LAMPMAN & SMITH

A STRUCTURAL ENGINEERING CORPORATION
805 AEROVISTA PLACE, SUITE 204 • SAN LUIS OBISPO • CALIFORNIA 93401
(805) 544-9173 • FAX (805) 543-2830 • Website: lampsmith.com
Since 1985

CHRISTOPHER I. LAMPMAN, S.E.
MICHAEL F. SMITH, P.E.

STRUCTURAL EVALUATION:

Job No.: LS08161

HUASNA BRIDGE:

HUASNA TOWNSITE ROAD
SAN LUIS OBISPO COUNTY

PREPARED FOR:

Oasis Associates Company, Inc.
3427 Miguelito Court
San Luis Obispo, CA 93401

06/23/08

LAMPMAN & SMITH
A STRUCTURAL ENGINEERING CORPORATION
805 AEROVISTA PLACE, SUITE 204 • SAN LUIS OBISPO • CA 93401
(805) 544-9173 • FAX (805) 543-2830 • Website: lampsmith.com
Since 1985

CHRISTOPHER I. LAMPMAN, S.E.
MICHAEL F. SMITH, P.E.

June 23, 2009
Job No.: LS08161
LS-33-09

Oasis Associates Company, Inc.
3427 Miguelito Court
San Luis Obispo, CA 93401

Attn: Carol Florence

Re: Huasna Bridge Evaluation, Huasna Townsite Road, San Luis Obispo County, CA.

Dear Ms. Florence,

As requested, the undersigned has evaluated the condition and load capacity of the subject bridge. Our evaluation is based on site visits as well as review of existing documentation provided by your office. Additionally, the evaluation includes analysis of HL-93 loading as required by the San Luis Obispo Department of Public Works.

Our evaluation of the bridge was done with regards to the ability of the bridge to support an oil truck, HL-93 loading configuration, as well as H20 loading.

The bridge remains in fair condition and has not significantly changed from the CalTrans Inspection Report dated July 9, 2007 (see attached). However, the planks show additional signs of wear and tear and several fasteners are loose and withdrawing from the stringers.

The existing planks and stringers are inadequate to support the HL-93 loading. Based on our analysis, a new deck with additional stringers could be installed to support the additional loads.

The HL-93 loading requires that the bridge support a tandem truck with 2 axles of 25 kips each spaced 4'-0" apart including lane loading. Calculations show that an additional stringer placed between the existing stringer would increase

the current capacity to support an HL-93 configuration with 20 kips per axle. To achieve full compliance with HL-93 loading, 2 additional stringers placed between the existing stringer can be implemented.

Either option would require the removal of the existing planks and the addition of new 6x16 stringers placed in between the existing stringers. Either new 6x planking or corrugated steel decking filled with asphalt would replace the existing deck.

It is our opinion that all construction work, in the above recommendations, can be accomplished from the deck level without disturbing the creek or working within the creek channel.

Thank you for your time and consideration. If you have any further questions concerning this matter, please feel free to contact this office.

Sincerely yours,

Michael F. Smith, P.E.

