DEPARTMENT OF TRANSPORTATION
Structure Maintenance & Investigations

Bridge Number : 20C0248
Facility Carried: LAMBERT BRIDGE RD
Location : 0.4 MI W OF DRY CREEK RD
City :
Inspection Date : 07/24/2017

Bridge Inspection Report

Inspection Type				
Routine	FC	Underwater	Special	Other
X				

STRUCTURE NAME: DRY CREEK

CONSTRUCTION INFORMATION

Year Built : 1915
Year Modified: N/A
Length (m) : 57.9

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

Structure Description: Through steel pinned Parker Truss with RC deck on RC seat abutments with monolithic wingwalls on spread footings

Span Configuration :1 @ 185.3 ft

SAFE LOAD CAPACITY AND RATINGS

Design Live Load: UNKNOWN
Inventory Rating: RF=0.56 =>18.1 metric tons Calculation Method: LOAD FACTOR
Operating Rating: RF=0.94 =>30.5 metric tons Calculation Method: LOAD FACTOR
Permit Rating : XXXXX
Posting Load : Type 3: Legal Type 3S2: Legal Type 3-3: Legal

DESCRIPTION ON STRUCTURE

Deck X-Section: 0.3 ft br, 16.4 ft, 0.3 ft br
Total Width: 5.2 m Net Width: 5.0 m No. of Lanes: 2 Speed: 15 mph
Min. Vertical Clearance: 4.01 m Overlay Thickness: 0.0 inches
Rail Code: 0000

Rail Type	Location	Length (ft)	Rail Modifications
Misc. Steel	Right/Left	460	

DESCRIPTION UNDER STRUCTURE

Channel Description: Bed rock, sand, gravel, brush

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 and about the structure. All visible elements were inspected.
Water in the channel was up to 2 feet deep and both abutments were in the dry. All substructure elements above ground were visible for inspection.

This bridge has the following fracture critical steel elements: lower chord truss

INSPECTION COMMENTARY

members, diagonal tension truss members, vertical truss members, and floor beams. A close-up investigation of these members was conducted by the Caltrans Fracture Critical Inspection Team on 5/10/2017 in accordance with the Fracture Critical Member Inspection Plan dated 06/14/2007.

SUPERSTRUCTURE

5/10/2017 FC Inspection: Pack rust and pitting was identified at all of the pin and eyebar connections along the bottom chord of the truss. Pitting was generally 0.06 - 0.125 inches deep, with pack rust ranging from 0.125 - 0.625 inches. Pitting up to 0.125 inches was also identified near the pin/eyebar connection on the top chord. As a result of the pack rust, diagonals are typically distorted near the pin/eyebar connections. A summary of pack rust and section loss measurements in inches is included in the table below.

Panel Point	Left		Right	
	Pack rust	Section loss	Pack rust	Section loss
L0	0	0	0	0
L1	0.25	0	0.625	0.125
L2	0.25	0	0.5	0.06
L3	0.5	0.125	0.625	0.125
L4	0.5	0.125	0.5	0.06
L5	0.375	0.125	0.375	0.06
L6	0.5	0.06	0.5	0.06
L7	0.5	0.06	0.375	0.06
L8	0.25	0.06	0.125	0
L9	0.625	0.25	0.375	0.06
L10	0	0	0	0

The pack rust and section loss at the lower panel points was observed from the deck roadway during the 2015 FC investigation and the condition of the panel point connections do not appear to have changed from the deterioration quantities shown in the above table. See work recommendation dated 08/03/2000 and archived photos dated 2009 and 2011.

DECK AND ROADWAY

This bridge lacks an approach rail at the northwest corner. An approach rail would protect the end post of the bridge railing and the truss. See work recommendation dated 06/27/2001 and Photo #4.

SAFE LOAD CAPACITY

A Load Rating Summary Sheet dated 1/07/2014 is on file for this structure based on LFR VIRTIS 6.5.0 AASHTO computer calculations dated 12/16/2013. While this report does not include a check of that analysis, it does verify that the structural conditions observed during this inspection are consistent with those assumed in that analysis.

