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

August 27, 2018

Ryan Bailey
Charles Cherundolo Consulting
1280 Route 46 West, Suite 9
Parsippany, NJ 07054

RE: **EM-SPRINT-135-180806** – Sprint notice of intent to modify an existing telecommunications facility located at 650 Glenbrook Road, Stamford, Connecticut.

Dear Mr. Bailey:

The Connecticut Siting Council (Council) is in receipt of your correspondence of August 27, 2018 submitted in response to the Council's August 13, 2018 notification of an incomplete request for exempt modification with regard to the above-referenced matter.

The incomplete letter recommended that Charles Cherundolo Consulting provide a Structural Analysis Report that accounts for all existing and proposed equipment at the facility. Upon the submittal of the mount analysis, Council staff further reviewed the structural analysis and has determined the Structual Analysis included all existing and proposed equipment on the facility. The submission renders 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/FC/emr

S:\EMS_TS\1_BYTOWN\Stamford\GlenbrookRd\SPRINT\em-sprint-135-180806_responseandacknowledgement_glenbrookrd.docx

Robidoux, Evan

From: Ryan Bailey <ryan@mackenzierealtyconsulting.com>
Sent: Monday, August 27, 2018 8:39 AM
To: Robidoux, Evan
Cc: CSC-DL Siting Council; Ryan Bailey
Subject: RE: Council Incomplete Letter for EM-SPRINT-135-180806-GlenbrookRd-Stamford
Attachments: CT52XC012-A_Sprint_MIMO_Upgrade_Mount Analysis_07.10.18.pdf

Thank you for sending this as I had not received it. If I am reading it correctly it appears you are looking for a mount analysis. Is that correct? If so, it is attached. Please let me know if you need me to send three hard copies as well.

Thank you

Ryan Bailey
Mackenzie Realty Consulting
3B Prospect Pl
Madison NJ 07940
856-625-1596
973-215-2940 Fax
ryan@mackenzierealtyconsulting.com

From: Robidoux, Evan
Sent: Friday, August 24, 2018 3:33 PM
To: Ryan Bailey
Cc: CSC-DL Siting Council
Subject: Council Incomplete Letter for EM-SPRINT-135-180806-GlenbrookRd-Stamford

Hi Ryan,

I was checking through some of the exempt modifications and noticed that the Incomplete Letter for this EM was not emailed out to you. You should have received the hard copies in the mail sometime last week, so if you haven't please let me know.

In either case I am emailing you the PDF of the letter. I apologize for any confusion this oversight may have caused.

Have a nice weekend!

Sincerely,

Evan Robidoux
Clerk Typist
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

WESTCHESTER
SERVICES LLC

Date: **July 10, 2018**

ARCHITECTURE & ENGINEERING DIVISION
604 FOX GLEN . BARRINGTON, IL 60010
847/277-0070 . FAX: 847/277-0080
AE@westchesterservices.com / www.westchesterservices.com

Tom Jupin
Charles Cherundolo Consulting, Inc.
1280 Rt. 46 West
Parsippany, NJ 07054

Subject: Mount Analysis Report

Sprint Co-Locate
Site Number: CT52XC012-A
Site Name: Stamford

Engineering Firm Designation: **Westchester Services, LLC**

Site Data: **650 Glenbrook Rd, Stamford, CT 06905**
Fairfield County – 60' Water Tower on 41' Rooftop

Tom Jupin,

Westchester Services, LLC is pleased to submit this **"Mount Analysis Report"** to determine the structural integrity of the above mentioned antenna mounting system.

The purpose of the analysis is to determine acceptability of the antenna mount stress levels. Based on our analysis we have determined the stress levels under the following load case to be:

Existing and Proposed Equipment Note: See Table 2-1 for the existing and proposed loading.	**Sufficient Capacity**

The analysis has been performed in accordance with the TIA-222-G standard and local code requirements based upon a wind speed of 119 mph 3-second gust, exposure category B with topographic category 1 and crest height of 0 feet.

We at Westchester Services, LLC appreciate the opportunity of providing our continuing professional services to you. If you have any questions or need further assistance on this or any other projects please give us a call.

I certify that this report was prepared by me or under my direct supervision and that I am a licensed Structural Engineer under the laws of the State of Connecticut.