attached

TABLE OF CONTENTS

Vicinity Map 1

Basis of Evaluation 2

Calculations 3-17

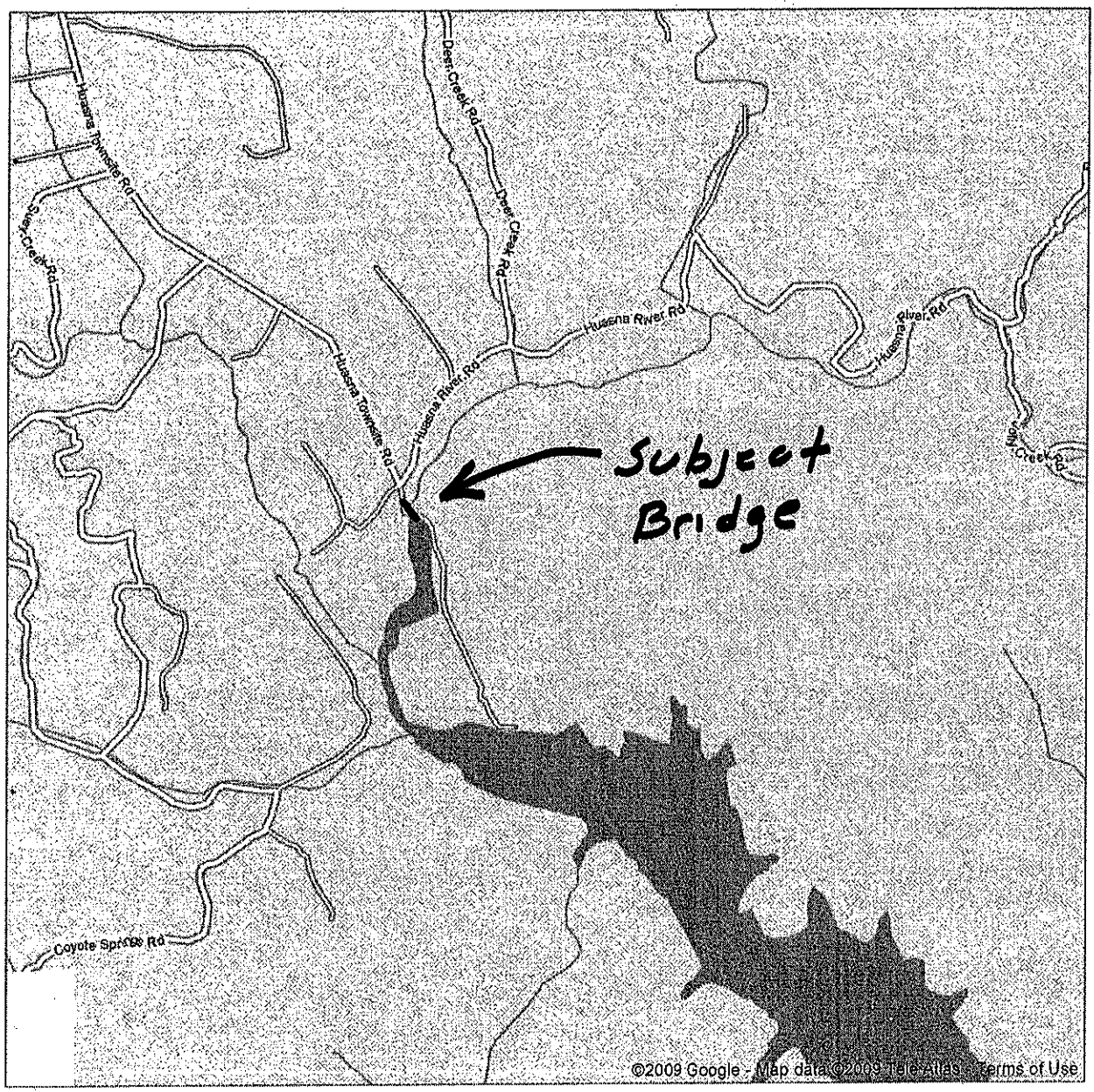
Cal Trans Inspection Report 18-19

Preliminary Design 20

1 of 20
LS08161

Google maps Address **Huasna Valley California 93420**

Get Google Maps on your phone
Text the word "GMAPS" to 466453

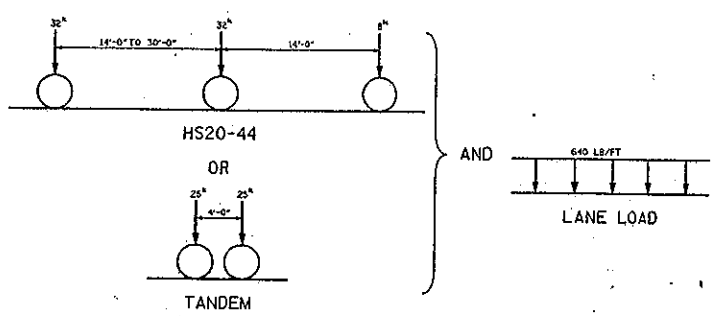


Basis of Evaluation:

Aashto 17TH edition
Loading: HL-93
DL: Decking - 25 psf
option: Conspan 12ga metal deck
Asphalt filled w/ wearing surface
- 35 psf

LL: HS20-44 or Tandem w/ Lane Load

HL93 Live Load (LRFD)



Note: Existing bridge stringers - 6x16 @ 24" o.c.
propose adding 6x16 B/T existing

Check 4x12 planks -

LAMPMAN & SMITH
A STRUCTURAL ENGINEERING CORPORATION

Plank design (cont)

$L = 12'' - 5.5/2 = 9.25'' < 12 - 5.5 + 3.5 = 10''$

$DL = 25^{\#}/12'' = .0021^{k}/in$ Wearing Surface $= .003^{k}/in$

$LL = 16^{k}/20'' = .8^{k}/in$ $b_t = 20''$

$$M_u = \frac{1.25(.0021)(9.25)^2}{8} + \frac{1.5(.003)(9.25)^2}{8} + \frac{1.75(.8)(9.25)^2}{8}$$

(.023, .045, 14.97)

