STATE OF CALIFORNIA - CALIFORNIA STATE TRANSPORTATION AGENCY
EDMUND G. BROWN JR., Governor

DEPARTMENT OF TRANSPORTATION
DIVISION OF MAINTENANCE
STRUCTURE MAINTENANCE & INVESTIGATIONS
100 South Main Street, 3rd Floor
LOS ANGELES, CA 90012
PHONE (213) 897-2004
FAX (213) 897-2033

KB

Jeff

Making Conservation a California Way of Life.

September 3, 2018

Mr. Shane Silsby
Director of Public Works
County of Orange
P O Box 4048
Santa Ana, CA 92702-4048

Dear Mr. Silsby:

In accordance with Title 23 of the Code of Federal Regulations (Federal Highway Act) and the National Bridge Inspection Standards (NBIS), Caltrans Structure Maintenance and Investigations performed an inspection of 2 bridges under your jurisdiction. The type of inspection is indicated on the bridge report transmittal sheet. The bridges have been rated to indicate their deficiencies, structural adequacy, safe load carrying capacity and overall general condition.

Enclosed are copies of the Bridge Inspection Reports for the structures noted on the attached transmittal sheet. These reports contain descriptions of physical changes to the structures since the last inspection, recommendations for work to be done, and additional information not recorded in the previous Bridge Reports.

Your attention is directed to the requirements of Title 23, Part 650 of the Code of Federal Regulations, where newly completed structures or any modification of existing structures shall be entered in the inventory within 90 days. Please notify this office of any newly constructed bridge or culvert within your jurisdiction, more than 20 feet measured along the center of the roadway and carrying public vehicular traffic or over a public roadway, in order that it may be entered in the inventory of bridge structures in compliance with Federal requirements.

Should you have any questions regarding the enclosed Bridge Inspection Reports, please contact Bing Wu @ (213) 897-0874.

Sincerely,

CHING CHAO
Office Chief
Structure Maintenance & Investigations - (Investigations-South)

Enclosures

STATE OF CALIFORNIA - CALIFORNIA STATE TRANSPORTATION AGENCY

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Bridge Report Transmittal Sheet

Batch 41527

County of Orange

Bridge #	Bridge Name	Location	Inspection Date	Inspection Type	Outstanding Work	Outstanding Cost
55C0017	SANTA ANA RIVER CHANNEL	0.7 MI E/O ROUTE 57 FWY.	12/31/2017	Routine	Y	$
55C0130	SANTA ANA RIVER CHANNEL	0.3 MI S/O ROUTE 91 FWY	12/31/2017	Routine	Y	$

2 Bridge(s) in this Transmittal

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Making Conservation a California Way of Life.

WEB SITES:

The National Bridge Inspection Standards (NBIS) Recording and Coding Guide for the Structure Inventory and Appraisal of the Nation's Bridges, Element Level Inspection, Structure Maintenance and Investigations Manuals, Local Assistance Program Guidelines and other related information are posted on Division of Maintenance, Structure Maintenance and Investigations; Division of Local Assistance, Local Highway Bridge Program (HBP) and FHWA websites.
The websites can be accessed at:

1. "Caltrans Structure Maintenance and Investigations" http://www.dot.ca.gov/hq/structur/strmaint/
2. "Caltrans Division of Local Assistance"
http/www.dot.ca.gov/hq/LocalPrograms/hbrr99/hbrr99a.htm
3. "FHWA" http/www.fhwa.dot.gov/BRIDGE/mtguide.pdf

Inspection Type Definitions

Routine Inspection:

Routine Inspections consist of both the initial Inventory Inspection (the first inspection of the bridge that places it in the bridge inventory or when there has been a change in the configuration of the structure) and subsequent regularly scheduled inspections. The initial inspection provides all the Structural Inventory & Appraisal (SI&A) data required by federal and state regulations, determines the baseline structural conditions, lists any existing problems, and establishes the load capacity of the structure. Subsequent inspections consist of observations, measurements needed to determine the physical and functional condition of the bridge, to identify any changes from the previously recorded conditions, and verification of its load capacity. These inspections are generally conducted from the deck, ground and/or water level, and from permanent work platforms and walkways, if present. Inspection of underwater portions of the substructure is limited to observations during low-flow periods and/or probing for signs of undermining. Special equipment should be utilized in circumstances where its use provides the only practical access to areas of the structure.

