

Steel Design Report

Element: **Untitled1 (C:\DCC\steel)**
 Description:
 Date: **10/31/2002 03:26 PM**

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

GENERAL INFORMATION

Description	Value
Design Criteria	Design
Design Code	AISC ASD (1990)
Total Span Length	24.00 Ft
First Node Support	Pinned
Last Node Support	Pinned
Total Load Deflection	L/240.00
Live Load Deflection	L/360.00
Maximum Stress Ratio	1.000
Bending Coefficient	1.0
Steel Yield Stress	36 K/In ²
Section Shape	W
Maximum Section Depth	36.00 In
Minimum Section Depth	12.00 In
Number of Solutions	10
Live Load Patterning	Yes

SPAN LENGTH DATA (Unit: Ft)

Span 1	12.00	Span 2	12.00	-	-	-	-
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LOAD INFORMATION

LOADS

Ref. No.	Load Case	Load Type	Dir	Begin Value	Begin Position	End Value	End Position
1	Dead	Linear	Y	-1.000 (K/Ft)	0.00 (Ft)	-1.000 (K/Ft)	24.000 (Ft)
2	Live	Concen	Y	-4.000 (K)	6.00 (Ft)	-	-

LOAD COMBINATIONS

LC1: DL Only
 LC2: DL + LL on Odd Spans
 LC3: DL + LL on Even Spans
 LC4: DL + LL on Spans-1

ELEMENT REPORTS

Note: Deflections are calculated based on $E*I = 1e+3 \text{ In}^2$

SPAN 1

Load Comb	Node No.	Inflection Points (Ft)	Axial (K)	Shear (K)	Moment (K-Ft)	Max Moment (K-Ft)	Distance (Ft)	Max Deflection (In)	Distance (Ft)
1	1	0.000	0.000	4.500	0.000	10.125	4.500	-194.069	5.058
	2	9.000	0.000	-7.500	-18.000				
2	1	0.000	0.000	6.125	0.000	18.750	6.000	-371.321	5.397
	2	9.372	0.000	-9.875	-22.500				
3	1	0.000	0.000	4.500	0.000	10.125	4.500	-194.069	5.058
	2	9.000	0.000	-7.500	-18.000				
4	1	0.000	0.000	6.125	0.000	18.750	6.000	-371.321	5.397
	2	9.372	0.000	-9.875	-22.500				

SPAN 2

Load Comb	Node No.	Inflection Points (Ft)	Axial (K)	Shear (K)	Moment (K-Ft)	Max Moment (K-Ft)	Distance (Ft)	Max Deflection	Distance (Ft)
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						(Ft)		(In)	
1	2	3.000	0.000	7.500	-18.000	10.125	7.500	-194.069	6.942
	3	12.000	0.000	-4.500	0.000				
2	2	3.750	0.000	7.875	-22.500	8.508	7.875	-131.238	7.450
	3	12.000	0.000	-4.125	-0.000				
3	2	3.000	0.000	7.500	-18.000	10.125	7.500	-194.069	6.942
	3	12.000	0.000	-4.500	0.000				
4	2	3.750	0.000	7.875	-22.500	8.508	7.875	-131.238	7.450
	3	12.000	0.000	-4.125	-0.000				

REACTIONS

Node No.	Load Comb	PX (K)	PY (K)	Moment (K-Ft)
1	LC1: DL Only	0.000	4.500	0.000
"	LC2: DL + LL on Odd Spans	0.000	6.125	0.000
"	LC3: DL + LL on Even Spans	0.000	4.500	0.000
"	LC4: DL + LL on Spans-1	0.000	6.125	0.000
2	LC1: DL Only	0.000	15.000	0.000
"	LC2: DL + LL on Odd Spans	0.000	17.750	0.000
"	LC3: DL + LL on Even Spans	0.000	15.000	0.000
"	LC4: DL + LL on Spans-1	0.000	17.750	0.000
3	LC1: DL Only	0.000	4.500	0.000
"	LC2: DL + LL on Odd Spans	0.000	4.125	-0.000
"	LC3: DL + LL on Even Spans	0.000	4.500	0.000
"	LC4: DL + LL on Spans-1	0.000	4.125	-0.000

CRITICAL STRESS DETAILS

Section Name: W12x14 Status: OK

SPAN 1

	Unit	Actual	Allowable	Ratio	Load Combination
Bending-X	K/In ²	-18.121	23.760	0.763	LC2: DL + LL on Odd Spans
Shear-Y	K/In ²	-4.146	14.400	0.288	LC2: DL + LL on Odd Spans
Total Deflection-Y	In	-0.145	0.600	0.241	LC2: DL + LL on Odd Spans
Live Deflection-Y	In	-0.069	0.400	0.173	LC2: DL + LL on Odd Spans

