

NTS

PROJECT: CT 1887

SUBJECT: Design Wind Loads on Other Structures

DESIGN WIND LOADS ON OTHER STRUCTURES:

(Chimneys, Tanks, Rooftop Equipment, & Similar Structures)

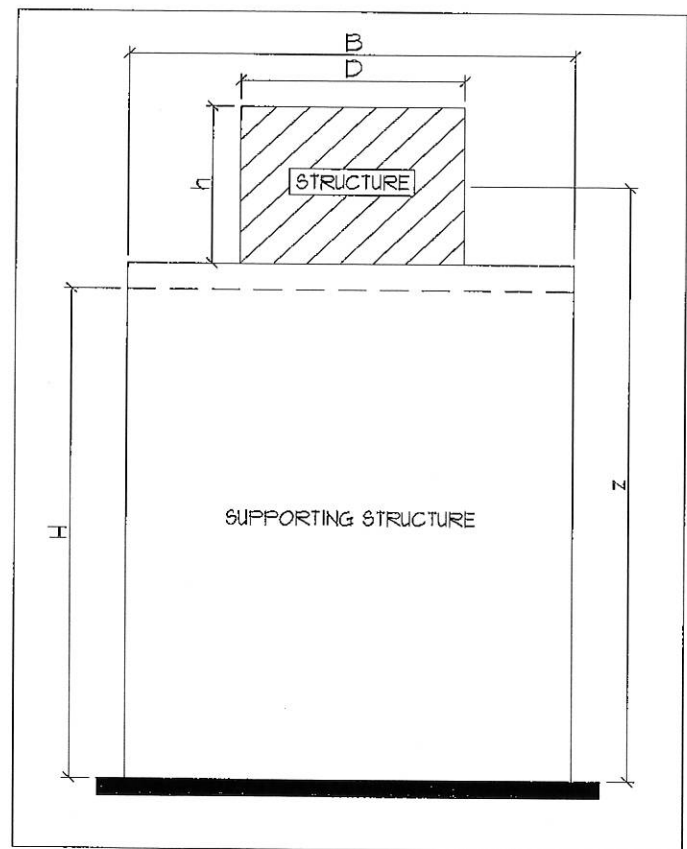
Label:

INPUT DATA:

Basic Wind Speed, V [mph]:	110
Exposure Category:	C
Importance Factor, I:	1.00
Structure:	
Cross-Section:	Round
Height, h [ft]:	10.0
Least Horizontal Dimension, D [ft]:	32.0
Average Elevation, z [ft]:	56.0
For Non-Rooftop, Flexible Structures, (if $n_1 < 1$ Hz):	
Depth, L [ft]:	
Natural Frequency, n_1 [Hz]:	
Damping Ratio, β :	0.005
Rooftop Structure?	No
Supporting Structure (of Rooftop Structure):	
Height, H [ft]:	
Minimum Width, B [ft]:	
For Flexible Supporting Structures, (if $n_1 < 1$ Hz):	
Depth, L [ft]:	
Natural Frequency, n_1 [Hz]:	
Damping Ratio, β :	0.005

DESIGN SUMMARY:

Design Wind Pressure, p [psf]:	14.0
Design Wind Pressure - Diagonal, p_d [psf]:	14.0





JOB NO.: U0142-630-121
 DATE: 06/22/12

DESIGNED: BDV
 CHECKED: TPH

SHEET 4 OF 31

PROJECT: CT 1887

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DESIGN WIND LOADS ON OTHER STRUCTURES:
 (Chimneys, Tanks, Rooftop Equipment, & Similar Structures)

Label: Concealment at Top of Tank

WIND ANALYSIS:

ASCE 7-02 Chapter 6 Reference:

Design Wind Pressure, p [psf]: 14.0
 Design Wind Pressure - Diagonal, p_d [psf]: 14.0

(Section 6.5.15)

Design Wind Pressure, p :

$$p = f_r q_z G C_f$$

(Equation 6-28)

Rooftop factor, f_r : 1.0
 Velocity Pressure, q_z [psf]: 33.0
 Gust Effect Factor, G or G_f : 0.85
 Force Coefficient, C_f : 0.50
 Force Coefficient - Diagonal, C_{fd} : 0.50

(ASCE 7-05 Section 6.5.15.1)

(Section 6.5.10)

(Section 6.5.8)

(Figure 6-21)

Velocity Pressure, q_z :

$$q_z = 0.00256 K_z K_{zt} K_d V^2 I$$

(Equation 6-15)

Velocity Pressure Exposure Coefficient, K_z : 1.12
 Topographic Factor, K_{zt} : 1.0
 Wind Directionality Factor, K_d : 0.95

(Table 6-3)

(Section 6.5.7.2)

(Table 6-4)

Velocity Pressure Exposure Coefficient, K_z :

$$K_z = 2.01(z/z_g)^{(2/\alpha)}$$

(Table 6-3)