Fracture Critical, Special Feature & Underwater Inspections:

Fracture Critical, Special Feature, and Underwater Inspections are up close, hands-on inspections of one or more members above or below the water level to identify any deficiencies not readily detectable using Routine Inspection procedures. These inspections generally require special equipment such as under-bridge inspection equipment, manlifts, boats, traffic control, and railroad flagging. Personnel with special skills such as divers or structural steel inspectors trained in non-destructive testing techniques may be required.

Other Inspections:

Other Inspections are conducted on damaged structures, structures that have developed specific problems, or structures suspected of developing problems. The scope of these investigations should be sufficient to determine the need for emergency load restrictions or closure of the structure, monitor a changing condition, and to assess the level of effort necessary to effect a repair.

DEPARTMENT OF TRANSPORTATION
Structure Maintenance & Investigations

Bridge Number : 55C0017
Facility Carried: LINCOLN AVENUE
Location : 0.7 MI E/O ROUTE 57 FWY.
City
Inspection Date : 12/31/2017
Inspection Type
Routine [X] FC [ ] Underwater [ ] Special [ ] Other [ ]

Bridge Inspection Report

STRUCTURE NAME: SANTA ANA RIVER CHANNEL

CONSTRUCTION INFORMATION

Year Built : 1970
Year Modified: 2014
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 HP 14X89. The widening: Box girder on RC pier walland RC open end diaphragm abutments, all supported upon steel piles from both side. (18 ft from each side).

Span Configuration : (W) 56.00 ft, 4 @ 78.00 ft, 56.00 ft (E)

SAFE LOAD CAPACITY AND RATINGS

Design Live Load: MS-18 OR HS-20
Inventory Rating: RF=1.71 =>55.4 metric tons Calculation Method: LOAD FACTOR
Operating Rating: RF=2.84 =>92.0 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) 1.00 ft br, 5.00 ft sw, 92.00 ft, 5.00 ft sw, 1.00 ft br (N).
Total Width: 31.6 m Net Width: 28.0 m No. of Lanes: 6 Speed: 45 mph
Min. Vertical Clearance: Unimpaired Overlay Thickness: 0.0 inches
Rail Code: 1000

DESCRIPTION UNDER STRUCTURE

Channel Description: Natural earth trapezoidal with rock slope protection, grouted 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

This inspection was performed by walking on the sidewalks, and under all spans. A full visual inspection is performed for the visible substructure elements.
The channel was dry at the time of inspection, however spans 3 , 4 and 5 were muddy.

INSPECTION COMMENTARY

SAFE LOAD CAPACITY

A Structure Rating Summary Sheet, dated 02/03/2014, is on-file for this structure. The current rating is based on a BDS computer output, dated 11/20/1979, while this report does not include a check of that analysis

WATERWAY

A channel cross section was taken during this inspection and is included with this report. This cross section is the first cross section for this channel. No significant scour is noticed in this diaphragm.

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
16			Top Flange-RC	2	4108	sq.m	3508	600	0	0
	1120		Efflorescence/Rust Staining	2	300		0	300	0	0
	1130		Cracking (RC and Other)	2	300		0	300	0	0
	521		Concrete Coat.(Meth/Paint/Seal)	2	2470	sq.m	2470	0	0	0

(16-1120)
There are transverse cracks in the soffit in several bays in most spans with white efflorescence.

(16-1130)
The deck at the widening sections has several transverse cracks 5-10 feet long, 0.05 inches wide and 1-2 feet spaced apart.

(16-521)
There were no significant defects noted.
Only the original portion of the bridge was treated with methacrylate.

104			Box Girder-PS Conc.	2	260	m	230	30	0	0
	1080		Delamination/Spall/Patched Area	2	5		0	5	0	0
	1110		Cracking (PS Conc.)	2	25		0	25	0	0

(104-1080)
Span 1: few sound patched areas 12 inches X 12 inches at mid-span.
There are several sound patched areas in several girders.

(104-1110)
Northerly box girder has few vertical cracks with light white efflorescence above pier walls #5 and #6.

