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

March 5, 2019

Kyle Richers
Transcend Wireless
10 Industrial Avenue, Suite 3
Mahwah, New Jersey 07430

RE: **EM-T-MOBILE-126-190301 –** T-Mobile notice of intent to modify an existing telecommunications facility located at 161 (a/k/a 219) Nells Rock Road, Shelton, Connecticut.

Dear Mr. Richers:

The Connecticut Siting Council (Council) received a notice of intent to modify the above-referenced facility on March 1, 2019.

According to Section 16-50j-71 of the Regulations of Connecticut State Agencies, "…any modification, as defined in Section 16-50j-2a of the Regulations of Connecticut State Agencies, to an existing tower site, except as specified in Sections 16-50j-72 and 16-50j-88 of the Regulations of Connecticut State Agencies, may have a substantial adverse environmental effect."

Staff has reviewed this exempt modification request for completeness and has identified a deficiency in the Rigorous Structural Analysis Report (SA) dated February 22, 2019 and prepared by GPD Engineering. The above-referenced document refers to the 2016 Connecticut State Building Code (CSBC); however, the 2018 CSBC became effective on October 1, 2018 and should be applied to this project.

Also a structural note on sheet C-2 of the Construction Drawings (CD) dated February 13, 2019 and prepared by Centek Engineering references an Antenna Mount Analysis Report (MA) dated October 22, 2018 and prepared by Centek Engineering, and a SA dated February 1, 2019 and prepared by GPD Engineering. No MA was provided with the request and the SA provided is dated February 22, 2019.

Therefore, the exempt modification request is incomplete at this time. The Council recommends that Transcend Wireless provide an updated SA that references the current 2018 CSBC, a CD that references the correct SA and MA and a MA showing the proposed mount modifications, on or before April 8, 2019. If additional time is needed to gather the requested information, please submit a written request for an extension of time prior to April 8, 2019.

This notice of incompletion shall have the effect of tolling the Federal Communications Commission (FCC) 60-day timeframe in accordance with Paragraph 217 of the FCC Wireless Infrastructure Report and Order issued on October 21, 2014 (FCC 14-153).

Thank you for your attention to this matter. Should you have any questions, please feel free to contact me at 860-827-2951.

Sincerely,

Melanie Bachman
Executive Director

MAB/IN/emr

c: The Honorable Mark A. Lauretti, Mayor, City of Shelton
Richard Schultz, AICP, Planning & Zoning Administrator, City of Shelton

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March 27, 2019

Kyle Richers
Transcend Wireless
10 Industrial Avenue, Suite 3
Mahwah, New Jersey 07430

RE: **EM-T-MOBILE-126-190301 –** T-Mobile notice of intent to modify an existing telecommunications facility located at 161 (a/k/a 219) Nells Rock Road, Shelton, Connecticut.

Dear Mr. Richers:

The Connecticut Siting Council (Council) received a notice of intent to modify the above-referenced facility on March 1, 2019. On March 5, 2019, the Council issued a letter (enclosed) stating that the request for exempt modification was incomplete because the Structural Analysis Report (SA) references the 2016 Connecticut State Building Code (CSBC). The 2018 CSBC became effective on October 1, 2018 and should have been applied to this project. Also, the Construction Drawings (CD) reference the wrong date of the SA and the Antenna Mount Analysis (MA) referenced in the CD was not provided. The Council recommended that Transcend Wireless provide an updated SA that references the current 2018 CSBC, a CD that references the correct SA and MA dates, and a MA showing the proposed mount modifications, on or before April 8, 2019.

On March 27, 2019, the Council received a SA dated February 1, 2019 which referenced the 2018 CSBC and a MA dated March 8, 2019. However, the submission does not contain an updated CD referencing the correct MA date.

Therefore, the exempt modification request remains incomplete at this time. The Council recommends that Transcend Wireless provide an updated CD that references the correct MA, on or before April 30, 2019. If additional time is needed to gather the requested information, please submit a written request for an extension of time prior to April 30, 2019. **Please provide an electronic version and one hard copy of the CD for the incomplete request to be rendered complete and processed.**

This notice of incompletion shall have the effect of tolling the Federal Communications Commission (FCC) 60-day timeframe in accordance with Paragraph 217 of the FCC Wireless Infrastructure Report and Order issued on October 21, 2014 (FCC 14-153).

Thank you for your attention to this matter. Should you have any questions, please feel free to contact me at 860-827-2951.

Sincerely,

Melanie Bachman
Executive Director

MAB/IN/emr

Enclosure: Incomplete Letter dated March 5, 2019.

c: The Honorable Mark A. Lauretti, Mayor, City of Shelton
Richard Schultz, AICP, Planning & Zoning Administrator, City of Shelton

CENTEK engineering

Centered on Solutions℠

Structural Analysis Report

Antenna Mount Analysis

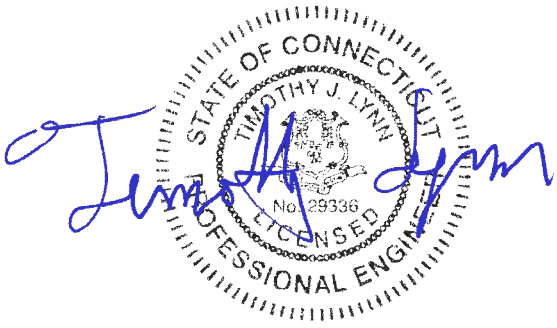
T-Mobile Site #: CT11199A

219 Nells Rock Road
Shelton, CT

Centek Project No. 18058.75

~~Date: September 19, 2018~~
Rev 2: March 8, 2019

Max Stress Ratio = 62.5%



Prepared for:

T-Mobile USA
35 Griffin Road
Bloomfield, CT 06002

Table of Contents

CENTEK engineering

Centered on Solutions℠

March 8, 2019

Mr. Dan Reid
Transcend Wireless
10 Industrial Ave
Mahwah, NJ 07430

Re: Structural Letter ~ Antenna Mount
T-Mobile – Site Ref: CT11199A
219 Nells Rock Road
Shelton, CT 06484

Centek Project No. 18058.75

Dear Mr. Reid,

Centek Engineering, Inc. has reviewed the T-Mobile antenna installation at the above referenced site. The purpose of the review is to determine the structural adequacy of the proposed mount, consisting of three (3) 5-ft T-Arms to support the equipment configuration. The review considered the effects of wind load, dead load and ice load in accordance with the 2015 International Building Code as modified by the 2018 Connecticut State Building Code (CTBC) including ASCE 7-10 and ANSI/TIA-222-G *Structural Standards for Steel Antenna Towers and Supporting Structures*.

The loads considered in this analysis consist of the following:

- T-Mobile:
  T-Arms: Three (3) Ericsson AIR32 panel antennas, three (3) RFS APXVAARR24-43-NA20 panel antennas, three (3) TMAs and three (3) Ericsson 4449 B71_B12 remote radio units mounted on three (3) T-Arms with a RAD center elevation of 135-ft +/- AGL.

The antenna mount was analyzed per the requirements of the 2015 International Building Code as modified by the 2018 Connecticut State Building Code considering a nominal design wind speed of 97 mph for Shelton as required in Appendix N of the 2018 Connecticut State Building Code.

A structural analysis of tower and foundation needs to be completed prior to any work.

Based on our review of the installation, it is our opinion that the existing antenna pipe mounts are inadequate to support the proposed antenna configuration. Replacement of the existing mounts with (3) SItePro XLD WiMAX Tower Mount (SitePro P/N CWT-02) w/ XLD Sector Frame Stabilizer Kit (SitePro P/N SFS-H) is required. If there are any questions regarding this matter, please feel free to call.

Respectfully Submitted by:

Timothy J. Lynn, PE
Structural Engineer

STATE OF CONNECTICUT
TIMOTHY J. LYNN
No. 29336
LICENSED
PROFESSIONAL ENGINEER

Section 2 - Calculations

CENTEK engineering
Centered on Solutions℠ www.centekeng.com
63-2 North Branford Road P: (203) 488-0580
Branford, CT 06405 F: (203) 488-8587

Subject: TIA-222-G Loads

Location: Shelton, CT

Rev. 0: 9/19/18

Prepared by: T.J.L. Checked by: C.F.C.
Job No. 18058.75

Development of Design Heights, Exposure Coefficients, and Velocity Pressures Per TIA-222-G

Wind Speeds

Basic Wind Speed $V := 97$ mph (User Input - 2016 CSBC Appendix N)

Basic Wind Speed with Ice $V_i := 50$ mph (User Input per Annex B of TIA-222-G)

Input

Structure Type = Structure_Type := Lattice (User Input)

Structure Category = $SC := II$ (User Input)

Exposure Category = $Exp := C$ (User Input)

Structure Height = $h := 162.5$ ft (User Input)

Height to Center of Antennas = $z_{AT\&T} := 135$ ft (User Input)

Radial Ice Thickness = $t_i := 0.75$ in (User Input per Annex B of TIA-222-G)

Radial Ice Density = $Id := 56.00$ pcf (User Input)

Topograpic Factor = $K_{zt} := 1.0$ (User Input)

$K_a := 1.0$ (User Input)

Gust Response Factor = $G_H = 0.85$ (User Input)

Output

Wind Direction Probability Factor =

$$K_d := \begin{cases} 0.95 & \text{if Structure\_Type = Pole} \\ 0.85 & \text{if Structure\_Type = Lattice} \end{cases} = 0.85$$

(Per Table 2-2 of TIA-222-G)

Importance Factors =

$$I_{Wind} := \begin{cases} 0.87 & \text{if } SC = 1 \\ 1.00 & \text{if } SC = 2 \\ 1.15 & \text{if } SC = 3 \end{cases} = 1$$

(Per Table 2-3 of TIA-222-G)

$$I_{Wind\_w\_Ice} := \begin{cases} 0 & \text{if } SC = 1 \\ 1.00 & \text{if } SC = 2 \\ 1.00 & \text{if } SC = 3 \end{cases} = 1$$

$$I_{ice} := \begin{cases} 0 & \text{if } SC = 1 \\ 1.00 & \text{if } SC = 2 \\ 1.25 & \text{if } SC = 3 \end{cases} = 1$$

$$K_{iz} := \left(\frac{z_{AT\&T}}{33}\right)^{0.1} = 1.151$$

$$t_{iz} := 2.0 \cdot t_i \cdot I_{ice} \cdot K_{iz} \cdot K_{zt}^{0.35} = 1.727$$

Velocity Pressure Coefficient Antennas =

$$Kz_{AT\&T} := 2.01\left(\left(\frac{z_{AT\&T}}{zg}\right)\right)^{\frac{2}{\alpha}} = 1.348$$

Velocity Pressure w/o Ice Antennas =

$$qz_{AT\&T} := 0.00256 \cdot K_d \cdot Kz_{AT\&T} \cdot V^2 \cdot I_{Wind} = 27.602$$

Velocity Pressure with Ice Antennas =

$$qz_{ice.AT\&T} := 0.00256 \cdot K_d \cdot Kz_{AT\&T} \cdot V_i^2 \cdot I_{Wind} = 7.334$$

CENTEK engineering
Centered on Solutions℠ www.centekeng.com
63-2 North Branford Road P: (203) 488-0580
Branford, CT 06405 F: (203) 488-8587

Subject:	TIA-222-G Loads
Location:	Shelton, CT
Rev. 0: 9/19/18	Prepared by: T.J.L. Checked by: C.F.C. Job No. 18058.75

Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	Ericsson AIR32		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 56.6$	in	(User Input)
Antenna Width =	$W_{ant} := 12.9$	in	(User Input)
Antenna Thickness =	$T_{ant} := 8.7$	in	(User Input)
Antenna Weight =	$WT_{ant} := 133$	lbs	(User Input)
Number of Antennas =	$N_{ant} := 1$		(User Input)
Antenna Aspect Ratio =	$Ar_{ant} := \frac{L_{ant}}{W_{ant}} = 4.4$		
Antenna Force Coefficient =	$Ca_{ant} = 1.28$		

Wind Load (without ice)

Surface Area for One Antenna =	$SA_{antF} := \frac{L_{ant} \cdot W_{ant}}{144} = 5.1$	sf
Total Antenna Wind Force =	$F_{ant} := qz_{AT\&T} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antF} = 153$	lbs
Surface Area for One Antenna =	$SA_{antS} := \frac{L_{ant} \cdot T_{ant}}{144} = 3.4$	sf
Total Antenna Wind Force =	$F_{ant} := qz_{AT\&T} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antS} = 103$	lbs

Wind Load (with ice)

Surface Area for One Antenna w/ Ice =	$SA_{ICEantF} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (W_{ant} + 2 \cdot t_{iz})}{144} = 6.8$	sf
Total Antenna Wind Force w/ Ice =	$Fi_{ant} := qz_{ice.AT\&T} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantF} = 55$	lbs
Surface Area for One Antenna w/ Ice =	$SA_{ICEantS} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz})}{144} = 5.1$	sf
Total Antenna Wind Force w/ Ice =	$Fi_{ant} := qz_{ice.AT\&T} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantS} = 41$	lbs

Gravity Load (without ice)

Weight of All Antennas =	$WT_{ant} \cdot N_{ant} = 133$	lbs

Gravity Loads (ice only)

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 6352$	cu in
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 2 \cdot t_{iz})(W_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz}) - V_{ant} = 5584$	cu in
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 181$	lbs
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 181$	lbs

Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	RFSAPXVAARR24-43		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 95.9$	in	(User Input)
Antenna Width =	$W_{ant} := 24$	in	(User Input)
Antenna Thickness =	$T_{ant} := 8.7$	in	(User Input)
Antenna Weight =	$WT_{ant} := 153$	lbs	(User Input)
Number of Antennas =	$N_{ant} := 1$		(User Input)
Antenna Aspect Ratio =	$Ar_{ant} := \frac{L_{ant}}{W_{ant}} = 4.0$		
Antenna Force Coefficient =	$Ca_{ant} = 1.27$		

Wind Load (without ice)

Surface Area for One Antenna =	$SA_{antF} := \frac{L_{ant} \cdot W_{ant}}{144} = 16$	sf
Total Antenna Wind Force =	$F_{ant} := qz_{AT\&T} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antF} = 475$	lbs
Surface Area for One Antenna =	$SA_{antS} := \frac{L_{ant} \cdot T_{ant}}{144} = 5.8$	sf
Total Antenna Wind Force =	$F_{ant} := qz_{AT\&T} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antS} = 172$	lbs

Wind Load (with ice)

Surface Area for One Antenna w/ Ice =	$SA_{ICEantF} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (W_{ant} + 2 \cdot t_{iz})}{144} = 18.9$	sf
Total Antenna Wind Force w/ Ice =	$Fi_{ant} := qz_{ice.AT\&T} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantF} = 150$	lbs
Surface Area for One Antenna w/ Ice =	$SA_{ICEantS} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz})}{144} = 8.4$	sf
Total Antenna Wind Force w/ Ice =	$Fi_{ant} := qz_{ice.AT\&T} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantS} = 66$	lbs

Gravity Load (without ice)

Weight of All Antennas =	$WT_{ant} \cdot N_{ant} = 153$	lbs

Gravity Loads (ice only)

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 2 \times 10^4$	cu in
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 2 \cdot t_{iz})(W_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz}) - V_{ant} = 1 \times 10^4$	cu in
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 425$	lbs
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 425$	lbs

Development of Wind & Ice Load on TMA's

TMA Data:

TMA Model =	Ericsson KRY112 TMA		
TMA Shape =	Flat		(User Input)
TMA Height =	$L_{TMA} := 7.7$	in	(User Input)
TMA Width =	$W_{TMA} := 7.5$	in	(User Input)
TMA Thickness =	$T_{TMA} := 3.4$	in	(User Input)
TMA Weight =	$WT_{TMA} := 11$	lbs	(User Input)
Number of TMA's =	$N_{TMA} := 1$		(User Input)
TMA Aspect Ratio =	$Ar_{TMA} := \frac{L_{TMA}}{W_{TMA}} = 1$		
TMA Force Coefficient =	$Ca_{TMA} = 1.2$		

Wind Load (without ice)

Surface Area for One TMA =	$SA_{TMAF} := \frac{L_{TMA} \cdot W_{TMA}}{144} = 0.4$	sf
Total TMA Wind Force =	$F_{TMA} := qz_{AT\&T} \cdot G_H \cdot Ca_{TMA} \cdot K_a \cdot SA_{TMAF} = 11$	lbs
Surface Area for One TMA =	$SA_{TMAS} := \frac{L_{TMA} \cdot T_{TMA}}{144} = 0.2$	sf
Total TMA Wind Force =	$F_{TMA} := qz_{AT\&T} \cdot G_H \cdot Ca_{TMA} \cdot K_a \cdot SA_{TMAS} = 5$	lbs

Wind Load (with ice)

Surface Area for One TMA w/ Ice =	$SA_{ICETMAF} := \frac{(L_{TMA} + 2 \cdot t_{iz}) \cdot (W_{TMA} + 2 \cdot t_{iz})}{144} = 0.8$	sf
Total TMA Wind Force w/ Ice =	$Fi_{TMA} := qz_{ice.AT\&T} \cdot G_H \cdot Ca_{TMA} \cdot K_a \cdot SA_{ICETMAF} = 6$	lbs
Surface Area for One TMA w/ Ice =	$SA_{ICETMAS} := \frac{(L_{TMA} + 2 \cdot t_{iz}) \cdot (T_{TMA} + 2 \cdot t_{iz})}{144} = 0.5$	sf
Total TMA Wind Force w/ Ice =	$Fi_{TMA} := qz_{ice.AT\&T} \cdot G_H \cdot Ca_{TMA} \cdot K_a \cdot SA_{ICETMAS} = 4$	lbs

Gravity Load (without ice)

Weight of All TMAs =	$WT_{TMA} \cdot N_{TMA} = 11$	lbs

Gravity Loads (ice only)

Volume of Each TMA =	$V_{TMA} := L_{TMA} \cdot W_{TMA} \cdot T_{TMA} = 196$	cu in
Volume of Ice on Each TMA =	$V_{ice} := (L_{TMA} + 2 \cdot t_{iz})(W_{TMA} + 2 \cdot t_{iz}) \cdot (T_{TMA} + 2 \cdot t_{iz}) - V_{TMA} = 641$	cu in
Weight of Ice on Each TMA =	$W_{ICETMA} := \frac{V_{ice}}{1728} \cdot Id = 21$	lbs
Weight of Ice on All TMAs =	$W_{ICETMA} \cdot N_{TMA} = 21$	lbs

Development of Wind & Ice Load on RRUS's

RRUS Data:

RRUS Model = Ericsson 4449 B71B12

RRUS Shape = Flat (User Input)

RRUS Height = $L_{RRUS} := 14.9$ in (User Input)

RRUS Width = $W_{RRUS} := 13.2$ in (User Input)

RRUS Thickness = $T_{RRUS} := 10.4$ in (User Input)

RRUS Weight = $WT_{RRUS} := 74$ lbs (User Input)

Number of RRUS's = $N_{RRUS} := 1$ (User Input)

RRUS Aspect Ratio = $Ar_{RRUS} := \frac{L_{RRUS}}{W_{RRUS}} = 1.1$

RRUS Force Coefficient = $Ca_{RRUS} = 1.2$

Wind Load (without ice)

Surface Area for One RRUS = $SA_{RRUSF} := \frac{L_{RRUS} \cdot W_{RRUS}}{144} = 1.4$ sf

Total RRUS Wind Force = $F_{RRUS} := qz_{AT\&T} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{RRUSF} = 38$ lbs

Surface Area for One RRUS = $SA_{RRUSS} := \frac{L_{RRUS} \cdot T_{RRUS}}{144} = 1.1$ sf

Total RRUS Wind Force = $F_{RRUS} := qz_{AT\&T} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{RRUSS} = 30$ lbs

Wind Load (with ice)

Surface Area for One RRUS w/ Ice = $SA_{ICERRUSF} := \frac{(L_{RRUS} + 2 \cdot t_{iz}) \cdot (W_{RRUS} + 2 \cdot t_{iz})}{144} = 2.1$ sf

Total RRUS Wind Force w/ Ice = $Fi_{RRUS} := qz_{ice.AT\&T} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{ICERRUSF} = 16$ lbs

Surface Area for One RRUS w/ Ice = $SA_{ICERRUSS} := \frac{(L_{RRUS} + 2 \cdot t_{iz}) \cdot (T_{RRUS} + 2 \cdot t_{iz})}{144} = 1.8$ sf

Total RRUS Wind Force w/ Ice = $Fi_{RRUS} := qz_{ice.AT\&T} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{ICERRUSS} = 13$ lbs

Gravity Load (without ice)

Weight of All RRUSs = $WT_{RRUS} \cdot N_{RRUS} = 74$ lbs

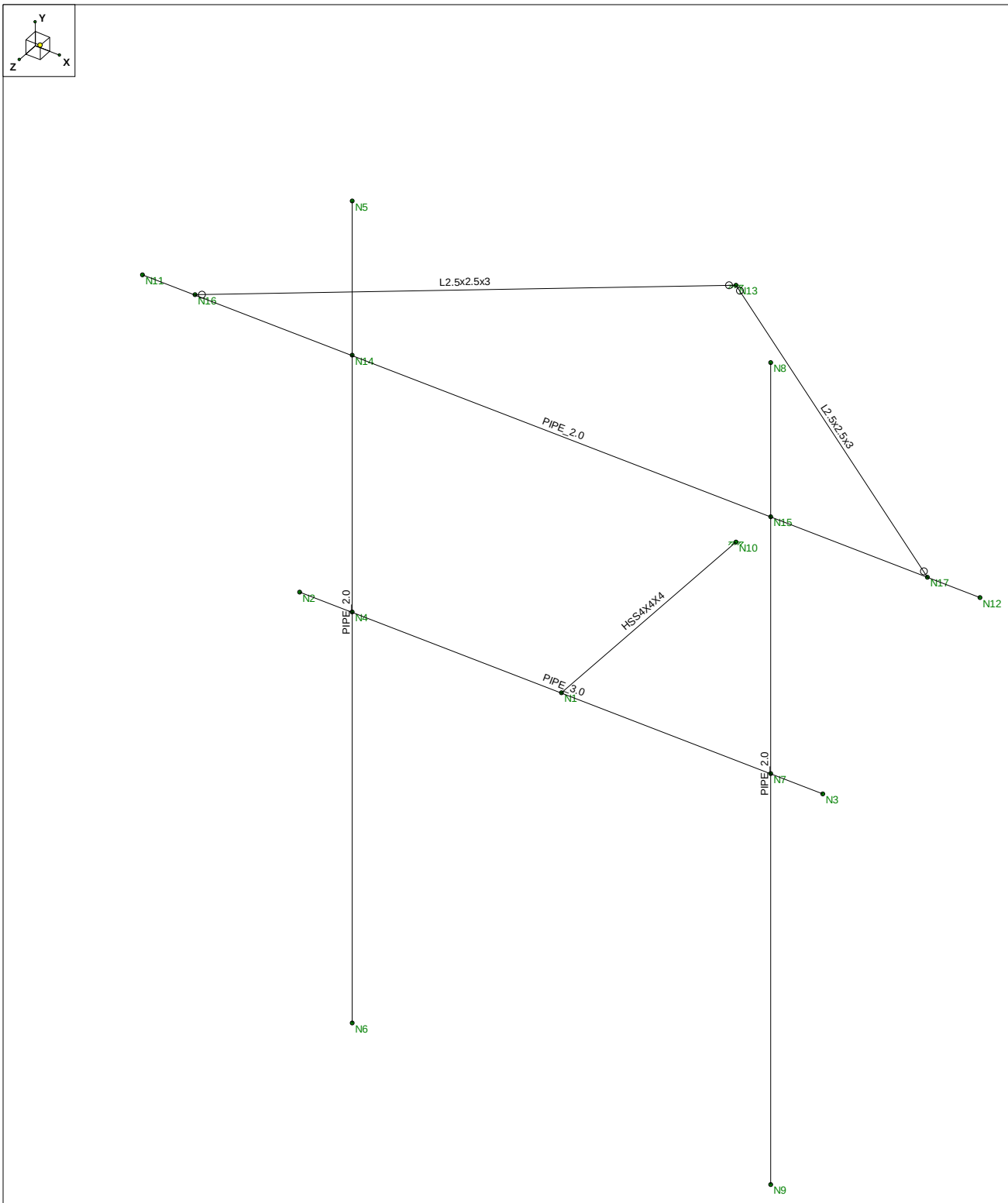
Gravity Loads (ice only)

Volume of Each RRUS = $V_{RRUS} := L_{RRUS} \cdot W_{RRUS} \cdot T_{RRUS} = 2045$ cu in

Volume of Ice on Each RRUS = $V_{ice} := (L_{RRUS} + 2 \cdot t_{iz})(W_{RRUS} + 2 \cdot t_{iz}) \cdot (T_{RRUS} + 2 \cdot t_{iz}) - V_{RRUS} = 2189$

Weight of Ice on Each RRUS = $W_{ICERRUS} := \frac{V_{ice}}{1728} \cdot Id = 71$ lbs

Weight of Ice on All RRUSs = $W_{ICERRUS} \cdot N_{RRUS} = 71$ lbs



Envelope Only Solution

Centek		
TJL	CT11196A - Mount	Oct 22, 2018 at 3:08 PM
18058.75	Member Framing	Mount.r3d

(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)	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): ASD
Cold Formed Steel Code	AISI S100-10: ASD
Wood Code	AWC NDS-12: ASD
Wood Temperature	< 100F
Concrete Code	ACI 318-11
Masonry Code	ACI 530-11: ASD
Aluminum Code	AA ADM1-10: ASD - Building
Stainless Steel Code	AISC 14th(360-10): ASD
Adjust Stiffness?	Yes(Iterative)

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?	No
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	4
Cd X	4
Rho Z	1
Rho X	1
Footing Overturning Safety Factor	1
Optimize for OTM/Sliding	No
Check Concrete Bearing	No
Footing Concrete Weight (k/ft^3)	150.001
Footing Concrete f'c (ksi)	4
Footing Concrete Ec (ksi)	3644
Lambda	1
Footing Steel fy (ksi)	60
Minimum Steel	0.0018
Maximum Steel	0.0075
Footing Top Bar	#3
Footing Top Bar Cover (in)	2
Footing Bottom Bar	#3
Footing Bottom Bar Cover (in)	3.5
Pedestal Bar	#3
Pedestal Bar Cover (in)	1.5
Pedestal Ties	#3

Hot Rolled Steel Properties

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

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design ...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	Outrigger	HSS4X4X4	Beam	Wide Flange	A500 Gr.46	Typical	3.37	7.8	7.8	12.8
2	Horz	PIPE_3.0	Beam	Pipe	A53 Grade B	Typical	2.07	2.85	2.85	5.69
3	Antenna Mast	PIPE_2.0	Column	Pipe	A53 Grade B	Typical	1.02	.627	.627	1.25
4	Brace	L2.5x2.5x3	Column	Pipe	A36 Gr.36	Typical	.901	.535	.535	.011
5	Horz Brace	PIPE_2.0	Column	Pipe	A53 Grade B	Typical	1.02	.627	.627	1.25

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	Horz	5			Lbyy						Lateral
2	M2	Antenna Mast	8			Lbyy						Lateral
3	M3	Antenna Mast	8			Lbyy						Lateral
4	M4	Outrigger	2.5			Lbyy						Lateral
5	M5	Horz Brace	8			Lbyy						Lateral
6	M6	Brace	4.301									Lateral
7	M7	Brace	4.301									Lateral

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(d...	Section/Shape	Type	Design List	Material	Design Rul...
1	M1	N2	N3			Horz	Beam	Pipe	A53 Gra...	Typical
2	M2	N6	N5			Antenna Mast	Column	Pipe	A53 Gra...	Typical
3	M3	N9	N8			Antenna Mast	Column	Pipe	A53 Gra...	Typical
4	M4	N10	N1			Outrigger	Beam	Wide Flange	A500 Gr....	Typical
5	M5	N11	N12			Horz Brace	Column	Pipe	A53 Gra...	Typical
6	M6	N16	N13			Brace	Column	Pipe	A36 Gr.36	Typical
7	M7	N13	N17			Brace	Column	Pipe	A36 Gr.36	Typical

