YOLO-06

DEPARTMENT OF TRANSPORTATION
Structure Maintenance & Investigations

Bridge Number : 24C0011
Facility Carried: SUTTER SLU BR RD
Location : SAC RIV ACROSS COURTLAND
City :
Inspection Date : 04/27/2016

Inspection Type
Routine FC Underwater Special Other
[X]

Bridge Inspection Report

STRUCTURE NAME: SUTTER SLOUGH

CONSTRUCTION INFORMATION

Year Built : 1939
Year Widened: 1970
Length (m) : 121

Skew (degrees): 99
No. of Joints : 2
No. of Hinges : 0

Structure Description: Steel through truss swing bridge, currently non-operable, with RC slab approach spans. Truss rest Piers 7 and 9 are constructed of 2 - 5 foot diameter steel shells filled with concrete each on 4 untreated DF piles. Truss swing Pier 8 is constructed of 8 - 4 foot diameter steel shells filled with concrete each on 4 untreated DF piles. Approach spans and abutments are on precast pre-stressed piles (3). Approach spans replaced in 1970.

Span Configuration : 1 @ 6.9 m, 4 @ 9.1 m, 1 @ 2.0 m, 2 @ 28.5 m, 1 @ 2.0 m, 1@9.1 m, 1@ 6.9 m

SAFE LOAD CAPACITY AND RATINGS

Design Live Load: M-13.5 OR H-15
Inventory Rating: RF=0.65 =>21.1 metric tons Calculation Method: ALLOWABLE STRESS
Operating Rating: RF=1.01 =>32.7 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: 0.3 m r - 7.3 m - 0.3 m r

Total Width: 7.9 m Net Width: 7.3 m No. of Lanes: 2 Speed: 50 mph
Min. Vertical Clearance: 4.50 m AC Thickness: 2.0 Inches

Rail Code: 0000

Rail Type	Location	Length (ft)	Rail Modifications
Misc. Steel	Right/Left	187	
Type 16	Right/Left	415	

DESCRIPTION UNDER STRUCTURE

Channel Description: Earth, grass banks.

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 and report was limited to the structural aspects of this structure excluding fracture critical, special features, and underwater elements. A separate inspection and report is prepared by the Office of Structure Maintenance and Investigations Fracture Critical Section, Underwater Investigations Team, and Engineering Services Electrical and Mechanical Section in accordance with the Complex Bridge Inspection Plan dated 03/05/2012.

The water depth was greater than 6 feet and flowing through Spans 3 through 9 at the time of this inspection. Bents 4, 5, 6, 7, and 8 were in water and visually inspected above the water line. The left and right trusses and bottom chords were inspected from the deck. Spans 4 through 6 were inspected from the channel banks. A complete visual inspection of the soffit, superstructure and substructure elements of Spans 1-2 and 10-11 was performed.

A fracture critical inspection was performed on 09/08/2014 and 01/07/2015 by the Office of Specialty Investigations and Bridge Management. The investigation was conducted in accordance with the Fracture Critical Member Inspection Plan dated 05/20/2008. Refer to the fracture critical inspection report for further detail.

An underwater inspection was performed on 10/21/2014 by the Underwater Investigations Team. The underwater portions of Piers 4 through 8 were looked at during their inspection. Their findings are summarized under the corresponding substructure elements. Refer to the 10/21/2014 underwater inspection report for further detail.

MISCELLANEOUS

There is a large amount of lumber stored under Span 1. If this wood were to catch fire it could substantially damage the bridge. This wood needs to be removed.

SAFE LOAD CAPACITY

The load rating for this structure is being reviewed by SM&I Ratings Branch under Work Request No. 4679. An updated Load Rating Summary Sheet will be archived when this review is complete. The current rating is based on allowable stress calculations dated 01/08/1980.

OPERATIONAL SIGNS

The minimum vertical clearance is posted at 14 feet - 4 inches at both portals of the bridge. The minimum vertical clearance was remeasured during this inspection and is still 14 feet 9 inches. See Photo 1.

WATERWAY

A large amount of drift and debris is accumulating at Bents 3, 4, 5, 6, and 7. A work recommendation was made to remove the drift and has not been completed. See Photo 4.

A new channel cross section was measured during this inspection. In comparison with the previous channel cross section no significant changes were noted.

