

**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



*Making Conservation  
a California Way of Life.*

July 4, 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 6 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,

A handwritten signature in blue ink, appearing to read "Ching Chao".

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

Enclosures

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**Bridge Report Transmittal Sheet****Batch 41392****County of Orange**

Bridge #	Bridge Name	Location	Inspection		Outstanding	
			Date	Type	Work	Cost
55C0177	SILVERADO CANYON CREEK	4.4 MI. E/O SANTIAGO ROAD	12/15/2017	Routine	Y	\$
55C0178	SILVERADO CANYON CREEK	4.9 MI. E/O SANTIAGO ROAD	12/15/2017	Routine	Y	\$
55C0179	SILVERADO CANYON CREEK	5.4 MI E/O SANTIAGO CYN	12/15/2017	Routine	Y	\$
55C0181	SILVERADO CANYON CREEK	3.1 MI E/O SANTIAGO ROAD	12/15/2017	Routine	Y	\$
55C0182	SILVERADO CANYON CREEK	3.6 MI. E/O SANTIAGO ROAD	12/15/2017	Routine	Y	\$
55C0183	SILVERADO CANYON CREEK	50' N/O SILVERADO CYN RD.	12/15/2017	Routine	N	\$

**6** Bridge(s) in this Transmittal

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**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** : 55C0177  
**Facility Carried**: SILVERADO CANYN RD  
**Location** : 4.4 MI. E/O SANTIAGO ROA  
**City** :  
**Inspection Date** : 12/15/2017

**Bridge Inspection Report**
**Inspection Type**

Routine	FC	Underwater	Special	Other
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**STRUCTURE NAME:** SILVERADO CANYON CREEK

**CONSTRUCTION INFORMATION**

Year Built : 1947	Skew (degrees): 45
Year Modified: N/A	No. of Joints : 0
Length (m) : 12.8	No. of Hinges : 0

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

Span Configuration : (W) 40.00 ft (E)

**SAFE LOAD CAPACITY AND RATINGS**

Design Live Load: UNKNOWN	
Inventory Rating: RF= 0.73	Calculation Method: (LRFR) LD & RES FACT RATING
Operating Rating: RF= 0.95	Calculation Method: (LRFR) LD & RES FACT RATING
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) 1.50 ft br, 27.00 ft, 1.50 ft br (N)

Total Width: 8.2 m	Net Width: 7.2 m	No. of Lanes: 2	Speed: 25 mph
Min. Vertical Clearance: Unimpaired			Overlay Thickness: 0.0 inches

Rail Code: 0000

Rail Type	Location	Length (ft)	Rail Modifications
Timber Rail	Left	42	
Miscellaneous	Right	42	

**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**

This inspection was performed by walking on the bridge shoulders and deck, and under the span. A full visual inspection is performed for the visible substructure elements. The water in the channel was 8 inches deep at 8 feet wide at next to the west Abutment at the

**INSPECTION COMMENTARY**

time of the inspection. Inspection access is from the east side and southwest quadrants.

The bridge deck was inspected on 12/15/2017 and the underside elements were inspected on 2/8/2018.

**DECK AND ROADWAY**

The north rail is loose at the east end.

**SAFE LOAD CAPACITY**

The load rating for this structure is calculated on 08/03/2017 by SMI Ratings Branch using BrR 6.8.0 AASHTO analysis, and the load rating summary sheet is archived on 08/31/2016.