Joint Coordinates and Temperatures

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Dia...
1	N1	0	0	3	0	
2	N2	-2.5	0	3	0	
3	N3	2.5	0	3	0	
4	N4	-2	0	3	0	
5	N5	-2	4	3	0	
6	N6	-2	-4	3	0	
7	N7	2	0	3	0	
8	N8	2	4	3	0	
9	N9	2	-4	3	0	
10	N10	0	0	.5	0	
11	N11	-4	2.5	3	0	
12	N12	4	2.5	3	0	
13	N13	0	2.5	.5	0	
14	N14	-2	2.5	3	0	
15	N15	2	2.5	3	0	
16	N16	-3.5	2.5	3	0	
17	N17	3.5	2.5	3	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	N10	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
2	N13	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction

Member Point Loads (BLC 2 : Equipment Weight)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M2	Y	-.067	2
2	M2	Y	-.067	6
3	M3	Y	-.077	1
4	M3	Y	-.077	7
5	M3	Y	-.011	3
6	M3	Y	-.074	5.5

Member Point Loads (BLC 3 : Ice Weight)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M2	Y	-.091	2
2	M2	Y	-.091	6
3	M3	Y	-.213	1
4	M3	Y	-.213	7
5	M3	Y	-.021	3
6	M3	Y	-.071	5.5

Member Point Loads (BLC 4 : Wind w/ Ice X)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M2	X	.021	2
2	M2	X	.021	6
3	M3	X	.033	1
4	M3	X	.033	7
5	M3	X	.004	3
6	M3	X	.013	5.5

Member Point Loads (BLC 5 : Wind X)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M2	X	.052	2
2	M2	X	.052	6
3	M3	X	.086	1
4	M3	X	.086	7
5	M3	X	.005	3
6	M3	X	.03	5.5

Member Point Loads (BLC 6 : Wind w/ Ice Z)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M2	Z	.028	2
2	M2	Z	.028	6
3	M3	Z	.075	1
4	M3	Z	.075	7

Member Point Loads (BLC 7 : Wind Z)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M2	Z	.077	2
2	M2	Z	.077	6
3	M3	Z	.238	1
4	M3	Z	.238	7

Member Distributed Loads (BLC 4 : Wind w/ Ice X)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/...	Start Location[ft,%]	End Location[ft,%]
1	M2	X	.003	.003	0	0
2	M3	X	.003	.003	0	0

Member Distributed Loads (BLC 5 : Wind X)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/...	Start Location[ft,%]	End Location[ft,%]
1	M2	X	.009	.009	0	0
2	M3	X	.009	.009	0	0

Member Distributed Loads (BLC 6 : Wind w/ Ice Z)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/...	Start Location[ft,%]	End Location[ft,%]
1	M1	Z	.003	.003	0	0
2	M5	Z	.003	.003	0	0

Member Distributed Loads (BLC 7 : Wind Z)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/...	Start Location[ft,%]	End Location[ft,%]
1	M1	Z	.009	.009	0	0
2	M5	Z	.009	.009	0	0

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distribu...	Area(M...	Surface...
1	Self Weight	DL		-1						
2	Equipment Weight	None					6			
3	Ice Weight	None					6			
4	Wind w/ Ice X	None					6	2		
5	Wind X	None					6	2		
6	Wind w/ Ice Z	None					4	2		
7	Wind Z	None					4	2		

Load Combinations

	Description	So...	P...	S...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...
1	1.2D + 1.6W (X-d..	Yes	Y		1	1.2	2	1.2	5	1.6														
2	0.9D + 1.6W (X-d..	Yes	Y		1	.9	2	.9	5	1.6														
3	1.2D + 1.0Di + 1....	Yes	Y		1	1.2	2	1.2	3	1	4	1												
4	1.2D + 1.6W (Z-d..	Yes	Y		1	1.2	2	1.2	7	1.6														
5	0.9D + 1.6W (Z-d..	Yes	Y		1	.9	2	.9	7	1.6														
6	1.2D + 1.0Di + 1....	Yes	Y		1	1.2	2	1.2	3	1	6	1												

Envelope Joint Reactions

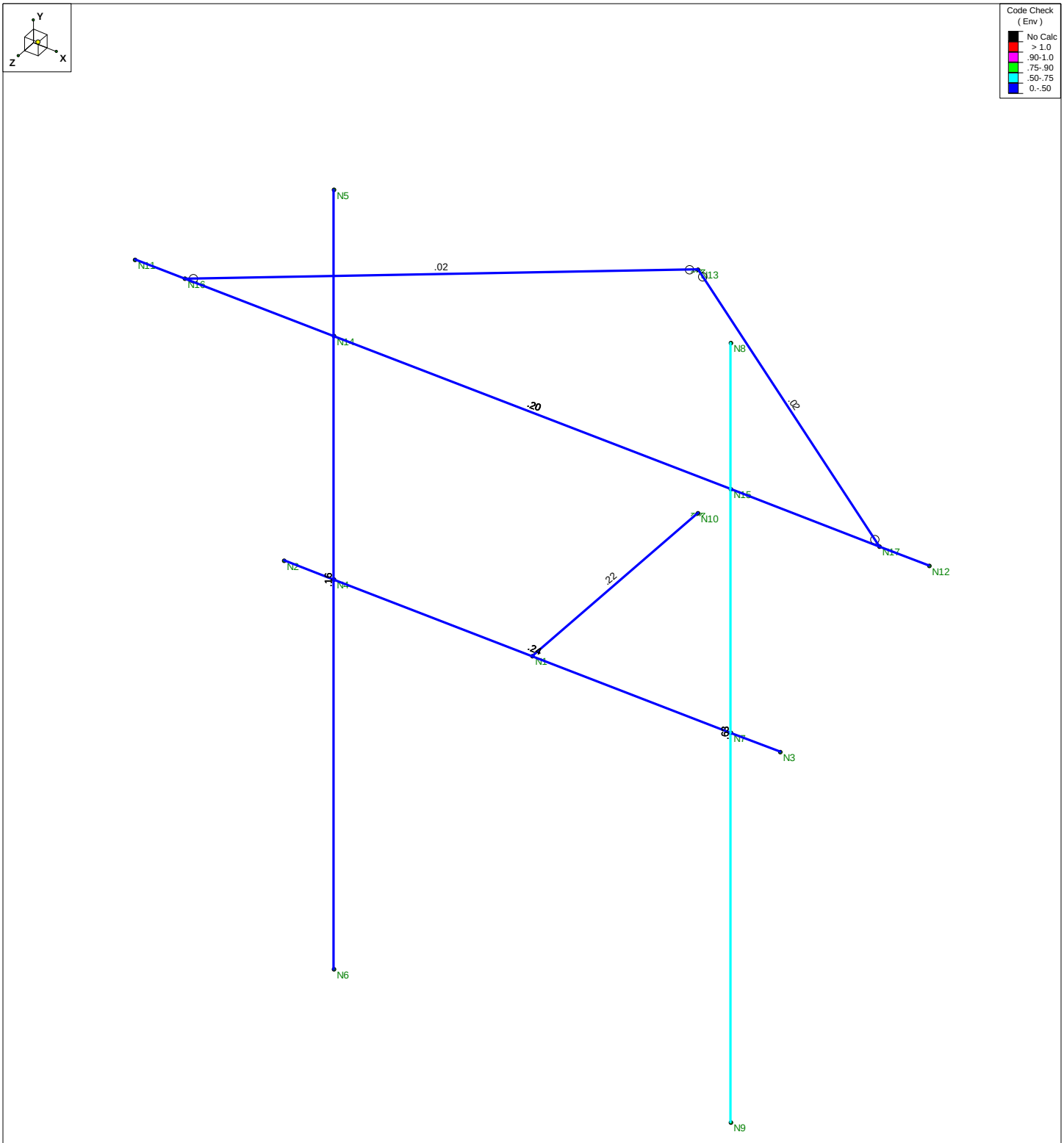
	Joint		X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N10	max	.149	4	1.34	3	.105	3	-.518	5	1.026	5	.649	3
2		min	-.675	2	.48	2	-.819	5	-3.041	3	-1.819	2	-.164	5
3	N13	max	-.053	2	.017	6	-.037	2	0	2	0	6	0	3
4		min	-.149	4	.012	5	-.389	4	-.001	4	0	1	0	5
5	Totals:	max	0	6	1.356	6	0	3						
6		min	-.728	1	.492	2	-1.195	4						

Envelope Joint Displacements

	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [...	LC	Y Rotation [...	LC	Z Rotation [...	LC
1	N1	max	.039	1	-.004	5	0	5	2.747e-03	3	1.958e-03	1	4.143e-04	5
2		min	-.027	5	-.06	3	0	3	-1.419e-04	5	-1.691e-03	5	-1.636e-03	3
3	N2	max	.039	1	-.022	2	.06	1	2.528e-03	3	2.01e-03	1	1.462e-03	4
4		min	-.027	5	-.047	4	-.039	5	-3.476e-04	5	-1.318e-03	5	-3.948e-04	3
5	N3	max	.039	1	0	5	.094	5	1.763e-03	3	2.33e-03	1	2.153e-04	5
6		min	-.027	5	-.164	3	-.066	1	-2.884e-03	5	-3.493e-03	5	-3.758e-03	3
7	N4	max	.039	1	-.021	2	.048	1	2.528e-03	3	2.01e-03	1	1.462e-03	4
8		min	-.027	5	-.045	6	-.032	5	-3.476e-04	5	-1.319e-03	5	-3.952e-04	3
9	N5	max	.113	3	-.021	2	.102	3	2.499e-03	4	2.26e-03	2	9.404e-04	5
10		min	-.084	5	-.046	6	.052	5	5.813e-04	2	-4.782e-03	4	-2.466e-03	3
11	N6	max	.17	1	-.021	2	.083	5	2.51e-03	3	2.01e-03	1	3.364e-03	1
12		min	-.01	6	-.045	6	-.103	3	-2.78e-03	5	-1.319e-03	5	-1.553e-04	6
13	N7	max	.039	1	-.001	5	.074	5	1.763e-03	3	2.33e-03	1	2.156e-04	5
14		min	-.027	5	-.141	3	-.052	1	-2.884e-03	5	-3.492e-03	5	-3.757e-03	3
15	N8	max	.114	1	-.002	5	.238	4	5.716e-03	4	3.266e-03	3	1.291e-03	5
16		min	-.091	5	-.142	3	-.056	2	-3.717e-04	3	4.274e-04	5	-1.711e-03	1
17	N9	max	.303	2	-.001	5	.823	5	1.739e-03	3	2.33e-03	1	7.398e-03	2
18		min	-.179	6	-.142	3	-.112	3	-1.979e-02	5	-3.492e-03	5	-3.649e-03	6
19	N10	max	0	6	0	6	0	6	0	6	0	6	0	6
20		min	0	1	0	1	0	1	0	1	0	1	0	1
21	N11	max	.083	1	.012	3	.13	1	2.495e-03	4	2.262e-03	2	1.05e-03	5
22		min	-.067	5	-.059	4	-.13	5	5.786e-04	2	-6.169e-03	4	-2.302e-03	3
23	N12	max	.083	1	.027	5	.08	5	5.229e-03	4	4.317e-03	3	1.177e-03	5
24		min	-.068	5	-.179	3	-.139	1	-3.679e-04	3	2.913e-03	5	-1.601e-03	1
25	N13	max	0	6	0	6	0	6	0	6	0	6	0	6
26		min	0	1	0	1	0	1	0	1	0	1	0	1
27	N14	max	.083	1	-.021	2	.077	3	2.499e-03	4	2.26e-03	2	9.404e-04	5
28		min	-.067	5	-.046	6	.009	5	5.813e-04	2	-4.782e-03	4	-2.449e-03	3
29	N15	max	.083	1	-.001	5	.136	4	5.242e-03	4	3.266e-03	3	1.29e-03	5
30		min	-.068	5	-.142	3	-.052	2	-3.71e-04	3	4.274e-04	5	-1.46e-03	1
31	N16	max	.083	1	-.002	3	.117	1	2.495e-03	4	2.262e-03	2	1.049e-03	5
32		min	-.067	5	-.054	4	-.093	5	5.786e-04	2	-6.172e-03	4	-2.303e-03	3
33	N17	max	.083	1	.02	5	.097	5	5.229e-03	4	4.317e-03	3	1.178e-03	5
34		min	-.068	5	-.17	3	-.116	1	-3.679e-04	3	2.916e-03	5	-1.6e-03	1

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

	Member	Shape	Code Check	Loc...	LC	Shea..	Loc.....		L..	phi*Pn..	phi*Pn..	phi*M...	phi*M...	...	Eqn
1	M1	PIPE 3.0	.242	2.5	3	.156	2.5		4	57.037	65.205	5.749	5.749	1..	H1-1b
2	M2	PIPE 2.0	.161	4	1	.093	4		4	14.916	32.13	1.872	1.872	1..	H1-1b
3	M3	PIPE 2.0	.625	4	4	.134	6.5		4	14.916	32.13	1.872	1.872	1..	H1-1b
4	M4	HSS4X4X4	.215	0	3	.082	0	y	3	135.916	139.518	16.181	16.181	1..	H1-1b
5	M5	PIPE 2.0	.202	6	4	.064	6		5	14.916	32.13	1.872	1.872	1..	H1-1b
6	M6	L2.5x2.5x3	.019	2.1...	4	.005	0	y	6	15.859	29.192	.873	1.725	1..	H2-1
7	M7	L2.5x2.5x3	.025	2.1...	4	.009	4.3...	y	4	15.859	29.192	.873	1.725	1..	H2-1



Member Code Checks Displayed (Enveloped)
Envelope Only Solution

Centek		
TJL	CT11196A - Mount	Oct 22, 2018 at 3:07 PM
18058.75	Unity Check	Mount.r3d

AT&T Towers
5600 Glenridge Drive
Atlanta, GA 30342
(404) 532-5855

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GPD# 2019723.01.SNET025.12
February 1, 2019

RIGOROUS STRUCTURAL ANALYSIS REPORT

AT&T DESIGNATION:	**Site USID:**	**27016**
	Alternate USID:	**SNET025**
	Site FA:	**10034975**
	Site Name:	**SHELTON EAST CENTRAL**
	AT&T Project:	**TMO Amend# Modification 6-5-18**
ANALYSIS CRITERIA:	**Codes:**	**TIA-222-G, 2018 Connecticut State Building Code & 2015 IBC** **125-mph Ultimate (3-second gust) with 0" ice** **97-mph Nominal (3-second gust) with 0" ice** **50-mph Nominal (3-second gust) with 3/4" ice**
SITE DATA:		**219 Nells Rock Road, Shelton, CT 06484, Fairfield County** **Latitude 41° 18' 15.070" N, Longitude 73° 7' 5.898" W** **Market: NEW ENGLAND** **162.5' Modified Self Support Tower**

Ms. Deborah Krenc,

GPD is pleased to submit this Revised Rigorous Structural Analysis Report to determine the structural integrity of the aforementioned tower. The purpose of the analysis is to determine the suitability of the tower with the existing and proposed loading configuration detailed in the analysis report.

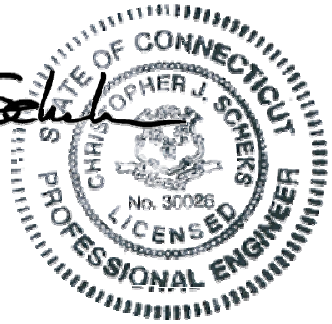
Analysis Results

Tower Stress Level with Proposed Equipment:	93.9%	Pass
Foundation Ratio with Proposed Equipment:	47.6%	Pass

We at GPD appreciate the opportunity of providing our continuing professional services to you and AT&T Towers. If you have any questions or need further assistance on this or any other projects, please do not hesitate to call.

Respectfully submitted,

Christopher J. Scheks, P.E.
Connecticut #: 0030026



SUMMARY & RESULTS

The purpose of this analysis was to verify whether the existing modified structure is capable of carrying the proposed loading configuration as specified by T-Mobile to AT&T Towers. This report was commissioned by Ms. Deborah Krenc of AT&T Towers.

This analysis has been performed in accordance with the 2018 Connecticut State Building Code based upon an ultimate 3-second gust wind speed of 125 mph converted to a nominal 3-second gust wind speed of 97 mph per Section 1609.3 and Appendix N as required for use in the TIA-222-G Standard per Exception #5 of Section 1609.1.1. Exposure Category B and Risk Category II were used in this analysis.

All modifications designed by GPD (Project #: 2013723.SNET025.01, dated 3/1/2013 & Project #: 2014701.02, dated 2/10/2014) were considered in the analysis.

The proposed coax shall be installed in a single row on Face D with the existing T-Mobile coax in order for the analysis to be valid. See Appendix C for the proposed coax layout.

TOWER SUMMARY AND RESULTS

Member	Capacity	Results
Legs	52.3%	Pass
Leg Bolts	55.2%	Pass
Diagonals	93.9%	Pass
Horizontals	73.3%	Pass
Redundant Members	88.3%	Pass
Inner Bracing	42.6%	Pass
Member Bolts	74.6%	Pass
Anchor Rods	47.5%	Pass
Foundations	47.6%	Pass

ANALYSIS METHOD

RISA-3D (Version 17.0.0) and tnxTower (Version 8.0.4.0), commercially available software programs, were used to create a three-dimensional model of the tower and calculate primary member stresses for various dead, wind, and ice load cases. Selected output from the analysis is included in Appendix B. The following table details the information provided to complete this structural analysis. This analysis is solely based on this information and is being completed without the benefit of a recent detailed site visit.

DOCUMENTS PROVIDED

Document	Remarks	Source
Site Lease Application	T-Mobile Colocation Application, dated 6/1/2018	AT&T
Mount Analysis	Centek Project #: 18058.75 Rev. 1, dated 10/22/2018	AT&T
Tower Design	Not Provided	N/A
Foundation Design	Not Provided	N/A
Foundation Mapping	GPD Project #: 2016713.69, dated 9/28/2016	AT&T
Geotechnical Report	GPD Project #: 2016713.69, dated 9/28/2016	AT&T
Previous Structural Analysis	GPD Project #: 2018723.01.SNET025.10, dated 6/8/2018	AT&T
Tower Mapping	GPD Project #: 2016713.69, dated 10/14/2016	AT&T
Modification Drawings	GPD Project #: 2013723.01.SNET025.01, dated 3/1/2013	AT&T
Modification Drawings	GPD Project #: 2014701.02, dated 2/10/2014	AT&T
Post Modification Inspection	GPD Project #: 2013723.01.SNET025.03, dated 9/26/2013	AT&T
Post Modification Inspection	GPD Project #: 2014723.01.SNET025.07, dated 6/4/2014	AT&T
Tower Sketch	AT&T Tower Sketch Issue 6, dated 6/6/2010	AT&T

ASSUMPTIONS

This rigorous structural analysis is based on the theoretical capacity of the members and is not a condition assessment of the tower. This analysis is from information supplied, and therefore, its results are based on and are as accurate as that supplied data. GPD has made no independent determination, nor is it required to, of its accuracy. The following assumptions were made for this structural analysis.

1. The tower member sizes and shapes are considered accurate as supplied. The material grade is as per data supplied and/or as assumed and as stated in the materials section.
2. The antenna configuration is as supplied and/or as modeled in the analysis. It is assumed to be complete and accurate. All antennas, mounts, coax and waveguides are assumed to be properly installed and supported as per manufacturer requirements.
3. Some assumptions are made regarding antennas and mount sizes and their projected areas based on best interpretation of data supplied and of best knowledge of antenna type and industry practice.
4. All mounts, if applicable, are considered adequate to support the loading. No actual analysis of the mount(s) is performed. This analysis is limited to analyzing the tower only.
5. The soil parameters are as per data supplied or as assumed and stated in the calculations.
6. Foundations are properly designed and constructed to resist the original design loads indicated in the documents provided.
7. The tower and structures have been properly maintained in accordance with TIA Standards and/or with manufacturer's specifications.
8. All welds and connections are assumed to develop at least the member capacity unless determined otherwise and explicitly stated in this report.
9. All prior structural modifications are assumed to be as per data supplied/available and to have been properly installed.
10. Foundation steel was not able to be determined through testing. Therefore, it was assumed that the foundation steel in place is equal to or in excess of the code required minimums.
11. Loading interpreted from photos is accurate to ± 5' AGL, antenna size accurate to ± 3.3 sf, and coax equal to the number of existing antennas without reserve.
12. All existing loading was obtained from the previous analysis by GPD (Project #: 2018723.01.SNET025.10, dated 6/8/2018), the provided Site Lease Application and site photos and is assumed to be accurate.
13. The proposed coax shall be installed in a single row on Face D with the existing T-Mobile coax in order for the analysis to be valid. See Appendix C for the proposed coax layout.
14. Face A is assumed to be at an azimuth of 57° based on the AT&T Tower Sketch Issue 6, dated 6/6/2010.

If any of these assumptions are not valid or have been made in error, this analysis may be affected, and GPD should be allowed to review any new information to determine its effect on the structural integrity of the tower.

DISCLAIMER OF WARRANTIES

GPD has not performed a recent site visit to the tower to verify the member sizes or antenna/coax loading. If the existing conditions are not as represented on the tower elevation contained in this report, we should be contacted immediately to evaluate the significance of the discrepancy. This is not a condition assessment of the tower or foundation. This report does not replace a full tower inspection. The tower and foundations are assumed to have been properly fabricated, erected, maintained, in good condition, twist free, and plumb.

The engineering services rendered by GPD in connection with this Rigorous Structural Analysis are limited to a computer analysis of the tower structure and theoretical capacity of its main structural members. No allowance was made for any damaged, bent, missing, loose, or rusted members (above and below ground). No allowance was made for loose bolts or cracked welds.

This analysis is limited to the designated maximum wind and seismic conditions per the governing tower standards and code. Wind forces resulting in tower vibrations near the structure's resonant frequencies were not considered in this analysis and are outside the scope of this analysis. Lateral loading from any dynamic response was not evaluated under a time-domain based fatigue analysis.

GPD does not analyze the fabrication of the structure (including welding). It is not possible to have all the very detailed information needed to perform a thorough analysis of every structural sub-component and connection of an existing tower. GPD provides a limited scope of service in that we cannot verify the adequacy of every weld, plate connection detail, etc. The purpose of this report is to assess the capability of adding appurtenances usually accompanied by transmission lines to the structure.

It is the owner's responsibility to determine the amount of ice accumulation in excess of the code specified amount, if any, that should be considered in the structural analysis.

The attached sketches are a schematic representation of the analyzed tower. If any material is fabricated from these sketches, the contractor shall be responsible for field verifying the existing conditions, proper fit, and clearance in the field. Any mentions of structural modifications are reasonable estimates and should not be used as a precise construction document. Precise modification drawings are obtainable from GPD, but are beyond the scope of this report.

Miscellaneous items such as antenna mounts, etc., have not been designed or detailed as a part of our work. We recommend that material of adequate size and strength be purchased from a reputable tower manufacturer.

Towers are designed to carry gravity, wind, and ice loads. All members, legs, diagonals, struts, and redundant members provide structural stability to the tower with little redundancy. Absence or removal of a member can trigger catastrophic failure unless a substitute is provided before any removal. Legs carry axial loads and derive their strength from shorter unbraced lengths by the presence of redundant members and their connection to the diagonals with bolts or welds. If the bolts or welds are removed without providing any substitute to the frame, the leg is subjected to a higher unbraced length that immediately reduces its load carrying capacity. If a diagonal is also removed in addition to the connection, the unbraced length of the leg is greatly increased, jeopardizing its load carrying capacity. Failure of one leg can result in a tower collapse because there is no redundancy. Redundant members and diagonals are critical to the stability of the tower.

GPD makes no warranties, expressed and/or implied, in connection with this report and disclaims any liability arising from material, fabrication, and erection of this tower. GPD will not be responsible whatsoever for, or on account of, consequential or incidental damages sustained by any person, firm, or organization as a result of any data or conclusions contained in this report. The maximum liability of GPD pursuant to this report will be limited to the total fee received for preparation of this report.

APPENDIX A

Tower Analysis Summary Form

Tower Analysis Summary Form

General Info

Site Name	SHELTON EAST CENTRAL
Site Number	27016
FA Number	10034975
Date of Analysis	2/1/2019
Company Performing Analysis	GPD

The information contained in this summary report is not to be used independently from the PE stamped tower analysis.

Tower Info	Description	Date
Tower Type (G, SST, MP)	SST	
Tower Height (top of steel AGL)	162.5'	
Tower Manufacturer	n/a	
Tower Model	n/a	
Tower Design	n/a	
Foundation Design	n/a	
Geotech Report	GPD Project #: 2016713.69	9/28/2016
Tower Mapping	GPD Project #: 2016713.69	10/14/2016
Previous Structural Analysis	GPD Project #: 2018723.01.SNET025.1(	6/8/2018
Modification Drawings	GPD Project #: 2013723.01.SNET025.01	3/1/2013
Modification Drawings	GPD Project #: 2014701.02	2/10/2014
Post Modification Inspection	GPD Project #: 2013723.01.SNET025.03	9/26/2013
Post Modification Inspection	GPD Project #: 2014723.01.SNET025.07	6/4/2014
Mount Analysis	Centek Project #: 18058.75 Rev. 1	10/22/2018
Foundation Mapping	GPD Project #: 2016713.69	9/28/2016

Design Parameters

Design Code Used	TIA-222-G, 2015 IBC 2018 CT Building Code
Location of Tower (County, State)	Fairfield, CT
Nominal Wind Speed (mph)	97 (3-second gust)
Ice Thickness (in)	0.75
Risk Category (I, II, III)	II
Exposure Category (B, C, D)	B
Topographic Category (1 to 5	1

Analysis Results (% Maximum Usage)

Existing/Reserved + Future + Proposed Condition	
Tower (%)	93.9%
Anchor Rods (%)	47.5%
Foundation (%)	47.6%
Foundation Adequate?	YES

All modifications designed by GPD (Project #: 2013723.SNET025.01, dated 3/1/2013 & Project #: 2014701.02, dated 2/10/2014) were considered in the analysis.

Steel Yield Strength (ksi)

Legs	36
Bracing	36
Member Bolts	A307/A325
Anchor Rods	C-1015

Note: Material grades assumed based on previous analysis.

