Jan. 19, 2023

Melanie A. Bachman
Zoning Officer
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

RE: Request of DISH Wireless LLC for Approval for the Shared Use of an Existing Tower
880 Post Road East
Westport, CT 06880
Latitude: 41° 08' 14.91" N / Longitude: 73° 20' 3.73" W

Dear Ms. Bachman,

Pursuant to Connecticut General Statues ("C.G.S.") §16-50aa, as amended, DISH Wireless LLC ("DISH") hereby requests an order from the Connecticut Siting Council ("Council") to approve the shared use by DISH of a new telecommunication tower at 880 Post Road East in Westport. The existing 180'-0" Self-Support tower is owned by the Connecticut DESPP ("CT DESPP"). The underlying property is owned by the CT DESPP. DISH requests that the Council find that the proposed shared use of the CT DESPP tower satisfies the criteria of C.G.S. §16-50aa and issue an order approving the proposed shared use. This modification/proposal includes hardware that is both 4G(LE) and 5G capable through remote software configuration and either or both services may be turned on or off at various times. A copy of this filing is being sent to Steve Smith, City of Westport – Building Official, Mary Young, City of Westport – Planning & Zoning Director, and Carey Thompson, Planning Specialist – Connecticut DESPP / CTS Unit

Background

The existing CT DESPP facility consists of a 180'-0" Self-Support tower within the existing compound. DISH is licensed by the Federal Communications Commission ("FCC") to provide wireless services throughout the State of Connecticut. DISH and the CT DESPP have agreed to the proposed shared use of the 880 Post Road East tower pursuant to mutually acceptable terms and conditions. Likewise, DISH and the CT DESPP have agreed to the proposed installation of the equipment cabinets on the ground on the West side of the tower within the existing compound. The CT DESPP has authorized DISH to apply for all necessary permits and approvals that may be required to share the existing tower.

DISH proposes to install 3 antennas, 6 RRU radios, 1 OVP and 1 cable at the 144-foot level. In addition, DISH will install a ground equipment cabinet on a 5ft x 7ft steel equipment platform. Included in the Construction Drawings are DISH's project specifications for locations of all proposed site improvements. The Construction Drawings also contain specifications for DISH's proposed antennas and groundwork.

The planned modifications of the facility fall squarely within those activities explicitly provided for in R.C.S.A. 16-50j-89.

1. The proposed modification will not result in an increase in the height of the existing structure. The top of the tower is 180-feet; Dish Wireless LLC proposed antennas will be located at a center line height of 144-feet.

2. The proposed modifications will not result in the increase of the site boundary as depicted on the attached site plan.

3. The proposed modifications will not increase noise levels at the facility by six decibels or more, or to levels that exceed local and state criteria. The incremental effect of the proposed changes will be negligent

4. The operation of the proposed antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communications Commission safety standard. As indicated in the attached power density calculations, the combined site operations will result in a total power density of 3.5119% as evidenced by Exhibit F.

C.G.S. § 16-50aa(c)(1) provides that, upon written request for approval of a proposed shared use, "if the Council finds that the proposed shared use of the facility is technically, legally, environmentally and economically feasible and meets public safety concerns, the council shall issue an order approving such a shared use." DISH respectfully submits that the shared use of the tower satisfies these criteria.

A. Technical Feasibility. The existing CT DESPP tower is structurally capable of supporting DISH's proposed improvements. The proposed shared use of this tower is, therefore, technically feasible. A Feasibility Structural Analysis Report ("Structural Report") prepared for this project confirms that this tower can support DISH's proposed loading. A copy of the Structural Report has been included in this application.

B. Legal Feasibility. Under C.G.S. § 16-50aa, the Council has been authorized to issue order approving the shared use of an existing tower such as the CT DESPP tower. This authority complements the Council's prior-existing authority under C.G.S. § 16-50p to issue orders approving the construction of new towers that are subject to the Council's jurisdiction. In addition, § 16-50x(a) directs the Council to "give such consideration to the other state laws and municipal regulations as it shall deem appropriate"

in ruling on requests for the shared use of existing tower facilities. Under the statutory authority vested in the Council, an order by the Council approving the requested shared use would permit the Applicant to obtain a building permit for the proposed installations.

C. Environmental Feasibility. The proposed shared use of the CT DESPP tower would have a minimal environmental effect for the following reasons:

1. The proposed installation will have no visual impact on the area of the tower. DISH's equipment cabinet would be installed within the existing facility compound. DISH's shared use of this tower therefore will not cause any significant change or alteration in the physical or environmental characteristics of the existing site.