OPERATIONAL SIGNS

As seen in Photos #1 and #2, signs stating the load limitations of this structure are present at both approaches to the bridge:

Weight Limit

INSPECTION COMMENTARY

15 TONS PER VEHICLE
17 TONS PER SEMI-TRAILER COMBINATION
17 TONS PER TRUCK AND FULL TRAILER

Signs Reading, "ONE LANE BRIDGE" were also present. See Photo #3.

EXISTING POSTING

In accordance with County Ordinance No. 2652 dated 6/26/80, existing posting is as follows:

Weight Limit
15 TONS PER VEHICLE
17 TONS PER SEMI-TRAILER COMBINATION
17 TONS PER TRUCK AND FULL TRAILER

RESCIND POSTING

New load capacity calculations have determined that the existing ordinance dated June 26, 1980 is no longer applicable and posting the bridge for less than legal loads is no longer required. The county should repeal or modify the existing ordinance to remove the posting on this bridge. A posting rescission letter dated 3/14/2014 was sent to the County of Sonoma to this effect.

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 with Eyebars

Fracture Critical: Yes Inspection Freq.: 24 Next Inspection: 05/10/2019

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	302	sq.m	205	0	97	0
	1130		**Cracking (RC and Other)**	2	97		0	0	97	0

(12-1130)
The deck exhibits severe size (0.09 inches wide) longitudinal and transverse cracks at 3 feet on center throughout, reflected by 0.04 inch wide soffit cracking without efflorescence. See Photo #5. A work recommendation to treat the deck with methacrylate was entered in 2015.

113			**Stringer-Steel**	2	347	m	0	347	0	0
	1000		**Corrosion**	2	347		0	347	0	0
	515		**Steel Coating-Paint**	2	406	sq.m	0	0	406	0
		3440	**Effectiveness (Steel PC)**	2	406		0	0	406	0

(113-1000)
Surface rust is present on all structural members. See Photo #7.

(113-515-3440)
The paint system on this structure has largely failed. See Photo #7. A work recommendation to clean

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
and repaint all superstructure elements was entered in 2000.										
120			**Truss-Steel**	2	116	m	0	98	18	0
	1000		**Corrosion**	2	114		0	96	18	0
	1900		**Distortion**	2	2		0	2	0	0
	515		**Steel Coating-Paint**	2	638	sq.m	0	0	638	0
		3440	**Effectiveness (Steel PC)**	2	638		0	0	638	0

(120)
No fractures or cracks were found in the lower chord members, the diagonal tension members, or the vertical tension members during the 5/10/2017 Fracture Critical Member Inspection.

(120-1000)
Surface rust is present on all structural members. See Photo #6.

Significant pack rust and section loss was observed at several of the lower chord panel points between the vertical gusset plates and the horizontal and diagonal eye-bars. No significant section loss was observed in the diagonal or horizontal eye-bars at this time. See the main text section of this report for a detailed account of pack rust on the truss members.

(120-1900)
5/10/2017 FC Inspection: Minor distortion was identified in the U2 & L3 diagonal (approximately 0.25 inches over 3 feet), and in the U5 & L6 diagonal (approximately 0.125 inches over 2 feet).

(120-515-3440)
The paint system on this structure has largely failed. See Photo #6. A work recommendation to clean and repaint all superstructure elements was entered in 2000.

152			**Floor Beam-Steel**	2	44	m	0	44	0	0
	1000		**Corrosion**	2	44		0	44	0	0
	515		**Steel Coating-Paint**	2	53	sq.m	0	0	53	0
		3440	**Effectiveness (Steel PC)**	2	53		0	0	53	0

(152)
No fractures or cracks were found in the floor beams during the 5/10/2017 Fracture Critical Member Inspection.

(152-1000)
Surface rust is present on all structural members. See Photo #7.