$= 15.05^{''-k}$

4x12: $C_{KF} = 2.5/1.55 = 2.94$

$C_F = 1.0$ $C_M = .95$ $C_{fu} = 1.1$ $C_i = .8$ $C_d = 1.5$ $C_r = .8$

$F_b = 1350(2.94)(1.0)(.95)(1.1)(.8)(1.5)(.8) = 3.56$ ksi

$\phi M_n = .95(22.97\ in^3)(3.56) = 69.5^{''-k} \geq 15.05^{''-k}$ ok

$F_v = 170(2.94)(.95)(.8)(.8) = 272$ psi

$\phi V_n = .75(272)(39.37)/1.5 = 5.36^{k}$ - ok

$$V_u = 1.25\left(.0021 \times \frac{9.25}{2}\right) + 1.5\left(.003 \times \frac{9.25}{2}\right) + 1.75\left(.8 \times \frac{(9.25 - 2.31)^2}{2(9.25)}\right)$$

(.02, 3.64)

$= 3.67^{k}$

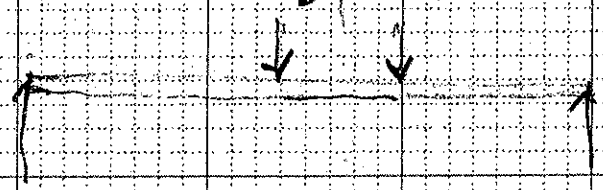
Stringer -

6x16 - $F_{bo} = 1.35$ ksi $W_t = 30^{\#/}$ $I = 1706.7\ in^4$

$C_{kF} = 2.94$ $C_F = .97$ $C_M = 1.0$ $C_d = .9$ $C_\lambda = .8$

$DC(DC) = 30 + 25 = 55^{\#/}$ $DC(DW) = 33^{\#/} + 50^{\#/}_{misc} = 83^{\#/}$

LL - HL-93 Design Tandem + Design Lane



See following pages:

$$M_u = 1.25(2.75) + 1.5(4.4) + 1.75\frac{(.15 \times 232)}{2\ wheels/lane} = 40.5^{1-k}$$

3.44 6.6 30.45 5/6.7 17.4 1-k

$F_b = 1.35(2.94)(1.0)(.97)(.9)(.8) = 2.46$ ksi

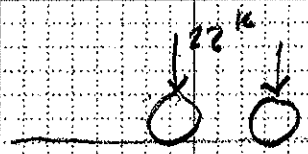
$\phi M_n = \phi F_b S = .95(2.46)(220) = 39.43^{1-k} < 40.5$ NG

Note: @ 8" o.c, $M_u = 30.34$

Check capacity:

$39.43 - (3.44 + 6.6) = 28.39^k / 1.75 = 16.22^{1-k}$

For Tandem w/ 22k axle load, $M = 15.6^{1-k} < 16.22^{1-k}$



ASD comparison - $M = 22.75^{1-k} = 273^{1-k}$

$f_b = \frac{273}{220.23} = 1.24$ ksi $/ .97 = 1.28$ ksi < 1.35 ksi ok

C_F

Matbeam by CivilState

Project: Huasna Vally Bride Evaluation
Project No: LS08161
User: MFS Date: 6/19/09
Description: HL-93 tandem truck with lane loading

No of Spans: 1
No of Divisions: 10
Span 1 = 20.000 ft

E = 1600.000 ksi
No of Sections: 1
Section 1 = 20.000 ft Ix = 1707.000 in^4

No of Interest Points: 1
Interest Point 1 = 1.330 ft

Applied System Loading:

Design Truck+Lane Loading: HL-93 Design Tandem+Design Lane
Distributed load = 0.640 k/ft
Number of Axles: 2

Axle Load k	Min ft	Max ft
25.000	-	-
25.000	4.000	4.000

Distributed Load: DC
Load: 0.055 k/ft
From: 0.000 ft To: 20.000 ft

Distributed Load: DW
Load: 0.088 k/ft
From: 0.000 ft To: 20.000 ft

Design Truck+Lane Loading Results:

Truck+Lane No.: 1
Truck+Lane Name: HL-93 Design Tandem+Design Lane

Support	Reaction (max) k	Reaction (min) k
1	51.38	0.00
2	51.38	0.00

M = .5 (S/6.67) Table 4.6.2.2.2a-1
2 wheel lines

Location ft	M (max/min) k-ft	V (max/min) k	d (max/min) in
0.000	0.00	51.38	0.00
	-0.00	0.00	0.00
1.330	4.75	47.20	1.20
	0.00	-1.68	0.00
2.000	6.86	45.12	1.78
	0.00	-2.55	0.00
4.000	12.03	39.06	3.38
	0.00	-5.24	0.00
6.000	15.51	33.12	4.67
	0.00	-10.52	0.00
8.000	17.30	27.24	5.52
	0.00	-16.00	0.00
10.000	17.40	21.56	5.81

	0.00	-21.56	0.00
12.000	17.30	16.00	5.52
	0.00	-27.24	0.00
14.000	15.51	10.52	4.67
	0.00	-33.12	0.00
16.000	12.03	5.24	3.38
	0.00	-39.06	0.00
18.000	6.86	2.55	1.78
	0.00	-45.12	0.00
20.000	0.00	0.00	0.00
	-0.00	-51.38	0.00

