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

March 23, 2020

RECEIVED

MAR 31 2020

OC PUBLIC WORKS DIRECTOR'S OFFICE



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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 4 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

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# **Bridge Report Transmittal Sheet**

## Batch <u>57987</u>

County of Orange						
Bridge # Bridge Name		Location	Inspection Date Type		Outstanding Work Cost	
55C0205	SANTA ANA DELHI CHANNEL	0.1 MI S/O BRISTOL STREET	02/06/2020	Routine	Y	•
55C0572	SANTA ANA DELHI CHANNEL	0.4 MI SW/O BRISTOL ST.	02/06/2020	Routine	Y	\$
55C0573	REDHILL CHANNEL	0.1 MI. NW/O BROWNING AVE	02/06/2020	Routine	N	\$
55C0574	REDHILL CHANNEL	0.1 MI. NW/O BROWNING AVE		Routine	Y	\$

4 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.



Structure Maintenance & Investigations

Bridge Number : 55C0574

Facility Carried: BENT TWIG LANE

Location : 0.1 MI. NW/O BROWNING AV

City :

Inspection Date : 02/06/2020

Inspection Type

Routine FC Underwater Special Other

Bridge Inspection Report

STRUCTURE NAME: REDHILL CHANNEL

CONSTRUCTION INFORMATION

Year Built : 1980 Skew (degrees): (Year Modified: 1989 No. of Joints : (Year Modified: 1989 No. of Hinges No. of Hinges : (Year Modified: 1989 No. of Hinges : (Year Modified: 1989 No. of Hinges No. of Hinges : (Year Modified: 1989 No. of Hinges : (Year Modified: 1989 No. of Hinges No. of Hinges : (Year Modified: 1989 No. of Hinges No. o

Structure Description: Triple 9 ft W x 5 ft H x 47 ft L RC box culvert beneath 1 ft of

earth fill and AC surfacing.

Span Configuration : (W) 3 @ 9.00 ft (E) clear, normal

SAFE LOAD CAPACITY AND RATINGS

Design Live Load: UNKNOWN

Inventory Rating: RF=1.00 =>32.4 metric tons Calculation Method: FIELD EVAL/ENG JUDGMENT Operating Rating: RF=1.67 =>54.1 metric tons Calculation Method: FIELD EVAL/ENG JUDGMENT

Permit Rating : PPPPP

Posting Load : Type 3: Legal

Type 3S2: Legal

Type 3-3:Legal

DESCRIPTION ON STRUCTURE

Deck X-Section: (S) 0.80 ft cu, 4.30 ft sw, 35.50 ft, 4.30 ft sw, 0.80 ft cu (N)

Total Width: 13.7 m Net Width: 10.8 m No. of Lanes: 2 Speed: 25 mph
Min. Vertical Clearance: Unimpaired Overlay Thickness: 3.0 inches

Rail Code: 0000

DESCRIPTION UNDER STRUCTURE

Channel Description: RC rectangular.

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 routine inspection was performed by Y. Chen and P. Piratheepan. The conditions of AC pavement surface and rails on the top of the bridge were inspected by walking along the sidewalks. The conditions of culvert cells were inspected at walking through each cell. At the time of inspection, there was up to 1-inch deep water on the bottom of all 3 cells. A 12 ft aluminum extension ladder was used to reach the channel bottom.

MISCELLANEOUS

The spalls at the chainlink fences bases have been repaired (Photo Number 8).

Printed on: Monday 03/16/2020 02:44 PM

55C0574/AAAI/57987

### INSPECTION COMMENTARY

SAFE LOAD CAPACITY

A revised assigned load rating has been performed on this structure by SMI Ratings Branch dated on 02/28/2019 based on Section 5.10 of the SM&I Inspection Procedure Manual and a Load Rating Summary Sheet (LRSS) dated on 03/12/2019 is in file. 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.

ELEMEI	NT INSPECTION RATINGS							-		
Elem No.	Defect Defect Element	Description	Env	Total Qty					Condition	
241	Culvert-RC		2	42	m	42	2	0	0	0
(241)										

There were no significant defects noted. There were no significant defects noted. All wall vertical and diagonal cracks are sealed with epoxy paste by local agency (Photo Numbers 3 - 6).

### WORK RECOMMENDATIONS

RecDate: 02/07/2018

EstCost:

Locate all chainlink fence base spalls,

Action : Super-Patch spalls StrTarget: 2 YEARS remove unsound concrete, clean and patch

the spalled areas.

