

Memorandum

*Flex your power!
Be energy efficient!*

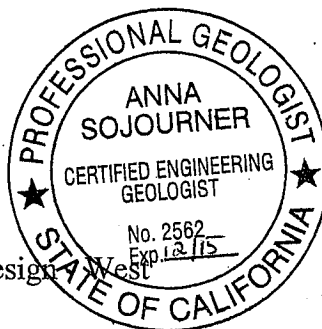
To: MR. TOM OSTROM
Supervising Bridge Engineer
Office of Earthquake Engineering

Date: March 14, 2014

Attention: Mark Yashinsky

File: 04-ALA-13 PM 4.85
59-93034-N
EFIS# 0000001016-N
Leona Heights POC 33-0161

From: ANNA SOJOURNER
Engineering Geologist
Office of Geotechnical Design - West
Geotechnical Services
Division of Engineering Services



CHRISTOPHER RISDEN
Chief, Branch B
Office of Geotechnical Design - West
Geotechnical Services
Division of Engineering Services

Subject: **EVALUATION OF FAULT RUPTURE POTENTIAL FOR LEONA HEIGHTS
PEDESTRIAN OVERCROSSING - BRIDGE 33-0161 ON STATE ROUTE 13, PM 4.85,
ALAMEDA COUNTY**

SUMMARY

Caltrans Bridge 33-0161, the Leona Heights Pedestrian Overcrossing (POC), lies in Oakland, Alameda County, on State Route (SR) 13 (ALA-13-4.85; Figure 1). The bridge lies within the active Hayward fault zone (north section), and lies approximately 330 meters from the creeping trace mapped by Lienkaemper (2008). A second mapped trace on the Alquist-Priolo Earthquake Fault Zone Map (State of California, 1982) crosses the bridge footprint.

Because the creeping trace (considered the most active trace) lies far from the bridge, the calculated offset at the bridge is a function of the subjective weight assigned to the fault trace that underlies the bridge. The calculated offsets reported here represent the maximum offset at this site, based on geologic judgment. The probabilistic horizontal offset at the bridge is 0.5 meters (1.6 feet) of right-lateral offset, oriented approximately 45° to the bridge and anywhere within the bridge footprint. The deterministic offset is 0.3 m (1 ft). Vertical offsets of approximately 10% of the horizontal offsets, or 0.05 meters (2 inches) should be assumed to occur with the horizontal offset.

INTRODUCTION

This evaluation was prepared as part of a statewide evaluation of fault rupture potential at Caltrans bridges. Caltrans policies regarding fault rupture at bridges are described in Memo to Designers 20-10 (2013). Caltrans requires a fault rupture evaluation if a bridge is located within

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an Alquist-Priolo Earthquake Fault Zone or within 300 meters (1,000 feet) of an un-zoned fault 15,000 years or younger in age.

The Leona Heights Pedestrian Overcrossing was constructed in 1965. The bridge was retrofitted in 1994. Please see Attachment A for the most recent bridge inspection report, which includes a bridge description.

This fault displacement hazard evaluation consisted of reviewing selected literature and LiDAR images, bridge records, a site visit, and deterministic and probabilistic calculations of potential offset.

LITERATURE AND FIELD REVIEW

Alquist-Priolo EFZ Map, FER 102, and Alquist-Priolo Studies

The Alquist-Priolo Special Studies Zones Map (East Oakland Quadrangle; State of California, 1982) is shown on Figure 2. An inferred fault strand (short-dashed line) crosses within the Leona Heights POC.

Northwest of the bridge, the inferred fault strand was mapped based on the work of several researchers, and Holocene offset was documented in one, while the other two lacked Holocene sediments. CGS FER 102 (CDMG, 1980) states:

“...Radbruch-Hall (1974) recognized one right-laterally deflected drainage and a trough [along the fault trace northwest of the Leona Heights POC]. Herd (1978) also recognized a series of buried scarps within this same area.

Of the consulting reports completed along [the trace northwest of the Leona Heights POC], Engeo (1977a, AP Site 538) found a highly complex zone of active faults about 80 feet wide. They documented two traces which reportedly cut soil horizons, and suspect that a third such trace exists.

Just to the north, Hallenbeck-McKey and Associates (1978b, AP Site 911) found what they believed was a strand of the Hayward, however, the site had been graded prior to their investigation and the young, diagnostic materials removed.

Southeast of the POC, Herd (1978) mapped the inferred fault strand. FER 102 (CDMG, 1980) states that this strand “was mapped by Herd (1978), based on aligned scarps. It appears that such a trace could conceivably exist...however, no other works have identified these [scarps] as fault-produced.”

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A fault evaluation study was conducted southeast of the bridge at Mountain Avenue and Observatory Drive (AP Site 2388; GeoResource Consultants, 1989). A slickensided shear was observed in bedrock in a trench excavated at the site, but the bedrock was overlain by fill and not by Holocene sediments, which could provide the age of faulting.

Lienkaemper (2008)

Figure 3 shows Lienkaemper's (2008) map of the Hayward fault near the Leona Heights POC. Lienkaemper's (2008) closest splay of the Hayward fault (heavy red) is approximately 330 meters (1,100 feet) west of the bridge. This map does not show every possible active fault trace, but only the most well-defined active traces (Lienkaemper, personal communication).

Logs of Test Borings

The Logs of Test Borings (LOTBs; August 1962) for this bridge shows shale bedrock at the west end of the bridge, and serpentine bedrock on the east end of the bridge. While the LOTBs show different rock types at each end of the bridge, and the bridge lies on a mapped fault strand, the difference in rock types may not be fault-related. The Franciscan Complex bedrock is a block-in-matrix rock (Medley, 1994). In the Franciscan Complex, rocks are not necessarily laterally continuous, and very different rock types may be found within a few meters of each other without recent faulting.