2. Operation of DISH's antennas at this site would not exceed the RF emissions standard adopted by the Federal Communications Commission ("FCC"). Included in the EME report of this filing are the approximation tables that demonstrate that DISH's proposed facility will operate well within the FCC RF emissions safety standards.

3. Under ordinary operating conditions, the proposed installation would not require the use of any water or sanitary facilities and would not generate air emissions or discharges to water bodies or sanitary facilities. After construction is complete the proposed installations would not generate any increased traffic to the CT DESPP facility other than periodic maintenance. The proposed shared use of the CT DESPP tower, would, therefore, have a minimal environmental effect, and is environmentally feasible.

D. Economic Feasibility. As previously mentioned, DISH has entered into an agreement with the CT DESPP for the shared use of the existing facility subject to mutually agreeable terms. The proposed tower sharing is, therefore, economically feasible.

E. Public Safety Concerns. As discussed above, the tower is structurally capable of supporting DISH's full array of 3 antennas, 6 RRU radios, 1 OVP and 1 cable and all related equipment. DISH is not aware of any public safety concerns relative to the proposed sharing of the existing CT DESPP tower.

Conclusion

For the reasons discussed above, the proposed shared use of the existing CT DESPP tower at 880 Post Road East satisfies the criteria stated in C.G.S. §16-50aa and advances the General Assembly's and the Council's goal of preventing the unnecessary proliferation of towers in Connecticut. The Applicant, therefore, respectfully requests that the Council issue an order approving the proposed shared use.

Sincerely,

Michael Jones
President, M+K Development
140 Beach 137th St
Rockaway Beach, NY 11694
732-677-8881

CC:
Steve Smith, City of Westport – Building Official
Mary Young, City of Westport – Planning & Zoning Director
Carey Thompson, Planning Specialist – Connecticut DESPP / CTS Unit

MK DEVELOPMENT

EXHIBIT A

Letter of Authorization

STATE OF CONNECTICUT

DEPARTMENT OF EMERGENCY SERVICES AND PUBLIC PROTECTION
Division of Statewide Emergency Telecommunications

Letter of Authorization

December 2, 2022

Dish Wireless, LLC
5701 South Santa Fe Drive
Littleton, CO 80120

Re: Development Application Letter of Authorization - 880 Post Road East, Westport, CT 06880 NJJER02042B

Dear Sir/Madam,

Connecticut Department of Emergency Services and Public Protection owns the tower facility at 880 Post Road East, Westport, CT 06880 and identified as Blocks #62, Lot #00 and #63, Lot #00 (the "Property"). Connecticut Department of Emergency Services and Public Protection hereby authorizes DISH Wireless LLC ("DISH") and its agent, O4 Innovations and M&K Development LLC, to file applications for the sole purpose of gaining any zoning approval and building permit(s) to install new telecommunications equipment ("Equipment") on an existing Self-Support tower on the Property. DISH and its afore mentioned agents shall not have authority to agree to any stipulations associated with their business before the Building Department that results in a duty on the part of Connecticut Department of Emergency Services and Public Protection that the Connecticut Department of Emergency Services and Public Protection has not expressly permitted in writing.

DISH shall not be permitted to install the Equipment on the property until DISH provides a copy of its building permit from the Town and until DISH complies with any and all requirements set forth in DISH's lease with Connecticut Department of Emergency Services and Public Protection.

Please contact me at 860-685-5107 or mark.gorka@ct.gov should you have any questions or concerns.

Sincerely,

Mark Gorka
Grants & Contracts Specialist
Connecticut DESPP / CTS Unit

1111 Country Club Road
Middletown, CT 06457
Phone: (860) 685-8080 / Fax: (860) 685-8362

MK DEVELOPMENT

EXHIBIT B

Property Card

0 POST RD E

Location	0 POST RD E	**Mblu**	F09/ / 062/000 /
Acct#	29330	**Owner**	CONNECTICUT STATE OF
Assessment	$1,184,800	**Appraisal**	$1,692,400
PID	100140	**Building Count**	1

Current Value

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2020	$1,066,900	$625,500	$1,692,400
Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2020	$746,900	$437,900	$1,184,800