Existing / Reserved Loading

Antenna								Mount			Transmission Line			
Antenna Owner	Mount Height (ft)	Antenna CL (ft)	Quantity	Type	Manufacturer	Model	Azimuth	Quantity	Manufacturer	Type	Quantity	Model	Size	Attachment Leg/Face
Unknown	162.5	170	1	Dipole	Unknown	10' Dipole		1	Unknown	28' Sq. Platform w/ Rails	1	Unknown	1/2"	Face D
Unknown	162.5	156	1	Dipole	Unknown	15' Dipole				on the same mount	1	Conduit	1-1/2"	Face D
Misc.	162.5	175	1	Light	Unknown	Beacon		1	Unknown	13' W5 x 13' Post	2	Unknown	7/8"	Face D
Unknown	162.5	184	1	Dipole	Unknown	15' Dipole		2	Unknown	14' Post w/ (2) 2' Side Arms	1	Unknown	3/4"	Face D
Unknown	162.5	183	1	Omni	Unknown	10' Omni				on the same mounts	1	Unknown	7/8"	Face C
AT&T Mobility	162.5	163	3	Panel	Quintel	QS66512-2	90/210/340	2	Unknown	W8 x 19' Beams	12	Unknown	1-5/8"	Face D
AT&T Mobility	162.5	163	3	Panel	CCI	HPA-65R-BUU-H6	90/210/340			on the same mounts				
AT&T Mobility	162.5	163	3	Panel	Powerwave	RA21.7770.00	25/143/265			on the same mounts				
AT&T Mobility	162.5	163	3	Panel	Kathrein	80010965	90/210/340			on the same mounts				
AT&T Mobility	162.5	163	6	RET	Powerwave	7020.00				on the same mounts				
AT&T Mobility	162.5	163	6	Triplexer	CCI	TPX-070821				on the same mounts				
AT&T Mobility	162.5	163	3	Kaelus	Bias-T	Smart Bias-T				on the same mounts				
AT&T Mobility	162.5	163	6	TMA	Powerwave	LGP 21401				on the same mounts				
AT&T Mobility	162.5	163	2	Filter	Commscope	WCS-IMFQ-AMT				on the same mounts				
AT&T Mobility	162.5	165	3	RRU	Ericsson	RRUS 11		1	Unknown	RRU Mount	6	DC Power	7/8"	Face D
AT&T Mobility	162.5	165	3	RRU	Ericsson	RRUS 12				on the same mount	3	Fiber Line	1/2"	Face D
AT&T Mobility	162.5	165	3	RRU	Ericsson	RRUS B14 4478				on the same mount				
AT&T Mobility	162.5	165	3	RRU	Ericsson	RRUS 32				on the same mount				
AT&T Mobility	162.5	165	3	RRU	Ericsson	RRUS 32 B2				on the same mount				
AT&T Mobility	162.5	165	3	RRU	Ericsson	RRUS 32 B66				on the same mount				
AT&T Mobility	162.5	167	3	Surge	Raycap	DC6-48-60-18-8F				on the same mount				
Sprint	153	152	3	RRH	Alcatel Lucent	RRH2X50-800		3	Unknown	Dual Standoff Mounts	3	Hybriflex	1-1/4"	Face B
Sprint	153	152	3	RRH	Alcatel Lucent	RRH1900-4X40				on the same mounts				
Sprint	153	152	3	RRH	Alcatel Lucent	TD-RRH8X20-25				on the same mounts				
Sprint	153	152	3	RRH	Alcatel Lucent	RRH-2x50-800				on the same mounts				
Sprint	148	149	3	Panel	RFS	APXVSPP18	50/270/250	3	Unknown	14' Sector Frames	3	Hybrid	1/2"	Face B
Sprint	148	149	3	Panel	Nokia	AAHC	50/270/250			on the same mounts	3	RET Cable	3/8"	Face B
Misc.	144							1	Unknown	30' x 30' Cross Catwalk w/ Rails				
T-Mobile	135	135	3	Panel	Ericsson	AIR21 B4A/B2P	60/180/300	3	Unknown	2' Standoffs	6	Unknown	1-5/8"	Face D
T-Mobile	135	135	3	Panel	Andrew	DBXNH-6565A-A2M	60/180/300			on the same mounts				
T-Mobile	135	135	3	RRU	Ericsson	RRUS 11 B2				on the same mounts				
T-Mobile	135	135	3	RRU	Ericsson	RRUS 11 B12				on the same mounts				
T-Mobile	135	135	3	TMA	Ericsson	KRY 112 144				on the same mounts				
Verizon	124	125	6	Panel	Andrew	DB846F65ZAXY	20/190/270	3	Unknown	12' Sector Frames	17	Unknown	1-5/8"	Face C
Verizon	124	125	4	Panel	Andrew	SBNHH-1D65B	20/270			on the same mounts	2	Hybrid Cable	1-5/8"	Face C
Verizon	124	125	2	Panel	Andrew	SBNHH-1D45B	190			on the same mounts				
Verizon	124	125	2	Panel	Antel	BXA 185063/12CF (Reserved)	190/270			on the same mounts				
Verizon	124	125	1	Panel	Antel	BXA 185085/12CF (Reserved)	20			on the same mounts				
Verizon	124	125	3	RRU	Alcatel Lucent	B13 RRH 4X30				on the same mounts				
Verizon	124	125	3	RRU	Alcatel Lucent	B25 RRH 4X30				on the same mounts				
Verizon	124	125	3	RRU	Alcatel Lucent	B66 RRH 4x45				on the same mounts				
Verizon	124	125	1	DC Box	RFS	DB-T1-6Z-8AB-0Z				on the same mounts				
Verizon	124	125	1	DC Box	RFS	DB-T1-6Z-8AB-0Z (Reserved)				on the same mounts				
Misc.	112.5							1	Unknown	4.25' x 7' Catwalk				
Misc.	87.5							2	Unknown	23' x 3' Catwalks				
Sprint	65	65	1	GPS	PCTEL	GPS-TMG-HR-26NCM				Leg Mounted	1	Unknown	1/2"	Face D
Misc.	62.5							1	Unknown	13' x 4.25' Catwalk				
Misc.	25							1	Unknown	13' x 4.25' Catwalk				

Note: (3) AIR21 B4A/B2P antennas, (3) DBXNH-6565A-A2M antennas and (3) RRUS 11 B2s and the existing standoffs at 135' shall be removed prior to the installation of the proposed loading. All remaining equipment shall be relocated to the new mounts.

Proposed Loading

Antenna								Mount			Transmission Line			
Antenna Owner	Mount Height (ft)	Antenna CL (ft)	Quantity	Type	Manufacturer	Model	Azimuth	Quantity	Manufacturer	Type	Quantity	Model	Size	Attachment Leg/Face
T-Mobile	135	135	3	Panel	Ericsson	AIR 32 KRD901146-1_B66A_B2A	60/180/300	3	SitePro	CWT-02 Mount	3	Hybrid Cable	1-5/8"	Face D
T-Mobile	135	135	3	Panel	RFS	APXVAARR24_43-U-NA20	60/180/300	3	SitePro	SFS-H Stabilizer Kit				
T-Mobile	135	135	3	RRU	Ericsson	RRU4449 B71+B12				on the new mounts				

Note: The proposed loading shall be installed in addition to the remaining existing loading at the same elevation.
Note: The proposed coax shall be installed in a single row on Face D with the existing T-Mobile coax in order for the analysis to be valid. See Appendix C for the proposed coax layout.

Future Loading

Antenna								Mount			Transmission Line			
Antenna Owner	Mount Height (ft)	Antenna CL (ft)	Quantity	Type	Manufacturer	Model	Azimuth	Quantity	Manufacturer	Type	Quantity	Model	Size	Attachment Leg/Face

APPENDIX B

Software Output Files and Calculations

Tower Input Data

The main tower is a 4x free standing tower with an overall height of 162.50 ft above the ground line.
The base of the tower is set at an elevation of 0.00 ft above the ground line.
The face width of the tower is 12.25 ft at the top and 36.25 ft at the base.
This tower is designed using the TIA-222-G standard.
The following design criteria apply:

Tower is located in Fairfield County, Connecticut.
Basic wind speed of 97 mph.
Structure Class II.
Exposure Category B.
Topographic Category 1.
Crest Height 0.00 ft.
Nominal ice thickness of 0.7500 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 50 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 60 mph.
Pressures are calculated at each section.
Stress ratio used in tower member design is 1.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	*Face or Leg*	*Allow Shield*	*Exclude From Torque Calculation*	*Component Type*	*Placement ft*	*Face Offset in*	*Lateral Offset (Frac FW)*	*#*	*# Per Row*	*Clear Spacing in*	*Width or Diameter in*	*Perimeter in*	*Weight plf*
Climbing Ladder (Af)	B	No	No	Af (CaAa)	162.50 - 10.00	-36.0000	0.4	1	1	3.8400	3.8400		4.81
Safety Line (3/8")	B	No	No	Ar (CaAa)	162.50 - 10.00	-36.0000	0.4	1	1	0.3750	0.3750		0.22
LDF4P-50A (1/2 FOAM)	C	No	No	Ar (CaAa)	162.50 - 65.00	0.0000	-0.45	1	1	0.6300	0.6300		0.15
LDF4P-50A (1/2 FOAM)	C	No	No	Ar (CaAa)	65.00 - 10.00	0.0000	-0.45	2	2	0.6300	0.6300		0.15
1-1/2" Rigid Conduit	C	No	No	Ar (CaAa)	162.50 - 10.00	0.0000	-0.44	1	1	1.5000	1.5000		1.00
LDF5-50A (7/8 FOAM)	C	No	No	Ar (CaAa)	162.50 - 10.00	0.0000	0.01	2	2	1.0000	1.0900		0.33
3/4" Lighting Cable	C	No	No	Ar (CaAa)	162.50 - 10.00	0.0000	0.02	1	1	0.7500	0.7500		0.35
LDF5-50A (7/8 FOAM)	D	No	No	Ar (CaAa)	162.50 - 10.00	0.0000	0.48	1	1	1.0000	1.0900		0.33
Feedline Ladder (Af)	C	No	No	Af (CaAa)	162.50 - 10.00	-1.0000	0.2	1	1	3.0000	3.0000		8.40
LDF7-50A (1-5/8 FOAM)	C	No	No	Ar (CaAa)	162.50 - 10.00	-6.0000	0.2	12	4	1.0000	1.9800		0.82
7/8" DC Power Cable	C	No	No	Ar (CaAa)	162.50 - 10.00	-5.0000	0.18	6	3	0.8750	0.8750		0.60
1/2" Fiber Cable	C	No	No	Ar (CaAa)	162.50 - 10.00	-5.0000	0.18	3	2	0.6300	0.6300		0.15
Feedline Ladder (Af)	A	No	No	Af (CaAa)	149.00 - 10.00	0.0000	0	1	1	3.0000	3.0000		8.40

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
1-1/4" Hybrid Cable	A	No	No	Ar (CaAa)	149.00 - 10.00	0.0000	0.04	3	3	1.0000	1.2500		1.00
1/2" Hybrid Cable	A	No	No	Ar (CaAa)	149.00 - 10.00	0.0000	0.03	3	2	0.5000	0.5000		30.00
3/8" RET Cable	A	No	No	Ar (CaAa)	149.00 - 10.00	0.0000	0.02	3	2	0.3750	0.3750		0.10
Feedline Ladder (Af)	C	No	No	Af (CaAa)	135.00 - 10.00	0.0000	0	1	1	3.0000	3.0000		8.40
LDF7-50A (1-5/8 FOAM)	C	No	No	Ar (CaAa)	135.00 - 10.00	0.0000	0.03	6	6	1.9800	1.9800		0.82
1-5/8" Hybrid Cable	C	No	No	Ar (CaAa)	135.00 - 10.00	0.0000	0.01	3	3	1.9800	1.9800		0.82
Feedline Ladder (Af)	D	No	No	Af (CaAa)	124.00 - 10.00	0.0000	0.45	1	1	3.0000	3.0000		8.40
LDF7-50A (1-5/8 FOAM)	D	No	No	Ar (CaAa)	124.00 - 10.00	0.0000	0.45	17	9	1.0000	1.9800		0.82
1-5/8" Hybrid Cable	D	No	No	Ar (CaAa)	124.00 - 10.00	0.0000	0.49	2	1	1.0000	1.9800		0.82

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
28' Square Platform w/ Rails	C	None		0.0000	162.50	No Ice	100.20	100.20	11871.000
						1/2" Ice	111.30	111.30	15623.000
						1" Ice	122.40	122.40	19375.000
Flash Beacon Lighting	C	From Leg	0.00 0.00 12.50	0.0000	162.50	No Ice 1/2" Ice 1" Ice	2.70 3.10 3.50	2.70 3.10 3.50	50.000 70.000 90.000
W5 x 13' Mount	C	From Leg	0.00 0.00 6.25	0.0000	162.50	No Ice 1/2" Ice 1" Ice	5.42 7.00 8.58	5.42 7.00 8.58	210.000 280.000 350.000
15' Dipole	B	From Face	7.00 -3.00 -6.50	0.0000	162.50	No Ice 1/2" Ice 1" Ice	3.00 4.53 6.07	3.00 4.53 6.07	40.000 63.137 95.792
10' Dipole	D	From Face	7.00 5.00 7.50	0.0000	162.50	No Ice 1/2" Ice 1" Ice	2.00 3.02 4.07	2.00 3.02 4.07	20.000 35.501 57.466
Pipe Mount 14'x2.875"	B	From Face	7.00 -5.00 5.50	0.0000	162.50	No Ice 1/2" Ice 1" Ice	4.03 5.46 6.91	4.03 5.46 6.91	90.000 119.246 157.489
2' Standoff	B	From Face	6.50 -5.00 9.50	0.0000	162.50	No Ice 1/2" Ice 1" Ice	1.14 1.79 2.44	1.62 2.41 3.20	37.400 55.340 73.280
2' Standoff	B	From Face	7.50 -5.00 9.50	0.0000	162.50	No Ice 1/2" Ice 1" Ice	1.14 1.79 2.44	1.62 2.41 3.20	37.400 55.340 73.280
15' Dipole	B	From Face	7.00 5.00 21.50	0.0000	162.50	No Ice 1/2" Ice 1" Ice	3.00 4.53 6.07	3.00 4.53 6.07	40.000 63.137 95.792
Pipe Mount 14'x2.875"	D	From Face	7.00 -5.00 5.50	0.0000	162.50	No Ice 1/2" Ice 1" Ice	4.03 5.46 6.91	4.03 5.46 6.91	90.000 119.246 157.489

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
2' Standoff	D	From Face	6.50	0.0000	162.50	No Ice	1.14	1.62	37.400
			-5.00			1/2" Ice	1.79	2.41	55.340
			9.50			1" Ice	2.44	3.20	73.280
2' Standoff	D	From Face	7.50	0.0000	162.50	No Ice	1.14	1.62	37.400
			-5.00			1/2" Ice	1.79	2.41	55.340
			9.50			1" Ice	2.44	3.20	73.280
10' Omni	D	From Face	8.00	0.0000	162.50	No Ice	2.00	2.00	25.000
			-5.00			1/2" Ice	3.02	3.02	40.501
			20.50			1" Ice	4.07	4.07	62.466
***									
W8 x 19' Beams	A	From Leg	5.00	13.0000	162.50	No Ice	17.00	1.00	290.000
			0.00			1/2" Ice	19.00	1.50	340.000
			1.00			1" Ice	21.00	2.00	330.000
W8 x 19' Beams	D	From Leg	5.00	-17.0000	162.50	No Ice	17.00	1.00	290.000
			0.00			1/2" Ice	19.00	1.50	340.000
			1.00			1" Ice	21.00	2.00	330.000
RA21.7770.00 w/Mount Pipe	A	From Leg	5.00	13.0000	162.50	No Ice	6.88	5.13	65.550
			0.00			1/2" Ice	7.47	6.25	121.085
			0.50			1" Ice	7.98	7.08	183.814
RA21.7770.00 w/Mount Pipe	D	From Leg	5.00	-17.0000	162.50	No Ice	6.88	5.13	65.550
			0.00			1/2" Ice	7.47	6.25	121.085
			0.50			1" Ice	7.98	7.08	183.814
RA21.7770.00 w/Mount Pipe	C	From Face	7.00	-4.0000	162.50	No Ice	6.88	5.13	65.550
			0.00			1/2" Ice	7.47	6.25	121.085
			0.50			1" Ice	7.98	7.08	183.814
HPA-65R-BUU-H6 w/ Mount Pipe	A	From Leg	5.00	13.0000	162.50	No Ice	9.90	8.11	76.550
			0.00			1/2" Ice	10.47	9.30	158.030
			0.50			1" Ice	11.01	10.21	247.793
HPA-65R-BUU-H6 w/ Mount Pipe	D	From Leg	5.00	-17.0000	162.50	No Ice	9.90	8.11	76.550
			0.00			1/2" Ice	10.47	9.30	158.030
			0.50			1" Ice	11.01	10.21	247.793
HPA-65R-BUU-H6 w/ Mount Pipe	C	From Face	7.00	-4.0000	162.50	No Ice	9.90	8.11	76.550
			0.00			1/2" Ice	10.47	9.30	158.030
			0.50			1" Ice	11.01	10.21	247.793
QS66512-2 w/ Mount Pipe	A	From Leg	5.00	13.0000	162.50	No Ice	8.37	8.46	136.550
			0.00			1/2" Ice	8.93	9.66	212.242
			0.50			1" Ice	9.46	10.55	296.075
QS66512-2 w/ Mount Pipe	D	From Leg	5.00	-17.0000	162.50	No Ice	8.37	8.46	136.550
			0.00			1/2" Ice	8.93	9.66	212.242
			0.50			1" Ice	9.46	10.55	296.075
QS66512-2 w/ Mount Pipe	C	From Face	7.00	-4.0000	162.50	No Ice	8.37	8.46	136.550
			0.00			1/2" Ice	8.93	9.66	212.242
			0.50			1" Ice	9.46	10.55	296.075
80010965 w/ Mount Pipe	A	From Leg	5.00	13.0000	162.50	No Ice	14.05	7.63	125.188
			0.00			1/2" Ice	14.69	8.90	221.670
			0.50			1" Ice	15.30	9.96	327.183
80010965 w/ Mount Pipe	D	From Leg	5.00	-17.0000	162.50	No Ice	14.05	7.63	125.188
			0.00			1/2" Ice	14.69	8.90	221.670
			0.50			1" Ice	15.30	9.96	327.183
80010965 w/ Mount Pipe	C	From Face	7.00	-4.0000	162.50	No Ice	14.05	7.63	125.188
			0.00			1/2" Ice	14.69	8.90	221.670
			0.50			1" Ice	15.30	9.96	327.183
(2) 7020.00 RET	A	From Leg	5.00	13.0000	162.50	No Ice	0.10	0.17	2.200
			0.00			1/2" Ice	0.15	0.24	5.156
			0.50			1" Ice	0.20	0.31	9.330
(2) 7020.00 RET	D	From Leg	5.00	-17.0000	162.50	No Ice	0.10	0.17	2.200
			0.00			1/2" Ice	0.15	0.24	5.156

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
			0.50			1" Ice	0.20	0.31	9.330
(2) 7020.00 RET	C	From Face	7.00	-4.0000	162.50	No Ice	0.10	0.17	2.200
			0.00			1/2" Ice	0.15	0.24	5.156
			0.50			1" Ice	0.20	0.31	9.330
(2) LGP21401	A	From Leg	5.00	13.0000	162.50	No Ice	1.10	0.21	14.100
			0.00			1/2" Ice	1.24	0.27	21.263
			0.50			1" Ice	1.38	0.35	30.319
(2) LGP21401	D	From Leg	5.00	-17.0000	162.50	No Ice	1.10	0.21	14.100
			0.00			1/2" Ice	1.24	0.27	21.263
			0.50			1" Ice	1.38	0.35	30.319
(2) LGP21401	C	From Face	7.00	-4.0000	162.50	No Ice	1.10	0.21	14.100
			0.00			1/2" Ice	1.24	0.27	21.263
			0.50			1" Ice	1.38	0.35	30.319
(2) TPX-070821	A	From Leg	5.00	13.0000	162.50	No Ice	0.47	0.10	7.500
			0.00			1/2" Ice	0.56	0.15	10.952
			0.50			1" Ice	0.66	0.20	15.735
(2) TPX-070821	D	From Leg	5.00	-17.0000	162.50	No Ice	0.47	0.10	7.500
			0.00			1/2" Ice	0.56	0.15	10.952
			0.50			1" Ice	0.66	0.20	15.735
(2) TPX-070821	C	From Face	7.00	-4.0000	162.50	No Ice	0.47	0.10	7.500
			0.00			1/2" Ice	0.56	0.15	10.952
			0.50			1" Ice	0.66	0.20	15.735
Smart Bias-T	A	From Leg	5.00	-17.0000	162.50	No Ice	0.14	0.08	3.300
			0.00			1/2" Ice	0.19	0.12	4.693
			0.50			1" Ice	0.25	0.17	6.947
Smart Bias-T	D	From Leg	5.00	-4.0000	162.50	No Ice	0.14	0.08	3.300
			0.00			1/2" Ice	0.19	0.12	4.693
			0.50			1" Ice	0.25	0.17	6.947
Smart Bias-T	C	From Face	7.00	13.0000	162.50	No Ice	0.14	0.08	3.300
			0.00			1/2" Ice	0.19	0.12	4.693
			0.50			1" Ice	0.25	0.17	6.947
WCS-IMFT-AMT	A	From Leg	5.00	-17.0000	162.50	No Ice	0.64	0.47	18.700
			0.00			1/2" Ice	0.75	0.56	24.918
			0.50			1" Ice	0.86	0.66	32.828
WCS-IMFT-AMT	C	From Face	7.00	13.0000	162.50	No Ice	0.64	0.47	18.700
			0.00			1/2" Ice	0.75	0.56	24.918
			0.50			1" Ice	0.86	0.66	32.828
(3) RRUS 11	C	None		0.0000	165.00	No Ice	2.78	1.19	50.700
						1/2" Ice	2.99	1.33	71.500
						1" Ice	3.21	1.49	95.335
(3) RRUS 32	C	None		0.0000	165.00	No Ice	3.31	2.42	77.000
						1/2" Ice	3.56	2.64	104.928
						1" Ice	3.81	2.86	136.466
(3) RRUS 32 B2	C	None		0.0000	165.00	No Ice	2.73	1.67	52.900
						1/2" Ice	2.95	1.86	73.957
						1" Ice	3.18	2.05	98.206
(3) RRUS 12	C	None		0.0000	165.00	No Ice	3.15	1.29	58.000
						1/2" Ice	3.36	1.44	81.222
						1" Ice	3.59	1.60	107.645
(3) RRUS B14 4478	C	None		0.0000	165.00	No Ice	1.65	0.81	60.000
						1/2" Ice	1.81	0.93	74.366
						1" Ice	1.98	1.06	91.233
(3) RRUS 32 B66	C	None		0.0000	165.00	No Ice	2.74	1.67	53.000
						1/2" Ice	2.96	1.86	74.114
						1" Ice	3.19	2.05	98.424
(3) DC6-48-60-18-8F Surge Suppression Unit	C	None		0.0000	167.00	No Ice	0.92	0.92	18.900
						1/2" Ice	1.46	1.46	36.615

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
						1" Ice	1.64	1.64	56.825
***									
14' Sector Frame	A	From Leg	2.00	-2.0000	148.00	No Ice	25.00	25.00	380.000
			0.00			1/2" Ice	33.12	33.12	556.690
			0.00			1" Ice	41.24	41.24	733.380
14' Sector Frame	B	From Leg	1.90	18.0000	148.00	No Ice	25.00	25.00	380.000
			0.62			1/2" Ice	33.12	33.12	556.690
			0.00			1" Ice	41.24	41.24	733.380
14' Sector Frame	C	From Leg	1.41	45.0000	148.00	No Ice	25.00	25.00	380.000
			1.41			1/2" Ice	33.12	33.12	556.690
			0.00			1" Ice	41.24	41.24	733.380
Pipe Mount 6'x2.375"	A	From Leg	4.00	-2.0000	148.00	No Ice	1.43	1.43	26.100
			0.00			1/2" Ice	1.92	1.92	36.927
			1.00			1" Ice	2.29	2.29	51.814
Pipe Mount 6'x2.375"	B	From Leg	3.80	18.0000	148.00	No Ice	1.43	1.43	26.100
			1.24			1/2" Ice	1.92	1.92	36.927
			1.00			1" Ice	2.29	2.29	51.814
Pipe Mount 6'x2.375"	C	From Leg	2.82	45.0000	148.00	No Ice	1.43	1.43	26.100
			2.82			1/2" Ice	1.92	1.92	36.927
			1.00			1" Ice	2.29	2.29	51.814
APXVSPP18 w/ Mount Pipe	A	From Leg	4.00	-2.0000	148.00	No Ice	8.02	6.71	78.900
			0.00			1/2" Ice	8.48	7.66	144.306
			1.00			1" Ice	8.94	8.49	217.469
APXVSPP18 w/ Mount Pipe	B	From Leg	3.80	18.0000	148.00	No Ice	8.02	6.71	78.900
			1.24			1/2" Ice	8.48	7.66	144.306
			1.00			1" Ice	8.94	8.49	217.469
APXVSPP18 w/ Mount Pipe	C	From Leg	2.82	58.0000	148.00	No Ice	8.02	6.71	78.900
			2.82			1/2" Ice	8.48	7.66	144.306
			1.00			1" Ice	8.94	8.49	217.469
AAHC w/ Mount Pipe	A	From Leg	1.00	0.0000	153.00	No Ice	4.89	3.26	121.870
			0.00			1/2" Ice	5.32	3.76	167.528
			0.00			1" Ice	5.77	4.28	218.421
AAHC w/ Mount Pipe	B	From Leg	1.00	0.0000	153.00	No Ice	4.89	3.26	121.870
			0.00			1/2" Ice	5.32	3.76	167.528
			0.00			1" Ice	5.77	4.28	218.421
AAHC w/ Mount Pipe	C	From Leg	1.00	0.0000	153.00	No Ice	4.89	3.26	121.870
			0.00			1/2" Ice	5.32	3.76	167.528
			0.00			1" Ice	5.77	4.28	218.421
RRH2X50-800	A	From Leg	1.00	0.0000	153.00	No Ice	1.70	1.28	52.900
			0.00			1/2" Ice	1.86	1.43	69.909
			0.00			1" Ice	2.03	1.58	89.609
RRH2X50-800	B	From Leg	1.00	0.0000	153.00	No Ice	1.70	1.28	52.900
			0.00			1/2" Ice	1.86	1.43	69.909
			0.00			1" Ice	2.03	1.58	89.609
RRH2X50-800	C	From Leg	1.00	0.0000	153.00	No Ice	1.70	1.28	52.900
			0.00			1/2" Ice	1.86	1.43	69.909
			0.00			1" Ice	2.03	1.58	89.609
1900MHz 4X40W RRH	A	From Leg	1.00	0.0000	153.00	No Ice	2.32	2.24	59.500
			0.00			1/2" Ice	2.53	2.44	82.622
			0.00			1" Ice	2.74	2.65	108.978
1900MHz 4X40W RRH	B	From Leg	1.00	0.0000	153.00	No Ice	2.32	2.24	59.500
			0.00			1/2" Ice	2.53	2.44	82.622
			0.00			1" Ice	2.74	2.65	108.978
1900MHz 4X40W RRH	C	From Leg	1.00	0.0000	153.00	No Ice	2.32	2.24	59.500
			0.00			1/2" Ice	2.53	2.44	82.622
			0.00			1" Ice	2.74	2.65	108.978
TD-RRH8x20-25	A	From Leg	1.00	0.0000	153.00	No Ice	3.70	1.29	66.000