STEEL INVESTIGATIONS

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

Floor Beams: FC Members,
Truss: FC Members

Fracture Critical: Yes Inspection Freq.: 24 Next Inspection: 09/08/2016

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
30			Steel Deck-Orthotropic	2	470	sq.m	0	470	0	0
	510		Deck Wearing Surface-Asphalt	2	470	sq.m	460	10	0	0
		3210	Delam./Pothole-AC (WS)	2	10		0	10	0	0
	515		Steel Coating-Paint	2	470	sq.m	0	470	0	0
		3410	Chalking (Steel PC)	2	470		0	470	0	0

(30)
There were no significant defects noted.

(30-510-3210)
There are transverse cracks in the AC overlay above the truss floor beams. The cracks have been sealed with an asphaltic sealer. Potholes are forming at these crack locations.

There is a 2 foot by 1 foot pothole in the AC overlay over the center swing pier. See Photo 2.

(30-515-3410)
The paint on the underside of the steel deck is chalking and faded. See Photo 5.

38			Slab-RC	2	548	sq.m	282	266	0	0
	1130		Cracking (RC and Other)	2	266		0	266	0	0
	510		Deck Wearing Surface-Asphalt	2	548	sq.m	324	0	0	224
		3230	Effectiveness (WS)	2	224		0	0	0	224

(38-1130)
Transverse and longitudinal deck cracks up to 1/32 inch wide and spaced as close as 1 foot apart are visible where the PCC deck surface has been exposed. The deck cracks are concentrated near the bents. See Photo 3.

(38-510-3230)
The AC chip seal has worn off approximately 50% of the PCC deck in Spans 1-6 and Spans 9-11. See Photo 3.

113			Stringer-Steel	2	570	m	570	0	0	0
	515		Steel Coating-Paint	2	694	sq.m	0	659	0	35
		3440	Effectiveness (Steel PC)	2	694		0	659	0	35

(113)
There were no significant defects noted.

(113-515-3440)
The paint on all the steel superstructure elements is faded and chalky. Freckled rust is forming at random locations. Flaking paint can be seen at the edges of some of the members. See Photo 5.

120			Truss-Steel	2	114	m	86	0	28	0
	1900		Distortion	2	28		0	0	28	0
	7000		Damage	2	28		0	0	28	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	950	sq.m	0	903	0	47
		3440	Effectiveness (Steel PC)	2	950		0	903	0	47

(120-1900)
There are two 3 inch long dings to the bottom chord of the right truss in Span 8. See Photo 6.

There is minor impact damage to the sway frames at U1, U3, U6, and U8 from vehicular impact. The flange edges are curled at the points of impact. The sway frame at U6 is bent slightly out of plane. Sway frames are secondary members and the damage reported above does not significantly impact the serviceability of this structure. See Photo 7.

The bridge has sustained damage to diagonal members U4-L5 and U5-L4, of the right truss, and member U5-L4, of the left truss, over the center swing pier between Spans 7 and 8. These members are bent below the rail height for 2 feet of their length and have been twisted as much as 3 inches put of plane. These members purpose was to take tension caused by the opening of the bridge when the truss is cantilevered. Since the bridge does not open anymore this damage is only cosmetic. See Photo 8 and 10.

The vertical member U5-L5 of the right truss has also sustained damage. It has been twisted, below the rail height, 2 inches out of plane for 2 feet in length. This vertical member is over the center pier and would only carry compression during the opening of the bridge. Since the bridge does not open anymore this damage is also cosmetic. See Photo 9.

(120-7000)
The distortion to the truss was caused by traffic impact.

(120-515-3440)
The paint on all the steel superstructure elements is faded and chalky. Freckled rust is forming at random locations. Flaking paint can be seen at the edges of some of the members. See Photo 5.

152			Floor Beam-Steel	2	80	m	0	80	0	0
	515		Steel Coating-Paint	2	169	sq.m	0	161	0	8
		3440	Effectiveness (Steel PC)	2	169		0	161	0	8

(152)
There were no significant defects noted.

(152-515-3440)
The paint on all the steel superstructure elements is faded and chalky. Freckled rust is forming at random locations. Flaking paint can be seen at the edges of some of the members. See Photo 5.

204			Column-PS Conc.	2	18	each	8	9	1	0
	1080		Delamination/Spall/Patched Area	2	2		0	1	1	0
	1190		Abrasion (PS Conc./RC)	2	8		0	8	0	0

(204-1080)
There is a concrete spall approximately 16 inches tall x 8 inches wide x 1 inch deep in Column 2 at Bent 9. No reinforcement has been exposed.