Distributed Load Results:

Distributed Load No.: 1
Distributed Load Name: DC

Support	Reaction k
1	0.55
2	0.55

Location ft	M k-ft	V k	d in
0.000	0.00	0.55	0.00
1.330	0.68	0.48	-0.02
2.000	0.99	0.44	-0.02
4.000	1.76	0.33	-0.04
6.000	2.31	0.22	-0.06
8.000	2.64	0.11	-0.07
10.000	2.75	-0.00	-0.07
12.000	2.64	-0.11	-0.07
14.000	2.31	-0.22	-0.06
16.000	1.76	-0.33	-0.04
18.000	0.99	-0.44	-0.02
20.000	0.00	-0.55	0.00

Distributed Load No.: 2
Distributed Load Name: DW

Support	Reaction k
1	0.88
2	0.88

Location ft	M k-ft	V k	d in
0.000	-0.00	0.88	0.00
1.330	1.09	0.76	-0.02
2.000	1.58	0.70	-0.04
4.000	2.82	0.53	-0.07
6.000	3.70	0.35	-0.09
8.000	4.22	0.18	-0.11
10.000	4.40	0.00	-0.12

7 OF 20
LS081161

12.000	4.22	-0.18	-0.11
14.000	3.70	-0.35	-0.09
16.000	2.82	-0.53	-0.07
18.000	1.58	-0.70	-0.04
20.000	0.00	-0.88	0.00

Matbeam by CivilState

Project: Huasna Valley Bridge Evaluation
Project No: LS08161
User: MFS Date: 6/19/01
Description: HS20-44

No of Spans: 1
No of Divisions: 10
Span 1 = 20.000 ft

E = 1700.000 ksi
No of Sections: 1
Section 1 = 20.000 ft Ix = 1707.000 in^4

No of Interest Points: 1
Interest Point 1 = 1.330 ft

Applied System Loading:

Truck Loading: H20
Number of Axles: 2

Axle Load k	Min ft	Max ft
8.000	-	-
32.000	14.000	14.000

Distributed Load: DC
Load: 0.055 k/ft
From: 0.000 ft To: 20.000 ft

Distributed Load: DW
Load: 0.088 k/ft
From: 0.000 ft To: 20.000 ft

Design Truck Loading Results:

Truck No.: 1
Truck Name: H20

Support	Reaction (max) k	Reaction (min) k
1	34.38	0.00
2	34.38	0.00

Location ft	M (max/min) k-ft	V (max/min) k	d (max/min) in
0.000	0.00	34.38	0.00
	-0.00	0.00	0.00
1.330	3.17	31.73	0.64
	0.00	-2.12	0.00
2.000	4.56	30.37	0.96
	0.00	-3.16	0.00
4.000	7.91	26.36	1.83
	0.00	-6.36	0.00
6.000	10.07	22.37	2.52
	0.00	-9.58	0.00
8.000	11.52	19.16	3.00
	0.00	-12.80	0.00
10.000	12.00	15.99	3.18
	0.00	-15.99	0.00

< HL-93

12.000	11.52	12.80	3.00
	0.00	-19.16	0.00
14.000	10.07	9.58	2.52
	0.00	-22.37	0.00
16.000	7.91	6.36	1.83
	0.00	-26.36	0.00
18.000	4.56	3.16	0.96
	0.00	-30.37	0.00
20.000	0.00	0.00	0.00
	-0.00	-34.38	0.00

Distributed Load Results:

Distributed Load No.: 1
Distributed Load Name: DC

Support	Reaction k
1	0.55
2	0.55

Location ft	M k-ft	V k	d in
0.000	0.00	0.55	0.00
1.330	0.68	0.48	-0.01
2.000	0.99	0.44	-0.02
4.000	1.76	0.33	-0.04
6.000	2.31	0.22	-0.06
8.000	2.64	0.11	-0.06
10.000	2.75	0.00	-0.07
12.000	2.64	-0.11	-0.06
14.000	2.31	-0.22	-0.06
16.000	1.76	-0.33	-0.04
18.000	0.99	-0.44	-0.02
20.000	0.00	-0.55	0.00

Distributed Load No.: 2
Distributed Load Name: DW

Support	Reaction k
1	0.88
2	0.88

Location ft	M k-ft	V k	d in
0.000	0.00	0.88	0.00
1.330	1.09	0.76	-0.02
2.000	1.58	0.70	-0.03
4.000	2.82	0.53	-0.06
6.000	3.70	0.35	-0.09
8.000	4.22	0.18	-0.10
10.000	4.40	0.00	-0.11
12.000	4.22	-0.18	-0.10

14.000	3.70	-0.35	-0.09
16.000	2.82	-0.53	-0.06
18.000	1.58	-0.70	-0.03
20.000	-0.00	-0.88	0.00

