

**CONDITION ASSESSMENT & LOAD EVALUATION
9TH STREET BRIDGE OVER SYDENHAM RIVER
CITY OF OWEN SOUND**

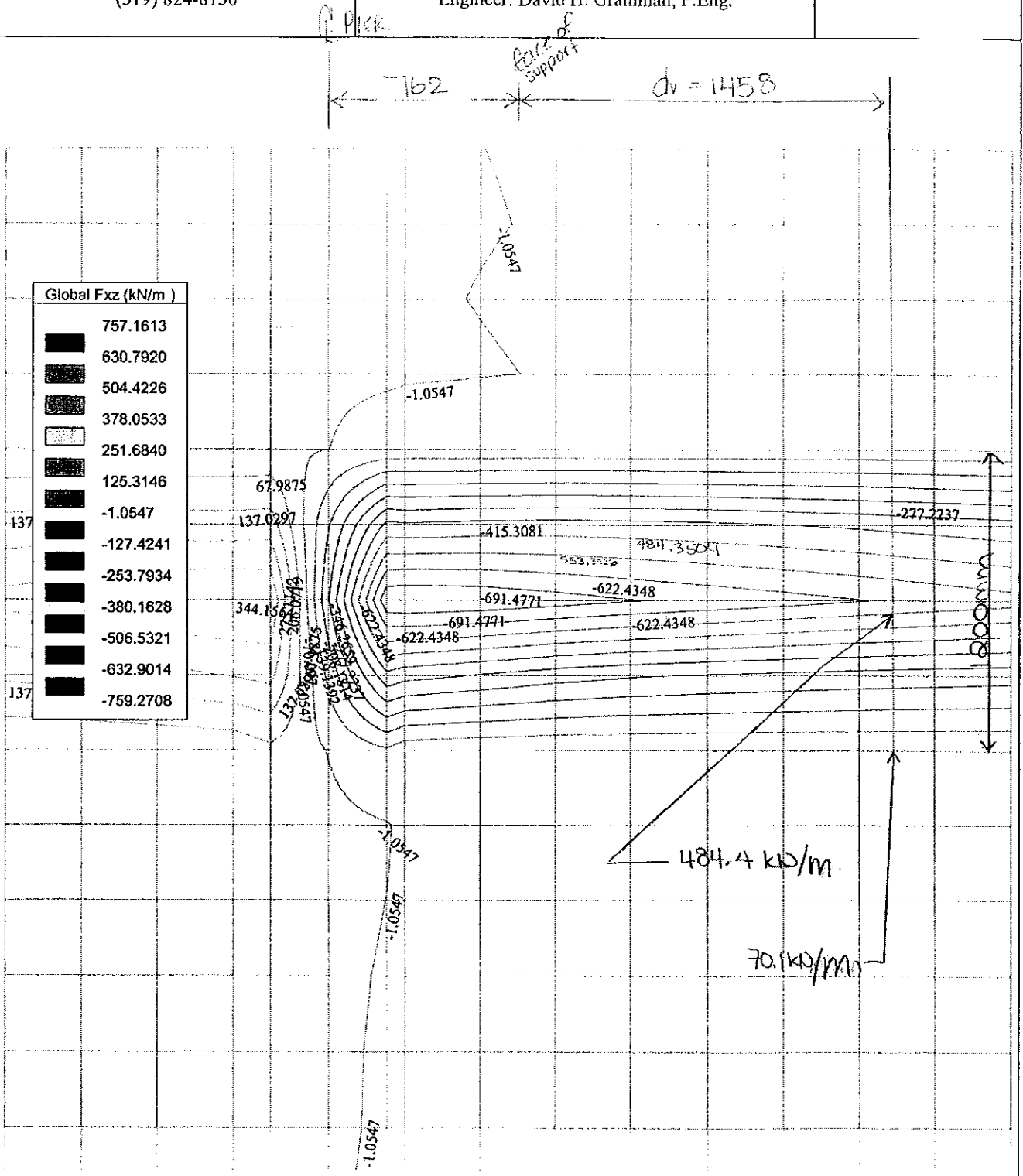
APPENDIX "H"

CALCULATIONS

GAMSBY & MANNEROW
 Suite 210, 255 Woodlawn Road West
 Guelph, ONTARIO
 (519) 824-8150

B1097 9th Street Bridge

Filename: C:\SFrame and Extras\SFrame\B1097\SFrame\9TH STREET BRIDGE.TEL
 GRAPHICAL RESULTS - Ld Comb 3 Dead Load->Global Fxz (kN/m)
 Engineer: David H. Grahlman, P.Eng.



Dead Load (Wheel Loads for max V, Fxz)