As-Built Plans

During construction in the early 1960's, large areas of SR 13, including under the Leona Heights POC, were excavated and backfilled. The as-built plans note "unsuitable material," probably saturated fault gouge and unconsolidated young sediments.

Bridge Inspection Reports

A bridge inspection report (8/15/2013; Attachment A) describes settlement of the stairs and curbs at Bent 2. The stairs are founded on spread footings in poor soils. There is no clear sense of slip and this deformation could be attributed to settlement and poor sub-base, as described below at the Carson Street Onramp. This may not be an active fault-related feature, although it indicates that the bridge lies in a fault zone with sheared fault gouge and saturated, unconsolidated sediments.

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Carson Street Onramp

The Carson Street onramp to southbound SR 13 passes under the Leona Heights POC and ends approximately 50 meters south of the POC. Carson Street onramp is a single-lane entrance to southbound SR 13. There are signs of pavement cracking and settlement at the side of an embankment constructed of engineered fill.

One large pavement crack, apparently unconnected to the engineered fill described above, cuts across the highway approximately parallel to the regional strike of the Hayward fault. It aligns with a cut slope across the highway. It is uncertain whether this is a fault-related feature or unrelated settlement and erosion. A 72 inch-diameter storm drain pipe crosses under SR 13 within the limits of the distressed shoulder section. Carlos Mora of District 4 Hydraulics confirmed that the interior of the storm drain shows no signs of distress or offset.

Geomorphology

I visited the site in January 2014. In addition to the bridge and roadway damage described above, several geomorphic features that align with the regional trend of the fault were observed (Figure 4). Within Leona Heights Park a swale and two slopes next to SR 13 align with the trend of the fault. These features are consistent with active fault zone, but do not conclusively confirm Holocene activity on this mapped strand.

Literature Review and Site Visits – Conclusions

The most well-defined and most active strand is mapped by Lienkaemper (2008) approximately 330 meters west of the bridge. The Leona Heights POC is located within a broad zone of fault-related deformation, likely containing multiple fault strands. Holocene-active and possible Holocene-active faults were exposed in Alquist-Priolo trenches along this trace. While none of the geomorphic features around the bridge conclusively define an active fault, taken together with the trenches, they indicate that an active fault underlies the bridge, as shown on the Alquist-Priolo map. This fault should be considered a potential source of offset within the bridge footprint, although the relative proportion of activity on this strand is unknown.

CALCULATIONS OF EXPECTED OFFSET

To quantify potential fault offset, I used a spreadsheet developed by the Division of Research and Innovation in collaboration with Geotechnical Services, based upon methods presented in Petersen, et al. (2011), and Abrahamson (2008). Both a deterministic fault displacement analysis and a probabilistic fault displacement analysis were performed. The input parameters included maximum magnitude, slip rate, mapping and base map errors, and average block model moment reduction (aseismicity factor).

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M_{max}

The M_{max} of 7.3 is cited in the Caltrans fault database¹, which references the USGS (2008).

Slip Rate

This report uses the slip rate from Dawson and Weldon (2012) of 9 mm/year.

Creep and Average Block Model Moment Reduction (Aseismicity Factor)

The Hayward fault is creeping at 4 ± 0.06 mm/year at the La Salle observation site about 4.6 kilometers (2.9 miles) northeast of the Leona Heights POC (Weldon et al., 2012). Creep sites along the northern Hayward fault have been monitored for 20-35 years.

Average slip on the fault as a whole should be reduced by the ratio of creep to slip rate for calculations of potential offset. We apply an average block model moment reduction (aseismicity factor) of 0.15 presented in the Uniform California Earthquake Rupture Forecast (UCERF 3; Weldon, et al., 2012). This has the effect of reducing the predicted offset to account for the reduction in moment created by creep on the fault plane.

Empirical Slip Measurements

Although numerous trenches have been excavated near the bridge and on the northern Hayward fault, there is a lack of published empirical slip measurements and none were incorporated into the spreadsheet. Alquist-Priolo trenches are usually excavated with the sole purpose of locating the fault and defining a building setback, and rarely are used to investigate earthquake histories or coseismic slip. Aagaard, Lienkaemper, and Schwartz (2012) show that slip on the creeping Hayward fault occurs through creep, coseismic slip, and post-seismic deformation. They write "...for the Hayward fault the models suggest that the long-term geologic slip will be dominated by contributions from interseismic creep and afterslip with a minimal contribution from coseismic slip." These sources of slip cannot usually be differentiated in trench exposures.

Site-to-Source Distance

Lienkaemper (2008) shows the most active traces of the Hayward fault approximately 330 meters (1,100 feet) west of the bridge. The fault shown on the Alquist-Priolo map (State of California, 1982) lies within the bridge footprint (distance = 0).

¹ CT fault database: http://dap3.dot.ca.gov/shake_stable/v2/technical.php

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Distributed Rupture

The methodology of Peterson et al. (2011) allows multiple strands to be weighted to account for rupture distribution. Peterson et al. (2011) discuss the assessment of distributed ruptures for fault rupture hazard along strike-slip faults (electronic supplement, Section 2).

“In contrast to principal fault rupture, we define the term *distributed faulting* as surface rupture that occurs along faults off of the principal fault trace and in response to an earthquake along the principal fault. Distributed ruptures . . . can occur on a variety of structures either related to the principal fault that ruptures during an earthquake, or along separate structures with no direct connection to the principal fault either at the surface or at depth. . . . Unlike the hazard presented by the principal fault trace, where the location is usually known from geologic mapping, distributed ruptures and their associated displacements can be along faults and structures that are unrecognized or are too small to be considered an independent seismogenic source.”