(152-515-3440)
The paint system on this structure has largely failed. See Photo #7. A work recommendation to clean and repaint all superstructure elements was entered in 2000.

162			**Steel Gusset Plate**	2	40	each	35	0	5	0
	1000		**Corrosion**	2	5		0	0	5	0

(162-1000)
5/10/2017 FC Inspection:

Up to 0.5 inches of pack rust and 0.125 inches of section loss were identified at the primary gusset plate/vertical connection at the right side of L1.

Approximately 0.75 inches of pack rust was also noted at the top of the end posts under the upper chord gusset plates at both end portals. The worst case is at U9R where light could be seen through the portal gusset plates where they were rusted through; however, the plates at U9L and U1L&R were in

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
similar condition. See work recommendation dated 08/03/2000 and archived photos dated 2009 and 2011.									
215		**Abutment-RC**	2	23	m	21	2	0	0
	1130	**Cracking (RC and Other)**	2	2		0	2	0	0
(215-1130) The left wingwall of Abutment 1 has cracked and separated from the breastwall and is leaning outward by approximately 18 inches, measured at the top of the wall. See Photo #8. Glen Wallis, Bridge Maintenance Engineer of Sonoma County, stated that this wingwall has been anchored to a new deadman and waler system (work completed in 2002).									
220		**Pile Cap/Footing-RC**	2	4	m	0	4	0	0
	6000	**Scour**	2	4		0	4	0	0
(220-6000) The left (upstream) half of the footing at Abutment 1 is vertically exposed by up to 28 inches with minor undermining at the upstream corner of up 4 inches vertically and 8 inches horizontally. See Photo #9. A preliminary scour investigation conducted by the Caltrans SMI Hydraulic Branch in August 2013 found that the footing is founded on soft rock. Corrective action is not warranted at this time, however this condition should be monitored during future inspections.									
304		**Joint-Open Expansion**	2	5	m	5	0	0	0
(304) There were no significant defects noted.									
308		**Joint-Steel Sliding Plates**	2	5	m	5	0	0	0
(308) There were no significant defects noted.									
311		**Bearing-Moveable**	2	2	each	0	2	0	0
	2210	**Movement (Bearings)**	2	2		0	2	0	0
(311-2210) Decayed vegetative debris has accumulated in and around the roller bearings at Abutment 1, and the bearings may be seized due to blanket rust on the rollers and bearing plates (see archived photo 13 dated 02/08/2011). The current distance between the edge of the top bearing plate and the backwall is 4.5 inches. A work recommendation to clean the rust from the bearings was entered in 2015.									
313		**Bearing-Fixed**	2	2	each	2	0	0	0
(313) There were no significant defects noted.									
330		**Railing-Metal**	2	116	m	0	116	0	0
	1000	**Corrosion**	2	116		0	116	0	0
(330-1000) The steel lattice rail exhibits light surface rust throughout with no section loss.									

WORK RECOMMENDATIONS

RecDate: 08/18/2015
Action : Bearings-Clean
Work By: LOCAL AGENCY
Status : PROPOSED

EstCost:
StrTarget: 1 YEAR
DistTarget:
EA:

Clean the debris and rust from the roller bearings at Abutment 1.

WORK RECOMMENDATIONS

RecDate: 08/18/2015 Action : Deck-Methacrylate Work By: LOCAL AGENCY Status : PROPOSED	EstCost: StrTarget: 2 YEARS DistTarget: EA:		Treat the deck with methacrylate resin.
RecDate: 06/27/2001 Action : Railing-Misc. Work By: LOCAL AGENCY Status : PROPOSED	EstCost: StrTarget: 2 YEARS DistTarget: EA:		Place approach rail at the northwest corner of the west end of the truss.
RecDate: 08/03/2000 Action : Paint-Full Prep Work By: LOCAL AGENCY Status : PROPOSED	EstCost: StrTarget: 2 YEARS DistTarget: EA:		Clean and repaint the superstructure steel throughout.
RecDate: 08/03/2000 Action : Super-Misc. Work By: LOCAL AGENCY Status : PROPOSED	EstCost: StrTarget: 2 YEARS DistTarget: EA:		Repair, suplement or replace the upper chord gusset plates at panel points U1 L&R and U9 L&R located at the top of both end portals.
RecDate: 08/03/2000 Action : Super-Misc. Work By: LOCAL AGENCY Status : PROPOSED	EstCost: StrTarget: 2 YEARS DistTarget: EA:		Repair, supplement or replace the corroded vertical gusset plates at the lower chord panel points.

