

**Structural Analysis Report**

Whisper 500  
30-ft Guyed Wind Turbine  
TEP # 061289  
November 6, 2006  
Page 1 of 7

**STRUCTURAL ANALYSIS REPORT**

**WHISPER 500  
30-ft GUYED WIND TURBINE**

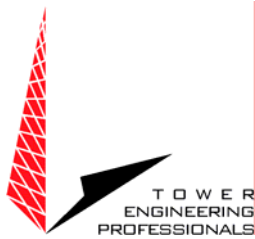
**TEP # 061289**

**Revision 0  
November 6, 2006**



**Prepared For:**





## **1.0 ASSIGNMENT**

**Subject** – Structural analysis of the 30-ft guyed wind turbine

**Purpose** – The objective of the analysis was to determine if the guyed wind turbine would meet the ASCE 7-05, Minimum Design Loads for Buildings and Other Structures and the 2003 International Building Code for four different load cases.

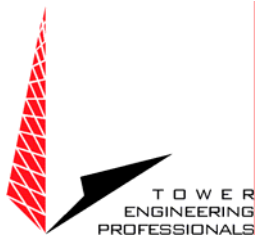
## **2.0 SCOPE OF SERVICES**

- 1) Conduct a structural analysis of the wind turbine support structure
- 2) Prepare a report of findings and conclusions

## **3.0 PARTICIPATING PERSONNEL**

Carrier Representative: Mr. Jay Yeager  
Southwest Windpower (SW)  
1801 W. Route 66  
Flagstaff, AZ 86001  
(928) 779-9463

Consulting Engineers: Mr. Michael L. Gardner, P.E.  
Mr. Ronnie E. Glover, EI  
Tower Engineering Professionals, Inc. (TEP)  
3703 Junction Boulevard  
Raleigh, NC 27603-5263  
(919) 661-6351



#### **4.0 BACKGROUND INFORMATION**

SW requested that TEP conduct a structural analysis of the guyed support structure. The analysis was to determine if the support structure would meet the ASCE 7-05. The structure is a 30-ft guyed, 5 Sch40-Grade 50 steel pipe with a Whisper 500 wind turbine installed.

TEP utilized the following information to complete the analysis:

- 1) Tower land kit installation manual by Southwest Windpower dated March 10, 2005, Document # 0030 REV C, provided by SW
- 2) Previous structural analysis by Southwest Windpower dated July 7, 2003, Document # 0191, provided by SW
- 3) Correspondence with SW with respect to the tower configuration

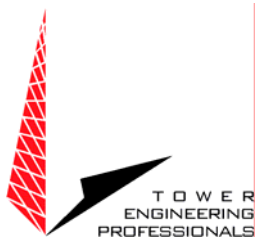
#### **5.0 INVESTIGATION**

**Analyzed Appurtenance** – See the appendix for a schedule including the wind turbine model considered in the analysis.

**Codes and Standards** – The structural analysis was performed in accordance with the ASCE/SEI 7-05, Minimum Design Loads for Buildings and Other Structures and the 2003 International Building Code.

**Basic Load Combinations** – Nine load combinations per ASCE 7-05 were considered for each of the four load cases as follows:

- |                       |                       |
|-----------------------|-----------------------|
| 1) $1.4D$             | D = dead load         |
| 2) $1.2D + 0.8W$      | W = wind load         |
| 3) $1.2D + 1.6W$      | E = earthquake load   |
| 4) $1.2D + 1.0E$      | $D_i$ = weight of ice |
| 5) $0.9D + 1.6W$      | $W_i$ = wind-on-ice   |
| 6) $0.9D + 1.0E$      |                       |
| 7) $1.2D + 0.2D_i$    |                       |
| 8) $1.2D + D_i + W_i$ |                       |
| 9) $0.9D + D_i + W_i$ |                       |



## **5.0 INVESTIGATION – continued**

**Load Cases** – Four load cases were considered in accordance with the above load combinations:

### **Load Case I – High wind, no ice, low seismic region**

1) A 150-mph 3-second gust wind was applied for stress analysis.

### **Load Case II – Moderate wind, heavy ice, low seismic region**

2) A 90-mph 3-second gust wind was applied for stress analysis.

3) A 40-mph 3-second gust wind was applied with 3/4” radial ice for stress analysis.

### **Load Case III – High wind, moderate ice, high seismic region**

4) A 130-mph 3-second gust wind was applied for stress analysis.

5) A 30-mph 3-second gust wind was applied with 1/4” radial ice for stress analysis.

### **Load Case IV – Low wind, no ice, high seismic region**

6) An 85-mph 3-second gust wind was applied for stress analysis.

### **Provisions of This Analysis**

- 1) The tower and foundation were constructed according to manufacturer’s requirements.
- 2) The tower has been maintained according to the manufacturer’s specifications.
- 3) The structural integrity of the tower and tower components has not been compromised.
- 4) The information provided by SW was assumed accurate and complete.
- 5) This analysis report is not a construction document.
- 6) In determination of the design loads, TEP assumed the following:
  - a) Importance Factor = 1.00
  - b) Exposure Category C
  - c) Site Class D assumed for all seismic conditionsThese assumptions may change depending on site specific data. See Recommendations.
- 7) The mechanical specifications for the Whisper 500 wind turbine at the top of the tower are as follows:
  - a) Rotor Diameter = 15 ft
  - b) Swept Area = 176.7 ft<sup>2</sup>
  - c) Turbine Weight = 155 lb
  - d) Turbine Thrust = 800 lb



**6.0 RESULTS** – It is the opinion of Tower Engineering Professionals, Inc. that:

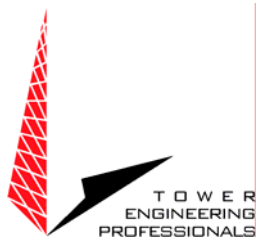
**Load Cases I – IV**

- 1) The superstructure will meet the ASCE 7-05 and 2003 IBC standards for structural capacity.

**7.0 RECOMMENDATIONS** – TEP recommends the following:

**Load Cases I – IV**

- 1) If the load differs from that described in the appendix of this report, or the assumptions listed in the provisions of this analysis are found to be invalid, another structural analysis should be performed.
- 2) This analysis report includes four load cases indicative to typical site design parameters. This analysis report is not a construction document. TEP shall reanalyze and issue a sealed report in the state specific to the wind turbine location.



**8.0 APPENDIX**

Height (ft)	Location	Mount	Description / Model
30	Top of Pipe Support	(1) Tower Insert Mount Bracket	Wind Turbine Whisper 500
9 – 30	–	–	(1) 21-ft 5 Sch40 ASTM A572 Gr. 50 Steel Pipe
0 – 9	–	–	(1) 9-ft 5 Sch40 ASTM A572 Gr. 50 Steel Pipe

**Superstructure Results:**

Item	Height (ft)	Result	Percent Capacity Used	Notes
<b>Deflection</b>	30	0.34-ft	-	
<b>Twist</b>	30	1.93°	-	
<b>Mast Pipe</b>	0 – 30	O. K.	39.9 %	
<b>Guy Wires</b>	0 – 30	O. K.	78.8 %	
<b>Pivot Bolt</b>	0	O. K.	14.6 %	Assumed A325 Type N 7/8" Φ

**Guy Wire Configuration:**

Guy Wires			Anchor Radius (ft)	IT @ 60°-F (kip) <sup>1</sup>	Allowable Tension (kip)	Maximum Tension (kip)
Elevation (ft)	Type	Diameter (in)				
23	7x19 Strand	5/16	15	0.56	5.88	4.63

<sup>1</sup> – Initial tension assumed to be 5% of breaking strength

**Substructure Results:**

Item	Analysis Reactions (Kip)	Notes
<b>Mast horizontal</b>	0.2	
<b>Mast vertical</b>	5.6	
<b>Anchor shear</b>	2.5	
<b>Anchor vertical</b>	3.9	
<b>Anchor rod</b>	4.6	
<b>Anchor angle</b>	56.8°	

