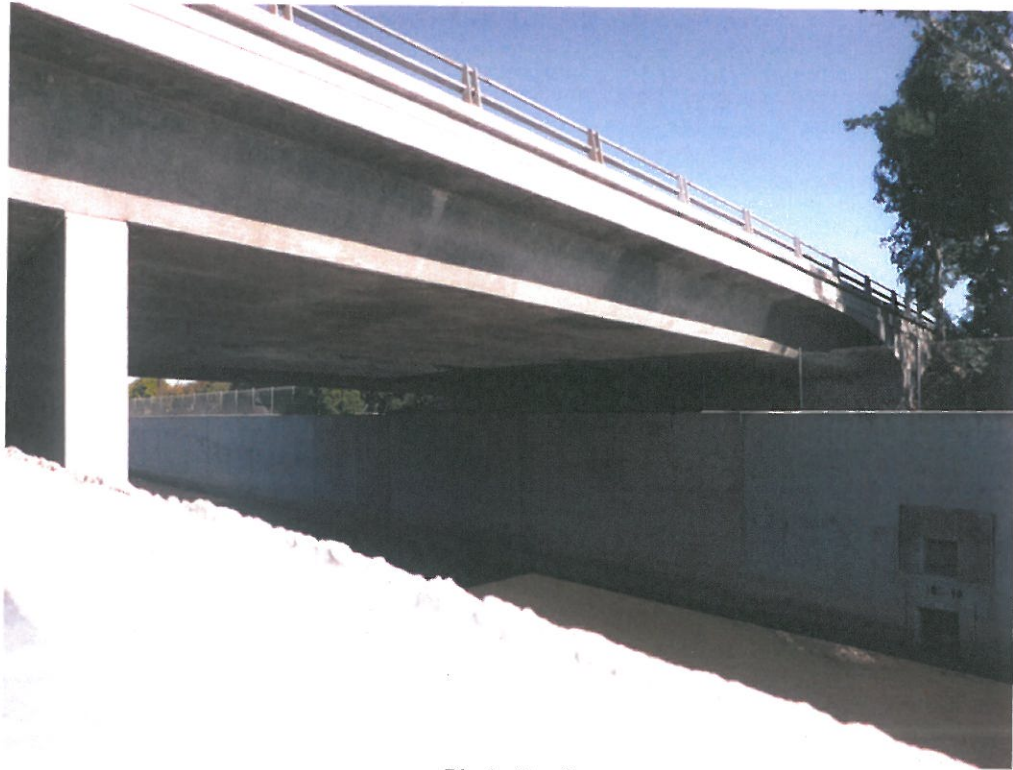


Photo No. 9

Underside View looking East

102 - PHOTO-Deck-Damage/Deterioration

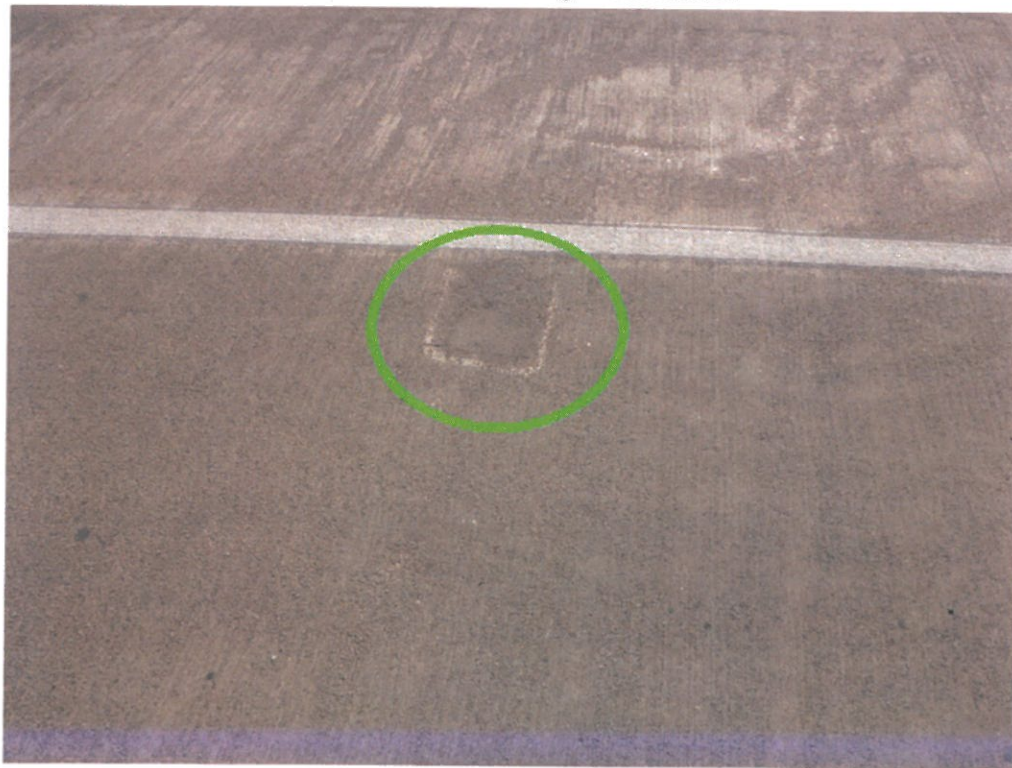


Photo No. 10

Sound patched spalls 1 ft X 1 ft in many locations.

SANTA ANA RIVER (ADAMS AVE)

0.5 MI E/O BROOKHURST ST

01/27/2017 [AAAJ]

55C0344

119 - PHOTO-Rail-Damage/Deterioration

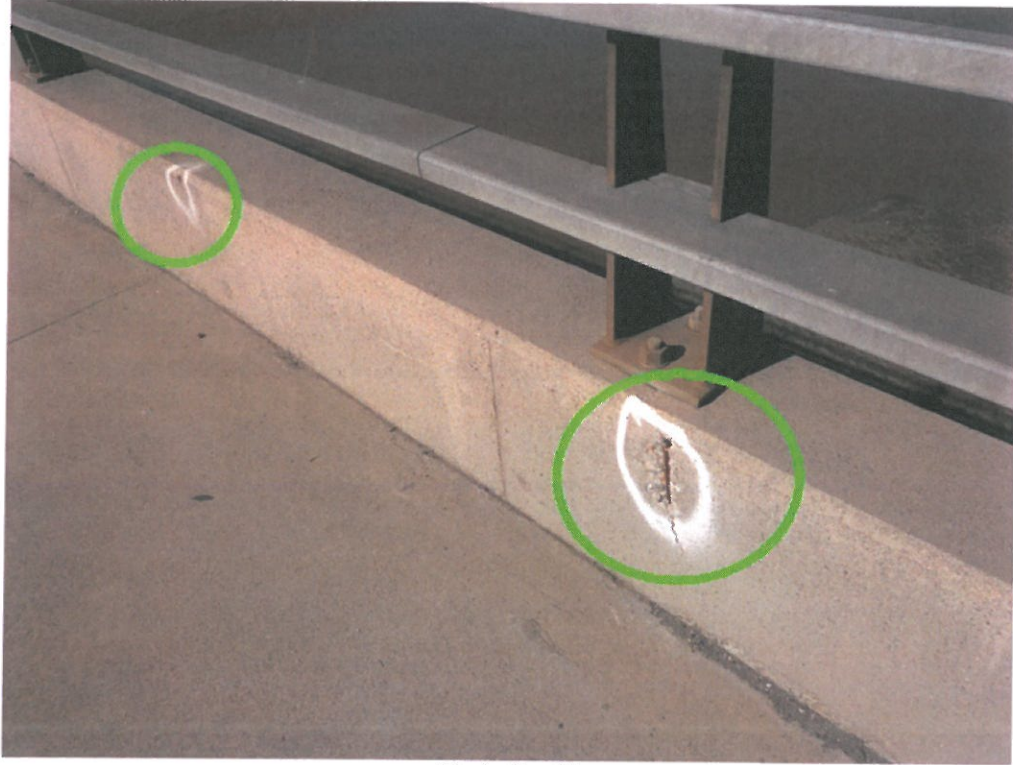


Photo No. 11

The north rail exhibits few spalls 5 inches 5 inches X 1 inches in many locations.

Orange County Bridge Review Summary

Dokken Engineering performed a field review of the Orange County bridge listed below in April 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: 55C0371

Bridge Name: Santa Ana River Channel

Year Built: 1974

Facility Carried: Segerstrom-Slater

The Santa Ana River Channel Bridge at Segerstrom-Slater Avenue is a continuous 5 span cast-in-place reinforced concrete T-Beam Bridge with pier wall and open-end diaphragm abutments supported on concrete piles.

Caltrans BIR recommendations:

- Repair vertical offset of sidewalk at northeast and southwest approaches.
- Repair spalls on inside face of bridge rails.

Field Inspection Observations

- Exposed rebar in barrier at several locations. (photo 6) Recommend patching spalled concrete.
- Torn joint seal (photo 5).
- Uneven sidewalk at bridge approach (photo 7).
- Bridge deck appears to be treated.
- Efflorescence on bridge soffit. OCPW stated the bridge deck has been treated.

Maintenance Needs Assessment

BPMP Assessment

- Replace torn joint seal.

General Maintenance – Non-BPMP

- Repair uneven sidewalk approach. Appears to be a result of sidewalk settling. Investigate cause of settling to ensure water is not removing fines under sidewalk.
- Monitor efflorescence on bridge soffit to determine if water is continuing to seep through deck.

Proposed BPMP Construction Costs

- Replace Joint seal ≈ \$40,000 (with engineering, traffic control, mobilization and contingency)

Construction Items Not Funded by BPMP

- Repair barrier spalls ≈ \$50,000 (includes engineering, traffic control, mobilization and contingency)

APPENDIX A

Photos and BIR



Photo 1:



Photo 2:



Photo 3:



Photo 4:



Failed Joint Seal

Photo 5: Failed Joint Seal



Exposed Rebar

Photo 6: Barrier



Photo 7: Sidewalk



Efflorescence

Photo 8:



DEPARTMENT OF TRANSPORTATION
Structure Maintenance & Investigations

Bridge Number : 55C0371
Facility Carried: SEGERSTROM-SLATER
Location : 0.3 MI. W/O HARBOR BLVD.
City :
Inspection Date : 10/24/2014

Bridge Inspection Report

Inspection Type
Routine FC Underwater Special Other

☒

STRUCTURE NAME: SANTA ANA RIVER CHANNEL (SEGERSTROM-SLATER)

CONSTRUCTION INFORMATION

Year Built : 1974 Skew (degrees): 13
Year Widened: 1982 No. of Joints : 2
Length (m) : 100 No. of Hinges : 0

Structure Description: Continuous 5-span CIP/RC T-beam (10 each) with RC pier walls and RC open end seat abutments, all supported upon concrete piles.

Span Configuration : (W) 16.5 m, 3 @ 21.9 m, 16.5 m (E) c/c

SAFE LOAD CAPACITY AND RATINGS

Design Live Load: MS-18 OR HS-20
Inventory Rating: RF=1.82 =>59.0 metric tons Calculation Method: LOAD FACTOR
Operating Rating: RF=3.03 =>98.2 metric tons Calculation Method: LOAD FACTOR
Permit Rating : PPPPP
Posting Load : Type 3: Legal Type 3S2: Legal Type 3-3: Legal

DESCRIPTION ON STRUCTURE

Deck X-Section: (S) 0.1 m br, 1.5 m sw, 19.5 m, 1.5 m sw, 0.1 m br (N)

Total Width: 23.2 m Net Width: 19.5 m No. of Lanes: 4 Speed: 45 mph

Min. Vertical Clearance: Unimpaired

Rail Code: 1000

Rail Type	Location	Length (ft)	Rail Modifications
Type 11	Right/Left	660	

DESCRIPTION UNDER STRUCTURE

Channel Description: RC 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

SCOPE AND ACCESS

The river was dry at inspection time. All elements were visually inspected.

REVISIONS

The bridge name was revised to include the road carried name.

Old name: SANTA ANA RIVER CHANNEL.

New name: SANTA ANA RIVER CHANNEL (SEGERSTROM-SLATER).

INSPECTION COMMENTARY

DECK AND ROADWAY

The approach sidewalks at the two corners northeast and southwest are vertically offset up to 2".

SAFE LOAD CAPACITY

A load Rating Summary sheet was in BIRIS. The current load rating was based on calculations dated 10/22/1982.

ELEMENT INSPECTION RATINGS AND COMMENTARY

Elem No.	Defect /Prot	Element Description	Env	Total Qty	Units	Qty in each Condition State	St. 1	St. 2	St. 3	St. 4
16		Top Flange-RC	2	2320	sq.m	2260	60	0	0	0
	1120	Efflorescence/Rust Staining	2	60		0	60	0	0	0
(16-1120)										
There are about 24 transverse cracks with white efflorescence in every span.										
110		Girder/Beam-RC	2	1000	m	999	1	0	0	0
	1080	Delamination/Spall/Patched Area	2	1		0	1	0	0	0
(110-1080)										
There is a spall (4" x 3" x 1") in girder 1 (north) of span 2 at bottom near pier wall 3.										
210		Pier Wall-RC	2	96	m	96	0	0	0	0
(210)										
There were no significant defects noted.										
215		Abutment-RC	2	48	m	48	0	0	0	0
(215)										
There were no significant defects noted.										
227		Pile-RC	2	1	ea.	1	0	0	0	0
(227)										
The pile element is included to indicate the presence of piles on this structure. The piles were not exposed for visual inspection. No indication of pile distress was noted in any substructure element.										
256		Slope Protection	2	2	ea.	2	0	0	0	0
(256)										
There were no significant defects noted.										
302		Joint-Compression Seal	2	40	m	40	0	0	0	0
(302)										
There were no significant defects noted.										
312		Bearing-Enclosed	2	2	each	2	0	0	0	0
(312)										
There were no significant defects noted.										
333		Railing-Other	2	200	m	190	10	0	0	0
	1080	Delamination/Spall/Patched Area	2	10		0	10	0	0	0
(333-1080)										
There are 2 spalls (200 mm x100 mm x 20 mm) with exposed rebars at the inside face of south rail 15 m										

ELEMENT INSPECTION RATINGS AND COMMENTARY

Elem No.	Defect /Prot	Defect	Element Description	Env Qty	Total Qty	Units Qty in each Condition State			
						St. 1	St. 2	St. 3	St. 4
			and 21 m from west end and many small spalls at the inside face of both rails.						

WORK RECOMMENDATIONS

RecDate: 10/24/2014
 Action : Railing-Misc.
 Work By: LOCAL AGENCY
 Status : PROPOSED

EstCost:
 StrTarget: 2 YEARS
 DistTarget:
 EA:

Repair the approach sidewalks at the two corners northeast and southwest are vertically offset up to 2".

RecDate: 05/16/2012
 Action : Railing-Repair
 Work By: LOCAL AGENCY
 Status : PROPOSED

EstCost:
 StrTarget: 2 YEARS
 DistTarget:
 EA:

Repair the 2 spalls (200 mm x100 mm x 20 mm) with exposed rebars at the inside face of south rail 15 m and 21 m from west end and many small spalls at the inside face of both rails.

Team Leader : Mikhael T. Zaarour
 Report Author : Mikhael T. Zaarour
 Inspected By : MT.Zaarour/KD.Henderson



Mikhael T. Zaarour
 Mikhael T. Zaarour (Registered Civil Engineer) (Date) 11/13/14

STRUCTURE INVENTORY AND APPRAISAL REPORT

***** IDENTIFICATION *****

(1) STATE NAME- CALIFORNIA 069
 (8) STRUCTURE NUMBER 55C0371
 (5) INVENTORY ROUTE(ON/UNDER)- ON 140000000
 (2) HIGHWAY AGENCY DISTRICT 12
 (3) COUNTY CODE 059 (4) PLACE CODE 00000
 (6) FEATURE INTERSECTED- SANTA ANA RIVER CHANNEL
 (7) FACILITY CARRIED- SEGERSTROM-SLATER
 (9) LOCATION- 0.3 MI. W/O HARBOR BLVD.
 (11) MILEPOINT/KILOMETERPOINT 0
 (12) BASE HIGHWAY NETWORK- NOT ON NET 0
 (13) LRS INVENTORY ROUTE & SUBROUTE
 (16) LATITUDE 33 DEG 42 MIN 32.3 SEC
 (17) LONGITUDE 117 DEG 55 MIN 32 SEC
 (98) BORDER BRIDGE STATE CODE % SHARE %
 (99) BORDER BRIDGE STRUCTURE NUMBER

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

(43) STRUCTURE TYPE MAIN:MATERIAL- CONCRETE CONT
 TYPE- TEE BEAM CODE 204
 (44) STRUCTURE TYPE APPR:MATERIAL- OTHER/NA
 TYPE- OTHER/NA CODE 000
 (45) NUMBER OF SPANS IN MAIN UNIT 5
 (46) NUMBER OF APPROACH SPANS 0
 (107) DECK STRUCTURE TYPE- CIP CONCRETE CODE 1
 (108) WEARING SURFACE / PROTECTIVE SYSTEM:
 A) TYPE OF WEARING SURFACE- NONE CODE 0
 B) TYPE OF MEMBRANE- NONE CODE 0
 C) TYPE OF DECK PROTECTION- NONE CODE 0

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

(27) YEAR BUILT 1974
 (106) YEAR RECONSTRUCTED 1982
 (42) TYPE OF SERVICE: ON- HIGHWAY-PEDESTRIAN 5
 UNDER- WATERWAY 5
 (28) LANES:ON STRUCTURE 04 UNDER STRUCTURE 00
 (29) AVERAGE DAILY TRAFFIC 30000
 (30) YEAR OF ADT 2012 (109) TRUCK ADT 1 %
 (19) BYPASS, DETOUR LENGTH 2 KM

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

(48) LENGTH OF MAXIMUM SPAN 21.9 M
 (49) STRUCTURE LENGTH 100.0 M
 (50) CURB OR SIDEWALK: LEFT 1.5 M RIGHT 1.5 M
 (51) BRIDGE ROADWAY WIDTH CURB TO CURB 19.5 M
 (52) DECK WIDTH OUT TO OUT 23.2 M
 (32) APPROACH ROADWAY WIDTH (W/SHOULDERS) 20.1 M
 (33) BRIDGE MEDIAN- NO MEDIAN 0
 (34) SKEW 13 DEG (35) STRUCTURE FLARED NO
 (10) INVENTORY ROUTE MIN VERT CLEAR 99.99 M
 (47) INVENTORY ROUTE TOTAL HORIZ CLEAR 19.5 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 = 95.2
 STATUS
 HEALTH INDEX 99.5
 PAINT CONDITION INDEX = N/A

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

(112) NBIS BRIDGE LENGTH- YES Y
 (104) HIGHWAY SYSTEM- NOT ON NHS 0
 (26) FUNCTIONAL CLASS- MINOR ARTERIAL URBAN 16
 (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 8
 (59) SUPERSTRUCTURE 8
 (60) SUBSTRUCTURE 8
 (61) CHANNEL & CHANNEL PROTECTION 9
 (62) CULVERTS N

***** LOAD RATING AND POSTING ***** CODE

(31) DESIGN LOAD- MS-18 OR HS-20 5
 (63) OPERATING RATING METHOD- LOAD FACTOR 1
 (64) OPERATING RATING- 98.2
 (65) INVENTORY RATING METHOD- LOAD FACTOR 1
 (66) INVENTORY RATING- 59.0
 (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 8
 (68) DECK GEOMETRY 7
 (69) UNDERCLEARANCES, VERTICAL & HORIZONTAL N
 (71) WATER ADEQUACY 9
 (72) APPROACH ROADWAY ALIGNMENT 8
 (36) TRAFFIC SAFETY FEATURES 1000
 (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 47242
 (115) YEAR OF FUTURE ADT 2031

***** INSPECTIONS *****

(90) INSPECTION DATE 10/14 (91) FREQUENCY 48 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)

Orange County Bridge Review Summary

Dokken Engineering performed a field review of the Orange County bridge listed below in April 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: 55C0404

Bridge Name: Anaheim-Barber City Channel

Year Built: 1959

Facility Carried: Dale Street

The Anaheim-Barber City channel culvert at Dale Street is a reinforced concrete double box culvert. Asphalt concrete overlay on deck.

Caltrans BIR recommendations:

- Patch east headwall spalls

Field Inspection Observations

- Spalled post pocket on east side (photo 3).
- Utility on the west side dripping water (photo 4), constantly keeping concrete wet.
- Minor soffit spall at east abutment/headwall (photo 4).
- Minor efflorescence visible on soffit (photo 5).

Maintenance Needs Assessment

BPMP Assessment

- N/A – No eligible maintenance activities

General Maintenance – Non-BPMP

- Recommend patching spalled concrete. No immediate actions required since not a high priority.
- Efflorescence likely from water penetrating through deck. Not significant problem at this time.
To repair will require deck AC removal, deck treatment, and grinding approach AC to conform to lower deck elevation.
- Recommend contacting utility owner to repair water drip problem.