In most cases, multiple fault strands lie close enough to each other and close enough to the structure that distributing slip among the strands results in a calculated offset at the bridge site that is influenced by each strand, and close to the total offset possible on or near the fault. At the Leona Heights POC, the dominantly active trace of the Hayward fault mapped by Lienkaemper (2008) lies far away enough from the bridge that it does not contribute to the calculated potential offset at the bridge. Thus, the calculated potential offset at the bridge is a direct function of the weight given to the fault shown on the Alquist-Priolo map.

Very little information is available to assess the relative proportion of Holocene activity on the second strand. Features indicating active faulting around this trace and around the Leona Heights POC are described in this report. The area is heavily urbanized and many geomorphic features have been destroyed. The weight assigned to this strand is highly subjective and could be revised in the future.

The fault mapped by Lienkaemper (2008) 330 meters from the bridge was weighted 80%, while the Alquist-Priolo fault (State of California, 1982) location within the bridge footprint was weighted 20%.

Calculated Potential Offset at the Bridge

The deterministic offset calculation results are shown in Figure 5. The probabilistic calculation results are shown in Figure 6. The probabilistic calculation yielded a larger offset and will be used per MTD 20-8.

Fault Offset within the Bridge Footprint

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Up to 0.5 meters (1.6 feet) of right-lateral offset could occur within the bridge footprint during an earthquake on the Hayward fault (Figure 6).

Vertical Displacement

Vertical displacements of up to 10% of the horizontal displacements, or 0.05 meters (2 inches) should be expected to occur with the horizontal displacements.

Table 1 - Results of Offset Calculations

Scenario	Site-to-source distance	Deterministic offset	Probabilistic offset, 975 yr return
80% Lienkaemper 20% Alquist-Priolo	330 m Lienkaemper 0 m Alquist-Priolo	0.3 m (1 foot)	0.5 m (1.6 feet)

RECOMMENDATIONS

No further geologic work is recommended at this time. If the bridge is prioritized for retrofit, this study should be reexamined in case there is new work on this fault or on rupture distribution that might change the assumptions used here. If you have any questions, please contact Anna Sojourner at (510) 622-8839.

c: TPokrywka, CRisden, Daily File

ASojourner/mm

Attachments: Figures 1 – 6; Attachment A

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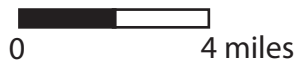
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SCALE

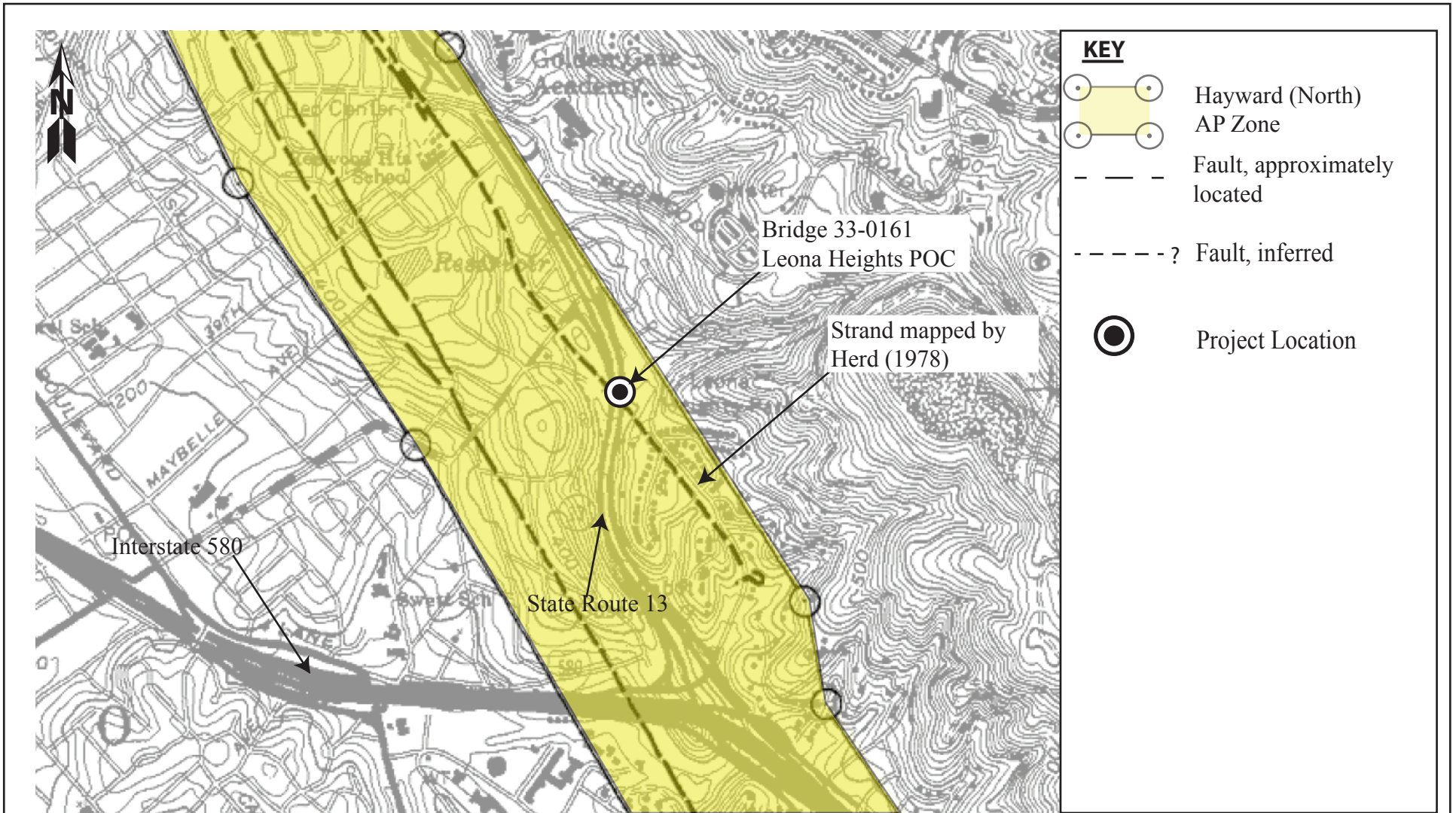


**DIVISION OF
ENGINEERING SERVICES**
 GEOTECHNICAL SERVICES
 GEOTECHNICAL DESIGN - WEST - BRANCH B

LOCATION MAP

04-ALA-013 PM 4.85 EFIS:000001016
 BRIDGE 33-0161 MARCH 2014

FIGURE 1



Source: California Geologic Survey; 1982, Special Studies Zone (Alquist-Priolo Special Studies Zone Act) Oakland East

