

Steel Check Report

Element: **Untitled2 ()**
 Description:
 Date: **10/31/2002 03:43 PM**

Company:
 User:
 Software: **Digital Canal Steel Beam Column Design**

GENERAL INFORMATION

Description	Value
Run Mode	Check Mode
Design Code	AISC LRFD (1994)
Beam-Column Length	12.00 ft
Steel Yield Stress	36.00 ksi
C_b Calculation	$12.5M_{max} / (2.5M_{max} + 3M_A + 4M_B + 3M_C)$
C_{mx} Calculation	Always use 1.0 (conservative)
C_{my} Calculation	Always use 1.0 (conservative)
L_x	12.00 ft
L_y	12.00 ft
L_z	12.00 ft
K_x	1.00
K_y	1.00
K_z	1.00
Total Load Deflection Limit	L / 240
Live Load Deflection Limit	L / 360
Lateral Torsional Braced (LTB) Length	
Section Shape	-
Maximum Section Depth	-
Minimum Section Depth	-
Back-Back Distance (double angles only)	-
Section Width (angles, double angles)	-
Check Section List	TS8x8x0.5
Maximum Stress Ratio	-

LOAD INFORMATION

Ref. No.	Load Case	Load Type	Dir	Begin Value	Begin Position	End Value	End Position
1	Dead	Concen	Z	-75 (kips)	12 (ft)	-	-
2	Live	Concen	Z	-115 (kips)	12 (ft)	-	-
3	Live	Linear	Y	-1.5 (kips / ft)	0 (ft)	-1.5 (kips / ft)	12 (ft)
4	Live	Concen	X	0.75 (kips)	5.2 (ft)	-	-

ANALYSIS RESULT

Note: Deflections are calculated based on $I_x = I_y = 1.0 \text{ in}^4$

LOAD COMBINATION LC1: 1.0DL+1.0LL+1.0WL+1.0SL

Distance (ft)	Shear Y (kips)	Shear X (kips)	Moment X (ft-kips)	Moment Y (ft-kips)	Deflection Y (in)	Deflection X (in)
0	9	-0.425	0	0	0	0
0.6	8.1	-0.425	5.13	-0.255	-3.84	0.247
1.2	7.2	-0.425	9.72	-0.51	-7.58	0.488
1.8	6.3	-0.425	13.8	-0.765	-11.1	0.718
2.4	5.4	-0.425	17.3	-1.02	-14.3	0.932
3	4.5	-0.425	20.3	-1.28	-17.2	1.12
3.6	3.6	-0.425	22.7	-1.53	-19.6	1.29
4.2	2.7	-0.425	24.6	-1.79	-21.6	1.42
4.8	1.8	-0.425	25.9	-2.04	-23	1.51
5.2	1.2	-0.425	26.5	-2.21	-23.6	1.55
5.2	1.2	0.325	26.5	-2.21	-23.6	1.55
5.4	0.9	0.325	26.7	-2.15	-23.8	1.56
5.76	0.366	0.325	27	-2.03	-24.1	1.57
6	0	0.325	27	-1.95	-24.1	1.57
6.6	-0.9	0.325	26.7	-1.75	-23.8	1.53
7.2	-1.8	0.325	25.9	-1.56	-23	1.46
7.8	-2.7	0.325	24.6	-1.37	-21.6	1.35
8.4	-3.6	0.325	22.7	-1.17	-19.6	1.21

9	-4.5	0.325	20.3	-0.975	-17.2	1.05
9.6	-5.4	0.325	17.3	-0.78	-14.3	0.861
10.2	-6.3	0.325	13.8	-0.585	-11.1	0.661
10.8	-7.2	0.325	9.72	-0.39	-7.58	0.447
11.4	-8.1	0.325	5.13	-0.195	-3.84	0.226
12	-9	0.325	0	0	0	0

