STATE OF CALIFORNIA - CALIFORNIA STATE TRANSPORTATION AGENCY

GAVIN NEWSOM, Governor

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.

ICB
or: Regina
c: Wendy 2 pgs

March 23, 2020

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 57987

County of Orange

Bridge #	Bridge Name	Location	Inspection Date	Inspection Type	Outstanding Work	Outstanding 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	02/06/2020	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.

DEPARTMENT OF TRANSPORTATION
Structure Maintenance & Investigations

Bridge Number : 55C0205
Facility Carried: SANTA ANA AVENUE
Location : 0.1 MI S/O BRISTOL STREE
City :
Inspection Date : 02/06/2020

Bridge Inspection Report

Inspection Type

Routine	FC	Underwater	Special	Other
X				

STRUCTURE NAME: SANTA ANA DELHI CHANNEL

CONSTRUCTION INFORMATION

Year Built : 1960
Year Modified: 1973
Length (m) : 16.5

Skew (degrees): 10
No. of Joints : 0
No. of Hinges : 0

Structure Description: Single span 22 PC/PS concrete beam sections with minimum 2 inches thick AC pavement on the top, on RC pile bent abutments with sheathing walls.

Span Configuration : (S) 53.00 ft (N)

SAFE LOAD CAPACITY AND RATINGS

Design Live Load: UNKNOWN
Inventory Rating: RF=0.52 =>16.8 metric tons Calculation Method: FIELD EVAL/ENG JUDGMENT
Operating Rating: RF=0.87 =>28.2 metric tons Calculation Method: FIELD EVAL/ENG JUDGMENT
Permit Rating : XXXXX
Posting Load : Type 3: Legal Type 3S2: Legal Type 3-3: Legal

DESCRIPTION ON STRUCTURE

Deck X-Section: (W) 0.60 ft r, 1.30 ft AC dike, 61.00 ft, 4.50 ft sw, 0.60 ft r (E)

Total Width: 20.4 m Net Width: 18.7 m No. of Lanes: 4 Speed: 45 mph
Min. Vertical Clearance: Unimpaired Overlay Thickness: 6.5 inches

Rail Code: 1000

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 eastern sidewalk and from the corners of the abutments. Under the bridge, the conditions of abutments and the PC/PS concrete box girder soffits were inspected by walking along the channel. At the time of inspection, the water in the channel was about 4-inch deep and 6 feet wide in the ditch along the middle of the channel. A 12 ft aluminum extension ladder was used to reach the channel bottom.

INSPECTION COMMENTARY

MISCELLANEOUS

There is a tree growing at the seat of Abutment 1 under the PC/PS concrete box girder unit 15 counting from the west side (Photo Number 2).

SAFE LOAD CAPACITY

The load rating for this structure is being reviewed by SMI Ratings Branch A request #7766 was sent the load rating department on 07/14/2017. An updated Load Rating Summary will be archived when this review is complete. Load Rating Summary Sheet is archived on 12/12/2014 for this structure.

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
16			**Top Flange-RC**	2	336	sq.m	336	0	0	0
	510		**Deck Wearing Surface-Asphalt**	2	308	sq.m	288	20	0	0
		3220	**Cracking-AC (WS)**	2	20		0	20	0	0

(16)
There were no significant defects noted.

(16-510-3220)
There are segmental transverse cracks at both abutments across the roadway, up to 10 feet each and 0.25 inch wide.

104			**Box Girder-PS Conc.**	2	17	m	14	2	1	0
	1080		**Delamination/Spall/Patched Area**	2	1		0	0	1	0
	1120		**Efflorescence/Rust Staining**	2	2		0	2	0	0

(104-1080)
There is a spall on the exterior face of the westerly box girder unit near the middle of the span, 12 inch x 8 inch x 1.5 inch.

(104-1120)
There are water brown stains in soffit between some PC/PS concrete box girder sections at the northeastern corner of the bridge.

215			**Abutment-RC**	2	10	m	9	1	0	0
	1130		**Cracking (RC and Other)**	2	1		0	1	0	0

(215)
Monolithic wingwalls (with the RC bent cap) are included in the total quantity.

(215-1130)
There is a vertical crack on the north abutment wall at the western side, up to 0.05 inch wide (Photo Number 4).

220			**Pile Cap/Footing-RC**	2	40	m	40	0	0	0

(220)
There were no significant defects noted.

