



STATE OF CONNECTICUT
CONNECTICUT SITING COUNCIL

Ten Franklin Square, New Britain, CT 06051
Phone: (860) 827-2935 Fax: (860) 827-2950A
E-Mail: siting.council@ct.gov
Web Site: portal.ct.gov/csc

VIA ELECTRONIC MAIL

March 12, 2021

Allison Hebel
Site Acquisition Consultant
Centerline Communications, LLC
750 West Center Street, Suite 301
West Bridgewater, MA 02379

RE: **EM-CING-052-210211** - New Cingular Wireless PCS, LLC (AT&T) notice of intent to modify an existing telecommunications facility located at 319 New Britain Avenue, Unit 321, Farmington, Connecticut.

Dear Ms. Hebel:

The Connecticut Siting Council (Council) is in receipt of your correspondence of March 10, 2021 submitted in response to the Council's March 10, 2021 notification of an incomplete request for exempt modification with regard to the above-referenced matter.

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

Thank you for your attention and cooperation.

Sincerely,

s/Melanie A. Bachman

Melanie A. Bachman
Executive Director

MAB/IN/emr

From: Allison Hebel <ahebel@clinellc.com>
Sent: Wednesday, March 10, 2021 10:23 AM
To: Robidoux, Evan <Evan.Robidoux@ct.gov>
Cc: CSC-DL Siting Council <Siting.Council@ct.gov>
Subject: RE: Council Incomplete Letter for EM-CING-052-210211 (319 New Britain Ave., Unit 321, Farmington)

Hi Evan,

Please see attached stamped and signed Structural Analysis and Mount Analysis. If you can confirm you've received both of these that would be great.



Allison Hebel | Site Acquisition Consultant
750 West Center St. Suite 301 | West Bridgewater, MA 02379
Phone: 215.588.7035 Fax: 508.819.3017
ahebel@clinellc.com | www.centerlinecommunications.com

From: Robidoux, Evan <Evan.Robidoux@ct.gov>
Sent: Wednesday, March 10, 2021 10:20 AM
To: Allison Hebel <ahebel@clinellc.com>
Cc: CSC-DL Siting Council <Siting.Council@ct.gov>
Subject: Council Incomplete Letter for EM-CING-052-210211 (319 New Britain Ave., Unit 321, Farmington)

Please see the attached correspondence.

Structural Analysis Report

Site Number	CT5404
FA Number	10071289
Site Name	Unionville - Farmington
Project	LTE 4C/5C/5G NR, BWE & RETRO
Pace ID	MRCTB048765, MRCTB048768, MRCTB048766, MRCTB048767, MRCTB048770
Site Location	319 – 321 New Britain Avenue Unionville, CT 06085 41.7497919° N, 72.8726989° W
Design Codes	TIA-222-G Standards 2015 IBC ASCE 7-10 2018 Connecticut State Building Code
Tower Classification	Monopole

	Stress Ratio	Overall Result
Structural Rating	98.7%	PASS

Client:

at&t Mobility Corp.
55 Cochituate Road
Framingham, MA 01701



at&t



Date: 2/2/2021

Digitally signed by: Derek J. Creaser, P.E.
DN: CN = Derek J. Creaser, P.E.
email = dcreaser@clinellc.com C = US O = Centerline Communications OU = Director - A&E Services
Date: 2021.02.02 16:18:23 -05'00'

Scope of Work:

Centerline Communications was authorized by AT&T to perform an analysis of the existing 190 ft monopole tower to determine its capacity to support the proposed and existing AT&T equipment listed in this report.

Existing and Proposed Appurtenances:

Carrier	Mounting Level (ft)	Center Line Elevation (ft)	Number of Appurtenances	Antenna Manufacturer	Appurtenance Model	Feed Lines (in)
-	188.0	192.17	1	-	3' DISH	(1) 7/8
		188.0	1	-	2.0" X 9' LONG PIPE	
-	188.0	190.0	3	-	6' OMNI	(3) 1/2
		188.0	3	-	5' STANDOFF	
		186.0	1	KATHREIN	PR-950	
-	183.75	183.75	2	-	3' YAGI	(2) 1/2
		183.75	2	-	5' STANDOFF	
-	178.5	183.83	1	-	3' OMNI	(1) 1/2
		178.5	2	-	5' STANDOFF	
SPRINT	173.75	173.75	3	RFS	APXVSP18-C-A20	(3) LDF6-50A
		173.75	6	-	96" x 18" PANEL ANTENNA	
		173.75	6	-	RRH	
		173.75	1	-	12' PLATFORM WITH HANDRAIL	
T-MOBILE	160.5	162.5	3	ANDREW	LNx-6516DS-A1M	(12) LDF7-50A (1) 1 3/8 (1) 5/16
		162.5	6	ERICSSON	AIR 21 B4A/B2P	
		162.5	3	ERICSSON	RRUS11 B12	
		162.5	3	ERICSSON	KRY11Q114/1	
		160.5	1	-	12' PLATFORM	
AT&T	150.0	150.0	3	KATHREIN	80010121	(6) 1-5/8 (2) FIBER (4) DC POWER (2) DC POWER
		150.0	3	CCI	TPA-65R-LCUUUU-H8	
		150.0	3	CCI	DMP65R-BU8DA	
		150.0	3	CCI	OPA65R-BU8DA	
		150.0	3	ERICSSON	RRUS 32 B30	
		150.0	3	ERICSSON	RRUS 32 B2	
		150.0	3	ERICSSON	4449 B5/12	
		150.0	3	ERICSSON	4478 B14	
		150.0	3	ERICSSON	8843 B2/B66A	
		150.0	2	RAYCAP	DC6-48-60-18-8F	
		150.0	1	RAYCAP	DC6-48-60-18-8F	
		150.0	6	POWERWAVE	LGP21901	
		150.0	6	POWERWAVE	LGP21401	
150.0	3	-	12' SECTOR FRAME			

-	113.0	116.0	3	-	4' OMNI	(3) LDF4-50A
		113.0	3	-	5' STANDOFF	
-	89.75	89.75	3	-	15' OMNI	(3) LDF4-50A
		89.75	3	-	5' STANDOFF	
-	52.0	52.0	1	-	GPS	(1) LDF4-50A
		52.0	1	-	3.5' STANDOFF	

Note: Proposed equipment shown in **bold**.

Design Criteria:

Design Codes:

2018 Connecticut State Building Code
 2015 International Building Code
 ASCE 7-10
 TIA-222-G Standards

Ultimate Wind Speed	125 mph
Wind Speed with Ice	50 mph
Ice Thickness	1.00 in.
Exposure Category	C
Topographic Category	1
Risk Category	II
Site Soil Class (Assumed)	D – Stiff Soil
Seismic Design Category	B

*Refer to calculations for additional design criteria.

Conclusion:

Section Capacity (Summary)

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail	
L1	191.08 - 165.33	Pole	TP26x19.5625x0.25	1	-4104.54	1475010.00	16.2	Pass	
L2	165.33 - 130.75	Pole	TP34.0052x24.77x0.3125	2	-13917.40	2384690.00	58.1	Pass	
L3	130.75 - 97.08	Pole	TP41.0625x32.437x0.375	3	-22407.20	3454030.00	73.6	Pass	
L4	97.08 - 64.25	Pole	TP49.0052x39.2383x0.375	4	-32579.60	3903670.00	88.3	Pass	
L5	64.25 - 32.25	Pole	TP56.0104x46.8227x0.375	5	-42646.50	4213510.00	98.7	Pass	
L6	32.25 - 1	Pole	TP62.0781x53.7291x0.375	6	122241.00	4296360.00	77.3	Pass	
L6	32 - 1	Reinforcing	6-1/2x1-1/4	14	- 370862.00	427884.00	86.7	Pass	
	42 - 32	Reinforcing	6-1/2x1-1/4	10	- 265855.00	427884.00	62.1	Pass	
							Summary		
							Pole (L5)	98.7	Pass
							Reinforcing (L6)	86.7	Pass
							Base Plate	85.9	Pass
							RATING =	98.7	Pass

Structure Rating (max from all components) =	PASS
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Recommendations:

The existing tower has sufficient capacity to support the existing and proposed loading for the final loading configuration. Modifications to the tower structure are not required.


Reference Documents:

- AT&T RFDS 4093553, dated January 21, 2020
- Construction Drawings by Empire Telecom, dated January 18, 2018
- Structural Analysis by Maser Consulting, dated August 16, 2018
- Mount Analysis by Maser Consulting, dated September 12, 2017
- Tower Mapping Report by Tower Engineering Professionals, dated December 20, 2017
- Site Notes and Photos by Centerline Communications, dated August 12, 2020

Assumptions and Limitations:

- The tower and structures were built and maintained with the manufacturer's specifications.
- The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in this report and the referenced drawings.
- Existing appurtenance information obtained from the previous Structural Analysis by Maser Consulting, dated August 16, 2018 and Tower Mapping Report by Tower Engineering Professionals, dated December 20, 2017.
- All of the previous tower modifications were built and maintained with the manufacturer's specifications as identified in the previous Structural Analysis by Maser Consulting, dated August 16, 2018.
- As-built foundation information was not available nor provided for this report. Therefore, the in-place capacity of the foundation could not be verified. A more thorough and accurate assessment of the foundation capacity will require site specific foundation information.

Design Calculations

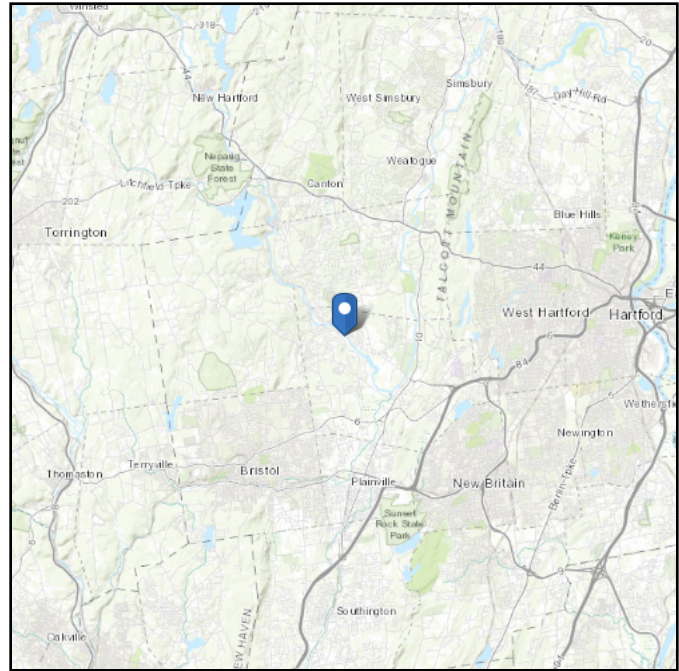
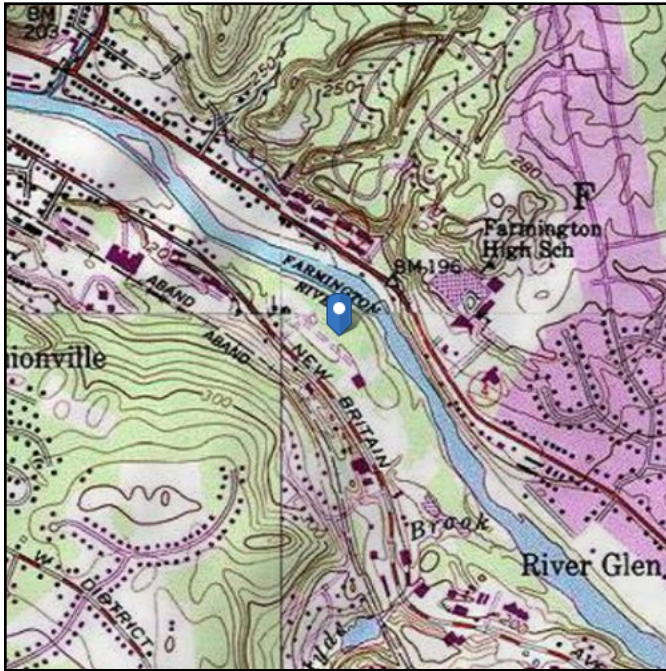


ASCE 7 Hazards Report

Address:
319 New Britain Ave
Unionville, Connecticut
06085

Standard: ASCE/SEI 7-10
Risk Category: II
Soil Class: D - Stiff Soil

Elevation: 187.43 ft (NAVD 88)
Latitude: 41.749403
Longitude: -72.872478



Wind

Results:

Wind Speed:	120 Vmph	125 Vmph per Connecticut State Building Code
10-year MRI	76 Vmph	
25-year MRI	86 Vmph	
50-year MRI	91 Vmph	
100-year MRI	98 Vmph	

Data Source: ASCE/SEI 7-10, Fig. 26.5-1A and Figs. CC-1–CC-4, incorporating errata of March 12, 2014

Date Accessed: Mon Feb 01 2021

Value provided is 3-second gust wind speeds at 33 ft above ground for Exposure C Category, based on linear interpolation between contours. Wind speeds are interpolated in accordance with the 7-10 Standard. Wind speeds correspond to approximately a 7% probability of exceedance in 50 years (annual exceedance probability = 0.00143, MRI = 700 years).

Site is in a hurricane-prone region as defined in ASCE/SEI 7-10 Section 26.2. Glazed openings need not be protected against wind-borne debris.

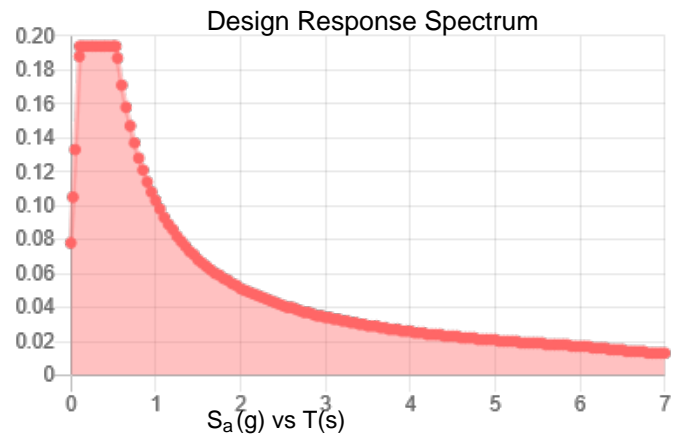
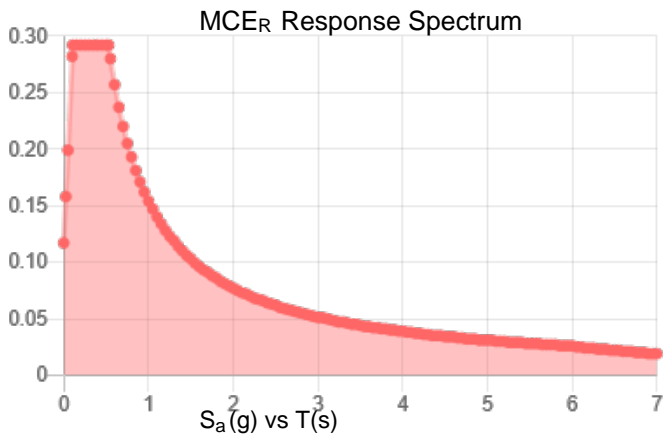
Mountainous terrain, gorges, ocean promontories, and special wind regions should be examined for unusual wind conditions.

Site Soil Class: D - Stiff Soil

Results:

S_s :	0.182	S_{DS} :	0.194
S_1 :	0.064	S_{D1} :	0.103
F_a :	1.6	T_L :	6
F_v :	2.4	PGA :	0.092
S_{MS} :	0.292	PGA _M :	0.147
S_{M1} :	0.154	F _{PGA} :	1.6
		I_e :	1

Seismic Design Category B



Data Accessed:

Mon Feb 01 2021

Date Source:

USGS Seismic Design Maps based on ASCE/SEI 7-10, incorporating Supplement 1 and errata of March 31, 2013, and ASCE/SEI 7-10 Table 1.5-2. Additional data for site-specific ground motion procedures in accordance with ASCE/SEI 7-10 Ch. 21 are available from USGS.

Ice

Results:

Ice Thickness: 1.00 in.

Concurrent Temperature: 5 F

Gust Speed: 50 mph

Data Source: Standard ASCE/SEI 7-10, Figs. 10-2 through 10-8

Date Accessed: Mon Feb 01 2021

Ice thicknesses on structures in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

Values provided are equivalent radial ice thicknesses due to freezing rain with concurrent 3-second gust speeds, for a 50-year mean recurrence interval, and temperatures concurrent with ice thicknesses due to freezing rain. Thicknesses for ice accretions caused by other sources shall be obtained from local meteorological studies. Ice thicknesses in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

Snow

Results:

Ground Snow Load, p_g : 35 lb/ft²

Elevation: 187.4 ft

Data Source: ASCE/SEI 7-10, Fig. 7-1.

Date Accessed: Mon Feb 01 2021

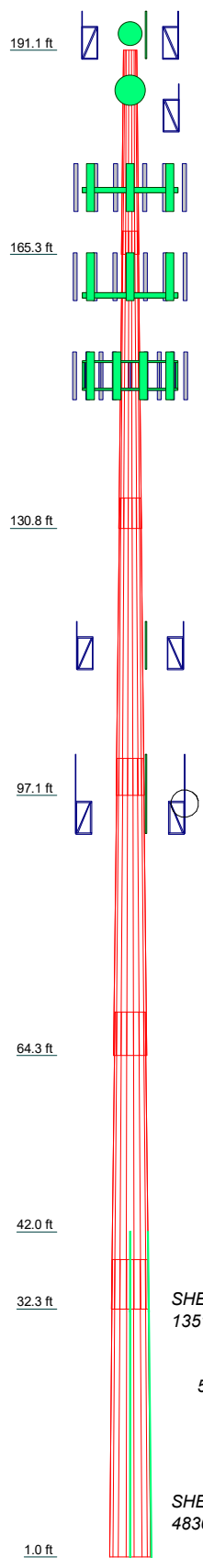
Values provided are ground snow loads. In areas designated "case study required," extreme local variations in ground snow loads preclude mapping at this scale. Site-specific case studies are required to establish ground snow loads at elevations not covered.

The ASCE 7 Hazard Tool is provided for your convenience, for informational purposes only, and is provided “as is” and without warranties of any kind. The location data included herein has been obtained from information developed, produced, and maintained by third party providers; or has been extrapolated from maps incorporated in the ASCE 7 standard. While ASCE has made every effort to use data obtained from reliable sources or methodologies, ASCE does not make any representations or warranties as to the accuracy, completeness, reliability, currency, or quality of any data provided herein. Any third-party links provided by this Tool should not be construed as an endorsement, affiliation, relationship, or sponsorship of such third-party content by or from ASCE.

ASCE does not intend, nor should anyone interpret, the results provided by this Tool to replace the sound judgment of a competent professional, having knowledge and experience in the appropriate field(s) of practice, nor to substitute for the standard of care required of such professionals in interpreting and applying the contents of this Tool or the ASCE 7 standard.

In using this Tool, you expressly assume all risks associated with your use. Under no circumstances shall ASCE or its officers, directors, employees, members, affiliates, or agents be liable to you or any other person for any direct, indirect, special, incidental, or consequential damages arising from or related to your use of, or reliance on, the Tool or any information obtained therein. To the fullest extent permitted by law, you agree to release and hold harmless ASCE from any and all liability of any nature arising out of or resulting from any use of data provided by the ASCE 7 Hazard Tool.

Section	1	2	3	4	5	6
Length (ft)	25.75	37.50	37.50	37.50	37.50	37.50
Number of Sides	18	18	18	18	18	18
Thickness (in)	0.2500	0.3125	0.3750	0.3750	0.3750	0.3750
Socket Length (ft)	2.92	3.83	4.67	5.50	6.25	6.25
Top Dia (in)	19.5625	24.7700	32.4370	39.2383	46.8227	53.7291
Bot Dia (in)	26.0000	34.0052	41.0625	49.0052	56.0104	62.0781
Grade						A572-65
Tube Length (ft)					10.00	31.00
Reinf Size						
Reinf Grade						
Weight (lb)	1566.6	3680.0	5524.6	6644.3	7752.3	8737.5
						33905.3



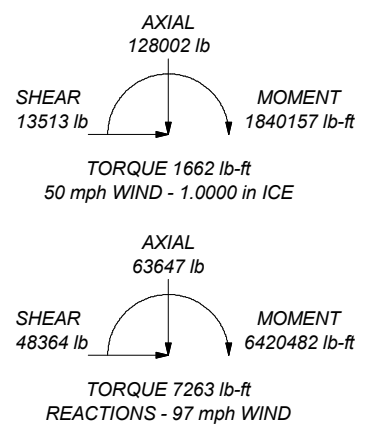
MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-65	65 ksi	80 ksi			

TOWER DESIGN NOTES

1. Tower is located in Hartford County, Connecticut.
2. Tower designed for Exposure C 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 1.00 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
8. TOWER RATING: 98.7%

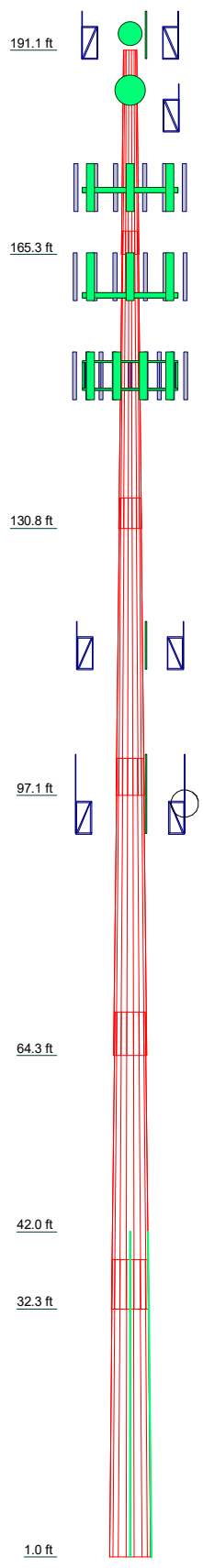
ALL REACTIONS ARE FACTORED



Centerline Communications
 750 West Center Street, Suite 301
 West Bridgewater, MA 02379
 Phone: (781) 713-4725
 FAX:

Job: CT5404 - Enfield - Unionville - Farmington		
Project:	Client: AT&T	Drawn by: Joshua Gildert
Code: TIA-222-G	Date: 02/02/21	App'd:
Path:		Scale: NTS
		Dwg No. E-1

Section	1	2	3	4	5	6
Length (ft)	25.75	37.50	37.50	37.50	37.50	37.50
Number of Sides	18	18	18	18	18	18
Thickness (in)	0.2500	0.3125	0.3750	0.3750	0.3750	0.3750
Socket Length (ft)	2.92	3.83	4.67	5.50	6.25	6.25
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Bot Dia (in)	26.0000	34.0052	41.0625	49.0052	56.0104	62.0781
Grade				A572-65		
Tube Length (ft)					10.00	31.00
Reinf Size						A
Reinf Grade						A
Weight (lb)	1566.6	3680.0	5524.6	6644.3	7752.3	8737.5



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
3' DISH	189	Pirot 12' T-Frame Sector Mount (1) (ATI)	150
5' Standoff	188	CCI TPA-65R-LCUUUU-H8 w/ MP (ATI)	150
5' Standoff	188	80010121 w/ Mount Pipe (ATI)	150
5' Standoff	188	80010121 w/ Mount Pipe (ATI)	150
6' Omni	188	RRUS 32 (ATI)	150
6' Omni	188	RRUS 32 (ATI)	150
6' Omni	188	RRUS 32 (ATI)	150
2.0" x 9' long pipe	188	RRUS 32 (ATI)	150
Kathrein Scala PR-950	188	RRUS 32 B2 (ATI)	150
5' Standoff	183.75	RRUS 32 B2 (ATI)	150
3' Yagi	183.75	DMP65R-BU8DA (ATI)	150
5' Standoff	183.75	DMP65R-BU8DA (ATI)	150
3' Yagi	183.75	DMP65R-BU8DA (ATI)	150
5' Standoff	178.5	DMP65R-BU8DA (ATI)	150
5' Standoff	178.5	OPA65R-BU8DA (ATI)	150
3' Omni	178.5	OPA65R-BU8DA (ATI)	150
12' Platform w / handrails (SPRINT)	173.75	OPA65R-BU8DA (ATI)	150
APXVSP18-C-A20 (SPRINT)	173.75	4449 B5/B12 (ATI)	150
APXVSP18-C-A20 (SPRINT)	173.75	4449 B5/B12 (ATI)	150
APXVSP18-C-A20 (SPRINT)	173.75	4449 B5/B12 (ATI)	150
(2) GENERIC PANEL ANTENNA (96"X18") (SPRINT)	173.75	4478 B14 (ATI)	150
(2) GENERIC PANEL ANTENNA (96"X18") (SPRINT)	173.75	4478 B14 (ATI)	150
(2) GENERIC PANEL ANTENNA (96"X18") (SPRINT)	173.75	4478 B14 (ATI)	150
(2) GENERIC RRH (SPRINT)	173.75	8843 B2/B66A (ATI)	150
(2) GENERIC RRH (SPRINT)	173.75	8843 B2/B66A (ATI)	150
(2) GENERIC RRH (SPRINT)	173.75	8843 B2/B66A (ATI)	150
LNx-6515DS-VTM (T-MOBILE)	160.5	DC6-48-60-0-8F (ATI)	150
LNx-6515DS-VTM (T-MOBILE)	160.5	(2) LGP21401 (ATI)	150
LNx-6515DS-VTM (T-MOBILE)	160.5	(2) LGP21401 (ATI)	150
(2) AIR 21 B4A B2P (T-MOBILE)	160.5	(2) LGP21901 (ATI)	150
(2) AIR 21 B4A B2P (T-MOBILE)	160.5	(2) LGP21901 (ATI)	150
(2) AIR 21 B4A B2P (T-MOBILE)	160.5	DC6-48-60-18-8F (ATI)	150
RRUS11 B12 (T-MOBILE)	160.5	80010121 w/ Mount Pipe (ATI)	150
RRUS11 B12 (T-MOBILE)	160.5	RRUS 32 B2 (ATI)	150
RRUS11 B12 (T-MOBILE)	160.5	4' Omni	113
KRY11Q114/1 (T-MOBILE)	160.5	4' Omni	113
KRY11Q114/1 (T-MOBILE)	160.5	4' Omni	113
KRY11Q114/1 (T-MOBILE)	160.5	5' Standoff	113
12' Platform (T-MOBILE)	160.5	5' Standoff	113
CCI TPA-65R-LCUUUU-H8 w/ MP (ATI)	150	5' Standoff	89.75
CCI TPA-65R-LCUUUU-H8 w/ MP (ATI)	150	5' Standoff	89.75
DC6-48-60-18-8F (ATI)	150	15' Omni	89.75
Pirot 12' T-Frame Sector Mount (1) (ATI)	150	15' Omni	89.75
Pirot 12' T-Frame Sector Mount (1) (ATI)	150	15' Omni	89.75
		5' Standoff	89.75
		3.5' Standoff	52
		GPS	52

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-65	65 ksi	80 ksi			

TOWER DESIGN NOTES

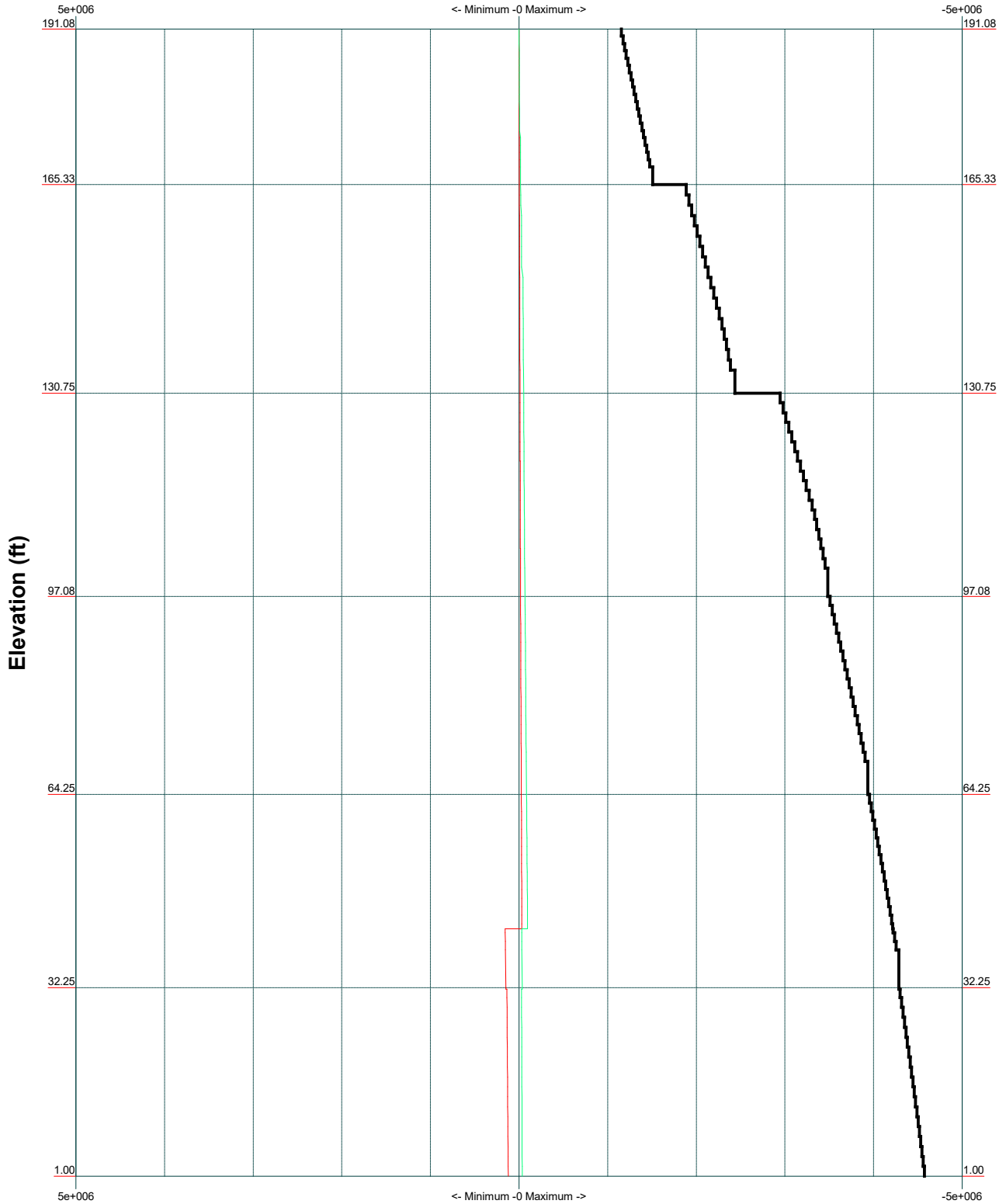
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2. Tower designed for Exposure C to the TIA-222-G Standard.
3. Tower designed for a 97 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness 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

Centerline Communications		Job: CT5404 - Enfield - Unionville - Farmington	
750 West Center Street, Suite 301		Project:	
West Bridgewater, MA 02379		Client: AT&T	Drawn by: Joshua Gildert
Phone: (781) 713-4725		Code: TIA-222-G	Date: 02/02/21
FAX:		Path:	App'd:
			Scale: NTS
			Dwg No. E-1

TIA-222-G - 97 mph/50 mph 1.0000 in Ice Exposure C

Leg Capacity ———

Leg Compression (lb)



Centerline Communications
 750 West Center Street, Suite 301
 West Bridgewater, MA 02379
 Phone: (781) 713-4725
 FAX:

Job: CT5404 - Enfield - Unionville - Farmington		
Project:		
Client: AT&T	Drawn by: Joshua Gildert	App'd:
Code: TIA-222-G	Date: 02/02/21	Scale: NTS
Path:		Dwg No. E-3

Vx

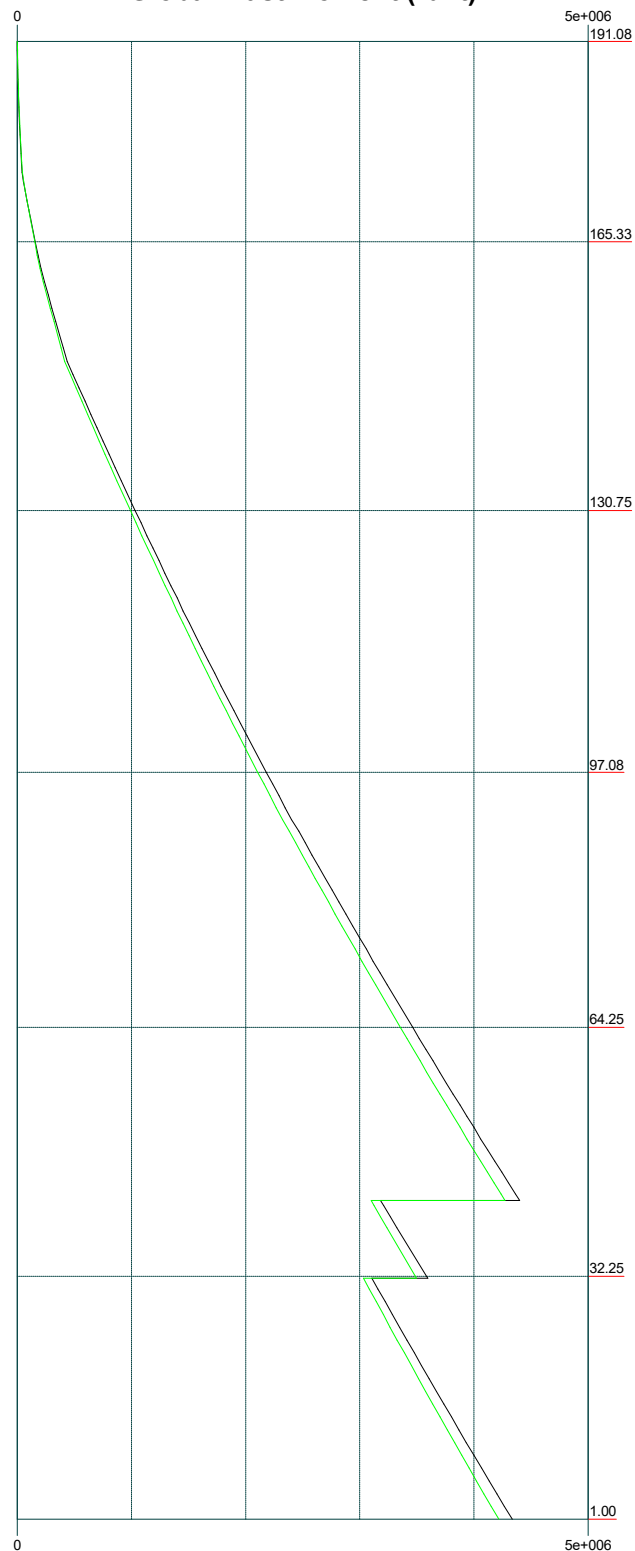
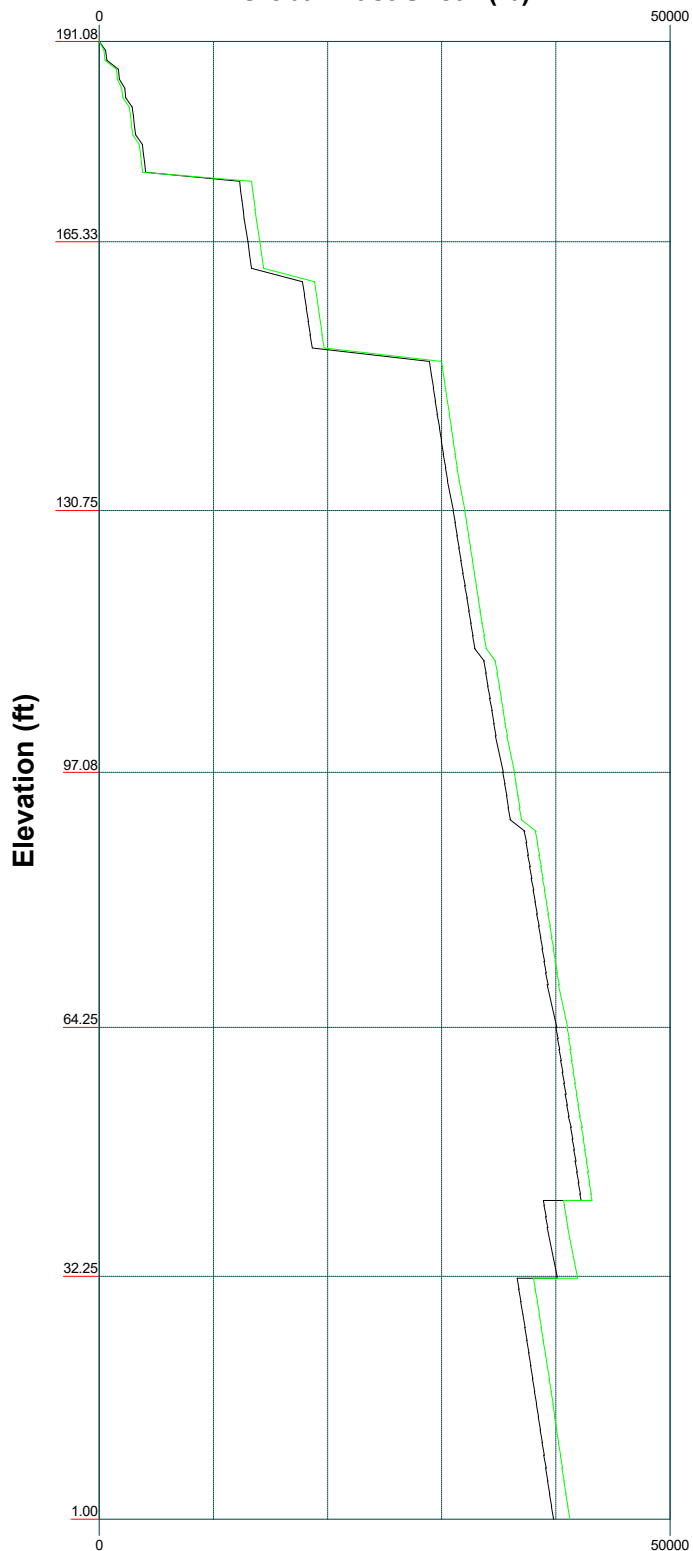
Vz