Owner of Record

Owner	CONNECTICUT STATE OF	**Sale Price**	$0
Co-Owner		**Certificate**	
Address	30 TRINTY ST HARTFORD, CT 06106	**Book & Page**	0000/0000
		Sale Date	07/08/2005
		Instrument	15

Ownership History

Ownership History

Owner	Sale Price	Certificate	Book & Page	Instrument	Sale Date
CONNECTICUT STATE OF	$0		0000/0000	15	07/08/2005

Building Information

Building 1 : Section 1

Year Built: 2004
Living Area: 800
Replacement Cost: $92,464
Building Percent Good: 88
Replacement Cost Less Depreciation: $81,400

Building Attributes	
Field	**Description**
Style:	Telephone Bldg
Model	Commercial
Grade	Average
Stories:	1
Occupancy	1.00
Exterior Wall 1	Brick/Masonry
Exterior Wall 2	
Roof Structure	Flat
Roof Cover	T&G/Rubber
Interior Wall 1	Minimum
Interior Wall 2	
Interior Floor 1	Concr-Finished
Interior Floor 2	
Heating Fuel	Gas
Heating Type	Hot Air-No Duc
AC Type	Central
Struct Class	

Building Photo

(https://images.vgsi.com/photos2/WestportCTPhotos//\00\01\27\24.jpg)

Building Layout

(ParcelSketch.ashx?pid=100140&bid=30123)

Building Sub-Areas (sq ft)	Legend

Bldg Use	State Bldg Com
Income Adj	
1st Floor Use:	
Heat/AC	Heat/AC Pkgs
Frame Type	Masonry
Baths/Plumbing	Average
Ceiling/Walls	Susp-Ceil Only
Rooms/Prtns	Average
Wall Height	10.00
% Comn Wall	

Code	Description	Gross Area	Living Area
BAS	First Floor	800	800
		800	800

Extra Features

Extra Features	Legend
No Data for Extra Features	

Land

Land Use

Use Code	918
Description	State Cell Site
Zone	GBD
Neighborhood	G
Alt Land Appr	No
Category	

Land Line Valuation

Size (Acres)	0.08
Frontage	
Depth	
Assessed Value	$437,900
Appraised Value	$625,500

Outbuildings

Outbuildings						Legend
Code	**Description**	**Sub Code**	**Sub Description**	**Size**	**Value**	**Bldg #**
FN3	Fence 6'			120.00 L.F.	$1,500	1

CELL	Cell on TWR	TW		3.00 Sites	$984,000	1

Valuation History

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2021	$1,066,900	$625,500	$1,692,400
2020	$1,066,900	$625,500	$1,692,400
2019	$1,071,500	$675,000	$1,746,500

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2021	$746,900	$437,900	$1,184,800
2020	$746,900	$437,900	$1,184,800
2019	$750,100	$472,500	$1,222,600

Property Location POST RD E | Map ID F09/ / 063/000 / | Bldg Name | State Use 435
Vision ID 100302 | Account # 29409 | Bldg # 1 | Sec # 1 of 1 | Card # 1 of 1 | Print Date 10/24/2022 12:50:19

CONSTRUCTION DETAIL

Element	Cd	Description
Style:	99	Vacant Land
Model	00	Vacant
Grade:		
Stories:		
Occupancy		
Exterior Wall 1		
Exterior Wall 2		
Roof Structure:		
Roof Cover		
Interior Wall 1		
Interior Wall 2		
Interior Flr 1		
Interior Flr 2		
Heat Fuel		
Heat Type:		
AC Type:		
Total Bedrooms		
Total Bthrms:		
Total Half Baths		
Total Xtra Fixtrs		
Total Rooms:		
Bath Style:		
Kitchen Style:		
Kitchens		
Whirlpool Tubs		
Hot Tubs		
Sauna (SF Area		
Fin Basement		
Fin Bsmt Qual		
Bsmt. Garages		
Interior Cond		
Fireplaces		
Ceiling Height		

CONSTRUCTION DETAIL (CONTINUED)

Element	Cd	Description
Fireplaces		
Ceiling Height		
Elevator		

CONDO DATA

Parcel Id		C		Owne	
		B		S	

Adjust Type	Code	Description	Factor%
Condo Flr			
Condo Unit			

COST / MARKET VALUATION

Building Value New	0
Year Built	0
Effective Year Built	
Depreciation Code	
Remodel Rating	
Year Remodeled	
Depreciation %	0
Functional Obsol	0
External Obsol	0
Trend Factor	1
Condition	
Condition %	100
Percent Good	
Cns Sect Rcnld	0
Dep % Ovr	
Dep Ovr Comment	
Misc Imp Ovr	
Misc Imp Ovr Comment	
Cost to Cure Ovr	
Cost to Cure Ovr Comment	

