



Mount Analysis Report

ATC Asset Name : Lacrosse FL 6
ATC Asset Number : 303048
Engineering Number : 14863653_C8_01
Mount Elevation : 191.75 ft
Proposed Carrier : T-Mobile
Carrier Site Name : 9JK0174A
Carrier Site Number : 9JK0174A
Site Location : 183 Southeast Waterleaf Drive
Lake City, FL 32024-0001
29.951501, -82.570729
County : Columbia
Date : June 26, 2024
Max Usage : 88%
Analysis Result : Contingent Pass

Prepared By:
Joseph Swier
Structural Engineer I

Joseph Swier



This item has been electronically signed and sealed by Sarah F. Rucker, PE on the date shown using a digital signature.

Printed copies are not considered signed and sealed and the signature must be verified on any electronic copies.

Sarah
Rucker

Digitally signed by
Sarah Rucker
Date: 2024.06.27
18:51:12 -04'00'

COA: 9053

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Introduction

The purpose of this report is to summarize results of the mount analysis performed for T-Mobile at 191.75 ft.

Supporting Documents

Specifications Sheet:	Sabre C10857007C, dated October 19, 2016
Radio Frequency Data Sheet:	RFDS ID #9JK0174A, dated May 30, 2024
Reference Photos:	Site photos from 2023

Analysis

This mount was analyzed using American Tower Corporation's Mount Analysis Program and RISA-3D

Basic Wind Speed:	121 mph (3-Second Gust)
Basic Wind Speed w/ Ice:	No Ice Considered
Codes:	ANSI/TIA-222-H / 2021 IBC / 8th ED (2023) Florida Building Code
Exposure Category:	C
Risk Category:	II
Topographic Factor Procedure:	Method 2
Feature:	Flat
Crest Height (H):	0 ft
Crest Length (L):	0 ft
Spectral Response:	Ss = 0.081, S1 = 0.048
Site Class:	D - Stiff Soil - Default
Live Loads:	Lm = 500 lbs, Lv = 250 lbs

*Live Load(s) reduction is confirmed to either not govern or not be applicable

Conclusion

Based on the analysis results, the antenna mount meets the requirements per the applicable codes listed above provided the modifications listed below are completed:

- On Beta, install P4 (4.5" x 72") in mount pipe position B2 to be located 3" from right end of mount face looking out from tower. Connect with Site Pro 1 SCX7-U (or approved equivalent) crossover plate kits.
- No structural failures were addressed with the noted contingencies. Contingencies address Carrier's antenna spacing requirements.

If you have any questions or require additional information, please reach out to your American Tower contact. If you do not have an American Tower contact and have an Engineering question, please contact MountAnalysis@americantower.com. Please include the American Tower site name, site number, and engineering number in the subject line for any questions.

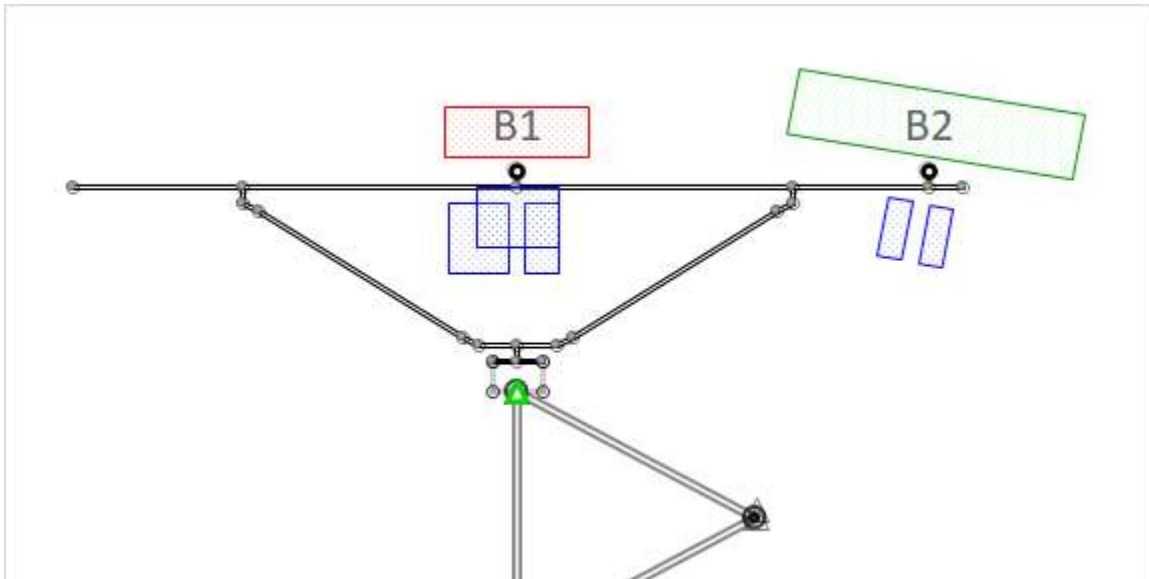
Application Loading

Mount Centerline (ft)	Equipment Centerline (ft)	Qty	Equipment Manufacturer & Model
191.8	193.0	3	Commscope FFV4-65C-R3-V1
		3	Ericsson Radio 4449 B12,B71 (75 lbs)
		3	Ericsson RRUS 4415 B25
		3	Ericsson 4424 B25
		1	Commscope VHLP4-11W/A
		2	Ceragon FibeAir IP-20D-HP

Structure Usages

Structural Component	Controlling Usage	Pass/Fail
Horizontals	52%	Pass
Verticals	28%	Pass
Diagonals	36%	Pass
Tie-Backs	11%	Pass
Mount Pipes	88%	Pass
Tower Leg Check	49%	Pass
Clamp Connection Check	22%	Pass

Mount Layout

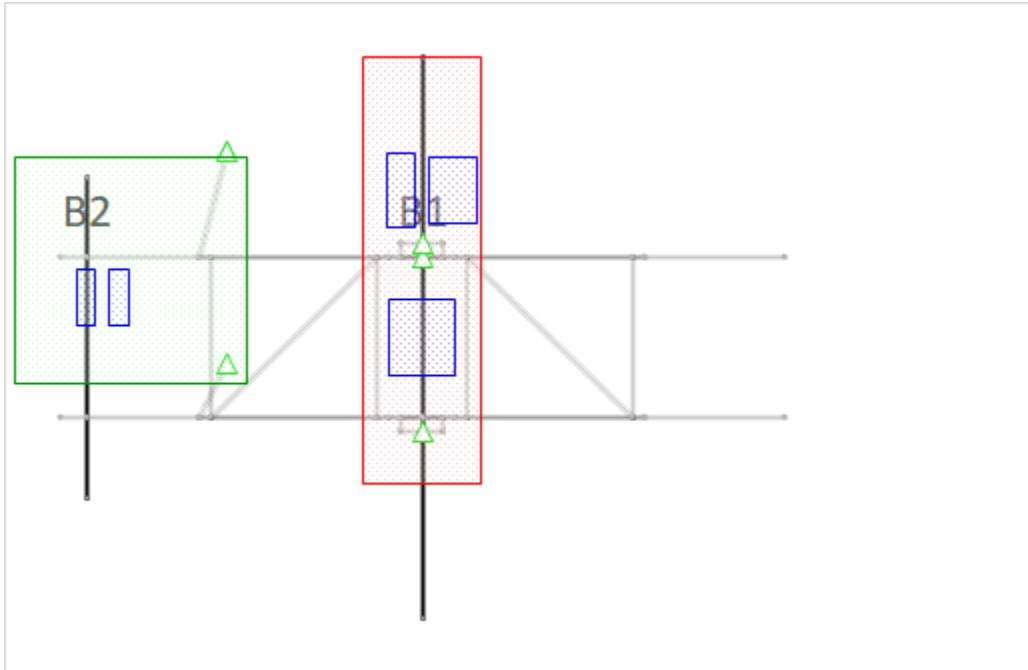


Equipment Position Table

MP	RAD Center (ft)	Qty.	Antenna Model	Max Width (in)	Left (in)	Right (in)
B1	193.0	1	Commscope FFV4-65C-R3-V1	25.2	N/A	N/A
	193.0	1	Ericsson Radio 4449 B12,B71 (75 lbs)			
	193.0	1	Ericsson RRUS 4415 B25			
	193.0	1	Ericsson 4424 B25			
B2	193.0	1	Commscope VHLP4-11W/A	-	-	-
	193.0	2	Ceragon FibeAir IP-20D-HP			

Equipment Layout

Front View - Beta





Standard Conditions

All engineering services performed by ATC Tower Services, LLC are prepared on the basis that the information used is current and correct. This information may consist of, but is not limited to the following:

- Information supplied by the client regarding equipment, mounts, and feed line loading
- Information from drawings, design and analysis documents, and field notes in the possession of ATC Tower Services, LLC

It is the responsibility of the client to ensure that the information provided to ATC Tower Services, LLC and used in the performance of our engineering services is correct and complete.