STATE OF CONNECTICUT
PHILIP KOZIOL
No. 32316
LICENSED
PROFESSIONAL ENGINEER

7/10/18
Exp. 1/31/19

Philip Koziol, PE
Professional Engineer

TABLE OF CONTENTS

1) INTRODUCTION

This structure is a 60' water tower on a 41' rooftop located in Fairfield County, CT. The proposed antennas will be mounted on existing antenna frames.

2) ANALYSIS CRITERIA

The structural analysis was performed in accordance with the requirements of TIA-222-G Structural Standards for Antenna Supporting Structures and Antennas using a ultimate gust wind speed of 119 mph (converted to 91 mph 3-second gust) with no ice, 50 mph with 0.75 inch ice thickness, Structure Class III, exposure category B with topographic category 1 and crest height of 0 feet.

Table 2-1 – Proposed Final Antenna Configuration
(New antennas in **bold**)

Center Line Elevation (ft)	Sector	Pos.	Antenna	Radio(s)	Note
93	Alpha	1			
		2	**(1) Nokia MiMO AAHC**		
		3		**(1) 1900MHz RRH** **(2) 800MHZ RRH**	
		4	**(1) Commscope NNVV-65B-R4**		
93	Beta	1	**(1) Nokia MiMO AAHC**	**(1) 1900MHz RRH**	
		2	(1) 24" dish		
		3		**(1) 800MHZ RRH**	
		4	**(1) Commscope NNVV-65B-R4**	**(1) 800MHZ RRH**	
93	Gamma	1			
		2	**(1) Nokia MiMO AAHC**		
		3		**(1) 1900MHz RRH** **(2) 800MHZ RRH**	
		4	**(1) Commscope NNVV-65B-R4**		

3) ANALYSIS PROCEDURE

Table 3-1 – Documents Provided

Document	Remarks	Reference	Date	Source
Mount Analysis	WSLLC	N/A	2/1/18	WSLLC
Structural Analysis	Atlantis Group	N/A	2/25/15	Sprint

3.1) Analysis Method

Mathcad 15 is a mathematics software program used for creating hand calc templates. The output of these calculations can be found in Appendix A.

4) ANALYSIS RESULTS

Table 4-1 – Critical Section Capacity (Summary)

Member Type	Elevation (ft)	% Capacity	Pass/Fail
Antenna Frame	93	10.8	Pass
Overall		10.8	Pass

4.1) Recommendations

The existing antenna frames will have sufficient capacity to support the existing and proposed loading.

5) ASSUMPTIONS

- The analysis performed is to the theoretical capacity of the members and connections. No accommodations are taken for any damaged, rusted, deteriorated, or otherwise compromised member conditions. To this, the tower or structure is assumed to be properly maintained and monitored and this analysis cannot be considered to be a condition assessment of the structure.
- The analysis is performed to the minimum design wind, ice, and other environmental loading prescribed by the governing building codes and standards. Any higher loading conditions required by the local jurisdiction or structure owner should be made known to Westchester immediately for analysis. No lesser conditions will be accommodated.
- Member sizes are assumed to be of standard AISC or manufacturer designations unless explicitly specified otherwise. The geometry of the tower or structure is assumed as schematic. Steel grade and concrete strength are assumed to be conservative standard and fully developed unless otherwise specified.
- The information provided to Westchester for analysis is assumed accurate and up to date as supplied. No independent efforts were taken by Westchester to verify the validity of the information supplied. If any additional information is presented at any time that contradicts what is referenced in the analysis, the analysis is invalid and must be performed again with the new information.
- Any reinforcement or modifications are assumed to be fully installed and functional.
- All welds are assumed to have been performed to current welding standards and are assumed to develop their full capacity and to be in good condition. In addition, all bolts and bolt-like anchors are assumed to be fully tightened, fastened, or bonded to the manufacturers' specifications and are assumed to have full capacity.
- Numerous connection details of large-scale structures are unobtainable and are omitted from the structural analysis. This includes, but is not limited to: bolts, welds, flanges, and plates. These connections are considered adequate and are therefore neglected from the analysis. In addition, in the absence of building plans, many wall, floor, and ceiling constructions can only be determined from observable field data and are supplemented by best judgment and experience.
- Antennas, dishes, feedlines, and any other such appurtenances are assumed adequate through manufacturer testing. No analysis is provided for the structural strength or stability of these items unless otherwise specified.
- Equipment mounting systems are assumed structurally sound unless specifically called for in the analysis.
- Soil conditions and foundations are not considered unless specified in the analysis and have no deterioration or defects. For sites located on a building, only local effects of the equipment is considered unless otherwise specified. The overall structure of the building and its foundation are assumed to be unaffected by the telecom equipment.
- Any changes or differences to the site or site plans at any time prior to installation must be brought to the attention of Westchester immediately.