110			Girder/Beam-RC	2	1040	m	1036	3	1	0
	1080		Delamination/Spall/Patched Area	2	3		0	2	1	0
	1130		Cracking (RC and Other)	2	1		0	1	0	0

(110-1080)
At span 2: girder #1 (original RC) has a spall 2.50 feet X 10 inches X 2 inches at mid-span. (see the attached photo no. 2)

Few sound patched areas at girders 6, 7 and 8 at span 6.

(110-1130)
There are shear cracks in most **girders**, up to 0.04 inches wide near the **supports**.

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
182			**EQ Restrainer Cable-Other**	2	6	ea.	6	0	0	0
(182)										
There were no significant defects noted.										
At Hinge 3.										
210			**Pier Wall-RC**	2	160	m	155	5	0	0
	1130		**Cracking (RC and Other)**	2	5		0	5	0	0
(210-1130)										
Pier walls have few vertical racks, up to 1.0 mm wide.										
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	31	m	26	5	0	0
	2320		**Seal Adhesion (Joints)**	2	5		0	5	0	0
(302-2320)										
The compression joint seal lost adhesion in few locations, the estimated depth of adhesion is more than 50%.										
312			**Bearing-Enclosed**	2	1	each	1	0	0	0
(312)										
There were no significant defects noted.										
331			**Railing-RC**	2	260	m	240	20	0	0
	1130		**Cracking (RC and Other)**	2	20		0	20	0	0
(331-1130)										
The RC rails have several vertical cracks, up to 0.05 inches wide and 10 feet spaced apart.										

WORK RECOMMENDATIONS

RecDate: 12/31/2017
Action : Super-Patch spalls
Work By: LOCAL AGENCY
Status : PROPOSED

EstCost:
StrTarget: 2 YEARS
DistTarget:
EA:

Patch the spall at span 2, girder #1 (original RC) that has a spall 2.50 feet X 10 inches X 2 inches at mid-span. (see the attached photo no. 2)

CHANNEL X-SECTION

Side : Upstream
Measured From : North overhang.

X-Section Date: 12/31/2017

Location	Horiz(m)	Vert(m)	Comments
Abutment 1	0.30	2.80	Face of the west Abutment, top of RSP
	1.00	1.00	
	3.70	3.43	top of wall
	3.75	4.64	bottom of wall, West edge of walk path

CHANNEL X-SECTION

Side : Upstream
Measured From : North overhang.

X-Section Date: 12/31/2017

Location	Horiz (m)	Vert (m)	Comments
	9.95	4.73	East edge of walk path
Pier wall 2	17.50	7.78	West face of PW 2
Pier wall 2	17.70	8.70	West face of PW 2
	30.00	8.71	
Pier wall 3	41.30	8.79	West face of PW 3
Pier wall 3	41.70	8.75	East face of PW 3
	53.00	8.60	
Pier wall 4	65.10	8.65	West face of PW 4
Pier wall 4	65.50	8.60	East face of PW 4
Pier wall 5	88.90	8.51	West face of PW 5
Pier wall 5	89.30	8.41	East face of PW 5
	101.00	8.29	
Pier wall 6	112.70	7.50	West face of PW 6
Pier wall 6	113.10	6.94	East face of PW 6
	117.46	5.04	top of slope
	125.16	7.78	teo of slope
Abutment 7	130.00	2.13	Face of the east Abutment

Team Leader : Ashraf Shenouda

Report Author : Ashraf Shenouda

Inspected By : A.Shenouda/KD.Henderson

8/27/18

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 000000000000
(16) LATITUDE 33 DEG 50 MIN 07.59 SEC
(17) LONGITUDE 117 DEG 51 MIN 50.13 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 2014
(42) TYPE OF SERVICE: ON- HIGHWAY 1
UNDER- WATERWAY 5
(28) LANES:ON STRUCTURE 06 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 1.5 M RIGHT 1.5 M
(51) BRIDGE ROADWAY WIDTH CURB TO CURB 28.0 M
(52) DECK WIDTH OUT TO OUT 31.6 M
(32) APPROACH ROADWAY WIDTH (W/SHOULDERS) 28.0 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 28.0 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 = 91.4
STATUS
HEALTH INDEX 96.7
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 7
(59) SUPERSTRUCTURE 7
(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 7
(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 79890
(115) YEAR OF FUTURE ADT 2035

********** INSPECTIONS **********

(90) INSPECTION DATE 12/17 (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)