Team Leader : Shawn Hart

Report Author : Shawn Hart

Inspected By : S.Hart/JL.Burke

1/16/2018

Shawn Hart (Registered Civil Engineer) (Date)

STRUCTURE INVENTORY AND APPRAISAL REPORT

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

(1) STATE NAME- CALIFORNIA 069
(8) STRUCTURE NUMBER **20C0248**
(5) INVENTORY ROUTE(ON/UNDER)- ON 140000000
(2) HIGHWAY AGENCY DISTRICT 04
(3) COUNTY CODE 097 (4) PLACE CODE 00000
(6) FEATURE INTERSECTED- DRY CREEK
(7) FACILITY CARRIED- LAMBERT BRIDGE RD
(9) LOCATION- 0.4 MI W OF DRY CREEK RD
(11) MILEPOINT/KILOMETERPOINT 0
(12) BASE HIGHWAY NETWORK- NOT ON NET 0
(13) LRS INVENTORY ROUTE & SUBROUTE
(16) LATITUDE 38 DEG 39 MIN 14.47 SEC
(17) LONGITUDE 122 DEG 55 MIN 39.72 SEC
(98) BORDER BRIDGE STATE CODE % SHARE %
(99) BORDER BRIDGE STRUCTURE NUMBER

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

(43) STRUCTURE TYPE MAIN:MATERIAL- STEEL
TYPE- TRUSS - THRU CODE 310
(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 1915
(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 838
(30) YEAR OF ADT 2008 (109) TRUCK ADT 1 %
(19) BYPASS, DETOUR LENGTH 18 KM

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

(48) LENGTH OF MAXIMUM SPAN 56.4 M
(49) STRUCTURE LENGTH 57.9 M
(50) CURB OR SIDEWALK: LEFT 0.0 M RIGHT 0.0 M
(51) BRIDGE ROADWAY WIDTH CURB TO CURB 5.0 M
(52) DECK WIDTH OUT TO OUT 5.2 M
(32) APPROACH ROADWAY WIDTH (W/SHOULDERS) 5.8 M
(33) BRIDGE MEDIAN- NO MEDIAN 0
(34) SKEW 0 DEG (35) STRUCTURE FLARED NO
(10) INVENTORY ROUTE MIN VERT CLEAR 3.98 M
(47) INVENTORY ROUTE TOTAL HORIZ CLEAR 5.0 M
(53) MIN VERT CLEAR OVER BRIDGE RDWY 4.01 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

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SUFFICIENCY RATING = 41.3
STATUS STRUCTURALLY DEFICIENT
HEALTH INDEX 69.8
PAINT CONDITION INDEX = 33.0

********** 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- ELIGIBLE 2

********** CONDITION ********** CODE

(58) DECK 4
(59) SUPERSTRUCTURE 5
(60) SUBSTRUCTURE 7
(61) CHANNEL & CHANNEL PROTECTION 7
(62) CULVERTS N

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

(31) DESIGN LOAD- UNKNOWN 0
(63) OPERATING RATING METHOD- LOAD FACTOR 1
(64) OPERATING RATING- 30.5
(65) INVENTORY RATING METHOD- LOAD FACTOR 1
(66) INVENTORY RATING- 18.1
(70) BRIDGE POSTING- > 39.9% BELOW 0
(41) STRUCTURE OPEN, POSTED OR CLOSED- P
DESCRIPTION- POSTED FOR LOAD