251			**Pile-CISS**	2	12	ea.	10	2	0	0
	1000		**Corrosion**	2	2		0	2	0	0

(251)
Up to 12 concrete pile steel shell top portions are partially exposed beyond the faces of the abutment walls, 3 at Abutment 1 and 9 at Abutment 2 (Photo Number 3, 4, 6).

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
(251-1000)									
Two exposed steel shells at the eastern side of Abutment 2 are rusted (Photo Number 6).									
330		**Railing-Metal**	2	33	m	33	0	0	0
(330)									
There were no significant defects noted.									

WORK RECOMMENDATIONS

RecDate: 02/07/2018 Action : Super-Patch spalls Work By: LOCAL AGENCY Status : PROPOSED	EstCost: StrTarget: 2 YEARS DistTarget: EA:	Patch the side spall at the western exterior PS concrete box beam section, located near the middle of the structure.
RecDate: 02/07/2018 Action : Appr. Roadway-Repair Work By: LOCAL AGENCY Status : PROPOSED	EstCost: StrTarget: 2 YEARS DistTarget: EA:	Seal the AC pavement cracks on the structural surface, especially near both abutments with asphalt slurry.
RecDate: 06/08/2011 Action : Sub-Misc. Work By: LOCAL AGENCY Status : PROPOSED	EstCost: StrTarget: 2 YEARS DistTarget: EA:	Remove the small tree growing in Abutment 1 seat beneath the PS concrete box beam section.

Team Leader : Young Chen

Report Author : Young Chen

Inspected By : Y.Chen/P.Piratheepan

Young Chen (Registered Civil Engineer) 3/16/2020 (Date)

STRUCTURE INVENTORY AND APPRAISAL REPORT

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

(1) STATE NAME- CALIFORNIA 069
(8) STRUCTURE NUMBER **55C0205**
(5) INVENTORY ROUTE(ON/UNDER)- ON 140000000
(2) HIGHWAY AGENCY DISTRICT 12
(3) COUNTY CODE 059 (4) PLACE CODE 00000
(6) FEATURE INTERSECTED- SANTA ANA DELHI CHANNEL
(7) FACILITY CARRIED- SANTA ANA AVENUE
(9) LOCATION- 0.1 MI S/O BRISTOL STREET
(11) MILEPOINT/KILOMETERPOINT 0
(12) BASE HIGHWAY NETWORK- NOT ON NET 0
(13) LRS INVENTORY ROUTE & SUBROUTE
(16) LATITUDE 33 DEG 39 MIN 55.22 SEC
(17) LONGITUDE 117 DEG 52 MIN 59.41 SEC
(98) BORDER BRIDGE STATE CODE % SHARE %
(99) BORDER BRIDGE STRUCTURE NUMBER

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

(43) STRUCTURE TYPE MAIN:MATERIAL- PRESTRESS CONC
TYPE- BOX BEAM OR GIRDER - MULTI CODE 505
(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- PRECAST CONC. PA CODE 2
(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 1960
(106) YEAR RECONSTRUCTED 1973
(42) TYPE OF SERVICE: ON- HIGHWAY-PEDESTRIAN 5
UNDER- WATERWAY 5
(28) LANES:ON STRUCTURE 04 UNDER STRUCTURE 00
(29) AVERAGE DAILY TRAFFIC 11532
(30) YEAR OF ADT 2010 (109) TRUCK ADT 1 %
(19) BYPASS, DETOUR LENGTH 2 KM

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

(48) LENGTH OF MAXIMUM SPAN 16.2 M
(49) STRUCTURE LENGTH 16.5 M
(50) CURB OR SIDEWALK: LEFT 0.0 M RIGHT 1.4 M
(51) BRIDGE ROADWAY WIDTH CURB TO CURB 18.7 M
(52) DECK WIDTH OUT TO OUT 20.4 M
(32) APPROACH ROADWAY WIDTH (W/SHOULDERS) 17.1 M
(33) BRIDGE MEDIAN- NO MEDIAN 0
(34) SKEW 10 DEG (35) STRUCTURE FLARED NO
(10) INVENTORY ROUTE MIN VERT CLEAR 99.99 M
(47) INVENTORY ROUTE TOTAL HORIZ CLEAR 18.7 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- 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 = 64.2