American Tower assumes that all structures were constructed in accordance with the drawings and specifications.

All connections are to be verified for condition and tightness by the installation contractor preceding any changes to the appurtenance mounting system and/or equipment attached to it.

Unless explicitly agreed by both the client and ATC Tower Services, LLC, all services will be performed in accordance with the current revision of ANSI/TIA-222.

Installation of all equipment and steel should be confirmed not to cause tower conflicts nor impede the tower climbing pegs.

All services are performed, results obtained, and recommendations made in accordance with generally accepted engineering principles and practices. ATC Tower Services, LLC is not responsible for the conclusions, opinions and recommendations made by others based on the information supplied herein.



Site Number: 303048
 Project Number: 14863653_C8_01
 Carrier: T-Mobile
 Mount Elevation: 191.75 ft
 Date: 6/26/2024

Mount Analysis Force Calculations

Wind & Ice Load Calculations			
Velocity Pressure Coefficient	K_z	1.45	
Topographic Factor	K_{zt}	1.00	
Rooftop Wind Speed-up Factor	K_s	1.00	
Shielding Factor	K_a	0.90	
Ground Elevation Factor	K_e	0.99	
Wind Direction Probability Factor	K_d	0.95	
Basic Wind Speed	V	121	mph
Velocity Pressure	q_z	51.4	psf
Height Escalation Factor	K_{iz}	1.19	
Thickness of Radial Glaze Ice	T_{iz}	0.00	in

Seismic Load Calculations			
Short Period DSRAP	S_{DS}	0.065	
1 Second DSRAP	S_{D1}	0.077	
Importance Factor	I	1.0	
Response Modification Coefficient	R	2.0	
Seismic Response Coefficient	C_s	0.032	
Amplification Factor	A	1.0	
Total Weight	W	871.6	lbs
Total Shear Force	V_s	28.2	lbs
Horizontal Seismic Load	E_h	28.2	lbs
Vertical Seismic Load	E_v	11.3	lbs

Antenna Calculations (Elevations per Application/RFDS)*								
Equipment	Height	Width	Depth	Weight	EPA_N	EPA_T	EPA_{Ni}	EPA_{Ti}
Model #	in	in	in	lbs	sqft	sqft	sqft	sqft
Commscope FFV4-65C-R3-V1	95.9	25.2	9.3	131.8	21.11	3.72	21.11	3.72
Ericsson Radio 4449 B12,B71 (75 lbs)	15.0	13.2	10.4	75.0	1.65	1.30	1.65	1.30
Ericsson RRUS 4415 B25	16.5	13.4	5.9	46.0	1.84	0.82	1.84	0.82
Ericsson 4424 B25	17.1	14.4	11.3	86.0	2.05	1.61	2.05	1.61
Commscope VHLP4-11W/A	50.8	50.8	12.7	70.5	8.95	3.58	8.95	3.58
Ceragon FibeAir IP-20D-HP	12.6	11.3	4.2	26.5	1.19	0.45	1.19	0.45

* Equipment with EPA values N/A were not considered in the mount analysis

**Equipment EPA has been adjusted per wind tunnel and CFD testing

Mount-to-Tower Connection Analysis

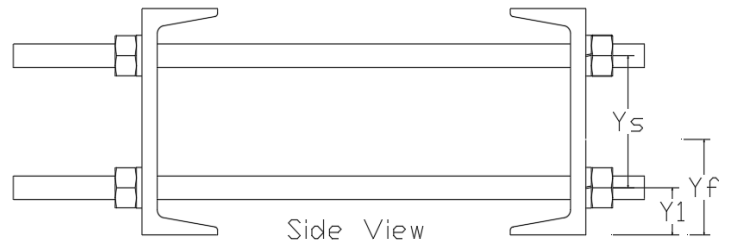
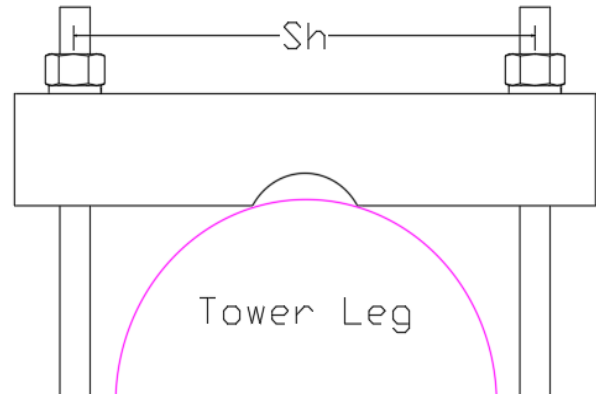
Applied Loads from RISA 3D

Controlling Load Combination		2	
Node Label / Orientation (Degrees)		N044	
Force in X	F _x	-1124.2	lbs
Force in Y	F _y	1104.6	lbs
Force in Z	F _z	1592.0	lbs
Moment about X	M _x	-552.3	lb-ft
Moment about Y	M _y	0.0	lb-ft
Moment about Z	M _z	-26.5	lb-ft

Bolt Capacity

Bolt Type		Threaded Rod(s)	
Threaded Rod(s) Quantity	n	4	
Bolt Diameter	D _B	5/8	in
Vertical Bolt Spacing	Y _s	2	in
Lower Bolt Edge Distance	Y ₁	1	in
Horizontal Bolt Spacing	S _h	6.5	in
Clamp Height	H	4	in
Load Eccentricity	Y _f	1.46875	in
Bolt Grade		A307	
Bolt F _y	F _{yB}	50	ksi
Bolt F _u	F _{uB}	60	ksi
Max Applied Tension	T _u	2.23	k
Tensile Strength	φT _n	10.2	k
Connection Capacity	T _u /φT _n	22%	Pass

Top View



Side View

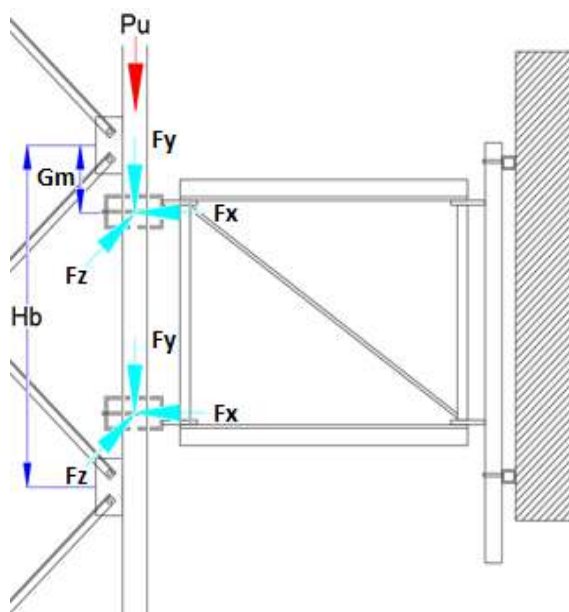
Tower Leg Reaction Analysis

Applied Loads from RISA 3D

Controlling Load Combination/ Leg Orient.	4	0	deg
Leg Node Label(s)	N043		
Force in X, F_x	3054.6		lbs
Force in Y, F_y	1556.0		lbs
Force in Z, F_z	-2398.2		lbs
Moment about X, M_x	-778.0		lb-ft
Moment about Y, M_y	0.0		lb-ft
Moment about Z, M_z	287.6		lb-ft