The following was reported in the 10/21/2014 Underwater Investigations Report:

A 4 inch diameter by 1 inch deep spall with no exposed reinforcing steel was noted on Pile 1, Bent 5.

(204-1190)
The following was reported in the 10/21/2014 Underwater Investigations Report:

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
Due to abrasion exposing course aggregate in the tidal zone on all piles of Bents 4, 5, and 6, the ELI abrasion element was applied to all 9 piles in condition state 2.										
215			**Abutment-RC**	2	20	m	20	0	0	0
(215) There are hairline vertical cracks with light efflorescence in the face of Abutment 1.										
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.										
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.										
251			**Pile-CISS**	2	12	ea.	2	0	10	0
	1000		**Corrosion**	2	10		0	0	10	0
(251-1000) The following was reported in the 10/21/2014 Underwater Investigations Report: Section loss was found at all 10 piles of Supports 7 and 8 but due to the large size of these piles, there is no structural concern.										
304			**Joint-Open Expansion**	2	16	m	16	0	0	0
(304) There were no significant defects noted.										
311			**Bearing-Moveable**	2	4	each	4	0	0	0
(311) There were no significant defects noted.										
313			**Bearing-Fixed**	2	2	each	2	0	0	0
(313) There were no significant defects noted.										
330			**Railing-Metal**	2	242	m	233	0	9	0
	1900		**Distortion**	2	9		0	0	9	0
	7000		**Damage**	2	9		0	0	9	0
	515		**Steel Coating-Paint**	2	70	sq.m	0	58	0	12
		3440	**Effectiveness (Steel PC)**	2	70		0	58	0	12
(330) The timber wheel guards have minor checks.										
(330-1900) The left metal bridge rail is distorted in two locations from vehicular impact. The web has buckled and flange has been bent between panel points 4 and 5 and panel points 6 and 7. See Photos 10 and 11. The right bridge rail is distorted from a vehicular impact between panel points 4 and 5. See Photo 8.										

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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

(330-7000)
The rail distortion was caused by impact damage.

(330-515-3440)
There are numerous scrapes on both painted steel bridge rails from vehicular impacts. The remaining paint on the bridge rail is chalking and faded.

WORK RECOMMENDATIONS

RecDate: 04/30/2012 Action : Railing-Repair Work By: LOCAL AGENCY Status : PROPOSED	EstCost: StrTarget: 3 YEARS DistTarget: EA:		Repair damage to the metal bridge rail of the left truss between Panel Points 6 and 7.
RecDate: 04/07/2010 Action : Super-Misc. Work By: LOCAL AGENCY Status : PROPOSED	EstCost: StrTarget: 2 YEARS DistTarget: EA:		Repair or replace damaged truss members L5-U5, L5-U4, and L4-U5 of the left truss and member L4-U5 of the right truss.
RecDate: 10/21/2009 Action : Sub-Remove Debris Work By: LOCAL AGENCY Status : PROPOSED	EstCost: StrTarget: 2 YEARS DistTarget: EA:		Remove drift and debris from Bents 3, 4, 5, 6 and 7.
RecDate: 04/19/2006 Action : Paint-Spot Prep Work By: LOCAL AGENCY Status : PROPOSED	EstCost: StrTarget: 6 YEARS DistTarget: EA:		Clean, spot prep and paint steel truss.
RecDate: 04/19/2006 Action : Bridge-Misc Work By: LOCAL AGENCY Status : PROPOSED	EstCost: StrTarget: 2 YEARS DistTarget: EA:		Remove timber, boat and mobile home trailer from under Span 1.

CHANNEL X-SECTION

Side : Upstream
Measured From : Top of Deck
X-Section Date: 04/27/2016

Location	Horiz(m)	Vert(m)	Comments
A1	0.00	0.80	
B2	6.50	2.80	
B3	15.40	3.30	
B4	24.80	7.00	
B5	33.50	7.90	
B6	44.00	8.90	
B7	47.00	12.60	
	57.80	15.50	
B8	70.00	14.30	
	98.00	7.10	
B9	103.70	5.80	

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CHANNEL X-SECTION

Side : Upstream

X-Section Date: 04/27/2016

Measured From : Top of Deck

Location	Horiz(m)	Vert(m)	Comments
B10	106.00	5.10	
B11	115.70	1.50	
A12	121.00	0.60	