Mx

Mz

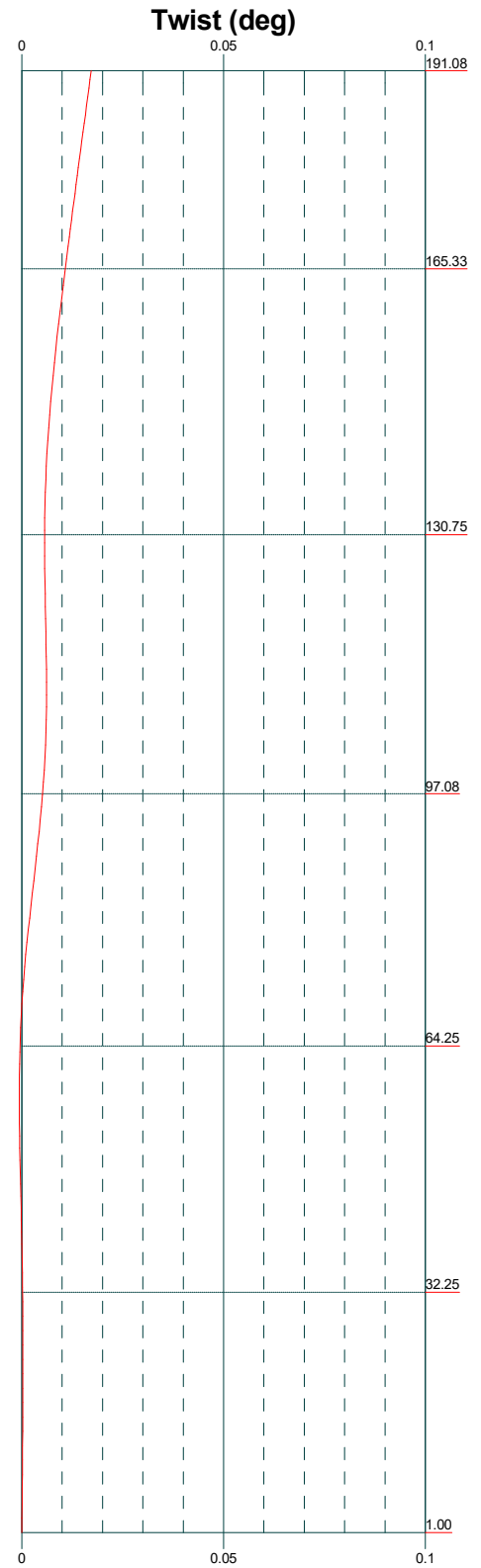
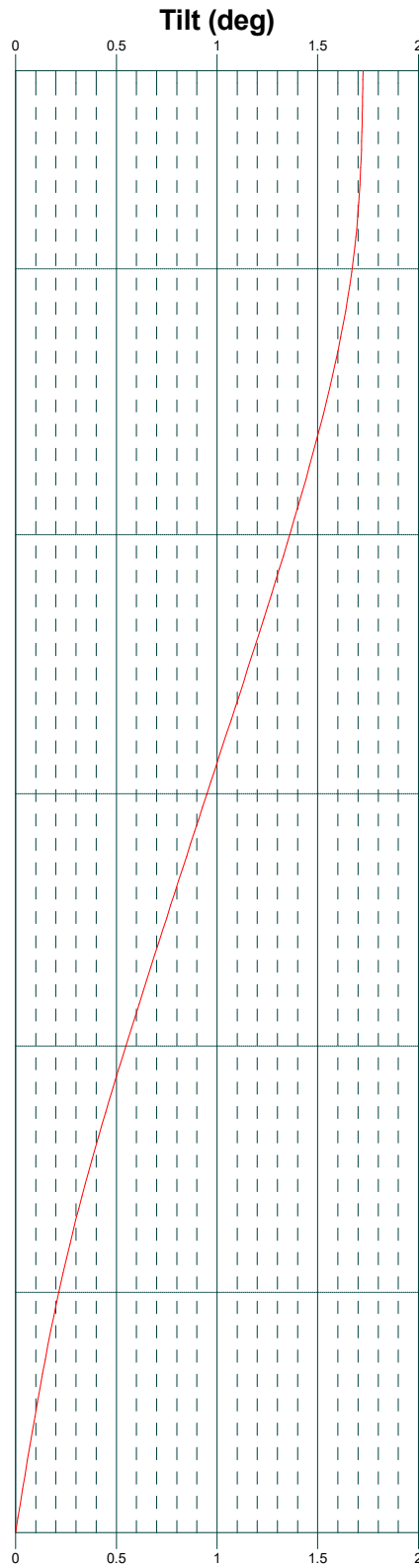
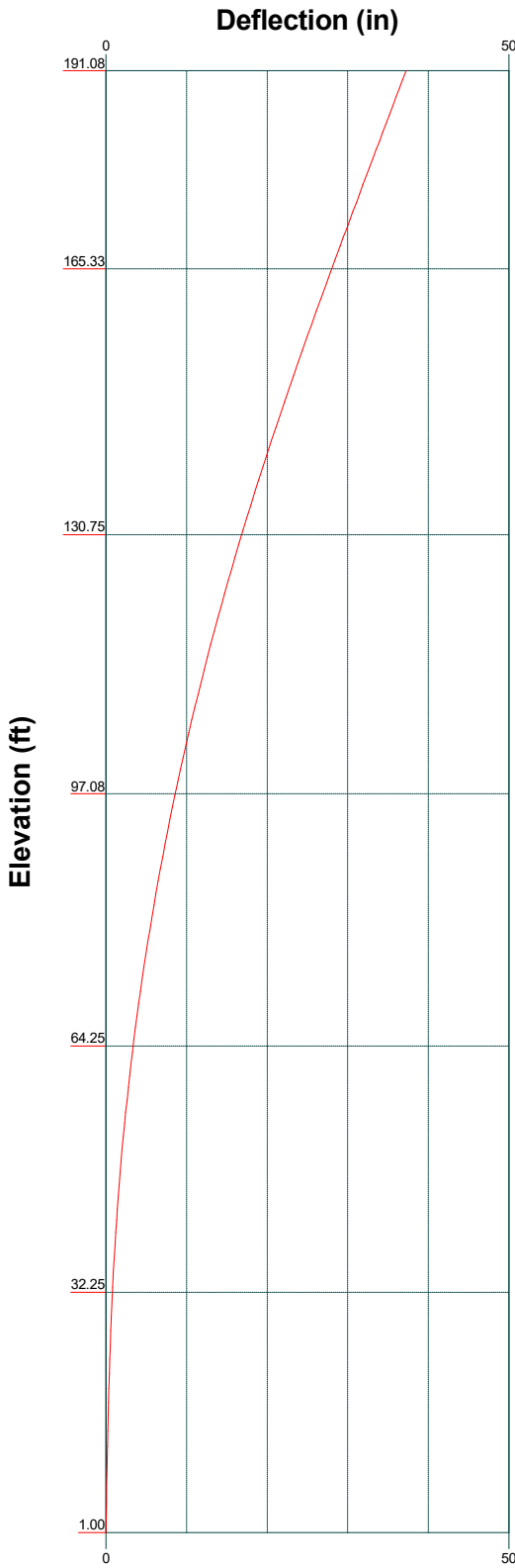
Global Mast Shear (lb)

Global Mast Moment (lb-ft)



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 Phone: (781) 713-4725
 FAX:

Job: CT5404 - Enfield - Unionville - Farmington		
Project:		
Client: AT&T	Drawn by: Joshua Gildert	App'd:
Code: TIA-222-G	Date: 02/02/21	Scale: NTS
Path:		Dwg No. E-4



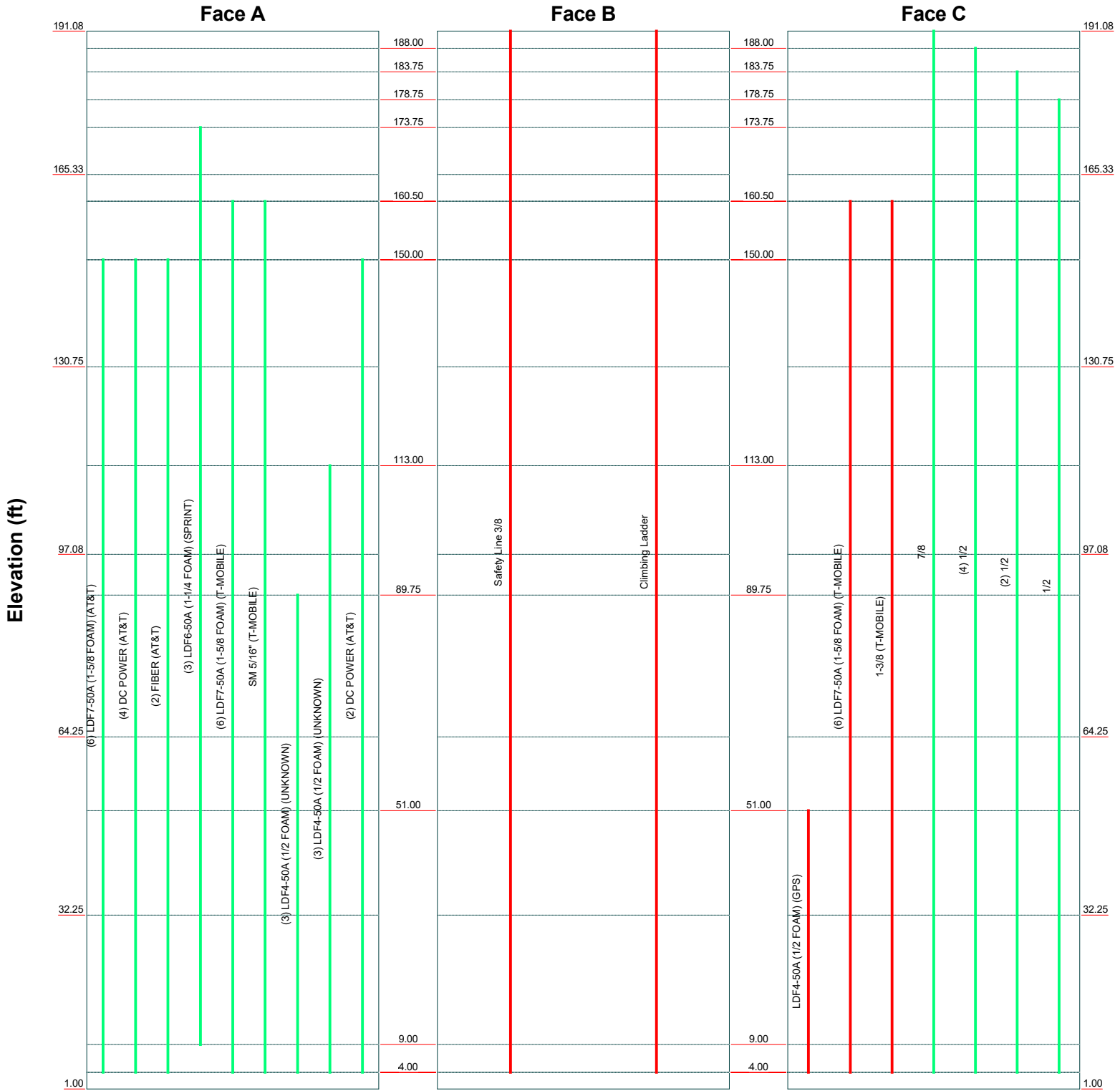
Centerline Communications
 750 West Center Street, Suite 301
 West Bridgewater, MA 02379
 Phone: (781) 713-4725
 FAX:

Job: CT5404 - Enfield - Unionville - Farmington		
Project:		
Client: AT&T	Drawn by: Joshua Gildert	App'd:
Code: TIA-222-G	Date: 02/02/21	Scale: NTS
Path:		Dwg No. E-5

Feed Line Distribution Chart

1' - 191'31/32"

— Round
 — Flat
 — App In Face
 — App Out Face
 — Truss Leg



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Project:		
Client: AT&T	Drawn by: Joshua Gildert	App'd:
Code: TIA-222-G	Date: 02/02/21	Scale: NTS
Path:		Dwg No. E-7

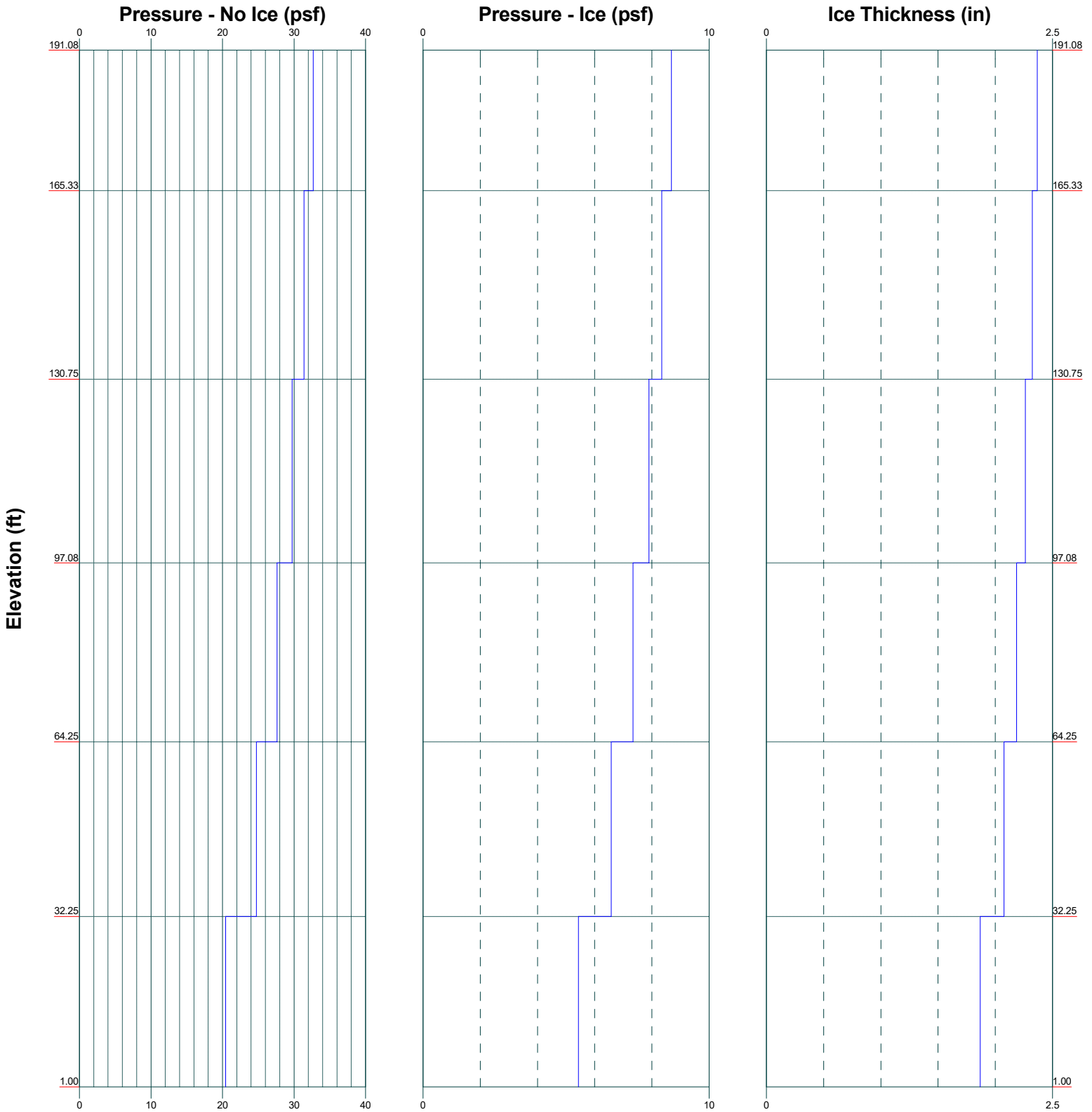
Stress Distribution Chart
1' - 32'3"

■ > 100%
 ■ 90%-100%
 ■ 75%-90%
 ■ 50%-75%
 ■ < 50% Overstress

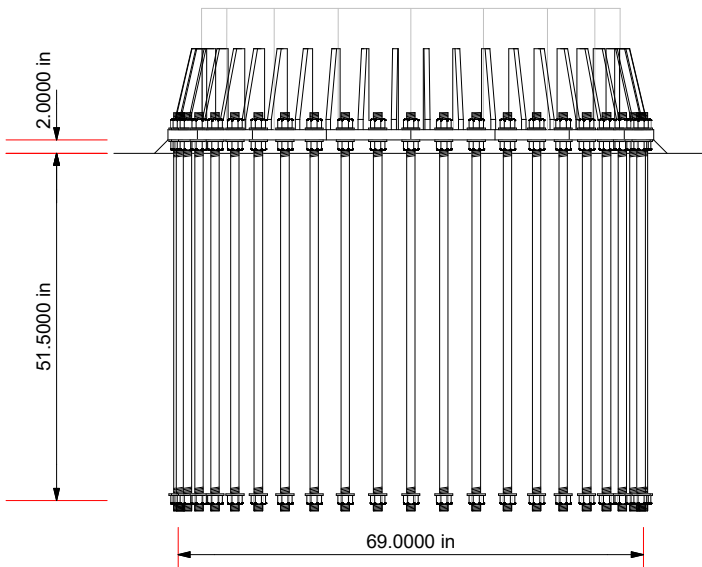
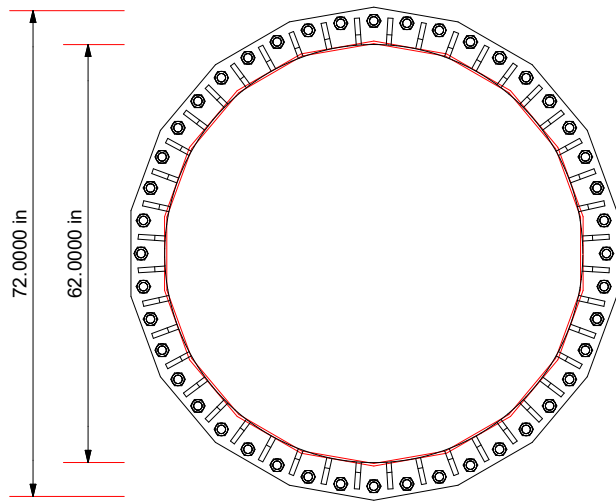


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	Project:		
	Client: AT&T	Drawn by: Joshua Gildert	App'd:
	Code: TIA-222-G	Date: 02/02/21	Scale: NTS
	Path:	Dwg No. E-8	

Wind Pressures and Ice Thickness
TIA-222-G - 97 mph/50 mph 1.0000 in Ice Exposure C



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	Project:		
	Client: AT&T	Drawn by: Joshua Gildert	App'd:
	Code: TIA-222-G	Date: 02/02/21	Scale: NTS
	Path:		Dwg No. E-9



FOUNDATION NOTES

1. Plate thickness is 1.5000 in.
2. Plate grade is A572-50.
3. Anchor bolt grade is A615-75.
4. f_c is 4 ksi.

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750 West Center Street, Suite 301			
West Bridgewater, MA 02379			
Phone: (781) 713-4725			
FAX:			
Project:	Client: AT&T	Drawn by: Joshua Gildert	App'd:
Code: TIA-222-G	Date: 02/02/21	Scale: NTS	Dwg No. F-1

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	Client	AT&T	Designed by	Joshua Gildert

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	191.08-165.33	25.75	2.92	18	19.5625	26.0000	0.2500	1.0000	A572-65 (65 ksi)
L2	165.33-130.75	37.50	3.83	18	24.7700	34.0052	0.3125	1.2500	A572-65 (65 ksi)
L3	130.75-97.08	37.50	4.67	18	32.4370	41.0625	0.3750	1.5000	A572-65 (65 ksi)
L4	97.08-64.25	37.50	5.50	18	39.2383	49.0052	0.3750	1.5000	A572-65 (65 ksi)
L5	64.25-32.25	37.50	6.25	18	46.8227	56.0104	0.3750	1.5000	A572-65 (65 ksi)
L6	32.25-1.00	37.50		18	53.7291	62.0781	0.3750	1.5000	A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in ²	I in ⁴	r in	C in	I/C in ³	J in ⁴	I/Q in ²	w in	w/t
L1	19.8257	15.3245	722.1042	6.8559	9.9377	72.6627	1445.1586	7.6637	3.0030	12.012
	26.3625	20.4326	1711.6544	9.1412	13.2080	129.5922	3425.5610	10.2183	4.1360	16.544
L2	25.8341	24.2588	1833.2875	8.6824	12.5832	145.6937	3668.9873	12.1317	3.8095	12.19
	34.4816	33.4189	4792.9383	11.9609	17.2746	277.4552	9592.1833	16.7126	5.4349	17.392
L3	33.7741	38.1618	4956.1743	11.3820	16.4780	300.7755	9918.8702	19.0845	5.0489	13.464
	41.6381	48.4283	10128.8154	14.4441	20.8597	485.5674	20270.9586	24.2188	6.5670	17.512
L4	41.0209	46.2571	8826.6486	13.7965	19.9331	442.8142	17664.9116	23.1329	6.2459	16.656
	49.7033	57.8821	17293.9344	17.2637	24.8946	694.6850	34610.6246	28.9465	7.9649	21.24
L5	48.8555	55.2844	15068.4649	16.4889	23.7859	633.5029	30156.7572	27.6475	7.5808	20.215
	56.8166	66.2200	25895.7972	19.7506	28.4533	910.1163	51825.6687	33.1163	9.1978	24.528
L6	55.9131	63.5047	22839.1296	18.9407	27.2944	836.7700	45708.3115	31.7584	8.7963	23.457
	62.9779	73.4421	35326.1730	21.9046	31.5357	1120.1971	70698.8291	36.7280	10.2657	27.375

Tower Elevation ft	Gusset Area (per face) ft ²	Gusset Thickness in	Gusset Grade	Adjust. Factor A _f	Adjust. Factor A _r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
L1 191.08-165.33				1	1	1			
L2 165.33-130.75				1	1	1			
L3 130.75-97.08				1	1	1			
L4 97.08-64.25				1	1	1			
L5 64.25-32.25				1	1	1			
L6 32.25-1.00				1	1	1			

Pole Reinforcing Data

Height Above Base ft	Segment Length ft	No. of Segments	Offset in	Grade	Type	Size	Unbraced Length ft	K	Bolt Hole Dia. in	Bolts per Row	Shear Lag Factor U
0.00	31.00	4	0.6250	A572-65	Flat Bar	6-1/2x1-1/4	1.00	1.00	0.7500	1	1.000

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	Client	AT&T	Designed by	Joshua Gildert

Height Above Base ft	Segment Length ft	No. of Segments	Offset in	Grade	Type	Size	Unbraced Length ft	K	Bolt Hole Dia. in	Bolts per Row	Shear Lag Factor U
31.00	10.00	4	0.6250	(65 ksi) A572-65 (65 ksi)	Flat Bar	6-1/2x1-1/4	1.00	1.00	0.7500	1	1.000

Monopole Base Plate Data

Base Plate Data	
Base plate is square	√
Base plate is grouted	
Anchor bolt grade	A615-75
Anchor bolt size	1.2500 in
Number of bolts	44
Embedment length	51.5000 in
f_c	4 ksi
Grout space	2.0000 in
Base plate grade	A572-50
Base plate thickness	1.5000 in
Bolt circle diameter	69.0000 in
Outer diameter	72.0000 in
Inner diameter	62.0000 in
Base plate type	Stiffened Plate
Bolts per stiffener	1
Stiffener thickness	0.7500 in
Stiffener height	12.0000 in

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Sector	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight plf
LDF4-50A (1/2 FOAM) (GPS)	C	No	Surface Ar (CaAa)	51.00 - 4.00	1	1	-0.100 -0.100	0.6300		0.15
LDF7-50A (1-5/8 FOAM) (T-MOBILE)	C	No	Surface Ar (CaAa)	160.50 - 4.00	6	6	0.000 0.450	1.9800		0.82
1-3/8 (T-MOBILE)	C	No	Surface Ar (CaAa)	160.50 - 4.00	1	1	0.500 0.500	1.3750		0.72
Safety Line 3/8	B	No	Surface Ar (CaAa)	191.08 - 4.00	1	1	0.000 0.000	0.3750		0.22
*** Climbing Ladder	B	No	Surface Ar (CaAa)	191.08 - 4.00	1	1	0.000 0.000	1.0000		3.00

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	C_{AA} ft ² /ft	Weight plf
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Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C _{AA} ft ² /ft	Weight plf
LDF7-50A (1-5/8 FOAM) (AT&T)	A	No	No	Inside Pole	150.00 - 4.00	6	No Ice	0.00	0.82
							1/2" Ice	0.00	0.82
							1" Ice	0.00	0.82
DC POWER (AT&T)	A	No	No	Inside Pole	150.00 - 4.00	4	No Ice	0.00	0.82
							1/2" Ice	0.00	0.82
							1" Ice	0.00	0.82
FIBER (AT&T)	A	No	No	Inside Pole	150.00 - 4.00	2	No Ice	0.00	0.82
							1/2" Ice	0.00	0.82
							1" Ice	0.00	0.82
LDF6-50A (1-1/4 FOAM) (SPRINT)	A	No	No	Inside Pole	173.75 - 9.00	3	No Ice	0.00	0.66
							1/2" Ice	0.00	0.66
							1" Ice	0.00	0.66
LDF7-50A (1-5/8 FOAM) (T-MOBILE)	A	No	No	Inside Pole	160.50 - 4.00	6	No Ice	0.00	0.82
							1/2" Ice	0.00	0.82
							1" Ice	0.00	0.82
SM 5/16" (T-MOBILE)	A	No	No	Inside Pole	160.50 - 4.00	1	No Ice	0.00	0.25
							1/2" Ice	0.00	0.25
							1" Ice	0.00	0.25
LDF4-50A (1/2 FOAM) (UNKNOWN)	A	No	No	Inside Pole	89.75 - 4.00	3	No Ice	0.00	0.15
							1/2" Ice	0.00	0.15
							1" Ice	0.00	0.15
LDF4-50A (1/2 FOAM) (UNKNOWN)	A	No	No	Inside Pole	113.00 - 4.00	3	No Ice	0.00	0.15
							1/2" Ice	0.00	0.15
							1" Ice	0.00	0.15

DC POWER (AT&T)	A	No	No	Inside Pole	150.00 - 4.00	2	No Ice	0.00	0.82
							1/2" Ice	0.00	0.82
							1" Ice	0.00	0.82

7/8	C	No	No	Inside Pole	191.08 - 4.00	1	No Ice	0.00	0.54
							1/2" Ice	0.00	0.54
							1" Ice	0.00	0.54
1/2	C	No	No	Inside Pole	188.00 - 4.00	4	No Ice	0.00	0.25
							1/2" Ice	0.00	0.25
							1" Ice	0.00	0.25
1/2	C	No	No	Inside Pole	183.75 - 4.00	2	No Ice	0.00	0.25
							1/2" Ice	0.00	0.25
							1" Ice	0.00	0.25
1/2	C	No	No	Inside Pole	178.75 - 4.00	1	No Ice	0.00	0.25
							1/2" Ice	0.00	0.25
							1" Ice	0.00	0.25

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A _R ft ²	A _F ft ²	C _{AA} In Face ft ²	C _{AA} Out Face ft ²	Weight lb
L1	191.08-165.33	A	0.000	0.000	0.000	0.000	16.67
		B	0.000	0.000	3.541	0.000	82.92
		C	0.000	0.000	0.000	0.000	49.14
L2	165.33-130.75	A	0.000	0.000	0.000	0.000	443.27
		B	0.000	0.000	4.755	0.000	111.35
		C	0.000	0.000	39.434	0.000	246.98
L3	130.75-97.08	A	0.000	0.000	0.000	0.000	634.44

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Tower Section	Tower Elevation ft	Face	A_R ft ²	A_F ft ²	C_{AA} In Face ft ²	C_{AA} Out Face ft ²	Weight lb
L4	97.08-64.25	B	0.000	0.000	4.630	0.000	108.42
		C	0.000	0.000	44.630	0.000	267.00
		A	0.000	0.000	0.000	0.000	637.87
L5	64.25-32.25	B	0.000	0.000	4.514	0.000	105.71
		C	0.000	0.000	43.516	0.000	260.34
		A	0.000	0.000	0.000	0.000	624.96
L6	32.25-1.00	B	0.000	0.000	4.400	0.000	103.04
		C	0.000	0.000	43.597	0.000	256.57
		A	0.000	0.000	0.000	0.000	541.82
		B	0.000	0.000	3.884	0.000	90.97
		C	0.000	0.000	39.225	0.000	228.26

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft ²	A_F ft ²	C_{AA} In Face ft ²	C_{AA} Out Face ft ²	Weight lb
L1	191.08-165.33	A	2.367	0.000	0.000	0.000	0.000	16.67
		B		0.000	0.000	27.916	0.000	537.68
		C		0.000	0.000	0.000	0.000	49.14
L2	165.33-130.75	A	2.323	0.000	0.000	0.000	0.000	443.27
		B		0.000	0.000	37.489	0.000	722.06
		C		0.000	0.000	79.952	0.000	1533.49
L3	130.75-97.08	A	2.263	0.000	0.000	0.000	0.000	634.44
		B		0.000	0.000	35.913	0.000	683.67
		C		0.000	0.000	89.823	0.000	1688.72
L4	97.08-64.25	A	2.186	0.000	0.000	0.000	0.000	637.87
		B		0.000	0.000	34.230	0.000	641.29
		C		0.000	0.000	86.697	0.000	1601.37
L5	64.25-32.25	A	2.077	0.000	0.000	0.000	0.000	624.96
		B		0.000	0.000	32.381	0.000	594.21
		C		0.000	0.000	92.778	0.000	1648.97
L6	32.25-1.00	A	1.868	0.000	0.000	0.000	0.000	541.82
		B		0.000	0.000	27.354	0.000	487.29
		C		0.000	0.000	85.753	0.000	1458.55

Feed Line Center of Pressure

Section	Elevation ft	CP_x in	CP_z in	CP_x Ice in	CP_z Ice in
L1	191.08-165.33	1.0125	-0.5846	2.8513	-1.6462
L2	165.33-130.75	-2.5084	5.0162	-0.7935	2.8478
L3	130.75-97.08	-3.0226	5.9194	-1.2427	3.6135
L4	97.08-64.25	-3.2215	6.3111	-1.3738	3.9738
L5	64.25-32.25	-3.3025	6.7900	-1.2927	4.9068
L6	32.25-1.00	-3.1237	6.6272	-1.1932	5.2331

Note: For pole sections, center of pressure calculations do not consider feed line shielding.

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Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
L1	4	Safety Line 3/8	165.33 - 191.08	1.0000	1.0000
L1	6	Climbing Ladder	165.33 - 191.08	1.0000	1.0000
L2	2	LDF7-50A (1-5/8 FOAM)	130.75 - 160.50	1.0000	1.0000
L2	3	1-3/8	130.75 - 160.50	1.0000	1.0000
L2	4	Safety Line 3/8	130.75 - 165.33	1.0000	1.0000
L2	6	Climbing Ladder	130.75 - 165.33	1.0000	1.0000
L3	2	LDF7-50A (1-5/8 FOAM)	97.08 - 130.75	1.0000	1.0000
L3	3	1-3/8	97.08 - 130.75	1.0000	1.0000
L3	4	Safety Line 3/8	97.08 - 130.75	1.0000	1.0000
L3	6	Climbing Ladder	97.08 - 130.75	1.0000	1.0000
L4	2	LDF7-50A (1-5/8 FOAM)	64.25 - 97.08	1.0000	1.0000
L4	3	1-3/8	64.25 - 97.08	1.0000	1.0000
L4	4	Safety Line 3/8	64.25 - 97.08	1.0000	1.0000
L4	6	Climbing Ladder	64.25 - 97.08	1.0000	1.0000
L5	1	LDF4-50A (1/2 FOAM)	32.25 - 51.00	1.0000	1.0000
L5	2	LDF7-50A (1-5/8 FOAM)	32.25 - 64.25	1.0000	1.0000
L5	3	1-3/8	32.25 - 64.25	1.0000	1.0000
L5	4	Safety Line 3/8	32.25 - 64.25	1.0000	1.0000
L5	6	Climbing Ladder	32.25 - 64.25	1.0000	1.0000
L6	1	LDF4-50A (1/2 FOAM)	4.00 - 32.25	1.0000	1.0000
L6	2	LDF7-50A (1-5/8 FOAM)	4.00 - 32.25	1.0000	1.0000
L6	3	1-3/8	4.00 - 32.25	1.0000	1.0000
L6	4	Safety Line 3/8	4.00 - 32.25	1.0000	1.0000
L6	6	Climbing Ladder	4.00 - 32.25	1.0000	1.0000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _A A _A Front	C _A A _A Side	Weight
			Horz Lateral	Vert					
			ft	ft	°	ft	ft ²	ft ²	lb
80010121 w/ Mount Pipe (AT&T)	A	From Face	4.00	0.0000	150.00	No Ice	5.51	4.72	66.00
			0.00	0.0000		1/2" Ice	5.98	5.56	114.79
			0.00	0.0000		1" Ice	6.43	6.29	170.04
80010121 w/ Mount Pipe (AT&T)	B	From Face	4.00	0.0000	150.00	No Ice	5.51	4.72	66.00
			0.00	0.0000		1/2" Ice	5.98	5.56	114.79
			0.00	0.0000		1" Ice	6.43	6.29	170.04
80010121 w/ Mount Pipe (AT&T)	C	From Face	4.00	0.0000	150.00	No Ice	5.51	4.72	66.00
			0.00	0.0000		1/2" Ice	5.98	5.56	114.79
			0.00	0.0000		1" Ice	6.43	6.29	170.04
RRUS 32	A	From Face	3.00	0.0000	150.00	No Ice	2.74	1.67	53.00

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	Client	AT&T	Designed by	Joshua Gildert

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight
			Horz	Vert					
			ft	ft	°	ft	ft ²	ft ²	lb
(AT&T)			0.00			1/2" Ice	2.96	1.86	74.11
			0.00			1" Ice	3.19	2.05	98.42
RRUS 32	B	From Face	3.00		0.0000	No Ice	2.74	1.67	53.00
(AT&T)			0.00			1/2" Ice	2.96	1.86	74.11
			0.00			1" Ice	3.19	2.05	98.42
RRUS 32	C	From Face	3.00		0.0000	No Ice	2.74	1.67	53.00
(AT&T)			0.00			1/2" Ice	2.96	1.86	74.11
			0.00			1" Ice	3.19	2.05	98.42
RRUS 32 B2	A	From Face	3.00		0.0000	No Ice	2.74	1.67	53.00
(AT&T)			0.00			1/2" Ice	2.96	1.86	74.11
			0.00			1" Ice	3.19	2.05	98.42
RRUS 32 B2	B	From Face	3.00		0.0000	No Ice	2.74	1.67	53.00
(AT&T)			0.00			1/2" Ice	2.96	1.86	74.11
			0.00			1" Ice	3.19	2.05	98.42
RRUS 32 B2	C	From Face	3.00		0.0000	No Ice	2.74	1.67	53.00
(AT&T)			0.00			1/2" Ice	2.96	1.86	74.11
			0.00			1" Ice	3.19	2.05	98.42
Pirot 12' T-Frame Sector Mount (1)	A	From Face	2.00		0.0000	No Ice	13.60	13.60	465.00
(AT&T)			0.00			1/2" Ice	18.40	18.40	600.00
			0.00			1" Ice	23.20	23.20	735.00
Pirot 12' T-Frame Sector Mount (1)	B	From Face	2.00		0.0000	No Ice	13.60	13.60	465.00
(AT&T)			0.00			1/2" Ice	18.40	18.40	600.00
			0.00			1" Ice	23.20	23.20	735.00
Pirot 12' T-Frame Sector Mount (1)	C	From Face	2.00		0.0000	No Ice	13.60	13.60	465.00
(AT&T)			0.00			1/2" Ice	18.40	18.40	600.00
			0.00			1" Ice	23.20	23.20	735.00
CCI TPA-65R-LCUUUU-H8 w/ MP	A	From Face	4.00		0.0000	No Ice	13.30	10.72	104.20
(AT&T)			0.00			1/2" Ice	13.90	12.15	204.76
			0.00			1" Ice	14.50	13.43	315.30
CCI TPA-65R-LCUUUU-H8 w/ MP	B	From Face	4.00		0.0000	No Ice	13.30	10.72	104.20
(AT&T)			0.00			1/2" Ice	13.90	12.15	204.76
			0.00			1" Ice	14.50	13.43	315.30
CCI TPA-65R-LCUUUU-H8 w/ MP	C	From Face	4.00		0.0000	No Ice	13.30	10.72	104.20
(AT&T)			0.00			1/2" Ice	13.90	12.15	204.76
			0.00			1" Ice	14.50	13.43	315.30
DC6-48-60-18-8F	A	From Face	2.00		0.0000	No Ice	3.20	4.27	37.00
(AT&T)			0.00			1/2" Ice	3.43	4.54	93.29
			0.00			1" Ice	3.66	4.81	154.44
DC6-48-60-18-8F	B	From Face	2.00		0.0000	No Ice	3.20	4.27	37.00
(AT&T)			0.00			1/2" Ice	3.43	4.54	93.29
			0.00			1" Ice	3.66	4.81	154.44

GPS	C	From Leg	3.50		0.0000	No Ice	0.26	0.31	24.87
			0.00			1/2" Ice	0.37	0.44	30.02
			0.00			1" Ice	0.49	0.60	36.75
3.5' Standoff	C	From Leg	1.75		0.0000	No Ice	0.99	0.99	20.00
			0.00			1/2" Ice	1.25	1.25	30.00
			0.00			1" Ice	1.50	1.50	40.00

5' Standoff	A	From Face	2.50		0.0000	No Ice	3.50	3.50	91.00
			0.00			1/2" Ice	4.20	4.20	120.00
			0.00			1" Ice	4.90	4.90	149.00
5' Standoff	B	From Face	2.50		0.0000	No Ice	3.50	3.50	91.00
			0.00			1/2" Ice	4.20	4.20	120.00
			0.00			1" Ice	4.90	4.90	149.00
5' Standoff	C	From Face	2.50		0.0000	No Ice	3.50	3.50	91.00
			0.00			1/2" Ice	4.20	4.20	120.00

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	Client	AT&T	Designed by	Joshua Gildert

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight	
			Horz	Vert						
			ft	ft	°	ft	ft ²	ft ²	lb	
15' Omni	A	From Face	0.00		0.0000	89.75	1" Ice	4.90	4.90	149.00
			5.00				No Ice	5.31	5.31	44.60
			0.00				1/2" Ice	7.08	7.08	83.61
			7.50				1" Ice	8.64	8.64	132.31
15' Omni	B	From Face	5.00		0.0000	89.75	No Ice	5.31	5.31	44.60
			0.00				1/2" Ice	7.08	7.08	83.61
			7.50				1" Ice	8.64	8.64	132.31
			5.00				No Ice	5.31	5.31	44.60
15' Omni	C	From Face	0.00		0.0000	89.75	1/2" Ice	7.08	7.08	83.61
			7.50				1" Ice	8.64	8.64	132.31
			5.00				No Ice	5.31	5.31	44.60
			0.00				1/2" Ice	7.08	7.08	83.61
			7.50				1" Ice	8.64	8.64	132.31

5' Standoff	A	From Face	2.50		0.0000	113.00	No Ice	3.50	3.50	91.00
			0.00				1/2" Ice	4.20	4.20	120.00
			0.00				1" Ice	4.90	4.90	149.00
5' Standoff	B	From Face	2.50		0.0000	113.00	No Ice	3.50	3.50	91.00
			0.00				1/2" Ice	4.20	4.20	120.00
			0.00				1" Ice	4.90	4.90	149.00
5' Standoff	C	From Face	2.50		0.0000	113.00	No Ice	3.50	3.50	91.00
			0.00				1/2" Ice	4.20	4.20	120.00
			0.00				1" Ice	4.90	4.90	149.00
4' Omni	A	From Face	5.00		0.0000	113.00	No Ice	1.21	1.21	44.60
			0.00				1/2" Ice	1.75	1.75	59.73
			3.00				1" Ice	2.01	2.01	77.99
4' Omni	B	From Face	5.00		0.0000	113.00	No Ice	1.21	1.21	44.60
			0.00				1/2" Ice	1.75	1.75	59.73
			3.00				1" Ice	2.01	2.01	77.99
4' Omni	C	From Face	5.00		0.0000	113.00	No Ice	1.21	1.21	44.60
			0.00				1/2" Ice	1.75	1.75	59.73
			3.00				1" Ice	2.01	2.01	77.99