LOAD COMBINATION LC2: 1.4DL

Distance (ft)	Shear Y (kips)	Shear X (kips)	Moment X (ft-kips)	Moment Y (ft-kips)	Deflection Y (in)	Deflection X (in)
0	0	0	0	0	0	0
0.6	0	0	0	0	0	0
1.2	0	0	0	0	0	0
1.8	0	0	0	0	0	0
2.4	0	0	0	0	0	0
3	0	0	0	0	0	0
3.6	0	0	0	0	0	0
4.2	0	0	0	0	0	0
4.8	0	0	0	0	0	0
5.4	0	0	0	0	0	0
6	0	0	0	0	0	0
6.6	0	0	0	0	0	0
7.2	0	0	0	0	0	0
7.8	0	0	0	0	0	0
8.4	0	0	0	0	0	0
9	0	0	0	0	0	0
9.6	0	0	0	0	0	0
10.2	0	0	0	0	0	0
10.8	0	0	0	0	0	0
11.4	0	0	0	0	0	0
12	0	0	0	0	0	0

LOAD COMBINATION LC3: 1.2DL+1.6LL+0.5SL

Distance (ft)	Shear Y (kips)	Shear X (kips)	Moment X (ft-kips)	Moment Y (ft-kips)	Deflection Y (in)	Deflection X (in)
0	14.4	-0.68	0	0	0	0
0.6	13	-0.68	8.21	-0.408	-6.15	0.395
1.2	11.5	-0.68	15.6	-0.816	-12.1	0.781
1.8	10.1	-0.68	22	-1.22	-17.8	1.15
2.4	8.64	-0.68	27.6	-1.63	-22.9	1.49
3	7.2	-0.68	32.4	-2.04	-27.5	1.8
3.6	5.76	-0.68	36.3	-2.45	-31.4	2.06
4.2	4.32	-0.68	39.3	-2.86	-34.5	2.27
4.8	2.88	-0.68	41.5	-3.26	-36.8	2.42
5.2	1.92	-0.68	42.4	-3.54	-37.8	2.48
5.2	1.92	0.52	42.4	-3.54	-37.8	2.48
5.4	1.44	0.52	42.8	-3.43	-38.1	2.5
5.76	0.585	0.52	43.1	-3.25	-38.5	2.51
6	0	0.52	43.2	-3.12	-38.6	2.51
6.6	-1.44	0.52	42.8	-2.81	-38.1	2.45
7.2	-2.88	0.52	41.5	-2.5	-36.8	2.33
7.8	-4.32	0.52	39.3	-2.18	-34.5	2.15
8.4	-5.76	0.52	36.3	-1.87	-31.4	1.93
9	-7.2	0.52	32.4	-1.56	-27.5	1.67
9.6	-8.64	0.52	27.6	-1.25	-22.9	1.38
10.2	-10.1	0.52	22	-0.936	-17.8	1.06
10.8	-11.5	0.52	15.6	-0.624	-12.1	0.716
11.4	-13	0.52	8.21	-0.312	-6.15	0.361
12	-14.4	0.52	0	0	0	0

LOAD COMBINATION LC4: 1.2DL+1.6SL+0.5LL

Distance (ft)	Shear Y (kips)	Shear X (kips)	Moment X (ft-kips)	Moment Y (ft-kips)	Deflection Y (in)	Deflection X (in)
0	4.5	-0.212	0	0	0	0
0.6	4.05	-0.212	2.56	-0.128	-1.92	0.123
1.2	3.6	-0.212	4.86	-0.255	-3.79	0.244
1.8	3.15	-0.212	6.89	-0.383	-5.55	0.359
2.4	2.7	-0.212	8.64	-0.51	-7.17	0.466
3	2.25	-0.212	10.1	-0.638	-8.6	0.562
3.6	1.8	-0.212	11.3	-0.765	-9.81	0.644
4.2	1.35	-0.212	12.3	-0.893	-10.8	0.71

4.8	0.9	-0.212	13	-1.02	-11.5	0.757
5.2	0.6	-0.212	13.3	-1.11	-11.8	0.776
5.2	0.6	0.163	13.3	-1.11	-11.8	0.776
5.4	0.45	0.163	13.4	-1.07	-11.9	0.782
5.76	0.183	0.163	13.5	-1.01	-12	0.786
6	0	0.163	13.5	-0.975	-12.1	0.784
6.6	-0.45	0.163	13.4	-0.877	-11.9	0.765
7.2	-0.9	0.163	13	-0.78	-11.5	0.728
7.8	-1.35	0.163	12.3	-0.683	-10.8	0.673
8.4	-1.8	0.163	11.3	-0.585	-9.81	0.604
9	-2.25	0.163	10.1	-0.487	-8.6	0.523
9.6	-2.7	0.163	8.64	-0.39	-7.17	0.431
10.2	-3.15	0.163	6.89	-0.292	-5.55	0.33
10.8	-3.6	0.163	4.86	-0.195	-3.79	0.224
11.4	-4.05	0.163	2.56	-0.0975	-1.92	0.113
12	-4.5	0.163	0	0	0	0

