STATE OF CONNECTICUT
CONNECTICUT SITING COUNCIL
Ten Franklin Square, New Britain, CT 06051
Phone: (860) 827-2935 Fax: (860) 827-2950
E-Mail: siting.council@ct.gov
www.ct.gov/csc

VIA ELECTRONIC MAIL

October 10, 2019

Kristina Cottone
Real Estate Specialist
Smartlink, LLC
85 Rangeway Road, Building 3, Suite 102
Billerica, MA 01862

RE: **EM-AT&T-103-190916 –** AT&T Mobility, LLC notice of intent to modify an existing telecommunications facility located at 600 Connecticut Avenue, Norwalk, Connecticut.

Dear Ms. Cottone:

The Connecticut Siting Council (Council) is in receipt of your correspondence of September 23, 2019 and October 7, 2019 submitted in response to the Council's September 20, 2019 and October 1, 2019 notification of an incomplete request for exempt modification with regard to the above-referenced matter.

The submissions render the request for exempt modification complete and the Council will process the request in accordance with the Federal Communications Commission 60-day timeframe.

Thank you for your attention and cooperation.

Sincerely,

Melanie A. Bachman
Executive Director

MAB/IN/emr

Robidoux, Evan

From:	Kristina Cottone <kristina.cottone@smartlinkllc.com>
Sent:	Monday, October 07, 2019 10:59 AM
To:	Robidoux, Evan
Cc:	CSC-DL Siting Council
Subject:	RE: Council Incomplete Letter
Attachments:	10034974_DE118_181206_CTL02108_MA_PASS w Mods.pdf

Good morning,

Please see attached requested document to finish this outstanding CSC filing. Please let me know if you need anything else.

Thank you,

smartlink

Kristina Cottone | Real Estate Specialist
Smartlink
85 Rangeway Road – Building 3 Suite 102
North Billerica MA, 01862
(m) 978.551.8627
Kristina.cottone@Smartlinkllc.com
smartlinkllc.com

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From: Robidoux, Evan <Evan.Robidoux@ct.gov>
Sent: Wednesday, October 2, 2019 10:37 AM
To: Kristina Cottone <kristina.cottone@smartlinkllc.com>
Cc: CSC-DL Siting Council <Siting.Council@ct.gov>
Subject: Council Incomplete Letter

Please see the attached correspondence.

Evan Robidoux
Clerk Typist

Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

FULLERTON
ENGINEERING·DESIGN

Fullerton Engineering Consultants, Inc.
1100 E. Woodfield Road, Suite 500
Schaumburg, IL 60173
Tel: 847.908.8400
www.fullertonengineering.com

December 5, 2018

RE:	**AT&T LTE 4C/5C/6C/7C/ RRH ADD**
Prepared For:	Smartlink / AT&T
Site Number:	CTL02108
FA Location:	10034974
Pace Number:	MRCTB025283/MRCTB025338/MRCTB025304/ MRCTB026716/MRCTB017068
Site Name:	NORWALK WEST-CT AVE.
Site Address:	613 Connecticut Avenue Norwalk, CT 06850

To Whom It May Concern,

This structural assessment is in regards to the adequacy of the existing low profile platform with handrails for the AT&T LTE 4C/5C/6C/7C/RRH ADD project. The purpose was to determine conformance of the existing antenna mounting structure under the 2018 Connecticut State Building Code and the industry standard ANSI/TIA-222-G (Structural Standards for Steel Antenna Towers and Antenna Supporting Structures). The antenna and the equipment supports were rated to the code requirement of 121 mph ultimate design wind speed, 110 m ph (3-second gust) basic wind speed, and an ice thickness of 0.75in. In addition, the mount has been analyzed for various live loading conditions consisting of a 250-pound man live load applied individually at the midpoint and cantilevered ends of horizontal members as well as a 500-pound man live load applied individually at mount pipe locations using a 3-second gust wind speed of 30 mph.

Based on collected information via a site visit dated 10/22/2018, technical data of the proposed equipment, structural calculations and engineering judgment, the existing low-profile platform with handrails is **adequate** to support the proposed installation for the above-referenced program. For installation details, see latest construction drawings prepared by Fullerton Engineering.

This PE certification completed by Fullerton Engineering Consultants is inclusive of the existing antenna mounting structure that will support the existing and proposed loading provided by the client.

This certification assumes that all the existing structural members of the existing antenna mounting structure are in good condition and have not been altered from the manufacturer's original design. Prior to installation of new equipment, contractor shall inspect the condition of all relevant members and connectors. The contractor shall be responsible for the means and methods of construction.

Respectfully,

Henry M. Bellagamba, P.E.

STATE OF CONNECTICUT
HENRY M. BELLAGAMBA
25358
LICENSED
PROFESSIONAL ENGINEER

FULLERTON
ENGINEERING · DESIGN

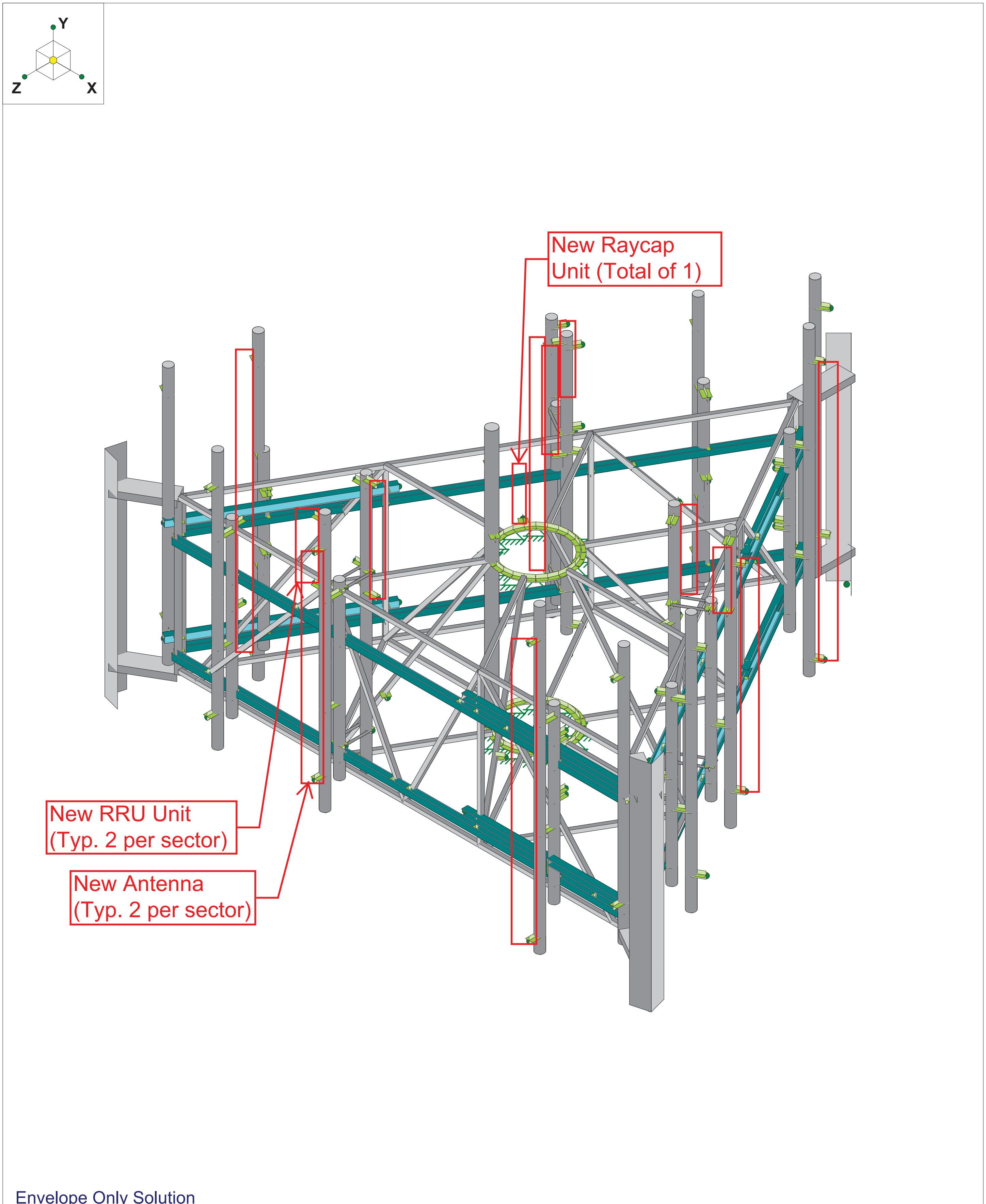
Fullerton Engineering Consultants, Inc.
1100 E. Woodfield Road, Suite 500
Schaumburg, IL 60173
Tel: 847.908.8400
www.fullertonengineering.com

Site Number: **CTL02108**
Site Name: Norwalk West-Ct Ave.
Created By: RH
Checked By: BK
Date: 12/5/2018
Code: ANSI/TIA-222-G

Sectors	3
Ka	0.9

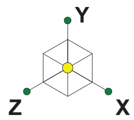
Base Structure Type	**Type**	Monopole	
Structure Height Above Grade (ft)	**Ht**	150.00	
RAD Center (ft)	**z**	135.00	
Windspeed no ice (mph, 3-sec gust)	**V**	110.00	see wind maps
Windspeed with ice (mph, 3-sec gust)	**Vi**	50.00	see wind maps
Windspeed for maintenance (mph, 3-sec gust)	**Vm**	30.00	Section 16.6
Ice Thickness	**ti**	0.75	see ice maps
Exposure Category (B/C/D)	**Exposure**	B	Section 2.6.5.1
Topographic Category (1,2,3,4)	**Topo**	1	Section 2.6.6.2
Structure Class (I,II,III)	**Class**	II	Table 2-1
Crest Height (or assume 5ft)	**C**	5.00	Section 2.6.6.4
Gust Effect Factor	**Gh**	0.85	Section 2.6.7.1
Design Ice Thickness	**tiz**	1.73	Section 2.6.8
Velocity Pressure for Maintenance	**qzm**	2.12	
Velocity Pressure With Ice	**qzi**	6.55	Section 2.6.9.6
Velocity Pressure No Ice	**qz**	31.68	Section 2.6.9.6

Appurtenance Properties								Loads (force per connection)							
Manufacturer	**Model**	**R/F**	**L**	**W**	**D**	**Weight**	**# Conn**	**Wt**	**Ice Wt**	**F no ice**	**S no ice**	**F ice**	**S ice**	**Fm**	**Sm**
Quintel	66512-2	Flat	72	12	9.6	111	2	55.5	85.7	99	82	26	23	7	6
Commscope	SBNHH-1D65A	Flat	55	11.9	7.1	43.5	2	21.8	53.8	71	47	20	14	5	3
Powerwave	7770	Flat	55	11	5	39	2	19.5	43.0	67	35	19	12	4	2
Ericsson	RRUS 32 B2	Flat	27.2	12.1	7	53	2	26.5	28.9	33	20	10	7	2	1
Ericsson	RRUS 4478 B14	Flat	16.5	13.4	7.7	59.5	2	29.8	22.5	22	13	7	5	1	1
Ericsson	RRUS-11	Flat	19.7	17	7.2	50	2	25.0	26.0	34	14	10	5	2	1
Ericsson	RRUS 32	Flat	27.2	12.1	7	60	2	30.0	28.9	33	20	10	7	2	1
Powerwave	LGP-21401	Flat	14.4	9.2	2.6	14.1	2	7.1	10.0	13	4	5	2	1	0
Raycap	DC6-48-60-18-8F	Round	24	9.7	9.7	32.8	1	32.8	63.9	27	27	9	9	2	2
						520.5									
	HSS1x1x8	Flat	126	1	1	0	10.5	0.0	6.6	4	4	4	4	0	0
	C3x6	Flat	42	3	1.6	0	3.500	0.0	10.8	10	6	4	3	1	1
	C5x6.7	Flat	14	5	1.8	0	1.167	0.0	14.9	12	5	5	3	1	1
	L5x5x5	Flat	60	5	5	0	5	0.0	18.6	16	16	5	5	1	1
	Unistrut	Flat	126	1.6	1.6	0	10.5	0.0	8.4	6	6	4	4	0	0
	Pipe 2.0	Round	72	2.4	2.4	0	6	0.0	8.7	6	6	2	2	0	0
	Pipe 2.0	Round	96	2.4	2.4	0	8	0.0	8.7	6	6	3	3	0	0
	Pipe 2.5	Round	96	2.9	2.9	0	8	0.0	9.8	7	7	3	3	0	0