SPAN 2

	Unit	Actual	Allowable	Ratio	Load Combination
Bending-X	K/In ²	-18.121	21.600	0.839	LC2: DL + LL on Odd Spans
Shear-Y	K/In ²	3.306	14.400	0.230	LC2: DL + LL on Odd Spans
Total Deflection-Y	In	-0.076	0.600	0.126	LC1: DL Only
Live Deflection-Y	In	0.024	0.400	0.059	LC2: DL + LL on Odd Spans

Section Name: W14x22 Status: OK

SPAN 1

	Unit	Actual	Allowable	Ratio	Load Combination
Bending-X	K/In ²	-9.310	23.760	0.392	LC2: DL + LL on Odd Spans
Shear-Y	K/In ²	-3.125	14.400	0.217	LC2: DL + LL on Odd Spans
Total Deflection-Y	In	-0.064	0.600	0.107	LC2: DL + LL on Odd Spans
Live Deflection-Y	In	-0.031	0.400	0.077	LC2: DL + LL on Odd Spans

SPAN 2

	Unit	Actual	Allowable	Ratio	Load Combination
Bending-X	K/In ²	-9.310	23.760	0.392	LC2: DL + LL on Odd Spans
Shear-Y	K/In ²	2.492	14.400	0.173	LC2: DL + LL on Odd Spans
Total Deflection-Y	In	-0.034	0.600	0.056	LC1: DL Only
Live Deflection-Y	In	0.010	0.400	0.026	LC2: DL + LL on Odd Spans

Section Name: W16x26 Status: OK

SPAN 1

	Unit	Actual	Allowable	Ratio	Load Combination
Bending-X	K/In ²	-7.031	23.760	0.296	LC2: DL + LL on Odd Spans
Shear-Y	K/In ²	-2.518	14.400	0.175	LC2: DL + LL on Odd Spans
Total Deflection-Y	In	-0.043	0.600	0.071	LC2: DL + LL on Odd Spans
Live Deflection-Y	In	-0.020	0.400	0.051	LC2: DL + LL on Odd Spans

SPAN 2

	Unit	Actual	Allowable	Ratio	Load Combination
Bending-X	K/In ²	-7.031	23.760	0.296	LC2: DL + LL on Odd Spans
Shear-Y	K/In ²	2.008	14.400	0.139	LC2: DL + LL on Odd Spans
Total Deflection-Y	In	-0.022	0.600	0.037	LC1: DL Only
Live Deflection-Y	In	0.007	0.400	0.017	LC2: DL + LL on Odd Spans

Section Name: W18x35 Status: OK

SPAN 1

	Unit	Actual	Allowable	Ratio	Load Combination
Bending-X	K/In ²	-4.688	23.760	0.197	LC2: DL + LL on Odd Spans
Shear-Y	K/In ²	-1.860	14.400	0.129	LC2: DL + LL on Odd Spans
Total Deflection-Y	In	-0.025	0.600	0.042	LC2: DL + LL on Odd Spans
Live Deflection-Y	In	-0.012	0.400	0.030	LC2: DL + LL on Odd Spans

SPAN 2

	Unit	Actual	Allowable	Ratio	Load Combination
Bending-X	K/In ²	-4.688	23.760	0.197	LC2: DL + LL on Odd Spans
Shear-Y	K/In ²	1.483	14.400	0.103	LC2: DL + LL on Odd Spans
Total Deflection-Y	In	-0.013	0.600	0.022	LC1: DL Only
Live Deflection-Y	In	0.004	0.400	0.010	LC2: DL + LL on Odd Spans

Section Name: W21x44 Status: OK

SPAN 1

	Unit	Actual	Allowable	Ratio	Load Combination
Bending-X	K/In ²	-3.309	23.760	0.139	LC2: DL + LL on Odd Spans
Shear-Y	K/In ²	-1.366	14.400	0.095	LC2: DL + LL on Odd Spans
Total Deflection-Y	In	-0.015	0.600	0.025	LC2: DL + LL on Odd Spans
Live Deflection-Y	In	-0.007	0.400	0.018	LC2: DL + LL on Odd Spans

SPAN 2

	Unit	Actual	Allowable	Ratio	Load Combination
Bending-X	K/In ²	-3.309	23.760	0.139	LC2: DL + LL on Odd Spans
Shear-Y	K/In ²	1.089	14.400	0.076	LC2: DL + LL on Odd Spans
Total Deflection-Y	In	-0.008	0.600	0.013	LC1: DL Only
Live Deflection-Y	In	0.002	0.400	0.006	LC2: DL + LL on Odd Spans

Section Name: W24x55 Status: OK

SPAN 1

	Unit	Actual	Allowable	Ratio	Load Combination
Bending-X	K/In ²	-2.368	23.760	0.100	LC2: DL + LL on Odd Spans
Shear-Y	K/In ²	-1.061	14.400	0.074	LC2: DL + LL on Odd Spans
Total Deflection-Y	In	-0.009	0.600	0.016	LC2: DL + LL on Odd Spans
Live Deflection-Y	In	-0.005	0.400	0.011	LC2: DL + LL on Odd Spans

