



VARIANCE

A variance is a means whereby the literal terms of these standards and regulations need not be applied if there are practical difficulties or unnecessary hardships associated with the subject site. In granting a variance, the spirit of these standards and regulations shall be observed, public safety and welfare secured, and substantial justice done.

Please include this page with your submittal. Submittal instructions and more information about checklist items can be found on page 2.

Development Application Form (pg. 3)

Written Narrative

Site Plan

~~Proof of Ownership (warranty deed or title policy)~~

~~Proof of Water and Sewer Services~~

~~Legal Description~~

~~Statement of Taxes Paid~~

Number of Variance Requests:

A variance may only be approved from the dimensional requirements, performance standards, and other special physical requirements contained in the Adams County development standards and regulations.

Type of Variance Request:	# of Requests:
Setback:	
Height:	
Lot Coverage:	
Other:	

Application Fees:	Amount:
Variance	\$500-residential \$700-non-residential <i>*\$100 per each additional request</i>



ADMINISTRATIVE REVIEW PERMIT

(FOR TELECOMMUNICATIONS)

Administrative Review Permit is a type of application that can be reviewed and approved by staff. Specific uses found within Section 3-07-01 require an administrative use permit for the use to be allowed on the property.

Please include this page with your submittal. Submittal instructions and more information about checklist items can be found on page 2.

Development Application Form (pg. 3)
Written Explanation
Site Plan
Proof of Ownership
Authorization from Telecommunications Provider
Landscape Plan
Legal Description
Statement of Taxes Paid

The following documents are only required for new freestanding cell towers and small cell applications.

Vicinity Map
ALTA Survey
Title Commitment with Exceptions
Master License Agreement (Small Cell Only)
Radio Frequency Coverage Map
Photo Simulations

Fees Due When Application is Deemed Complete	
Administrative Review Permit	• \$1,000 (telecommunications) • \$300 (other)

Guide to Development Application Submittal

This application shall be submitted and uploaded through the E-Permit Center portal. Once a complete application has been received, fees will be invoiced and payable online at www.permits.adcogov.org.

Written Explanation/ Description of Work:

- Name of the Service provider and explanation of why the project is necessary
- A clear and concise description of the proposal. Please include timeframe, purpose of project, improvements to the site, and how the proposal meets the requirements outlined in Section 4-09-02-07

Scaled Site Plan:

- Renderings of existing and proposed improvements including:
 - Location and dimension of improvements
 - Tower height, setbacks, driveways, fencing, parking, and lease areas
 - Please illustrate tower height and all setbacks on a table
 - Contour map

Proof of Ownership:

- A deed may be found in the Office of the Clerk and Recorder; or
- A title commitment is prepared by a professional title company

Authorization from the Telecommunication provider

- A signed letter stating permission to apply for Administrative Review Permit

Landscape Plan (*not required for small cell facilities*)

- A landscape plan should include plant types, installation size, fence elevations, and details
- A landscape maintenance plan is required
- If this application is a renewal of a previously approved tower, please provide the landscaping plan that was approved and the current state of the landscaping on site

Legal Description

- Geographical description used to locate and identify a property

Statement of Taxes Paid

- All taxes on the subject property must be paid in full. Please contact the Adams County Treasurer's Office or visit www.adcotax.com

Vicinity Map

- A map clearly showing the location of the existing cell towers within a 1000-foot buffer of the proposed site

ALTA Survey

- Survey should show the location of the existing improvements, utilities, easements, and boundary lines

Title Commitment with Exceptions

- A title commitment is prepared by professional title company. Additional approval may be required in conjunction with an Administrative Review Permit. To determine if this is needed, please contact the E-Permits Center at epermitcenter@adcogov.org

New freestanding cell tower/ modification to existing cell tower, small cell (Not in Right-of-Way)

- Building Permit

Small Cell (within the Right-of-Way)

- Utility Permit

Radio Frequency Coverage Maps

- Maps showing the radio coverage before and after the placement of the tower

Photo Simulations

- Photo simulations must show the conditions of the site from the right-of-way before and after the tower is placed. For existing towers, provide photos of the cell tower from the right-of-way



DEVELOPMENT APPLICATION FORM

PROJECT NAME:

APPLICANT

Name(s):

Phone #:

Address:

City, State, Zip:

2nd Phone #:

Email:

OWNER

Name(s):

Phone #:

Address:

City, State, Zip:

2nd Phone #:

Email:

TECHNICAL REPRESENTATIVE (Consultant, Engineer, Surveyor, Architect, etc.)

Name:

Phone #:

Address:

City, State, Zip:

2nd Phone #:

Email:

DESCRIPTION OF SITE

Address:

City, State, Zip:

Area (acres or square feet):

Tax Assessor
Parcel Number:

Existing
Zoning:

Existing Land Use:

Proposed Land
Use:

Have you attended a Conceptual Review? YES ☐ NO ☐

If yes, please list PRE#:

I hereby certify that I am making this application as owner of the above-described property or acting under the authority of the owner (attached authorization, if not owner). I am familiar with all pertinent requirements, procedures, and fees of the County. I understand that the Application Review Fee is non-refundable. All statements made on this form and additional application materials are true to the best of my knowledge and belief.

Name:

Date:

Owner's Printed Name

Name:

Owner's Signature

Adams County Sheriff's Office Tower Build Project Explanation

- Adams County has awarded KNS Communications the bid to erect a 75' communications tower at 2550 Strasburg, Rd. Strasburg, CO. 80136.
- Adams County is the service provider for the antennae.
- The tower is needed to relocate the 7 antennae currently located on the roof of the building. We will require a relief to Chapter 4- Design Requirements and Performance Standards section 4-03-02-02-02 Communication Tower, Non-commercial (page 4-12). From 2 antennae to 7.
- The tower will enable ADCO to increase its ability to communicate with other ADCO sites by raising antennae height and line of site. Tower will allow for removal of all penetrations from the building's roof allowing ACFFM to patch and re-roof the facility.
- The following steps will be taken to complete the agreed to project.

Proposed Tower CenterPoint: Google image at end of document.

Lat: 39°45'7.27"N

Lon: 104°19'13.58"W

Pre-Construction Process

- E-permit
- Submit Variance Application to allow seven antennae.
- Submit Building Permit
- Submit a Conceptual Review to the County
- Apply for construction permit with the County

Tower Construction Process: Detailed PE stamped drawings will be the reference for all construction processes. KNS will be the project management firm overseeing the following

- Design, fabricate and supply one (1) 75 ft. self-support tower complete.
- Geotechnical report.
- Mobilize crew to site.
- Off load and inventory of all materials.
- Supply & install foundations according to installation drawings.

- Provide 14 day and 28 day concrete break test results.
- Install 75 ft. self-support tower at new site.
- Supply & install safety climb device.
- Supply & install a 12" waveguide ladder on one face of the tower.
- Supply & install 1' x 20' transmission line-bridge.
- Supply & install lightning rod to top of tower.
- Supply & install EIA/ Motorola R56 standard grounding system with chemical rods around tower base.
 - a) Buried at 2' depth.
 - b) All connections to be exothermically connected.
 - c) Each tower legs have its own vertical chemical rod with inspection port.
 - d) Install 10' stinger connected to the tower ground ring for the external bus bar.
 - e) All exposed ground wire to be covered with liquid flex and sealed.
- Supply & install a two-hole grounding bus bar at the base of the tower and connect to the tower ground ring.
 - Clean up site and remove job associated debris.

Antenna Move Process:

- KNS will do all FCC applications for moving the antennas from the roof of the Sheriff's Office building to the communications tower.
- New coax will be ran internally to the building's radio equipment.
- The antennas will physically be moved from the Sheriff's Office roof to the communications tower.
- Radio systems will be cut over and tested for operability.
- Existing mounts on roof of Sheriff's office will be removed.



Parcel #: 0181334201001



I want to...



Description

[Property Report](#) - 2550 STRASBURG RD
ADAMS COUNTY

Hyperlinks

[Link to Property Report](#)