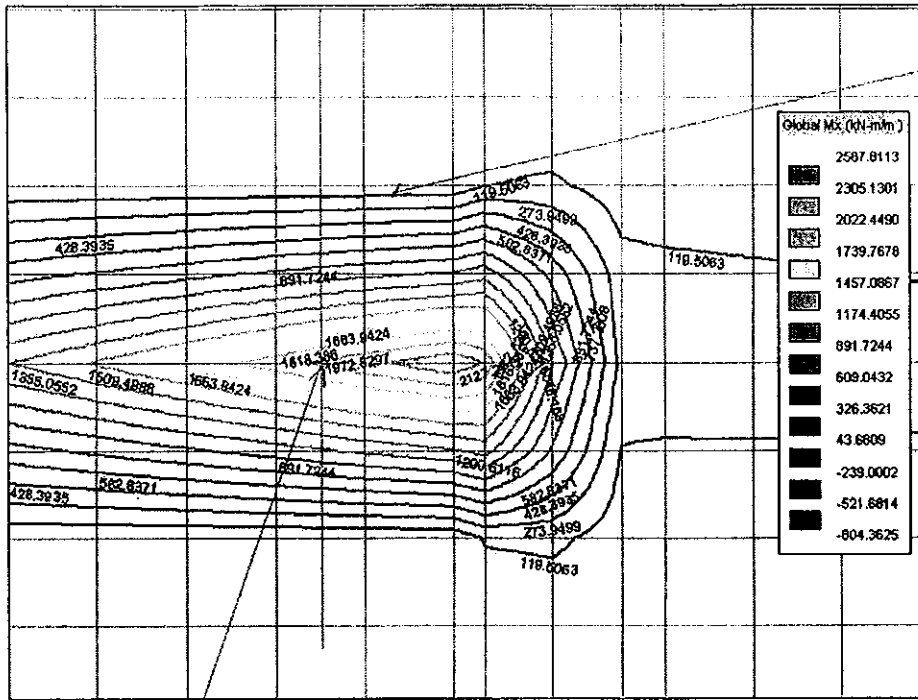
Wednesday August 22 2007, 4:03 pm

S-FRAME

Enterprise Version 7.02

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Mx (max M, right pier)



119.5 kNm/m

1200mm Strip

1972.8 kNm/m

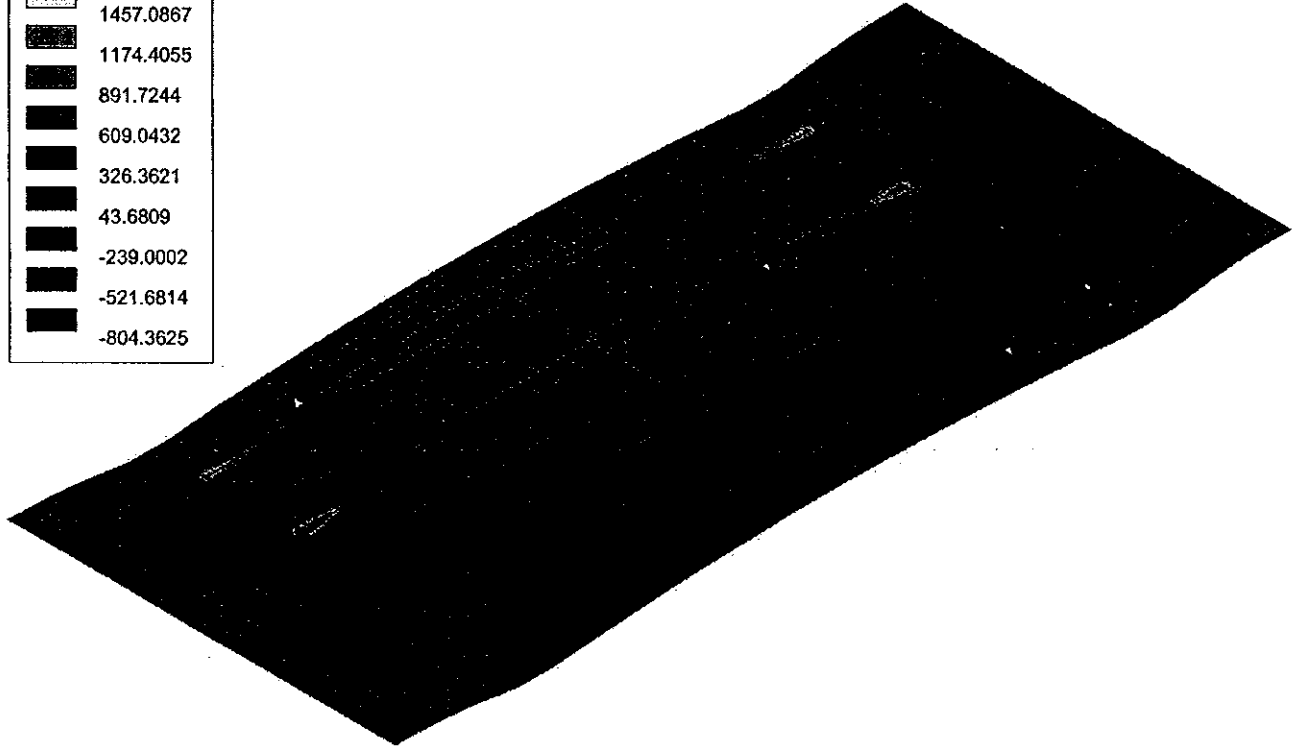
1524mm
PIER WIDTH

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B1097 9th Street Bridge

Filename: C:\SFrame and Extras\SFrame\B1097\SFrame\9TH STREET BRIDGE.TEL
GRAPHICAL RESULTS - Ld Case 6 WL - max M->Global Mx (kN-m/m)
Engineer: David H. Grahman, P.Eng.

Global Mx (kN-m/m)	
█	2587.8113
█	2305.1301
█	2022.4490
█	1739.7678
█	1457.0867
█	1174.4055
█	891.7244
█	609.0432
█	326.3621
█	43.6809
█	-239.0002
█	-521.6814
█	-804.3625



Live Load (Wheel Loads for max M)