SPAN 2

	Unit	Actual	Allowable	Ratio	Load Combination
Bending-X	K/In ²	-2.368	23.760	0.100	LC2: DL + LL on Odd Spans
Shear-Y	K/In ²	0.846	14.400	0.059	LC2: DL + LL on Odd Spans
Total Deflection-Y	In	-0.005	0.600	0.008	LC1: DL Only
Live Deflection-Y	In	0.002	0.400	0.004	LC2: DL + LL on Odd Spans

Section Name: W27x84 Status: OK

SPAN 1

	Unit	Actual	Allowable	Ratio	Load Combination
Bending-X	K/In ²	-1.268	23.760	0.053	LC2: DL + LL on Odd Spans
Shear-Y	K/In ²	-0.804	14.400	0.056	LC2: DL + LL on Odd Spans
Total Deflection-Y	In	-0.004	0.600	0.007	LC2: DL + LL on Odd Spans
Live Deflection-Y	In	-0.002	0.400	0.005	LC2: DL + LL on Odd Spans

SPAN 2

	Unit	Actual	Allowable	Ratio	Load Combination
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Bending-X	K/In ²	-1.268	23.760	0.053	LC2: DL + LL on Odd Spans
Shear-Y	K/In ²	0.641	14.400	0.045	LC2: DL + LL on Odd Spans
Total Deflection-Y	In	-0.002	0.600	0.004	LC1: DL Only
Live Deflection-Y	In	0.001	0.400	0.002	LC2: DL + LL on Odd Spans

Section Name: W30x90 Status: OK

SPAN 1

	Unit	Actual	Allowable	Ratio	Load Combination
Bending-X	K/In ²	-1.102	23.760	0.046	LC2: DL + LL on Odd Spans
Shear-Y	K/In ²	-0.712	14.400	0.049	LC2: DL + LL on Odd Spans
Total Deflection-Y	In	-0.004	0.600	0.006	LC2: DL + LL on Odd Spans
Live Deflection-Y	In	-0.002	0.400	0.004	LC2: DL + LL on Odd Spans

SPAN 2

	Unit	Actual	Allowable	Ratio	Load Combination
Bending-X	K/In ²	-1.102	23.760	0.046	LC2: DL + LL on Odd Spans
Shear-Y	K/In ²	0.567	14.400	0.039	LC2: DL + LL on Odd Spans
Total Deflection-Y	In	-0.002	0.600	0.003	LC1: DL Only
Live Deflection-Y	In	0.001	0.400	0.001	LC2: DL + LL on Odd Spans

Section Name: W33x118 Status: OK

SPAN 1

	Unit	Actual	Allowable	Ratio	Load Combination
Bending-X	K/In ²	-0.752	23.760	0.032	LC2: DL + LL on Odd Spans
Shear-Y	K/In ²	-0.546	14.400	0.038	LC2: DL + LL on Odd Spans
Total Deflection-Y	In	-0.002	0.600	0.004	LC2: DL + LL on Odd Spans
Live Deflection-Y	In	-0.001	0.400	0.003	LC2: DL + LL on Odd Spans

SPAN 2

	Unit	Actual	Allowable	Ratio	Load Combination
Bending-X	K/In ²	-0.752	23.760	0.032	LC2: DL + LL on Odd Spans
Shear-Y	K/In ²	0.436	14.400	0.030	LC2: DL + LL on Odd Spans
Total Deflection-Y	In	-0.001	0.600	0.002	LC1: DL Only
Live Deflection-Y	In	0.000	0.400	0.001	LC2: DL + LL on Odd Spans

Section Name: W36x135 Status: OK

SPAN 1

	Unit	Actual	Allowable	Ratio	Load Combination
Bending-X	K/In ²	-0.615	23.760	0.026	LC2: DL + LL on Odd Spans
Shear-Y	K/In ²	-0.463	14.400	0.032	LC2: DL + LL on Odd Spans
Total Deflection-Y	In	-0.002	0.600	0.003	LC2: DL + LL on Odd Spans
Live Deflection-Y	In	-0.001	0.400	0.002	LC2: DL + LL on Odd Spans

SPAN 2

	Unit	Actual	Allowable	Ratio	Load Combination
Bending-X	K/In ²	-0.615	23.760	0.026	LC2: DL + LL on Odd Spans
Shear-Y	K/In ²	0.369	14.400	0.026	LC2: DL + LL on Odd Spans
Total Deflection-Y	In	-0.001	0.600	0.001	LC1: DL Only
Live Deflection-Y	In	0.000	0.400	0.001	LC2: DL + LL on Odd Spans