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 : 12/31/2017

Bridge Inspection Report

Inspection Type

Routine	FC	Underwater	Special	Other
X				

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 induding 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 ft, 16 @ 55.00 ft, 41.00 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=0.86 =>27.9 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) 1.25 ft br; 5.00 ft sw; 35.00 ft; 4.00 ft cu. med.; 35.00 ft; 5.00 ft sw; 1.25 ft 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

INSPECTION COMMENTARY

This inspection was performed by walking on the sidewalks, raised median and under all spans. A visual inspection is performed for the visible substructure elements. The water in the channel was up to 3.5 feet deep at spans 3 to 8 (no underside Inspection) & 1 foot water at span 11 to span 16 that were inspected using arain boots. Inspection access is through a vehicular access at northeast gate.

DECK AND ROADWAY

Southeast corner of the sidewalk settled up to 3/4 inches, with a spall 8 inches X 3 inches X 1 inch at the sidewalk approach at the same location.

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	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	7440	sq.m	6990	450	0	0
	1080		**Delamination/Spall/Patched Area**	2	50		0	50	0	0
	1120		**Efflorescence/Rust Staining**	2	400		0	400	0	0
	1130		**Cracking (RC and Other)**	2	400		400	0	0	0
	521		**Concrete Coat.(Meth/Paint/Seal)**	2	6222	sq.m	6222	0	0	0

(16-1080)
The concrete deck has few sound patched areas +/- 2 feet X 18 inches in several locations, mostly in spans 12, 14 and 16.

(16-1120)
The soffit exhibits: (see the attached photo no. 1)
* span #1: all bays under the traffic lanes (original bridge) has several transverse cracks with heavy white efflorescence;
* span #2: all bays under the traffic lanes (original bridge) has several transverse cracks, up to 6 feet long with light white efflorescence mostly at south end; and
* at spans #8 to #18: few transverse cracks with light white efflorescence; these cracks mirror the deck cracks.

(16-1130)
The bridge deck is treated with methacrylate and all the deck cracks that were in condition state 2 will move to condition state 1.

(16-521)
There were no significant defects noted.
The deck is sealed with methacrylate in around year 2012.

110			**Girder/Beam-RC**	2	3524	m	3251	270	3	0
	1080		**Delamination/Spall/Patched Area**	2	23		0	20	3	0
	1130		**Cracking (RC and Other)**	2	250		0	250	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
			(110-1080)							

The concrete girders exhibit:
At span 2: Girder 3, has six sound patched areas +/- 12 inches X 10 inches in different locations.

* at span 9:
- girder 1 exhibits a spall 3 inches X 3 inches X 1 inch at west fascia at 15 feet from PW #10;
- girder 3 exhibits four spalls +/- 12 inches X 5 inches X 2 inch at west fascia; (see the attached photo no. 3)
- girder #9 exhibits two spalls 5 inches X 5 inches X 1 inch at 5 feet north from intermediate diaphragm at both faces; and
- girder #10 exhibits a spall 5 inches X 6 inches X 1 inch at 5 feet north from intermediate diaphragm at west face.

* at span 10: a spall 4 inches X 4 inches X 1 inch at girder #9 at 2 feet from the intermediate diaphragm without any rebar exposed.

* at span 11: girder #10 (from west) has a spall 10 inches X 3 inches X 1 inch with rebar exposed and rusted at 5 feet north of intermediate diaphragm.

* at span 17: most girders from 3 to 10 have up to two sound patched areas +/- 12 inches X 12 inches.

(110-1130)

The concrete girders exhibit: (see the attached photo no. 4)
* in span 2: most original girders (south end) have few shear cracks (2 cracks at each girder) 0.04 inches wide;

* in span 9:
- 4 shear cracks (at each end) at each original girder , up to 0.04 inches wide;

* in 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 the middle 2/3rd of the span.

* most original girders exhibit few shear cracks up to 0.03 inches wide at both ends.

182		**EQ Restrainer Cable-Other**	2	40	ea.	35	5	0	0
	1000	**Corrosion**	2	5		0	5	0	0

(182-1000)

Steel cables of the seismic retrofit have a sign of rust of some of them.

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

(210-1080)

Pier wall #11 exhibits two spalls 3 inches X 3 inches X 1 inch at north face.