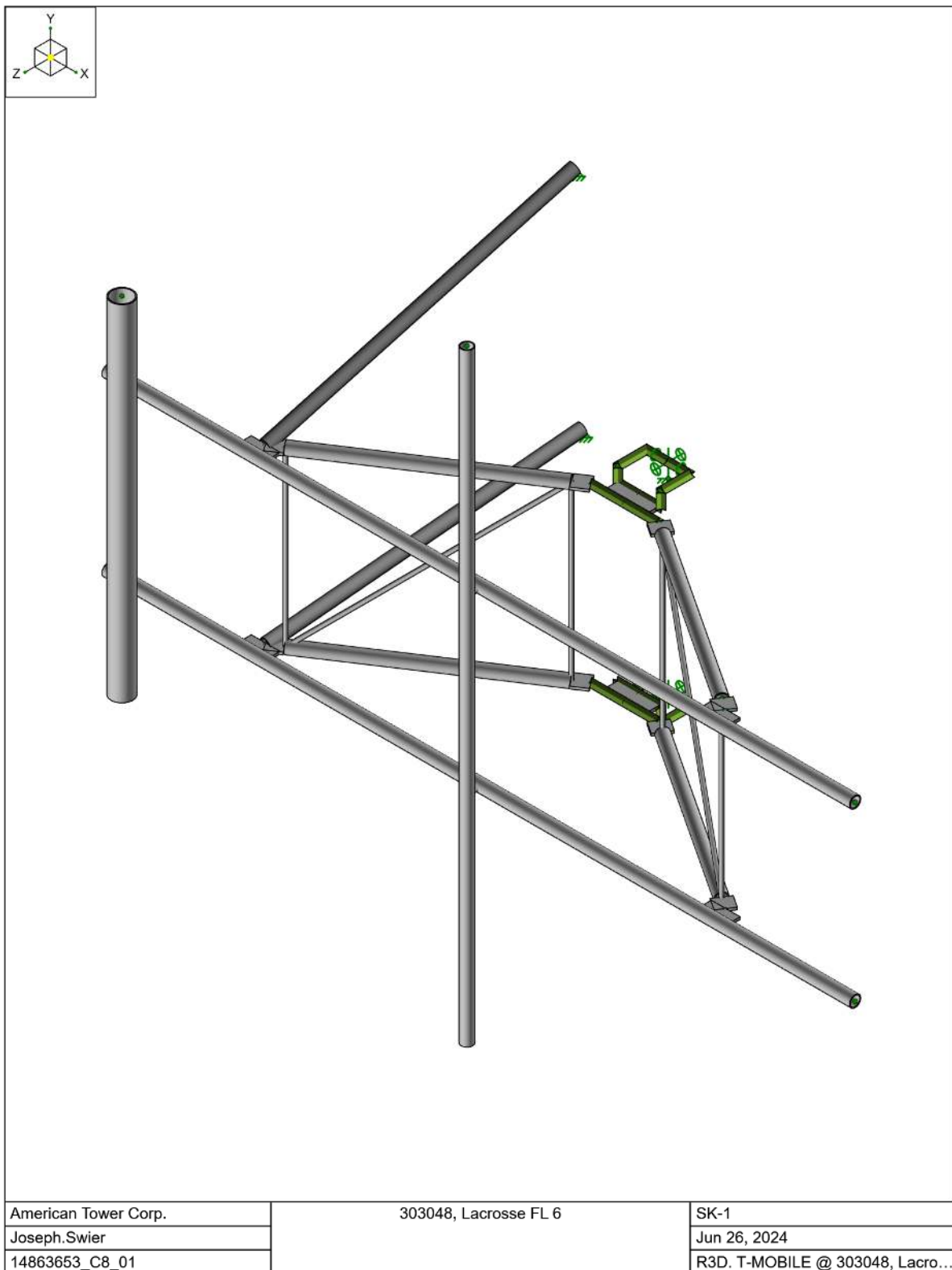
Tower Leg Properties

Leg Type		Solid Round	Mods
Leg Member		SR_2	N
Leg Bay Height	H_b	3.91	ft
Upper Mount Offset	G_m	36.00	in
Tower Axial Load	P_{U_T}		k
Leg Grade		A572-50	
Leg Yield Strength	F_y	50	ksi
Cross Sectional Area	A_g	3.142	in ²
Radius of Gyration	r	0.500	in
Moment of Inertia	I	0.785	in ⁴
Major Section Modulus	S_{max}	0.785	in ³
Minimum Section Modulus	S_{min}	0.785	in ³
Plastic Modulus	Z_{min}	1.571	in ³
Torsional Constant	J	1.571	in ⁴
Elastic Modulus	E	29,000	ksi
Shear Modulus	G	11,200	ksi
Slenderness Limit	N/A	N/A	-
Member Slenderness	KL/r	93.8	-
Rotation of Leg	Θ	N/A	rads
Leg Torsional Stiffness	k	N/A	k-in/rad



Tower Leg Analysis

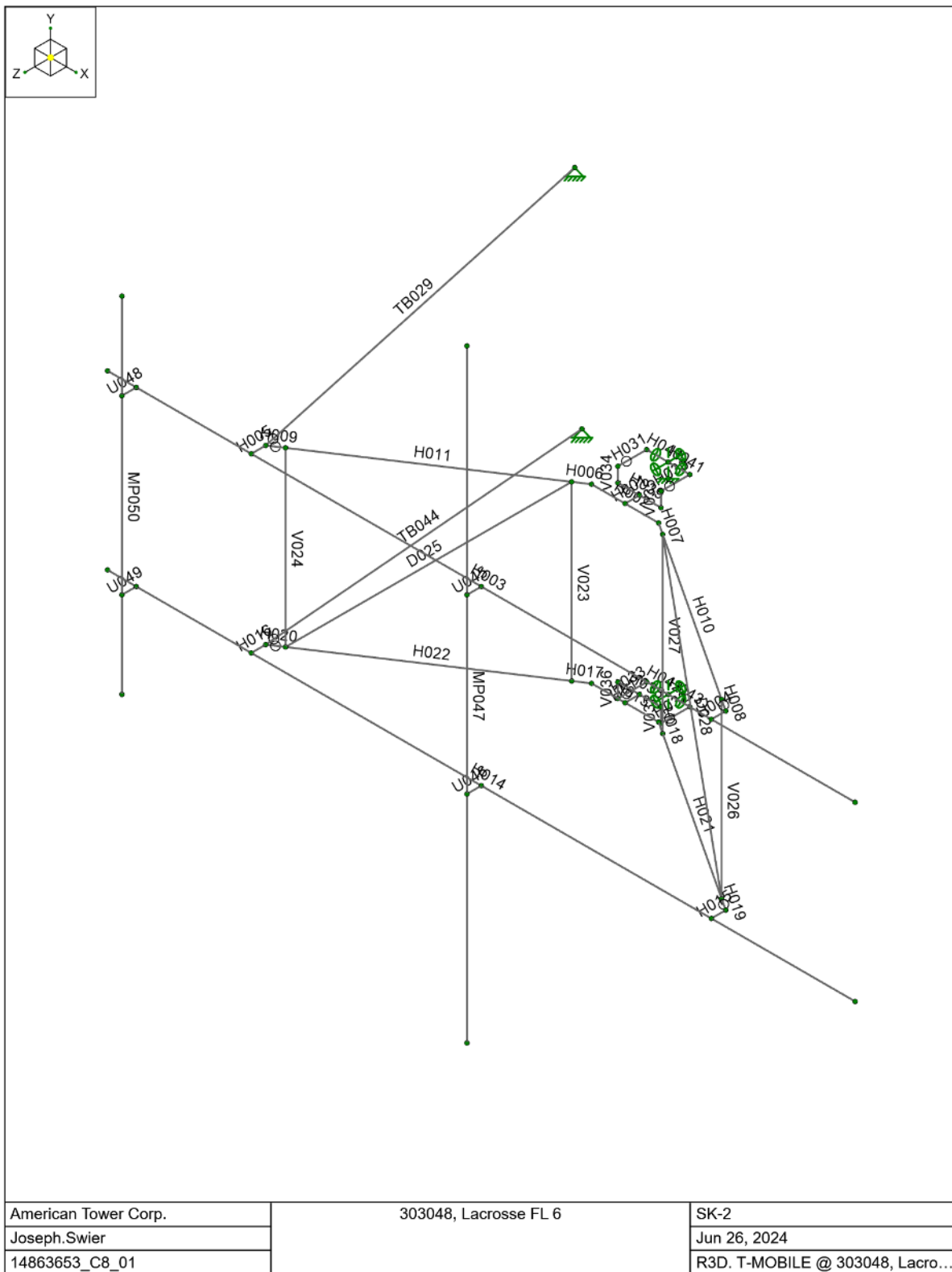
Critical Stress	F_{cr}	26.3	ksi
Axial Stress	σ_a	0.50	ksi
Shear Stress	τ_b	2.01	ksi
Maj. Bending Stress	σ_{bw}	26.18	ksi
Min. Bending Stress	σ_{bz}	20.68	ksi
Torsional Stress	τ_t	0.00	ksi
Normal Stress Limit State	F_{un}	45.0	ksi
Shear Stress Limit State	F_{uv}	27.0	ksi
Maj. Bend. Stress Limit State	F_{cbw}	100.0	ksi
Min. Bend. Stress Limit State	F_{cbz}	100.0	ksi
Buckling Limit State	F_{ca}	23.6	ksi
Torsional/Shear Impact	$\Sigma \tau / F_{uv}$	9%	Pass
Buckling/Axial Impact	$\Sigma \sigma / F_{un}$	49%	Pass