<p>SCALE</p>		<p>DIVISION OF ENGINEERING SERVICES GEOTECHNICAL SERVICES GEOTECHNICAL DESIGN - WEST - BRANCH B</p>	<p>Special Studies Zones Map</p>
			<p>04-ALA-013 PM 4.85 EFIS:000001016</p>
			<p>BRIDGE 33-0161 MARCH 2014</p>
			<p>FIGURE 2</p>



Source: http://pubs.usgs.gov/ds/2006/177/HF_C.htm

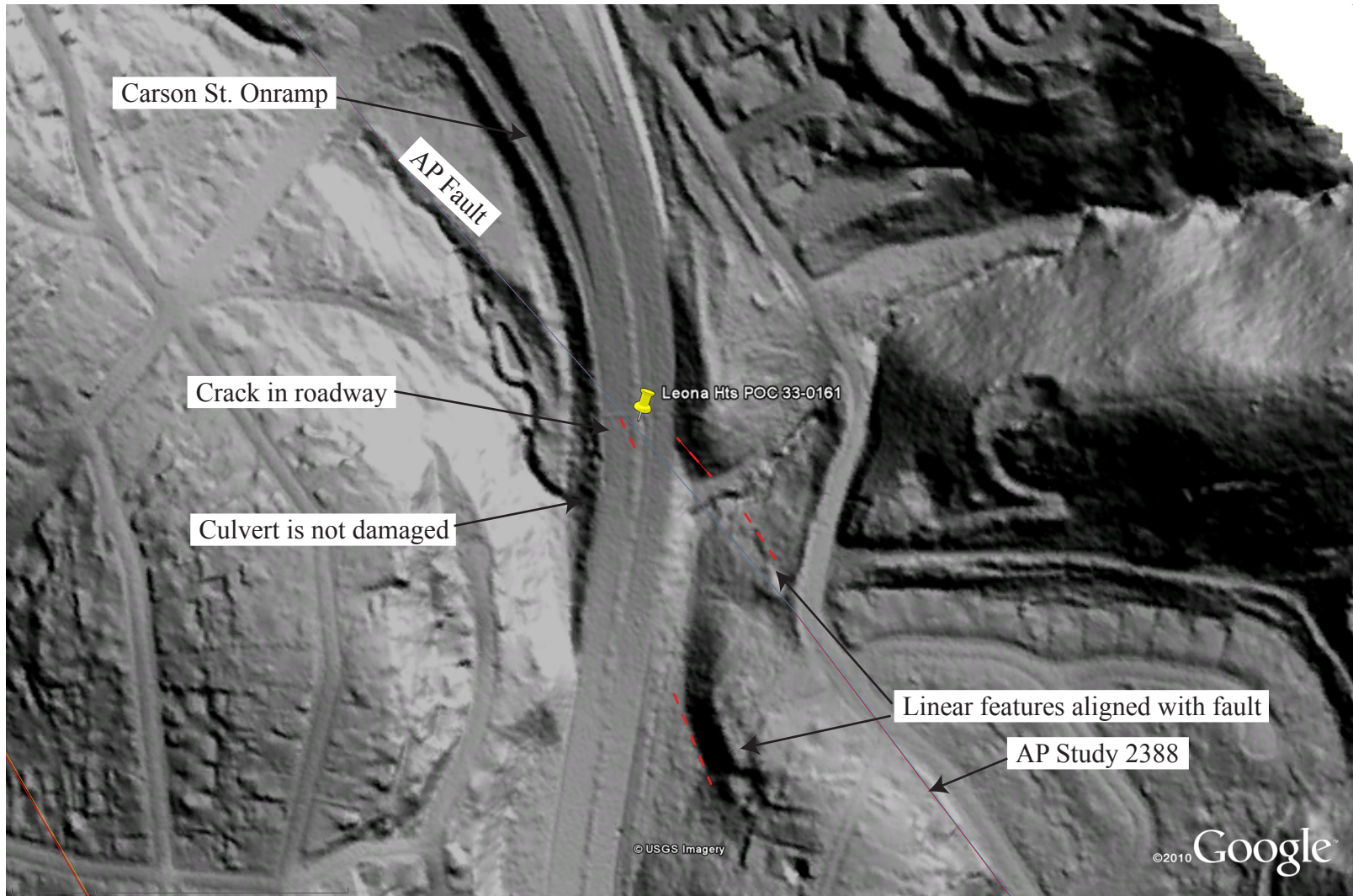
SCALE
Not to Scale



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Lienkaemper (2008) Map of Hayward fault
04-ALA-013 PM 4.85 EFIS:000001016
BRIDGE 33-0161 MARCH 2014