Matbeam by CivilState

Project: Huasna Valley Bridge Evaluation
Project No: LS08161
User: MFS Date: 6/19/09
Description: Allowabl load for HL-93 configuration

No of Spans: 1
No of Divisions: 10
Span 1 = 20.000 ft

E = 1700.000 ksi
No of Sections: 1
Section 1 = 20.000 ft Ix = 1707.000 in^4

No of Interest Points: 1
Interest Point 1 = 1.330 ft

Applied System Loading:

Design Truck+Lane Loading: HL-93 Design Tandem+Design Lane
Distributed load = 0.640 k/ft
Number of Axles: 2

Axle Load k	Min ft	Max ft
22.000	-	-
22.000	4.000	4.000

Distributed Load: DC
Load: 0.055 k/ft
From: 0.000 ft To: 20.000 ft

Distributed Load: DW
Load: 0.088 k/ft
From: 0.000 ft To: 20.000 ft

Design Truck+Lane Loading Results:

Truck+Lane No.: 1
Truck+Lane Name: HL-93 Design Tandem+Design Lane

Support	Reaction (max) k	Reaction (min) k
1	45.98	0.00
2	45.98	0.00

Location ft	M (max/min) k-ft	V (max/min) k	d (max/min) in
0.000	0.00	45.98	0.00
	-0.00	0.00	0.00
1.330	4.25	42.20	1.01
	0.00	-1.48	0.00
2.000	6.14	40.33	1.50
	0.00	-2.26	0.00
4.000	10.77	34.86	2.86
	0.00	-4.64	0.00
6.000	13.89	29.52	3.94
	0.00	-9.32	0.00
8.000	15.50	24.25	4.66
	0.00	-14.21	0.00
10.000	15.60	19.16	4.91

	0.00	-19.16	0.00
12.000	15.50	14.21	4.66
	0.00	-24.25	0.00
14.000	13.89	9.32	3.94
	0.00	-29.52	0.00
16.000	10.77	4.64	2.86
	0.00	-34.86	0.00
18.000	6.14	2.26	1.50
	0.00	-40.33	0.00
20.000	0.00	0.00	0.00
	-0.00	-45.98	0.00

Distributed Load Results:

Distributed Load No.: 1
Distributed Load Name: DC

Support	Reaction k
1	0.55
2	0.55

Location ft	M k-ft	V k	d in
0.000	0.00	0.55	0.00
1.330	0.68	0.48	-0.01
2.000	0.99	0.44	-0.02
4.000	1.76	0.33	-0.04
6.000	2.31	0.22	-0.06
8.000	2.64	0.11	-0.06
10.000	2.75	0.00	-0.07
12.000	2.64	-0.11	-0.06
14.000	2.31	-0.22	-0.06
16.000	1.76	-0.33	-0.04
18.000	0.99	-0.44	-0.02
20.000	0.00	-0.55	0.00

Distributed Load No.: 2
Distributed Load Name: DW

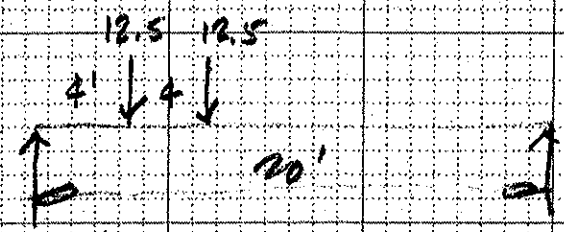
Support	Reaction k
1	0.88
2	0.88

Location ft	M k-ft	V k	d in
0.000	0.00	0.88	0.00
1.330	1.09	0.76	-0.02
2.000	1.58	0.70	-0.03
4.000	2.82	0.53	-0.06
6.000	3.70	0.35	-0.09
8.000	4.22	0.18	-0.10
10.000	4.40	0.00	-0.11

12.000	4.22	-0.18	-0.10
14.000	3.70	-0.35	-0.09
16.000	2.82	-0.53	-0.06
18.000	1.58	-0.70	-0.03
20.000	-0.00	-0.88	0.00

Check shear -

$V_{LL} = .5[(.6 V_{LU}) + V_{LD}]$



V_{LU} @ 3d = 19.53^k $F_V = .17(2.9+)(.65)(.9)(.9) = .272$ ksi

$V_{LD} = 2.93^k$

$V_{LL} = .5[.6(19.53) + 2.93] = 7.32^k$

$V_{DC} = .49^k$

$V_{DW} = .76^k$

$V_u = \overbrace{1.25(.33) + 1.5(.53)}^{1.2} + 1.75(7.32) = 14.55^k$

$V_n = \frac{.272(5.5)(15.5)}{1.5} = 15.46^k$ $\phi V_n = .75(15.46) =$
$= 11.59^k$ - NG

Check capacity @ 22^k axle -

$V_{LU} = 17.43^k$ $V_{LL} = .5[.6(17.43) + 2.61] = 6.53^k$

$V_u = 1.2 + 1.75(6.53) = 12.6^k$ NG

@ 20^k axle -

$V_{LL} = .5[.6(16.03) + 2.4] = 6.0^k$

$V_u = 1.2 + 1.75(6) = 11.7^k \approx 11.6$ OK.