Proposed BPMP Construction Costs

- N/A

Construction Items Not Funded by BPMP

- Repair Spalls < \$10,000 (includes engineering, mobilization and contingency)
- Utility repair should be funded by utility company

APPENDIX A

Photos and BIR



Photo 1:



Photo 2:



Photo 3: Railing Curb



Photo 4: Watermain



Photo 5: Bridge Soffit



Photo 6: Bridge Deck



DEPARTMENT OF TRANSPORTATION
Structure Maintenance & Investigations

Bridge Number : 55C0404
Facility Carried: DALE STREET
Location : 0.1 MI N/O CHAPMAN AVENUE
City :
Inspection Date : 09/10/2015

Bridge Inspection Report

Inspection Type
Routine FC Underwater Special Other

☒

STRUCTURE NAME: ANAHEIM-BARBER CITY CHANNEL

CONSTRUCTION INFORMATION

Year Built : 1959 Skew (degrees): 38
Year Widened: N/A No. of Joints : 0
Length (m) : 10.1 No. of Hinges : 0

Structure Description: Double 3.7 m W x 3.0 m H x 27.4 m L RC box culvert (grade top)
beneath 0.3 m of earth fill.

Span Configuration : (S) 2 @ 3.7 m (N) clear, normal

SAFE LOAD CAPACITY AND RATINGS

Design Live Load: UNKNOWN
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) 0.2 m cu, 2.5 m sw, 14.9 m, 0.2 m cu, 2.0 m ea, 1.2 m sw, 0.2 m cu (E)
Total Width: 24.4 m Net Width: 14.9 m No. of Lanes: 3 Speed: 35 mph
Min. Vertical Clearance: Unimpaired Overlay Thickness: 3.0 Inches

Rail Code: 0000

Rail Type	Location	Length (ft)	Rail Modifications
None	Right/Left		CLF

DESCRIPTION UNDER STRUCTURE

Channel Description: RC trapezoidal upstream and downstream.

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

SCOPE AND ACCESS

There channel was dry, the inspection performed by walking on the road and under. There was no access to the channel the inspector jump the CLF. All elements were visually inspected.

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	54	m	44	9	1 0
	1080		Delamination/Spall/Patched Area	2	2		0	1	1 0
	1120		Efflorescence/Rust Staining	2	1		0	1	0 0
	1130		Cracking (RC and Other)	2	7		0	7	0 0

(241-1080)

There are 2 incipient spalls 300 mm x 200mm at the inside face of headwall under posts 2 & 3.
There is a spall 100 mm x 100 mm x 25 mm with exposed rebar at the bottom of east headwall of barrel #1 (south).

(241-1120)

There is white efflorescence at the soffit along the construction joint.

(241-1130)

There are vertical cracks 1 mm wide, 4 cracks in south wall, 7 cracks in middle wall and 3 cracks in north wall

WORK RECOMMENDATIONS

RecDate: 06/08/2011

Action : Super-Patch spalls

Work By: LOCAL AGENCY

Status : PROPOSED

EstCost:

StrTarget: 2 YEARS

DistTarget:

EA:

Repair the spall 100 mm x 100 mm x 25 mm with exposed rebar at the bottom of east headwall of barrel #1 (south) and the 2 incipient spalls 300 mm x 200mm at the inside face of headwall under posts 2 & 3.

Team Leader : Mikhael T. Zaarour

Report Author : Mikhael T. Zaarour

Inspected By : MT.Zaarour/DH.Kim



Mikhael T. Zaarour (Registered Civil Engineer) (Date) 10/21/15

STRUCTURE INVENTORY AND APPRAISAL REPORT

***** IDENTIFICATION *****

(1) STATE NAME- CALIFORNIA 069
 (8) STRUCTURE NUMBER 55C0404
 (5) INVENTORY ROUTE(ON/UNDER)- ON 140000000
 (2) HIGHWAY AGENCY DISTRICT 12
 (3) COUNTY CODE 059 (4) PLACE CODE 00000
 (6) FEATURE INTERSECTED- ANAHEIM-BARBER CITY CHA
 (7) FACILITY CARRIED- DALE STREET
 (9) LOCATION- 0.1 MI N/O CHAPMAN AVENUE
 (11) MILEPOINT/KILOMETERPOINT 0
 (12) BASE HIGHWAY NETWORK- NOT ON NET 0
 (13) LRS INVENTORY ROUTE & SUBROUTE
 (16) LATITUDE 33 DEG 47 MIN 24.05 SEC
 (17) LONGITUDE 117 DEG 59 MIN 02.63 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 1959
 (106) YEAR RECONSTRUCTED 0000
 (42) TYPE OF SERVICE: ON- HIGHWAY-PEDESTRIAN 5
 UNDER- WATERWAY 5
 (28) LANES:ON STRUCTURE 03 UNDER STRUCTURE 00
 (29) AVERAGE DAILY TRAFFIC 16000
 (30) YEAR OF ADT 2009 (109) TRUCK ADT 1 %
 (19) BYPASS, DETOUR LENGTH 2 KM

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

(48) LENGTH OF MAXIMUM SPAN 3.7 M
 (49) STRUCTURE LENGTH 10.1 M
 (50) CURB OR SIDEWALK: LEFT 2.5 M RIGHT 1.2 M
 (51) BRIDGE ROADWAY WIDTH CURB TO CURB 14.9 M
 (52) DECK WIDTH OUT TO OUT 24.4 M
 (32) APPROACH ROADWAY WIDTH (W/SHOULDERS) 15.2 M
 (33) BRIDGE MEDIAN- NO MEDIAN 0
 (34) SKEW 38 DEG (35) STRUCTURE FLARED NO
 (10) INVENTORY ROUTE MIN VERT CLEAR 99.99 M
 (47) INVENTORY ROUTE TOTAL HORIZ CLEAR 14.9 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 = 87.9 *****

STATUS
 HEALTH INDEX 93.3
 PAINT CONDITION INDEX = N/A

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

(112) NBIS BRIDGE LENGTH- YES Y
 (104) HIGHWAY SYSTEM- NOT ON NHS 0
 (26) FUNCTIONAL CLASS- MINOR ARTERIAL URBAN 16
 (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 9
 (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- 40.5
 (65) INVENTORY RATING METHOD- FIELD EVAL/ENG JUI 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 6
 (69) UNDERCLEARANCES, VERTICAL & HORIZONTAL N
 (71) WATER ADEQUACY 9
 (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 20791
 (115) YEAR OF FUTURE ADT 2035

***** INSPECTIONS *****

(90) INSPECTION DATE 09/15 (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)

Orange County Bridge Review Summary

Dokken Engineering performed a field review of the Orange County bridge listed below in April 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: 55C0477

Bridge Name: Sand Canyon Wash

Year Built: 1973

Facility Carried: Mason Regional Parkway

The Sand Canyon Wash Bridge at Mason Regional PRX is cast-in-place reinforced concrete triple box culvert.

Caltrans BIR recommendations:

- Clean and grub channel.

Field Inspection Observations

- Minor Spalling on pier nose (photo 4). Recommend repairing spalled surface area.
- Exposed footing (photo 4).
- Diagonal and vertical cracks on culvert walls (photo 4).
- Overgrown vegetation. (photo 5)

Maintenance Needs Assessment

BPMP Assessment

- N/A – No eligible maintenance activities
- However, exposed footing should be monitored. If the bridge is on piles this will not pose a future issue.

General Maintenance – Non-BPMP

- Repair spall and cracks on pier nose.
- Remove vegetation.

Proposed BPMP Construction Costs

- Scour counter measure would be funded if become needed. No action needed at this time.

Construction Items Not Funded by BPMP

- Repair Pier nose cracks and Spalls ≈ \$15,000 (includes engineering, mobilization and contingency)
- Remove vegetation.

APPENDIX A

Photos and BIR



Photo 1:



Photo 2:



Photo 3:



Photo 4: Culvert Wall



Photo 5: Channel Vegetation



DEPARTMENT OF TRANSPORTATION
Structure Maintenance & Investigations

Bridge Number : 55C0477
Facility Carried: MASON REGIONAL PRK
Location : 50' s/o University Drive
City :
Inspection Date : 12/09/2014

Bridge Inspection Report

Inspection Type
Routine FC Underwater Special Other
☒

STRUCTURE NAME: SAND CANYON WASH

CONSTRUCTION INFORMATION

Year Built : 1973 Skew (degrees): 99
Year Widened: N/A No. of Joints : 0
Length (m) : 12.2 No. of Hinges : 0

Structure Description: Triple 3.7 m W x 2.7 m H x 15.2 m L RC box culvert (grade top)
beneath 0.6 m of earth fill.

Span Configuration : (S) 3 @ 3.7 m (N) clear, normal

SAFE LOAD CAPACITY AND RATINGS

Design Live Load: UNKNOWN
Inventory Rating: RF=1.00 =>32.4 metric tons Calculation Method: FIELD EVAL/ENG JUDGMENT
Operating Rating: RF=1.67 =>54.1 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) 0.5 m br, 1.2 m sw, 6.9 m, 1.8 m cu med, 3.5 m, 1.2 m sw, 0.5 m br (E)

Total Width: 14.6 m Net Width: 10.4 m No. of Lanes: 3 Speed: 25 mph

Min. Vertical Clearance: Unimpaired

Rail Code: 0000 Rail Description: Timber Railing

DESCRIPTION UNDER STRUCTURE

Channel Description: Natural earth trapezoidal with rock slopes at the site.

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

SCOPE AND ACCESS

The wash was dry at time of inspection. All elements were visually inspected.

CULVERT

The downstream live trees accumulated 300 mm dirt and water inside the barrels #1 and #3.

SAFE LOAD CAPACITY



ELEMENT INSPECTION RATINGS AND COMMENTARY

Elem No.	Defect /Prot	Element Description	Env	Total Qty	Units	Qty in each Condition State			
						St. 1	St. 2	St. 3	St. 4
241		Culvert-RC	2	45	m	35	10	0	0
	1130	Cracking (RC and Other)	2	10		0	10	0	0
(241-1130)									
There are vertical cracks up to 1 mm wide in the culvert walls as fallow 5 cracks in wall #1, 6 cracks in walls #2 & #3, and 3 cracks in wall #4.									
332		Railing-Timber	2	32	m	32	0	0	0
(332)									
There were no significant defects noted.									

WORK RECOMMENDATIONS

RecDate: 06/08/2011 EstCost: Remove and clean the downstream channel
 Action : Remove Vegetation StrTarget: 2 YEARS from live trees and accumulated dirt
 Work By: LOCAL AGENCY DistTarget:
 Status : PROPOSED EA:

Team Leader : Mikhael T. Zaarour
 Report Author : Mikhael T. Zaarour
 Inspected By : MT.Zaarour/KD.Henderson



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



STRUCTURE INVENTORY AND APPRAISAL REPORT

***** IDENTIFICATION *****

(1) STATE NAME- CALIFORNIA 069
 (8) STRUCTURE NUMBER 55C0477
 (5) INVENTORY ROUTE(ON/UNDER)- ON 140000000
 (2) HIGHWAY AGENCY DISTRICT 12
 (3) COUNTY CODE 059 (4) PLACE CODE 00000
 (6) FEATURE INTERSECTED- SAND CANYON WASH
 (7) FACILITY CARRIED- MASON REGIONAL PRK
 (9) LOCATION- 50' s/o University Drive
 (11) MILEPOINT/KILOMETERPOINT 0
 (12) BASE HIGHWAY NETWORK- NOT ON NET 0
 (13) LRS INVENTORY ROUTE & SUBROUTE
 (16) LATITUDE 33 DEG 39 MIN 25.58 SEC
 (17) LONGITUDE 117 DEG 49 MIN 53.4 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 3
 (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 1973
 (106) YEAR RECONSTRUCTED 0000
 (42) TYPE OF SERVICE: ON- HIGHWAY-PEDESTRIAN 5
 UNDER- WATERWAY 5
 (28) LANES:ON STRUCTURE 03 UNDER STRUCTURE 00
 (29) AVERAGE DAILY TRAFFIC 300
 (30) YEAR OF ADT 2010 (109) TRUCK ADT 1 %
 (19) BYPASS, DETOUR LENGTH 199 KM

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

(48) LENGTH OF MAXIMUM SPAN 3.7 M
 (49) STRUCTURE LENGTH 12.2 M
 (50) CURB OR SIDEWALK: LEFT 1.2 M RIGHT 1.2 M
 (51) BRIDGE ROADWAY WIDTH CURB TO CURB 10.4 M
 (52) DECK WIDTH OUT TO OUT 14.6 M
 (32) APPROACH ROADWAY WIDTH (W/SHOULDERS) 10.4 M
 (33) BRIDGE MEDIAN- CLOSED (NO BARRIER) 2
 (34) SKEW 99 DEG (35) STRUCTURE FLARED NO
 (10) INVENTORY ROUTE MIN VERT CLEAR 99.99 M
 (47) INVENTORY ROUTE TOTAL HORIZ CLEAR 6.9 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 = 76.7
 STATUS FUNCTIONALLY OBSOLETE
 HEALTH INDEX 94.9
 PAINT CONDITION INDEX = N/A

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

(112) NBIS BRIDGE LENGTH- YES Y
 (104) HIGHWAY SYSTEM- NOT ON NHS 0
 (26) FUNCTIONAL CLASS- LOCAL URBAN 19
 (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- 54.1
 (65) INVENTORY RATING METHOD- FIELD EVAL/ENG JUL 0
 (66) INVENTORY RATING- 32.4
 (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 7
 (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- MISC STRUCTURAL WORK CODE 38
 (76) LENGTH OF STRUCTURE IMPROVEMENT 12.2 M
 (94) BRIDGE IMPROVEMENT COST \$114,000
 (95) ROADWAY IMPROVEMENT COST \$22,800
 (96) TOTAL PROJECT COST \$191,520
 (97) YEAR OF IMPROVEMENT COST ESTIMATE 2010
 (114) FUTURE ADT 361
 (115) YEAR OF FUTURE ADT 2031

***** INSPECTIONS *****

(90) INSPECTION DATE 12/14 (91) FREQUENCY 48 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)

Orange County Bridge Review Summary

Dokken Engineering performed field reviews of selected Orange County bridges in February and April of 2017 to identifying maintenance activities eligible for Caltrans' Bridge Preventive Maintenance Program funding. Additional maintenance activities not eligible for funding were also identified, and maintenance recommendations in the most recent Caltrans Bridge Inspection Report (BIR) were confirmed.

Bridge Number: 55C0511M

Bridge Name: Santiago Creek

Year Built: 1982

Facility Carried: Villa Park Road

The Santiago Creek culvert is a single span multiple corrugated steel pipe culvert beneath 40 feet of earth fill. There was not access to the culvert and it was not visible from the road.

Caltrans BIR recommendations:

- None

Field Inspection Observations

- No work recommendation can be made for this culvert. There was no access and the culvert was not visible from the road.

Maintenance Needs Assessment

BPMP Assessment

- N/A – No eligible maintenance activities

General Maintenance – Non-BPMP

- No recommendations.

Proposed BPMP Construction Costs

- N/A

Construction Items Not Funded by BPMP

- N/A

APPENDIX A

Photos and BIR



Photo 1: Santiago Creek Bridge



Photo 2: Santiago Creek Bridge



Photo 3:



DEPARTMENT OF TRANSPORTATION
Structure Maintenance & Investigations

Bridge Number : 55C0511M
Facility Carried: VILLA PARK ROAD
Location : 1.74 MI. E/O ROUTE 55 FW
City :
Inspection Date : 08/07/2014
Inspection Type
Routine FC Underwater Special Other
☒

Bridge Inspection Report

STRUCTURE NAME: SANTIAGO CREEK

CONSTRUCTION INFORMATION

Year Built : 1982
Year Widened: N/A
Length (m) : 6.7

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

Structure Description: Single 6.4 m diameter x 100.5 m L corrugated steel multiplate pipe culvert (non-grade top) beneath 12.2 m of earth fill.

Span Configuration : (W) 1 @ 6.4 m (E) clear, normal

SAFE LOAD CAPACITY AND RATINGS

Design Live Load: UNKNOWN

Inventory Rating: RF=1.00 =>32.4 metric tons

Calculation Method: FIELD EVAL/ENG JUDGMENT

Operating Rating: RF=1.67 =>54.1 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) 25.0 m (N)

Total Width: .0 m Net Width: .0 m

No. of Lanes: 4

Speed: 45 mph

Min. Vertical Clearance: Unimpaired

Rail Code: 0000 Rail Description: Chain link fence.

DESCRIPTION UNDER STRUCTURE

Channel Description: Earth basin reservoir downstream and natural gravel upstream.

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.

INSPECTION COMMENTARY

SCOPE AND ACCESS

The basin was dry at the north side of the culvert and subside at the south side. All elements were visually inspected.

SAFE LOAD CAPACITY

A load Rating Summary sheet was in BIRIS. This load rating was assigned in accordance with current SM&I procedures.

ELEMENT INSPECTION RATINGS AND COMMENTARY

Elem No.	Defect /Prot	Defect Element Description	Env	Total Qty	Units	Qty in each Condition	State		
						St. 1	St. 2	St. 3	St. 4
240		Culvert-Steel	2	101	m	99	0	0	2
	516	Steel Coating-Galvanized	2	2000	sq.m	0	800	400	800
	1010	Cracking	2	2		0	0	0	2
	3440	Effectiveness (Steel PC)	2	2000		0	800	400	800

(240-1010)

There was 2 cuts 8" and 3" in the steel plates at the south end to the east side.

(240-516-3440)

The culvert invert was rusted. the galvanized coat was gone at the pipe bottom and 2/3 of the pipe show some type of rust especially at the connection between plates.

WORK RECOMMENDATIONS - NONE

Team Leader : Mikhael T. Zaarour
 Report Author : Mikhael T. Zaarour
 Inspected By : MT.Zaarour/M.Zolfaghari

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

9/9/14



STRUCTURE INVENTORY AND APPRAISAL REPORT

***** IDENTIFICATION *****

(1) STATE NAME- CALIFORNIA 069
 (8) STRUCTURE NUMBER 55C0511M
 (5) INVENTORY ROUTE (ON/UNDER)- ON 140000000
 (2) HIGHWAY AGENCY DISTRICT 12
 (3) COUNTY CODE 059 (4) PLACE CODE 00000
 (6) FEATURE INTERSECTED- SANTIAGO CREEK
 (7) FACILITY CARRIED- VILLA PARK ROAD
 (9) LOCATION- 1.74 MI. E/O ROUTE 55 FWY
 (11) MILEPOINT/KILOMETERPOINT 0
 (12) BASE HIGHWAY NETWORK- PART OF NET 1
 (13) LRS INVENTORY ROUTE & SUBROUTE 000000000000
 (16) LATITUDE 33 DEG 48 MIN 37.24 SEC
 (17) LONGITUDE 117 DEG 48 MIN 19.16 SEC
 (98) BORDER BRIDGE STATE CODE % SHARE %
 (99) BORDER BRIDGE STRUCTURE NUMBER

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

(43) STRUCTURE TYPE MAIN:MATERIAL- STEEL
 TYPE- CULVERT CODE 319
 (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- 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 1982
 (106) YEAR RECONSTRUCTED 0000
 (42) TYPE OF SERVICE: ON- HIGHWAY-PEDESTRIAN 5
 UNDER- WATERWAY 5
 (28) LANES:ON STRUCTURE 04 UNDER STRUCTURE 00
 (29) AVERAGE DAILY TRAFFIC 26000
 (30) YEAR OF ADT 2003 (109) TRUCK ADT 1 %
 (19) BYPASS, DETOUR LENGTH 6 KM

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

(48) LENGTH OF MAXIMUM SPAN 6.4 M
 (49) STRUCTURE LENGTH 6.7 M
 (50) CURB OR SIDEWALK: LEFT 0.0 M RIGHT 0.0 M
 (51) BRIDGE ROADWAY WIDTH CURB TO CURB 0.0 M
 (52) DECK WIDTH OUT TO OUT 0.0 M
 (32) APPROACH ROADWAY WIDTH (W/SHOULDERS) 25.0 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 25.0 M
 (53) MIN VERT CLEAR OVER BRIDGE RDWY 99.99 M
 (54) MIN VERT UNDERCLEAR REF- NOT H/RR 0.0 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 = 73.1
 STATUS
 HEALTH INDEX 98.0
 PAINT CONDITION INDEX = N/A

***** CLASSIFICATION *****

(112) NBIS BRIDGE LENGTH- YES Y
 (104) HIGHWAY SYSTEM- NOT ON NHS 0
 (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 *****

(58) DECK N
 (59) SUPERSTRUCTURE N
 (60) SUBSTRUCTURE N
 (61) CHANNEL & CHANNEL PROTECTION 9
 (62) CULVERTS 7

***** LOAD RATING AND POSTING *****

(31) DESIGN LOAD- UNKNOWN 0
 (63) OPERATING RATING METHOD- FIELD EVAL/ENG JUD 0
 (64) OPERATING RATING- 54.1
 (65) INVENTORY RATING METHOD- FIELD EVAL/ENG JUL 0
 (66) INVENTORY RATING- 32.4
 (70) BRIDGE POSTING- EQUAL TO OR ABOVE LEGAL LOADS 5
 (41) STRUCTURE OPEN, POSTED OR CLOSED- A
 DESCRIPTION- OPEN, NO RESTRICTION

***** APPRAISAL *****

(67) STRUCTURAL EVALUATION 7
 (68) DECK GEOMETRY N
 (69) UNDERCLEARANCES, VERTICAL & HORIZONTAL N
 (71) WATER ADEQUACY 9
 (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 53049
 (115) YEAR OF FUTURE ADT 2029

***** INSPECTIONS *****

(90) INSPECTION DATE 08/14 (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)

Orange County Bridge Review Summary

Dokken Engineering performed a field review of the Orange County bridge listed below in April 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: 55C0534

Bridge Name: Handy Creek

Year Built: 1985

Facility Carried: Meads Avenue

The Handy Creek Bridge at Meads Avenue is a simple span cast-in-place reinforced concrete slab with end diaphragm abutments supported on concrete piles.