Nominal Height of Atmospheric Boundary Layer, z_g [ft]: 900
 3-s Gust-Speed Power Law Exponent, α : 9.5

(Table 6-2)

(Table 6-2)



JOB NO.: U0142-630-121
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SHEET

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OF

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STEALTH PANEL SPAN ANALYSIS

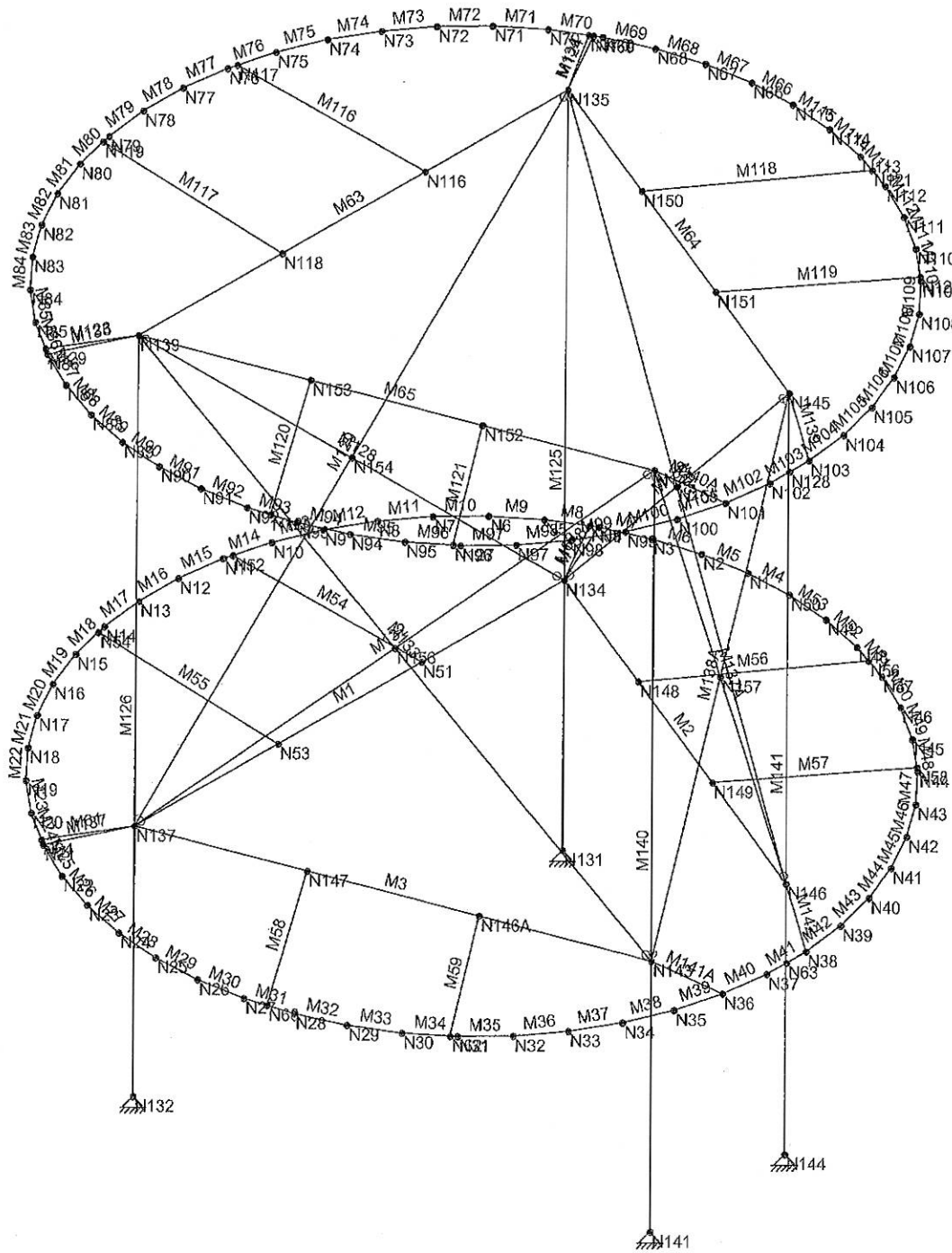
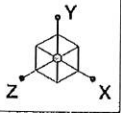
INPUT

Panel Label:	Panels					
Stealth Panel Type:	SSV					
Panel Span (ft):	10					
Wind Pressure (psf):	14.0					
Panel Bolt Spacing (in.):	18					
Factor of Safety (F.S.):	3					

OUTPUT

Panel Moment, M_{max} (lb-ft/ft):	175					
Panel Reactions, V_{max} (lbs/ft):	70					
Max. Bolt Tension, T_{max} (lbs/bolt):	105					
Panel Ulf. Bending Cap., M_u (lb-ft/ft):	1799					
Allowable Panel Cap., M_{all} (lb-ft/ft):	600					
Panel Capacity Check:	Okay					

Max. Panel Deflection, (in.):	4.3					
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Results for LC 1, Dead Load

