DEPARTMENT OF TRANSPORTATION
Structure Maintenance & Investigations

Bridge Number : 55C0174
Facility Carried: SILVERADO CNYN RD.
Location : 1.6 MI E/O SANTIAGO ROAD
City :
Inspection Date : 05/08/2019

Bridge Inspection Report

Inspection Type

Routine	FC	Underwater	Special	Other
[X]	[ ]	[ ]	[ ]	[ ]

STRUCTURE NAME: SILVERADO CANYON CREEK

CONSTRUCTION INFORMATION

Year Built : 1935
Year Modified: N/A
Length (m) : 17.7
Skew (degrees): 36
No. of Joints : 0
No. of Hinges : 0

Structure Description: CIP/RC deck on riveted steel floor beams on simply supported riveted steel through girders (2) on RC pedestals on RC closed end backfilled cantilever abutments on spread footings.

Span Configuration : (W) 1 @ 50.83 feet (E).

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: LOAD FACTOR
Operating Rating: RF=1.15 =>37.3 metric tons Calculation Method: LOAD FACTOR
Permit Rating : GGGGG
Posting Load : Type 3: Legal Type 3S2: Legal Type 3-3: Legal

DESCRIPTION ON STRUCTURE

Deck X-Section: (S) 2.30 feet cu, 23.00 feet, 2.30 feet cu, 4.00 feet sw (N).
Total Width: 9.7 m Net Width: 7.0 m No. of Lanes: 2 Speed: 45 mph
Min. Vertical Clearance: Unimpaired Overlay Thickness: 0.0 inches
Rail Code: 0000

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
A complete routine inspection was performed by walking on and around the bridge to inspect all visible elements of the bridge structure. Bridge deck was inspected by walking on shoulder. Soffit and all substructure were inspected by walking underneath the bridge with binoculars and rain boots due to 1.0 foot deep of water close to abutment #1 at the time of inspection.

There is no need for a special equipment to inspect this structure except rain boots if it is in raining season.

INSPECTION COMMENTARY

This structure is on the list of bridge replacement program from the Orange County Department of Public Works according to Regina Hu, Senior Civil Engineer.

FRACTURE CRITICAL INVESTIGATION
Here is the summary of the fracture critical member inspection that was performed on 05/28/2014 by Carlos Villalobos and Anousheh Rouzbehani from the Office of Specialty Investigation and Bridge Management in Southern Office.

The structure was accessed with a ladder from the ground below. Lane closures and traffic control were not needed.

The investigation was conducted in accordance with the Fracture Critical Member Inspection Plan, dated 05/21/2008.

REVISIONS
The entire quantity of the concrete abutments ELI #215 is modified from 24 to 34 meters because the wingwalls are monolithic with the abutments.

DECK AND ROADWAY
AC roadway is at both of the approach and departure lanes.

The bridge deck has a spall at (8.0 inches L X 3.0 inches W X 2.0 inches D) on eastbound lane, at the easterly abutment. In addition, there are also two sound patched areas at (2.0 feet L X 1.0 foot W; and 12.0 inches L X 6.0 inches W) on easbound lane, at the westerly abutment. They were patched previously but all failed again.

The concrete deck has transverse cracks, up to 0.04 inches wide, 3.0 feet long and 3.0 feet in spacing.

The deck has several longitudinal and transverse cracks, 0.03 inches wide and 3.0 feet long without any efflorescence at most bays; and also, there is a longitudinal crack in bays #1, #2, #3 and #4 approximately 10.0 feet from the north end.

The surface of the bridge deck is about forty percent of abrasion.

SUPERSTRUCTURE
The condition of steel girders and floor beams have not changed since the last routine bridge inspection. The condition of painting of steel members is in good condition.

SUBSTRUCTURE
There is a spall at (18.0 inches L X 3.0 inches W X 3.0 inches D) with exposed and rusted rebars at the northeast wingwall. In addition, there three spalls at (12.0 inches L X 3.0 inches W X 2.0 inches D) at the top of east back wall.

There are random vertical cracks at (0.05 inches wide) in the westerly abutment wall.

The upstream is at the southerly channel. The current of the water has been running directly to the southwest wingwall of the westerly abutment at 1.0 foot deep by 4.0 feet wide at the time of inspection. The westerly abutment wall and wingwalls were probed around the area for checking the scour. There is no sign of scour at this time.

SAFE LOAD CAPACITY
A Load Rating Summary Sheet is achieved on 02/03/2014 for this structure. The current rating has been assigned in accordance with SM & I procedures for this structure. Based on the field conditions and load history, the structure is adequate to carry legal loads.

STEEL INVESTIGATIONS

This structure qualifies for an in-depth Steel investigation because it possesses the following fracture critical or fatigue prone details:

Girder (Built-Up): FC Members

Fracture Critical: Yes Inspection Freq.: 24 Next Inspection: 05/10/2020

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	148	sq.m	71	77	0	0
	1080		Delamination/Spall/Patched Area	2	2		0	2	0	0
	1130		Cracking (RC and Other)	2	15		0	15	0	0
	1190		Abrasion (PS Conc./RC)	2	60		0	60	0	0

(12)
Deck cracks on surface and soffit with efflorescence.

(12-1080)
The bridge deck has a spall at (8.0 inches L X 3.0 inches W X 2.0 inches D) on eastbound lane, at the easterly abutment. In addition, there are also two sound patched areas at (2.0 feet L X 1.0 foot W; and 12.0 inches L X 6.0 inches W) on easbound lane, at the westerly abutment. They were patched previously but all failed again.