FIGURE 3



NO SCALE



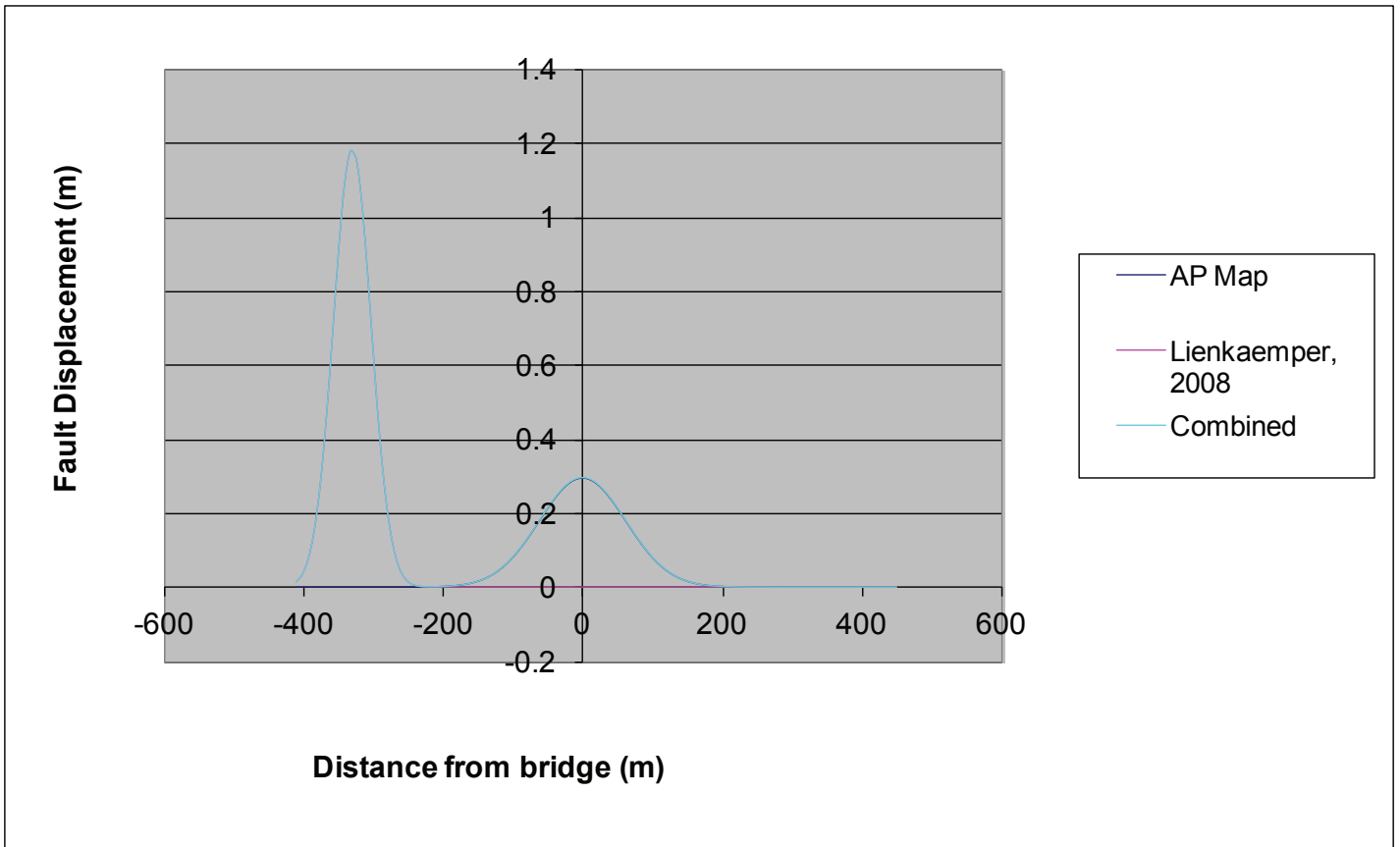
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GEOMORPHIC FEATURES

04-ALA-013 PM 4.85 EFIS:000001016

BRIDGE 33-0161 MARCH 2014

FIGURE 4



Graph showing deterministic offset within the bridge footprint, with 80% of offset on Lienkaemper (2008) trace and 20% on AP Map trace. Offset at the bridge (distance = 0) could be up to 0.3 meters.