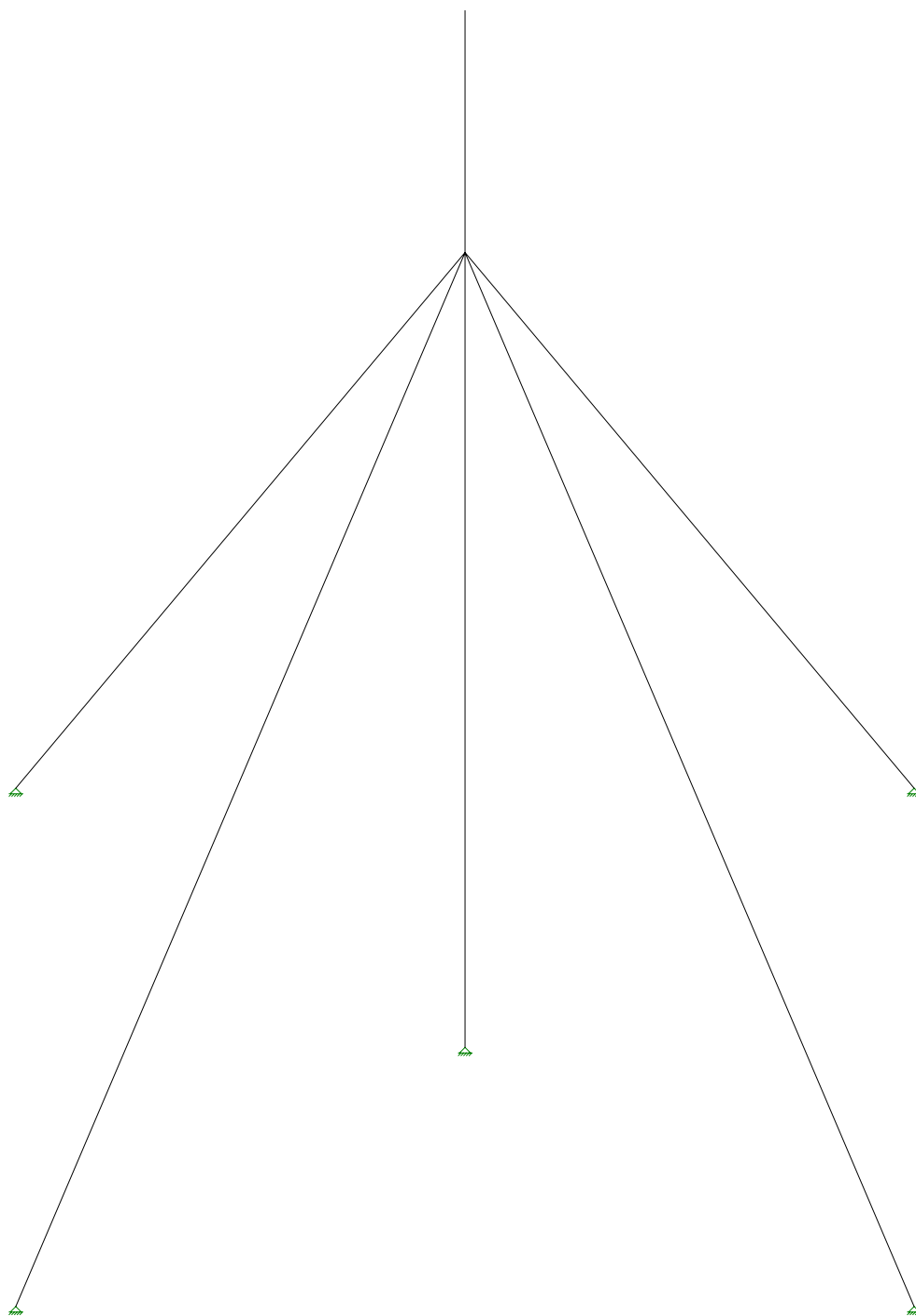


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### 9.0 ATTACHMENTS

- 1) Program Output



Solution: Envelope

Tower Engineering Profes...

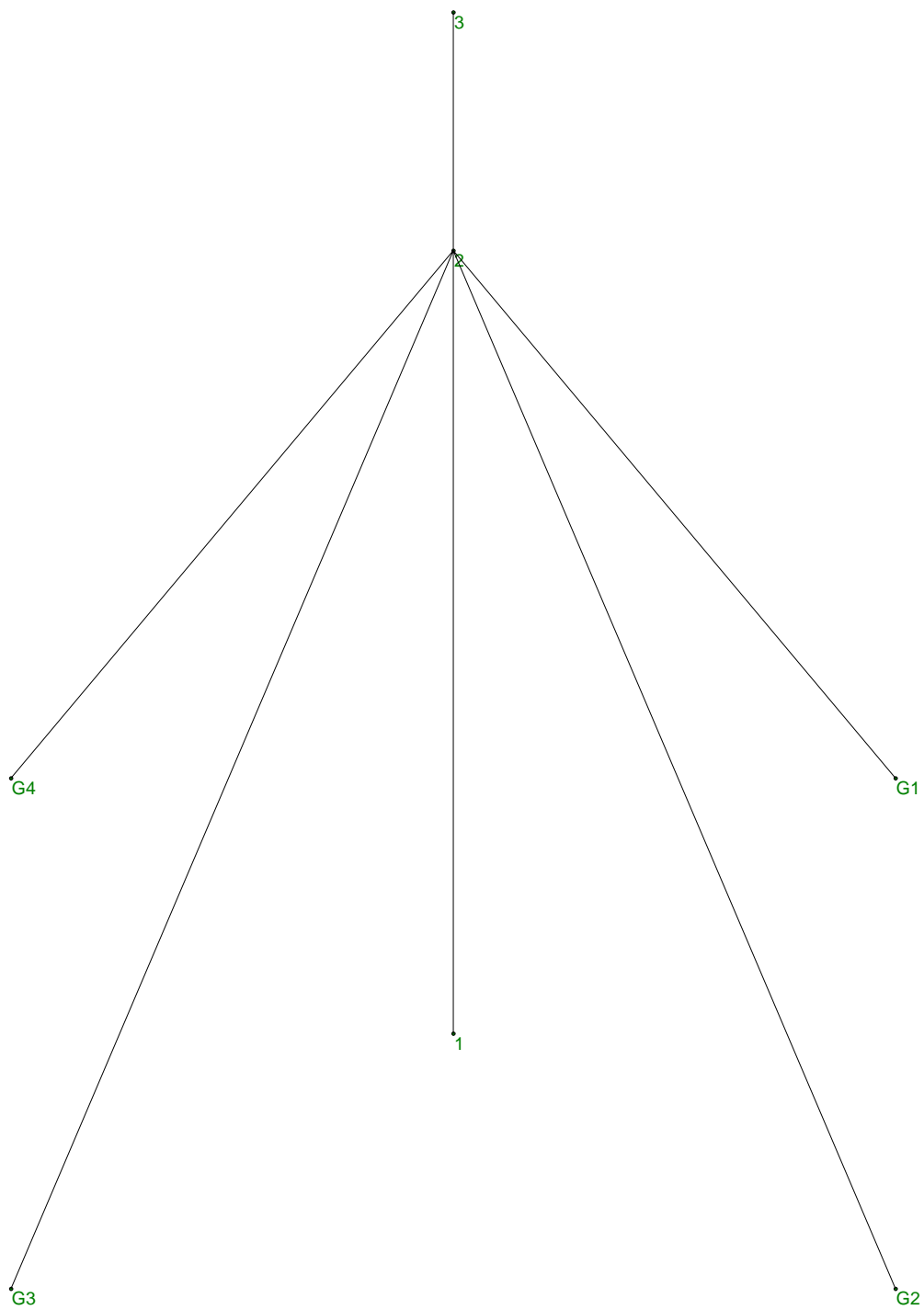
Whisper 500 30-ft

REG

Nov 2, 2006 at 5:38 PM

061289

30-ft - 500 LC #1.r3d



Solution: Envelope

Tower Engineering Profes...