LNX-6515DS-VTM (T-MOBILE)	A	From Face	4.00		0.0000	160.50	No Ice	11.45	7.70	50.30
			0.00				1/2" Ice	12.06	8.29	116.17
			2.00				1" Ice	12.69	8.89	189.71
LNX-6515DS-VTM (T-MOBILE)	B	From Face	4.00		0.0000	160.50	No Ice	11.45	7.70	50.30
			0.00				1/2" Ice	12.06	8.29	116.17
			2.00				1" Ice	12.69	8.89	189.71
LNX-6515DS-VTM (T-MOBILE)	C	From Face	4.00		0.0000	160.50	No Ice	11.45	7.70	50.30
			0.00				1/2" Ice	12.06	8.29	116.17
			2.00				1" Ice	12.69	8.89	189.71
(2) AIR 21 B4A B2P (T-MOBILE)	A	From Face	4.00		0.0000	160.50	No Ice	6.09	4.30	81.57
			0.00				1/2" Ice	6.46	4.65	123.39
			2.00				1" Ice	6.84	5.00	170.33
(2) AIR 21 B4A B2P (T-MOBILE)	B	From Face	4.00		0.0000	160.50	No Ice	6.09	4.30	81.57
			0.00				1/2" Ice	6.46	4.65	123.39
			2.00				1" Ice	6.84	5.00	170.33
(2) AIR 21 B4A B2P (T-MOBILE)	C	From Face	4.00		0.0000	160.50	No Ice	6.09	4.30	81.57
			0.00				1/2" Ice	6.46	4.65	123.39
			2.00				1" Ice	6.84	5.00	170.33
RRUS11 B12 (T-MOBILE)	A	From Face	3.00		0.0000	160.50	No Ice	2.79	1.19	50.70
			0.00				1/2" Ice	3.00	1.34	71.57
			2.00				1" Ice	3.21	1.50	95.48
RRUS11 B12 (T-MOBILE)	B	From Face	3.00		0.0000	160.50	No Ice	2.79	1.19	50.70
			0.00				1/2" Ice	3.00	1.34	71.57
			2.00				1" Ice	3.21	1.50	95.48
RRUS11 B12 (T-MOBILE)	C	From Face	3.00		0.0000	160.50	No Ice	2.79	1.19	50.70
			0.00				1/2" Ice	3.00	1.34	71.57
			2.00				1" Ice	3.21	1.50	95.48

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<i>Description</i>	<i>Face or Leg</i>	<i>Offset Type</i>	<i>Offsets: Horz Lateral Vert</i> <i>ft ft ft</i>	<i>Azimuth Adjustment</i> <i>°</i>	<i>Placement</i> <i>ft</i>	<i>C_{AA} Front</i> <i>ft²</i>	<i>C_{AA} Side</i> <i>ft²</i>	<i>Weight</i> <i>lb</i>
KRY11Q114/1 (T-MOBILE)	A	From Face	3.00 0.00 2.00	0.0000	160.50	No Ice 1.67 1/2" Ice 1.83 1" Ice 2.00	0.45 0.55 0.65	31.00 41.95 55.17
KRY11Q114/1 (T-MOBILE)	B	From Face	3.00 0.00 2.00	0.0000	160.50	No Ice 1.67 1/2" Ice 1.83 1" Ice 2.00	0.45 0.55 0.65	31.00 41.95 55.17
KRY11Q114/1 (T-MOBILE)	C	From Face	3.00 0.00 2.00	0.0000	160.50	No Ice 1.67 1/2" Ice 1.83 1" Ice 2.00	0.45 0.55 0.65	31.00 41.95 55.17
12' Platform (T-MOBILE)	C	None		0.0000	160.50	No Ice 22.00 1/2" Ice 27.00 1" Ice 32.00	22.00 28.00 34.00	900.00 1200.00 1500.00

5' Standoff	B	From Face	2.50 0.00 0.00	0.0000	178.50	No Ice 3.50 1/2" Ice 4.20 1" Ice 4.90	3.50 4.20 4.90	91.00 120.00 149.00
5' Standoff	C	From Face	2.50 0.00 0.00	0.0000	178.50	No Ice 3.50 1/2" Ice 4.20 1" Ice 4.90	3.50 4.20 4.90	91.00 120.00 149.00
3' Omni	B	From Face	5.00 0.00 5.33	0.0000	178.50	No Ice 0.90 1/2" Ice 1.35 1" Ice 1.56	0.90 1.35 1.56	44.60 57.50 72.98

5' Standoff	B	From Face	2.50 0.00 0.00	0.0000	183.75	No Ice 3.50 1/2" Ice 4.20 1" Ice 4.90	3.50 4.20 4.90	91.00 120.00 149.00
3' Yagi	B	From Face	5.00 0.00 0.00	0.0000	183.75	No Ice 0.52 1/2" Ice 0.71 1" Ice 0.90	0.52 0.71 0.90	10.00 14.81 21.81
5' Standoff	C	From Face	2.50 0.00 0.00	0.0000	183.75	No Ice 3.50 1/2" Ice 4.20 1" Ice 4.90	3.50 4.20 4.90	91.00 120.00 149.00
3' Yagi	C	From Face	5.00 0.00 0.00	0.0000	183.75	No Ice 0.52 1/2" Ice 0.71 1" Ice 0.90	0.52 0.71 0.90	10.00 14.81 21.81
5' Standoff	A	From Face	2.50 0.00 0.00	0.0000	188.00	No Ice 3.50 1/2" Ice 4.20 1" Ice 4.90	3.50 4.20 4.90	91.00 120.00 149.00
5' Standoff	B	From Face	2.50 0.00 0.00	0.0000	188.00	No Ice 3.50 1/2" Ice 4.20 1" Ice 4.90	3.50 4.20 4.90	91.00 120.00 149.00
5' Standoff	C	From Face	2.50 0.00 0.00	0.0000	188.00	No Ice 3.50 1/2" Ice 4.20 1" Ice 4.90	3.50 4.20 4.90	91.00 120.00 149.00
6' Omni	A	From Face	5.00 0.00 5.00	0.0000	188.00	No Ice 1.79 1/2" Ice 2.70 1" Ice 3.08	1.79 2.70 3.08	44.60 64.64 88.99
6' Omni	B	From Face	5.00 0.00 5.00	0.0000	188.00	No Ice 1.79 1/2" Ice 2.70 1" Ice 3.08	1.79 2.70 3.08	44.60 64.64 88.99
6' Omni	C	From Face	5.00 0.00 5.00	0.0000	188.00	No Ice 1.79 1/2" Ice 2.70 1" Ice 3.08	1.79 2.70 3.08	44.60 64.64 88.99

2.0" x 9' long pipe	C	From Leg	5.00 0.00	0.0000	188.00	No Ice 2.14 1/2" Ice 3.07	2.14 3.07	32.94 47.76

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Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight	
			Horz	Vert						
			ft	ft	°	ft	ft ²	ft ²	lb	
***			0.00			1" Ice	4.03	4.03	62.58	
DMP65R-BU8DA (AT&T)	A	From Face	4.00	0.00	0.0000	150.00	No Ice	17.87	8.12	95.70
			0.00			1/2" Ice	18.50	8.72	193.28	
			0.00			1" Ice	19.14	9.32	299.13	
DMP65R-BU8DA (AT&T)	B	From Face	4.00	0.00	0.0000	150.00	No Ice	17.87	8.12	95.70
			0.00			1/2" Ice	18.50	8.72	193.28	
			0.00			1" Ice	19.14	9.32	299.13	
DMP65R-BU8DA (AT&T)	C	From Face	4.00	0.00	0.0000	150.00	No Ice	17.87	8.12	95.70
			0.00			1/2" Ice	18.50	8.72	193.28	
			0.00			1" Ice	19.14	9.32	299.13	
OPA65R-BU8DA (AT&T)	A	From Face	4.00	0.00	0.0000	150.00	No Ice	18.09	8.20	76.50
			0.00			1/2" Ice	18.72	8.79	175.49	
			0.00			1" Ice	19.36	9.40	282.75	
OPA65R-BU8DA (AT&T)	B	From Face	4.00	0.00	0.0000	150.00	No Ice	18.09	8.20	76.50
			0.00			1/2" Ice	18.72	8.79	175.49	
			0.00			1" Ice	19.36	9.40	282.75	
OPA65R-BU8DA (AT&T)	C	From Face	4.00	0.00	0.0000	150.00	No Ice	18.09	8.20	76.50
			0.00			1/2" Ice	18.72	8.79	175.49	
			0.00			1" Ice	19.36	9.40	282.75	
4449 B5/B12 (AT&T)	A	From Face	3.00	0.00	0.0000	150.00	No Ice	1.64	1.29	74.00
			0.00			1/2" Ice	1.80	1.44	91.12	
			0.00			1" Ice	1.97	1.59	110.94	
4449 B5/B12 (AT&T)	B	From Face	3.00	0.00	0.0000	150.00	No Ice	1.64	1.29	74.00
			0.00			1/2" Ice	1.80	1.44	91.12	
			0.00			1" Ice	1.97	1.59	110.94	
4449 B5/B12 (AT&T)	C	From Face	3.00	0.00	0.0000	150.00	No Ice	1.64	1.29	74.00
			0.00			1/2" Ice	1.80	1.44	91.12	
			0.00			1" Ice	1.97	1.59	110.94	
4478 B14 (AT&T)	A	From Face	3.00	0.00	0.0000	150.00	No Ice	2.02	1.25	59.40
			0.00			1/2" Ice	2.20	1.40	77.01	
			0.00			1" Ice	2.39	1.55	97.40	
4478 B14 (AT&T)	B	From Face	3.00	0.00	0.0000	150.00	No Ice	2.02	1.25	59.40
			0.00			1/2" Ice	2.20	1.40	77.01	
			0.00			1" Ice	2.39	1.55	97.40	
4478 B14 (AT&T)	C	From Face	3.00	0.00	0.0000	150.00	No Ice	2.02	1.25	59.40
			0.00			1/2" Ice	2.20	1.40	77.01	
			0.00			1" Ice	2.39	1.55	97.40	
8843 B2/B66A (AT&T)	A	From Face	3.00	0.00	0.0000	150.00	No Ice	3.50	2.36	85.00
			0.00			1/2" Ice	3.74	2.57	114.30	
			0.00			1" Ice	3.99	2.78	147.22	
8843 B2/B66A (AT&T)	B	From Face	3.00	0.00	0.0000	150.00	No Ice	3.50	2.36	85.00
			0.00			1/2" Ice	3.74	2.57	114.30	
			0.00			1" Ice	3.99	2.78	147.22	
8843 B2/B66A (AT&T)	C	From Face	3.00	0.00	0.0000	150.00	No Ice	3.50	2.36	85.00
			0.00			1/2" Ice	3.74	2.57	114.30	
			0.00			1" Ice	3.99	2.78	147.22	
DC6-48-60-0-8F (AT&T)	A	From Face	2.00	0.00	0.0000	150.00	No Ice	0.92	0.92	32.80
			0.00			1/2" Ice	1.46	1.46	50.52	
			0.00			1" Ice	1.64	1.64	70.72	
(2) LGP21401 (AT&T)	A	From Face	3.00	0.00	0.0000	150.00	No Ice	1.08	0.36	19.00
			0.00			1/2" Ice	1.21	0.45	26.13	
			0.00			1" Ice	1.35	0.56	35.14	
(2) LGP21401 (AT&T)	B	From Face	3.00	0.00	0.0000	150.00	No Ice	1.08	0.36	19.00
			0.00			1/2" Ice	1.21	0.45	26.13	
			0.00			1" Ice	1.35	0.56	35.14	
(2) LGP21401	C	From Face	3.00	0.00	0.0000	150.00	No Ice	1.08	0.36	19.00

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Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight	
			Horz	Lateral						Vert
			ft	ft	°	ft	ft ²	ft ²	lb	
(AT&T)			0.00			1/2" Ice	1.21	0.45	26.13	
			0.00			1" Ice	1.35	0.56	35.14	
(2) LGP21901 (AT&T)	A	From Face	3.00		0.0000	150.00	No Ice	0.23	5.50	
			0.00				1/2" Ice	0.29	7.92	
			0.00				1" Ice	0.36	11.41	
(2) LGP21401 (AT&T)	B	From Face	3.00		0.0000	150.00	No Ice	1.08	19.00	
			0.00				1/2" Ice	1.21	26.13	
			0.00				1" Ice	1.35	35.14	
(2) LGP21901 (AT&T)	C	From Face	3.00		0.0000	150.00	No Ice	0.23	5.50	
			0.00				1/2" Ice	0.29	7.92	
			0.00				1" Ice	0.36	11.41	

12' Platform w / handrails (SPRINT)	C	None			0.0000	173.75	No Ice	28.00	28.00	1200.00
							1/2" Ice	33.00	33.00	1600.00
							1" Ice	38.00	38.00	2000.00
APXVSP18-C-A20 (SPRINT)	A	From Face	4.00		0.0000	173.75	No Ice	11.03	10.91	86.50
			0.00				1/2" Ice	11.54	11.42	174.66
			0.00				1" Ice	12.06	11.94	270.12
APXVSP18-C-A20 (SPRINT)	B	From Face	4.00		0.0000	173.75	No Ice	11.03	10.91	86.50
			0.00				1/2" Ice	11.54	11.42	174.66
			0.00				1" Ice	12.06	11.94	270.12
APXVSP18-C-A20 (SPRINT)	C	From Face	4.00		0.0000	173.75	No Ice	11.03	10.91	86.50
			0.00				1/2" Ice	11.54	11.42	174.66
			0.00				1" Ice	12.06	11.94	270.12
(2) GENERIC PANEL ANTENNA (96"X18") (SPRINT)	A	From Face	4.00		0.0000	173.75	No Ice	15.91	9.91	125.00
			0.00				1/2" Ice	16.53	10.52	222.00
			0.00				1" Ice	17.15	11.13	327.22
(2) GENERIC PANEL ANTENNA (96"X18") (SPRINT)	B	From Face	4.00		0.0000	173.75	No Ice	15.91	9.91	125.00
			0.00				1/2" Ice	16.53	10.52	222.00
			0.00				1" Ice	17.15	11.13	327.22
(2) GENERIC PANEL ANTENNA (96"X18") (SPRINT)	C	From Face	4.00		0.0000	173.75	No Ice	15.91	9.91	125.00
			0.00				1/2" Ice	16.53	10.52	222.00
			0.00				1" Ice	17.15	11.13	327.22
(2) GENERIC RRH (SPRINT)	A	From Face	3.00		0.0000	173.75	No Ice	2.79	1.19	50.70
			0.00				1/2" Ice	3.00	1.34	71.57
			0.00				1" Ice	3.21	1.50	95.48
(2) GENERIC RRH (SPRINT)	B	From Face	3.00		0.0000	173.75	No Ice	2.79	1.19	50.70
			0.00				1/2" Ice	3.00	1.34	71.57
			0.00				1" Ice	3.21	1.50	95.48
(2) GENERIC RRH (SPRINT)	C	From Face	3.00		0.0000	173.75	No Ice	2.79	1.19	50.70
			0.00				1/2" Ice	3.00	1.34	71.57
			0.00				1" Ice	3.21	1.50	95.48

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets:		Azimuth Adjustment	3 dB Beam Width	Elevation	Outside Diameter	Aperture Area	Weight	
				Horz	Lateral							Vert
			ft	ft	°	°	ft	ft	ft ²	lb		
3' DISH	C	Paraboloid	From	1.00		-60.0000		189.00	3.00	No Ice	7.07	50.00

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Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft	Aperture Area ft ²	Weight lb
		w/Shroud (HP)	Face	0.00					1/2" Ice	88.35
				4.17					1" Ice	126.69
Kathrein Scala PR-950	C	Grid	From	5.00	-60.0000		188.00		No Ice	38.00
			Face	0.00					1/2" Ice	43.00
				-2.00					1" Ice	50.00

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice
3	0.9 Dead+1.6 Wind 0 deg - No Ice
4	1.2 Dead+1.6 Wind 30 deg - No Ice
5	0.9 Dead+1.6 Wind 30 deg - No Ice
6	1.2 Dead+1.6 Wind 60 deg - No Ice
7	0.9 Dead+1.6 Wind 60 deg - No Ice
8	1.2 Dead+1.6 Wind 90 deg - No Ice
9	0.9 Dead+1.6 Wind 90 deg - No Ice
10	1.2 Dead+1.6 Wind 120 deg - No Ice
11	0.9 Dead+1.6 Wind 120 deg - No Ice
12	1.2 Dead+1.6 Wind 150 deg - No Ice
13	0.9 Dead+1.6 Wind 150 deg - No Ice
14	1.2 Dead+1.6 Wind 180 deg - No Ice
15	0.9 Dead+1.6 Wind 180 deg - No Ice
16	1.2 Dead+1.6 Wind 210 deg - No Ice
17	0.9 Dead+1.6 Wind 210 deg - No Ice
18	1.2 Dead+1.6 Wind 240 deg - No Ice
19	0.9 Dead+1.6 Wind 240 deg - No Ice
20	1.2 Dead+1.6 Wind 270 deg - No Ice
21	0.9 Dead+1.6 Wind 270 deg - No Ice
22	1.2 Dead+1.6 Wind 300 deg - No Ice
23	0.9 Dead+1.6 Wind 300 deg - No Ice
24	1.2 Dead+1.6 Wind 330 deg - No Ice
25	0.9 Dead+1.6 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice+1.0 Temp
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service
41	Dead+Wind 60 deg - Service
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service

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Comb. No.	Description
47	Dead+Wind 240 deg - Service
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb	
Pole	Max. Vert	1	36286.62	1.64	1.74	
	Max. H _x	21	23635.07	39777.32	136.16	
	Max. H _z	3	23160.34	223.54	41206.24	
	Max. M _x	2	4334178.50	223.56	41182.36	
	Max. M _z	8	4205344.58	-39662.50	-120.78	
	Max. Torsion	21	7227.94	39777.32	136.16	
	Min. Vert	31	-121808.50	-10507.93	-6160.78	
	Min. H _x	9	23690.83	-39692.94	-121.52	
	Min. H _z	15	23160.10	-160.08	-41191.69	
	Min. M _x	14	-4335054.13	-159.23	-41166.83	
Reinf @ Azimuth 90 deg	Min. M _z	20	-4217050.63	39747.70	136.46	
	Min. Torsion	9	-7263.70	-39692.94	-121.52	
	Max. Vert	8	360342.87	-1.36	18.89	
	Max. H _x	20	-346695.83	6438.10	15.27	
	Max. H _z	12	190327.76	-848.98	1770.95	
	Min. Vert	20	-346695.83	6438.10	15.27	
	Min. H _x	30	168894.74	-1091.07	5.76	
	Min. H _z	4	182482.11	-850.50	-1643.99	
	Max. Vert	2	370786.80	-32.68	-267.40	
	Reinf @ Azimuth 0 deg	Max. H _x	6	186668.57	1494.28	766.31
Max. H _z		27	167601.51	-11.33	1039.46	
Min. Vert		14	-355914.19	-24.49	-6531.48	
Min. H _x		22	196174.91	-1626.64	757.55	
Min. H _z		14	-355914.19	-24.49	-6531.48	
Max. Vert		20	361397.93	-8.31	-20.43	
Reinf @ Azimuth 270 deg		Max. H _x	36	169067.95	1091.43	-5.60
		Max. H _z	16	180560.04	850.39	1633.93
		Min. Vert	8	-345668.12	-6409.76	-18.80
		Min. H _x	8	-345668.12	-6409.76	-18.80
	Min. H _z	24	190846.39	848.85	-1780.13	
	Max. Vert	14	370862.33	25.50	268.18	
	Reinf @ Azimuth 180 deg	Max. H _x	10	196040.19	1624.65	-757.73
		Max. H _z	2	-355840.51	31.23	6529.43
		Min. Vert	2	-355840.51	31.23	6529.43
		Min. H _x	18	186172.11	-1493.60	-766.71
Min. H _z		33	168328.28	5.30	-1040.60	

Tower Mast Reaction Summary

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Load Combination	Vertical lb	Shear _x lb	Shear _z lb	Overturning Moment, M _x lb-ft	Overturning Moment, M _z lb-ft	Torque lb-ft
Dead Only	53039.54	-0.08	-0.06	1686.12	-1376.41	0.01
1.2 Dead+1.6 Wind 0 deg - No Ice	63647.03	-284.24	-46966.19	-6251508.72	56277.14	4.88
0.9 Dead+1.6 Wind 0 deg - No Ice	47735.31	-284.26	-46967.86	-6185887.81	55965.57	6.01
1.2 Dead+1.6 Wind 30 deg - No Ice	63647.44	22831.42	-40514.79	-5382133.17	-3010866.36	4035.76
0.9 Dead+1.6 Wind 30 deg - No Ice	47735.57	22831.40	-40514.75	-5325526.73	-2978602.54	4037.60
1.2 Dead+1.6 Wind 60 deg - No Ice	63647.44	39634.94	-23299.22	-3087649.66	-5232865.93	6563.14
0.9 Dead+1.6 Wind 60 deg - No Ice	47735.57	39634.90	-23299.20	-3055429.02	-5177034.02	6567.55
1.2 Dead+1.6 Wind 90 deg - No Ice	63647.35	45935.20	156.49	34277.35	-6068275.14	7254.99
0.9 Dead+1.6 Wind 90 deg - No Ice	47735.46	45934.81	156.50	33323.10	-6003523.51	7263.26
1.2 Dead+1.6 Wind 120 deg - No Ice	63647.44	41100.75	24384.40	3245071.53	-5414074.25	5985.46
0.9 Dead+1.6 Wind 120 deg - No Ice	47735.57	41100.71	24384.38	3210187.17	-5356557.22	5996.10
1.2 Dead+1.6 Wind 150 deg - No Ice	63647.44	23773.90	41998.89	5581568.06	-3142112.50	3027.88
0.9 Dead+1.6 Wind 150 deg - No Ice	47735.57	23773.88	41998.85	5521991.64	-3108477.72	3035.80
1.2 Dead+1.6 Wind 180 deg - No Ice	63647.03	206.85	46951.81	6252778.09	-44011.57	-317.74
0.9 Dead+1.6 Wind 180 deg - No Ice	47735.31	206.86	46953.49	6186103.17	-42986.66	-316.75
1.2 Dead+1.6 Wind 210 deg - No Ice	63647.44	-22688.83	40597.11	5402634.82	2979163.09	-3316.82
0.9 Dead+1.6 Wind 210 deg - No Ice	47735.57	-22688.81	40597.07	5344730.45	2948169.83	-3323.01
1.2 Dead+1.6 Wind 240 deg - No Ice	63647.44	-39686.08	23239.38	3079536.14	5239901.99	-6118.80
0.9 Dead+1.6 Wind 240 deg - No Ice	47735.57	-39686.04	23239.36	3046421.73	5184825.98	-6129.89
1.2 Dead+1.6 Wind 270 deg - No Ice	63647.35	-46038.45	-165.04	-32158.87	6085476.93	-7222.00
0.9 Dead+1.6 Wind 270 deg - No Ice	47735.45	-46038.05	-165.03	-32215.86	6021373.29	-7231.55
1.2 Dead+1.6 Wind 300 deg - No Ice	63647.44	-41151.95	-24413.96	-3247098.38	5421030.41	-6160.20
0.9 Dead+1.6 Wind 300 deg - No Ice	47735.57	-41151.91	-24413.94	-3213182.92	5364316.42	-6165.50
1.2 Dead+1.6 Wind 330 deg - No Ice	63647.44	-23832.95	-42084.02	-5594360.58	3150511.05	-3507.76
0.9 Dead+1.6 Wind 330 deg - No Ice	47735.57	-23832.93	-42083.98	-5535641.65	3117663.37	-3509.07
1.2 Dead+1.0 Ice+1.0 Temp	128001.73	-0.42	-0.43	13084.13	-7903.78	-0.06
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	128001.70	-240.81	-13403.46	-1809018.98	43665.61	-1114.71
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	128001.72	6656.21	-11505.43	-1542909.65	-909734.55	564.42
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	128001.72	11580.54	-6622.68	-880612.13	-1580976.60	1035.35
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	128001.70	13385.76	30.91	20340.58	-1827264.25	1162.43
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	128001.72	11621.95	6709.36	926397.32	-1589957.38	1002.91
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	128001.72	6719.94	11576.43	1584990.00	-923794.54	396.35

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Load Combination	Vertical lb	Shear _x lb	Shear _z lb	Overturning Moment, M _x lb-ft	Overturning Moment, M _z lb-ft	Torque lb-ft
deg+1.0 Ice+1.0 Temp						
1.2 Dead+1.0 Wind 180	128001.70	54.36	13338.96	1822036.64	-20132.72	-62.35
deg+1.0 Ice+1.0 Temp						
1.2 Dead+1.0 Wind 210	128001.72	-6636.75	11516.66	1572134.67	889216.52	-499.41
deg+1.0 Ice+1.0 Temp						
1.2 Dead+1.0 Wind 240	128001.72	-11729.62	6493.44	879751.61	1596544.03	-1661.89
deg+1.0 Ice+1.0 Temp						
1.2 Dead+1.0 Wind 270	128001.70	-13475.22	-147.51	-18438.36	1830216.80	-1477.34
deg+1.0 Ice+1.0 Temp						
1.2 Dead+1.0 Wind 300	128001.72	-11703.03	-6756.17	-909704.35	1591088.22	-1421.53
deg+1.0 Ice+1.0 Temp						
1.2 Dead+1.0 Wind 330	128001.72	-6865.65	-11595.61	-1562455.10	938631.35	-1322.71
deg+1.0 Ice+1.0 Temp						
Dead+Wind 0 deg - Service	53039.51	-60.81	-10048.21	-1329961.02	10890.45	15.65
Dead+Wind 30 deg - Service	53039.51	4884.18	-8667.06	-1144577.98	-642134.32	864.44
Dead+Wind 60 deg - Service	53039.51	8478.84	-4984.25	-656004.97	-1115119.60	1411.19
Dead+Wind 90 deg - Service	53039.51	9826.86	33.47	8620.50	-1292990.40	1582.04
Dead+Wind 120 deg - Service	53039.53	8793.17	5216.84	692354.44	-1154004.40	1331.81
Dead+Wind 150 deg - Service	53039.51	5085.79	8984.54	1189886.39	-670179.84	690.71
Dead+Wind 180 deg - Service	53039.51	44.25	10045.13	1332849.77	-10452.87	-61.70
Dead+Wind 210 deg - Service	53039.51	-4853.69	8684.66	1151570.49	633200.48	-743.32
Dead+Wind 240 deg - Service	53039.53	-8490.51	4971.87	656996.72	1114544.80	-1370.95
Dead+Wind 270 deg - Service	53039.51	-9848.95	-35.30	-5512.26	1294502.15	-1589.31
Dead+Wind 300 deg - Service	53039.51	-8803.39	-5222.72	-690071.44	1153220.26	-1330.83
Dead+Wind 330 deg - Service	53039.53	-5098.86	-9003.52	-1190126.75	669893.35	-740.85

Solution Summary

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX lb	PY lb	PZ lb	PX lb	PY lb	PZ lb	
1	0.00	-53039.54	0.00	0.08	53039.54	0.06	0.000%
2	-284.29	-63647.45	-46971.32	284.24	63647.03	46966.19	0.007%
3	-284.29	-47735.59	-46971.32	284.26	47735.31	46967.86	0.005%
4	22831.49	-63647.45	-40514.93	-22831.42	63647.44	40514.79	0.000%
5	22831.49	-47735.59	-40514.93	-22831.40	47735.57	40514.75	0.000%
6	39635.08	-63647.45	-23299.30	-39634.94	63647.44	23299.22	0.000%
7	39635.08	-47735.59	-23299.30	-39634.90	47735.57	23299.20	0.000%
8	45936.53	-63647.45	156.49	-45935.20	63647.35	-156.49	0.002%
9	45936.53	-47735.59	156.49	-45934.81	47735.46	-156.50	0.003%
10	41100.89	-63647.45	24384.48	-41100.75	63647.44	-24384.40	0.000%
11	41100.89	-47735.59	24384.48	-41100.71	47735.57	-24384.38	0.000%
12	23773.98	-63647.45	41999.04	-23773.90	63647.44	-41998.89	0.000%
13	23773.98	-47735.59	41999.04	-23773.88	47735.57	-41998.85	0.000%
14	206.89	-63647.45	46956.94	-206.85	63647.03	-46951.81	0.007%
15	206.89	-47735.59	46956.94	-206.86	47735.31	-46953.49	0.005%
16	-22688.91	-63647.45	40597.26	22688.83	63647.44	-40597.11	0.000%
17	-22688.91	-47735.59	40597.26	22688.81	47735.57	-40597.07	0.000%
18	-39686.23	-63647.45	23239.45	39686.08	63647.44	-23239.38	0.000%
19	-39686.23	-47735.59	23239.45	39686.04	47735.57	-23239.36	0.000%
20	-46039.78	-63647.45	-165.06	46038.45	63647.35	165.04	0.002%
21	-46039.78	-47735.59	-165.06	46038.05	47735.45	165.03	0.003%
22	-41152.09	-63647.45	-24414.05	41151.95	63647.44	24413.96	0.000%
23	-41152.09	-47735.59	-24414.05	41151.91	47735.57	24413.94	0.000%
24	-23833.03	-63647.45	-42084.17	23832.95	63647.44	42084.02	0.000%
25	-23833.03	-47735.59	-42084.17	23832.93	47735.57	42083.98	0.000%
26	0.00	-128001.73	0.00	0.42	128001.73	0.43	0.000%
27	-240.85	-128001.73	-13404.70	240.81	128001.70	13403.46	0.001%

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Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX lb	PY lb	PZ lb	PX lb	PY lb	PZ lb	
28	6656.56	-128001.73	-11506.02	-6656.21	128001.72	11505.43	0.001%
29	11581.14	-128001.73	-6623.01	-11580.54	128001.72	6622.68	0.001%
30	13387.01	-128001.73	30.93	-13385.76	128001.70	-30.91	0.001%
31	11622.56	-128001.73	6709.71	-11621.95	128001.72	-6709.36	0.001%
32	6720.29	-128001.73	11577.03	-6719.94	128001.72	-11576.43	0.001%
33	54.38	-128001.73	13340.21	-54.36	128001.70	-13338.96	0.001%
34	-6637.09	-128001.73	11517.26	6636.75	128001.72	-11516.66	0.001%
35	-11730.23	-128001.73	6493.77	11729.62	128001.72	-6493.44	0.001%
36	-13476.47	-128001.73	-147.54	13475.22	128001.70	147.51	0.001%
37	-11703.64	-128001.73	-6756.52	11703.03	128001.72	6756.17	0.001%
38	-6866.01	-128001.73	-11596.20	6865.65	128001.72	11595.61	0.001%
39	-60.83	-53039.54	-10050.02	60.81	53039.51	10048.21	0.003%
40	4885.05	-53039.54	-8668.61	-4884.18	53039.51	8667.06	0.003%
41	8480.36	-53039.54	-4985.14	-8478.84	53039.51	4984.25	0.003%
42	9828.62	-53039.54	33.48	-9826.86	53039.51	-33.47	0.003%
43	8793.98	-53039.54	5217.33	-8793.17	53039.53	-5216.84	0.002%
44	5086.70	-53039.54	8986.15	-5085.79	53039.51	-8984.54	0.003%
45	44.27	-53039.54	10046.95	-44.25	53039.51	-10045.13	0.003%
46	-4854.54	-53039.54	8686.22	4853.69	53039.51	-8684.66	0.003%
47	-8491.30	-53039.54	4972.33	8490.51	53039.53	-4971.87	0.002%
48	-9850.71	-53039.54	-35.32	9848.95	53039.51	35.30	0.003%
49	-8804.94	-53039.54	-5223.65	8803.39	53039.51	5222.72	0.003%
50	-5099.34	-53039.54	-9004.37	5098.86	53039.53	9003.52	0.002%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	6	0.00000001	0.00000001
2	Yes	17	0.00006885	0.00013402
3	Yes	17	0.00004634	0.00009255
4	Yes	22	0.00000001	0.00010639
5	Yes	21	0.00000001	0.00013602
6	Yes	22	0.00000001	0.00009651
7	Yes	21	0.00000001	0.00012302
8	Yes	19	0.00001883	0.00011201
9	Yes	18	0.00002419	0.00014793
10	Yes	22	0.00000001	0.00011450
11	Yes	21	0.00000001	0.00014615
12	Yes	22	0.00000001	0.00010626
13	Yes	21	0.00000001	0.00013507
14	Yes	17	0.00006884	0.00014022
15	Yes	17	0.00004633	0.00009677
16	Yes	22	0.00000001	0.00009807
17	Yes	21	0.00000001	0.00012500
18	Yes	22	0.00000001	0.00010786
19	Yes	21	0.00000001	0.00013814
20	Yes	19	0.00001881	0.00009102
21	Yes	18	0.00002416	0.00012084
22	Yes	22	0.00000001	0.00010436
23	Yes	21	0.00000001	0.00013276
24	Yes	22	0.00000001	0.00011298
25	Yes	21	0.00000001	0.00014406
26	Yes	13	0.00000001	0.00003188
27	Yes	20	0.00006743	0.00013432
28	Yes	21	0.00000001	0.00008870

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29	Yes	21	0.00000001	0.00008850
30	Yes	20	0.00006768	0.00013638
31	Yes	21	0.00000001	0.00009296
32	Yes	21	0.00000001	0.00009109
33	Yes	20	0.00006740	0.00013419
34	Yes	21	0.00000001	0.00008791
35	Yes	21	0.00000001	0.00009129
36	Yes	20	0.00006768	0.00013640
37	Yes	21	0.00000001	0.00009055
38	Yes	21	0.00000001	0.00009217
39	Yes	16	0.00011285	0.00010432
40	Yes	16	0.00011271	0.00014747
41	Yes	16	0.00011287	0.00012112
42	Yes	16	0.00011318	0.00011958
43	Yes	17	0.00005958	0.00009042
44	Yes	16	0.00011262	0.00013225
45	Yes	16	0.00011284	0.00010472
46	Yes	16	0.00011271	0.00012218
47	Yes	17	0.00005963	0.00008593
48	Yes	16	0.00011318	0.00011826
49	Yes	16	0.00011278	0.00012855
50	Yes	17	0.00005949	0.00008460

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	191.08 - 165.33	37.239	44	1.7257	0.0185
L2	168.25 - 130.75	29.043	44	1.6872	0.0123
L3	134.58 - 97.08	17.958	44	1.4026	0.0055
L4	101.75 - 64.25	9.569	44	1.0091	0.0029
L5	69.75 - 32.25	4.058	50	0.6140	0.0015
L6	38.5 - 1	1.124	50	0.2696	0.0007

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
193.17	3' DISH	44	37.239	1.7257	0.0189	64860
188.00	5' Standoff	44	36.124	1.7244	0.0180	64860
186.00	Kathrein Scala PR-950	44	35.400	1.7234	0.0175	63839
183.75	5' Standoff	44	34.586	1.7218	0.0168	44243
178.50	5' Standoff	44	32.695	1.7157	0.0153	25779
173.75	12' Platform w/ handrails	44	30.994	1.7059	0.0140	18713
160.50	LNx-6515DS-VTM	44	26.340	1.6447	0.0106	9858
150.00	80010121 w/ Mount Pipe	44	22.798	1.5613	0.0082	6969
113.00	5' Standoff	44	12.134	1.1482	0.0036	4685
89.75	5' Standoff	50	7.195	0.8599	0.0024	4667
52.00	GPS	44	2.109	0.4069	0.0010	5121

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Maximum Tower Deflections - Design Wind

Section No.	Elevation <i>ft</i>	Horz. Deflection <i>in</i>	Gov. Load Comb.	Tilt <i>°</i>	Twist <i>°</i>
L1	191.08 - 165.33	174.508	24	8.0998	0.0833
L2	168.25 - 130.75	136.228	24	7.9296	0.0552
L3	134.58 - 97.08	84.338	24	6.5983	0.0249
L4	101.75 - 64.25	44.979	24	4.7487	0.0134
L5	69.75 - 32.25	19.083	24	2.8891	0.0071
L6	38.5 - 1	5.283	24	1.2681	0.0032

Critical Deflections and Radius of Curvature - Design Wind

Elevation <i>ft</i>	Appurtenance	Gov. Load Comb.	Deflection <i>in</i>	Tilt <i>°</i>	Twist <i>°</i>	Radius of Curvature <i>ft</i>
193.17	3' DISH	24	174.508	8.0998	0.0899	14909
188.00	5' Standoff	24	169.300	8.0952	0.0857	14909
186.00	Kathrein Scala PR-950	24	165.921	8.0913	0.0829	14674
183.75	5' Standoff	24	162.123	8.0851	0.0798	10169
178.50	5' Standoff	24	153.288	8.0593	0.0727	5924
173.75	12' Platform w / handrails	24	145.344	8.0153	0.0663	4298
160.50	LNx-6515DS-VTM	24	123.588	7.7323	0.0499	2220
150.00	80010121 w/ Mount Pipe	24	107.014	7.3426	0.0387	1547
113.00	5' Standoff	24	57.024	5.4029	0.0165	1017
89.75	5' Standoff	24	33.826	4.0465	0.0110	1003
52.00	GPS	24	9.917	1.9141	0.0046	1091

Base Plate Design Data

Plate Thickness <i>in</i>	Number of Anchor Bolts	Anchor Bolt Size <i>in</i>	Actual Allowable Bolt Tension <i>lb</i>	Actual Allowable Concrete Stress <i>ksi</i>	Actual Allowable Plate Stress <i>ksi</i>	Actual Allowable Stiffener Stress <i>ksi</i>	Controlling Condition	Critical Ratio
1.5000	44	1.2500	56867.00	3.505	18.260	6.157	Conc fc	0.86
			69029.14	4.080	45.000	45.000		
			0.82	0.86	0.41	0.14		

Compression Checks

Pole Design Data

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Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u lb	φP _n lb	Ratio $\frac{P_u}{\phi P_n}$
L1	191.08 - 165.33 (1)	TP26x19.5625x0.25	25.75	0.00	0.0	19.8534	-4104.54	1475010.00	0.003
L2	165.33 - 130.75 (2)	TP34.0052x24.77x0.3125	37.50	0.00	0.0	32.4834	-13917.40	2384690.00	0.006
L3	130.75 - 97.08 (3)	TP41.0625x32.437x0.375	37.50	0.00	0.0	47.1498	-22407.20	3454030.00	0.006
L4	97.08 - 64.25 (4)	TP49.0052x39.2383x0.375	37.50	0.00	0.0	56.1771	-32579.60	3903670.00	0.008
L5	64.25 - 32.25 (5)	TP56.0104x46.8227x0.375	37.50	0.00	0.0	63.3768	-42646.50	4213510.00	0.010
L6	32.25 - 1 (6)	TP62.0781x53.7291x0.375	37.50	0.00	0.0	73.4421	-33266.20	4574150.00	0.007

Pole Bending Design Data

Section No.	Elevation ft	Size	M _{ux} lb-ft	φM _{ux} lb-ft	Ratio $\frac{M_{ux}}{\phi M_{ux}}$	M _{uy} lb-ft	φM _{uy} lb-ft	Ratio $\frac{M_{uy}}{\phi M_{uy}}$
L1	191.08 - 165.33 (1)	TP26x19.5625x0.25	120536.67	757278.33	0.159	0.00	757278.33	0.000
L2	165.33 - 130.75 (2)	TP34.0052x24.77x0.3125	920266.67	1603258.33	0.574	0.00	1603258.33	0.000
L3	130.75 - 97.08 (3)	TP41.0625x32.437x0.375	2047075.00	2809108.33	0.729	0.00	2809108.33	0.000
L4	97.08 - 64.25 (4)	TP49.0052x39.2383x0.375	3311666.67	3788350.00	0.874	0.00	3788350.00	0.000
L5	64.25 - 32.25 (5)	TP56.0104x46.8227x0.375	4509216.67	4617225.00	0.977	0.00	4617225.00	0.000
L6	32.25 - 1 (6)	TP62.0781x53.7291x0.375	4451325.00	5814041.33	0.766	0.00	5814041.33	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V _u lb	φV _n lb	Ratio $\frac{V_u}{\phi V_n}$	Actual T _u lb-ft	φT _n lb-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	191.08 - 165.33 (1)	TP26x19.5625x0.25	13741.40	737503.00	0.019	3539.17	1518691.67	0.002
L2	165.33 - 130.75 (2)	TP34.0052x24.77x0.3125	32038.40	1192350.00	0.027	3203.85	3215058.33	0.001
L3	130.75 - 97.08 (3)	TP41.0625x32.437x0.375	36772.10	1727020.00	0.021	3186.14	5633116.67	0.001
L4	97.08 - 64.25 (4)	TP49.0052x39.2383x0.375	41615.50	1951840.00	0.021	3171.13	7595058.00	0.000
L5	64.25 - 32.25 (5)	TP56.0104x46.8227x0.375	44570.20	2106760.00	0.021	3398.47	9255583.33	0.000
L6	32.25 - 1 (6)	TP62.0781x53.7291x0.375	42281.30	2287070.00	0.018	3512.50	11653000.00	0.000