Limit HL-93 tandem to 20^k/axle

Matbeam by CivilState

Project: Huasna Vally Bride Evaluation
Project No: LS08161
User: MFS Date: 6/19/09
Description: HL-93 tandem truck with lane loading

No of Spans: 1
No of Divisions: 10
Span 1 = 20.000 ft

E = 1600.000 ksi
No of Sections: 1
Section 1 = 20.000 ft Ix = 1707.000 in^4

No of Interest Points: 2
Interest Point 1 = 1.330 ft

No of Interest Points: 2
Interest Point 2 = 4.000 ft

Applied System Loading:

Design Truck+Lane Loading: HL-93 Design Tandem+Design Lane
Distributed load = 0.640 k/ft
Number of Axles: 2

Axle Load k	Min ft	Max ft
20.000	-	-
20.000	4.000	4.000

Distributed Load: DC
Load: 0.055 k/ft
From: 0.000 ft To: 20.000 ft

Distributed Load: DW
Load: 0.088 k/ft
From: 0.000 ft To: 20.000 ft

Design Truck+Lane Loading Results:

Truck+Lane No.: 1
Truck+Lane Name: HL-93 Design Tandem+Design Lane

Support	Reaction (max) k	Reaction (min) k
1	42.38	0.00
2	42.38	0.00

Location ft	M (max/min) k-ft	V (max/min) k	d (max/min) in
0.000	0.00	42.38	0.00
	-0.00	0.00	0.00
1.330	52.25	38.87	0.99
	0.00	-1.35	0.00
2.000	75.52	37.14	1.48
	0.00	-2.06	0.00
4.000	132.38	32.06	2.80
	0.00	-4.24	0.00
6.000	170.78	27.12	3.87
	0.00	-8.53	0.00

/2 wheel line → 16.03k

8.000	190.72	22.26	4.58
	0.00	-13.01	0.00
10.000	192.00	17.57	4.82
	0.00	-17.57	0.00
12.000	190.72	13.01	4.58
	0.00	-22.26	0.00
14.000	170.78	8.53	3.87
	0.00	-27.12	0.00
16.000	132.38	4.24	2.80
	0.00	-32.06	0.00
18.000	75.52	2.06	1.48
	0.00	-37.14	0.00
20.000	0.00	0.00	0.00
	-0.00	-42.38	0.00

Distributed Load Results:

Distributed Load No.: 1
Distributed Load Name: DC

Support	Reaction k
1	0.55
2	0.55

Location ft	M k-ft	V k	d in
0.000	0.00	0.55	0.00
1.330	0.68	0.48	-0.02
2.000	0.99	0.44	-0.02
4.000	1.76	0.33	-0.04
6.000	2.31	0.22	-0.06
8.000	2.64	0.11	-0.07
10.000	2.75	0.00	-0.07
12.000	2.64	-0.11	-0.07
14.000	2.31	-0.22	-0.06
16.000	1.76	-0.33	-0.04
18.000	0.99	-0.44	-0.02
20.000	-0.00	-0.55	0.00

Distributed Load No.: 2
Distributed Load Name: DW

Support	Reaction k
1	0.88
2	0.88

Location ft	M k-ft	V k	d in
0.000	0.00	0.88	0.00
1.330	1.09	0.76	-0.02
2.000	1.58	0.70	-0.04
4.000	2.82	0.53	-0.07

6.000	3.70	0.35	-0.09
8.000	4.22	0.18	-0.11
10.000	4.40	0.00	-0.12
12.000	4.22	-0.18	-0.11
14.000	3.70	-0.35	-0.09
16.000	2.82	-0.53	-0.07
18.000	1.58	-0.70	-0.04
20.000	0.00	-0.88	0.00

Distributed load = 0.640 k/ft
Number of Axles: 2

Axle Load k	Min ft	Max ft

DEPARTMENT OF TRANSPORTATION
Structure Maintenance & Investigations

Bridge Number : 49C0147
Facility Carried: HUASNA TOWNSITE RD
Location : 3.1 MI SE OF HUASNA
City :
Inspection Date : 07/09/2007

Bridge Inspection Report

Inspection Type

Routine	FC	Underwater	Special	Other
X				

STRUCTURE NAME: HUASNA RIVER

CONSTRUCTION INFORMATION

Year Built : 1965
Year Widened: N/A
Length (m) : 53

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

Structure Description: Simple span timber stringer (9) with timber deck on timber pile (3) bents and abutments.