Caltrans BIR recommendations:

- None

Field Inspection Observations

- Fill from equestrian trail is encroaching onto the shoulder (photo 1).
 - There was limited access to the substructure due to several feet of standing water (photo 2).
- Overall, this bridge appears to be in good condition.

Maintenance Needs Assessment

BPMP Assessment

- N/A – No eligible maintenance activities

General Maintenance – Non-BPMP

- No recommendations.

Proposed BPMP Construction Costs

- N/A

Construction Items Not Funded by BPMP

- N/A

APPENDIX A

Photos and BIR



Photo 1: Bridge



Photo 2



DEPARTMENT OF TRANSPORTATION
Structure Maintenance & Investigations

Bridge Number : 55C0534
Facility Carried: MEADS AVENUE
Location : 0.3 MI E/O ORANGE PARK B
City :
Inspection Date : 08/07/2015

Bridge Inspection Report

Inspection Type

Routine FC Underwater Special Other

☒

STRUCTURE NAME: HANDY CREEK

CONSTRUCTION INFORMATION

Year Built : 1985 Skew (degrees): 99
Year Widened: 1990 No. of Joints : 0
Length (m) : 8.5 No. of Hinges : 0

Structure Description: Single span CIP/RC deck slab with RC open end diaphragm abutments,
all supported upon concrete piles.

Span Configuration : (W) 1 @ 7.3 m (E) c/c

SAFE LOAD CAPACITY AND RATINGS

Design Live Load: MS-18+MOD OR HS-20+MOD
Inventory Rating: RF=1.00 =>32.4 metric tons Calculation Method: ASSIGNED (LFD)
Operating Rating: RF=1.67 =>54.1 metric tons Calculation Method: ASSIGNED (LFD)
Permit Rating : PPPPP
Posting Load : Type 3: Legal Type 3S2: Legal Type 3-3: Legal

DESCRIPTION ON STRUCTURE

Deck X-Section: (N) 0.1 m br, 2.2 m sw, 0.6 m br, 8.8 m, 0.1 m br (S)
Total Width: 11.9 m Net Width: 8.8 m No. of Lanes: 2 Speed: 25 mph
Min. Vertical Clearance: Unimpaired Overlay Thickness: 0.0 Inches
Rail Code: 1000

Rail Type	Location	Length (ft)	Rail Modifications
MBBR	Right/Left	99	

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

SCOPE AND ACCESS

There was about 2' deep stagnate water in the creek. All elements were visually inspected from the side due to clearance under the structure.

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 State	Condition	State
							St. 1	St. 2	St. 3 St. 4
38			Slab-RC	2	101	sq.m	91	10	0 0
	1130		Cracking (RC and Other)	2	10		0	10	0 0
(38-1130) There are 1 mm wide diagonal cracks at the corners									
215			Abutment-RC	3	34	m	34	0	0 0
(215) There were no significant defects noted.									
252			Pile-CIDH	2	1	ea.	1	0	0 0
(252) The pile element is included to indicate the presence of piles on this structure. The piles were not exposed for visual inspection. No indication of pile distress was noted in any substructure element.									
330			Railing-Metal	2	17	m	17	0	0 0
(330) There were no significant defects noted.									

WORK RECOMMENDATIONS - NONE

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 55C0534
 (5) INVENTORY ROUTE(ON/UNDER)- ON 140000000
 (2) HIGHWAY AGENCY DISTRICT 12
 (3) COUNTY CODE 059 (4) PLACE CODE 00000
 (6) FEATURE INTERSECTED- HANDY CREEK
 (7) FACILITY CARRIED- MEADS AVENUE
 (9) LOCATION- 0.3 MI E/O ORANGE PARK BL
 (11) MILEPOINT/KILOMETERPOINT 0
 (12) BASE HIGHWAY NETWORK- NOT ON NET 0
 (13) LRS INVENTORY ROUTE & SUBROUTE
 (16) LATITUDE 33 DEG 48 MIN 26.85 SEC
 (17) LONGITUDE 117 DEG 46 MIN 43.57 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- NONE CODE 0
 B) TYPE OF MEMBRANE- NONE CODE 0
 C) TYPE OF DECK PROTECTION- NONE CODE 0

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

(27) YEAR BUILT 1985
 (106) YEAR RECONSTRUCTED 1990
 (42) TYPE OF SERVICE: ON- HIGHWAY-PEDESTRIAN 5
 UNDER- WATERWAY 5
 (28) LANES:ON STRUCTURE 02 UNDER STRUCTURE 00
 (29) AVERAGE DAILY TRAFFIC 1000
 (30) YEAR OF ADT 2011 (109) TRUCK ADT 1 %
 (19) BYPASS, DETOUR LENGTH 2 KM

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

(48) LENGTH OF MAXIMUM SPAN 7.3 M
 (49) STRUCTURE LENGTH 8.5 M
 (50) CURB OR SIDEWALK: LEFT 0.0 M RIGHT 0.0 M
 (51) BRIDGE ROADWAY WIDTH CURB TO CURB 8.8 M
 (52) DECK WIDTH OUT TO OUT 11.9 M
 (32) APPROACH ROADWAY WIDTH (W/SHOULDERS) 6.1 M
 (33) BRIDGE MEDIAN- NO MEDIAN 0
 (34) SKEW 99 DEG (35) STRUCTURE FLARED NO
 (10) INVENTORY ROUTE MIN VERT CLEAR 99.99 M
 (47) INVENTORY ROUTE TOTAL HORIZ CLEAR 8.8 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 = 88.6
 STATUS
 HEALTH INDEX 97.9
 PAINT CONDITION INDEX = N/A

***** CLASSIFICATION *****

(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 *****

(58) DECK 7
 (59) SUPERSTRUCTURE 7
 (60) SUBSTRUCTURE 8
 (61) CHANNEL & CHANNEL PROTECTION 8
 (62) CULVERTS N

***** LOAD RATING AND POSTING *****

(31) DESIGN LOAD- MS-18+MOD OR HS-20+MOD 6
 (63) OPERATING RATING METHOD- ASSIGNED (LFD) A
 (64) OPERATING RATING- 54.1
 (65) INVENTORY RATING METHOD- ASSIGNED (LFD) A
 (66) INVENTORY RATING- 32.4
 (70) BRIDGE POSTING- EQUAL TO OR ABOVE LEGAL LOADS 5
 (41) STRUCTURE OPEN, POSTED OR CLOSED- A
 DESCRIPTION- OPEN, NO RESTRICTION

***** APPRAISAL *****

(67) STRUCTURAL EVALUATION 7
 (68) DECK GEOMETRY 5
 (69) UNDERCLEARANCES, VERTICAL & HORIZONTAL N
 (71) WATER ADEQUACY 5
 (72) APPROACH ROADWAY ALIGNMENT 5
 (36) TRAFFIC SAFETY FEATURES 1000
 (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 1282
 (115) YEAR OF FUTURE ADT 2032

***** INSPECTIONS *****

(90) INSPECTION DATE 08/15 (91) FREQUENCY 48 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)

Orange County Bridge Review Summary

Dokken Engineering performed a field review of the Orange County bridge listed below in April 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: 55C0550

Bridge Name: Aliso Creek

Year Built: 1988

Facility Carried: Aliso Creek Road

The Aliso Creek Bridge at Aliso Creek Road is a single span cast-in-place post tensioned concrete box girder with diaphragm abutments supported on concrete piles.

Caltrans BIR recommendations:

- Seal severe cracks with epoxy at the east end of the WB lanes.

Field Inspection Observations

- Due to traffic, there was limited deck access. Efflorescence visible on bridge soffit (photo 1), this may be a result of a leaking utility. Recommend determining if there are utilities through bridge that may be leaking, since moisture must be present in bridge cells to cause the efflorescence.
- Some down drains are clogged (photo 2). Note this is not eligible for BPMP funds.

Maintenance Needs Assessment

BPMP Assessment

- Seal cracks at east end of WB lanes per Caltrans BIR recommendation. These are condition state 2, therefore eligible for funding.

General Maintenance – Non-BPMP

- Clean out down drains.

Proposed BPMP Construction Costs

- Seal Bridge Deck cracks ≈ \$65,000
- Traffic Control for deck sealing ≈ \$15,000

Construction Items Not Funded by BPMP

- Clean Down Drain ≈ \$4,000 (performed same time as deck sealing)

APPENDIX A

Photos and BIR



Photo 1:



Photo 2:



Photo 3:



Photo 4: Bridge Soffit

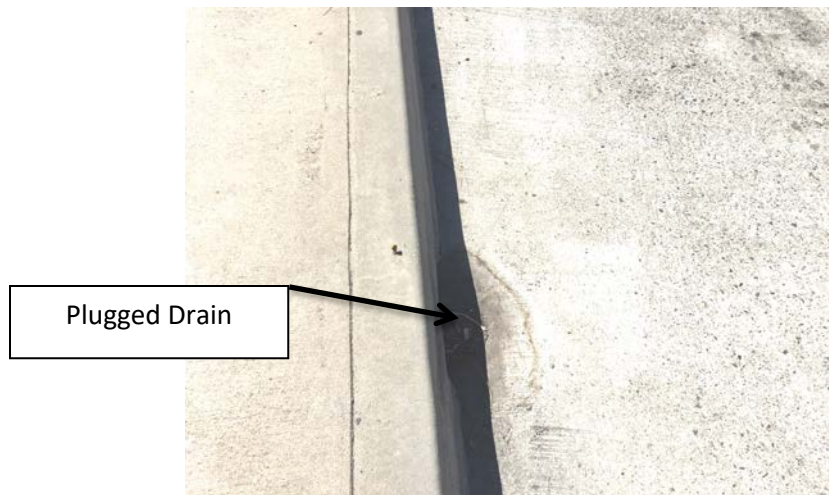


Photo 5: Bridge Deck



DEPARTMENT OF TRANSPORTATION
Structure Maintenance & Investigations

Bridge Number : 55C0550
Facility Carried: ALISO CREEK ROAD
Location : 100' W/O ALICIA PARKWAY
City :
Inspection Date : 08/14/2015

Bridge Inspection Report

Inspection Type

Routine FC Underwater Special Other

☒

STRUCTURE NAME: ALISO CREEK

CONSTRUCTION INFORMATION

Year Built : 1988 Skew (degrees): 20
Year Widened: N/A No. of Joints : 0
Length (m) : 51.8 No. of Hinges : 0

Structure Description: Single span CIP/PS concrete box girder (16 cells) with RC open end diaphragm abutments, all supported upon concrete piles.

Span Configuration : (W) 50.0 m (E) c/c

SAFE LOAD CAPACITY AND RATINGS

Design Live Load: MS-18+MOD OR HS-20+MOD
Inventory Rating: RF=1.00 =>32.4 metric tons Calculation Method: ASSIGNED (LFD)
Operating Rating: RF=1.67 =>54.1 metric tons Calculation Method: ASSIGNED (LFD)
Permit Rating : PPPPP
Posting Load : Type 3: Legal Type 3S2: Legal Type 3-3: Legal

DESCRIPTION ON STRUCTURE

Deck X-Section: (N) 0.3 m br, 1.5 m sw, 34.5 m, 1.5 m sw, 0.3 m br (N)
Total Width: 38.0 m Net Width: 34.5 m No. of Lanes: 9 Speed: 50 mph
Min. Vertical Clearance: Unimpaired Overlay Thickness: 0.0 Inches
Rail Code: 0000

Rail Type	Location	Length (ft)	Rail Modifications
Type 26	Right/Left	1085	

DESCRIPTION UNDER STRUCTURE

Channel Description: Natural earth, trapezoidal with RC slope protection through the site.

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

SCOPE AND ACCESS

The channel was dry at time of inspection. The inspection was performed by walking on the deck and under the structure. All elements were visually inspected.

DECK

The 5 mm thick at the north corner of Abutment 2 (leveling concrete) is broken into pieces and peeled off.

INSPECTION COMMENTARY**SAFE LOAD CAPACITY**

A Load Rating Summary Sheet dated 03/30/2013 is on file for this structure. The current rating has been assigned in accordance with SM&I procedures.

SCOPE AND ACCESS**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
16			Top Flange-RC	2	1970	sq.m	183	1787	0	0
	1130		Cracking (RC and Other)	2	1787		0	1787	0	0
(16-1130)										
There are cracks 1 mm wide throughout the deck mainly in the ends										
104			Box Girder-PS Conc.	2	104	m	104	0	0	0
(104)										
There were no significant defects noted.										
215			Abutment-RC	2	93	m	93	0	0	0
(215)										
There were no significant defects noted.										
256			Slope Protection	2	2	ea.	2	0	0	0
(256)										
There were no significant defects noted.										
331			Railing-RC	2	104	m	104	0	0	0
(331)										
There were no significant defects noted.										

WORK RECOMMENDATIONS

RecDate: 03/30/2013

Action : Deck-Methacrylate

Work By: LOCAL AGENCY

Status : PROPOSED

EstCost:

StrTarget: 2 YEARS

DistTarget:

EA:

Seal with epoxy the severe cracks (up to 5 mm wide) at the east end of the WB lanes.

Team Leader : Mikhael T. Zaarour

Report Author : Mikhael T. Zaarour

Inspected By : MT.Zaarour/KD.Henderson

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

9/23/15



STRUCTURE INVENTORY AND APPRAISAL REPORT

***** IDENTIFICATION *****

(1) STATE NAME- CALIFORNIA 069
 (8) STRUCTURE NUMBER 55C0550
 (5) INVENTORY ROUTE(ON/UNDER)- ON 140000000
 (2) HIGHWAY AGENCY DISTRICT 12
 (3) COUNTY CODE 059 (4) PLACE CODE 00000
 (6) FEATURE INTERSECTED- ALISO CREEK
 (7) FACILITY CARRIED- ALISO CREEK ROAD
 (9) LOCATION- 100' W/O ALICIA PARKWAY
 (11) MILEPOINT/KILOMETERPOINT 0
 (12) BASE HIGHWAY NETWORK- PART OF NET 1
 (13) LRS INVENTORY ROUTE & SUBROUTE 000000000000
 (16) LATITUDE 33 DEG 33 MIN 19.74 SEC
 (17) LONGITUDE 117 DEG 43 MIN 07.56 SEC
 (98) BORDER BRIDGE STATE CODE % SHARE %
 (99) BORDER BRIDGE STRUCTURE NUMBER

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

(43) STRUCTURE TYPE MAIN:MATERIAL- PRESTRESS CONC
 TYPE- BOX BEAM OR GIRDER - MULTI CODE 505
 (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- NONE CODE 0
 B) TYPE OF MEMBRANE- NONE CODE 0
 C) TYPE OF DECK PROTECTION- NONE CODE 0

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

(27) YEAR BUILT 1988
 (106) YEAR RECONSTRUCTED 0000
 (42) TYPE OF SERVICE: ON- HIGHWAY-PEDESTRIAN 5
 UNDER- WATERWAY 5
 (28) LANES:ON STRUCTURE 09 UNDER STRUCTURE 00
 (29) AVERAGE DAILY TRAFFIC 25915
 (30) YEAR OF ADT 2011 (109) TRUCK ADT 1 %
 (19) BYPASS, DETOUR LENGTH 3 KM

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

(48) LENGTH OF MAXIMUM SPAN 50.0 M
 (49) STRUCTURE LENGTH 51.8 M
 (50) CURB OR SIDEWALK: LEFT 1.5 M RIGHT 1.5 M
 (51) BRIDGE ROADWAY WIDTH CURB TO CURB 34.5 M
 (52) DECK WIDTH OUT TO OUT 38.0 M
 (32) APPROACH ROADWAY WIDTH (W/SHOULDERS) 34.5 M
 (33) BRIDGE MEDIAN- NO MEDIAN 0
 (34) SKEW 20 DEG (35) STRUCTURE FLARED NO
 (10) INVENTORY ROUTE MIN VERT CLEAR 99.99 M
 (47) INVENTORY ROUTE TOTAL HORIZ CLEAR 34.5 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 = 92.3
 STATUS
 HEALTH INDEX 74.6
 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 6
 (59) SUPERSTRUCTURE 8
 (60) SUBSTRUCTURE 8
 (61) CHANNEL & CHANNEL PROTECTION 9
 (62) CULVERTS N

***** LOAD RATING AND POSTING ***** CODE

(31) DESIGN LOAD- MS-18+MOD OR HS-20+MOD 6
 (63) OPERATING RATING METHOD- ASSIGNED (LFD) A
 (64) OPERATING RATING- 54.1
 (65) INVENTORY RATING METHOD- ASSIGNED (LFD) A
 (66) INVENTORY RATING- 32.4
 (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 8
 (68) DECK GEOMETRY 5
 (69) UNDERCLEARANCES, VERTICAL & HORIZONTAL N
 (71) WATER ADEQUACY 9
 (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 46252
 (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)

Orange County Bridge Review Summary

Dokken Engineering performed a field review of the Orange County bridge listed below in April 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: 55C0561

Bridge Name: Dana Point Harbor

Year Built: 1970

Facility Carried: Island Way

The Dana Point Harbor Bridge at Island Way is a simply supported 4-span precast prestressed concrete box girder with a continuous reinforced concrete deck. The bridge is supported on single column bents and strutted abutments supported on spread footings.

Caltrans BIR recommendations:

- Remove and repair unsound concrete in splash zone.

Field Inspection Observations

- Minor spalling on walkway
- There was minimal access to the substructure (photo 1 and 2). Overall this bridge appears to be in good condition.
- Joint seals filled with debris. (photo 3) No immediate action required.

Maintenance Needs Assessment

BPMP Assessment

- N/A – No eligible maintenance activities

General Maintenance – Non-BPMP

- Recommend patching spalled concrete. No immediate actions required since not a high priority.

Proposed BPMP Construction Costs

- N/A

Construction Items Not Funded by BPMP

- Repair Spalls ≈ \$30,000, complicated by water access and wet conditions (includes engineering, mobilization and contingency)

APPENDIX A

Photos and BIR



Photo 1:



Photo 2:



Photo 3:



Photo 4:

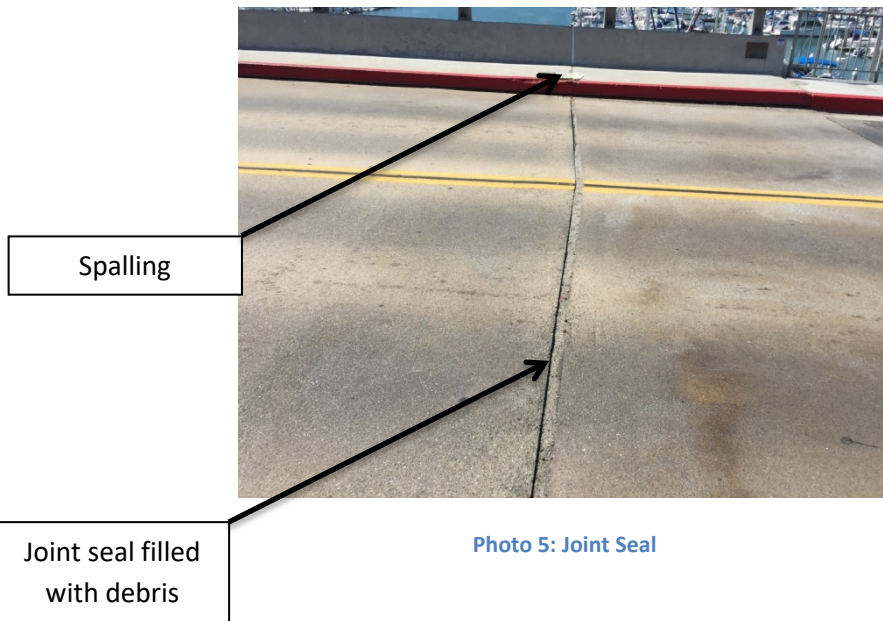


Photo 5: Joint Seal



DEPARTMENT OF TRANSPORTATION
Structure Maintenance & Investigations

Bridge Number : 55C0561
Facility Carried: ISLAND WAY
Location : 0.1 MI S/O DANA PT HBR D
City :
Inspection Date : 02/27/2015
Inspection Type
Routine FC Underwater Special Other
☒

Bridge Inspection Report

STRUCTURE NAME: DANA POINT HARBOR

CONSTRUCTION INFORMATION

Year Built : 1970 Skew (degrees): 0
Year Widened: N/A No. of Joints : 0
Length (m) : 62.5 No. of Hinges : 0

Structure Description: Simply supported 4-span PC/PS concrete box girder (8 units) with a continuous RC deck and RC single column bents and RC closed end strutted abutments, all supported upon spread footings.

Span Configuration : (S) 4 @ 15.2 m (N) c/c

SAFE LOAD CAPACITY AND RATINGS

Design Live Load: MS-18 OR HS-20
Inventory Rating: RF=1.00 =>32.4 metric tons Calculation Method: ASSIGNED (LFD)
Operating Rating: RF=1.67 =>54.1 metric tons Calculation Method: ASSIGNED (LFD)
Permit Rating : PPPPP
Posting Load : Type 3: Legal Type 3S2: Legal Type 3-3: Legal

DESCRIPTION ON STRUCTURE

Deck X-Section: (W) 0.4 m br, 1.5 m sw, 8.5 m, 1.5 m sw, 0.4 m br (E)
Total Width: 12.5 m Net Width: 8.5 m No. of Lanes: 2 Speed: 25 mph
Min. Vertical Clearance: Unimpaired AC Thickness:
Rail Code: 1000

Rail Type	Location	Length (ft)	Rail Modifications
Type 2	Right/Left	410	5 ft sidw walk

DESCRIPTION UNDER STRUCTURE

Channel Description: Tidal basin.