Pole Interaction Design Data

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Section No.	Elevation ft	Ratio P_u	Ratio M_{ux}	Ratio M_{uy}	Ratio V_u	Ratio T_u	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
		ϕP_n	ϕM_{ux}	ϕM_{uy}	ϕV_n	ϕT_n			
L1	191.08 - 165.33 (1)	0.003	0.159	0.000	0.019	0.002	0.162	1.000	4.8.2
L2	165.33 - 130.75 (2)	0.006	0.574	0.000	0.027	0.001	0.581	1.000	4.8.2
L3	130.75 - 97.08 (3)	0.006	0.729	0.000	0.021	0.001	0.736	1.000	4.8.2
L4	97.08 - 64.25 (4)	0.008	0.874	0.000	0.021	0.000	0.883	1.000	4.8.2
L5	64.25 - 32.25 (5)	0.010	0.977	0.000	0.021	0.000	0.987	1.000	4.8.2
L6	32.25 - 1 (6)	0.007	0.766	0.000	0.018	0.000	0.773	1.000	4.8.2

Reinforcing Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in ²	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
L6	32 - 1	6-1/2x1-1/4	31.00	1.00	33.3	8.1250	-370862.00	427884.00	0.867 ¹
L6	42 - 32	6-1/2x1-1/4	10.00	1.00	33.3	8.1250	-265855.00	427884.00	0.621 ¹

¹ $P_u / \phi P_n$ controls

Reinforcing Bending Design Data

Section No.	Elevation ft	Size	M_{ux} lb-ft	ϕM_{ux} lb-ft	Ratio $\frac{M_{ux}}{\phi M_{ux}}$	M_{uy} lb-ft	ϕM_{uy} lb-ft	Ratio $\frac{M_{uy}}{\phi M_{uy}}$
L6	32 - 1	6-1/2x1-1/4	-0.00	64365.25	0.000	-0.00	12377.92	0.000
L6	42 - 32	6-1/2x1-1/4	-1588.32	64365.25	0.025	0.45	12377.92	0.000

Reinforcing Interaction Design Data

Section No.	Elevation ft	Size	Ratio P_u	Ratio M_{ux}	Ratio M_{uy}	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
			ϕP_n	ϕM_{ux}	ϕM_{uy}			
L6	32 - 1	6-1/2x1-1/4	0.867	0.000	0.000	0.867 ¹	1.000	4.8.1
L6	42 - 32	6-1/2x1-1/4	0.621	0.025	0.000	0.621 ¹	1.000	4.8.1

¹ $P_u / \phi P_n$ controls

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Tension Checks

Reinforcing Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u lb	φP _n lb	Ratio $\frac{P_u}{\phi P_n}$
L6	32 - 1	6-1/2x1-1/4	31.00	1.00	33.3	7.1875	357002.00	431250.00	0.828 ¹
L6	42 - 32	6-1/2x1-1/4	10.00	1.00	33.3	7.1875	259782.00	431250.00	0.602 ¹

¹ P_u / φP_n controls

Reinforcing Bending Design Data

Section No.	Elevation ft	Size	M _{ux} lb-ft	φM _{ux} lb-ft	Ratio $\frac{M_{ux}}{\phi M_{ux}}$	M _{uy} lb-ft	φM _{uy} lb-ft	Ratio $\frac{M_{uy}}{\phi M_{uy}}$
L6	32 - 1	6-1/2x1-1/4	-5408.34	64365.25	0.084	1.50	12377.92	0.000
L6	42 - 32	6-1/2x1-1/4	-3958.73	64365.25	0.062	1.17	12377.92	0.000

Reinforcing Interaction Design Data

Section No.	Elevation ft	Size	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{ux}}$	Ratio $\frac{M_{uy}}{\phi M_{uy}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L6	32 - 1	6-1/2x1-1/4	0.828	0.084	0.000	0.828 ¹	1.000	4.8.1
L6	42 - 32	6-1/2x1-1/4	0.602	0.062	0.000	0.602 ¹	1.000	4.8.1

¹ P_u / φP_n controls

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	φP _{allow} lb	% Capacity	Pass Fail	
L1	191.08 - 165.33	Pole	TP26x19.5625x0.25	1	-4104.54	1475010.00	16.2	Pass	
L2	165.33 - 130.75	Pole	TP34.0052x24.77x0.3125	2	-13917.40	2384690.00	58.1	Pass	
L3	130.75 - 97.08	Pole	TP41.0625x32.437x0.375	3	-22407.20	3454030.00	73.6	Pass	
L4	97.08 - 64.25	Pole	TP49.0052x39.2383x0.375	4	-32579.60	3903670.00	88.3	Pass	
L5	64.25 - 32.25	Pole	TP56.0104x46.8227x0.375	5	-42646.50	4213510.00	98.7	Pass	
L6	32.25 - 1	Pole	TP62.0781x53.7291x0.375	6	122241.00	4296360.00	77.3	Pass	
L6	32 - 1	Reinforcing	6-1/2x1-1/4	14	-370862.00	427884.00	86.7	Pass	
	42 - 32	Reinforcing	6-1/2x1-1/4	10	-265855.00	427884.00	62.1	Pass	
							Summary		
							Pole (L5)	98.7	Pass
							Reinforcing (L6)	86.7	Pass

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Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
						Base Plate	85.9	Pass
						RATING =	98.7	Pass

Program Version 8.0.7.5 - 8/3/2020 File:C:/Users/Joshua Gildert/Box/Projects/New England Projects/AT&T/NEW ENGLAND/CT/CT5404 - 319-321 NEW BRITAIN AVE, FARMINGTON CT - MP/2C, 3C, Retro, 5G/Structural/Working Files/Structural Analysis/Analysis/tnx/CT5404.eri

Mount Analysis Report

Site Number	CT5404
FA Number	10071289
Site Name	Unionville - Farmington
Project	LTE 4C/5C/5G NR, BWE & RETRO
Pace ID	MRCTB048765, MRCTB048768, MRCTB048766, MRCTB048767, MRCTB048770
Site Location	319 – 321 New Britain Avenue Unionville, CT 06085 41.7497919° N, 72.8726989° W
Design Codes	TIA-222-H Standards 2018 IBC ASCE 7-16 2018 CT State Building Code
Mount Centerline	150 ft.
Mount Classification	Sector Frame

	Stress Ratio	Overall Result
Existing Mount	79%	PASS

Client:

at&t Mobility Corp.
 55 Cochituate Road
 Framingham, MA 01701



at&t



Date: 12/23/2020

Digitally signed by: Derek J. Creaser, P.E.
 DN: CN = Derek J. Creaser, P.E.
 email = dcreaser@clinellc.com C = US O = Centerline Communications OU = Director - A&E Services
 Date: 2020.12.23 10:09:58 -05'00'

Scope of Work:

Centerline Communications was authorized by AT&T to perform a mount analysis of the existing antenna mount to determine its capacity to support the proposed and existing AT&T equipment listed in this report. This mount was analyzed using RISA 3D v17.0.4.

Final Appurtenances Configuration:

Elevation (ft)	Position ¹	Azimuth (degrees)	Quantity	Appurtenance	Sector
150	MP1	40	1	800-10121 Antenna	Sector 1
150	MP2	40	1	DMP65R-BU8DA Antenna	
150	MP3	40	1	OPA65R-BU8DA Antenna	
150	MP4	40	1	TPA-65R-LCUUUU-H8 Antenna	
150	R1	40	2	LGP21401 TMA	
150	MP1	40	1	4449 B5/B12 RRH	
150	R5	40	1	4478 B14 RRH	
150	R5	40	1	8843 B2/B66A RRH	
150	R4	40	1	RRUS-E2 B29 RRH	
150	R6	40	1	RRUS-32 B30 RRH	
150	MP13	40	1	DC6-48-60-0-8F Squid	
150	MP5	160	1	800-10121 Antenna	
150	MP6	160	1	DMP65R-BU8DA Antenna	
150	MP7	160	1	OPA65R-BU8DA Antenna	
150	MP8	160	1	TPA-65R-LCUUUU-H8 Antenna	
150	R2	160	2	LGP21401 TMA	
150	R7	160	1	4449 B5/B12 RRH	
150	R8	160	1	4478 B14 RRH	
150	R8	160	1	8843 B2/B66A RRH	
150	R7	160	1	RRUS-E2 B29 RRH	
150	R10	160	1	RRUS-32 B30 RRH	
150	R9	160	1	DC6-48-60-0-8F Squid	
150	MP9	260	1	800-10121 Antenna	Sector 3
150	MP10	260	1	DMP65R-BU8DA Antenna	
150	MP11	260	1	OPA65R-BU8DA Antenna	
150	MP12	260	1	TPA-65R-LCUUUU-H8 Antenna	
150	R3	260	2	LGP21401 TMA	
150	MP9	260	1	4449 B5/B12 RRH	
150	R13	260	1	4478 B14 RRH	
150	R13	260	1	8843 B2/B66A RRH	
150	R11	260	1	RRUS-E2 B29 RRH	
150	R12	260	1	RRUS-32 B30 RRH	
150	R11	260	1	DC6-48-60-0-8F Squid	

Notes:

1. MP represent Mount Pipe and R represent RRH mount.
2. Existing Appurtenance
3. **Proposed Appurtenance**

Design Criteria:

Design Codes:

TIA-222-H Standards
 2018 IBC
 ASCE 7-16
 2018 CT State Building Code

Ultimate Wind Speed	116 mph
Wind Speed with Ice	50 mph
Ice Thickness	1.5 in.
Exposure Category	C
Topographic Method	Method 1, Cat. 1
Risk Category	II
Site Soil Class (Assumed)	D-Stiff Soil
Seismic Design Category	B
Spectral Response Acceleration Parameter at a Short Periods, S_s	0.184 g
Spectral Response Acceleration Parameter at a Period of 1 Second, S_1	0.054 g
Short Period Site Coefficient, F_a	1.6
Long Period Site Coefficient, F_v	2.4

*Refer to calculations for additional design criteria.

Conclusion:

The results of the analysis concluded that the existing AT&T mounts *are capable* to support the proposed and existing AT&T equipment loads upon completion of the modifications. Centerline Communications recommends the following:

- Install (1) 2" STD x 8.0' long mount pipe in all sectors.

	Stress Ratio	Overall Result
Existing Mount	79%	PASS

Reference Documents:

- AT&T RFDS ID #4093553 V1.0, dated 08/14/2020
- Structural Analysis by Maser Consulting, dated 08/16/2018
- Tower Mapping by Tower Engineering Professionals, dated 12/20/2017
- Mount Mapping Report by Trylon, dated 11/17/2020

Assumptions and Limitations:

- The calculations performed by Centerline Communications are limited to the structural members in these calculations only.
- Structural calculations in this report do not check the adequacy of the supporting structure, other mounts, or coax mounting attachments.
- The calculation assumes all structural members to be in good condition i.e. no damage, rust or other defects.

Photos:



Alpha Sector



Beta Sector




Gamma Sector



Overall Tower

Design Calculations

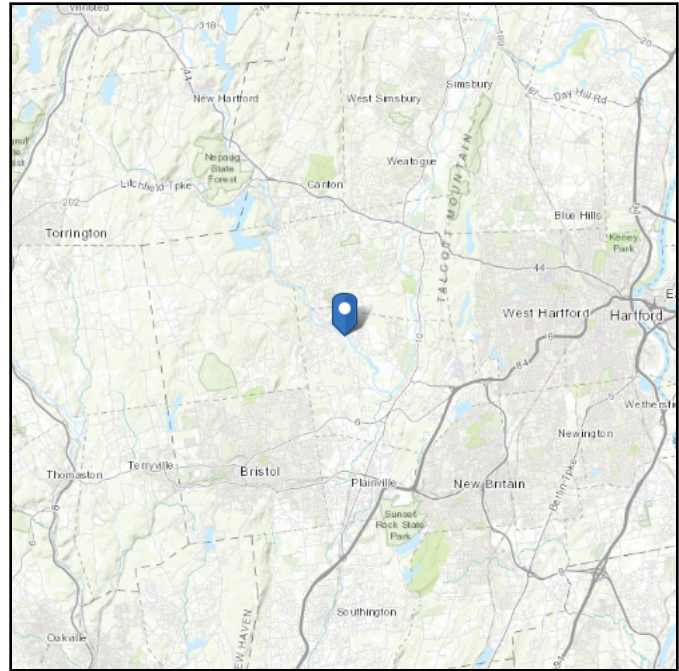


ASCE 7 Hazards Report

Address:
No Address at This Location

Standard: ASCE/SEI 7-16
Risk Category: II
Soil Class: D - Default (see Section 11.4.3)

Elevation: 185.49 ft (NAVD 88)
Latitude: 41.749792
Longitude: -72.872699



Wind

Results:

Wind Speed:	116 Vmph
10-year MRI	75 Vmph
25-year MRI	84 Vmph
50-year MRI	90 Vmph
100-year MRI	96 Vmph

Data Source: ASCE/SEI 7-16, Fig. 26.5-1B and Figs. CC.2-1–CC.2-4

Date Accessed: Tue Dec 22 2020

Value provided is 3-second gust wind speeds at 33 ft above ground for Exposure C Category, based on linear interpolation between contours. Wind speeds are interpolated in accordance with the 7-16 Standard. Wind speeds correspond to approximately a 7% probability of exceedance in 50 years (annual exceedance probability = 0.00143, MRI = 700 years).

Site is in a hurricane-prone region as defined in ASCE/SEI 7-16 Section 26.2. Glazed openings need not be protected against wind-borne debris.

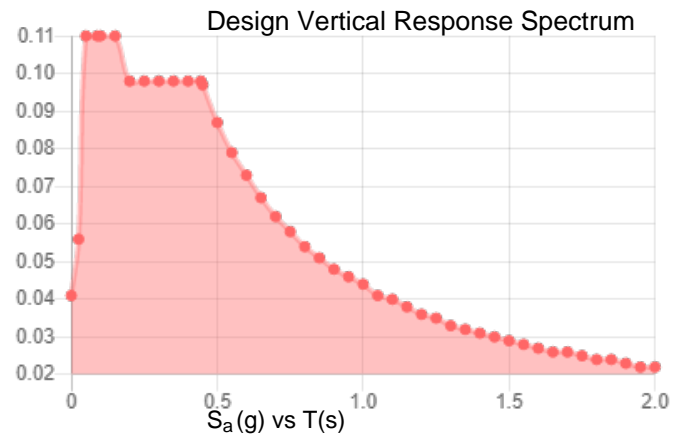
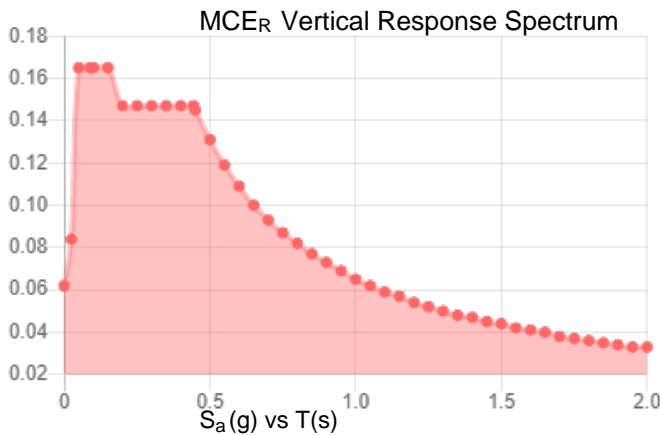
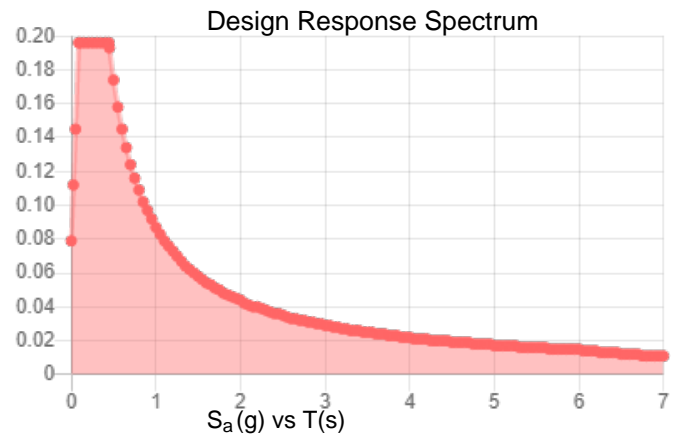
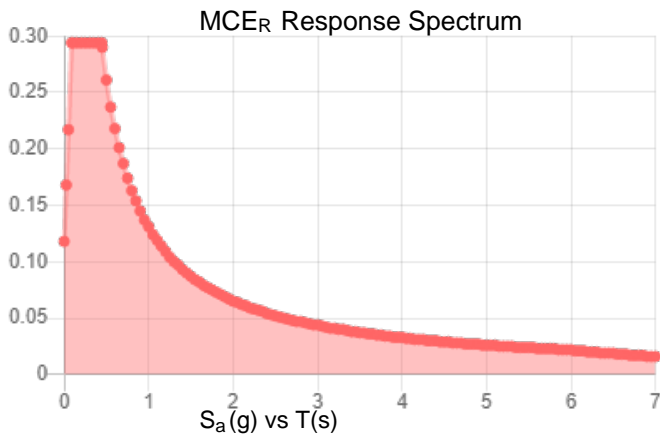
Mountainous terrain, gorges, ocean promontories, and special wind regions should be examined for unusual wind conditions.

Site Soil Class: D - Default (see Section 11.4.3)

Results:

S_s :	0.184	S_{D1} :	0.087
S_1 :	0.054	T_L :	6
F_a :	1.6	PGA :	0.099
F_v :	2.4	PGA _M :	0.158
S_{MS} :	0.294	F_{PGA} :	1.6
S_{M1} :	0.131	I_e :	1
S_{DS} :	0.196	C_v :	0.7

Seismic Design Category B



Data Accessed:

Tue Dec 22 2020

Date Source:

USGS Seismic Design Maps based on ASCE/SEI 7-16 and ASCE/SEI 7-16 Table 1.5-2. Additional data for site-specific ground motion procedures in accordance with ASCE/SEI 7-16 Ch. 21 are available from USGS.

Ice

Results:

Ice Thickness: 1.50 in.

Concurrent Temperature: 5 F

Gust Speed: 50 mph

Data Source: Standard ASCE/SEI 7-16, Figs. 10-2 through 10-8

Date Accessed: Tue Dec 22 2020

Ice thicknesses on structures in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

Values provided are equivalent radial ice thicknesses due to freezing rain with concurrent 3-second gust speeds, for a 500-year mean recurrence interval, and temperatures concurrent with ice thicknesses due to freezing rain. Thicknesses for ice accretions caused by other sources shall be obtained from local meteorological studies. Ice thicknesses in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

The ASCE 7 Hazard Tool is provided for your convenience, for informational purposes only, and is provided “as is” and without warranties of any kind. The location data included herein has been obtained from information developed, produced, and maintained by third party providers; or has been extrapolated from maps incorporated in the ASCE 7 standard. While ASCE has made every effort to use data obtained from reliable sources or methodologies, ASCE does not make any representations or warranties as to the accuracy, completeness, reliability, currency, or quality of any data provided herein. Any third-party links provided by this Tool should not be construed as an endorsement, affiliation, relationship, or sponsorship of such third-party content by or from ASCE.

ASCE does not intend, nor should anyone interpret, the results provided by this Tool to replace the sound judgment of a competent professional, having knowledge and experience in the appropriate field(s) of practice, nor to substitute for the standard of care required of such professionals in interpreting and applying the contents of this Tool or the ASCE 7 standard.

In using this Tool, you expressly assume all risks associated with your use. Under no circumstances shall ASCE or its officers, directors, employees, members, affiliates, or agents be liable to you or any other person for any direct, indirect, special, incidental, or consequential damages arising from or related to your use of, or reliance on, the Tool or any information obtained therein. To the fullest extent permitted by law, you agree to release and hold harmless ASCE from any and all liability of any nature arising out of or resulting from any use of data provided by the ASCE 7 Hazard Tool.

Site Details	
Site Name	UNIONVILLE-FARMINGTON
Carrier	AT&T
City, State	UNIONVILLE, CT
Project	LTE 4C, 5C, 5G NR, BWE & RETRO

Mount Details	
Mount Type	Sector Frame
Mount Height, z	150 ft
Number of Sectors	3
Tower Type	Monopole
Tower Height, h	190 ft

Topographic Factors	
Topographic Procedure	No Topo
Feature	Flat
Crest Height, H	N/A ft
Distance from Crest, x	N/A ft
Slope (H/L)	N/A
Topographic Factor, K_{zt}	1.00

Seismic Factors	
Importance Factor, I_E	1
Short Period Spectral Acceleration, S_s	0.184 g
1 Second Period Spectral Acceleration, S_1	0.054 g
Long-Period Transition Period, T_L	6
Design Category	B
Short Period Site Coefficient, F_a	1.60
Long-Period Site Coefficient, F_v	2.4

Site Parameters	
Wind Speed, V	116 mph
Wind Speed with Ice, V_i	50 mph
Design Ice Thickness, t_i	1.5 in
Risk Category	II
Exposure Category	C
AMSL	185 ft
Site Soil Class	D-Stiff Soil (Assumed)

Code	
Building Code	2018 IBC
TIA Code	TIA-222-H
ASCE Code	7-16

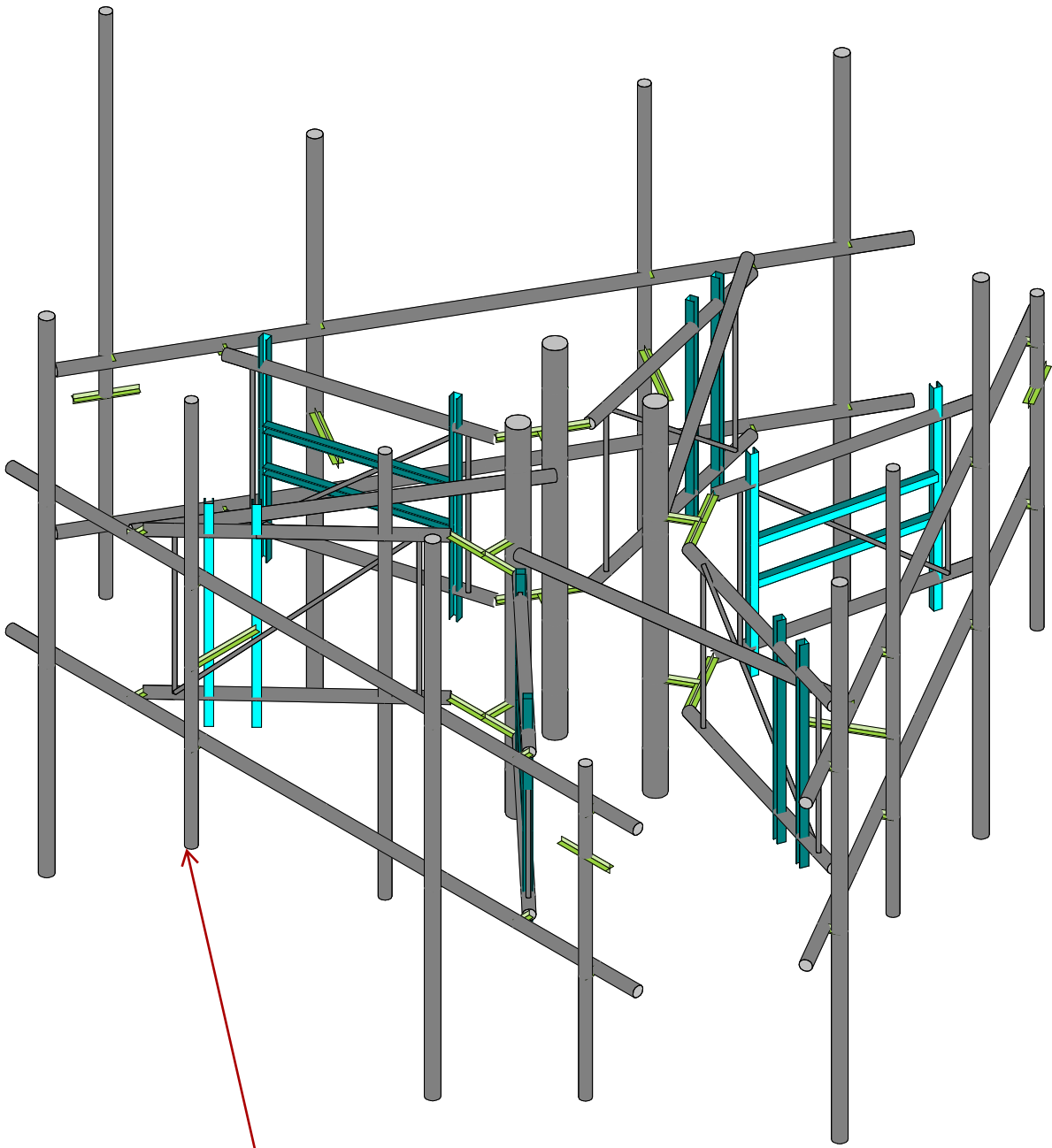
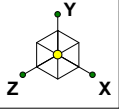
Site Constants	
Importance Factor, I	1.00
Wind Direction Prob. Factor, K_d	0.95
Velocity Pressure Coefficient, K_z	1.38
Ground Elevation Factor, K_e	0.99
Roof Wind Speed-Up Factor, K_s	1.00
Gust Effect Factor, G_h	1.00
Design Ice Thickness, t_{iz}	1.75 in
Velocity Pressure, q_z	44.81 psf
Velocity Pressure with Ice, q_{zi}	8.32 psf
Shielding Factor, K_a	0.90
Flat Velocity Pressure ($Ca = 2.0$)	89.61 psf
Round Velocity Pressure ($Ca = 1.2$)	53.77 psf
Round Velocity Pressure with Ice ($Ca = 1.2$)	9.99 psf
Engineer Initials	AP

Sector 1							
Appurtenances	Rad. Ht., ft	Wind Force				Dimensions	Weights
		Front EPA ft ²	Side EPA ft ²	0° Force lbs.	90° Force lbs.	H/W/D, in	Wt./Wt. _{ice} , lbs.
800-10121 Antenna	150	5.16	3.29	208.14	132.78	54.5\10.3\5.9	46.3\136.04
DMP65R-BU8DA Antenna	150	17.87	8.12	720.68	327.54	96\20.7\7.7	95.7\376.92
OPA65R-BU8DA Antenna	150	18.09	8.20	729.46	330.68	96\21\7.8	76.5\381.92
TPA-65R-LCUUUU-H8 Antenna	150	13.30	8.82	536.25	355.77	96\14.4\8.6	75\312.13
LGP21401 TMA	150	1.08	0.36	43.55	14.44	14.4\9\2.7	19\33.49
LGP21401 TMA	150	1.08	0.36	43.55	14.44	14.4\9\2.7	19\33.49
4449 B5/B12 RRH	150	1.65	1.30	66.54	52.42	15\13.2\10.4	73\72.19
4478 B14 RRH	150	2.02	1.25	81.51	50.49	18.1\13.4\8.3	59.4\74.1
8843 B2/B66A RRH	150	1.64	1.35	66.09	54.58	14.9\13.2\10.9	72\73.67
RRUS-E2 B29 RRH	150	3.15	1.29	126.83	51.83	20.4\18.5\7.5	53\95.39
RRUS-32 B30 RRH	150	2.6923	1.57275	108.568	63.423	26.7\12.1\6.7	60\85.29
DC6-48-60-0-8F Squid	150	3.5957	3.59571	145.002	145.002	31.4\10.24\10.24	26.2\106.46

*Dish force coefficient is calculated per Annex C of TIA-222-H, if available.

Existing Mount Results





**INSTALL (1) 2" STD. X 8' LONG
PIPE MOUNT IN EACH SECTOR**

Centerline Communication...

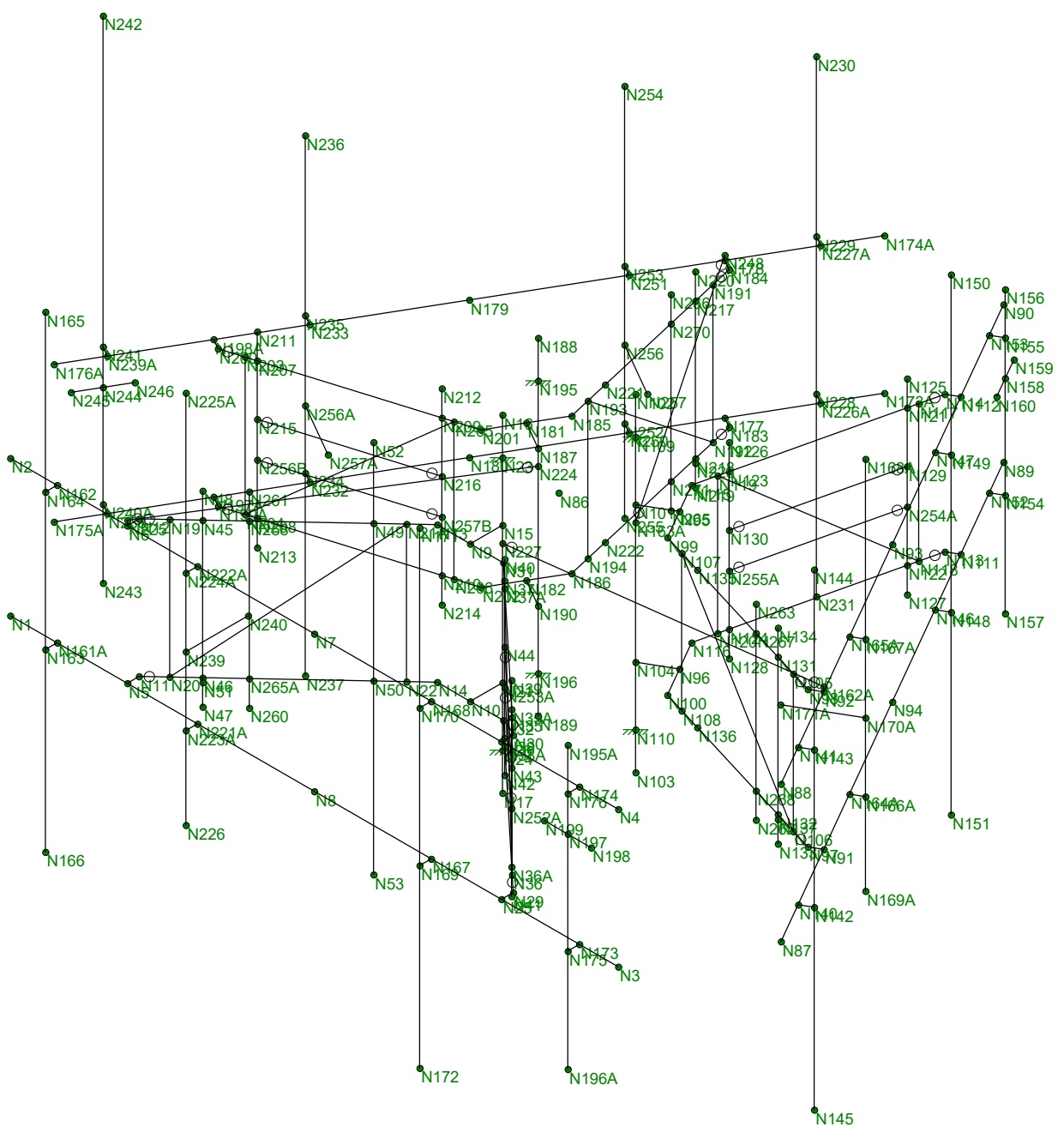
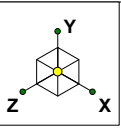
AP

CT5404_Mount

RENDERING

Dec 23, 2020 at 8:30 AM

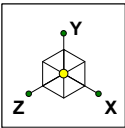
CT5404.r3d



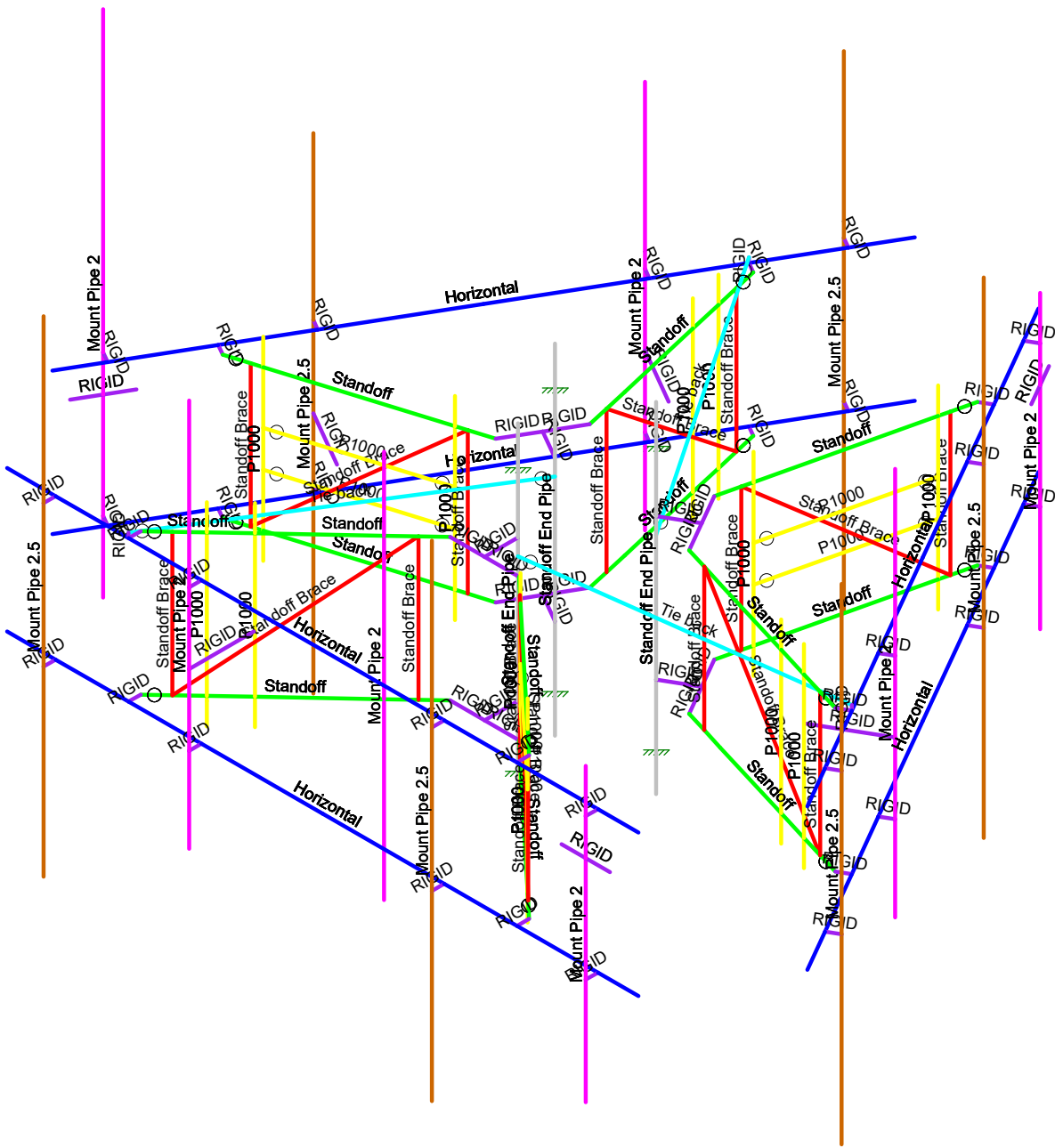
Centerline Communication...
AP

CT5404_Mount

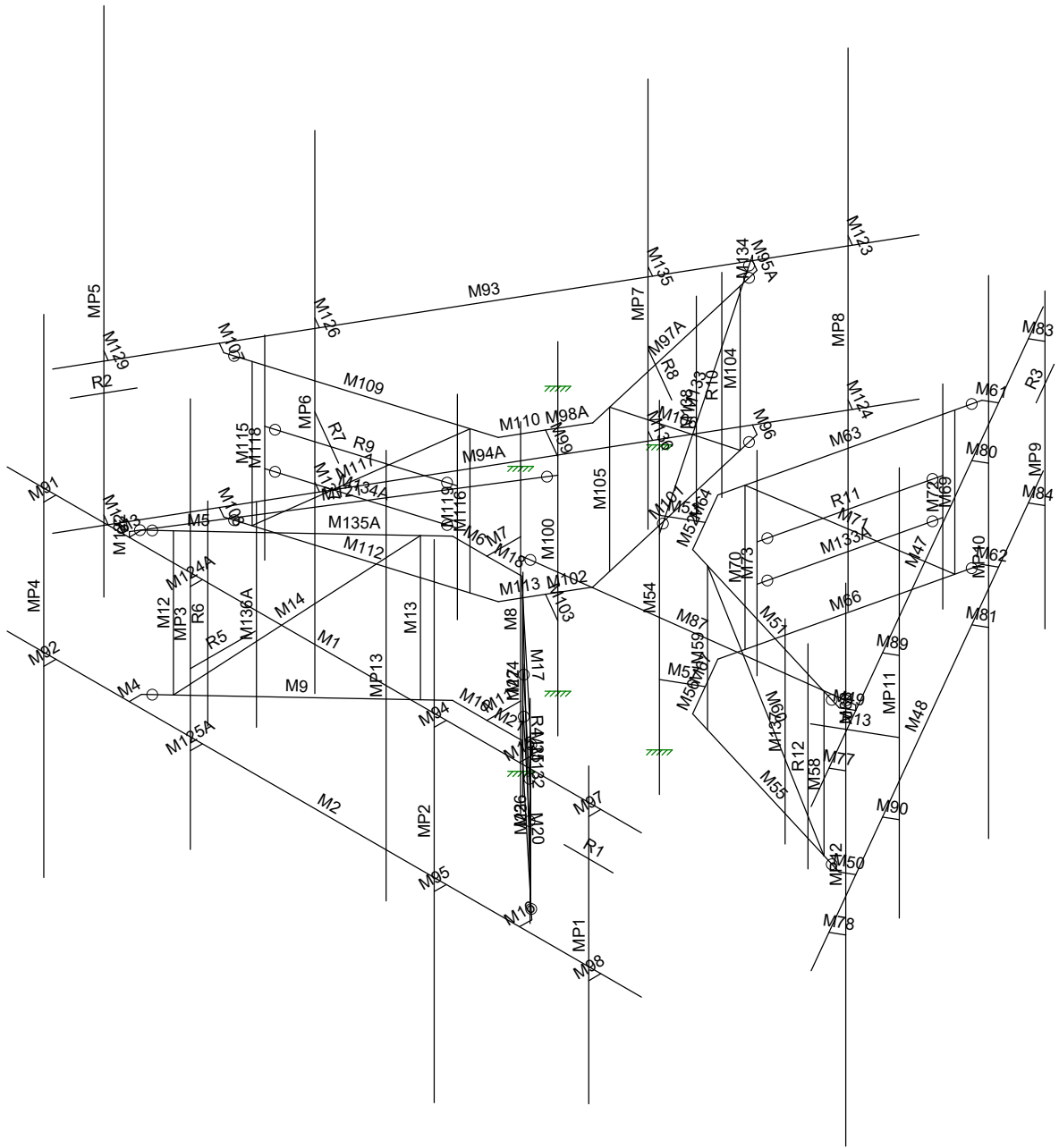
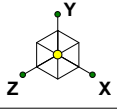
WIREFRAME
Dec 23, 2020 at 8:30 AM
CT5404.r3d



Section Sets	
[Blue Box]	Horizontal
[Green Box]	Standoff
[Red Box]	Standoff Brace
[Grey Box]	Standoff End Pipe
[Magenta Box]	Mount Pipe 2
[Cyan Box]	Tie back
[Orange Box]	Mount Pipe 2.5
[Yellow Box]	P1000
[Purple Box]	RIGID



Centerline Communication...		SECTION SET
AP	CT5404_Mount	Dec 23, 2020 at 8:31 AM
		CT5404.r3d



Centerline Communication...