Pier wall #14 exhibits a **spall** 1.5 feet diameter X 2 inches at 15 feet from west end **southerly** face.

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
			(210-1130) Pier walls exhibit: Pier wall #2 exhibits two vertical cracks, 0.05 inches wide. Pier wall #3 exhibits a vertical crack, 0.04 inches wide. Pier wall #10 exhibits a vertical crack, at the west portion 0.04 inches wide. Pier wall #11 exhibits a vertical crack, 0.04 inches wide. Pier wall #12 exhibits two vertical cracks, up to 0.05 inches wide at the westerly portion. Pier wall #14 exhibits two vertical crack, 0.04 inches wide. Pier wall #15 exhibits 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. Pier wall #16 exhibits 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.							
301		**Joint-Pourable Seal**		2	88	m	75	13	0	0
	2320	**Seal Adhesion (Joints)**		2	13		0	13	0	0
			(301) The joint seals were replaced around year 2012.							
			(301-2320) The pourable joint seal at hinge 3 lost adhesion about 17 feet long. The pourable joint seal at hinge 7 lost adhesion about 6 feet long at westbound lanes. The pourable joint seal at hinge 16 lost adhesion about 20 feet long at westbound and southbound lanes.							
312		**Bearing-Enclosed**		2	2	each	2	0	0	0
			(312) The enclosed bearing pads are not exposed for visual inspection.							
331		**Railing-RC**		2	591	m	531	60	0	0
	1130	**Cracking (RC and Other)**		2	60		0	60	0	0
			(331-1130) The RC rails have several vertical cracks, up to 0.05 inches wide and 10 feet spaced apart.							

WORK RECOMMENDATIONS

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 inches at 15 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 +/- 12 inches X 5 inches X 2 inches. (see the attached photo no. 3)

Team Leader : Ashraf Shenouda

Report Author : Ashraf Shenouda

Inspected By : A.Shenouda/KD.Henderson

8/27/18

Ashraf Shenouda (Registered Civil Engineer) (Date)

REGISTERED PROFESSIONAL ENGINEER
Ashraf Shenouda
No. 64332
06/30/2019
CIVIL
STATE OF CALIFORNIA

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 2003 (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 = 69.0
STATUS
HEALTH INDEX 97.8
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- 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 2035

********** INSPECTIONS **********

(90) INSPECTION DATE 12/17 (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 RIVER CHANNEL

0.7 MI E/O ROUTE 57 FWY. 12/31/2017 [AAAI] 55C0017

133 - PHOTO-Unclassified

Photo No. 1

Steel pipe at the bridge centerline, hanged from he soffit.

