



DEPARTMENT OF TRANSPORTATION
Structure Maintenance & Investigations

Bridge Number : 55C0130
Facility Carried: GLASSELL STREET
Location : 0.3 MI S/O ROUTE 91 FWY
City :
Inspection Date : 07/11/2019

Bridge Inspection Report

Inspection Type
Routine ☒ FC ☐ Underwater ☐ Special ☐ Other ☐

STRUCTURE NAME: SANTA ANA RIVER CHANNEL

CONSTRUCTION INFORMATION

Year Built : 1963
Year Modified: 2005
Length (m) : 293.5
Skew (degrees): 0
No. of Joints : 4
No. of Hinges : 4

Structure Description: 18 span continuous CIP RC "T" beam (12 each total including widening) supported by RC pier walls and open end RC diaphragm abutments on steel piles, except Pier 10 through Pier 18 of the east half widening which are RC column (4 each) bents on continuous RC footing and steel piles.

Widen 2005: the bridge was widened 2 CIP/RC beam (2 each) at the west and the east ends.

Span Configuration : (S) 41.00 feet, 16 @ 55.00 feet, 41.00 feet (N).

SAFE LOAD CAPACITY AND RATINGS

Design Live Load: UNKNOWN
Inventory Rating: RF=0.52 =>16.8 metric tons
Operating Rating: RF=0.86 =>27.9 metric tons
Permit Rating : XXXXX
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) 1.25 feet br; 5.00 feet sw; 35.00 feet; 4.00 feet cu. med.; 35.00 feet; 5.00 feet sw; 1.25 feet br (E).

Total Width: 26.1 m Net Width: 21.2 m No. of Lanes: 4 Speed: 45 mph
Min. Vertical Clearance: Unimpaired Overlay Thickness: 0.0 inches
Rail Code: 1000

DESCRIPTION UNDER STRUCTURE

Channel Description: Natural sandy earth trapezoidal with rock 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

A complete routine inspection was performed by walking on and around the bridge to

INSPECTION COMMENTARY

inspect all visible elements of the bridge structure. Bridge deck was inspected by walking on shoulder and sidewalk. Soffit and all substructure were inspected by walking underneath the bridge with rain boots and binoculars due to 10.0 to 14.0 inches deep of water inside spans #11 to #16 at the time of inspection.

There is no need for a special equipment to inspect this structure with rain boots and binoculars.

DECK AND ROADWAY

There are longitudinal and transverse deck cracks (0.04 to 0.06 inches wide, 1.0 to 2.0 feet in spacing) but the deck has been treated with Methacrylate.

The following locations of deck soffit cracks are below:

Span #1: all bays under the traffic lanes (original bridge) has several transverse cracks with heavy white efflorescence (see the attached photo no. 1).

Span #2: all bays under the traffic lanes (original bridge) has several transverse cracks, up to 6.0 feet long with white efflorescence mostly at the southerly end.

Spans #8 to #18 have transverse cracks with white efflorescence but these cracks mirror through the top deck cracks.

Concrete bridge rails have several vertical cracks, up to 0.05 inches wide and 10.0 feet spaced apart.

Southeast corner of the sidewalk has a settlement from 0.5 to 1.0 inch with a spall at (8.0 inches L X 3.0 inches W X 1.0 inch D) at the same location at the approach.

Type A at hinge #16 started deteriorating at 2.0 to 3.0 inches gap at 85.0 degree of Fahrenheit with full of debris.

Type B at hinges #3, #7 and #12 started deteriorating at 2.0 to 3.0 inches gap at 85.0 degree of Fahrenheit with full of debris.

SUPERSTRUCTURE

Below is the following locations of concrete girders with cracks:

Span #9, girder #1 has a spall (3.0 inches L X 3.0 inches W X 1.0 inch D) at the westerly fascia at 15.0 feet from pierwall #10. Girder #3 has four spalls at (12.0 inches L X 5.0 inches W X 2.0 inches D) at westerly fascia (see the attached photo no. 3). Girder #9 has two spalls at (5.0 inches L X 5.0 inches W X 1.0 inch D) approximately 5.0 feet north from intermediate diaphragm at both faces. In addition, Girder #10 has a spall at (5.0 inches L X 6.0 inches W X 1.0 inch D) approximately 5.0 feet north from intermediate diaphragm at the westerly face.