Wednesday August 22 2007, 11:47 am

S-FRAME

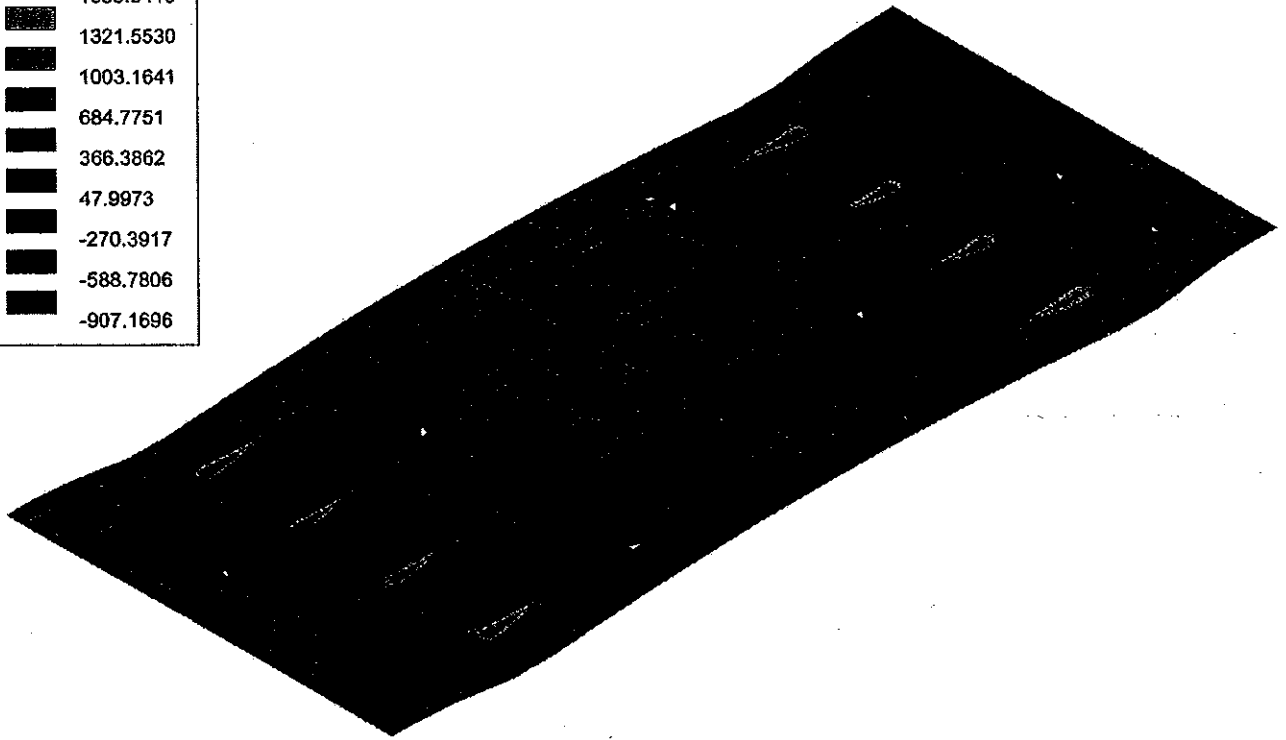
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B1097 9th Street Bridge

Filename: C:\SFrame and Extras\SFrame\B1097\SFrame\9TH STREET BRIDGE.TEL
GRAPHICAL RESULTS - Ld Comb 3 Dead Load->Global Mx (kN-m/m)
Engineer: David H. Grahman, P.Eng.

Global Mx (kN-m/m)	
■	2913.4976
■	2595.1086
■	2276.7197
■	1958.3308
■	1639.9419
■	1321.5530
■	1003.1641
■	684.7751
■	366.3862
■	47.9973
■	-270.3917
■	-588.7806
■	-907.1696