107 - PHOTO-Super-Damage/Deteroration

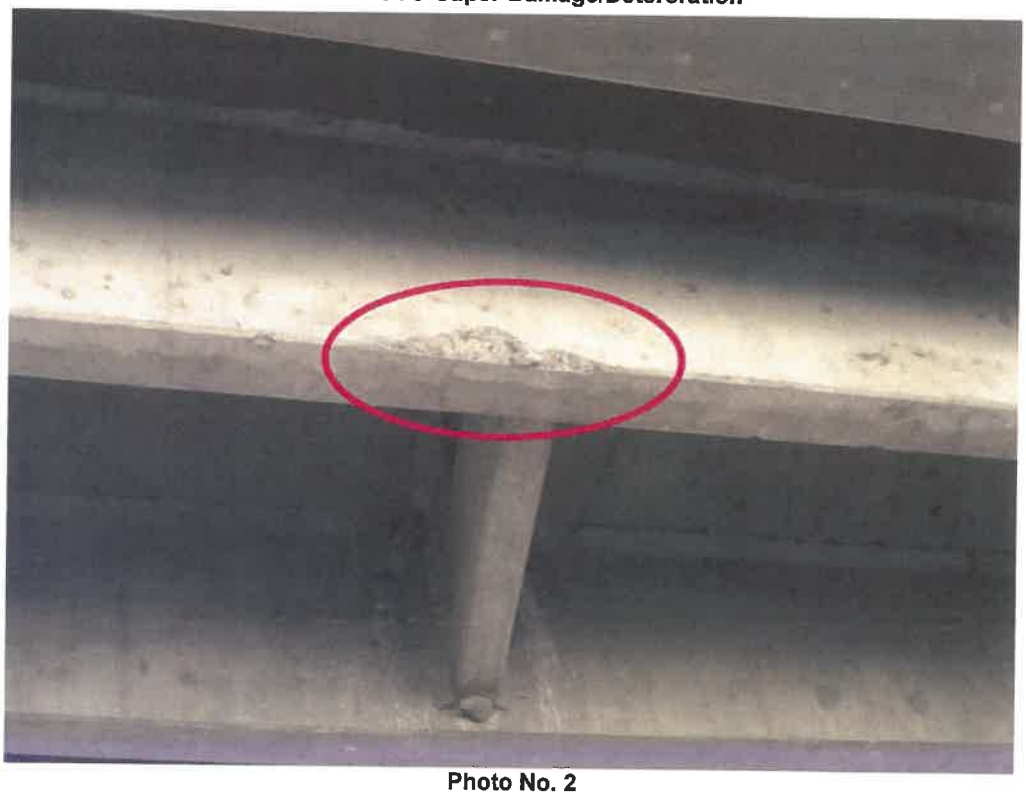

Photo No. 2

Spall 2.5 ft X 10 in. X 2 in. at span 2, id-span of girder 1.

SANTA ANA RIVER CHANNEL

0.3 MI S/O ROUTE 91 FWY

12/31/2017 [AAAK]