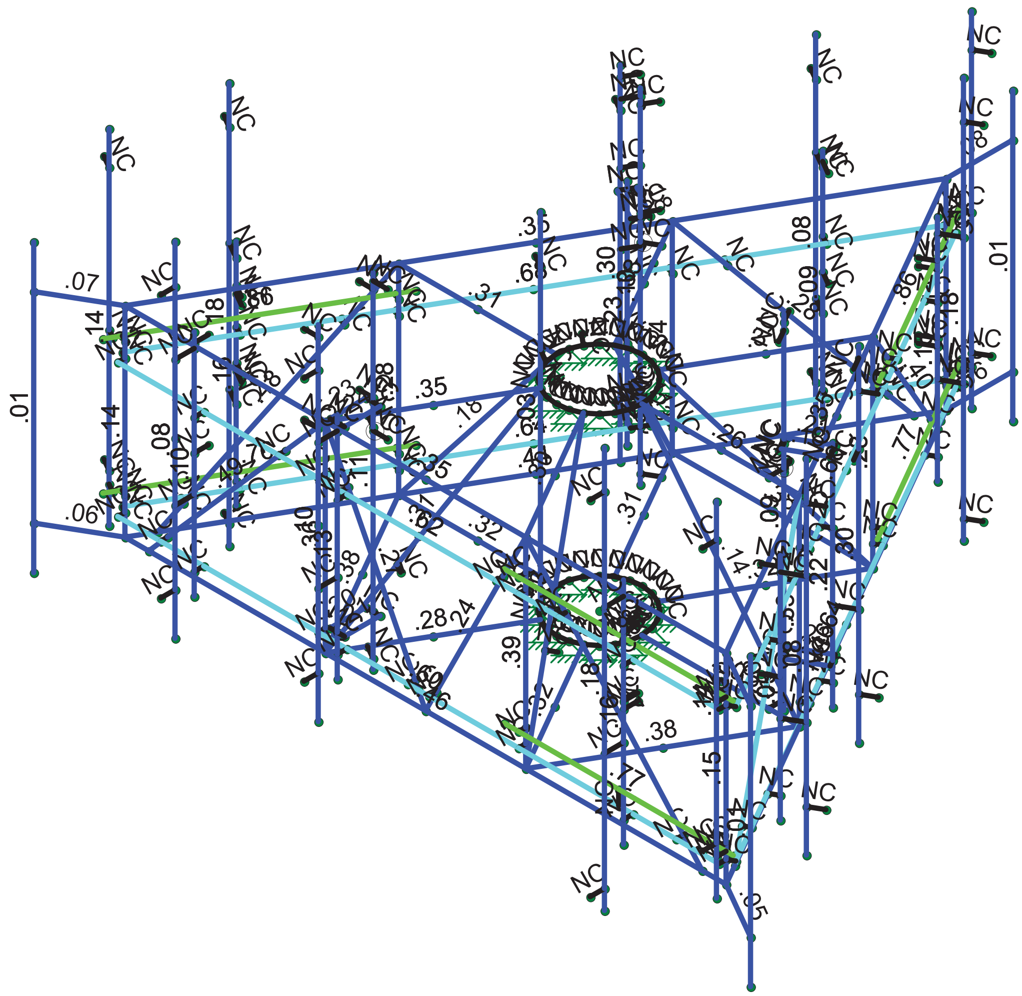
Envelope Only Solution

Fullerton Engineering Con...		SK - 1
RH	Mount Analysis	Dec 5, 2018 at 6:12 PM
CTL02108	3D Render	CTL02108 - Mount Analysis - Con...



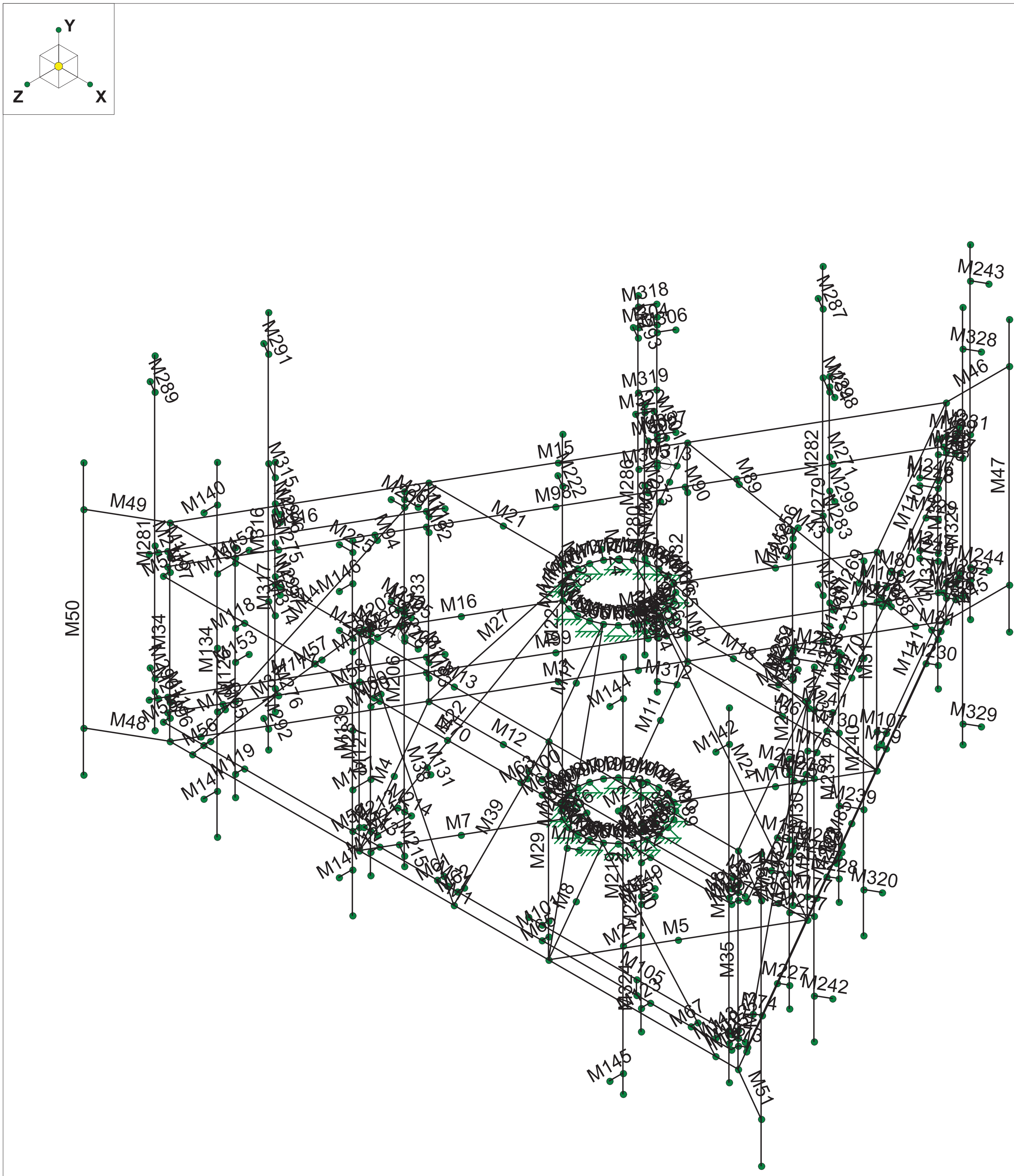
Code Check
(Env)

- No Calc
- > 1.0
- .90-1.0
- .75-.90
- .50-.75
- 0.-.50



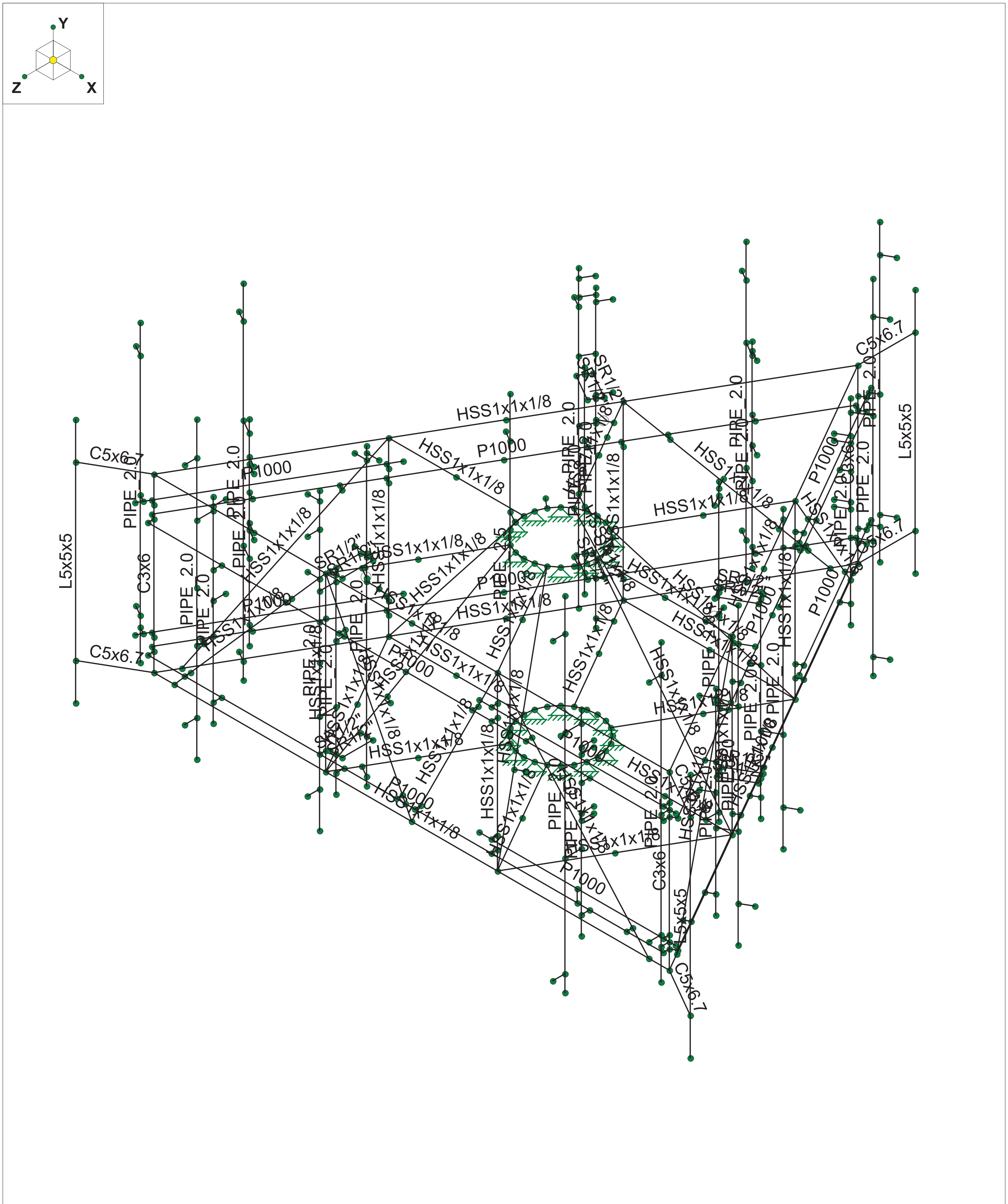
Member Code Checks Displayed (Enveloped)
Envelope Only Solution

Fullerton Engineering Con...		SK - 2
RH	Mount Analysis	Dec 5, 2018 at 6:13 PM
CTL02108	Unity Graphic	CTL02108 - Mount Analysis - Con...



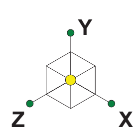
Envelope Only Solution

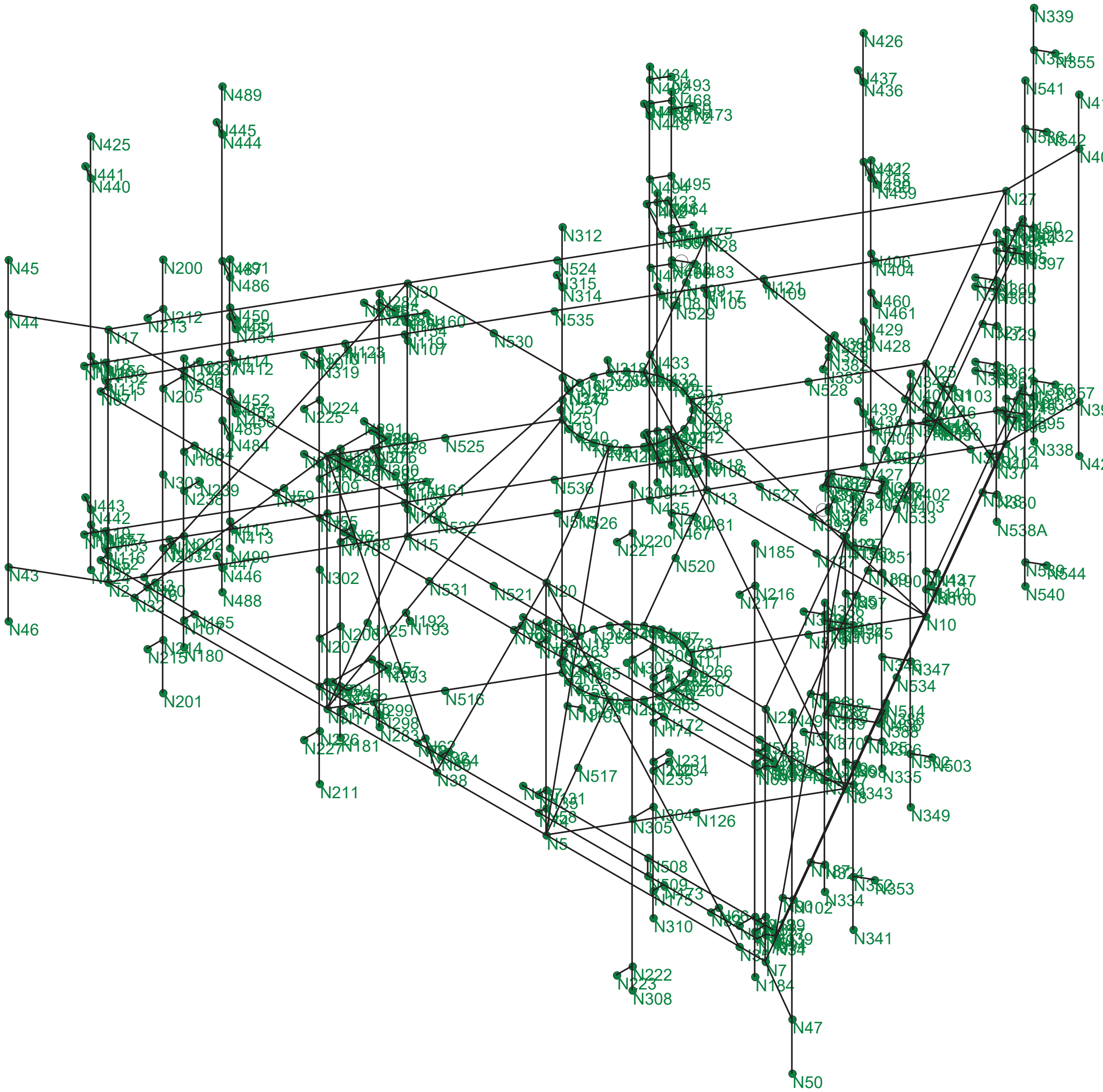
Fullerton Engineering Con...		SK - 3
RH	Mount Analysis	Dec 5, 2018 at 6:14 PM
CTL02108	Member Label	CTL02108 - Mount Analysis - Con...