Dead Load

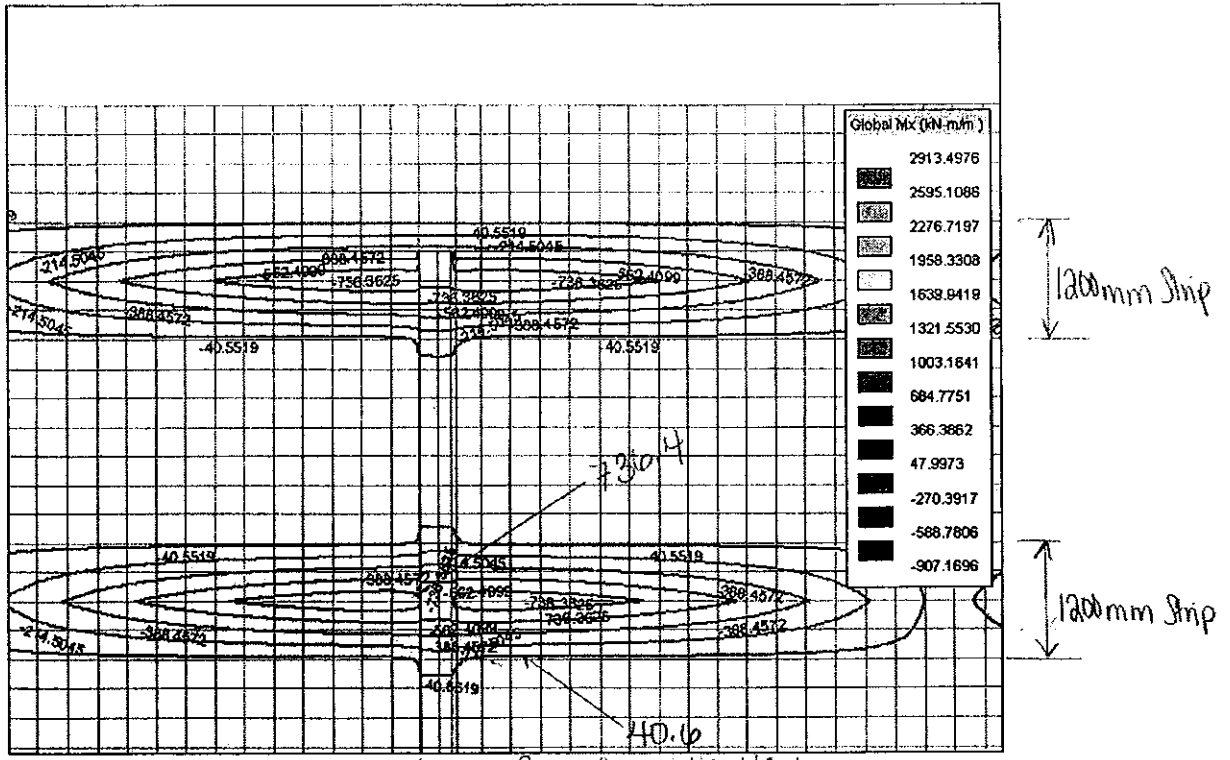
Wednesday August 22 2007, 11:27 am

S-FRAME

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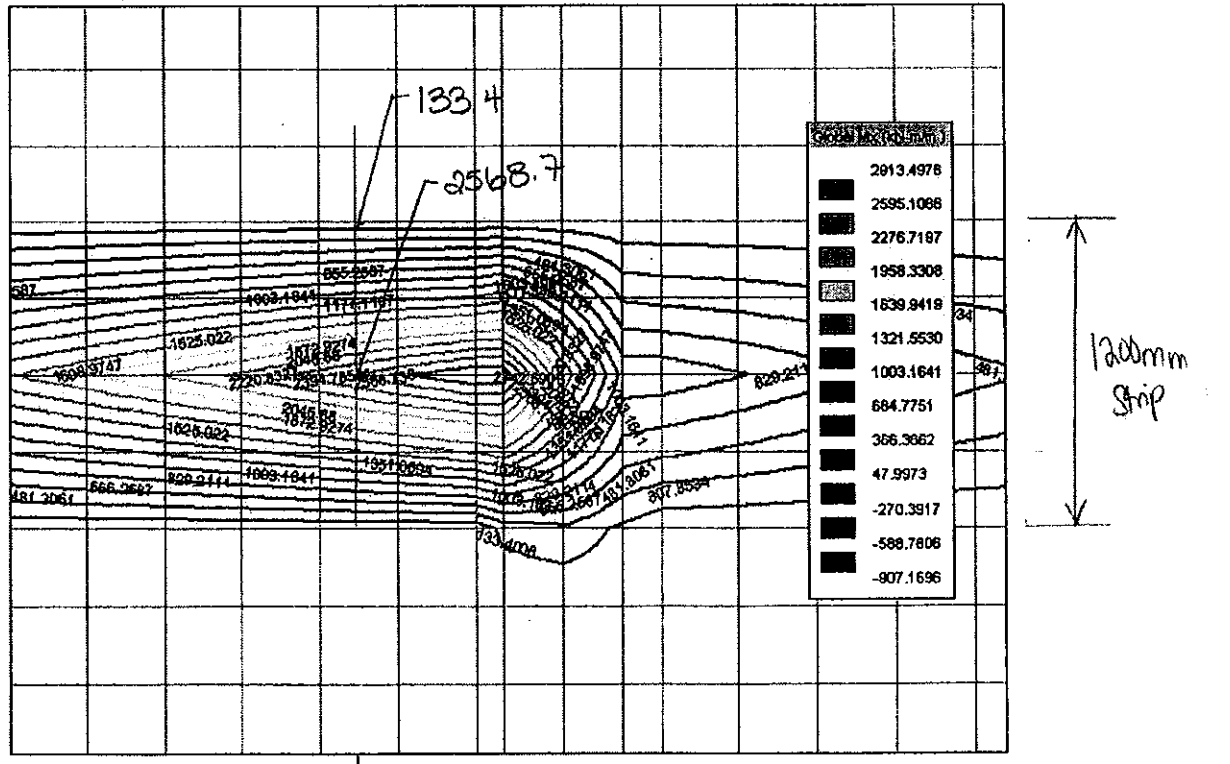
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Mx (dead load, left pier)



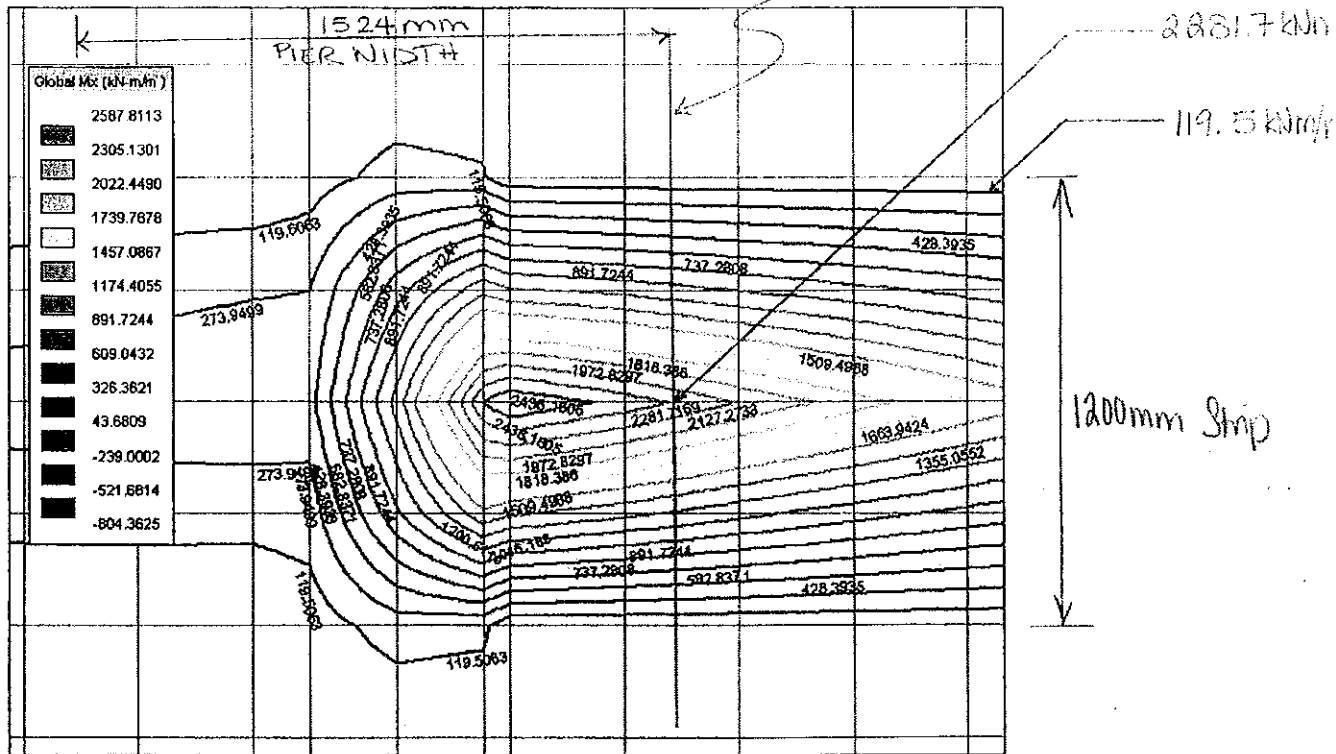
← fore of middle diaphragm
381 (mid-diaphragm)