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 inspection was performed by walking the deck and under spans 1 and 4. All elements above water have been visually inspected.

UNDERWATER INVESTIGATION

The inspection was performed in June 2014. No defected on the substructure were found and remain in good condition. This element will remain in condition state 1.

INSPECTION COMMENTARY

MISCELLANEOUS

This location in Anaheim Bay is a navigable waterway for smaller boats which is under the jurisdiction of the United States Coast Guard.

SAFE LOAD CAPACITY

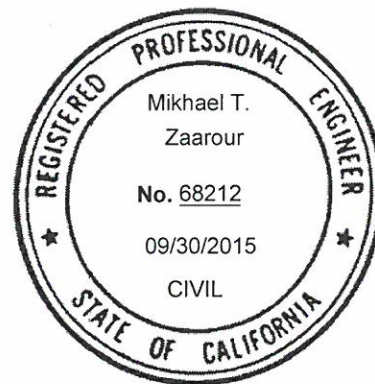
ELEMENT INSPECTION RATINGS AND COMMENTARY

Elem No.	Defect /Prot	Element Description	Env	Total Qty	Units	Qty in each Condition	State		
						St. 1	St. 2	St. 3	St. 4
16		Top Flange-RC	3	781	sq.m	781	0	0	0
	511	Deck Wearing Surface-Concrete	3	533	sq.m	533	0	0	0
(16)									
There were no significant defects noted.									
(16-511)									
There were no significant defects noted.									
104		Box Girder-PS Conc.	3	62	m	62	0	0	0
(104)									
There were no significant defects noted.									
205		Column-RC	4	3	each	3	0	0	0
(205)									
There were no significant defects noted.									
215		Abutment-RC	2	30	m	30	0	0	0
(215)									
There were no significant defects noted.									
234		Pier Cap-RC	3	36	m	34	2	0	0
	1120	Efflorescence/Rust Staining	3	2		0	2	0	0
(234-1120)									
Rust stain on the surface of pier #4									
256		Slope Protection	3	2	ea.	2	0	0	0
(256)									
There were no significant defects noted.									
312		Bearing-Enclosed	3	8	each	8	0	0	0
(312)									
The bearing element is included to indicate the presence of bearings on this structure. The bearings were not exposed for visual inspection. No indication of bearing distress was noted in any substructure element.									
321		Approach Slab-RC	3	52	sq.m	52	0	0	0
(321)									
There were no significant defects noted.									
333		Railing-Other	3	142	m	142	0	0	0
(333)									
There were no significant defects noted.									

WORK RECOMMENDATIONS - NONE

Team Leader : Mikhael T. Zaarour
Report Author : Mikhael T. Zaarour
Inspected By : MT.Zaarour/M.Zolfaghari

Mikhael T. Zaarour 3/30/15
Mikhael T. Zaarour (Registered Civil Engineer) (Date)



STRUCTURE INVENTORY AND APPRAISAL REPORT

***** IDENTIFICATION *****

(1) STATE NAME- CALIFORNIA 069
 (8) STRUCTURE NUMBER 55C0561
 (5) INVENTORY ROUTE(ON/UNDER)- ON 140000000
 (2) HIGHWAY AGENCY DISTRICT 12
 (3) COUNTY CODE 059 (4) PLACE CODE 00000
 (6) FEATURE INTERSECTED- DANA POINT HARBOR
 (7) FACILITY CARRIED- ISLAND WAY
 (9) LOCATION- 0.1 MI S/O DANA PT HBR DR
 (11) MILEPOINT/KILOMETERPOINT 0
 (12) BASE HIGHWAY NETWORK- NOT ON NET 0
 (13) LRS INVENTORY ROUTE & SUBROUTE
 (16) LATITUDE 33 DEG 27 MIN 35.58 SEC
 (17) LONGITUDE 117 DEG 41 MIN 57.87 SEC
 (98) BORDER BRIDGE STATE CODE % SHARE %
 (99) BORDER BRIDGE STRUCTURE NUMBER

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

(43) STRUCTURE TYPE MAIN:MATERIAL- PRSTR CONC CONT
 TYPE- BOX BEAM OR GIRDER - MULTI CODE 605
 (44) STRUCTURE TYPE APPR:MATERIAL- OTHER/NA
 TYPE- OTHER/NA CODE 000
 (45) NUMBER OF SPANS IN MAIN UNIT 4
 (46) NUMBER OF APPROACH SPANS 0
 (107) DECK STRUCTURE TYPE- PRECAST CONC. PA CODE 2
 (108) WEARING SURFACE / PROTECTIVE SYSTEM:
 A) TYPE OF WEARING SURFACE- CONCRETE CODE 1
 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-PEDESTRIAN 5
 UNDER- WATERWAY 5
 (28) LANES:ON STRUCTURE 02 UNDER STRUCTURE 00
 (29) AVERAGE DAILY TRAFFIC 3510
 (30) YEAR OF ADT 2011 (109) TRUCK ADT 1 %
 (19) BYPASS, DETOUR LENGTH 199 KM

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

(48) LENGTH OF MAXIMUM SPAN 15.2 M
 (49) STRUCTURE LENGTH 62.5 M
 (50) CURB OR SIDEWALK: LEFT 1.5 M RIGHT 1.5 M
 (51) BRIDGE ROADWAY WIDTH CURB TO CURB 8.5 M
 (52) DECK WIDTH OUT TO OUT 12.5 M
 (32) APPROACH ROADWAY WIDTH (W/SHOULDERS) 8.5 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 8.5 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- NO CONTROL CODE 0
 (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 = 61.0
 STATUS
 HEALTH INDEX 99.9
 PAINT CONDITION INDEX = N/A

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

(112) NBIS BRIDGE LENGTH- YES Y
 (104) HIGHWAY SYSTEM- NOT ON NHS 0
 (26) FUNCTIONAL CLASS- LOCAL URBAN 19
 (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 8
 (59) SUPERSTRUCTURE 8
 (60) SUBSTRUCTURE 7
 (61) CHANNEL & CHANNEL PROTECTION 9
 (62) CULVERTS N

***** LOAD RATING AND POSTING ***** CODE

(31) DESIGN LOAD- MS-18 OR HS-20 5
 (63) OPERATING RATING METHOD- ASSIGNED (LFD) A
 (64) OPERATING RATING- 54.1
 (65) INVENTORY RATING METHOD- ASSIGNED (LFD) A
 (66) INVENTORY RATING- 32.4
 (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 7
 (68) DECK GEOMETRY 4
 (69) UNDERCLEARANCES, VERTICAL & HORIZONTAL N
 (71) WATER ADEQUACY 9
 (72) APPROACH ROADWAY ALIGNMENT 8
 (36) TRAFFIC SAFETY FEATURES 1000
 (113) SCOUR CRITICAL BRIDGES 5

***** 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 3176
 (115) YEAR OF FUTURE ADT 2037

***** INSPECTIONS *****

(90) INSPECTION DATE 02/15 (91) FREQUENCY 48 MO
 (92) CRITICAL FEATURE INSPECTION: (93) CFI DATE
 A) FRACTURE CRIT DETAIL- NO MO A)
 B) UNDERWATER INSP- YES 60 MO B) 06/14
 C) OTHER SPECIAL INSP- NO MO C)

Orange County Bridge Review Summary

Dokken Engineering performed a field review of the Orange County bridge listed below in April 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: 55C0572

Bridge Name: Santa Ana Delhi Channel

Year Built: 1988

Facility Carried: Irvine Avenue

The Santa Ana Delhi Channel Bridge at Irvine Avenue is a reinforced concrete triple box culvert.

Caltrans BIR recommendations:

- None

Field Inspection Observations

- Diagonal cracks on pier nosing.
- Efflorescence visible on bridge soffit (photo 4). Difficult to determine source of water due to cover and AC on deck.

Maintenance Needs Assessment

BPMP Assessment

- Efflorescence likely from water penetrating through deck. Not significant problem at this time and no action recommended. To repair will require deck AC and fill removal, deck treatment, and replacing fill and AC. Condition of soffit should be monitored for continued deterioration.

General Maintenance – Non-BPMP

- Monitor cracks on pier nose. Epoxy seal if condition worsens.

Proposed BPMP Construction Costs

- If deck seal project initiated, cost likely exceeds \$200,000.

Construction Items Not Funded by BPMP

- N/A

APPENDIX A

Photos and BIR



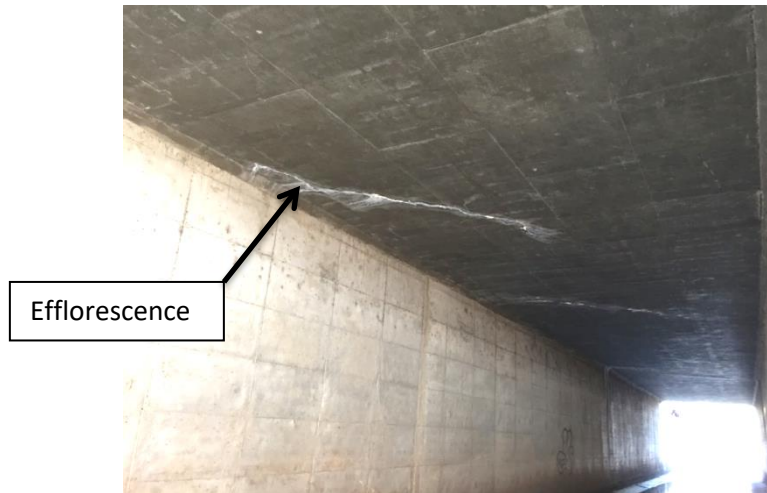
Photo 1:



Photo 2:

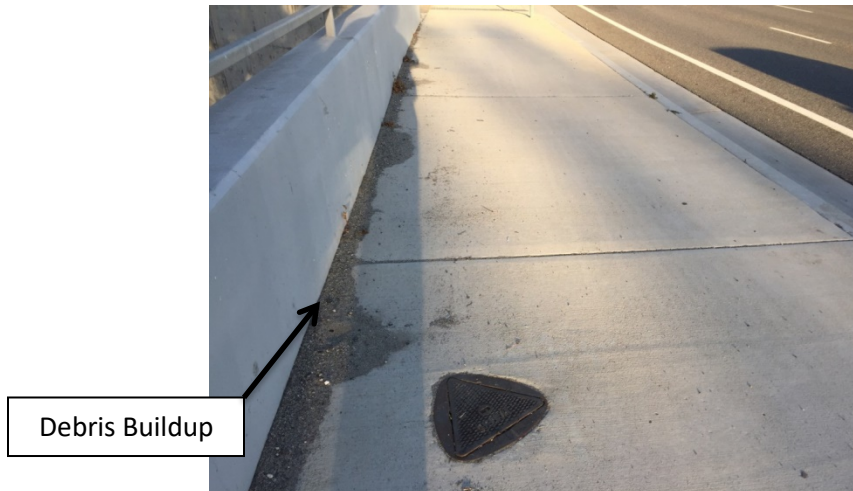


Photo 3:



Efflorescence

Photo 4: Bridge Soffit



Debris Buildup

Photo 5: Sidewalk



Cracks

Photo 6:



DEPARTMENT OF TRANSPORTATION
Structure Maintenance & Investigations

Bridge Number : 55C0572
Facility Carried: IRVINE AVENUE
Location : 0.4 MI SW/O BRISTOL ST.
City :
Inspection Date : 12/09/2014

Bridge Inspection Report

Inspection Type
Routine FC Underwater Special Other
☒

STRUCTURE NAME: SANTA ANA DELHI CHANNEL

CONSTRUCTION INFORMATION

Year Built : 1988	Skew (degrees): 38
Year Widened: N/A	No. of Joints : 0
Length (m) : 22.3	No. of Hinges : 0

Structure Description: Triple 5.5 m W x 4.6 m H x 45.7 m L RC box culvert (grade top)
beneath 1.5 m of earth fill.

Span Configuration : (W) 3 @ 5.5 m (E) clear, normal

SAFE LOAD CAPACITY AND RATINGS

Design Live Load: UNKNOWN		
Inventory Rating: RF=1.00 =>32.4 metric tons	Calculation Method: FIELD EVAL/ENG JUDGMENT	
Operating Rating: RF=1.67 =>54.1 metric tons	Calculation Method: FIELD EVAL/ENG JUDGMENT	
Permit Rating : PPPPP		
Posting Load : Type 3: <u>Legal</u>	Type 3S2: <u>Legal</u>	Type 3-3: <u>Legal</u>

DESCRIPTION ON STRUCTURE

Deck X-Section: (S) 0.3 m br, 2.8 m sw, 11.6 m, 3.75 m med, 11.5 m, 2.9 m sw, 0.3 m br (N)
Total Width: 45.1 m Net Width: 30.3 m No. of Lanes: 6 Speed: 50 mph
Min. Vertical Clearance: Unimpaired
Rail Code: 0000 Rail Description: Concrete type 26 mod.

DESCRIPTION UNDER STRUCTURE

Channel Description: RC rectangular.

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

SCOPE AND ACCESS

Access into the channel in from northwest quadrant the channel was dry at time of inspection. All elements were inspected.

ELEMENT INSPECTION RATINGS AND COMMENTARY

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	138	m	126	6	6	0
	1120		Efflorescence/Rust Staining	2	6		0	0	6	0
	1130		Cracking (RC and Other)	2	6		0	6	0	0

(241-1120)

There are 2 longitudinal cracks in the soffit of every barrel with light brown efflorescence.

(241-1130)

There are 1 mm wide vertical cracks in the walls as fallow 1 crack in wall # 1, 3 cracks in wall # 3, and 6 cracks in wall #3.

331			Railing-RC	2	45	m	39	6	0	0
-----	--	--	------------	---	----	---	----	---	---	---

(331)


There were no significant defects noted.

WORK RECOMMENDATIONS - NONE

Team Leader : Mikhael T. Zaarour

Report Author : Mikhael T. Zaarour

Inspected By : MT.Zaarour/KD.Henderson

 12/15/14

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



STRUCTURE INVENTORY AND APPRAISAL REPORT

***** IDENTIFICATION *****

(1) STATE NAME- CALIFORNIA 069
 (8) STRUCTURE NUMBER 55C0572
 (5) INVENTORY ROUTE(ON/UNDER)- ON 140000000
 (2) HIGHWAY AGENCY DISTRICT 12
 (3) COUNTY CODE 059 (4) PLACE CODE 00000
 (6) FEATURE INTERSECTED- SANTA ANA DELHI CHANNEL
 (7) FACILITY CARRIED- IRVINE AVENUE
 (9) LOCATION- 0.4 MI SW/O BRISTOL ST.
 (11) MILEPOINT/KILOMETERPOINT 0
 (12) BASE HIGHWAY NETWORK- NOT ON NET 0
 (13) LRS INVENTORY ROUTE & SUBROUTE
 (16) LATITUDE 33 DEG 39 MIN 35.67 SEC
 (17) LONGITUDE 117 DEG 52 MIN 52.73 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 3
 (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 1988
 (106) YEAR RECONSTRUCTED 0000
 (42) TYPE OF SERVICE: ON- HIGHWAY-PEDESTRIAN 5
 UNDER- WATERWAY 5
 (28) LANES:ON STRUCTURE 06 UNDER STRUCTURE 00
 (29) AVERAGE DAILY TRAFFIC 18000
 (30) YEAR OF ADT 2009 (109) TRUCK ADT 1 %
 (19) BYPASS, DETOUR LENGTH 2 KM

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

(48) LENGTH OF MAXIMUM SPAN 5.5 M
 (49) STRUCTURE LENGTH 22.3 M
 (50) CURB OR SIDEWALK: LEFT 2.4 M RIGHT 0.0 M
 (51) BRIDGE ROADWAY WIDTH CURB TO CURB 30.3 M
 (52) DECK WIDTH OUT TO OUT 45.1 M
 (32) APPROACH ROADWAY WIDTH (W/SHOULDERS) 30.3 M
 (33) BRIDGE MEDIAN- CLOSED (NO BARRIER) 2
 (34) SKEW 38 DEG (35) STRUCTURE FLARED NO
 (10) INVENTORY ROUTE MIN VERT CLEAR 99.99 M
 (47) INVENTORY ROUTE TOTAL HORIZ CLEAR 30.3 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 = 95.3
 STATUS
 HEALTH INDEX 95.6
 PAINT CONDITION INDEX = N/A

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

(112) NBIS BRIDGE LENGTH- YES Y
 (104) HIGHWAY SYSTEM- NOT ON NHS 0
 (26) FUNCTIONAL CLASS- MINOR ARTERIAL URBAN 16
 (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 9
 (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- 54.1
 (65) INVENTORY RATING METHOD- FIELD EVAL/ENG JUL 0
 (66) INVENTORY RATING- 32.4
 (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 7
 (68) DECK GEOMETRY 9
 (69) UNDERCLEARANCES, VERTICAL & HORIZONTAL N
 (71) WATER ADEQUACY 9
 (72) APPROACH ROADWAY ALIGNMENT 7
 (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 26553
 (115) YEAR OF FUTURE ADT 2031

***** INSPECTIONS *****

(90) INSPECTION DATE 12/14 (91) FREQUENCY 48 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)

Orange County Bridge Review Summary

Dokken Engineering performed a field review of the Orange County bridge listed below in April 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: 55C0573

Bridge Name: Redhill Channel

Year Built: 1980

Facility Carried: Riverford Road

The Redhill Channel culvert at River Road is a reinforced concrete double box culvert. There was no access to the culvert. The culvert was visually inspected from the access roads.

Caltrans BIR recommendations:

- None

Field Inspection Observations

- Vertical cracks on pier nosing.
- There appears to be excessive AC overly. Recommend no addition AC lifts be placed on structure.

Maintenance Needs Assessment

BPMP Assessment

- N/A – No eligible maintenance activities

General Maintenance – Non-BPMP

- Monitor vertical cracks on pier nose. Epoxy inject if increase in size or spalling occurs. Not critical at this time.

Proposed BPMP Construction Costs

- N/A

Construction Items Not Funded by BPMP

- N/A

APPENDIX A

Photos and BIR



Photo 1: Redhill Channel Bridge



Photo 2: Pier Wall



Photo 3: Parapet View



DEPARTMENT OF TRANSPORTATION
Structure Maintenance & Investigations

Bridge Number : 55C0573
Facility Carried: RIVERFORD ROAD
Location : 0.1 MI. NW/O BROWNING AV
City :
Inspection Date : 08/05/2015

Bridge Inspection Report

Inspection Type

Routine FC Underwater Special Other

☒

STRUCTURE NAME: REDHILL CHANNEL

CONSTRUCTION INFORMATION

Year Built : 1980 Skew (degrees): 0
Year Widened: 1989 No. of Joints : 0
Length (m) : 6.7 No. of Hinges : 0

Structure Description: Double 3.7 m W and 2.6 m W x 2.4 m H x 14.3 m L RC box culvert
(grade top) beneath 0.6 m of earth fill.

Span Configuration : (W) 2.6 m, 3.7 m (E) clear, normal

SAFE LOAD CAPACITY AND RATINGS

Design Live Load: UNKNOWN

Inventory Rating: RF=1.00 =>32.4 metric tons

Calculation Method: FIELD EVAL/ENG JUDGMENT

Operating Rating: RF=1.67 =>54.1 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, 1.2 m sw, 11.0 m, 1.2 m sw, 0.2 m br (N)

Total Width: 14.8 m Net Width: 11.0 m No. of Lanes: 2 Speed: 25 mph

Min. Vertical Clearance: Unimpaired

Overlay Thickness: 3.0 Inches

Rail Code: 0000

Rail Type	Location	Length (ft)	Rail Modifications
Masonry	Right/Left	64	

DESCRIPTION UNDER STRUCTURE

Channel Description: RC rectangular.

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

SCOPE AND ACCESS

The inspection was performed by walking on the deck and using the ladder to access under the structure. All elements were visually inspected.

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	28	m	28	0	0	0
(241)										
There are 5 hairline vertical cracks in the middle pier wall with white efflorescence.										
331			Railing-RC	2	13	m	13	0	0	0
(331)										
There were no significant defects noted.										