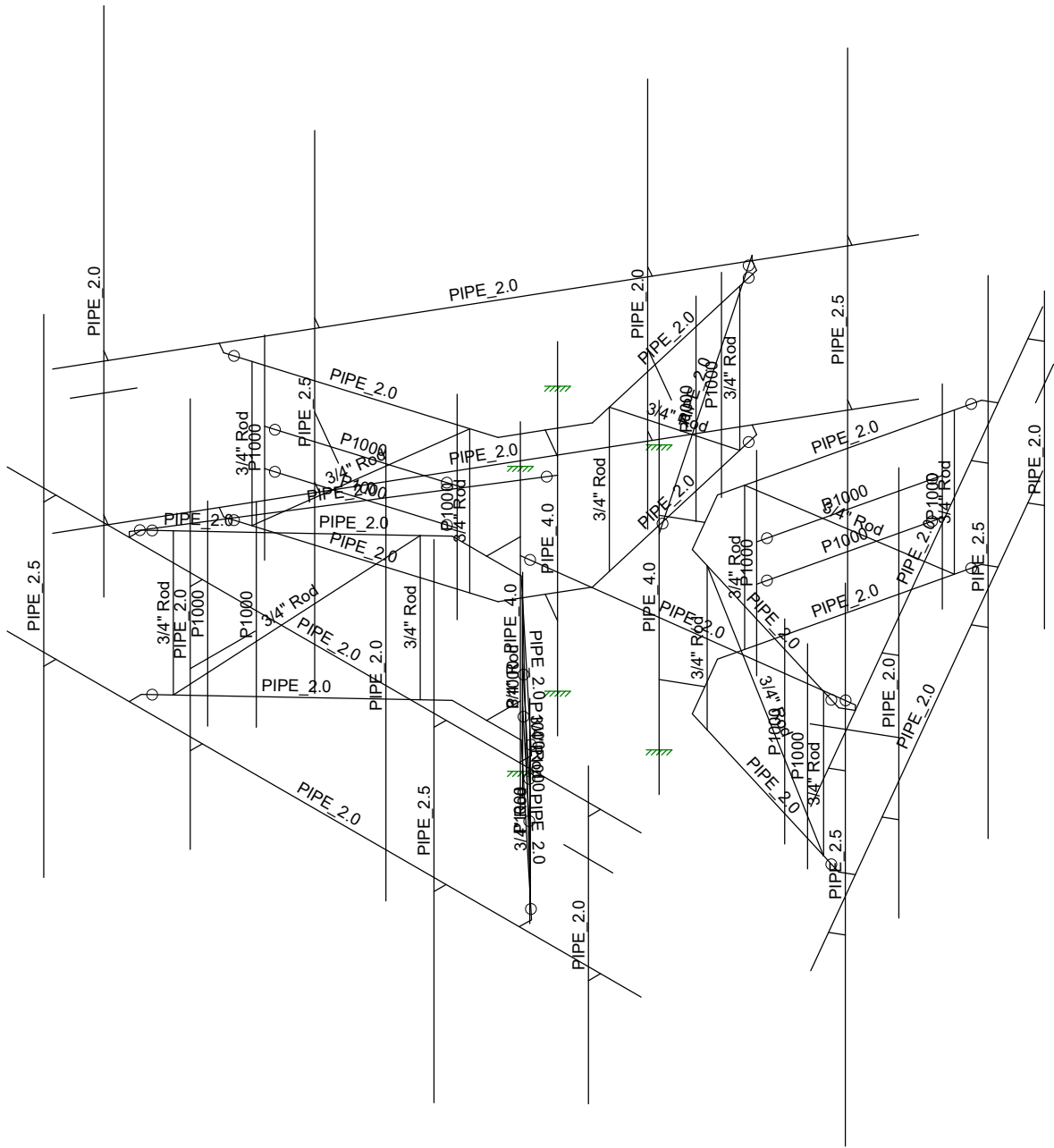
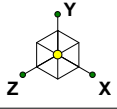
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CT5404_Mount

MEMBER LABEL

Dec 23, 2020 at 8:31 AM

CT5404.r3d



Centerline Communication...

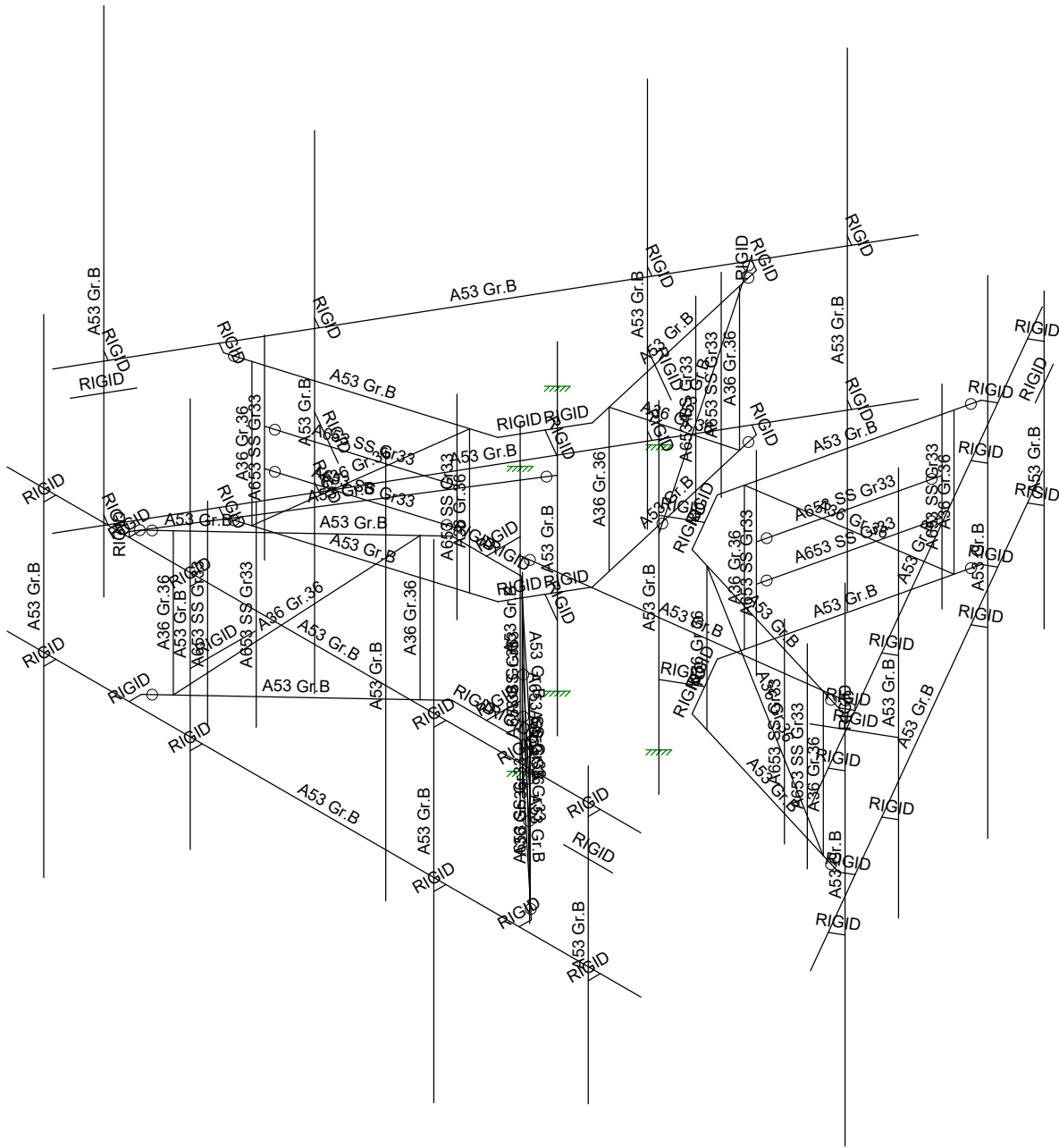
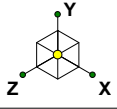
AP

CT5404_Mount

MEMBER SHAPE

Dec 23, 2020 at 8:32 AM

CT5404.r3d



Centerline Communication...

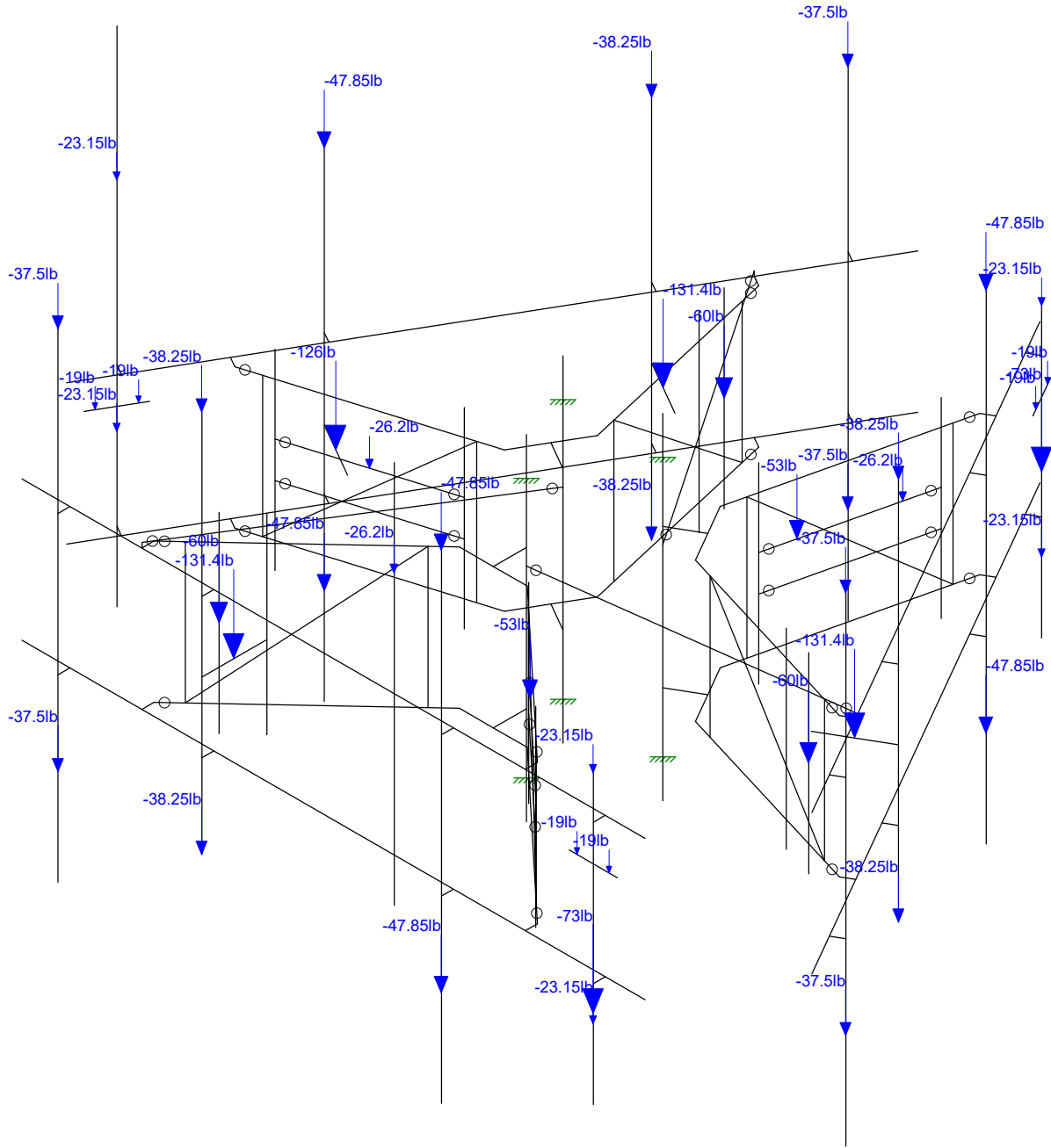
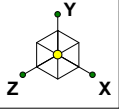
AP

CT5404_Mount

MATERIAL SETS

Dec 23, 2020 at 8:32 AM

CT5404.r3d



Loads: BLC 1, Dead Load

Centerline Communication...

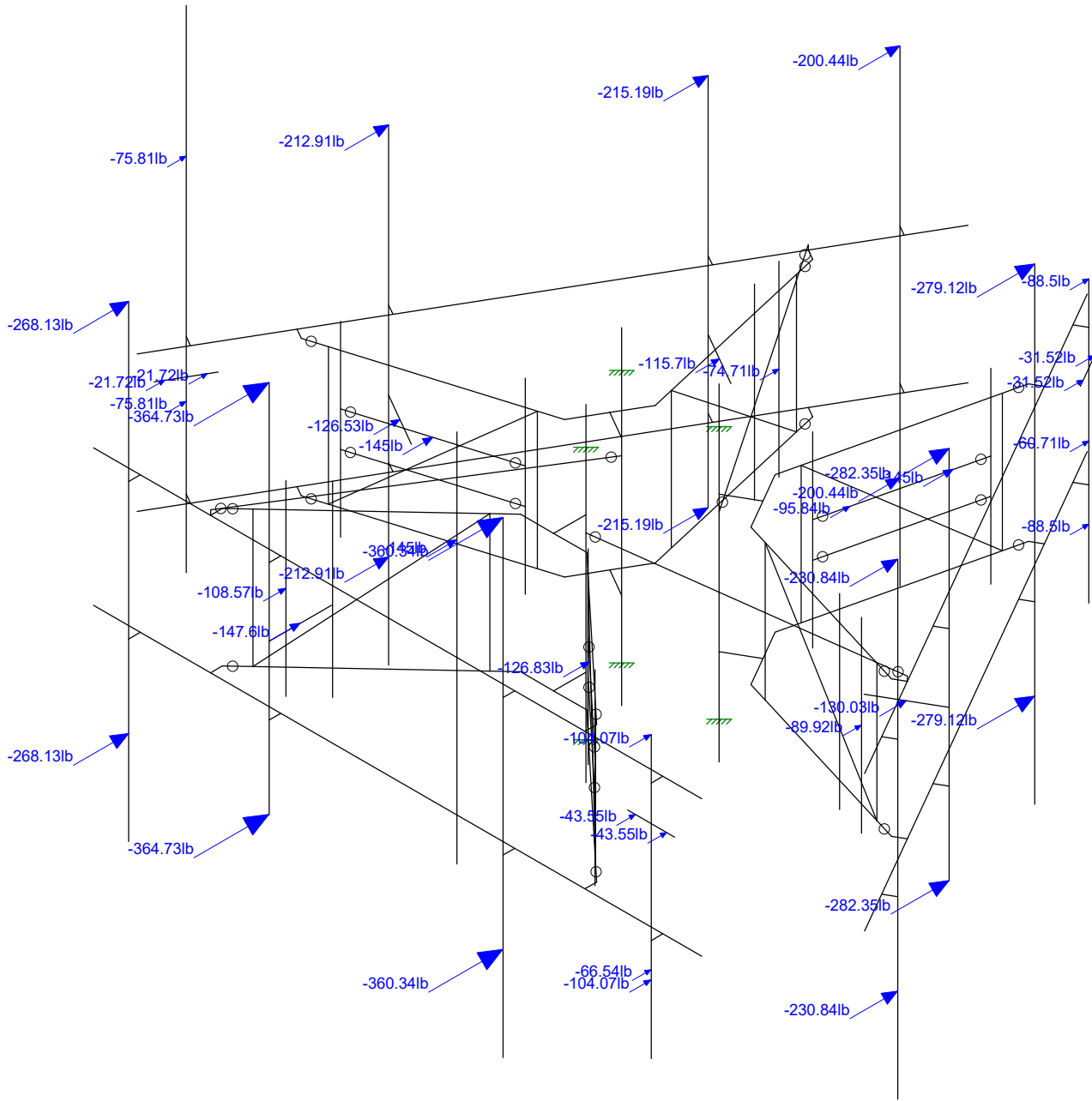
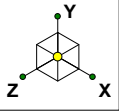
AP

CT5404_Mount

DEAD LOAD

Dec 23, 2020 at 8:32 AM

CT5404.r3d



Loads: BLC 2, Wind 0

Centerline Communication...

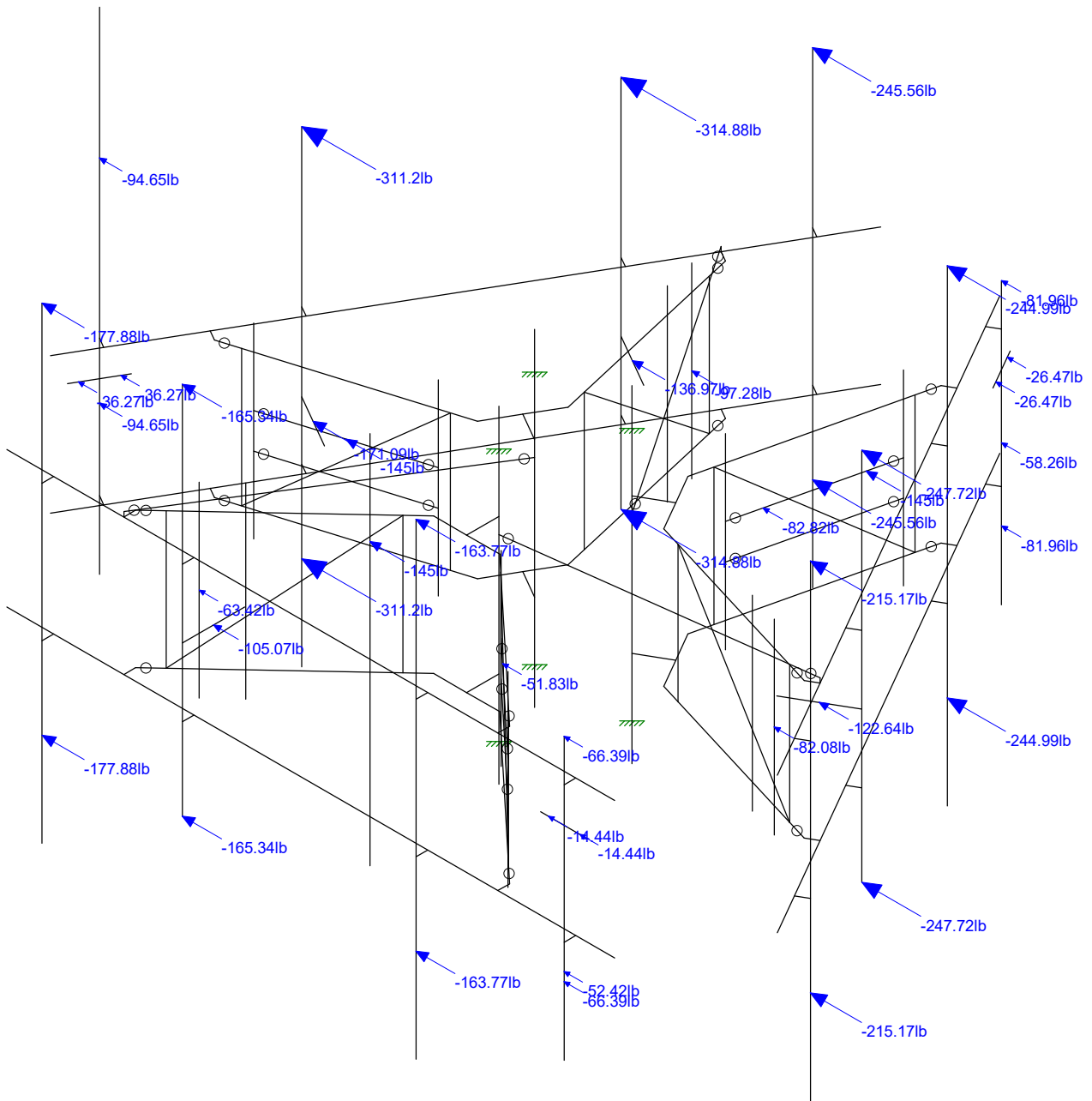
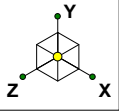
AP

CT5404_Mount

WIND 0

Dec 23, 2020 at 8:33 AM

CT5404.r3d



Loads: BLC 5, Wind 90

Centerline Communication...

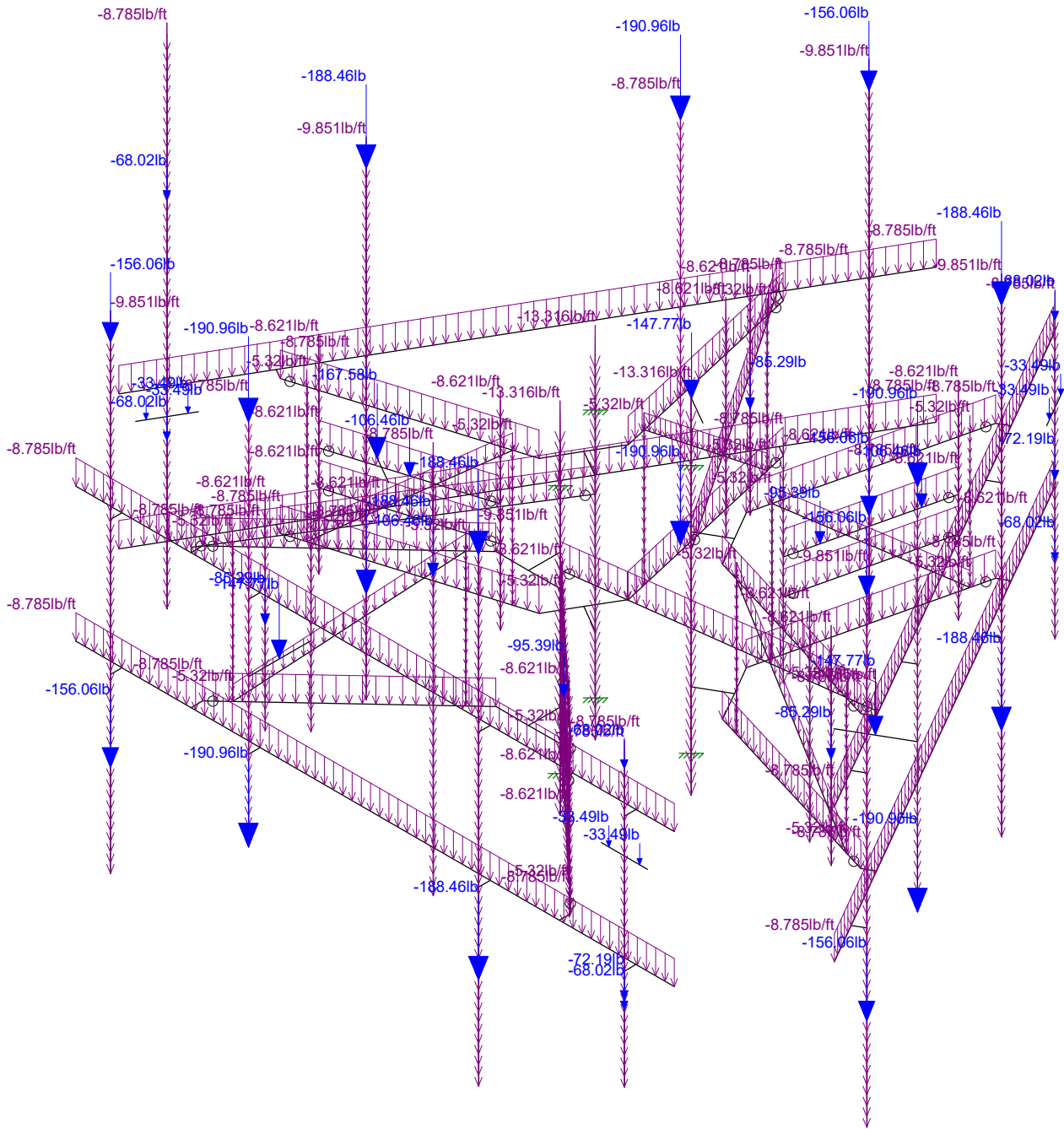
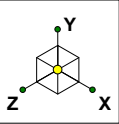
AP

CT5404_Mount

WIND 90

Dec 23, 2020 at 8:33 AM

CT5404.r3d



Loads: BLC 9, Ice Weight

Centerline Communication...

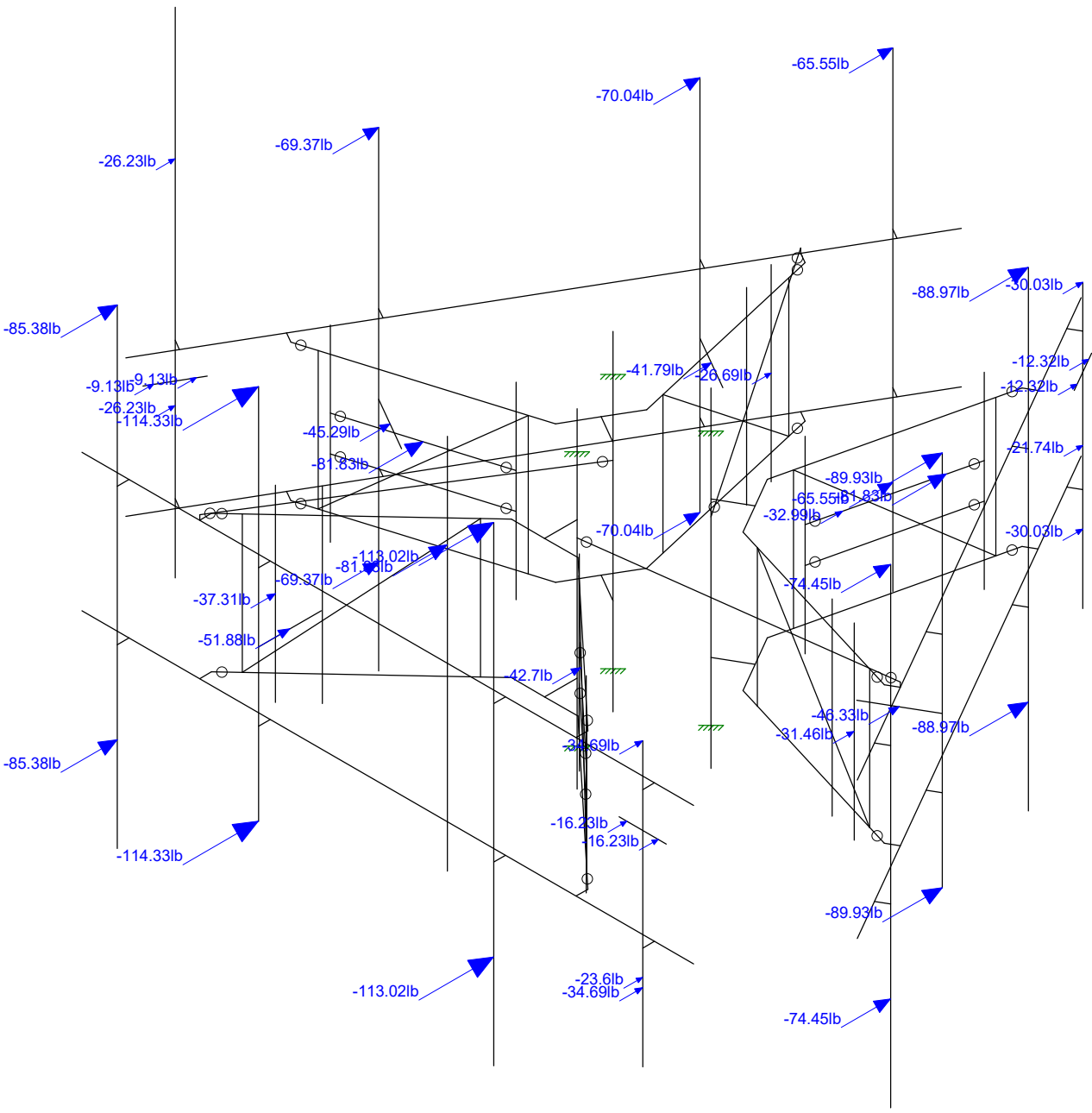
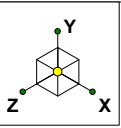
AP

CT5404_Mount

ICE WEIGHT

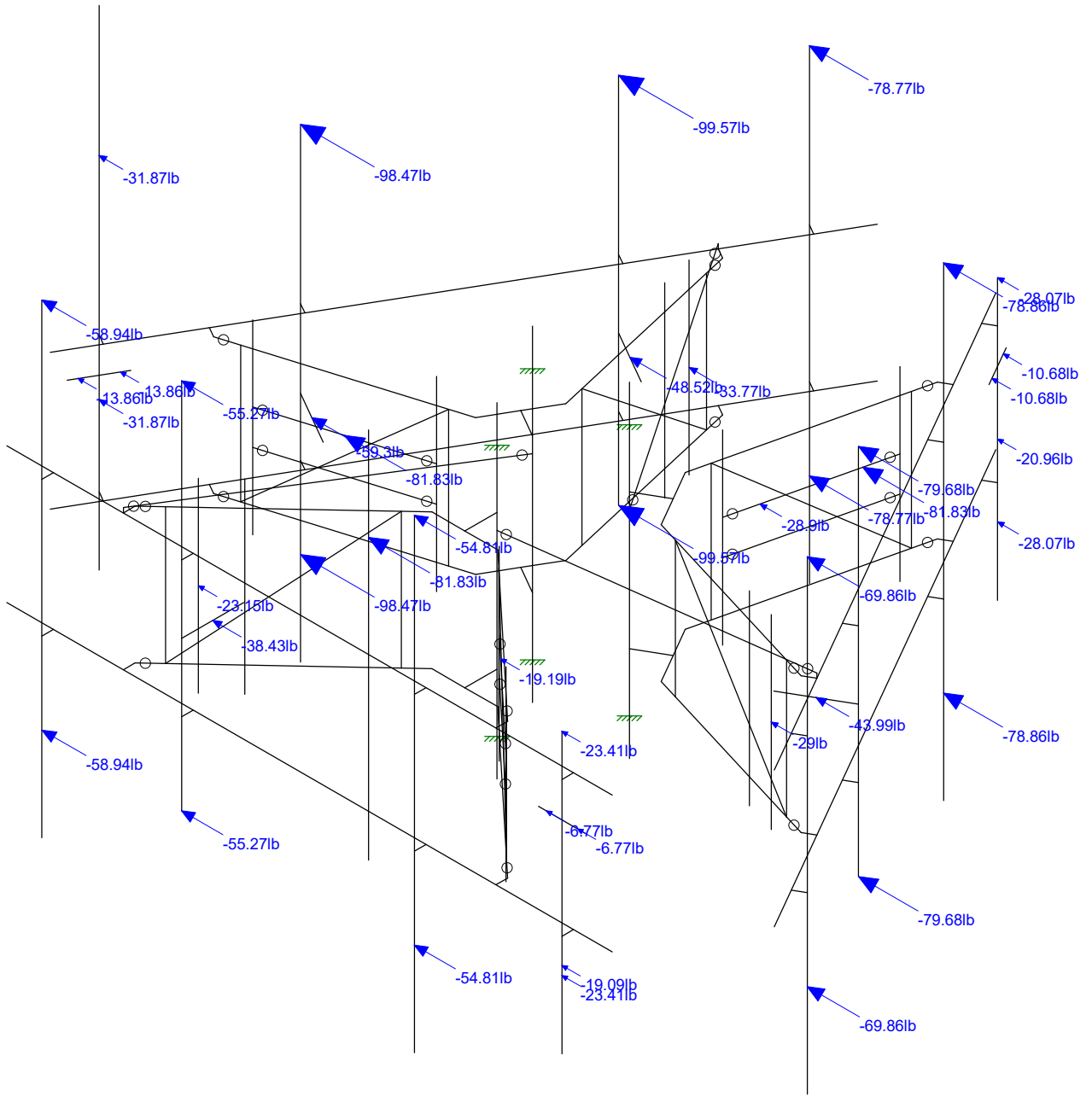
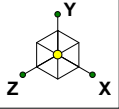
Dec 23, 2020 at 8:33 AM

CT5404.r3d



Loads: BLC 10, Ice + Wind 0

Centerline Communication...	CT5404_Mount	ICE + WIND 0
AP		Dec 23, 2020 at 8:33 AM
		CT5404.r3d



Loads: BLC 13, Ice + Wind 90

Centerline Communication...

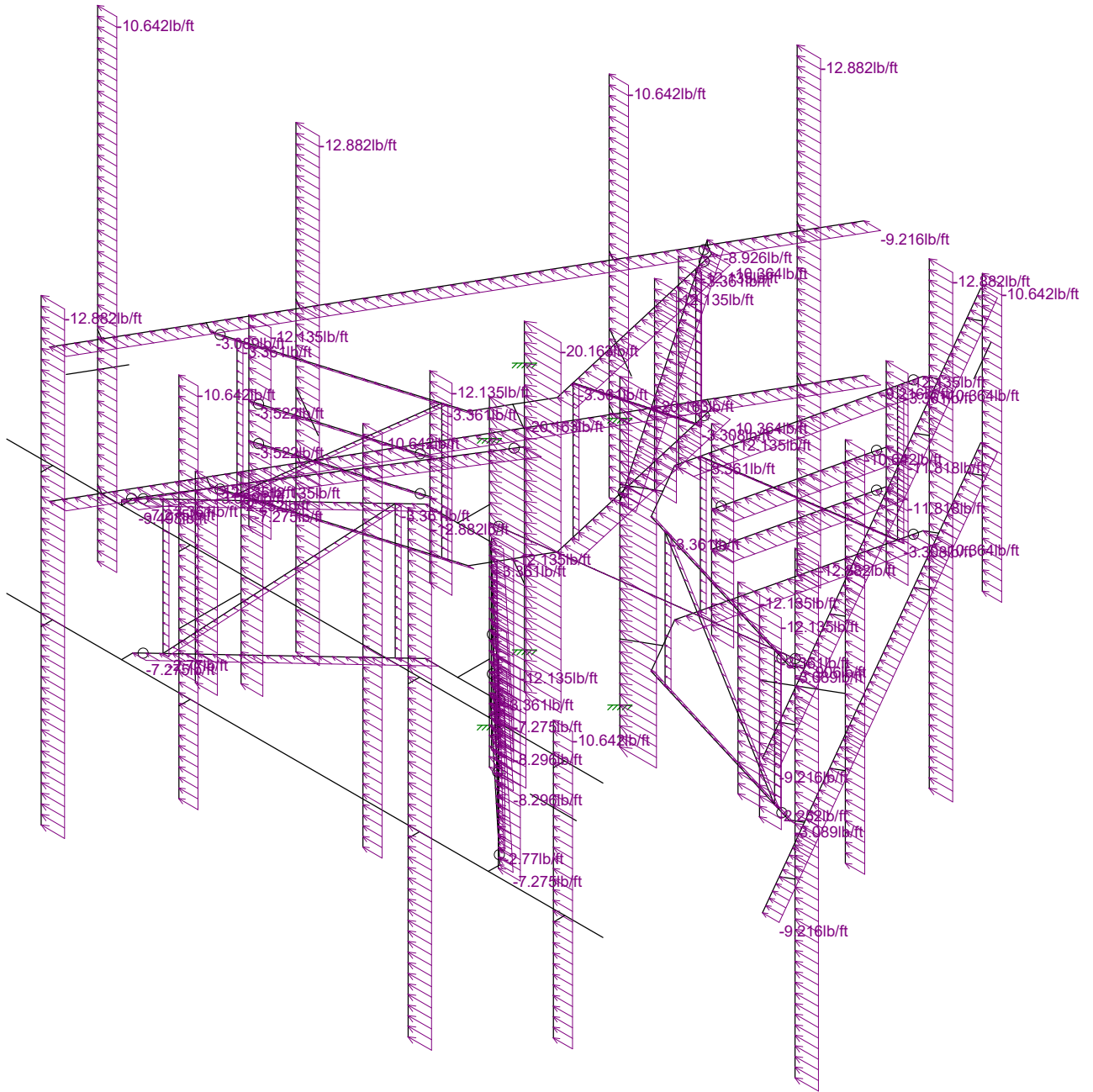
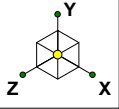
AP

CT5404_Mount

ICE + WIND 90

Dec 23, 2020 at 8:33 AM

CT5404.r3d



Loads: BLC 18, Distri. Wind X

Centerline Communication...