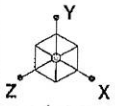
Vector
BDV
U0142-630-121

CT 1887 Tank Concealment Support Frame

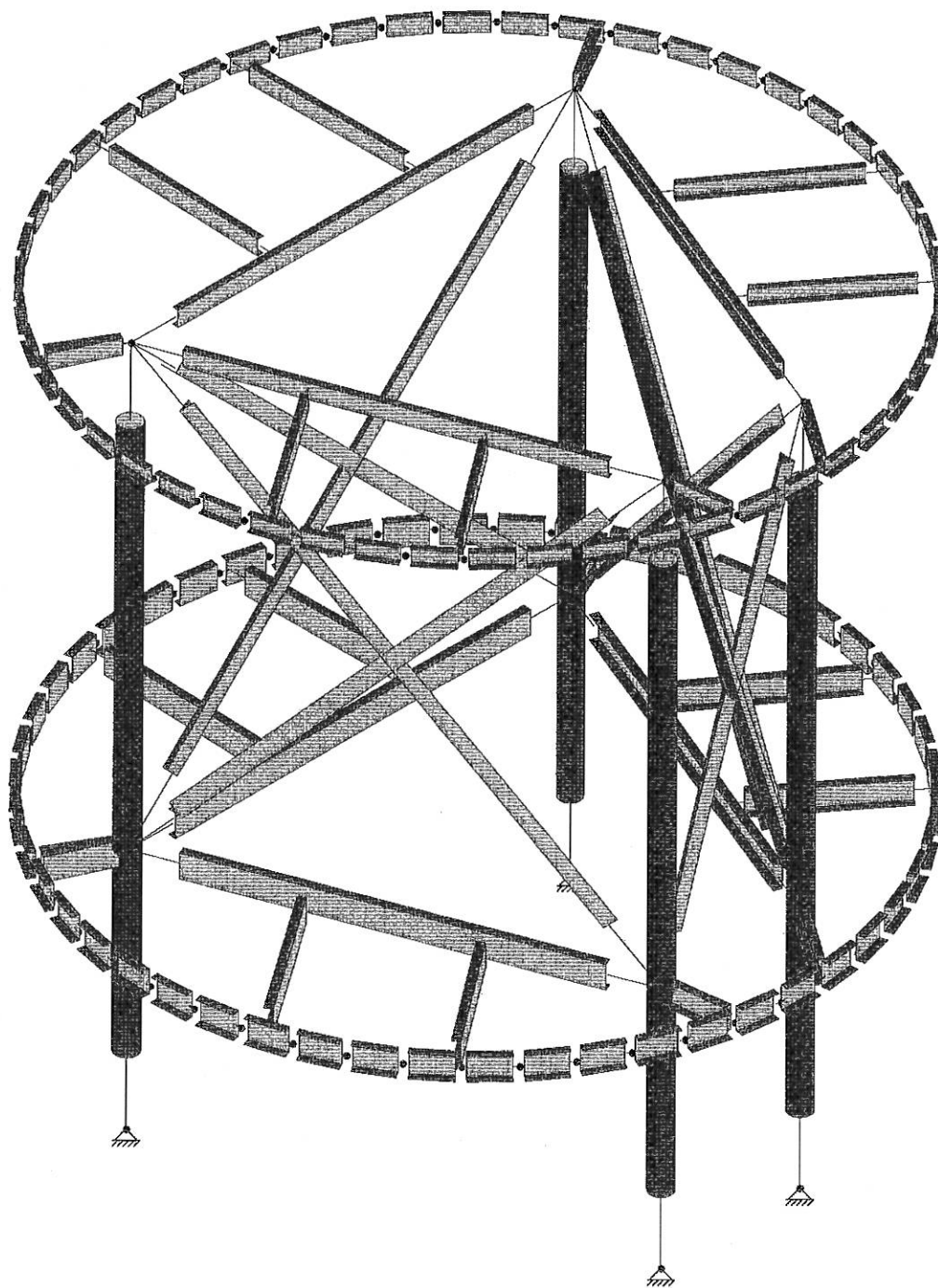
SK - 1

Aug 2, 2012 at 7:48 AM

CT 1887 frame.R3D