Details

Parcel Number
0181334201001

Subdivision
STRASBURG EAST

Parcel Address 1:
2550 STRASBURG RD

Parcel Address 2:
N/A

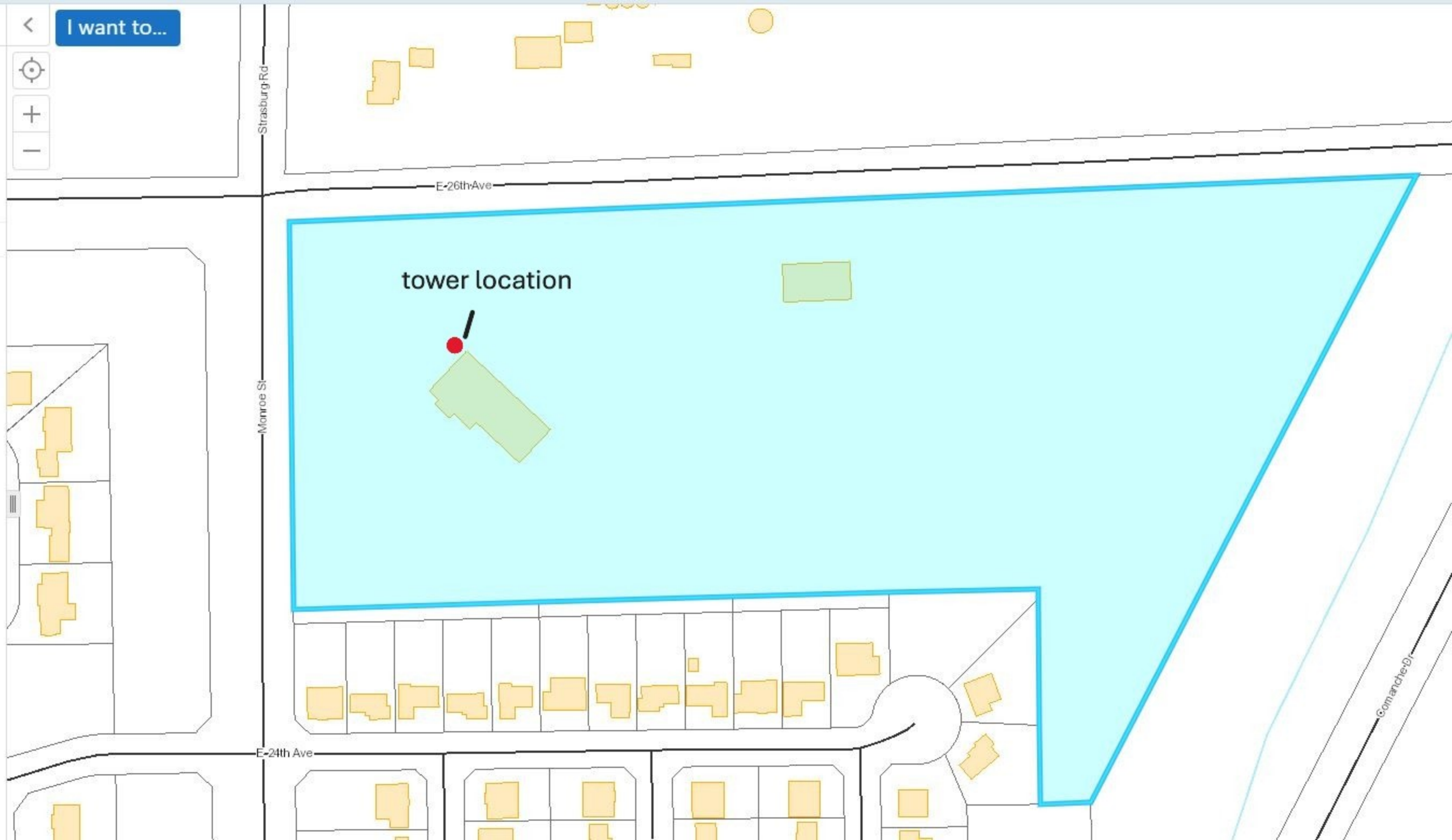
Owner
ADAMS COUNTY

Owner Address:
4430 S ADAMS COUNTY PKWY STE C5000A

Owner City, State, Zip:
BRIGHTON CO 80601-8204

Property Info

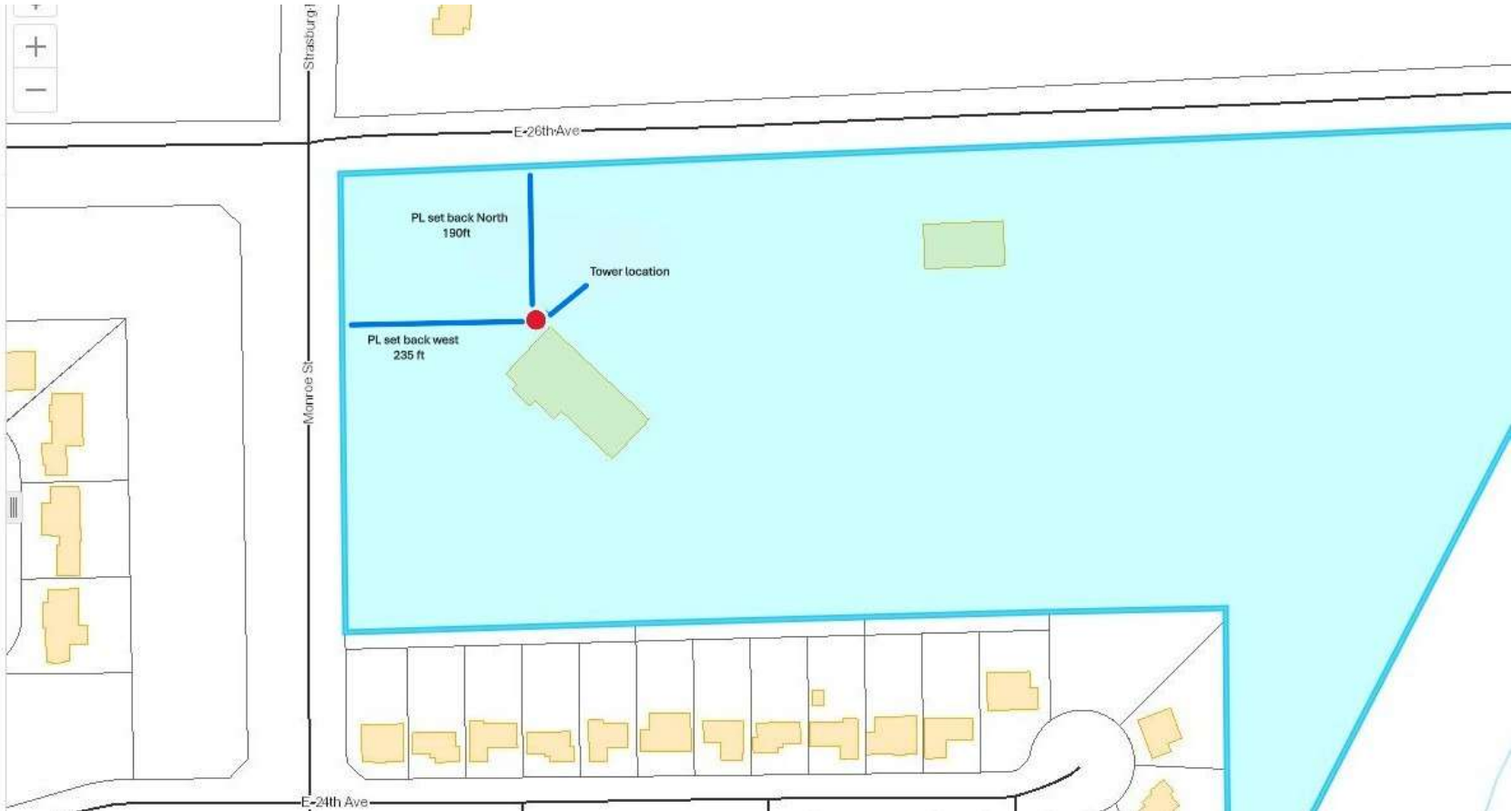
0181334201001



STRASBURG RD

NTY PKWY STE C5000A

-8204



DESIGN SUBMITTAL

Proposed 75-ft Self Support Tower

PJF Project No.: A37725-0001.003.8200

Site Name: Adams County CO
Location: Strasburg, CO
Manufacturer: Rio Steel
Year of Mfr: 2025
Lat/Long: 39° 45' 7.27" N
104° 19' 13.58" W

Prepared For:



Rio Steel & Tower, Ltd.

12017 Mitchell Drive
Alvarado, TX
Attn: Vance Hapeman

July 15, 2025

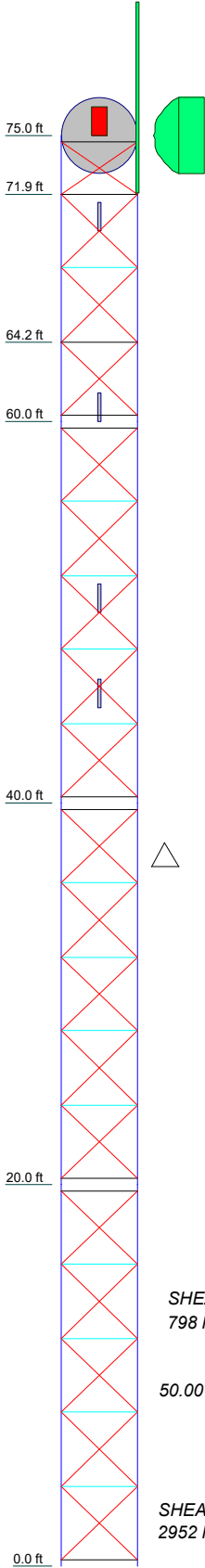
Designed By:
Michael Bange, PE
Project Engineer
mbange@pauljford.com



250 E Broad St, Suite 600
Columbus, OH 43215
Phone 614.221.6679



Section	T1	T2	T3	T4	T5	T6
Legs						
Leg Grade	SR 1 3/4" solid					
Diagonals	A572-50					
Diagonal Grade	SR 5/8" solid					
Top Girts	A36					
Bottom Girts	L 2 x 2 x 3/16					
Horizontals	L 2 x 2 x 3/16					
Face Width (ft)	4					
# Panels @ (ft)	18 @ 3.875					
Weight (lb)	3329.9					

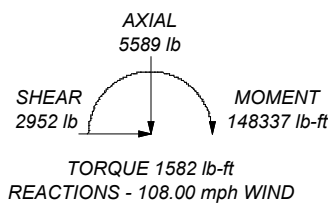
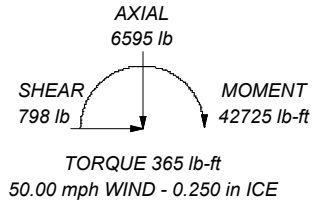


ALL REACTIONS
ARE FACTORED

MAX. CORNER REACTIONS AT BASE:

DOWN: 44684 lb
SHEAR: 779 lb

UPLIFT: -39897 lb
SHEAR: 1259 lb



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Lightning Rod (5/8" x 4')	75	1" x 1.5' Omni	70
(2) Sidelight (FAA L-810)	75	Sidarm (2' x 3')	60
Pipe Mount (4' x 4" Sch 40)	75	1" x 1.5' Omni	60
Pipe Mount (4' x 4" Sch 40)	75	Sidarm (2' x 3')	50
4 ft w/ HP	75	1" x 1.5' Omni	50
4 ft w/ HP	75	Sidarm (2' x 3')	45
Sidarm (2' x 3')	70	1" x 1.5' Omni	45

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi	A36	36 ksi	58 ksi

TOWER DESIGN NOTES

1. Tower is located in Adams County, Colorado.
2. Tower designed for Exposure C to the TIA-222-H Standard.
3. Tower designed for a 108.00 mph basic wind in accordance with the TIA-222-H Standard.
4. Tower is also designed for a 50.00 mph basic wind with 0.25 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60.00 mph wind.
6. Tower Risk Category II.
7. Topographic Category 1 with Crest Height of 0 ft
8. TOWER RATING: 94.2%



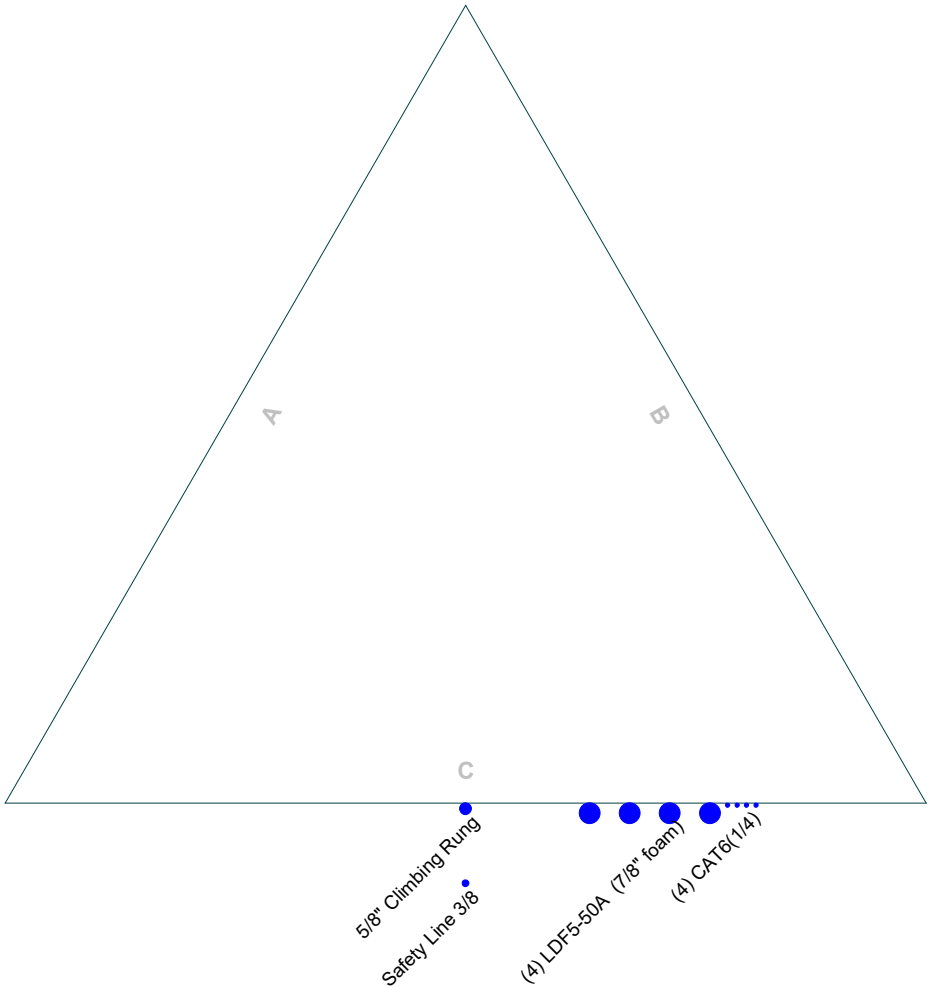
Paul J. Ford and Company
250 E. Broad St., Ste 600
Columbus, OH 43215
Phone: 614-221-6679
FAX:

Job: 75 ft SST; Adams County, CO		
Project: 37725-0001		
Client: Rio Steel & Tower, LTD	Drawn by: Michael Bange	App'd:
Code: TIA-222-H	Date: 07/01/25	Scale: NTS
Path:	Dwg No. E-1	

G:\TOWER\377 Rio Steel (CSB)\2025\37725-0001 Adams Co\37725-0001 003 8200 Final\37725-0001 003 8200.dwg

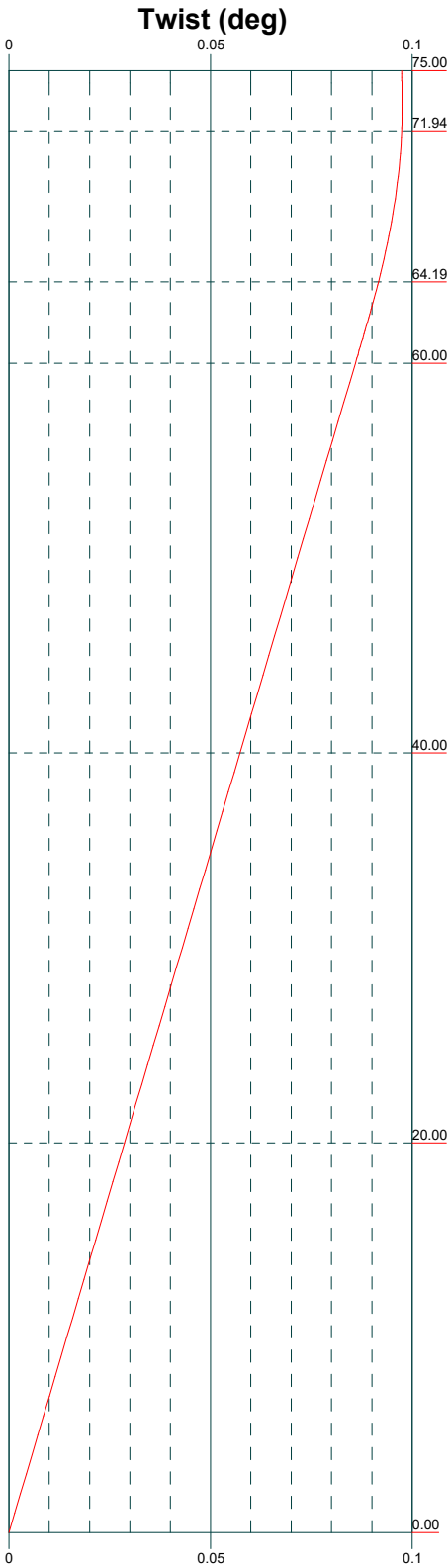
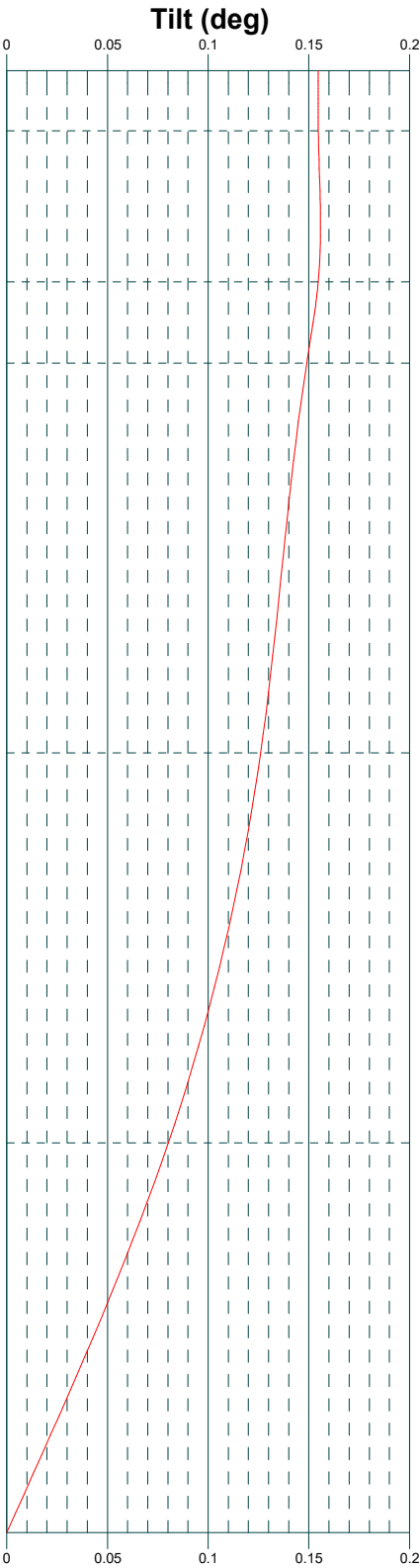
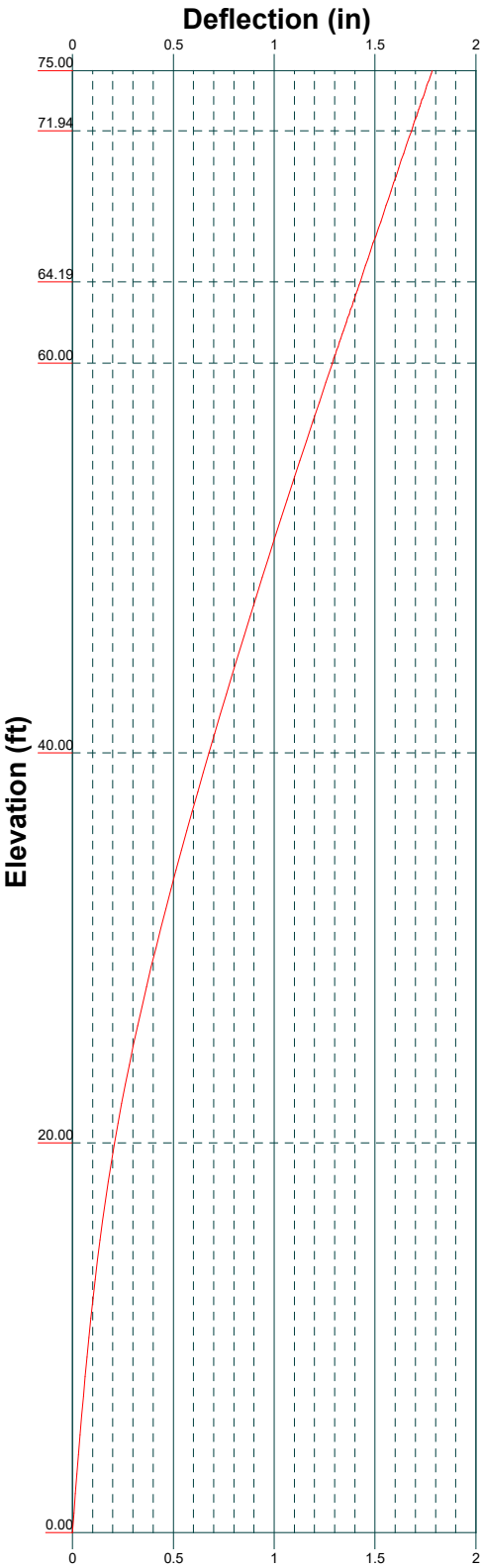
Feed Line Plan

Round Flat App In Face App Out Face



 PJFLogo	Paul J. Ford and Company			Job: 75 ft SST; Adams County, CO	
	250 E. Broad St., Ste 600 Columbus, OH 43215 Phone: 614-221-6679 FAX:			Project: 37725-0001	
	Client: Rio Steel & Tower, LTD		Drawn by: Michael Bange	App'd:	
	Code: TIA-222-H		Date: 07/01/25	Scale: NTS	
	Path:		Dwg No. E-7		

G:\TOWER\377 Rio Steel (CSB)\2025\37725-0001 Adams Co\37725-0001 603 8200 Final\37725-0001 603 8200.dwg



	Job	75 ft SST; Adams County, CO	Page	1 of 16
	Project	37725-0001	Date	16:04:33 07/01/25
	Client	Rio Steel & Tower, LTD	Designed by	Michael Bange

Tower Input Data

The main tower is a 3x free standing tower with an overall height of 75.00 ft above the ground line.

The base of the tower is set at an elevation of 0.00 ft above the ground line.

The face width of the tower is 4.00 ft at the top and 4.00 ft at the base.

This tower is designed using the TIA-222-H standard.

The following design criteria apply:

Tower is located in Adams County, Colorado.

Tower base elevation above sea level: 5363 ft.

Basic wind speed of 108.00 mph.

Risk Category II.

Exposure Category C.

Simplified Topographic Factor Procedure for wind speed-up calculations is used.

Topographic Category: 1.

Crest Height: 0 ft.

Nominal ice thickness of 0.250 in.

Ice thickness is considered to increase with height.

Ice density of 56 pcf.

A wind speed of 50.00 mph is used in combination with ice.

Deflections calculated using a wind speed of 60.00 mph.

Tension only take-up is 0.008 in.

Non-linear (P-delta) analysis was used.

Pressures are calculated at each section.

Stress ratio used in tower member design is 1.