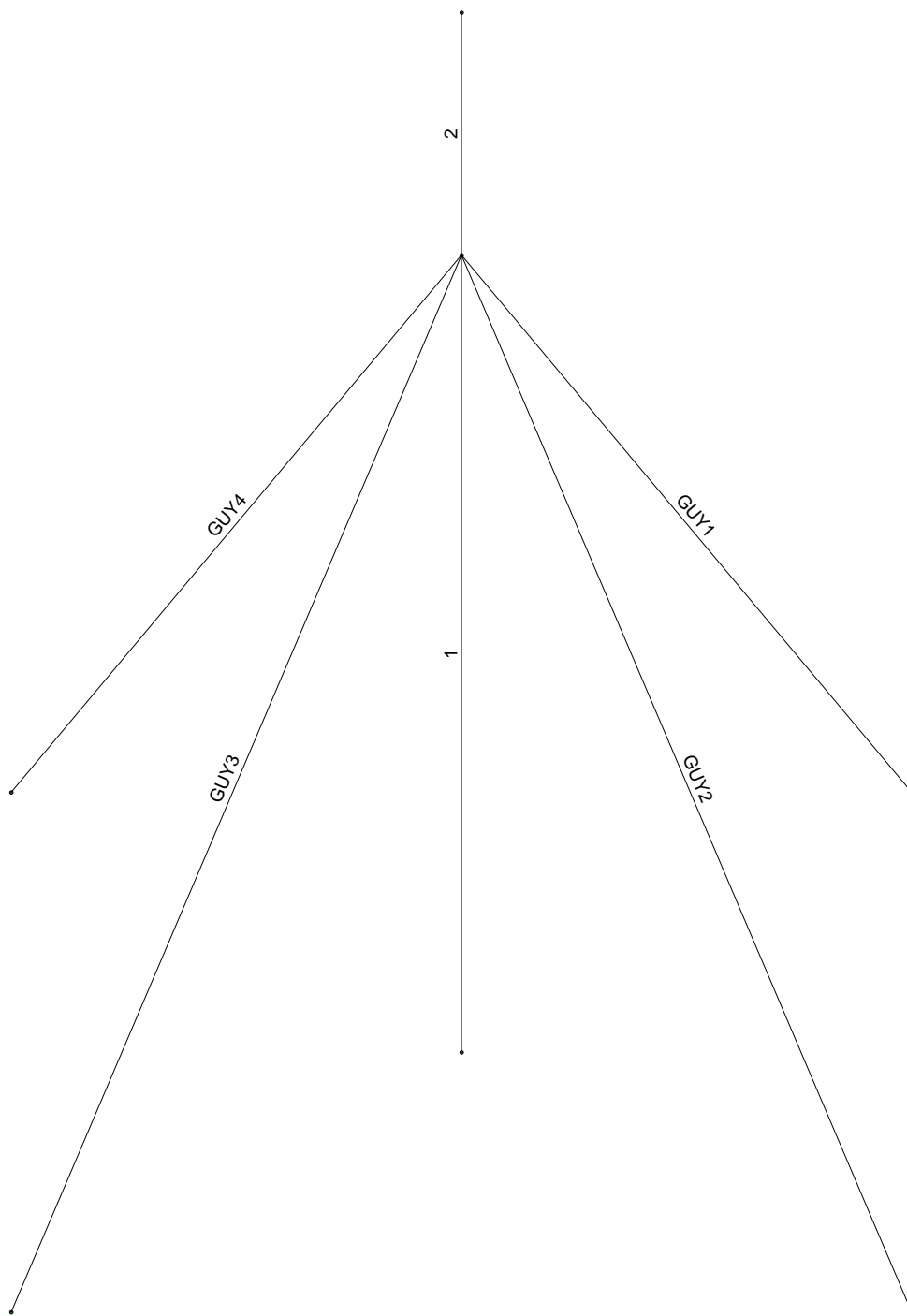
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30-ft - 500 LC #1.r3d



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Whisper 500 30-ft

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30-ft - 500 LC #1.r3d

### Basic Load Cases

	BLC Description	Category	X Gr...	Y Grav...	Z Grav...	Joint	Point	Distributed	Area (... Surfac...
1	Dead	DL		-1		3		4	
2	Wind	WL				3		2	
3	Earthquake	EL				3			
4	Ice Weight	DL				3		2	
5	Wind on Iced Members	WL				3		2	

### Load Combinations

	Description	Solve	PDelta	SRSS	BLC Factor	BLC Factor	BLC Factor	BLC Factor	BLC Factor	BLC Factor	BLC Factor	BLC Factor
1	Comb 1	Yes	Y		1	1.4						
2	Comb 2	Yes	Y		1	1.2	2	.8				
3	Comb 3	Yes	Y		1	1.2	2	1.6				
4	Comb 4	Yes	Y		1	1.2	3	1				
5	Comb 5	Yes	Y		1	.9	2	1.6				
6	Comb 6	Yes	Y		1	.9	3	1				
7	Comb 7	Yes	Y		1	1.2	4	.2				
8	Comb 8	Yes	Y		1	1.2	4	1	5	1		
9	Comb 9	Yes	Y		1	.9	4	1	5	1		

### General Material Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (\1E5 F)	Density[k/ft^3]
1	gen Conc3NW	3155	1372	.15	.6	.145
2	gen Conc4NW	3644	1584	.15	.6	.145
3	gen Conc3LW	2085	906	.15	.6	.11
4	gen Conc4LW	2408	1047	.15	.6	.11
5	gen Alum	10600	4077	.3	1.29	.173
6	gen Steel	29000	11154	.3	.65	.49
7	RIGID	1e+7		0	0	0
8	Guy E=26800	26800	11154	.3	1.17	0

### Joint Coordinates and Temperatures

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Diap...
1	1	0	0	0	0	
2	2	0	23	0	0	
3	3	0	30	0	0	
4	G1	0	0	-15	0	
5	G2	15	0	0	0	
6	G3	0	0	15	0	
7	G4	-15	0	0	0	

### Joint Boundary Conditions

	Joint Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot.[k-ft/rad]	Y Rot.[k-ft/rad]	Z Rot.[k-ft/rad]	Footing
1	G1	Reaction	Reaction	Reaction				
2	G2	Reaction	Reaction	Reaction				
3	G3	Reaction	Reaction	Reaction				
4	G4	Reaction	Reaction	Reaction				
5	1	Reaction	Reaction	Reaction				

**Member Primary Data**

	Label	I Joint	J Joint	K Joint	Rotate(...)	Section/Shape	Type	Design List	Material	Design Rules
1	1	1	2			PIPE 5.0	Column	Pipe	A572 Gr.50	Typical
2	2	2	3			PIPE 5.0	Column	Pipe	A572 Gr.50	Typical
3	GUY1	G1	2			5/16" EHS	None	None	Guy E=26800	Typical
4	GUY2	G2	2			5/16" EHS	None	None	Guy E=26800	Typical
5	GUY3	G3	2			5/16" EHS	None	None	Guy E=26800	Typical
6	GUY4	G4	2			5/16" EHS	None	None	Guy E=26800	Typical

**Member Advanced Data**

	Label	I Release	J Release	I Offset[in]	J Offset[in]	T/C Only	Physical	TOM	Inactive
1	1						Yes		
2	2						Yes		
3	GUY1					Tension Only	Yes		
4	GUY2					Tension Only	Yes		
5	GUY3					Tension Only	Yes		
6	GUY4					Tension Only	Yes		

**Joint Loads and Enforced Displacements (BLC 1 : Dead)**

	Joint Label	L,D,M	Direction	Magnitude[k,k-ft in,rad k*s^2/ft]
1	3	L	Y	-.155
2	2	L	Y	-.0056
3	2	L	Y	-.0056