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
			0.00				1/2" Ice	3.95	1.46	89.937
			0.00				1" Ice	4.20	1.64	117.219
TD-RRH8x20-25	B	From Leg	1.00		0.0000	153.00	No Ice	3.70	1.29	66.000
			0.00				1/2" Ice	3.95	1.46	89.937
			0.00				1" Ice	4.20	1.64	117.219
TD-RRH8x20-25	C	From Leg	1.00		0.0000	153.00	No Ice	3.70	1.29	66.000
			0.00				1/2" Ice	3.95	1.46	89.937
			0.00				1" Ice	4.20	1.64	117.219
RRH 2x50 800 MHz	A	From Leg	1.00		0.0000	153.00	No Ice	1.73	1.33	53.000
			0.00				1/2" Ice	1.90	1.48	70.435
			0.00				1" Ice	2.07	1.64	90.593
RRH 2x50 800 MHz	B	From Leg	1.00		0.0000	153.00	No Ice	1.73	1.33	53.000
			0.00				1/2" Ice	1.90	1.48	70.435
			0.00				1" Ice	2.07	1.64	90.593
RRH 2x50 800 MHz	C	From Leg	1.00		0.0000	153.00	No Ice	1.73	1.33	53.000
			0.00				1/2" Ice	1.90	1.48	70.435
			0.00				1" Ice	2.07	1.64	90.593
(2) 2.5" x 3.5' Mount Pipe	A	From Leg	0.50		0.0000	153.00	No Ice	0.74	0.74	20.000
			0.00				1/2" Ice	0.96	0.96	26.726
			0.00				1" Ice	1.18	1.18	35.997
(2) 2.5" x 3.5' Mount Pipe	B	From Leg	0.50		0.0000	153.00	No Ice	0.74	0.74	20.000
			0.00				1/2" Ice	0.96	0.96	26.726
			0.00				1" Ice	1.18	1.18	35.997
(2) 2.5" x 3.5' Mount Pipe	C	From Leg	0.50		0.0000	153.00	No Ice	0.74	0.74	20.000
			0.00				1/2" Ice	0.96	0.96	26.726
			0.00				1" Ice	1.18	1.18	35.997
***										
30' x 30' Cross Catwalk w/ Handrails	C	None			0.0000	144.00	No Ice	78.00	78.00	5664.000
							1/2" Ice	84.00	84.00	7807.000
							1" Ice	90.00	90.00	9950.000
***										
CWT-02 T-Arm	A	From Leg	1.00		0.0000	135.00	No Ice	2.78	2.23	113.000
			0.00				1/2" Ice	3.39	2.43	143.000
			0.00				1" Ice	4.00	2.63	173.000
CWT-02 T-Arm	B	From Leg	1.00		0.0000	135.00	No Ice	2.78	2.23	113.000
			0.00				1/2" Ice	3.39	2.43	143.000
			0.00				1" Ice	4.00	2.63	173.000
CWT-02 T-Arm	D	From Leg	1.00		0.0000	135.00	No Ice	2.78	2.23	113.000
			0.00				1/2" Ice	3.39	2.43	143.000
			0.00				1" Ice	4.00	2.63	173.000
SFS-H Stabilizer Kit (1)	A	From Leg	1.00		0.0000	135.00	No Ice	3.16	1.92	65.660
			0.00				1/2" Ice	3.57	2.13	85.358
			0.00				1" Ice	3.98	2.35	105.056
SFS-H Stabilizer Kit (1)	B	From Leg	1.00		0.0000	135.00	No Ice	3.16	1.92	65.660
			0.00				1/2" Ice	3.57	2.13	85.358
			0.00				1" Ice	3.98	2.35	105.056
SFS-H Stabilizer Kit (1)	D	From Leg	1.00		0.0000	135.00	No Ice	3.16	1.92	65.660
			0.00				1/2" Ice	3.57	2.13	85.358
			0.00				1" Ice	3.98	2.35	105.056
AIR 32 KRD901146-1 B66A/B2A w/ Mount Pipe	A	From Leg	2.00		48.0000	135.00	No Ice	6.58	5.90	150.450
			1.00				1/2" Ice	6.97	6.56	209.555
			0.00				1" Ice	7.37	7.24	275.399
AIR 32 KRD901146-1 B66A/B2A w/ Mount Pipe	B	From Leg	2.00		78.0000	135.00	No Ice	6.58	5.90	150.450
			1.00				1/2" Ice	6.97	6.56	209.555
			0.00				1" Ice	7.37	7.24	275.399
AIR 32 KRD901146-1 B66A/B2A w/ Mount Pipe	D	From Leg	2.00		18.0000	135.00	No Ice	6.58	5.90	150.450
			1.00				1/2" Ice	6.97	6.56	209.555

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
			0.00			1" Ice	7.37	7.24	275.399
APXVAARR24_43-U-NA20 w/ Mount Pipe	A	From Leg	2.00 -1.00 0.00	-72.0000	135.00	No Ice 1/2" Ice 1" Ice	20.24 20.89 21.55	10.79 12.21 13.49	157.200 290.893 435.197
APXVAARR24_43-U-NA20 w/ Mount Pipe	B	From Leg	2.00 -1.00 0.00	-42.0000	135.00	No Ice 1/2" Ice 1" Ice	20.24 20.89 21.55	10.79 12.21 13.49	157.200 290.893 435.197
APXVAARR24_43-U-NA20 w/ Mount Pipe	D	From Leg	2.00 -1.00 0.00	18.0000	135.00	No Ice 1/2" Ice 1" Ice	20.24 20.89 21.55	10.79 12.21 13.49	157.200 290.893 435.197
RRU4449 B71+B12	A	From Leg	2.00 0.00 0.00	0.0000	135.00	No Ice 1/2" Ice 1" Ice	1.65 1.81 1.98	1.16 1.30 1.45	70.000 86.164 104.952
RRU4449 B71+B12	B	From Leg	2.00 0.00 0.00	0.0000	135.00	No Ice 1/2" Ice 1" Ice	1.65 1.81 1.98	1.16 1.30 1.45	70.000 86.164 104.952
RRU4449 B71+B12	D	From Leg	2.00 0.00 0.00	0.0000	135.00	No Ice 1/2" Ice 1" Ice	1.65 1.81 1.98	1.16 1.30 1.45	70.000 86.164 104.952
RRUS 11 B12	A	From Leg	2.00 0.00 0.00	0.0000	135.00	No Ice 1/2" Ice 1" Ice	2.83 3.04 3.26	1.18 1.33 1.48	50.700 71.570 95.487
RRUS 11 B12	B	From Leg	2.00 0.00 0.00	0.0000	135.00	No Ice 1/2" Ice 1" Ice	2.83 3.04 3.26	1.18 1.33 1.48	50.700 71.570 95.487
RRUS 11 B12	D	From Leg	2.00 0.00 0.00	0.0000	135.00	No Ice 1/2" Ice 1" Ice	2.83 3.04 3.26	1.18 1.33 1.48	50.700 71.570 95.487
KRY 112 144/1	A	From Leg	2.00 0.00 0.00	0.0000	135.00	No Ice 1/2" Ice 1" Ice	0.35 0.43 0.51	0.17 0.23 0.30	11.000 14.176 18.583
KRY 112 144/1	B	From Leg	2.00 0.00 0.00	0.0000	135.00	No Ice 1/2" Ice 1" Ice	0.35 0.43 0.51	0.17 0.23 0.30	11.000 14.176 18.583
KRY 112 144/1	D	From Leg	2.00 0.00 0.00	0.0000	135.00	No Ice 1/2" Ice 1" Ice	0.35 0.43 0.51	0.17 0.23 0.30	11.000 14.176 18.583
***									
12' Sector Frame	A	From Leg	0.50 0.00 0.00	8.0000	124.00	No Ice 1/2" Ice 1" Ice	18.81 24.75 30.69	10.62 15.16 19.70	513.500 719.590 925.680
12' Sector Frame	C	From Leg	0.50 0.00 0.00	-2.0000	124.00	No Ice 1/2" Ice 1" Ice	18.81 24.75 30.69	10.62 15.16 19.70	513.500 719.590 925.680
12' Sector Frame	D	From Leg	0.50 0.00 0.00	-12.0000	124.00	No Ice 1/2" Ice 1" Ice	18.81 24.75 30.69	10.62 15.16 19.70	513.500 719.590 925.680
(2) DB846F65ZAXY w/Mount Pipe	A	From Leg	1.00 0.00 1.00	8.0000	124.00	No Ice 1/2" Ice 1" Ice	7.27 7.88 8.48	7.82 9.01 9.91	46.550 113.929 189.249
(2) DB846F65ZAXY w/Mount Pipe	C	From Leg	1.00 0.00 1.00	-2.0000	124.00	No Ice 1/2" Ice 1" Ice	7.27 7.88 8.48	7.82 9.01 9.91	46.550 113.929 189.249
(2) DB846F65ZAXY w/Mount Pipe	D	From Leg	1.00 0.00 1.00	-12.0000	124.00	No Ice 1/2" Ice 1" Ice	7.27 7.88 8.48	7.82 9.01 9.91	46.550 113.929 189.249
BXA-185085/12CF w/ Mount	A	From Leg	1.00	8.0000	124.00	No Ice	4.77	5.36	47.740

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Offsets: Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
Pipe			0.00				1/2" Ice	5.22	6.17	93.913
			1.00				1" Ice	5.68	6.98	148.113
BXA-185063/12CF w/ mount pipe	C	From Leg	1.00		-2.0000	124.00	No Ice	5.00	5.30	40.550
			0.00				1/2" Ice	5.55	6.47	86.486
			1.00				1" Ice	6.07	7.35	139.852
BXA-185063/12CF w/ mount pipe	D	From Leg	1.00		-12.0000	124.00	No Ice	5.00	5.30	40.550
			0.00				1/2" Ice	5.55	6.47	86.486
			1.00				1" Ice	6.07	7.35	139.852
(2) SBNHH-1D65B w/ Mount Pipe	A	From Leg	1.00		8.0000	124.00	No Ice	8.16	6.16	59.300
			0.00				1/2" Ice	8.62	6.82	120.285
			1.00				1" Ice	9.09	7.51	189.029
(2) SBNHH-1D45B w/ Mount Pipe	C	From Leg	1.00		-2.0000	124.00	No Ice	11.40	6.71	83.600
			0.00				1/2" Ice	11.89	7.66	165.080
			1.00				1" Ice	12.38	8.49	254.719
(2) SBNHH-1D65B w/ Mount Pipe	D	From Leg	1.00		-12.0000	124.00	No Ice	8.16	6.16	59.300
			0.00				1/2" Ice	8.62	6.82	120.285
			1.00				1" Ice	9.09	7.51	189.029
B13 RRH 4X30	A	From Leg	1.00		8.0000	124.00	No Ice	2.06	1.32	55.600
			0.00				1/2" Ice	2.24	1.48	72.875
			1.00				1" Ice	2.43	1.64	92.951
B13 RRH 4X30	C	From Leg	1.00		-2.0000	124.00	No Ice	2.06	1.32	55.600
			0.00				1/2" Ice	2.24	1.48	72.875
			1.00				1" Ice	2.43	1.64	92.951
B13 RRH 4X30	D	From Leg	1.00		-12.0000	124.00	No Ice	2.06	1.32	55.600
			0.00				1/2" Ice	2.24	1.48	72.875
			1.00				1" Ice	2.43	1.64	92.951
B25 RRH4X30	A	From Leg	1.00		8.0000	124.00	No Ice	2.20	1.74	55.000
			0.00				1/2" Ice	2.39	1.92	75.465
			1.00				1" Ice	2.59	2.11	98.944
B25 RRH4X30	C	From Leg	1.00		-2.0000	124.00	No Ice	2.20	1.74	55.000
			0.00				1/2" Ice	2.39	1.92	75.465
			1.00				1" Ice	2.59	2.11	98.944
B25 RRH4X30	D	From Leg	1.00		-12.0000	124.00	No Ice	2.20	1.74	55.000
			0.00				1/2" Ice	2.39	1.92	75.465
			1.00				1" Ice	2.59	2.11	98.944
B66A RRH4X45	A	From Leg	1.00		8.0000	124.00	No Ice	2.54	1.61	56.800
			0.00				1/2" Ice	2.75	1.79	76.924
			1.00				1" Ice	2.97	1.98	100.146
B66A RRH4X45	C	From Leg	1.00		-2.0000	124.00	No Ice	2.54	1.61	56.800
			0.00				1/2" Ice	2.75	1.79	76.924
			1.00				1" Ice	2.97	1.98	100.146
B66A RRH4X45	D	From Leg	1.00		-12.0000	124.00	No Ice	2.54	1.61	56.800
			0.00				1/2" Ice	2.75	1.79	76.924
			1.00				1" Ice	2.97	1.98	100.146
DB-T1-6Z-8AB-0Z	A	From Leg	1.00		8.0000	124.00	No Ice	4.80	2.00	44.000
			0.00				1/2" Ice	5.07	2.19	80.134
			1.00				1" Ice	5.35	2.39	120.222
DB-T1-6Z-8AB-0Z	C	From Leg	1.00		-2.0000	124.00	No Ice	4.80	2.00	44.000
			0.00				1/2" Ice	5.07	2.19	80.134
			1.00				1" Ice	5.35	2.39	120.222
***										
4.25' x 7' Catwalk	B	From Face	0.00		0.0000	112.50	No Ice	11.50	8.90	750.000
			0.00				1/2" Ice	13.40	10.50	1000.000
			0.00				1" Ice	15.30	12.10	1250.000
23' x 3' Catwalk	A	From Face	0.00		0.0000	87.50	No Ice	31.40	12.80	1784.000
			0.00				1/2" Ice	36.80	15.70	2514.000
			0.00				1" Ice	42.20	18.60	3244.000

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
23' x 3' Catwalk	B	From Face	0.00 0.00	0.0000	87.50	No Ice 1/2" Ice	31.40 36.80	12.80 15.70	1784.000 2514.000
			0.00			1" Ice	42.20	18.60	3244.000
GPS-TMG-HR-26N	B	From Leg	0.50 0.00	0.0000	65.00	No Ice 1/2" Ice	0.13 0.18	0.13 0.18	0.600 2.371
			0.00			1" Ice	0.24	0.24	5.075
13' x 4.25' Catwalk	B	From Face	0.00 0.00	0.0000	62.50	No Ice 1/2" Ice	18.85 26.00	7.00 8.00	1250.000 1750.000
			0.00			1" Ice	33.15	9.00	2250.000
13' x 4.25' Catwalk	B	From Face	0.00 0.00	0.0000	25.00	No Ice 1/2" Ice	18.85 26.00	7.00 8.00	1250.000 1750.000
			0.00			1" Ice	33.15	9.00	2250.000
Side Light	A	From Leg	1.00 0.00	0.0000	92.00	No Ice 1/2" Ice	0.33 0.47	0.33 0.47	7.000 7.050
			0.00			1" Ice	0.60	0.60	7.100
Side Light	D	From Leg	1.00 0.00	0.0000	92.00	No Ice 1/2" Ice	0.33 0.47	0.33 0.47	7.000 7.050
			0.00			1" Ice	0.60	0.60	7.100

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (\1E5 F)	Density[k/...	Yield[ksi]	Ry	Fu[ksi]	Rt
1	A36	29000	11200	.295	.65	.49	36	1.5	58	1.2

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design R...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	TWR_LEG_T1	L6x6x1/2	Column	Single Angle	A36	Typical	5.75	19.908	19.908	.479
2	TWR_TOP_GIRT_T1	MC18x58_HRA	Beam	Channel	A36	Typical	17.1	17.8	676	2.81
3	TWR_DIAG_T1	L 3-1/2x3-1/2x1/4	Column	Single Angle	A36	Typical	1.688	2.01	2.01	.035
4	TWR_STEP_T1	L3x2-1/2x1/4	Beam	Single Angle	A36	Typical	1.313	.743	1.173	.027
5	TWR_RED_VERT_...	L2.5x2.5x3	Beam	Single Angle	A36	Typical	.901	.535	.535	.011
6	TWR_LEG_T2	L6x6x1/2	Column	Single Angle	A36	Typical	5.75	19.908	19.908	.479
7	TWR_TOP_GIRT_T2	2L3-1/2x3x5/16x3/8	Beam	None	A36	Typical	3.87	6.995	4.66	.126
8	TWR_DIAG_T2	L3-1/2x3x1/4	Column	Single Angle	A36	Typical	1.563	1.304	1.913	.033
9	TWR_STEP_T2	C6X8.2	Beam	Channel	A36	Typical	2.39	.687	13.1	.074
10	TWR_RED_VERT_...	L2.5x2.5x3	Beam	Channel	A36	Typical	.901	.535	.535	.011
11	TWR_LEG_T3	L6x6x5/8	Column	Single Angle	A36	Typical	7.109	24.158	24.158	.926
12	TWR_TOP_GIRT_T3	2L3x2-1/2x1/4x3/8	Beam	None	A36	Typical	2.63	3.373	2.35	.055
13	TWR_INNER_SUP...	2L2-1/2x2x3/16x3/8	Beam	None	A36	Typical	1.617	1.379	1.017	.019
14	TWR_DIAG_T3	L4x3x1/4	Column	Single Angle	A36	Typical	1.688	1.355	2.769	.035
15	TWR_STEP_T3	L3x2-1/2x1/4	Beam	Single Angle	A36	Typical	1.313	.743	1.173	.027
16	TWR_RED_VERT_...	L2.5x2.5x3	Beam	Single Angle	A36	Typical	.901	.535	.535	.011
17	TWR_INNER_SQ_...	L3X2.5X4	Beam	Single Angle	A36	Typical	1.32	.734	1.16	.03
18	TWR_INNER_COR...	L2.5x2.5x3	Beam	Single Angle	A36	Typical	.901	.535	.535	.011
19	TWR_INNER_TRI_...	L2X2.5X3	Beam	Single Angle	A36	Typical	.809	.509	.291	.009
20	TWR_INNER_LAD...	L2X2.5X3	Beam	Single Angle	A36	Typical	.809	.509	.291	.009
21	TWR_LEG_T4	L6x6x5/8	Column	Single Angle	A36	Typical	7.109	24.158	24.158	.926
22	TWR_DIAG_T4mods	L4x3x1/4	Column	Single Angle	A36	Typical	1.688	1.355	2.769	.035
23	TWR_TOP_GIRT_T4	2L3x2-1/2x1/4x3/8	Beam	None	A36	Typical	2.63	3.373	2.35	.055
24	TWR_RED_VERT_...	L2.5x2.5x3	Beam	None	A36	Typical	.901	.535	.535	.011
25	TWR_STEP_T4	L3x2-1/2x1/4	Beam	Single Angle	A36	Typical	1.313	.743	1.173	.027
26	TWR_LEG_T5	L6x6x3/4	Column	Single Angle	A36	Typical	8.438	28.155	28.155	1.582
27	TWR_HORZ_T5	2L3x2-1/2x1/4x3/8	Beam	None	A36	Typical	2.63	3.373	2.35	.055
28	TWR_DIAG_T5	2L2-1/2x2-1/2x1/4x3/8	Column	None	A36	Typical	2.38	3.347	1.41	.049
29	TWR_RED_HORZ_...	L2-1/2x2x3/16	Beam	Single Angle	A36	Typical	.809	.291	.509	.009
30	TWR_RED_DIAG_...	L2-1/2x2-1/2x3/16	Column	Single Angle	A36	Typical	.902	.547	.547	.011
31	TWR_INNER_SUP...	2L2-1/2x2-1/2x3/16x3/8	Beam	None	A36	Typical	1.8	2.499	1.09	.021
32	TWR_INNER_SQ_...	LL2.5x2x3x3	Beam	None	A36	Typical	1.64	1.38	1.02	.021
33	TWR_INNER_COR...	L2X2.5X3	Beam	None	A36	Typical	.809	.509	.291	.009
34	TWR_INNER_TRI_...	L2X2.5X3	Beam	None	A36	Typical	.809	.509	.291	.009
35	TWR_INNER_LAD...	L2X2.5X3	Beam	None	A36	Typical	.809	.509	.291	.009
36	TWR_LEG_T6	L6x6x3/4	Column	Single Angle	A36	Typical	8.438	28.155	28.155	1.582
37	TWR_HORZ_T6	2L2-1/2x2-1/2x1/4x3/8	Beam	None	A36	Typical	2.38	3.347	1.41	.049
38	TWR_DIAG_T6	2L2-1/2x2-1/2x1/4x3/8	Column	None	A36	Typical	2.38	3.347	1.41	.049
39	TWR_RED_HORZ_...	L2-1/2x2x3/16	Beam	Single Angle	A36	Typical	.809	.291	.509	.009
40	TWR_RED_DIAG_...	L2-1/2x2-1/2x3/16	Column	Single Angle	A36	Typical	.902	.547	.547	.011
41	TWR_INNER_SUP...	2L2-1/2x2-1/2x3/16x3/8	Beam	None	A36	Typical	1.8	2.499	1.09	.021
42	TWR_INNER_SQ_...	LL2.5x2x3x3	Beam	None	A36	Typical	1.64	1.38	1.02	.021
43	TWR_INNER_COR...	L2X2.5X3	Beam	None	A36	Typical	.809	.509	.291	.009
44	TWR_INNER_TRI_...	L2X2.5X3	Beam	None	A36	Typical	.809	.509	.291	.009
45	TWR_INNER_LAD...	L2X2.5X3	Beam	None	A36	Typical	.809	.509	.291	.009
46	TWR_LEG_T7	L6x6x7/8	Column	Single Angle	A36	Typical	9.734	31.917	31.917	2.484
47	TWR_HORZ_T7	2L2-1/2x2-1/2x1/4x3/8	Beam	None	A36	Typical	2.38	3.347	1.41	.049
48	TWR_DIAG_T7	2L2-1/2x2-1/2x1/4x3/8	Column	None	A36	Typical	2.38	3.347	1.41	.049
49	TWR_RED_HORZ_...	L2-1/2x2x3/16	Beam	Single Angle	A36	Typical	.809	.291	.509	.009
50	TWR_RED_DIAG_...	L2-1/2x2-1/2x3/16	Column	Single Angle	A36	Typical	.902	.547	.547	.011

Hot Rolled Steel Section Sets (Continued)

	Label	Shape	Type	Design List	Material	Design R...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
51	TWR_INNER_SUP...	2L2-1/2x2-1/2x3/16x3/8	Beam	None	A36	Typical	1.8	2.499	1.09	.021
52	TWR_INNER_SQ_...	LL2.5x2x3x3	Beam	None	A36	Typical	1.64	1.38	1.02	.021
53	TWR_INNER_COR...	L2X2.5X3	Beam	None	A36	Typical	.809	.509	.291	.009
54	TWR_INNER_BRA...	L2.5x2.5x4	Beam	None	A36	Typical	1.19	.692	.692	.026
55	TWR_INNER_GIRT...	L2X2.5X3	Beam	None	A36	Typical	.809	.509	.291	.009
56	TWR_INNER_TRI_...	L2X2.5X3	Beam	None	A36	Typical	.809	.509	.291	.009
57	TWR_INNER_LAD...	L2X2.5X3	Beam	None	A36	Typical	.809	.509	.291	.009
58	TWR_LEG_T8	L6x6x7/8	Column	Single Angle	A36	Typical	9.734	31.917	31.917	2.484
59	TWR_HORZ_T8	2L2-1/2x2-1/2x1/4x3/8	Beam	None	A36	Typical	2.38	3.347	1.41	.049
60	TWR_DIAG_T8	2L2-1/2x2-1/2x1/4x3/8	Column	None	A36	Typical	2.38	3.347	1.41	.049
61	TWR_RED_HORZ_...	L2-1/2x2x3/16	Beam	Single Angle	A36	Typical	.809	.291	.509	.009
62	TWR_RED_DIAG_...	L2-1/2x2-1/2x3/16	Column	Single Angle	A36	Typical	.902	.547	.547	.011
63	TWR_INNER_SUP...	2L2-1/2x2-1/2x3/16x3/8	Beam	None	A36	Typical	1.8	2.499	1.09	.021
64	TWR_INNER_SQ_...	LL2.5x2x3x3	Beam	None	A36	Typical	1.64	1.38	1.02	.021
65	TWR_INNER_COR...	L2X2.5X3	Beam	None	A36	Typical	.809	.509	.291	.009
66	TWR_INNER_TRI_...	L2X2.5X3	Beam	None	A36	Typical	.809	.509	.291	.009
67	TWR_INNER_LAD...	L2X2.5X3	Beam	None	A36	Typical	.809	.509	.291	.009
68	TWR_LEG_T9	L8x8x3/4	Column	Single Angle	A36	Typical	11.438	69.738	69.738	2.145
69	TWR_HORZ_T9	2L3x2-1/2x1/4x3/8	Beam	None	A36	Typical	2.63	3.373	2.35	.055
70	TWR_DIAG_T9	2L2-1/2x2-1/2x1/4x3/8	Column	None	A36	Typical	2.38	3.347	1.41	.049
71	TWR_RED_HORZ_...	L2-1/2x2-1/2x1/4	Beam	Single Angle	A36	Typical	1.188	.703	.703	.025
72	TWR_RED_DIAG_...	L2-1/2x2-1/2x3/16	Column	Single Angle	A36	Typical	.902	.547	.547	.011
73	TWR_INNER_SUP...	2L2-1/2x2-1/2x3/16x3/8	Beam	None	A36	Typical	1.8	2.499	1.09	.021
74	TWR_INNER_SQ_...	LL2.5x2x3x3	Beam	None	A36	Typical	1.64	1.38	1.02	.021
75	TWR_INNER_COR...	L3X3X4	Beam	None	A36	Typical	1.44	1.23	1.23	.031
76	TWR_INNER_BRA...	L2.5x2.5x4	Beam	None	A36	Typical	1.19	.692	.692	.026
77	TWR_INNER_TRI_...	L2.5x2.5x4	Beam	None	A36	Typical	1.19	.692	.692	.026
78	TWR_INNER_LAD...	2L2-1/2x2-1/2x3/16x3/8	Beam	None	A36	Typical	1.8	2.499	1.09	.021
79	TWR_LEG_T10	L8x8x7/8	Column	Single Angle	A36	Typical	13.234	79.581	79.581	3.378
80	TWR_HORZ_T10	2L3x2-1/2x1/4x3/8	Beam	None	A36	Typical	2.63	3.373	2.35	.055
81	TWR_DIAG_T10	2L3x3x3/8x3/8	Column	None	A36	Typical	4.22	8.394	3.52	.198
82	TWR_RED_HORZ_...	L2-1/2x2x3/16	Beam	None	A36	Typical	.809	.291	.509	.009
83	TWR_RED_HORZ_...	2L2-1/2x2-1/2x1/4x3/8	Beam	None	A36	Typical	2.38	3.347	1.41	.049
84	TWR_RED_DIAG_...	L2-1/2x2-1/2x3/16	Column	Single Angle	A36	Typical	.902	.547	.547	.011
85	TWR_RED_DIAG_...	L3x3-1/2x1/4	Column	Single Angle	A36	Typical	1.563	1.913	1.304	.033
86	TWR_RED_HIP_2_...	L4x4x3/8	Beam	Single Angle	A36	Typical	2.859	4.359	4.359	.134
87	TWR_RED_HIPDIA...	2L2-1/2x2-1/2x1/4x3/8	Column	None	A36	Typical	2.38	3.347	1.41	.049
88	TWR_INNER_SUP...	L3x3x1/4	Beam	Single Angle	A36	Typical	1.438	1.244	1.244	.03
89	TWR_INNER_SQ_...	2L3x2-1/2x1/4x3/8	Beam	Single Angle	A36	Typical	2.63	3.373	2.35	.055
90	TWR_INNER_COR...	L3x3x1/4	Beam	Single Angle	A36	Typical	1.438	1.244	1.244	.03
91	TWR_INNER_BRA...	L2.5x2.5x3	Beam	Single Angle	A36	Typical	.901	.535	.535	.011
92	TWR_INNER_TRI_...	L2.5x2.5x3	Beam	Single Angle	A36	Typical	.901	.535	.535	.011
93	TWR_INNER_LAD...	L4X4X6	Beam	Single Angle	A36	Typical	2.86	4.32	4.32	.141
94	TWR_LEG_T11	L8X8X1_HRA	Column	Single Angle	A36	Typical	15	88.983	88.983	5
95	TWR_HORZ_T11	2L3x3x3/8x3/8	Beam	None	A36	Typical	4.22	8.394	3.52	.198
96	TWR_DIAG_T11	2L3x3-1/2x3/8x3/8	Column	None	A36	Typical	4.59	12.838	3.69	.215
97	TWR_RED_HORZ_...	L2-1/2x2-1/2x3/16	Beam	None	A36	Typical	.902	.547	.547	.011
98	TWR_RED_HORZ_...	2L2-1/2x2-1/2x1/4x3/8	Beam	None	A36	Typical	2.38	3.347	1.41	.049
99	TWR_RED_DIAG_...	L2-1/2x2-1/2x3/16	Column	None	A36	Typical	.902	.547	.547	.011
100	TWR_RED_DIAG_...	2L2-1/2x2x1/4x3/8	Column	None	A36	Typical	2.13	1.858	1.31	.044
101	TWR_RED_SUBH...	2L2-1/2x3-1/2x1/4x3/8	Beam	None	A36	Typical	2.88	8.466	1.55	.06
102	TWR_RED_BRAC...	L2.5x2.5x4	Beam	None	A36	Typical	1.19	.692	.692	.026
103	TWR_RED_VERT_...	L3x3x1/4	Beam	None	A36	Typical	1.438	1.244	1.244	.03
104	TWR_RED_HIP_2_...	L4x4x3/8	Beam	Single Angle	A36	Typical	2.859	4.359	4.359	.134
105	TWR_RED_HIPDIA...	2L2-1/2x2-1/2x1/4x3/8	Column	None	A36	Typical	2.38	3.347	1.41	.049
106	TWR_RED_HIPBR...	L2x2x3	Column	None	A36	Typical	.722	.271	.271	.009
107	TWR_INNER_SUP...	2L3x2-1/2x1/4x3/8	Beam	None	A36	Typical	2.63	3.373	2.35	.055