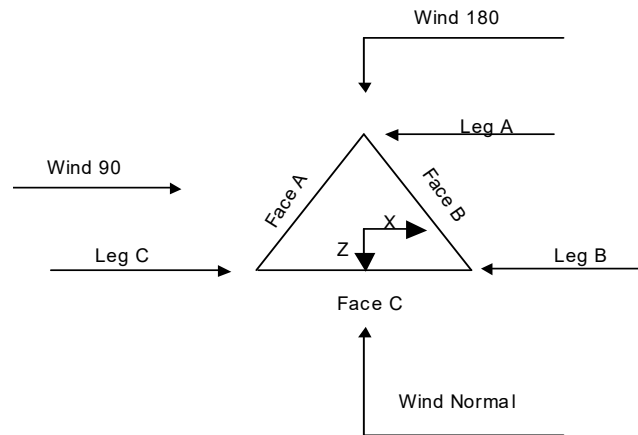
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

Consider Moments - Legs	Assume Legs Pinned	√ Calculate Redundant Bracing Forces
Consider Moments - Horizontals	Assume Rigid Index Plate	Ignore Redundant Members in FEA
Consider Moments - Diagonals	√ Use Clear Spans For Wind Area	SR Leg Bolts Resist Compression
Use Moment Magnification	√ Use Clear Spans For KL/r	All Leg Panels Have Same Allowable
√ Use Code Stress Ratios	Retension Guys To Initial Tension	Offset Girt At Foundation
√ Use Code Safety Factors - Guys	Bypass Mast Stability Checks	√ Consider Feed Line Torque
Escalate Ice	Use Azimuth Dish Coefficients	√ Include Angle Block Shear Check
Always Use Max Kz	√ Project Wind Area of Appurtenances	Use TIA-222-H Bracing Resist. Exemption
Kz In Exposure D Hurricane Region	Alternative Appurt. EPA Calculation	Use TIA-222-H Tension Splice Exemption
Include Bolts In Member Capacity	Autocalc Torque Arm Areas	Poles
Leg Bolts Are At Top Of Section	Add IBC .6D+W Combination	Include Shear-Torsion Interaction
√ Secondary Horizontal Braces Leg	√ Sort Capacity Reports By Component	Always Use Sub-Critical Flow
Use Diamond Inner Bracing (4 Sided)	Triangulate Diamond Inner Bracing	Use Top Mounted Sockets
√ SR Members Have Cut Ends	Treat Feed Line Bundles As Cylinder	Pole Without Linear Attachments
SR Members Are Concentric	Ignore KL/ry For 60 Deg. Angle Legs	Pole With Shroud Or No Appurtenances
Distribute Leg Loads As Uniform	Use ASCE 10 X-Brace Ly Rules	Outside and Inside Corner Radii Are Known
Use Special Wind Profile		



Job	75 ft SST; Adams County, CO	Page	2 of 16
Project	37725-0001	Date	16:04:33 07/01/25
Client	Rio Steel & Tower, LTD	Designed by	Michael Bange



Triangular Tower

Tower Section Geometry

<i>Tower Section</i>	<i>Tower Elevation</i>	<i>Assembly Database</i>	<i>Description</i>	<i>Section Width</i>	<i>Number of Sections</i>	<i>Section Length</i>
	<i>ft</i>			<i>ft</i>		<i>ft</i>
T1	75.00-71.94			4.00	1	3.06
T2	71.94-64.19			4.00	1	7.75
T3	64.19-60.00			4.00	1	4.19
T4	60.00-40.00			4.00	1	20.00
T5	40.00-20.00			4.00	1	20.00
T6	20.00-0.00			4.00	1	20.00

Tower Section Geometry (cont'd)

<i>Tower Section</i>	<i>Tower Elevation</i>	<i>Diagonal Spacing</i>	<i>Bracing Type</i>	<i>Has K Brace End Panels</i>	<i>Has Horizontals</i>	<i>Top Girt Offset</i>	<i>Bottom Girt Offset</i>
	<i>ft</i>	<i>ft</i>				<i>in</i>	<i>in</i>
T1	75.00-71.94	2.75	TX Brace	No	Yes	3.750	0.000
T2	71.94-64.19	3.88	TX Brace	No	Yes	0.000	0.000
T3	64.19-60.00	3.88	TX Brace	No	Yes	0.000	3.750
T4	60.00-40.00	3.88	TX Brace	No	Yes	3.750	3.750
T5	40.00-20.00	3.88	TX Brace	No	Yes	3.750	3.750
T6	20.00-0.00	3.88	TX Brace	No	Yes	3.750	3.750

**Job**

75 ft SST; Adams County, CO

Page

3 of 16

Project

37725-0001

Date

16:04:33 07/01/25

Client

Rio Steel & Tower, LTD

Designed by

Michael Bange

Tower Section Geometry (cont'd)

<i>Tower Elevation ft</i>	<i>Leg Type</i>	<i>Leg Size</i>	<i>Leg Grade</i>	<i>Diagonal Type</i>	<i>Diagonal Size</i>	<i>Diagonal Grade</i>
T1 75.00-71.94	Solid Round	1 3/4" solid	A572-50 (50 ksi)	Solid Round	5/8" solid	A36 (36 ksi)
T2 71.94-64.19	Solid Round	1 3/4" solid	A572-50 (50 ksi)	Solid Round	5/8" solid	A36 (36 ksi)
T3 64.19-60.00	Solid Round	1 3/4" solid	A572-50 (50 ksi)	Solid Round	5/8" solid	A36 (36 ksi)
T4 60.00-40.00	Solid Round	1 3/4" solid	A572-50 (50 ksi)	Solid Round	5/8" solid	A36 (36 ksi)
T5 40.00-20.00	Solid Round	1 3/4" solid	A572-50 (50 ksi)	Solid Round	5/8" solid	A36 (36 ksi)
T6 20.00-0.00	Solid Round	1 3/4" solid	A572-50 (50 ksi)	Solid Round	5/8" solid	A36 (36 ksi)

Tower Section Geometry (cont'd)

<i>Tower Elevation ft</i>	<i>Top Girt Type</i>	<i>Top Girt Size</i>	<i>Top Girt Grade</i>	<i>Bottom Girt Type</i>	<i>Bottom Girt Size</i>	<i>Bottom Girt Grade</i>
T1 75.00-71.94	Equal Angle	L 2 x 2 x 3/16	A36 (36 ksi)	Equal Angle		A36 (36 ksi)
T2 71.94-64.19	Equal Angle	L 2 x 2 x 3/16	A36 (36 ksi)	Equal Angle		A36 (36 ksi)
T3 64.19-60.00	Equal Angle	L 2 x 2 x 3/16	A36 (36 ksi)	Equal Angle	L 2 x 2 x 3/16	A36 (36 ksi)
T4 60.00-40.00	Equal Angle	L 2 x 2 x 3/16	A36 (36 ksi)	Equal Angle	L 2 x 2 x 3/16	A36 (36 ksi)
T5 40.00-20.00	Equal Angle	L 2 x 2 x 3/16	A36 (36 ksi)	Equal Angle	L 2 x 2 x 3/16	A36 (36 ksi)
T6 20.00-0.00	Equal Angle	L 2 x 2 x 3/16	A36 (36 ksi)	Equal Angle	L 2 x 2 x 3/16	A36 (36 ksi)

Tower Section Geometry (cont'd)

<i>Tower Elevation ft</i>	<i>No. of Mid Girts</i>	<i>Mid Girt Type</i>	<i>Mid Girt Size</i>	<i>Mid Girt Grade</i>	<i>Horizontal Type</i>	<i>Horizontal Size</i>	<i>Horizontal Grade</i>
T1 75.00-71.94	None	Single Angle		A36 (36 ksi)	Equal Angle	L 2 x 2 x 3/16	A36 (36 ksi)
T2 71.94-64.19	None	Single Angle		A36 (36 ksi)	Equal Angle	L 2 x 2 x 3/16	A36 (36 ksi)
T3 64.19-60.00	None	Single Angle		A36 (36 ksi)	Equal Angle	L 2 x 2 x 3/16	A36 (36 ksi)
T4 60.00-40.00	None	Single Angle		A36 (36 ksi)	Equal Angle	L 2 x 2 x 3/16	A36 (36 ksi)
T5 40.00-20.00	None	Single Angle		A36 (36 ksi)	Equal Angle	L 2 x 2 x 3/16	A36 (36 ksi)
T6 20.00-0.00	None	Single Angle		A36	Equal Angle	L 2 x 2 x 3/16	A36

	Job	75 ft SST; Adams County, CO	Page	4 of 16
	Project	37725-0001	Date	16:04:33 07/01/25
	Client	Rio Steel & Tower, LTD	Designed by	Michael Bange

Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
				(36 ksi)			(36 ksi)

Tower Section Geometry (cont'd)

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
T1 75.00-71.94	0.00	0.000	A36 (36 ksi)	1	1	1.05	0.000	0.000	36.000
T2 71.94-64.19	0.00	0.000	A36 (36 ksi)	1	1	1.05	0.000	0.000	36.000
T3 64.19-60.00	0.00	0.000	A36 (36 ksi)	1	1	1.05	0.000	0.000	36.000
T4 60.00-40.00	0.00	0.000	A36 (36 ksi)	1	1	1.05	0.000	0.000	36.000
T5 40.00-20.00	0.00	0.000	A36 (36 ksi)	1	1	1.05	0.000	0.000	36.000
T6 20.00-0.00	0.00	0.000	A36 (36 ksi)	1	1	1.05	0.000	0.000	36.000

Tower Section Geometry (cont'd)

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	Legs	K Factors ¹						
				X Brace Diags X Y	K Brace Diags X Y	Single Diags X Y	Girts X Y	Horiz. X Y	Sec. Horiz. X Y	Inner Brace X Y
T1 75.00-71.94	Yes	Yes	1	1	1	1	1	1	1	1
T2 71.94-64.19	Yes	Yes	1	1	1	1	1	1	1	1
T3 64.19-60.00	Yes	Yes	1	1	1	1	1	1	1	1
T4 60.00-40.00	Yes	Yes	1	1	1	1	1	1	1	1
T5 40.00-20.00	Yes	Yes	1	1	1	1	1	1	1	1
T6 20.00-0.00	Yes	Yes	1	1	1	1	1	1	1	1

¹Note: K factors are applied to member segment lengths. K-braces without inner supporting members will have the K factor in the out-of-plane direction applied to the overall length.

Tower Section Geometry (cont'd)



Tower Elevation ft	Redundant Horizontal		Redundant Diagonal		Redundant Sub-Diagonal		Redundant Sub-Horizontal		Redundant Vertical		Redundant Hip		Redundant Hip Diagonal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T1 75.00-71.94	0.000	0.75 (1)	0.000	0.75 (1)	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75 (1)	0.000	0.75 (1)
	0.000	0.75 (2)	0.000	0.75 (2)							0.000	0.75 (2)	0.000	0.75 (2)
	0.000	0.75 (3)	0.000	0.75 (3)							0.000	0.75 (3)	0.000	0.75 (3)
	0.000	0.75 (4)	0.000	0.75 (4)							0.000	0.75 (4)	0.000	0.75 (4)
T2 71.94-64.19	0.000	0.75 (1)	0.000	0.75 (1)	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75 (1)	0.000	0.75 (1)
	0.000	0.75 (2)	0.000	0.75 (2)							0.000	0.75 (2)	0.000	0.75 (2)
	0.000	0.75 (3)	0.000	0.75 (3)							0.000	0.75 (3)	0.000	0.75 (3)
	0.000	0.75 (4)	0.000	0.75 (4)							0.000	0.75 (4)	0.000	0.75 (4)
T3 64.19-60.00	0.000	0.75 (1)	0.000	0.75 (1)	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75 (1)	0.000	0.75 (1)
	0.000	0.75 (2)	0.000	0.75 (2)							0.000	0.75 (2)	0.000	0.75 (2)
	0.000	0.75 (3)	0.000	0.75 (3)							0.000	0.75 (3)	0.000	0.75 (3)
	0.000	0.75 (4)	0.000	0.75 (4)							0.000	0.75 (4)	0.000	0.75 (4)
T4 60.00-40.00	0.000	0.75 (1)	0.000	0.75 (1)	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75 (1)	0.000	0.75 (1)
	0.000	0.75 (2)	0.000	0.75 (2)							0.000	0.75 (2)	0.000	0.75 (2)
	0.000	0.75 (3)	0.000	0.75 (3)							0.000	0.75 (3)	0.000	0.75 (3)
	0.000	0.75 (4)	0.000	0.75 (4)							0.000	0.75 (4)	0.000	0.75 (4)
T5 40.00-20.00	0.000	0.75 (1)	0.000	0.75 (1)	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75 (1)	0.000	0.75 (1)
	0.000	0.75 (2)	0.000	0.75 (2)							0.000	0.75 (2)	0.000	0.75 (2)
	0.000	0.75 (3)	0.000	0.75 (3)							0.000	0.75 (3)	0.000	0.75 (3)
	0.000	0.75 (4)	0.000	0.75 (4)							0.000	0.75 (4)	0.000	0.75 (4)