WORK RECOMMENDATIONS - NONE

Team Leader : Mikhael T. Zaarour

Report Author : Mikhael T. Zaarour

Inspected By : MT.Zaarour/KD.Henderson

M. KWS 9/23/15
Mikhael T. Zaarour (Registered Civil Engineer) (Date)



STRUCTURE INVENTORY AND APPRAISAL REPORT

***** IDENTIFICATION *****

(1) STATE NAME- CALIFORNIA 069
 (8) STRUCTURE NUMBER 55C0573
 (5) INVENTORY ROUTE (ON/UNDER) - ON 140000000
 (2) HIGHWAY AGENCY DISTRICT 12
 (3) COUNTY CODE 059 (4) PLACE CODE 00000
 (6) FEATURE INTERSECTED- REDHILL CHANNEL
 (7) FACILITY CARRIED- RIVERFORD ROAD
 (9) LOCATION- 0.1 MI. NW/O BROWNING AVE
 (11) MILEPOINT/KILOMETERPOINT 0
 (12) BASE HIGHWAY NETWORK- NOT ON NET 0
 (13) LRS INVENTORY ROUTE & SUBROUTE
 (16) LATITUDE 33 DEG 44 MIN 17.15 SEC
 (17) LONGITUDE 117 DEG 48 MIN 08.32 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 1980
 (106) YEAR RECONSTRUCTED 1989
 (42) TYPE OF SERVICE: ON- HIGHWAY-PEDESTRIAN 5
 UNDER- WATERWAY 5
 (28) LANES:ON STRUCTURE 02 UNDER STRUCTURE 00
 (29) AVERAGE DAILY TRAFFIC 1000
 (30) YEAR OF ADT 2009 (109) TRUCK ADT 1 %
 (19) BYPASS, DETOUR LENGTH 2 KM

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

(48) LENGTH OF MAXIMUM SPAN 3.7 M
 (49) STRUCTURE LENGTH 6.7 M
 (50) CURB OR SIDEWALK: LEFT 1.2 M RIGHT 1.2 M
 (51) BRIDGE ROADWAY WIDTH CURB TO CURB 11.0 M
 (52) DECK WIDTH OUT TO OUT 14.8 M
 (32) APPROACH ROADWAY WIDTH (W/SHOULDERS) 11.0 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 11.0 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 = 96.9
 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 URBAN 19
 (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 9
 (62) CULVERTS 8

***** LOAD RATING AND POSTING ***** CODE

(31) DESIGN LOAD- UNKNOWN 0
 (63) OPERATING RATING METHOD- FIELD EVAL/ENG JUD 0
 (64) OPERATING RATING- 54.1
 (65) INVENTORY RATING METHOD- FIELD EVAL/ENG JUL 0
 (66) INVENTORY RATING- 32.4
 (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 8
 (68) DECK GEOMETRY 7
 (69) UNDERCLEARANCES, VERTICAL & HORIZONTAL N
 (71) WATER ADEQUACY 9
 (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 2061
 (115) YEAR OF FUTURE ADT 2032

***** INSPECTIONS *****

(90) INSPECTION DATE 08/15 (91) FREQUENCY 48 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)

Orange County Bridge Review Summary

Dokken Engineering performed a field review of the Orange County bridge listed below in April 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: 55C0574

Bridge Name: Redhill Channel

Year Built: 1980

Facility Carried: Bent Twig Lane

The Redhill Channel culvert at Bent Twig Lane is a reinforced concrete Triple box culvert.

Caltrans BIR recommendations:

- Repair post pocket spalls.

Field Inspection Observations

- There was no access to the culvert. The culvert was visually inspected from the access roads.
- Spalling and delaminated concrete around post pockets (photo 1 & 3).
- Rusted galvanized fence post likely cause of spall (photo 3).

Maintenance Needs Assessment

BPMP Assessment

- N/A – No eligible maintenance activities.

General Maintenance – Non-BPMP

- Replace fence post and repair post pocket spalls. If fence post not replaced, spall will reoccur.

Proposed BPMP Construction Costs

- N/A

Construction Items Not Funded by BPMP

- Repair spalled concrete and replace fence post < \$15,000 (includes engineering, mobilization and contingency).

APPENDIX A

Photos and BIR

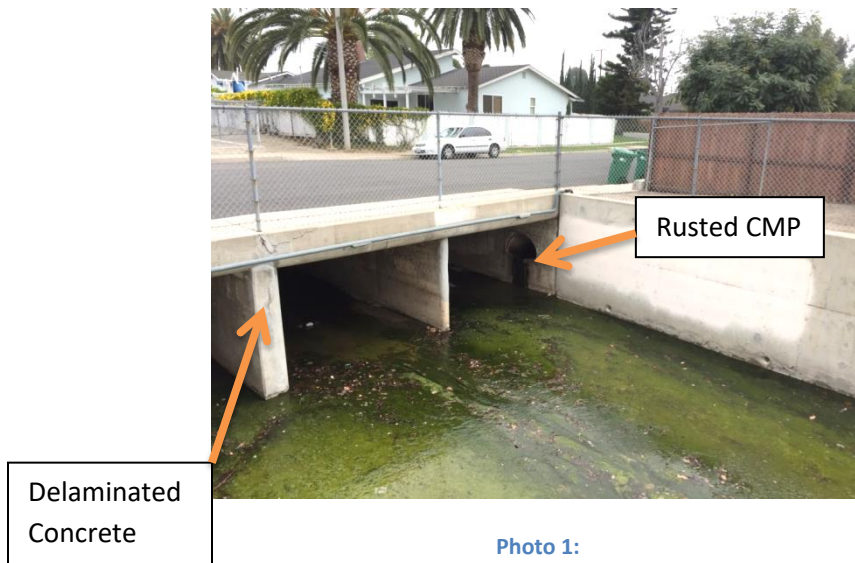




Photo 4:



Photo 5:



DEPARTMENT OF TRANSPORTATION
Structure Maintenance & Investigations

Bridge Number : 55C0574
Facility Carried: BENT TWIG LANE
Location : 0.1 MI. NW/O BROWNING AV
City :
Inspection Date : 08/05/2015

Bridge Inspection Report

Inspection Type

Routine FC Underwater Special Other

☒

STRUCTURE NAME: REDHILL CHANNEL

CONSTRUCTION INFORMATION

Year Built : 1980 Skew (degrees): 0
Year Widened: 1989 No. of Joints : 0
Length (m) : 8.8 No. of Hinges : 0

Structure Description: Triple 2.7 m W x 1.5 m H x 14.3 m L RC box culvert (grade top)
beneath 0.3 m of earth fill.

Span Configuration : (W) 3 @ 2.7 m (E) clear, normal

SAFE LOAD CAPACITY AND RATINGS

Design Live Load: UNKNOWN

Inventory Rating: RF=1.00 =>32.4 metric tons

Calculation Method: FIELD EVAL/ENG JUDGMENT

Operating Rating: RF=1.67 =>54.1 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 cu, 1.3 m sw, 10.8 m, 1.3 m sw, 0.2 m br (N)

Total Width: 13.7 m Net Width: 10.8 m No. of Lanes: 2 Speed: 25 mph

Min. Vertical Clearance: Unimpaired

Overlay Thickness: 3.0 Inches

Rail Code: 0000 Rail Description: Chain link fence.

DESCRIPTION UNDER STRUCTURE

Channel Description: RC rectangular.

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

SCOPE AND ACCESS

The inspection was performed by walking on the deck and using the ladder to access under the structure. All elements were visually inspected.

There is a post pocket spalls 400 mm x 300 mm x 75 mm at the CLF post #2 from west in the north headwall.

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.


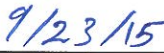
INSPECTION COMMENTARYELEMENT INSPECTION RATINGS AND NOTES

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	42	m	42	0	0	0
(241)										
There were no significant defects noted.										

WORK RECOMMENDATIONS

RecDate: 07/13/2011 EstCost: Repiar the post pocket spalls 400 mm x
 Action : Super-Patch spalls StrTarget: 2 YEARS 300 mm x 75 mm at the CLF post #2 from
 Work By: LOCAL AGENCY DistTarget: west in the north headwall.
 Status : PROPOSED EA:

Team Leader : Mikhael T. Zaarour
 Report Author : Mikhael T. Zaarour
 Inspected By : MT.Zaarour/KD.Henderson



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



STRUCTURE INVENTORY AND APPRAISAL REPORT

***** IDENTIFICATION *****

(1) STATE NAME- CALIFORNIA 069
 (8) STRUCTURE NUMBER 55C0574
 (5) INVENTORY ROUTE(ON/UNDER)- ON 140000000
 (2) HIGHWAY AGENCY DISTRICT 12
 (3) COUNTY CODE 059 (4) PLACE CODE 00000
 (6) FEATURE INTERSECTED- REDHILL CHANNEL
 (7) FACILITY CARRIED- BENT TWIG LANE
 (9) LOCATION- 0.1 MI. NW/O BROWNING AVE
 (11) MILEPOINT/KILOMETERPOINT 0
 (12) BASE HIGHWAY NETWORK- NOT ON NET 0
 (13) LRS INVENTORY ROUTE & SUBROUTE
 (16) LATITUDE 33 DEG 44 MIN 19.55 SEC
 (17) LONGITUDE 117 DEG 48 MIN 06.11 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 3
 (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 1980
 (106) YEAR RECONSTRUCTED 1989
 (42) TYPE OF SERVICE: ON- HIGHWAY-PEDESTRIAN 5
 UNDER- WATERWAY 5
 (28) LANES:ON STRUCTURE 02 UNDER STRUCTURE 00
 (29) AVERAGE DAILY TRAFFIC 500
 (30) YEAR OF ADT 2011 (109) TRUCK ADT 1 %
 (19) BYPASS, DETOUR LENGTH 2 KM

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

(48) LENGTH OF MAXIMUM SPAN 2.7 M
 (49) STRUCTURE LENGTH 8.8 M
 (50) CURB OR SIDEWALK: LEFT 1.3 M RIGHT 1.3 M
 (51) BRIDGE ROADWAY WIDTH CURB TO CURB 10.8 M
 (52) DECK WIDTH OUT TO OUT 13.7 M
 (32) APPROACH ROADWAY WIDTH (W/SHOULDERS) 10.8 M
 (33) BRIDGE MEDIAN- CLOSED (NO BARRIER) 2
 (34) SKEW 0 DEG (35) STRUCTURE FLARED NO
 (10) INVENTORY ROUTE MIN VERT CLEAR 99.99 M
 (47) INVENTORY ROUTE TOTAL HORIZ CLEAR 10.8 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 = 97.0
 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- 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 N
 (59) SUPERSTRUCTURE N
 (60) SUBSTRUCTURE N
 (61) CHANNEL & CHANNEL PROTECTION 9
 (62) CULVERTS 8

***** LOAD RATING AND POSTING ***** CODE

(31) DESIGN LOAD- UNKNOWN 0
 (63) OPERATING RATING METHOD- FIELD EVAL/ENG JUD 0
 (64) OPERATING RATING- 54.1
 (65) INVENTORY RATING METHOD- FIELD EVAL/ENG JUL 0
 (66) INVENTORY RATING- 32.4
 (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 8
 (68) DECK GEOMETRY 6
 (69) UNDERCLEARANCES, VERTICAL & HORIZONTAL N
 (71) WATER ADEQUACY 9
 (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 921
 (115) YEAR OF FUTURE ADT 2032

***** INSPECTIONS *****

(90) INSPECTION DATE 08/15 (91) FREQUENCY 48 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)

Orange County Bridge Review Summary

Dokken Engineering performed a field review of the Orange County bridge listed below in April 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: 55C0606

Bridge Name: Arroyo Trabuco

Year Built: 1991

Facility Carried: Oso Parkway

The Arroyo Trabuco Bridge at Oso Parkway is a continuous five span cast-in-place concrete box girder with reinforced concrete open-end seat abutments supported on concrete piles.

Caltrans BIR recommendations:

- The County investigate the dripping water through bridge soffit openings, cells, and vent holes.
- BIR notes nearly 60,000 ft² of deck should be considered for deck treatment. However, all treatment is listed under condition state 1 and is therefore ineligible for BPMP funding.

Field Inspection Observations

- Efflorescence near each wetted area indicating water is seeping through soffit slab. Water dripping in span 1, this appears to be from a utility line in the bridge. Recommend contacting utility and have utility owner correct problem before significant damage, such as corrosion, occurs to soffit. Note, if the leaking utility is sewer water then much more corrosive. Soffit opening cover appears to be corroding (Photo 4). Note this work is not eligible for BPMP funds.
- Joint seal detached at north end. (photo 5)
- Significant bank erosion. It is unclear if the water is from weep hole drainage system or detached joint seal. Since there does not appear to be water coming from the seat, it is assumed it is from the weep holes system. Investigate source of water and repair leak before condition worsens. Note this is not eligible for BPMP funds. (Photo 6 & 7)
- Minor deck cracking, not a priority to address.

Maintenance Needs Assessment

BPMP Assessment

- Repair joint seals.
- Identify water source causing bank erosion and repair problem.

General Maintenance – Non-BPMP

- Clean out down drains.
- Deck cracks are condition state 1, so are not considered significant and are not eligible for BPMP funding.
- Have utility owner stop leaks.

Proposed BPMP Construction Costs

- Joint Seal = 104 ft * \$150/LF ≈ \$16,000
- Traffic Control ≈ \$15,000
- Bank erosion ≈ \$20,000. Difficult to estimate until water source identified
- Estimated Total Construction Cost (with engineering, mobilization and contingency) ≈ \$65,000

Construction Items Not Funded by BPMP

- Bridge deck treatment (low priority due to relatively minor cracking) ≈ \$200,000 (includes engineering, mobilization and contingency)
- Clean deck drains ≈ \$10,000, includes traffic control and assumes pipes clogged
- Utility repair should be covered by utility owner

APPENDIX A

Photos and BIR



Photo 1:



Photo 2:



Photo 3:

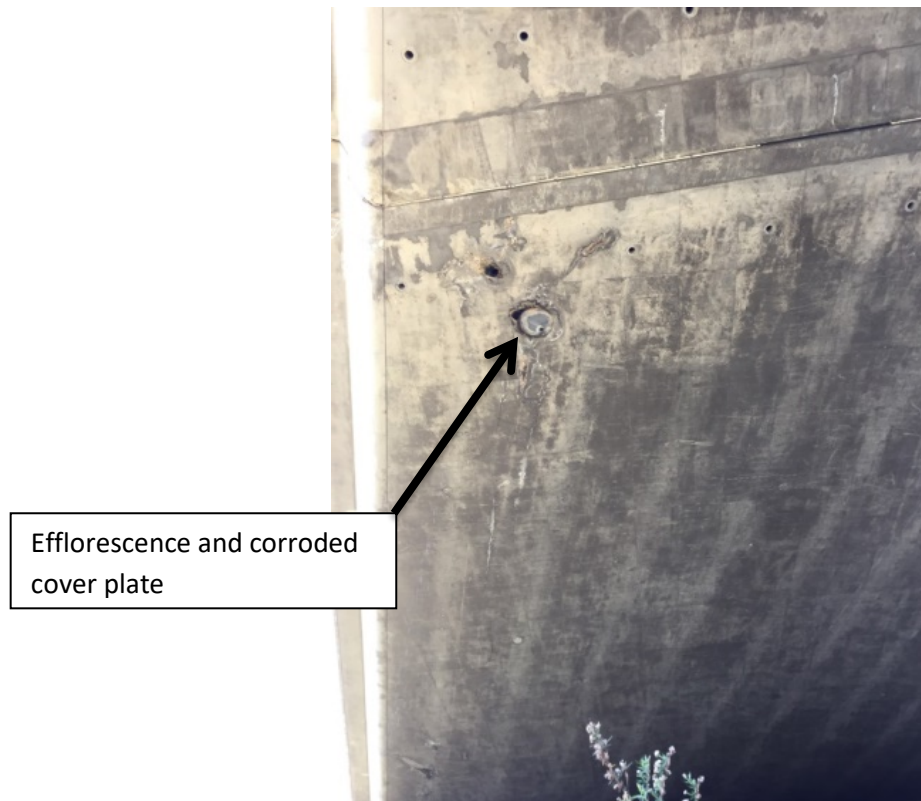


Photo 4: Bridge Soffit showing efflorescence and corroded cover plate

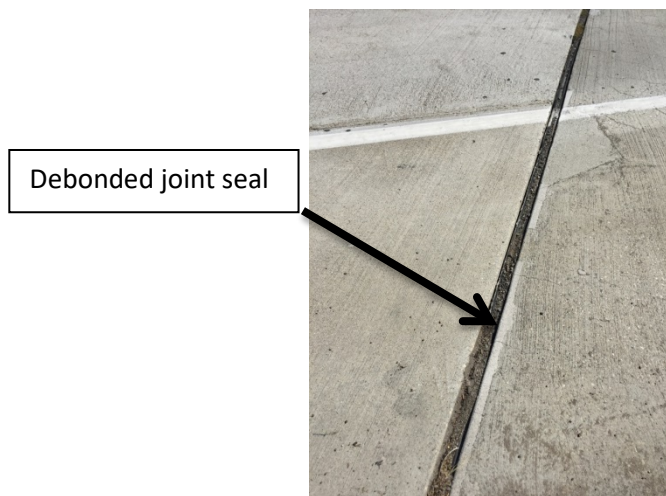


Photo 5: Detached joint seal at north end of bridge

Deep Rutting



Photo 6: Rutting at abutment



Photo 7: Erosion at abutment weep hole drainage system


DEPARTMENT OF TRANSPORTATION
 Structure Maintenance & Investigations

 Bridge Number : 55C0606
 Facility Carried: OSO PARKWAY
 Location : 0.6 MI E/O FELIPE ROAD
 City :
 Inspection Date : 01/29/2015

Inspection Type

Routine FC Underwater Special Other

☒
Bridge Inspection Report
STRUCTURE NAME: ARROYO TRABUCO

CONSTRUCTION INFORMATION

 Year Built : 1991 Skew (degrees): 99
 Year Widened: N/A No. of Joints : 3
 Length (m) : 202.7 No. of Hinges : 1

Structure Description: Continuous 5 span CIP/PS concrete box girder (11 cells) with RC 2-column bents and RC open end seat abutments, all supported upon concrete piles (Abutment 1 has steel piles).

Span Configuration : (W) 45.7 m, 3 @ 36.6 m, 45.7 m (E) c/c

SAFE LOAD CAPACITY AND RATINGS

Design Live Load: MS-18+MOD OR HS-20+MOD

Inventory Rating: RF=1.00 =>32.4 metric tons

Calculation Method: ASSIGNED (LFD)

Operating Rating: RF=1.67 =>54.1 metric tons

Calculation Method: ASSIGNED (LFD)

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 br, 1.5 m sw, 13.4 m, 1.2 m cu med, 13.4 m, 1.5 m sw, 0.3 m br (N)

Total Width: 31.7 m Net Width: 26.8 m No. of Lanes: 6 Speed: 55 mph

Min. Vertical Clearance: Unimpaired

AC Thickness: 0.0 Inches

Rail Code: 0110

Rail Type	Location	Length (ft)	Rail Modifications
Type 26	Right/Left	1410	

DESCRIPTION UNDER STRUCTURE

Channel Description: Natural earth open wash with a cobbled streambed.

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
SCOPE AND ACCESS

There is 4" deep water in span 4, all elements have been visually inspected.

There is water dripping from the soffit vent hole in south side of span # 1.

SAFE LOAD CAPACITY

INSPECTION COMMENTARY

A Load Rating Summary Sheet dated 05/27/2014 is on file for this structure. The current rating has been assigned in accordance with SM&I procedures.

ELEMENT INSPECTION RATINGS AND COMMENTARY									
Elem No.	Defect /Prot	Element Description	Env	Total Qty	Units	Qty in each Condition State			
						St. 1	St. 2	St. 3	St. 4
16		Top Flange-RC	2	6425	sq.m	6425	0	0	0
	521	Concrete Coat. (Meth/Paint/Seal)	2	5420	sq.m	5420	0	0	0
(16)									
There were no significant defects noted.									
(16-521)									
There were no significant defects noted.									
104		Box Girder-PS Conc.	2	203	m	195	8	0	0
	1120	Efflorescence/Rust Staining	2	8		0	8	0	0
(104-1120)									
There are cracks with water stain in the soffit of the box girder, 2 craks in every spans.									
205		Column-RC	2	8	each	8	0	0	0
(205)									
There were no significant defects noted.									
215		Abutment-RC	2	88	m	88	0	0	0
(215)									
There were no significant defects noted.									
225		Pile-Steel	2	1	ea.	1	0	0	0
(225)									
The pile element is included to indicate the presence of piles on this structure. The piles were not exposed for visual inspection. No indication of pile distress was noted in any substructure element.									
227		Pile-RC	2	1	ea.	1	0	0	0
(227)									
The pile element is included to indicate the presence of piles on this structure. The piles were not exposed for visual inspection. No indication of pile distress was noted in any substructure element.									
300		Joint-Strip Seal Exp	2	80	m	80	0	0	0
(300)									
There were no significant defects noted.									
302		Joint-Compression Seal	2	40	m	40	0	0	0
(302)									
There were no significant defects noted.									
312		Bearing-Enclosed	2	2	each	2	0	0	0
(312)									
There were no significant defects noted.									
321		Approach Slab-RC	2	264	sq.m	264	0	0	0
(321)									

ELEMENT INSPECTION RATINGS AND COMMENTARY

Elem No.	Defect /Prot	Element Description	Env	Total Qty	Units	Qty in each State	Condition	State
						St. 1	St. 2	St. 3 St. 4

There were no significant defects noted.

331		Railing-RC	2	404	m	404	0	0 0
-----	--	------------	---	-----	---	-----	---	-----

(331)

There were no significant defects noted.

WORK RECOMMENDATIONS

RecDate: 02/22/2011

EstCost:

The city should investigate the dripping

Action : Drainage Issue

StrTarget: 2 YEARS

water through the bridge cell.