Mx (dead load, left pier)

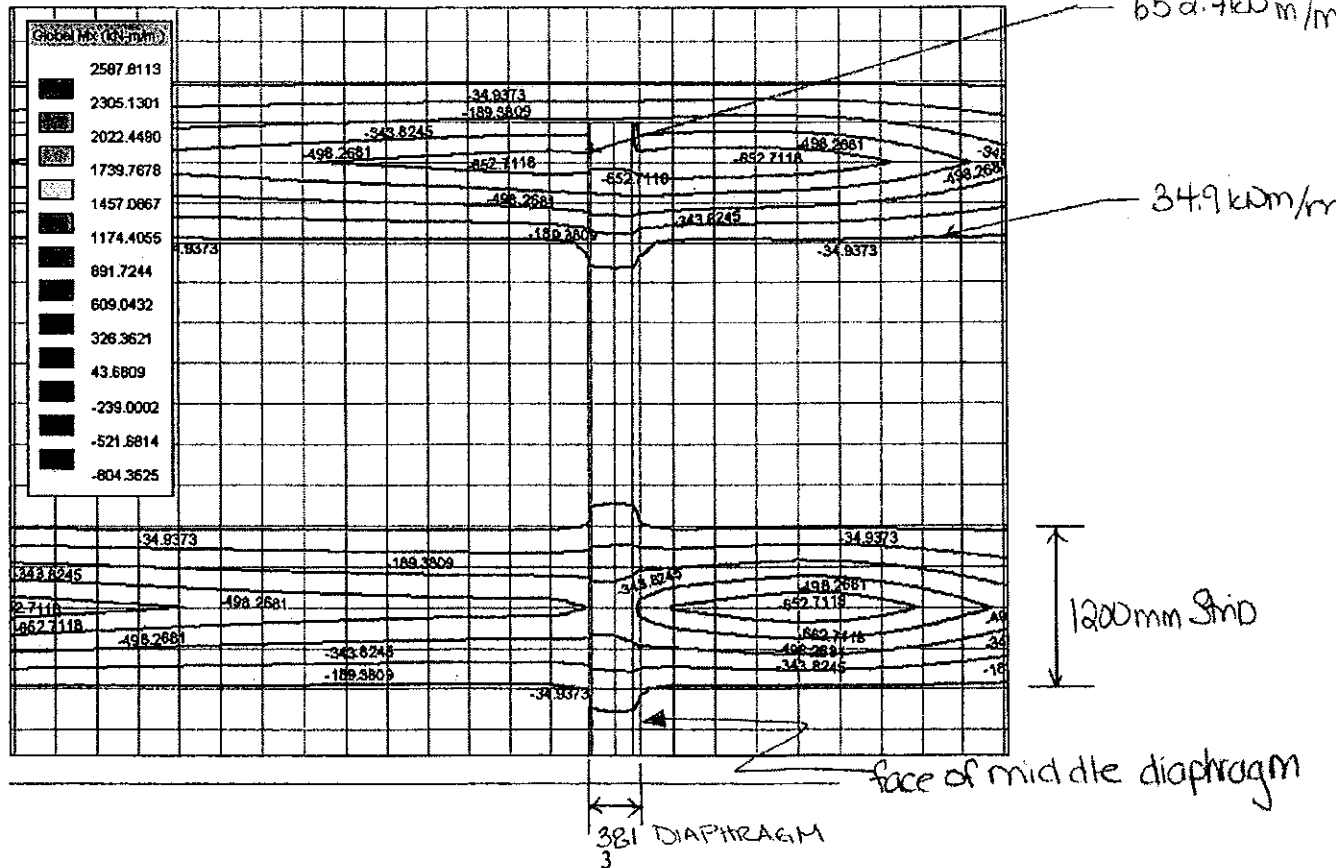


edge of support

Mx (WL at max M, left pier)



Mx (max M, mid span)