Envelope Only Solution

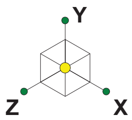
Fullerton Engineering Con...		SK - 4
RH	Mount Analysis	Dec 5, 2018 at 6:15 PM
CTL02108	Shape	CTL02108 - Mount Analysis - Con...

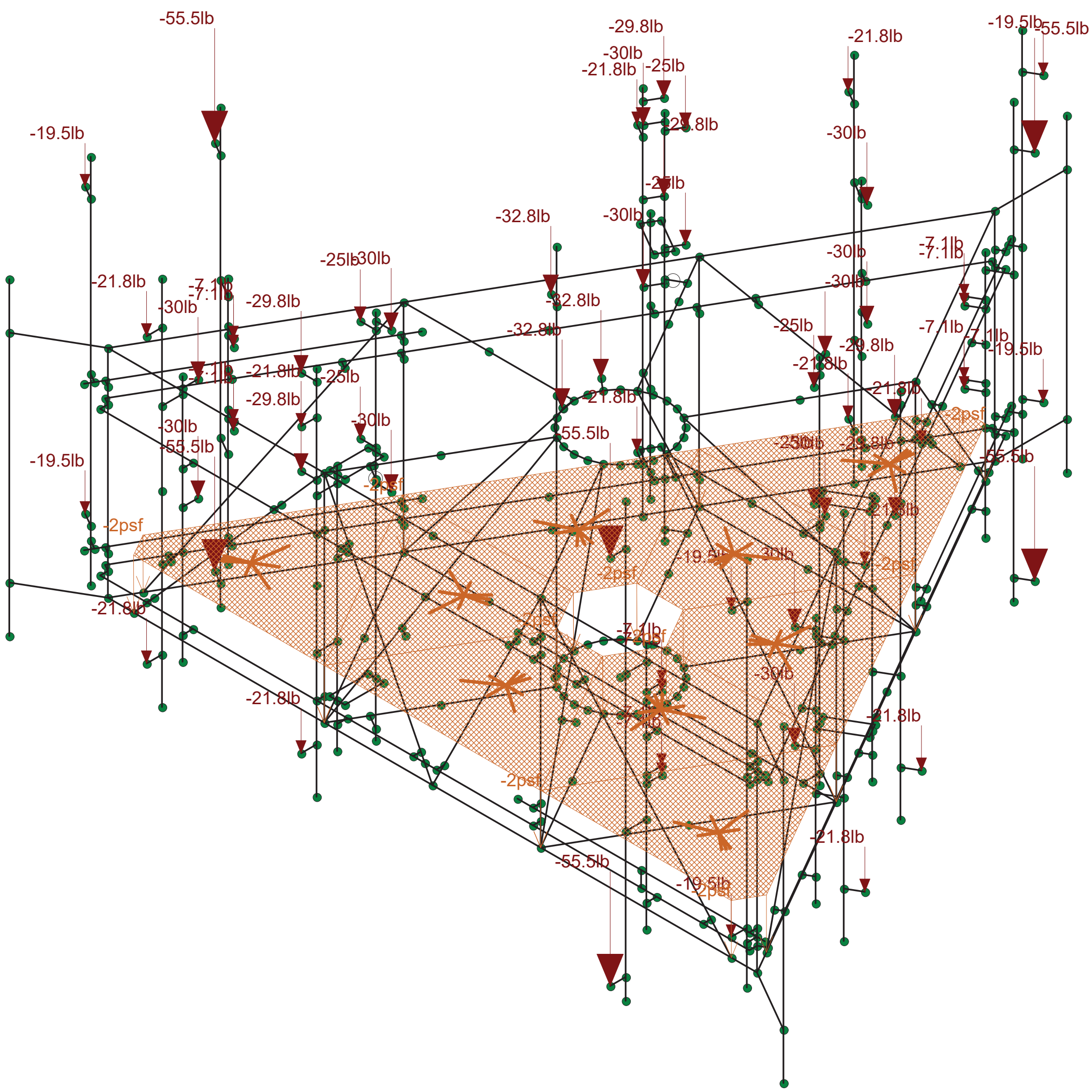




Envelope Only Solution

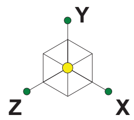
Fullerton Engineering Con...		SK - 5
RH	Mount Analysis	Dec 5, 2018 at 6:16 PM
CTL02108	Nodes	CTL02108 - Mount Analysis - Con...

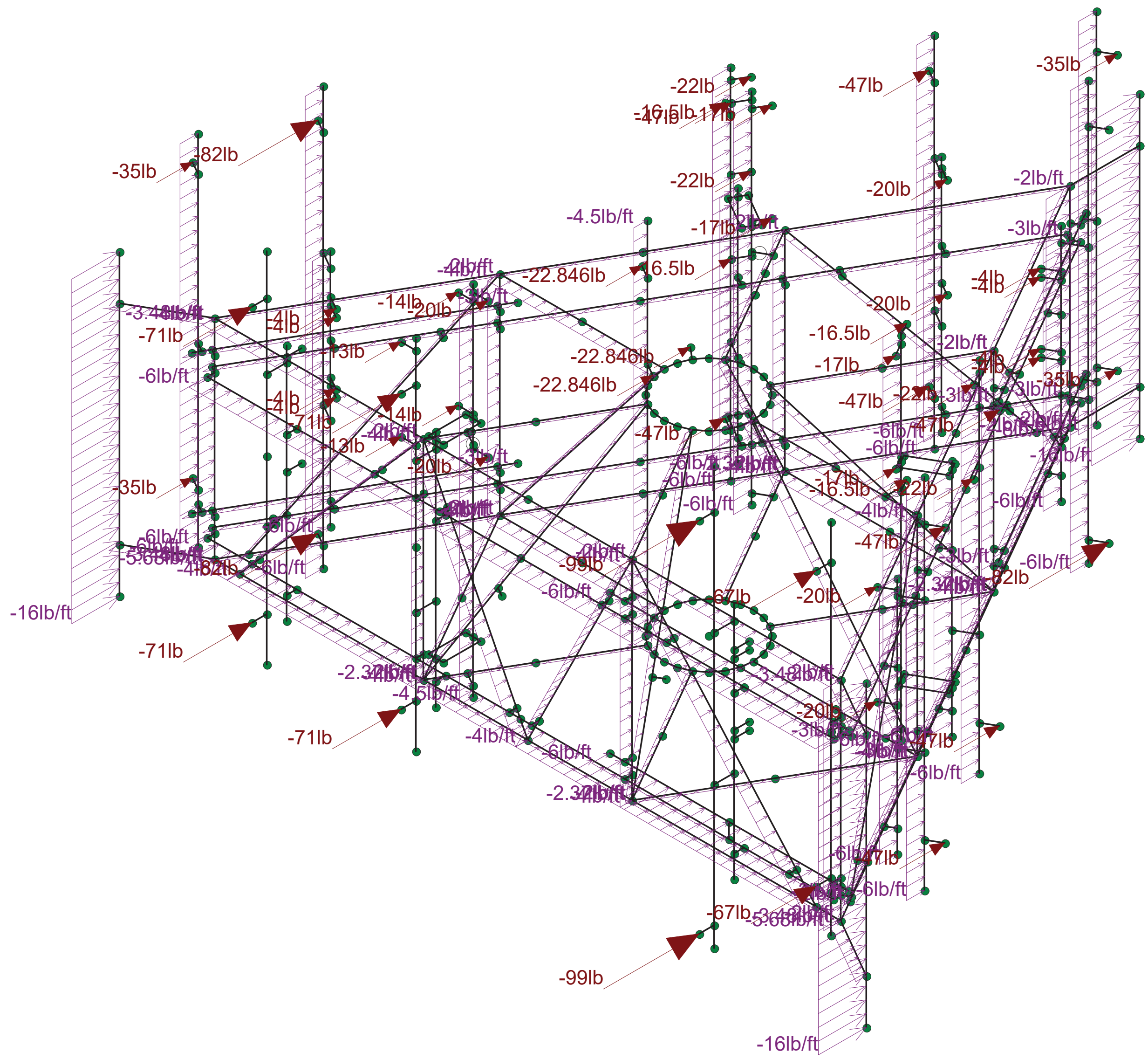




Loads: BLC 1, DL
Envelope Only Solution

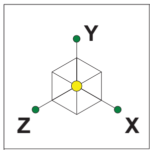
Fullerton Engineering Con...		SK - 6
RH	Mount Analysis	Dec 5, 2018 at 6:17 PM
CTL02108	Dead Load	CTL02108 - Mount Analysis - Con...

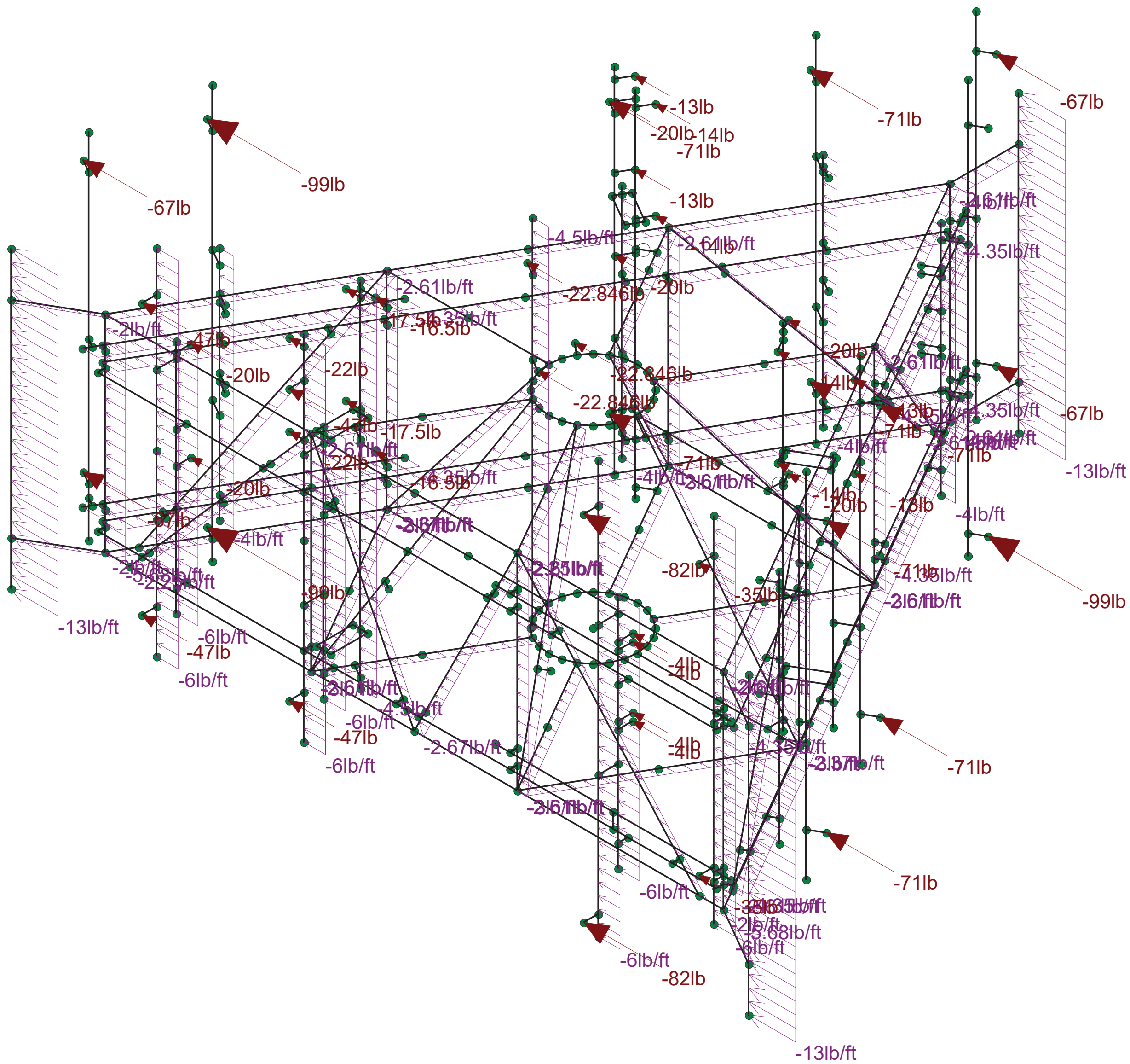




Loads: BLC 3, WL(0)
Envelope Only Solution

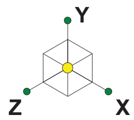
Fullerton Engineering Con...		SK - 7
RH	Mount Analysis	Dec 5, 2018 at 6:18 PM
CTL02108	Wind Load (Z-Direction)	CTL02108 - Mount Analysis - Con...

