



CITY OF BETHEL

SPECIAL PLANNING COMMISSION MEETING

THURSDAY, JULY 18, 2024, 6:30 PM

LOCATION: 300 CHIEF EDDIE HOFFMAN HIGHWAY, BETHEL ALASKA

Join Zoom Meeting:

<https://us06web.zoom.us/j/6563579419?pwd=2r9sk6APaAeOLVL6ViyWCAgrbmOaot.1&omn=85202105662Meeting>

ID: 656 357 9419 Passcode: 771709

Phone Toll Free: 888 475 4499

833 548 0276

833 548 0282

877 853 5257

MEMBERS

Kathy Hanson, Chair Lorin Bradbury, Vice Chair
Mary Beth Hessler, Council Rep.
Alex Wasierski Shadi Rabi
Haley Hanson Sundi Scott
Vacant Seat, Alternate 1
Vacant Seat, Alternate 2

STAFF

Pauline Boratko, Ex Officio Member
Lee Foley, City Planner
planning@cityofbethel.net
907-543-5301

I. CALL TO ORDER

II. ROLL CALL

III. PEOPLE TO BE HEARD – FIVE MINUTES PER PERSON

A. Please submit written public comments to planning@cityofbethel.net by 4:00 p.m. the day of the meeting.

IV. NEW BUSINESS:

A. Public Hearing- Bethel Broadcasting dba KYUK is seeking permitting with the City of Bethel in order to replace its existing self-support tower located at 640 Radio Street, Bethel, Alaska 99559

V. MEMBER COMMENTS

VI. ADJOURNMENT

Posted <<07/12/2024>> at City Hall, AC Co., Swanson's, and the Post Office.

Ex-Officio Staff

CITY OF BETHEL PLANNING OFFICE

Po Box 1388

Bethel, AK 99559

(907) 543-5306

(907) 543-5301

(907) 543-4168 (facsimile)

**APPLICATION FOR A SPECIAL USE PERMIT
TALL TOWERS***Please enter the following information:***Owner of Tower Facility**

Name of Owner: Bethel Broadcasting, Inc.

Contact Name: Kristin Hall Telephone: 907-545-4208

Address: P.O. Box 468

City: Bethel State: AK Zip: 99559

Email: kristin@kyuk.org

Operator of Tower Facility: *Please check ☐ if same as above*

Name of Owner: _____

Contact Name: _____ Telephone: _____

Address: _____

City: _____ State: _____ Zip: _____

Email: _____

Applicant (Developer): *Please check ☐ if same as above*

Name of Owner: _____

Contact Name: _____ Telephone: _____

Address: _____

City: _____ State: _____ Zip: _____

Email: _____

Property Owner: *Please check ☐ if same as above*

Name of Owner: _____

Contact Name: _____ Telephone: _____

Address: _____

City: _____ State: _____ Zip: _____

Email: _____

APPLICATION CHECKLIST

This document is provided as a resource for the Applicant to assist with preparing the Application submittal package. Please attach this checklist to the application. Please note that all applicable items are due at the time the application is submitted. **Incomplete applications will not be processed.**

REQUIRED DOCUMENT

Applicant must submit one (1) original, six (6) copies and one (1) electronic copy on either a CD or a Thumb Drive. ALL DOCUMENTS MUST BE CLEARLY LABELED AND IN THE ORDER BELOW.

- | | |
|--------------------------|---|
| ☐ | Tower Description |
| ☐ | Property Ownership & Authorization to Use Property |
| ☐ | Tower Operations |
| ☐ | Security Plan |
| ☐ | Description of Signage |
| ☐ | Lighting Description (if applicable) |
| ☐ | Utilities; Setbacks; Parking |
| ☐ | Notice to Applicants |
| ☐ | Equipment Shelters (if applicable) |
| ☐ | Landscaping Plan |
| ☐ | Engineer Reports |
| ☐ | Determination of No Hazard to Air Navigation from the FAA |
| ☐ | Hazardous Materials Plan |
| ☐ | Decommissioning Plan |
| ☐ | Planning Commission Review Criteria - Questionnaire |
| ☐ | Proof of Liability Insurance |
| ☐ | Visibility |

Pursuant to BMC 16.10, both the Tower Owner and the Applicant (if different), hereby submit this Application for a Special Use Permit.

TOWER OWNER:

Shane Iverson

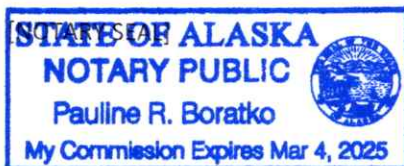
Signature

Dated: 8/30/23

Printed Name: Shane Iverson

On this 30th day of August, 2023 before me, the undersigned, a Notary Public in and for the State of Alaska, personally appeared Shane Iverson, known to me to be the identical person who executed the foregoing instrument and who acknowledged to me that he/she executed the same freely and voluntarily, with full knowledge of its contents, for the uses and purposes therein mentioned.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal the day and year above written.



Pauline R. Boratko

Notary Public in and for the State of Alaska
My Commission Expires: 3/4/2025

APPLICANT:

Shane Iverson

Signature

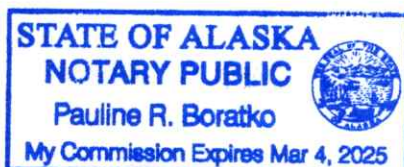
Dated: 8/30/23

Printed Name: Shane Iverson

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IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal the day and year above written.

[NOTARY SEAL]



Pauline R. Boratko

Notary Public in and for the State of Alaska
My Commission Expires: 3/4/2025

OPERATOR:

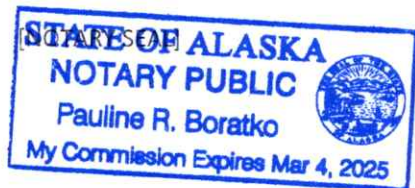
Shane IversonDated: 8/30/23

Signature

Printed Name: Shane Iverson

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IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal the day and year above written.



Pauline R. Boratko
 Notary Public in and for the State of Alaska
 My Commission Expires: 3/4/2025

FOR OFFICIAL USE ONLY

City Departments and Agency Review

- | | |
|-----------------------|-----------------------------|
| 1. _____ Public Works | 2. _____ Engineer |
| 3. _____ City Planner | 4. _____ Streets and Roads |
| 5. _____ Fire Dept. | 6. _____ Army Corp. of Eng. |
| 7. _____ FEMA | 8. _____ Other: |

Carefully read instructions and applicable City code. Fill out forms completely. Attach information as needed. Incomplete applications will create a delay in the review process. Please provide one hard copy and one electronic copy via email.

Application Fee must be attached:	\$750.00	Special Use Permit
Payment Type:	☐ Credit Card ☐ Check ☐ Money Order ☐ Cashier's Check	

KYUK Studio Radio Tower Project Narrative

KYUK's "studio tower" is the tower located in the center of town, outside of the KYUK station (640 Radio St. Bethel, AK 99559). See attachment **1. AUG23_Proposed Studio Tower Lot Photo**. The studio tower was damaged last winter due to icing and extreme winds. An inspection of the tower, foundation, and soil samples confirmed replacing the structure and foundation to improve structural integrity and stability was the most prudent course of action.

As advised by the City of Bethel Planning Department, the replacement project will be processed under BMC 16.10.200 – *Reconstruction and Replacement*. KYUK is the sole owner of the studio tower, and is responsible for all aspects of the operation, improvement, development, and maintenance. We will be replacing KYUK's self-support tower with an updated self-support tower at the existing KYUK site, as this is the location that is designated for the operation of KYUK's FM and TV broadcast stations per our FCC license. KYUK resides within a Public Land and Institutions zone, and the replacement tower will serve all the same operations as the original structure. In accordance with BMC 16.10.200.D, the replacement tower shall not increase lighting, change the type of lighting, change the tower type, change the location of the tall structure, or increase the height of the tall structure. See attachment **2. Design Drawings KYUK Studio Tower.pdf** for additional details.

KYUK has contracted Alaska Public Media with support from Hatfield & Dawson and Magnum Towers for broadcast engineering, Haas & Associates for foundation design, and SouthCentral Communications, LLC for construction of the project.

The original KYUK studio tower is located at 60°47.4927' N/161°46.4100' W. The base of the new KYUK tower will be moved 30 feet southwest from the existing structure to 60°47.4857' N 161°46.4162' W. As shown in attachment **1. AUG23_Proposed Studio Tower Lot Photo.pdf**, the new KYUK tower sits directly next to the old tower, between KYUK lots 2B and 2C. We do not anticipate the project will impact any traffic patterns or the health and safety of the residents of Bethel.

We intend to cause as little disruption as possible to the existing visual impact, operations, and broadcast while adhering to all local, state, and national regulations with the utmost safety. The TIA-222 is a structural standard that defines the requirements for a structure like the KYUK studio tower to ensure it can withstand various environmental conditions like wind, snow, and ice. In the attachment **3. Final Design Submittal KYUK Studio Tower.pdf**, our adherence to TIA-222 standards is noted on page 5. The new tower will house all four of the existing antennas on the current tower and will be able to accommodate up to 6 antenna arrays, on the condition that specific engineering provisions are implemented by the co-located service provider as to not disrupt Bethel Broadcasting's own services, as outlined in BMC 16.10.110(F) – Design Criteria.

Antennas Currently on KYUK tower:

- KYUK 90.3FM antenna
- KYUK television antenna
- City of Bethel First Responders Communication antenna
- State of Alaska, Department of Correction Internal Communications antenna

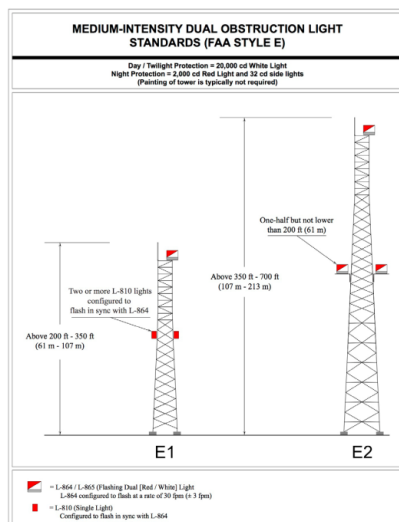
Per BMC 16.10.110(B)(3), an 8 ft. fence will be installed around the base of the tower once construction of the tower has been completed. All existing required signage per BMC 16.10.110(D) that is used at the studio tower site will remain.

The new studio tower will replace the existing tower at the same height of 180 ft. This is within the City of Bethel's tall tower limit of 250 ft. The face width of the tower is 5 ft at the top and 27.5 ft. at the base. The design of the tower meets all stipulations outlined in BMC 16.10.110(F) – Design Criteria.

The new tower will utilize the same lighting system that is currently being used on the existing tower, which is a dual lighting system per FAA specifications. This dual lighting system includes red lights (L-864) for nighttime and medium-intensity, flashing white lights (L-865) for daytime and twilight use. The light system is controlled by a device (photocell) that changes the light's intensity when the ambient light changes. The system should automatically change steps when, in the Northern Hemisphere, the northern sky illuminance reaching a north-facing vertical surface is as follows:

1. Twilight-to-Night. This should not occur before the illumination drops below 5 foot-candles (53.8 lux) but should occur before it drops below 2 foot-candles (21.5 lux).
2. Night-to-Day. The intensity changes listed above should be reversed when changing from the night-to-day mode.

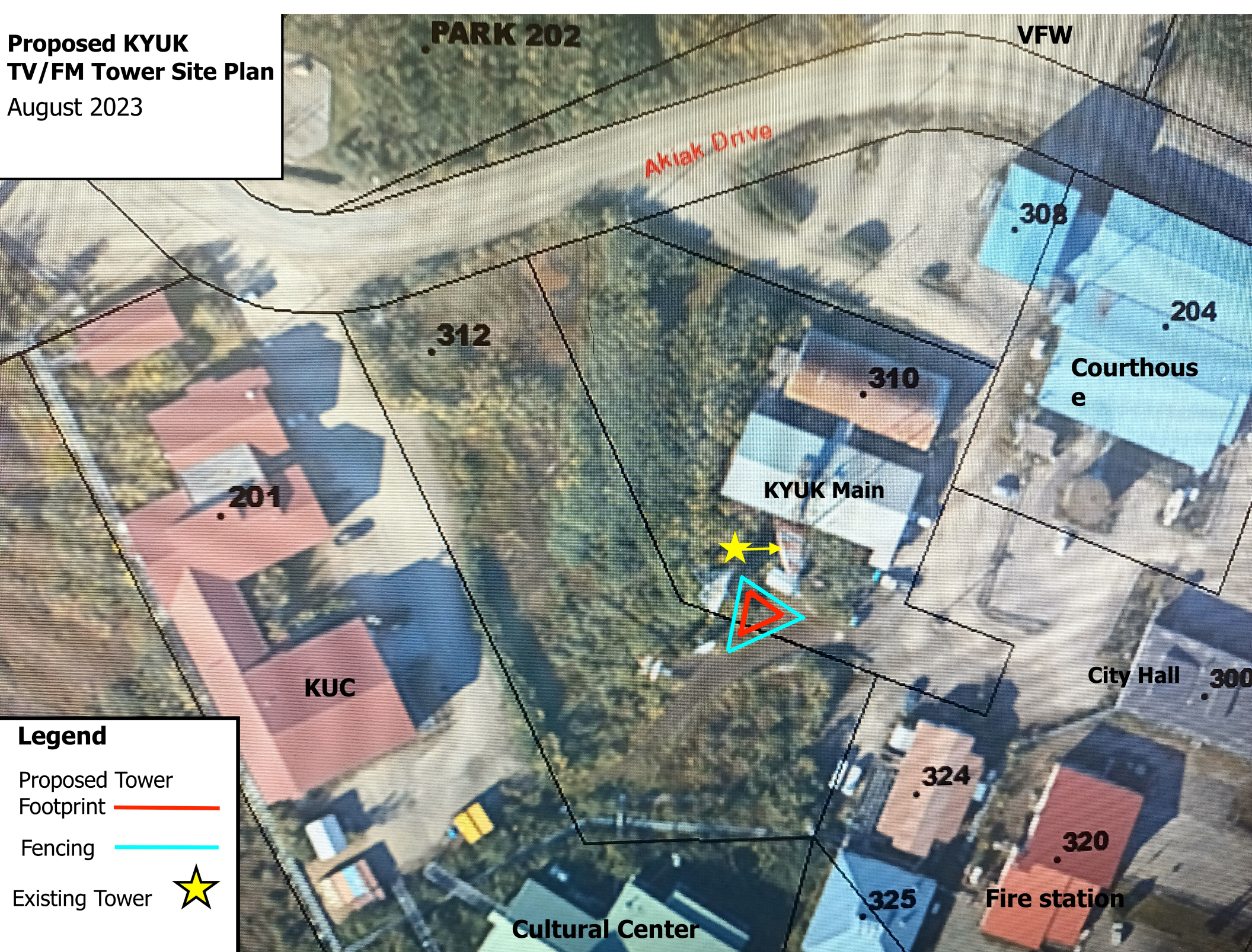
The lighting system is planned to be the E1 system as depicted below:



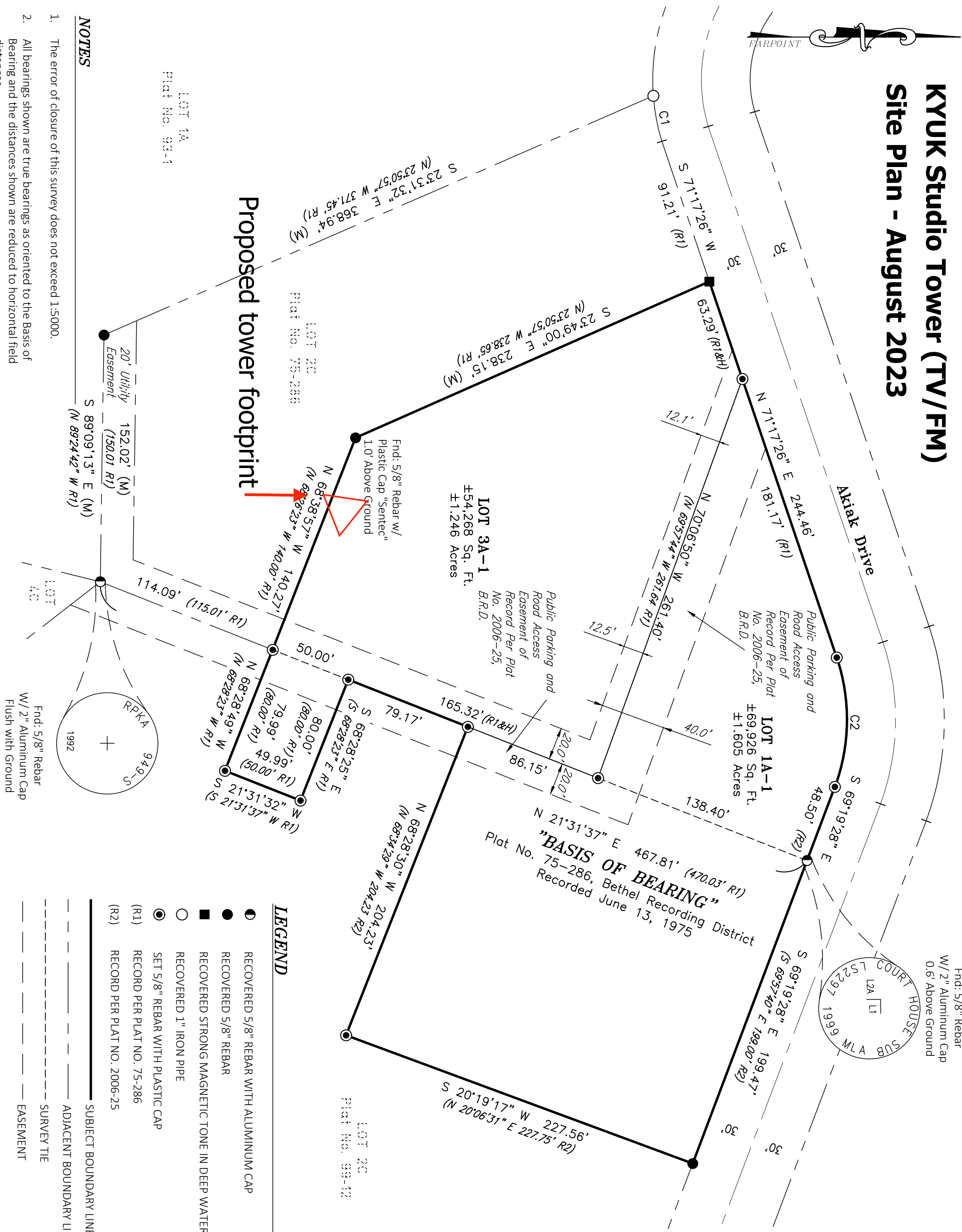
As of submittal of this application, waivers to the setback guidelines outlined in BMC 16.10.110(G) are currently pending, awaiting signatures by all adjoining property owners as outlined in BMC 16.10.110(G)(6), and the following supporting documentation is included:

- COB_Letter of Concurrence of Setback Waiver.pdf
- UAF_Letter of Concurrence of Setback Waiver.pdf

**Proposed KYUK
TV/FM Tower Site Plan**
August 2023



KYUK Studio Tower (TV/FM)
Site Plan - August 2023



- NOTES**
- The error of closure of this survey does not exceed 1:5000.
 - All bearings shown are true bearings as oriented to the Basis of Bearing and the distances shown are reduced to horizontal field distances.
 - Lots 1A-1 and 3A-1 are located within the Public Lands and Institutions Zone.
 - This subdivision is located entirely within Zone "X" determined to be outside the 0.2% annual chance floodplain, on the Flood Insurance Rate Map number 02021040042C bearing a Revision Date of September 25, 2009.
 - The purpose of this subdivision is to subdivide Lots 1A and 3A creating Lot 3A-1 to resemble, as best as possible, the boundary and acreage of Lot 2B of City Center Subdivision, Plat No. 75-286, Bethel Recording District.

SURVEYOR'S CERTIFICATE

I hereby certify that I am a registered professional land surveyor in the state of Alaska and that this plat represents a survey made by me or under my direct supervision, and that the monuments shown on the plat actually exist as described, and that all dimensional and other details are true and correct to the best of my knowledge.



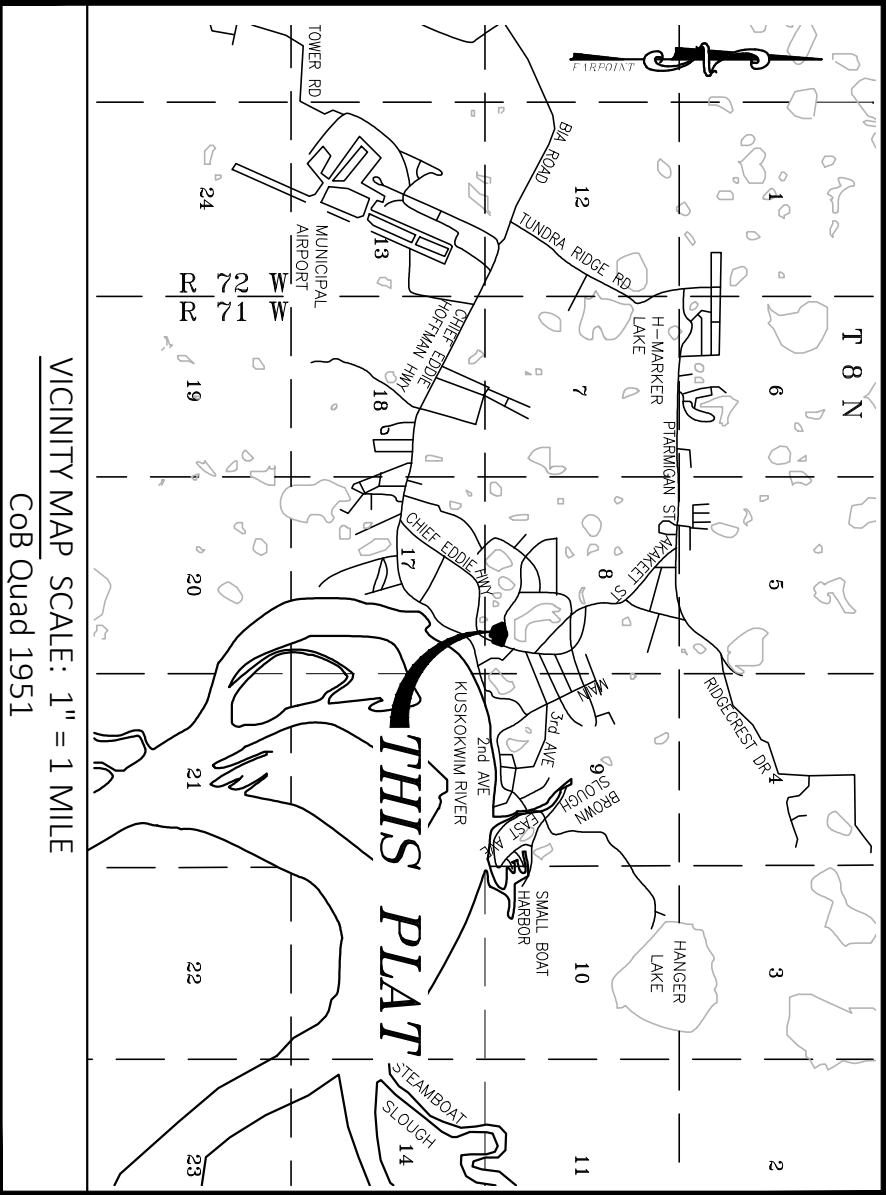
CURVE DATA				
CURVE	RADIUS	ARC	TANGENT	CHORD
C1	130.00'	28.54'	14.35'	12.34'46"
C1 (R1)	130.00'	30.00'	15.07'	13.13'32.0"
C2	120.00'	81.17'	42.21'	38'45.19"
C2 (R2)	120.00'	80.41'	41.78'	38'23.35"

PLATTING OFFICERS CERTIFICATE

I CERTIFY THAT THIS SUBDIVISION PLAT HAS BEEN FOUND TO COMPLY WITH THE LAND SUBDIVISION REGULATIONS OF THE CITY OF BETHEL, AND THAT THE PLAT HAS BEEN APPROVED BY THE PLATTING AUTHORITY BY RESOLUTION NUMBER _____, DATED _____, AND THAT THIS PLAT HAS BEEN APPROVED FOR RECORDING FOR THE FOURTH JUDICIAL DISTRICT OF BETHEL, ALASKA.

CITY OF BETHEL PLATTING OFFICER

DATE



CERTIFICATE OF OWNERSHIP AND DEDICATION

I certify that I am the owner of the property, or of an interest therein, shown and described on this plat, and that I adopt this plan of subdivision by my free consent and dedicate all rights-of-way, streets, alleys, ways, and public areas to the City of Bethel and grant to the City of Bethel for the uses shown all easements not shown as private.

Peter Williams, City Manager
For: City of Bethel
P.O. Box 1388
Bethel, Alaska 99559

NOTARY'S ACKNOWLEDGMENT

Subscribed and sworn before me this _____ Day of _____, 2022

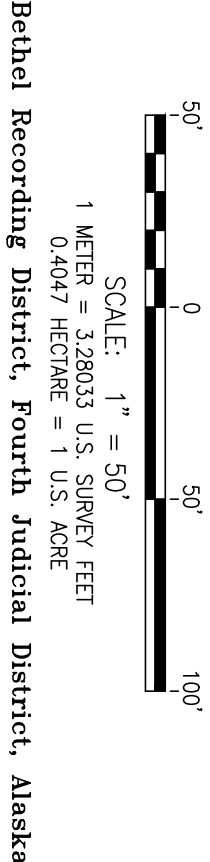
By: _____ for, _____

personally appearing before me.

Notary Public for the State of Alaska
My Commission Expires _____

TAX CERTIFICATION

This subdivision is outside any taxing authority at the time of filing.



Bethel Recording District, Fourth Judicial District, Alaska

Plat of
Courthouse Subdivision Addition #1
Creating
Lot 1A-1 and Lot 3A-1

A subdivision of Lot 1A and Lot 3A, Courthouse Subdivision ADD #1,
Plat No. 2006-25

Located Within:

SECTIONS 8 and 9, TOWNSHIP 8 NORTH, RANGE 71 WEST, Seward Meridian, Alaska.
Containing 2,851 acres more or less.

Farpoint Land Services, LLC
SURVEYING, MAPPING, LAND PLANNING, GIS
1131 E. 76th Ave., Suite 101 Anchorage, Alaska 99518
FarpointAK.com (907) 522-7770 survey@farpointak.com

Drawn: JLA Date: 12/14/2021 Field BK/Pg: 157/23-24 WO #: 20303
Checked: MH Scale: 1"=50' Sheet: 1 of 1 Drawing: 20303 Plat

180' SELF SUPPORT TOWER

BETHEL, AK

BETHEL, ALASKA
BETHEL COUNTY

LAT: 60° 47' 30.30", LONG: -161° 46' 30.30"

PROJECT CONTACTS

CLIENT:

MAGNUM TOWERS

CONTACT: JEFF STYLER AT JEFF@MAGNUMTOWERS.COM

PH: (916) 381-5053

ENGINEER OF RECORD:

PJFTELECOM@PAULJFORD.COM

WIND DESIGN DATA

REFERENCE STANDARD	ANSI/TIA-222-H-2017
LOCAL CODE	2021 IBC
BASIC WIND SPEED (MPH)	147
ICE THICKNESS (IN)	0.5
ICE WIND SPEED (MPH)	60
SERVICE WIND SPEED (MPH)	60
RISK CATEGORY	II
EXPOSURE CATEGORY	C
MAXIMUM TOPOGRAPHIC FACTOR, K _{zT}	1.0

SHEET INDEX

SHEET NUMBER	DESCRIPTION
T-1	TITLE SHEET
N-1	NOTES
S-1	TOWER ELEVATION
S-2	BOLTED TOWER SECTION DETAILS
S-3	TOWER FLANGE DETAILS
S-4	SPECIAL INSPECTION

FACTORED BASE REACTIONS

SHEAR (KIPS)	90.5
AXIAL (KIPS)	52.6
MOMENT (KIP-FT)	9273.2

FACTORED LEG REACTIONS

MAX COMPRESSION (KIPS)	406.9
COMPRESSION SHEAR (KIPS)	55.5
MAX TENSION (KIPS)	360.6
TENSION SHEAR (KIPS)	49.3

PJF PAUL J. FORD & COMPANY
250 E Broad St, Ste 600 · Columbus, OH 43215
Phone 614.221.6679 www.pauljford.com

MAGNUM TOWERS

9370 ELDER CREEK ROAD SACRAMENTO, CA 95829
(916) 381-5053

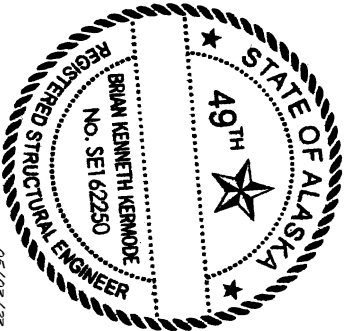
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BETHEL, AK
BETHEL, ALASKA
180' SELF SUPPORT TOWER

PROJECT No: A65022-0025.002.8200
DRAWN BY: TAN
DESIGNED BY: JMF
CHECKED BY: AKT
DATE: 5/1/2023

TITLE
SHEET

T-1



05/03/23

REV	DATE	DESCRIPTION
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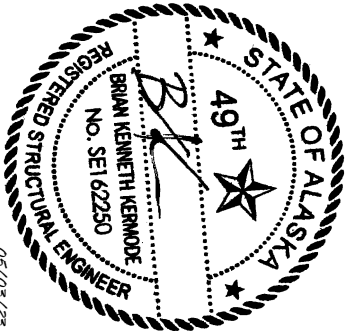
GENERAL NOTES:

- ERECTION TOLERANCES SHALL BE AS SPECIFIED BY THE TIA STANDARD.
- ALL LEG FLANGE BOLTS SHALL BE FULLY PRETENSIONED IN ACCORDANCE WITH AISCS "TURN-OF-NUT" METHOD. ALL OTHER BOLTS SHALL BE TORQUED TO THE SNUG-TIGHT CONDITION AS DEFINED BY AISCS.
- ALL CLIMBING FACILITIES, TOWER LIGHTING, LIGHTNING PROTECTION, AND GROUNDING SHALL BE IN ACCORDANCE WITH THE REFERENCED TIA STANDARD AND SUPPLIED BY OTHERS, UNO.
- PAUL J. FORD AND COMPANY HAS NOT DESIGNED OR DETAILED STANDARD PARTS AND ASSEMBLIES SUCH AS ANTENNA MOUNTS, WAVEGUIDE LADDERS, GUY CABLE HARDWARE, ETC. IT IS ASSUMED THAT THESE ITEMS CAN BE MORE COST EFFECTIVELY SUPPLIED BY OTHERS IN LIEU OF PRODUCING A CUSTOM DESIGN.
- THE CONTRACTOR IS RESPONSIBLE FOR LOCATING ANY UTILITIES THAT MAY BE ENCOUNTERED PRIOR TO EXCAVATION.
- ALL CONSTRUCTION MEANS AND METHODS, INCLUDING BUT NOT LIMITED TO, ERECTION PLANS, RIGGING PLANS, CLIMBING PLANS, AND RESCUE PLANS SHALL BE THE RESPONSIBILITY OF THE GENERAL CONTRACTOR RESPONSIBLE FOR THE EXECUTION OF THE WORK CONTAINED HEREIN AND SHALL MEET ANSI/ASSE A10.48 (LATEST EDITION); FEDERAL, STATE, AND LOCAL REGULATIONS; AND ANY APPLICABLE INDUSTRY CONSENSUS STANDARDS RELATED TO THE CONSTRUCTION ACTIVITIES BEING PERFORMED. ALL RIGGING PLANS SHALL ADHERE TO ANSI/ASSE A10.48 (LATEST EDITION).
- THE CONTRACTOR MUST BE EXPERIENCED IN THE PERFORMANCE OF WORK SIMILAR TO THAT DESCRIBED ON THESE DRAWINGS. BY ACCEPTANCE OF THIS PROJECT, THE CONTRACTOR IS ATTESTING THAT HE DOES HAVE SUFFICIENT EXPERIENCE AND ABILITY, THAT HE IS KNOWLEDGEABLE OF THE WORK TO BE PERFORMED AND THAT HE IS PROPERLY LICENSED TO DO THIS WORK IN THE JURISDICTION IN WHICH THE WORK IS TO BE PERFORMED.
- SPECIAL INSPECTIONS SHALL BE PERFORMED IN ACCORDANCE WITH THE LAST SHEET OF THESE DRAWINGS.
- SPECIAL INSPECTIONS ARE NOT REQUIRED FOR WORK PERFORMED ON THE PREMISES OF A FABRICATOR APPROVED IN ACCORDANCE WITH SECTION 1704.2.5.1 OF THE IBC.

STEEL NOTES:

- ALL STEEL SHALL CONFORM TO THE FOLLOWING:
 - PIPE LEGS: ASTM A500 GR C (60 KSI YIELD POINT MATERIAL)
 - ALL OTHER STEEL SHAPES AND PLATES: ASTM A572 GR 50 (60 KSI YIELD POINT MATERIAL)
 - STRUCTURAL BOLTS: ASTM A325 TYPE 1 WITH ASTM A563 GRADE DH NUTS
- ALL SNUG-TIGHTENED BOLTS SHALL BE PROVIDED WITH LOCKING HARDWARE. ALL PRETENSIONED BOLTS SHALL BE PROVIDED WITH WASHERS CONFORMING TO ASTM F436 TYPE 1.
- BOLTS SHALL BE GALVANIZED ACCORDING TO ASTM A153.
- ALL HOLES SHALL BE SIZED 1/16" LARGER THAN THE BOLT DIAMETER, UNO. SLOTTED OR OVERSIZED HOLES ARE NOT PERMITTED.
- WELDED CONNECTIONS SHALL CONFORM TO THE LATEST REVISED CODE OF THE AMERICAN WELDING SOCIETY AWS D1.1 USING E70XX ELECTRODES.
- ALL NEW STEEL SHALL BE HOT-DIP GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123.
- GALVANIZED SURFACES DAMAGED DURING TRANSPORTATION OR ERECTION AND ASSEMBLY AS WELL AS ANY ABRASIONS, CUTS, FIELD DRILLING, AND FIELD WELDING SHALL BE REPAIRED WITH A COLD GALVANIZING COMPOUND CONFORMING TO ASTM A780.