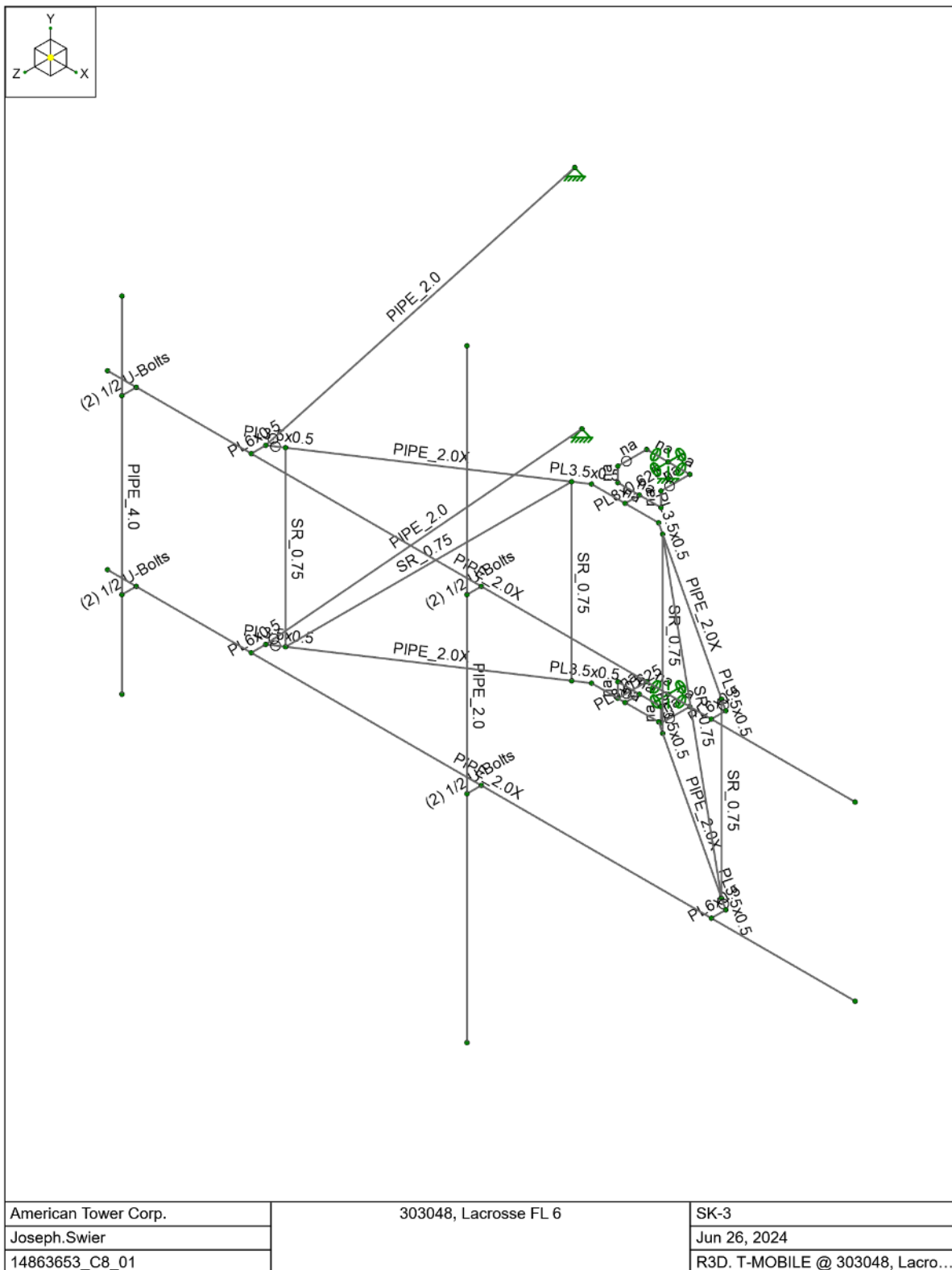


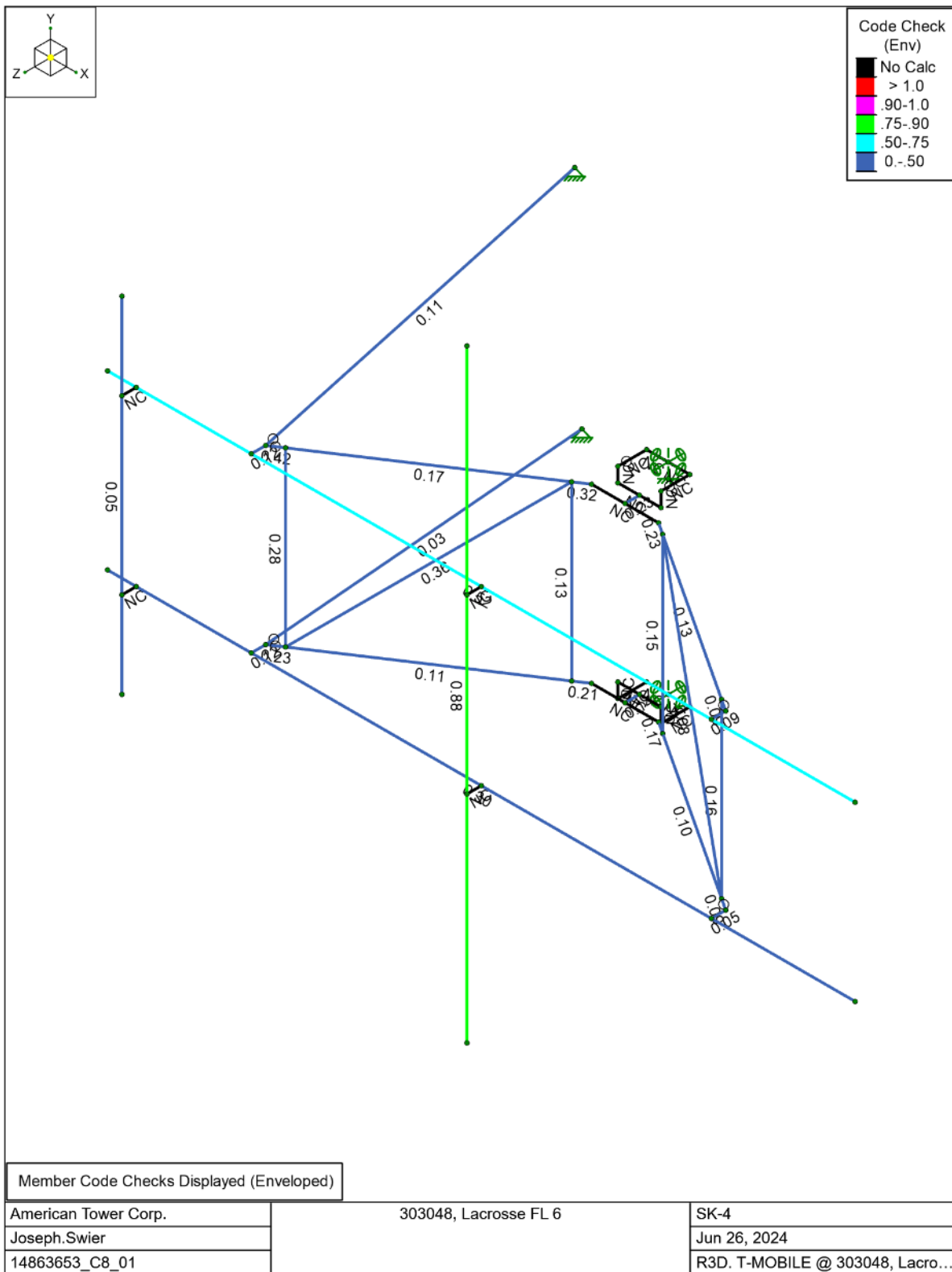


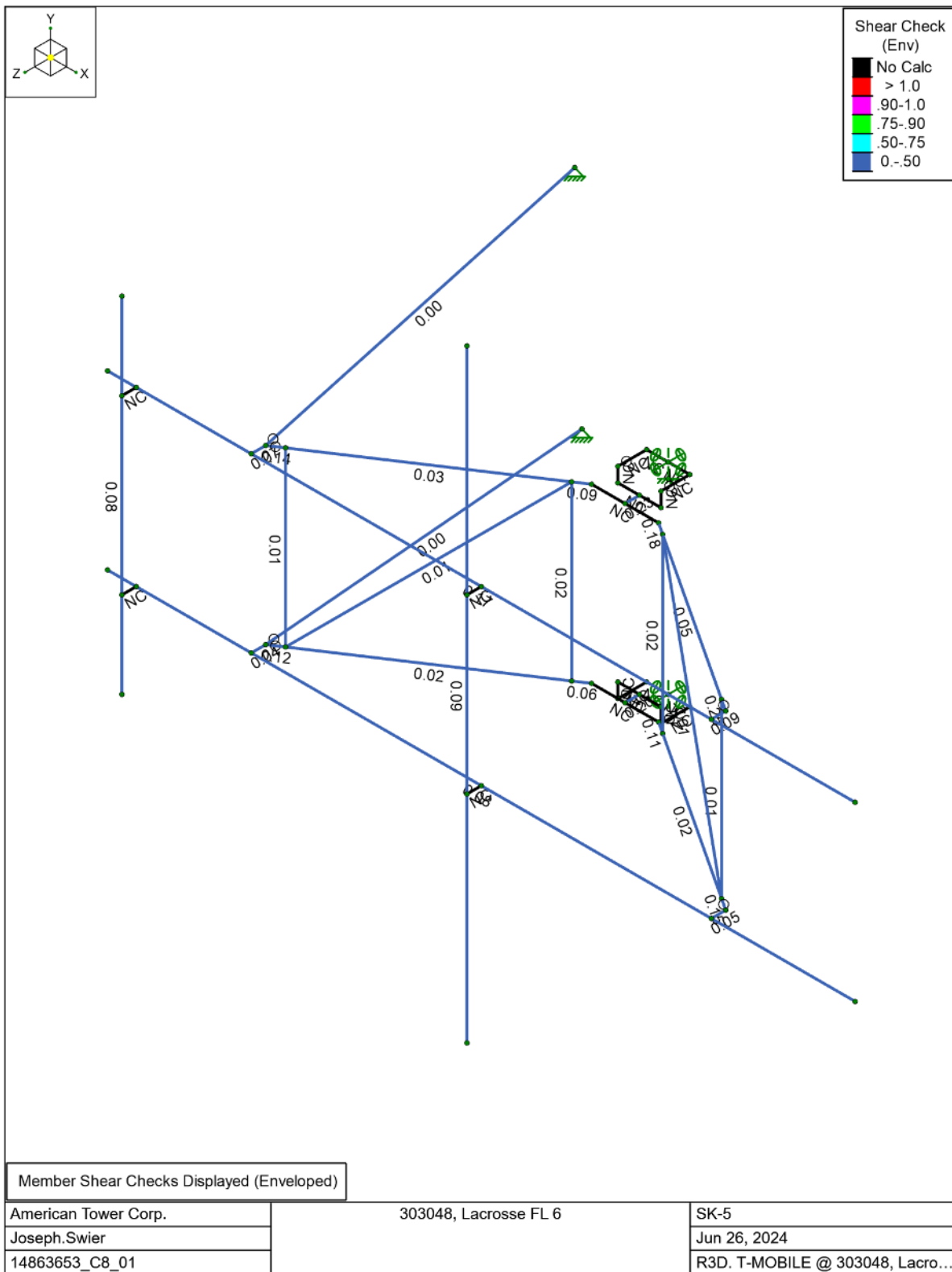
Company : American Tower Corp.
Designer : Joseph.Swier
Job Number : 14863653_C8_01
Model Name : 303048, Lacrosse FL 6

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Company : American Tower Corp.
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Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Nodal	Point	Distributed
1	D	DL		-1			8	
2	Di	IL						
3	W 0	WL					10	35
4	W 30	WL					17	69
5	W 60	WL					17	69
6	W 90	WL					10	34
7	W 120	WL					17	69
8	W 150	WL					17	69
9	W 180	WL					10	35
10	W 210	WL					17	69
11	W 240	WL					17	69
12	W 270	WL					10	34
13	W 300	WL					17	69
14	W 330	WL					17	69
15	Wi 0	WL						
16	Wi 30	WL						
17	Wi 60	WL						
18	Wi 90	WL						
19	Wi 120	WL						
20	Wi 150	WL						
21	Wi 180	WL						