**Joint Loads and Enforced Displacements (BLC 2 : Wind)**

	Joint Label	L,D,M	Direction	Magnitude[k,k-ft in,rad k*s^2/ft]
1	3	L	X	.8
2	2	L	X	.0185
3	2	L	X	.0185

**Joint Loads and Enforced Displacements (BLC 3 : Earthquake)**

	Joint Label	L,D,M	Direction	Magnitude[k,k-ft in,rad k*s^2/ft]
1	1	L	X	.004
2	2	L	X	.006
3	3	L	X	.001

**Joint Loads and Enforced Displacements (BLC 4 : Ice Weight)**

	Joint Label	L,D,M	Direction	Magnitude[k,k-ft in,rad k*s^2/ft]
1	3	L	Y	0
2	2	L	Y	0
3	2	L	Y	0

**Joint Loads and Enforced Displacements (BLC 5 : Wind on Iced Members)**

	Joint Label	L,D,M	Direction	Magnitude[k,k-ft in,rad k*s^2/ft]
1	3	L	X	0
2	2	L	X	0
3	2	L	X	0

**Member Distributed Loads (BLC 1 : Dead)**

	Member Label	Direction	Start Magnitude[k/ft,deg]	End Magnitud...	Start Location[...]	End Location[ft,%]
1	GUY1	T	-30.27	-30.27	0	0
2	GUY2	T	-30.27	-30.27	0	0

**Member Distributed Loads (BLC 1 : Dead) (Continued)**

	Member Label	Direction	Start Magnitude[k/ft,deg]	End Magnitud...	Start Location[...	End Location[ft, %]
3	GUY3	T	-30.27	-30.27	0	0
4	GUY4	T	-30.27	-30.27	0	0

**Member Distributed Loads (BLC 2 : Wind)**

	Member Label	Direction	Start Magnitude[k/ft,deg]	End Magnitud...	Start Location[...	End Location[ft, %]
1	1	X	.0254	.0254	0	0
2	2	X	.0254	.0254	0	0

**Member Distributed Loads (BLC 4 : Ice Weight)**

	Member Label	Direction	Start Magnitude[k/ft,deg]	End Magnitud...	Start Location[...	End Location[ft, %]
1	1	Y	0	0	0	0
2	2	Y	0	0	0	0

**Member Distributed Loads (BLC 5 : Wind on Iced Members)**

	Member Label	Direction	Start Magnitude[k/ft,deg]	End Magnitud...	Start Location[...	End Location[ft, %]
1	1	X	0	0	0	0
2	2	X	0	0	0	0

**Envelope Joint Reactions**

	Joint		X [k]	lc	Y [k]	lc	Z [k]	lc	MX [k-ft]	lc	MY [k-ft]	lc	MZ [k-ft]	lc
1	G1	max	.008	5	-.385	5	-.251	5	0	1	0	1	0	1
2		min	0	1	-.633	1	-.413	1	0	1	0	1	0	1
3	G2	max	.413	1	0	2	0	1	0	1	0	1	0	1
4		min	0	2	-.633	1	0	4	0	1	0	1	0	1
5	G3	max	.008	5	-.385	5	.413	1	0	1	0	1	0	1
6		min	0	1	-.633	1	.251	5	0	1	0	1	0	1
7	G4	max	-.266	9	-.407	9	0	5	0	1	0	1	0	1
8		min	-2.535	3	-3.878	3	0	7	0	1	0	1	0	1
9	1	max	0	9	5.648	3	0	7	0	1	0	1	0	1
10		min	-.04	5	2.173	6	0	5	0	1	0	1	0	1
11	Totals:	max	0	9	.847	1	0	5						
12		min	-2.558	3	.545	5	0	1						

**Envelope Member Section Forces**

	Member	Sec		Axial[k]	lc	y Shear[k]	lc	z Shear[k]	lc	Torque...	lc	y-y Momen...	lc	z-z Moment[k...	lc
1	1	1	max	5.648	3	.069	5	0	1	0	1	0	1	0	1
2			min	2.173	6	0	4	0	1	0	1	0	1	0	1
9		5	max	5.245	3	0	1	0	1	0	1	0	1	9.177	3
10			min	1.87	6	-.866	3	0	1	0	1	0	1	0	1
11	2	1	max	.36	1	1.572	3	0	1	0	1	0	1	10.007	3
12			min	.232	6	0	1	0	1	0	1	0	1	0	1
19		5	max	.217	1	1.287	3	0	1	0	1	0	1	0	1
20			min	-.139	6	0	1	0	1	0	1	0	1	0	1
21	GUY1	1	max	-.459	5	0	3	0	1	0	1	0	1	0	1
22			min	-.756	1	0	6	-.01	3	0	1	0	1	0	1
29		5	max	-.459	5	0	3	0	1	0	1	0	1	0	6
30			min	-.756	1	0	6	-.01	3	0	1	-.277	3	0	3
31	GUY2	1	max	0	2	0	4	0	1	0	1	0	1	0	1
32			min	-.756	1	0	2	0	1	0	1	0	1	0	1
39		5	max	0	2	0	4	0	1	0	1	0	1	0	2
40			min	-.756	1	0	2	0	1	0	1	0	1	0	4
41	GUY3	1	max	-.459	5	0	3	.01	3	0	1	0	1	0	1
42			min	-.756	1	0	6	0	1	0	1	0	1	0	1

**Envelope Member Section Forces (Continued)**

Member	Sec		Axial[k]	lc	y Shear[k]	lc	z Shear[k]	lc	Torque...	lc	y-y Momen...	lc	z-z Moment[k...	lc
49	5	max	-459	5	0	3	.01	3	0	1	.277	3	0	6
50		min	-756	1	0	6	0	1	0	1	0	1	0	3
51	GUY4	max	-486	9	0	1	0	1	0	1	0	1	0	1
52		min	-4.633	3	-.013	5	0	1	0	1	0	1	0	1
59	5	max	-486	9	0	1	0	1	0	1	0	1	.365	5
60		min	-4.633	3	-.013	5	0	1	0	1	0	1	0	1

**Envelope Member Section Deflections**

Member	Sec		x [in]	lc	y [in]	lc	z [in]	lc	x Rotate [r...	lc	(n) L/y Ratio	lc	(n) L/z Ratio	lc
1	1	max	0	1	0	1	0	1	0	1	NC	1	NC	1
2		min	0	1	0	1	0	1	0	1	NC	1	NC	1
9	5	max	-.004	6	0	1	0	1	0	1	NC	1	NC	1
10		min	-.012	3	-1.591	5	0	1	0	1	173.432	5	NC	1
11	2	max	-.004	6	0	1	0	1	0	1	NC	1	NC	1
12		min	-.012	3	-1.591	5	0	1	0	1	NC	5	NC	1
19	5	max	-.005	6	0	1	0	1	0	1	NC	1	NC	1
20		min	-.012	3	-4.073	5	0	1	0	1	33.844	5	NC	1
21	GUY1	max	0	1	0	1	0	1	0	1	NC	1	NC	1
22		min	0	1	0	1	0	1	-1.204e-2	5	NC	1	NC	1
29	5	max	-.004	6	-.002	6	0	1	0	1	NC	6	NC	1
30		min	-.01	3	-.007	3	-1.591	5	-1.204e-2	5	NC	3	207.055	5
31	GUY2	max	0	1	0	1	0	1	0	1	NC	1	NC	1
32		min	0	1	0	1	0	1	0	1	NC	1	NC	1
39	5	max	-.004	9	1.327	5	0	1	0	1	248.332	5	NC	1
40		min	-.879	5	-.004	1	0	1	0	1	NC	1	NC	1
41	GUY3	max	0	1	0	1	0	1	1.204e-2	5	NC	1	NC	1
42		min	0	1	0	1	0	1	0	1	NC	1	NC	1
49	5	max	-.004	6	-.002	6	1.591	5	1.204e-2	5	NC	6	207.055	5
50		min	-.01	3	-.007	3	0	1	0	1	NC	3	NC	1
51	GUY4	max	0	1	0	1	0	1	0	1	NC	1	NC	1
52		min	0	1	0	1	0	1	0	1	NC	1	NC	1
59	5	max	.86	5	-.002	9	0	1	0	1	NC	9	NC	1
60		min	-.006	1	-1.339	5	0	1	0	1	246.073	5	NC	1