55C0130

102 - PHOTO-Deck-Damage/Deterioration

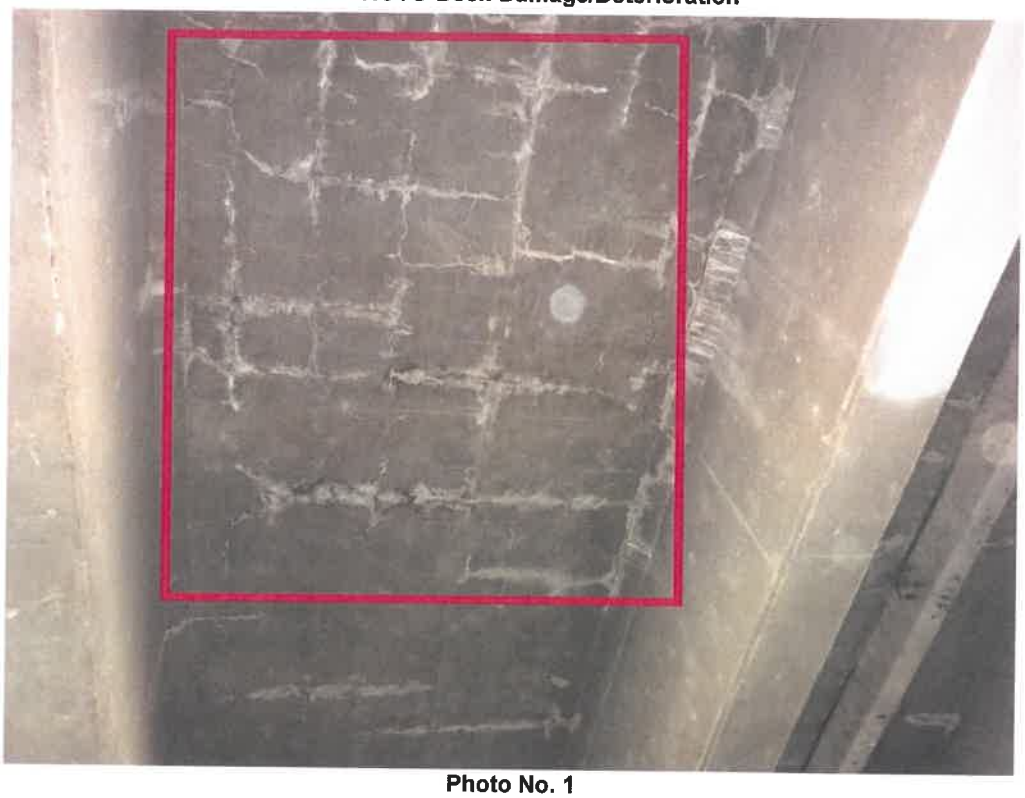

Photo No. 1

113 - PHOTO-Sub-Damage/Deterioration

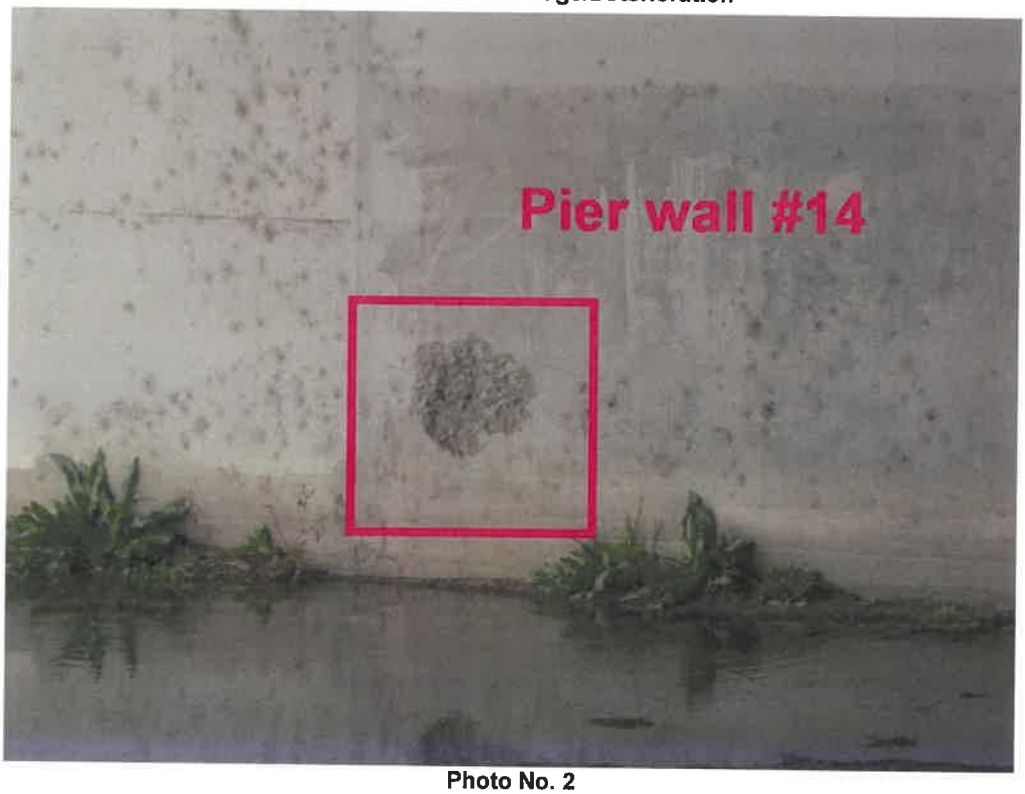

Photo No. 2

Spalll 1.5 feet diameter X 2 inches deep at pier wall 14.

SANTA ANA RIVER CHANNEL

0.3 MI S/O ROUTE 91 FWY

12/31/2017 [AAAK]