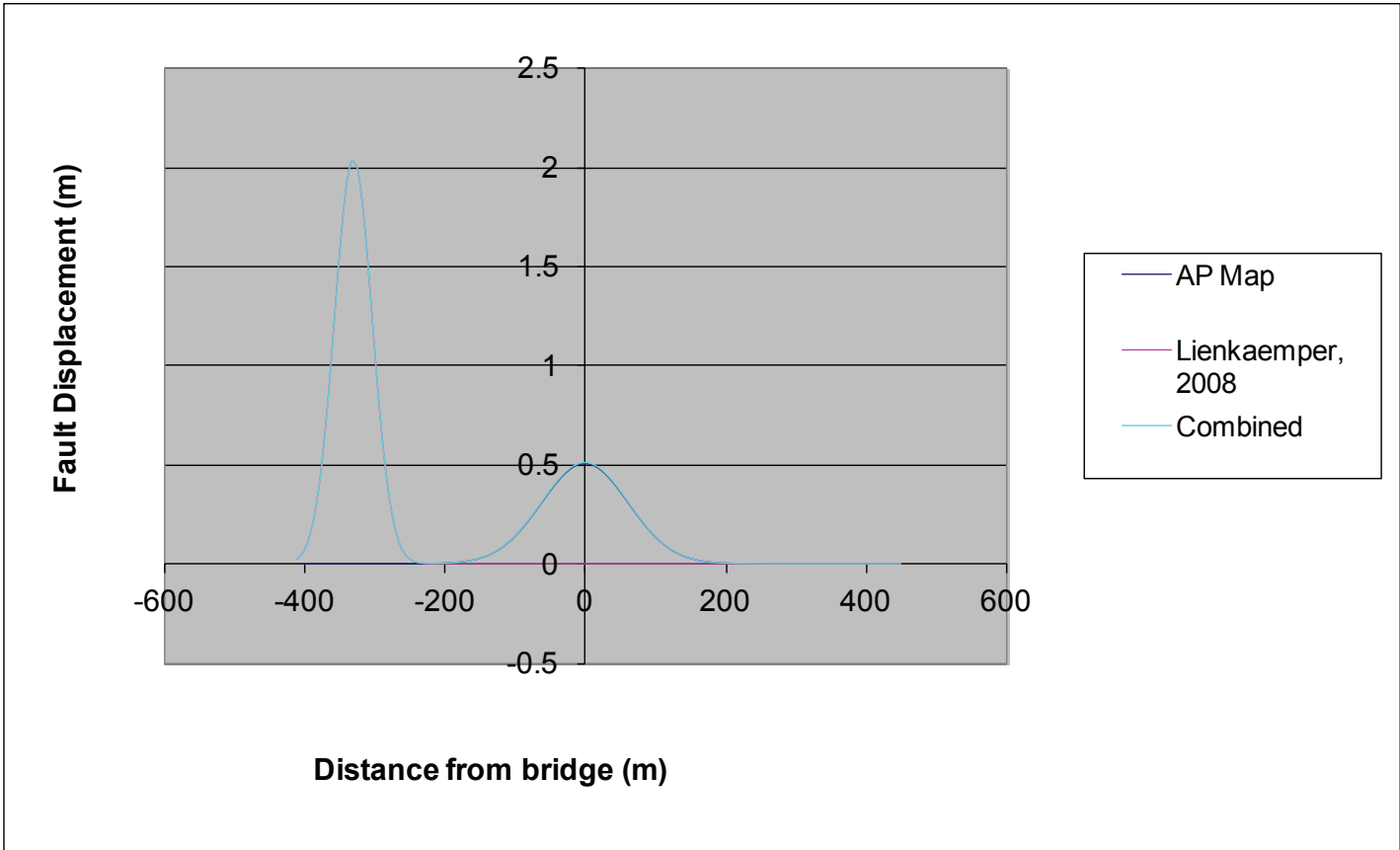
Figure 5 **Deterministic Offset 80%/20%**

04-ALA-13 PM 7.4

Bridge 33 0161

EFIS 04-0000001016-N

March 2014



Graph showing probabilistic offset within the bridge footprint, with 80% of offset on Lienkaemper (2008) trace and 20% on AP Map trace. Offset at the bridge (distance = 0) could be up to 0.5 meters.



Figure 6	Probabilistic Offset 80%/20%
04-ALA-13 PM 4.85	Bridge # 33 0161
EFIS 04-0000001016-N	March 2014

Attachment A



DEPARTMENT OF TRANSPORTATION
Structure Maintenance & Investigations

Bridge Number : 33 0161
Facility Carried: PEDESTRIAN WALKWAY
Location : 04-ALA-013-4.85-OAK
City : OAKLAND
Inspection Date : 02/27/2013

Bridge Inspection Report

Inspection Type

Routine FC Underwater Special Other

STRUCTURE NAME: LEONA HEIGHTS PARK POC

CONSTRUCTION INFORMATION

Year Built : 1966 Skew (degrees): 0
Year Widened: N/A No. of Joints : 3
Length (m) : 75 No. of Hinges : 0

Structure Description: Approach Spans 1 through 3 (1965): Continuous RC slab staircase, on RC column (1) bents, RC pierwall, and RC diaphragm abutment. All founded on spread foundations. Span 1 is an enclosed bin.

Main Spans 4 through 6 (1965): RC box girder (1 cell) on RC column (1) bents, and RC seat type abutment. All founded on spread foundations.

Earthquake Retrofit (1994): Partial height steel column casing added to Bent 4 and 6. Full height steel column casing and footing retrofit added to Bent 5. Restrainer cable added to superstructure at Bent 2. Buried restrainer cables and new abutment face added at Abutment 7.

Span Configuration : Slab 1 @ 8.0 m (bin), 1 @ 5.7 m, 1 @ 7.5 m;
Box girder: 1 @ 23.5 m, 1 @ 18.0 m, 1 @ 11.9 m

SAFE LOAD CAPACITY AND RATINGS

Design Live Load: PEDESTRIAN
Inventory Rating: N/A Calculation Method: NO RATING ANALYSIS
Operating Rating: N/A Calculation Method: NO RATING ANALYSIS
Permit Rating : N/A
Posting Load : Type 3: N/A Type 3S2: N/A Type 3-3: N/A

DESCRIPTION ON STRUCTURE

Deck X-Section: 0.33 m br, 2.4 m, 0.33 m br
Total Width: N/A Net Width: N/A No. of Lanes: N/A Speed: N/A ph
Min. Vertical Clearance: Unimpaired
Rail Code: NNNN

Rail Type	Location	Length (ft)	Rail Modifications
None	Right/Left	492	Chain link fence with RC curb

DESCRIPTION UNDER STRUCTURE

Facility Name	Func Class	Lanes	Horiz Clr (m)	Vert Clr (m)
STATE ROUTE 13	12	4	16.50	5.13

Channel Description: Structure not over waterway.

INSPECTION COMMENTARY

REVISIONS

NBI Item 10, Vertical Clearance (Under), and 54b, Vertical Clearance (Under), was modified to 16 feet 10 inches (5.13 m) based on the Terramatrix VC diagram.

NBI Item 63, Operating Rating Method, and 65, Inventory Rating Method, was modified to 5:

INSPECTION COMMENTARY

No Rating Analysis.

NBI Item 107, Deck Structure Type, was modified to 1: CIP Concrete, and NBI Item 108, Wearing Surface and Protection System, was modified to 000 to accurately reflect the CIP deck throughout the structure.

ELI Element 182, Other Type EQ Restrainer Cable, was increased to 2 each to account for the cables at Bent 2 and the buried cables at Abutment 7.