**Basic Load Cases**

	BLC Description	Category	X Gr...	Y Grav...	Z Grav...	Joint	Point	Distributed	Area (... Surfac...
1	Dead	DL		-1		3		4	
2	Wind	WL				3		2	
3	Earthquake	EL				3			
4	Ice Weight	DL				3		2	
5	Wind on Iced Members	WL				3		2	

**Load Combinations**

	Description	Solve	PDelta	SRSS	BLC Factor	BLC Factor	BLC Factor	BLC Factor	BLC Factor	BLC Factor	BLC Factor	BLC Factor
1	Comb 1	Yes	Y		1	1.4						
2	Comb 2	Yes	Y		1	1.2	2	.8				
3	Comb 3	Yes	Y		1	1.2	2	1.6				
4	Comb 4	Yes	Y		1	1.2	3	1				
5	Comb 5	Yes	Y		1	.9	2	1.6				
6	Comb 6	Yes	Y		1	.9	3	1				
7	Comb 7	Yes	Y		1	1.2	4	.2				
8	Comb 8	Yes	Y		1	1.2	4	1	5	1		
9	Comb 9	Yes	Y		1	.9	4	1	5	1		

**General Material Properties**

	Label	E [ksi]	G [ksi]	Nu	Therm (\1E5 F)	Density[k/ft^3]
1	gen Conc3NW	3155	1372	.15	.6	.145
2	gen Conc4NW	3644	1584	.15	.6	.145
3	gen Conc3LW	2085	906	.15	.6	.11
4	gen Conc4LW	2408	1047	.15	.6	.11
5	gen Alum	10600	4077	.3	1.29	.173
6	gen Steel	29000	11154	.3	.65	.49
7	RIGID	1e+7		0	0	0
8	Guy E=26800	26800	11154	.3	1.17	0

**Joint Coordinates and Temperatures**

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Diap...
1	1	0	0	0	0	
2	2	0	23	0	0	
3	3	0	30	0	0	
4	G1	0	0	-15	0	
5	G2	15	0	0	0	
6	G3	0	0	15	0	
7	G4	-15	0	0	0	

**Joint Boundary Conditions**

	Joint Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot.[k-ft/rad]	Y Rot.[k-ft/rad]	Z Rot.[k-ft/rad]	Footing
1	G1	Reaction	Reaction	Reaction				
2	G2	Reaction	Reaction	Reaction				
3	G3	Reaction	Reaction	Reaction				
4	G4	Reaction	Reaction	Reaction				
5	1	Reaction	Reaction	Reaction				

**Member Primary Data**

	Label	I Joint	J Joint	K Joint	Rotate(...)	Section/Shape	Type	Design List	Material	Design Rules
1	1	1	2			PIPE 5.0	Column	Pipe	A572 Gr.50	Typical
2	2	2	3			PIPE 5.0	Column	Pipe	A572 Gr.50	Typical
3	GUY1	G1	2			5/16" EHS	None	None	Guy E=26800	Typical
4	GUY2	G2	2			5/16" EHS	None	None	Guy E=26800	Typical
5	GUY3	G3	2			5/16" EHS	None	None	Guy E=26800	Typical
6	GUY4	G4	2			5/16" EHS	None	None	Guy E=26800	Typical

**Member Advanced Data**

	Label	I Release	J Release	I Offset[in]	J Offset[in]	T/C Only	Physical	TOM	Inactive
1	1						Yes		
2	2						Yes		
3	GUY1					Tension Only	Yes		
4	GUY2					Tension Only	Yes		
5	GUY3					Tension Only	Yes		
6	GUY4					Tension Only	Yes		

**Joint Loads and Enforced Displacements (BLC 1 : Dead)**

	Joint Label	L,D,M	Direction	Magnitude[k,k-ft in,rad k*s^2/ft]
1	3	L	Y	-.155
2	2	L	Y	-.0056
3	2	L	Y	-.0056

**Joint Loads and Enforced Displacements (BLC 2 : Wind)**

	Joint Label	L,D,M	Direction	Magnitude[k,k-ft in,rad k*s^2/ft]
1	3	L	X	.8
2	2	L	X	.0067
3	2	L	X	.0067

**Joint Loads and Enforced Displacements (BLC 3 : Earthquake)**

	Joint Label	L,D,M	Direction	Magnitude[k,k-ft in,rad k*s^2/ft]
1	1	L	X	.009
2	2	L	X	.012
3	3	L	X	.003

**Joint Loads and Enforced Displacements (BLC 4 : Ice Weight)**

	Joint Label	L,D,M	Direction	Magnitude[k,k-ft in,rad k*s^2/ft]
1	3	L	Y	-.05
2	2	L	Y	-.0896
3	2	L	Y	-.0896

**Joint Loads and Enforced Displacements (BLC 5 : Wind on Iced Members)**

	Joint Label	L,D,M	Direction	Magnitude[k,k-ft in,rad k*s^2/ft]
1	3	L	X	.05
2	2	L	X	.0139
3	2	L	X	.0139

**Member Distributed Loads (BLC 1 : Dead)**

	Member Label	Direction	Start Magnitude[k/ft,deg]	End Magnitud...	Start Location[...]	End Location[ft,%]
1	GUY1	T	-30.27	-30.27	0	0
2	GUY2	T	-30.27	-30.27	0	0

**Member Distributed Loads (BLC 1 : Dead) (Continued)**

	Member Label	Direction	Start Magnitude[k/ft,deg]	End Magnitud...	Start Location[...	End Location[ft, %]
3	GUY3	T	-30.27	-30.27	0	0
4	GUY4	T	-30.27	-30.27	0	0

**Member Distributed Loads (BLC 2 : Wind)**

	Member Label	Direction	Start Magnitude[k/ft,deg]	End Magnitud...	Start Location[...	End Location[ft, %]
1	1	X	.0091	.0091	0	0
2	2	X	.0091	.0091	0	0

**Member Distributed Loads (BLC 4 : Ice Weight)**

	Member Label	Direction	Start Magnitude[k/ft,deg]	End Magnitud...	Start Location[...	End Location[ft, %]
1	1	Y	-.0128	-.0128	0	0
2	2	Y	-.0128	-.0128	0	0

**Member Distributed Loads (BLC 5 : Wind on Iced Members)**

	Member Label	Direction	Start Magnitude[k/ft,deg]	End Magnitud...	Start Location[...	End Location[ft, %]
1	1	X	.0028	.0028	0	0
2	2	X	.0028	.0028	0	0

**Envelope Joint Reactions**

	Joint		X [k]	lc	Y [k]	lc	Z [k]	lc	MX [k-ft]	lc	MY [k-ft]	lc	MZ [k-ft]	lc
1	G1	max	.01	5	-.391	5	-.255	5	0	1	0	1	0	1
2		min	0	1	-.633	1	-.413	1	0	1	0	1	0	1
3	G2	max	.413	1	0	2	0	1	0	1	0	1	0	1
4		min	0	2	-.633	1	0	8	0	1	0	1	0	1
5	G3	max	.01	5	-.391	5	.413	1	0	1	0	1	0	1
6		min	0	1	-.633	1	.255	5	0	1	0	1	0	1
7	G4	max	-.273	6	-.419	6	0	5	0	1	0	1	0	1
8		min	-1.975	3	-3.036	3	0	7	0	1	0	1	0	1
9	1	max	.218	3	4.82	3	0	4	0	1	0	1	0	1
10		min	-.015	9	2.173	6	0	5	0	1	0	1	0	1
11	Totals:	max	0	1	1.339	8	0	5						
12		min	-1.738	5	.545	6	0	1						