LOAD COMBINATION LC5: 1.2DL+1.6SL+0.8WL

Distance (ft)	Shear Y (kips)	Shear X (kips)	Moment X (ft-kips)	Moment Y (ft-kips)	Deflection Y (in)	Deflection X (in)
0	0	0	0	0	0	0
0.6	0	0	0	0	0	0
1.2	0	0	0	0	0	0
1.8	0	0	0	0	0	0
2.4	0	0	0	0	0	0
3	0	0	0	0	0	0
3.6	0	0	0	0	0	0
4.2	0	0	0	0	0	0
4.8	0	0	0	0	0	0
5.4	0	0	0	0	0	0
6	0	0	0	0	0	0
6.6	0	0	0	0	0	0
7.2	0	0	0	0	0	0
7.8	0	0	0	0	0	0
8.4	0	0	0	0	0	0
9	0	0	0	0	0	0
9.6	0	0	0	0	0	0
10.2	0	0	0	0	0	0
10.8	0	0	0	0	0	0
11.4	0	0	0	0	0	0
12	0	0	0	0	0	0

LOAD COMBINATION LC6: 1.2DL+1.3WL+0.5LL+0.5SL

Distance (ft)	Shear Y (kips)	Shear X (kips)	Moment X (ft-kips)	Moment Y (ft-kips)	Deflection Y (in)	Deflection X (in)
0	4.5	-0.212	0	0	0	0
0.6	4.05	-0.212	2.56	-0.128	-1.92	0.123
1.2	3.6	-0.212	4.86	-0.255	-3.79	0.244
1.8	3.15	-0.212	6.89	-0.383	-5.55	0.359
2.4	2.7	-0.212	8.64	-0.51	-7.17	0.466
3	2.25	-0.212	10.1	-0.638	-8.6	0.562
3.6	1.8	-0.212	11.3	-0.765	-9.81	0.644
4.2	1.35	-0.212	12.3	-0.893	-10.8	0.71
4.8	0.9	-0.212	13	-1.02	-11.5	0.757
5.2	0.6	-0.212	13.3	-1.11	-11.8	0.776
5.2	0.6	0.163	13.3	-1.11	-11.8	0.776
5.4	0.45	0.163	13.4	-1.07	-11.9	0.782
5.76	0.183	0.163	13.5	-1.01	-12	0.786
6	0	0.163	13.5	-0.975	-12.1	0.784
6.6	-0.45	0.163	13.4	-0.877	-11.9	0.765
7.2	-0.9	0.163	13	-0.78	-11.5	0.728
7.8	-1.35	0.163	12.3	-0.683	-10.8	0.673
8.4	-1.8	0.163	11.3	-0.585	-9.81	0.604
9	-2.25	0.163	10.1	-0.487	-8.6	0.523
9.6	-2.7	0.163	8.64	-0.39	-7.17	0.431
10.2	-3.15	0.163	6.89	-0.292	-5.55	0.33
10.8	-3.6	0.163	4.86	-0.195	-3.79	0.224
11.4	-4.05	0.163	2.56	-0.0975	-1.92	0.113
12	-4.5	0.163	0	0	0	0