<b><u>ELEMENT INSPECTION RATINGS AND COMMENTARY</u></b>									
<b>Elem No.</b>	<b>Defect /Prot</b>	<b>Element Description</b>	<b>Env</b>	<b>Total Qty</b>	<b>Units</b>	<b>Qty in each Condition State</b>			
						<b>St. 1</b>	<b>St. 2</b>	<b>St. 3</b>	<b>St. 4</b>
12		Deck-RC	2	105	sq.m	39	50	16	0
	1080	Delamination/Spall/Patched Area	2	1		0	0	1	0
	1120	Efflorescence/Rust Staining	2	10		0	10	0	0
	1130	Cracking (RC and Other)	2	55		0	40	15	0
	1190	Abrasion (PS Conc./RC)	2	2		2	0	0	0
(12-1080)									
There are two spalls 15 inches X 10 inches X 2 inches in the eastbound direction at 3 feet from the east end; and around these spalls, there is an unsound concrete area 4 feet X 3 feet. (see the attached photos no. 1 and 2)									
(12-1120)									
The soffit exhibits:									
* two transverse cracks +/- 2 feet long with light white efflorescence in bay #2 at the east end.									
* two transverse cracks +/- 3 feet long with light white efflorescence in bay #3 at the west end.									
(12-1130)									
There are unsealed transverse cracks in the concrete deck, up to 0.06 inches wide and 12 inches spaced apart.									
(12-1190)									
The concrete deck exhibits light abrasion about 70% of the entire deck area.									
107		Girder/Beam-Steel	2	52	m	26	26	0	0
	1000	Corrosion	2	25		0	25	0	0
	1900	Distortion	2	1		0	1	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
	515		Steel Coating-Paint	2	116	sq.m	64	26	20	6
		3440	Effectiveness (Steel PC)	2	52		0	26	20	6
(107-1000)										
The steel girders exhibit pitting rust the surface.										
(107-1900)										
Steel girder #1 (north girder) exhibits 3 inches dent at the bottom flange at 10 feet from the west abutment. (see the attached photo no. 3)										
(107-515-3440)										
The paint system is failed especially at the the bottom flange of all girders.										
	215		Abutment-RC	2	24	m	22	2	0	0
	1130		Cracking (RC and Other)	2	2		0	2	0	0
(215-1130)										
The concrete Abutments have few vertical cracks, up to 0.05 inches wide.										
	312		Bearing-Enclosed	2	2	each	2	0	0	0
(312)										
The enclosed bearing pads are not exposed for visual inspection.										
	332		Railing-Timber	2	13	m	12	1	0	0
	1020		Connection	2	1		0	1	0	0
(332-1020)										
There is a wooden post broken at the west side of the northerly bridge rail.										
	333		Railing-Other	2	13	m	9	0	2	2
	1020		Connection	2	4		0	0	2	2
(333-1020)										
There are two wooden posts missing in the southerly bridge railing.										

**WORK RECOMMENDATIONS**

RecDate: 07/12/2011

Action : Deck-Methacrylate

Work By: LOCAL AGENCY

Status : PROPOSED

EstCost:

StrTarget: 2 YEARS

DistTarget:

EA:

Repair the deck spall 15 inches X 10 inches X 2 inches in the eastbound direction at 3 feet from the east end; and around this spall, there is an unsound concrete area 4 feet X 3 feet.

Clean and seal the deck cracks with methacrylate.

RecDate: 07/12/2011

Action : Paint-Full Prep

Work By: LOCAL AGENCY

Status : PROPOSED

EstCost:

StrTarget: 4 YEARS

DistTarget:

EA:

Clean and paint the steel girders

WORK RECOMMENDATIONS

RecDate: 02/09/2005	EstCost:	Replace the two wooden posts missing in
Action : Railing-Repair	StrTarget: 2 YEARS	the southerly bridge railing.
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) 6/27/18



# **STRUCTURE INVENTORY AND APPRAISAL REPORT**

## \*\*\*\*\* IDENTIFICATION \*\*\*\*\*

(1) STATE NAME- CALIFORNIA 069  
 (8) STRUCTURE NUMBER 55C0177  
 (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- 4.4 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 48.7 SEC  
 (17) LONGITUDE 117 DEG 36 MIN 42.76 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 7.2 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 7.2 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 = 44.6  
 STATUS  
 HEALTH INDEX 81.4  
 PAINT CONDITION INDEX = 75.9

## \*\*\*\*\* 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	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= 0.95	
(65) INVENTORY RATING METHOD- (LRFR) LD & RES FA	8
(66) INVENTORY RATING- RF= 0.73	
(70) BRIDGE POSTING- EQUAL TO OR ABOVE LEGAL LOADS	5
(41) STRUCTURE OPEN, POSTED OR CLOSED- DESCRIPTION- OPEN, NO RESTRICTION	A