55C0130

107 - PHOTO-Super-Damage/Deteroration

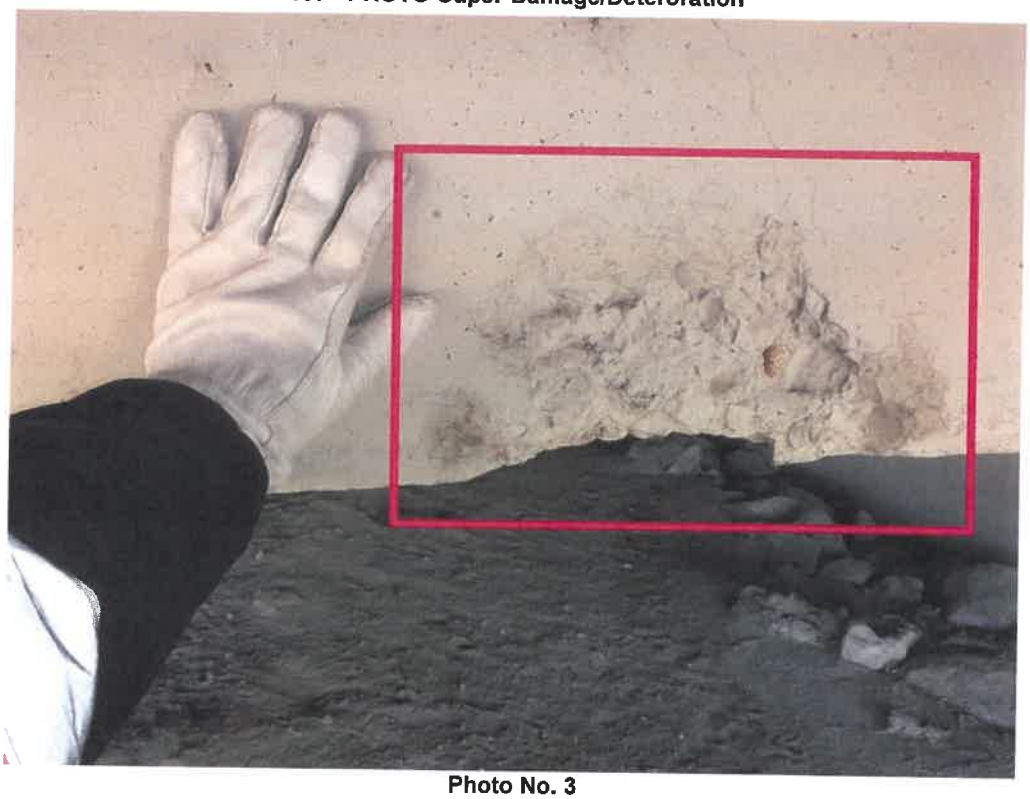

Photo No. 3

Spalls 12 in X 5 in. X 2 in.at G#9 at span 9.

107 - PHOTO-Super-Damage/Deteroration

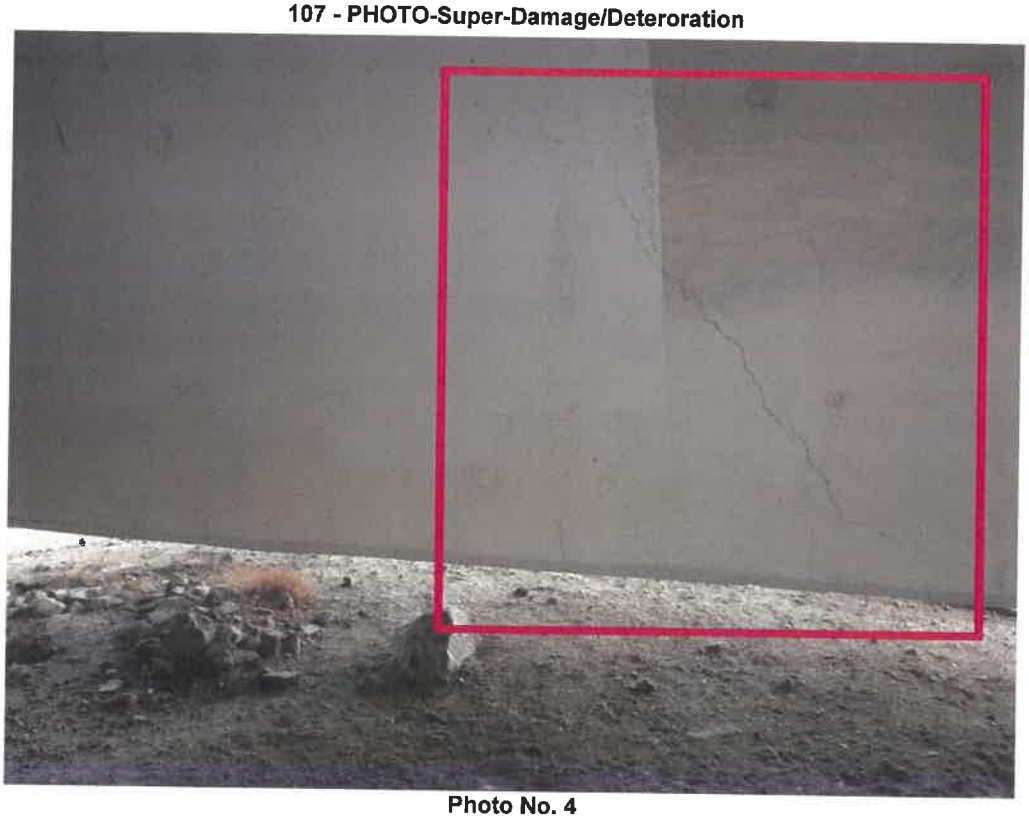

Photo No. 4

Diagonal cracks at the RC girders, up to 0.04 inches wide.