Work By: LOCAL AGENCY

DistTarget:

Status : PROPOSED

EA:

Team Leader : Mikhael T. Zaarour

Report Author : Mikhael T. Zaarour

Inspected By : MT.Zaarour/KD.Henderson

Mikhael T. Zaarour 3/30/15
 Mikhael T. Zaarour (Registered Civil Engineer) (Date)



STRUCTURE INVENTORY AND APPRAISAL REPORT

***** IDENTIFICATION *****

(1) STATE NAME- CALIFORNIA 069
 (8) STRUCTURE NUMBER 55C0606
 (5) INVENTORY ROUTE(ON/UNDER)- ON 140000000
 (2) HIGHWAY AGENCY DISTRICT 12
 (3) COUNTY CODE 059 (4) PLACE CODE 00000
 (6) FEATURE INTERSECTED- ARROYO TRABUCO
 (7) FACILITY CARRIED- OSO PARKWAY
 (9) LOCATION- 0.6 MI E/O FELIPE ROAD
 (11) MILEPOINT/KILOMETERPOINT 0
 (12) BASE HIGHWAY NETWORK- PART OF NET 1
 (13) LRS INVENTORY ROUTE & SUBROUTE 000000000000
 (16) LATITUDE 33 DEG 35 MIN 04.43 SEC
 (17) LONGITUDE 117 DEG 38 MIN 04.21 SEC
 (98) BORDER BRIDGE STATE CODE % SHARE %
 (99) BORDER BRIDGE STRUCTURE NUMBER

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

(43) STRUCTURE TYPE MAIN:MATERIAL- PRSTR CONC CONT
 TYPE- BOX BEAM OR GIRDER - MULTI CODE 605
 (44) STRUCTURE TYPE APPR:MATERIAL- OTHER/NA
 TYPE- OTHER/NA CODE 000
 (45) NUMBER OF SPANS IN MAIN UNIT 5
 (46) NUMBER OF APPROACH SPANS 0
 (107) DECK STRUCTURE TYPE- CIP CONCRETE CODE 1
 (108) WEARING SURFACE / PROTECTIVE SYSTEM:
 A) TYPE OF WEARING SURFACE- NONE CODE 0
 B) TYPE OF MEMBRANE- NONE CODE 0
 C) TYPE OF DECK PROTECTION- NONE CODE 0

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

(27) YEAR BUILT 1991
 (106) YEAR RECONSTRUCTED 0000
 (42) TYPE OF SERVICE: ON- HIGHWAY-PEDESTRIAN 5
 UNDER- WATERWAY 5
 (28) LANES:ON STRUCTURE 06 UNDER STRUCTURE 00
 (29) AVERAGE DAILY TRAFFIC 27000
 (30) YEAR OF ADT 2013 (109) TRUCK ADT 1 %
 (19) BYPASS, DETOUR LENGTH 11 KM

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

(48) LENGTH OF MAXIMUM SPAN 45.7 M
 (49) STRUCTURE LENGTH 202.7 M
 (50) CURB OR SIDEWALK: LEFT 1.5 M RIGHT 1.5 M
 (51) BRIDGE ROADWAY WIDTH CURB TO CURB 26.8 M
 (52) DECK WIDTH OUT TO OUT 31.7 M
 (32) APPROACH ROADWAY WIDTH (W/SHOULDERS) 26.8 M
 (33) BRIDGE MEDIAN- CLOSED NON-MOUNTABLE 3
 (34) SKEW 99 DEG (35) STRUCTURE FLARED NO
 (10) INVENTORY ROUTE MIN VERT CLEAR 99.99 M
 (47) INVENTORY ROUTE TOTAL HORIZ CLEAR 13.4 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 = 85.1

STATUS

HEALTH INDEX 99.9

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 8
 (59) SUPERSTRUCTURE 7
 (60) SUBSTRUCTURE 8
 (61) CHANNEL & CHANNEL PROTECTION 9
 (62) CULVERTS N

***** LOAD RATING AND POSTING ***** CODE

(31) DESIGN LOAD- MS-18+MOD OR HS-20+MOD 6
 (63) OPERATING RATING METHOD- ASSIGNED (LFD) A
 (64) OPERATING RATING- 54.1
 (65) INVENTORY RATING METHOD- ASSIGNED (LFD) A
 (66) INVENTORY RATING- 32.4
 (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 7
 (68) DECK GEOMETRY 7
 (69) UNDERCLEARANCES, VERTICAL & HORIZONTAL N
 (71) WATER ADEQUACY 9
 (72) APPROACH ROADWAY ALIGNMENT 8
 (36) TRAFFIC SAFETY FEATURES 0110
 (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 56200
 (115) YEAR OF FUTURE ADT 2035

***** INSPECTIONS *****

(90) INSPECTION DATE 01/15 (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)

Orange County Bridge Review Summary

Dokken Engineering performed a field review of the Orange County bridge listed below in April 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: 55C0628

Bridge Name: San Juan Creek

Year Built: 1997

Facility Carried: Antonio Parkway

The San Juan Creek Bridge at Antonio Parkway is a continuous five span cast-in-place post tension concrete box girder with two column bents and closed end seat abutments supported on driven steel H-piles and CIDH piles. The bridge was widened in 2013.

Caltrans BIR recommendations:

- None
- Although not noted in recommendations, the element inspection report indicates the bridge will qualify for deck treatment since ~68,000 ft² of deck is in condition state 2.

Field Inspection Observations

- Expansion joints and deck drains are full of dirt.
- Sand is piling up on the northeast side of sidewalk.

Maintenance Needs Assessment

BPMP Assessment

- Deck treatment is eligible for funding. However, consider low priority at this time.

General Maintenance – Non-BPMP

- Clean deck drains and remove sand from sidewalk.

Proposed BPMP Construction Costs

- Seal bridge deck ≈ \$200,000
- Estimated Total Construction Cost ≈ \$250,000 (with engineering, traffic control, mobilization and contingency)

Construction Items Not Funded by BPMP

- Unplug deck drains ≈ \$10,000, includes traffic control and assumes pipes clogged

APPENDIX A

Photos and BIR



Photo 1:



Photo 2:



Photo 3:



Photo 4:



Photo 5:



Photo 6:



DEPARTMENT OF TRANSPORTATION
Structure Maintenance & Investigations

Bridge Number : 55C0670
Facility Carried: HICKS CANYN HAUL RD
Location : 4.6 MI. SE/O CHAPMAN AVE
City :
Inspection Date : 08/13/2015
Inspection Type
Routine FC Underwater Special Other

Bridge Inspection Report

☒

STRUCTURE NAME: HICKS CANYON HAUL ROAD OC

CONSTRUCTION INFORMATION

Year Built : 1995
Year Widened: N/A
Length (m) : 36.5
Skew (degrees): 0
No. of Joints : 0
No. of Hinges : 0

Structure Description: Simply supported two span PC/PS concrete channel girders (3 each) with a continuous composite CIP concrete deck, and with an RC two column bent, and with RC open end diaphragm abutments, all supported upon driven Class 70C piles.

Span Configuration : (S) 13.0 m, 22.3 m (N) c/c

SAFE LOAD CAPACITY AND RATINGS

Design Live Load: UNKNOWN
Inventory Rating: RF=1.00 =>32.4 metric tons
Operating Rating: RF=1.67 =>54.1 metric tons
Permit Rating : PGGGG
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: (W) 0.2 m br, 0.7 m sw, 7.3 m, 0.7 m sw, 0.2 m br (E)
Total Width: 9.1 m Net Width: 7.3 m No. of Lanes: 2 Speed: mph
Min. Vertical Clearance: Unimpaired Overlay Thickness: 0.0 Inches
Rail Code: 1000

Rail Type	Location	Length (ft)	Rail Modifications
Type 26	Right/Left	150	

DESCRIPTION UNDER STRUCTURE

Facility Name	Func Class	Lanes	Horiz Clr (m)	Vert Clr (m)
Santiago Canyon Road	14	2	18.30	4.80

Channel Description: Under span #1 natural with riprap under the structure.

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

SCOPE AND ACCESS

The channel was dry during this inspection, and substructure elements were visually inspected. The top did not inspected

INSPECTION COMMENTARY**DECK AND ROADWAY**

The roadway on the structure is closed there is no public access.

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 State	Condition	State
							St. 1	St. 2	St. 3 St. 4
15			Top Flange-PS Conc.	2	333	sq.m	333	0	0 0
(15)			There were no significant defects noted.						
511			Deck Wearing Surface-Concrete	2	266	sq.m	266	0	0 0
(16-511)			There were no significant defects noted.						
109			Girder/Beam-PS Conc.	2	105	m	105	0	0 0
(109)			There were no significant defects noted.						
205			Column-RC	2	2	each	2	0	0 0
(205)			There were no significant defects noted.						
215			Abutment-RC	2	24	m	24	0	0 0
(215)			There were no significant defects noted.						
226			Pile-PS Conc.	2	1	ea.	1	0	0 0
(226)			The pile element is included to indicate the presence of piles on this structure. The piles were not exposed for visual inspection. No indication of pile distress was noted in any substructure element.						
234			Pier Cap-RC	2	18	m	18	0	0 0
(234)			There were no significant defects noted.						
312			Bearing-Enclosed	2	2	each	2	0	0 0
(312)			There were no significant defects noted.						
331			Railing-RC	2	72	m	72	0	0 0
(331)			There were no significant defects noted.						

WORK RECOMMENDATIONS - NONE

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 55C0670
 (5) INVENTORY ROUTE (ON/UNDER) - ON 11800000
 (2) HIGHWAY AGENCY DISTRICT 12
 (3) COUNTY CODE 059 (4) PLACE CODE 00000
 (6) FEATURE INTERSECTED- SANTIAGO CANYON ROAD
 (7) FACILITY CARRIED- HICKS CNYN HAUL RD
 (9) LOCATION- 4.6 MI. SE/O CHAPMAN AVE.
 (11) MILEPOINT/KILOMETERPOINT 0
 (12) BASE HIGHWAY NETWORK- NOT ON NET 0
 (13) LRS INVENTORY ROUTE & SUBROUTE 000000000000
 (16) LATITUDE 33 DEG 45 MIN 34.8 SEC
 (17) LONGITUDE 117 DEG 42 MIN 10.15 SEC
 (98) BORDER BRIDGE STATE CODE % SHARE %
 (99) BORDER BRIDGE STRUCTURE NUMBER

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

(43) STRUCTURE TYPE MAIN:MATERIAL- PRESTRESS CONC
 TYPE- STRINGER/MULTI-BEAM OR GDR CODE 502
 (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- CIP CONCRETE CODE 1
 (108) WEARING SURFACE / PROTECTIVE SYSTEM:
 A) TYPE OF WEARING SURFACE- NONE CODE 0
 B) TYPE OF MEMBRANE- NONE CODE 0
 C) TYPE OF DECK PROTECTION- NONE CODE 0

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

(27) YEAR BUILT 1995
 (106) YEAR RECONSTRUCTED 0000
 (42) TYPE OF SERVICE: ON- HIGHWAY 1
 UNDER- HIGHWAY W/NO PEDESTAL 1
 (28) LANES:ON STRUCTURE 02 UNDER STRUCTURE 02
 (29) AVERAGE DAILY TRAFFIC 1
 (30) YEAR OF ADT 2009 (109) TRUCK ADT 0 %
 (19) BYPASS, DETOUR LENGTH 22 KM

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

(48) LENGTH OF MAXIMUM SPAN 22.6 M
 (49) STRUCTURE LENGTH 36.5 M
 (50) CURB OR SIDEWALK: LEFT 0.7 M RIGHT 0.7 M
 (51) BRIDGE ROADWAY WIDTH CURB TO CURB 7.3 M
 (52) DECK WIDTH OUT TO OUT 9.1 M
 (32) APPROACH ROADWAY WIDTH (W/SHOULDERS) 7.3 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 7.3 M
 (53) MIN VERT CLEAR OVER BRIDGE RDWY 99.99 M
 (54) MIN VERT UNDERCLEAR REF- HIGHWAY 4.87 M
 (55) MIN LAT UNDERCLEAR RT REF- HIGHWAY 3.6 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 = 97.0
 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 URBAN 19
 (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 8
 (59) SUPERSTRUCTURE 8
 (60) SUBSTRUCTURE 8
 (61) CHANNEL & CHANNEL PROTECTION N
 (62) CULVERTS N

***** LOAD RATING AND POSTING *****

CODE
 (31) DESIGN LOAD- UNKNOWN 0
 (63) OPERATING RATING METHOD- FIELD EVAL/ENG JUD 0
 (64) OPERATING RATING- 54.1
 (65) INVENTORY RATING METHOD- FIELD EVAL/ENG JUL 0
 (66) INVENTORY RATING- 32.4
 (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 8
 (68) DECK GEOMETRY 6
 (69) UNDERCLEARANCES, VERTICAL & HORIZONTAL 5
 (71) WATER ADEQUACY N
 (72) APPROACH ROADWAY ALIGNMENT 8
 (36) TRAFFIC SAFETY FEATURES 1000
 (113) SCOUR CRITICAL BRIDGES N

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

CODE
 (75) TYPE OF WORK-
 (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 1
 (115) YEAR OF FUTURE ADT 2035

***** INSPECTIONS *****

(90) INSPECTION DATE 08/15 (91) FREQUENCY 48 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)

Orange County Bridge Review Summary

Dokken Engineering performed a field review of the Orange County bridge listed below in April 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: 55C0629

Bridge Name: Wildlife Undercrossing

Year Built: 1997

Facility Carried: Antonio Parkway

The existing Wildlife undercrossing Bridge at Antonio Parkway is a continuous three span cast-in-place reinforced concrete box girder with reinforced concrete three column bents, and reinforced concrete open seat abutments, all supported on CIDH concrete piles.

Caltrans BIR recommendations:

- None

Field Inspection Observations

- Minor deck cracking observed. No action needed.

Maintenance Needs Assessment

BPMP Assessment

- N/A – No eligible maintenance activities

General Maintenance – Non-BPMP

- No recommendations.

Proposed BPMP Construction Costs

- N/A

Construction Items Not Funded by BPMP

- N/A

APPENDIX A

Photos and BIR



Photo 1:



Photo 2:



Photo 3:

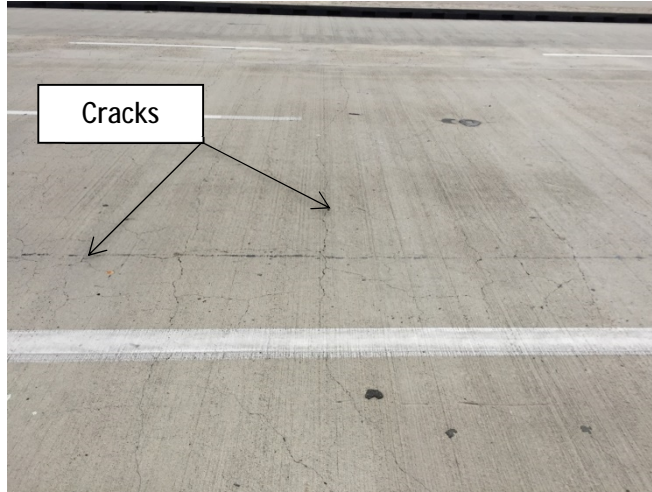


Photo 4: Bridge Deck

Bridge Number : 55C0629
Facility Carried: ANTONIO PARKWAY
Location : 0.5 MI. S/O OSO PARKWAY
City :
Inspection Date : 01/29/2015

Routine	FC	Underwater	Special	Other
---------	----	------------	---------	-------

X

STRUCTURE NAME: WILDLIFE UNDERCROSSING

CONSTRUCTION INFORMATION

Year Built	: 1997	Skew (degrees):	0
Year Widened:	2008	No. of Joints :	2
Length (m) :	71.6	No. of Hinges :	0

Structure Description: Continuous three span CIP/RC box girder (seven cells) with RC three column bents, and RC open seat abutments, all supported upon 406 mm diameter CIDH concrete piles.

Span Configuration : (S) 20.9 m, 29.0 m, 20.9 m (N)
widened (S) 8.5 m, 9 m, 20.9 m, 29.0 m, 20.9 m (N)

SAFE LOAD CAPACITY AND RATINGS

Design Live Load: MS-18+MOD OR HS-20+MOD

Inventory Rating: RF=1.00 =>32.4 metric tons

Calculation Method: ASSIGNED (LFD)

Operating Rating: RF=1.67 =>54.1 metric tons

Calculation Method: ASSIGNED (LFD)

Permit Rating : P P P P P

Posting Load : Type 3: Legal

Type 3S2: Legal

Type 3-3: Legal

DESCRIPTION ON STRUCTURE

Deck X-Section: (W) 0.5 m br, 1.3 m sw, 13.3 m, 1.2 m med, 13.3, 1.3 m sw, 0.5 m br (E)

Total Width: 31.2 m Net Width: 26.6 m No. of Lanes: 4 Speed: 55 mph

Min. Vertical Clearance: Unimpaired

AC Thickness: 0.0 Inches

Rail Code: 1111

Rail Type	Location	Length (ft)	Rail Modifications
Type 26	Right/Left	528	Timber top

DESCRIPTION UNDER STRUCTURE

Channel Description: Natural earth canyon

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

SCOPE AND ACCESS

The channel was dry at time of inspection, all elements have been visually inspected.

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 COMMENTARY

Elem No.	Defect /Prot	Defect	Element Description	Env	Total Qty	Units	Qty in each St.	Condition	State
							1	2	3
							St.	St.	St.
							4		
16			Top Flange-RC	2	2270	sq.m	2270	0	0
(16)									
There were no significant defects noted.									
38			Slab-RC	2	200	sq.m	200	0	0
(38)									
There were no significant defects noted.									
105			Box Girder-RC	2	142	m	142	0	0
(105)									
There were no significant defects noted.									
205			Column-RC	2	13	each	13	0	0
(205)									
There were no significant defects noted.									
215			Abutment-RC	2	80	m	80	0	0
(215)									
There were no significant defects noted.									
252			Pile-CIDH	2	1	ea.	1	0	0
(252)									
The pile element is included to indicate the presence of piles on this structure. The piles were not exposed for visual inspection. No indication of pile distress was noted in any substructure element.									
302			Joint-Compression Seal	2	42	m	42	0	0
(302)									
There were no significant defects noted.									
312			Bearing-Enclosed	2	2	each	2	0	0
(312)									
There were no significant defects noted.									
321			Approach Slab-RC	2	478	sq.m	478	0	0
(321)									
There were no significant defects noted.									
331			Railing-RC	2	142	m	142	0	0
(331)									
There were no significant defects noted.									

WORK RECOMMENDATIONS - NONE

Team Leader : Mikhael T. Zaarour
Report Author : Mikhael T. Zaarour
Inspected By : MT.Zaarour/KD.Henderson

 3/30/15
Mikhael T. Zaarour (Registered Civil Engineer) (Date)



STRUCTURE INVENTORY AND APPRAISAL REPORT

***** IDENTIFICATION *****

(1) STATE NAME- CALIFORNIA 069
 (8) STRUCTURE NUMBER 55C0629
 (5) INVENTORY ROUTE(ON/UNDER)- ON 14000000
 (2) HIGHWAY AGENCY DISTRICT 12
 (3) COUNTY CODE 059 (4) PLACE CODE 00000
 (6) FEATURE INTERSECTED- WILDLIFE UNDERCROSSING
 (7) FACILITY CARRIED- ANTONIO PARKWAY
 (9) LOCATION- 0.5 MI. S/O OSO PARKWAY
 (11) MILEPOINT/KILOMETERPOINT 0
 (12) BASE HIGHWAY NETWORK- PART OF NET 1
 (13) LRS INVENTORY ROUTE & SUBROUTE 000000000000
 (16) LATITUDE 33 DEG 34 MIN 34.64 SEC
 (17) LONGITUDE 117 DEG 37 MIN 57.64 SEC
 (98) BORDER BRIDGE STATE CODE % SHARE %
 (99) BORDER BRIDGE STRUCTURE NUMBER

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

(43) STRUCTURE TYPE MAIN:MATERIAL- CONCRETE CONT
 TYPE- BOX BEAM OR GIRDER - MULTI CODE 205
 (44) STRUCTURE TYPE APPR:MATERIAL- CONCRETE CONT
 TYPE- SLAB CODE 201
 (45) NUMBER OF SPANS IN MAIN UNIT 3
 (46) NUMBER OF APPROACH SPANS 2
 (107) DECK STRUCTURE TYPE- CIP CONCRETE CODE 1
 (108) WEARING SURFACE / PROTECTIVE SYSTEM:
 A) TYPE OF WEARING SURFACE- NONE CODE 0
 B) TYPE OF MEMBRANE- NONE CODE 0
 C) TYPE OF DECK PROTECTION- NONE CODE 0

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

(27) YEAR BUILT 1997
 (106) YEAR RECONSTRUCTED 2008
 (42) TYPE OF SERVICE: ON- HIGHWAY-PEDESTRIAN 5
 UNDER- OTHER 0
 (28) LANES:ON STRUCTURE 04 UNDER STRUCTURE 00
 (29) AVERAGE DAILY TRAFFIC 23400
 (30) YEAR OF ADT 2011 (109) TRUCK ADT 1 %
 (19) BYPASS, DETOUR LENGTH 11 KM

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

(48) LENGTH OF MAXIMUM SPAN 29.0 M
 (49) STRUCTURE LENGTH 71.6 M
 (50) CURB OR SIDEWALK: LEFT 0.0 M RIGHT 0.0 M
 (51) BRIDGE ROADWAY WIDTH CURB TO CURB 26.6 M
 (52) DECK WIDTH OUT TO OUT 31.2 M
 (32) APPROACH ROADWAY WIDTH (W/SHOULDERS) 26.6 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 13.3 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 = 87.9
 STATUS
 HEALTH INDEX 100.0
 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 8
 (59) SUPERSTRUCTURE 8
 (60) SUBSTRUCTURE 8
 (61) CHANNEL & CHANNEL PROTECTION N
 (62) CULVERTS N

***** LOAD RATING AND POSTING ***** CODE

(31) DESIGN LOAD- MS-18+MOD OR HS-20+MOD 6
 (63) OPERATING RATING METHOD- ASSIGNED (LFD) A
 (64) OPERATING RATING- 54.1
 (65) INVENTORY RATING METHOD- ASSIGNED (LFD) A
 (66) INVENTORY RATING- 32.4
 (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 8
 (68) DECK GEOMETRY 9
 (69) UNDERCLEARANCES, VERTICAL & HORIZONTAL N
 (71) WATER ADEQUACY N
 (72) APPROACH ROADWAY ALIGNMENT 8
 (36) TRAFFIC SAFETY FEATURES 1111
 (113) SCOUR CRITICAL BRIDGES N

***** 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 42329
 (115) YEAR OF FUTURE ADT 2037

***** INSPECTIONS *****

(90) INSPECTION DATE 01/15 (91) FREQUENCY 48 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)

Orange County Bridge Review Summary

Dokken Engineering performed a field review of the Orange County bridge listed below in April 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: 55C0631

Bridge Name: Santa Anna River Channel

Year Built: 1994

Facility Carried: Harbor Boulevard

The existing Santa Ana River Channel at Harbor Boulevard is a continuous 5 span precast, prestressed I-girder bridge with reinforced concrete piers wall and open end diaphragm abutments supported on driven class 70 & class 100 piles and prestressed concrete pile.