ELI Element 210, RC Pierwall, was added to account for the pierwall at Bent 2.

ELI Element 304, Open Expansion Joint, was added to account for the open joints at Bent 2 and Bent 4.

ELI Element 330, Metal Bridge Railing, was removed. The chain link fence on both sides of the structure was intended for pedestrian traffic only.

ELI Element 312, Enclosed/Concealed Bearing, was added to replace ELI Element 311, Movable Bearing. No bearings were visible.

NOMENCLATURE

The west abutment was designated as Abutment 1 to correlate to SM&I convention, current post mile convention, and recent inspection reports. The nomenclature does not correlate to the 1966 and 2004 as-built plans.

INSPECTION ACCESS

The interior of the box girder and the interior of the bin span were not accessible. The steel access door at the left side of Span 1 was bolted shut. Remaining bridge elements that were not buried were visually inspected from the deck, or ground at the exterior shoulders of State Route 13.

APPROACH

The approach at Abutment 1 consisted of RC slabs and RC stairs at grade. The RC approach rail at the right side of Abutment 1 was offset 2 inches towards the right and State Route 13 when compared to the RC bridge rail / curb. Additionally, the longitudinal gap at the top of the wall was 1 inch, and the gap at the bottom of the wall was 1/2 inch. Refer to attached photograph 4.

The approach at Abutment 7 consisted of an RC slab and dirt and natural soil. The soil at the end of the slab was 3 inches lower than slab.

DECK AND RAIL

The deck of the box girder and RC slab staircase were covered with paint. The paint obscured minor cracks at distress.

There were minor transverse cracks throughout the RC curb on both sides of the bridge.

INSPECTION COMMENTARY

The cracks were less than 1/64 inch in width, and spaced at 1 to 2 feet on center.

There were minor areas of minor surface rust throughout the chain link fence. The rust was predominantly located at the connections on the fence and encompassed less than 2% of the total fence area.

The RC rails / curbs at Bent 2 have shifted longitudinally and transversely. The rails / curbs on both sides of the bridge on the Span 2 side of Bent 2 have moved towards to the right and State Route 13, when compared to the rails / curbs on the Span 1 side of Bent 2. The longitudinal gap and transverse offset were measured as follows

	Gap	Offset
Left	2-1/2 inches	1 inch
Right	0 inch	1 inch

The compression joint seal at Abutment 7 appeared to be in adequate condition.

The open joints at the Bents 2 and 4 were filled with dirt and debris.

The electroliers and electrical box covers throughout the deck were previously removed. Electrical wires were emanating from the exposed areas.

The deck drains were clogged with dirt and debris.

SUPERSTRUCTURE

Paint and graffiti were present on superstructure elements within 15 feet of the ground. The paint obscured minor cracks and distress.

There were transverse cracks on the bottom of the box girder, in Spans 4 through 6. The cracks were less than 1/64 inch in width, spaced at 1 to 2 feet on center, and did not exhibit efflorescence of staining.

There were transverse cracks on the bottom of the overhangs of the box girder at the bents. The cracks were approximately 1/64 inch in width, spaced at 18 inches on center, and exhibited minor efflorescence.

Refer to attached photograph 6 for general details of the restrainer cables at Bent 2.

SUBSTRUCTURE

Paint and graffiti were present on substructure elements within 15 feet of the ground. The paint obscured minor cracks and distress.

No notable distress was observed.

Refer to attached photograph 6 for general details of Abutment 7.

PAINT CONDITION

The paint on the steel column casings appeared to be in adequate condition. Areas of the casings have been repainted to cover graffiti.

INSPECTION COMMENTARY

SAFE LOAD CAPACITY

Neither a load rating nor load rating summary sheet have been completed for this structure. The structure does not carry vehicular traffic.

MISCELLANEOUS

Routine roadway and underside photographs were taken and are included with this report, Refer to attached photographs 1 through 3.

The Terrametrix VC diagram was visually verified, and a copy is included with this report.

The metal beam guard rail and timber posts protecting Bent 4 at the exterior shoulder of southbound State Route 13 was damaged, from multiple vehicular impacts. The guard rail was not functional.

ELEMENT INSPECTION RATINGS

Elem No.	Element Description	Env	Total		Qty in each Condition State				
			Qty	Units	St. 1	St. 2	St. 3	St. 4	St. 5
12	Concrete Deck - Bare	2	170	sq.m.	170	0	0	0	0
38	Concrete Slab - Bare	2	70	sq.m.	70	0	0	0	0
105	Reinforced Concrete Closed Webs/Box Girder	2	56	m.	56	0	0	0	0
182	Other Type EQ Restrainer Cable	2	2	ea.	2	0	0	0	0
205	Reinforced Conc Column or Pile Extension	2	3	ea.	3	0	0	0	0
210	Reinforced Conc Pier Wall	2	3	m.	3	0	0	0	0
215	Reinforced Conc Abutment	2	6	m.	6	0	0	0	0
254	Steel Seismic Column Shell (Full Height)	2	1	ea.	1	0	0	0	0
255	Steel Seismic Column Shell (Partial Height)	2	2	ea.	2	0	0	0	0
302	Compression Joint Seal	2	3	m.	3	0	0	0	0
304	Open Expansion Joint	2	6	m.	6	0	0	0	0
312	Enclosed/Concealed Bearing	2	2	ea.	2	0	0	0	0

WORK RECOMMENDATIONS

RecDate: 02/27/2013 EstCost: \$2,500 Re-level the dirt approach at Abutment 7.
 Action : Deck-Misc. StrTarget: 2 YEARS
 Work By: BRIDGE CREW DistTarget:
 Status : PROPOSED EA:

RecDate: 03/21/2005 EstCost: \$1,250 Cover / remove the exposed electrical
 Action : Deck-Misc. StrTarget: 1 YEAR wires emanating from the open electrolier
 Work By: BRIDGE CREW DistTarget: boxes throughout the deck.
 Status : PROPOSED EA:

WORK RECOMMENDATIONS

RecDate: 07/01/2000 EstCost:
 Action : ADA Compliance Work StrTarget: 6 YEARS
 Work By: STRAIN DistTarget:
 Status : TEN YEAR PLAN EA: TF20A

This structure has been identified as needing Americans with Disabilities Act (ADA) compliance work. Consult the District ADA coordinator for information on required modifications.