REV	DATE	DESCRIPTION
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BETHEL, AK
BETHEL, ALASKA
180' SELF SUPPORT TOWER



PAUL J. FORD & COMPANY
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MAGNUM TOWERS

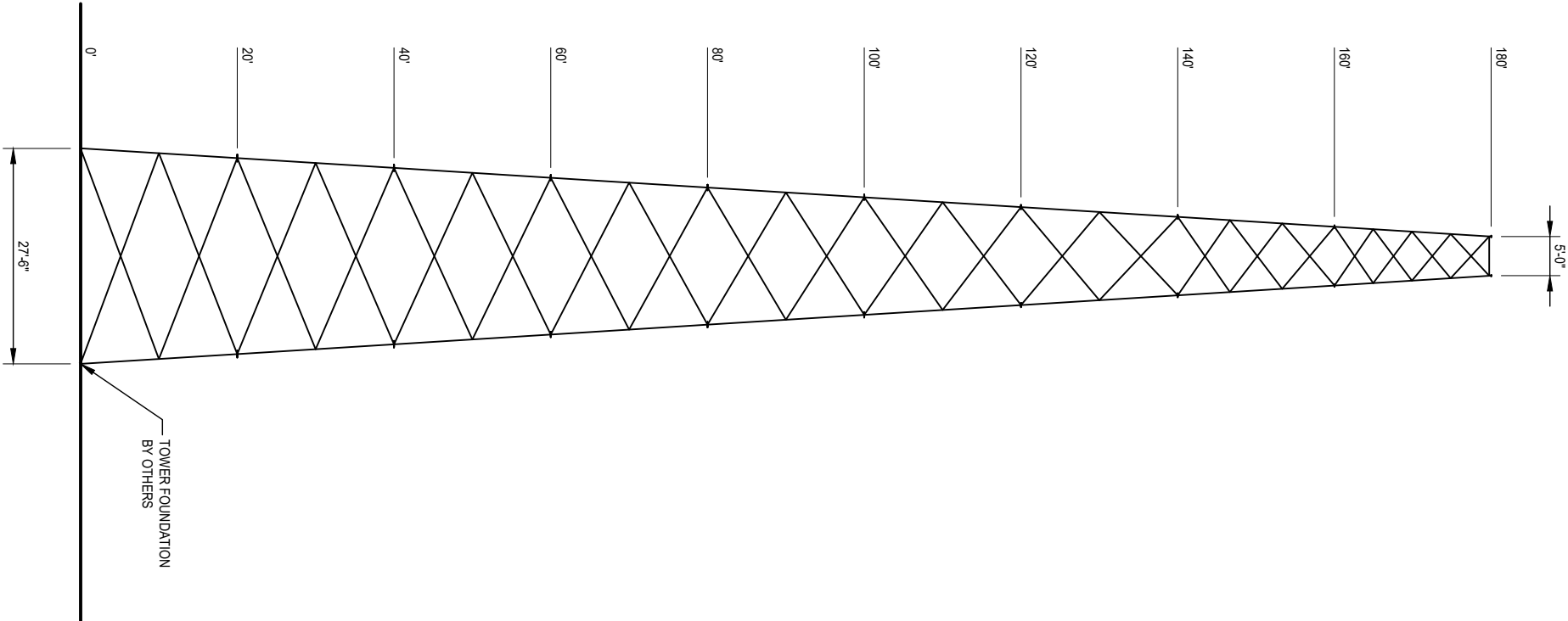
9370 ELDER CREEK ROAD SACRAMENTO, CA 95829
(916) 381-5053

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PROJECT No:	A65022-0025.002.8200
DRAWN BY:	TAN
DESIGNED BY:	JMF
CHECKED BY:	AKT
DATE:	5/1/2023

NOTES

N-1



TOWER ELEVATION

TOWER MATERIAL LIST				
ELEVATION	LEGS	DIAGONALS	HORIZONTALS	BAY SPACING
160' TO 180'	2.875" OD x 0.203" THK	L2 x 2 x 3/16	L2 x 2 x 3/16	4 BAYS @ 4'-1"
140' TO 160'	4.500" OD x 0.237" THK	L2 1/2 x 2 1/2 x 3/16	N/A	3 BAYS @ 6'-8"
120' TO 140'	6.625" OD x 0.280" THK	L3 x 3 x 3/16	N/A	2 BAYS @ 10'-0"
100' TO 120'	6.625" OD x 0.280" THK	L3 x 3 x 1/4	N/A	2 BAYS @ 10'-0"
80' TO 100'	8.625" OD x 0.322" THK	L3 1/2 x 3 1/2 x 1/4	N/A	2 BAYS @ 10'-0"
60' TO 80'	8.625" OD x 0.322" THK	L4 x 4 x 1/4	N/A	2 BAYS @ 10'-0"
40' TO 60'	8.625" OD x 0.322" THK	L4 x 4 x 1/4	N/A	2 BAYS @ 10'-0"
20' TO 40'	10.750" OD x 0.365" THK	L5 x 5 x 5/16	N/A	2 BAYS @ 10'-0"
0' TO 20'	10.750" OD x 0.365" THK	L5 x 5 x 5/16	N/A	2 BAYS @ 10'-0"

ANTENNA LIST			
ELEV	QTY	ANTENNA	COAX
176'	12	96" x 12" x 6" PANEL ANTENNA W/ MOUNT PIPE	(12) 1 5/8"
176'	12	20" x 15' x 10" RRU	-
176'	3	RAYCAP RCMDC-3315-PF-48	-
166'	12	96" x 12" x 6" PANEL ANTENNA W/ MOUNT PIPE	(12) 1 5/8"
166'	12	20" x 15' x 10" RRU	-
166'	3	RAYCAP RCMDC-3315-PF-48	-

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PAUL J. FORD & COMPANY
250 E Broad St, Ste 600 · Columbus, OH 43215
Phone 614.221.6679 www.pauljford.com

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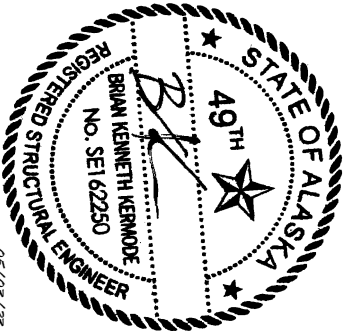
BETHEL, AK
BETHEL, ALASKA
180' SELF SUPPORT TOWER

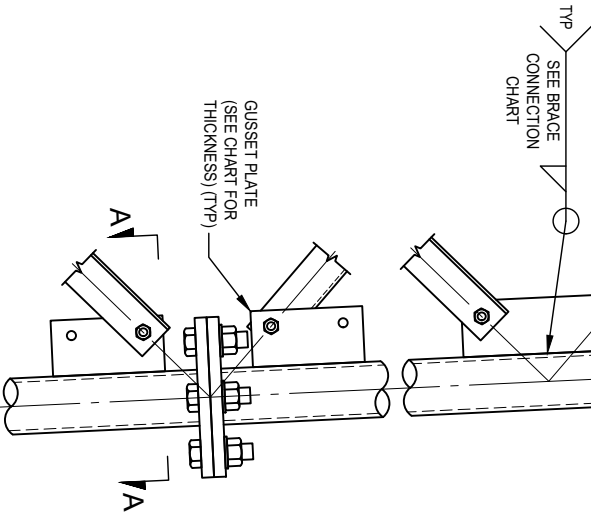
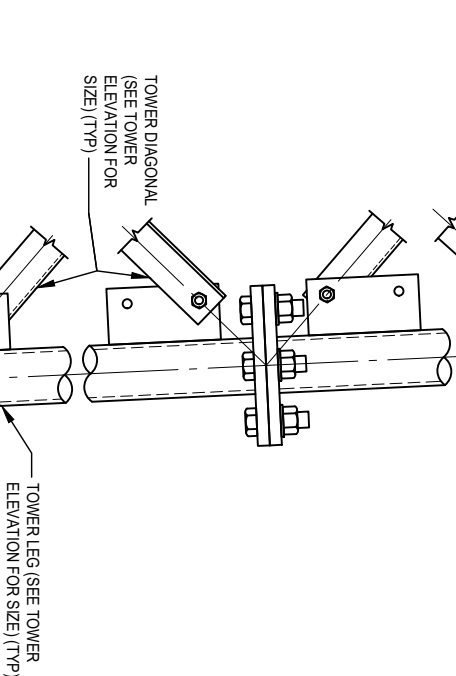
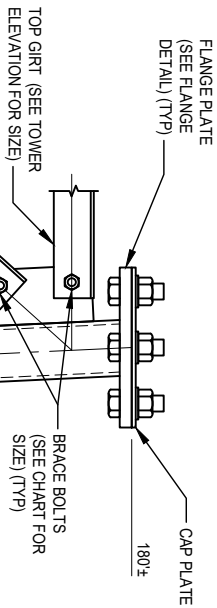
PROJECT No:	A65022-0025.002.8200
DRAWN BY:	TAN
DESIGNED BY:	JMF
CHECKED BY:	AKT
DATE:	5/1/2023

TOWER
ELEVATION

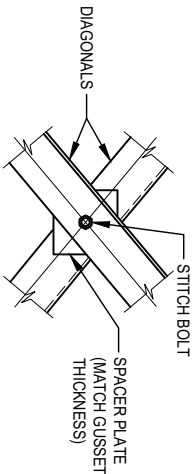
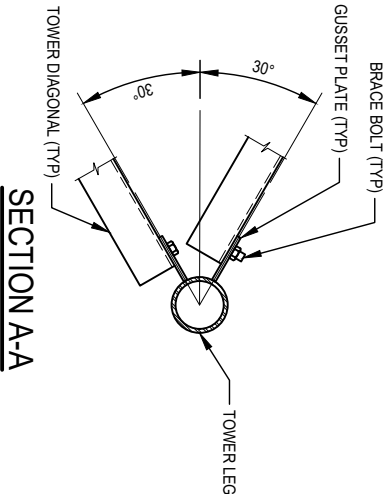
S-1

REV	DATE	DESCRIPTION
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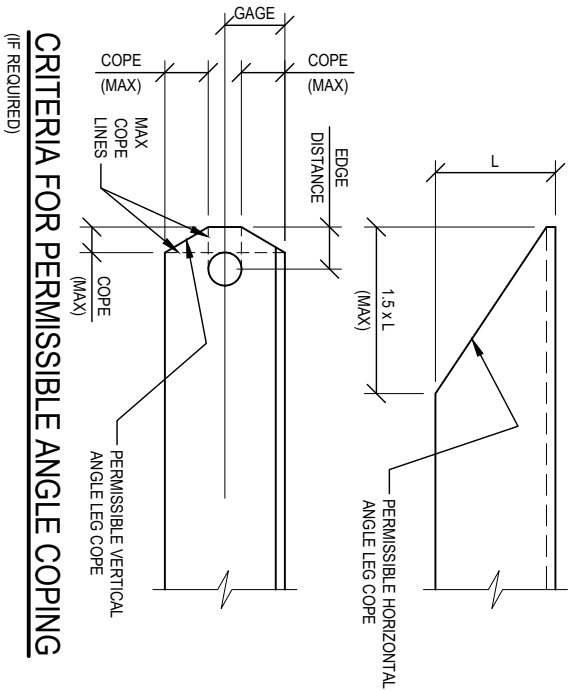


PARTIAL ELEVATION

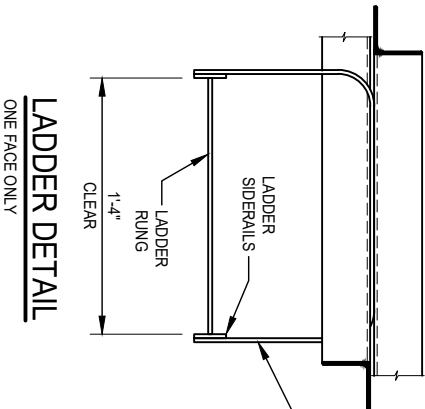
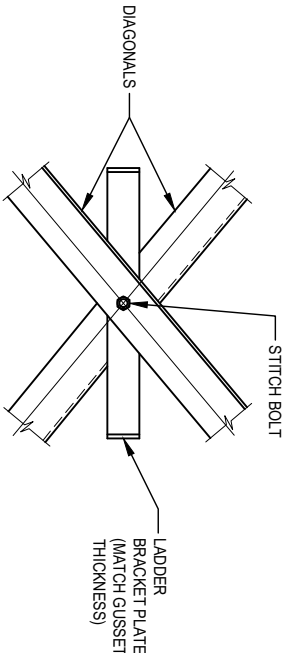


DIAGONAL CONNECTION
NON-LADDER FACES

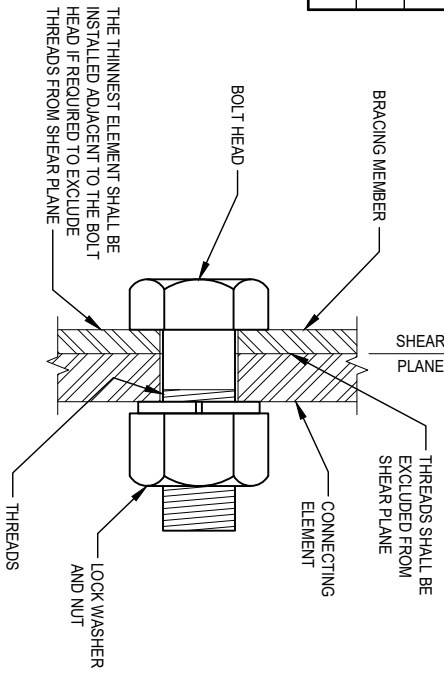
BRACE CONNECTION CHART					
ELEVATION	BRACE BOLTS	MEMBER EDGE DISTANCE	MEMBER GAGE	GUSSET THICKNESS	GUSSET WELD
160' TO 180'	(1) 5/8" $\emptyset$	1 1/4"	1 1/8"	3/8"	5/16"
140' TO 160'	(1) 5/8" $\emptyset$	1 1/4"	1 1/4"	3/8"	5/16"
120' TO 140'	(1) 3/4" $\emptyset$	1 1/2"	1 1/2"	3/8"	5/16"
100' TO 120'	(1) 3/4" $\emptyset$	1 1/2"	1 1/2"	3/8"	5/16"
80' TO 100'	(1) 3/4" $\emptyset$	1 1/2"	1 3/4"	3/8"	5/16"
60' TO 80'	(1) 3/4" $\emptyset$	1 1/2"	2"	3/8"	5/16"
40' TO 60'	(1) 3/4" $\emptyset$	1 1/2"	2"	3/8"	5/16"
20' TO 40'	(1) 7/8" $\emptyset$	1 3/4"	2 1/2"	1/2"	3/8"
0' TO 20'	(1) 7/8" $\emptyset$	1 3/4"	2 1/2"	1/2"	3/8"



CRITERIA FOR PERMISSIBLE ANGLE COPING
(IF REQUIRED)