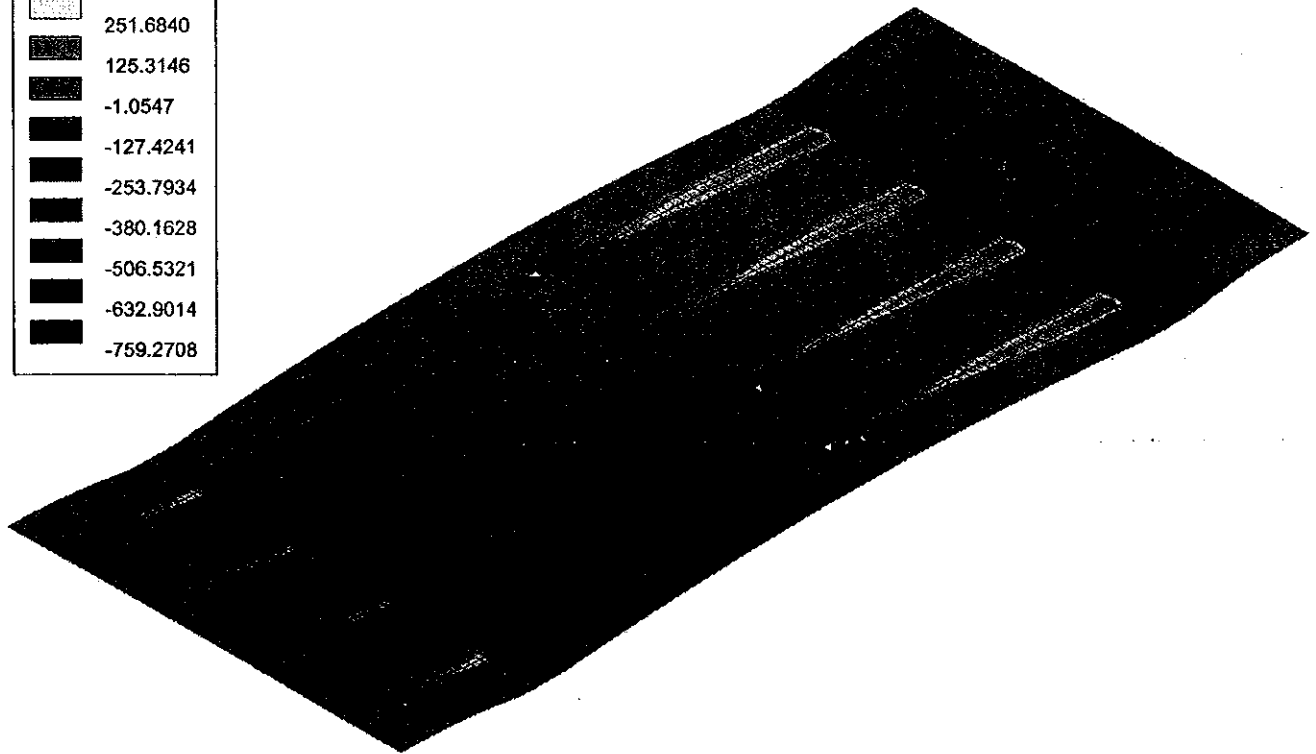


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B1097 9th Street Bridge

Filename: C:\SFrame and Extras\SFrame\B1097\SFrame\9TH STREET BRIDGE.TEL
GRAPHICAL RESULTS - Ld Comb 3 Dead Load->Global Fxz (kN/m)
Engineer: David H. Grahlman, P.Eng.

Global Fxz (kN/m)	
■	757.1613
■	630.7920
■	504.4226
■	378.0533
■	251.6840
■	125.3146
■	-1.0547
■	-127.4241
■	-253.7934
■	-380.1628
■	-506.5321
■	-632.9014
■	-759.2708



Dead Load (Wheel Loads for max V, Fxz)

Wednesday August 22 2007, 4:05 pm

S-FRAME

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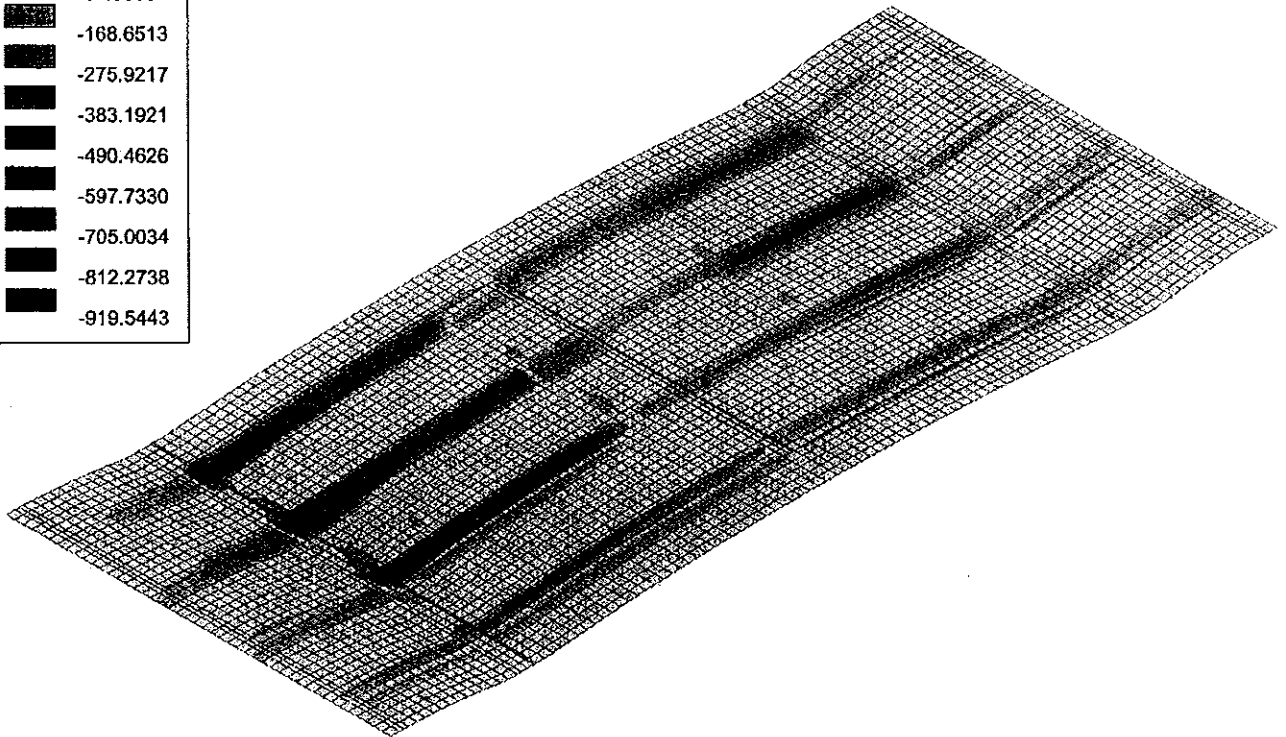
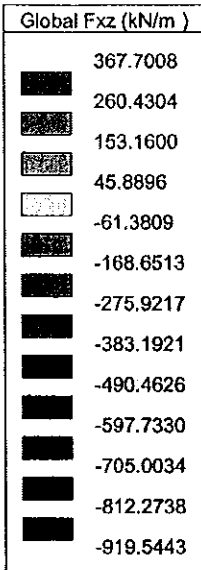
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B1097 9th Street Bridge