LOAD COMBINATION LC7: 1.2DL+0.5LL+0.2SL

Distance (ft)	Shear Y (kips)	Shear X (kips)	Moment X (ft-kips)	Moment Y (ft-kips)	Deflection Y (in)	Deflection X (in)
0	4.5	-0.212	0	0	0	0
0.6	4.05	-0.212	2.56	-0.128	-1.92	0.123
1.2	3.6	-0.212	4.86	-0.255	-3.79	0.244
1.8	3.15	-0.212	6.89	-0.383	-5.55	0.359
2.4	2.7	-0.212	8.64	-0.51	-7.17	0.466
3	2.25	-0.212	10.1	-0.638	-8.6	0.562
3.6	1.8	-0.212	11.3	-0.765	-9.81	0.644
4.2	1.35	-0.212	12.3	-0.893	-10.8	0.71
4.8	0.9	-0.212	13	-1.02	-11.5	0.757
5.2	0.6	-0.212	13.3	-1.11	-11.8	0.776
5.2	0.6	0.163	13.3	-1.11	-11.8	0.776
5.4	0.45	0.163	13.4	-1.07	-11.9	0.782
5.76	0.183	0.163	13.5	-1.01	-12	0.786
6	0	0.163	13.5	-0.975	-12.1	0.784
6.6	-0.45	0.163	13.4	-0.877	-11.9	0.765
7.2	-0.9	0.163	13	-0.78	-11.5	0.728
7.8	-1.35	0.163	12.3	-0.683	-10.8	0.673
8.4	-1.8	0.163	11.3	-0.585	-9.81	0.604
9	-2.25	0.163	10.1	-0.487	-8.6	0.523
9.6	-2.7	0.163	8.64	-0.39	-7.17	0.431
10.2	-3.15	0.163	6.89	-0.292	-5.55	0.33
10.8	-3.6	0.163	4.86	-0.195	-3.79	0.224
11.4	-4.05	0.163	2.56	-0.0975	-1.92	0.113
12	-4.5	0.163	0	0	0	0

LOAD COMBINATION LC8: 0.9DL+1.3WL

Distance (ft)	Shear Y (kips)	Shear X (kips)	Moment X (ft-kips)	Moment Y (ft-kips)	Deflection Y (in)	Deflection X (in)
0	0	0	0	0	0	0
0.6	0	0	0	0	0	0
1.2	0	0	0	0	0	0
1.8	0	0	0	0	0	0
2.4	0	0	0	0	0	0
3	0	0	0	0	0	0
3.6	0	0	0	0	0	0
4.2	0	0	0	0	0	0
4.8	0	0	0	0	0	0
5.4	0	0	0	0	0	0
6	0	0	0	0	0	0
6.6	0	0	0	0	0	0
7.2	0	0	0	0	0	0
7.8	0	0	0	0	0	0
8.4	0	0	0	0	0	0
9	0	0	0	0	0	0
9.6	0	0	0	0	0	0
10.2	0	0	0	0	0	0
10.8	0	0	0	0	0	0
11.4	0	0	0	0	0	0
12	0	0	0	0	0	0

LOAD COMBINATION LC9: 0.9DL-1.3WL

Distance (ft)	Shear Y (kips)	Shear X (kips)	Moment X (ft-kips)	Moment Y (ft-kips)	Deflection Y (in)	Deflection X (in)
0	0	0	0	0	0	0
0.6	0	0	0	0	0	0
1.2	0	0	0	0	0	0
1.8	0	0	0	0	0	0
2.4	0	0	0	0	0	0
3	0	0	0	0	0	0
3.6	0	0	0	0	0	0
4.2	0	0	0	0	0	0
4.8	0	0	0	0	0	0
5.4	0	0	0	0	0	0
6	0	0	0	0	0	0
6.6	0	0	0	0	0	0
7.2	0	0	0	0	0	0
7.8	0	0	0	0	0	0
8.4	0	0	0	0	0	0
9	0	0	0	0	0	0
9.6	0	0	0	0	0	0

10.2	0	0	0	0	0	0
10.8	0	0	0	0	0	0
11.4	0	0	0	0	0	0
12	0	0	0	0	0	0

SELECTED LOAD COMBINATIONS

Load Combination	Code Check	Total	Live	Dependent	Conditional
LC1: 1.0DL+1.0LL+1.0WL+1.0SL	x	x		-	-
LC2: 1.4DL	x			-	-
LC3: 1.2DL+1.6LL+0.5SL	x			-	-
LC4: 1.2DL+1.6SL+0.5LL	x			-	-
LC5: 1.2DL+1.6SL+0.8WL	x			-	-
LC6: 1.2DL+1.3WL+0.5LL+0.5SL	x			-	-
LC7: 1.2DL+0.5LL+0.2SL	x			-	-
LC8: 0.9DL+1.3WL	x			-	-
LC9: 0.9DL-1.3WL	x			-	-

Design Procedure for TS8X8X.5

Designed according to AISC LRFD 2nd Edition (1994)

Critical load effect at distance 5.76 feet under load combination LC3: 1.2DL+1.6LL+0.5SL