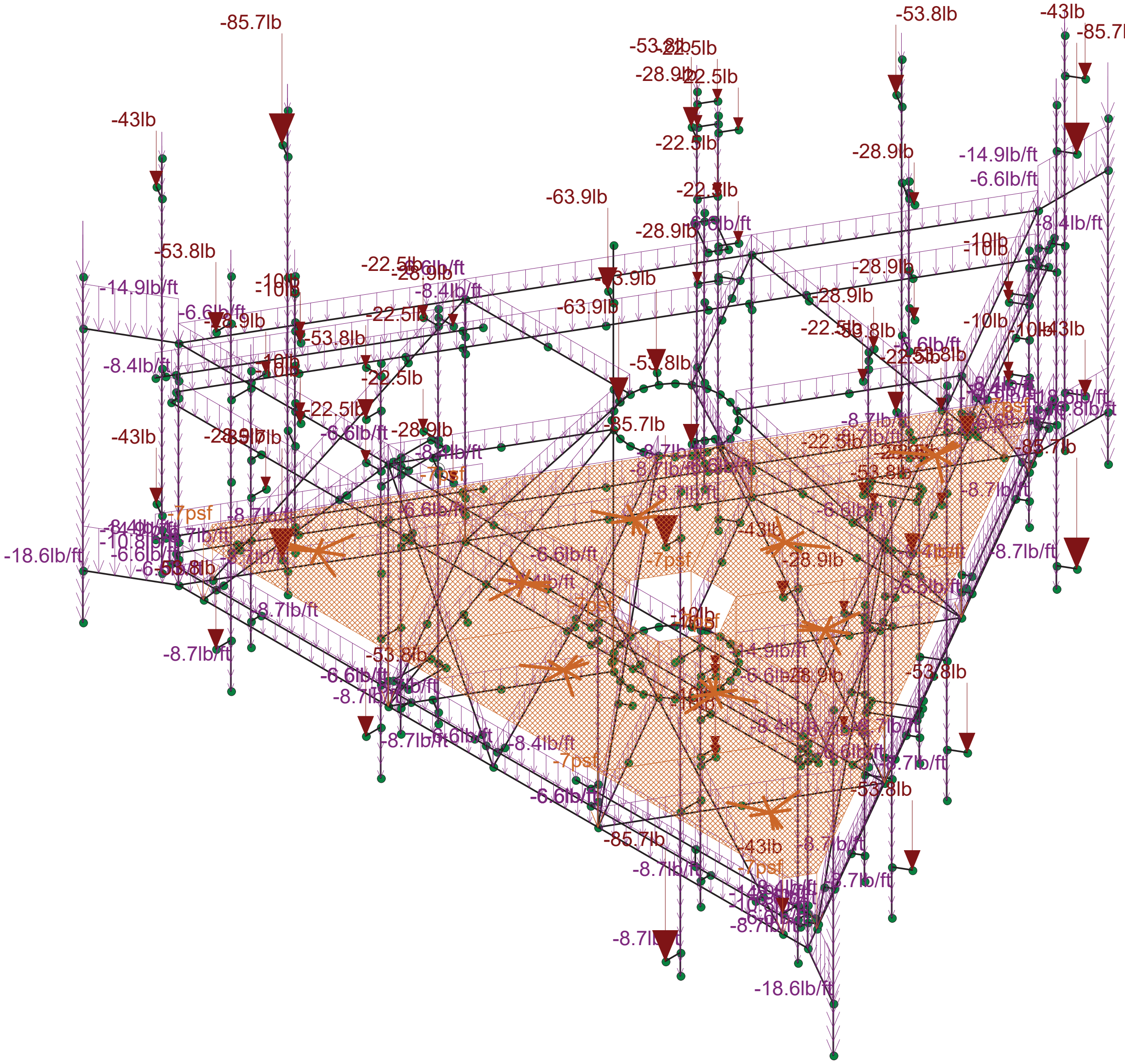




Loads: BLC 4, WL(90)
Envelope Only Solution

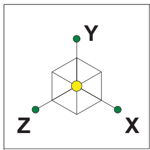
Fullerton Engineering Con...		SK - 8
RH	Mount Analysis	Dec 5, 2018 at 6:18 PM
CTL02108	Wind Load (X-Direction)	CTL02108 - Mount Analysis - Con...

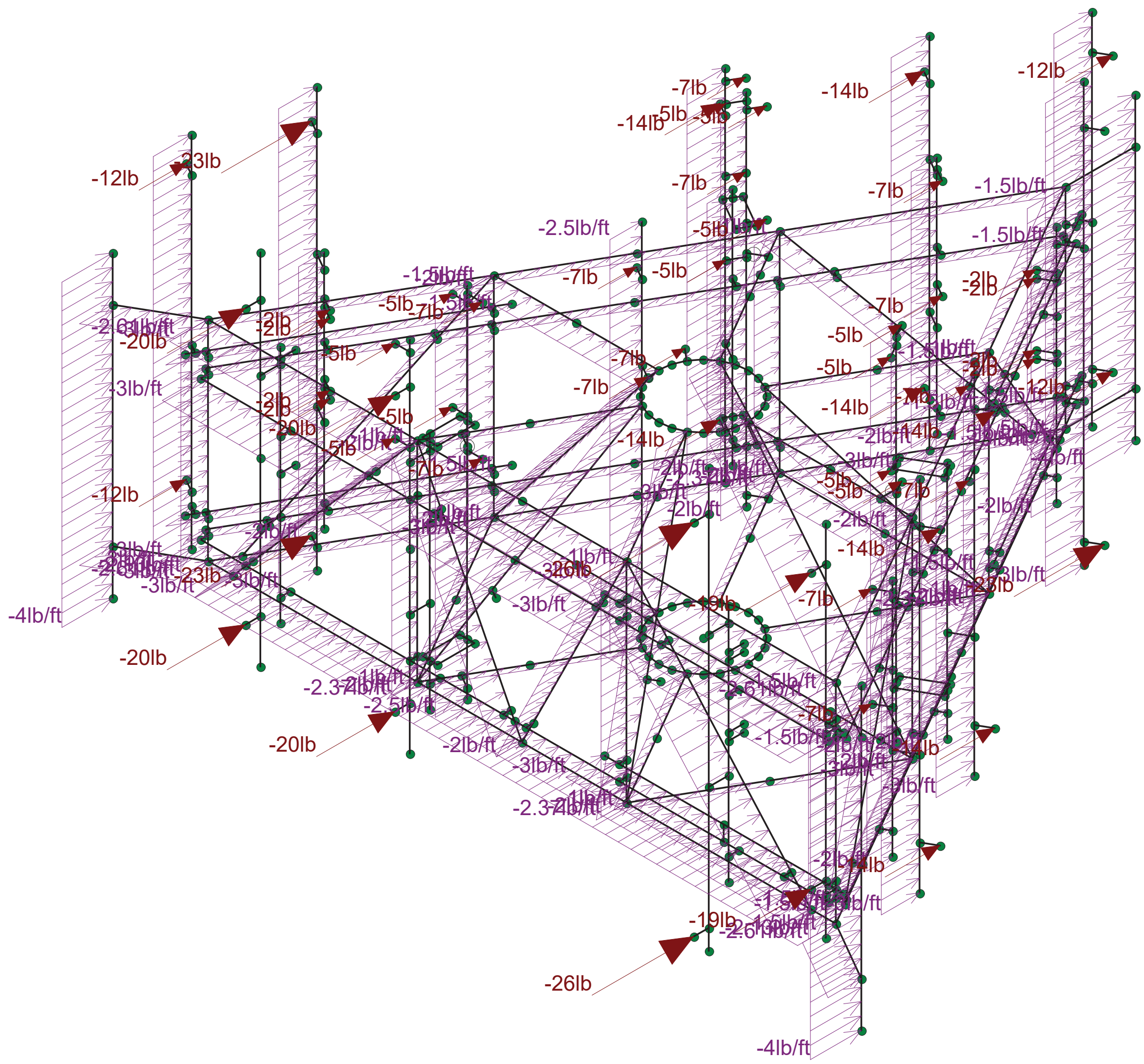




Loads: BLC 2, DLi
Envelope Only Solution

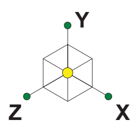
Fullerton Engineering Con...		SK - 9
RH	Mount Analysis	Dec 5, 2018 at 6:19 PM
CTL02108	Ice Load	CTL02108 - Mount Analysis - Con...