********** APPRAISAL ********** CODE

(67) STRUCTURAL EVALUATION 5
(68) DECK GEOMETRY 2
(69) UNDERCLEARANCES, VERTICAL & HORIZONTAL N
(71) WATER ADEQUACY 7
(72) APPROACH ROADWAY ALIGNMENT 3
(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 57.9 M
(94) BRIDGE IMPROVEMENT COST $690,000
(95) ROADWAY IMPROVEMENT COST $138,000
(96) TOTAL PROJECT COST $1,159,200
(97) YEAR OF IMPROVEMENT COST ESTIMATE 2017
(114) FUTURE ADT 1250
(115) YEAR OF FUTURE ADT 2037

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

(90) INSPECTION DATE 07/17 (91) FREQUENCY 24 MO
(92) CRITICAL FEATURE INSPECTION: (93) CFI DATE
A) FRACTURE CRIT DETAIL- YES 24 MO A) 05/17
B) UNDERWATER INSP- NO MO B)
C) OTHER SPECIAL INSP- NO MO C)

DRY CREEK

0.4 MI W OF DRY CREEK RD 07/24/2017 [AAAX] 20C0248

137 - PHOTO-Operational Signs

Photo No. 1

Load Limit Sign- Advance Warning

137 - PHOTO-Operational Signs

Photo No. 2

Load Limit Sign- On Bridge

DRY CREEK

0.4 MI W OF DRY CREEK RD 07/24/2017 [AAAX] 20C0248

137 - PHOTO-Operational Signs

Photo No. 3
'One Lane Bridge' Sign

133 - PHOTO-Unclassified

Photo No. 4
Missing Approach Rail- Northwest Corner

DRY CREEK

0.4 MI W OF DRY CREEK RD | 07/24/2017 [AAAX] | 20C0248

102 - PHOTO-Deck-Damage/Deterioration

Photo No. 5
Deck Cracking (typ)

108 - PHOTO-Super-Details

Photo No. 6
Truss Condition

DRY CREEK

0.4 MI W OF DRY CREEK RD 07/24/2017 [AAAX] 20C0248

108 - PHOTO-Super-Details

Photo No. 7

Floorbeam and Stringer Condition (typ)

113 - PHOTO-Sub-Damage/Deterioration

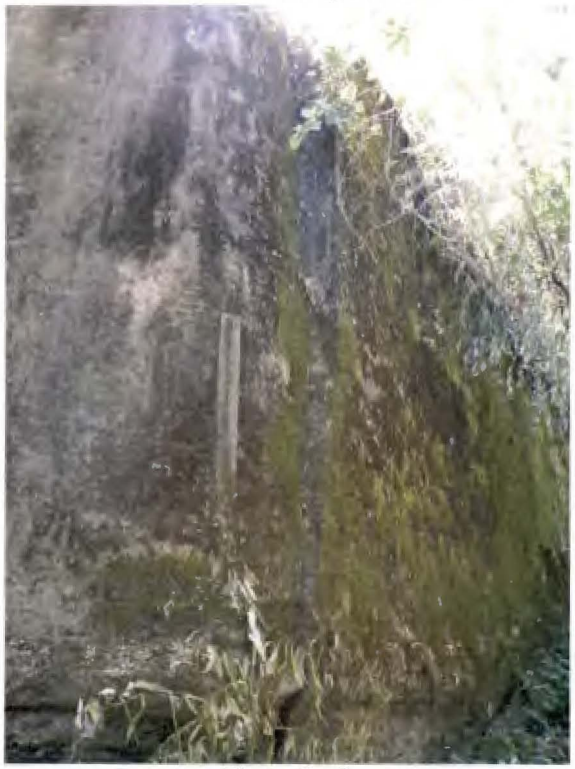

Photo No. 8

Abutment 1, Left Wingwall Condition

DRY CREEK

0.4 MI W OF DRY CREEK RD | 07/24/2017 [AAAX] | 20C0248

129 - PHOTO-Hydraulic-Details

Photo No. 9

Abutment 1 Left Side Footing Exposure