	Job	75 ft SST; Adams County, CO	Page	6 of 16
	Project	37725-0001	Date	16:04:33 07/01/25
	Client	Rio Steel & Tower, LTD	Designed by	Michael Bange

Tower Elevation ft	Redundant Horizontal		Redundant Diagonal		Redundant Sub-Diagonal		Redundant Sub-Horizontal		Redundant Vertical		Redundant Hip		Redundant Hip Diagonal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T6 20.00-0.00	0.000	0.75 (1)	0.000	0.75 (1)	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75 (1)	0.000	0.75 (1)

	0.000	0.75 (2)	0.000	0.75 (2)						0.000	0.75 (2)	0.000	0.75 (2)
--	-------	----------	-------	----------	--	--	--	--	--	-------	----------	-------	----------

	0.000	0.75 (3)	0.000	0.75 (3)						0.000	0.75 (3)	0.000	0.75 (3)
--	-------	----------	-------	----------	--	--	--	--	--	-------	----------	-------	----------

	0.000	0.75 (4)	0.000	0.75 (4)						0.000	0.75 (4)	0.000	0.75 (4)
--	-------	----------	-------	----------	--	--	--	--	--	-------	----------	-------	----------

Tower Section Geometry (cont'd)

Tower Elevation ft	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T1 75.00-71.94	Flange	0.750	0	0.000	0	0.000	0	0.000	0	0.625	0	0.000	0	0.625	0
		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T2 71.94-64.19	Flange	0.750	0	0.000	0	0.000	0	0.000	0	0.625	0	0.000	0	0.625	0
		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T3 64.19-60.00	Flange	0.750	3	0.000	0	0.000	0	0.000	0	0.625	0	0.000	0	0.625	0
		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T4 60.00-40.00	Flange	0.750	3	0.000	0	0.000	0	0.000	0	0.000	0	0.000	0	0.000	0
		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T5 40.00-20.00	Flange	0.750	3	0.000	0	0.000	0	0.000	0	0.000	0	0.000	0	0.000	0
		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T6 20.00-0.00	Flange	0.750	0	0.000	0	0.000	0	0.000	0	0.000	0	0.000	0	0.000	0
		A325N		A325N		A325N		A325N		A325N		A325N		A325N	

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
Safety Line 3/8	C	No	No	Ar (CaAa)	70.00 - 0.00	4.000	0	1	1	0.375	0.375		0.22
5/8" Climbing Rung **	C	No	No	Ar (CaAa)	70.00 - 0.00	0.000	0	1	1	0.625	0.625		1.04

	Job											Page
	75 ft SST; Adams County, CO											7 of 16
	Project											Date
37725-0001											16:04:33 07/01/25	
Client											Designed by	
Rio Steel & Tower, LTD											Michael Bange	

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
CAT6(1/4)	C	No	No	Ar (CaAa)	75.00 - 0.00	0.000	-0.3	4	4	0.250	0.240		0.05
LDF5-50A (7/8" foam)	C	No	No	Ar (CaAa)	70.00 - 60.00	0.000	-0.2	1	1	1.000 1.090	1.090		0.33
LDF5-50A (7/8" foam)	C	No	No	Ar (CaAa)	60.00 - 50.00	0.000	-0.2	2	2	1.000 1.090	1.090		0.33
LDF5-50A (7/8" foam)	C	No	No	Ar (CaAa)	50.00 - 45.00	0.000	-0.2	3	3	1.000 1.090	1.090		0.33
LDF5-50A (7/8" foam)	C	No	No	Ar (CaAa)	45.00 - 0.00	0.000	-0.2	4	4	1.000 1.090	1.090		0.33

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C _A A _A Front ft ²	C _A A _A Side ft ²	Weight lb
Lightning Rod (5/8" x 4')	B	From Leg	0.00 0 2	0.000	75.00	No Ice 1/2" Ice	0.25 0.66	0.25 0.66	4 7
(2) Sidelight (FAA L-810)	A	From Leg	0.50 0 0	0.000	75.00	No Ice 1/2" Ice	0.27 0.40	0.27 0.40	7 12
**									
Pipe Mount (4' x 4" Sch 40)	A	From Leg	0.50 0 0	0.000	75.00	No Ice 1/2" Ice	1.30 1.58	1.30 1.58	43 56
Pipe Mount (4' x 4" Sch 40)	B	From Leg	0.50 0 0	0.000	75.00	No Ice 1/2" Ice	1.30 1.58	1.30 1.58	43 56
Sidearm (2' x 3')	A	From Leg	1.50 0 0	0.000	70.00	No Ice 1/2" Ice	1.50 2.50	3.00 4.00	188 275
1" x 1.5' Omni	A	From Leg	3.00 0 1	0.000	70.00	No Ice 1/2" Ice	0.13 0.23	0.13 0.23	14 15
Sidearm (2' x 3')	A	From Leg	1.50 0 0	0.000	60.00	No Ice 1/2" Ice	1.50 2.50	3.00 4.00	188 275
1" x 1.5' Omni	A	From Leg	3.00 0 1	0.000	60.00	No Ice 1/2" Ice	0.13 0.23	0.13 0.23	14 15
Sidearm (2' x 3')	A	From Leg	1.50 0 0	0.000	50.00	No Ice 1/2" Ice	1.50 2.50	3.00 4.00	188 275
1" x 1.5' Omni	A	From Leg	3.00 0 1	0.000	50.00	No Ice 1/2" Ice	0.13 0.23	0.13 0.23	14 15
Sidearm (2' x 3')	A	From Leg	1.50 0 0	0.000	45.00	No Ice 1/2" Ice	1.50 2.50	3.00 4.00	188 275
1" x 1.5' Omni	A	From Leg	3.00 0 1	0.000	45.00	No Ice 1/2" Ice	0.13 0.23	0.13 0.23	14 15

	Job	75 ft SST; Adams County, CO	Page	8 of 16
	Project	37725-0001	Date	16:04:33 07/01/25
	Client	Rio Steel & Tower, LTD	Designed by	Michael Bange

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert	Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight
			ft ft ft	°	ft	ft ²	ft ²	lb

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert	Azimuth Adjustment	3 dB Beam Width	Elevation	Outside Diameter	Aperture Area	Weight
				ft ft ft	°	°	ft	ft	ft ²	lb
4 ft w/ HP	A	Paraboloid w/Shroud (HP)	From Leg	1.00 0 0	Worst		75.00	4.00	No Ice 1/2" Ice	12.57 13.10
4 ft w/ HP	B	Paraboloid w/Shroud (HP)	From Leg	1.00 0 0	Worst		75.00	4.00	No Ice 1/2" Ice	12.57 13.10

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.0 Wind 0 deg - No Ice
3	0.9 Dead+1.0 Wind 0 deg - No Ice
4	1.2 Dead+1.0 Wind 30 deg - No Ice
5	0.9 Dead+1.0 Wind 30 deg - No Ice
6	1.2 Dead+1.0 Wind 60 deg - No Ice
7	0.9 Dead+1.0 Wind 60 deg - No Ice
8	1.2 Dead+1.0 Wind 90 deg - No Ice
9	0.9 Dead+1.0 Wind 90 deg - No Ice
10	1.2 Dead+1.0 Wind 120 deg - No Ice
11	0.9 Dead+1.0 Wind 120 deg - No Ice
12	1.2 Dead+1.0 Wind 150 deg - No Ice
13	0.9 Dead+1.0 Wind 150 deg - No Ice
14	1.2 Dead+1.0 Wind 180 deg - No Ice
15	0.9 Dead+1.0 Wind 180 deg - No Ice
16	1.2 Dead+1.0 Wind 210 deg - No Ice
17	0.9 Dead+1.0 Wind 210 deg - No Ice
18	1.2 Dead+1.0 Wind 240 deg - No Ice
19	0.9 Dead+1.0 Wind 240 deg - No Ice
20	1.2 Dead+1.0 Wind 270 deg - No Ice
21	0.9 Dead+1.0 Wind 270 deg - No Ice
22	1.2 Dead+1.0 Wind 300 deg - No Ice
23	0.9 Dead+1.0 Wind 300 deg - No Ice
24	1.2 Dead+1.0 Wind 330 deg - No Ice
25	0.9 Dead+1.0 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice



Job 75 ft SST; Adams County, CO Project 37725-0001 Client Rio Steel & Tower, LTD	Page 9 of 16
	Date 16:04:33 07/01/25
	Designed by Michael Bange

Comb. No.	Description
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice
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
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
Leg C	Max. Vert	18	43698	652	-419
	Max. H _x	20	36192	660	-180
	Max. H _z	5	-34476	-740	895
	Min. Vert	7	-39897	-1063	675
	Min. H _x	6	-39696	-1071	674
	Min. H _z	15	20786	136	-632
Leg B	Max. Vert	10	44028	-578	-544
	Max. H _x	20	-33599	1034	282
	Max. H _z	3	-19709	55	1289
	Min. Vert	23	-39657	960	861
	Min. H _x	7	21476	-676	321
	Min. H _z	14	21437	85	-916
Leg A	Max. Vert	2	44684	152	764
	Max. H _x	21	2246	1043	-94
	Max. H _z	2	44684	152	764
	Min. Vert	15	-37632	-225	-1240
	Min. H _x	11	-18991	-1131	-700
	Min. H _z	14	-36954	-217	-1246

Tower Mast Reaction Summary

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	4658	0	0	-3260	-536	0
1.2 Dead+1.0 Wind 0 deg - No Ice	5589	0	-2931	-148336	-629	1340

	Job	Page
	75 ft SST; Adams County, CO	10 of 16
	Project	Date
	37725-0001	16:04:33 07/01/25
	Client	Designed by
	Rio Steel & Tower, LTD	Michael Bange