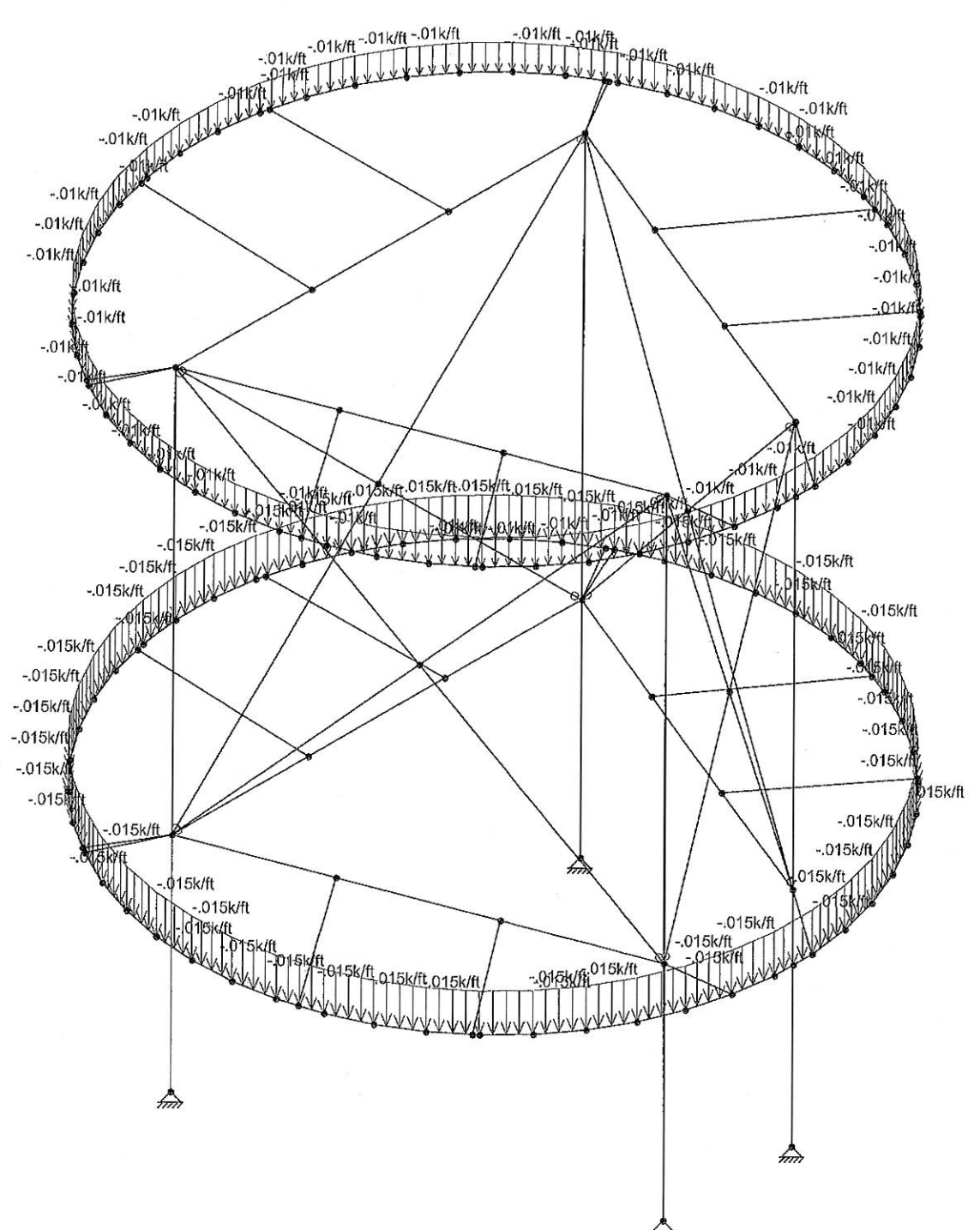
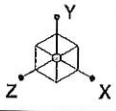
Sh. 7



Results for LC 1, Dead Load

Vector	CT 1887 Tank Concealment Support Frame	SK - 2
BDV		Aug 2, 2012 at 7:50 AM
U0142-630-121		CT 1887 frame.R3D