PAINT CONDITION INDEX = N/A

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

(112) NBIS BRIDGE LENGTH- YES Y
(104) HIGHWAY SYSTEM- NOT ON NHS 0
(26) FUNCTIONAL CLASS- MINOR ARTERIAL URBAN 16
(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 7
(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- FIELD EVAL/ENG JUD 0
(64) OPERATING RATING- 28.2
(65) INVENTORY RATING METHOD- FIELD EVAL/ENG JUD 0
(66) INVENTORY RATING- 16.8
(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 4
(68) DECK GEOMETRY 6
(69) UNDERCLEARANCES, VERTICAL & HORIZONTAL N
(71) WATER ADEQUACY 8
(72) APPROACH ROADWAY ALIGNMENT 8
(36) TRAFFIC SAFETY FEATURES 1000
(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 18984
(115) YEAR OF FUTURE ADT 2038

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

(90) INSPECTION DATE 02/20 (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)

SANTA ANA DELHI CHANNEL

0.1 MI S/O BRISTOL STREET

02/06/2020 [AAAJ]

55C0205

101 - PHOTO> Routine-Elevation View

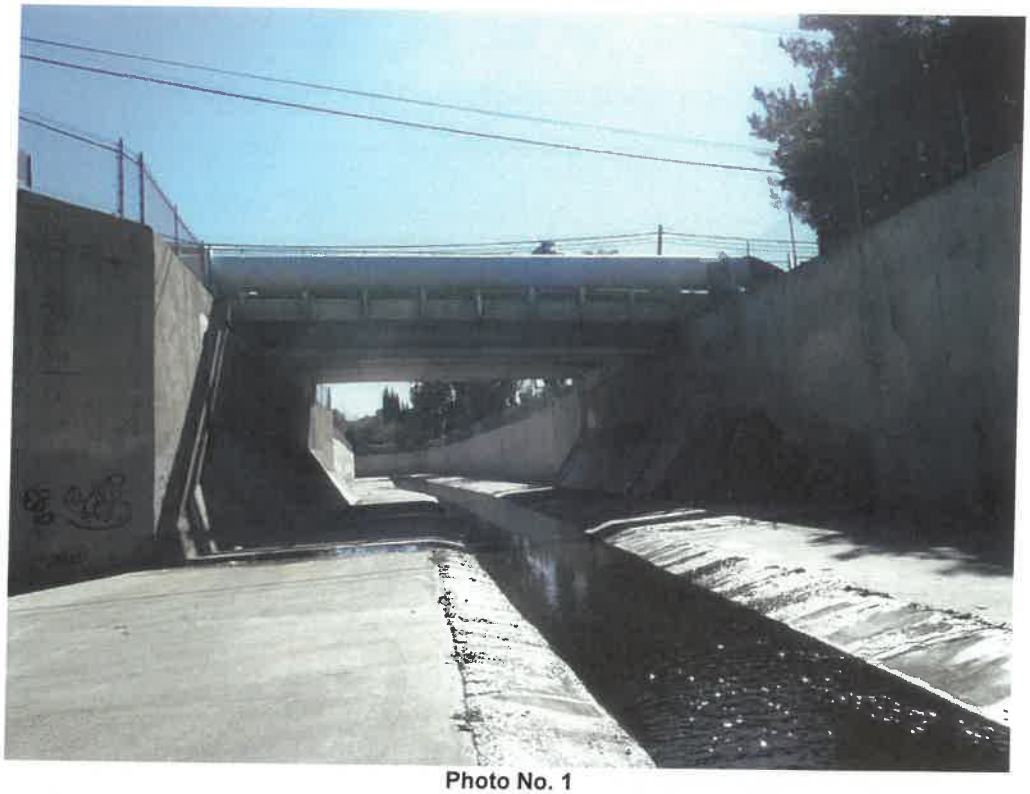

Photo No. 1

SIDE VIEW LOOKING SOUTHEAST

135 - PHOTO> Routine-Underside View

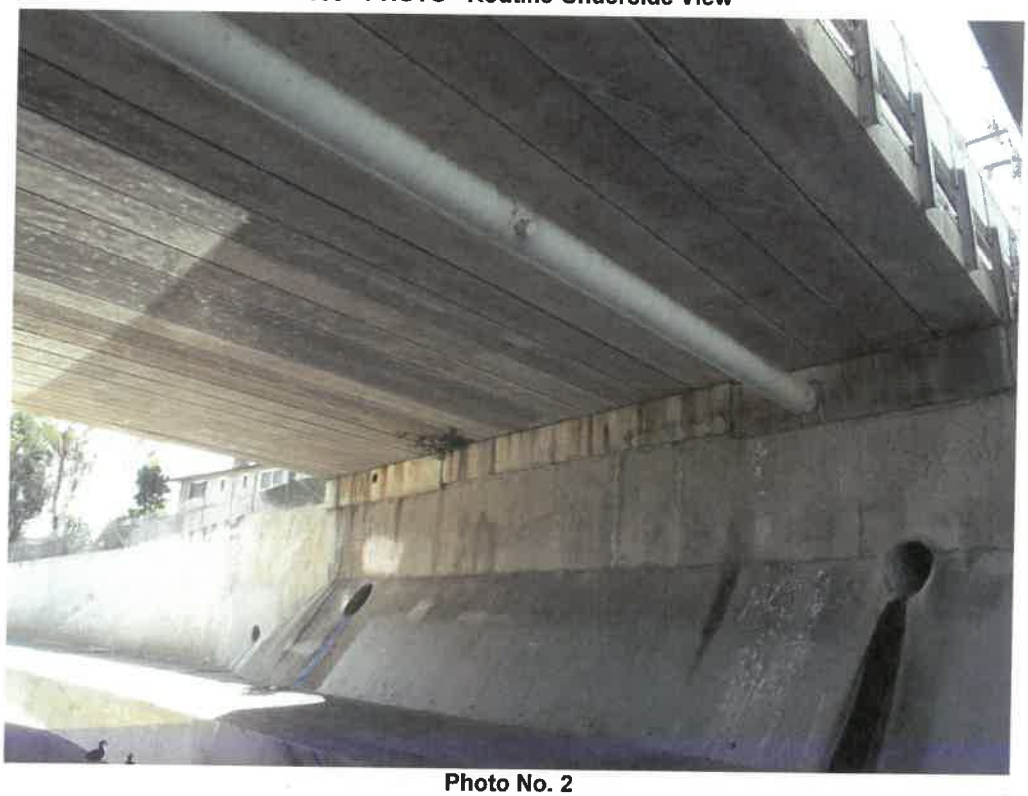

Photo No. 2

UNDER VIEW TOWARD ABUTMENT 1 AT SOUTHEWESTERN SIDE

SANTA ANA DELHI CHANNEL

0.1 MI S/O BRISTOL STREET

02/06/2020 [AAAJ]