Caltrans BIR recommendations:

- Clean clogged drains

Field Inspection Observations

- Plugged drain inlets.
- Efflorescence visible on the bridge soffit (photo 1). Per site inspection it appears the bridge deck has been treated. Need to confirm with OCPW.

Maintenance Needs Assessment

BPMP Assessment

- N/A – No eligible maintenance activities, unless bridge deck has not been treated. Treating the deck is eligible for BPMP funding since deck is condition state 2.

General Maintenance – Non-BPMP

- Clean clogged drains.

Proposed BPMP Construction Costs

- None, unless bridge deck has not been treated.

Construction Items Not Funded by BPMP

- Clean deck drains < \$5,000

APPENDIX A

Photos and BIR



Photo 1: Santa Anna River Channel



Photo 2:

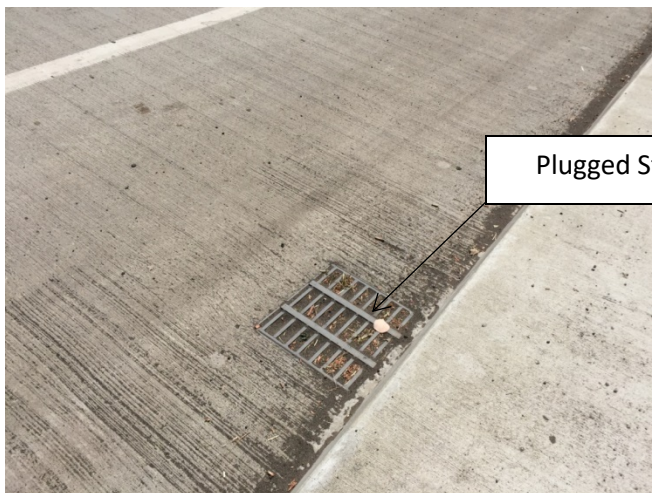


Photo 3: Deck Drain



Photo 4: Sidewalk

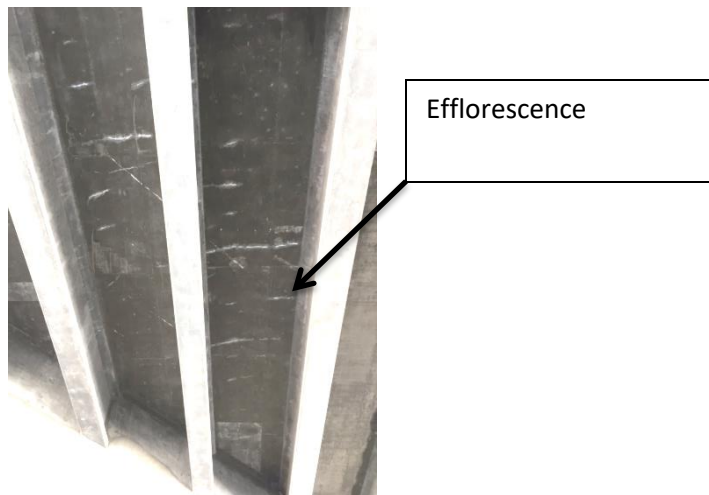


Photo 5: Bridge Soffit



Photo 6:



DEPARTMENT OF TRANSPORTATION
Structure Maintenance & Investigations

Bridge Number : 55C0205
Facility Carried: SANTA ANA AVENUE
Location : 0.1 MI S/O BRISTOL STREE
City :
Inspection Date : 01/27/2017
Inspection Type
Routine FC Underwater Special Other
☒

Bridge Inspection Report

STRUCTURE NAME: SANTA ANA-DELHI CHANNEL

CONSTRUCTION INFORMATION

Year Built : 1960 Skew (degrees): 10
Year Modified: 1973 No. of Joints : 0
Length (m) : 16.5 No. of Hinges : 0

Structure Description: Single span PC/PS concrete beam units (22 units) on RC pile bent cap with monolithic wingwalls with sheathing walls.

Span Configuration : (S) 54.00 ft (N)

SAFE LOAD CAPACITY AND RATINGS

Design Live Load: UNKNOWN
Inventory Rating: RF=0.52 =>16.8 metric tons Calculation Method: FIELD EVAL/ENG JUDGMENT
Operating Rating: RF=0.87 =>28.2 metric tons Calculation Method: FIELD EVAL/ENG JUDGMENT
Permit Rating : XXXXX
Posting Load : Type 3: Legal Type 3S2: Legal Type 3-3: Legal

DESCRIPTION ON STRUCTURE

Deck X-Section: (W) 0.67 ft br, 1.33 ft AC dike, 61.42 ft, 4.50 ft sw, 0.67 m br (E)
Total Width: 20.4 m Net Width: 18.7 m No. of Lanes: 4 Speed: 45 mph
Min. Vertical Clearance: Unimpaired Overlay Thickness: 6.5 Inches
Rail Code: 1000

Rail Type	Location	Length (ft)	Rail Modifications
MBBR		108	

DESCRIPTION UNDER STRUCTURE

Channel Description: RC rectangular.

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

SCOPE AND ACCESS

This inspection was performed by walking on the bridge sidewalks, and under the span of the superstructure. The water in the channel is about 3 inches through a small ditch 5 feet wide in the middle of the channel. All visible substructure elements were inspected.

Pedestrian access under the bridge is from a ramp at the north-west quadrant.

INSPECTION COMMENTARY

REVISIONS

AC thickness overlay is changed from 3 inches to be 9 inches at the west side and 4 inches at the east side. The average AC thickness is about 6.5 inches. (see the attached photos 1 & 2)

Element 15 (Prestressed top flange-RC) is replaced Element 16 (Top flange-RC) with the same quantity.

The substructure element is revised to be Bent cap 20 m; and piles #251 (2 each) instead of element #215 RC Abutment.

DECK AND ROADWAY

AC overlay exhibits two transverse cracks above both abutments, 20 feet long and 0.2 inches wide.

SUBSTRUCTURE

There is a tree growing at the seat of Abutment 1 under slab unit 9 (counting from east).

SAFE LOAD CAPACITY

The load rating for this structure is being reviewed by SMI Ratings Branch. A request #7766 was sent the load rating department on 07/14/2017. An updated Load Rating Summary will be archived when this review is complete. Load Rating Summary Sheet is archived on 12/12/2014 for this structure. While this report does not include a check of that analysis, it does verify that the structural conditions observed during this inspection are consistent with those assumed in that analysis.

ELEMENT INSPECTION RATINGS AND NOTES									
Elem No.	Defect /Prot	Element Description	Env	Total Qty	Units	Qty in St. 1	each St. 2	Condition St. 3	State St. 4
15		Top Flange-PS Conc.	2	336	sq.m	336	0	0	0
	510	Deck Wearing Surface-Asphalt	2	308	sq.m	308	0	0	0
(15)									
There were no significant defects noted.									
(15-510)									
There were no significant defects noted.									
104		Box Girder-PS Conc.	2	17	m	14	2	1	0
	1080	Delamination/Spall/Patched Area	2	1		0	0	1	0
	1120	Efflorescence/Rust Staining	2	2		0	2	0	0
(104-1080)									
The westerly face of the westerly box girder unit exhibits a spall 12 inches X 8 inches X 1.5 inch at									

ELEMENT INSPECTION RATINGS AND NOTES

Elem No.	Defect /Prot	Element Description	Env	Total Qty	Units	Qty in each Condition State			
						St. 1	St. 2	St. 3	St. 4
the mid-span. (see the attached photos 4 & 5)									
(104-1120)									
There was water stain in soffit generated in between the bog girders units.									
215		Abutment-RC	2	10	m	10	0	0	0
(215)									
Monolithic wingwalls (with the RC bent cap) are included in the total quantity.									
234		Pier Cap-RC	2	40	m	40	0	0	0
(234)									
There were no significant defects noted.									
251		Pile-CISS	2	2	ea.	0	2	0	0
1000		Corrosion	2	2		0	2	0	0
(251)									
There are only two piles that are visbile at the north Abutment at the east side.									
(251-1000)									
The exterior steel shells of the north piles (east side) is rusted. (see the attached photo 9)									
330		Railing-Metal	2	33	m	33	0	0	0
(330)									
There were no significant defects noted.									

WORK RECOMMENDATIONS

RecDate: 06/08/2011

EstCost:

Remove the small tree that are growing in
Abutment 1 seat.

Action : Sub-Misc.

StrTarget: 2 YEARS

Work By: LOCAL AGENCY

DistTarget:

Status : PROPOSED

EA:

Team Leader : Ashraf Shenouda

Report Author : Ashraf Shenouda

Inspected By : A.Shenouda/KD.Henderson



Ashraf Shenouda (Registered Civil Engineer) (Date)

7-25-17



STRUCTURE INVENTORY AND APPRAISAL REPORT

***** IDENTIFICATION *****

(1) STATE NAME- CALIFORNIA 069
 (8) STRUCTURE NUMBER 55C0205
 (5) INVENTORY ROUTE (ON/UNDER)- ON 140000000
 (2) HIGHWAY AGENCY DISTRICT 12
 (3) COUNTY CODE 059 (4) PLACE CODE 00000
 (6) FEATURE INTERSECTED- SANTA ANA DELHI CHANNEL
 (7) FACILITY CARRIED- SANTA ANA AVENUE
 (9) LOCATION- 0.1 MI S/O BRISTOL STREET
 (11) MILEPOINT/KILOMETERPOINT 0
 (12) BASE HIGHWAY NETWORK- NOT ON NET 0
 (13) LRS INVENTORY ROUTE & SUBROUTE
 (16) LATITUDE 33 DEG 39 MIN 55.22 SEC
 (17) LONGITUDE 117 DEG 52 MIN 59.41 SEC
 (98) BORDER BRIDGE STATE CODE % SHARE %
 (99) BORDER BRIDGE STRUCTURE NUMBER

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

(43) STRUCTURE TYPE MAIN:MATERIAL- PRESTRESS CONC
 TYPE- BOX BEAM OR GIRDER - MULTI CODE 505
 (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- PRECAST CONC. PA CODE 2
 (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 1960
 (106) YEAR RECONSTRUCTED 1973
 (42) TYPE OF SERVICE: ON- HIGHWAY-PEDESTRIAN 5
 UNDER- WATERWAY 5
 (28) LANES:ON STRUCTURE 04 UNDER STRUCTURE 00
 (29) AVERAGE DAILY TRAFFIC 11000
 (30) YEAR OF ADT 2008 (109) TRUCK ADT 1 %
 (19) BYPASS, DETOUR LENGTH 2 KM

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

(48) LENGTH OF MAXIMUM SPAN 16.2 M
 (49) STRUCTURE LENGTH 16.5 M
 (50) CURB OR SIDEWALK: LEFT 0.0 M RIGHT 1.4 M
 (51) BRIDGE ROADWAY WIDTH CURB TO CURB 18.7 M
 (52) DECK WIDTH OUT TO OUT 20.4 M
 (32) APPROACH ROADWAY WIDTH (W/SHOULDERS) 17.1 M
 (33) BRIDGE MEDIAN- NO MEDIAN 0
 (34) SKEW 10 DEG (35) STRUCTURE FLARED NO
 (10) INVENTORY ROUTE MIN VERT CLEAR 99.99 M
 (47) INVENTORY ROUTE TOTAL HORIZ CLEAR 18.7 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- NO CONTROL CODE 0
 (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 = 64.3

STATUS

HEALTH INDEX 99.4

PAINT CONDITION INDEX = N/A

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

(112) NBIS BRIDGE LENGTH- YES Y
 (104) HIGHWAY SYSTEM- NOT ON NHS 0
 (26) FUNCTIONAL CLASS- MINOR ARTERIAL URBAN 16
 (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 7
 (59) SUPERSTRUCTURE 5
 (60) SUBSTRUCTURE 7
 (61) CHANNEL & CHANNEL PROTECTION 8
 (62) CULVERTS N

***** LOAD RATING AND POSTING ***** CODE

(31) DESIGN LOAD- UNKNOWN 0
 (63) OPERATING RATING METHOD- FIELD EVAL/ENG JUD 0
 (64) OPERATING RATING- 28.2
 (65) INVENTORY RATING METHOD- FIELD EVAL/ENG JUD 0
 (66) INVENTORY RATING- 16.8
 (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 6
 (69) UNDERCLEARANCES, VERTICAL & HORIZONTAL N
 (71) WATER ADEQUACY 8
 (72) APPROACH ROADWAY ALIGNMENT 8
 (36) TRAFFIC SAFETY FEATURES 1000
 (113) SCOUR CRITICAL BRIDGES 5

***** 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 18984
 (115) YEAR OF FUTURE ADT 2038

***** INSPECTIONS *****

(90) INSPECTION DATE 01/17 (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)

Orange County Bridge Review Summary

Dokken Engineering performed a field review of the Orange County bridge listed below in April 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: 55C0637

Bridge Name: Arroyo Trabuco

Year Built: 2005

Facility Carried: Crown Valley PKWY

The Arroyo Trabuco Bridge at Oso Parkway is a continuous four span cast-in-place prestressed concrete box girder with reinforced concrete (RC), 2 column bents and RC closed end cantilever abutments supported on CIDH concrete piles.

Caltrans BIR recommendations:

- Weld back the sheared off middle steel bar of the joint seal assembly. (From 2013 BIR, although not repaired not in 2015 BIR).
- Clean out all dirt and debris in all joint seals.

Field Inspection Observations

- There is efflorescence visible on soffit near the soffit opening cover plate which is heavily corroded. Water leaking/dripping in span 1, this appears to be a water line.
- Torn joint seal (photo 1).

Maintenance Needs Assessment

BPMP Assessment

- Repair joint seal assembly.

General Maintenance – Non-BPMP

- Recommend contacting utility owner of water line. Note this will not eligible for BPMP funds but should be covered by the utility owner.

Proposed BPMP Construction Costs

- Joint Seal Assembly = 168 ft * \$200/LF ≈ \$ 34,000
- Traffic Control = \$10,000
- Estimated Total Construction Cost (with engineering, mobilization and contingency) ≈ \$50,000

Construction Items Not Funded by BPMP

- Utility repair should be funded by utility company
- Soffit cover plate replacement

APPENDIX A

Photos and BIR



Photo 1:



Photo 2:



Photo 3:



Photo 4:



Photo 5:



Photo 6:

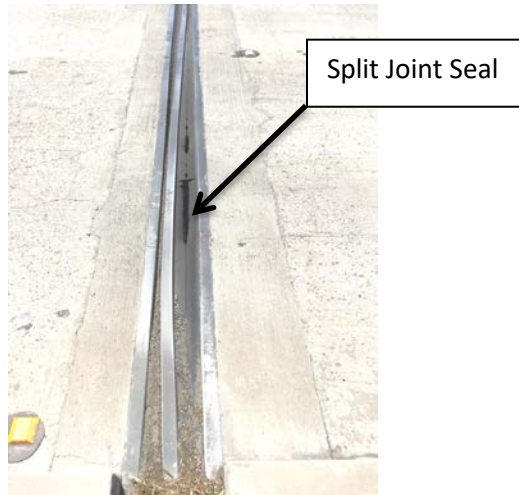


Photo 7: Joint Seal



Photo 8: Bridge Soffit


DEPARTMENT OF TRANSPORTATION
 Structure Maintenance & Investigations

 Bridge Number : 55C0637
 Facility Carried: CROWN VALLEY PKWY
 Location : 0.5 MI E/O MARGUERITE PW
 City :
 Inspection Date : 01/29/2015

Bridge Inspection Report

 Inspection Type
 Routine FC Underwater Special Other
☒
STRUCTURE NAME: ARROYO TRABUCO

CONSTRUCTION INFORMATION

 Year Built : 2000 Skew (degrees): 0
 Year Widened: 2005 No. of Joints : 2
 Length (m) : 238 No. of Hinges : 0

Structure Description: Continuous 4-span CIP/PS concrete box girder (5 cells) with RC 2-column bents and RC closed end backfilled cantilever abutments, all supported upon 610 mm diameter (abutments) and 3050 mm diameter (bents) CIDH concrete piles.

Widen (North side): Continuous 4-span CIP/PS concrete box girder (3 cells) with RC 1-column bents and RC closed end backfilled cantilever abutments.

Span Configuration : (W) 51.3 m, 67.0 m, 67.0 m, 51.3 m (E) c/c

SAFE LOAD CAPACITY AND RATINGS

 Design Live Load: HL 93
 Inventory Rating: RF= 1.00 Calculation Method: ASSIGNED (LRFD)
 Operating Rating: RF= 1.30 Calculation Method: ASSIGNED (LRFD)
 Permit Rating : PPPPP
 Posting Load : Type 3: Legal Type 3S2: Legal Type 3-3: Legal
DESCRIPTION ON STRUCTURE

Deck X-Section: (N) 0.3 m br, 1.5 m sw, 16.7 m, 1.5 m median, 16.8 m; 1.5 m sw, 0.3 m br (S)

Total Width: 38.3 m Net Width: 33.5 m No. of Lanes: 7 Speed: 55 mph

Min. Vertical Clearance: Unimpaired

AC Thickness: 0.0 Inches

Rail Code: 0110

Rail Type	Location	Length (ft)	Rail Modifications
Type 26	Right/Left	1640	

DESCRIPTION UNDER STRUCTURE

Channel Description: Natural earth canyon.

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
SCOPE AND ACCESS

The channel was dry at time of inspection, all elements have been visually inspected.

SAFE LOAD CAPACITY

INSPECTION COMMENTARY

A Load Rating Summary Sheet dated 03/19/2013 is on file for this structure. The current rating has been assigned in accordance with SMI procedures.

ELEMENT INSPECTION RATINGS AND COMMENTARY								
Elem No.	Defect /Prot	Element Description	Env	Total Qty	Units	Qty in each St.	Condition	State
						1	2	3 4
16		Top Flange-RC	2	9115	sq.m	9115	0	0 0
(16) There were no significant defects noted.								
104		Box Girder-PS Conc.	2	476	m	468	8	0 0
	1110	Cracking (PS Conc.)	2	8		0	8	0 0
(104-1110) There are few longitudinal cracks in the soffit of the box girder in span #4.								
205		Column-RC	2	9	each	9	0	0 0
(205) There were no significant defects noted.								
215		Abutment-RC	2	90	m	90	0	0 0
(215) There were no significant defects noted.								
252		Pile-CIDH	2	1	ea.	1	0	0 0
(252) The pile element is included to indicate the presence of piles on this structure. The piles were not exposed for visual inspection. No indication of pile distress was noted in any substructure element.								
256		Slope Protection	2	2	ea.	2	0	0 0
(256) There were no significant defects noted.								
303		Joint-Assembly w/ Seal	2	76	m	76	0	0 0
(303) There were no significant defects noted.								
312		Bearing-Enclosed	2	2	each	2	0	0 0
(312) There were no significant defects noted.								
321		Approach Slab-RC	2	555	sq.m	555	0	0 0
(321) There were no significant defects noted.								
331		Railing-RC	2	476	m	476	0	0 0
(331) There were no significant defects noted.								


WORK RECOMMENDATIONS

RecDate: 02/10/2013
Action : Super-Misc.
Work By: LOCAL AGENCY
Status : PROPOSED

EstCost:
StrTarget: 2 YEARS
DistTarget:
EA:

The county has to check the utility pipes inside the box cells where the soffit access is leaking water and the cover place is heavily rusted and corroded in span 4.