Hot Rolled Steel Section Sets (Continued)

	Label	Shape	Type	Design List	Material	Design R...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
108	TWR_INNER_SQ_...	LL2.5x2.5x4x3	Beam	None	A36	Typical	2.38	3.31	1.38	.052
109	TWR_INNER_COR...	L3.5X3.5X5	Beam	None	A36	Typical	2.1	2.44	2.44	.073
110	TWR_INNER_BRA...	L2.5x2.5x3	Beam	None	A36	Typical	.901	.535	.535	.011
111	TWR_INNER_TRI_...	L2.5x2.5x4	Beam	None	A36	Typical	1.19	.692	.692	.026
112	TWR_INNER_LAD...	L2.5x2.5x4	Beam	None	A36	Typical	1.19	.692	.692	.026

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distribut...	Area(Me...	Surface(...
1	Dead	None		-1		60	510	44		
2	No Ice Wind 0 deg	None				60	1230	132		
3	No Ice Wind 45 deg	None				120	1192	176		
4	No Ice Wind 90 deg	None				60	1222	132		
5	No Ice Wind 135 deg	None				120	1196	176		
6	No Ice Wind 180 deg	None				60	1230	132		
7	No Ice Wind 225 deg	None				120	1192	176		
8	No Ice Wind 270 deg	None				60	1222	132		
9	No Ice Wind 315 deg	None				120	1196	176		
10	Ice	None				60	506	440		
11	Temperature Drop	None						396		
12	Ice Wind 0 deg	None				60	1206	124		
13	Ice Wind 45 deg	None				120	1144	176		
14	Ice Wind 90 deg	None				60	1206	132		
15	Ice Wind 135 deg	None				120	1146	136		
16	Ice Wind 180 deg	None				60	1206	124		
17	Ice Wind 225 deg	None				120	1144	176		
18	Ice Wind 270 deg	None				60	1206	132		
19	Ice Wind 315 deg	None				120	1146	136		
20	Service Wind 0 deg	None				60	1182	132		
21	Service Wind 45 deg	None				120	1140	176		
22	Service Wind 90 deg	None				60	1190	132		
23	Service Wind 135 deg	None				120	1146	176		
24	Service Wind 180 deg	None				60	1182	132		
25	Service Wind 225 deg	None				120	1140	176		
26	Service Wind 270 deg	None				60	1190	132		
27	Service Wind 315 deg	None				120	1146	176		

Load Combinations

	Description	So...	P...	S...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...
1	Dead Only	Yes			1	1	28	1	29	1	0		0		0		0		0			
2	1.2 Dead+1.6 Wind 0 de...	Yes			1	1.2	2	1.6	28	1.2	29	1	0		0		0		0			
3	0.9 Dead+1.6 Wind 0 de...	Yes			1	.9	2	1.6	28	.9	29	1	0		0		0		0			
4	1.2 Dead+1.6 Wind 45 d...	Yes			1	1.2	3	1.6	28	1.2	29	1	0		0		0		0			
5	0.9 Dead+1.6 Wind 45 d...	Yes			1	.9	3	1.6	28	.9	29	1	0		0		0		0			
6	1.2 Dead+1.6 Wind 90 d...	Yes			1	1.2	4	1.6	28	1.2	29	1	0		0		0		0			
7	0.9 Dead+1.6 Wind 90 d...	Yes			1	.9	4	1.6	28	.9	29	1	0		0		0		0			
8	1.2 Dead+1.6 Wind 135 ...	Yes			1	1.2	5	1.6	28	1.2	29	1	0		0		0		0			
9	0.9 Dead+1.6 Wind 135 ...	Yes			1	.9	5	1.6	28	.9	29	1	0		0		0		0			
10	1.2 Dead+1.6 Wind 180 ...	Yes			1	1.2	6	1.6	28	1.2	29	1	0		0		0		0			
11	0.9 Dead+1.6 Wind 180 ...	Yes			1	.9	6	1.6	28	.9	29	1	0		0		0		0			
12	1.2 Dead+1.6 Wind 225 ...	Yes			1	1.2	7	1.6	28	1.2	29	1	0		0		0		0			
13	0.9 Dead+1.6 Wind 225 ...	Yes			1	.9	7	1.6	28	.9	29	1	0		0		0		0			
14	1.2 Dead+1.6 Wind 270 ...	Yes			1	1.2	8	1.6	28	1.2	29	1	0		0		0		0			
15	0.9 Dead+1.6 Wind 270 ...	Yes			1	.9	8	1.6	28	.9	29	1	0		0		0		0			
16	1.2 Dead+1.6 Wind 315 ...	Yes			1	1.2	9	1.6	28	1.2	29	1	0		0		0		0			

Load Combinations (Continued)

	Description	So..	P...	S...	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac...
17	0.9 Dead+1.6 Wind 315 ...	Yes			1	.9	9	1.6	28	.9	29	1	0		0		0		0		0			
18	1.2 Dead+1.0 Ice+1.0 T...	Yes			1	1.2	10	1	11	1	28	1.2	29	1	0		0		0		0			
19	1.2 Dead+1.0 Wind 0 de...	Yes			1	1.2	12	1	10	1	11	1	28	1.2	29	1	0		0		0			
20	1.2 Dead+1.0 Wind 45 d...	Yes			1	1.2	13	1	10	1	11	1	28	1.2	29	1	0		0		0			
21	1.2 Dead+1.0 Wind 90 d...	Yes			1	1.2	14	1	10	1	11	1	28	1.2	29	1	0		0		0			
22	1.2 Dead+1.0 Wind 135 ...	Yes			1	1.2	15	1	10	1	11	1	28	1.2	29	1	0		0		0			
23	1.2 Dead+1.0 Wind 180 ...	Yes			1	1.2	16	1	10	1	11	1	28	1.2	29	1	0		0		0			
24	1.2 Dead+1.0 Wind 225 ...	Yes			1	1.2	17	1	10	1	11	1	28	1.2	29	1	0		0		0			
25	1.2 Dead+1.0 Wind 270 ...	Yes			1	1.2	18	1	10	1	11	1	28	1.2	29	1	0		0		0			
26	1.2 Dead+1.0 Wind 315 ...	Yes			1	1.2	19	1	10	1	11	1	28	1.2	29	1	0		0		0			
27	Dead+Wind 0 deg - Serv...	Yes			1	1	20	1	28	1	29	1	0		0		0		0		0			
28	Dead+Wind 45 deg - Se...	Yes			1	1	21	1	28	1	29	1	0		0		0		0		0			
29	Dead+Wind 90 deg - Se...	Yes			1	1	22	1	28	1	29	1	0		0		0		0		0			
30	Dead+Wind 135 deg - S...	Yes			1	1	23	1	28	1	29	1	0		0		0		0		0			
31	Dead+Wind 180 deg - S...	Yes			1	1	24	1	28	1	29	1	0		0		0		0		0			
32	Dead+Wind 225 deg - S...	Yes			1	1	25	1	28	1	29	1	0		0		0		0		0			
33	Dead+Wind 270 deg - S...	Yes			1	1	26	1	28	1	29	1	0		0		0		0		0			
34	Dead+Wind 315 deg - S...	Yes			1	1	27	1	28	1	29	1	0		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	N189	max	24.959	12	204.807	12	18.011	5	0	34	.071	16	0	34
2		min	-18.889	5	-133.06	5	-24.509	12	0	1	-.162	22	0	1
3	N190	max	18.641	17	199.835	8	18.65	17	0	34	.073	13	0	34
4		min	-24.719	8	-137.569	17	-24.471	8	0	1	-.182	20	0	1
5	N191	max	17.986	13	200.342	4	24.917	4	0	34	.068	8	0	34
6		min	-24.229	4	-136.146	13	-19.105	13	0	1	-.161	26	0	1
7	N192	max	24.595	16	206.42	16	25.083	16	0	34	.059	5	0	34
8		min	-18.344	9	-132.628	9	-18.579	9	0	1	-.182	24	0	1
9	Totals:	max	78.308	15	332.712	26	79.124	3						
10		min	-78.308	6	116.464	3	-79.124	10						

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

	Member	Shape	Code Check	Lo...	LC	She...	Lo...	...	LC	phi*Pnc...	phi*Pnt [k]	phi*M...	phi*M...	...	Eqn
1	M9	L 3-1/2x3-1/...	.268	7.0...	14	.005	9.66	z	24	17.938	54.675	.918	3.864	1	H2-1
2	M10	L 3-1/2x3-1/...	.270	7.5...	6	.006	9.66	z	23	17.938	54.675	.918	3.864	1	H2-1
3	M11	L 3-1/2x3-1/...	.262	7.0...	10	.005	9.66	z	22	17.938	54.675	.918	3.864	1	H2-1
4	M12	L 3-1/2x3-1/...	.263	7.5...	2	.006	9.66	z	21	17.938	54.675	.918	3.864	1	H2-1
5	M13	L 3-1/2x3-1/...	.266	6.8...	6	.005	9.66	z	20	17.938	54.675	.918	3.864	1	H2-1
6	M14	L 3-1/2x3-1/...	.264	7.5...	14	.006	9.66	z	19	17.938	54.675	.918	3.864	1	H2-1
7	M15	L 3-1/2x3-1/...	.284	6.8...	2	.005	9.66	z	25	17.938	54.675	.918	3.864	1	H2-1
8	M16	L 3-1/2x3-1/...	.284	7.5...	10	.006	9.66	z	25	17.938	54.675	.918	3.864	1	H2-1
9	M29	L3-1/2x3x1/4	.644	10....	14	.006	10....	z	23	12.408	50.625	1.022	3.011	1	H2-1
10	M30	L3-1/2x3x1/4	.644	10....	6	.006	10....	z	22	12.408	50.625	1.022	3.341	1	H2-1
11	M31	L3-1/2x3x1/4	.670	10....	10	.006	10....	z	22	12.408	50.625	1.022	3.011	1	H2-1
12	M32	L3-1/2x3x1/4	.665	10....	2	.006	10....	z	20	12.408	50.625	1.022	3.341	1	H2-1
13	M33	L3-1/2x3x1/4	.666	10....	6	.006	10....	z	20	12.408	50.625	1.022	3.011	1	H2-1
14	M34	L3-1/2x3x1/4	.665	10....	14	.006	10....	z	26	12.408	50.625	1.022	3.341	1	H2-1
15	M35	L3-1/2x3x1/4	.647	10....	2	.006	10....	z	25	12.408	50.625	1.022	3.011	1	H2-1
16	M36	L3-1/2x3x1/4	.649	10....	10	.006	10....	z	25	12.408	50.625	1.022	3.341	1	H2-1
17	M54	L4x3x1/4	.690	10....	14	.006	10....	z	19	12.882	54.675	1.049	3.492	1	H2-1
18	M55	L4x3x1/4	.697	10....	6	.006	10....	z	23	12.882	54.675	1.049	3.874	1	H2-1
19	M56	L4x3x1/4	.716	10....	10	.006	10....	z	22	12.882	54.675	1.049	3.492	1	H2-1
20	M57	L4x3x1/4	.709	10....	2	.006	10....	z	20	12.882	54.675	1.049	3.874	1	H2-1

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

	Member	Shape	Code Check	Lo...	LC	She...	Lo...	...	LC	phi*Pnc...	phi*Pnt [k]	phi*M...	phi*M...	...	Eqn
21	M58	L4x3x1/4	.735	10....	6	.006	10....	z	20	12.882	54.675	1.049	3.492	1	H2-1
22	M59	L4x3x1/4	.728	10....	14	.006	10....	z	26	12.882	54.675	1.049	3.874	1	H2-1
23	M60	L4x3x1/4	.698	10....	2	.006	10....	z	25	12.882	54.675	1.049	3.492	1	H2-1
24	M61	L4x3x1/4	.704	10....	10	.006	10....	z	21	12.882	54.675	1.049	3.874	1	H2-1
25	M91	2L2-1/2x2-1/...	.695	8.2...	14	.003	8.2...	y	26	20.24	77.112	5.381	2.133	1	H1-1a
26	M94	2L2-1/2x2-1/...	.710	8.2...	6	.003	8.2...	y	20	20.24	77.112	5.381	2.133	1	H1-1a
27	M98	2L2-1/2x2-1/...	.685	8.2...	10	.004	8.2...	y	24	20.24	77.112	5.381	2.133	1	H1-1a
28	M101	2L2-1/2x2-1/...	.682	8.2...	2	.004	8.2...	y	26	20.24	77.112	5.381	2.133	1	H1-1a
29	M105	2L2-1/2x2-1/...	.700	8.2...	6	.004	8.2...	y	22	20.24	77.112	5.381	2.133	1	H1-1a
30	M108	2L2-1/2x2-1/...	.687	8.2...	14	.004	8.2...	y	24	20.24	77.112	5.381	2.133	1	H1-1a
31	M112	2L2-1/2x2-1/...	.706	8.2...	2	.003	8.2...	y	20	20.24	77.112	5.381	2.133	1	H1-1a
32	M115	2L2-1/2x2-1/...	.708	8.2...	10	.003	8.2...	y	22	20.24	77.112	5.381	2.133	1	H1-1a
33	M128	2L2-1/2x2-1/...	.711	8.5...	14	.004	8.5...	y	19	18.729	77.112	5.381	2.133	1	H1-1a
34	M131	2L2-1/2x2-1/...	.727	8.5...	6	.004	8.5...	y	20	18.729	77.112	5.381	2.133	1	H1-1a
35	M135	2L2-1/2x2-1/...	.702	8.5...	10	.004	8.5...	y	26	18.729	77.112	5.381	2.133	1	H1-1a
36	M138	2L2-1/2x2-1/...	.700	8.5...	2	.004	8.5...	y	26	18.729	77.112	5.381	2.133	1	H1-1a
37	M142	2L2-1/2x2-1/...	.711	8.5...	6	.004	8.5...	y	22	18.729	77.112	5.381	2.133	1	H1-1a
38	M145	2L2-1/2x2-1/...	.694	8.5...	14	.004	8.5...	y	23	18.729	77.112	5.381	2.133	1	H1-1a
39	M149	2L2-1/2x2-1/...	.719	8.5...	2	.004	8.5...	y	20	18.729	77.112	5.381	2.133	1	H1-1a
40	M152	2L2-1/2x2-1/...	.718	8.5...	10	.004	8.5...	y	22	18.729	77.112	5.381	2.133	1	H1-1a
41	M165	2L2-1/2x2-1/...	.806	8.8...	14	.004	8.8...	y	26	17.34	77.112	5.381	2.133	1	H1-1a
42	M168	2L2-1/2x2-1/...	.828	8.8...	6	.004	8.8...	y	20	17.34	77.112	5.381	2.133	1	H1-1a
43	M172	2L2-1/2x2-1/...	.800	8.8...	10	.004	8.8...	y	24	17.34	77.112	5.381	2.133	1	H1-1a
44	M175	2L2-1/2x2-1/...	.789	8.8...	2	.004	8.8...	y	26	17.34	77.112	5.381	2.133	1	H1-1a
45	M179	2L2-1/2x2-1/...	.816	8.8...	6	.004	8.8...	y	23	17.34	77.112	5.381	2.133	1	H1-1a
46	M182	2L2-1/2x2-1/...	.786	8.8...	14	.004	8.8...	y	24	17.34	77.112	5.381	2.133	1	H1-1a
47	M186	2L2-1/2x2-1/...	.825	8.8...	2	.004	8.8...	y	20	17.34	77.112	5.381	2.133	1	H1-1a
48	M189	2L2-1/2x2-1/...	.825	8.8...	10	.004	8.8...	y	22	17.34	77.112	5.381	2.133	1	H1-1a
49	M202	2L2-1/2x2-1/...	.881	9.2...	14	.004	9.2...	y	26	16.045	77.112	5.381	2.133	1	H1-1a
50	M205	2L2-1/2x2-1/...	.907	9.2...	6	.004	9.2...	y	20	16.045	77.112	5.381	2.133	1	H1-1a
51	M209	2L2-1/2x2-1/...	.872	9.2...	10	.004	9.2...	y	24	16.045	77.112	5.381	2.133	1	H1-1a
52	M212	2L2-1/2x2-1/...	.864	9.2...	2	.004	9.2...	y	26	16.045	77.112	5.381	2.133	1	H1-1a
53	M216	2L2-1/2x2-1/...	.886	9.2...	6	.004	9.2...	y	22	16.045	77.112	5.381	2.133	1	H1-1a
54	M219	2L2-1/2x2-1/...	.854	9.2...	14	.004	9.2...	y	23	16.045	77.112	5.381	2.133	1	H1-1a
55	M223	2L2-1/2x2-1/...	.900	9.2...	2	.004	9.2...	y	20	16.045	77.112	5.381	2.133	1	H1-1a
56	M226	2L2-1/2x2-1/...	.899	9.2...	10	.004	9.2...	y	22	16.045	77.112	5.381	2.133	1	H1-1a
57	M239	2L2-1/2x2-1/...	.905	9.5...	14	.004	9.5...	y	26	15.651	77.112	5.381	2.133	1	H1-1a
58	M242	2L2-1/2x2-1/...	.939	9.5...	6	.004	9.5...	y	21	15.651	77.112	5.381	2.133	1	H1-1a
59	M246	2L2-1/2x2-1/...	.909	9.5...	10	.004	9.5...	y	25	15.651	77.112	5.381	2.133	1	H1-1a
60	M249	2L2-1/2x2-1/...	.901	9.5...	2	.004	9.5...	y	26	15.651	77.112	5.381	2.133	1	H1-1a
61	M253	2L2-1/2x2-1/...	.913	9.5...	6	.004	9.5...	y	22	15.651	77.112	5.381	2.133	1	H1-1a
62	M256	2L2-1/2x2-1/...	.885	9.5...	14	.004	9.5...	y	24	15.651	77.112	5.381	2.133	1	H1-1a
63	M260	2L2-1/2x2-1/...	.930	9.5...	2	.004	9.5...	y	21	15.651	77.112	5.381	2.133	1	H1-1a
64	M263	2L2-1/2x2-1/...	.939	9.5...	10	.004	9.5...	y	23	15.651	77.112	5.381	2.133	1	H1-1a
65	M276	2L3x3x3/8x3/8	.593	19....	14	.002	19....	y	25	35.431	136.728	11.376	4.498	1	H1-1a
66	M281	2L3x3x3/8x3/8	.614	19....	6	.003	19....	y	21	35.431	136.728	11.376	4.498	1	H1-1a
67	M287	2L3x3x3/8x3/8	.591	19....	10	.003	19....	y	24	35.431	136.728	11.376	4.498	1	H1-1a
68	M292	2L3x3x3/8x3/8	.587	19....	2	.003	19....	y	19	35.431	136.728	11.376	4.498	1	H1-1a
69	M300	2L3x3x3/8x3/8	.593	19....	6	.003	19....	y	21	35.431	136.728	11.376	4.498	1	H1-1a
70	M305	2L3x3x3/8x3/8	.573	19....	14	.003	19....	y	25	35.431	136.728	11.376	4.498	1	H1-1a
71	M313	2L3x3x3/8x3/8	.608	19....	2	.002	19....	y	26	35.431	136.728	11.376	4.498	1	H1-1a
72	M318	2L3x3x3/8x3/8	.611	19....	10	.003	19....	y	24	35.431	136.728	11.376	4.498	1	H1-1a
73	M337	2L3x3-1/2x3/...	.480	0	14	.005	15....	y	10	48.209	148.716	15.04	4.593	1	H1-1a
74	M342	2L3x3-1/2x3/...	.495	0	6	.005	15....	y	10	48.209	148.716	15.04	4.593	1	H1-1a
75	M349	2L3x3-1/2x3/...	.482	0	10	.005	15....	y	6	48.209	148.716	15.04	4.593	1	H1-1a
76	M354	2L3x3-1/2x3/...	.479	0	2	.005	15....	y	6	48.209	148.716	15.04	4.593	1	H1-1a
77	M363	2L3x3-1/2x3/...	.480	0	6	.005	15....	y	2	48.209	148.716	15.04	4.593	1	H1-1a

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

	Member	Shape	Code Check	Lo...	LC	She...	Lo...	...	LC	phi*Pnc...	phi*Pnt [k]	phi*M...	phi*M...	...	Eqn
78	M368	2L3x3-1/2x3/...	.465	0	14	.005	15....	y	2	48.209	148.716	15.04	4.593	1	H1-1a
79	M377	2L3x3-1/2x3/...	.496	0	2	.006	15....	y	14	48.209	148.716	15.04	4.593	1	H1-1a
80	M382	2L3x3-1/2x3/...	.499	0	10	.005	15....	y	14	48.209	148.716	15.04	4.593	1	H1-1a
81	M90	2L3x2-1/2x1/...	.198	0	6	.006	9.8...	y	24	40.651	85.212	5.423	4.855	1	H1-...
82	M97	2L3x2-1/2x1/...	.191	0	3	.007	9.8...	y	23	40.651	85.212	5.423	4.855	1	H1-...
83	M104	2L3x2-1/2x1/...	.196	9.8...	6	.006	9.8...	y	25	40.651	85.212	5.423	3.034	1	H1-...
84	M111	2L3x2-1/2x1/...	.197	9.8...	3	.006	9.8...	y	24	40.651	85.212	5.423	3.034	1	H1-...
85	M127	2L2-1/2x2-1/...	.439	10....	6	.007	10....	y	24	21.014	77.112	5.381	2.133	1	H1-1a
86	M134	2L2-1/2x2-1/...	.433	10....	2	.007	10....	y	19	21.014	77.112	5.381	2.133	1	H1-1a
87	M141	2L2-1/2x2-1/...	.439	10....	6	.007	10....	y	25	21.014	77.112	5.381	2.133	1	H1-1a
88	M148	2L2-1/2x2-1/...	.434	10....	2	.007	10....	y	26	21.014	77.112	5.381	2.133	1	H1-1a
89	M164	2L2-1/2x2-1/...	.603	11....	6	.007	11....	y	26	17.698	77.112	5.381	2.133	1	H1-1a
90	M171	2L2-1/2x2-1/...	.586	11....	2	.008	11....	y	25	17.698	77.112	5.381	2.133	1	H1-1a
91	M178	2L2-1/2x2-1/...	.612	11....	6	.008	11....	y	23	17.698	77.112	5.381	2.133	1	H1-1a
92	M185	2L2-1/2x2-1/...	.616	11....	10	.008	11....	y	21	17.698	77.112	5.381	2.133	1	H1-1a
93	M201	2L2-1/2x2-1/...	.733	12....	6	.008	12....	y	23	15.084	77.112	5.381	2.133	1	H1-1a
94	M208	2L2-1/2x2-1/...	.710	12....	2	.008	12....	y	25	15.084	77.112	5.381	2.133	1	H1-1a
95	M215	2L2-1/2x2-1/...	.723	12....	6	.008	12....	y	22	15.084	77.112	5.381	2.133	1	H1-1a
96	M222	2L2-1/2x2-1/...	.729	12....	10	.008	12....	y	25	15.084	77.112	5.381	2.133	1	H1-1a
97	M238	2L3x2-1/2x1/...	.544	13....	6	.008	13....	y	24	21.715	85.212	5.423	3.034	1	H1-1a
98	M245	2L3x2-1/2x1/...	.537	13....	2	.008	13....	y	23	21.715	85.212	5.423	3.034	1	H1-1a
99	M252	2L3x2-1/2x1/...	.546	13....	6	.008	13....	y	21	21.715	85.212	5.423	3.034	1	H1-1a
100	M259	2L3x2-1/2x1/...	.546	13....	10	.008	13....	y	26	21.715	85.212	5.423	3.034	1	H1-1a
101	M275	2L3x2-1/2x1/...	.659	14....	6	.008	14....	y	23	19.415	85.212	5.423	3.034	1	H1-1a
102	M286	2L3x2-1/2x1/...	.650	14....	2	.009	14....	y	22	19.415	85.212	5.423	3.034	1	H1-1a
103	M299	2L3x2-1/2x1/...	.659	14....	6	.009	14....	y	19	19.415	85.212	5.423	3.034	1	H1-1a
104	M312	2L3x2-1/2x1/...	.658	14....	10	.008	14....	y	25	19.415	85.212	5.423	3.034	1	H1-1a
105	M336	2L3x3x3/8x3/8	.272	16....	6	.005	8.1...	y	24	51.173	136.728	11.376	4.498	...	H1-1a
106	M348	2L3x3x3/8x3/8	.259	16....	2	.005	24....	y	20	51.173	136.728	11.376	4.498	...	H1-1a
107	M362	2L3x3x3/8x3/8	.263	16....	6	.005	8.1...	y	20	51.173	136.728	11.376	4.498	...	H1-1a
108	M376	2L3x3x3/8x3/8	.274	16....	10	.005	24....	y	24	51.173	136.728	11.376	4.498	...	H1-1a
109	M490	L2.5x2.5x4	.022	2.9...	19	.002	0	y	6	12.752	38.556	1.114	2.159	1	H2-1
110	M491	L2.5x2.5x4	.022	2.9...	25	.002	0	y	10	12.752	38.556	1.114	2.159	1	H2-1
111	M466	L2.5x2.5x4	.029	3.3...	26	.002	0	y	14	9.505	38.556	1.114	2.076	1	H2-1
112	M467	L2.5x2.5x4	.029	3.3...	22	.002	0	y	10	9.505	38.556	1.114	2.076	1	H2-1
113	M468	L2.5x2.5x4	.029	3.3...	23	.002	0	y	2	9.505	38.556	1.114	2.076	1	H2-1
114	M469	L2.5x2.5x4	.029	3.3...	26	.002	0	y	6	9.505	38.556	1.114	2.076	1	H2-1
115	M452	L2.5x2.5x3	.037	3.6...	25	.002	7.2...	y	6	6.307	29.192	.873	1.42	1	H2-1
116	M453	L2.5x2.5x3	.037	3.6...	22	.003	7.2...	y	2	6.307	29.192	.873	1.42	1	H2-1
117	M454	L2.5x2.5x3	.037	3.6...	26	.003	7.2...	y	6	6.307	29.192	.873	1.42	1	H2-1
118	M455	L2.5x2.5x3	.037	3.6...	24	.002	7.2...	y	2	6.307	29.192	.873	1.42	1	H2-1
119	M420	L2.5x2.5x3	.044	4.07	26	.002	8.1...	y	22	4.957	29.192	.873	1.352	1	H2-1
120	M421	L2.5x2.5x3	.044	4.07	22	.002	8.1...	y	23	4.957	29.192	.873	1.352	1	H2-1
121	M422	L2.5x2.5x3	.044	4.07	26	.002	8.1...	y	25	4.957	29.192	.873	1.352	1	H2-1
122	M423	L2.5x2.5x3	.044	4.07	22	.002	8.1...	y	26	4.957	29.192	.873	1.352	1	H2-1
123	M530	L2.5x2.5x3	.013	0	8	.001	5.6...	y	12	10.337	29.192	.873	1.609	...	H2-1*
124	M531	L2.5x2.5x3	.016	0	12	.001	0	y	8	10.337	29.192	.873	1.609	...	H2-1*
125	M532	L2.5x2.5x3	.013	0	16	.001	5.6...	y	12	10.337	29.192	.873	1.609	...	H2-1*
126	M512	L2X2.5X3	.043	0	8	.002	0	y	4	4.806	26.198	1.609	.704	...	H2-1*
127	M513	L2X2.5X3	.049	0	12	.002	0	y	8	4.806	26.198	1.609	.704	...	H2-1*
128	M514	L2X2.5X3	.042	0	17	.002	0	y	4	4.806	26.198	1.609	.704	...	H2-1*
129	M502	L2X2.5X3	.066	0	8	.002	0	y	4	4.016	26.198	1.609	.704	...	H2-1*
130	M503	L2X2.5X3	.074	0	12	.002	0	y	8	4.016	26.198	1.609	.704	...	H2-1*
131	M504	L2X2.5X3	.065	0	16	.002	0	y	4	4.016	26.198	1.609	.704	...	H2-1*
132	M487	L2X2.5X3	.057	0	8	.003	0	y	12	3.405	26.198	1.609	.704	...	H2-1*
133	M488	L2X2.5X3	.062	0	13	.003	0	y	16	3.405	26.198	1.609	.704	...	H2-1*
134	M489	L2X2.5X3	.055	0	17	.003	8.2...	y	4	3.405	26.198	1.609	.704	...	H2-1*