**Envelope Member Section Forces**

	Member	Sec		Axial[k]	lc	y Shear[k]	lc	z Shear[k]	lc	Torque...	lc	y-y Momen...	lc	z-z Momen[k...	lc
1	1	1	max	4.82	3	.015	9	0	1	0	1	0	1	0	1
2			min	2.173	6	-.199	3	0	1	0	1	0	1	0	1
9		5	max	4.416	3	0	1	0	1	0	1	0	1	8.428	3
10			min	1.87	6	-.534	3	0	1	0	1	0	1	0	1
11	2	1	max	.449	8	1.389	3	0	1	0	1	0	1	9.369	3
12			min	.232	5	0	1	0	1	0	1	0	1	0	1
19		5	max	.236	8	1.287	3	0	1	0	1	0	1	0	1
20			min	-.139	5	0	1	0	1	0	1	0	1	0	1
21	GUY1	1	max	-.467	5	0	3	0	1	0	1	0	1	0	1
22			min	-.756	1	0	6	-.012	3	0	1	0	1	0	1
29		5	max	-.467	5	0	3	0	1	0	1	0	1	0	6
30			min	-.756	1	0	6	-.012	3	0	1	-.319	3	0	3
31	GUY2	1	max	0	2	0	8	0	1	0	1	0	1	0	1
32			min	-.756	1	0	2	0	1	0	1	0	1	0	1
39		5	max	0	2	0	8	0	1	0	1	0	1	0	2
40			min	-.756	1	0	2	0	1	0	1	0	1	-.012	8
41	GUY3	1	max	-.467	5	0	3	.012	3	0	1	0	1	0	1
42			min	-.756	1	0	6	0	1	0	1	0	1	0	1

**Envelope Member Section Forces (Continued)**

Member	Sec		Axial[k]	lc	y Shear[k]	lc	z Shear[k]	lc	Torque...	lc	y-y Momen...	lc	z-z Moment[k...	lc
49	5	max	-467	5	0	3	.012	3	0	1	.319	3	0	6
50		min	-756	1	0	6	0	1	0	1	0	1	0	3
51	GUY4	max	-501	6	0	1	0	1	0	1	0	1	0	1
52		min	-3.622	3	-.015	5	0	1	0	1	0	1	0	1
59	5	max	-501	6	0	1	0	1	0	1	0	1	.406	5
60		min	-3.622	3	-.015	5	0	1	0	1	0	1	0	1

**Envelope Member Section Deflections**

Member	Sec		x [in]	lc	y [in]	lc	z [in]	lc	x Rotate [r...	lc	(n) L/y Ratio	lc	(n) L/z Ratio	lc
1	1	max	0	1	0	1	0	1	0	1	NC	1	NC	1
2		min	0	1	0	1	0	1	0	1	NC	1	NC	1
9	5	max	-.004	6	0	1	0	1	0	1	NC	1	NC	1
10		min	-.01	3	-1.203	5	0	1	0	1	229.373	5	NC	1
11	2	max	-.004	6	0	1	0	1	0	1	NC	1	NC	1
12		min	-.01	3	-1.203	5	0	1	0	1	NC	5	NC	1
19	5	max	-.005	6	0	1	0	1	0	1	NC	1	NC	1
20		min	-.01	3	-3.742	5	0	1	0	1	33.091	5	NC	1
21	GUY1	max	0	1	0	1	0	1	0	1	NC	1	NC	1
22		min	0	1	0	1	0	1	-1.261e-2	5	NC	1	NC	1
29	5	max	-.004	6	-.002	6	0	1	0	1	NC	6	NC	1
30		min	-.009	3	-.006	3	-1.203	5	-1.261e-2	5	NC	3	273.842	5
31	GUY2	max	0	1	0	1	0	1	0	1	NC	1	NC	1
32		min	0	1	0	1	0	1	0	1	NC	1	NC	1
39	5	max	-.005	7	1.003	5	0	1	0	1	328.591	5	NC	1
40		min	-.665	5	-.004	1	0	1	0	1	NC	1	NC	1
41	GUY3	max	0	1	0	1	0	1	1.261e-2	5	NC	1	NC	1
42		min	0	1	0	1	0	1	0	1	NC	1	NC	1
49	5	max	-.004	6	-.002	6	1.203	5	1.261e-2	5	NC	6	273.842	5
50		min	-.009	3	-.006	3	0	1	0	1	NC	3	NC	1
51	GUY4	max	0	1	0	1	0	1	0	1	NC	1	NC	1
52		min	0	1	0	1	0	1	0	1	NC	1	NC	1
59	5	max	.65	5	-.003	7	0	1	0	1	NC	7	NC	1
60		min	-.006	1	-1.013	5	0	1	0	1	NC	5	NC	1

**Basic Load Cases**

	BLC Description	Category	X Gr...	Y Grav...	Z Grav...	Joint	Point	Distributed	Area (... Surfac...
1	Dead	DL		-1		3		4	
2	Wind	WL				3		2	
3	Earthquake	EL				3			
4	Ice Weight	DL				3		2	
5	Wind on Iced Members	WL				3		2	

**Load Combinations**

	Description	Solve	PDelta	SRSS	BLC Factor	BLC Factor	BLC Factor	BLC Factor	BLC Factor	BLC Factor	BLC Factor	BLC Factor
1	Comb 1	Yes	Y		1	1.4						
2	Comb 2	Yes	Y		1	1.2	2	.8				
3	Comb 3	Yes	Y		1	1.2	2	1.6				
4	Comb 4	Yes	Y		1	1.2	3	1				
5	Comb 5	Yes	Y		1	.9	2	1.6				
6	Comb 6	Yes	Y		1	.9	3	1				
7	Comb 7	Yes	Y		1	1.2	4	.2				
8	Comb 8	Yes	Y		1	1.2	4	1	5	1		
9	Comb 9	Yes	Y		1	.9	4	1	5	1		

**General Material Properties**

	Label	E [ksi]	G [ksi]	Nu	Therm (\1E5 F)	Density[k/ft^3]
1	gen Conc3NW	3155	1372	.15	.6	.145
2	gen Conc4NW	3644	1584	.15	.6	.145
3	gen Conc3LW	2085	906	.15	.6	.11
4	gen Conc4LW	2408	1047	.15	.6	.11
5	gen Alum	10600	4077	.3	1.29	.173
6	gen Steel	29000	11154	.3	.65	.49
7	RIGID	1e+7		0	0	0
8	Guy E=26800	26800	11154	.3	1.17	0

**Joint Coordinates and Temperatures**

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Diap...
1	1	0	0	0	0	
2	2	0	23	0	0	
3	3	0	30	0	0	
4	G1	0	0	-15	0	
5	G2	15	0	0	0	
6	G3	0	0	15	0	
7	G4	-15	0	0	0	

**Joint Boundary Conditions**

	Joint Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot.[k-ft/rad]	Y Rot.[k-ft/rad]	Z Rot.[k-ft/rad]	Footing
1	G1	Reaction	Reaction	Reaction				
2	G2	Reaction	Reaction	Reaction				
3	G3	Reaction	Reaction	Reaction				
4	G4	Reaction	Reaction	Reaction				
5	1	Reaction	Reaction	Reaction				

**Member Primary Data**

	Label	I Joint	J Joint	K Joint	Rotate(...)	Section/Shape	Type	Design List	Material	Design Rules
1	1	1	2			PIPE 5.0	Column	Pipe	A572 Gr.50	Typical
2	2	2	3			PIPE 5.0	Column	Pipe	A572 Gr.50	Typical
3	GUY1	G1	2			5/16" EHS	None	None	Guy E=26800	Typical
4	GUY2	G2	2			5/16" EHS	None	None	Guy E=26800	Typical
5	GUY3	G3	2			5/16" EHS	None	None	Guy E=26800	Typical
6	GUY4	G4	2			5/16" EHS	None	None	Guy E=26800	Typical