22	Wi 210	WL						
23	Wi 240	WL						
24	Wi 270	WL						
25	Wi 300	WL						
26	Wi 330	WL						
27	Ws 0	WL					10	35
28	Ws 30	WL					17	69
29	Ws 60	WL					17	69
30	Ws 90	WL					10	34
31	Ws 120	WL					17	69
32	Ws 150	WL					17	69
33	Ws 180	WL					10	35
34	Ws 210	WL					17	69
35	Ws 240	WL					17	69
36	Ws 270	WL					10	34
37	Ws 300	WL					17	69
38	Ws 330	WL					17	69
39	Ev -Y	ELY		-0.013			8	
40	Eh -Z	ELZ			-0.032		8	
41	Eh -X	ELX	-0.032				8	
42	Lv (1)	LL					1	
43	Lv (2)	LL					1	
44	Lv (3)	LL					1	
45	Lv (4)	LL					1	
46	Lv (5)	LL					1	
47	Lv (6)	LL					1	
48	Lm (1)	LL				1		
49	Lm (2)	LL				1		

Load Combinations

	Description	Solve	P-Delta	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
1	1.4D	Yes	Y	DL	1.4						
2	1.2D + 1.0W [0°]	Yes	Y	DL	1.2	3	1				



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Load Combinations (Continued)