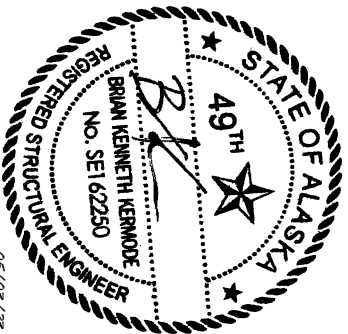


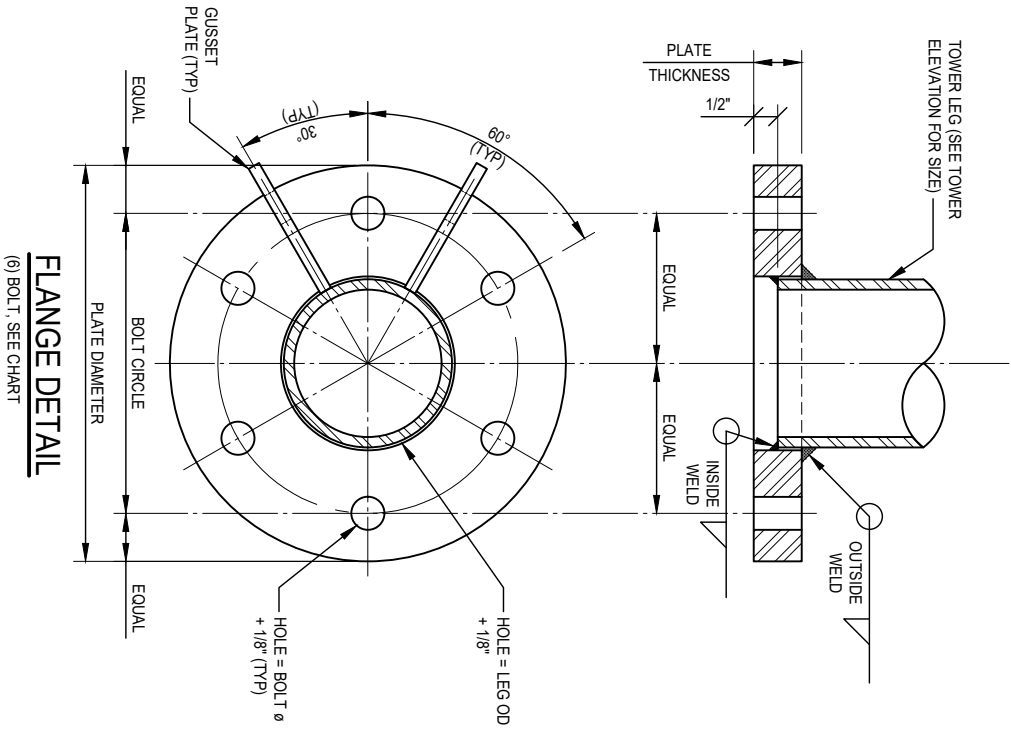
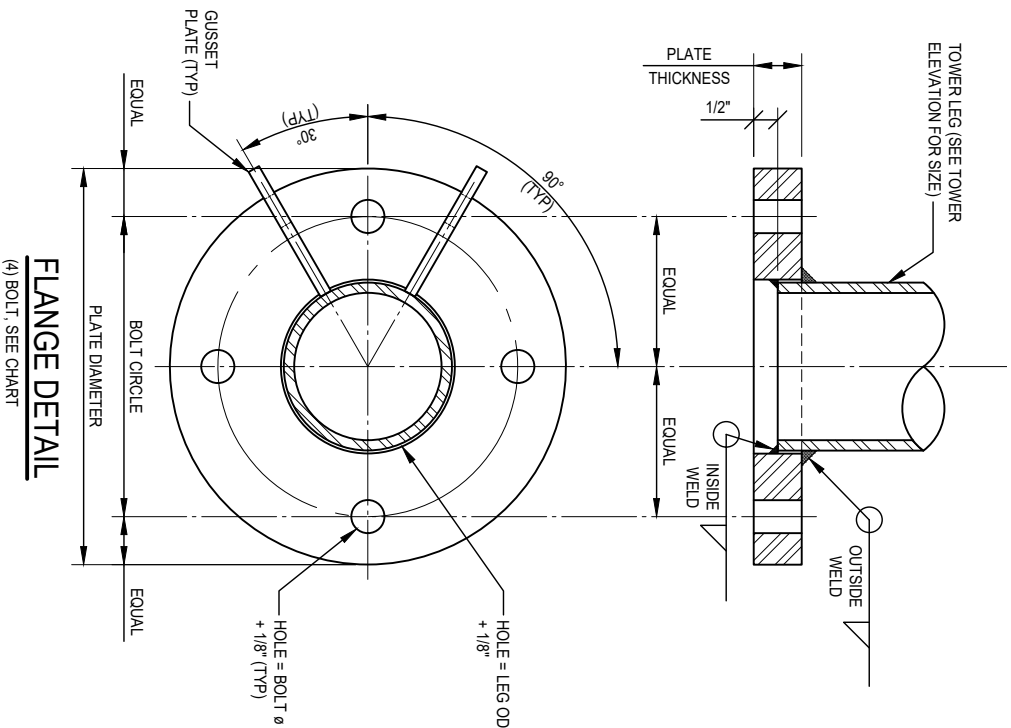
LADDER DETAIL
ONE FACE ONLY



X-CONDITION SINGLE SHEAR CONNECTION

ALL BRACE BOLTS SHALL MEET THE REQUIREMENTS OF THIS DETAIL. IF THE CONTRACTOR CANNOT ACHIEVE THE CONDITION REPRESENTED IN THIS DETAIL, PAUL J FORD AND COMPANY SHALL BE CONTACTED IMMEDIATELY TO EVALUATE THE STRUCTURAL SIGNIFICANCE OF THE DEVIATION.





FLANGE PLATE CHART				
ELEVATION	PLATE SIZE	BOLT CIRCLE	BOLT	OUTSIDE FILLET
180'	7/8" THK x 7 1/4"	5 1/4"	(4) 5/8"	1/4"
160'	1 1/4" THK x 9"	7"	(4) 5/8"	1/4"
140'	1 1/4" THK x 11 3/4"	9 1/2"	(4) 3/4"	1/4"
120'	1 1/4" THK x 13"	10"	(4) 1"	3/16"
100'	1 1/2" THK x 15"	12"	(4) 1"	3/16"
80'	1 1/4" THK x 15"	12"	(6) 1"	1/4"
60'	1 1/4" THK x 15"	12"	(6) 1"	3/16"
40'	1 3/4" THK x 17"	14"	(6) 1"	3/16"
20'	1 1/2" THK x 18 3/4"	15"	(6) 1 1/4"	1/4"
0'	1 1/2" THK x 19"	15 1/4"	(6) 1 1/4" *	1/2"

* ANCHOR RODS BY OTHERS

FLANGE DETAIL

(4) BOLT, SEE CHART

FLANGE DETAIL

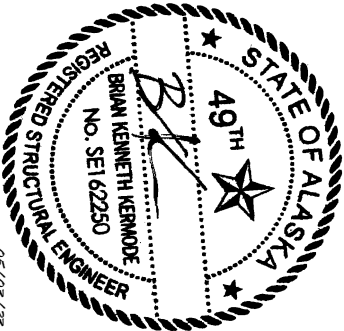
(6) BOLT, SEE CHART

BETHEL, AK
BETHEL, ALASKA
180' SELF SUPPORT TOWER

PROJECT NO:	A65022-0025.002.8200
DRAWN BY:	TAN
DESIGNED BY:	JMF
CHECKED BY:	AKT
DATE:	5/1/2023

TOWER FLANGE
DETAILS

S-3



05/03/23

PAUL J. FORD & COMPANY
250 E Broad St, Ste 600 · Columbus, OH 43215
Phone 614.221.6679 www.pauljford.com

MAGNUM TOWERS
9370 ELDER CREEK ROAD SACRAMENTO, CA 95829
(916) 381-5053

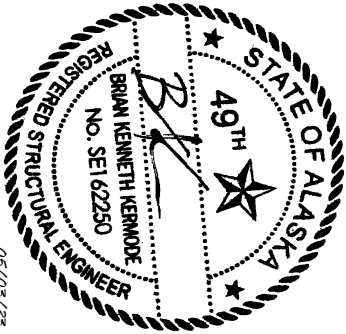
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WELDING INSPECTION - IBC 2021 1705.2.1		QC	QA	REFERENCE STANDARD		
INSPECTION TASKS PRIOR TO WELDING						
WELDER QUALIFICATION RECORDS AND CONTINUITY RECORDS	P	O	ASC 360, TABLE N5.4.1			
WELDING PROCEDURE SPECIFICATIONS (WPS) AVAILABLE	P	P				
MANUFACTURER CERTIFICATIONS FOR WELDING CONSUMABLES AVAILABLE	P	P				
MATERIAL IDENTIFICATION (TYPE/GRADE)	O	O				
WELDER IDENTIFICATION SYSTEM ¹	O	O				
FIT-UP OF GROOVE WELDS (INCLUDING JOINT GEOMETRY)			ASC 360, TABLE N5.4.1			
• JOINT PREPARATION						
• DIMENSIONS (ALIGNMENT, ROOT OPENING, ROOT FACE, BEVEL)		O				
• CLEANLINESS (CONDITION OF STEEL SURFACES)						
• TACKING (TACK WELD QUALITY AND LOCATION)						
• BACKING TYPE AND FIT (IF APPLICABLE)			ASC 360, TABLE N5.4.1			
FIT-UP OF CAP GROOVE WELDS OF HHS T, Y, AND K JOINTS WITHOUT BACKING (INCLUDING JOINT GEOMETRY)						
• JOINT PREPARATIONS		P				
• DIMENSIONS (ALIGNMENT, ROOT OPENING, ROOT FACE, BEVEL)						
• CLEANLINESS (CONDITION OF STEEL SURFACES)						
• TACKING (TACK WELD QUALITY AND LOCATION)			ASC 360, TABLE N5.4.1			
CONFIGURATION AND FINISH OF ACCESS HOLES		O				
FIT-UP OF FILLET WELDS						
• DIMENSIONS (ALIGNMENT, GAPS AT ROOT)						
• CLEANLINESS (CONDITION OF STEEL SURFACES)		O				
• TACKING (TACK WELD QUALITY AND LOCATION)			ASC 360, TABLE N5.4.1			
CHECK WELDING EQUIPMENT		O				
-						
INSPECTION TASKS DURING WELDING						
CONTROL AND HANDLING OF WELDING CONSUMABLES					ASC 360, TABLE N5.4.2	
• PACKAGING	O	O				
• EXPOSURE CONTROL						
NO WELDING OVER CRACKED TACK WELDS	O	O				
ENVIRONMENTAL CONDITIONS						
• WIND SPEED WITHIN LIMITS	O	O	ASC 360, TABLE N5.4.2			
• PRECIPITATION AND TEMPERATURE						
WPS FOLLOWED						
• SETTINGS ON WELDING EQUIPMENT						
• TRAVEL SPEED						
• SELECTED WELDING MATERIALS	O	O	ASC 360, TABLE N5.4.2			
• SHIELDING GAS TYPE/FLOW RATE						
• PREHEAT APPLIED						
• INTERPASS TEMPERATURE MAINTAINED (MIN/MAX)						
• PROPER POSITION (F, Y, H, OH)						
WELDING TECHNIQUES			ASC 360, TABLE N5.4.2			
• INTERPASS AND FINAL CLEANING	O	O				
• EACH PASS WITHIN PROFILE LIMITATIONS						
• EACH PASS MEETS QUALITY REQUIREMENTS						
PLACEMENT AND INSTALLATION OF STEEL HEADED STUD ANCHORS	P	P				
INSPECTION TASKS AFTER WELDING						
WELDS CLEANED	O	O	ASC 360, TABLE N5.4.3			
SIZE, LENGTH AND LOCATION OF WELDS	P	P				
WELDS MEET VISUAL ACCEPTANCE CRITERIA						
• CRACK PROHIBITION						
• WELD/BASE-METAL FUSION						
• CRATER CROSS SECTION	P	P	ASC 360, TABLE N5.4.3			
• WELD PROFILES						
• WELD SIZE						
• UNDERCUT						
• POROSITY						
ARC STRIKES	P	P	ASC 360, TABLE N5.4.3			
K-AREA ²	P	P				
WELD ACCESS HOLES IN ROLLED HEAVY SHAPES AND BUILT-UP HEAVY SHAPES ³	P	P				
BACKING REMOVED AND WELD TABS REMOVED (IF REQUIRED)	P	P				
REPAIR ACTIVITIES	P	P				
DOCUMENT ACCEPTANCE OR REJECTION OF WELDED JOINT OR MEMBER	P	P	ASC 360, TABLE N5.4.3			
NO PROHIBITED WELDS HAVE BEEN ADDED WITHOUT THE APPROVAL OF THE EOR	P	P				
THE FABRICATOR OR ERECTOR, AS APPLICABLE, SHALL MAINTAIN A SYSTEM BY WHICH A WELDER WHO HAS WELDED A JOINT OR MEMBER CAN BE IDENTIFIED. STAMPS, IF USED, SHALL BE THE LOW-STRESS TYPE.						
WHEN WELDING OF DOUBLER PLATES, CONTINUITY PLATES OR STIFFENERS HAS BEEN PERFORMED IN THE K-AREA, VISUALLY INSPECT THE WEB K-AREA FOR CRACKS WITHIN 3 IN. (75 mm) OF THE WELD.						
AFTER ROLLED HEAVY SHAPES (SEE SECTION A3.1c) AND BUILT-UP HEAVY SHAPES (SEE SECTION A3.1d) ARE WELDED, VISUALLY INSPECT THE WELD ACCESS HOLES FOR CRACKS.						

BOLTING INSPECTION - IBC 2021 1705.2.1		QC	QA	REFERENCE STANDARD
INSPECTION TASKS PRIOR TO BOLTING				
MANUFACTURER'S CERTIFICATIONS AVAILABLE FOR FASTENER MATERIALS	O	P	ASC 360, TABLE N5.6-1	
FASTENERS MARKED IN ACCORDANCE WITH ASTM REQUIREMENTS	O	O		
CORRECT FASTENERS SELECTED FOR THE JOINT DETAIL (GRADE, TYPE, BOLT LENGTH IF THREADS ARE TO BE EXCLUDED FROM SHEAR PLANE)	O	O		
CORRECT BOLTING PROCEDURES SELECTED FOR JOINT DETAIL	O	O		
CONNECTING ELEMENTS, INCLUDING THE APPROPRIATE FAYING SURFACE CONDITION AND HOLE PREPARATION, IF SPECIFIED, MEET APPLICABLE REQUIREMENTS	O	O		
PRE-INSTALLATION VERIFICATION TESTING BY INSTALLATION PERSONNEL OBSERVED AND DOCUMENTED FOR FASTENER ASSEMBLIES AND METHODS USED	P	O	ASC 360, TABLE N5.6-1	
PROTECTED STORAGE PROVIDED FOR BOLTS, NUTS, WASHERS AND OTHER FASTENER COMPONENTS	O	O		
INSPECTION TASKS DURING BOLTING				
FASTENER ASSEMBLIES PLACED IN ALL HOLES AND WASHERS AND NUTS ARE POSITIONED AS REQUIRED	O	O	ASC 360, TABLE N5.6-2	
JOINT BROUGHT TO THE SNUG-TIGHT CONDITION PRIOR TO THE PRETENSIONING OPERATION	O	O		
FASTENER COMPONENT NOT TURNED BY THE WRENCH PREVENTED FROM ROTATING	O	O		
FASTENERS ARE PRETENSIONED IN ACCORDANCE WITH THE RGSC SPECIFICATION, PROGRESSING SYSTEMATICALLY FROM THE MOST RIGID POINT TOWARD THE FREE EDGES	O	O		
INSPECTION TASKS AFTER BOLTING				
DOCUMENT ACCEPTANCE OR REJECTION OF BOLTED CONNECTIONS	P	P	ASC 360, TABLE N5.6-3	

QC - QUALITY CONTROL AS SPECIFIED IN THIS TABLE SHALL BE PROVIDED BY THE FABRICATOR AND ERECTOR
QA - QUALITY ASSURANCE AS SPECIFIED IN THIS TABLE SHALL BE PROVIDED BY THE AUTHORITY HAVING JURISDICTION, OWNER, OR ENGINEER OF RECORD
O - OBSERVE THESE ITEMS ON A RANDOM BASIS. OPERATIONS NEED NOT BE DELAYED PENDING THESE INSPECTIONS
P - PERFORM THESE TASKS FOR EACH WELDED JOINT OR MEMBER, OR BOLTED CONNECTION

REV	DATE	DESCRIPTION
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S-4

SPECIAL INSPECTION

PROJECT NO:	A65022-0025.002.8200
DRAWN BY:	TAN
DESIGNED BY:	JMF
CHECKED BY:	AKT
DATE:	5/1/2023

BETHEL, AK
BETHEL, ALASKA
180' SELF SUPPORT TOWER

PAUL J. FORD & COMPANY
250 E Broad St, Ste 600 · Columbus, OH 43215
Phone 614.221.6679 www.pauljford.com

MAGNUM TOWERS
9370 ELDER CREEK ROAD SACRAMENTO, CA 95829
(916) 381-5053

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DESIGN SUBMITTAL

Proposed 180-ft Self Support Tower

PJF Project No.: A65022-0025.002.8200

Site Name: Bethel, AK
Location: Bethel, AK
Manufacturer: Magnum Towers, Inc.
Year of Mfr: 2023
Lat/Long: 60° 47' 30.3" N
161° 46' 30.3" W

Prepared For:



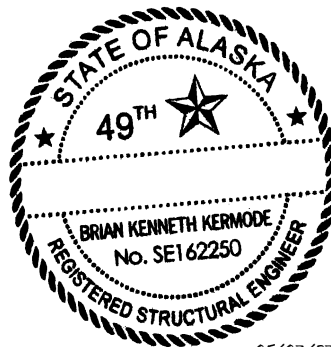
Magnum Towers

9370 Elder Creek Road
Sacramento, CA
Attn: Jeff Styler

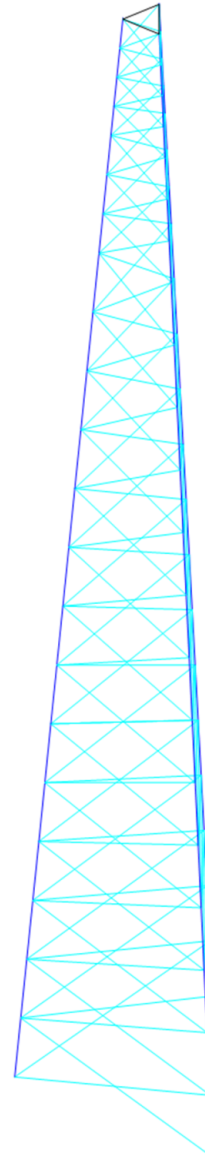
May 1, 2023

Designed By:
John Fawcett
Structural Designer
jfawcett@pauljford.com

AKT

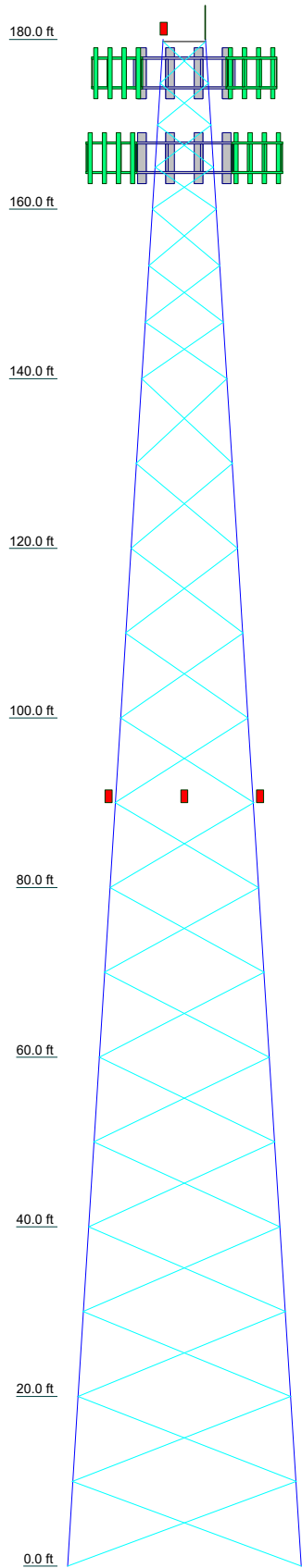


05/03/23



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

Section	T1	T2	T3	T4	T5	T6	T7	T8	T9	
Legs	A	Pipe 4.5" x 0.237" (4 STD)	Pipe 6.625" x 0.280" (6 STD)	Pipe 6.625" x 0.322" (8 STD)	Pipe 8.625" x 0.365" (10 STD)	Pipe 10.75" x 0.365" (10 STD)				
Leg Grade										
Diagonals										
Diagonal Grade										
Top Girts										
Face Width (ft)										
# Panels @ (ft)										
Weight (lb)										



MARK	SIZE	MARK	SIZE
A	Pipe 2.875" x 0.203" (2.5 STD)		

GRADE	Fy	Fu	GRADE	Fy	Fu
A500-50	50 ksi	62 ksi	A572-50	50 ksi	65 ksi

TOWER DESIGN NOTES

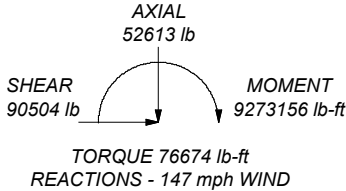
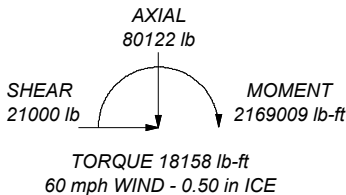
1. Tower is located in Bethel County, Alaska.
2. Tower designed for Exposure C to the TIA-222-H Standard.
3. Tower designed for a 147 mph basic wind in accordance with the TIA-222-H Standard.
4. Tower is also designed for a 60 mph basic wind with 0.50 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Risk Category II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TOWER RATING: 92.5%

ALL REACTIONS
ARE FACTORED

MAX. CORNER REACTIONS AT BASE:

DOWN: 406890 lb
SHEAR: 55533 lb

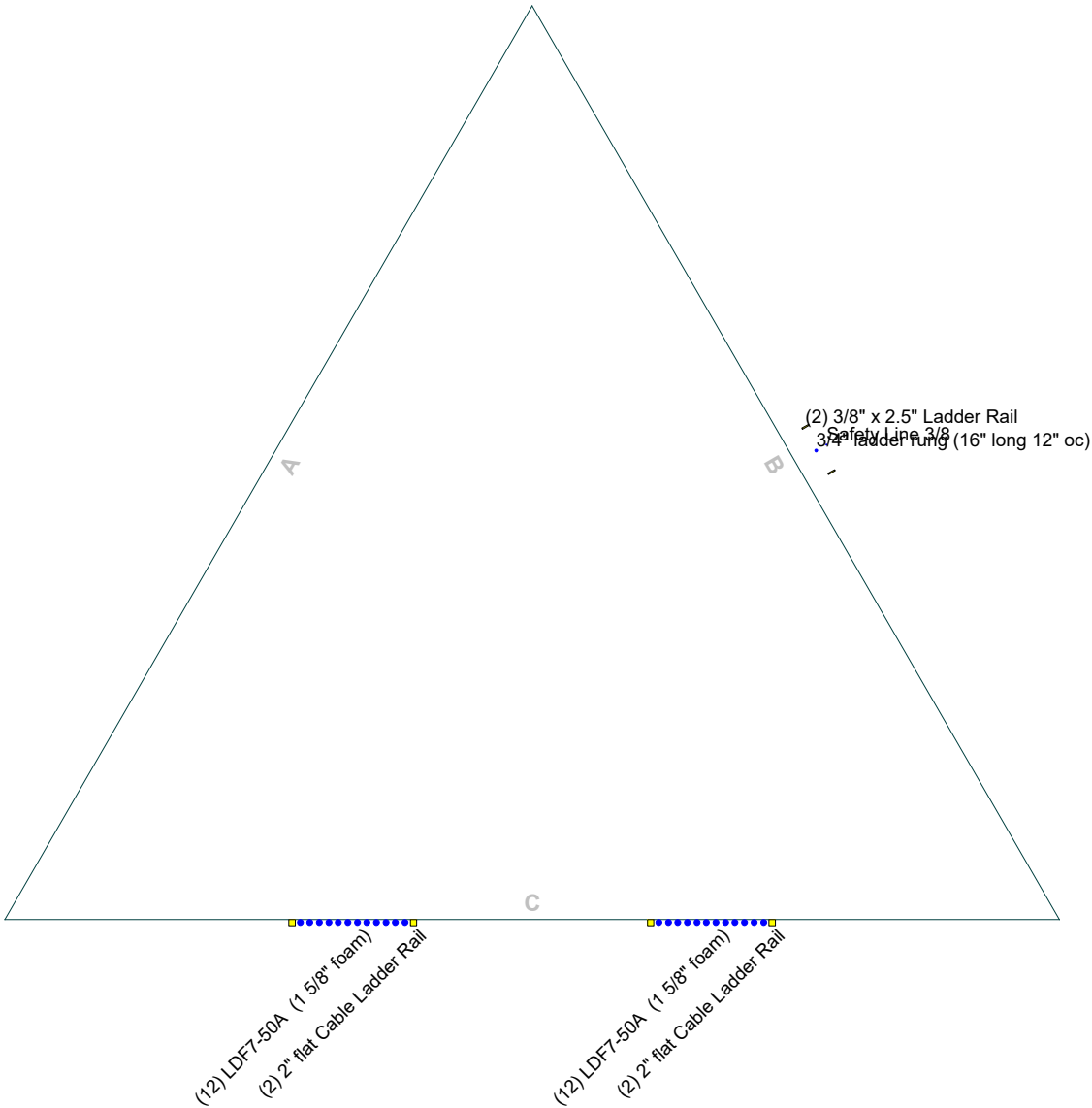
UPLIFT: -360567 lb
SHEAR: 49324 lb



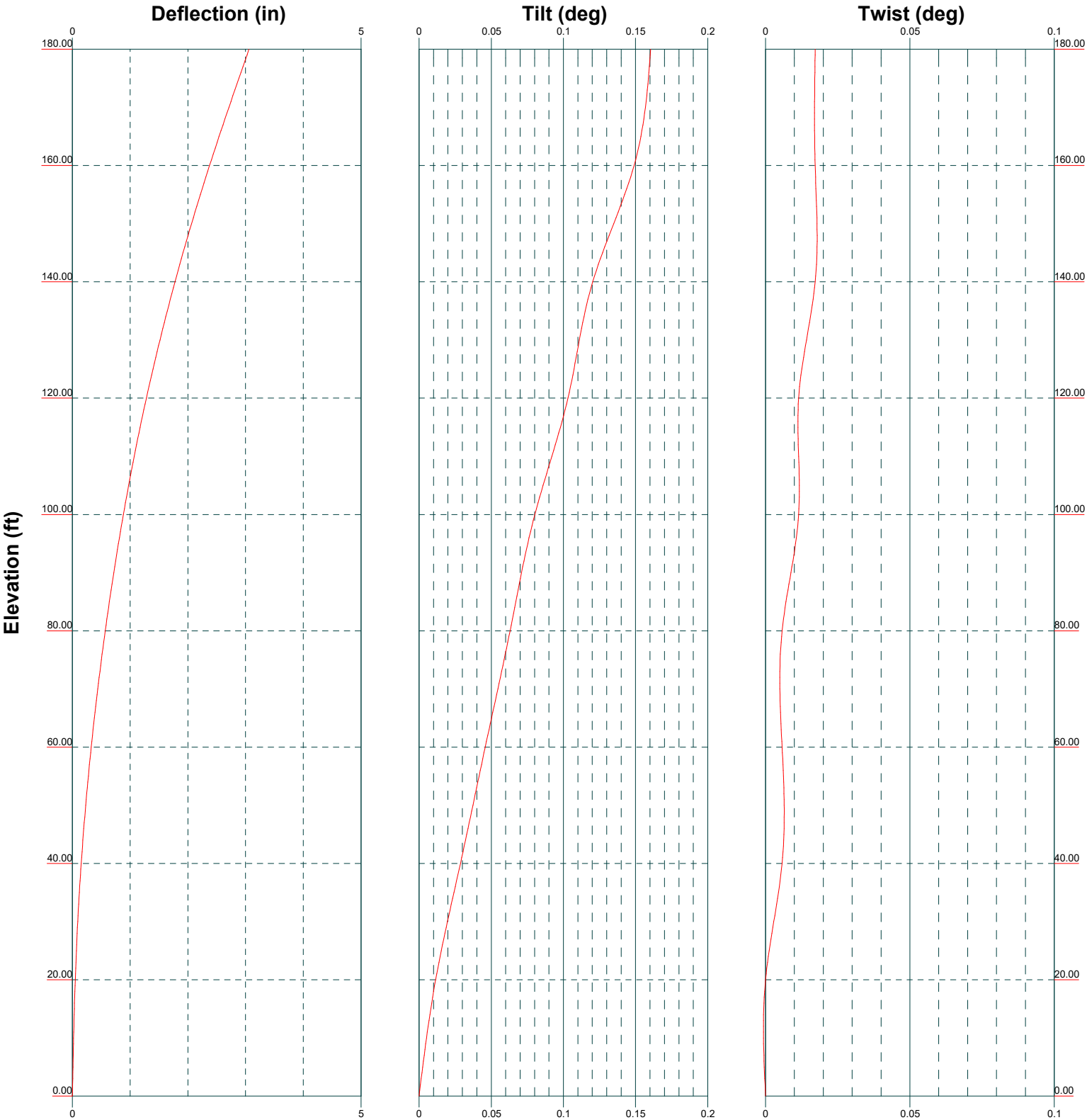
 Paul J. Ford and Company 250 E. Broad St., Ste 600 Columbus, OH 43215 Phone: 614-221-6679 FAX:	Job: 180' SST - Bethel, AK		
	Project: 65022-0025.002.8200		
	Client: Magnum Tower	Drawn by: JMF	App'd:
	Code: TIA-222-H	Date: 04/27/23	Scale: NTS
	Path:		Dwg No. E-1

Feed Line Plan

Round Flat App In Face App Out Face



 Paul J. Ford and Company 250 E. Broad St., Ste 600 Columbus, OH 43215 Phone: 614-221-6679 FAX:	Job: 180' SST - Bethel, AK		
	Project: 65022-0025.002.8200		
	Client: Magnum Tower	Drawn by: JMF	App'd:
	Code: TIA-222-H	Date: 04/27/23	Scale: NTS
	Path: G:\TCW\ER\180 - Magnum Towers\2022\65022-0025 - Bethel, AK\65022-0025.002.8200 - Final\TIA\65022-0025.002.8200.dwg		



	Job	180' SST - Bethel, AK	Page	1 of 15
	Project	65022-0025.002.8200	Date	14:40:20 04/27/23
	Client	Magnum Tower	Designed by	JMF

Tower Input Data

The main tower is a 3x free standing tower with an overall height of 180.00 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 5.00 ft at the top and 27.50 ft at the base.

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

The following design criteria apply:

Tower is located in Bethel County, Alaska.

Tower base elevation above sea level: 28.00 ft.

Basic wind speed of 147 mph.

Risk Category II.

Exposure Category C.

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

Topographic Category: 1.

Crest Height: 0.00 ft.

Nominal ice thickness of 0.50 in.

Ice thickness is considered to increase with height.

Ice density of 56 pcf.

A wind speed of 60 mph is used in combination with ice.

Deflections calculated using a wind speed of 60 mph.

A non-linear (P-delta) analysis was used.

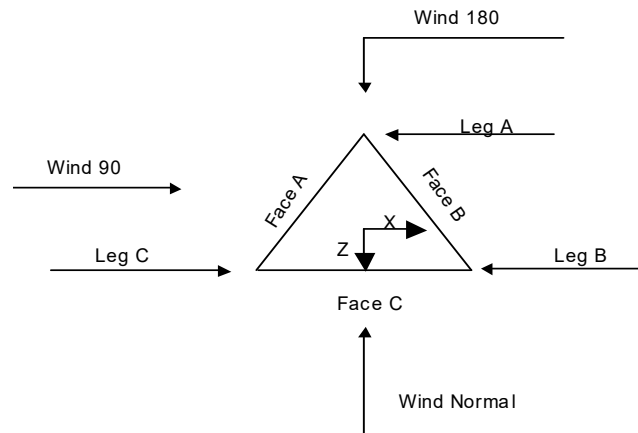
Pressures are calculated at each section.

Stress ratio used in tower member design is 1.

Options

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

	Job	180' SST - Bethel, AK	Page 2 of 15
	Project	65022-0025.002.8200	Date 14:40:20 04/27/23
	Client	Magnum Tower	Designed by JMF



Triangular Tower

Tower Section Geometry

Tower Section	Tower Elevation	Assembly Database	Description	Section Width	Number of Sections	Section Length
	<i>ft</i>			<i>ft</i>		<i>ft</i>
T1	180.00-160.00			5.00	1	20.00
T2	160.00-140.00			7.50	1	20.00
T3	140.00-120.00			10.00	1	20.00
T4	120.00-100.00			12.50	1	20.00
T5	100.00-80.00			15.00	1	20.00
T6	80.00-60.00			17.50	1	20.00
T7	60.00-40.00			20.00	1	20.00
T8	40.00-20.00			22.50	1	20.00
T9	20.00-0.00			25.00	1	20.00

Tower Section Geometry (cont'd)

Tower Section	Tower Elevation	Diagonal Spacing	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset	Bottom Girt Offset
	<i>ft</i>	<i>ft</i>				<i>in</i>	<i>in</i>
T1	180.00-160.00	4.94	X Brace	No	No	3.00	0.00
T2	160.00-140.00	6.67	X Brace	No	No	0.00	0.00
T3	140.00-120.00	10.00	X Brace	No	No	0.00	0.00
T4	120.00-100.00	10.00	X Brace	No	No	0.00	0.00
T5	100.00-80.00	10.00	X Brace	No	No	0.00	0.00
T6	80.00-60.00	10.00	X Brace	No	No	0.00	0.00
T7	60.00-40.00	10.00	X Brace	No	No	0.00	0.00
T8	40.00-20.00	10.00	X Brace	No	No	0.00	0.00
T9	20.00-0.00	10.00	X Brace	No	No	0.00	0.00

	Job	180' SST - Bethel, AK	Page	3 of 15
	Project	65022-0025.002.8200	Date	14:40:20 04/27/23
	Client	Magnum Tower	Designed by	JMF