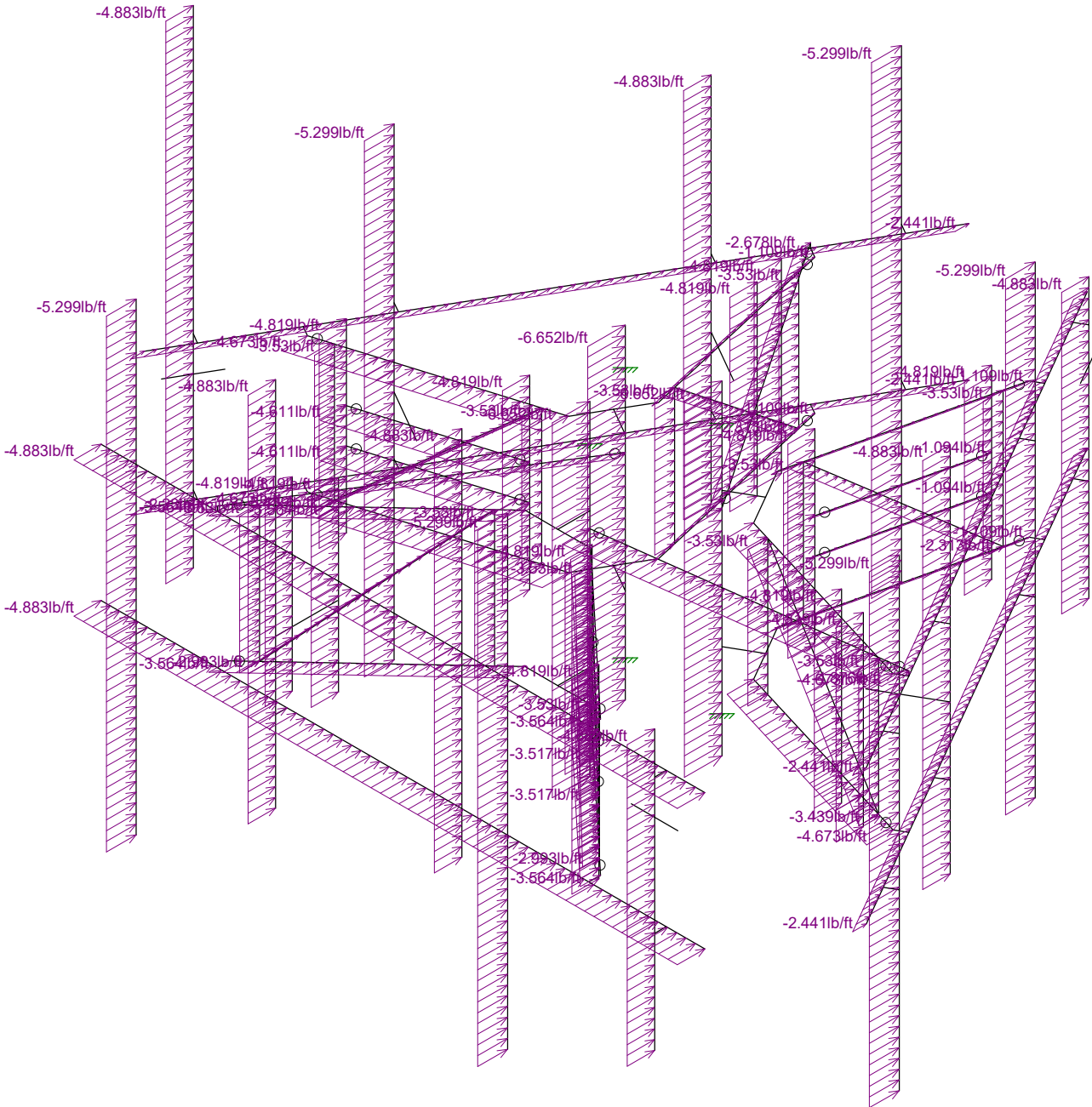
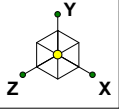
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CT5404_Mount

DISTR. WIND 90

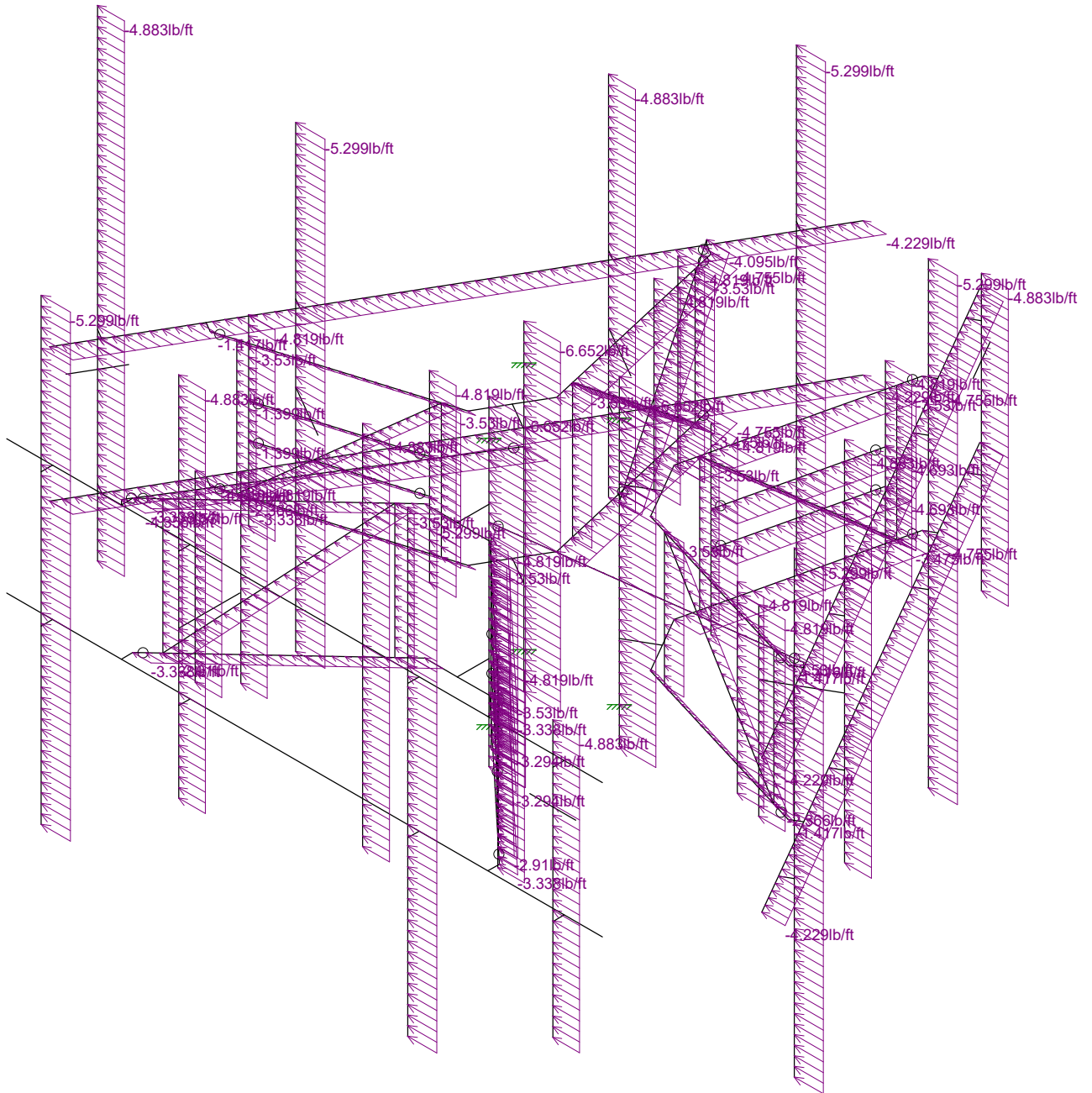
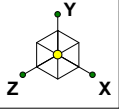
Dec 23, 2020 at 8:34 AM

CT5404.r3d



Loads: BLC 19, Distri. Ice + Wind Z

Centerline Communication...		DISTR. ICE + WIND 0
AP	CT5404_Mount	Dec 23, 2020 at 8:34 AM
		CT5404.r3d



Loads: BLC 20, Distr. Ice + Wind X

Centerline Communication...

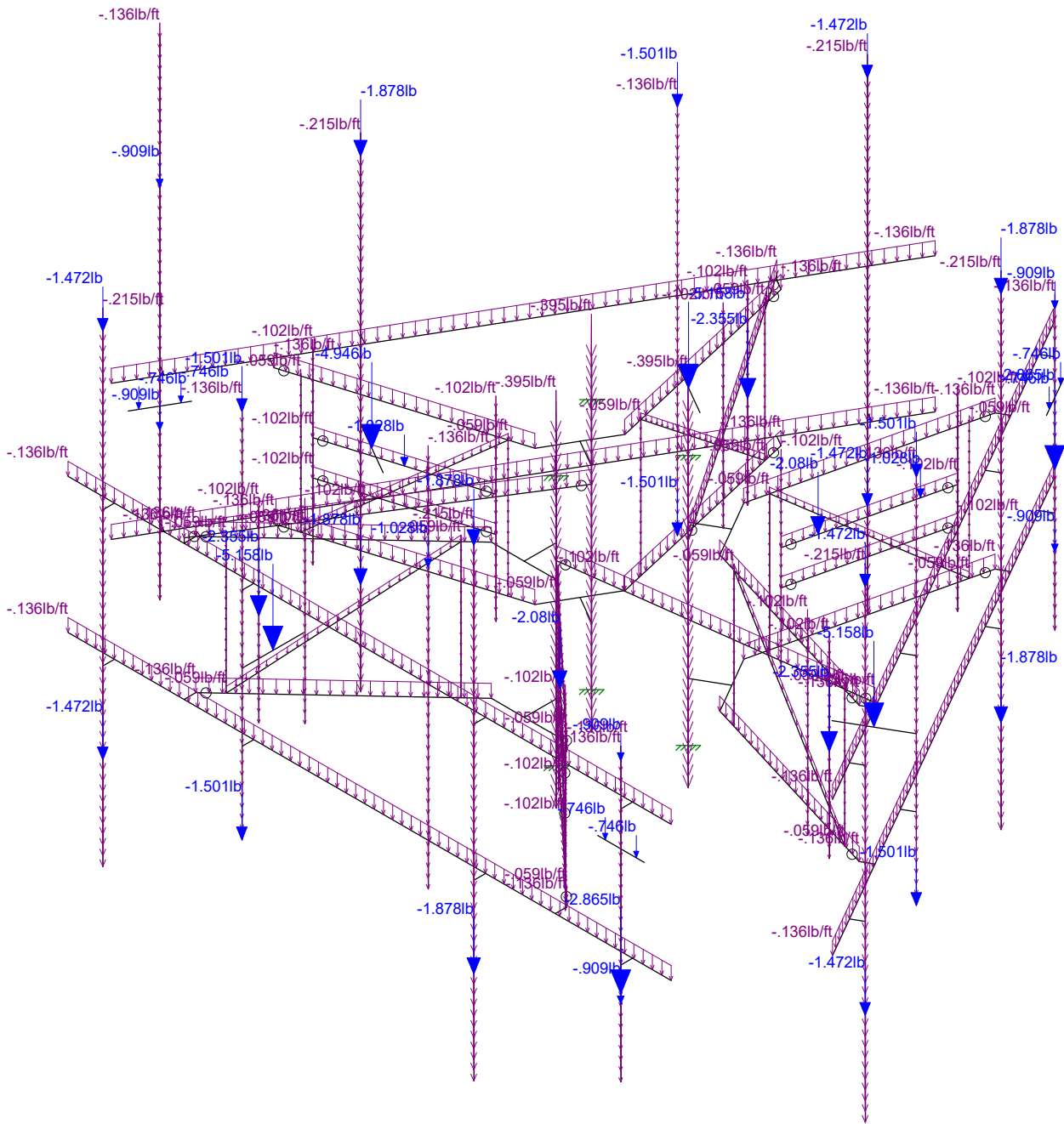
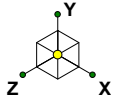
AP

CT5404_Mount

DISTR. ICE + WIND 90

Dec 23, 2020 at 8:34 AM

CT5404.r3d



Loads: BLC 21, Seismic Load Y

Centerline Communication...

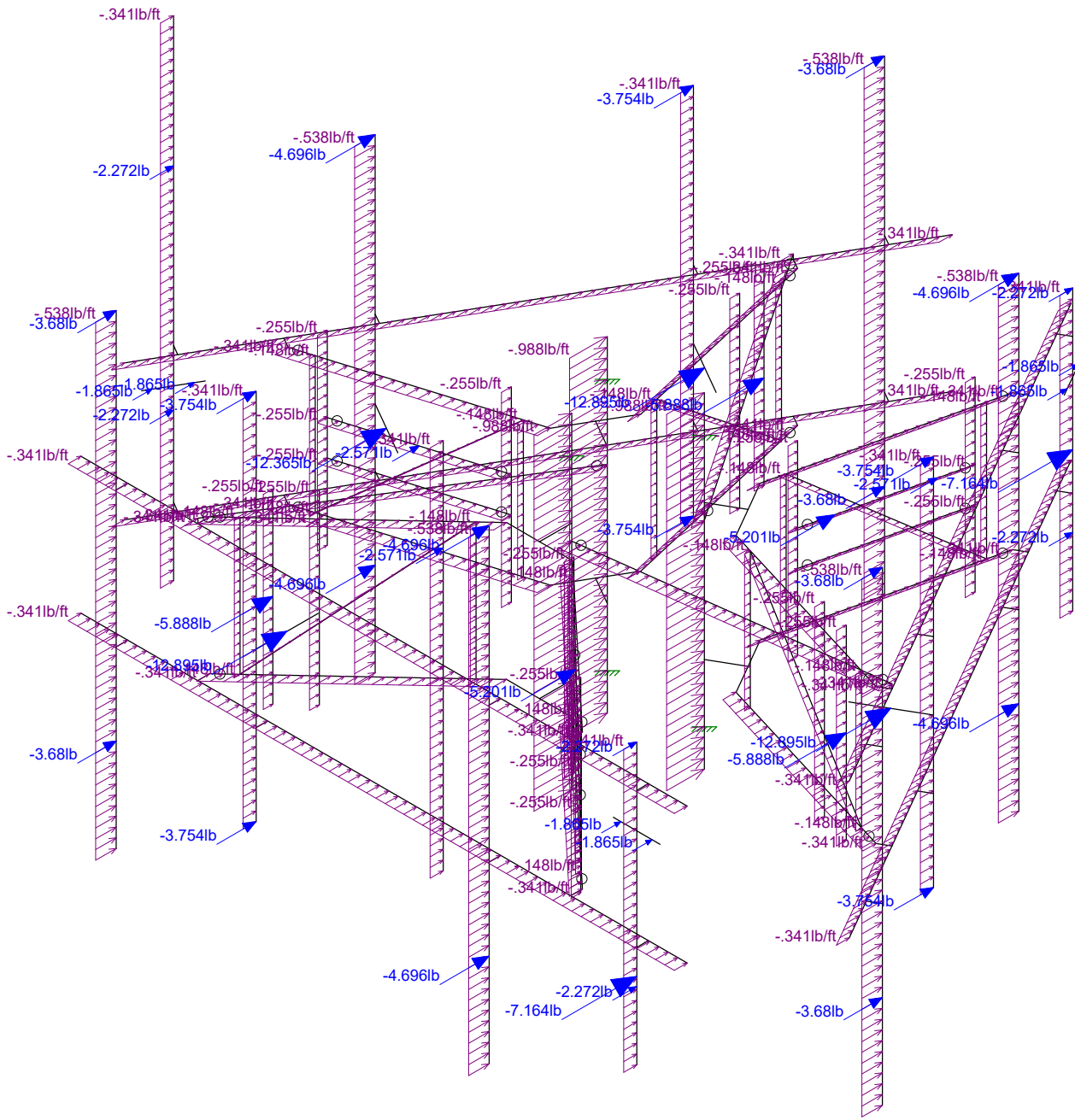
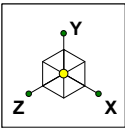
AP

CT5404_Mount

SEISMIC Y

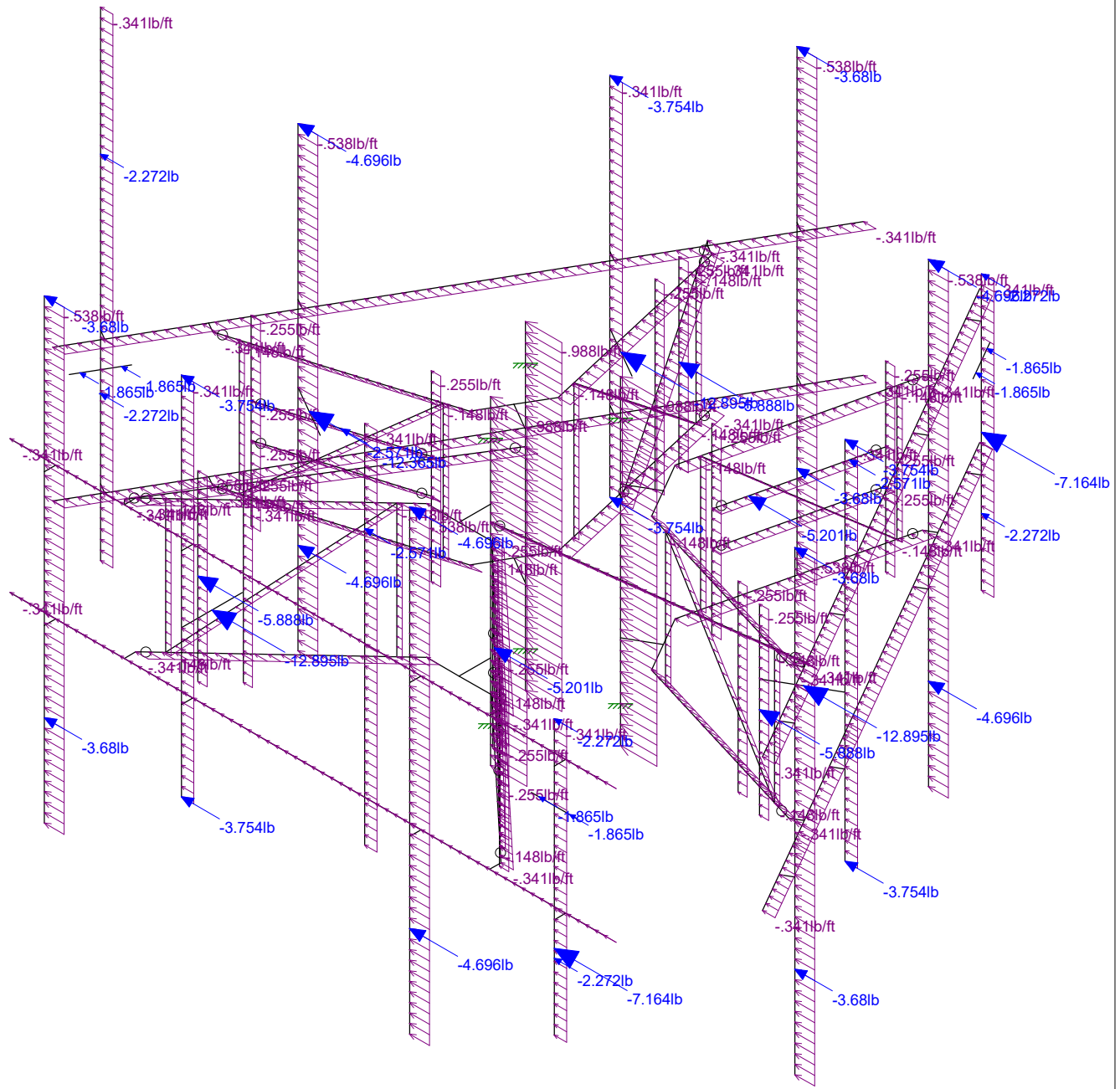
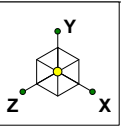
Dec 23, 2020 at 8:34 AM

CT5404.r3d



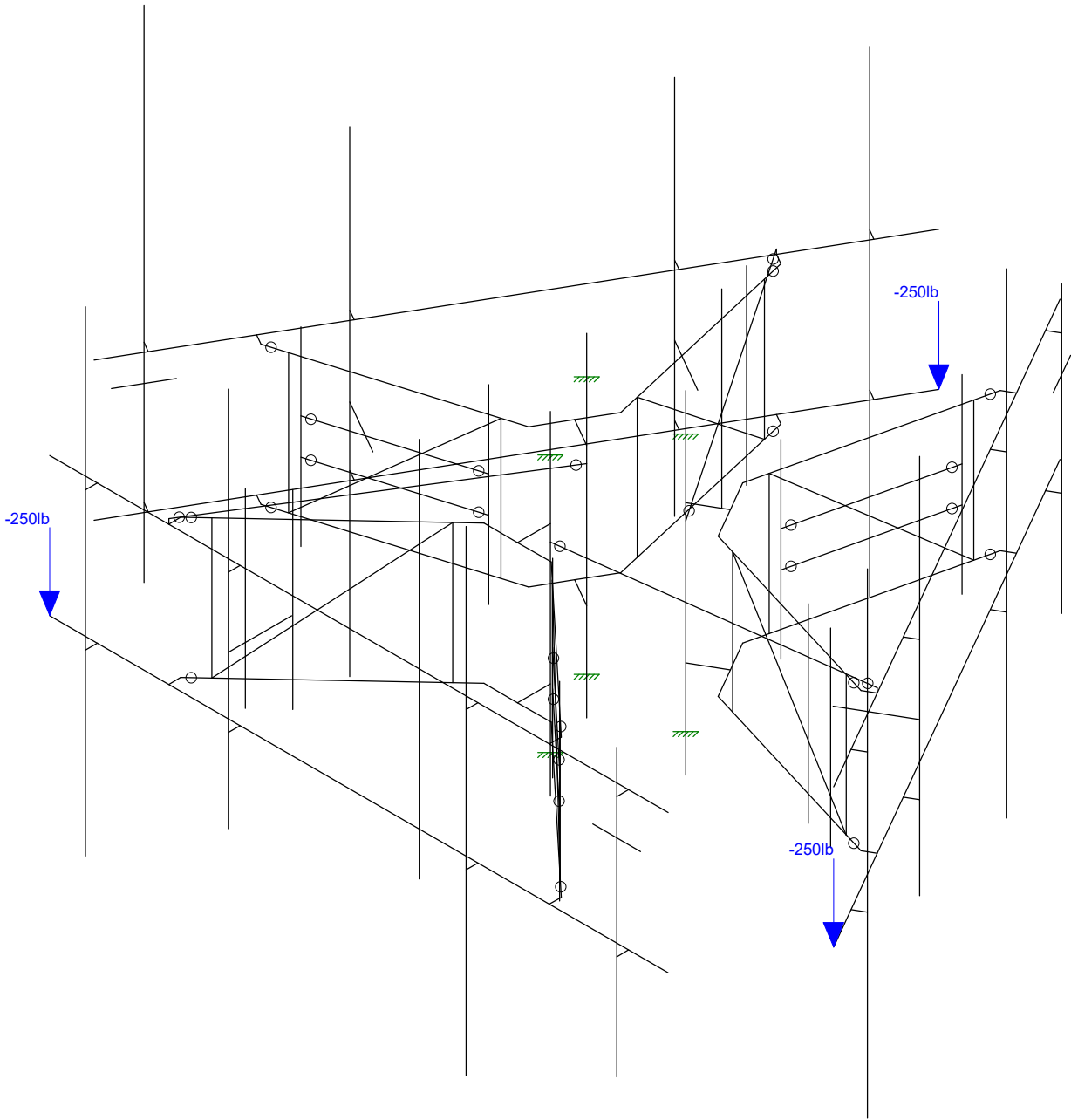
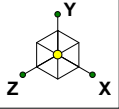
Loads: BLC 22, Seismic Load Z

Centerline Communication...	CT5404_Mount	SEISMIC Z
AP		Dec 23, 2020 at 8:34 AM
		CT5404.r3d



Loads: BLC 23, Seismic Load X

Centerline Communication...		SEISMIC X
AP	CT5404_Mount	Dec 23, 2020 at 8:35 AM
		CT5404.r3d



Loads: BLC 24, Live Loads 1

Centerline Communication...

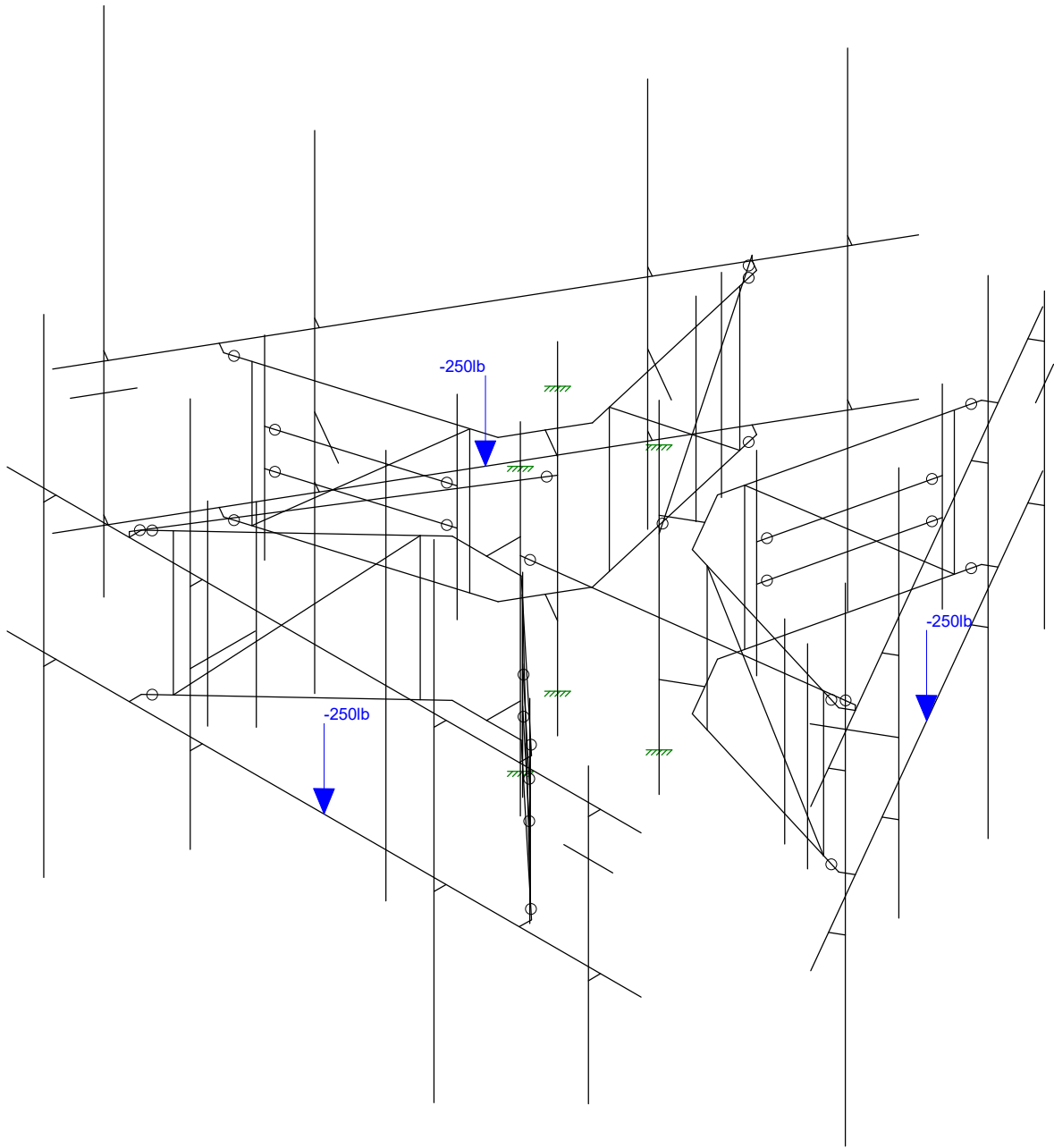
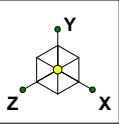
AP

CT5404_Mount

LIVE LOAD 1

Dec 23, 2020 at 8:35 AM

CT5404.r3d



Loads: BLC 25, Live Loads 2

Centerline Communication...

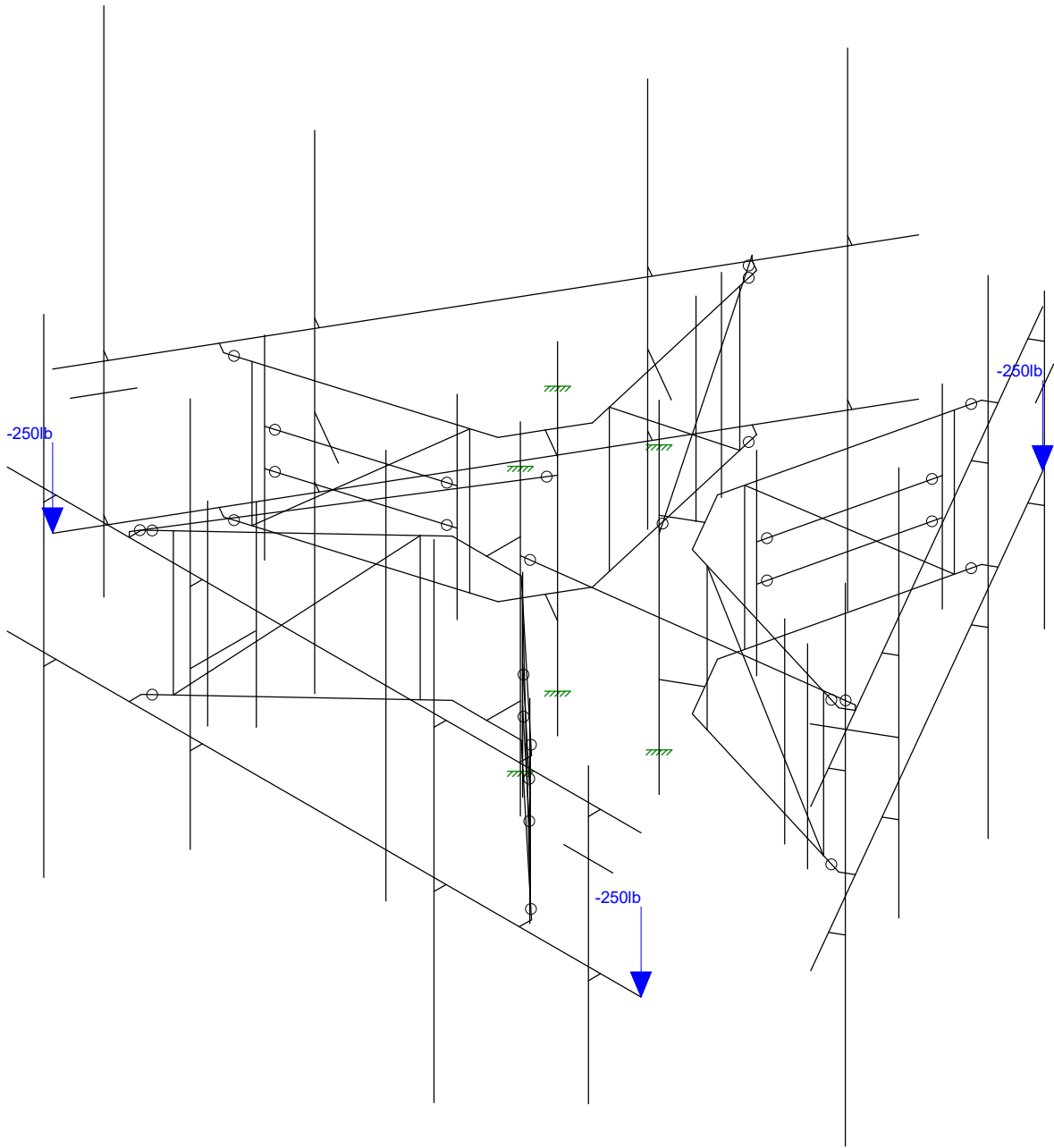
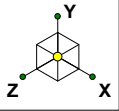
AP

CT5404_Mount

LIVE LOAD 2

Dec 23, 2020 at 8:35 AM

CT5404.r3d



Loads: BLC 26, Live Loads 3

Centerline Communication...

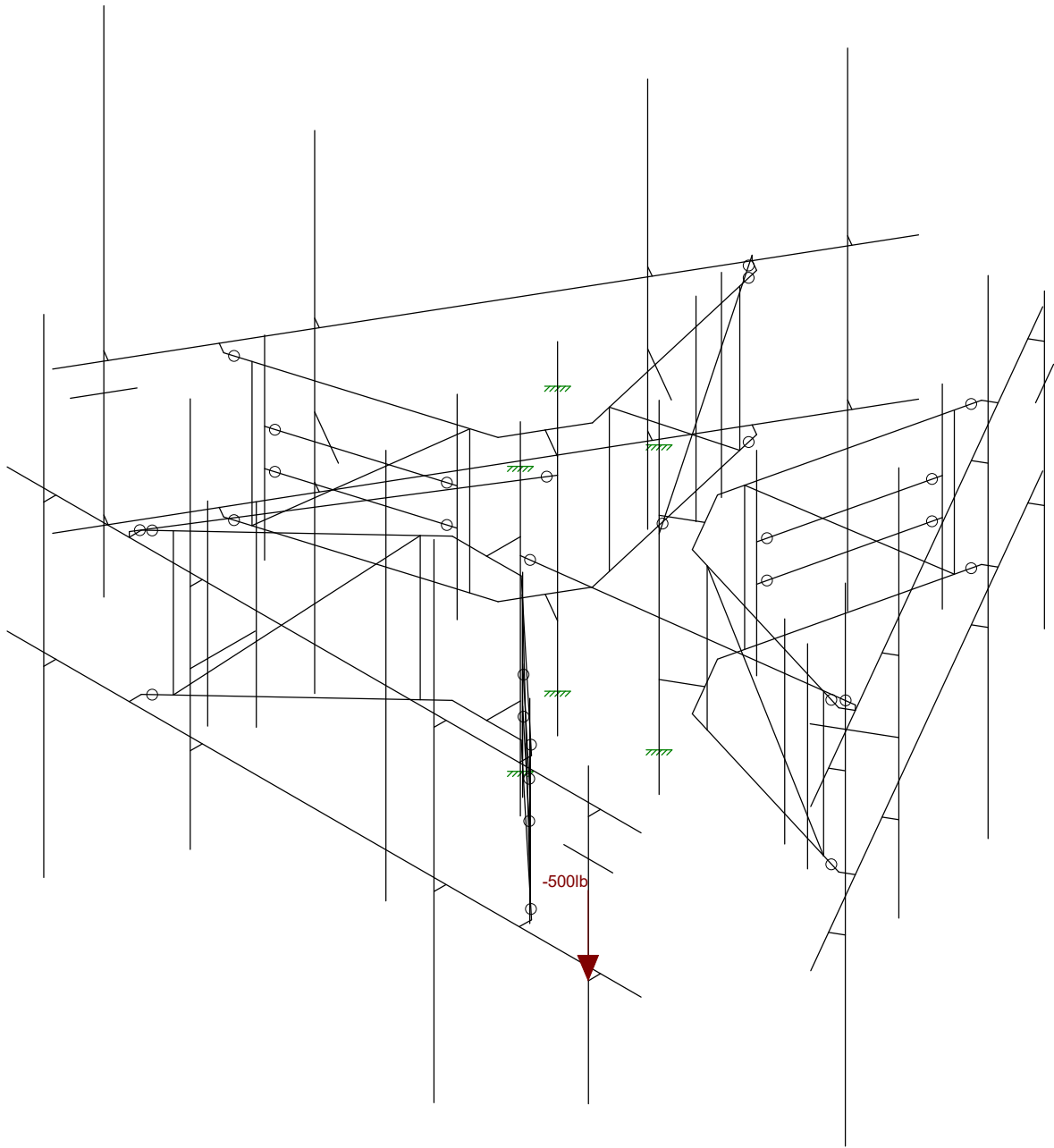
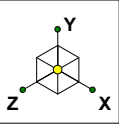
AP

CT5404_Mount

LIVE LOAD 3

Dec 23, 2020 at 8:35 AM

CT5404.r3d



Loads: BLC 27, Maintenance Load 1

Centerline Communication...

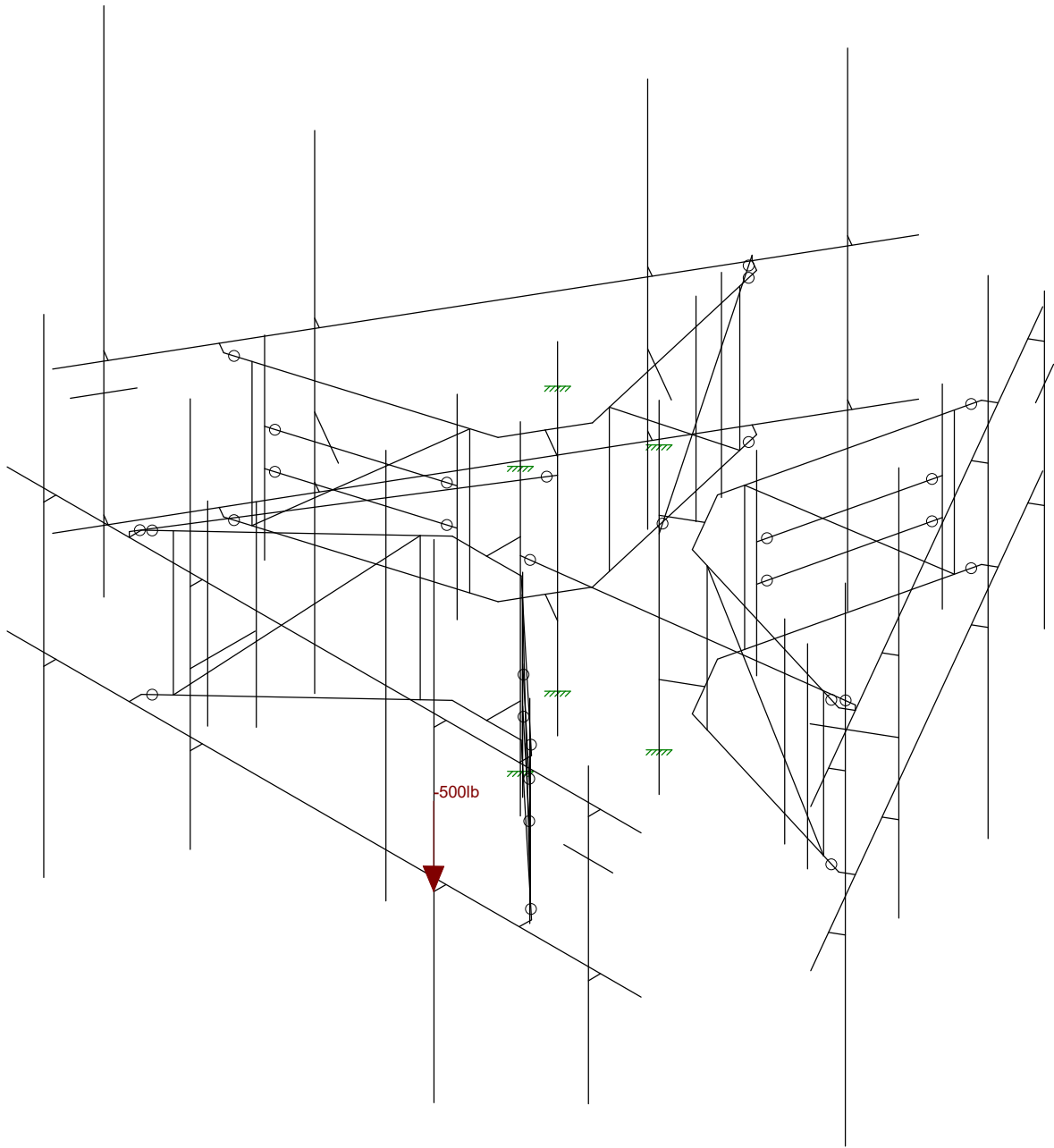
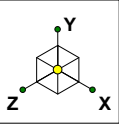
AP

CT5404_Mount

MAINTENANCE LOAD 1

Dec 23, 2020 at 8:35 AM

CT5404.r3d



Loads: BLC 28, Maintenance Load 2

Centerline Communication...

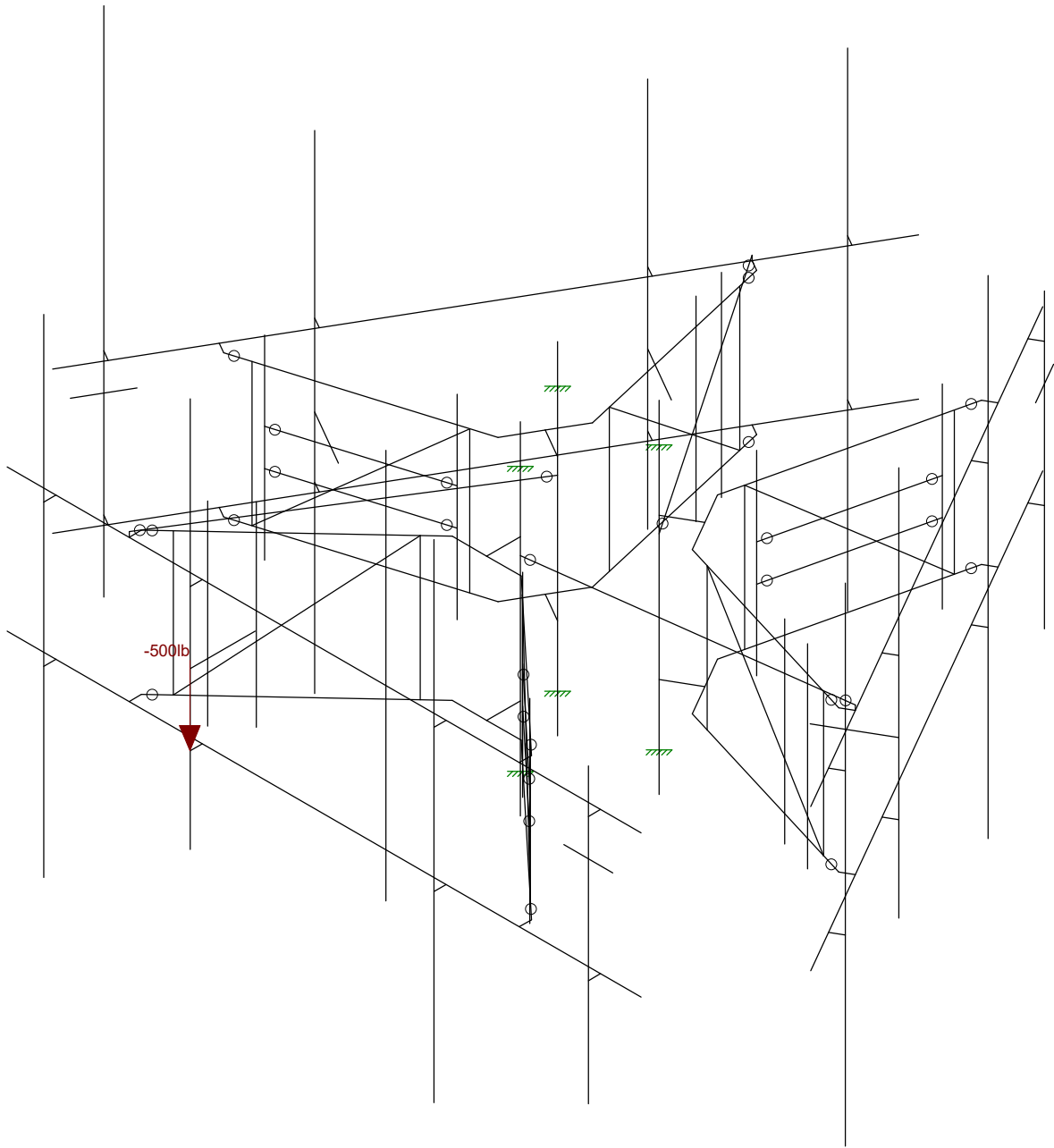
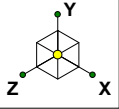
AP

CT5404_Mount

MAINTENANCE LOAD 2

Dec 23, 2020 at 8:36 AM

CT5404.r3d



Loads: BLC 29, Maintenance Load 3

Centerline Communication...