	Description	Solve	P-Delta	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
3	1.2D + 1.0W [30°]	Yes	Y	DL	1.2	4	1				
4	1.2D + 1.0W [60°]	Yes	Y	DL	1.2	5	1				
5	1.2D + 1.0W [90°]	Yes	Y	DL	1.2	6	1				
6	1.2D + 1.0W [120°]	Yes	Y	DL	1.2	7	1				
7	1.2D + 1.0W [150°]	Yes	Y	DL	1.2	8	1				
8	1.2D + 1.0W [180°]	Yes	Y	DL	1.2	9	1				
9	1.2D + 1.0W [210°]	Yes	Y	DL	1.2	10	1				
10	1.2D + 1.0W [240°]	Yes	Y	DL	1.2	11	1				
11	1.2D + 1.0W [270°]	Yes	Y	DL	1.2	12	1				
12	1.2D + 1.0W [300°]	Yes	Y	DL	1.2	13	1				
13	1.2D + 1.0W [330°]	Yes	Y	DL	1.2	14	1				
14	0.9D + 1.0W [0°]	Yes	Y	DL	0.9	3	1				
15	0.9D + 1.0W [30°]	Yes	Y	DL	0.9	4	1				
16	0.9D + 1.0W [60°]	Yes	Y	DL	0.9	5	1				
17	0.9D + 1.0W [90°]	Yes	Y	DL	0.9	6	1				
18	0.9D + 1.0W [120°]	Yes	Y	DL	0.9	7	1				
19	0.9D + 1.0W [150°]	Yes	Y	DL	0.9	8	1				
20	0.9D + 1.0W [180°]	Yes	Y	DL	0.9	9	1				
21	0.9D + 1.0W [210°]	Yes	Y	DL	0.9	10	1				
22	0.9D + 1.0W [240°]	Yes	Y	DL	0.9	11	1				
23	0.9D + 1.0W [270°]	Yes	Y	DL	0.9	12	1				
24	0.9D + 1.0W [300°]	Yes	Y	DL	0.9	13	1				
25	0.9D + 1.0W [330°]	Yes	Y	DL	0.9	14	1				
26	1.2D + 1.0Di + 1.0Wi [0°] + 1.0Ti	Yes	Y	DL	1.2	IL	1	15	1		
27	1.2D + 1.0Di + 1.0Wi [30°] + 1.0Ti	Yes	Y	DL	1.2	IL	1	16	1		
28	1.2D + 1.0Di + 1.0Wi [60°] + 1.0Ti	Yes	Y	DL	1.2	IL	1	17	1		
29	1.2D + 1.0Di + 1.0Wi [90°] + 1.0Ti	Yes	Y	DL	1.2	IL	1	18	1		
30	1.2D + 1.0Di + 1.0Wi [120°] + 1.0Ti	Yes	Y	DL	1.2	IL	1	19	1		
31	1.2D + 1.0Di + 1.0Wi [150°] + 1.0Ti	Yes	Y	DL	1.2	IL	1	20	1		
32	1.2D + 1.0Di + 1.0Wi [180°] + 1.0Ti	Yes	Y	DL	1.2	IL	1	21	1		
33	1.2D + 1.0Di + 1.0Wi [210°] + 1.0Ti	Yes	Y	DL	1.2	IL	1	22	1		
34	1.2D + 1.0Di + 1.0Wi [240°] + 1.0Ti	Yes	Y	DL	1.2	IL	1	23	1		
35	1.2D + 1.0Di + 1.0Wi [270°] + 1.0Ti	Yes	Y	DL	1.2	IL	1	24	1		
36	1.2D + 1.0Di + 1.0Wi [300°] + 1.0Ti	Yes	Y	DL	1.2	IL	1	25	1		
37	1.2D + 1.0Di + 1.0Wi [330°] + 1.0Ti	Yes	Y	DL	1.2	IL	1	26	1		
38	1.2D + 1.0Ev + 1.0Eh [0°]	Yes	Y	DL	1.2	ELY	1	ELZ	1	ELX	0.001
39	1.2D + 1.0Ev + 1.0Eh [30°]	Yes	Y	DL	1.2	ELY	1	ELZ	0.866	ELX	0.5
40	1.2D + 1.0Ev + 1.0Eh [60°]	Yes	Y	DL	1.2	ELY	1	ELZ	0.5	ELX	0.866
41	1.2D + 1.0Ev + 1.0Eh [90°]	Yes	Y	DL	1.2	ELY	1	ELZ	0.001	ELX	1
42	1.2D + 1.0Ev + 1.0Eh [120°]	Yes	Y	DL	1.2	ELY	1	ELZ	-0.5	ELX	0.866
43	1.2D + 1.0Ev + 1.0Eh [150°]	Yes	Y	DL	1.2	ELY	1	ELZ	-0.866	ELX	0.5
44	1.2D + 1.0Ev + 1.0Eh [180°]	Yes	Y	DL	1.2	ELY	1	ELZ	-1	ELX	0.001
45	1.2D + 1.0Ev + 1.0Eh [210°]	Yes	Y	DL	1.2	ELY	1	ELZ	-0.866	ELX	-0.5
46	1.2D + 1.0Ev + 1.0Eh [240°]	Yes	Y	DL	1.2	ELY	1	ELZ	-0.5	ELX	-0.866
47	1.2D + 1.0Ev + 1.0Eh [270°]	Yes	Y	DL	1.2	ELY	1	ELZ	0.001	ELX	-1
48	1.2D + 1.0Ev + 1.0Eh [300°]	Yes	Y	DL	1.2	ELY	1	ELZ	0.5	ELX	-0.866
49	1.2D + 1.0Ev + 1.0Eh [330°]	Yes	Y	DL	1.2	ELY	1	ELZ	0.866	ELX	-0.5
50	0.9D + 1.0Ev + 1.0Eh [0°]	Yes	Y	DL	0.9	ELY	1	ELZ	1	ELX	0.001
51	0.9D + 1.0Ev + 1.0Eh [30°]	Yes	Y	DL	0.9	ELY	1	ELZ	0.866	ELX	0.5
52	0.9D + 1.0Ev + 1.0Eh [60°]	Yes	Y	DL	0.9	ELY	1	ELZ	0.5	ELX	0.866
53	0.9D + 1.0Ev + 1.0Eh [90°]	Yes	Y	DL	0.9	ELY	1	ELZ	0.001	ELX	1
54	0.9D + 1.0Ev + 1.0Eh [120°]	Yes	Y	DL	0.9	ELY	1	ELZ	-0.5	ELX	0.866
55	0.9D + 1.0Ev + 1.0Eh [150°]	Yes	Y	DL	0.9	ELY	1	ELZ	-0.866	ELX	0.5
56	0.9D + 1.0Ev + 1.0Eh [180°]	Yes	Y	DL	0.9	ELY	1	ELZ	-1	ELX	0.001
57	0.9D + 1.0Ev + 1.0Eh [210°]	Yes	Y	DL	0.9	ELY	1	ELZ	-0.866	ELX	-0.5



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Load Combinations (Continued)

	Description	Solve	P-Delta	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
58	0.9D + 1.0Ev + 1.0Eh [240°]	Yes	Y	DL	0.9	ELY	1	ELZ	-0.5	ELX	-0.866
59	0.9D + 1.0Ev + 1.0Eh [270°]	Yes	Y	DL	0.9	ELY	1	ELZ	0.001	ELX	-1
60	0.9D + 1.0Ev + 1.0Eh [300°]	Yes	Y	DL	0.9	ELY	1	ELZ	0.5	ELX	-0.866
61	0.9D + 1.0Ev + 1.0Eh [330°]	Yes	Y	DL	0.9	ELY	1	ELZ	0.866	ELX	-0.5
62	1.2D + 1.5Lv(1)	Yes	Y	DL	1.2	42	1.5				
63	1.2D + 1.5Lv(2)	Yes	Y	DL	1.2	43	1.5				
64	1.2D + 1.5Lv(3)	Yes	Y	DL	1.2	44	1.5				
65	1.2D + 1.5Lv(4)	Yes	Y	DL	1.2	45	1.5				
66	1.2D + 1.5Lv(5)	Yes	Y	DL	1.2	46	1.5				
67	1.2D + 1.5Lv(6)	Yes	Y	DL	1.2	47	1.5				
68	1.2D + 1.5Lm(1) + 1.0Wm [0°]	Yes	Y	DL	1.2	48	1.5	27	1		
69	1.2D + 1.5Lm(1) + 1.0Wm [30°]	Yes	Y	DL	1.2	48	1.5	28	1		
70	1.2D + 1.5Lm(1) + 1.0Wm [60°]	Yes	Y	DL	1.2	48	1.5	29	1		
71	1.2D + 1.5Lm(1) + 1.0Wm [90°]	Yes	Y	DL	1.2	48	1.5	30	1		
72	1.2D + 1.5Lm(1) + 1.0Wm [120°]	Yes	Y	DL	1.2	48	1.5	31	1		
73	1.2D + 1.5Lm(1) + 1.0Wm [150°]	Yes	Y	DL	1.2	48	1.5	32	1		
74	1.2D + 1.5Lm(1) + 1.0Wm [180°]	Yes	Y	DL	1.2	48	1.5	33	1		
75	1.2D + 1.5Lm(1) + 1.0Wm [210°]	Yes	Y	DL	1.2	48	1.5	34	1		
76	1.2D + 1.5Lm(1) + 1.0Wm [240°]	Yes	Y	DL	1.2	48	1.5	35	1		
77	1.2D + 1.5Lm(1) + 1.0Wm [270°]	Yes	Y	DL	1.2	48	1.5	36	1		
78	1.2D + 1.5Lm(1) + 1.0Wm [300°]	Yes	Y	DL	1.2	48	1.5	37	1		
79	1.2D + 1.5Lm(1) + 1.0Wm [330°]	Yes	Y	DL	1.2	48	1.5	38	1		
80	1.2D + 1.5Lm(2) + 1.0Wm [0°]	Yes	Y	DL	1.2	49	1.5	27	1		
81	1.2D + 1.5Lm(2) + 1.0Wm [30°]	Yes	Y	DL	1.2	49	1.5	28	1		
82	1.2D + 1.5Lm(2) + 1.0Wm [60°]	Yes	Y	DL	1.2	49	1.5	29	1		
83	1.2D + 1.5Lm(2) + 1.0Wm [90°]	Yes	Y	DL	1.2	49	1.5	30	1		
84	1.2D + 1.5Lm(2) + 1.0Wm [120°]	Yes	Y	DL	1.2	49	1.5	31	1		
85	1.2D + 1.5Lm(2) + 1.0Wm [150°]	Yes	Y	DL	1.2	49	1.5	32	1		
86	1.2D + 1.5Lm(2) + 1.0Wm [180°]	Yes	Y	DL	1.2	49	1.5	33	1		
87	1.2D + 1.5Lm(2) + 1.0Wm [210°]	Yes	Y	DL	1.2	49	1.5	34	1		
88	1.2D + 1.5Lm(2) + 1.0Wm [240°]	Yes	Y	DL	1.2	49	1.5	35	1		
89	1.2D + 1.5Lm(2) + 1.0Wm [270°]	Yes	Y	DL	1.2	49	1.5	36	1		
90	1.2D + 1.5Lm(2) + 1.0Wm [300°]	Yes	Y	DL	1.2	49	1.5	37	1		
91	1.2D + 1.5Lm(2) + 1.0Wm [330°]	Yes	Y	DL	1.2	49	1.5	38	1		