APPENDIX A

CALCULATIONS

References:

1) 2015 International Building Code
2) ANSI TIA-222-G, Structural Standard for Antenna Supporting Structures and Antennas
3) AISC 360-10 Specification for Structural Steel Buildings
4) Mount analysis by Westchester Services dated 2/1/18

Input

Wind Factors (as per TIA-222-G)

$V := 91$ *mph*	V_{ult} *from Ref. (1) converted to* V_{3sec} *for use with Ref. (2)*
$V_i := 50$ *mph*	*Basic wind speed with ice*
$t_i := 0.75 \cdot in$	*Design ice thickness*
$G_H := 1$	*Ref. (2), Section 2.6.7.3*
$i_m := 1.15$	*Importance Factor*
$K_d := 0.95$	*Wind Direction Probability Factor, Ref. (2), Table 2-2*
$Ex := \text{"B"}$	*Exposure category. See Ref. (2), Table 2-4*
$TC := \text{"1"}$	*Topographic Category. See Ref. (2), Table 2-5*
$H := 0 \cdot ft$	*Crest Height*

Equipment Properties

Antennas

Antenna name/model	Number of antennas $n_{ant} :=$	Height of antennas $height_{ant} :=$ (·in)	Width of antennas $width_{ant} :=$ (·in)	Depth of antennas $depth_{ant} :=$ (·in)	Elevation of antennas $z_{ant} :=$ (·ft)	Weight of antennas $Weight_{ant} :=$ (·lbf)	Shape of antenna (1 = Flat, 0 = Round) $SHAPE :=$
"MiMO AAHC"	1	25.6	19.7	9.6	93	103.7	1
"NNVV-65B-R4"	1	72	19.6	7.8	93	77.4	1
"RRH-2x50-800"	1	16	12.9	10.7	93	60	1
"RRH 1900 4x45 65MHz"	1	25	10.7	11.1	93	68	1
"24" dish"	1	24	24	6	93	30	1
"not used"	0	0	1	1	100	0	1
"not used"	0	0	1	1	100	0	1
"not used"	0	0	1	1	100	0	1
"not used"	0	0	1	1	100	0	0
"not used"	0	0	1	1	85	0	1
"not used"	0	0	1	1	85	0	1
"not used"	0	0	1	1	85	0	1
"not used"	0	0	1	1	97	0	1
"not used"	0	0	1	1	50	0	1

No shielding is taken into account

**Matrix elements with a value of "1" are just placeholder values to prevent divide by 0 / NaN errors.*

Wind load calculations collapsed

Equipment Frame

An analysis of the frame was conducted using RISA 3D with the above outlined equipment and the following load conditions.

Load Case 1 (design wind with no ice)

$F_1 := F_{A_1} + F_{A_4}$ — $F_1 = 144.189\ \text{lbf}$ — *Antenna position 1*

$W_1 := Weight_{ant_1} + Weight_{ant_4}$ — $W_1 = 171.7\ \text{lbf}$

$F_2 := F_{A_5}$ — $F_2 = 107.607\ \text{lbf}$ — *Antenna position 2*

$W_2 := Weight_{ant_5}$ — $W_2 = 30\ \text{lbf}$

$F_3 := F_{A_3}$ — $F_3 = 38.559\ \text{lbf}$ — *Antenna position 3*

$W_3 := Weight_{ant_3}$ — $W_3 = 60\ \text{lbf}$

$F_4 := F_{A_2} + F_{A_3}$ — $F_4 = 313.653\ \text{lbf}$ — *Antenna position 4*

$W_4 := Weight_{ant_2} + Weight_{ant_3}$ — $W_4 = 137.4\ \text{lbf}$

Load Case 2 (ice wind with ice)