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 180.00-160.00	Pipe	Pipe 2.875" x 0.203" (2.5 STD)	A500-50 (50 ksi)	Equal Angle	L 2 x 2 x 3/16	A572-50 (50 ksi)
T2 160.00-140.00	Pipe	Pipe 4.5" x 0.237" (4 STD)	A500-50 (50 ksi)	Equal Angle	L 2.5 x 2.5 x 3/16	A572-50 (50 ksi)
T3 140.00-120.00	Pipe	Pipe 6.625" x 0.280" (6 STD)	A500-50 (50 ksi)	Equal Angle	L 3 x 3 x 3/16	A572-50 (50 ksi)
T4 120.00-100.00	Pipe	Pipe 6.625" x 0.280" (6 STD)	A500-50 (50 ksi)	Equal Angle	L 3 x 3 x 1/4	A572-50 (50 ksi)
T5 100.00-80.00	Pipe	Pipe 8.625" x 0.322" (8 STD)	A500-50 (50 ksi)	Equal Angle	L 3.5 x 3.5 x 1/4	A572-50 (50 ksi)
T6 80.00-60.00	Pipe	Pipe 8.625" x 0.322" (8 STD)	A500-50 (50 ksi)	Equal Angle	L 4 x 4 x 1/4	A572-50 (50 ksi)
T7 60.00-40.00	Pipe	Pipe 8.625" x 0.322" (8 STD)	A500-50 (50 ksi)	Equal Angle	L 4 x 4 x 1/4	A572-50 (50 ksi)
T8 40.00-20.00	Pipe	Pipe 10.75" x 0.365" (10 STD)	A500-50 (50 ksi)	Equal Angle	L 5 x 5 x 5/16	A572-50 (50 ksi)
T9 20.00-0.00	Pipe	Pipe 10.75" x 0.365" (10 STD)	A500-50 (50 ksi)	Equal Angle	L 5 x 5 x 5/16	A572-50 (50 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 180.00-160.00	Equal Angle	L 2 x 2 x 3/16	A572-50 (50 ksi)	Solid Round		A36 (36 ksi)

Tower Section Geometry (cont'd)

<i>Tower Elevation ft</i>	<i>Gusset Area (per face) ft²</i>	<i>Gusset Thickness in</i>	<i>Gusset Grade</i>	<i>Adjust. Factor A_f</i>	<i>Adjust. Factor A_r</i>	<i>Weight Mult.</i>	<i>Double Angle Stitch Bolt Spacing Diagonals in</i>	<i>Double Angle Stitch Bolt Spacing Horizontals in</i>	<i>Double Angle Stitch Bolt Spacing Redundants in</i>
T1 180.00-160.00	0.00	0.38	A572-50 (50 ksi)	1.03	1	1.1	0.00	0.00	36.00
T2 160.00-140.00	0.00	0.38	A572-50 (50 ksi)	1.03	1	1.1	0.00	0.00	36.00
T3 140.00-120.00	0.00	0.38	A572-50 (50 ksi)	1.03	1	1.1	0.00	0.00	36.00
T4 120.00-100.00	0.00	0.38	A572-50 (50 ksi)	1.03	1	1.1	0.00	0.00	36.00
T5 100.00-80.00	0.00	0.38	A572-50 (50 ksi)	1.03	1	1.1	0.00	0.00	36.00
T6 80.00-60.00	0.00	0.38	A572-50 (50 ksi)	1.03	1	1.1	0.00	0.00	36.00
T7 60.00-40.00	0.00	0.38	A572-50 (50 ksi)	1.03	1	1.1	0.00	0.00	36.00
T8 40.00-20.00	0.00	0.50	A572-50 (50 ksi)	1.03	1	1.1	0.00	0.00	36.00
T9 20.00-0.00	0.00	0.50	A572-50 (50 ksi)	1.03	1	1.1	0.00	0.00	36.00

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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	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75
180.00-160.00														
T2	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75
160.00-140.00														
T3	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75
140.00-120.00														
T4	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75
120.00-100.00														
T5	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75
100.00-80.00														
T6 80.00-60.00	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75
T7 60.00-40.00	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75
T8 40.00-20.00	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75
T9 20.00-0.00	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75

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	Flange	0.63	4	0.63	1	0.63	1	0.00	0	0.38	0	0.00	0	0.38	0
180.00-160.00		A325N		A325X		A325X		A325N		A325N		A325N		A325N	
T2	Flange	0.75	4	0.63	1	0.00	0	0.00	0	0.50	0	0.00	0	0.50	0
160.00-140.00		A325N		A325X		A325N		A325N		A325N		A325N		A325N	
T3	Flange	1.00	4	0.75	1	0.00	0	0.00	0	0.50	0	0.00	0	0.50	0
140.00-120.00		A325N		A325X		A325N		A325N		A325N		A325N		A325N	
T4	Flange	1.00	4	0.75	1	0.00	0	0.00	0	0.50	0	0.00	0	0.50	0
120.00-100.00		A325N		A325X		A325N		A325N		A325N		A325N		A325N	
T5	Flange	1.00	6	0.75	1	0.00	0	0.00	0	0.50	0	0.00	0	0.50	0
100.00-80.00		A325N		A325X		A325N		A325N		A325N		A325N		A325N	
T6 80.00-60.00	Flange	1.00	6	0.75	1	0.00	0	0.00	0	0.50	0	0.00	0	0.50	0
		A325N		A325X		A325N		A325N		A325N		A325N		A325N	
T7 60.00-40.00	Flange	1.00	6	0.75	1	0.00	0	0.00	0	0.50	0	0.00	0	0.50	0
		A325N		A325X		A325N		A325N		A325N		A325N		A325N	
T8 40.00-20.00	Flange	1.25	6	0.88	1	0.00	0	0.00	0	0.50	0	0.00	0	0.50	0
		A325N		A325X		A325N		A325N		A325N		A325N		A325N	
T9 20.00-0.00	Flange	1.25	6	0.88	1	0.00	0	0.00	0	0.50	0	0.00	0	0.50	0
		A325N		A325X		A325N		A325N		A325N		A325N		A325N	

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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	B	No	No	Ar (CaAa)	180.00 - 0.00	11.00	0	1	1	0.38	0.38		0.22
3/8" x 2.5"	B	No	No	Af (CaAa)	180.00 - 0.00	7.00	0	2	2	16.00 0.38	0.38		3.19
Ladder Rail 3/4" ladder rung (16" long 12" oc)	B	No	No	Ar (CaAa)	180.00 - 0.00	7.00	0	1	1	1.00	1.00		2.00
LDF7-50A (1 5/8" foam)	C	No	No	Ar (CaAa)	176.00 - 0.00	0.00	-0.17	12	12	1.00 1.98	1.98		0.92
2" flat Cable Ladder Rail	C	No	No	Af (CaAa)	176.00 - 0.00	0.00	-0.17	2	2	36.00 2.00	2.00		2.12
LDF7-50A (1 5/8" foam)	C	No	No	Ar (CaAa)	166.00 - 0.00	0.00	0.17	12	12	1.00 1.98	1.98		0.92
2" flat Cable Ladder Rail	C	No	No	Af (CaAa)	166.00 - 0.00	0.00	0.17	2	2	36.00 2.00	2.00		2.12

Discrete Tower Loads

<i>Description</i>	<i>Face or Leg</i>	<i>Offset Type</i>	<i>Offsets: Horz Lateral Vert ft ft ft</i>	<i>Azimuth Adjustment °</i>	<i>Placement ft</i>		<i>C_AA_A Front ft²</i>	<i>C_AA_A Side ft²</i>	<i>Weight lb</i>
Lightning Rod (5/8" x 4')	B	From Leg	0.00 0 2	0.000	180.00	No Ice 1/2" Ice	0.25 0.66	0.25 0.66	4 7
Beacon (FAA L-864)	C	From Leg	0.00 0 1	0.000	180.00	No Ice 1/2" Ice	1.20 2.20	1.20 2.20	46 83
Sidelight (FAA L-810)	A	From Leg	1.00 0 0	0.000	90.00	No Ice 1/2" Ice	0.20 0.40	0.20 0.40	3 6
Sidelight (FAA L-810)	B	From Leg	1.00 0 0	0.000	90.00	No Ice 1/2" Ice	0.20 0.40	0.20 0.40	3 6
Sidelight (FAA L-810)	C	From Leg	1.00 0 0	0.000	90.00	No Ice 1/2" Ice	0.20 0.40	0.20 0.40	3 6
(4) 96" x 12" x 6" Panel w/Mount Pipe	A	From Leg	4.00 0 0	0.000	176.00	No Ice 1/2" Ice	11.70 12.42	8.94 10.45	93 179
(4) 96" x 12" x 6" Panel w/Mount Pipe	B	From Leg	4.00 0 0	0.000	176.00	No Ice 1/2" Ice	11.70 12.42	8.94 10.45	93 179
(4) 96" x 12" x 6" Panel w/Mount Pipe	C	From Leg	4.00 0 0	0.000	176.00	No Ice 1/2" Ice	11.70 12.42	8.94 10.45	93 179
(4) 20" x 15" x 10" RRU	A	From Leg	4.00 0 0	0.000	176.00	No Ice 1/2" Ice	2.50 2.70	1.67 1.84	50 73
(4) 20" x 15" x 10" RRU	B	From Leg	4.00 0 0	0.000	176.00	No Ice 1/2" Ice	2.50 2.70	1.67 1.84	50 73

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<i>Description</i>	<i>Face or Leg</i>	<i>Offset Type</i>	<i>Offsets: Horz Lateral Vert ft ft ft</i>	<i>Azimuth Adjustment °</i>	<i>Placement ft</i>	<i>C_{AA} Front ft²</i>	<i>C_{AA} Side ft²</i>	<i>Weight lb</i>	
(4) 20" x 15" x 10" RRU	C	From Leg	4.00 0 0	0.000	176.00	No Ice 1/2" Ice	2.50 2.70	1.67 1.84	50 73
RCMDC-3315-PF-48	A	From Leg	4.00 0 0	0.000	176.00	No Ice 1/2" Ice	3.36 3.60	2.19 2.39	32 61
RCMDC-3315-PF-48	B	From Leg	4.00 0 0	0.000	176.00	No Ice 1/2" Ice	3.36 3.60	2.19 2.39	32 61
RCMDC-3315-PF-48	C	From Leg	4.00 0 0	0.000	176.00	No Ice 1/2" Ice	3.36 3.60	2.19 2.39	32 61
Generic Heavy Sector Frame	A	From Leg	2.00 0 0	0.000	176.00	No Ice 1/2" Ice	25.00 30.00	15.00 20.00	500 800
Generic Heavy Sector Frame	B	From Leg	2.00 0 0	0.000	176.00	No Ice 1/2" Ice	25.00 30.00	15.00 20.00	500 800
Generic Heavy Sector Frame	C	From Leg	2.00 0 0	0.000	176.00	No Ice 1/2" Ice	25.00 30.00	15.00 20.00	500 800
(4) 96" x 12" x 6" Panel w/Mount Pipe	A	From Leg	4.00 0 0	0.000	166.00	No Ice 1/2" Ice	11.70 12.42	8.94 10.45	93 179
(4) 96" x 12" x 6" Panel w/Mount Pipe	B	From Leg	4.00 0 0	0.000	166.00	No Ice 1/2" Ice	11.70 12.42	8.94 10.45	93 179
(4) 96" x 12" x 6" Panel w/Mount Pipe	C	From Leg	4.00 0 0	0.000	166.00	No Ice 1/2" Ice	11.70 12.42	8.94 10.45	93 179
(4) 20" x 15" x 10" RRU	A	From Leg	4.00 0 0	0.000	166.00	No Ice 1/2" Ice	2.50 2.70	1.67 1.84	50 73
(4) 20" x 15" x 10" RRU	B	From Leg	4.00 0 0	0.000	166.00	No Ice 1/2" Ice	2.50 2.70	1.67 1.84	50 73
(4) 20" x 15" x 10" RRU	C	From Leg	4.00 0 0	0.000	166.00	No Ice 1/2" Ice	2.50 2.70	1.67 1.84	50 73
RCMDC-3315-PF-48	A	From Leg	4.00 0 0	0.000	166.00	No Ice 1/2" Ice	3.36 3.60	2.19 2.39	32 61
RCMDC-3315-PF-48	B	From Leg	4.00 0 0	0.000	166.00	No Ice 1/2" Ice	3.36 3.60	2.19 2.39	32 61
RCMDC-3315-PF-48	C	From Leg	4.00 0 0	0.000	166.00	No Ice 1/2" Ice	3.36 3.60	2.19 2.39	32 61
Generic Heavy Sector Frame	A	From Leg	2.00 0 0	0.000	166.00	No Ice 1/2" Ice	25.00 30.00	15.00 20.00	500 800
Generic Heavy Sector Frame	B	From Leg	2.00 0 0	0.000	166.00	No Ice 1/2" Ice	25.00 30.00	15.00 20.00	500 800
Generic Heavy Sector Frame	C	From Leg	2.00 0 0	0.000	166.00	No Ice 1/2" Ice	25.00 30.00	15.00 20.00	500 800

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Load Combinations

<i>Comb. No.</i>	<i>Description</i>
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
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

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Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Leg C	Max. Vert	18	366312	43537	-23282
	Max. H _x	18	366312	43537	-23282
	Max. H _z	5	-313363	-36583	22954
	Min. Vert	7	-317692	-38039	20094
	Min. H _x	7	-317692	-38039	20094
	Min. H _z	16	344663	39427	-24459
Leg B	Max. Vert	10	366947	-43477	-23414
	Max. H _x	23	-317216	37963	20205
	Max. H _z	25	-312886	36450	23168
	Min. Vert	23	-317216	37963	20205
	Min. H _x	10	366947	-43477	-23414
	Min. H _z	12	345298	-39308	-24688
Leg A	Max. Vert	2	406890	152	55533
	Max. H _x	21	12330	3731	1456
	Max. H _z	2	406890	152	55533
	Min. Vert	15	-360567	-143	-49323
	Min. H _x	9	12330	-3719	1456
	Min. H _z	15	-360567	-143	-49323

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	43845	0	0	21697	-7254	0
1.2 Dead+1.0 Wind 0 deg - No Ice	52613	0	-90504	-9272688	-8756	6991
0.9 Dead+1.0 Wind 0 deg - No Ice	39460	0	-90504	-9273154	-6569	6977
1.2 Dead+1.0 Wind 30 deg - No Ice	52613	43162	-74758	-7759113	-4503810	73477
0.9 Dead+1.0 Wind 30 deg - No Ice	39460	43162	-74758	-7760532	-4498662	73441
1.2 Dead+1.0 Wind 60 deg - No Ice	52613	64275	-37109	-3918080	-6840670	76660
0.9 Dead+1.0 Wind 60 deg - No Ice	39460	64275	-37109	-3921973	-6833904	76624
1.2 Dead+1.0 Wind 90 deg - No Ice	52613	61633	0	26140	-6697926	19316
0.9 Dead+1.0 Wind 90 deg - No Ice	39460	61633	0	19599	-6691152	19299
1.2 Dead+1.0 Wind 120 deg - No Ice	52613	69103	39897	4176665	-7197351	70079
0.9 Dead+1.0 Wind 120 deg - No Ice	39460	69103	39897	4167393	-7190405	70054
1.2 Dead+1.0 Wind 150 deg - No Ice	52613	43162	74758	7811510	-4503436	61372
0.9 Dead+1.0 Wind 150 deg - No Ice	39460	43162	74758	7799858	-4498295	61359
1.2 Dead+1.0 Wind 180 deg - No Ice	52613	0	84930	8912794	-8752	-6988
0.9 Dead+1.0 Wind 180 deg - No Ice	39460	0	84930	8900405	-6567	-6975
1.2 Dead+1.0 Wind 210 deg -	52613	-43162	74758	7811543	4485944	-73477

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<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>
No Ice						
0.9 Dead+1.0 Wind 210 deg - No Ice	39460	-43162	74758	7799888	4485174	-73441
1.2 Dead+1.0 Wind 240 deg - No Ice	52613	-69103	39897	4176695	7179887	-76674
0.9 Dead+1.0 Wind 240 deg - No Ice	39460	-69103	39897	4167420	7177313	-76639
1.2 Dead+1.0 Wind 270 deg - No Ice	52613	-61633	0	26141	6680474	-19317
0.9 Dead+1.0 Wind 270 deg - No Ice	39460	-61633	0	19600	6678071	-19299
1.2 Dead+1.0 Wind 300 deg - No Ice	52613	-64275	-37109	-3918089	6823206	-70067
0.9 Dead+1.0 Wind 300 deg - No Ice	39460	-64275	-37109	-3921985	6820811	-70043
1.2 Dead+1.0 Wind 330 deg - No Ice	52613	-43162	-74758	-7759128	4486314	-61373
0.9 Dead+1.0 Wind 330 deg - No Ice	39460	-43162	-74758	-7760549	4485539	-61359
1.2 Dead+1.0 Ice	80122	0	0	71305	-12963	-1
1.2 Dead+1.0 Wind 0 deg+1.0 Ice	80122	0	-21000	-2091240	-13001	2930
1.2 Dead+1.0 Wind 30 deg+1.0 Ice	80122	9478	-16416	-1630174	-995485	18158
1.2 Dead+1.0 Wind 60 deg+1.0 Ice	80122	13356	-7711	-748303	-1432950	15101
1.2 Dead+1.0 Wind 90 deg+1.0 Ice	80122	13184	0	71499	-1438789	4351
1.2 Dead+1.0 Wind 120 deg+1.0 Ice	80122	14128	8157	923926	-1489453	12357
1.2 Dead+1.0 Wind 150 deg+1.0 Ice	80122	9478	16416	1773170	-995458	13189
1.2 Dead+1.0 Wind 180 deg+1.0 Ice	80122	0	20109	2168970	-12997	-2930
1.2 Dead+1.0 Wind 210 deg+1.0 Ice	80122	-9478	16416	1773175	969464	-18157
1.2 Dead+1.0 Wind 240 deg+1.0 Ice	80122	-14128	8157	923930	1463461	-15103
1.2 Dead+1.0 Wind 270 deg+1.0 Ice	80122	-13184	0	71499	1412795	-4351
1.2 Dead+1.0 Wind 300 deg+1.0 Ice	80122	-13356	-7711	-748302	1406954	-12355
1.2 Dead+1.0 Wind 330 deg+1.0 Ice	80122	-9478	-16416	-1630173	969485	-13190
Dead+Wind 0 deg - Service	43845	0	-15627	-1570524	-7270	1163
Dead+Wind 30 deg - Service	43845	7465	-12930	-1312617	-777672	12236
Dead+Wind 60 deg - Service	43845	11184	-6457	-656966	-1182834	12769
Dead+Wind 90 deg - Service	43845	10817	0	21739	-1164938	3215
Dead+Wind 120 deg - Service	43845	11988	6921	734781	-1242281	11672
Dead+Wind 150 deg - Service	43845	7465	12930	1356102	-777658	10222
Dead+Wind 180 deg - Service	43845	0	14699	1545367	-7270	-1163
Dead+Wind 210 deg - Service	43845	-7465	12930	1356104	763119	-12236
Dead+Wind 240 deg - Service	43845	-11988	6921	734783	1227742	-12770
Dead+Wind 270 deg - Service	43845	-10817	0	21739	1150399	-3215
Dead+Wind 300 deg - Service	43845	-11184	-6457	-656966	1168295	-11671
Dead+Wind 330 deg - Service	43845	-7465	-12930	-1312616	763132	-10222