Work By: LOCAL AGENCY

Status : PROPOSED

DistTarget:

EA:

Team Leader : Young Chen

Report Author : Young Chen

Inspected By : Y.Chen/P.Piratheepan

Young Chen (Registered Civil Engineer)

PROFESSION Young Chen No. 60487 06/30/2020 CIVIL

# STRUCTURE INVENTORY AND APPRAISAL REPORT

	**************************************	***********
(1)	STATE NAME- CALIFORNIA 069	SUFFICIENCY RATING = 97.0
	STRUCTURE NUMBER 55C0574	PAINT CONDITION INDEX = N/A
(5)	INVENTORY ROUTE(ON/UNDER) - ON 140000000	
	HIGHWAY AGENCY DISTRICT 12	
(3)	COUNTY CODE 059 (4) PLACE CODE 00000	******** CLASSIFICATION ******** CODE
(6)	FEATURE INTERSECTED- REDHILL CHANNEL	(112) NBIS BRIDGE LENGTH- YES
	FACILITY CARRIED- BENT TWIG LANE	(104) HIGHWAY SYSTEM- NOT ON NHS
	LOCATION- 0.1 MI. NW/O BROWNING AVE	(26) FINCETONAL GLAGO
(11)	MILEPOINT/KILOMETERPOINT 0	(100) DEFENDE HIGHWAY
	BASE HIGHWAY NETWORK- NOT ON NET 0	(100) DEFENSE HIGHWAY- NOT STRAHNET 0 (101) PARALLEL STRUCTURE- NONE EXISTS N
	LRS INVENTORY ROUTE & SUBROUTE	(102) DIRECTION OF HELDER
	LATITUDE 33 DEG 44 MIN 19.55 SEC	(102) DIRECTION OF TRAFFIC 2 WAY 2 (103) TEMPORARY STRUCTURE-
(17)	LONGITUDE 117 DEG 48 MIN 06.11 SEC	(105) FED.LANDS HWY- NOT APPLICABLE
(98)	BORDER BRIDGE STATE CODE	
	BORDER BRIDGE STRUCTURE NUMBER	(110) DESIGNATED NATIONAL NETWORK - NOT ON NET (20) TOLL- ON FREE ROAD
		(21) MAINTAIN COIDING WIGHT A CONTRACT
*	****** STRUCTURE TYPE AND MATERIAL *******	(22) OMNER GOLDEN, ILLOWER PROPERTY AND ADDRESS OF THE PROPERTY ADDRESS OF THE PROPERT
(43)	STRUCTURE TYPE MAIN: MATERIAL- CONCRETE	(27) HIGGORIGAL GEOVERN
	TYPE- CULVERT CODE 119	
(44) :	STRUCTURE TYPE APPR:MATERIAL- OTHER/NA TYPE- OTHER/NA CODE 000	******** CODE
(45) 1	MIMPER OF CRANC IN ACT IN ACT IN	(58) DECK N
	3	(59) SUPERSTRUCTURE N
	NUMBER OF APPROACH SPANS 0	(60) SUBSTRUCTURE N
	DECK STRUCTURE TYPE- NOT APPLICABLE CODE N	(61) CHANNEL & CHANNEL PROTECTION 9
(108) V	WEARING SURFACE / PROTECTIVE SYSTEM:	(62) CULVERTS 7
A) 7	TYPE OF WEARING SURFACE- NOT APPLICABLE CODE N	****** LOAD RATING AND POSTING ****** CODE
B) 1	TYPE OF MEMBRANE- NOT APPLICABLE CODE N	(21) DECICAL LORD INVOICE
	TYPE OF DECK PROTECTION- NOT APPLICABLE CODE N	(63) OPERATING RATING METHOD- FIELD EVAL/ENG JUD 0
	******** AGE AND SERVICE *********	(64) OPERATING RATING- 54.1
	YEAR BUILT 1980	(65) INVENTORY RATING METHOD- FIELD EVAL/ENG JUL 0
	YEAR RECONSTRUCTED 1989	(66) INVENTIONAL PROPERTY
(42) T	YPE OF SERVICE: ON- HIGHWAY-PEDESTRIAN 5	(70) BRIDGE POSTING- EQUAL TO OR ABOVE LEGAL LOADS 5
(28) T	UNDER- WATERWAY 5 ANES:ON STRUCTURE 02 UNDER STRUCTURE 00	(41) CTRICTIPE OPEN POSTED OF GLOSE
(29) A	VEDACE DATIVE EDADETC	DESCRIPTION- OPEN, NO RESTRICTION
	EAR OF ADT 2011 (109) TRUCK ADT 1 %	
	VD3.00 PP-0	********* APPRAISAL *********** CODE
		(67) STRUCTURAL EVALUATION 7
	******** GEOMETRIC DATA **********	(68) DECK GEOMETRY
	ENGTH OF MAXIMUM SPAN 2.7 M	(69) UNDERCLEARANCES, VERTICAL & HORIZONTAL N
	TRUCTURE LENGTH 8.8 M	(71) WATER ADEQUACY 9
(50) C(	JRB OR SIDEWALK: LEFT 1.3 M RIGHT 1.3 M	(72) APPROACH ROADWAY ALIGNMENT 8
	RIDGE ROADWAY WIDTH CURB TO CURB 10.8 M	(36) TRAFFIC SAFETY FEATURES 0000
	3CK WIDTH OUT TO OUT 13.7 M	(113) SCOUR CRITICAL BRIDGES 8
(32) AF	PPROACH ROADWAY WIDTH (W/SHOULDERS) 10.8 M	******* PROPOSED IMPROVEMENTS *******
	RIDGE MEDIAN- CLOSED (NO BARRIER) 2	(75) TYPE OF WORK- CODE
(34) SK	(,	(76) LENGTH OF STRUCTURE IMPROVEMENT M
(10) IN	IVENTORY ROUTE MIN VERT CLEAR 99.99 M	(94) BRIDGE IMPROVEMENT COST
(4/) IN (53) MT	IVENTORY ROUTE TOTAL HORIZ CLEAR 10.8 M IN VERT CLEAR OVER BRIDGE RDWY 99.99 M	(95) ROADWAY IMPROVEMENT COST
	N VEDE INDERGIAND DES	(96) TOTAL PROJECT COST
(55) MT	** * * * * * * * * * * * * * * * * * *	(97) YEAR OF IMPROVEMENT COST ESTIMATE
(56) MI	N IAT INDEDCTERS IT	(114) FUTURE ADT 937
		(115) YEAR OF FUTURE ADT 2037
	************ NAVIGATION DATA **********	**************************************
	VIGATION CONTROL- NOT APPLICABLE CODE N ER PROTECTION- CODE	(90) INSPECTION DATE 02/20 (91) FREQUENCY 48 MO
	VICATION VERTICAL CLEARANCE	(92) CRITICAL FEATURE INSPECTION: (93) CFI DATE
	RT-LIFT BRIDGE NAW MIN WEDT CLEAR	A) FRACTURE CRIT DETAIL- NO MO A)
	VICATION HODIFONIAL CLEAR PROPERTY	B) UNDERWATER INSP- NO MO B)
, ,	VIGATION HORIZONTAL CLEARANCE 0.0 M	C) OTHER SPECIAL INSP- NO MO C)
	·	9