En. B

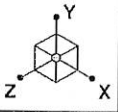


Loads: BLC 2, Panel Dead Load
Results for LC 1, Dead Load

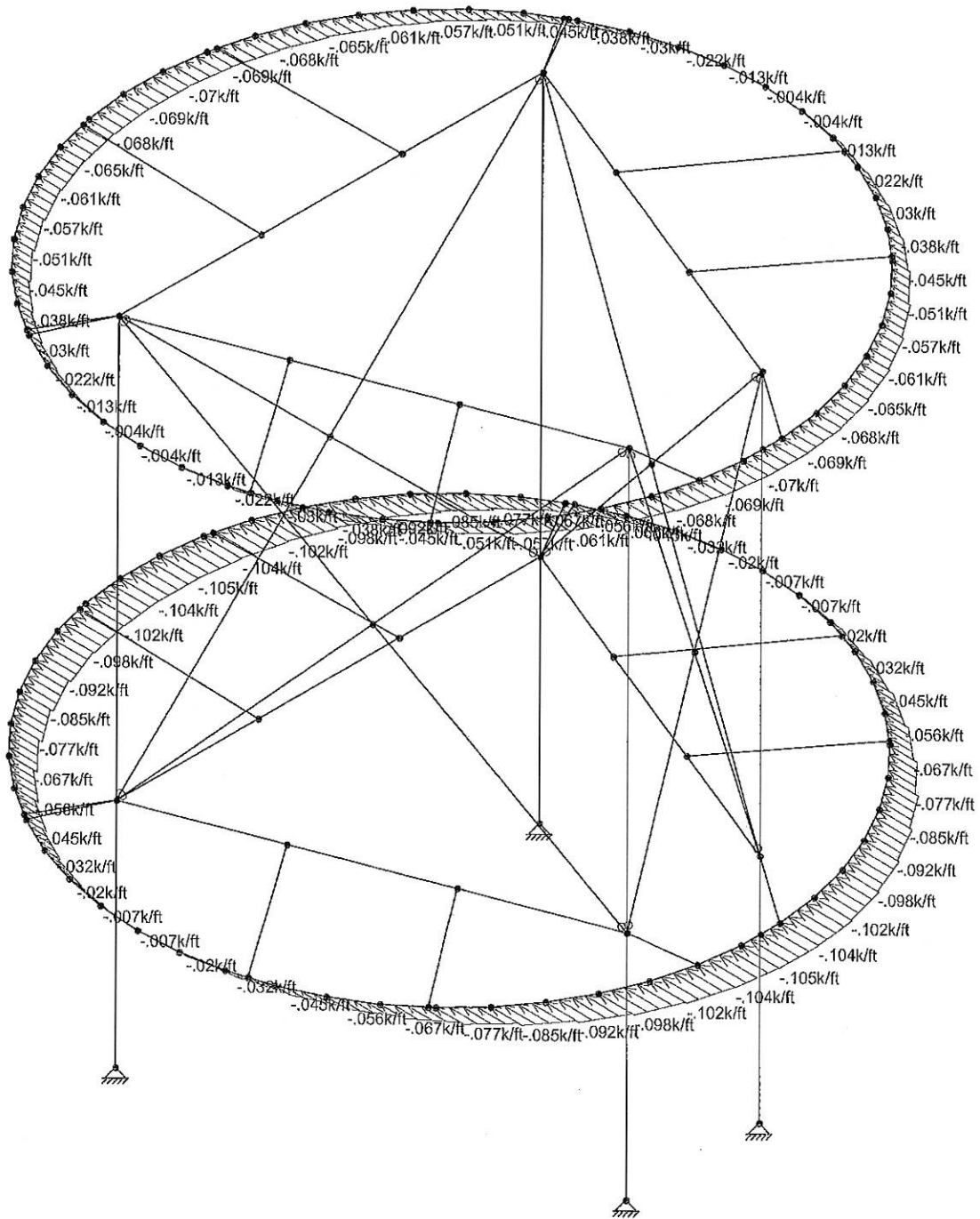
Vector
BDV
U0142-630-121

CT 1887 Tank Concealment Support Frame

SK - 3
Aug 2, 2012 at 7:50 AM
CT 1887 frame.R3D



Sh. 9A

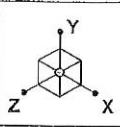


Loads: BLC 3, Wind Load
 Results for LC 1, Dead Load

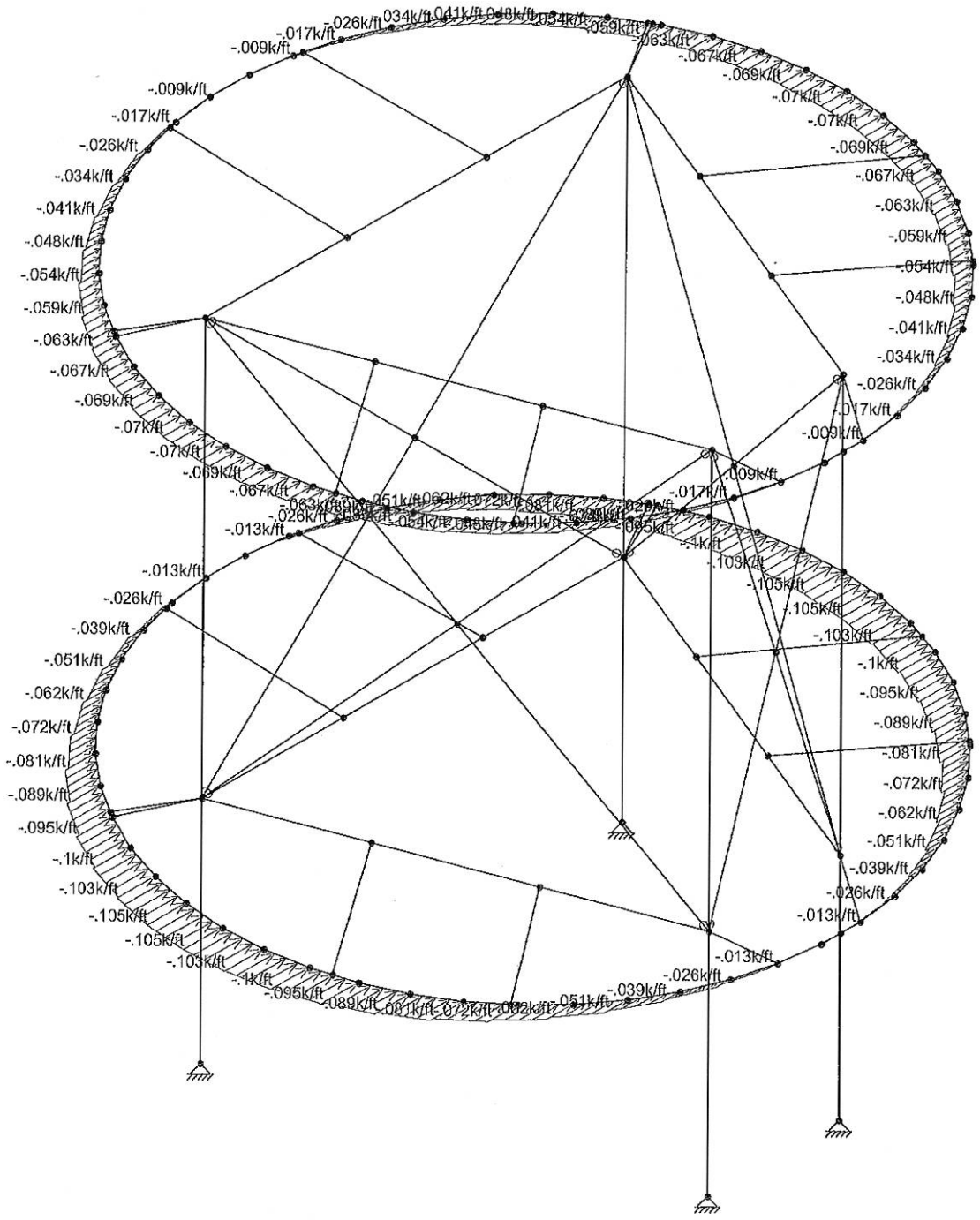
Vector
 BDV
 U0142-630-121

CT 1887 Tank Concealment Support Frame

SK - 4
 Aug 2, 2012 at 7:51 AM
 CT 1887 frame.R3D

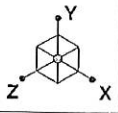


82.98

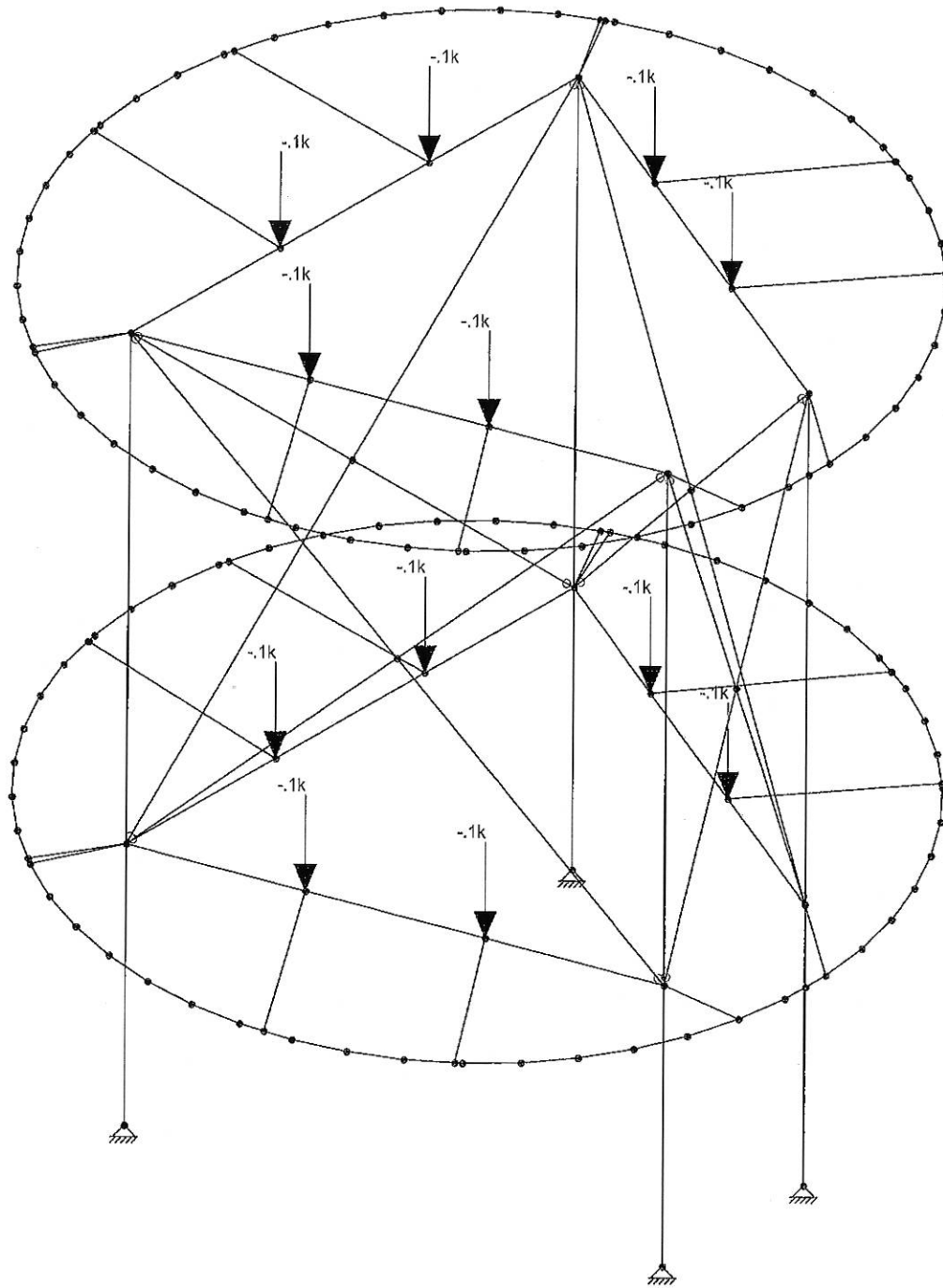


Loads: BLC 5, Wind Load Z
 Results for LC 1, Dead Load

Vector	CT 1887 Tank Concealment Support Frame	SK - 5
BDV		Aug 2, 2012 at 7:51 AM
U0142-630-121		CT 1887 frame.R3D



Sk. 10



Loads: BLC 4, Antennas and Mounts
Results for LC 1, Dead Load

Vector	CT 1887 Tank Concealment Support Frame	SK - 6
BDV		Aug 2, 2012 at 7:51 AM
U0142-630-121		CT 1887 frame.R3D

Hot Rolled Steel Properties

Label	E (ksi)	G (ksi)	Nu	Therm. (1/F)	Density (lb/ft ³)	Yield (ksi)	Rv	Fu (ksi)	Rt
1	A36 Gr.36	29000	11154	3	65	49	36	58	1.2
2	A572 Gr.50	29000	11154	3	65	49	50	58	1.2
3	A992	29000	11154	3	65	49	50	58	1.2