<i>Load Combination</i>	<i>Vertical lb</i>	<i>Shear_x lb</i>	<i>Shear_z lb</i>	<i>Overturning Moment, M_x lb-ft</i>	<i>Overturning Moment, M_z lb-ft</i>	<i>Torque lb-ft</i>
0.9 Dead+1.0 Wind 0 deg - No Ice	4192	0	-2931	-147041	-470	1338
1.2 Dead+1.0 Wind 30 deg - No Ice	5589	1426	-2469	-126569	-71444	763
0.9 Dead+1.0 Wind 30 deg - No Ice	4192	1426	-2469	-125324	-71139	761
1.2 Dead+1.0 Wind 60 deg - No Ice	5589	2431	-1401	-74610	-123159	-306
0.9 Dead+1.0 Wind 60 deg - No Ice	4192	2430	-1402	-73492	-122747	-298
1.2 Dead+1.0 Wind 90 deg - No Ice	5589	2732	0	-3918	-140879	-1362
0.9 Dead+1.0 Wind 90 deg - No Ice	4192	2731	0	-2934	-140416	-1350
1.2 Dead+1.0 Wind 120 deg - No Ice	5589	2557	1476	69798	-128362	-1582
0.9 Dead+1.0 Wind 120 deg - No Ice	4192	2557	1476	70628	-127921	-1575
1.2 Dead+1.0 Wind 150 deg - No Ice	5589	1425	2469	118723	-71488	-1559
0.9 Dead+1.0 Wind 150 deg - No Ice	4192	1425	2469	119458	-71171	-1558
1.2 Dead+1.0 Wind 180 deg - No Ice	5589	0	2784	134467	-660	-1340
0.9 Dead+1.0 Wind 180 deg - No Ice	4192	0	2784	135200	-502	-1341
1.2 Dead+1.0 Wind 210 deg - No Ice	5589	-1425	2469	118720	70153	-764
0.9 Dead+1.0 Wind 210 deg - No Ice	4192	-1425	2469	119456	70170	-762
1.2 Dead+1.0 Wind 240 deg - No Ice	5589	-2557	1476	69793	127044	303
0.9 Dead+1.0 Wind 240 deg - No Ice	4192	-2557	1476	70626	126936	297
1.2 Dead+1.0 Wind 270 deg - No Ice	5589	-2732	0	-3926	139583	1362
0.9 Dead+1.0 Wind 270 deg - No Ice	4192	-2731	0	-2940	139447	1350
1.2 Dead+1.0 Wind 300 deg - No Ice	5589	-2429	-1403	-74626	121836	1582
0.9 Dead+1.0 Wind 300 deg - No Ice	4192	-2430	-1403	-73515	121775	1577
1.2 Dead+1.0 Wind 330 deg - No Ice	5589	-1426	-2469	-126575	70181	1559
0.9 Dead+1.0 Wind 330 deg - No Ice	4192	-1426	-2469	-125328	70194	1558
1.2 Dead+1.0 Ice	6595	0	0	-4549	-894	0
1.2 Dead+1.0 Wind 0 deg+1.0 Ice	6595	0	-798	-42716	-896	353
1.2 Dead+1.0 Wind 30 deg+1.0 Ice	6595	387	-671	-36868	-19555	230
1.2 Dead+1.0 Wind 60 deg+1.0 Ice	6595	639	-369	-22737	-32400	-50
1.2 Dead+1.0 Wind 90 deg+1.0 Ice	6595	722	0	-4551	-36986	-293
1.2 Dead+1.0 Wind 120 deg+1.0 Ice	6595	665	384	14230	-33432	-353
1.2 Dead+1.0 Wind 150 deg+1.0 Ice	6595	387	671	27767	-19563	-364
1.2 Dead+1.0 Wind 180 deg+1.0 Ice	6595	0	769	32425	-903	-353

	Job	75 ft SST; Adams County, CO	Page	11 of 16
	Project	37725-0001	Date	16:04:33 07/01/25
	Client	Rio Steel & Tower, LTD	Designed by	Michael Bange

<i>Load Combination</i>	<i>Vertical lb</i>	<i>Shear_x lb</i>	<i>Shear_z lb</i>	<i>Overturning Moment, M_x lb-ft</i>	<i>Overturning Moment, M_z lb-ft</i>	<i>Torque lb-ft</i>
1.2 Dead+1.0 Wind 210 deg+1.0 Ice	6595	-387	671	27766	17757	-230
1.2 Dead+1.0 Wind 240 deg+1.0 Ice	6595	-665	384	14229	31630	50
1.2 Dead+1.0 Wind 270 deg+1.0 Ice	6595	-722	0	-4552	35187	293
1.2 Dead+1.0 Wind 300 deg+1.0 Ice	6595	-639	-369	-22739	30604	354
1.2 Dead+1.0 Wind 330 deg+1.0 Ice	6595	-387	-671	-36869	17763	365
Dead+Wind 0 deg - Service	4658	0	-906	-47826	-536	414
Dead+Wind 30 deg - Service	4658	440	-763	-41111	-22389	238
Dead+Wind 60 deg - Service	4658	751	-433	-25088	-38342	-93
Dead+Wind 90 deg - Service	4658	844	0	-3263	-43811	-422
Dead+Wind 120 deg - Service	4658	790	456	19485	-39943	-489
Dead+Wind 150 deg - Service	4658	440	763	34586	-22395	-478
Dead+Wind 180 deg - Service	4658	0	860	39456	-543	-413
Dead+Wind 210 deg - Service	4658	-440	763	34586	21311	-238
Dead+Wind 240 deg - Service	4658	-790	456	19485	38862	93
Dead+Wind 270 deg - Service	4658	-844	0	-3264	42734	422
Dead+Wind 300 deg - Service	4658	-751	-433	-25089	37268	488
Dead+Wind 330 deg - Service	4658	-440	-763	-41112	21317	479

Maximum Tower Deflections - Service Wind

<i>Section No.</i>	<i>Elevation ft</i>	<i>Horz. Deflection in</i>	<i>Gov. Load Comb.</i>	<i>Tilt °</i>	<i>Twist °</i>
T1	75 - 71.9375	1.78	39	0.156	0.099
T2	71.9375 - 64.1875	1.68	39	0.156	0.096
T3	64.1875 - 60	1.43	39	0.154	0.089
T4	60 - 40	1.29	39	0.151	0.083
T5	40 - 20	0.68	39	0.128	0.057
T6	20 - 0	0.21	39	0.079	0.028

Critical Deflections and Radius of Curvature - Service Wind

<i>Elevation ft</i>	<i>Appurtenance</i>	<i>Gov. Load Comb.</i>	<i>Deflection in</i>	<i>Tilt °</i>	<i>Twist °</i>	<i>Radius of Curvature ft</i>
75.00	4 ft w/ HP	39	1.78	0.156	0.099	138441
70.00	Sidearm (2' x 3')	39	1.62	0.155	0.094	138441
60.00	Sidearm (2' x 3')	39	1.29	0.151	0.083	89772
50.00	Sidearm (2' x 3')	39	0.97	0.143	0.070	52814
45.00	Sidearm (2' x 3')	39	0.82	0.136	0.063	49299

Maximum Tower Deflections - Design Wind



Job 75 ft SST; Adams County, CO	Project 37725-0001	Page 12 of 16
		Date 16:04:33 07/01/25
	Client Rio Steel & Tower, LTD	Designed by Michael Bange

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	75 - 71.9375	5.54	2	0.469	0.511
T2	71.9375 - 64.1875	5.23	2	0.468	0.499
T3	64.1875 - 60	4.47	3	0.463	0.477
T4	60 - 40	4.06	3	0.457	0.455
T5	40 - 20	2.20	3	0.391	0.333
T6	20 - 0	0.73	3	0.246	0.183

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
75.00	4 ft w/ HP	2	5.54	0.469	0.511	49029
70.00	Sidearm (2' x 3')	2	5.04	0.468	0.493	49029
60.00	Sidearm (2' x 3')	3	4.06	0.457	0.455	32341
50.00	Sidearm (2' x 3')	3	3.10	0.432	0.395	19215
45.00	Sidearm (2' x 3')	3	2.64	0.414	0.363	18386

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt lb	Allowable Load per Bolt lb	Ratio Load Allowable	Allowable Ratio	Criteria
T3	64.1875	Leg	A325N	0.750	3	1371	30101	0.046	1	Bolt Tension
T4	60	Leg	A325N	0.750	3	4342	30101	0.144	1	Bolt Tension
T5	40	Leg	A325N	0.750	3	8384	30101	0.279	1	Bolt Tension

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L _u ft	KI/r	A in ²	P _u lb	φP _n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	75 - 71.9375	1 3/4" solid	3.06	2.75	75.4 K=1.00	2.405	-1804	71402	0.025 ¹
T2	71.9375 - 64.1875	1 3/4" solid	7.75	3.88	106.3 K=1.00	2.405	-4206	47387	0.089 ¹
T3	64.1875 - 60	1 3/4" solid	4.19	3.88	106.3 K=1.00	2.405	-5615	47387	0.118 ¹
T4	60 - 40	1 3/4" solid	20.00	3.88	106.3 K=1.00	2.405	-15761	47387	0.333 ¹
T5	40 - 20	1 3/4" solid	20.00	3.88	106.3 K=1.00	2.405	-28671	47387	0.605 ¹



Job 75 ft SST; Adams County, CO Project 37725-0001 Client Rio Steel & Tower, LTD	Page 13 of 16
	Date 16:04:33 07/01/25
	Designed by Michael Bange

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u lb	φP _n lb	Ratio $\frac{P_u}{\phi P_n}$
T6	20 - 0	1 3/4" solid	20.00	3.88	106.3 K=1.00	2.405	-44659	47387	0.942 ¹

¹ P_u / φP_n controls

Horizontal 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 $\frac{P_u}{\phi P_n}$
T2	71.9375 - 64.1875	L 2 x 2 x 3/16	4.00	3.85	118.7 K=1.01	0.715	-1293	14337	0.090 ¹
T4	60 - 40	L 2 x 2 x 3/16	4.00	3.85	118.7 K=1.01	0.715	-1677	14337	0.117 ¹
T5	40 - 20	L 2 x 2 x 3/16	4.00	3.85	118.7 K=1.01	0.715	-2070	14337	0.144 ¹
T6	20 - 0	L 2 x 2 x 3/16	4.00	3.85	118.7 K=1.01	0.715	-2417	14337	0.169 ¹

¹ P_u / φP_n controls

Top Girt 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 $\frac{P_u}{\phi P_n}$
T1	75 - 71.9375	L 2 x 2 x 3/16	4.00	3.85	118.7 K=1.01	0.715	-1006	14337	0.070 ¹
T2	71.9375 - 64.1875	L 2 x 2 x 3/16	4.00	3.85	118.7 K=1.01	0.715	-1513	14337	0.106 ¹
T3	64.1875 - 60	L 2 x 2 x 3/16	4.00	3.85	118.7 K=1.01	0.715	-1346	14337	0.094 ¹
T4	60 - 40	L 2 x 2 x 3/16	4.00	3.85	118.7 K=1.01	0.715	-811	14337	0.057 ¹
T5	40 - 20	L 2 x 2 x 3/16	4.00	3.85	118.7 K=1.01	0.715	-1140	14337	0.080 ¹
T6	20 - 0	L 2 x 2 x 3/16	4.00	3.85	118.7 K=1.01	0.715	-1386	14337	0.097 ¹