Member Primary Data

	Label	I Node	J Node	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rule
1	H001	N002	N029	90	PL8x0.625	Beam	None	A572-50	Typical
2	H002	N003	N004		RIGID	None	None	RIGID	Typical
3	H003	N005	N006		PIPE 2.0X	Beam	None	A500 Gr. C	Typical
4	H004	N007	N009	90	PL6x0.5	Beam	None	A572-50	Typical
5	H005	N008	N010	90	PL6x0.5	Beam	None	A572-50	Typical
6	H006	N004	N011	90	PL3.5x0.5	Beam	None	A572-50	Typical
7	H007	N012	N003	90	PL3.5x0.5	Beam	None	A572-50	Typical
8	H008	N009	N013	90	PL3.5x0.5	Beam	None	A572-50	Typical
9	H009	N010	N014	90	PL3.5x0.5	Beam	None	A572-50	Typical
10	H010	N013	N012		PIPE 2.0X	Beam	None	A500 Gr. C	Typical
11	H011	N014	N011		PIPE 2.0X	Beam	None	A500 Gr. C	Typical
12	H012	N015	N030	90	PL8x0.625	Beam	None	A572-50	Typical
13	H013	N016	N017		RIGID	None	None	RIGID	Typical
14	H014	N018	N019		PIPE 2.0X	Beam	None	A500 Gr. C	Typical
15	H015	N020	N022	90	PL6x0.5	Beam	None	A572-50	Typical
16	H016	N021	N023	90	PL6x0.5	Beam	None	A572-50	Typical
17	H017	N017	N024	90	PL3.5x0.5	Beam	None	A572-50	Typical
18	H018	N025	N016	90	PL3.5x0.5	Beam	None	A572-50	Typical



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 Designer : Joseph.Swier
 Job Number : 14863653_C8_01
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Member Primary Data (Continued)

	Label	I Node	J Node	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rule
19	H019	N022	N026	90	PL3.5x0.5	Beam	None	A572-50	Typical
20	H020	N023	N027	90	PL3.5x0.5	Beam	None	A572-50	Typical
21	H021	N026	N025		PIPE 2.0X	Beam	None	A500 Gr. C	Typical
22	H022	N027	N024		PIPE 2.0X	Beam	None	A500 Gr. C	Typical
23	V023	N011	N024		SR 0.75	Column	None	A572-50	Typical
24	V024	N014	N027		SR 0.75	Column	None	A572-50	Typical
25	D025	N027	N011		SR 0.75	Column	None	A572-50	Typical
26	V026	N013	N026		SR 0.75	Column	None	A572-50	Typical
27	V027	N012	N025		SR 0.75	Column	None	A572-50	Typical
28	D028	N026	N012		SR 0.75	Column	None	A572-50	Typical
29	TB029	N010	N028		PIPE 2.0	Column	None	A53 Gr. B	Typical
30	H030	N031	N035		RIGID	None	None	RIGID	Typical
31	H031	N032	N036		RIGID	None	None	RIGID	Typical
32	H032	N033	N037		RIGID	None	None	RIGID	Typical
33	H033	N034	N038		RIGID	None	None	RIGID	Typical
34	V034	N040	N036		RIGID	None	None	RIGID	Typical
35	V035	N039	N035		RIGID	None	None	RIGID	Typical
36	V036	N038	N042		RIGID	None	None	RIGID	Typical
37	V037	N037	N041		RIGID	None	None	RIGID	Typical
38	H038	N041	N042		RIGID	None	None	RIGID	Typical
39	H039	N039	N040		RIGID	None	None	RIGID	Typical
40	H040	N043	N032		RIGID	None	None	RIGID	Typical
41	H041	N031	N043		RIGID	None	None	RIGID	Typical
42	H042	N044	N034		RIGID	None	None	RIGID	Typical
43	H043	N044	N033		RIGID	None	None	RIGID	Typical
44	TB044	N023	N045		PIPE 2.0	Column	None	A53 Gr. B	Typical
45	U045	N046	N048		(2) 1/2 U-Bolts	Beam	None	A36	Typical
46	U046	N049	N050		(2) 1/2 U-Bolts	Beam	None	A36	Typical
47	MP047	N051	N052		PIPE 2.0	Column	None	A53 Gr. B	Typical
48	U048	N047	N053		(2) 1/2 U-Bolts	Beam	None	A36	Typical
49	U049	N054	N055		(2) 1/2 U-Bolts	Beam	None	A36	Typical
50	MP050	N056	N057		PIPE 4.0	Column	None	A53 Gr. B	Typical

Hot Rolled Steel Design Parameters

	Label	Shape	Length [in]	Lb y-y [in]	Lb z-z [in]	Lcomp top [in]	L-Torque [in]	K y-y	K z-z	Function
1	H001	PL8x0.625	3			Lbyy		1	1	Lateral
2	H003	PIPE 2.0X	156			Lbyy		1	1	Lateral
3	H004	PL6x0.5	3			Lbyy		2.1	2.1	Lateral
4	H005	PL6x0.5	3			Lbyy		2.1	2.1	Lateral
5	H006	PL3.5x0.5	3			Lbyy		2.1	2.1	Lateral
6	H007	PL3.5x0.5	3			Lbyy		2.1	2.1	Lateral
7	H008	PL3.5x0.5	3			Lbyy		2.1	2.1	Lateral
8	H009	PL3.5x0.5	3			Lbyy		2.1	2.1	Lateral
9	H010	PIPE 2.0X	43.092			Lbyy		0.8	0.8	Lateral
10	H011	PIPE 2.0X	43.092			Lbyy		0.8	0.8	Lateral
11	H012	PL8x0.625	3			Lbyy		1	1	Lateral
12	H014	PIPE 2.0X	156			Lbyy		1	1	Lateral
13	H015	PL6x0.5	3			Lbyy		2.1	2.1	Lateral
14	H016	PL6x0.5	3			Lbyy		2.1	2.1	Lateral
15	H017	PL3.5x0.5	3			Lbyy		2.1	2.1	Lateral
16	H018	PL3.5x0.5	3			Lbyy		2.1	2.1	Lateral
17	H019	PL3.5x0.5	3			Lbyy		2.1	2.1	Lateral
18	H020	PL3.5x0.5	3			Lbyy		2.1	2.1	Lateral
19	H021	PIPE 2.0X	43.092			Lbyy		0.8	0.8	Lateral
20	H022	PIPE 2.0X	43.092			Lbyy		0.8	0.8	Lateral



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 Designer : Joseph.Swier
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Hot Rolled Steel Design Parameters (Continued)

	Label	Shape	Length [in]	Lb y-y [in]	Lb z-z [in]	Lcomp top [in]	L-Torque [in]	K y-y	K z-z	Function
21	V023	SR 0.75	36			Lbyy		0.65	0.65	Lateral
22	V024	SR 0.75	36			Lbyy		0.65	0.65	Lateral
23	D025	SR 0.75	56.151			Lbyy		0.65	0.65	Lateral
24	V026	SR 0.75	36			Lbyy		0.65	0.65	Lateral
25	V027	SR 0.75	36			Lbyy		0.65	0.65	Lateral
26	D028	SR 0.75	56.151			Lbyy		0.65	0.65	Lateral
27	TB029	PIPE 2.0	63.516			Lbyy		1	1	Lateral
28	TB044	PIPE 2.0	61.482			Lbyy		1	1	Lateral
29	U045	(2) 1/2 U-Bolts	3			Lbyy		0.5	0.5	Lateral
30	U046	(2) 1/2 U-Bolts	3			Lbyy		0.5	0.5	Lateral
31	MP047	PIPE 2.0	126	Segment	Segment	Lbyy	Segment	2.1	2.1	Lateral
32	U048	(2) 1/2 U-Bolts	3			Lbyy		0.5	0.5	Lateral
33	U049	(2) 1/2 U-Bolts	3			Lbyy		0.5	0.5	Lateral
34	MP050	PIPE 4.0	72	Segment	Segment	Lbyy	Segment	2.1	2.1	Lateral

Node Boundary Conditions

	Node Label	X [lb/in]	Y [lb/in]	Z [lb/in]	X Rot [k-in/rad]	Y Rot [k-in/rad]	Z Rot [k-in/rad]
1	N001	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
2	N028	Reaction	Reaction	Reaction			
3	N043	Reaction	Reaction	Reaction	Reaction		Reaction
4	N044	Reaction	Reaction	Reaction	Reaction		Reaction
5	N045	Reaction	Reaction	Reaction			

Member Advanced Data

	Label	I Release	J Release	Physical	Deflection Ratio Options	Activation	Seismic DR
1	H001			Yes	N/A		None
2	H002			Yes	** NA **		None
3	H003			Yes	N/A		None
4	H004			Yes	N/A		None
5	H005			Yes	N/A		None
6	H006			Yes	N/A		None
7	H007			Yes	N/A		None
8	H008	BenPIN		Yes	N/A		None
9	H009	BenPIN		Yes	N/A		None
10	H010			Yes	N/A		None
11	H011			Yes	N/A		None
12	H012			Yes	N/A		None
13	H013			Yes	** NA **		None
14	H014			Yes	N/A		None
15	H015			Yes	N/A		None
16	H016			Yes	N/A		None
17	H017			Yes	N/A		None
18	H018			Yes	N/A		None
19	H019	BenPIN		Yes	N/A		None
20	H020	BenPIN		Yes	N/A		None
21	H021			Yes	N/A		None
22	H022			Yes	N/A		None
23	V023			Yes	** NA **		None
24	V024			Yes	** NA **		None
25	D025			Yes	** NA **		None
26	V026			Yes	** NA **		None
27	V027			Yes	** NA **		None
28	D028			Yes	** NA **		None