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

	Member	Shape	Code Check	Lo...	LC	She...	Lo...	...	LC	phi*Pnc...	phi*Pnt [k]	phi*M...	phi*M...	...	Eqn
135	M477	L2X2.5X3	.061	0	8	.003	0	y	4	2.924	26.198	1.609	.704	...	H2-1*
136	M478	L2X2.5X3	.067	0	12	.003	0	y	8	2.924	26.198	1.609	.704	...	H2-1*
137	M479	L2X2.5X3	.059	0	16	.003	0	y	4	2.924	26.198	1.609	.704	...	H2-1*
138	M463	L3X3X4	.045	0	12	.002	0	y	8	8.472	46.656	1.688	2.845	...	H2-1*
139	M464	L3X3X4	.043	0	8	.002	0	y	4	8.472	46.656	1.688	2.845	...	H2-1*
140	M465	L3X3X4	.042	0	17	.002	0	y	12	8.472	46.656	1.688	2.845	...	H2-1*
141	M449	L3x3x1/4	.050	0	8	.003	0	y	4	7.598	46.575	.67	2.794	...	H2-1*
142	M450	L3x3x1/4	.051	0	13	.003	0	y	8	7.598	46.575	.67	2.794	...	H2-1*
143	M451	L3x3x1/4	.049	0	17	.003	0	y	4	7.598	46.575	.67	2.794	...	H2-1*
144	M417	L3.5X3.5X5	.030	0	8	.003	11....	y	4	11.667	68.04	2.882	4.898	...	H2-1*
145	M418	L3.5X3.5X5	.032	0	13	.003	11....	y	8	11.667	68.04	2.882	4.898	...	H2-1*
146	M419	L3.5X3.5X5	.030	0	17	.003	11....	y	4	11.667	68.04	2.882	4.898	...	H2-1*
147	M492	L2X2.5X3	.035	2.9...	21	.002	5.8...	y	24	6.81	26.198	1.609	.644	1	H2-1
148	M493	L2X2.5X3	.045	2.9...	22	.002	0	y	26	6.81	26.198	1.609	.644	1	H2-1
149	M494	L2X2.5X3	.045	2.9...	23	.002	5.8...	y	26	6.81	26.198	1.609	.644	1	H2-1
150	M535	L2X2.5X3	.115	4	20	.002	8	y	16	3.619	26.198	1.609	.627	1	H2-1
151	M517	L2X2.5X3	.232	4	6	.002	0	y	8	3.619	26.198	1.609	.627	1	H2-1
152	M507	L2X2.5X3	.336	4	6	.002	8	y	8	3.619	26.198	1.609	.627	1	H2-1
153	M497	L2X2.5X3	.297	4	6	.002	0	y	16	3.619	26.198	1.609	.627	1	H2-1
154	M482	L2X2.5X3	.313	4	6	.002	0	y	8	3.619	26.198	1.609	.627	1	H2-1
155	M472	2L2-1/2x2-1/...	.049	0	6	.002	0	y	16	26.081	58.32	4.017	2.611	1	H1-...
156	M458	L4X4X6	.057	4	6	.002	0	y	16	41.657	92.664	4.398	8.566	1	H2-1
157	M426	L2.5x2.5x4	.209	4	6	.002	0	y	16	6.777	38.556	1.114	1.972	1	H2-1
158	M526	L3X2.5X4	.045	3.9...	16	.002	7.9...	y	12	8.813	42.768	1.251	2.172	1	H2-1
159	M527	L3X2.5X4	.045	3.9...	8	.002	7.9...	y	12	8.813	42.768	1.251	2.172	1	H2-1
160	M528	L3X2.5X4	.045	3.9...	14	.001	7.9...	y	6	8.813	42.768	1.251	2.172	1	H2-1
161	M529	L3X2.5X4	.045	3.9...	10	.001	7.9...	y	19	8.813	42.768	1.251	2.172	1	H2-1
162	M508	LL2.5x2x3x3	.043	4.9...	14	.002	0	z	2	16.604	53.136	2.725	2.524	1	H1-1b
163	M509	LL2.5x2x3x3	.043	4.9...	10	.002	0	z	6	16.604	53.136	2.725	2.524	1	H1-1b
164	M510	LL2.5x2x3x3	.041	4.9...	14	.002	0	z	10	16.604	53.136	2.725	2.524	1	H1-1b
165	M511	LL2.5x2x3x3	.041	4.9...	10	.002	0	z	14	16.604	53.136	2.725	2.524	1	H1-1b
166	M498	LL2.5x2x3x3	.059	5.37	14	.003	0	z	2	13.873	53.136	2.725	2.524	1	H1-1b
167	M499	LL2.5x2x3x3	.059	5.37	10	.003	0	z	6	13.873	53.136	2.725	2.524	1	H1-1b
168	M500	LL2.5x2x3x3	.052	5.37	14	.003	0	z	10	13.873	53.136	2.725	2.524	1	H1-1b
169	M501	LL2.5x2x3x3	.052	5.37	10	.003	0	z	14	13.873	53.136	2.725	2.524	1	H1-1b
170	M483	LL2.5x2x3x3	.095	5.8...	24	.003	0	z	6	11.764	53.136	2.725	2.524	1	H1-1b
171	M484	LL2.5x2x3x3	.091	5.8...	21	.003	11....	z	2	11.764	53.136	2.725	2.524	1	H1-1b
172	M485	LL2.5x2x3x3	.056	5.8...	2	.003	0	z	14	11.764	53.136	2.725	2.524	1	H1-1b
173	M486	LL2.5x2x3x3	.068	5.8...	12	.003	0	z	2	11.764	53.136	2.725	2.524	1	H1-1b
174	M473	LL2.5x2x3x3	.085	6.2...	12	.003	12....	z	2	10.1	53.136	2.725	2.524	1	H1-1b
175	M474	LL2.5x2x3x3	.087	6.2...	12	.003	12....	z	6	10.1	53.136	2.725	2.524	1	H1-1b
176	M475	LL2.5x2x3x3	.069	6.2...	6	.003	12....	z	10	10.1	53.136	2.725	2.524	1	H1-1b
177	M476	LL2.5x2x3x3	.068	6.2...	2	.003	12....	z	14	10.1	53.136	2.725	2.524	1	H1-1b
178	M459	LL2.5x2x3x3	.122	6.7...	12	.004	13....	z	2	10.465	53.136	2.725	1.577	1	H1-1b
179	M460	LL2.5x2x3x3	.126	6.7...	12	.004	0	z	6	10.465	53.136	2.725	1.577	1	H1-1b
180	M461	LL2.5x2x3x3	.102	6.7...	6	.004	13....	z	10	10.465	53.136	2.725	1.577	1	H1-1b
181	M462	LL2.5x2x3x3	.101	6.7...	2	.004	0	z	14	10.465	53.136	2.725	1.577	1	H1-1b
182	M441	2L3x2-1/2x1/...	.107	7.2...	22	.004	14....	z	14	22.832	85.212	5.423	3.034	1	H1-1b
183	M442	2L3x2-1/2x1/...	.107	7.2...	26	.004	0	z	10	22.832	85.212	5.423	3.034	1	H1-1b
184	M443	2L3x2-1/2x1/...	.108	7.2...	24	.004	14....	z	6	22.832	85.212	5.423	3.034	1	H1-1b
185	M444	2L3x2-1/2x1/...	.108	7.2...	24	.004	0	z	2	22.832	85.212	5.423	3.034	1	H1-1b
186	M409	LL2.5x2.5x4x3	.112	8.1...	22	.004	16....	z	14	18.589	77.112	5.321	2.083	1	H1-1b
187	M410	LL2.5x2.5x4x3	.112	8.1...	26	.004	16....	z	2	18.589	77.112	5.321	2.083	1	H1-1b
188	M411	LL2.5x2.5x4x3	.113	8.1...	24	.004	16....	z	6	18.589	77.112	5.321	2.083	1	H1-1b
189	M412	LL2.5x2.5x4x3	.113	8.1...	24	.004	0	z	2	18.589	77.112	5.321	2.083	1	H1-1b
190	M49	2L2-1/2x2x3/...	.218	5.6...	25	.010	11....	z	24	14.219	52.397	2.723	1.582	1	H1-1b
191	M50	2L2-1/2x2x3/...	.196	5.6...	20	.010	0	z	26	14.219	52.397	2.723	1.582	1	H1-1b

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

	Member	Shape	Code Check	Lo...	LC	She...	Lo...	...	LC	phi*Pnc...	phi*Pnt [k]	phi*M...	phi*M...	...	Eqn
192	M51	2L2-1/2x2x3/...	.218	5.6...	25	.010	0	z	24	14.219	52.397	2.723	1.582	1	H1-1b
193	M52	2L2-1/2x2x3/...	.191	5.6...	21	.010	0	z	26	14.219	52.397	2.723	1.582	1	H1-1b
194	M118	2L2-1/2x2-1/...	.239	6.9...	24	.011	13....	z	24	18.665	58.32	4.017	1.632	1	H1-1b
195	M119	2L2-1/2x2-1/...	.208	6.9...	20	.011	13....	z	22	18.665	58.32	4.017	1.632	1	H1-1b
196	M120	2L2-1/2x2-1/...	.239	6.9...	24	.011	0	z	24	18.665	58.32	4.017	1.632	1	H1-1b
197	M121	2L2-1/2x2-1/...	.206	6.9...	20	.011	13....	z	22	18.665	58.32	4.017	1.632	1	H1-1b
198	M155	2L2-1/2x2-1/...	.268	7.5...	24	.011	15....	z	24	15.733	58.32	4.017	1.632	1	H1-1b
199	M156	2L2-1/2x2-1/...	.242	7.5...	20	.012	15....	z	22	15.733	58.32	4.017	1.632	1	H1-1b
200	M157	2L2-1/2x2-1/...	.268	7.5...	24	.011	0	z	23	15.733	58.32	4.017	1.632	1	H1-1b
201	M158	2L2-1/2x2-1/...	.239	7.5...	20	.011	15....	z	22	15.733	58.32	4.017	1.632	1	H1-1b
202	M192	2L2-1/2x2-1/...	.310	8.2...	24	.012	16....	z	24	13.428	58.32	4.017	1.632	1	H1-1b
203	M193	2L2-1/2x2-1/...	.293	8.2...	20	.013	16....	z	22	13.428	58.32	4.017	1.632	1	H1-1b
204	M194	2L2-1/2x2-1/...	.342	8.2...	24	.013	0	z	23	13.428	58.32	4.017	1.632	1	H1-1b
205	M195	2L2-1/2x2-1/...	.295	8.2...	20	.013	0	z	21	13.428	58.32	4.017	1.632	1	H1-1b
206	M229	2L2-1/2x2-1/...	.355	8.9	24	.013	17.8	z	25	11.811	58.32	4.017	1.632	1	H1-1b
207	M230	2L2-1/2x2-1/...	.331	8.9	24	.013	0	z	22	11.811	58.32	4.017	2.611	1	H1-1b
208	M231	2L2-1/2x2-1/...	.355	8.9	24	.013	0	z	24	11.811	58.32	4.017	1.632	1	H1-1b
209	M232	2L2-1/2x2-1/...	.325	8.9	24	.013	17.8	z	23	11.811	58.32	4.017	2.611	1	H1-1b
210	M266	2L2-1/2x2-1/...	.426	9.5...	24	.015	19....	z	25	10.292	58.32	4.017	1.632	1	H1-1b
211	M267	2L2-1/2x2-1/...	.403	9.5...	24	.015	0	z	22	10.292	58.32	4.017	2.611	1	H1-1b
212	M268	2L2-1/2x2-1/...	.426	9.5...	24	.015	0	z	24	10.292	58.32	4.017	1.632	1	H1-1b
213	M269	2L2-1/2x2-1/...	.397	9.5...	24	.014	19....	z	23	10.292	58.32	4.017	2.611	1	H1-1b
214	M327	L3x3x1/4	.144	0	14	.008	10....	z	24	7.598	46.575	.67	2.658	1	H2-1
215	M328	L3x3x1/4	.149	0	10	.008	10....	z	20	7.598	46.575	.67	2.658	1	H2-1
216	M329	L3x3x1/4	.148	20....	10	.008	10....	z	24	7.598	46.575	.67	2.658	1	H2-1
217	M330	L3x3x1/4	.116	20....	6	.008	10....	z	21	7.598	46.575	.67	2.658	1	H2-1
218	M392	2L3x2-1/2x1/...	.121	11....	23	.007	11....	z	21	27.824	85.212	5.423	3.034	1	H1-1b
219	M393	2L3x2-1/2x1/...	.076	11....	20	.007	11....	z	19	27.824	85.212	5.423	4.855	1	H1-1b
220	M394	2L3x2-1/2x1/...	.122	11....	25	.007	11....	z	25	27.824	85.212	5.423	3.034	1	H1-1b
221	M395	2L3x2-1/2x1/...	.078	11....	24	.007	11....	z	23	27.824	85.212	5.423	4.855	1	H1-1b
222	M533	L2X2.5X3	.013	2.1...	4	.001	0	y	10	12.015	26.198	1.609	.655	1	H2-1
223	M534	L2X2.5X3	.013	2.1...	4	.001	0	y	14	12.015	26.198	1.609	.655	1	H2-1
224	M515	L2X2.5X3	.054	2.4...	12	.002	4.9...	y	22	9.396	26.198	1.609	.651	1	H2-1
225	M516	L2X2.5X3	.055	2.4...	12	.002	0	y	26	9.396	26.198	1.609	.651	1	H2-1
226	M505	L2X2.5X3	.078	2.6...	12	.002	0	y	20	8.008	26.198	1.609	.648	1	H2-1
227	M506	L2X2.5X3	.078	2.6...	12	.002	5.3...	y	20	8.008	26.198	1.609	.648	1	H2-1
228	M495	L2X2.5X3	.110	2.9...	12	.002	0	y	20	6.805	26.198	1.609	.644	1	H2-1
229	M496	L2X2.5X3	.110	2.9...	12	.002	5.8...	y	20	6.805	26.198	1.609	.644	1	H2-1
230	M480	L2X2.5X3	.138	3.1...	12	.002	6.3...	y	20	5.79	26.198	1.609	.641	1	H2-1
231	M481	L2X2.5X3	.138	3.1...	12	.002	6.3...	y	20	5.79	26.198	1.609	.641	1	H2-1
232	M470	L2.5x2.5x4	.119	3.4...	12	.002	6.8...	y	12	9.262	38.556	1.114	2.068	1	H2-1
233	M471	L2.5x2.5x4	.119	3.4...	12	.002	0	y	12	9.262	38.556	1.114	2.068	1	H2-1
234	M456	L2.5x2.5x3	.195	3.6...	12	.002	7.3...	y	12	6.025	29.192	.873	1.407	1	H2-1
235	M457	L2.5x2.5x3	.195	3.6...	12	.002	7.3...	y	12	6.025	29.192	.873	1.407	1	H2-1
236	M424	L2.5x2.5x4	.185	4.2...	12	.003	0	y	20	5.989	38.556	1.114	1.932	1	H2-1
237	M425	L2.5x2.5x4	.185	4.2...	12	.003	0	y	20	5.989	38.556	1.114	1.932	1	H2-1
238	M1	L6x6x1/2	.086	1.7...	24	.053	12....	z	2	145.933	186.3	5.356	28.731	1	H2-1
239	M2	L6x6x1/2	.089	1.1...	22	.047	12....	z	14	145.933	186.3	5.356	28.731	1	H2-1
240	M3	L6x6x1/2	.089	1.5...	20	.047	12....	y	14	145.933	186.3	5.356	28.731	1	H2-1
241	M4	L6x6x1/2	.089	2.4...	26	.053	12....	y	10	145.933	186.3	5.356	28.731	1	H2-1
242	M21	L6x6x1/2	.149	3.1...	24	.008	12....	y	6	146.506	186.3	5.356	28.772	1	H2-1
243	M22	L6x6x1/2	.156	2.7...	22	.011	12....	y	2	146.506	186.3	5.356	28.772	1	H2-1
244	M23	L6x6x1/2	.163	3.5...	20	.011	12....	z	10	146.506	186.3	5.356	28.772	1	H2-1
245	M24	L6x6x1/2	.154	3.7...	26	.011	12....	z	6	146.506	186.3	5.356	28.772	1	H2-1
246	M41	L6x6x5/8	.203	7.8...	12	.007	12....	z	2	181.223	230.344	6.62	36.329	1	H2-1
247	M42	L6x6x5/8	.195	7.8...	8	.005	12....	y	2	181.223	230.344	6.62	36.329	1	H2-1
248	M43	L6x6x5/8	.197	7.8...	4	.007	12....	y	14	181.223	230.344	6.62	36.329	1	H2-1

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

	Member	Shape	Code Check	Lo...	LC	She...	Lo...	...	LC	phi*Pnc...	phi*Pnt [k]	phi*M...	phi*M...	...	Eqn
249	M44	L6x6x5/8	.203	7.8...	16	.007	12....	z	6	181.223	230.344	6.62	36.329	1	H2-1
250	M66	L6x6x5/8	.286	2.88	12	.017	12....	z	2	181.667	230.344	6.62	36.356	1	H2-1
251	M67	L6x6x5/8	.274	2.88	8	.016	12....	z	14	181.667	230.344	6.62	36.356	1	H2-1
252	M68	L6x6x5/8	.274	3.0...	4	.012	12....	z	10	181.667	230.344	6.62	36.356	1	H2-1
253	M69	L6x6x5/8	.284	2.7...	16	.016	12....	y	10	181.667	230.344	6.62	36.356	1	H2-1
254	M86	L6x6x3/4	.276	3.7...	12	.005	0	y	8	219.956	273.375	7.874	42.663	1	H2-1
255	M87	L6x6x3/4	.266	9.95	8	.005	0	y	4	219.956	273.375	7.874	42.663	1	H2-1
256	M88	L6x6x3/4	.266	9.95	4	.004	0	y	16	219.956	273.375	7.874	42.663	1	H2-1
257	M89	L6x6x3/4	.278	3.7...	16	.004	0	y	12	219.956	273.375	7.874	42.663	1	H2-1
258	M123	L6x6x3/4	.366	3.4...	12	.005	12....	y	8	219.956	273.375	7.874	42.663	1	H2-1
259	M124	L6x6x3/4	.351	3.5...	8	.005	12....	y	4	219.956	273.375	7.874	42.663	1	H2-1
260	M125	L6x6x3/4	.353	3.5...	4	.005	12....	y	16	219.956	273.375	7.874	42.663	1	H2-1
261	M126	L6x6x3/4	.365	3.4...	16	.005	12....	y	12	219.956	273.375	7.874	42.663	1	H2-1
262	M160	L6x6x7/8	.445	6.2...	12	.008	12....	y	8	253.44	315.394	12.909	48.933	1	H2-1
263	M161	L6x6x7/8	.426	6.2...	8	.006	12....	y	4	253.44	315.394	12.909	48.933	1	H2-1
264	M162	L6x6x7/8	.431	6.2...	4	.007	12....	y	16	253.44	315.394	12.909	48.933	1	H2-1
265	M163	L6x6x7/8	.452	6.2...	16	.009	12....	y	12	253.44	315.394	12.909	48.933	1	H2-1
266	M197	L6x6x7/8	.517	6.2...	12	.006	0	y	8	253.44	315.394	12.909	48.933	1	H2-1
267	M198	L6x6x7/8	.496	6.2...	8	.006	0	y	4	253.44	315.394	12.909	48.933	1	H2-1
268	M199	L6x6x7/8	.500	6.2...	4	.006	0	y	16	253.44	315.394	12.909	48.933	1	H2-1
269	M200	L6x6x7/8	.523	6.2...	16	.006	12....	y	12	253.44	315.394	12.909	48.933	1	H2-1
270	M234	L8x8x3/4	.394	9.4...	12	.009	0	y	8	328.455	370.575	14.199	79.541	1	H2-1
271	M235	L8x8x3/4	.380	2.7...	8	.009	0	y	4	328.455	370.575	14.199	79.541	1	H2-1
272	M236	L8x8x3/4	.381	2.7...	4	.008	0	y	16	328.455	370.575	14.199	79.541	1	H2-1
273	M237	L8x8x3/4	.399	9.4...	16	.008	0	y	12	328.455	370.575	14.199	79.541	1	H2-1
274	M271	L8x8x7/8	.419	17....	12	.006	0	y	8	345.459	428.794	16.437	90.618	1	H2-1
275	M272	L8x8x7/8	.404	17....	8	.006	0	z	12	345.459	428.794	16.437	90.618	1	H2-1
276	M273	L8x8x7/8	.405	17....	4	.006	0	y	16	345.459	428.794	16.437	90.618	1	H2-1
277	M274	L8x8x7/8	.422	17....	16	.006	0	z	4	345.459	428.794	16.437	90.618	1	H2-1
278	M332	L8X8X1_HRA	.436	16....	12	.007	16....	y	24	391.033	486	18.665	101.1...	1	H2-1
279	M333	L8X8X1_HRA	.419	16....	8	.007	16....	z	22	391.033	486	18.665	101.1...	1	H2-1
280	M334	L8X8X1_HRA	.424	16....	4	.006	12....	y	4	391.033	486	18.665	101.1...	1	H2-1
281	M335	L8X8X1_HRA	.441	16....	16	.006	16....	z	26	391.033	486	18.665	101.1...	1	H2-1
282	M401	L2.5x2.5x4	.123	2.47	22	.001	5.1...	y	8	16.194	38.556	1.114	2.224	1	H2-1
283	M402	L2.5x2.5x4	.052	1.3...	22	.001	2.7...	y	16	30.324	38.556	1.114	2.505	1	H2-1
284	M403	L2.5x2.5x4	.123	2.47	24	.001	0	y	24	16.194	38.556	1.114	2.224	1	H2-1
285	M404	L2.5x2.5x4	.053	1.3...	24	.001	0	y	20	30.324	38.556	1.114	2.505	1	H2-1
286	M405	L2.5x2.5x4	.121	2.47	20	.002	5.1...	y	20	16.194	38.556	1.114	2.224	1	H2-1
287	M406	L2.5x2.5x4	.052	1.3...	20	.001	0	y	24	30.324	38.556	1.114	2.505	1	H2-1
288	M407	L2.5x2.5x4	.124	2.47	26	.001	5.1...	y	16	16.194	38.556	1.114	2.224	1	H2-1
289	M408	L2.5x2.5x4	.053	1.3...	26	.001	2.7...	y	8	30.324	38.556	1.114	2.505	1	H2-1
290	M280	L3x3-1/2x1/4	.038	0	11	.006	12....	z	19	6.974	50.625	1.301	3.568	1	H2-1
291	M285	L3x3-1/2x1/4	.040	1.1...	11	.005	12....	z	19	6.974	50.625	1.301	2.891	1	H2-1
292	M291	L3x3-1/2x1/4	.037	0	7	.006	0	z	25	6.974	50.625	1.301	3.568	1	H2-1
293	M296	L3x3-1/2x1/4	.045	1.1...	7	.005	12....	z	25	6.974	50.625	1.301	2.891	1	H2-1
294	M304	L3x3-1/2x1/4	.042	0	3	.006	12....	z	24	6.974	50.625	1.301	3.568	1	H2-1
295	M309	L3x3-1/2x1/4	.042	1.1...	5	.005	0	z	23	6.974	50.625	1.301	2.891	1	H2-1
296	M317	L3x3-1/2x1/4	.043	0	15	.006	0	z	21	6.974	50.625	1.301	3.568	1	H2-1
297	M322	L3x3-1/2x1/4	.035	1.1...	15	.005	12....	z	21	6.974	50.625	1.301	2.891	1	H2-1
298	M341	2L2-1/2x2x1/...	.118	6.6...	26	.005	0	y	25	12.583	69.012	3.669	3.3	1	H1-1b
299	M346	2L2-1/2x2x1/...	.119	6.6...	20	.004	13....	y	21	12.583	69.012	3.669	3.3	1	H1-1b
300	M353	2L2-1/2x2x1/...	.117	6.6...	25	.005	0	y	23	12.583	69.012	3.669	3.3	1	H1-1b
301	M358	2L2-1/2x2x1/...	.118	6.6...	25	.004	13....	y	19	12.583	69.012	3.669	3.3	1	H1-1b
302	M367	2L2-1/2x2x1/...	.118	6.6...	22	.005	13....	y	21	12.583	69.012	3.669	3.3	1	H1-1b
303	M372	2L2-1/2x2x1/...	.119	6.6...	24	.004	13....	y	25	12.583	69.012	3.669	3.3	1	H1-1b
304	M381	2L2-1/2x2x1/...	.117	6.6...	21	.005	13....	y	19	12.583	69.012	3.669	3.3	1	H1-1b
305	M386	2L2-1/2x2x1/...	.118	6.6...	21	.004	13....	y	23	12.583	69.012	3.669	3.3	1	H1-1b