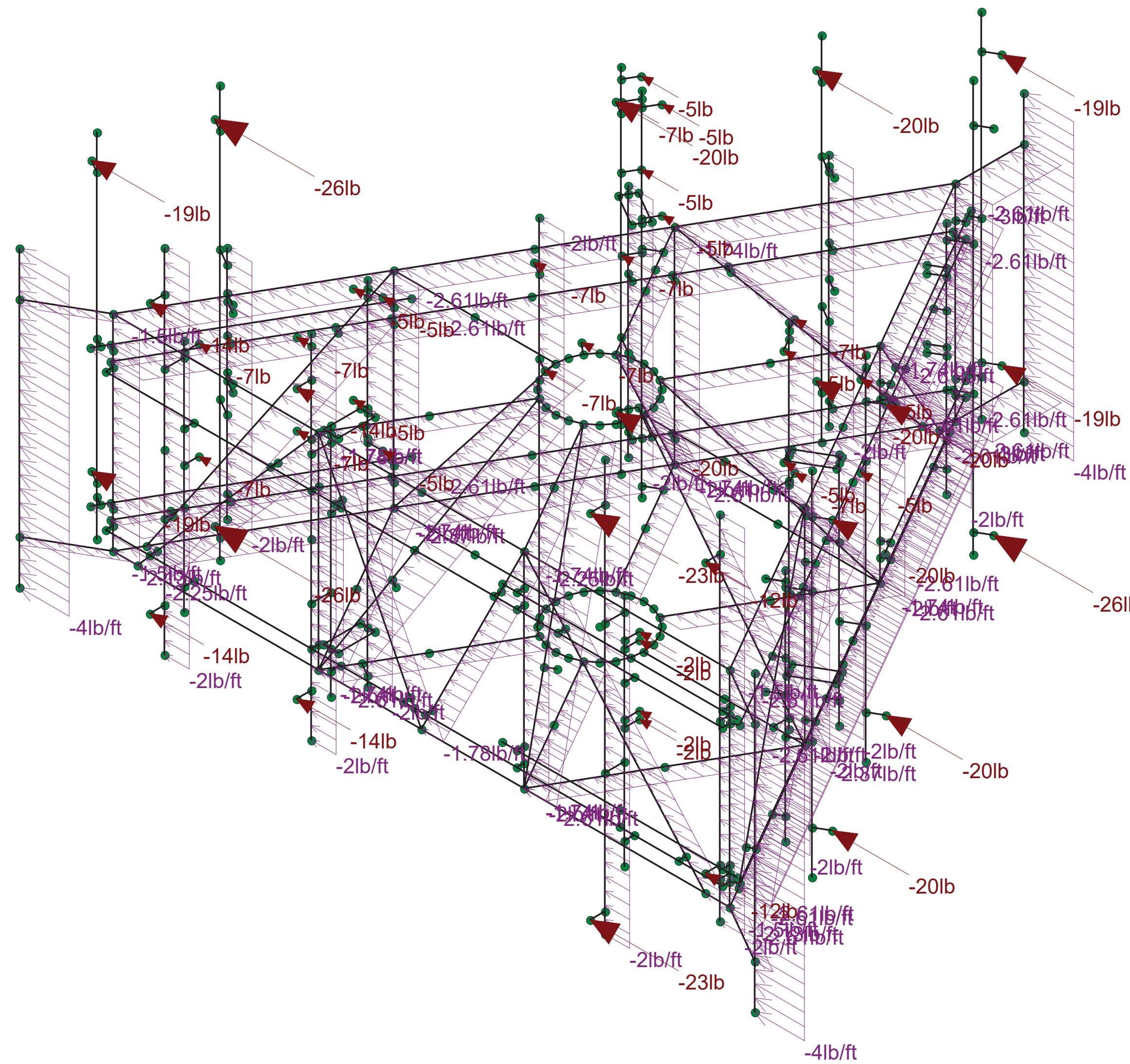




Loads: BLC 5, WL.i(0)
Envelope Only Solution

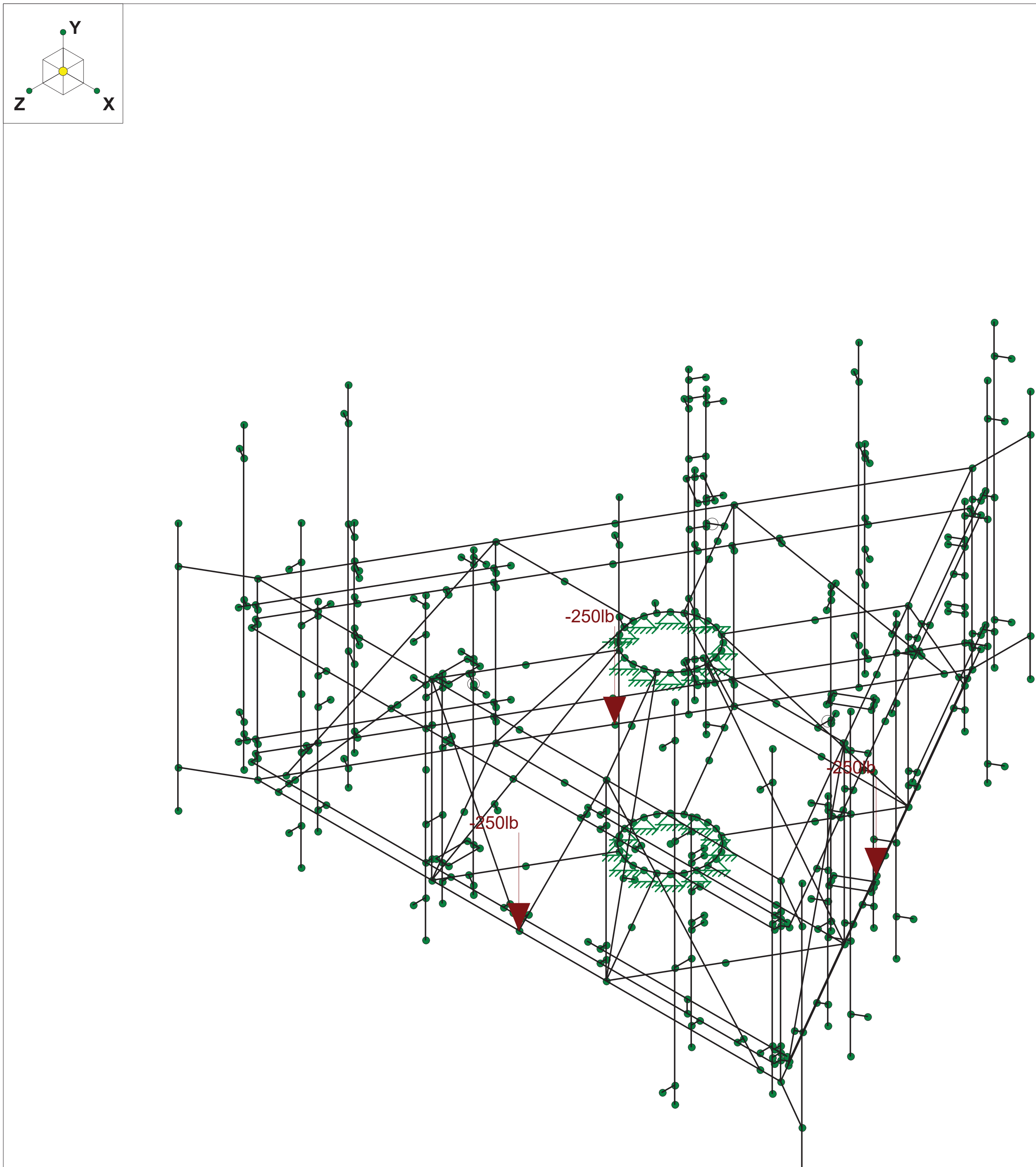
Fullerton Engineering Con...		SK - 10
RH	Mount Analysis	Dec 5, 2018 at 6:21 PM
CTL02108	Wind Load with Ice (Z-Direction)	CTL02108 - Mount Analysis - Con...





Loads: BLC 6, WL.i(90)
Envelope Only Solution

Fullerton Engineering Con...		SK - 11
RH	Mount Analysis	Dec 5, 2018 at 6:22 PM
CTL02108	Wind Load with Ice (X-Direction)	CTL02108 - Mount Analysis - Con...



250 lb Live Loads are applied on each face horizontal and standoff members.
Only one is shown for clarification purposes but all are considered in the calculations.

Loads: BLC 10, LV1
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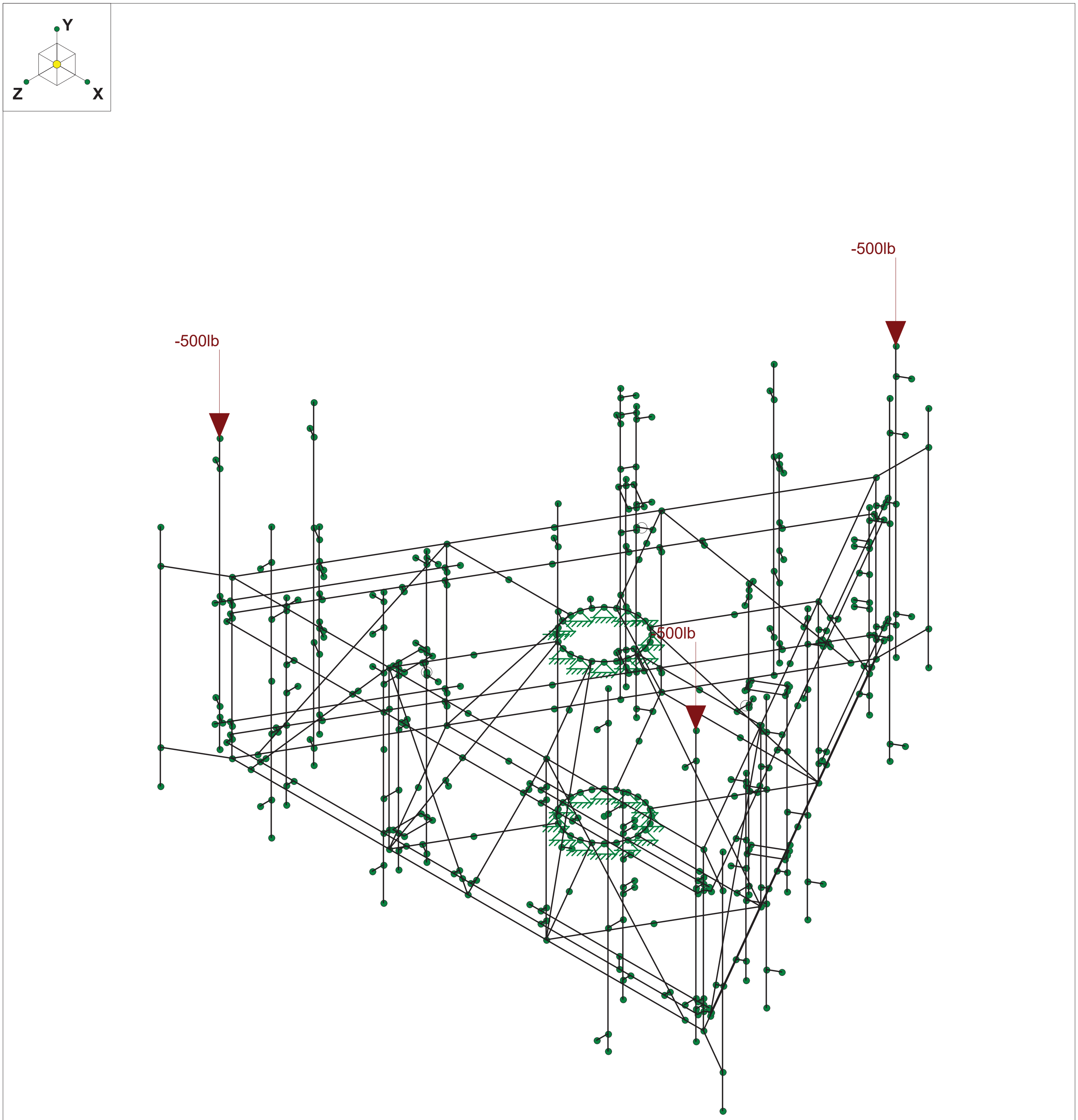
Fullerton Engineering Con...		SK - 12
RH	Mount Analysis	Dec 5, 2018 at 6:22 PM
CTL02108	250 lb Live Load	CTL02108 - Mount Analysis - Con...



500 lb Live Loads are applied at mounting pipe positions.
Only one id shown for clarification purposes but all are considered in the calculations.

Loads: BLC 12, LM1
Envelope Only Solution

Fullerton Engineering Con...		SK - 13
RH	Mount Analysis	Dec 5, 2018 at 6:23 PM
CTL02108	500 lb Live Load	CTL02108 - Mount Analysis - Con...

(Global) Model Settings

Display Sections for Member Calcs	5
Max Internal Sections for Member Calcs	97
Include Shear Deformation?	Yes
Increase Nailing Capacity for Wind?	Yes
Include Warping?	Yes
Trans Load Btwn Intersecting Wood Wall?	Yes
Area Load Mesh (in^2)	144
Merge Tolerance (in)	.12
P-Delta Analysis Tolerance	0.50%
Include P-Delta for Walls?	Yes
Automatically Iterate Stiffness for Walls?	Yes
Max Iterations for Wall Stiffness	3
Gravity Acceleration (in/sec^2)	386.4
Wall Mesh Size (in)	12
Eigensolution Convergence Tol. (1.E-)	4
Vertical Axis	Y
Global Member Orientation Plane	XZ
Static Solver	Sparse Accelerated
Dynamic Solver	Accelerated Solver

Hot Rolled Steel Code	AISC 14th(360-10): LRFD
Adjust Stiffness?	Yes(Iterative)
RISAConnection Code	AISC 14th(360-10): LRFD
Cold Formed Steel Code	AISI S100-12: LRFD
Wood Code	None
Wood Temperature	< 100F
Concrete Code	None
Masonry Code	None
Aluminum Code	None - Building

Number of Shear Regions	4
Region Spacing Increment (in)	4
Biaxial Column Method	Exact Integration
Parme Beta Factor (PCA)	.65
Concrete Stress Block	Rectangular
Use Cracked Sections?	Yes
Use Cracked Sections Slab?	Yes
Bad Framing Warnings?	No
Unused Force Warnings?	Yes
Min 1 Bar Diam. Spacing?	No
Concrete Rebar Set	REBAR_SET_ASTMA615
Min % Steel for Column	1
Max % Steel for Column	8

(Global) Model Settings, Continued

Seismic Code	ASCE 7-10
Seismic Base Elevation (in)	Not Entered
Add Base Weight?	Yes
Ct X	.02
Ct Z	.02
T X (sec)	Not Entered
T Z (sec)	Not Entered
R X	3
R Z	3
Ct Exp. X	.75
Ct Exp. Z	.75
SD1	1
SDS	1
S1	1
TL (sec)	5
Risk Cat	I or II
Drift Cat	Other
Om Z	1
Om X	1
Cd Z	4
Cd X	4
Rho Z	1
Rho X	1

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distribut...	Area(M...	Surface...
1	DL	None		-1		63			9	
2	DLi	None				63		89	9	
3	WL(0)	None				56		81		
4	WL(90)	None				50		66		
5	WL.i(0)	None				56		81		
6	WL.i(90)	None				50		67		
7	T	None								
8	WM(0)	None				45		51		
9	WM(90)	None				43		45		
10	LV1	None				3				
11	LV2	None				3				
12	LM1	None				3				
13	LM2	None				3				
14	LM3	None				3				
15	LM4	None				3				
16	LM5	None				3				
17	LM6	None				3				
18	LM7	None				3				
19	LM8	None				1				
20	LV3	None				3				
21	LV4	None				3				
22	LV5	None				3				
23	LV6	None				6				
24	LV7	None				3				
25	LV8	None								
26	BLC 1 Transient Area Loads	None						153		
27	BLC 2 Transient Area Loads	None						153		