¹ P_u / φP_n controls

Bottom Girt 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 $\frac{P_u}{\phi P_n}$
T3	64.1875 - 60	L 2 x 2 x 3/16	4.00	3.85	118.7	0.715	-945	14337	0.066 ¹



Job 75 ft SST; Adams County, CO Project 37725-0001 Client Rio Steel & Tower, LTD	Page 14 of 16
	Date 16:04:33 07/01/25
	Designed by Michael Bange

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u lb	φP _n lb	Ratio $\frac{P_u}{\phi P_n}$
T4	60 - 40	L 2 x 2 x 3/16	4.00	3.85	K=1.01 118.7	0.715	-1221	14337	0.085 ¹
T5	40 - 20	L 2 x 2 x 3/16	4.00	3.85	K=1.01 118.7	0.715	-1528	14337	0.107 ¹
T6	20 - 0	L 2 x 2 x 3/16	4.00	3.85	K=1.01 118.7 K=1.01	0.715	-1806	14337	0.126 ¹

¹ P_u / φP_n controls

Tension Checks

Leg 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 $\frac{P_u}{\phi P_n}$
T1	75 - 71.9375	1 3/4" solid	3.06	0.31	8.6	2.405	61	108238	0.001 ¹
T2	71.9375 - 64.1875	1 3/4" solid	7.75	3.88	106.3	2.405	1282	108238	0.012 ¹
T3	64.1875 - 60	1 3/4" solid	4.19	0.31	8.6	2.405	4114	108238	0.038 ¹
T4	60 - 40	1 3/4" solid	20.00	0.31	8.6	2.405	13025	108238	0.120 ¹
T5	40 - 20	1 3/4" solid	20.00	0.31	8.6	2.405	25152	108238	0.232 ¹
T6	20 - 0	1 3/4" solid	20.00	0.31	8.6	2.405	39906	108238	0.369 ¹

¹ P_u / φP_n controls

Diagonal 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 $\frac{P_u}{\phi P_n}$
T1	75 - 71.9375	5/8" solid	4.85	4.68	359.2	0.307	1634	9940	0.164 ¹
T2	71.9375 - 64.1875	5/8" solid	5.57	5.37	412.1	0.307	1586	9940	0.160 ¹
T3	64.1875 - 60	5/8" solid	5.57	5.37	412.1	0.307	1794	9940	0.180 ¹
T4	60 - 40	5/8" solid	5.57	5.37	412.1	0.307	2572	9940	0.259 ¹
T5	40 - 20	5/8" solid	5.57	5.37	412.1	0.307	3113	9940	0.313 ¹
T6	20 - 0	5/8" solid	5.57	5.37	412.1	0.307	3592	9940	0.361 ¹

¹ P_u / φP_n controls

Horizontal Design Data (Tension)



Job 75 ft SST; Adams County, CO Project 37725-0001 Client Rio Steel & Tower, LTD	Page 15 of 16
	Date 16:04:33 07/01/25
	Designed by Michael Bange

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u lb	φP _n lb	Ratio $\frac{P_u}{\phi P_n}$
T2	71.9375 - 64.1875	L 2 x 2 x 3/16	4.00	3.85	75.0	0.715	73	23166	0.003 ¹
T4	60 - 40	L 2 x 2 x 3/16	4.00	3.85	75.0	0.715	273	23166	0.012 ¹
T5	40 - 20	L 2 x 2 x 3/16	4.00	3.85	75.0	0.715	497	23166	0.021 ¹
T6	20 - 0	L 2 x 2 x 3/16	4.00	3.85	75.0	0.715	774	23166	0.033 ¹

¹ P_u / φP_n controls

Top Girt 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 $\frac{P_u}{\phi P_n}$
T1	75 - 71.9375	L 2 x 2 x 3/16	4.00	3.85	75.0	0.715	31	23166	0.001 ¹
T2	71.9375 - 64.1875	L 2 x 2 x 3/16	4.00	3.85	75.0	0.715	73	23166	0.003 ¹
T3	64.1875 - 60	L 2 x 2 x 3/16	4.00	3.85	75.0	0.715	97	23166	0.004 ¹
T4	60 - 40	L 2 x 2 x 3/16	4.00	3.85	75.0	0.715	273	23166	0.012 ¹
T5	40 - 20	L 2 x 2 x 3/16	4.00	3.85	75.0	0.715	497	23166	0.021 ¹
T6	20 - 0	L 2 x 2 x 3/16	4.00	3.85	75.0	0.715	774	23166	0.033 ¹

¹ P_u / φP_n controls

Bottom Girt 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 $\frac{P_u}{\phi P_n}$
T3	64.1875 - 60	L 2 x 2 x 3/16	4.00	3.85	75.0	0.715	97	23166	0.004 ¹
T4	60 - 40	L 2 x 2 x 3/16	4.00	3.85	75.0	0.715	273	23166	0.012 ¹
T5	40 - 20	L 2 x 2 x 3/16	4.00	3.85	75.0	0.715	497	23166	0.021 ¹
T6	20 - 0	L 2 x 2 x 3/16	4.00	3.85	75.0	0.715	774	23166	0.033 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
T1	75 - 71.9375	Leg	1 3/4" solid	3	-1804	71402	2.5	Pass
T2	71.9375 - 64.1875	Leg	1 3/4" solid	15	-4206	47387	8.9	Pass
T3	64.1875 - 60	Leg	1 3/4" solid	36	-5615	47387	11.8	Pass
T4	60 - 40	Leg	1 3/4" solid	51	-15761	47387	33.3	Pass
T5	40 - 20	Leg	1 3/4" solid	102	-28671	47387	60.5	Pass
T6	20 - 0	Leg	1 3/4" solid	153	-44659	47387	94.2	Pass
T1	75 - 71.9375	Diagonal	5/8" solid	9	1634	9940	16.4	Pass



Job 75 ft SST; Adams County, CO Project 37725-0001 Client Rio Steel & Tower, LTD	Page 16 of 16
	Date 16:04:33 07/01/25
	Designed by Michael Bange

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
T2	71.9375 - 64.1875	Diagonal	5/8" solid	21	1586	9940	16.0	Pass
T3	64.1875 - 60	Diagonal	5/8" solid	45	1794	9940	18.0	Pass
T4	60 - 40	Diagonal	5/8" solid	60	2572	9940	25.9	Pass
T5	40 - 20	Diagonal	5/8" solid	111	3113	9940	31.3	Pass
T6	20 - 0	Diagonal	5/8" solid	162	3592	9940	36.1	Pass
T2	71.9375 - 64.1875	Horizontal	L 2 x 2 x 3/16	25	-1293	14337	9.0	Pass
T4	60 - 40	Horizontal	L 2 x 2 x 3/16	65	-1677	14337	11.7	Pass
T5	40 - 20	Horizontal	L 2 x 2 x 3/16	116	-2070	14337	14.4	Pass
T6	20 - 0	Horizontal	L 2 x 2 x 3/16	167	-2417	14337	16.9	Pass
T1	75 - 71.9375	Top Girt	L 2 x 2 x 3/16	4	-1006	14337	7.0	Pass
T2	71.9375 - 64.1875	Top Girt	L 2 x 2 x 3/16	16	-1513	14337	10.6	Pass
T3	64.1875 - 60	Top Girt	L 2 x 2 x 3/16	37	-1346	14337	9.4	Pass
T4	60 - 40	Top Girt	L 2 x 2 x 3/16	52	-811	14337	5.7	Pass
T5	40 - 20	Top Girt	L 2 x 2 x 3/16	104	-1140	14337	8.0	Pass
T6	20 - 0	Top Girt	L 2 x 2 x 3/16	155	-1386	14337	9.7	Pass
T3	64.1875 - 60	Bottom Girt	L 2 x 2 x 3/16	40	-945	14337	6.6	Pass
T4	60 - 40	Bottom Girt	L 2 x 2 x 3/16	55	-1221	14337	8.5	Pass
T5	40 - 20	Bottom Girt	L 2 x 2 x 3/16	106	-1528	14337	10.7	Pass
T6	20 - 0	Bottom Girt	L 2 x 2 x 3/16	157	-1806	14337	12.6	Pass
Summary								
Leg (T6)							94.2	Pass
Diagonal (T6)							36.1	Pass
Horizontal (T6)							16.9	Pass
Top Girt (T2)							10.6	Pass
Bottom Girt (T6)							12.6	Pass
Bolt Checks							27.9	Pass
RATING =							94.2	Pass

Self-Support Tower Anchor Rod Capacity - TIA-H

Loads

Compression :	<u>44.684</u> kips	Tension :	<u>39.897</u> kips
Comp. Shear :	<u>0.779</u> kips	Ten. Shear :	<u>1.259</u> kips

Code: TIA-H

Maximum Ratio: 1.00

Grout $f_c \geq 5000$ psi:

Existing Anchor Rods

Anchor Rod ϕ : 3/4 in

Anchor Rod Quantity : 3

Anchor Rod Grade : A193 Gr B7

F_y : 105 ksi

F_u : 125 ksi

Threads per Inch 10

Net Tensile Area 0.33 in²

ϕ_t : 0.75

$\phi_t R_{nt}$: 94.07 kip

Anchor Rod Ratio : 0.424

l_{ar} : 0.75 inches

Comp. M_u : 0.38 k-in Ten. M_u : 0.61 k-in

ϕ_c : 0.90

ϕ_v : 0.75

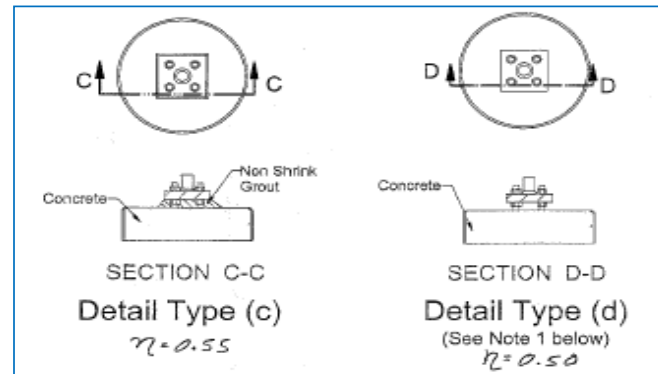
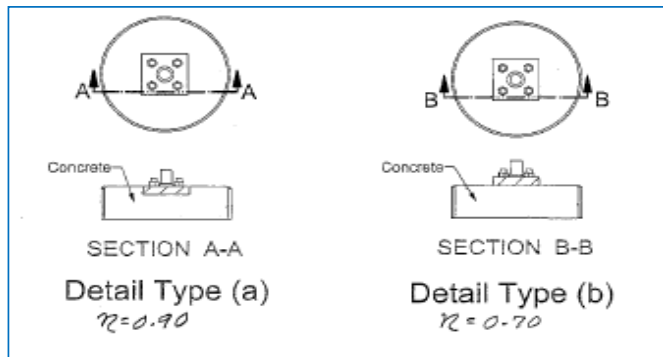
ϕ_f : 0.90