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

	Member	Shape	Code Check	Lo...	LC	She...	Lo...	...	LC	phi*Pnc...	phi*Pnt [k]	phi*M...	phi*M...	...	Eqn
306	M93	L2-1/2x2-1/2...	.041	0	9	.004	0	z	25	6.596	29.236	.351	1.426	1	H2-1
307	M96	L2-1/2x2-1/2...	.040	0	11	.004	7.6...	z	21	6.596	29.236	.351	1.426	1	H2-1
308	M100	L2-1/2x2-1/2...	.039	0	5	.004	7.6...	z	23	6.596	29.236	.351	1.426	1	H2-1
309	M103	L2-1/2x2-1/2...	.044	0	7	.004	0	z	19	6.596	29.236	.351	1.426	1	H2-1
310	M107	L2-1/2x2-1/2...	.043	0	17	.004	0	z	21	6.596	29.236	.351	1.426	1	H2-1
311	M110	L2-1/2x2-1/2...	.044	0	5	.004	7.6...	z	25	6.596	29.236	.351	1.426	1	H2-1
312	M114	L2-1/2x2-1/2...	.044	0	13	.004	0	z	19	6.596	29.236	.351	1.426	1	H2-1
313	M117	L2-1/2x2-1/2...	.040	0	17	.004	7.6...	z	23	6.596	29.236	.351	1.426	1	H2-1
314	M130	L2-1/2x2-1/2...	.065	0	10	.004	0	z	24	6.066	29.236	.351	1.402	1	H2-1
315	M133	L2-1/2x2-1/2...	.055	0	11	.004	7.9...	z	22	6.066	29.236	.351	1.402	1	H2-1
316	M137	L2-1/2x2-1/2...	.064	0	6	.004	0	z	22	6.066	29.236	.351	1.402	1	H2-1
317	M140	L2-1/2x2-1/2...	.057	0	7	.004	0	z	20	6.066	29.236	.351	1.402	1	H2-1
318	M144	L2-1/2x2-1/2...	.066	0	2	.004	7.9...	z	20	6.066	29.236	.351	1.402	1	H2-1
319	M147	L2-1/2x2-1/2...	.056	0	5	.004	0	z	26	6.066	29.236	.351	1.402	1	H2-1
320	M151	L2-1/2x2-1/2...	.067	0	12	.004	7.9...	z	26	6.066	29.236	.351	1.402	1	H2-1
321	M154	L2-1/2x2-1/2...	.053	0	15	.004	0	z	24	6.066	29.236	.351	1.402	1	H2-1
322	M167	L2-1/2x2-1/2...	.109	0	10	.004	0	z	19	5.598	29.236	.351	1.379	1	H2-1
323	M170	L2-1/2x2-1/2...	.038	0	11	.004	8.2...	z	22	5.598	29.236	.351	1.379	1	H2-1
324	M174	L2-1/2x2-1/2...	.102	0	6	.004	0	z	25	5.598	29.236	.351	1.379	1	H2-1
325	M177	L2-1/2x2-1/2...	.040	0	7	.004	8.2...	z	20	5.598	29.236	.351	1.379	1	H2-1
326	M181	L2-1/2x2-1/2...	.104	0	2	.004	8.2...	z	19	5.598	29.236	.351	1.379	1	H2-1
327	M184	L2-1/2x2-1/2...	.038	0	3	.004	8.2...	z	26	5.598	29.236	.351	1.379	1	H2-1
328	M188	L2-1/2x2-1/2...	.111	0	14	.004	8.2...	z	25	5.598	29.236	.351	1.379	1	H2-1
329	M191	L2-1/2x2-1/2...	.036	0	15	.004	8.2...	z	24	5.598	29.236	.351	1.379	1	H2-1
330	M204	L2-1/2x2-1/2...	.133	0	10	.004	0	z	19	5.169	29.236	.351	1.355	1	H2-1
331	M207	L2-1/2x2-1/2...	.043	0	11	.004	8.5...	z	22	5.169	29.236	.351	1.355	1	H2-1
332	M211	L2-1/2x2-1/2...	.124	0	6	.004	0	z	26	5.169	29.236	.351	1.355	1	H2-1
333	M214	L2-1/2x2-1/2...	.046	0	7	.004	0	z	24	5.169	29.236	.351	1.355	1	H2-1
334	M218	L2-1/2x2-1/2...	.125	0	2	.004	0	z	20	5.169	29.236	.351	1.355	1	H2-1
335	M221	L2-1/2x2-1/2...	.044	0	3	.004	0	z	26	5.169	29.236	.351	1.355	1	H2-1
336	M225	L2-1/2x2-1/2...	.134	0	14	.004	8.5...	z	22	5.169	29.236	.351	1.355	1	H2-1
337	M228	L2-1/2x2-1/2...	.042	0	15	.004	8.5...	z	24	5.169	29.236	.351	1.355	1	H2-1
338	M241	L2-1/2x2-1/2...	.175	0	8	.005	0	z	21	4.765	29.236	.351	1.33	1	H2-1
339	M244	L2-1/2x2-1/2...	.145	0	13	.005	8.8...	z	23	4.765	29.236	.351	1.33	1	H2-1
340	M248	L2-1/2x2-1/2...	.170	0	4	.005	0	z	19	4.765	29.236	.351	1.33	1	H2-1
341	M251	L2-1/2x2-1/2...	.147	0	8	.005	0	z	24	4.765	29.236	.351	1.33	1	H2-1
342	M255	L2-1/2x2-1/2...	.170	0	16	.005	0	z	21	4.765	29.236	.351	1.33	1	H2-1
343	M258	L2-1/2x2-1/2...	.149	0	4	.005	8.8...	z	19	4.765	29.236	.351	1.33	1	H2-1
344	M262	L2-1/2x2-1/2...	.173	0	12	.005	0	z	23	4.765	29.236	.351	1.33	1	H2-1
345	M265	L2-1/2x2-1/2...	.147	0	17	.005	8.8...	z	25	4.765	29.236	.351	1.33	1	H2-1
346	M279	L2-1/2x2-1/2...	.142	0	11	.003	9.35	z	25	4.666	29.236	.351	1.324	1	H2-1
347	M284	L2-1/2x2-1/2...	.138	0	11	.003	0	z	21	4.666	29.236	.351	1.324	1	H2-1
348	M290	L2-1/2x2-1/2...	.140	0	7	.003	0	z	23	4.666	29.236	.351	1.324	1	H2-1
349	M295	L2-1/2x2-1/2...	.146	0	7	.003	0	z	19	4.666	29.236	.351	1.324	1	H2-1
350	M303	L2-1/2x2-1/2...	.140	0	3	.003	9.35	z	21	4.666	29.236	.351	1.324	1	H2-1
351	M308	L2-1/2x2-1/2...	.144	0	3	.003	0	z	25	4.666	29.236	.351	1.324	1	H2-1
352	M316	L2-1/2x2-1/2...	.146	0	15	.003	9.35	z	19	4.666	29.236	.351	1.324	1	H2-1
353	M321	L2-1/2x2-1/2...	.140	0	15	.003	0	z	23	4.666	29.236	.351	1.324	1	H2-1
354	M340	L2-1/2x2-1/2...	.441	9.6...	12	.003	4.8...	y	24	4.299	29.236	.351	1.298	1	H2-1
355	M345	L2-1/2x2-1/2...	.433	9.4...	8	.004	4.8...	y	22	4.299	29.236	.351	1.298	1	H2-1
356	M352	L2-1/2x2-1/2...	.105	0	9	.004	9.6...	y	22	4.299	29.236	.351	1.298	1	H2-1
357	M357	L2-1/2x2-1/2...	.111	0	5	.004	9.6...	y	20	4.299	29.236	.351	1.298	1	H2-1
358	M366	L2-1/2x2-1/2...	.426	9.6...	4	.003	4.8...	y	20	4.299	29.236	.351	1.298	1	H2-1
359	M371	L2-1/2x2-1/2...	.439	9.5...	16	.004	4.8...	y	26	4.299	29.236	.351	1.298	1	H2-1
360	M380	L2-1/2x2-1/2...	.109	0	17	.004	9.6...	y	26	4.299	29.236	.351	1.298	1	H2-1
361	M385	L2-1/2x2-1/2...	.102	0	13	.004	9.6...	y	24	4.299	29.236	.351	1.298	1	H2-1
362	M427	L2x2x3	.100	3.8...	26	.002	0	y	10	2.911	23.393	.558	.877	1	H2-1

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

	Member	Shape	Code Check	Lo...	LC	She...	Lo...	...	LC	phi*Pnc...	phi*Pnt [k]	phi*M...	phi*M...	...	Eqn
363	M428	L2x2x3	.050	3.8...	24	.002	0	y	23	2.911	23.393	.558	.877	1	H2-1
364	M429	L2x2x3	.100	3.8...	22	.002	0	y	2	2.911	23.393	.558	.877	1	H2-1
365	M430	L2x2x3	.040	2.7...	26	.002	5.4...	y	4	5.811	23.393	.558	.99	1	H2-1
366	M431	L2x2x3	.040	2.7...	22	.002	5.4...	y	4	5.811	23.393	.558	.99	1	H2-1
367	M432	L2x2x3	.054	4	24	.002	8	y	8	2.678	23.393	.558	.862	1	H2-1
368	M298	2L2-1/2x2-1/...	.090	5.6...	21	.004	0	y	22	16.51	77.112	5.381	3.414	1	H1-1b
369	M311	2L2-1/2x2-1/...	.090	5.6...	19	.004	11....	y	20	16.51	77.112	5.381	3.414	1	H1-1b
370	M324	2L2-1/2x2-1/...	.090	5.6...	24	.004	0	y	26	16.51	77.112	5.381	3.414	1	H1-1b
371	M326	2L2-1/2x2-1/...	.090	5.6...	22	.004	0	y	24	16.51	77.112	5.381	3.414	1	H1-1b
372	M445	2L2-1/2x2-1/...	.034	5.6...	19	.002	0	z	16	16.51	77.112	5.381	3.414	1	H1-1b
373	M446	2L2-1/2x2-1/...	.034	5.6...	21	.002	0	z	12	16.51	77.112	5.381	3.414	1	H1-1b
374	M447	2L2-1/2x2-1/...	.034	5.6...	26	.002	0	z	12	16.51	77.112	5.381	3.414	1	H1-1b
375	M448	2L2-1/2x2-1/...	.034	5.6...	24	.002	11....	z	8	16.51	77.112	5.381	3.414	1	H1-1b
376	M361	2L2-1/2x2-1/...	.100	6.0...	19	.004	12....	y	24	14.698	77.112	5.381	3.414	1	H1-1b
377	M375	2L2-1/2x2-1/...	.099	6.0...	26	.004	12....	y	22	14.698	77.112	5.381	3.414	1	H1-1b
378	M389	2L2-1/2x2-1/...	.100	6.0...	24	.004	12....	y	20	14.698	77.112	5.381	3.414	1	H1-1b
379	M391	2L2-1/2x2-1/...	.100	6.0...	22	.004	12....	y	26	14.698	77.112	5.381	3.414	1	H1-1b
380	M413	2L2-1/2x2-1/...	.060	6.2...	22	.002	12....	y	8	14.698	77.112	5.381	3.414	1	H1-1b
381	M414	2L2-1/2x2-1/...	.061	6.0...	20	.002	0	y	4	14.698	77.112	5.381	3.414	1	H1-1b
382	M415	2L2-1/2x2-1/...	.060	6.0...	26	.002	0	y	16	14.698	77.112	5.381	3.414	1	H1-1b
383	M416	2L2-1/2x2-1/...	.060	6.0...	23	.002	0	y	12	14.698	77.112	5.381	3.414	1	H1-1b
384	M297	L4x4x3/8	.003	0	22	.006	0	z	20	15.028	92.644	1.775	7.349	1	H2-1
385	M310	L4x4x3/8	.003	0	20	.006	0	z	26	15.028	92.644	1.775	7.349	1	H2-1
386	M323	L4x4x3/8	.003	0	26	.006	0	z	24	15.028	92.644	1.775	7.349	1	H2-1
387	M325	L4x4x3/8	.003	0	24	.006	0	z	22	15.028	92.644	1.775	7.349	1	H2-1
388	M360	L4x4x3/8	.003	15....	22	.007	15....	z	24	11.812	92.644	1.775	7.015	1	H2-1
389	M374	L4x4x3/8	.004	0	20	.007	0	z	22	11.812	92.644	1.775	7.015	1	H2-1
390	M388	L4x4x3/8	.003	0	26	.007	15....	z	20	11.812	92.644	1.775	7.015	1	H2-1
391	M390	L4x4x3/8	.005	0	24	.007	15....	z	26	11.812	92.644	1.775	7.015	1	H2-1
392	M278	2L2-1/2x2-1/...	.086	4.8...	26	.005	9.6...	y	24	25.631	77.112	5.381	3.414	1	H1-1b
393	M283	2L2-1/2x2-1/...	.086	4.8...	20	.005	9.6...	y	22	25.631	77.112	5.381	3.414	1	H1-1b
394	M289	2L2-1/2x2-1/...	.085	4.8...	24	.005	9.6...	y	22	25.631	77.112	5.381	3.414	1	H1-1b
395	M294	2L2-1/2x2-1/...	.084	4.8...	26	.005	9.6...	y	20	25.631	77.112	5.381	3.414	1	H1-1b
396	M302	2L2-1/2x2-1/...	.085	4.8...	22	.005	9.6...	y	24	25.631	77.112	5.381	3.414	1	H1-1b
397	M307	2L2-1/2x2-1/...	.085	4.8...	24	.005	9.6...	y	26	25.631	77.112	5.381	3.414	1	H1-1b
398	M315	2L2-1/2x2-1/...	.085	4.8...	20	.005	9.6...	y	26	25.631	77.112	5.381	3.414	1	H1-1b
399	M320	2L2-1/2x2-1/...	.086	4.8...	22	.005	9.6...	y	24	25.631	77.112	5.381	3.414	1	H1-1b
400	M339	2L2-1/2x2-1/...	.106	5.4...	26	.005	0	y	24	19.988	77.112	5.381	3.414	1	H1-1b
401	M344	2L2-1/2x2-1/...	.102	5.4...	20	.005	0	y	22	19.988	77.112	5.381	3.414	1	H1-1b
402	M351	2L2-1/2x2-1/...	.098	5.4...	25	.005	0	y	22	19.988	77.112	5.381	3.414	1	H1-1b
403	M356	2L2-1/2x2-1/...	.123	5.2	25	.005	0	y	20	19.988	77.112	5.381	3.414	1	H1-1b
404	M365	2L2-1/2x2-1/...	.127	5.6...	22	.005	10....	y	20	19.988	77.112	5.381	3.414	1	H1-1b
405	M370	2L2-1/2x2-1/...	.101	5.4...	24	.005	0	y	26	19.988	77.112	5.381	3.414	1	H1-1b
406	M379	2L2-1/2x2-1/...	.097	5.4...	21	.005	0	y	26	19.988	77.112	5.381	3.414	1	H1-1b
407	M384	2L2-1/2x2-1/...	.103	5.4...	21	.005	0	y	24	19.988	77.112	5.381	3.414	1	H1-1b
408	M92	L2-1/2x2x3/16	.032	0	17	.004	0	z	26	10.615	26.198	.264	1.286	1	H2-1
409	M95	L2-1/2x2x3/16	.031	0	3	.004	0	z	20	10.615	26.198	.264	1.286	1	H2-1
410	M99	L2-1/2x2x3/16	.029	0	15	.004	0	z	24	10.615	26.198	.264	1.286	1	H2-1
411	M102	L2-1/2x2x3/16	.032	0	15	.004	0	z	26	10.615	26.198	.264	1.286	1	H2-1
412	M106	L2-1/2x2x3/16	.032	0	9	.004	0	z	22	10.615	26.198	.264	1.286	1	H2-1
413	M109	L2-1/2x2x3/16	.034	0	13	.004	0	z	24	10.615	26.198	.264	1.286	1	H2-1
414	M113	L2-1/2x2x3/16	.034	0	5	.004	0	z	20	10.615	26.198	.264	1.286	1	H2-1
415	M116	L2-1/2x2x3/16	.032	0	9	.004	0	z	22	10.615	26.198	.264	1.286	1	H2-1
416	M129	L2-1/2x2x3/16	.050	0	3	.004	5.37	z	22	8.835	26.198	.264	1.249	1	H2-1
417	M132	L2-1/2x2x3/16	.045	0	3	.004	5.37	z	20	8.835	26.198	.264	1.249	1	H2-1
418	M136	L2-1/2x2x3/16	.050	0	15	.004	5.37	z	23	8.835	26.198	.264	1.249	1	H2-1
419	M139	L2-1/2x2x3/16	.045	0	15	.004	5.37	z	26	8.835	26.198	.264	1.249	1	H2-1

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

	Member	Shape	Code Check	Lo...	LC	She...	Lo...	...	LC	phi*Pnc...	phi*Pnt [k]	phi*M...	phi*M...	...	Eqn
420	M143	L2-1/2x2x3/16	.050	0	11	.004	5.37	z	25	8.835	26.198	.264	1.249	1	H2-1
421	M146	L2-1/2x2x3/16	.046	0	13	.004	5.37	z	20	8.835	26.198	.264	1.249	1	H2-1
422	M150	L2-1/2x2x3/16	.051	0	5	.004	5.37	z	24	8.835	26.198	.264	1.249	1	H2-1
423	M153	L2-1/2x2x3/16	.045	0	7	.004	5.37	z	22	8.835	26.198	.264	1.249	1	H2-1
424	M166	L2-1/2x2x3/16	.069	0	3	.004	5.8...	z	20	7.439	26.198	.264	1.213	1	H2-1
425	M169	L2-1/2x2x3/16	.035	0	3	.004	5.8...	z	20	7.439	26.198	.264	1.213	1	H2-1
426	M173	L2-1/2x2x3/16	.072	0	15	.004	5.8...	z	26	7.439	26.198	.264	1.213	1	H2-1
427	M176	L2-1/2x2x3/16	.035	0	15	.004	5.8...	z	26	7.439	26.198	.264	1.213	1	H2-1
428	M180	L2-1/2x2x3/16	.071	0	11	.004	5.8...	z	20	7.439	26.198	.264	1.213	1	H2-1
429	M183	L2-1/2x2x3/16	.032	0	11	.004	5.8...	z	24	7.439	26.198	.264	1.213	1	H2-1
430	M187	L2-1/2x2x3/16	.068	0	7	.004	5.8...	z	23	7.439	26.198	.264	1.213	1	H2-1
431	M190	L2-1/2x2x3/16	.032	0	7	.004	5.8...	z	25	7.439	26.198	.264	1.213	1	H2-1
432	M203	L2-1/2x2x3/16	.094	0	3	.004	6.2...	z	26	6.349	26.198	.264	1.179	1	H2-1
433	M206	L2-1/2x2x3/16	.044	0	3	.004	6.2...	z	23	6.349	26.198	.264	1.179	1	H2-1
434	M210	L2-1/2x2x3/16	.098	0	15	.004	6.2...	z	24	6.349	26.198	.264	1.179	1	H2-1
435	M213	L2-1/2x2x3/16	.045	0	15	.004	6.2...	z	25	6.349	26.198	.264	1.179	1	H2-1
436	M217	L2-1/2x2x3/16	.096	0	11	.004	6.2...	z	22	6.349	26.198	.264	1.179	1	H2-1
437	M220	L2-1/2x2x3/16	.042	0	11	.004	6.2...	z	19	6.349	26.198	.264	1.179	1	H2-1
438	M224	L2-1/2x2x3/16	.092	0	7	.004	6.2...	z	20	6.349	26.198	.264	1.179	1	H2-1
439	M227	L2-1/2x2x3/16	.042	0	7	.004	6.2...	z	25	6.349	26.198	.264	1.179	1	H2-1
440	M240	L2-1/2x2-1/2...	.096	0	17	.004	0	z	26	10.917	38.475	.461	2.121	1	H2-1
441	M243	L2-1/2x2-1/2...	.088	0	5	.004	0	z	23	10.917	38.475	.461	2.121	1	H2-1
442	M247	L2-1/2x2-1/2...	.097	0	13	.004	0	z	24	10.917	38.475	.461	2.121	1	H2-1
443	M250	L2-1/2x2-1/2...	.086	0	17	.004	0	z	25	10.917	38.475	.461	2.121	1	H2-1
444	M254	L2-1/2x2-1/2...	.097	0	9	.004	0	z	22	10.917	38.475	.461	2.121	1	H2-1
445	M257	L2-1/2x2-1/2...	.084	0	13	.004	0	z	19	10.917	38.475	.461	2.121	1	H2-1
446	M261	L2-1/2x2-1/2...	.093	0	5	.004	0	z	21	10.917	38.475	.461	2.121	1	H2-1
447	M264	L2-1/2x2-1/2...	.087	0	9	.004	0	z	25	10.917	38.475	.461	2.121	1	H2-1
448	M277	L2-1/2x2x3/16	.053	0	3	.005	0	y	26	11.352	26.198	.264	1.301	1	H2-1
449	M282	L2-1/2x2x3/16	.053	0	3	.006	0	y	20	11.352	26.198	.264	1.301	1	H2-1
450	M288	L2-1/2x2x3/16	.052	0	15	.005	0	y	20	11.352	26.198	.264	1.301	1	H2-1
451	M293	L2-1/2x2x3/16	.053	0	15	.006	0	y	26	11.352	26.198	.264	1.301	1	H2-1
452	M301	L2-1/2x2x3/16	.052	0	11	.005	0	y	26	11.352	26.198	.264	1.301	1	H2-1
453	M306	L2-1/2x2x3/16	.052	0	11	.006	0	y	24	11.352	26.198	.264	1.301	1	H2-1
454	M314	L2-1/2x2x3/16	.053	0	7	.005	0	y	24	11.352	26.198	.264	1.301	1	H2-1
455	M319	L2-1/2x2x3/16	.053	0	7	.006	0	y	22	11.352	26.198	.264	1.301	1	H2-1
456	M338	L2-1/2x2-1/2...	.020	0	4	.005	5.4...	y	20	13.065	29.236	.351	1.609	1	H2-1
457	M343	L2-1/2x2-1/2...	.018	0	16	.005	5.4...	y	21	13.065	29.236	.351	1.609	1	H2-1
458	M350	L2-1/2x2-1/2...	.029	0	16	.005	5.4...	y	26	13.065	29.236	.351	1.609	1	H2-1
459	M355	L2-1/2x2-1/2...	.030	0	12	.005	5.4...	y	20	13.065	29.236	.351	1.609	1	H2-1
460	M364	L2-1/2x2-1/2...	.017	0	12	.005	5.4...	y	25	13.065	29.236	.351	1.609	1	H2-1
461	M369	L2-1/2x2-1/2...	.018	0	8	.005	5.4...	y	26	13.065	29.236	.351	1.609	1	H2-1
462	M378	L2-1/2x2-1/2...	.030	0	8	.005	5.4...	y	22	13.065	29.236	.351	1.609	1	H2-1
463	M383	L2-1/2x2-1/2...	.029	0	4	.005	5.4...	y	24	13.065	29.236	.351	1.609	1	H2-1
464	M347	2L2-1/2x3-1/...	.107	9.0...	23	.005	9.0...	y	25	7.402	93.312	9.918	2.218	1	H1-1b
465	M359	2L2-1/2x3-1/...	.107	9.0...	21	.005	9.0...	y	23	7.402	93.312	9.918	2.218	1	H1-1b
466	M373	2L2-1/2x3-1/...	.107	9.0...	19	.005	9.0...	y	21	7.402	93.312	9.918	2.218	1	H1-1b
467	M387	2L2-1/2x3-1/...	.108	9.0...	25	.005	9.0...	y	19	7.402	93.312	9.918	2.218	1	H1-1b
468	M540	L2.5x2.5x3	.012	3.7...	19	.000	6.7...	y	12	7.302	29.192	.873	1.46	1	H2-1
469	M541	L2.5x2.5x3	.012	3.7...	25	.000	0	y	8	7.302	29.192	.873	1.46	1	H2-1
470	M542	L2.5x2.5x3	.012	3.7...	23	.000	6.7...	y	21	7.302	29.192	.873	1.46	1	H2-1
471	M543	L2.5x2.5x3	.012	3.7...	21	.000	6.7...	y	26	7.302	29.192	.873	1.46	1	H2-1
472	M536	L2.5x2.5x3	.021	3.6...	19	.000	6.6...	y	4	7.422	29.192	.873	1.464	1	H2-1
473	M537	L2.5x2.5x3	.022	3.6...	25	.001	6.6...	y	20	7.422	29.192	.873	1.464	1	H2-1
474	M538	L2.5x2.5x3	.022	3.6...	23	.001	6.6...	y	21	7.422	29.192	.873	1.464	1	H2-1
475	M539	L2.5x2.5x3	.021	3.6...	21	.000	0	y	4	7.422	29.192	.873	1.464	1	H2-1
476	M522	L2.5x2.5x3	.012	3.6...	19	.000	0	y	12	7.516	29.192	.873	1.468	1	H2-1

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

	Member	Shape	Code Check	Lo...	LC	She...	Lo...	...	LC	phi*Pnc...	phi*Pnt [k]	phi*M...	phi*M...	...	Eqn
477	M523	L2.5x2.5x3	.012	3.6...	25	.000	6.61	y	16	7.516	29.192	.873	1.468	1	H2-1
478	M524	L2.5x2.5x3	.012	3.6...	23	.000	0	y	14	7.516	29.192	.873	1.468	1	H2-1
479	M525	L2.5x2.5x3	.012	3.6...	21	.000	6.61	y	4	7.516	29.192	.873	1.468	1	H2-1
480	M518	L2.5x2.5x3	.879	1.9...	23	.000	6.5...	y	14	7.594	29.192	.873	1.47	1	H2-1
481	M519	L2.5x2.5x3	.862	1.9...	21	.001	0	y	26	7.594	29.192	.873	1.47	1	H2-1
482	M520	L2.5x2.5x3	.865	1.9...	19	.001	0	y	22	7.594	29.192	.873	1.47	1	H2-1
483	M521	L2.5x2.5x3	.883	1.9...	25	.000	6.5...	y	10	7.594	29.192	.873	1.47	1	H2-1
484	M397	L3x3x1/4	.007	12....	23	.000	0	y	14	5.037	46.575	.67	2.421	1	H2-1
485	M398	L3x3x1/4	.007	12....	21	.000	12....	y	19	5.037	46.575	.67	2.421	1	H2-1
486	M399	L3x3x1/4	.007	12....	25	.000	12....	y	2	5.037	46.575	.67	2.421	1	H2-1
487	M400	L3x3x1/4	.007	12....	19	.000	0	y	21	5.037	46.575	.67	2.421	1	H2-1
488	M433	L3x3x1/4	.039	0	22	.001	8.6...	y	6	10.663	46.575	.67	2.836	1	H2-1
489	M434	L3x3x1/4	.039	0	22	.001	0	y	23	10.663	46.575	.67	2.836	1	H2-1
490	M435	L3x3x1/4	.039	0	24	.001	0	y	25	10.663	46.575	.67	2.836	1	H2-1
491	M436	L3x3x1/4	.039	0	24	.001	0	y	10	10.663	46.575	.67	2.836	1	H2-1
492	M437	L3x3x1/4	.039	0	26	.001	0	y	19	10.663	46.575	.67	2.836	1	H2-1
493	M438	L3x3x1/4	.039	0	26	.001	0	y	14	10.663	46.575	.67	2.836	1	H2-1
494	M439	L3x3x1/4	.043	0	20	.001	8.6...	y	21	10.663	46.575	.67	2.836	1	H2-1
495	M440	L3x3x1/4	.043	0	20	.001	0	y	2	10.663	46.575	.67	2.836	1	H2-1
496	M17	L3x2-1/2x1/4	.019	8.4...	25	.005	6.5...	z	24	20.579	42.525	.536	2.498	1	H2-1
497	M18	L3x2-1/2x1/4	.022	8.6...	10	.005	6.5...	z	22	20.579	42.525	.536	2.498	1	H2-1
498	M19	L3x2-1/2x1/4	.018	8.6...	6	.005	6.5...	z	26	20.579	42.525	.536	2.498	1	H2-1
499	M20	L3x2-1/2x1/4	.016	8.4...	19	.005	6.5...	z	24	20.579	42.525	.536	2.498	1	H2-1
500	M37	C6X8.2	.048	0	6	.006	7.4...	y	26	20.619	77.436	2.108	10.347	1	H1-...
501	M38	C6X8.2	.051	7.4...	10	.006	7.4...	y	24	20.619	77.436	2.108	10.347	1	H1-...
502	M39	C6X8.2	.049	7.4...	6	.006	7.4...	y	24	20.619	77.436	2.108	10.347	1	H1-...
503	M40	C6X8.2	.045	0	10	.006	7.4...	y	22	20.619	77.436	2.108	10.347	1	H1-...
504	M62	L3x2-1/2x1/4	.023	0	4	.006	8.4...	z	20	14.249	42.525	.536	2.326	1	H2-1
505	M63	L3x2-1/2x1/4	.025	16....	10	.006	8.4...	z	24	14.249	42.525	.536	2.326	1	H2-1
506	M64	L3x2-1/2x1/4	.030	10....	7	.006	8.4...	z	23	14.249	42.525	.536	2.295	1	H2-1
507	M65	L3x2-1/2x1/4	.025	0	10	.006	8.4...	z	22	14.249	42.525	.536	2.326	1	H2-1
508	M82	L3x2-1/2x1/4	.031	12....	17	.007	9.3...	z	20	12.021	42.525	.536	2.202	1	H2-1
509	M83	L3x2-1/2x1/4	.028	12....	13	.007	9.3...	z	26	12.021	42.525	.536	2.202	1	H2-1
510	M84	L3x2-1/2x1/4	.022	12....	9	.007	9.3...	z	22	12.021	42.525	.536	2.202	1	H2-1
511	M85	L3x2-1/2x1/4	.033	6.6...	9	.007	9.3...	z	20	12.021	42.525	.536	2.202	1	H2-1
512	M5	MC18x58_H...	.019	6.1...	19	.003	0	y	26	202.265	554.04	23.037	198.3...	1	H1-1b
513	M6	MC18x58_H...	.019	6.1...	25	.003	0	y	23	202.265	554.04	23.037	198.3...	1	H1-1b
514	M7	MC18x58_H...	.019	6.1...	23	.003	12....	y	24	202.265	554.04	23.037	198.3...	1	H1-1b
515	M8	MC18x58_H...	.019	6.1...	21	.003	0	y	20	202.265	554.04	23.037	198.3...	1	H1-1b
516	M25	2L3-1/2x3x5/...	.036	10....	23	.003	7.0...	y	21	54.189	125.388	9.481	8.24	1	H1-1b
517	M26	2L3-1/2x3x5/...	.036	10....	21	.003	7.0...	y	23	54.189	125.388	9.481	8.24	1	H1-1b
518	M27	2L3-1/2x3x5/...	.036	10....	19	.003	7.0...	y	21	54.189	125.388	9.481	8.24	1	H1-1b
519	M28	2L3-1/2x3x5/...	.036	10....	25	.003	7.0...	y	23	54.189	125.388	9.481	8.24	1	H1-1b
520	M45	2L3x2-1/2x1/...	.059	7.9...	23	.004	7.9...	y	20	51.046	85.212	5.423	3.034	1	H1-1b
521	M46	2L3x2-1/2x1/...	.100	7.9...	21	.008	10....	z	22	51.046	85.212	5.423	3.034	1	H1-1b
522	M47	2L3x2-1/2x1/...	.100	7.9...	19	.008	5.8...	z	19	51.046	85.212	5.423	3.034	1	H1-1b
523	M48	2L3x2-1/2x1/...	.059	7.9...	25	.004	7.9...	y	23	51.046	85.212	5.423	3.034	1	H1-1b
524	M70	2L3x2-1/2x1/...	.111	8.8...	23	.005	8.8...	y	20	17.249	85.212	5.423	3.034	1	H1-1b
525	M71	2L3x2-1/2x1/...	.112	8.8...	21	.005	8.8...	y	26	17.249	85.212	5.423	3.034	1	H1-1b
526	M72	2L3x2-1/2x1/...	.112	8.8...	19	.005	8.8...	y	22	17.249	85.212	5.423	3.034	1	H1-1b
527	M73	2L3x2-1/2x1/...	.112	8.8...	25	.005	8.8...	y	20	17.249	85.212	5.423	3.034	1	H1-1b