$F_{1.ice} := F_{A.ice_1} + F_{A.ice_4}$ — $F_{1.ice} = 62.663\ \text{lbf}$ — *Antenna position 1*

$W_{1.ice} := W_{ant.ice_1} + W_{ant.ice_4}$ — $W_{1.ice} = 422.379\ \text{lbf}$

$F_{2.ice} := F_{A.ice_5}$ — $F_{2.ice} = 43.671\ \text{lbf}$ — *Antenna position 2*

$W_{2.ice} := W_{ant.ice_5}$ — $W_{2.ice} = 164.587\ \text{lbf}$

$F_{3.ice} := F_{A.ice_3}$ — $F_{3.ice} = 18.704\ \text{lbf}$ — *Antenna position 3*

$W_{3.ice} := W_{ant.ice_3}$ — $W_{3.ice} = 144.552\ \text{lbf}$

$F_{4.ice} := F_{A.ice_2} + F_{A.ice_3}$ — $F_{4.ice} = 121.623\ \text{lbf}$ — *Antenna position 4*

$W_{4.ice} := W_{ant.ice_2} + W_{ant.ice_3}$ — $W_{4.ice} = 534.545\ \text{lbf}$

RISA 3D Loads Input

Loads will be applied equally at the top and bottom of the mounting pipes, as this is the connection location from the antennas to the pipes.

	Wind Load (no ice)	Dead Load (no ice)	Wind Load (with ice)	Dead Load (with ice)
Position 1:	$\frac{F_1}{2} = 72.095\,lbf$	$\frac{W_1}{2} = 85.85\,lbf$	$\frac{F_{1.ice}}{2} = 31.332\,lbf$	$\frac{W_{1.ice} - W_1}{2} = 125.339\,lbf$
Position 2:	$F_2 = 107.607\,lbf$	$W_2 = 30\,lbf$	$F_{2.ice} = 43.671\,lbf$	$W_{2.ice} - W_2 = 134.587\,lbf$
Position 3:	$F_3 = 38.559\,lbf$	$W_3 = 60\,lbf$	$F_{3.ice} = 18.704\,lbf$	$W_{3.ice} - W_3 = 84.552\,lbf$
Position 4:	$\frac{F_4}{2} = 156.827\,lbf$	$\frac{W_4}{2} = 68.7\,lbf$	$\frac{F_{4.ice}}{2} = 60.812\,lbf$	$\frac{W_{4.ice} - W_4}{2} = 198.572\,lbf$