	Job	180' SST - Bethel, AK	Page	11 of 15
	Project	65022-0025.002.8200	Date	14:40:20 04/27/23
	Client	Magnum Tower	Designed by	JMF

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	180 - 160	3.06	44	0.162	0.019
T2	160 - 140	2.38	44	0.149	0.018
T3	140 - 120	1.78	39	0.123	0.015
T4	120 - 100	1.28	39	0.102	0.012
T5	100 - 80	0.88	39	0.078	0.009
T6	80 - 60	0.57	39	0.062	0.007
T7	60 - 40	0.33	39	0.044	0.005
T8	40 - 20	0.15	39	0.026	0.003
T9	20 - 0	0.05	39	0.013	0.001

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
180.00	Lightning Rod (5/8" x 4')	44	3.06	0.162	0.019	196169
176.00	(4) 96" x 12" x 6" Panel w/Mount Pipe	44	2.92	0.161	0.019	196169
166.00	(4) 96" x 12" x 6" Panel w/Mount Pipe	44	2.58	0.155	0.018	70060
90.00	Sidelight (FAA L-810)	39	0.72	0.069	0.008	62563

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	180 - 160	18.16	2	0.963	0.115
T2	160 - 140	14.11	2	0.886	0.106
T3	140 - 120	10.54	2	0.728	0.090
T4	120 - 100	7.59	2	0.606	0.071
T5	100 - 80	5.22	2	0.465	0.056
T6	80 - 60	3.36	2	0.365	0.042
T7	60 - 40	1.92	2	0.262	0.030
T8	40 - 20	0.90	2	0.155	0.017
T9	20 - 0	0.29	2	0.078	0.009

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
180.00	Lightning Rod (5/8" x 4')	2	18.16	0.963	0.115	33252
176.00	(4) 96" x 12" x 6" Panel w/Mount Pipe	2	17.33	0.952	0.113	33252
166.00	(4) 96" x 12" x 6" Panel w/Mount Pipe	2	15.29	0.918	0.109	11875
90.00	Sidelight (FAA L-810)	2	4.23	0.411	0.049	10560

	Job	180' SST - Bethel, AK	Page	12 of 15
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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
T1	180	Leg	A325N	0.63	4	7326	20340	0.360	1	Bolt Tension
		Diagonal	A325X	0.63	1	8386	9369	0.895	1	Member Block Shear
		Top Girt	A325X	0.63	1	1290	9369	0.138	1	Member Block Shear
T2	160	Leg	A325N	0.75	4	20861	30101	0.693	1	Bolt Tension
		Diagonal	A325X	0.63	1	8515	12431	0.685	1	Member Bearing
T3	140	Leg	A325N	1.00	4	31273	54517	0.574	1	Bolt Tension
		Diagonal	A325X	0.75	1	9285	14991	0.619	1	Member Bearing
T4	120	Leg	A325N	1.00	4	41610	54517	0.763	1	Bolt Tension
		Diagonal	A325X	0.75	1	9503	19988	0.475	1	Member Bearing
T5	100	Leg	A325N	1.00	6	34192	54517	0.627	1	Bolt Tension
		Diagonal	A325X	0.75	1	10287	19988	0.515	1	Member Bearing
T6	80	Leg	A325N	1.00	6	40497	54517	0.743	1	Bolt Tension
		Diagonal	A325X	0.75	1	11308	19988	0.566	1	Member Bearing
T7	60	Leg	A325N	1.00	6	46692	54517	0.856	1	Bolt Tension
		Diagonal	A325X	0.75	1	12208	19988	0.611	1	Member Bearing
T8	40	Leg	A325N	1.25	6	52733	87220	0.605	1	Bolt Tension
		Diagonal	A325X	0.88	1	13765	29250	0.471	1	Member Bearing
T9	20	Leg	A325N	1.25	6	58670	87220	0.673	1	Bolt Tension
		Diagonal	A325X	0.88	1	15087	29250	0.516	1	Member Bearing

Compression Checks

Leg 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	180 - 160	Pipe 2.875" x 0.203" (2.5 STD)	20.05	4.95	62.7 K=1.00	1.70	-34834	57525	0.606 ¹
T2	160 - 140	Pipe 4.5" x 0.237" (4 STD)	20.05	6.68	53.1 K=1.00	3.17	-91245	116191	0.785 ¹
T3	140 - 120	Pipe 6.625" x 0.280" (6 STD)	20.05	10.03	53.6 K=1.00	5.58	-135586	203607	0.666 ¹
T4	120 - 100	Pipe 6.625" x 0.280" (6 STD)	20.05	10.03	53.6 K=1.00	5.58	-180503	203607	0.887 ¹
T5	100 - 80	Pipe 8.625" x 0.322" (8 STD)	20.05	10.03	41.0 K=1.00	8.40	-223717	334345	0.669 ¹
T6	80 - 60	Pipe 8.625" x 0.322" (8 STD)	20.05	10.03	41.0 K=1.00	8.40	-266623	334345	0.797 ¹
T7	60 - 40	Pipe 8.625" x 0.322" (8 STD)	20.05	10.03	41.0 K=1.00	8.40	-309298	334345	0.925 ¹
T8	40 - 20	Pipe 10.75" x 0.365" (10 STD)	20.05	10.03	32.7 K=1.00	11.91	-352749	495459	0.712 ¹
T9	20 - 0	Pipe 10.75" x 0.365" (10 STD)	20.05	10.03	32.7 K=1.00	11.91	-396165	495459	0.800 ¹

¹ P_u / φP_n controls

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	Project	65022-0025.002.8200	Date 14:40:20 04/27/23
	Client	Magnum Tower	Designed by JMF

Diagonal 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	180 - 160	L 2 x 2 x 3/16	8.73	4.26	129.7 K=1.00	0.71	-8512	12165	0.700 ¹
T2	160 - 140	L 2.5 x 2.5 x 3/16	11.68	5.72	138.6 K=1.00	0.90	-8193	13436	0.610 ¹
T3	140 - 120	L 3 x 3 x 3/16	15.53	7.65	153.9 K=1.00	1.09	-9505	13165	0.722 ¹
T4	120 - 100	L 3 x 3 x 1/4	17.51	8.64	175.0 K=1.00	1.44	-9899	13452	0.736 ¹
T5	100 - 80	L 3.5 x 3.5 x 1/4	19.62	9.59	165.8 K=1.00	1.69	-10784	17598	0.613 ¹
T6	80 - 60	L 4 x 4 x 1/4	21.81	10.68	161.3 K=1.00	1.94	-11909	21351	0.558 ¹
T7	60 - 40	L 4 x 4 x 1/4	24.06	11.81	178.3 K=1.00	1.94	-13031	17475	0.746 ¹
T8	40 - 20	L 5 x 5 x 5/16	26.35	12.84	155.0 K=1.00	3.03	-14595	36089	0.404 ¹
T9	20 - 0	L 5 x 5 x 5/16	28.68	14.01	169.1 K=1.00	3.03	-16656	30330	0.549 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	180 - 160	L 2 x 2 x 3/16	5.03	4.50	137.1 K=1.00	0.71	-1185	10895	0.109 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	180 - 160	Pipe 2.875" x 0.203" (2.5 STD)	20.05	4.95	62.7	1.70	29303	76682	0.382 ¹
T2	160 - 140	Pipe 4.5" x 0.237" (4 STD)	20.05	6.68	53.1	3.17	83446	142832	0.584 ¹
T3	140 - 120	Pipe 6.625" x 0.280" (6 STD)	20.05	10.03	53.6	5.58	125092	251161	0.498 ¹
T4	120 - 100	Pipe 6.625" x 0.280" (6 STD)	20.05	10.03	53.6	5.58	166441	251161	0.663 ¹

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	Client	Magnum Tower	Designed by JMF

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u lb	φP _n lb	Ratio $\frac{P_u}{\phi P_n}$
T5	100 - 80	Pipe 8.625" x 0.322" (8 STD)	20.05	10.03	41.0	8.40	205152	377967	0.543 ¹
T6	80 - 60	Pipe 8.625" x 0.322" (8 STD)	20.05	10.03	41.0	8.40	242982	377967	0.643 ¹
T7	60 - 40	Pipe 8.625" x 0.322" (8 STD)	20.05	10.03	41.0	8.40	280154	377967	0.741 ¹
T8	40 - 20	Pipe 10.75" x 0.365" (10 STD)	20.05	10.03	32.7	11.91	316396	535873	0.590 ¹
T9	20 - 0	Pipe 10.75" x 0.365" (10 STD)	20.05	10.03	32.7	11.91	352022	535873	0.657 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	180 - 160	L 2 x 2 x 3/16	8.73	4.26	85.7	0.43	8386	21001	0.399 ¹
T2	160 - 140	L 2.5 x 2.5 x 3/16	10.35	5.07	80.5	0.57	8515	27838	0.306 ¹
T3	140 - 120	L 3 x 3 x 3/16	15.53	7.65	99.8	0.69	9285	33855	0.274 ¹
T4	120 - 100	L 3 x 3 x 1/4	17.51	8.64	113.6	0.92	9503	44652	0.213 ¹
T5	100 - 80	L 3.5 x 3.5 x 1/4	19.62	9.59	107.4	1.10	10287	53793	0.191 ¹
T6	80 - 60	L 4 x 4 x 1/4	21.81	10.68	104.2	1.29	11308	62933	0.180 ¹
T7	60 - 40	L 4 x 4 x 1/4	24.06	11.81	115.0	1.29	12208	62933	0.194 ¹
T8	40 - 20	L 5 x 5 x 5/16	26.35	12.84	99.6	2.04	13765	99359	0.139 ¹
T9	20 - 0	L 5 x 5 x 5/16	28.68	14.01	108.5	2.04	15087	99359	0.152 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	180 - 160	L 2 x 2 x 3/16	5.03	4.50	93.2	0.43	1290	21001	0.061 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	180 - 160	Leg	Pipe 2.875" x 0.203" (2.5 STD)	3	-34834	57525	60.6	Pass
T2	160 - 140	Leg	Pipe 4.5" x 0.237" (4 STD)	33	-91245	116191	78.5	Pass
T3	140 - 120	Leg	Pipe 6.625" x 0.280" (6 STD)	54	-135586	203607	66.6	Pass
T4	120 - 100	Leg	Pipe 6.625" x 0.280" (6 STD)	69	-180503	203607	88.7	Pass

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Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
T5	100 - 80	Leg	Pipe 8.625" x 0.322" (8 STD)	84	-223717	334345	66.9	Pass
T6	80 - 60	Leg	Pipe 8.625" x 0.322" (8 STD)	99	-266623	334345	79.7	Pass
T7	60 - 40	Leg	Pipe 8.625" x 0.322" (8 STD)	114	-309298	334345	92.5	Pass
T8	40 - 20	Leg	Pipe 10.75" x 0.365" (10 STD)	129	-352749	495459	71.2	Pass
T9	20 - 0	Leg	Pipe 10.75" x 0.365" (10 STD)	144	-396165	495459	80.0	Pass
T1	180 - 160	Diagonal	L 2 x 2 x 3/16	10	-8512	12165	70.0	Pass
T2	160 - 140	Diagonal	L 2.5 x 2.5 x 3/16	37	-8193	13436	61.0	Pass
T3	140 - 120	Diagonal	L 3 x 3 x 3/16	58	-9505	13165	72.2	Pass
T4	120 - 100	Diagonal	L 3 x 3 x 1/4	73	-9899	13452	73.6	Pass
T5	100 - 80	Diagonal	L 3.5 x 3.5 x 1/4	88	-10784	17598	61.3	Pass
T6	80 - 60	Diagonal	L 4 x 4 x 1/4	103	-11909	21351	55.8	Pass
T7	60 - 40	Diagonal	L 4 x 4 x 1/4	118	-13031	17475	74.6	Pass
T8	40 - 20	Diagonal	L 5 x 5 x 5/16	133	-14595	36089	40.4	Pass
T9	20 - 0	Diagonal	L 5 x 5 x 5/16	148	-16656	30330	54.9	Pass
T1	180 - 160	Top Girt	L 2 x 2 x 3/16	6	-1185	10895	10.9	Pass
Summary								
Leg (T7)							92.5	Pass
Diagonal (T7)							74.6	Pass
Top Girt (T1)							10.9	Pass
Bolt Checks							89.5	Pass
RATING =							92.5	Pass



PAUL J. FORD
& COMPANY

250 E Broad St, Ste 600 • Columbus, OH 43215
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PJF Job #: **65022-0025.002.8200**

Engineer: **JMF**

Site Name: BETHEL, AK

Site #:

Page: **1 of 1**

Date: **4/27/2023**

Base Flange Bolts

Φ =	0.75	
Bolt Dia. =	1.25	in
Bolt Fu =	120	ksi
Bolt Qty. =	6	
Thread Condition =	N	X or N
Required Tensile Strength =	360.6	K
Required Shear Strength =	49.3	K

(Tower Base Reactions)

Bolt Tensile and Shear Strength (TIA-222-G)

$$A_n = 0.969 \text{ in}^2$$

$$\Phi R_{nt} = 523.3 \text{ K}$$

$$\Phi R_{nv} = 298.2 \text{ K}$$

$$\text{Tensile Ratio} = \underline{\mathbf{68.9\%}} \leftarrow \text{Governs}$$

$$\text{Shear Ratio} = 16.5\%$$

$$\text{Combined Ratio} = 50.2\%$$

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)

Latitude: 60.79175

Longitude: -161.775083

Elevation: 27.986362181652797 ft ()



Wind

Results:

Wind Speed	147 Vmph
10-year MRI	104 Vmph
25-year MRI	112 Vmph
50-year MRI	120 Vmph
100-year MRI	127 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 Apr 24 2023

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).