Filename: C:\SFrame and Extras\SFrame\B1097\SFrame\9TH STREET BRIDGE.TEL
GRAPHICAL RESULTS - Ld Case 7 WL - max V->Global Fxz (kN/m)
Engineer: David H. Grahlman, P.Eng.



Live Load (Wheel Loads for max V, Fxz)

Wednesday August 22 2007, 3:55 pm

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Project Information

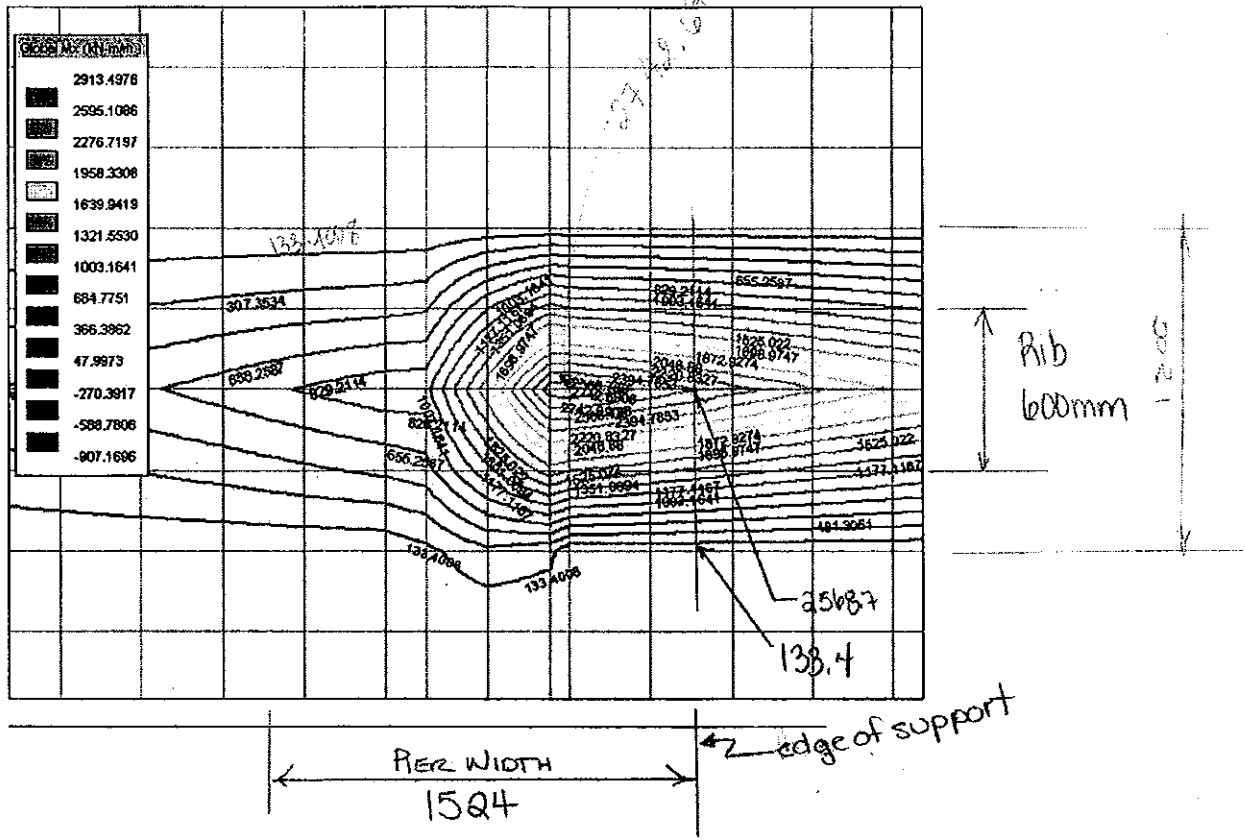
Project Name: B1097 9th Street Bridge

Structure Description:

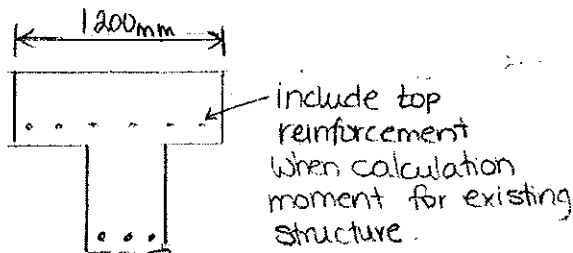
Engineer: David H. Grahlman, P.Eng.