**Member Advanced Data**

	Label	I Release	J Release	I Offset[in]	J Offset[in]	T/C Only	Physical	TOM	Inactive
1	1						Yes		
2	2						Yes		
3	GUY1					Tension Only	Yes		
4	GUY2					Tension Only	Yes		
5	GUY3					Tension Only	Yes		
6	GUY4					Tension Only	Yes		

**Joint Loads and Enforced Displacements (BLC 1 : Dead)**

	Joint Label	L,D,M	Direction	Magnitude[k,k-ft in,rad k*s^2/ft]
1	3	L	Y	-.155
2	2	L	Y	-.0056
3	2	L	Y	-.0056

**Joint Loads and Enforced Displacements (BLC 2 : Wind)**

	Joint Label	L,D,M	Direction	Magnitude[k,k-ft in,rad k*s^2/ft]
1	3	L	X	.8
2	2	L	X	.0139
3	2	L	X	.0139

**Joint Loads and Enforced Displacements (BLC 3 : Earthquake)**

	Joint Label	L,D,M	Direction	Magnitude[k,k-ft in,rad k*s^2/ft]
1	1	L	X	.067
2	2	L	X	.088
3	3	L	X	.02

**Joint Loads and Enforced Displacements (BLC 4 : Ice Weight)**

	Joint Label	L,D,M	Direction	Magnitude[k,k-ft in,rad k*s^2/ft]
1	3	L	Y	-.05
2	2	L	Y	-.0134
3	2	L	Y	-.0134

**Joint Loads and Enforced Displacements (BLC 5 : Wind on Iced Members)**

	Joint Label	L,D,M	Direction	Magnitude[k,k-ft in,rad k*s^2/ft]
1	3	L	X	.05
2	2	L	X	.0031
3	2	L	X	.0031

**Member Distributed Loads (BLC 1 : Dead)**

	Member Label	Direction	Start Magnitude[k/ft,deg]	End Magnitud...	Start Location[...]	End Location[ft,%]
1	GUY1	T	-30.27	-30.27	0	0
2	GUY2	T	-30.27	-30.27	0	0

**Member Distributed Loads (BLC 1 : Dead) (Continued)**

	Member Label	Direction	Start Magnitude[k/ft,deg]	End Magnitud...	Start Location[...	End Location[ft,%]
3	GUY3	T	-30.27	-30.27	0	0
4	GUY4	T	-30.27	-30.27	0	0

**Member Distributed Loads (BLC 2 : Wind)**

	Member Label	Direction	Start Magnitude[k/ft,deg]	End Magnitud...	Start Location[...	End Location[ft,%]
1	1	X	.0191	.0191	0	0
2	2	X	.0191	.0191	0	0

**Member Distributed Loads (BLC 4 : Ice Weight)**

	Member Label	Direction	Start Magnitude[k/ft,deg]	End Magnitud...	Start Location[...	End Location[ft,%]
1	1	Y	-.0037	-.0037	0	0
2	2	Y	-.0037	-.0037	0	0

**Member Distributed Loads (BLC 5 : Wind on Iced Members)**

	Member Label	Direction	Start Magnitude[k/ft,deg]	End Magnitud...	Start Location[...	End Location[ft,%]
1	1	X	.0012	.0012	0	0
2	2	X	.0012	.0012	0	0

**Joint Reactions**

LC	Joint Label	X [k]	Y [k]	Z [k]	MX [k-ft]	MY [k-ft]	MZ [k-ft]
No Data to Print ...							

**Member Section Forces**

LC	Member Label	Sec	Axial[k]	y Shear[k]	z Shear[k]	Torque[k-ft]	y-y Moment[k-...	z-z Moment[k-...
No Data to Print ...								

**Member Section Deflections**

LC	Member Label	Sec	x [in]	y [in]	z [in]	x Rotate[rad]	(n) L/y Ratio	(n) L/z Ratio
No Data to Print ...								

**Basic Load Cases**

	BLC Description	Category	X Gr...	Y Grav...	Z Grav...	Joint	Point	Distributed	Area (... Surfac...
1	Dead	DL		-1		3		4	
2	Wind	WL				3		2	
3	Earthquake	EL				3			
4	Ice Weight	DL				3		2	
5	Wind on Iced Members	WL				3		2	

**Load Combinations**

	Description	Solve	PDelta	SRSS	BLC Factor	BLC Factor	BLC Factor	BLC Factor	BLC Factor	BLC Factor	BLC Factor	BLC Factor
1	Comb 1	Yes	Y		1	1.4						
2	Comb 2	Yes	Y		1	1.2	2	.8				
3	Comb 3	Yes	Y		1	1.2	2	1.6				
4	Comb 4	Yes	Y		1	1.2	3	1				
5	Comb 5	Yes	Y		1	.9	2	1.6				
6	Comb 6	Yes	Y		1	.9	3	1				
7	Comb 7	Yes	Y		1	1.2	4	.2				
8	Comb 8	Yes	Y		1	1.2	4	1	5	1		
9	Comb 9	Yes	Y		1	.9	4	1	5	1		

**General Material Properties**

	Label	E [ksi]	G [ksi]	Nu	Therm (\1E5 F)	Density[k/ft^3]
1	gen Conc3NW	3155	1372	.15	.6	.145
2	gen Conc4NW	3644	1584	.15	.6	.145
3	gen Conc3LW	2085	906	.15	.6	.11
4	gen Conc4LW	2408	1047	.15	.6	.11
5	gen Alum	10600	4077	.3	1.29	.173
6	gen Steel	29000	11154	.3	.65	.49
7	RIGID	1e+7		0	0	0
8	Guy E=26800	26800	11154	.3	1.17	0

**Joint Coordinates and Temperatures**

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Diap...
1	1	0	0	0	0	
2	2	0	23	0	0	
3	3	0	30	0	0	
4	G1	0	0	-15	0	
5	G2	15	0	0	0	
6	G3	0	0	15	0	
7	G4	-15	0	0	0	

**Joint Boundary Conditions**

	Joint Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot.[k-ft/rad]	Y Rot.[k-ft/rad]	Z Rot.[k-ft/rad]	Footing
1	G1	Reaction	Reaction	Reaction				
2	G2	Reaction	Reaction	Reaction				
3	G3	Reaction	Reaction	Reaction				
4	G4	Reaction	Reaction	Reaction				
5	1	Reaction	Reaction	Reaction				

**Member Primary Data**

	Label	I Joint	J Joint	K Joint	Rotate(...)	Section/Shape	Type	Design List	Material	Design Rules
1	1	1	2			PIPE 5.0	Column	Pipe	A572 Gr.50	Typical
2	2	2	3			PIPE 5.0	Column	Pipe	A572 Gr.50	Typical
3	GUY1	G1	2			5/16" EHS	None	None	Guy E=26800	Typical
4	GUY2	G2	2			5/16" EHS	None	None	Guy E=26800	Typical
5	GUY3	G3	2			5/16" EHS	None	None	Guy E=26800	Typical
6	GUY4	G4	2			5/16" EHS	None	None	Guy E=26800	Typical

**Member Advanced Data**

	Label	I Release	J Release	I Offset[in]	J Offset[in]	T/C Only	Physical	TOM	Inactive
1	1						Yes		
2	2						Yes		
3	GUY1					Tension Only	Yes		
4	GUY2					Tension Only	Yes		
5	GUY3					Tension Only	Yes		
6	GUY4					Tension Only	Yes		

**Joint Loads and Enforced Displacements (BLC 1 : Dead)**

	Joint Label	L,D,M	Direction	Magnitude[k,k-ft in,rad k*s^2/ft]
1	3	L	Y	-.155
2	2	L	Y	-.0056
3	2	L	Y	-.0056

**Joint Loads and Enforced Displacements (BLC 2 : Wind)**

	Joint Label	L,D,M	Direction	Magnitude[k,k-ft in,rad k*s^2/ft]
1	3	L	X	.8
2	2	L	X	.006
3	2	L	X	.006