Load Combinations

	Description	S...	P...	S...	B...	Fa...	B...	Fac...	B...	Fac...	B...	Fac...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
1	1.2*DL + 1.6 * WL(0)	Yes	Y		1	1.2	3	1.6																
2	1.2*DL + 1.6* WL(30)	Yes	Y		1	1.2	3	1.39	4	.8														
3	1.2*DL + 1.6* WL(60)	Yes	Y		1	1.2	3	.8	4	1.39														
4	1.2*DL + 1.6*WL(90)	Yes	Y		1	1.2	4	1.6																
5	1.2*DL + 1.6*WL(120)	Yes	Y		1	1.2	3	-.8	4	1.39														
6	1.2*DL +1.6*WL(150)	Yes	Y		1	1.2	3	-1.39	4	.8														
7	1.2*DL + 1.6 * WL(180)	Yes	Y		1	1.2	3	-1.6																
8	1.2*DL + 1.6* WL(210)	Yes	Y		1	1.2	3	-1.39	4	-.8														
9	1.2*DL + 1.6* WL(240)	Yes	Y		1	1.2	3	-.8	4	-1.39														
10	1.2*DL + 1.6*WL(270)	Yes	Y		1	1.2	4	-1.6																
11	1.2*DL + 1.6*WL(300)	Yes	Y		1	1.2	3	.8	4	-1.39														
12	1.2*DL +1.6*WL(330)	Yes	Y		1	1.2	3	1.39	4	-.8														
13	1.2*DL+1.0*DLi+1.0*WL.i(0)+1.0*T	Yes	Y		1	1.2	2	1	5	1	7	1												
14	1.2*DL+1.0*DLi+1.0*WL.i(30)+1.0...	Yes	Y		1	1.2	2	1	5	.866	6	.5	7											
15	1.2*DL+1.0*DLi+1.0*WL.i(60)+1.0...	Yes	Y		1	1.2	2	1	5	.5	6	.866	7											
16	1.2*DL+1.0*DLi+1.0*WL.i(90)+1.0...	Yes	Y		1	1.2	2	1	6	1	7	1												
17	1.2*DL+1.0*DLi+1.0*WL.i(120)+1...	Yes	Y		1	1.2	2	1	5	-.5	6	.866	7											
18	1.2*DL+1.0*DLi+1.0*WL.i(150)+1...	Yes	Y		1	1.2	2	1	5	-.866	6	.5	7											
19	1.2*DL+1.0*DLi+1.0*WL.i(180)+1...	Yes	Y		1	1.2	2	1	5	-1	7	1												
20	1.2*DL+1.0*DLi+1.0*WL.i(210)+1...	Yes	Y		1	1.2	2	1	5	-.866	6	-.5	7											
21	1.2*DL+1.0*DLi+1.0*WL.i(240)+1...	Yes	Y		1	1.2	2	1	5	-.5	6	-.866	7											
22	1.2*DL+1.0*DLi+1.0*WL.i(270)+1...	Yes	Y		1	1.2	2	1	6	-1	7	1												
23	1.2*DL+1.0*DLi+1.0*WL.i(300)+1...	Yes	Y		1	1.2	2	1	5	.5	6	-.866	7											
24	1.2*DL+1.0*DLi+1.0*WL.i(330)+1...	Yes	Y		1	1.2	2	1	5	.866	6	-.5	7											
25	0.9*DL+1.6*WL(0)	Yes	Y		1	.9	3	1.6																
26	0.9*DL+1.6*WL(30)	Yes	Y		1	.9	3	1.39	4	.8														
27	0.9*DL+1.6*WL(60)	Yes	Y		1	.9	3	.8	4	1.39														
28	0.9*DL+1.6*WL(90)	Yes	Y		1	.9	4	1.6																
29	0.9*DL+1.6*WL(120)	Yes	Y		1	.9	3	-.8	4	1.39														
30	0.9*DL+1.6*WL(150)	Yes	Y		1	.9	3	-1.39	4	.8														
31	0.9*DL+1.6*WL(180)	Yes	Y		1	.9	3	-1.6																
32	0.9*DL+1.6*WL(210)	Yes	Y		1	.9	3	-1.39	4	-.8														
33	0.9*DL+1.6*WL(240)	Yes	Y		1	.9	3	-.8	4	-1.39														
34	0.9*DL+1.6*WL(270)	Yes	Y		1	.9	4	-1.6																
35	0.9*DL+1.6*WL(300)	Yes	Y		1	.9	3	.8	4	-1.39														
36	0.9*DL+1.6*WL(330)	Yes	Y		1	.9	3	1.39	4	-.8														
37	1.2*DL+1.5*LV1	Yes	Y		1	1.2	10	1.5																
38	1.2*DL+1.5*LV2	Yes	Y		1	1.2	11	1.5																
39	1.2*DL+1.5*LM1+1.0*WM(0)	Yes	Y		1	1.2	12	1.5	8	1														
40	1.2*DL+1.5*LM1+1.0*WM(30)	Yes	Y		1	1.2	12	1.5	8	.866	9	.5												
41	1.2*DL+1.5*LM1+1.0*WM(60)	Yes	Y		1	1.2	12	1.5	8	.5	9	.866												
42	1.2*DL+1.5*LM1+1.0*WM(90)	Yes	Y		1	1.2	12	1.5	9	1														
43	1.2*DL+1.5*LM1+1.0*WM(120)	Yes	Y		1	1.2	12	1.5	8	-.5	9	.866												
44	1.2*DL+1.5*LM1+1.0*WM(150)	Yes	Y		1	1.2	12	1.5	8	-.866	9	.5												
45	1.2*DL+1.5*LM1+1.0*WM(180)	Yes	Y		1	1.2	12	1.5	8	-1														
46	1.2*DL+1.5*LM1+1.0*WM(210)	Yes	Y		1	1.2	12	1.5	8	-.866	9	-.5												
47	1.2*DL+1.5*LM1+1.0*WM(240)	Yes	Y		1	1.2	12	1.5	8	-.5	9	-.866												
48	1.2*DL+1.5*LM1+1.0*WM(270)	Yes	Y		1	1.2	12	1.5	9	-1														
49	1.2*DL+1.5*LM1+1.0*WM(300)	Yes	Y		1	1.2	12	1.5	8	.5	9	-.866												
50	1.2*DL+1.5*LM1+1.0*WM(330)	Yes	Y		1	1.2	12	1.5	8	.866	9	-.5												
51	1.2*DL+1.5*LM2+1.0*WM(0)	Yes	Y		1	1.2	13	1.5	8	1														
52	1.2*DL+1.5*LM2+1.0*WM(30)	Yes	Y		1	1.2	13	1.5	8	.866	9	.5												
53	1.2*DL+1.5*LM2+1.0*WM(60)	Yes	Y		1	1.2	13	1.5	8	.5	9	.866												
54	1.2*DL+1.5*LM2+1.0*WM(90)	Yes	Y		1	1.2	13	1.5	9	1														
55	1.2*DL+1.5*LM2+1.0*WM(120)	Yes	Y		1	1.2	13	1.5	8	-.5	9	.866												
56	1.2*DL+1.5*LM2+1.0*WM(150)	Yes	Y		1	1.2	13	1.5	8	-.866	9	.5												

Load Combinations (Continued)

	Description	S...	P...	S...	B...	Fa...	B...	Fac...	B...	Fac...	B...	Fac...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
57	1.2*DL+1.5*LM2+1.0*WM(180)	Yes	Y		1	1.2	13	1.5	8	-1														
58	1.2*DL+1.5*LM2+1.0*WM(210)	Yes	Y		1	1.2	13	1.5	8	-.866	9	-.5												
59	1.2*DL+1.5*LM2+1.0*WM(240)	Yes	Y		1	1.2	13	1.5	8	-.5	9	-.866												
60	1.2*DL+1.5*LM2+1.0*WM(270)	Yes	Y		1	1.2	13	1.5	9	-1														
61	1.2*DL+1.5*LM2+1.0*WM(300)	Yes	Y		1	1.2	13	1.5	8	.5	9	-.866												
62	1.2*DL+1.5*LM2+1.0*WM(330)	Yes	Y		1	1.2	13	1.5	8	.866	9	-.5												
63	1.2*DL+1.5*LM3+1.0*WM(0)	Yes	Y		1	1.2	14	1.5	8	1														
64	1.2*DL+1.5*LM3+1.0*WM(30)	Yes	Y		1	1.2	14	1.5	8	.866	9	.5												
65	1.2*DL+1.5*LM3+1.0*WM(60)	Yes	Y		1	1.2	14	1.5	8	.5	9	.866												
66	1.2*DL+1.5*LM3+1.0*WM(90)	Yes	Y		1	1.2	14	1.5	9	1														
67	1.2*DL+1.5*LM3+1.0*WM(120)	Yes	Y		1	1.2	14	1.5	8	-.5	9	.866												
68	1.2*DL+1.5*LM3+1.0*WM(150)	Yes	Y		1	1.2	14	1.5	8	-.866	9	.5												
69	1.2*DL+1.5*LM3+1.0*WM(180)	Yes	Y		1	1.2	14	1.5	8	-1														
70	1.2*DL+1.5*LM3+1.0*WM(210)	Yes	Y		1	1.2	14	1.5	8	-.866	9	-.5												
71	1.2*DL+1.5*LM3+1.0*WM(240)	Yes	Y		1	1.2	14	1.5	8	-.5	9	-.866												
72	1.2*DL+1.5*LM3+1.0*WM(270)	Yes	Y		1	1.2	14	1.5	9	-1														
73	1.2*DL+1.5*LM3+1.0*WM(300)	Yes	Y		1	1.2	14	1.5	8	.5	9	-.866												
74	1.2*DL+1.5*LM3+1.0*WM(330)	Yes	Y		1	1.2	14	1.5	8	.866	9	-.5												
75	1.2*DL+1.5*LM4+1.0*WM(0)	Yes	Y		1	1.2	15	1.5	8	1														
76	1.2*DL+1.5*LM4+1.0*WM(30)	Yes	Y		1	1.2	15	1.5	8	.866	9	.5												
77	1.2*DL+1.5*LM4+1.0*WM(60)	Yes	Y		1	1.2	15	1.5	8	.5	9	.866												
78	1.2*DL+1.5*LM4+1.0*WM(90)	Yes	Y		1	1.2	15	1.5	9	1														
79	1.2*DL+1.5*LM4+1.0*WM(120)	Yes	Y		1	1.2	15	1.5	8	-.5	9	.866												
80	1.2*DL+1.5*LM4+1.0*WM(150)	Yes	Y		1	1.2	15	1.5	8	-.866	9	.5												
81	1.2*DL+1.5*LM4+1.0*WM(180)	Yes	Y		1	1.2	15	1.5	8	-1														
82	1.2*DL+1.5*LM4+1.0*WM(210)	Yes	Y		1	1.2	15	1.5	8	-.866	9	-.5												
83	1.2*DL+1.5*LM4+1.0*WM(240)	Yes	Y		1	1.2	15	1.5	8	-.5	9	-.866												
84	1.2*DL+1.5*LM4+1.0*WM(270)	Yes	Y		1	1.2	15	1.5	9	-1														
85	1.2*DL+1.5*LM4+1.0*WM(300)	Yes	Y		1	1.2	15	1.5	8	.5	9	-.866												
86	1.2*DL+1.5*LM4+1.0*WM(330)	Yes	Y		1	1.2	15	1.5	8	.866	9	-.5												
87	1.2*DL+1.5*LM5+1.0*WM(0)	Yes	Y		1	1.2	16	1.5	8	1														
88	1.2*DL+1.5*LM5+1.0*WM(30)	Yes	Y		1	1.2	16	1.5	8	.866	9	.5												
89	1.2*DL+1.5*LM5+1.0*WM(60)	Yes	Y		1	1.2	16	1.5	8	.5	9	.866												
90	1.2*DL+1.5*LM5+1.0*WM(90)	Yes	Y		1	1.2	16	1.5	9	1														
91	1.2*DL+1.5*LM5+1.0*WM(120)	Yes	Y		1	1.2	16	1.5	8	-.5	9	.866												
92	1.2*DL+1.5*LM5+1.0*WM(150)	Yes	Y		1	1.2	16	1.5	8	-.866	9	.5												
93	1.2*DL+1.5*LM5+1.0*WM(180)	Yes	Y		1	1.2	16	1.5	8	-1														
94	1.2*DL+1.5*LM5+1.0*WM(210)	Yes	Y		1	1.2	16	1.5	8	-.866	9	-.5												
95	1.2*DL+1.5*LM5+1.0*WM(240)	Yes	Y		1	1.2	16	1.5	8	-.5	9	-.866												
96	1.2*DL+1.5*LM5+1.0*WM(270)	Yes	Y		1	1.2	16	1.5	9	-1														
97	1.2*DL+1.5*LM5+1.0*WM(300)	Yes	Y		1	1.2	16	1.5	8	.5	9	-.866												
98	1.2*DL+1.5*LM5+1.0*WM(330)	Yes	Y		1	1.2	16	1.5	8	.5	9	-.866												
99	1.2*DL+1.5*LM6+1.0*WM(30)	Yes	Y		1	1.2	17	1.5	8	.866	9	.5												
100	1.2*DL+1.5*LM6+1.0*WM(60)	Yes	Y		1	1.2	17	1.5	8	.5	9	.866												
101	1.2*DL+1.5*LM6+1.0*WM(90)	Yes	Y		1	1.2	17	1.5	9	1														
102	1.2*DL+1.5*LM6+1.0*WM(120)	Yes	Y		1	1.2	17	1.5	8	-.5	9	.866												
103	1.2*DL+1.5*LM6+1.0*WM(150)	Yes	Y		1	1.2	17	1.5	8	-.866	9	.5												
104	1.2*DL+1.5*LM6+1.0*WM(180)	Yes	Y		1	1.2	17	1.5	8	-1														
105	1.2*DL+1.5*LM6+1.0*WM(210)	Yes	Y		1	1.2	17	1.5	8	-.866	9	-.5												
106	1.2*DL+1.5*LM6+1.0*WM(240)	Yes	Y		1	1.2	17	1.5	8	-.5	9	-.866												
107	1.2*DL+1.5*LM6+1.0*WM(270)	Yes	Y		1	1.2	17	1.5	9	-1														
108	1.2*DL+1.5*LM6+1.0*WM(300)	Yes	Y		1	1.2	17	1.5	8	.5	9	-.866												
109	1.2*DL+1.5*LM6+1.0*WM(330)	Yes	Y		1	1.2	17	1.5	8	.5	9	-.866												
110	1.2*DL+1.5*LM7+1.0*WM(30)	Yes	Y		1	1.2	18	1.5	8	.866	9	.5												
111	1.2*DL+1.5*LM7+1.0*WM(60)	Yes	Y		1	1.2	18	1.5	8	.5	9	.866												
112	1.2*DL+1.5*LM7+1.0*WM(90)	Yes	Y		1	1.2	18	1.5	9	1														
113	1.2*DL+1.5*LM7+1.0*WM(120)	Yes	Y		1	1.2	18	1.5	8	-.5	9	.866												

Load Combinations (Continued)