55C0205

135 - PHOTO> Routine-Underside View

Photo No. 3

UNDER VIEW TOWARD ABUTMENT 2 AT NORTHEASTERN SIDE

113 - PHOTO> Sub-Damage/Deterioration

Photo No. 4

TYPICAL ABUTMENT WALL VERTICAL CRACKS

SANTA ANA DELHI CHANNEL

0.1 MI S/O BRISTOL STREET 02/06/2020 [AAAJ] 55C0205

135 - PHOTO> Routine-Underside View

Photo No. 5

UNDER VIEW TOWARD ABUTMENT 1, NOTE THE UTILITY PIPE

113 - PHOTO> Sub-Damage/Deterioration

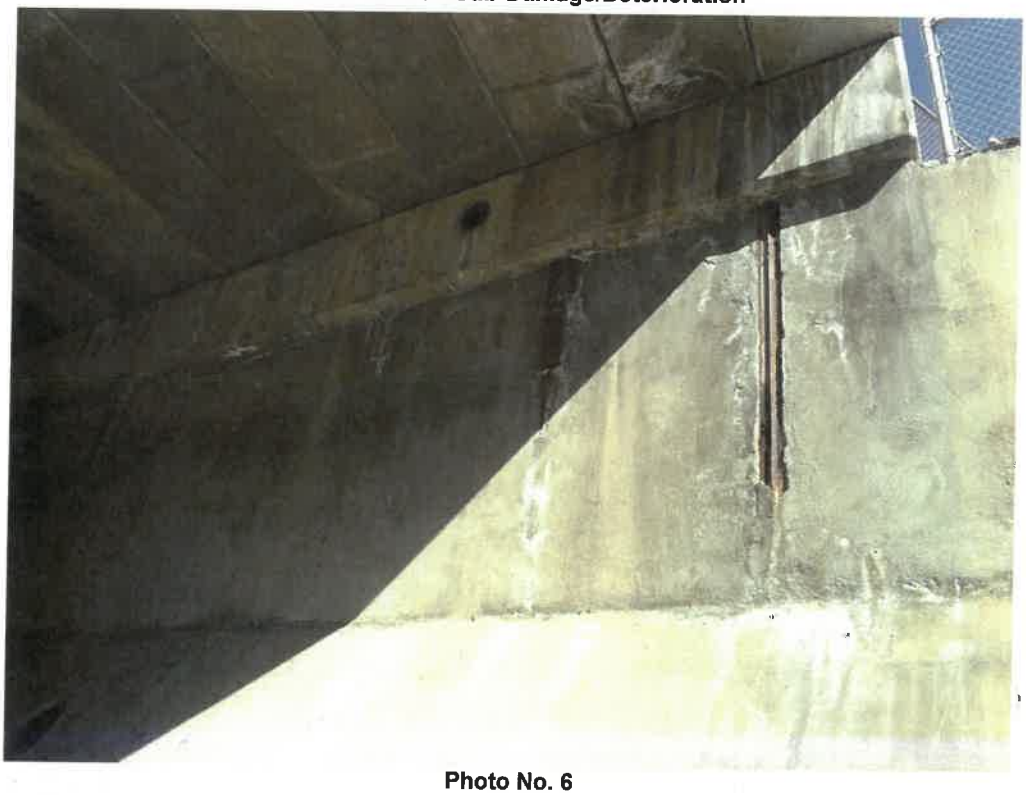

Photo No. 6

THE EXPOSED CONCRETE PILE STEEL CASING AT EASTERN SIDE OF ABUTMENT 2

SANTA ANA DELHI CHANNEL

0.1 MI S/O BRISTOL STREET

02/06/2020 [AAAJ]

55C0205

101 - PHOTO> Routine-Elevation View

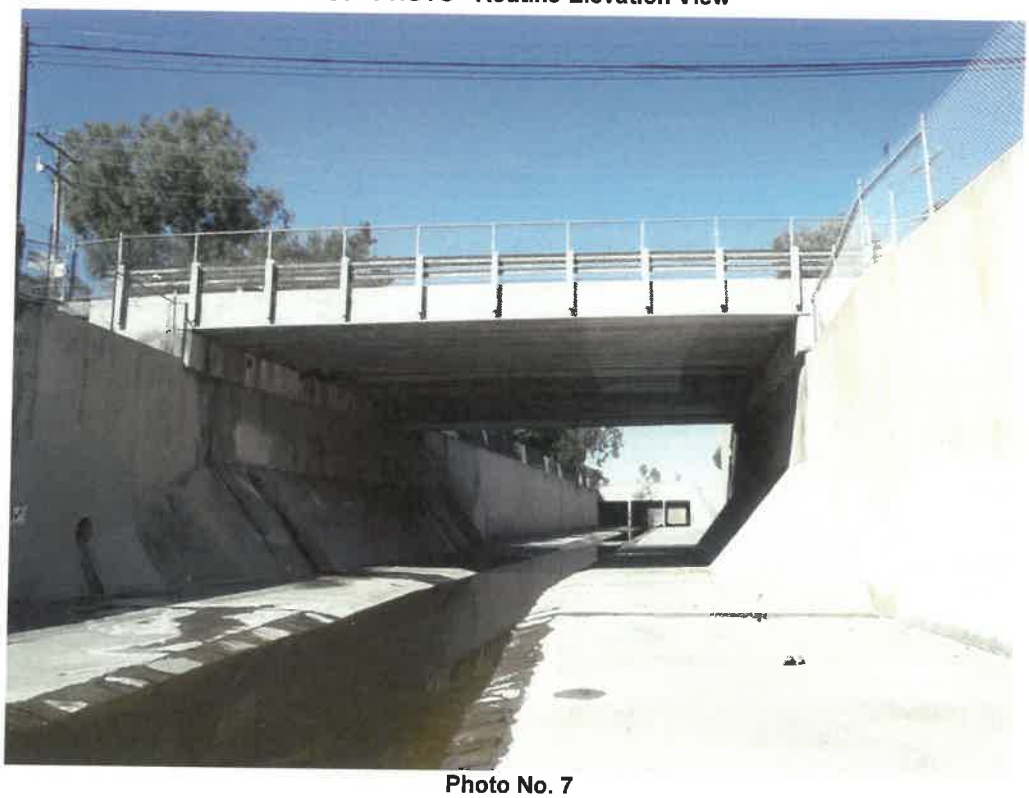

Photo No. 7

SIDE VIEW LOOKING NORTHWEST