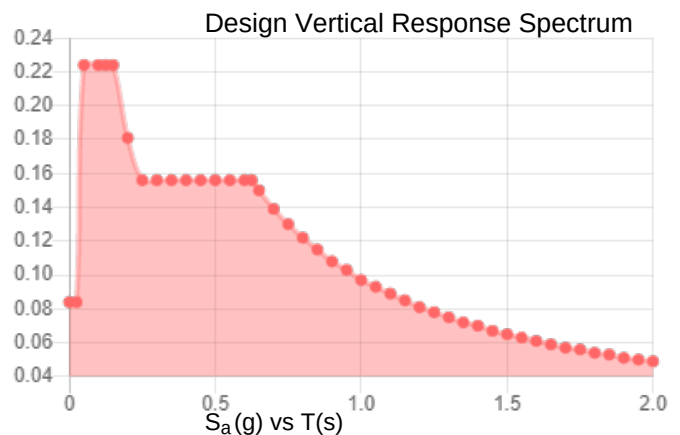
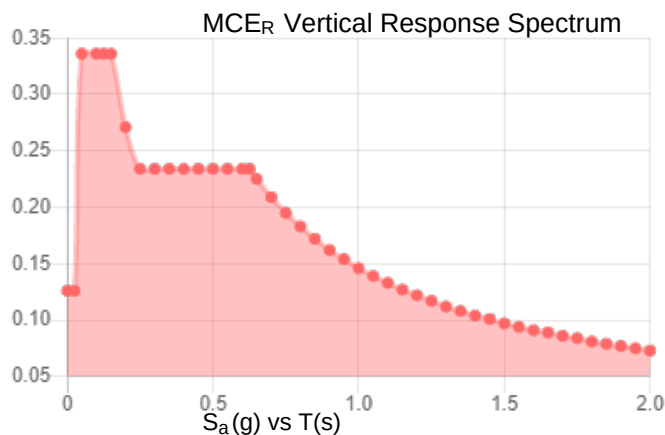
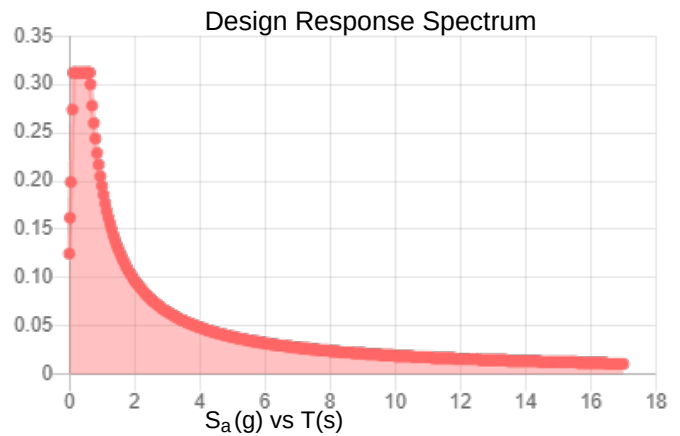
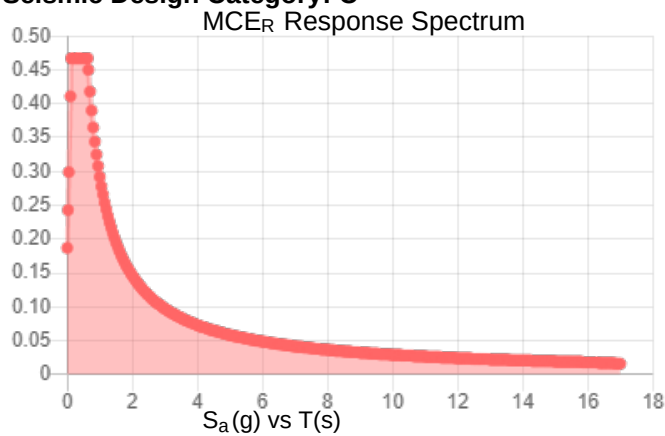
Site is in a hurricane-prone region as defined in ASCE/SEI 7-16 Section 26.2. Glazed openings shall be protected against wind-borne debris as specified in Section 26.12.3.

Site Soil Class:

Results:

S_S :	0.3	S_{D1} :	0.195
S_1 :	0.124	T_L :	16
F_a :	1.56	PGA :	0.126
F_v :	2.351	PGA _M :	0.195
S_{MS} :	0.467	F_{PGA} :	1.548
S_{M1} :	0.292	I_e :	1
S_{DS} :	0.312	C_v :	0.899

Seismic Design Category: C



Data Accessed:

Mon Apr 24 2023

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.

Results:

Ice Thickness: 0.50 in.
Concurrent Temperature: -25 F
Gust Speed 60 mph

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

Date Accessed: Mon Apr 24 2023

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.

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LETTER OF CONCURRENCE FOR SETBACK WAIVER

**TO: City of Bethel
P. O. Box 1388
Bethel, AK 99559**

**FROM: Bethel Broadcasting, Inc., (dba KYUK)
P.O. Box 468
Bethel, AK 99559**

BACKGROUND:

Bethel Broadcasting, Inc. (KYUK) is seeking permitting with the City of Bethel in order to replace its existing self-support tower located at 640 Radio St., Bethel, AK 99559. KYUK is the sole owner of the existing and proposed KYUK studio tower, and is responsible for all aspects of the operation, improvement, development, and maintenance. We will be replacing KYUK's self-support tower with an updated self-support tower at the existing KYUK site, as this is the location that is designated for the operation of KYUK's FM and TV broadcast stations per our FCC license.

We intend to cause as little disruption as possible to the existing visual impact, operations, and broadcast while adhering to all local, state, and national regulations with the utmost safety. The new tower will house all four of the existing antennas on the current tower including KYUK's FM and TV antennas, the City of Bethel's First Responders communications antenna, and the State of Alaska's Department of Correction internal communications antenna.

The new tower will utilize the same lighting system that is currently being used on the existing tower, which is a dual lighting system per FAA specifications. This dual lighting system includes red lights (L-864) for nighttime and medium-intensity, flashing white lights (L-865) for daytime and twilight use. The light system is controlled by a device (photocell) that changes the light's intensity when the ambient light changes. The system should automatically change steps when, in the Northern Hemisphere, the northern sky illuminance reaching a north-facing vertical surface is as follows:

1. Twilight-to-Night. This should not occur before the illumination drops below 5 foot-candles (53.8 lux) but should occur before it drops below 2 foot-candles (21.5 lux).
2. Night-to-Day. The intensity changes listed above should be reversed when changing from the night-to-day mode.

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(907) 543-3131**



The new studio tower will replace the existing tower at the same height of 180 ft. This is within the City of Bethel's tall tower limit of 250 ft. The face width of the tower is 5 ft at the top and 27.5 ft. at the base. The design of the tower meets all stipulations outlined in BMC 16.10.110(F) – Design Criteria.

The proposed tower utilizes breakpoint design technology and is designed with adherence to industry best practices including the TIA-222-H and the 2021 International Building Code (IBC) standards. The tower is designed to pass Risk Category II wind speed of 147 mph. The Risk Category II wind speeds are based on a 700-year mean recurrence interval, which comes out to a 0.143% probability that that wind speed will be exceeded annually. In the event windspeeds reach 147 mph the tower would then reach 92.5% stressed.

Per BMC 16.10.110(G) (included below as reference) the required setback of the proposed tower would be 154 ft. The proposed tower is depicted on PAGE 4, and will be located approximately 74 ft. from the City of Bethel's property line. The exact location of the tower falls between KYUK owned lots 3A-1 and 2C (plat 99-12), 60°47.4857' N 161°46.4162' W.

In accordance with BMC 16.10.110(G)(6) we are requesting permission be granted by the City of Bethel (an adjoining property owner) to allow for a modification of the required minimum setback distance for the proposed KYUK tower. In addition to our adherence to the TIA-222-H and 2021 IBC, KYUK will also erect a safety fence upon completion of erecting the new tower, and adhere to all FAA and FCC licensing and registration requirements.

Section 16.10.110(G) Bethel Municipal Code provides:

Setbacks. Freestanding towers and appurtenant structures shall be subject to the setbacks described below:

1. If the tower is not constructed using breakpoint design technology, the minimum setback distance from the nearest property line must be equal to the height of the proposed tower.
2. If the tower has been constructed using breakpoint design technology, the minimum setback distance must be equal to one hundred ten (110) percent of the distance from the top of the structure to the breakpoint level of the structure, or the minimum yard setback requirements, whichever is greater. For example, on a one-hundred- (100-) foot-tall freestanding tower with a breakpoint at eighty (80) feet, the minimum setback distance would be twenty-two (22) feet (one hundred ten (110) percent of twenty (20) feet, the distance from the top of the tower to the breakpoint) plus the

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minimum side or rear yard setback requirements for that zoning district. Certification, by a professional engineer registered in the state of Alaska, of the breakpoint design and the design's fall radius must be provided with the application.

3. Any appurtenant structure must be located so as to comply with the applicable minimum setback requirements for the property on which it is situated.

4. Guy, guy anchors, and accessory facilities must meet zoning district setback requirements.

5. Setbacks will be determined from the dimensions of the entire lot, even though the tall structure may be located on lease areas within the lot.

6. A variance from the setback requirement may be granted by the planning commission upon receipt of signed and duly notarized waivers by all adjoining property owners agreeing to such modification or waiver.

I hereby state that I am the owner of [Lot 2 (Plat 99-12, Bethel Recording District, Fourth Judicial District, State of Alaska)]. An adjoining property of Lot 2C owned by Bethel Broadcasting, Inc. (dba KYUK) (Plat 99-12, Bethel Recording District, Fourth Judicial District, State of Alaska).

I understand that the KYUK studio tower will be located entirely within the KYUK property line, and do not object to the proposed structure or activity located within the area required as a setback distance, as required by BMC 16.10.110(G).

[Signature]
Signature, Adjacent Owner

5/29/24
Date

WILLIAM ARNOLD
Printed Name, Adjacent Owner

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**Proposed KYUK
TV/FM Tower Site Plan
August 2023**

Legend

- Proposed Tower Footprint (red outline)
- Fencing (blue outline)
- Existing Tower (yellow star)

The map shows the proposed tower footprint and fencing near the intersection of Highway Drive and VFW. Existing towers are marked with yellow stars. The map also shows the locations of KUS, KYUK, and other nearby structures.

5/29/24 (Date)

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(907) 543-3131



LETTER OF CONCURRENCE FOR SETBACK WAIVER

**TO: University of Alaska
815 Bragaw, Suite 101
Anchorage, AK 99508**

**FROM: Bethel Broadcasting, Inc., dba (KYUK)
P.O. Box 468
Bethel, AK 99559**

BACKGROUND:

Bethel Broadcasting, Inc. (KYUK) is seeking permitting with the City of Bethel in order to replace its existing self-support tower located at 640 Radio St., Bethel, AK 99559. KYUK is the sole owner of the existing and proposed KYUK studio tower, and is responsible for all aspects of the operation, improvement, development, and maintenance. We will be replacing KYUK's self-support tower with an updated self-support tower at the existing KYUK site, as this is the location that is designated for the operation of KYUK's FM and TV broadcast stations per our FCC license.

We intend to cause as little disruption as possible to the existing visual impact, operations, and broadcast while adhering to all local, state, and national regulations with the utmost safety. The new tower will house all four of the existing antennas on the current tower including KYUK's FM and TV antennas, the City of Bethel's First Responders communications antenna, and the State of Alaska's Department of Correction internal communications antenna.

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The new studio tower will replace the existing tower at the same height of 180 ft. This is within the City of Bethel's tall tower limit of 250 ft. The face width of the tower is 5 ft at the top and 27.5 ft. at the base. The design of the tower meets all stipulations outlined in BMC 16.10.110(F) – Design Criteria.

The proposed tower utilizes breakpoint design technology and is designed with adherence to industry best practices including the TIA-222-H and the 2021 International Building Code (IBC) standards. The tower is designed to pass Risk Category II wind speed of 147 mph. The Risk Category II wind speeds are based on a 700-year mean recurrence interval, which comes out to a 0.143% probability that that wind speed will be exceeded annually. In the event windspeeds reach 147 mph the tower would then reach 92.5% stressed.

Per BMC 16.10.110(G) (included below as reference) the required setback of the proposed tower would be 154 ft. The proposed tower is depicted on PAGE 4, and will be located approximately 141 ft from the **University of Alaska's** property line. The exact location of the tower falls between KYUK owned lots 3A-1 and 2C (plat 99-12), 60°47.4857' N 161°46.4162' W.

In accordance with BMC 16.10.110(G)(6) we are requesting permission be granted by the **University of Alaska** (an adjoining property owner) to allow for a modification of the required minimum setback distance for the proposed KYUK tower. In addition to our adherence to the TIA-222-H and 2021 IBC, KYUK will also erect a safety fence upon completion of erecting the new tower, and adhere to all FAA and FCC licensing and registration requirements.

Section 16.10.110(G) Bethel Municipal Code provides:

Setbacks. Freestanding towers and appurtenant structures shall be subject to the setbacks described below:

1. If the tower is not constructed using breakpoint design technology, the minimum setback distance from the nearest property line must be equal to the height of the proposed tower.
2. If the tower has been constructed using breakpoint design technology, the minimum setback distance must be equal to one hundred ten (110) percent of the distance from the top of the structure to the breakpoint level of the structure, or the minimum yard setback requirements, whichever is greater. For example, on a one-hundred- (100-) foot-tall freestanding tower with a breakpoint at eighty (80) feet, the minimum setback distance would be twenty-two (22) feet (one hundred ten (110) percent of twenty (20) feet, the distance from the top of the tower to the breakpoint) plus the

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minimum side or rear yard setback requirements for that zoning district. Certification, by a professional engineer registered in the state of Alaska, of the breakpoint design and the design's fall radius must be provided with the application.

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4. Guy, guy anchors, and accessory facilities must meet zoning district setback requirements.

5. Setbacks will be determined from the dimensions of the entire lot, even though the tall structure may be located on lease areas within the lot.

6. A variance from the setback requirement may be granted by the planning commission upon receipt of signed and duly notarized waivers by all adjoining property owners agreeing to such modification or waiver.

I hereby state that I am the owner of **[Lot 1A (Plat 93-01, Bethel Recording District, Fourth Judicial District, State of Alaska)]**. An adjoining property of Lot 2C owned by Bethel Broadcasting, Inc. (dba KYUK) (Plat 99-12, Bethel Recording District, Fourth Judicial District, State of Alaska).

I understand that the KYUK studio tower will be located entirely within the KYUK property line, and do not object to the proposed structure or activity located within the area required as a setback distance, as required by BMC 16.10.110(G).

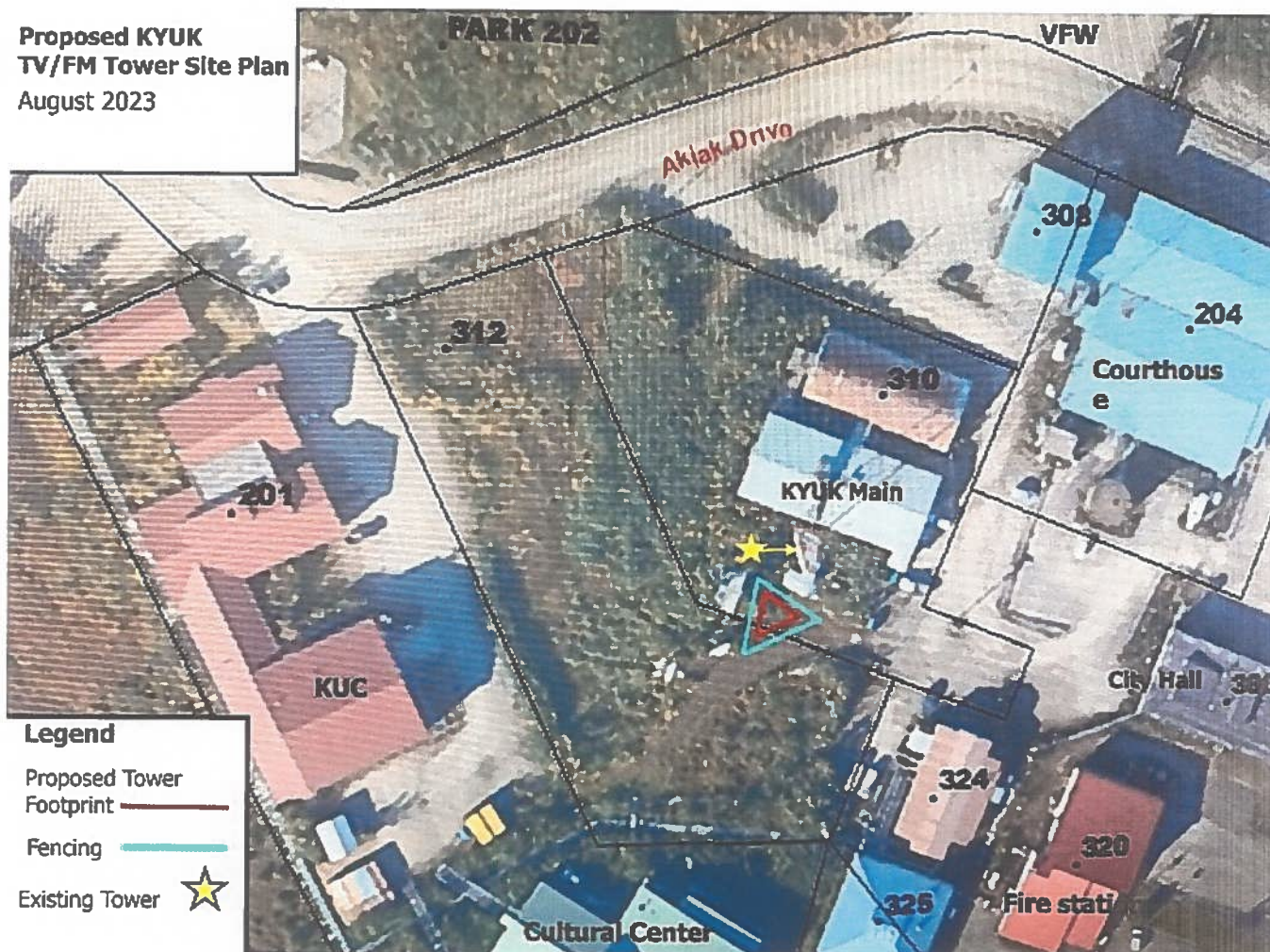
DocuSigned by:
Adrienne K. Stolpe
A05C50F98B834C1
Signature, Adjacent Owner
Adrienne K. Stolpe Director
Printed Name, Adjacent Owner

September 18, 2023
Date



DRAWING, PHOTO, OR SURVEY OF KYUK STUDIO TOWER SITE

Proposed KYUK
TV/FM Tower Site Plan
August 2023



Legend

- Proposed Tower Footprint
- Fencing
- Existing Tower

DS
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(Initials of Adjacent Owner)

September 18, 2023

(Date)

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