$\phi_v R_{nv}$: 62.13 kips

$\phi_t M_n$: 18.79 k-in

$\phi_c R_{nc}$: 125.25 kips

$\phi_c R_{nvc}$: 56.36 kips



SST Unit Base Foundation

Job # : 37725-0001
Site Name: Adams County

TIA-222 Revision: H

Top & Bot. Pad Rein. Different?:	☐
Tower Centroid Offset?:	☐
Block Foundation?:	☒
Rectangular Pad?:	☐

Superstructure Analysis Reactions		
Global Moment, M :	148.337	ft-kips
Global Axial, P :	5.589	kips
Global Shear, V :	2.953	kips
Leg Compression, P_{comp} :	44.684	kips
Leg Comp. Shear, V_{u,comp} :	0.779	kips
Leg Uplift, P_{uplift} :	39.893	kips
Leg Uplift. Shear, V_{u,uplift} :	1.258	kips
Tower Height, H :	75	ft
Base Face Width, BW :	4	ft
BP Dist. Above Fdn, bp_{dist} :	1.5	in
Anchor Bolt Circle, BC :	8.5	in

Foundation Analysis Checks				
	Capacity	Demand	Rating	Check
<i>Lateral (Sliding) (kips)</i>	18.25	2.95	16.2%	Pass
<i>Bearing Pressure (ksf)</i>	3.34	2.33	69.8%	Pass
<i>Overturning (kip*ft)</i>	194.81	162.73	83.5%	Pass
<i>Pad Flexure (kip*ft)</i>	2777.57	56.95	2.1%	Pass
<i>Pad Shear - 1-way (kips)</i>	568.45	0.00	0.0%	Pass
<i>Pad Shear - Comp 2-way (ksi)</i>	0.201	0.004	2.2%	Pass
<i>Flexural 2-way (Comp) (kip*ft)</i>	2423.90	0.00	0.0%	Pass
<i>Pad Shear - Tension 2-way (ksi)</i>	0.201	0.004	1.9%	Pass
<i>Flexural 2-way (Tension) (kip*ft)</i>	2423.90	0.00	0.0%	Pass

Structural Rating:	2.2%
Soil Rating:	83.5%

Pad Properties		
Depth, D :	4.50	ft
Pad Width, W₁ :	9.00	ft
Pad Thickness, T :	4.75	ft
Pad Rebar Size (Bottom dir. 2), Sp₂ :	9	
Pad Rebar Quantity (Bottom dir. 2), mp₂ :	12	
Pad Clear Cover, cc_{pad} :	3	in

Material Properties		
Rebar Grade, Fy :	60	ksi
Concrete Compressive Strength, F'c :	4.5	ksi
Dry Concrete Density, δc :	150	pcf

Soil Properties		
Total Soil Unit Weight, γ :	100	pcf
Ultimate Net Bearing, Qnet :	4.000	ksf
Cohesion, Cu :		ksf
Friction Angle, φ :	30	degrees
SPT Blow Count, N_{blows} :		
Base Friction, μ :		
Neglected Depth, N :	4.2	ft
Foundation Bearing on Rock?	No	
Groundwater Depth, gw :	N/A	ft

<-- Toggle between Gross and Net

ASCE 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)

Latitude:

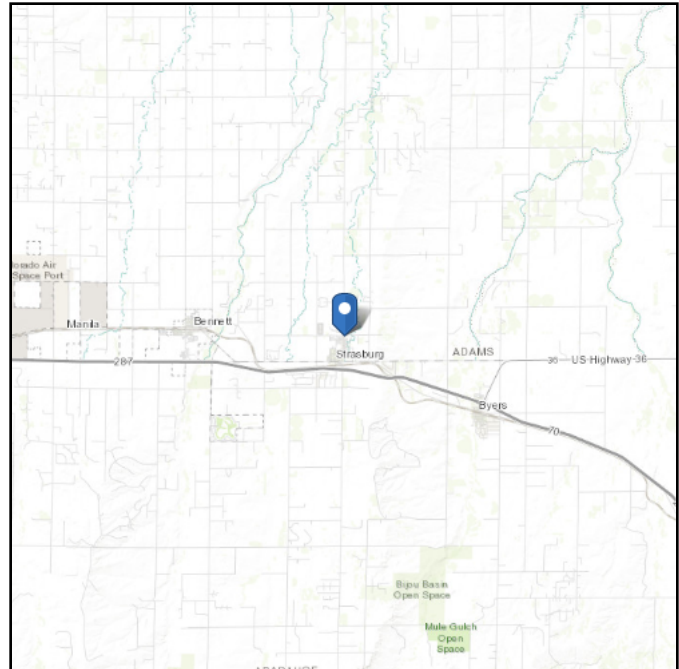
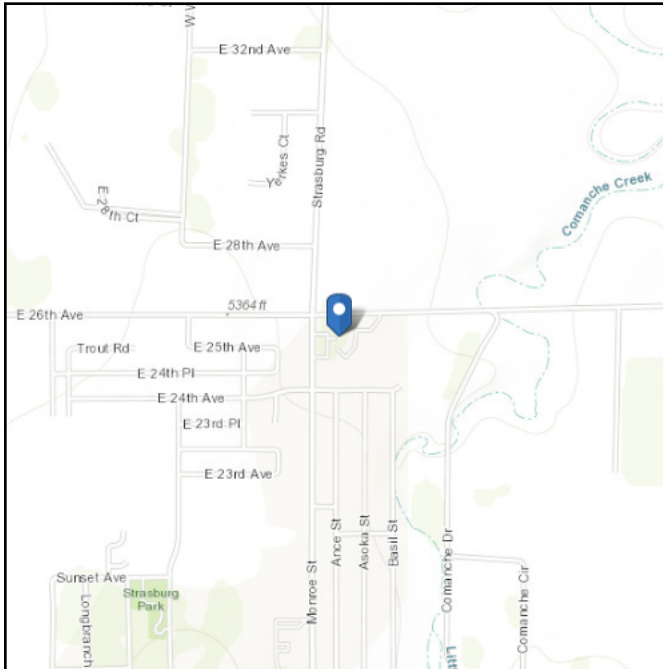
39.752019

Longitude:

-104.320439

Elevation:

5363.2494622703025 ft
(NAVD 88)



Wind

Results:

Wind Speed	108 Vmph
10-year MRI	77 Vmph
25-year MRI	84 Vmph
50-year MRI	89 Vmph
100-year MRI	94 Vmph

Data Source:

ASCE/SEI 7-16, Fig. 26.5-1B and Figs. CC.2-1–CC.2-4, and Section 26.5.2

Date Accessed:

Mon Jun 02 2025

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).

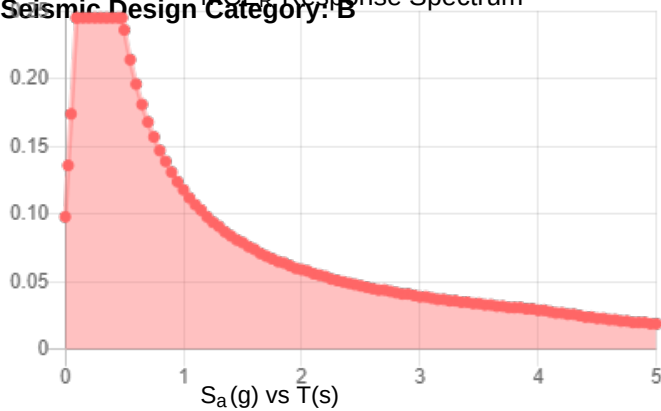
Site is not in a hurricane-prone region as defined in ASCE/SEI 7-16 Section 26.2.

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

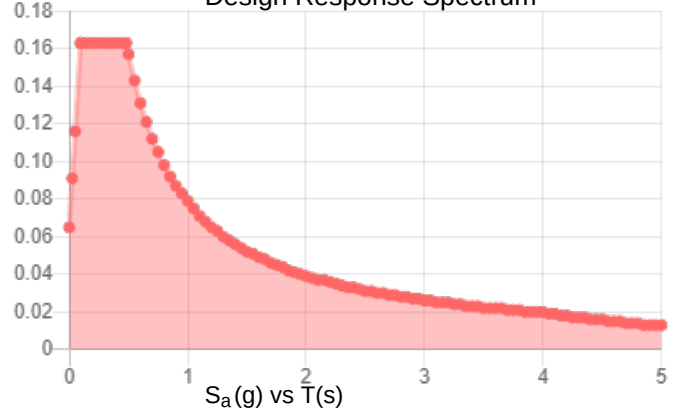
Results:

S_S :	0.153	S_{D1} :	0.079
S_1 :	0.049	T_L :	4
F_a :	1.6	PGA :	0.078
F_v :	2.4	PGA _M :	0.125
S_{MS} :	0.245	F_{PGA} :	1.6
S_{M1} :	0.118	I_e :	1
S_{DS} :	0.163	C_v :	0.7

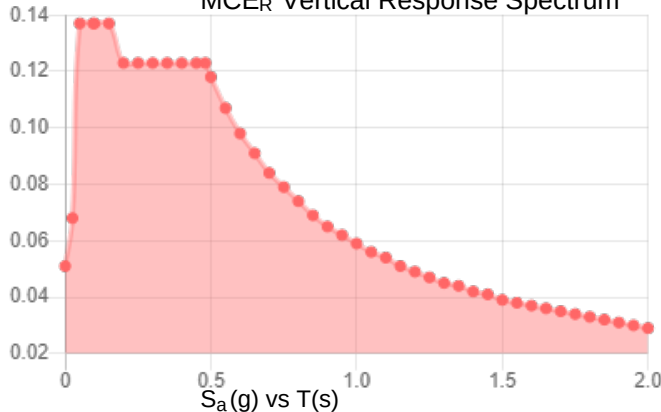
Seismic Design Category: B MCE_R Response Spectrum



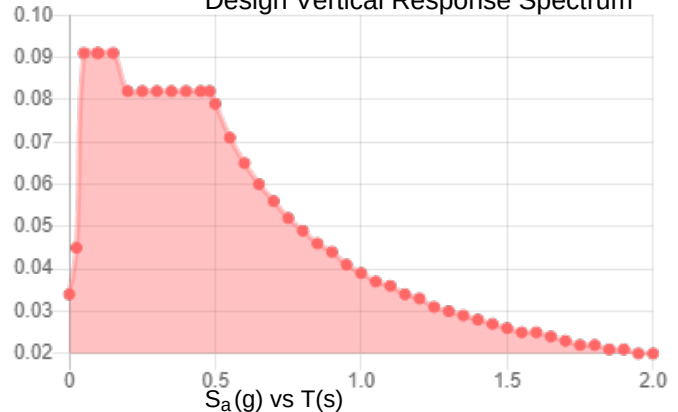
Design Response Spectrum



MCE_R Vertical Response Spectrum



Design Vertical Response Spectrum



Data Accessed: Mon Jun 02 2025

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: 0.25 in.
Concurrent Temperature: 5 F
Gust Speed 50 mph

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

Date Accessed: Mon Jun 02 2025

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

In the mountain west, ice thicknesses may exceed the mapped values in the foothills and passes. However, at elevations above 5,000 ft, freezing rain is unlikely.

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 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 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 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 Hazard Tool.