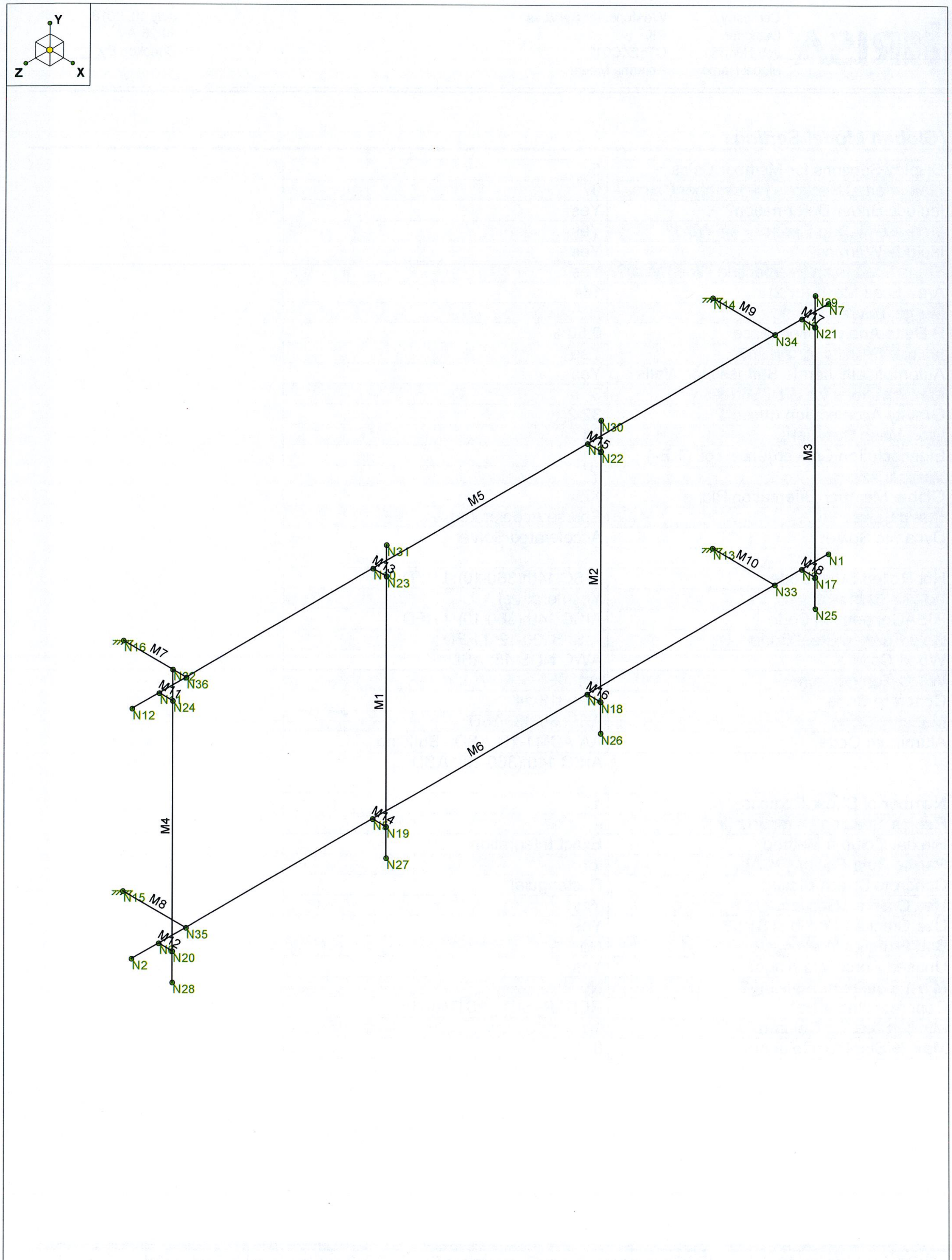
Wind loads on frame members

Round - Horizontal

$h := 2.875in$ $C_a := 1.2$

$w_{1p} := h \cdot q_{z.ant_1} \cdot C_a = 6.445 \cdot plf$

$w_{1p.ice} := h \cdot q_{z.ant.ice_1} \cdot C_a = 1.946 \cdot plf$



Y
Z
X
N14
M9
N29
N7
N34
N21
M3
N30
N22
M5
M2
N31
N23
N13
M10
N1
N17
N33
N25
N16
M7
N36
N12
N24
M1
N18
N26
M6
M4
N19
N27
N15
M8
N35
N2
N20
N28

(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 (ft/sec^2)	32.2
Wall Mesh Size (in)	24
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	AWC NDS-15: ASD
Wood Temperature	< 100F
Concrete Code	ACI 318-14
Masonry Code	ACI 530-13: ASD
Aluminum Code	AA ADM1-10: ASD - Building
	AISC 14th(360-10): ASD

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 (ft)	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	1
Cd X	1
Rho Z	1
Rho X	1

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (\1E...	Density[k/ft...	Yield[ksi]	Ry	Fu[ksi]	Rt
1	A992	29000	11154	.3	.65	.49	50	1.1	65	1.1
2	A36 Gr.36	29000	11154	.3	.65	.49	36	1.5	58	1.2
3	A572 Gr.50	29000	11154	.3	.65	.49	50	1.1	65	1.1
4	A500 Gr.B RND	29000	11154	.3	.65	.527	42	1.4	58	1.3
5	A500 Gr.B Rect	29000	11154	.3	.65	.527	46	1.4	58	1.3
6	A53 Gr.B	29000	11154	.3	.65	.49	35	1.6	60	1.2
7	A1085	29000	11154	.3	.65	.49	50	1.4	65	1.3