Span #10, there is a spall at (4.0 inches L X 4.0 inches W X 1.0 inch D) on girder #9 approximately 2.0 feet from the intermediate diaphragm without any rebar exposed.

Girder #10 of Span #11 (from west) has a spall at (10.0 inches L X 3.0 inches W X 1.0 inch D) with rebar exposed and rusted approximately 5.0 feet north of intermediate diaphragm.

The following is the locations of concrete girders with cracks below (see the attached photo no. 4):

Span #2, most original girders (south end) have random diagonal cracks (2 shears cracks at each girder) 0.04 inches wide.

Span #9 has 4 diagonal cracks (shear cracks) at each end of each original girder, up to 0.04 inches wide;

INSPECTION COMMENTARY

Span #10, girders #7, #8, #9 and #10 each has eight vertical cracks, up to 0.04 inches wide and 2.5 feet spaced apart mostly at 2/3 of the span length

Most of original girders have random diagonal (shear) cracks up to 0.03 inches wide at both ends.

Restrainer Steel Cables (seismic retrofit) some of them have a minor rust.

SUBSTRUCTURE

Pier wall #11 has two spalls at (3.0 inches L X 3.0 inches W X 1.0 inch D) at the northerly face.

Pier wall #14 has a spall at (1.5 feet diameter X 2.0 inches) approximately 15.0 feet from westerly end, southerly face.

Below is the following locations of pier walls with cracks:

Pier wall #2 has two vertical cracks, 0.05 inches wide.

Pier wall #3 has a vertical crack, 0.04 inches wide.

Pier wall #10 has a vertical crack, at the west portion 0.04 inches wide.

Pier wall #11 has a vertical crack, 0.04 inches wide.

Pier wall #12 has two vertical cracks, up to 0.05 inches wide at the westerly portion.

Pier wall #14 has two vertical crack, 0.04 inches wide.

Pier wall #15 has a vertical crack, 0.04 inches wide at the westerly portion and one horizontal crack 0.05 inches wide at the east portion of the pier wall. In addition, pier wall #16 has a vertical crack, 0.05 inches wide.

SAFE LOAD CAPACITY

A Load Rating Summary sheet is archived on 01/31/2016. As-built drawings are not available for the original bridge. The Load rating Summary Sheet has verified the physical conditions assumed in the above referenced load rating calculation have not changed significantly.

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	7440	sq.m	7005	280	155	0
	1080	Delamination/Spall/Patched Area	2	5		0	0	5	0
	1120	Efflorescence/Rust Staining	2	280		0	280	0	0
	1130	Cracking (RC and Other)	2	150		0	0	150	0
	521	Concrete Coat. (Meth/Paint/Seal)	2	6222	sq.m	6222	0	0	0

(16)

Deck cracks, soffit cracks with efflorescence.

(16-1080)

Southeast corner of the sidewalk has a settlement from 0.5 to 1.0 inch with a spall at (8.0 inches L X 3.0 inches W X 1.0 inch D) at the same location at the approach.

(16-1120)

ELEMENT INSPECTION RATINGS AND COMMENTARY

Elem No.	Defect /Prot	Element Description	Env Qty	Total Qty	Units	Qty in each Condition State			
						St. 1	St. 2	St. 3	St. 4

The following locations of deck soffit cracks are below:

Span #1: all bays under the traffic lanes (original bridge) has several transverse cracks with heavy white efflorescence (see the attached photo no. 1).

Span #2: all bays under the traffic lanes (original bridge) has several transverse cracks, up to 6.0 feet long with white efflorescence mostly at the southerly end.

Spans #8 to #18 have transverse cracks with light white efflorescence but these cracks mirror through the top deck cracks.

(16-1130)

There are longitudinal and transverse deck cracks (0.04 to 0.06 inches wide, 1.0 to 2.0 feet in spacing) but the deck has been treated with Methacrylate.

(16-521)

There were no significant defects noted. The deck cracks were sealed with methacrylate around year 2012.

110	Girder/Beam-RC	2	3524	m	3256	265	3	0
1080	Delamination/Spall/Patched Area	2	20		2	15	3	0
1130	Cracking (RC and Other)	2	250		0	250	0	0

(110)

Spalls and cracks.