Span Configuration : 6.1m, 6.4m, 2@5.8m, 5.0m, 4@5.8m

LOAD CAPACITY AND RATINGS

Design Live Load: OTHER OR UNKNOWN
Inventory Rating: 16.3 metric tons Calculation Method: ALLOWABLE STRESS
Operating Rating: 22.7 metric tons Calculation Method: ALLOWABLE STRESS
~~Permit~~ Rating : XXXXX
Posting Load : Type 3 N/A Type 3S2 N/A Type 3-3 N/A

DESCRIPTION ON STRUCTURE

Deck X-Section: 0.05m br, 3.7m, 0.05br
Total Width: 3.9 m Net Width: 3.9 m No. of Lanes: 1
Rail Description: Timber posts with MBGR Rail Code : 0000
Min. Vertical Clearance: Unimpaired

DESCRIPTION UNDER STRUCTURE

Channel Description: Sand and gravel

CONDITION TEXT

CONDITION OF STRUCTURE

The Abutment 1 timber backwall is deteriorating for a length of approximately 1-m on the right side as previously reported. This condition has remained relatively stable since the previous inspection.

The bridge rail is loose on both sides. Several of the timber posts are loose on the structure.

The timber deck planks are pulling up at several locations.

The approach fill is sloughing at the right side of Abutment 10. Boards have been effectively utilized on the left side of Abutment 10 to prevent the approach fill from doing what it is on the right side.

Minor checking was noted in the timber caps.

Several of the timber columns have been banded including Column 2 in Bent 2; Columns 2 and 3 in Bent 4; Column 2 in Bent 5. The columns in Bent 5 have been replaced sometime in the past. Column 3 in Bent 5 is of smaller diameter than the other columns used to support the structure. This smaller column exhibits a few significant splits.

CONDITION TEXT

Otherwise, there were no other notable defects observed and the structure remains in satisfactory condition.

The flow in the channel was slow and shallow at the time of this inspection. No scour was observed.

SIGNS

There are one lane bridge signs and horizontal clearance markers in place at both approaches.

ELEMENT INSPECTION RATINGS

P#Elem	Element Description	Env	Total Qty	Units	Qty in each Condition State St. 1	St. 2	St. 3	St. 4	St. 5
101 31	Timber Deck - Bare	2	207	sq.m.	207	0	0	0	0
101 111	Timber Open Girder/Beam	2	371	m.	371	0	0	0	0
101 206	Timber Column or Pile Extension	2	24	ea.	24	0	0	0	0
101 216	Timber Abutment	2	9	m.	8	0	1	0	0
101 235	Timber Cap	2	55	m.	55	0	0	0	0
101 333	Other Bridge Railing	2	106	m.	106	0	0	0	0

WORK RECOMMENDATIONS

RecDate: 07/09/2007
Action : Sub-Misc.
Work By: LOCAL AGENCY
Status : PROPOSED

EstCost:
StrTarget: 2 YEARS
DistTarget:
EA:

Band Column 3 in Bent 5.

RecDate: 07/24/2005
Action : Railing-Misc.
Work By: LOCAL AGENCY
Status : PROPOSED

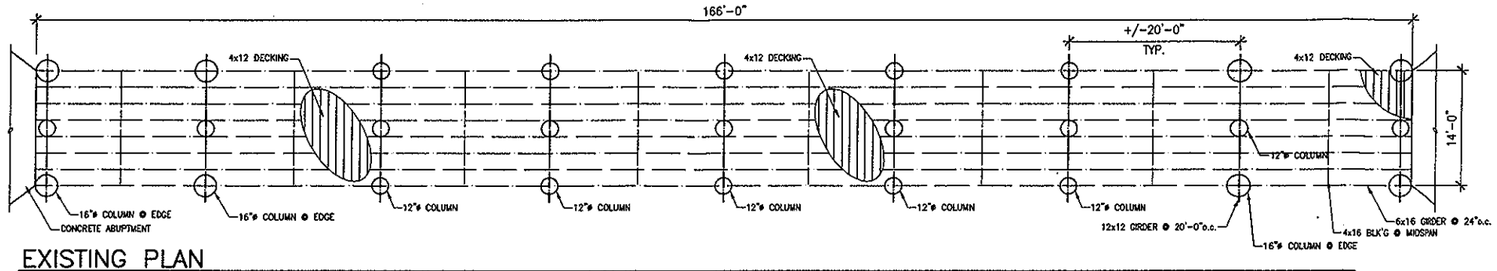
EstCost:
StrTarget:
DistTarget:
EA:

Secure rail post on the left side of the bridge.