Joint Coordinates and Temperatures

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From ...
1	N1	0	0	0	0	
2	N2	0	0	13	0	
3	N3	0	0	.5	0	
4	N4	0	0	4.5	0	
5	N5	0	0	8.5	0	
6	N6	0	0	12.5	0	
7	N7	0	4	0	0	
8	N8	0	4	.5	0	
9	N9	0	4	4.5	0	
10	N10	0	4	8.5	0	
11	N11	0	4	12.5	0	
12	N12	0	4	13	0	
13	N13	-1.167	0	1	0	
14	N14	-1.167	4	1	0	

Joint Coordinates and Temperatures (Continued)

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From ...
15	N15	-1.167	0	12	0	
16	N16	-1.167	4	12	0	
17	N17	.25	0	.5	0	
18	N18	.25	0	4.5	0	
19	N19	.25	0	8.5	0	
20	N20	.25	0	12.5	0	
21	N21	.25	4	.5	0	
22	N22	.25	4	4.5	0	
23	N23	.25	4	8.5	0	
24	N24	.25	4	12.5	0	
25	N25	.25	-.5	.5	0	
26	N26	.25	-.5	4.5	0	
27	N27	.25	-.5	8.5	0	
28	N28	.25	-.5	12.5	0	
29	N29	.25	4.5	.5	0	
30	N30	.25	4.5	4.5	0	
31	N31	.25	4.5	8.5	0	
32	N32	.25	4.5	12.5	0	
33	N33	0	0	1	0	
34	N34	0	4	1	0	
35	N35	0	0	12	0	
36	N36	0	4	12	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]
1	N16	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
2	N15	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
3	N13	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
4	N14	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction

Hot Rolled Steel Design Parameters

	Label	Shape	Length[ft]	Lbyy[ft]	Lbzz[ft]	Lcomp top[ft]	Lcomp bot[ft]	L-torqu...	Kyy	Kzz	Cb	Function
1	M1	PIPE_2.0	5			Lbyy						Lateral
2	M2	PIPE_2.0	5			Lbyy						Lateral
3	M3	PIPE_2.0	5			Lbyy						Lateral
4	M4	PIPE_2.0	5			Lbyy						Lateral
5	M5	PIPE_2.5	13			Lbyy						Lateral
6	M6	PIPE_2.5	13			Lbyy						Lateral
7	M7	HSS3x3x3	1.167			Lbyy						Lateral
8	M8	HSS3x3x3	1.167			Lbyy						Lateral
9	M9	HSS3x3x3	1.167			Lbyy						Lateral
10	M10	HSS3x3x3	1.167			Lbyy						Lateral

Joint Loads and Enforced Displacements (BLC 2 : NS)

	Joint Label	L,D,M	Direction	Magnitude[(k,k-ft), (in,rad), (k*s^2/ft, k*s^2*ft)]
1	N30	L	X	.108
2	N25	L	X	.072

Joint Loads and Enforced Displacements (BLC 2 : NS) (Continued)

	Joint Label	L,D,M	Direction	Magnitude[(k,k-ft), (in,rad), (k*s^2/ft, k*s^2*ft)]
3	N29	L	X	.072
4	N28	L	X	.157
5	N32	L	X	.157
6	N27	L	X	.039

Joint Loads and Enforced Displacements (BLC 3 : EW)

	Joint Label	L,D,M	Direction	Magnitude[(k,k-ft), (in,rad), (k*s^2/ft, k*s^2*ft)]
1	N30	L	Z	.108
2	N25	L	Z	.072
3	N29	L	Z	.072
4	N28	L	Z	.157
5	N32	L	Z	.157
6	N27	L	Z	.039

Joint Loads and Enforced Displacements (BLC 4 : ew)

	Joint Label	L,D,M	Direction	Magnitude[(k,k-ft), (in,rad), (k*s^2/ft, k*s^2*ft)]
1	N30	L	Z	.044
2	N25	L	Z	.031
3	N29	L	Z	.031
4	N28	L	Z	.061
5	N32	L	Z	.061
6	N27	L	Z	.019

Joint Loads and Enforced Displacements (BLC 5 : ns)