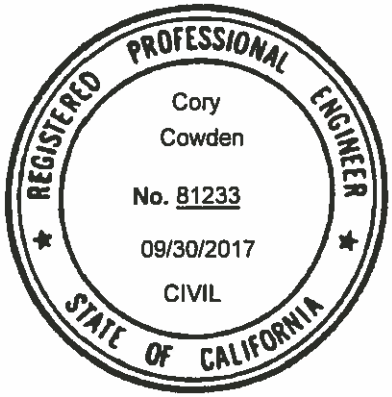
Team Leader : Cory Cowden

Report Author : Cory Cowden

Inspected By : C.Cowden/TJ.Oppezzo

6/28/16

Cory Cowden (Registered Civil Engineer) (Date)



STRUCTURE INVENTORY AND APPRAISAL REPORT

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

(1) STATE NAME- CALIFORNIA 069
(8) STRUCTURE NUMBER **24C0011**
(5) INVENTORY ROUTE(ON/UNDER)- ON 140000000
(2) HIGHWAY AGENCY DISTRICT 03
(3) COUNTY CODE 067 (4) PLACE CODE 00000
(6) FEATURE INTERSECTED- SUTTER SLOUGH
(7) FACILITY CARRIED- SUTTER SLU BR RD
(9) LOCATION- SAC RIV ACROSS COURTLAND
(11) MILEPOINT/KILOMETERPOINT 0
(12) BASE HIGHWAY NETWORK- PART OF NET 1
(13) LRS INVENTORY ROUTE & SUBROUTE 000000000000
(16) LATITUDE 38 DEG 19 MIN 38.07 SEC
(17) LONGITUDE 121 DEG 34 MIN 36.59 SEC
(98) BORDER BRIDGE STATE CODE % SHARE %
(99) BORDER BRIDGE STRUCTURE NUMBER

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

(43) STRUCTURE TYPE MAIN:MATERIAL- STEEL
TYPE- MOVABLE - SWING CODE 317
(44) STRUCTURE TYPE APPR:MATERIAL- CONCRETE CONT
TYPE- SLAB CODE 201
(45) NUMBER OF SPANS IN MAIN UNIT 2
(46) NUMBER OF APPROACH SPANS 9
(107) DECK STRUCTURE TYPE- CORRUGATED STEEL CODE 6
(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 1970
(42) TYPE OF SERVICE: ON- HIGHWAY 1
UNDER- WATERWAY 5
(28) LANES:ON STRUCTURE 02 UNDER STRUCTURE 00
(29) AVERAGE DAILY TRAFFIC 1913
(30) YEAR OF ADT 2008 (109) TRUCK ADT 5 %
(19) BYPASS, DETOUR LENGTH 199 KM

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

(48) LENGTH OF MAXIMUM SPAN 28.7 M
(49) STRUCTURE LENGTH 121.0 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 7.9 M
(32) APPROACH ROADWAY WIDTH (W/SHOULDERS) 7.0 M
(33) BRIDGE MEDIAN- NO MEDIAN 0
(34) SKEW 99 DEG (35) STRUCTURE FLARED YES
(10) INVENTORY ROUTE MIN VERT CLEAR 4.50 M
(47) INVENTORY ROUTE TOTAL HORIZ CLEAR 7.3 M
(53) MIN VERT CLEAR OVER BRIDGE RDWY 4.50 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 = 40.6
STATUS
HEALTH INDEX 86.5
PAINT CONDITION INDEX = 64.1

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

(112) NBIS BRIDGE LENGTH- YES Y
(104) HIGHWAY SYSTEM- NOT ON NHS 0
(26) FUNCTIONAL CLASS- MINOR ARTERIAL RURAL 06
(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 7
(61) CHANNEL & CHANNEL PROTECTION 6
(62) CULVERTS N

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

(31) DESIGN LOAD- M-13.5 OR H-15 2
(63) OPERATING RATING METHOD- ALLOWABLE STRESS 2
(64) OPERATING RATING- 32.7
(65) INVENTORY RATING METHOD- ALLOWABLE STRESS 2
(66) INVENTORY RATING- 21.1
(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 8
(72) APPROACH ROADWAY ALIGNMENT 5
(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 3227
(115) YEAR OF FUTURE ADT 2034

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

(90) INSPECTION DATE 04/16 (91) FREQUENCY 24 MO
(92) CRITICAL FEATURE INSPECTION: (93) CFI DATE
A) FRACTURE CRIT DETAIL- YES 24 MO A) 09/14
B) UNDERWATER INSP- YES 60 MO B) 10/14
C) OTHER SPECIAL INSP- NO MO C)