(110-1080)

The following is the locations of concrete girders with cracks below:

Span #9, girder #1 has a spall (3.0 inches L X 3.0 inches W X 1.0 inch D) at the westerly fascia at 15.0 feet from pierwall #10. Girder #3 has four spalls at (12.0 inches L X 5.0 inches W X 2.0 inches D) at westerly fascia (see the attached photo no. 3). Girder #9 has two spalls at (5.0 inches L X 5.0 inches W X 1.0 inch D) approximately 5.0 feet north from intermediate diaphragm at both faces. In addition, Girder #10 has a spall at (5.0 inches L X 6.0 inches W X 1.0 inch D) approximately 5.0 feet north from intermediate diaphragm at the westerly face.

Span #10, there is a spall at (4.0 inches L X 4.0 inches W X 1.0 inch D) on girder #9 approximately 2.0 feet from the intermediate diaphragm without any rebar exposed.

Girder #10 of Span #11 (from west) has a spall at (10.0 inches L X 3.0 inches W X 1.0 inch D) with rebar exposed and rusted approximately 5.0 feet north of intermediate diaphragm.

(110-1130)

The following is the locations of concrete girders with cracks below (see the attached photo no. 4):

Span #2, most original girders (south end) have random diagonal cracks (2 shears cracks at each girder) 0.04 inches wide.

Span #9 has 4 diagonal cracks (shear cracks) at each end of each original girder, up to 0.04 inches wide;

Span #10, girders #7, #8, #9 and #10 each has eight vertical cracks, up to 0.04 inches wide and 2.5 feet spaced apart mostly at 2/3 of the span length

Most of original girders have random diagonal (shear) cracks up to 0.03 inches wide at both ends.

182	EQ Restrainer Cable-Other	2	40	ea.	36	4	0	0
1000	Corrosion	2	4		0	4	0	0

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
(182)		Minor corrosion.							
(182-1000)		Restrainer Steel Cables (seismic retrofit) some of them have a minor rust.							
205		Column-RC	2	36	each	36	0	0	0
(205)		4 columns at each Bent , at Bents 10 to 18. There were no significant defects noted.							
210		Pier Wall-RC	2	280	m	269	10	1	0
1080		Delamination/Spall/Patched Area	2	1		0	0	1	0
1130		Cracking (RC and Other)	2	10		0	10	0	0
(210)		Minor spalls and cracks.							
(210-1080)		Pier wall #11 has two spalls at (3.0 inches L X 3.0 inches W X 1.0 inch D) at the northerly face.							
		Pier wall #14 has a spall at (1.5 feet diameter X 2.0 inches) approximately 15.0 feet from westerly end, southerly face.							
(210-1130)		Below is the following locations of pier walls with cracks:							
		Pier wall #2 has two vertical cracks, 0.05 inches wide.							
		Pier wall #3 has a vertical crack, 0.04 inches wide.							
		Pier wall #10 has a vertical crack, at the west portion 0.04 inches wide.							
		Pier wall #11 has a vertical crack, 0.04 inches wide.							
		Pier wall #12 has two vertical cracks, up to 0.05 inches wide at the westerly portion.							
		Pier wall #14 has two vertical crack, 0.04 inches wide.							
		Pier wall #15 has a vertical crack, 0.04 inches wide at the westerly portion and one horizontal crack 0.05 inches wide at the east portion of the pier wall. In addition, pier wall #16 has a vertical crack, 0.05 inches wide.							
215		Abutment-RC	2	36	m	36	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.							
256		Slope Protection	2	1	ea.	1	0	0	0
(256)		There were no significant defects noted.							
		Only at south Abutment.							

ELEMENT INSPECTION RATINGS AND COMMENTARY

Elem No.	Defect /Prot	Element Description	Env	Total Qty	Units	Qty in each State	St. 1	St. 2	St. 3	St. 4
301		Joint-Pourable Seal	2	22	m	19	3	0	0	0
	2320	Seal Adhesion (Joints)	2	3		0	3	0	0	0
(301)										
The joint seals were replaced around year 2012.										
(301-2320)										
Type A at hinge #16 started deteriorating at 2.0 to 3.0 inches gap at 85.0 degree of Fahrenheit with full of debris.										
302		Joint-Compression Seal	2	66	m	60	6	0	0	0
	2320	Seal Adhesion (Joints)	2	6		0	6	0	0	0
(302-2320)										
Type B at hinges #3, #7 and #12 started deteriorating at 2.0 to 3.0 inches gap at 85.0 degree of Fahrenheit with full of debris.										
312		Bearing-Enclosed	2	2	each	2	0	0	0	0
(312)										
The enclosed bearing pads are not exposed for visual inspection.										
331		Railing-RC	2	591	m	531	60	0	0	0
	1130	Cracking (RC and Other)	2	60		0	60	0	0	0

(331)

There were no significant defects noted.