Team Leader : Matthew O'Leary
 Report Author : Matthew O'Leary
 Inspected By : M.O'Leary/H.Kuntz

[Handwritten Signature]
8/15/2013
 Matthew O'Leary (Registered Civil Engineer) (Date)



STRUCTURE INVENTORY AND APPRAISAL REPORT

***** IDENTIFICATION *****

(1) STATE NAME- CALIFORNIA 069
 (8) STRUCTURE NUMBER 33 0161
 (5) INVENTORY ROUTE (ON/UNDER)- UNDER 231000130
 (2) HIGHWAY AGENCY DISTRICT 04
 (3) COUNTY CODE 001 (4) PLACE CODE 53000
 (6) FEATURE INTERSECTED- STATE ROUTE 13
 (7) FACILITY CARRIED- PEDESTRIAN WALKWAY
 (9) LOCATION- 04-ALA-013-4.85-OAK
 (11) MILEPOINT/KILOMETERPOINT 4.85
 (12) BASE HIGHWAY NETWORK- PART OF NET 1
 (13) LRS INVENTORY ROUTE & SUBROUTE 000000001301
 (16) LATITUDE 37 DEG 47 MIN 29.7 SEC
 (17) LONGITUDE 122 DEG 10 MIN 51.45 SEC
 (98) BORDER BRIDGE STATE CODE % SHARE %
 (99) BORDER BRIDGE STRUCTURE NUMBER

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

(43) STRUCTURE TYPE MAIN:MATERIAL- CONCRETE CONT
 TYPE- BOX BEAM OR GIRDER - MULTI CODE 205
 (44) STRUCTURE TYPE APPR:MATERIAL- CONCRETE CONT
 TYPE- SLAB CODE 201
 (45) NUMBER OF SPANS IN MAIN UNIT 3
 (46) NUMBER OF APPROACH SPANS 3
 (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 1966
 (106) YEAR RECONSTRUCTED 0000
 (42) TYPE OF SERVICE: ON- PEDESTRIAN-BICYCLE 3
 UNDER- HIGHWAY W/WO PEDESTF 1
 (28) LANES:ON STRUCTURE UNDER STRUCTURE 04
 (29) AVERAGE DAILY TRAFFIC 94000
 (30) YEAR OF ADT 2009 (109) TRUCK ADT 2 %
 (19) BYPASS, DETOUR LENGTH 0 KM

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

(48) LENGTH OF MAXIMUM SPAN 23.5 M
 (49) STRUCTURE LENGTH 75.0 M
 (50) CURB OR SIDEWALK: LEFT 0.0 M RIGHT 0.0 M
 (51) BRIDGE ROADWAY WIDTH CURB TO CURB N
 (52) DECK WIDTH OUT TO OUT 3.1 M
 (32) APPROACH ROADWAY WIDTH (W/SHOULDERS) N
 (33) BRIDGE MEDIAN- NO MEDIAN 0
 (34) SKEW 0 DEG (35) STRUCTURE FLARED NO
 (10) INVENTORY ROUTE MIN VERT CLEAR 5.13 M
 (47) INVENTORY ROUTE TOTAL HORIZ CLEAR 16.5 M
 (53) MIN VERT CLEAR OVER BRIDGE RDWY 99.99 M
 (54) MIN VERT UNDERCLEAR REF- HIGHWAY 5.13 M
 (55) MIN LAT UNDERCLEAR RT REF- HIGHWAY 2.8 M
 (56) MIN LAT UNDERCLEAR LT 6.5 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

***** SUFFICIENCY RATING *****

SUFFICIENCY RATING =
 STATUS
 HEALTH INDEX .0
 PAINT CONDITION INDEX = N/A

***** CLASSIFICATION *****

(112) NBIS BRIDGE LENGTH- YES Y
 (104) HIGHWAY SYSTEM- NOT ON NHS 0
 (26) FUNCTIONAL CLASS- PRIN ART FWY/EXP URBAN 12
 (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- STATE HIGHWAY AGENCY 01
 (22) OWNER- STATE HIGHWAY AGENCY 01
 (37) HISTORICAL SIGNIFICANCE- NOT ELIGIBLE 5

***** CONDITION *****

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

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

(31) DESIGN LOAD- PEDESTRIAN 7
 (63) OPERATING RATING METHOD- NO RATING ANALYSIS 5
 (64) OPERATING RATING- .0
 (65) INVENTORY RATING METHOD- NO RATING ANALYSIS 5
 (66) INVENTORY RATING- .0
 (70) BRIDGE POSTING- EQUAL TO OR ABOVE LEGAL LOADS 5
 (41) STRUCTURE OPEN, POSTED OR CLOSED- A
 DESCRIPTION- OPEN, NO RESTRICTION

***** APPRAISAL *****

(67) STRUCTURAL EVALUATION 7
 (68) DECK GEOMETRY *
 (69) UNDERCLEARANCES, VERTICAL & HORIZONTAL 3
 (71) WATER ADEQUACY N
 (72) APPROACH ROADWAY ALIGNMENT 6
 (36) TRAFFIC SAFETY FEATURES NNNN
 (113) SCOUR CRITICAL BRIDGES N

***** 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 68759
 (115) YEAR OF FUTURE ADT 2035

***** INSPECTIONS *****

(90) INSPECTION DATE 02/13 (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)