	Joint Label	L,D,M	Direction	Magnitude[(k,k-ft), (in,rad), (k*s^2/ft, k*s^2*ft)]
1	N30	L	X	.044
2	N25	L	X	.031
3	N29	L	X	.031
4	N28	L	X	.061
5	N32	L	X	.061
6	N27	L	X	.019

Joint Loads and Enforced Displacements (BLC 6 : no ice)

	Joint Label	L,D,M	Direction	Magnitude[(k,k-ft), (in,rad), (k*s^2/ft, k*s^2*ft)]
1	N30	L	Y	.03
2	N25	L	Y	.086
3	N29	L	Y	.086
4	N28	L	Y	.069
5	N32	L	Y	.069
6	N27	L	Y	.06

Joint Loads and Enforced Displacements (BLC 7 : ice)

	Joint Label	L,D,M	Direction	Magnitude[(k,k-ft), (in,rad), (k*s^2/ft, k*s^2*ft)]
1	N30	L	Y	.135
2	N25	L	Y	.125
3	N29	L	Y	.125
4	N28	L	Y	.199
5	N32	L	Y	.199
6	N27	L	Y	.085

Member Distributed Loads (BLC 2 : NS)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/ft,F,k..	Start Location[ft,%]	End Location[ft,%]
1	M2	X	.006	.006	0	0
2	M3	X	.006	.006	0	0
3	M5	X	.006	.006	0	0
4	M6	X	.006	.006	0	0

Member Distributed Loads (BLC 3 : EW)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/ft,F,k..	Start Location[ft,%]	End Location[ft,%]
1	M2	Z	.006	.006	0	0
2	M3	Z	.006	.006	0	0
3	M5	Z	.006	.006	0	0
4	M6	Z	.006	.006	0	0

Member Distributed Loads (BLC 4 : ew)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/ft,F,k..	Start Location[ft,%]	End Location[ft,%]
1	M2	Z	.002	.002	0	0
2	M3	Z	.002	.002	0	0
3	M5	Z	.002	.002	0	0
4	M6	Z	.002	.002	0	0

Member Distributed Loads (BLC 5 : ns)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/ft,F,k..	Start Location[ft,%]	End Location[ft,%]
1	M2	X	.002	.002	0	0
2	M3	X	.002	.002	0	0
3	M5	X	.002	.002	0	0
4	M6	X	.002	.002	0	0

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed	Area(Me...	Surface(P...
1	DL	DL		-1						
2	NS	WL				6		4		
3	EW	WL				6		4		
4	ew	WL				6		4		
5	ns	WL				6		4		
6	no ice	DL				6				
7	ice	SL				6				

Load Combinations

	Description	Solve	P...	S...	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac...
1	1.4DL	Yes	Y		1	1.4	6	-1.4																
2	1.2DL+1.6Wo 0deg	Yes	Y		1	1.2	6	-1.2	2	1.6	3													
3	1.2DL+1.6Wo 30d...	Yes	Y		1	1.2	6	-1.2	2	1.3...	3	.8												
4	1.2DL+1.6Wo 60d...	Yes	Y		1	1.2	6	-1.2	2	.8	3	1.3...												
5	1.2DL+1.6Wo 90d...	Yes	Y		1	1.2	6	-1.2	2		3	1.6												
6	1.2DL+1.6Wo 120...	Yes	Y		1	1.2	6	-1.2	2	-.8	3	1.3...												
7	1.2DL+1.6Wo 150...	Yes	Y		1	1.2	6	-1.2	2	-1.3...	3	.8												
8	1.2DL+1.6Wo 180...	Yes	Y		1	1.2	6	-1.2	2	-1.6	3													

Load Combinations (Continued)