4	A500 Gr.42	29000	11154	3	65	49	42	56	1.1
5	A53 Gr. B	29000	11154	3	65	49	35	56	1.1

Hot Rolled Steel Section Sets

Label	Shape	Type	Design List	Material	Design Rules	A (in ²)	I _y (in ⁴)	I _z (in ⁴)	J (in ⁴)
1	CHANNEL	C6x8.2	Beam	A36 Gr.36	Typical	2.39	88.7	13.1	.074
2	CHANNEL	C4x5.4	Beam	A36 Gr.36	Typical	1.58	31.2	3.85	.04
3	PIPE	PIPE 5.0	Column	A36 Gr.36	Typical	4.01	14.3	14.3	28.6
4	BRACE	L4x4x4	V-Brace	A36 Gr.36	Typical	1.93	3	3	.044

Hot Rolled Steel Design Parameters

Label	Shape	Length (ft)	Lb/ft	Comp. bo (ft)	Segment	L-Top (ft)	Kxy	Kzz	Ch	Function
1	M1	CHANNEL	10.167	Segment	Segment					Lateral
2	M2	CHANNEL	9.459	Segment	Segment					Lateral
3	M3	CHANNEL	9.459	Segment	Segment					Lateral
4	M4	CHANNEL	9.42	Segment	Segment					Lateral
5	M5	CHANNEL	9.42	Segment	Segment					Lateral
6	M6	CHANNEL	9.42	Segment	Segment					Lateral
7	M7	CHANNEL	9.42	Segment	Segment					Lateral
8	M8	CHANNEL	9.42	Segment	Segment					Lateral
9	M9	CHANNEL	9.42	Segment	Segment					Lateral
10	M10	CHANNEL	9.42	Segment	Segment					Lateral
11	M11	CHANNEL	9.42	Segment	Segment					Lateral
12	M12	CHANNEL	9.42	Segment	Segment					Lateral
13	M13	CHANNEL	9.42	Segment	Segment					Lateral
14	M14	CHANNEL	9.42	Segment	Segment					Lateral