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Member Advanced Data (Continued)

	Label	I Release	J Release	Physical	Deflection Ratio Options	Activation	Seismic DR
29	TB029	BenPIN		Yes	** NA **		None
30	H030		BenPIN	Yes	** NA **		None
31	H031		BenPIN	Yes	** NA **		None
32	H032		BenPIN	Yes	** NA **		None
33	H033		BenPIN	Yes	** NA **		None
34	V034			Yes	** NA **		None
35	V035			Yes	** NA **		None
36	V036			Yes	** NA **		None
37	V037			Yes	** NA **		None
38	H038			Yes	** NA **		None
39	H039			Yes	** NA **		None
40	H040			Yes	** NA **		None
41	H041			Yes	** NA **		None
42	H042			Yes	** NA **		None
43	H043			Yes	** NA **		None
44	TB044	BenPIN		Yes	** NA **		None
45	U045			Yes	N/A	Exclude	None
46	U046			Yes	N/A	Exclude	None
47	MP047			Yes	** NA **		None
48	U048			Yes	N/A	Exclude	None
49	U049			Yes	N/A	Exclude	None
50	MP050			Yes	** NA **		None

Hot Rolled Steel Properties

	Label	E [psi]	G [psi]	Nu	Therm. Coeff. [1e ⁶ F ⁻¹]	Density [lb/ft ³]	Yield [psi]	Ry	Fu [psi]	Rt
1	A572-50	2.9e+07	1.115e+07	0.3	0.65	490	50000	1.1	65000	1.1
2	A36	2.9e+07	1.115e+07	0.3	0.65	490	36000	1.5	58000	1.2
3	A500 Gr. C	2.9e+07	1.115e+07	0.3	0.65	490	46000	1.4	62000	1.3
4	A53 Gr. B	2.9e+07	1.115e+07	0.3	0.65	490	35000	1.6	60000	1.2

Envelope Node Reactions

	Node Label		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [lb-ft]	LC	MY [lb-ft]	LC	MZ [lb-ft]	LC
1	N001	max	0	91	0	91	0	91	0	91	0	91	0	91
2		min	0	1	0	1	0	1	0	1	0	1	0	1
3	N028	max	217.239	9	917.897	9	2286.443	15	0	91	0	91	0	91
4		min	-226.832	15	-928.026	15	-2229.935	9	0	1	0	1	0	1
5	N043	max	3054.574	4	1556.04	4	1202.356	22	353.143	22	0	91	298.864	18
6		min	-2432.389	22	-706.286	22	-2398.244	4	-778.02	4	0	1	-349.731	12
7	N044	max	537.321	21	1222.65	13	1592.029	2	184.128	19	0	91	135.84	22
8		min	-1769.492	81	-368.256	19	-312.999	20	-611.325	13	0	1	-165.332	4
9	N045	max	25.176	22	102.586	22	578.061	4	0	91	0	91	0	91
10		min	-35.315	3	-103.199	4	-487.362	22	0	1	0	1	0	1
11	Totals:	max	1772.357	18	1774.558	76	2800.079	14						
12		min	-1795.25	12	768.418	16	-2610.888	8						

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

	Member	Shape	Code Check Loc[in]	LC	Shear Check Loc[in]	Dir	LC	phi*Pnc [lb]	phi*Pnt [lb]	phi*Mn y-y [lb-ft]	phi*Mn z-z [lb-ft]	Cb	Eqn		
1	H001	PL8x0.625	0.225	3	4	0.225	3	y	4	241168.799	246093.75	3204.346	44860.84	1.154	H1-1b
2	H003	PIPE_2.0X	0.522	78	7	0.168	126.75	8	7677.082	57960	3325.8	3325.8	1.606	H1-1b	
3	H004	PL6x0.5	0.091	3	8	0.088	3	y	8	117445.877	135000	1406.25	16875	1.667	H1-1b
4	H005	PL6x0.5	0.117	0	81	0.071	3	y	7	117445.877	135000	1406.25	16875	1.667	H1-1b
5	H006	PL3.5x0.5	0.324	0	4	0.094	0	y	7	68510.095	78750	820.312	5742.188	1.023	H1-1b



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

Member	Shape	Code Check	Loc[in]	LC Shear Check	Loc[in]	Dir	LC phi*Pnc [lb]	phi*Pnt [lb]	phi*Mn y-y [lb-ft]	phi*Mn z-z [lb-ft]	Cb	Eqn			
6	H007	PL3.5x0.5	0.232	3	4	0.183	3	y	7	68510.095	78750	820.312	5742.188	1.028	H1-1b
7	H008	PL3.5x0.5	0.089	3	76	0.255	3	y	8	68510.095	78750	820.312	5742.188	1.667	H1-1b
8	H009	PL3.5x0.5	0.421	3	3	0.145	3	y	7	68510.095	78750	820.312	5742.188	1.665	H1-1b
9	H010	PIPE_2.0X	0.133	43.092	3	0.046	43.092	8	50623.795	57960	3325.8	3325.8	1.487	H1-1b	
10	H011	PIPE_2.0X	0.173	43.092	4	0.029	43.092	7	50623.795	57960	3325.8	3325.8	2.201	H1-1b	
11	H012	PL8x0.625	0.143	3	80	0.196	0.156	y	81	241168.799	246093.75	3204.346	44860.84	1.154	H1-1b
12	H014	PIPE_2.0X	0.303	78	76	0.078	126.75	82	7677.082	57960	3325.8	3325.8	1.666	H1-1b	
13	H015	PL6x0.5	0.053	3	73	0.047	3	y	73	117445.877	135000	1406.25	16875	1.667	H1-1b
14	H016	PL6x0.5	0.117	0	90	0.039	3	y	73	117445.877	135000	1406.25	16875	1.667	H1-1b
15	H017	PL3.5x0.5	0.206	0	81	0.058	3	y	6	68510.095	78750	820.312	5742.188	1.023	H1-1b
16	H018	PL3.5x0.5	0.169	0	10	0.107	3	y	4	68510.095	78750	820.312	5742.188	1.038	H1-1b
17	H019	PL3.5x0.5	0.089	3	73	0.151	3	y	73	68510.095	78750	820.312	5742.188	1.667	H1-1b
18	H020	PL3.5x0.5	0.23	3	85	0.119	3	y	72	68510.095	78750	820.312	5742.188	1.667	H1-1b
19	H021	PIPE_2.0X	0.105	21.546	66	0.023	0	72	50623.795	57960	3325.8	3325.8	1.333	H1-1b	
20	H022	PIPE_2.0X	0.109	43.092	80	0.019	0	72	50623.795	57960	3325.8	3325.8	2.257	H1-1b	
21	V023	SR_0.75	0.132	36	80	0.022	0	4	6408.009	19880.391	248.505	248.505	2.268	H1-1b*	
22	V024	SR_0.75	0.275	0	3	0.009	0	4	6408.009	19880.391	248.505	248.505	2.316	H1-1a	
23	D025	SR_0.75	0.36	26.321	22	0.01	0	4	2634.014	19880.391	248.505	248.505	2.27	H1-1a	
24	V026	SR_0.75	0.161	0	9	0.012	0	3	6408.009	19880.391	248.505	248.505	2.155	H1-1b	
25	V027	SR_0.75	0.15	0	10	0.022	0	4	6408.009	19880.391	248.505	248.505	2.123	H1-1b	
26	D028	SR_0.75	0.081	56.151	9	0.006	0	13	2634.014	19880.391	248.505	248.505	1.804	H1-1b	
27	TB029	PIPE_2.0	0.108	63.516	15	0.003	63.516	11	22963.075	32130	1871.625	1871.625	1.136	H1-1b*	
28	TB044	PIPE_2.0	0.031	30.741	4	0.003	61.482	11	23454.375	32130	1871.625	1871.625	1.136	H1-1b	
29	MP047	PIPE_2.0	0.881	44.625	7	0.092	45.938	7	15275.24	32130	1871.625	1871.625	2.177	H1-1b	
30	MP050	PIPE_4.0	0.046	54	90	0.082	18	15	82122.844	93240	10631.25	10631.25	1.482	H1-1b	