Team Leader : Mikhael T. Zaarour
Report Author : Mikhael T. Zaarour
Inspected By : MT.Zaarour/KD.Henderson

 3/30/15
Mikhael T. Zaarour (Registered Civil Engineer) (Date)



STRUCTURE INVENTORY AND APPRAISAL REPORT

***** IDENTIFICATION *****

(1) STATE NAME- CALIFORNIA 069
 (8) STRUCTURE NUMBER 55C0637
 (5) INVENTORY ROUTE(ON/UNDER)- ON 150000000
 (2) HIGHWAY AGENCY DISTRICT 12
 (3) COUNTY CODE 059 (4) PLACE CODE 00000
 (6) FEATURE INTERSECTED- ARROYO TRABUCO
 (7) FACILITY CARRIED- CROWN VALLEY PKWY
 (9) LOCATION- 0.5 MI E/O MARGUERITE PWY
 (11) MILEPOINT/KILOMETERPOINT 0
 (12) BASE HIGHWAY NETWORK- PART OF NET 1
 (13) LRS INVENTORY ROUTE & SUBROUTE 000000000000
 (16) LATITUDE 33 DEG 33 MIN 46.01 SEC
 (17) LONGITUDE 117 DEG 39 MIN 10.4 SEC
 (98) BORDER BRIDGE STATE CODE % SHARE %
 (99) BORDER BRIDGE STRUCTURE NUMBER

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

(43) STRUCTURE TYPE MAIN:MATERIAL- PRSTR CONC CONT
 TYPE- BOX BEAM OR GIRDER - MULTI CODE 605
 (44) STRUCTURE TYPE APPR:MATERIAL- OTHER/NA
 TYPE- OTHER/NA CODE 000
 (45) NUMBER OF SPANS IN MAIN UNIT 4
 (46) NUMBER OF APPROACH SPANS 0
 (107) DECK STRUCTURE TYPE- CIP CONCRETE CODE 1
 (108) WEARING SURFACE / PROTECTIVE SYSTEM:
 A) TYPE OF WEARING SURFACE- NONE CODE 0
 B) TYPE OF MEMBRANE- NONE CODE 0
 C) TYPE OF DECK PROTECTION- NONE CODE 0

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

(27) YEAR BUILT 2000
 (106) YEAR RECONSTRUCTED 2005
 (42) TYPE OF SERVICE: ON- HIGHWAY-PEDESTRIAN 5
 UNDER- WATERWAY 5
 (28) LANES:ON STRUCTURE 07 UNDER STRUCTURE 00
 (29) AVERAGE DAILY TRAFFIC 33160
 (30) YEAR OF ADT 2011 (109) TRUCK ADT 1 %
 (19) BYPASS, DETOUR LENGTH 20 KM

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

(48) LENGTH OF MAXIMUM SPAN 67.0 M
 (49) STRUCTURE LENGTH 238.0 M
 (50) CURB OR SIDEWALK: LEFT 1.5 M RIGHT 1.5 M
 (51) BRIDGE ROADWAY WIDTH CURB TO CURB 33.5 M
 (52) DECK WIDTH OUT TO OUT 38.3 M
 (32) APPROACH ROADWAY WIDTH (W/SHOULDERS) 33.5 M
 (33) BRIDGE MEDIAN- CLOSED NON-MOUNTABLE 3
 (34) SKEW 0 DEG (35) STRUCTURE FLARED YES
 (10) INVENTORY ROUTE MIN VERT CLEAR 99.99 M
 (47) INVENTORY ROUTE TOTAL HORIZ CLEAR 16.8 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 = 84.0

STATUS

HEALTH INDEX 100.0

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 8
 (59) SUPERSTRUCTURE 8
 (60) SUBSTRUCTURE 8
 (61) CHANNEL & CHANNEL PROTECTION 9
 (62) CULVERTS N

***** LOAD RATING AND POSTING ***** CODE

(31) DESIGN LOAD- HL 93 A
 (63) OPERATING RATING METHOD- ASSIGNED (LRFD) F
 (64) OPERATING RATING- RF= 1.30
 (65) INVENTORY RATING METHOD- ASSIGNED (LRFD) F
 (66) INVENTORY RATING- RF= 1.00
 (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 8
 (68) DECK GEOMETRY 9
 (69) UNDERCLEARANCES, VERTICAL & HORIZONTAL N
 (71) WATER ADEQUACY 9
 (72) APPROACH ROADWAY ALIGNMENT 8
 (36) TRAFFIC SAFETY FEATURES 0110
 (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 60565
 (115) YEAR OF FUTURE ADT 2035

***** INSPECTIONS *****

(90) INSPECTION DATE 01/15 (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)

Orange County Bridge Review Summary

Dokken Engineering performed a field review of the Orange County bridge listed below in April 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: 55C0670

Bridge Name: Hicks Canyon Haul Road OC

Year Built: 1995

Facility Carried: Hicks Canyon Haul RD

The Hicks Canyon Haul Road Bridge over crossing at Hicks Canyon Road is a two span precast prestressed concrete girder bridge with a continuous composite cast-in-place deck. The Bridge is supported by a two-column bent and opened end diaphragm abutment. The substructure is supported on driven class 70C piles.

Caltrans BIR recommendations:

- None

Field Inspection Observations

- Note there was no access due to gated roads to the bridge deck and limited access to the substructure.
- No work recommendations at this time.

Maintenance Needs Assessment

BPMP Assessment

- N/A – No eligible maintenance activities

General Maintenance – Non-BPMP

- No recommendations.

Proposed BPMP Construction Costs

- N/A

Construction Items Not Funded by BPMP

- N/A

APPENDIX A

Photos and BIR



Photo 1: Bridge Soffit



Photo 2: Bridge Elevation



Photo 3: Bridge Abut



DEPARTMENT OF TRANSPORTATION
Structure Maintenance & Investigations

Bridge Number : 55C0670
Facility Carried: HICKS CANYON HAUL RD
Location : 4.6 MI. SE/O CHAPMAN AVE
City :
Inspection Date : 08/13/2015
Inspection Type
Routine FC Underwater Special Other

Bridge Inspection Report

☒

STRUCTURE NAME: HICKS CANYON HAUL ROAD OC

CONSTRUCTION INFORMATION

Year Built : 1995
Year Widened: N/A
Length (m) : 36.5
Skew (degrees): 0
No. of Joints : 0
No. of Hinges : 0

Structure Description: Simply supported two span PC/PS concrete channel girders (3 each) with a continuous composite CIP concrete deck, and with an RC two column bent, and with RC open end diaphragm abutments, all supported upon driven Class 70C piles.

Span Configuration : (S) 13.0 m, 22.3 m (N) c/c

SAFE LOAD CAPACITY AND RATINGS

Design Live Load: UNKNOWN
Inventory Rating: RF=1.00 =>32.4 metric tons
Operating Rating: RF=1.67 =>54.1 metric tons
Permit Rating : PGGGG
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: (W) 0.2 m br, 0.7 m sw, 7.3 m, 0.7 m sw, 0.2 m br (E)
Total Width: 9.1 m Net Width: 7.3 m No. of Lanes: 2 Speed: mph
Min. Vertical Clearance: Unimpaired Overlay Thickness: 0.0 Inches
Rail Code: 1000

Rail Type	Location	Length (ft)	Rail Modifications
Type 26	Right/Left	150	

DESCRIPTION UNDER STRUCTURE

Facility Name	Func Class	Lanes	Horiz Clr (m)	Vert Clr (m)
Santiago Canyon Road	14	2	18.30	4.80

Channel Description: Under span #1 natural with riprap under the structure.

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

SCOPE AND ACCESS

The channel was dry during this inspection, and substructure elements were visually inspected. The top did not inspected

INSPECTION COMMENTARY**DECK AND ROADWAY**

The roadway on the structure is closed there is no public access.

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 State	Condition	State
							St. 1	St. 2	St. 3 St. 4
15			Top Flange-PS Conc.	2	333	sq.m	333	0	0 0
(15)			There were no significant defects noted.						
511			Deck Wearing Surface-Concrete	2	266	sq.m	266	0	0 0
(16-511)			There were no significant defects noted.						
109			Girder/Beam-PS Conc.	2	105	m	105	0	0 0
(109)			There were no significant defects noted.						
205			Column-RC	2	2	each	2	0	0 0
(205)			There were no significant defects noted.						
215			Abutment-RC	2	24	m	24	0	0 0
(215)			There were no significant defects noted.						
226			Pile-PS Conc.	2	1	ea.	1	0	0 0
(226)			The pile element is included to indicate the presence of piles on this structure. The piles were not exposed for visual inspection. No indication of pile distress was noted in any substructure element.						
234			Pier Cap-RC	2	18	m	18	0	0 0
(234)			There were no significant defects noted.						
312			Bearing-Enclosed	2	2	each	2	0	0 0
(312)			There were no significant defects noted.						
331			Railing-RC	2	72	m	72	0	0 0
(331)			There were no significant defects noted.						

WORK RECOMMENDATIONS - NONE

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 55C0670
 (5) INVENTORY ROUTE (ON/UNDER) - ON 1:800000
 (2) HIGHWAY AGENCY DISTRICT 12
 (3) COUNTY CODE 059 (4) PLACE CODE 00000
 (6) FEATURE INTERSECTED- SANTIAGO CANYON ROAD
 (7) FACILITY CARRIED- HICKS CNYN HAUL RD
 (9) LOCATION- 4.6 MI. SE/O CHAPMAN AVE.
 (11) MILEPOINT/KILOMETERPOINT 0
 (12) BASE HIGHWAY NETWORK- NOT ON NET 0
 (13) LRS INVENTORY ROUTE & SUBROUTE 000000000000
 (16) LATITUDE 33 DEG 45 MIN 34.8 SEC
 (17) LONGITUDE 117 DEG 42 MIN 10.15 SEC
 (98) BORDER BRIDGE STATE CODE % SHARE %
 (99) BORDER BRIDGE STRUCTURE NUMBER

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

(43) STRUCTURE TYPE MAIN:MATERIAL- PRESTRESS CONC
 TYPE- STRINGER/MULTI-BEAM OR GDR CODE 502
 (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- CIP CONCRETE CODE 1
 (108) WEARING SURFACE / PROTECTIVE SYSTEM:
 A) TYPE OF WEARING SURFACE- NONE CODE 0
 B) TYPE OF MEMBRANE- NONE CODE 0
 C) TYPE OF DECK PROTECTION- NONE CODE 0

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

(27) YEAR BUILT 1995
 (106) YEAR RECONSTRUCTED 0000
 (42) TYPE OF SERVICE: ON- HIGHWAY 1
 UNDER- HIGHWAY W/NO PEDESTAL 1
 (28) LANES:ON STRUCTURE 02 UNDER STRUCTURE 02
 (29) AVERAGE DAILY TRAFFIC 1
 (30) YEAR OF ADT 2009 (109) TRUCK ADT 0 %
 (19) BYPASS, DETOUR LENGTH 22 KM

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

(48) LENGTH OF MAXIMUM SPAN 22.6 M
 (49) STRUCTURE LENGTH 36.5 M
 (50) CURB OR SIDEWALK: LEFT 0.7 M RIGHT 0.7 M
 (51) BRIDGE ROADWAY WIDTH CURB TO CURB 7.3 M
 (52) DECK WIDTH OUT TO OUT 9.1 M
 (32) APPROACH ROADWAY WIDTH (W/SHOULDERS) 7.3 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 7.3 M
 (53) MIN VERT CLEAR OVER BRIDGE RDWY 99.99 M
 (54) MIN VERT UNDERCLEAR REF- HIGHWAY 4.87 M
 (55) MIN LAT UNDERCLEAR RT REF- HIGHWAY 3.6 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 = 97.0
 STATUS
 HEALTH INDEX 100.0
 PAINT CONDITION INDEX = N/A

***** CLASSIFICATION *****

(112) NBIS BRIDGE LENGTH- YES Y
 (104) HIGHWAY SYSTEM- NOT ON NHS 0
 (26) FUNCTIONAL CLASS- LOCAL URBAN 19
 (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 *****

(58) DECK 8
 (59) SUPERSTRUCTURE 8
 (60) SUBSTRUCTURE 8
 (61) CHANNEL & CHANNEL PROTECTION N
 (62) CULVERTS N

***** LOAD RATING AND POSTING *****

(31) DESIGN LOAD- UNKNOWN 0
 (63) OPERATING RATING METHOD- FIELD EVAL/ENG JUD 0
 (64) OPERATING RATING- 54.1
 (65) INVENTORY RATING METHOD- FIELD EVAL/ENG JUL 0
 (66) INVENTORY RATING- 32.4
 (70) BRIDGE POSTING- EQUAL TO OR ABOVE LEGAL LOADS 5
 (41) STRUCTURE OPEN, POSTED OR CLOSED- A
 DESCRIPTION- OPEN, NO RESTRICTION

***** APPRAISAL *****

(67) STRUCTURAL EVALUATION 8
 (68) DECK GEOMETRY 6
 (69) UNDERCLEARANCES, VERTICAL & HORIZONTAL 5
 (71) WATER ADEQUACY N
 (72) APPROACH ROADWAY ALIGNMENT 8
 (36) TRAFFIC SAFETY FEATURES 1000
 (113) SCOUR CRITICAL BRIDGES N

***** 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 1
 (115) YEAR OF FUTURE ADT 2035

***** INSPECTIONS *****

(90) INSPECTION DATE 08/15 (91) FREQUENCY 48 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)

Orange County Bridge Review Summary

Dokken Engineering performed a field review of the Orange County bridge listed below in April 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: 55C0690

Bridge Name: Handy Creek

Year Built: 2012

Facility Carried: Orange Park BLVD

The Handy Creek Bridge at Orange Park Blvd is a single span cast-in-place reinforced concrete slab bridge with diaphragm abutments supported on concrete pile.

Caltrans BIR recommendations:

- None

Field Inspection Observations

- There was about a 1 foot deep stagnate water in the creek.
- Overall, bridge appears to be in good condition.
- Scour counter measures appear to be in good condition.

Maintenance Needs Assessment

BPMP Assessment

- N/A – No eligible maintenance activities

General Maintenance – Non-BPMP

- No recommendations.

Proposed BPMP Construction Costs

- N/A

Construction Items Not Funded by BPMP

- N/A

APPENDIX A

Photos and BIR



Photo 1:



Photo 2:



Photo 2:



Photo 4:



DEPARTMENT OF TRANSPORTATION
Structure Maintenance & Investigations

Bridge Number : 55C0690
Facility Carried: ORANGE PARK BLVD
Location : 0.25 SOUTH SANTIAGO RD
City :
Inspection Date : 09/10/2015

Bridge Inspection Report

Inspection Type
Routine FC Underwater Special Other

☒

STRUCTURE NAME: HANDY CREEK

CONSTRUCTION INFORMATION

Year Built : 2012 Skew (degrees): 27
Year Widened: N/A No. of Joints : 0
Length (m) : 12 No. of Hinges :

Structure Description: Single span RC slab bridge on two RC abutments, all on piles.

Span Configuration : (S) 12.0 m (N) c/c.

SAFE LOAD CAPACITY AND RATINGS

Design Live Load: HL 93
Inventory Rating: RF= 1.00 Calculation Method: ASSIGNED (LRFD)
Operating Rating: RF= 1.30 Calculation Method: ASSIGNED (LRFD)
Permit Rating : PPPPP
Posting Load : Type 3: Legal Type 3S2: Legal Type 3-3: Legal

DESCRIPTION ON STRUCTURE

Deck X-Section: (W) 0.5 br, 3.05 m sw, 0.5 br, 13.2 m, 0.5 m br (S).

Total Width: 17.8 m Net Width: 13.2 m No. of Lanes: 2 Speed: 40 mph
Min. Vertical Clearance: Unimpaired Overlay Thickness: 0.0 Inches

Rail Code: 1000

Rail Type	Location	Length (ft)	Rail Modifications
ST-30	Right/Left	80	
ST-30	Other	40	Side walk rails

DESCRIPTION UNDER STRUCTURE

Channel Description: Natural earth trapezoidal. Riprap slope at north side and Retaining wall at south side.

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

SCOPE AND ACCESS

The water depth at the time of this inspection measured approximately 3 inches mostly at the south side. All substructure elements were visually inspected, pedestrian access is from the north side side.

SAFE LOAD CAPACITY

A Load Rating Summary Sheet dated 09/30/2013 is on file for this structure. The current rating has been assigned in accordance with SM&I procedures.

INSPECTION COMMENTARYELEMENT INSPECTION RATINGS AND NOTES

Elem No.	Defect /Prot	Element Description	Env	Total Qty	Units	Qty in each St. 1	St. 2	St. 3	St. 4	Condition State
38		Slab-RC	2	213	sq.m	201	12	0	0	
	1120	Efflorescence/Rust Staining	2	1		1	0	0	0	
	1130	Cracking (RC and Other)	2	12		0	12	0	0	

(38-1120)

The soffit at the north side exhibits a longitudinal cracks 10 feet long with light white efflorescence at 30 ft from the east end almost closed to the center line of the bridge.

(38-1130)

The concrete deck exhibits a longitudinal crack 0.04 inch wide at the center of the bridge at the north end, and few scattered cracks < 0.02 inch wide.

215		Abutment-RC	2	20	m	20	0	0	0	
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(215)

There were no significant defects noted.

227		Pile-RC	2	1	ea.	1	0	0	0	
-----	--	---------	---	---	-----	---	---	---	---	--

(227)

The pile element is included to indicate the presence of piles on this structure. The piles were not exposed for visual inspection. No indication of pile distress was noted in any substructure element.

256		Slope Protection	2	1	ea.	1	0	0	0	
-----	--	------------------	---	---	-----	---	---	---	---	--

(256)

There were no significant defects noted.

330		Railing-Metal	2	36	m	36	0	0	0	
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(330)


There were no significant defects noted.

WORK RECOMMENDATIONS - NONE

Team Leader : Mikhael T. Zaarour

Report Author : Mikhael T. Zaarour

Inspected By : MT.Zaarour/DH. Kim


 Mikhael T. Zaarour (Registered Civil Engineer)


 (Date)


STRUCTURE INVENTORY AND APPRAISAL REPORT

***** IDENTIFICATION *****

(1) STATE NAME- CALIFORNIA 069
 (8) STRUCTURE NUMBER 55C0690
 (5) INVENTORY ROUTE (ON/UNDER) - ON 15000000
 (2) HIGHWAY AGENCY DISTRICT 12
 (3) COUNTY CODE 059 (4) PLACE CODE 00000
 (6) FEATURE INTERSECTED- HANDY CREEK
 (7) FACILITY CARRIED- ORANGE PARK BLVD
 (9) LOCATION- 0.25 SOUTH SANTIAGO RD
 (11) MILEPOINT/KILOMETERPOINT 0
 (12) BASE HIGHWAY NETWORK- NOT ON NET 0
 (13) LRS INVENTORY ROUTE & SUBROUTE
 (16) LATITUDE 33 DEG 48 MIN 37.06 SEC
 (17) LONGITUDE 117 DEG 46 MIN 56.08 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- NONE CODE 0
 B) TYPE OF MEMBRANE- NONE CODE 0
 C) TYPE OF DECK PROTECTION- NONE CODE 0

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

(27) YEAR BUILT 2012
 (106) YEAR RECONSTRUCTED
 (42) TYPE OF SERVICE: ON- HIGHWAY-PEDESTRIAN 5
 UNDER- WATERWAY 5
 (28) LANES:ON STRUCTURE 02 UNDER STRUCTURE 00
 (29) AVERAGE DAILY TRAFFIC 1100
 (30) YEAR OF ADT 2012 (109) TRUCK ADT 2 %
 (19) BYPASS, DETOUR LENGTH 2 KM

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

(48) LENGTH OF MAXIMUM SPAN 11.7 M
 (49) STRUCTURE LENGTH 12.0 M
 (50) CURB OR SIDEWALK: LEFT 0.0 M RIGHT 0.0 M
 (51) BRIDGE ROADWAY WIDTH CURB TO CURB 13.2 M
 (52) DECK WIDTH OUT TO OUT 17.8 M
 (32) APPROACH ROADWAY WIDTH (W/SHOULDERS) 13.2 M
 (33) BRIDGE MEDIAN- NO MEDIAN 0
 (34) SKEW 27 DEG (35) STRUCTURE FLARED NO
 (10) INVENTORY ROUTE MIN VERT CLEAR 99.99 M
 (47) INVENTORY ROUTE TOTAL HORIZ CLEAR 13.2 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

***** SUFFICIENCY RATING *****

SUFFICIENCY RATING = 97.9
 STATUS
 HEALTH INDEX 98.5
 PAINT CONDITION INDEX = N/A

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

(112) NBIS BRIDGE LENGTH- YES Y
 (104) HIGHWAY SYSTEM- NOT ON NHS 0
 (26) FUNCTIONAL CLASS- MINOR ARTERIAL URBAN 16
 (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- CITY OR MUNICIPAL HIGHWAY AGENCY 04
 (22) OWNER- CITY OR MUNICIPAL HIGHWAY AGENCY 04
 (37) HISTORICAL SIGNIFICANCE- NOT ELIGIBLE 5

***** CONDITION ***** CODE

(58) DECK 7
 (59) SUPERSTRUCTURE 7
 (60) SUBSTRUCTURE 8
 (61) CHANNEL & CHANNEL PROTECTION 8
 (62) CULVERTS N

***** LOAD RATING AND POSTING ***** CODE

(31) DESIGN LOAD- HL 93 A
 (63) OPERATING RATING METHOD- ASSIGNED (LRFD) F
 (64) OPERATING RATING- RF= 1.30
 (65) INVENTORY RATING METHOD- ASSIGNED (LRFD) F
 (66) INVENTORY RATING- RF= 1.00
 (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 7
 (68) DECK GEOMETRY 7
 (69) UNDERCLEARANCES, VERTICAL & HORIZONTAL N
 (71) WATER ADEQUACY 9
 (72) APPROACH ROADWAY ALIGNMENT 8
 (36) TRAFFIC SAFETY FEATURES 1000
 (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 2000
 (115) YEAR OF FUTURE ADT 2032

***** INSPECTIONS *****

(90) INSPECTION DATE 09/15 (91) FREQUENCY 48 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)