15	M15	CHANNEL	9.42	Segment	Segment					Lateral
16	M16	CHANNEL	9.42	Segment	Segment					Lateral
17	M17	CHANNEL	9.42	Segment	Segment					Lateral
18	M18	CHANNEL	9.42	Segment	Segment					Lateral
19	M19	CHANNEL	9.42	Segment	Segment					Lateral
20	M20	CHANNEL	9.42	Segment	Segment					Lateral
21	M21	CHANNEL	9.42	Segment	Segment					Lateral
22	M22	CHANNEL	9.42	Segment	Segment					Lateral
23	M23	CHANNEL	9.42	Segment	Segment					Lateral
24	M24	CHANNEL	9.42	Segment	Segment					Lateral
25	M25	CHANNEL	9.42	Segment	Segment					Lateral
26	M26	CHANNEL	9.42	Segment	Segment					Lateral
27	M27	CHANNEL	9.42	Segment	Segment					Lateral
28	M28	CHANNEL	9.42	Segment	Segment					Lateral
29	M29	CHANNEL	9.42	Segment	Segment					Lateral
30	M30	CHANNEL	9.42	Segment	Segment					Lateral
31	M31	CHANNEL	9.42	Segment	Segment					Lateral
32	M32	CHANNEL	9.42	Segment	Segment					Lateral
33	M33	CHANNEL	9.42	Segment	Segment					Lateral
34	M34	CHANNEL	9.42	Segment	Segment					Lateral
35	M35	CHANNEL	9.42	Segment	Segment					Lateral
36	M36	CHANNEL	9.42	Segment	Segment					Lateral
37	M37	CHANNEL	9.42	Segment	Segment					Lateral
38	M38	CHANNEL	9.42	Segment	Segment					Lateral
39	M39	CHANNEL	9.42	Segment	Segment					Lateral