INPUT**PROPERTIES:**

A (in ²)	14.4	b _f (in)	8	K _x	1	S _x (in ³)	32.9
I _x (in ⁴)	131	t _f (in)	0.5	K _y	1	S _y (in ³)	32.9
I _y (in ⁴)	131	d (in)	8	K _z	1	Z _x (in ³)	39.7
r _x (in)	3.03	t _w (in)	0.5	L _x (in)	144	Z _y (in ³)	39.7
r _y (in)	3.03	k (in)	1	L _y (in)	144		
J (in ⁴)	217	x ₀ (in)	0	L _z (in)	0		
C _w (in ⁶)	0	y ₀ (in)	0	C _b	1		
a	0	x _{bar} (in)	4	C _{mx}	1	Welded	No
b	0	y _{bar} (in)	4	C _{my}	1	F _y (ksi)	36

LOAD EFFECTS:

P _u (kips)	M _{ux} (ft-kips)	M _{uy} (ft-kips)	V _{ux} (kips)	V _{uy} (kips)
274	43.13	-3.247	0.52	0.5854

SOLUTION**1. CHECK SECTION COMPACTNESS**

Description	Formula	Value	Code
l _(flange)	b / t _f	12	LRFD Table B5.1
l _{p(flange)}	190 / F _y ^{0.5}	31.67	LRFD Table B5.1
l _{r(flange)}	238 / ((F _y - F _r) / k _c) ^{0.5}	39.67	LRFD Table B5.1
l _(web)	h / t _w	12	LRFD Table B5.1
l _{p(web)}	(for P _u / (F _b P _y) > 0.125) 191 (2.33 - P _u / (F _b P _y)) / F _y ^{0.5} >= 253 / F _y ^{0.5}	55.48	LRFD Table B5.1
l _{r(web)}	970 (1 - 0.74 P _u / (F _b P _y)) / F _y ^{0.5}	91.41	LRFD Table B5.1

Note:

- 1). F_r = 10 ksi
- 2). h = d - 2k = 6 in; b = b_f - 2k = 6 in
- 3). k_c = k_c = 4 / (h / t_w)^{0.5} and 0.35 <= k_c <= 0.736 (LRFD Table B5.1) = 0.736 in
- 4). P_y = A F_y = 518.4 kips

2. CHECK AXIAL STRENGTH

(a). Local Buckling

Description	Formula	Value	Code
KL / r	max(K _x L _x / r _x , K _y L _y / r _y)	47.52	
l _c	l _c = KL / (rp) (F _y / E) ^{0.5}	0.533	LRFD E2-4
Q _s	Q _s = 1.0	1	Not Applicable
Q _a	(for both flange and web) b / t < 238 / f ^{0.5} Q _a = 1.0	1	
Q	Q _s Q _a	1	LRFD A-B5-17
F _{cr} (ksi)	(for l _c Q ^{0.5} <= 1.5) F _{cr} = Q (0.658) ^(Ql^{cl c}) F _y	31.96	LRFD A-B5-15

(b). Flexural-Torsional Buckling

Description	Formula	Value	Code
F _e	F _e = (p ² EC _w / (K _z L _z) ² + GJ) / (I _x + I _y)	9276	LRFD A-E3-5
l _e	l _e = (F _y / F _e) ^{0.5}	0.0623	LRFD A-E3-4
Q	Q _s Q _a	1	LRFD A-B5-17
F _{cr} (ksi)	(for l _e Q ^{0.5} <= 1.5) F _{cr} = Q (0.658) ^(Ql^{cl e}) F _y	35.94	LRFD A-E3-2

Axial Capacity: P_n = F_{cr} A = 460.3 kips**3. CHECK FLEXURAL STRENGTH**

(a). Yielding - strong and weak axis

Description	Formula	Value	Code
M _{px} (ft-kips)	M _{px} = F _y Z _x <= 1.5 F _y S _x	119.1	LRFD F1-1
M _{py} (ft-kips)	M _{py} = F _y Z _y <= 1.5 F _y S _y	119.1	LRFD F1-1

(c). Flange-Local-Buckling (FLB) - About Strong Axis

Description	Formula	Value	Code
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M_r (ft-kips)	$M_r = F_r S_{x(\text{eff})}$	71.28	LRFD Table A-F1.1
M_{nx} (ft-kips)	(for $l < l_p$) $M_n = M_p$	119.1	LRFD Table A-F1.1

Note:

- $l = l_{(\text{flange})}$, $l_p = l_{p(\text{flange})}$, $l_r = l_{r(\text{flange})}$
- $M_p = M_{px}$

(d). Web-Local-Buckling (WLB) - About Strong Axis

Description	Formula	Value	Code
M_r (ft-kips)	$M_r = F_y S_x$	98.7	LRFD Table A-F1.1
M_{nx} (ft-kips)	(for $l < l_p$) $M_n = M_p$	119.1	LRFD Table A-F1.1

Note:

- $l = l_{(\text{web})}$, $l_p = l_{p(\text{web})}$, $l_r = l_{r(\text{web})}$
- $M_p = M_{px}$ Flexural Capacity - Strong Axis: $M_{nx} = 119.1$ ft-kips
Flexural Capacity - Weak Axis: $M_{ny} = 119.1$ ft-kips

4. CHECK AXIAL AND FLEXURAL INTERACTION

Description	Formula	Value	Code
P_{e1x} (kips)	$P_{e1x} = EI_x p^2 / (K_x L_x)^2$	1808	LRFD C1
B_{1x}	$B_{1x} = C_{mx} / (1 - P_u / P_{e1x}) \geq 1.0$	1.179	LRFD C1-2
M_{ux} (ft-kips)	$B_{1x} M_{ux}$	50.83	LRFD C1-1
P_{e1y} (kips)	$P_{e1y} = EI_y p^2 / (K_y L_y)^2$	1808	LRFD C1
B_{1y}	$B_{1y} = C_{my} / (1 - P_u / P_{e1y}) \geq 1.0$	1.179	LRFD C1-2
M_{uy} (ft-kips)	$B_{1y} M_{uy}$	3.827	LRFD C1-1

Note:

- Moment magnification factor B_1 is conservatively applied to overall moment
- Moment magnification factor B_2 is assumed to have been taken care of by P-Delta Analysis

Axial and Flexural Interaction: $F = 0.85$; $F_b = 0.90$ for $P_u / (F P_n) \geq 0.20$ $P_u / (F P_n) + 8 / 9 (M_{ux} / (F_b M_{nx}) + M_{uy} / (F_b M_{ny})) = 1.154$ (LRFD H1-1a)**AXIAL-FLEXURAL INTERACTION STATUS: NG****5. CHECK SHEAR STRENGTH**

Description	Formula	Value	Code
V_{ny} (kips)	(for $h / t_w \leq 418 / F_y^{0.5}$) $V_n = 0.6 F_y A_w$	172.8	LRFD F2-1
V_{nx} (kips)	(for $h / t_w \leq 418 / F_y^{0.5}$) $V_n = 0.6 F_y A_w$	172.8	LRFD F2-1

 $F_v = 0.90$ $V_{uy} / (F_v V_{ny}) = 0.003764$ **SHEAR-Y STATUS: OK** $V_{ux} / (F_v V_{nx}) = 0.003344$ **SHEAR-X STATUS: OK****5. CHECK TOTAL LOAD DEFLECTIONS (Load Combination: D_x - LC1: 1.0DL+1.0LL+1.0WL+1.0SL, D_y - LC1: 1.0DL+1.0LL+1.0WL+1.0SL)**

Description	Formula	Value	Code
Allowable D_x	$L/240$	0.60	Not Applicable
Allowable D_y	$L/240$	0.60	Not Applicable

Note:

 $D_{x(\text{Act})} / D_{x(\text{All})} = 0.01 / 0.60 = 0.02$ **TOTAL LOAD DEFLECTION-X STATUS: OK** $D_{y(\text{Act})} / D_{y(\text{All})} = 0.18 / 0.60 = 0.31$ **TOTAL LOAD DEFLECTION-Y STATUS: OK****6. CHECK LIVE LOAD DEFLECTIONS (Load Combination: D_x - Not Applicable, D_y - Not Applicable)**

Description	Formula	Value	Code
Allowable D_x	$L/360$	0.40	Not Applicable
Allowable D_y	$L/360$	0.40	Not Applicable

Note:

 $D_{x(\text{Act})} / D_{x(\text{All})} = 0.00 / 0.40 = 0.00$ **LIVE LOAD DEFLECTION-X STATUS: OK** $D_{y(\text{Act})} / D_{y(\text{All})} = 0.00 / 0.40 = 0.00$ **LIVE LOAD DEFLECTION-Y STATUS: OK**