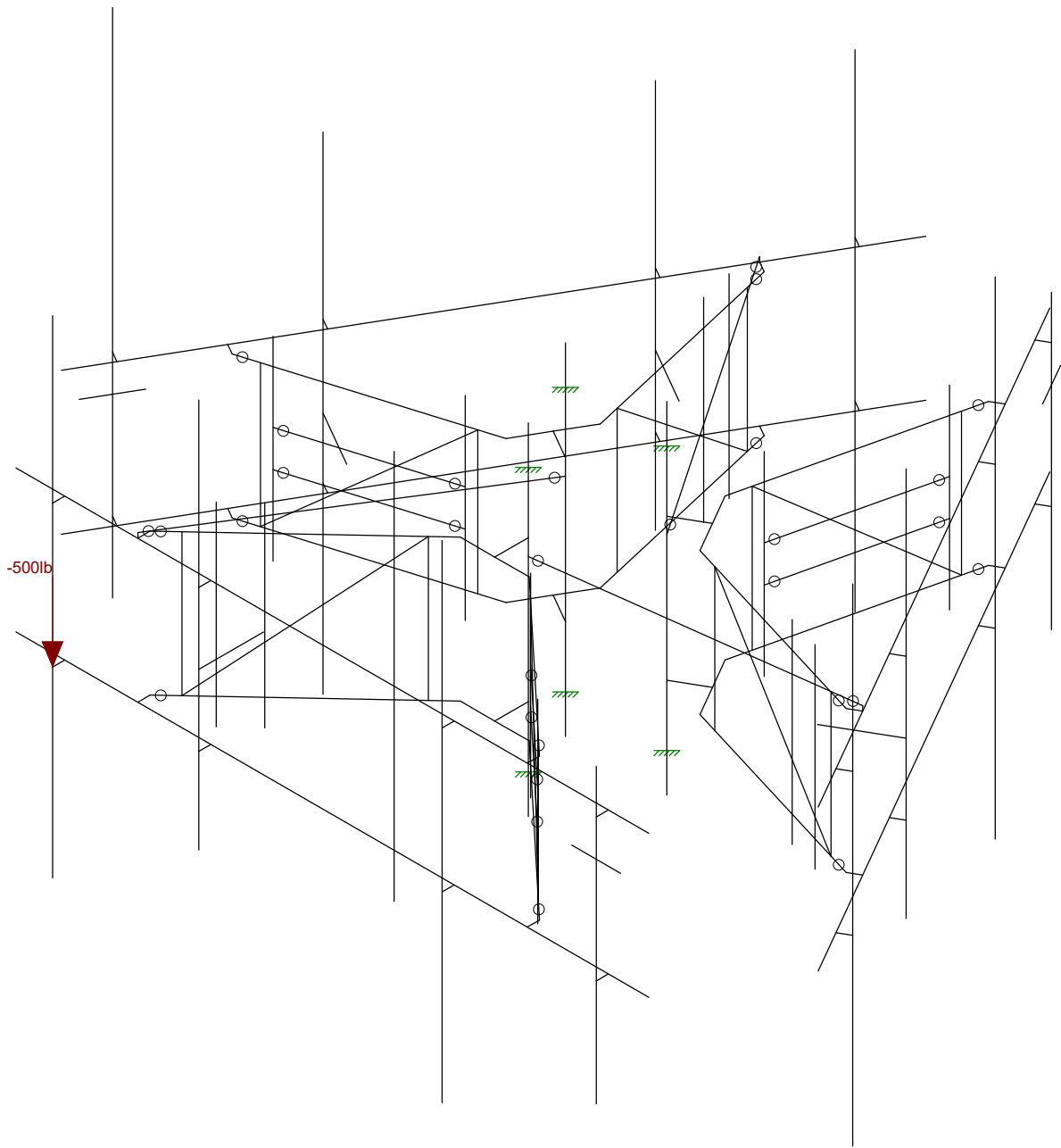
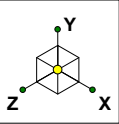
AP

CT5404_Mount

MAINTENANCE LOAD 3

Dec 23, 2020 at 8:36 AM

CT5404.r3d



Loads: BLC 30, Maintenance Load 4

Centerline Communication...

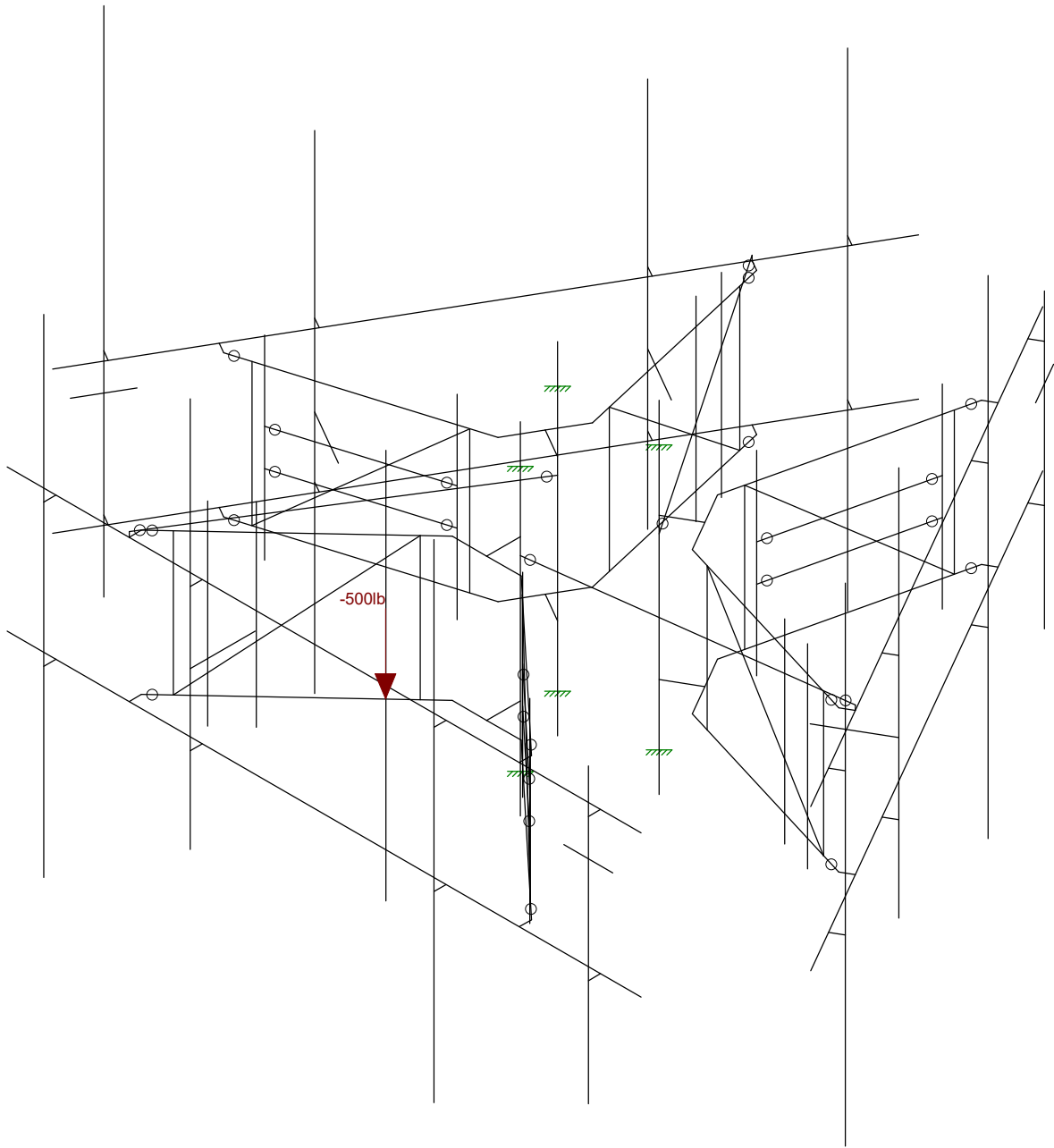
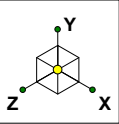
AP

CT5404_Mount

MAINTENANCE LOAD 4

Dec 23, 2020 at 8:36 AM

CT5404.r3d



Loads: BLC 31, Maintenance Load 5

Centerline Communication...

AP

CT5404_Mount

MAINTENANCE LOAD 5

Dec 23, 2020 at 8:36 AM

CT5404.r3d

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (/1...	Density[lb/ft^3]	Yield[ksi]	Ry	Fu[ksi]	Rt
1	A992	29000	11154	.3	.65	490	50	1.1	65	1.1
2	A36 Gr.36	29000	11154	.3	.65	490	36	1.5	58	1.2
3	A572 Gr.50	29000	11154	.3	.65	490	50	1.1	65	1.1
4	A500 Gr.B RND	29000	11154	.3	.65	527	42	1.4	58	1.3
5	A500 Gr.B Rect	29000	11154	.3	.65	527	46	1.4	58	1.3
6	A53 Gr.B	29000	11154	.3	.65	490	35	1.6	60	1.2
7	A1085	29000	11154	.3	.65	490	50	1.25	65	1.15
8	A913 Gr.65	29000	11154	.3	.65	490	65	1.1	80	1.1

Cold Formed Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (/1E5 F)	Density[lb/ft^3]	Yield[ksi]	Fu[ksi]
1	A653 SS Gr33	29500	11346	.3	.65	490	33	45
2	A653 SS Gr50/1	29500	11346	.3	.65	490	50	65

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design ...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	Horizontal	PIPE 2.0	Beam	Pipe	A53 Gr.B	Typical	1.02	.627	.627	1.25
2	Standoff	PIPE 2.0	Beam	Pipe	A53 Gr.B	Typical	1.02	.627	.627	1.25
3	Standoff Brace	3/4" Rod	Beam	BAR	A36 Gr.36	Typical	.442	.016	.016	.031
4	Standoff End Pi...	PIPE 4.0	Beam	Pipe	A53 Gr.B	Typical	2.96	6.82	6.82	13.6
5	Mount Pipe 2	PIPE 2.0	Beam	Pipe	A53 Gr.B	Typical	1.02	.627	.627	1.25
6	Tie back	PIPE 2.0	Beam	Pipe	A53 Gr.B	Typical	1.02	.627	.627	1.25
7	Mount Pipe 2.5	PIPE 2.5	Beam	Pipe	A53 Gr.B	Typical	1.61	1.45	1.45	2.89

Cold Formed Steel Section Sets

	Label	Shape	Type	Design List	Material	Design Rules	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	P1000	P1000	None	None	A653 SS Gr33	Typical	.763	.175	.268	.009

Joint Coordinates and Temperatures

	Label	X [in]	Y [in]	Z [in]	Temp [F]	Detach From Diap...
1	N1	0	0	0	0	
2	N2	0	35	0	0	
3	N3	156	0	0	0	
4	N4	156	35	0	0	
5	N5	30	0	0	0	
6	N6	30	35	0	0	
7	N7	78	35	0	0	
8	N8	78	0	0	0	
9	N9	78	35	-40	0	
10	N10	78	0	-40	0	
11	N11	30	0	-3	0	
12	N12	30	35	-3	0	
13	N13	69.5	35	-40	0	
14	N14	69.5	0	-40	0	
15	N15	78	35	-48.25	0	
16	N16	78	59.5	-48.25	0	
17	N17	78	-24.5	-48.25	0	
18	N21	78	0	-48.25	0	
19	N19	34.057828	35	-6.801004	0	
20	N20	34.057828	0	-6.801004	0	



Company : Centerline Communications, LLC
 Designer : AP
 Job Number :
 Model Name : CT5404_Mount

Dec 23, 2020
 8:38 AM
 Checked By: DC, AA

Joint Coordinates and Temperatures (Continued)

	Label	X [in]	Y [in]	Z [in]	Temp [F]	Detach From Diap...
21	N21A	65.442503	35	-36.199307	0	
22	N22	65.442503	0	-36.199307	0	
23	N23	78	50	-48.25	0	
24	N24	78	-15	-48.25	0	
25	N25	126	0	0	0	
26	N26	126	35	0	0	
27	N29	126	0	-3	0	
28	N30	126	35	-3	0	
29	N31	86.5	35	-40	0	
30	N32	86.5	0	-40	0	
31	N35	121.942172	35	-6.801004	0	
32	N36	121.942172	0	-6.801004	0	
33	N37	90.557497	35	-36.199307	0	
34	N38	90.557497	0	-36.199307	0	
35	N35A	120.116514	35	-8.511114	0	
36	N36A	120.116514	0	-8.511114	0	
37	N37A	92.383155	35	-34.489197	0	
38	N38A	92.383155	0	-34.489197	0	
39	N39	120.116514	41.5	-8.511114	0	
40	N40	92.383155	41.5	-34.489197	0	
41	N41	120.116514	-6.5	-8.511114	0	
42	N42	92.383155	-6.5	-34.489197	0	
43	N43	120.116514	22	-8.511114	0	
44	N44	92.383155	22	-34.489197	0	
45	N45	38.43678	35	-10.902806	0	
46	N46	38.43678	0	-10.902806	0	
47	N47	38.43678	-6.5	-10.902806	0	
48	N48	38.43678	41.5	-10.902806	0	
49	N49	61.063552	35	-32.097504	0	
50	N50	61.063552	0	-32.097504	0	
51	N51	38.43678	-1.063	-10.902806	0	
52	N52	61.063552	53	-32.097504	0	
53	N53	61.063552	-43	-32.097504	0	
54	N161A	12	0	0	0	
55	N162	12	35	0	0	
56	N163	12	0	3	0	
57	N164	12	35	3	0	
58	N165	12	75	3	0	
59	N166	12	-45	3	0	
60	N167	108	0	0	0	
61	N168	108	35	0	0	
62	N169	108	0	3	0	
63	N170	108	35	3	0	
64	N171	108	75	3	0	
65	N172	108	-45	3	0	
66	N173	146	0	0	0	
67	N174	146	35	0	0	
68	N175	146	0	3	0	
69	N176	146	35	3	0	
70	N195A	146	45.75	3	0	
71	N196A	146	-26.25	3	0	
72	N197	146	26	3	0	
73	N198	152	26	3	0	
74	N199	140	26	3	0	
75	N224	65.500655	31	-69.8995	0	
76	N225	30	36.2	0	0	
77	N227	78	31	-48.25	0	



Joint Coordinates and Temperatures (Continued)

	Label	X [in]	Y [in]	Z [in]	Temp [F]	Detach From Diap...
78	N221A	48	0	0	0	
79	N222A	48	35	0	0	
80	N223A	48	0	3	0	
81	N224A	48	35	3	0	
82	N225A	48	75	3	0	
83	N226	48	-21	3	0	
84	N239	48	17.5	3	0	
85	N240	48	17.5	-13	0	
86	N86	78	35	-62.683	0	
87	N87	171.28507	0	-26.474519	0	
88	N88	171.28507	35	-26.474519	0	
89	N89	93.28507	0	-161.574481	0	
90	N90	93.28507	35	-161.574481	0	
91	N91	156.28507	0	-52.455281	0	
92	N92	156.28507	35	-52.455281	0	
93	N93	132.28507	35	-94.0245	0	
94	N94	132.28507	0	-94.0245	0	
95	N95	97.644054	35	-74.0245	0	
96	N96	97.644054	0	-74.0245	0	
97	N97	153.686994	0	-50.955281	0	
98	N98	153.686994	35	-50.955281	0	
99	N99	101.894054	35	-66.663284	0	
100	N100	101.894054	0	-66.663284	0	
101	N101	90.499345	35	-69.8995	0	
102	N102	90.499345	59.5	-69.8995	0	
103	N103	90.499345	-24.5	-69.8995	0	
104	N104	90.499345	0	-69.8995	0	
105	N105	148.366314	35	-52.568961	0	
106	N106	148.366314	0	-52.568961	0	
107	N107	107.2143	35	-65.049735	0	
108	N108	107.2143	0	-65.049735	0	
109	N109	90.499345	50	-69.8995	0	
110	N110	90.499345	-15	-69.8995	0	
111	N111	108.28507	0	-135.593719	0	
112	N112	108.28507	35	-135.593719	0	
113	N113	105.686994	0	-134.093719	0	
114	N114	105.686994	35	-134.093719	0	
115	N115	93.394054	35	-81.385716	0	
116	N116	93.394054	0	-81.385716	0	
117	N117	104.424143	35	-128.679035	0	
118	N118	104.424143	0	-128.679035	0	
119	N119	94.656803	35	-86.799958	0	
120	N120	94.656803	0	-86.799958	0	
121	N121	103.855973	35	-126.242914	0	
122	N122	103.855973	0	-126.242914	0	
123	N123	95.224972	35	-89.236079	0	
124	N124	95.224972	0	-89.236079	0	
125	N125	103.855973	41.5	-126.242914	0	
126	N126	95.224972	41.5	-89.236079	0	
127	N127	103.855973	-6.5	-126.242914	0	
128	N128	95.224972	-6.5	-89.236079	0	
129	N129	103.855973	22	-126.242914	0	
130	N130	95.224972	22	-89.236079	0	
131	N131	142.624573	35	-54.310343	0	
132	N132	142.624573	0	-54.310343	0	
133	N133	142.624573	-6.5	-54.310343	0	
134	N134	142.624573	41.5	-54.310343	0	



Joint Coordinates and Temperatures (Continued)

	Label	X [in]	Y [in]	Z [in]	Temp [F]	Detach From Diap...
135	N135	112.956041	35	-63.308353	0	
136	N136	112.956041	0	-63.308353	0	
137	N137	142.624573	-1.063	-54.310343	0	
138	N140	165.28507	0	-36.866823	0	
139	N141	165.28507	35	-36.866823	0	
140	N142	167.883147	0	-38.366823	0	
141	N143	167.883147	35	-38.366823	0	
142	N144	167.883147	75	-38.366823	0	
143	N145	167.883147	-45	-38.366823	0	
144	N146	117.28507	0	-120.005262	0	
145	N147	117.28507	35	-120.005262	0	
146	N148	119.883147	0	-121.505262	0	
147	N149	119.883147	35	-121.505262	0	
148	N150	119.883147	75	-121.505262	0	
149	N151	119.883147	-45	-121.505262	0	
150	N152	98.28507	0	-152.914227	0	
151	N153	98.28507	35	-152.914227	0	
152	N154	100.883147	0	-154.414227	0	
153	N155	100.883147	35	-154.414227	0	
154	N156	100.883147	45.75	-154.414227	0	
155	N157	100.883147	-26.25	-154.414227	0	
156	N158	100.883147	26	-154.414227	0	
157	N159	97.883147	26	-159.61038	0	
158	N160	103.883147	26	-149.218075	0	
159	N162A	156.28507	36.2	-52.455281	0	
160	N163A	90.499345	31	-69.8995	0	
161	N164A	147.28507	0	-68.043738	0	
162	N165A	147.28507	35	-68.043738	0	
163	N166A	149.883147	0	-69.543738	0	
164	N167A	149.883147	35	-69.543738	0	
165	N168A	149.883147	75	-69.543738	0	
166	N169A	149.883147	-21	-69.543738	0	
167	N170A	149.883147	17.5	-69.543738	0	
168	N171A	136.02674	17.5	-61.543738	0	
169	N173A	62.71493	0	-161.574481	0	
170	N174A	62.71493	35	-161.574481	0	
171	N175A	-15.28507	0	-26.474519	0	
172	N176A	-15.28507	35	-26.474519	0	
173	N177	47.71493	0	-135.593719	0	
174	N178	47.71493	35	-135.593719	0	
175	N179	23.71493	35	-94.0245	0	
176	N180	23.71493	0	-94.0245	0	
177	N181	58.355946	35	-74.0245	0	
178	N182	58.355946	0	-74.0245	0	
179	N183	50.313006	0	-134.093719	0	
180	N184	50.313006	35	-134.093719	0	
181	N185	62.605946	35	-81.385716	0	
182	N186	62.605946	0	-81.385716	0	
183	N187	65.500655	35	-69.8995	0	
184	N188	65.500655	59.5	-69.8995	0	
185	N189	65.500655	-24.5	-69.8995	0	
186	N190	65.500655	0	-69.8995	0	
187	N191	51.575857	35	-128.679035	0	
188	N192	51.575857	0	-128.679035	0	
189	N193	61.343197	35	-86.799958	0	
190	N194	61.343197	0	-86.799958	0	
191	N195	65.500655	50	-69.8995	0	



Joint Coordinates and Temperatures (Continued)

	Label	X [in]	Y [in]	Z [in]	Temp [F]	Detach From Diap...
192	N196	65.500655	-15	-69.8995	0	
193	N197A	-0.28507	0	-52.455281	0	
194	N198A	-0.28507	35	-52.455281	0	
195	N199A	2.313006	0	-50.955281	0	
196	N200	2.313006	35	-50.955281	0	
197	N201	54.105946	35	-66.663284	0	
198	N202	54.105946	0	-66.663284	0	
199	N203	7.633686	35	-52.568961	0	
200	N204	7.633686	0	-52.568961	0	
201	N205	48.7857	35	-65.049735	0	
202	N206	48.7857	0	-65.049735	0	
203	N207	10.027513	35	-53.294972	0	
204	N208	10.027513	0	-53.294972	0	
205	N209	46.391873	35	-64.323724	0	
206	N210	46.391873	0	-64.323724	0	
207	N211	10.027513	41.5	-53.294972	0	
208	N212	46.391873	41.5	-64.323724	0	
209	N213	10.027513	-6.5	-53.294972	0	
210	N214	46.391873	-6.5	-64.323724	0	
211	N215	10.027513	22	-53.294972	0	
212	N216	46.391873	22	-64.323724	0	
213	N217	52.938647	35	-122.835851	0	
214	N218	52.938647	0	-122.835851	0	
215	N219	52.938647	-6.5	-122.835851	0	
216	N220	52.938647	41.5	-122.835851	0	
217	N221	59.980408	35	-92.643143	0	
218	N222	59.980408	0	-92.643143	0	
219	N223	52.938647	-1.063	-122.835851	0	
220	N226A	56.71493	0	-151.182177	0	
221	N227A	56.71493	35	-151.182177	0	
222	N228	54.116853	0	-152.682177	0	
223	N229	54.116853	35	-152.682177	0	
224	N230	54.116853	75	-152.682177	0	
225	N231	54.116853	-45	-152.682177	0	
226	N232	8.71493	0	-68.043738	0	
227	N233	8.71493	35	-68.043738	0	
228	N234	6.116853	0	-69.543738	0	
229	N235	6.116853	35	-69.543738	0	
230	N236	6.116853	75	-69.543738	0	
231	N237	6.116853	-45	-69.543738	0	
232	N238	-10.28507	0	-35.134773	0	
233	N239A	-10.28507	35	-35.134773	0	
234	N240A	-12.883147	0	-36.634773	0	
235	N241	-12.883147	35	-36.634773	0	
236	N242	-12.883147	108.5	-36.634773	0	
237	N243	-12.883147	-17.5	-36.634773	0	
238	N244	-12.883147	26	-36.634773	0	
239	N245	-15.883147	26	-31.43862	0	
240	N246	-9.883147	26	-41.830925	0	
241	N248	47.71493	36.2	-135.593719	0	
242	N250	38.71493	0	-120.005262	0	
243	N251	38.71493	35	-120.005262	0	
244	N252	36.116853	0	-121.505262	0	
245	N253	36.116853	35	-121.505262	0	
246	N254	36.116853	75	-121.505262	0	
247	N255	36.116853	-21	-121.505262	0	
248	N256	36.116853	17.5	-121.505262	0	

Joint Coordinates and Temperatures (Continued)

	Label	X [in]	Y [in]	Z [in]	Temp [F]	Detach From Diap...
249	N257	49.97326	17.5	-113.505262	0	
250	N256A	6.116853	15	-69.543738	0	
251	N257A	19.97326	15	-61.543738	0	
252	N252A	120.116514	13	-8.511114	0	
253	N253A	92.383155	13	-34.489197	0	
254	N254A	103.855973	13	-126.242914	0	
255	N255A	95.224972	13	-89.236079	0	
256	N256B	10.027513	13	-53.294972	0	
257	N257B	46.391873	13	-64.323724	0	
258	N258	44.596505	35	-16.672675	0	
259	N260	44.596505	-6.5	-16.672675	0	
260	N261	44.596505	41.5	-16.672675	0	
261	N262	134.547858	-6.5	-56.759887	0	
262	N263	134.547858	41.5	-56.759887	0	
263	N265	54.855638	-6.5	-114.616438	0	
264	N266	54.855638	41.5	-114.616438	0	
265	N265A	44.596505	0	-16.672675	0	
266	N267	134.547858	35	-56.759887	0	
267	N268	134.547858	0	-56.759887	0	
268	N270	54.855638	35	-114.616438	0	
269	N271	54.855638	0	-114.616438	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	N23	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
2	N24	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
3	N109	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
4	N110	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
5	N195	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
6	N196	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction

Hot Rolled Steel Design Parameters

	Label	Shape	Length[in]	Lbyy[in]	Lbzz[in]	Lcomp top[in]	Lcomp bot[in]	L-torqu...	Kyy	Kzz	Cb	Function
1	M1	Horizontal	156			Lbyy						Lateral
2	M2	Horizontal	156			Lbyy						Lateral
3	M5	Standoff	20			Lbyy						Lateral
4	M8	Standoff En...	84			Lbyy						Lateral
5	M9	Standoff	54.123			Lbyy						Lateral
6	M12	Standoff Br...	35			Lbyy						Lateral
7	M13	Standoff Br...	35			Lbyy						Lateral
8	M14	Standoff Br...	55.446			Lbyy						Lateral
9	M17	Standoff	54.123			Lbyy						Lateral
10	M20	Standoff	54.123			Lbyy						Lateral
11	M23	Standoff Br...	35			Lbyy						Lateral
12	M24	Standoff Br...	35			Lbyy						Lateral
13	M25	Standoff Br...	55.446			Lbyy						Lateral
14	MP13	Mount Pipe 2	96			Lbyy						Lateral
15	MP4	Mount Pipe ...	120			Lbyy						Lateral
16	MP2	Mount Pipe ...	120			Lbyy						Lateral
17	MP1	Mount Pipe 2	72			Lbyy						Lateral
18	M121	Tie back	78.57			Lbyy						Lateral
19	MP3	Mount Pipe 2	96			Lbyy						Lateral
20	M47	Horizontal	156			Lbyy						Lateral
21	M48	Horizontal	156			Lbyy						Lateral



Hot Rolled Steel Design Parameters (Continued)

	Label	Shape	Length[in]	Lbyy[in]	Lbzz[in]	Lcomp top[in]	Lcomp bot[in]	L-torqu...	Kyy	Kzz	Cb	Function
22	M51	Standoff	54.123			Lbyy						Lateral
23	M54	Standoff En...	84			Lbyy						Lateral
24	M55	Standoff	54.123			Lbyy						Lateral
25	M58	Standoff Br...	35			Lbyy						Lateral
26	M59	Standoff Br...	35			Lbyy						Lateral
27	M60	Standoff Br...	55.446			Lbyy						Lateral
28	M63	Standoff	54.123			Lbyy						Lateral
29	M66	Standoff	54.123			Lbyy						Lateral
30	M69	Standoff Br...	35			Lbyy						Lateral
31	M70	Standoff Br...	35			Lbyy						Lateral
32	M71	Standoff Br...	55.446			Lbyy						Lateral
33	MP12	Mount Pipe ...	120			Lbyy						Lateral
34	MP10	Mount Pipe ...	120			Lbyy						Lateral
35	MP9	Mount Pipe 2	72			Lbyy						Lateral
36	M87	Tie back	78.57			Lbyy						Lateral
37	MP11	Mount Pipe 2	96			Lbyy						Lateral
38	M93	Horizontal	156			Lbyy						Lateral
39	M94A	Horizontal	156			Lbyy						Lateral
40	M97A	Standoff	54.123			Lbyy						Lateral
41	M100	Standoff En...	84			Lbyy						Lateral
42	M101	Standoff	54.123			Lbyy						Lateral
43	M104	Standoff Br...	35			Lbyy						Lateral
44	M105	Standoff Br...	35			Lbyy						Lateral
45	M106	Standoff Br...	55.446			Lbyy						Lateral
46	M109	Standoff	54.123			Lbyy						Lateral
47	M112	Standoff	54.123			Lbyy						Lateral
48	M115	Standoff Br...	35			Lbyy						Lateral
49	M116	Standoff Br...	35			Lbyy						Lateral
50	M117	Standoff Br...	55.446			Lbyy						Lateral
51	MP8	Mount Pipe ...	120			Lbyy						Lateral
52	MP6	Mount Pipe ...	120			Lbyy						Lateral
53	MP5	Mount Pipe 2	126			Lbyy						Lateral
54	M133	Tie back	78.57			Lbyy						Lateral
55	MP7	Mount Pipe 2	96			Lbyy						Lateral
56	M135A	Standoff	34.123			Lbyy						Lateral

Cold Formed Steel Design Parameters

	Label	Shape	Length...	Lbyy[in]	Lbzz[in]	Lcomp to...	Lcomp bo...	L-torque[in]	Kyy	Kzz	Cb	R	a[in]	Funct...
1	M26	P1000	48											Lateral
2	M27	P1000	48											Lateral
3	R4	P1000	38											Lateral
4	R6	P1000	48											Lateral
5	M72	P1000	48											Lateral
6	M73	P1000	48											Lateral
7	R11	P1000	38											Lateral
8	R12	P1000	48											Lateral
9	M118	P1000	48											Lateral
10	M119	P1000	48											Lateral
11	R9	P1000	38											Lateral
12	R10	P1000	48											Lateral
13	M132	P1000	38											Lateral
14	M133A	P1000	38											Lateral
15	M134A	P1000	38											Lateral
16	M136A	P1000	48											Lateral
17	M137	P1000	48											Lateral



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 Designer : AP
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Cold Formed Steel Design Parameters (Continued)

	Label	Shape	Length...	Lbyy[in]	Lbzz[in]	Lcomp to...	Lcomp bo...L-torque[in]	Kyy	Kzz	Cb	R	afin]	Funct...
18	M138	P1000	48										Lateral

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rules
1	M1	N2	N4			Horizontal	Beam	Pipe	A53 Gr.B	Typical
2	M2	N1	N3			Horizontal	Beam	Pipe	A53 Gr.B	Typical
3	M3	N6	N12			RIGID	None	None	RIGID	Typical
4	M4	N5	N11			RIGID	None	None	RIGID	Typical
5	M5	N12	N258			Standoff	Beam	Pipe	A53 Gr.B	Typical
6	M6	N13	N9			RIGID	None	None	RIGID	Typical
7	M7	N9	N15			RIGID	None	None	RIGID	Typical
8	M8	N16	N17			Standoff End ...	Beam	Pipe	A53 Gr.B	Typical
9	M9	N11	N14			Standoff	Beam	Pipe	A53 Gr.B	Typical
10	M10	N14	N10			RIGID	None	None	RIGID	Typical
11	M11	N10	N21			RIGID	None	None	RIGID	Typical
12	M12	N19	N20			Standoff Brace	Beam	BAR	A36 Gr.36	Typical
13	M13	N21A	N22			Standoff Brace	Beam	BAR	A36 Gr.36	Typical
14	M14	N20	N21A			Standoff Brace	Beam	BAR	A36 Gr.36	Typical
15	M15	N26	N30			RIGID	None	None	RIGID	Typical
16	M16	N25	N29			RIGID	None	None	RIGID	Typical
17	M17	N30	N31			Standoff	Beam	Pipe	A53 Gr.B	Typical
18	M18	N31	N9			RIGID	None	None	RIGID	Typical
19	M20	N29	N32			Standoff	Beam	Pipe	A53 Gr.B	Typical
20	M21	N32	N10			RIGID	None	None	RIGID	Typical
21	M23	N35	N36			Standoff Brace	Beam	BAR	A36 Gr.36	Typical
22	M24	N37	N38			Standoff Brace	Beam	BAR	A36 Gr.36	Typical
23	M25	N36	N37			Standoff Brace	Beam	BAR	A36 Gr.36	Typical
24	M26	N39	N41		45	P1000	None	None	A653 SS ...	Typical
25	M27	N40	N42		45	P1000	None	None	A653 SS ...	Typical
26	R4	N43	N44			P1000	None	None	A653 SS ...	Typical
27	R6	N48	N47		315	P1000	None	None	A653 SS ...	Typical
28	MP13	N52	N53			Mount Pipe 2	Beam	Pipe	A53 Gr.B	Typical
29	M91	N162	N164			RIGID	None	None	RIGID	Typical
30	M92	N161A	N163			RIGID	None	None	RIGID	Typical
31	MP4	N165	N166			Mount Pipe 2.5	Beam	Pipe	A53 Gr.B	Typical
32	M94	N168	N170			RIGID	None	None	RIGID	Typical
33	M95	N167	N169			RIGID	None	None	RIGID	Typical
34	MP2	N171	N172			Mount Pipe 2.5	Beam	Pipe	A53 Gr.B	Typical
35	M97	N174	N176			RIGID	None	None	RIGID	Typical
36	M98	N173	N175			RIGID	None	None	RIGID	Typical
37	MP1	N195A	N196A			Mount Pipe 2	Beam	Pipe	A53 Gr.B	Typical
38	R1	N199	N198			RIGID	None	None	RIGID	Typical
39	M121	N225	N224			Tie back	Beam	Pipe	A53 Gr.B	Typical
40	M122	N225	N6			RIGID	None	None	RIGID	Typical
41	M124A	N222A	N224A			RIGID	None	None	RIGID	Typical
42	M125A	N221A	N223A			RIGID	None	None	RIGID	Typical
43	MP3	N225A	N226			Mount Pipe 2	Beam	Pipe	A53 Gr.B	Typical
44	R5	N239	N240			RIGID	None	None	RIGID	Typical
45	M47	N88	N90			Horizontal	Beam	Pipe	A53 Gr.B	Typical
46	M48	N87	N89			Horizontal	Beam	Pipe	A53 Gr.B	Typical
47	M49	N92	N98			RIGID	None	None	RIGID	Typical
48	M50	N91	N97			RIGID	None	None	RIGID	Typical
49	M51	N98	N99			Standoff	Beam	Pipe	A53 Gr.B	Typical
50	M52	N99	N95			RIGID	None	None	RIGID	Typical
51	M53	N95	N101			RIGID	None	None	RIGID	Typical



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Member Primary Data (Continued)

	Label	I Joint	J Joint	K Joint	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rules
52	M54	N102	N103			Standoff End ...	Beam	Pipe	A53 Gr.B	Typical
53	M55	N97	N100			Standoff	Beam	Pipe	A53 Gr.B	Typical
54	M56	N100	N96			RIGID	None	None	RIGID	Typical
55	M57	N96	N104			RIGID	None	None	RIGID	Typical
56	M58	N105	N106			Standoff Brace	Beam	BAR	A36 Gr.36	Typical
57	M59	N107	N108			Standoff Brace	Beam	BAR	A36 Gr.36	Typical
58	M60	N106	N107			Standoff Brace	Beam	BAR	A36 Gr.36	Typical
59	M61	N112	N114			RIGID	None	None	RIGID	Typical
60	M62	N111	N113			RIGID	None	None	RIGID	Typical
61	M63	N114	N115			Standoff	Beam	Pipe	A53 Gr.B	Typical
62	M64	N115	N95			RIGID	None	None	RIGID	Typical
63	M66	N113	N116			Standoff	Beam	Pipe	A53 Gr.B	Typical
64	M67	N116	N96			RIGID	None	None	RIGID	Typical
65	M69	N117	N118			Standoff Brace	Beam	BAR	A36 Gr.36	Typical
66	M70	N119	N120			Standoff Brace	Beam	BAR	A36 Gr.36	Typical
67	M71	N118	N119			Standoff Brace	Beam	BAR	A36 Gr.36	Typical
68	M72	N125	N127		285	P1000	None	None	A653 SS ...	Typical
69	M73	N126	N128		285	P1000	None	None	A653 SS ...	Typical
70	R11	N129	N130			P1000	None	None	A653 SS ...	Typical
71	R12	N134	N133		200	P1000	None	None	A653 SS ...	Typical
72	M77	N141	N143			RIGID	None	None	RIGID	Typical
73	M78	N140	N142			RIGID	None	None	RIGID	Typical
74	MP12	N144	N145			Mount Pipe 2.5	Beam	Pipe	A53 Gr.B	Typical
75	M80	N147	N149			RIGID	None	None	RIGID	Typical
76	M81	N146	N148			RIGID	None	None	RIGID	Typical
77	MP10	N150	N151			Mount Pipe 2.5	Beam	Pipe	A53 Gr.B	Typical
78	M83	N153	N155			RIGID	None	None	RIGID	Typical
79	M84	N152	N154			RIGID	None	None	RIGID	Typical
80	MP9	N156	N157			Mount Pipe 2	Beam	Pipe	A53 Gr.B	Typical
81	R3	N160	N159			RIGID	None	None	RIGID	Typical
82	M87	N162A	N227			Tie back	Beam	Pipe	A53 Gr.B	Typical
83	M88	N162A	N92			RIGID	None	None	RIGID	Typical
84	M89	N165A	N167A			RIGID	None	None	RIGID	Typical
85	M90	N164A	N166A			RIGID	None	None	RIGID	Typical
86	MP11	N168A	N169A			Mount Pipe 2	Beam	Pipe	A53 Gr.B	Typical
87	R13	N170A	N171A			RIGID	None	None	RIGID	Typical
88	M93	N174A	N176A			Horizontal	Beam	Pipe	A53 Gr.B	Typical
89	M94A	N173A	N175A			Horizontal	Beam	Pipe	A53 Gr.B	Typical
90	M95A	N178	N184			RIGID	None	None	RIGID	Typical
91	M96	N177	N183			RIGID	None	None	RIGID	Typical
92	M97A	N184	N185			Standoff	Beam	Pipe	A53 Gr.B	Typical
93	M98A	N185	N181			RIGID	None	None	RIGID	Typical
94	M99	N181	N187			RIGID	None	None	RIGID	Typical
95	M100	N188	N189			Standoff End ...	Beam	Pipe	A53 Gr.B	Typical
96	M101	N183	N186			Standoff	Beam	Pipe	A53 Gr.B	Typical
97	M102	N186	N182			RIGID	None	None	RIGID	Typical
98	M103	N182	N190			RIGID	None	None	RIGID	Typical
99	M104	N191	N192			Standoff Brace	Beam	BAR	A36 Gr.36	Typical
100	M105	N193	N194			Standoff Brace	Beam	BAR	A36 Gr.36	Typical
101	M106	N192	N193			Standoff Brace	Beam	BAR	A36 Gr.36	Typical
102	M107	N198A	N200			RIGID	None	None	RIGID	Typical
103	M108	N197A	N199A			RIGID	None	None	RIGID	Typical
104	M109	N200	N201			Standoff	Beam	Pipe	A53 Gr.B	Typical
105	M110	N201	N181			RIGID	None	None	RIGID	Typical
106	M112	N199A	N202			Standoff	Beam	Pipe	A53 Gr.B	Typical
107	M113	N202	N182			RIGID	None	None	RIGID	Typical
108	M115	N203	N204			Standoff Brace	Beam	BAR	A36 Gr.36	Typical



Member Primary Data (Continued)