Project #: 2019723.01.SNET025.12

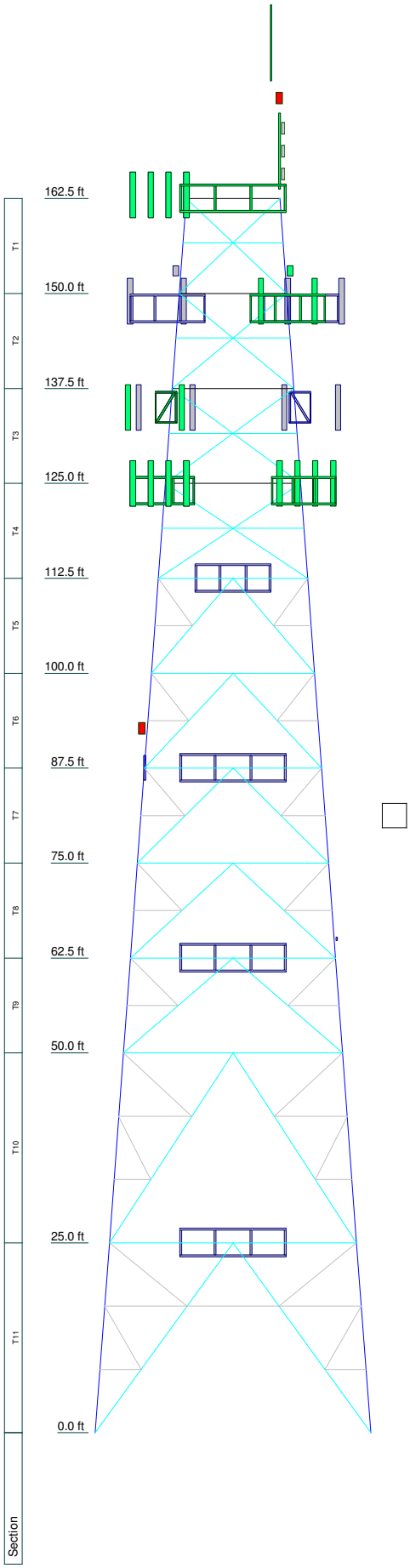
Date: 2/1/2019

Bolt Checks

Section #	Elevation	Component Type	Bolt Grade	Bolt Size (in)	# of Bolts	Maximum Load (k)	Maximum Load per Bolt (k)	Allowable Load per Bolt (k)	Ratio	Allowable Ratio	% Capacity	Criteria
T1	162.5	Diagonal	A307	0.75	5	5.154	1.031	8.946	0.115	1.000	11.5%	Bolt Shear
		Secondary Horizontal	A307	0.75	2	0.279	0.14	8.946	0.016	1.000	1.6%	Bolt Shear
T2	150	Leg	A307	0.75	16	23.99	2.999	17.892	0.168	1.000	16.8%	Bolt DS
		Diagonal	A307	0.75	4	7.498	1.874	8.946	0.210	1.000	21.0%	Bolt Shear
		Secondary Horizontal	A307	0.75	3	1.057	0.352	8.946	0.039	1.000	3.9%	Bolt Shear
T3	137.5	Diagonal	A307	0.75	5	8.35	1.67	8.946	0.187	1.000	18.7%	Bolt Shear
		Secondary Horizontal	A307	0.75	2	0.387	0.194	8.946	0.022	1.000	2.2%	Bolt Shear
T4	125	Leg	A307	0.75	16	51.761	6.47	17.892	0.362	1.000	36.2%	Bolt DS
		Top Girt	A307	0.75	2	4.589	2.294	17.892	0.128	1.000	12.8%	Bolt Shear
		Redundant Vertical	A307	0.75	1	6.678	6.678	8.946	0.746	1.000	74.6%	Bolt Shear
		Secondary Horizontal	A307	0.75	2	0.347	0.174	8.946	0.019	1.000	1.9%	Bolt Shear
		Diagonal	A307	0.75	4	10.22	2.555	8.946	0.286	1.000	28.6%	Bolt Shear
T5	112.5	Horizontal	A307	0.75	2	8.09	4.045	17.892	0.226	1.000	22.6%	Bolt Shear
		Diagonal	A307	0.75	2	13.861	6.93	17.892	0.387	1.000	38.7%	Bolt Shear
T6	100	Leg	A307	0.75	20	80.626	8.063	17.892	0.451	1.000	45.1%	Bolt DS
		Horizontal	A307	0.75	2	9.028	4.514	17.892	0.252	1.000	25.2%	Bolt Shear
		Diagonal	A307	0.75	2	12.93	6.465	17.892	0.361	1.000	36.1%	Bolt Shear
		Inner Corner	A307	0.75	2	1.907	0.954	8.057	0.118	1.000	11.8%	Member Block Shear
T7	87.5	Horizontal	A307	0.75	2	9.457	4.728	17.892	0.264	1.000	26.4%	Bolt Shear
		Diagonal	A307	0.75	2	13.614	6.807	17.892	0.380	1.000	38.0%	Bolt Shear
T8	75	Leg	A307	0.75	28	114.287	8.163	17.892	0.456	1.000	45.6%	Bolt DS
		Horizontal	A307	0.75	2	9.687	4.844	17.892	0.271	1.000	27.1%	Bolt Shear
		Diagonal	A307	0.75	2	13.696	6.848	17.892	0.383	1.000	38.3%	Bolt Shear
		Inner Corner	A307	0.75	2	1.732	0.866	8.057	0.107	1.000	10.7%	Member Block Shear
T9	62.5	Leg	A307	0.75	28	130.545	9.325	17.892	0.521	1.000	52.1%	Bolt DS
		Horizontal	A307	0.75	2	10.171	5.086	17.892	0.284	1.000	28.4%	Bolt Shear
		Diagonal	A307	0.75	3	14.003	4.668	17.892	0.261	1.000	26.1%	Bolt Shear
		Inner Corner	A307	0.75	2	2.081	1.04	8.946	0.116	1.000	11.6%	Bolt Shear
T10	50	Leg	A307	0.75	32	146.651	9.166	17.892	0.512	1.000	51.2%	Bolt DS
		Horizontal	A307	0.75	3	11.031	3.677	17.892	0.206	1.000	20.6%	Bolt Shear
		Diagonal	A325N	0.75	3	21.052	7.017	31.266	0.224	1.000	22.4%	Member Block Shear
		Inner Corner	A307	0.75	2	2.369	1.184	8.946	0.132	1.000	13.2%	Bolt Shear
T11	25	Leg	A307	0.75	36	177.774	9.876	17.892	0.552	1.000	55.2%	Bolt DS
		Horizontal	A307	0.75	3	12.051	4.017	17.892	0.225	1.000	22.5%	Bolt Shear
		Diagonal	A307	0.75	5	21.875	4.375	17.892	0.245	1.000	24.5%	Bolt Shear
		Redundant Diagonal	A307	0.75	2	1.882	0.941	8.057	0.117	1.000	11.7%	Member Block Shear
		Redundant Brace	A307	0.75	2	1.87	0.935	8.946	0.105	1.000	10.5%	Bolt Shear
		Inner Corner	A307	0.75	2	2.183	1.092	8.946	0.122	1.000	12.2%	Bolt Shear
										Maximum Capacity	74.6%	

APPENDIX C

Tower Elevation Drawing



MATERIAL STRENGTH

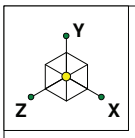
GRADE	Fy	Fu	GRADE	Fy	Fu
A36	36 ksi	58 ksi			

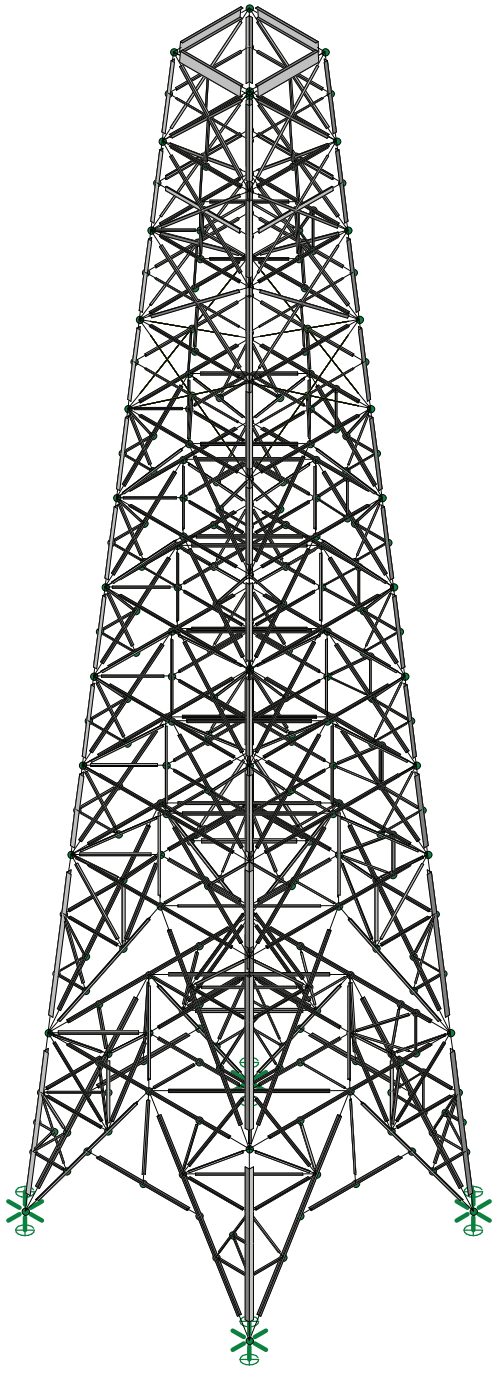
TOWER DESIGN NOTES

1. Tower is located in Fairfield County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-G Standard.
3. Tower designed for a 97 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.00 ft

GPD
520 South Main Street Suite 2531
Akron, Ohio 44311
Phone: (555) 555-1234
FAX: (555) 555-1235

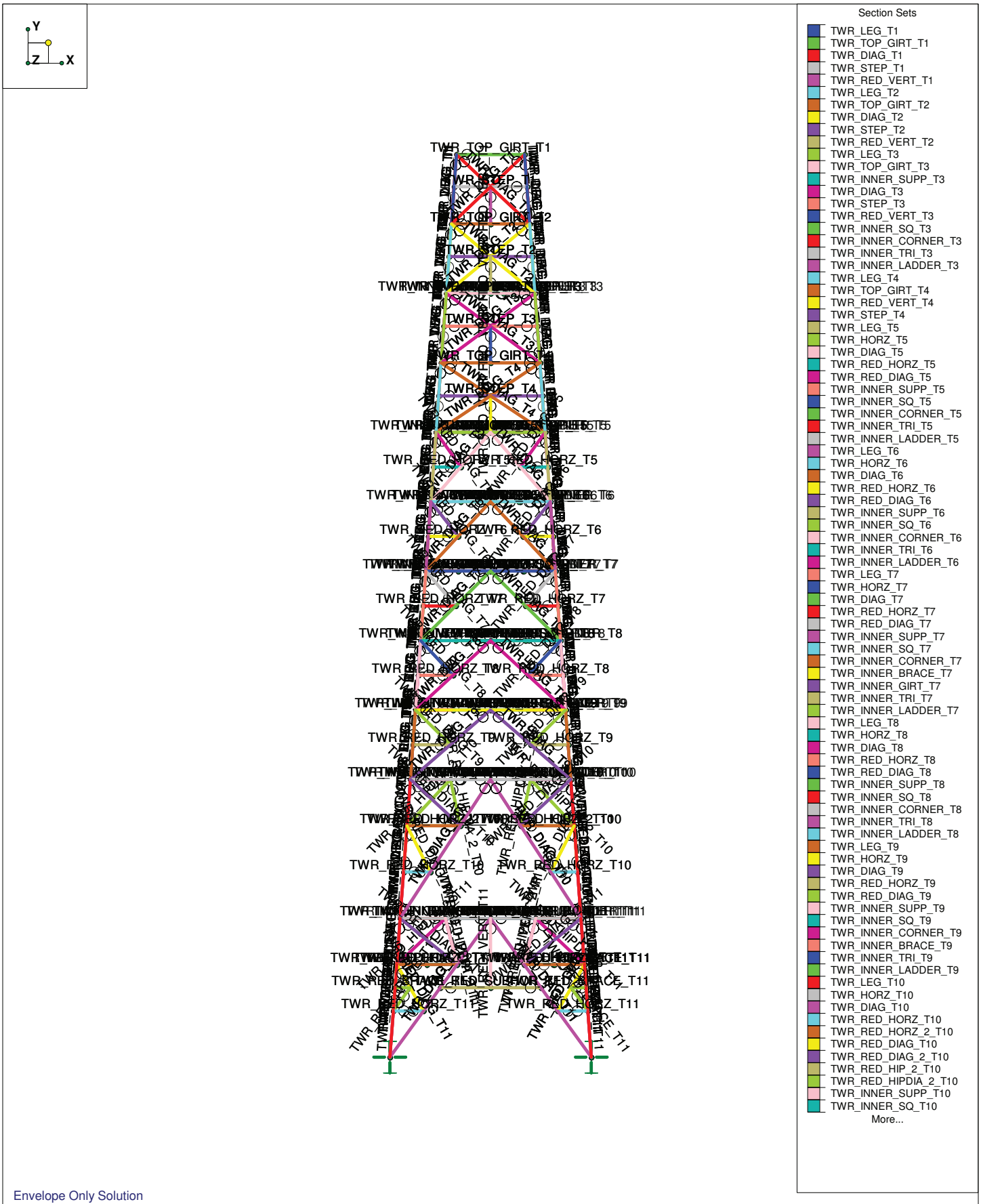
Job: ***27016 SHELTON EAST CENTRAL***		
Project: ***2019723.01.SNET025.12***		
Client: AT&T Towers	Drawn by: jstokes	App'd:
Code: TIA-222-G	Date: 02/01/19	Scale: NTS
Path: T:\ATandT\SNET025\20 2019723.01.SNET025.12_AT&T TMO SA Re-Run\Software Models\TNX\SNET025.eri		Dwg No. E-1





Envelope Only Solution

GPD	27016 SHELTON EAST CENTRAL	SK - 1
J. Stokes		Jan 28, 2019 at 12:06 PM
2019723.01.SNET025.12		SNET025.r3d

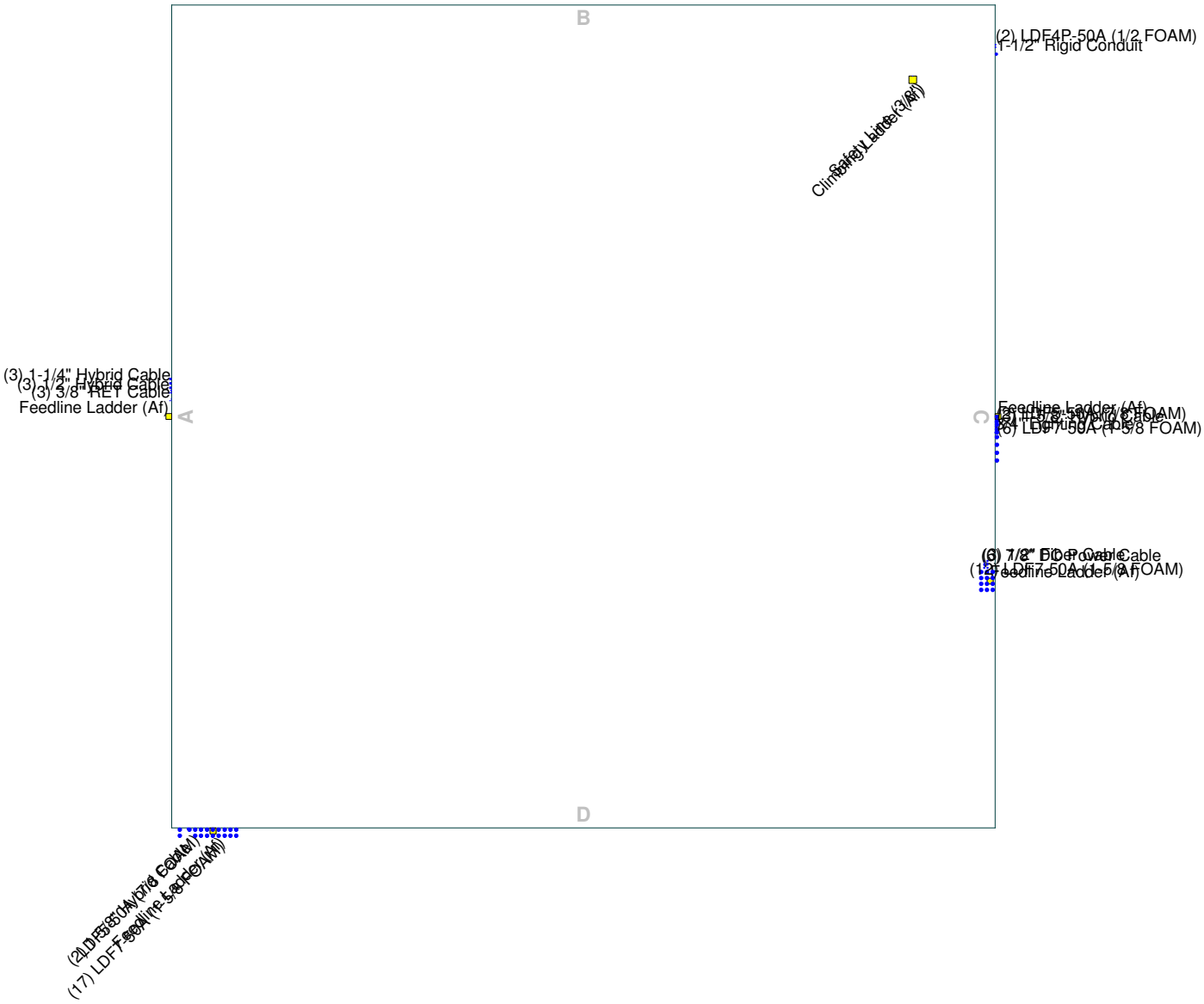


Envelope Only Solution

GPD	27016 SHELTON EAST CENTRAL	SK - 2
J. Stokes		Jan 28, 2019 at 12:07 PM
2019723.01.SNET025.12		SNET025.r3d

Feed Line Plan

Round Flat App In Face App Out Face



GPD
520 South Main Street Suite 2531
Akron, Ohio 44311
Phone: (555) 555-1234
FAX: (555) 555-1235

Job: ***27016 SHELTON EAST CENTRAL***		
Project: ***2019723.01.SNET025.12***		
Client: AT&T Towers	Drawn by: jstokes	App'd:
Code: TIA-222-G	Date: 02/01/19	Scale: NTS
Path: T:\ATandT\SNET025\20 2019723.01.SNET025.12_AT&T TMO SA Re-Run\Software Models\TNX\SNET025.er		Dwg No. E-7

APPENDIX D

Anchor Rod Analysis

Self-Support Anchor Rod Analysis
27016 SHELTON EAST CENTRAL
2019723.01.SNET025.12

General Info	
Code	TIA-222-G
Modified Anchor Rods	No
Clear Distance > d_b	No
Leg Eccentricity	No
Max Capacity	1.05

Tower Reactions		
Detail Type =	d	
Eta Factor, η =	0.50	
Down Load, P_u =	206.42	kips
Down Load Shear, V_u =	35.13	kips
Uplift, P_u =	137.57	kips
Uplift Shear, V_u =	26.37	kips

Anchor Rods		
Number of Anchor Rods, N =	4	
Anchor Rod Grade =	C-1015	
Anchor Rod Diameter, d_d =	2.25	in
Tensile, F_{ub} =	56	ksi

Anchor Rod Results		
$(P_u + V_u/\eta)$	69.2	kips
$\phi*R_{nt} = \phi*F_{ub}*A_n$ =	145.6	kips
Anchor Rod Stress Ratio =	47.5%	OK

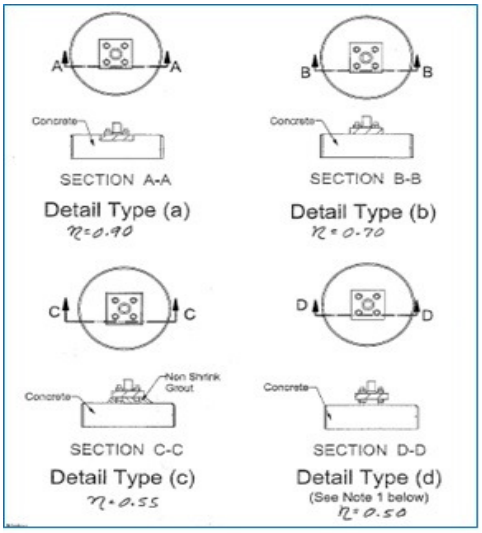


Figure 4-4 of TIA-222-G

APPENDIX E

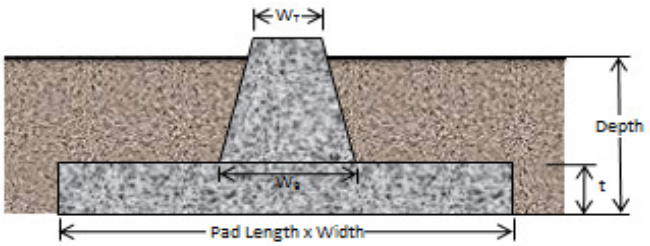
Foundation Analysis

Individual Pad and Frustum Uplift Check
27016 SHELTON EAST CENTRAL
2019723.01.SNET025.12

Tower Reactions		
Uplift	137.6	k

Uplift Summary		
Capacity	**47.6%**	**OK**

General Info	
Code	TIA-222-G
Max Capacity	1.05



Pad & Pier Geometry		
Pier Top Width W_T	3.5	ft
Pier Bottom Widthm W_B	7.5	ft
Pad Length, L	15	ft
Pad Width, W	15	ft
Pad Thickness, t	2	ft
Depth, D	8	ft
Height Above Grade, HG	1	ft

Soil Capacity Calculations		
W_s	220.76	k
W_c	100.66	k
Uplift Resistance	289.28	k

Soil Properties

Ignored Depth	3.5	ft	Water Table	8	ft
Layer	C, psf	ϕ, degrees	γ_{soil}, pcf	$\gamma_{concrete}$, pcf	d, ft
1	0	0	125	150	3.5
2	0	38	125	150	4.5
3	0	42	145	150	1
4	12000	0	155	150	5

Mat Foundation Analysis
27016 SHELTON EAST CENTRAL
2019723.01.SNET025.12

General Info	
Foundation Criteria	GPD
TIA Code	TIA-222-G
Soil Code	AASHTO 2012
Concrete Code	ACI 318-11
Seismic Design Category	B
Tower Height	162.5 ft
Bearing On	Soil
Foundation Type	SS Individual Pad
Pier Type	Square
Reinforcing Known	No
Max Bearing Capacity	105%
Max Overturning Capacity	105%

Tower Reactions	
Moment, M	
Axial, P	206.42 k
Shear, V	35.129 k

Pad & Pier Geometry	
Pier Width, ø	5.62 ft
Pad Length, L [y]	15 ft
Pad Width, W [x]	15 ft
Pad Thickness, t	2 ft
Depth, D	8 ft
Height Above Grade, HG	1 ft
Tower Centroid, X	7.5 ft
Tower Centroid, Y	7.5 ft
Tower Eccentricity	0.0000 ft

Pad & Pier Reinforcing	
Rebar Fy	60 ksi
Concrete F'c	3 ksi
Pier Reinforcing Clear Cover	3 in
Shear Rebar Type	Tie
Shear Rebar Size	# 4
Pad Reinforcing Clear Cover	3 in
Reinforced Top & Bottom?	Yes
Pad Reinforcing Size	# 8
Pad Quantity Per Layer	15
Pier Rebar Size	# 10
Pier Quantity of Rebar	7

Soil Properties	
Soil Type	Granular
Soil Unit Weight	125 pcf
Angle of Friction, ø	38
Base Friction Coeff. Provided in Geo?	Yes
Base Friction Coefficient, µ	0.5
Bearing Type	Net
Ultimate Bearing	18 ksf
Water Table Depth	99 ft
Frost Depth	3.5 ft

GPD Mat Foundation Analysis - V3.2

Bearing Summary					
Case	*Demand/Limits*	*Capacity/Availability*	*Check*	*Eccentricity*	*Load Case*
Qxmax	2.63 ksf	14.25 ksf	OK, <= 105%	L/150000.0	1.2D+1.6W
Qymax	2.63 ksf	14.25 ksf	OK, <= 105%	W/150000.0	1.2D+1.6W
Qmax @ 45°	2.23 ksf	14.25 ksf	OK, <= 105%	W/25000.0	1.2D+1.6W
Controlling Capacity		**18.4%**	**Pass**		

Overturning Summary					
Case	*Demand/Limits*	*Capacity/Availability*	*Check*		*Load Case*
Ovtx	0.1 k-ft	2819.8 k-ft	0.0%	OK	0.9D+1.6W
Ovty	0.1 k-ft	2819.8 k-ft	0.0%	OK	0.9D+1.6W
Ovtxy	0.3 k-ft	3759.7 k-ft	0.0%	OK	0.9D+1.6W
Controlling Capacity		**0.0%**	**Pass**		

Sliding Summary					
Case	*Demand/Limits*	*Capacity/Availability*	*Check*		*Load Case*
Slidingx	35.1 k	250.1 k	14.0%	OK	0.9D+1.6W
Slidingy	35.1 k	250.1 k	14.0%	OK	0.9D+1.6W
Controlling Capacity		**14.0%**	**Pass**		

Reinforcement Summary					
Component	*Demand/Limits*	*Capacity/Availability*	*Check*		*Load Case*
Pad Flexural Bending	14.1 k-ft	66.6 k-ft	21.2%	OK	1.2D+1.6W
One-Way Shear in Pad	59.1 k	288.4 k	20.5%	OK	1.2D+1.6W
Two-Way Shear in Pad	217.6 k	1114.3 k	19.5%	OK	0.9D+1.6W
Compression on Pier	246.2 k	13917.4 k	1.8%	OK	1.2D+1.6W
Moment on Pier	215.9 k-ft	1366.8 k-ft	15.8%	OK	1.2D+1.6W
As Min Pad Met?	1.58 sq. in.	0.21 sq. in.	Yes		
As Min Pier Met?	8.89 sq. in.	22.74 sq. in.	No		
Controlling Capacity		**21.2%**	**Pass**		

<-- Minimum reinforcement assumed