55C0574

100 - PHOTO> Routine-Roadway View



Photo No. 1
ROADWAY VIEW LOOKING NORTHWEST

101 - PHOTO> Routine-Elevation View



Photo No. 2 SIDE VIEW LOOKING NORTHEAST

02/06/2020 [AAAI]

135 - PHOTO> Routine-Underside View



Photo No. 3
UNDER VIEW IN THE EAST CELL, LOOKING NORTHEAST





Photo No. 4
UNDER VIEW IN THE MIDDLE CELL, LOOKING NORTHEAST

02/06/2020 [AAAI]

135 - PHOTO> Routine-Underside View



Photo No. 5
UNDER VIEW IN THE WEST CELL, LOOKING NORTHEAST

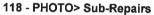




Photo No. 6
TYPICAL SEALED WALL CRACKS ALONG CELLS

101 - PHOTO> Routine-Elevation View

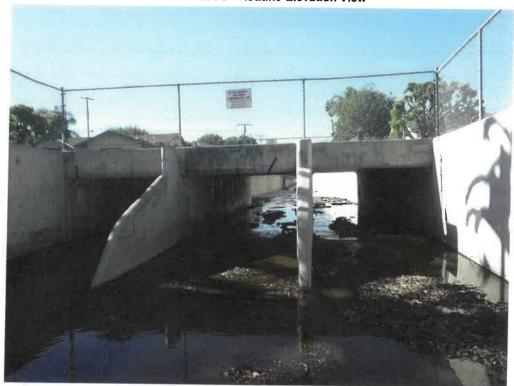


Photo No. 7
SIDE VIEW LOOKING SOUTHWEST

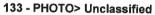




Photo No. 8

THE REPAIRED CHAINLINK FENCE BASE LOCATED AT THE NORTHEASTERN CORNER OF THE STRUCTURE