	Label	I Joint	J Joint	K Joint	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rules
109	M116	N205	N206			Standoff Brace	Beam	BAR	A36 Gr.36	Typical
110	M117	N204	N205			Standoff Brace	Beam	BAR	A36 Gr.36	Typical
111	M118	N211	N213		165	P1000	None	None	A653 SS ...	Typical
112	M119	N212	N214		165	P1000	None	None	A653 SS ...	Typical
113	R9	N215	N216			P1000	None	None	A653 SS ...	Typical
114	R10	N220	N219		75	P1000	None	None	A653 SS ...	Typical
115	M123	N227A	N229			RIGID	None	None	RIGID	Typical
116	M124	N226A	N228			RIGID	None	None	RIGID	Typical
117	MP8	N230	N231			Mount Pipe 2.5	Beam	Pipe	A53 Gr.B	Typical
118	M126	N233	N235			RIGID	None	None	RIGID	Typical
119	M127	N232	N234			RIGID	None	None	RIGID	Typical
120	MP6	N236	N237			Mount Pipe 2.5	Beam	Pipe	A53 Gr.B	Typical
121	M129	N239A	N241			RIGID	None	None	RIGID	Typical
122	M130	N238	N240A			RIGID	None	None	RIGID	Typical
123	MP5	N242	N243			Mount Pipe 2	Beam	Pipe	A53 Gr.B	Typical
124	R2	N246	N245			RIGID	None	None	RIGID	Typical
125	M133	N248	N163A			Tie back	Beam	Pipe	A53 Gr.B	Typical
126	M134	N248	N178			RIGID	None	None	RIGID	Typical
127	M135	N251	N253			RIGID	None	None	RIGID	Typical
128	M136	N250	N252			RIGID	None	None	RIGID	Typical
129	MP7	N254	N255			Mount Pipe 2	Beam	Pipe	A53 Gr.B	Typical
130	R8	N256	N257			RIGID	None	None	RIGID	Typical
131	R7	N256A	N257A			RIGID	None	None	RIGID	Typical
132	M132	N252A	N253A			P1000	None	None	A653 SS ...	Typical
133	M133A	N254A	N255A			P1000	None	None	A653 SS ...	Typical
134	M134A	N256B	N257B			P1000	None	None	A653 SS ...	Typical
135	M135A	N258	N13			Standoff	Beam	Pipe	A53 Gr.B	Typical
136	M136A	N261	N260		315	P1000	None	None	A653 SS ...	Typical
137	M137	N263	N262		200	P1000	None	None	A653 SS ...	Typical
138	M138	N266	N265		75	P1000	None	None	A653 SS ...	Typical

Member Advanced Data

	Label	I Release	J Release	I Offset[in]	J Offset[in]	T/C Only	Physical	Defl Ra...	Analysis Offs...	Inactive	Seismi...
1	M1						Yes				None
2	M2						Yes				None
3	M3						Yes	** NA **			None
4	M4						Yes	** NA **			None
5	M5	BenPIN					Yes	Default			None
6	M6						Yes	** NA **			None
7	M7						Yes	** NA **			None
8	M8						Yes				None
9	M9	BenPIN					Yes	Default			None
10	M10						Yes	** NA **			None
11	M11						Yes	** NA **			None
12	M12					Euler Buckling	Yes				None
13	M13					Euler Buckling	Yes				None
14	M14					Euler Buckling	Yes				None
15	M15						Yes	** NA **			None
16	M16						Yes	** NA **			None
17	M17	BenPIN					Yes	Default			None
18	M18						Yes	** NA **			None
19	M20	BenPIN					Yes	Default			None
20	M21						Yes	** NA **			None
21	M23					Euler Buckling	Yes				None
22	M24					Euler Buckling	Yes				None



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Member Advanced Data (Continued)

	Label	I Release	J Release	I Offset[in]	J Offset[in]	T/C Only	Physical	Defl Ra...	Analysis Offs...	Inactive	Seismi...
23	M25					Euler Buckling	Yes				None
24	M26						Yes	** NA **			None
25	M27						Yes	** NA **			None
26	R4	BenPIN	BenPIN				Yes	** NA **			None
27	R6						Yes	** NA **			None
28	MP13						Yes	Default			None
29	M91						Yes	** NA **			None
30	M92						Yes	** NA **			None
31	MP4						Yes	Default			None
32	M94						Yes	** NA **			None
33	M95						Yes	** NA **			None
34	MP2						Yes	Default			None
35	M97						Yes	** NA **			None
36	M98						Yes	** NA **			None
37	MP1						Yes	Default			None
38	R1						Yes	** NA **			None
39	M121	BenPIN	BenPIN				Yes	Default			None
40	M122						Yes	** NA **			None
41	M124A						Yes	** NA **			None
42	M125A						Yes	** NA **			None
43	MP3						Yes	Default			None
44	R5						Yes	** NA **			None
45	M47						Yes				None
46	M48						Yes				None
47	M49						Yes	** NA **			None
48	M50						Yes	** NA **			None
49	M51	BenPIN					Yes	Default			None
50	M52						Yes	** NA **			None
51	M53						Yes	** NA **			None
52	M54						Yes				None
53	M55	BenPIN					Yes	Default			None
54	M56						Yes	** NA **			None
55	M57						Yes	** NA **			None
56	M58					Euler Buckling	Yes				None
57	M59					Euler Buckling	Yes				None
58	M60					Euler Buckling	Yes				None
59	M61						Yes	** NA **			None
60	M62						Yes	** NA **			None
61	M63	BenPIN					Yes	Default			None
62	M64						Yes	** NA **			None
63	M66	BenPIN					Yes	Default			None
64	M67						Yes	** NA **			None
65	M69					Euler Buckling	Yes	Default			None
66	M70					Euler Buckling	Yes				None
67	M71					Euler Buckling	Yes				None
68	M72						Yes	** NA **			None
69	M73						Yes	** NA **			None
70	R11	BenPIN	BenPIN				Yes	** NA **			None
71	R12						Yes	** NA **			None
72	M77						Yes	** NA **			None
73	M78						Yes	** NA **			None
74	MP12						Yes				None
75	M80						Yes	** NA **			None
76	M81						Yes	** NA **			None
77	MP10						Yes				None
78	M83						Yes	** NA **			None
79	M84						Yes	** NA **			None



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Member Advanced Data (Continued)

	Label	I Release	J Release	I Offset[in]	J Offset[in]	T/C Only	Physical	Defl Ra...	Analysis Offs...	Inactive	Seismi...
80	MP9						Yes	Default			None
81	R3						Yes	** NA **			None
82	M87	BenPIN	BenPIN				Yes	Default			None
83	M88						Yes	** NA **			None
84	M89						Yes	** NA **			None
85	M90						Yes	** NA **			None
86	MP11						Yes				None
87	R13						Yes	** NA **			None
88	M93						Yes				None
89	M94A						Yes				None
90	M95A						Yes	** NA **			None
91	M96						Yes	** NA **			None
92	M97A	BenPIN					Yes	Default			None
93	M98A						Yes	** NA **			None
94	M99						Yes	** NA **			None
95	M100						Yes				None
96	M101	BenPIN					Yes	Default			None
97	M102						Yes	** NA **			None
98	M103						Yes	** NA **			None
99	M104					Euler Buckling	Yes				None
100	M105					Euler Buckling	Yes				None
101	M106					Euler Buckling	Yes				None
102	M107						Yes	** NA **			None
103	M108						Yes	** NA **			None
104	M109	BenPIN					Yes	Default			None
105	M110						Yes	** NA **			None
106	M112	BenPIN					Yes	Default			None
107	M113						Yes	** NA **			None
108	M115					Euler Buckling	Yes				None
109	M116					Euler Buckling	Yes				None
110	M117					Euler Buckling	Yes				None
111	M118						Yes	** NA **			None
112	M119						Yes	** NA **			None
113	R9	BenPIN	BenPIN				Yes	** NA **			None
114	R10						Yes	** NA **			None
115	M123						Yes	** NA **			None
116	M124						Yes	** NA **			None
117	MP8						Yes				None
118	M126						Yes	** NA **			None
119	M127						Yes	** NA **			None
120	MP6						Yes	Default			None
121	M129						Yes	** NA **			None
122	M130						Yes	** NA **			None
123	MP5						Yes	Default			None
124	R2						Yes	** NA **			None
125	M133	BenPIN	BenPIN				Yes	Default			None
126	M134						Yes	** NA **			None
127	M135						Yes	** NA **			None
128	M136						Yes	** NA **			None
129	MP7						Yes				None
130	R8						Yes	** NA **			None
131	R7						Yes	** NA **			None
132	M132	BenPIN	BenPIN				Yes	** NA **			None
133	M133A	BenPIN	BenPIN				Yes	** NA **			None
134	M134A	BenPIN	BenPIN				Yes	** NA **			None
135	M135A						Yes				None
136	M136A						Yes	** NA **			None



Member Advanced Data (Continued)

	Label	I Release	J Release	I Offset[in]	J Offset[in]	T/C Only	Physical	Defl Ra...	Analysis Offs...	Inactive	Seismi...
137	M137						Yes	** NA **			None
138	M138						Yes	** NA **			None

Basic Load Cases

	BLC Description	Category	X Grav...	Y Grav...	Z Grav...	Joint	Point	Distrib...	Area(M...Surfac...
1	Dead Load	DL		-1			48		
2	Wind 0	WLZ					96		
3	Wind 30	None					96		
4	Wind 60	None					96		
5	Wind 90	WLX					96		
6	Wind 120	None					96		
7	Wind 150	None					96		
8	Wind 180	WLZ					96		
9	Ice Weight	DL					48	138	
10	Ice + Wind 0	WLZ					96		
11	Ice + Wind 30	None					96		
12	Ice + Wind 60	None					96		
13	Ice + Wind 90	WLX					96		
14	Ice + Wind 120	None					96		
15	Ice + Wind 150	None					96		
16	Ice + Wind 180	WLZ					96		
17	Distri. Wind Z	WLZ						138	
18	Distri. Wind X	WLX						138	
19	Distri. Ice + Win...	WLZ						138	
20	Distr. Ice + Win...	WLX						138	
21	Seismic Load Y	ELY					48	138	
22	Seismic Load Z	ELZ					48	138	
23	Seismic Load X	ELX					48	138	
24	Live Loads 1	LL					3		
25	Live Loads 2	LL					3		
26	Live Loads 3	LL					3		
27	Maintenance Lo...	None					1		
28	Maintenance Lo...	None					1		
29	Maintenance Lo...	None					1		
30	Maintenance Lo...	None					1		
31	Maintenance Lo...	None					1		
32	Maintenance Lo...	None					1		
33	Maintenance Lo...	None					1		
34	Maintenance Lo...	None					1		
35	Maintenance Lo...	None					1		
36	Maintenance Lo...	None					1		
37	Maintenance Lo...	None					1		
38	Maintenance Lo...	None					1		
39	Maintenance Lo...	None					1		

Load Combinations

	Description	S...	PDelta	SRSS	B...	Fa...	BLC Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
1	1.4D	Yes	Y		1	1.4													
2	1.2D + 1.0W 0°	Yes	Y		1	1.2	2	1	17	1	18								
3	1.2D + 1.0W 30°	Yes	Y		1	1.2	3	1	17	.866	18	.5							
4	1.2D + 1.0W 60°	Yes	Y		1	1.2	4	1	17	.5	18	.866							
5	1.2D + 1.0W 90°	Yes	Y		1	1.2	5	1	17		18	1							
6	1.2D + 1.0W 120°	Yes	Y		1	1.2	6	1	17	-.5	18	.866							
7	1.2D + 1.0W 150°	Yes	Y		1	1.2	7	1	17	-.8...	18	.5							



Load Combinations (Continued)

	Description	S...	PDelta	SRSS	B...	Fa...	BLC	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	
8	1.2D + 1.0W 180°	Yes	Y		1	1.2	8	1	17	-1	18														
9	0.9D + 1.0W 0°	Yes	Y		1	.9	2	1	17	1	18														
10	0.9D + 1.0W 30°	Yes	Y		1	.9	3	1	17	.866	18	.5													
11	0.9D + 1.0W 60°	Yes	Y		1	.9	4	1	17	.5	18	.866													
12	0.9D + 1.0W 90°	Yes	Y		1	.9	5	1	17		18	1													
13	0.9D + 1.0W 120°	Yes	Y		1	.9	6	1	17	-.5	18	.866													
14	0.9D + 1.0W 150°	Yes	Y		1	.9	7	1	17	-.8...	18	.5													
15	0.9D + 1.0W 180°	Yes	Y		1	.9	8	1	17	-1	18														
16	1.2D + 1.0Di + 1.0...	Yes	Y		1	1.2	9	1	10	1	19	1	20												
17	1.2D + 1.0Di + 1.0...	Yes	Y		1	1.2	9	1	11	1	19	.866	20	.5											
18	1.2D + 1.0Di + 1.0...	Yes	Y		1	1.2	9	1	12	1	19	.5	20	.866											
19	1.2D + 1.0Di + 1.0...	Yes	Y		1	1.2	9	1	13	1	19		20	1											
20	1.2D + 1.0Di + 1.0...	Yes	Y		1	1.2	9	1	14	1	19	-.5	20	.866											
21	1.2D + 1.0Di + 1.0...	Yes	Y		1	1.2	9	1	15	1	19	-.8...	20	.5											
22	1.2D + 1.0Di + 1.0...	Yes	Y		1	1.2	9	1	16	1	19	-1	20												
23	1.2D + 1.0Ev + 1.0...	Yes	Y		1	1.2	21	1	22	1	23														
24	1.2D + 1.0Ev + 1.0...	Yes	Y		1	1.2	21	1	22	.866	23	.5													
25	1.2D + 1.0Ev + 1.0...	Yes	Y		1	1.2	21	1	22	.5	23	.866													
26	1.2D + 1.0Ev + 1.0...	Yes	Y		1	1.2	21	1	22		23	1													
27	1.2D + 1.0Ev + 1.0...	Yes	Y		1	1.2	21	1	22	-.5	23	.866													
28	1.2D + 1.0Ev + 1.0...	Yes	Y		1	1.2	21	1	22	-.8...	23	.5													
29	1.2D + 1.0Ev + 1.0...	Yes	Y		1	1.2	21	1	22	-1	23														
30	1.0D + 1.5Lv + 1.0...	Yes	Y		1	1	24	1.5	2	.239	17	.239	18												
31	1.0D + 1.5Lv + 1.0...	Yes	Y		1	1	24	1.5	3	.239	17	.207	18	.12											
32	1.0D + 1.5Lv + 1.0...	Yes	Y		1	1	24	1.5	4	.239	17	.12	18	.207											
33	1.0D + 1.5Lv + 1.0...	Yes	Y		1	1	24	1.5	5	.239	17		18	.239											
34	1.0D + 1.5Lv + 1.0...	Yes	Y		1	1	24	1.5	6	.239	17	-.12	18	.207											
35	1.0D + 1.5Lv + 1.0...	Yes	Y		1	1	24	1.5	7	.239	17	-.2...	18	.12											
36	1.0D + 1.5Lv + 1.0...	Yes	Y		1	1	24	1.5	8	.239	17	-.2...	18												
37	1.0D + 1.5Lv + 1.0...	Yes	Y		1	1	25	1.5	2	.239	17		18												
38	1.0D + 1.5Lv + 1.0...	Yes	Y		1	1	25	1.5	3	.239	17	.12	18												
39	1.0D + 1.5Lv + 1.0...	Yes	Y		1	1	25	1.5	4	.239	17	.207	18												
40	1.0D + 1.5Lv + 1.0...	Yes	Y		1	1	25	1.5	5	.239	17		18												
41	1.0D + 1.5Lv + 1.0...	Yes	Y		1	1	25	1.5	6	.239	17	.207	18												
42	1.0D + 1.5Lv + 1.0...	Yes	Y		1	1	25	1.5	7	.239	17	.12	18												
43	1.0D + 1.5Lv + 1.0...	Yes	Y		1	1	25	1.5	8	.239	17		18												
44	1.0D + 1.5Lv + 1.0...	Yes	Y		1	1	26	1.5	2	.239	17	.057	18												
45	1.0D + 1.5Lv + 1.0...	Yes	Y		1	1	26	1.5	3	.239	17	.05	18	.029											
46	1.0D + 1.5Lv + 1.0...	Yes	Y		1	1	26	1.5	4	.239	17	.029	18	.05											
47	1.0D + 1.5Lv + 1.0...	Yes	Y		1	1	26	1.5	5	.239	17		18	.057											
48	1.0D + 1.5Lv + 1.0...	Yes	Y		1	1	26	1.5	6	.239	17	-.0...	18	.05											
49	1.0D + 1.5Lv + 1.0...	Yes	Y		1	1	26	1.5	7	.239	17	-.05	18	.029											
50	1.0D + 1.5Lv + 1.0...	Yes	Y		1	1	26	1.5	8	.239	17	-.0...	18												
51	1.2D + 1.5Lv	Yes	Y		1	1.2	24	1.5																	
52	1.2D + 1.5Lv	Yes	Y		1	1.2	25	1.5																	
53	1.2D + 1.5Lv	Yes	Y		1	1.2	26	1.5																	
54	1.2D + 1.5Lm + 1.0...	Yes	Y		1	1.2	27	1.5	2	.067	17	.067	18												
55	1.2D + 1.5Lm + 1.0...	Yes	Y		1	1.2	27	1.5	3	.067	17	.058	18	.033											
56	1.2D + 1.5Lm + 1.0...	Yes	Y		1	1.2	27	1.5	4	.067	17	.033	18	.058											
57	1.2D + 1.5Lm + 1.0...	Yes	Y		1	1.2	27	1.5	5	.067	17		18	.067											
58	1.2D + 1.5Lm + 1.0...	Yes	Y		1	1.2	27	1.5	6	.067	17	-.0...	18	.058											
59	1.2D + 1.5Lm + 1.0...	Yes	Y		1	1.2	27	1.5	7	.067	17	-.0...	18	.033											
60	1.2D + 1.5Lm + 1.0...	Yes	Y		1	1.2	27	1.5	8	.067	17	-.0...	18												
61	1.2D + 1.5Lm + 1.0...	Yes	Y		1	1.2	28	1.5	2	.067	17	.067	18												
62	1.2D + 1.5Lm + 1.0...	Yes	Y		1	1.2	28	1.5	3	.067	17	.058	18	.033											
63	1.2D + 1.5Lm + 1.0...	Yes	Y		1	1.2	28	1.5	4	.067	17	.033	18	.058											
64	1.2D + 1.5Lm + 1.0...	Yes	Y		1	1.2	28	1.5	5	.067	17		18	.067											



Load Combinations (Continued)

	Description	S...	PDelta	SRSS	B...	Fa...	BLC	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...
65	1.2D + 1.5Lm + 1...	Yes	Y		1	1.2	28	1.5	6	.067	17	-0...	18	.058									
66	1.2D + 1.5Lm + 1...	Yes	Y		1	1.2	28	1.5	7	.067	17	-0...	18	.033									
67	1.2D + 1.5Lm + 1...	Yes	Y		1	1.2	28	1.5	8	.067	17	-0...	18										
68	1.2D + 1.5Lm + 1...	Yes	Y		1	1.2	29	1.5	2	.067	17	.067	18										
69	1.2D + 1.5Lm + 1...	Yes	Y		1	1.2	29	1.5	3	.067	17	.058	18	.033									
70	1.2D + 1.5Lm + 1...	Yes	Y		1	1.2	29	1.5	4	.067	17	.033	18	.058									
71	1.2D + 1.5Lm + 1...	Yes	Y		1	1.2	29	1.5	5	.067	17		18	.067									
72	1.2D + 1.5Lm + 1...	Yes	Y		1	1.2	29	1.5	6	.067	17	-0...	18	.058									
73	1.2D + 1.5Lm + 1...	Yes	Y		1	1.2	29	1.5	7	.067	17	-0...	18	.033									
74	1.2D + 1.5Lm + 1...	Yes	Y		1	1.2	29	1.5	8	.067	17	-0...	18										
75	1.2D + 1.5Lm + 1...	Yes	Y		1	1.2	30	1.5	2	.067	17	.067	18										
76	1.2D + 1.5Lm + 1...	Yes	Y		1	1.2	30	1.5	3	.067	17	.058	18	.033									
77	1.2D + 1.5Lm + 1...	Yes	Y		1	1.2	30	1.5	4	.067	17	.033	18	.058									
78	1.2D + 1.5Lm + 1...	Yes	Y		1	1.2	30	1.5	5	.067	17		18	.067									
79	1.2D + 1.5Lm + 1...	Yes	Y		1	1.2	30	1.5	6	.067	17	-0...	18	.058									
80	1.2D + 1.5Lm + 1...	Yes	Y		1	1.2	30	1.5	7	.067	17	-0...	18	.033									
81	1.2D + 1.5Lm + 1...	Yes	Y		1	1.2	30	1.5	8	.067	17	-0...	18										
82	1.2D + 1.5Lm + 1...	Yes	Y		1	1.2	31	1.5	2	.067	17	.067	18										
83	1.2D + 1.5Lm + 1...	Yes	Y		1	1.2	31	1.5	3	.067	17	.058	18	.033									
84	1.2D + 1.5Lm + 1...	Yes	Y		1	1.2	31	1.5	4	.067	17	.033	18	.058									
85	1.2D + 1.5Lm + 1...	Yes	Y		1	1.2	31	1.5	5	.067	17		18	.067									
86	1.2D + 1.5Lm + 1...	Yes	Y		1	1.2	31	1.5	6	.067	17	-0...	18	.058									
87	1.2D + 1.5Lm + 1...	Yes	Y		1	1.2	31	1.5	7	.067	17	-0...	18	.033									
88	1.2D + 1.5Lm + 1...	Yes	Y		1	1.2	31	1.5	8	.067	17	-0...	18										
89	1.2D + 1.5Lm + 1...	Yes	Y		1	1.2	32	1.5	2	.067	17	.067	18										
90	1.2D + 1.5Lm + 1...	Yes	Y		1	1.2	32	1.5	3	.067	17	.058	18	.033									
91	1.2D + 1.5Lm + 1...	Yes	Y		1	1.2	32	1.5	4	.067	17	.033	18	.058									
92	1.2D + 1.5Lm + 1...	Yes	Y		1	1.2	32	1.5	5	.067	17		18	.067									
93	1.2D + 1.5Lm + 1...	Yes	Y		1	1.2	32	1.5	6	.067	17	-0...	18	.058									
94	1.2D + 1.5Lm + 1...	Yes	Y		1	1.2	32	1.5	7	.067	17	-0...	18	.033									
95	1.2D + 1.5Lm + 1...	Yes	Y		1	1.2	32	1.5	8	.067	17	-0...	18										
96	1.2D + 1.5Lm + 1...	Yes	Y		1	1.2	33	1.5	2	.067	17	.067	18										
97	1.2D + 1.5Lm + 1...	Yes	Y		1	1.2	33	1.5	3	.067	17	.058	18	.033									
98	1.2D + 1.5Lm + 1...	Yes	Y		1	1.2	33	1.5	4	.067	17	.033	18	.058									
99	1.2D + 1.5Lm + 1...	Yes	Y		1	1.2	33	1.5	5	.067	17		18	.067									
100	1.2D + 1.5Lm + 1...	Yes	Y		1	1.2	33	1.5	6	.067	17	-0...	18	.058									
101	1.2D + 1.5Lm + 1...	Yes	Y		1	1.2	33	1.5	7	.067	17	-0...	18	.033									
102	1.2D + 1.5Lm + 1...	Yes	Y		1	1.2	33	1.5	8	.067	17	-0...	18										
103	1.2D + 1.5Lm + 1...	Yes	Y		1	1.2	34	1.5	2	.067	17	.067	18										
104	1.2D + 1.5Lm + 1...	Yes	Y		1	1.2	34	1.5	3	.067	17	.058	18	.033									
105	1.2D + 1.5Lm + 1...	Yes	Y		1	1.2	34	1.5	4	.067	17	.033	18	.058									
106	1.2D + 1.5Lm + 1...	Yes	Y		1	1.2	34	1.5	5	.067	17		18	.067									
107	1.2D + 1.5Lm + 1...	Yes	Y		1	1.2	34	1.5	6	.067	17	-0...	18	.058									
108	1.2D + 1.5Lm + 1...	Yes	Y		1	1.2	34	1.5	7	.067	17	-0...	18	.033									
109	1.2D + 1.5Lm + 1...	Yes	Y		1	1.2	34	1.5	8	.067	17	-0...	18										
110	1.2D + 1.5Lm + 1...	Yes	Y		1	1.2	35	1.5	2	.067	17	.067	18										
111	1.2D + 1.5Lm + 1...	Yes	Y		1	1.2	35	1.5	3	.067	17	.058	18	.033									
112	1.2D + 1.5Lm + 1...	Yes	Y		1	1.2	35	1.5	4	.067	17	.033	18	.058									
113	1.2D + 1.5Lm + 1...	Yes	Y		1	1.2	35	1.5	5	.067	17		18	.067									
114	1.2D + 1.5Lm + 1...	Yes	Y		1	1.2	35	1.5	6	.067	17	-0...	18	.058									
115	1.2D + 1.5Lm + 1...	Yes	Y		1	1.2	35	1.5	7	.067	17	-0...	18	.033									
116	1.2D + 1.5Lm + 1...	Yes	Y		1	1.2	35	1.5	8	.067	17	-0...	18										
117	1.2D + 1.5Lm + 1...	Yes	Y		1	1.2	36	1.5	2	.067	17	.067	18										
118	1.2D + 1.5Lm + 1...	Yes	Y		1	1.2	36	1.5	3	.067	17	.058	18	.033									
119	1.2D + 1.5Lm + 1...	Yes	Y		1	1.2	36	1.5	4	.067	17	.033	18	.058									
120	1.2D + 1.5Lm + 1...	Yes	Y		1	1.2	36	1.5	5	.067	17		18	.067									
121	1.2D + 1.5Lm + 1...	Yes	Y		1	1.2	36	1.5	6	.067	17	-0...	18	.058									

Load Combinations (Continued)

Description	S...	PDelta	SRSS	B...	Fa...	BLC	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...
122	1.2D + 1.5Lm + 1...	Yes	Y		1	1.2	36	1.5	7	.067	17	-0...	18	.033												
123	1.2D + 1.5Lm + 1...	Yes	Y		1	1.2	36	1.5	8	.067	17	-0...	18													
124	1.2D + 1.5Lm + 1...	Yes	Y		1	1.2	37	1.5	2	.067	17	.067	18													
125	1.2D + 1.5Lm + 1...	Yes	Y		1	1.2	37	1.5	3	.067	17	.058	18	.033												
126	1.2D + 1.5Lm + 1...	Yes	Y		1	1.2	37	1.5	4	.067	17	.033	18	.058												
127	1.2D + 1.5Lm + 1...	Yes	Y		1	1.2	37	1.5	5	.067	17		18	.067												
128	1.2D + 1.5Lm + 1...	Yes	Y		1	1.2	37	1.5	6	.067	17	-0...	18	.058												
129	1.2D + 1.5Lm + 1...	Yes	Y		1	1.2	37	1.5	7	.067	17	-0...	18	.033												
130	1.2D + 1.5Lm + 1...	Yes	Y		1	1.2	37	1.5	8	.067	17	-0...	18													
131	1.2D + 1.5Lm + 1...	Yes	Y		1	1.2	38	1.5	2	.067	17	.067	18													
132	1.2D + 1.5Lm + 1...	Yes	Y		1	1.2	38	1.5	3	.067	17	.058	18	.033												
133	1.2D + 1.5Lm + 1...	Yes	Y		1	1.2	38	1.5	4	.067	17	.033	18	.058												
134	1.2D + 1.5Lm + 1...	Yes	Y		1	1.2	38	1.5	5	.067	17		18	.067												
135	1.2D + 1.5Lm + 1...	Yes	Y		1	1.2	38	1.5	6	.067	17	-0...	18	.058												
136	1.2D + 1.5Lm + 1...	Yes	Y		1	1.2	38	1.5	7	.067	17	-0...	18	.033												
137	1.2D + 1.5Lm + 1...	Yes	Y		1	1.2	38	1.5	8	.067	17	-0...	18													
138	1.2D + 1.5Lm + 1...	Yes	Y		1	1.2	39	1.5	2	.067	17	.067	18													
139	1.2D + 1.5Lm + 1...	Yes	Y		1	1.2	39	1.5	3	.067	17	.058	18	.033												
140	1.2D + 1.5Lm + 1...	Yes	Y		1	1.2	39	1.5	4	.067	17	.033	18	.058												
141	1.2D + 1.5Lm + 1...	Yes	Y		1	1.2	39	1.5	5	.067	17		18	.067												
142	1.2D + 1.5Lm + 1...	Yes	Y		1	1.2	39	1.5	6	.067	17	-0...	18	.058												
143	1.2D + 1.5Lm + 1...	Yes	Y		1	1.2	39	1.5	7	.067	17	-0...	18	.033												
144	1.2D + 1.5Lm + 1...	Yes	Y		1	1.2	39	1.5	8	.067	17	-0...	18													

Envelope AISC 15th(360-16): LRFD Steel Code Checks

Member	Shape	Code Check	Loc[in]	LC	Shea..	Loc.....	L...	phi*Pnc [lb]	phi*Pnt [lb]	phi*Mn y-y [..	phi*Mn z-z [lb.....	Eqn
1	M47	PIPE_2.0	.793	30.875	8	.217	30....	7 5820.472	32130	1871.625	1871.625	2..H1-1a
2	MP3	PIPE_2.0	.691	40	2	.081	40	14 14916.096	32130	1871.625	1871.625	1..H1-1b
3	M93	PIPE_2.0	.684	47.125	2	.225	30....	12 5820.472	32130	1871.625	1871.625	2..H1-1a
4	MP7	PIPE_2.0	.604	40	5	.074	40	7 14916.096	32130	1871.625	1871.625	1..H1-1b
5	M1	PIPE_2.0	.581	30.875	5	.292	30....	2 5820.472	32130	1871.625	1871.625	2..H1-1a
6	MP11	PIPE_2.0	.543	40	9	.076	40	3 14916.096	32130	1871.625	1871.625	1..H1-1b
7	M54	PIPE_4.0	.496	9.625	11	.344	9.6...	11 79713.212	93240	10631.25	10631.25	3..H1-1b
8	M55	PIPE_2.0	.469	54.123	3	.194	54....	3 25176.042	32130	1871.625	1871.625	4..H1-1b
9	M97A	PIPE_2.0	.464	54.123	2	.209	54....	2 25176.042	32130	1871.625	1871.625	4..H1-1b
10	M101	PIPE_2.0	.454	54.123	8	.195	54....	8 25176.042	32130	1871.625	1871.625	4..H1-1b
11	M135A	PIPE_2.0	.445	34.123	21	.206	34....	20 29161.326	32130	1871.625	1871.625	4..H1-1b
12	M51	PIPE_2.0	.441	5.638	3	.153	54....	22 25176.042	32130	1871.625	1871.625	3..H1-1a
13	M100	PIPE_4.0	.433	9.625	2	.358	9.6...	2 79713.212	93240	10631.25	10631.25	2..H1-1b
14	M9	PIPE_2.0	.419	54.123	16	.187	54....	2 25176.042	32130	1871.625	1871.625	3..H1-1b
15	M66	PIPE_2.0	.406	54.123	4	.139	5.0...	20 25176.042	32130	1871.625	1871.625	2..H1-1b
16	M8	PIPE_4.0	.383	9.625	7	.296	9.6...	6 79713.212	93240	10631.25	10631.25	3..H1-1b
17	M48	PIPE_2.0	.367	47.125	3	.143	30....	2 5820.472	32130	1871.625	1871.625	2..H1-1b
18	MP2	PIPE_2.5	.362	40	2	.073	75	7 22373.407	50715	3596.25	3596.25	3..H1-1b
19	M112	PIPE_2.0	.349	54.123	7	.167	5.0...	22 25176.042	32130	1871.625	1871.625	3..H1-1b
20	M94A	PIPE_2.0	.347	47.125	6	.179	30....	5 5820.472	32130	1871.625	1871.625	2..H1-1b
21	M63	PIPE_2.0	.344	54.123	4	.153	54....	19 25176.042	32130	1871.625	1871.625	3..H1-1b
22	M2	PIPE_2.0	.320	48.75	7	.179	30....	8 5820.472	32130	1871.625	1871.625	3..H1-1b
23	M109	PIPE_2.0	.320	54.123	2	.174	5.0...	17 25176.042	32130	1871.625	1871.625	2..H1-1b
24	MP6	PIPE_2.5	.311	40	5	.088	75	7 22373.407	50715	3596.25	3596.25	1..H1-1b
25	M87	PIPE_2.0	.310	39.285	8	.044	78....	11 19216.827	32130	1871.625	1871.625	1..H1-1a
26	M20	PIPE_2.0	.300	54.123	20	.133	5.0...	16 25176.042	32130	1871.625	1871.625	3..H1-1b
27	M17	PIPE_2.0	.298	54.123	20	.135	54....	16 25176.042	32130	1871.625	1871.625	3..H1-1b
28	MP5	PIPE_2.0	.285	73.5	5	.092	73.5	4 8922.084	32130	1871.625	1871.625	2..H1-1b
29	MP10	PIPE_2.5	.283	40	8	.080	75	11 22373.407	50715	3596.25	3596.25	2..H1-1b



Company : Centerline Communications, LLC
 Designer : AP
 Job Number :
 Model Name : CT5404_Mount

Dec 23, 2020
 8:38 AM
 Checked By: DC, AA

Envelope AISC 15th(360-16): LRFD Steel Code Checks (Continued)

Member	Shape	Code Check	Loc[in]	LC	Shear	Loc	Dir	LC	phi*Pnc [lb]	phi*Pnt [lb]	phi*Mn y-y [lb]	phi*Mn z-z [lb]	Eqn
30	MP1	PIPE_2.0	.280	45.75	57	.045	11	50	20866.733	32130	1871.625	1871.625	2..H1-1b
31	MP9	PIPE_2.0	.278	45.75	130	.042	11	1	20866.733	32130	1871.625	1871.625	2..H1-1b
32	MP4	PIPE_2.5	.277	40	15	.054	75	11	22373.407	50715	3596.25	3596.25	2..H1-1b
33	M106	3/4" Rod	.254	55.446	21	.019	55	7	1141.371	14313.866	178.929	178.929	2..H1-1...
34	M60	3/4" Rod	.252	55.446	17	.023	0	4	1141.371	14313.866	178.929	178.929	2..H1-1...
35	MP8	PIPE_2.5	.250	40	5	.078	75	6	22373.407	50715	3596.25	3596.25	1..H1-1b
36	MP12	PIPE_2.5	.242	40	8	.076	75	2	22373.407	50715	3596.25	3596.25	3..H1-1b
37	M121	PIPE_2.0	.237	39.285	4	.045	78	6	19216.827	32130	1871.625	1871.625	1..H1-1a
38	M14	3/4" Rod	.230	55.446	22	.012	55	13	1141.371	14313.866	178.929	178.929	2..H1-1...
39	M5	PIPE_2.0	.228	5.417	16	.152	5.4	22	31077.531	32130	1871.625	1871.625	1..H1-1b
40	M133	PIPE_2.0	.221	38.467	2	.044	0	2	19216.827	32130	1871.625	1871.625	1..H1-1a
41	M117	3/4" Rod	.217	55.446	16	.024	55	2	1141.371	14313.866	178.929	178.929	2..H1-1...
42	M71	3/4" Rod	.209	55.446	22	.029	55	11	1141.371	14313.866	178.929	178.929	2..H1-1...
43	M25	3/4" Rod	.197	55.446	20	.018	55	6	1141.371	14313.866	178.929	178.929	2..H1-1...
44	M105	3/4" Rod	.090	0	9	.007	35	14	2864.383	14313.866	178.929	178.929	1..H1-1...
45	M13	3/4" Rod	.088	0	14	.005	35	6	2864.383	14313.866	178.929	178.929	3..H1-1...
46	MP13	PIPE_2.0	.079	53	16	.036	18	5	14916.096	32130	1871.625	1871.625	1..H1-1b
47	M12	3/4" Rod	.060	0	14	.028	0	12	2864.383	14313.866	178.929	178.929	1..H1-1...
48	M104	3/4" Rod	.048	0	10	.037	0	6	2864.383	14313.866	178.929	178.929	2..H1-1...
49	M23	3/4" Rod	.029	0	15	.018	35	4	2864.383	14313.866	178.929	178.929	1..H1-1...
50	M70	3/4" Rod	.025	0	13	.006	35	3	2864.383	14313.866	178.929	178.929	1..H1-1...
51	M115	3/4" Rod	.023	0	11	.022	0	6	2864.383	14313.866	178.929	178.929	2..H1-1...
52	M24	3/4" Rod	.021	0	10	.004	35	12	2864.383	14313.866	178.929	178.929	2..H1-1...
53	M59	3/4" Rod	.021	0	15	.008	35	10	2864.383	14313.866	178.929	178.929	2..H1-1...
54	M58	3/4" Rod	.003	0	15	.039	35	3	2864.383	14313.866	178.929	178.929	2..H1-1...
55	M116	3/4" Rod	.001	0	15	.006	0	6	2864.383	14313.866	178.929	178.929	2..H1-1...
56	M69	3/4" Rod	.000	0	144	.025	0	3	2864.383	14313.866	178.929	178.929	2..H1-1a

Envelope AISI S100-16: LRFD Cold Formed Steel Code Checks

Member	Shape	Code ...	Loc[in]	LC	Shear	Loc[in]	Dir	LC	phi*Pn[lb]	phi*Tn[lb]	phi*Mny...	phi*Mnz...	phi*V...	phi*V...	Cb	Eqn
1	M26	P1000	.362	6.5	21	.091	6.5	y 22	13195.0...	22666.1...	400.383	816.4	1763...	3526...	2.04	H1.2-1
2	M27	P1000	.175	19.5	2	.062	6.5	y 3	13195.0...	22666.1...	400.383	816.4	1763...	3526...	1.969	H1.2-1
3	R4	P1000	.186	30.083	2	.083	38	y 20	14967.2...	22666.1...	400.383	816.4	1763...	3526...	1.337	H1.2-1
4	R6	P1000	.360	6.5	22	.063	6.5	y 22	13195.0...	22666.1...	400.383	816.4	1763...	3526...	1.959	H1.2-1
5	M72	P1000	.329	41.5	21	.111	6.5	y 16	13195.0...	22666.1...	449.18	816.4	1763...	3526...	1.948	H1.2-1
6	M73	P1000	.262	19.5	5	.075	6.5	y 7	13195.0...	22666.1...	400.383	816.4	1763...	3526...	2.045	H1.2-1
7	R11	P1000	.277	10.292	5	.102	38	y 17	14967.2...	22666.1...	400.383	816.4	1763...	3526...	1.119	H1.2-1
8	R12	P1000	.378	6.5	16	.094	41.5	y 4	13195.0...	22666.1...	400.383	816.4	1763...	3526...	1.815	H1.2-1
9	M118	P1000	.501	6.5	17	.118	6.5	y 20	13195.0...	22666.1...	400.383	816.4	1763...	3526...	2.079	H1.2-1
10	M119	P1000	.175	41.5	2	.058	6.5	y 12	13195.0...	22666.1...	400.383	816.4	1763...	3526...	2.205	H1.2-1
11	R9	P1000	.350	19	8	.053	38	y 20	14967.2...	22666.1...	400.383	816.4	1763...	3526...	1.288	H1.2-1
12	R10	P1000	.405	6.5	5	.074	41.5	y 21	13195.0...	22666.1...	400.383	816.4	1763...	3526...	1.928	H1.2-1
13	M132	P1000	.027	19	7	.012	0	y 20	14967.2...	22666.1...	449.18	816.4	1763...	3526...	1.136	H1.1-2
14	M133A	P1000	.040	19	5	.014	0	y 17	14967.2...	22666.1...	400.383	816.4	1763...	3526...	1.136	H1.1-2
15	M134A	P1000	.039	19	8	.014	38	y 21	14967.2...	22666.1...	400.383	816.4	1763...	3526...	1.136	H1.1-2
16	M136A	P1000	.138	6.5	22	.024	6.5	y 20	13195.0...	22666.1...	400.383	816.4	1763...	3526...	1.947	H1.1-2
17	M137	P1000	.243	41.5	4	.055	41.5	y 4	13195.0...	22666.1...	449.18	816.4	1763...	3526...	2.035	H1.2-1
18	M138	P1000	.147	6.5	18	.036	41.5	y 7	13195.0...	22666.1...	400.383	816.4	1763...	3526...	1.856	H1.2-1