Hot Rolled Steel Design Parameters (Continued)

Label	Shape	Length (ft)	Lb/ft	Comp. bo (ft)	Segment	L-Top (ft)	Kxy	Kzz	Ch	Function
40	M40	CHANNEL	9.42	Segment	Segment					Lateral
41	M41	CHANNEL	9.42	Segment	Segment					Lateral
42	M42	CHANNEL	9.42	Segment	Segment					Lateral
43	M43	CHANNEL	9.42	Segment	Segment					Lateral
44	M44	CHANNEL	9.42	Segment	Segment					Lateral
45	M45	CHANNEL	9.42	Segment	Segment					Lateral
46	M46	CHANNEL	9.42	Segment	Segment					Lateral
47	M47	CHANNEL	9.42	Segment	Segment					Lateral
48	M48	CHANNEL	9.42	Segment	Segment					Lateral
49	M49	CHANNEL	9.42	Segment	Segment					Lateral
50	M50	CHANNEL	9.42	Segment	Segment					Lateral
51	M51	CHANNEL	9.42	Segment	Segment					Lateral
52	M52	CHANNEL	9.42	Segment	Segment					Lateral
53	M53	CHANNEL	9.42	Segment	Segment					Lateral
54	M54	CHANNEL	4.39	Segment	Segment					Lateral
55	M55	CHANNEL	4.39	Segment	Segment					Lateral
56	M56	CHANNEL	3.939	Segment	Segment					Lateral
57	M57	CHANNEL	3.94	Segment	Segment					Lateral
58	M58	CHANNEL	3.939	Segment	Segment					Lateral
59	M59	CHANNEL	3.939	Segment	Segment					Lateral
60	M60	CHANNEL	1.626	Segment	Segment					Lateral
61	M61	CHANNEL	1.626	Segment	Segment					Lateral
62	M62	CHANNEL	1.626	Segment	Segment					Lateral
63	M63	CHANNEL	1.626	Segment	Segment					Lateral
64	M64	CHANNEL	9.469	Segment	Segment					Lateral
65	M65	CHANNEL	9.469	Segment	Segment					Lateral
66	M66	CHANNEL	9.42	Segment	Segment					Lateral
67	M67	CHANNEL	9.42	Segment	Segment					Lateral
68	M68	CHANNEL	9.42	Segment	Segment					Lateral
69	M69	CHANNEL	9.42	Segment	Segment					Lateral
70	M70	CHANNEL	9.42	Segment	Segment					Lateral
71	M71	CHANNEL	9.42	Segment	Segment					Lateral
72	M72	CHANNEL	9.42	Segment	Segment					Lateral
73	M73	CHANNEL	9.42	Segment	Segment					Lateral
74	M74	CHANNEL	9.42	Segment	Segment					Lateral
75	M75	CHANNEL	9.42	Segment	Segment					Lateral
76	M76	CHANNEL	9.42	Segment	Segment					Lateral
77	M77	CHANNEL	9.42	Segment	Segment					Lateral
78	M78	CHANNEL	9.42	Segment	Segment					Lateral
79	M79	CHANNEL	9.42	Segment	Segment					Lateral
80	M80	CHANNEL	9.42	Segment	Segment					Lateral
81	M81	CHANNEL	9.42	Segment	Segment					Lateral
82	M82	CHANNEL	9.42	Segment	Segment					Lateral
83	M83	CHANNEL	9.42	Segment	Segment					Lateral
84	M84	CHANNEL	9.42	Segment	Segment					Lateral
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90	M90	CHANNEL	9.42	Segment	Segment					Lateral
91	M91	CHANNEL	9.42	Segment	Segment					Lateral
92	M92	CHANNEL	9.42	Segment	Segment					Lateral
93	M93	CHANNEL	9.42	Segment	Segment					Lateral
94	M94	CHANNEL	9.42	Segment	Segment					Lateral
95	M95	CHANNEL	9.42	Segment	Segment					Lateral
96	M96	CHANNEL	9.42	Segment	Segment					Lateral
97	M97	CHANNEL	9.42	Segment	Segment					Lateral

26.11