	Description	S...	P...	S...	B...	Fa...	B...	Fac...	B...	Fac...	B...	Fac...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
114	1.2*DL+1.5*LM7+1.0*WM(150)	Yes	Y		1	1.2	18	1.5	8	-.866	9	.5												
115	1.2*DL+1.5*LM7+1.0*WM(180)	Yes	Y		1	1.2	18	1.5	8	-1														
116	1.2*DL+1.5*LM7+1.0*WM(210)	Yes	Y		1	1.2	18	1.5	8	-.866	9	-.5												
117	1.2*DL+1.5*LM7+1.0*WM(240)	Yes	Y		1	1.2	18	1.5	8	-.5	9	-.866												
118	1.2*DL+1.5*LM7+1.0*WM(270)	Yes	Y		1	1.2	18	1.5	9	-1														
119	1.2*DL+1.5*LM7+1.0*WM(300)	Yes	Y		1	1.2	18	1.5	8	.5	9	-.866												
120	1.2*DL+1.5*LM7+1.0*WM(330)	Yes	Y		1	1.2	18	1.5	8	.5	9	-.866												
121	1.2*DL+1.5*LM8+1.0*WM(30)	Yes	Y		1	1.2	19	1.5	8	.866	9	.5												
122	1.2*DL+1.5*LM8+1.0*WM(60)	Yes	Y		1	1.2	19	1.5	8	.5	9	.866												
123	1.2*DL+1.5*LM8+1.0*WM(90)	Yes	Y		1	1.2	19	1.5	9	1														
124	1.2*DL+1.5*LM8+1.0*WM(120)	Yes	Y		1	1.2	19	1.5	8	-.5	9	.866												
125	1.2*DL+1.5*LM8+1.0*WM(150)	Yes	Y		1	1.2	19	1.5	8	-.866	9	.5												
126	1.2*DL+1.5*LM8+1.0*WM(180)	Yes	Y		1	1.2	19	1.5	8	-1														
127	1.2*DL+1.5*LM8+1.0*WM(210)	Yes	Y		1	1.2	19	1.5	8	-.866	9	-.5												
128	1.2*DL+1.5*LM8+1.0*WM(240)	Yes	Y		1	1.2	19	1.5	8	-.5	9	-.866												
129	1.2*DL+1.5*LM8+1.0*WM(270)	Yes	Y		1	1.2	19	1.5	9	-1														
130	1.2*DL+1.5*LM8+1.0*WM(300)	Yes	Y		1	1.2	19	1.5	8	.5	9	-.866												
131	1.2*DL+1.5*LM8+1.0*WM(330)	Yes	Y		1	1.2	19	1.5	8	.5	9	-.866												
132	1.2*DL+1.5*LV3	Yes	Y		1	1.2	20	1.5																
133	1.2*DL+1.5*LV4	Yes	Y		1	1.2	21	1.5																
134	1.2*DL+1.5*LV5	Yes	Y		1	1.2	22	1.5																
135	1.2*DL+1.5*LV6	Yes	Y		1	1.2	23	1.5																
136	1.2*DL+1.5*LV7	Yes	Y		1	1.2	24	1.5																
137	1.2*DL+1.5*LV8	Yes	Y		1	1.2	25	1.5																

Envelope Joint Reactions

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N240	max	912.644	6	1012.194	5	539.537	36	0	1	0	1	0	1
2		min	-579.272	36	-454.728	35	-811.514	6	0	1	0	1	0	1
3	N241	max	218.246	25	1147.02	8	637.028	26	0	1	0	1	0	1
4		min	-257.314	7	-762.785	26	-1000.665	8	0	1	0	1	0	1
5	N242	max	304.947	29	1064.673	13	104.863	29	0	1	0	1	0	1
6		min	-903.556	23	-234.316	30	-311.477	23	0	1	0	1	0	1
7	N243	max	153.189	28	636.275	10	429.102	10	.096	135	.035	30	.136	135
8		min	-517.638	22	-394.869	28	-260.161	28	-.003	34	-.065	12	-.018	28
9	N244	max	215.926	3	1141.179	16	977.404	2	0	1	0	1	0	1
10		min	-115.936	33	-61.653	34	-457.023	32	0	1	0	1	0	1
11	N245	max	733.377	2	891.963	13	193.921	2	0	1	0	1	0	1
12		min	-389.58	32	-392.797	31	-103.358	32	0	1	0	1	0	1
13	N246	max	542.271	26	1054.882	9	494.025	27	0	1	0	1	0	1
14		min	-836.226	8	-670.936	27	-712.64	9	0	1	0	1	0	1
15	N247	max	704.015	30	1073.098	13	324.873	11	0	1	0	1	0	1
16		min	-1191.005	12	-416.425	31	-147.894	29	0	1	0	1	0	1
17	N248	max	48.436	78	521.5	135	585.302	11	0	1	0	1	0	1
18		min	-74.632	60	-237.626	28	-316.031	29	0	1	0	1	0	1
19	N249	max	749.671	15	1176.969	16	755.737	15	0	1	0	1	0	1
20		min	-336.894	33	-121.297	33	-331.742	33	0	1	0	1	0	1
21	N250	max	624.301	15	789.688	13	92.573	33	0	1	0	1	0	1
22		min	-239.158	32	-370.646	31	-278.968	15	0	1	0	1	0	1
23	N251	max	332.432	6	1207.885	5	773.613	36	.071	36	.122	6	.066	18
24		min	-238.997	36	-588.454	35	-1251.242	6	-.142	6	-.077	36	-.017	135
25	N258	max	41.997	28	186.016	38	355.46	22	0	1	0	1	0	1
26		min	-403.253	23	-161.007	132	-91.312	28	0	1	0	1	0	1
27	N259	max	100.066	7	279.254	132	419.186	16	0	1	0	1	0	1
28		min	-85.303	25	-107.688	38	-102.822	34	0	1	0	1	0	1

Envelope Joint Reactions (Continued)

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
29	N260	max	1147.949	2	190.199	38	230.714	2	0	1	0	1	0	1
30		min	-818.122	32	-160.119	132	-124.92	32	0	1	0	1	0	1
31	N261	max	629.868	7	280.733	132	464.508	26	0	1	0	1	0	1
32		min	-503.823	26	-109.065	38	-531.639	8	0	1	0	1	0	1
33	N262	max	265.853	36	191.517	38	547.112	36	0	1	0	1	0	1
34		min	-341.005	6	-159.998	132	-912.199	6	0	1	0	1	0	1
35	N263	max	885.182	30	281.661	132	234.172	29	0	1	0	1	0	1
36		min	-1037.238	12	-107.193	38	-309.7	11	0	1	0	1	0	1
37	N264	max	327.073	15	271.66	132	311.596	4	0	1	0	1	0	1
38		min	-145.227	34	-108.883	38	-192.443	34	0	1	0	1	0	1
39	N265	max	1087.916	2	193.767	38	205.164	32	0	1	0	1	0	1
40		min	-753.12	32	-159.2	132	-319.859	2	0	1	0	1	0	1
41	N266	max	322.966	32	272.56	132	773.051	25	0	1	0	1	0	1
42		min	-323.41	2	-112.245	38	-921.014	7	0	1	0	1	0	1
43	N267	max	482.75	36	195.295	38	396.262	36	0	1	0	1	0	1
44		min	-766.236	6	-159.636	132	-657.479	6	0	1	0	1	0	1
45	N268	max	918.627	30	272.709	132	232.792	11	0	1	0	1	0	1
46		min	-1078.07	12	-112.063	38	-144.379	29	0	1	0	1	0	1
47	N269	max	72.268	36	191.984	38	578.849	22	0	1	0	1	0	1
48		min	-138.087	6	-160.647	132	12.632	27	0	1	0	1	0	1
49	Totals:	max	5154.786	28	9683.888	18	5854.973	25						
50		min	-5154.788	10	2559.137	36	-5854.981	7						

Envelope AISI S100-12: LRFD Cold Formed Steel Code Checks

	Member	Shape	Code Che...	Loc[in]	LC	Shear Check	Loc[in]...		LC	phi*Pn[...	phi*T...	phi*M...	phi*M...	Cb	Cm...	Cm...	Eqn
1	M116	P1000	.864	46.5	47	.860	45	y	47	6344.4...	1327...	.442	.515	3.5...	.6	.85	C3.3...
2	M110	P1000	.863	46.5	42	.859	45	y	42	6344.4...	1327...	.442	.515	3.3...	.6	.85	C3.3...
3	M104	P1000	.859	46.5	50	.856	45	y	50	6344.4...	1327...	.442	.515	3.4...	.6	.85	C3.3...
4	M105	P1000	.771	46.5	45	.765	45	y	45	6344.4...	1327...	.442	.515	3.0...	.6	.85	C3.3...
5	M111	P1000	.765	46.5	48	.757	45	y	48	6344.4...	1327...	.442	.515	4.1...	.6	.85	C3.3...
6	M117	P1000	.764	46.5	41	.756	45	y	41	6344.4...	1327...	.442	.515	4.1...	.6	.85	C3.3...
7	M84	P1000	.684	126	56	.400	42	z	84	6382.9...	1327...	.262	.497	2.2...	.85	.76	C5.1...
8	M98	P1000	.681	126	55	.455	126	y	2	6382.9...	1327...	.262	.497	2.22	.85	.797	C5.1...
9	M99	P1000	.640	108.9...	60	.500	116....	z	61	6542.57	1327...	.442	.515	2.1...	.85	.687	C3.3...
10	M85	P1000	.640	108.9...	55	.499	116....	z	55	6542.57	1327...	.442	.515	2.2...	.85	.716	C3.3...
11	M70	P1000	.619	0	108	.570	47.25	z	84	6382.9...	1327...	.262	.497	2.1...	.85	.843	C5.1...
12	M71	P1000	.604	17.063	99	.472	9.188	z	102	6542.57	1327...	.442	.515	1.0...	.85	.625	C3.3...

Stress ratio <1. Members are adequate.

Envelope AISC 14th(360-10): LRFD Steel Code Checks

	Member	Shape	Code Check	Loc[in]	LC	Shear Che...	Loc[in]...		LC	phi*Pnc [...	phi*Pnt ...	phi*Mn...	phi*Mn...	Cb	Eqn
1	M41	HSS1x1x1/8	.525	0	30	.101	0	y	12	4110.119	18133.2	.5	.5	4.384	H1-1a
2	M37	HSS1x1x1/8	.490	0	25	.096	0	y	7	4110.118	18133.2	.5	.5	4.33	H1-1a
3	M44	HSS1x1x1/8	.485	55.973	31	.092	55.973	y	1	4110.118	18133.2	.5	.5	3.926	H1-1a
4	M40	HSS1x1x1/8	.467	55.973	36	.093	55.973	y	6	4110.118	18133.2	.5	.5	4.345	H1-1a
5	M2	HSS1x1x1/8	.462	0	12	.278	3.938	y	12	17900.38	18133.2	.5	.5	1.503	H1-1b
6	M1	HSS1x1x1/8	.459	0	7	.273	122....	y	6	17900.381	18133.2	.5	.5	1.491	H1-1b
7	M3	HSS1x1x1/8	.437	126	1	.269	122....	y	1	17900.381	18133.2	.5	.5	2.205	H1-1b
8	M42	HSS1x1x1/8	.398	55.973	28	.068	50.143	y	54	4110.118	18133.2	.5	.5	4.185	H1-1a
9	M29	HSS1x1x1/8	.389	0	8	.073	4.813	y	56	7285.833	18133.2	.5	.5	2.921	H1-1a
10	M6	HSS1x1x1/8	.384	21	135	.051	42	y	135	7285.833	18133.2	.5	.5	1.758	H1-1b
11	M5	HSS1x1x1/8	.382	21	135	.051	42	y	135	7285.833	18133.2	.5	.5	1.766	H1-1b
12	M4	HSS1x1x1/8	.382	21	135	.052	42	y	135	7285.833	18133.2	.5	.5	1.763	H1-1b
13	M28	HSS1x1x1/8	.364	0	6	.055	0	y	6	7285.833	18133.2	.5	.5	3.772	H1-1a
14	M15	HSS1x1x1/8	.352	63	134	.050	84	y	134	14436.956	18133.2	.5	.5	2.244	H1-1b

Stress ratio <1. Members are adequate.