File Name: C:\SFrame and Extras\SFrame\B1097\SFrame\9TH STREET BRIDGE.TEL

Mx (dead load, left pier)



SKETCH:



EVALUATION LIMITS = 1

POSITIVE MOMENT

$T = 11.15 \quad U = 0.95 \quad P = 0.7P_b$

$$F = \frac{UR_L - \sum w_o D - \sum w_a A}{\alpha_L L (1 + I)}$$

$$= \frac{0.95 (1224 \text{ kNm}) - 466 \text{ kNm} - \phi}{413 \text{ kNm}}$$

$$= 1.687$$

\therefore POSTING FACTOR = 1.0

\therefore POSTED WEIGHT $P_w = 1.0 (625 \text{ kN}) = 625 \text{ kN}$ - NO POSTING
cl. 14.17.2 (a)

NEGATIVE MOMENT

$U = 0.95 \quad P = 0.7P_b$

$$F = \frac{UR_L - \sum w_o D - \sum w_a A}{\alpha_L L (1 + I)}$$

$$= \frac{0.95 (3225.7 \text{ kNm}) - 1621 \text{ kNm} - \phi}{1441 \text{ kNm}}$$

$$= 1.063$$

\therefore NO LOAD POSTING REQ'D cl. 14.17.2 (a)

SHEAR (over support)

$$F = \frac{UR_L - \sum w_o D - \sum w_a A}{\alpha_L L (1 + I)}$$

$T = 11.15 \quad U = 1.05$

$$= \frac{1.05 (15992 \text{ kN}) - 3332 \text{ kN}}{5072 \text{ kN}}$$

$$= 2.66$$

\therefore NO POSTING REQUIRED

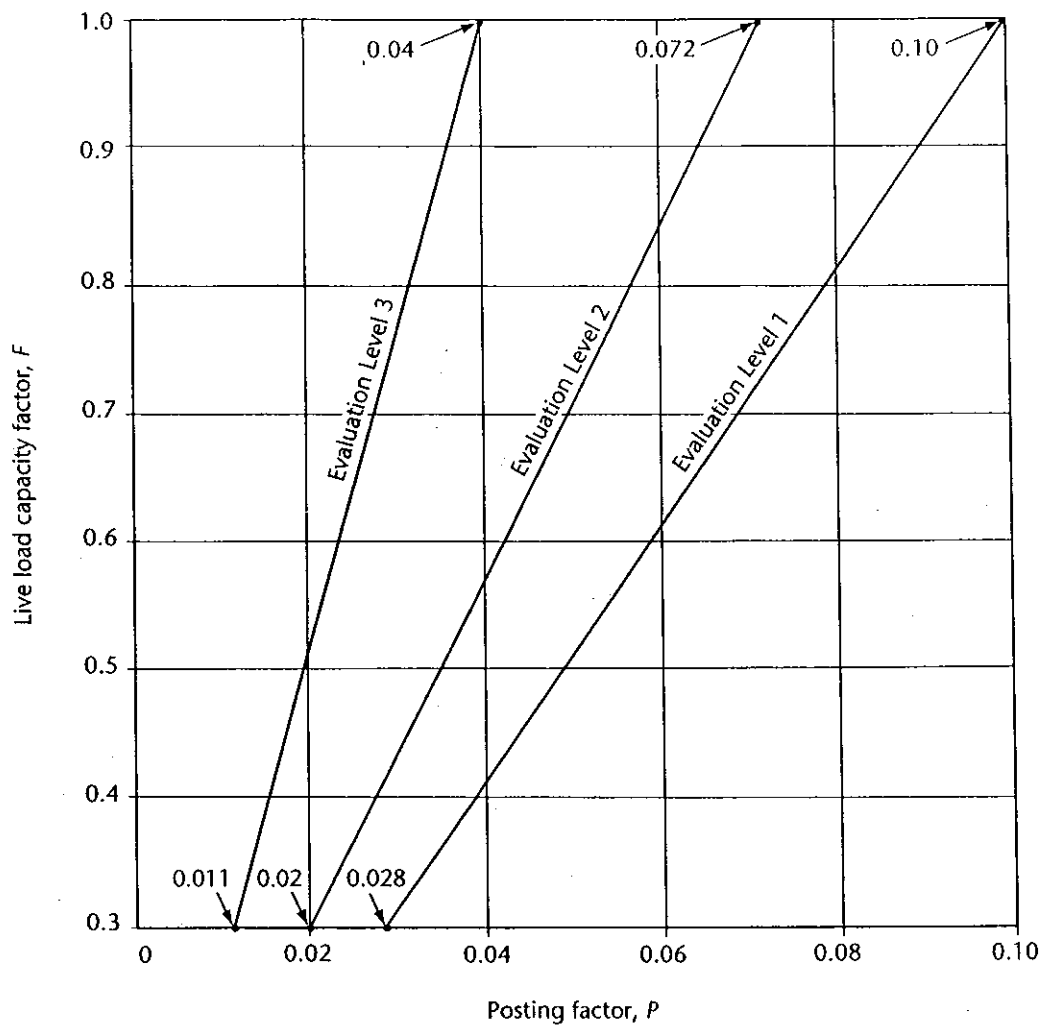


Figure 14.8
Posting loads for gross vehicle weight
 (See Clauses 14.17.2 and 14.17.3.1.)

14.17.3 Posting signs

14.17.3.1 General

The posted weight limit(s) in tonnes shall be PW , where P is the posting factor shown in Figure 14.8 and W is in kilonewtons and as specified in Clause 14.9.1.2. For ONT loads specified for use in Ontario, W equals 625 kN.

14.17.3.2 Single posting signs for vehicles

Posting signs shall be in accordance with the regulations set by the Regulatory Authority. Posting shall show the gross vehicle weight to the nearest tonne.