Inspected By : Anthony Fernandes

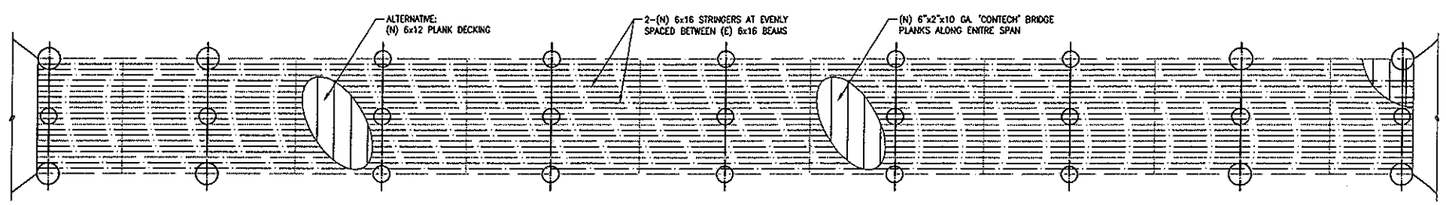
Registered Civil Engineer

REGISTERED PROFESSIONAL ENGINEER
ANTHONY FERNANDES
No. 60501
Exp. 06/30/08
CIVIL
STATE OF CALIFORNIA



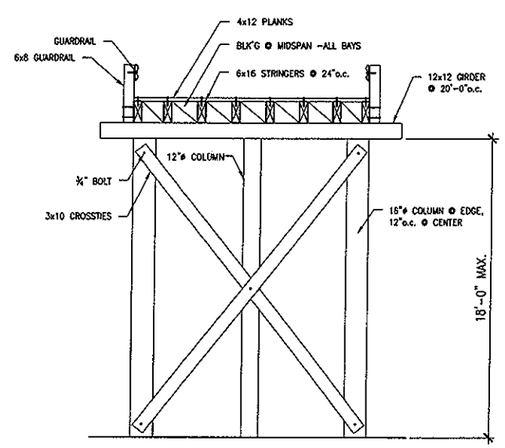
EXISTING PLAN

SCALE: 1/8"=1'-0"



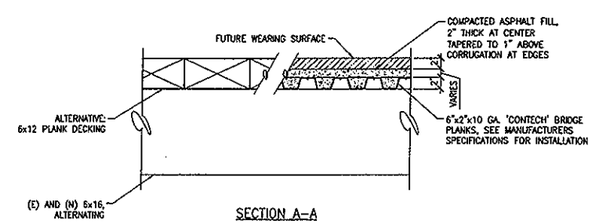
PROPOSED PLAN

SCALE: 1/8"=1'-0"

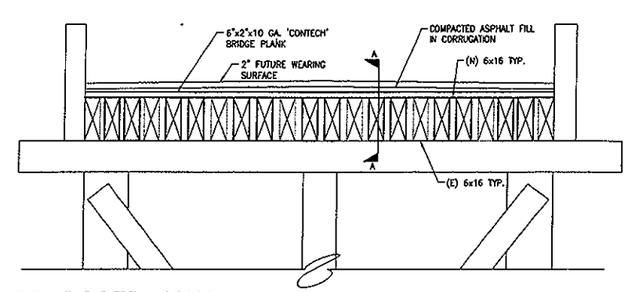


EXISTING SECTION

SCALE: 1/4"=1'-0"



SECTION A-A



PROPOSED SECTION

SCALE: 1/2"=1'-0"

NOT FOR CONSTRUCTION

REVISIONS	BY

DESIGN, DRAWING, NOTES AND SPECIFICATIONS ARE THE PROPERTY AND SHALL REMAIN THE PROPERTY OF LAMPMAN & SMITH, CONSULTING ENGINEERS, AND MAY NOT BE REPRODUCED, CHANGED OR COPIED IN ANY FORM OR MANNER WHATSOEVER, NOR ASSIGNED TO ANY THIRD PARTY WITHOUT FIRST OBTAINING THE EXPRESSED WRITTEN CONSENT OF L&S. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE EXPRESSED WRITTEN CONSENT OF L&S. VIOLATORS WILL BE PROSECUTED TO THE FULLEST EXTENT OF THE LAW. COPYRIGHT 2008.

LAMPMAN & SMITH
A STRUCTURAL ENGINEERING CORPORATION
865 ALVARADO PLACE, SUITE 204
SAN LUIS OBISPO, CA 93401
PHONE: (805) 544-9313
FAX: (805)-543-2830

REGISTERED PROFESSIONAL ENGINEER
VIRGILIO C. LAMPMAN
No. 17000
STRUCTURAL
STATE OF CALIFORNIA

NOT FOR CONSTRUCTION

BRIDGE STREGTHENING DETAILS

Proposed Bridge Stregthening
Porter Bridge - End of Huasna Township
Prepared for EXCELLERON

DATE	08/27/08
SCALE	AS SHOWN
DRAWN	L & S
JOB	LS08161
SHEET	S-1
OF	SHEETS