(12-1130)
The concrete deck has transverse cracks, up to 0.04 inches wide, 3.0 feet long and 3.0 feet in spacing.

The deck has several longitudinal and transverse cracks, 0.03 inches wide and 3.0 feet long without any efflorescence at most bays; and also, there is a longitudinal crack in bays #1, #2, #3 and #4 approximately 10.0 feet from the north end.

(12-1190)
The surface of the bridge deck is about forty percent of abrasion.

107			Girder/Beam-Steel	2	35	m	33	0	2	0
	1900		Distortion	2	2		0	0	2	0
	7000		Damage	2	2		0	0	2	0
	515		Steel Coating-Paint	2	168	sq.m	168	0	0	0

(107)
FCMI (05/10/2018): See the report narrative for the list of members that were inspected.

A fracture critical member inspection was performed (on 05/19/2016) on the tension stress areas of the left and right girders. No fractures or cracks were found.

(107-1900)
Both through girders were hit and deformed especially at the east end (see the attached photo no. 5).

(107-7000)
Both through girders were hit and deformed especially at the east end (see the attached photo no. 5).

(107-515)
Paint is in good condition.

152			Floor Beam-Steel	2	68	m	68	0	0	0
	515		Steel Coating-Paint	2	164	sq.m	164	0	0	0

(152)
There were no significant defects noted.

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
(152-515) Paint is in good condition.									
215		**Abutment-RC**	2	34	m	30	3	1	0
	1080	**Delamination/Spall/Patched Area**	2	2		0	1	1	0
	1130	**Cracking (RC and Other)**	2	2		0	2	0	0
(215) Monolithic wingwalls are included in the total quantity.									
(215-1080) Northeast wingwall has a spall (1.5 feet L X 3.0 inches W X 3.0 inches D) with exposed and rusted rebars (see the attached photo no. 7). In addition, there three spalls at (12.0 inches L X 3.0 inches W X 2.0 inches D) at the top of east back wall.									
(215-1130) There are random vertical cracks at (0.05 inches wide) in the westerly abutment wall.									
311		**Bearing-Moveable**	2	3	each	3	0	0	0
(311) There were no significant defects noted.									
313		**Bearing-Fixed**	2	3	each	3	0	0	0
(313) There were no significant defects noted.									

WORK RECOMMENDATIONS

RecDate: 05/08/2019 Action : Deck-Methacrylate Work By: LOCAL AGENCY Status : PROPOSED	EstCost: StrTarget: 2 YEARS DistTarget: EA:	Prior to seal deck cracks with Methacrylate. Contractors need to repair all deck and joint spalls throughout the entire deck.
RecDate: 12/15/2017 Action : Sub-Patch spalls Work By: LOCAL AGENCY Status : PROPOSED	EstCost: StrTarget: 2 YEARS DistTarget: EA:	Re-patch the spall at (1.5 feet L X 3.0 inches W X 3.0 inches D) with exposed and rusted rebars at the northeast wingwall

Team Leader : Edwin Mah

Report Author : Nelson N. Vo

Inspected By : NN.Vo/E.Mah

7/17/2019

Edwin Mah (Registered Civil Engineer) (Date)

STRUCTURE INVENTORY AND APPRAISAL REPORT

********** IDENTIFICATION **********

(1) STATE NAME- CALIFORNIA 069
(8) STRUCTURE NUMBER **55C0174**
(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 CNYN RD.
(9) LOCATION- 1.6 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 44.33 SEC
(17) LONGITUDE 117 DEG 39 MIN 00.74 SEC
(98) BORDER BRIDGE STATE CODE % SHARE %
(99) BORDER BRIDGE STRUCTURE NUMBER

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

(43) STRUCTURE TYPE MAIN:MATERIAL- STEEL
TYPE- GIRDER & FLOORBEAM SYSTEM CODE 303
(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 1935
(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 2000
(30) YEAR OF ADT 2019 (109) TRUCK ADT 1 %
(19) BYPASS, DETOUR LENGTH 199 KM

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

(48) LENGTH OF MAXIMUM SPAN 17.7 M
(49) STRUCTURE LENGTH 17.7 M
(50) CURB OR SIDEWALK: LEFT 0.7 M RIGHT 1.2 M
(51) BRIDGE ROADWAY WIDTH CURB TO CURB 7.0 M
(52) DECK WIDTH OUT TO OUT 9.7 M
(32) APPROACH ROADWAY WIDTH (W/SHOULDERS) 7.0 M
(33) BRIDGE MEDIAN- NO MEDIAN 0
(34) SKEW 36 DEG (35) STRUCTURE FLARED NO
(10) INVENTORY ROUTE MIN VERT CLEAR 99.99 M
(47) INVENTORY ROUTE TOTAL HORIZ CLEAR 7.0 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

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SUFFICIENCY RATING = 49.5

PAINT CONDITION INDEX = 100.0

********** 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 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- LOAD FACTOR 1
(64) OPERATING RATING- 37.3
(65) INVENTORY RATING METHOD- LOAD FACTOR 1
(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 3
(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 4204
(115) YEAR OF FUTURE ADT 2037

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

(90) INSPECTION DATE 05/19 (91) FREQUENCY 24 MO
(92) CRITICAL FEATURE INSPECTION: (93) CFI DATE
A) FRACTURE CRIT DETAIL- YES 24 MO A) 05/18
B) UNDERWATER INSP- NO MO B)
C) OTHER SPECIAL INSP- NO MO C)