(331-1130)

Concrete bridge rails have several vertical cracks, up to 0.05 inches wide and 10.0 feet spaced apart.

WORK RECOMMENDATIONS

RecDate: 12/31/2017

Action : Sub-Patch spalls

Work By: LOCAL AGENCY

Status : PROPOSED

EstCost:

StrTarget: 2 YEARS

DistTarget:

EA:

Patch Pier wall #14 that has a spall (1.5 feet diameter X 2.0 inches) approximately 15.0 feet from west end southerly face (see the attached photo no. 2).

RecDate: 12/31/2017

Action : Super-Patch spalls

Work By: LOCAL AGENCY

Status : PROPOSED

EstCost:

StrTarget: 2 YEARS


DistTarget:

EA:

Patch all the spalls at the concrete girders at span #9 that have several spalls about (12.0 inches L X 5.0 inches W X 2.0 inches D) (see the attached photo no. 3).

Team Leader : Nelson N. Vo
Report Author : Nelson N. Vo
Inspected By : NN.Vo/E.Mah



 8/22/2019
Edwin Mah (Registered Civil Engineer) (Date)

CC: City of Orange
City of Anaheim

STRUCTURE INVENTORY AND APPRAISAL REPORT

***** IDENTIFICATION *****

(1) STATE NAME- CALIFORNIA 069
 (8) STRUCTURE NUMBER 55C0130
 (5) INVENTORY ROUTE(ON/UNDER)- ON 150000000
 (2) HIGHWAY AGENCY DISTRICT 12
 (3) COUNTY CODE 059 (4) PLACE CODE 00000
 (6) FEATURE INTERSECTED- SANTA ANA RIVER CHANNEL
 (7) FACILITY CARRIED- GLASSELL STREET
 (9) LOCATION- 0.3 MI S/O ROUTE 91 FWY
 (11) MILEPOINT/KILOMETERPOINT 0
 (12) BASE HIGHWAY NETWORK- PART OF NET 1
 (13) LRS INVENTORY ROUTE & SUBROUTE 000000000000
 (16) LATITUDE 33 DEG 50 MIN 35.94 SEC
 (17) LONGITUDE 117 DEG 51 MIN 09.2 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 18
 (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 1963
 (106) YEAR RECONSTRUCTED 2005
 (42) TYPE OF SERVICE: ON- HIGHWAY 1
 UNDER- WATERWAY 5
 (28) LANES:ON STRUCTURE 04 UNDER STRUCTURE 00
 (29) AVERAGE DAILY TRAFFIC 22000
 (30) YEAR OF ADT 2019 (109) TRUCK ADT 1 %
 (19) BYPASS, DETOUR LENGTH 5 KM

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

(48) LENGTH OF MAXIMUM SPAN 16.8 M
 (49) STRUCTURE LENGTH 293.5 M
 (50) CURB OR SIDEWALK: LEFT 0.0 M RIGHT 0.0 M
 (51) BRIDGE ROADWAY WIDTH CURB TO CURB 21.2 M
 (52) DECK WIDTH OUT TO OUT 26.1 M
 (32) APPROACH ROADWAY WIDTH (W/SHOULDERS) 21.2 M
 (33) BRIDGE MEDIAN- CLOSED NON-MOUNTABLE 3
 (34) SKEW 0 DEG (35) STRUCTURE FLARED NO
 (10) INVENTORY ROUTE MIN VERT CLEAR 99.99 M
 (47) INVENTORY ROUTE TOTAL HORIZ CLEAR 10.6 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 = 69.0
 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- 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 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- 27.9
 (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 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 45792
 (115) YEAR OF FUTURE ADT 2037

***** INSPECTIONS *****

(90) INSPECTION DATE 07/19 (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)