**Joint Loads and Enforced Displacements (BLC 3 : Earthquake)**

	Joint Label	L,D,M	Direction	Magnitude[k,k-ft in,rad k*s^2/ft]
1	1	L	X	.067
2	2	L	X	.088
3	3	L	X	.02

**Joint Loads and Enforced Displacements (BLC 4 : Ice Weight)**

	Joint Label	L,D,M	Direction	Magnitude[k,k-ft in,rad k*s^2/ft]
1	3	L	Y	0
2	2	L	Y	0
3	2	L	Y	0

**Joint Loads and Enforced Displacements (BLC 5 : Wind on Iced Members)**

	Joint Label	L,D,M	Direction	Magnitude[k,k-ft in,rad k*s^2/ft]
1	3	L	X	0
2	2	L	X	0
3	2	L	X	0

**Member Distributed Loads (BLC 1 : Dead)**

	Member Label	Direction	Start Magnitude[k/ft,deg]	End Magnitud...	Start Location[...]	End Location[ft,%]
1	GUY1	T	-30.27	-30.27	0	0
2	GUY2	T	-30.27	-30.27	0	0

**Member Distributed Loads (BLC 1 : Dead) (Continued)**

	Member Label	Direction	Start Magnitude[k/ft,deg]	End Magnitud...	Start Location[...	End Location[ft, %]
3	GUY3	T	-30.27	-30.27	0	0
4	GUY4	T	-30.27	-30.27	0	0

**Member Distributed Loads (BLC 2 : Wind)**

	Member Label	Direction	Start Magnitude[k/ft,deg]	End Magnitud...	Start Location[...	End Location[ft, %]
1	1	X	.0082	.0082	0	0
2	2	X	.0082	.0082	0	0

**Member Distributed Loads (BLC 4 : Ice Weight)**

	Member Label	Direction	Start Magnitude[k/ft,deg]	End Magnitud...	Start Location[...	End Location[ft, %]
1	1	Y	0	0	0	0
2	2	Y	0	0	0	0

**Member Distributed Loads (BLC 5 : Wind on Iced Members)**

	Member Label	Direction	Start Magnitude[k/ft,deg]	End Magnitud...	Start Location[...	End Location[ft, %]
1	1	X	0	0	0	0
2	2	X	0	0	0	0

**Envelope Joint Reactions**

	Joint		X [k]	lc	Y [k]	lc	Z [k]	lc	MX [k-ft]	lc	MY [k-ft]	lc	MZ [k-ft]	lc
1	G1	max	.01	5	-.391	5	-.255	5	0	1	0	1	0	1
2		min	0	1	-.633	1	-.413	1	0	1	0	1	0	1
3	G2	max	.413	1	0	2	0	1	0	1	0	1	0	1
4		min	0	2	-.633	1	0	4	0	1	0	1	0	1
5	G3	max	.01	5	-.391	5	.413	1	0	1	0	1	0	1
6		min	0	1	-.633	1	.255	5	0	1	0	1	0	1
7	G4	max	-.266	9	-.407	9	0	5	0	1	0	1	0	1
8		min	-1.944	3	-2.99	3	0	7	0	1	0	1	0	1
9	1	max	.232	3	4.774	3	0	7	0	1	0	1	0	1
10		min	-.062	6	2.173	6	0	5	0	1	0	1	0	1
11	Totals:	max	0	9	.847	1	0	5						
12		min	-1.693	3	.545	6	0	1						

**Envelope Member Section Forces**

	Member	Sec		Axial[k]	lc	y Shear[k]	lc	z Shear[k]	lc	Torque...	lc	y-y Momen...	lc	z-z Momen[k...	lc
1	1	1	max	4.774	3	0	1	0	1	0	1	0	1	0	1
2			min	2.173	6	-.214	3	0	1	0	1	0	1	0	1
9		5	max	4.37	3	0	1	0	1	0	1	0	1	8.387	3
10			min	1.87	6	-.516	3	0	1	0	1	0	1	0	1
11	2	1	max	.36	1	1.379	3	0	1	0	1	0	1	9.334	3
12			min	.232	5	0	1	0	1	0	1	0	1	0	1
19		5	max	.217	1	1.287	3	0	1	0	1	0	1	0	1
20			min	-.139	5	0	1	0	1	0	1	0	1	0	1
21	GUY1	1	max	-.467	5	0	3	0	1	0	1	0	1	0	1
22			min	-.756	1	0	6	-.012	3	0	1	0	1	0	1
29		5	max	-.467	5	0	3	0	1	0	1	0	1	0	6
30			min	-.756	1	0	6	-.012	3	0	1	-.321	3	0	3
31	GUY2	1	max	0	2	0	4	0	1	0	1	0	1	0	1
32			min	-.756	1	0	2	0	1	0	1	0	1	0	1
39		5	max	0	2	0	4	0	1	0	1	0	1	0	2
40			min	-.756	1	0	2	0	1	0	1	0	1	-.007	4
41	GUY3	1	max	-.467	5	0	3	.012	3	0	1	0	1	0	1
42			min	-.756	1	0	6	0	1	0	1	0	1	0	1

**Envelope Member Section Forces (Continued)**

Member	Sec		Axial[k]	lc	y Shear[k]	lc	z Shear[k]	lc	Torque...	lc	y-y Momen...	lc	z-z Moment[k...	lc
49	5	max	-467	5	0	3	.012	3	0	1	.321	3	0	6
50		min	-756	1	0	6	0	1	0	1	0	1	0	3
51	GUY4	max	-486	9	0	1	0	1	0	1	0	1	0	1
52		min	-3.566	3	-.015	5	0	1	0	1	0	1	0	1
59	5	max	-486	9	0	1	0	1	0	1	0	1	.409	5
60		min	-3.566	3	-.015	5	0	1	0	1	0	1	0	1

**Envelope Member Section Deflections**

Member	Sec		x [in]	lc	y [in]	lc	z [in]	lc	x Rotate [r...	lc	(n) L/y Ratio	lc	(n) L/z Ratio	lc
1	1	max	0	1	0	1	0	1	0	1	NC	1	NC	1
2		min	0	1	0	1	0	1	0	1	NC	1	NC	1
9	5	max	-.004	6	0	1	0	1	0	1	NC	1	NC	1
10		min	-.01	3	-1.182	5	0	1	0	1	233.551	5	NC	1
11	2	max	-.004	6	0	1	0	1	0	1	NC	1	NC	1
12		min	-.01	3	-1.182	5	0	1	0	1	NC	5	NC	1
19	5	max	-.005	6	0	1	0	1	0	1	NC	1	NC	1
20		min	-.01	3	-3.723	5	0	1	0	1	33.05	5	NC	1
21	GUY1	max	0	1	0	1	0	1	0	1	NC	1	NC	1
22		min	0	1	0	1	0	1	-1.264e-2	5	NC	1	NC	1
29	5	max	-.004	6	-.002	6	0	1	0	1	NC	6	NC	1
30		min	-.008	3	-.006	3	-1.182	5	-1.264e-2	5	NC	3	278.83	5
31	GUY2	max	0	1	0	1	0	1	0	1	NC	1	NC	1
32		min	0	1	0	1	0	1	0	1	NC	1	NC	1
39	5	max	-.004	9	.985	5	0	1	0	1	334.589	5	NC	1
40		min	-.653	5	-.004	1	0	1	0	1	NC	1	NC	1
41	GUY3	max	0	1	0	1	0	1	1.264e-2	5	NC	1	NC	1
42		min	0	1	0	1	0	1	0	1	NC	1	NC	1
49	5	max	-.004	6	-.002	6	1.182	5	1.264e-2	5	NC	6	278.83	5
50		min	-.008	3	-.006	3	0	1	0	1	NC	3	NC	1
51	GUY4	max	0	1	0	1	0	1	0	1	NC	1	NC	1
52		min	0	1	0	1	0	1	0	1	NC	1	NC	1
59	5	max	.638	5	-.002	9	0	1	0	1	NC	9	NC	1
60		min	-.006	1	-.995	5	0	1	0	1	NC	5	NC	1