Envelope AISC 14th(360-10): LRFD Steel Code Checks (Continued)

	Member	Shape	Code Check	Loc[in]	LC	Shear Che...	Loc[in]	...	LC	phi*Pnc [...	phi*Pnt ...	phi*Mn...	phi*Mn...	Cb	Eqn
15	M14	HSS1x1x1/8	.351	63	134	.050	84	y	134	14436.956	18133.2	.5	.5	2.248	H1-1b
16	M13	HSS1x1x1/8	.346	63	134	.050	84	y	134	14436.956	18133.2	.5	.5	2.251	H1-1b
17	M16	HSS1x1x1/8	.346	0	1	.096	0	y	88	10327.805	18133.2	.5	.5	3.526	H1-1b
18	M32	HSS1x1x1/8	.341	4.375	14	.101	0	y	37	7285.833	18133.2	.5	.5	3.845	H1-1a
19	M20	HSS1x1x1/8	.335	0	8	.089	0	y	96	10327.805	18133.2	.5	.5	3.598	H1-1b
20	M23	HSS1x1x1/8	.330	53.413	26	.011	53.413	z	11	4513.495	18133.2	.5	.5	1.723	H1-1a
21	M30	HSS1x1x1/8	.328	4.375	23	.100	0	y	37	7285.833	18133.2	.5	.5	4.033	H1-1a
22	M12	HSS1x1x1/8	.321	33	132	.061	33	y	132	10327.805	18133.2	.5	.5	1.857	H1-1b
23	M10	HSS1x1x1/8	.320	33	132	.061	33	y	132	10327.805	18133.2	.5	.5	1.856	H1-1b
24	M8	HSS1x1x1/8	.319	33	132	.061	33	y	132	10327.805	18133.2	.5	.5	1.862	H1-1b
25	M21	HSS1x1x1/8	.311	33	135	.061	33	y	135	10327.805	18133.2	.5	.5	1.853	H1-1b
26	M19	HSS1x1x1/8	.310	33	135	.061	33	y	135	10327.805	18133.2	.5	.5	1.853	H1-1b
27	M11	HSS1x1x1/8	.309	6.187	92	.138	0	y	89	10327.805	18133.2	.5	.5	3.135	H1-1b
28	M22	HSS1x1x1/8	.307	53.413	35	.010	53.413	z	4	4513.495	18133.2	.5	.5	1.948	H1-1a
29	M9	HSS1x1x1/8	.304	6.188	88	.137	0	y	97	10327.805	18133.2	.5	.5	3.154	H1-1b
30	M17	HSS1x1x1/8	.304	33	135	.058	33	y	135	10327.805	18133.2	.5	.5	1.872	H1-1b
31	M286	PIPE_2.0	.300	24.75	1	.031	24.75		11	20866.733	32130	1.872	1.872	1.469	H1-1b
32	M240	PIPE_2.0	.297	24.75	7	.034	24.75		1	20866.733	32130	1.872	1.872	1.285	H1-1b
33	M43	HSS1x1x1/8	.285	5.831	107	.074	0	y	4	4110.118	18133.2	.5	.5	3.422	H1-1b
34	M7	HSS1x1x1/8	.282	6.187	93	.127	0	y	92	10327.805	18133.2	.5	.5	3.197	H1-1b
35	M31	HSS1x1x1/8	.279	0	135	.143	0	y	7	7285.833	18133.2	.5	.5	4.625	H1-1b
36	M33	HSS1x1x1/8	.279	0	135	.122	4.813	y	1	7285.833	18133.2	.5	.5	4.613	H1-1b
37	M38	HSS1x1x1/8	.273	42.066	10	.033	0	y	4	5839.909	18133.2	.5	.5	3.812	H1-1a
38	M18	HSS1x1x1/8	.259	0	5	.091	0	y	92	10327.805	18133.2	.5	.5	3.717	H1-1b
39	M202	SR1/2"	.237	7.5	95	.028	7.5		97	5263.413	6361.725	.053	.053	2.271	H1-1b
40	M39	HSS1x1x1/8	.237	0	28	.029	5.381	z	7	5839.909	18133.2	.5	.5	1.608	H1-1a
41	M260	SR1/2"	.234	7.5	97	.019	7.5		9	5263.413	6361.725	.053	.053	2.255	H1-1b
42	M203	SR1/2"	.233	0	8	.026	7.5		97	5263.413	6361.725	.053	.053	2.216	H1-1b
43	M308	SR1/2"	.232	7.5	89	.022	7.5		1	5263.413	6361.725	.053	.053	2.255	H1-1b
44	M280	PIPE_2.0	.231	18.5	2	.079	18.5		6	26521.424	32130	1.872	1.872	1.714	H1-1b
45	M261	SR1/2"	.229	7.5	97	.019	7.5		2	5263.413	6361.725	.053	.053	2.254	H1-1b
46	M309	SR1/2"	.229	7.5	90	.021	7.5		1	5263.413	6361.725	.053	.053	2.255	H1-1b
47	M234	PIPE_2.0	.221	18.5	11	.089	18.5		2	26521.424	32130	1.872	1.872	1.95	H1-1b
48	M252	SR1/2"	.207	0	88	.043	7.5		2	5263.413	6361.725	.053	.053	2.252	H1-1b
49	M211	SR1/2"	.205	7.5	95	.013	7.5		92	5263.413	6361.725	.053	.053	2.265	H1-1b
50	M212	SR1/2"	.203	7.5	95	.013	7.5		93	5263.413	6361.725	.053	.053	2.265	H1-1b
51	M300	SR1/2"	.202	0	93	.047	7.5		6	5263.413	6361.725	.053	.053	2.253	H1-1b
52	M253	SR1/2"	.182	0	87	.040	7.5		2	5263.413	6361.725	.053	.053	2.247	H1-1b
53	M301	SR1/2"	.180	0	90	.044	7.5		6	5263.413	6361.725	.053	.053	2.244	H1-1b
54	M219	PIPE_2.0	.179	28	1	.036	55.125		10	17855.085	32130	1.872	1.872	2.594	H1-1b
55	M316	PIPE_2.0	.178	28	10	.037	55.125		12	17855.085	32130	1.872	1.872	1.832	H1-1b
56	M327	PIPE_2.0	.178	28	4	.037	28		26	17855.085	32130	1.872	1.872	2.606	H1-1b
57	M27	HSS1x1x1/8	.177	0	31	.009	53.413	y	135	4513.495	18133.2	.5	.5	1.863	H1-1b*
58	M317	PIPE_2.0	.159	32.5	12	.070	40		12	26521.424	32130	1.872	1.872	1.68	H1-1b
59	M220	PIPE_2.0	.155	32.5	4	.067	40		4	26521.424	32130	1.872	1.872	1.81	H1-1b
60	M327A	PIPE_2.0	.151	18.5	4	.066	18.5		7	26521.424	32130	1.872	1.872	2.933	H1-1b
61	M35	C3x6	.148	0	1	.094	32.813	y	6	37162.504	79200	1.572	6.525	1.61	H1-1b
62	M128	PIPE_2.0	.143	36	7	.027	10.5		7	20866.733	32130	1.872	1.872	3.147	H1-1b
63	M235	PIPE_2.0	.142	36	10	.034	35.25		5	20866.733	32130	1.872	1.872	1.51	H1-1b
64	M281	PIPE_2.0	.142	36	4	.024	7.5		6	20866.733	32130	1.872	1.872	1.549	H1-1b
65	M24	HSS1x1x1/8	.140	53.413	30	.013	53.413	z	7	4513.495	18133.2	.5	.5	2.49	H1-1b*
66	M34	C3x6	.137	0	1	.078	32.813	y	3	37162.504	79200	1.572	6.525	1.71	H1-1b
67	M127	PIPE_2.0	.127	32.5	4	.071	45		6	26521.424	32130	1.872	1.872	2.027	H1-1b
68	M25	HSS1x1x1/8	.124	53.413	28	.010	53.413	z	1	4513.495	18133.2	.5	.5	1.715	H1-1b*
69	M36	C3x6	.115	0	5	.064	7.438	z	4	37162.504	79200	1.572	6.525	1.627	H1-1b
70	M26	HSS1x1x1/8	.114	53.413	22	.008	53.413	y	22	4513.495	18133.2	.5	.5	2.145	H1-1b
71	M206	PIPE_2.0	.110	44.25	6	.082	44.25		7	20866.733	32130	1.872	1.872	1.615	H1-1b

Envelope AISC 14th(360-10): LRFD Steel Code Checks (Continued)

	Member	Shape	Code Check	Loc[in]	LC	Shear Che...	Loc[in] ...		LC	phi*Pnc [...	phi*Pnt ...	phi*Mn...	phi*Mn...	Cb	Eqn
72	M303	PIPE_2.0	.099	44.25	2	.060	44.25		2	20866.733	32130	1.872	1.872	2.054	H1-1b
73	M139	PIPE_2.0	.097	51	5	.030	51		9	20866.733	32130	1.872	1.872	1.554	H1-1b
74	M126	PIPE_2.0	.095	32.5	5	.043	32.5		10	26521.424	32130	1.872	1.872	2.091	H1-1b
75	M233	PIPE_2.0	.095	32.5	2	.047	32.5		2	26521.424	32130	1.872	1.872	1.871	H1-1b
76	M279	PIPE_2.0	.093	32.5	1	.049	32.5		6	26521.424	32130	1.872	1.872	1.475	H1-1b
77	M255	PIPE_2.0	.092	44.25	11	.054	44.25		11	20866.733	32130	1.872	1.872	2.035	H1-1b
78	M134	PIPE_2.0	.081	24	1	.021	24		4	20866.733	32130	1.872	1.872	2.454	H1-1b
79	M282	PIPE_2.0	.080	24	10	.024	24		5	20866.733	32130	1.872	1.872	1.827	H1-1b
80	M236	PIPE_2.0	.080	24	4	.024	24		3	20866.733	32130	1.872	1.872	1.781	H1-1b
81	M46	C5x6.7	.077	0	12	.022	7	z	11	83481.735	88650	2.227	13.313	1.907	H1-1b
82	M49	C5x6.7	.071	0	4	.020	7	z	3	83481.738	88650	2.227	13.313	1.699	H1-1b
83	M52	C5x6.7	.070	0	8	.020	7	z	7	83481.738	88650	2.227	13.313	1.741	H1-1b
84	M48	C5x6.7	.058	0	6	.019	7	z	6	83481.738	88650	2.227	13.313	1.651	H1-1b
85	M45	C5x6.7	.056	0	5	.019	7	z	4	83481.735	88650	2.227	13.313	1.624	H1-1b
86	M51	C5x6.7	.050	0	2	.016	7	z	1	83481.738	88650	2.227	13.313	1.649	H1-1b
87	M221	PIPE_2.5	.032	31.5	5	.006	24.75		12	37773.818	50715	3.596	3.596	2.476	H1-1b
88	M53	L5x5x5	.015	50.625	20	.006	9.375	y	1	76065.401	99468	6.383	12.944	1.255	H2-1
89	M47	L5x5x5	.015	50.625	24	.009	9.375	y	5	76065.401	99468	6.383	12.757	1.155	H2-1
90	M50	L5x5x5	.015	50.625	16	.005	9.375	y	8	76065.401	99468	6.383	12.743	1.148	H2-1

Stress ratio <1.0.
Members are
adequate.

CCI Site No. : CTL02108 **CCI Site Name:** Norwalk West-CT Ave **Prepared By:** RH **Checked By**: BK	**Fullerton Engineering Consultants, Inc.** 1100 E. Woodfield Road, Suite 500 Schaumburg, IL 60173 (847) 908-8400	**Date:** 12/5/2018

Mount-to-Tower Connection Calculations

Existing Platform is connected to the monopole via (12) 3/4" ϕ Bolts, grade A307 (conservatively assumed).

Maximum Reactions from Risa Mount Analysis Node "N251":

Envelope Joint Reactions

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
17	N248	max	48.436	78	521.501	135	585.3	11	0	1	0	1	0	1
18		min	-74.631	60	-237.628	28	-316.027	29	0	1	0	1	0	1
19	N249	max	749.682	15	1176.979	16	755.748	15	0	1	0	1	0	1
20		min	-336.88	33	-121.293	33	-331.725	33	0	1	0	1	0	1
21	N250	max	624.309	15	789.688	13	92.57	33	0	1	0	1	0	1
22		min	-239.14	32	-370.649	31	-278.972	15	0	1	0	1	0	1
23	N251	max	332.435	6	1207.877	5	773.629	36	.071	36	.122	6	.066	18
24		min	-239.001	36	-588.448	35	-1251.255	6	-.142	6	-.077	36	-.017	135
25	N258	max	42.007	28	186.016	38	355.45	22	0	1	0	1	0	1
26		min	-403.239	23	-161.007	132	-91.322	28	0	1	0	1	0	1
27	N259	max	100.074	7	279.254	132	419.195	16	0	1	0	1	0	1
28		min	-85.31	25	-107.688	38	-102.818	34	0	1	0	1	0	1
29	N260	max	1147.935	2	190.199	38	230.71	2	0	1	0	1	0	1
30		min	-818.105	32	-160.119	132	-124.913	32	0	1	0	1	0	1

$X := 332.435 lbf$ — *Maximum Reaction - X direction*

$Y := 1207.877 lbf$ — *Maximum Reaction - Y direction*

$Z := 1251.255 lbf$ — *Maximum Reaction - Z direction*

$P_t := Y$ — $P_t = 1207.88\, lbf$ — *Factored Tensile Force*

$P_v := \sqrt{X^2 + Z^2}$ — $P_v = 1294.66\, lbf$ — *Factored Shear Force*

$d_b := 0.75 in$ — *Diameter of rod*

$A_b := 0.25\pi \cdot d_b^2$ — $A_b = 0.44 \cdot in^2$ — *Area of rod*

$P_{t\_bolt} := P_t$ — $P_{t\_bolt} = 1207.88\, lbf$ — *Tension/Compression at rod*

$P_{v\_bolt} := P_v$ — $P_{v\_bolt} = 1294.66\, lbf$ — *Shear at rod*

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Tensile and Shear Strength of Threaded Rods

$F_{nt} := 45ksi$

Nominal tensile strength per AISC 360-10, Table J3.2

$F_{nv} := 27ksi$

Nominal shear strength per AISC 360-10, Table J3.2

$\phi_{bolt} := .75$

Resistance Factor (LRFD - AISC 360, Section J3-6)

$R_{nt} := \phi_{bolt} \cdot F_{nt} \cdot A_b$ $R_{nt} = 14.91 \cdot kip$

Design Nominal Tensile Strength (AISC 360, Section J3-1)

$R_{nv} := \phi_{bolt} \cdot F_{nv} \cdot A_b$ $R_{nv} = 8.95 \cdot kip$

Design Nominal Shear Strength (AISC 360, Section J3-1)

$$\frac{P_{t\_bolt}}{R_{nt}} = 8.1 \cdot \%$$

$$\frac{P_{v\_bolt}}{R_{nv}} = 14.47 \cdot \%$$

$Check$ = "Bolts are adequate. Effects of combined stress don't need to be investigated because ratio of either tension or shear is under 30% "