## \*\*\*\*\* APPRAISAL \*\*\*\*\*

	CODE
(67) STRUCTURAL EVALUATION	5
(68) DECK GEOMETRY	3
(69) UNDERCLEARANCES, VERTICAL & HORIZONTAL	N
(71) WATER ADEQUACY	5
(72) APPROACH ROADWAY ALIGNMENT	8
(36) TRAFFIC SAFETY FEATURES	0000
(113) SCOUR CRITICAL BRIDGES	8

## \*\*\*\*\* PROPOSED IMPROVEMENTS \*\*\*\*\*

(75) TYPE OF WORK- REPLACE FOR DEFICIENC	CODE 31
(76) LENGTH OF STRUCTURE IMPROVEMENT	12.8 M
(94) BRIDGE IMPROVEMENT COST	\$241,500
(95) ROADWAY IMPROVEMENT COST	\$48,300
(96) TOTAL PROJECT COST	\$405,720
(97) YEAR OF IMPROVEMENT COST ESTIMATE	2017
(114) FUTURE ADT	4204
(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)	



102 - PHOTO-Deck-Damage/Deterioration



Photo No. 1

Deck spall and unsound area 3 feet X 2 feet at 3 feet from east end , eastbound lane.

102 - PHOTO-Deck-Damage/Deterioration

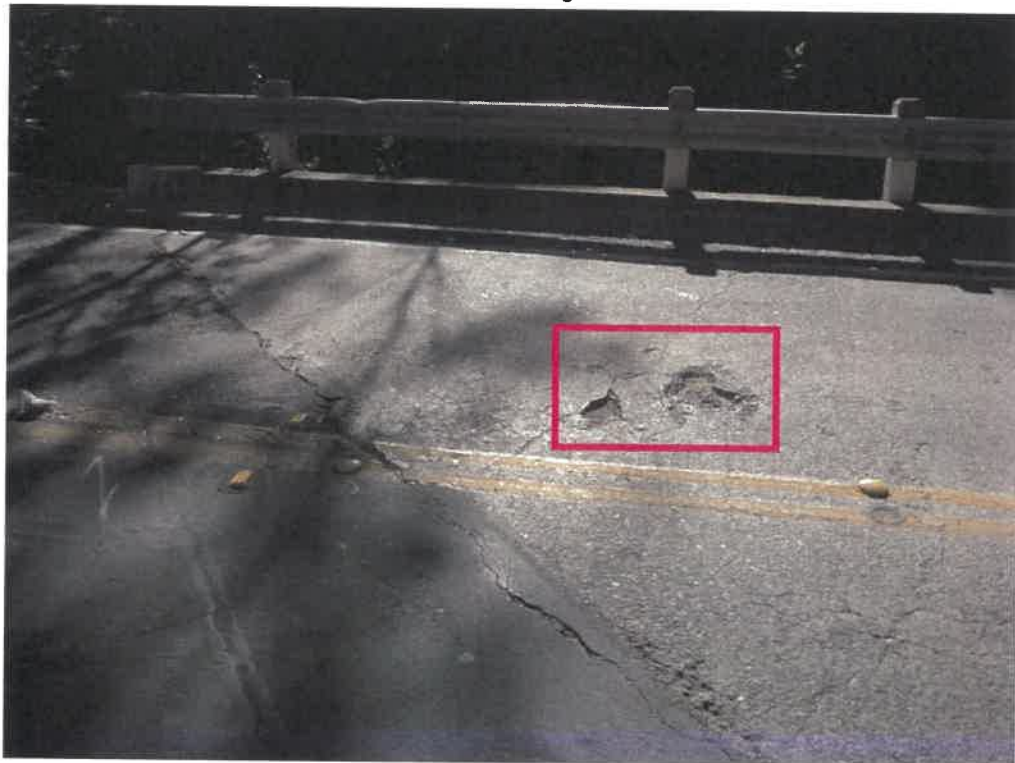


Photo No. 2

Deck spall and unsound area 3 feet X 2 feet at 3 feet from east end , eastbound lane.

4.4 MI. E/O SANTIAGO ROAD

## SILVERADO CANYON CREEK

12/15/2017 [AAAK]

55C0177

107 - PHOTO-Super-Damage/Deteroration



Photo No. 3

3 inches dent at the girder 1.