	Description	Solve	P...	S...	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac...
9	1.2DL+1.6Wo 210...	Yes	Y		1	1.2	6	-1.2	2	-1.3...	3	-.8												
10	1.2DL+1.6Wo 240...	Yes	Y		1	1.2	6	-1.2	2	-.8	3	-1.3...												
11	1.2DL+1.6Wo 270...	Yes	Y		1	1.2	6	-1.2	2		3	-1.6												
12	1.2DL+1.6Wo 300...	Yes	Y		1	1.2	6	-1.2	2	.8	3	-1.3...												
13	1.2DL+1.6Wo 330...	Yes	Y		1	1.2	6	-1.2	2	1.3...	3	-.8												
14	1.2DL+1.0Wi+1.0...	Yes	Y		1	1.2	6	-1.2	5	1	4		7	-1										
15	1.2DL+1.0Wi+1.0...	Yes	Y		1	1.2	6	-1.2	5	.866	4	.5	7	-1										
16	1.2DL+1.0Wi+1.0...	Yes	Y		1	1.2	6	-1.2	5	.5	4	.866	7	-1										
17	1.2DL+1.0Wi+1.0...	Yes	Y		1	1.2	6	-1.2	5		4	1	7	-1										
18	1.2DL+1.0Wi+1.0...	Yes	Y		1	1.2	6	-1.2	5	-.5	4	.866	7	-1										
19	1.2DL+1.0Wi+1.0...	Yes	Y		1	1.2	6	-1.2	5	-.866	4	.5	7	-1										
20	1.2DL+1.0Wi+1.0...	Yes	Y		1	1.2	6	-1.2	5	-1	4		7	-1										
21	1.2DL+1.0Wi+1.0...	Yes	Y		1	1.2	6	-1.2	5	-.866	4	-.5	7	-1										
22	1.2DL+1.0Wi+1.0...	Yes	Y		1	1.2	6	-1.2	5	-.5	4	-.866	7	-1										
23	1.2DL+1.0Wi+1.0...	Yes	Y		1	1.2	6	-1.2	5		4	-1	7	-1										
24	1.2DL+1.0Wi+1.0...	Yes	Y		1	1.2	6	-1.2	5	.5	4	-.866	7	-1										
25	1.2DL+1.0Wi+1.0...	Yes	Y		1	1.2	6	-1.2	5	.866	4	-.5	7	-1										

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	N16	max	.34	8	.464	21	.417	12	.1	12	.394	6	.488	22
2		min	-.39	2	.069	3	-.403	6	.023	6	-.402	12	.131	4
3	N15	max	.394	8	.466	15	.308	12	.108	6	.346	5	.49	16
4		min	-.343	2	.068	9	-.322	6	.015	12	-.339	11	.123	10
5	N13	max	.26	8	.399	25	.328	10	-.035	3	.332	5	.427	25
6		min	-.207	2	.148	7	-.318	4	-.094	21	-.336	11	.167	7
7	N14	max	.32	8	.399	20	.42	10	-.035	10	.39	5	.42	17
8		min	-.373	2	.15	2	-.43	4	-.095	16	-.385	11	.196	10
9	Totals:	max	1.314	8	1.641	18	1.314	11						
10		min	-1.314	2	.773	12	-1.314	5						

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

	Member	Shape	Code Check	Loc...	LC	Shear Check	Loc......		LC	phi*Pn...	phi*Pn...	phi*Mn..	phi*Mn.....		Eqn
1	M5	PIPE_2.5	.108	11....	9	.051	.948		8	13.46	50.715	3.596	3.596	2..	H1-1b
2	M7	HSS3x3x3	.095	0	11	.037	0	z	12	77.457	78.246	6.796	6.796	1..	H1-1b
3	M9	HSS3x3x3	.091	0	5	.035	0	y	18	77.457	78.246	6.796	6.796	1..	H1-1b
4	M8	HSS3x3x3	.089	0	5	.036	0	y	17	77.457	78.246	6.796	6.796	1..	H1-1b
5	M10	HSS3x3x3	.084	0	11	.034	0	y	23	77.457	78.246	6.796	6.796	1..	H1-1b
6	M6	PIPE_2.5	.075	11....	8	.052	12....		2	13.46	50.715	3.596	3.596	2..	H1-1b
7	M4	PIPE_2.0	.065	4.531	13	.026	4.531		13	23.809	32.13	1.872	1.872	2..	H1-1b
8	M2	PIPE_2.0	.062	4.479	17	.018	4.531		3	23.809	32.13	1.872	1.872	1..	H1-1b
9	M1	PIPE_2.0	.061	4.479	17	.011	.521		2	23.809	32.13	1.872	1.872	1..	H1-1b
10	M3	PIPE_2.0	.047	4.479	14	.012	4.531		3	23.809	32.13	1.872	1.872	2..	H1-1b