No Sketch

OB - OUTBUILDING & YARD ITEMS(L) / XF - BUILDING EXTRA FEATURES(B)

Code	Descript	Sub	Sub Ty	L/B	Units	Unit Pric	Yr Blt	Cond. C	% Gd	Grade	Grade A	Appr. V
CELL	Cell on	TW		L	3	328000.	2010		100	00	1.00	984,00

BUILDING SUB-AREA SUMMARY SECTION

Code	Description	Living Area	Floor Area	Eff Area	Unit Cost	Undeprec Value
	Ttl Gross Liv / Lease Area	0	0			0

Property Location POST RD E | Map ID F09/ / 063/000 / | Bldg Name | State Use 435
Vision ID 100302 | Account # 29409 | Bldg # 1 | Sec # 1 of 1 | Card # 1 of 1 | Print Date 10/24/2022 12:50:19

CURRENT OWNER

CONNECTICUT STATE OF
CELL TOWER/WALGREENS
30 TRINITY ST

HARTFORD CT 06106

1

TOPO	UTILITIES	STRT / ROAD	LOCATION

SUPPLEMENTAL DATA

Alt Prcl ID 53184	Lift Hse
Historic ID	Asking $
Census	
WestportC	
Survey Ma	
Survey Ma	
GIS ID F09063000	Assoc Pid#

CURRENT ASSESSMENT

Description	Code	Appraised	Assessed
UTL BLDG	4-2	1,000	700
UTL OUTBL	4-3	984,000	688,800
		Total 985,000	689,500

6158

WESTPORT, CT

VISION

RECORD OF OWNERSHIP

RECORD OF OWNERSHIP	BK-VOL/PAGE		SALE DATE	Q/U	V/I	SALE PRICE	VC
CONNECTICUT STATE OF	0000	0000	10-01-2005	U	I	0	

PREVIOUS ASSESSMENTS (HISTORY)

Year	Code	Assessed	Year	Code	Assessed V	Year	Code	Assessed
2021	4-2	700	2020	4-2	700	2020	4-2	700
	4-3	688,800		4-3	688,800		4-3	688,800
	Total	689,500		Total	689,500		Total	689,500

EXEMPTIONS

Year	Code	Description	Amount
		Total	0.00

OTHER ASSESSMENTS

Code	Description	Number	Amount	Comm Int

This signature acknowledges a visit by a Data Collector or Assessor

ASSESSING NEIGHBORHOOD

Nbhd	Sub	Nbhd Name	B	Tracing	Batch
0001	A	0001			

NOTES

CELL TOWER BEHIND THE WALGREENS AT
880 POST RD E
3 CELL SITES

TOWER VALUE= 2000 X 12=24000 X .75=18000
18000/.11=163,600 X 3=490,800

FKA LIST #14621

APPRAISED VALUE SUMMARY

Appraised Bldg. Value (Card)	1,000
Appraised Xf (B) Value (Bldg)	0
Appraised Ob (B) Value (Bldg)	984,000
Appraised Land Value (Bldg)	0
Special Land Value	0
Total Appraised Parcel Value	985,000
Valuation Method	I
Total Appraised Parcel Value	985,000

BUILDING PERMIT RECORD

Permit Id	Issue Date	Type	Amount	Insp Date	% Comp	Date Comp	Comments

Permit Id	Comments

VISIT / CHANGE HISTORY

Date	Id	Type	Is	Cd	Purpost/Result
06-25-2020	BL.			19	Field Review
05-13-2010	J			11	QC - Check/Field Review

LAND LINE VALUATION SECTION

B	Use Code	Description	Zone	Land	Land Units		Unit Price	Size Adj	Site Index	Cond.	Nbhd.	Nbhd. Adj	Notes	Location Adjustment		Adj Unit P	Land Value
1	435	Cell Site Vac Lnd	GBD		0	SF	0.00	1.00000	C	1.00		1.000			0.0000		0
Total Card Land Units					0	SF	Parcel Total Land Area			0.000						Total Land Value		0

MK DEVELOPMENT

EXHIBIT C

Construction Drawings

DISH Wireless L.L.C. SITE ID:

NJJER02042B

DISH Wireless L.L.C. SITE ADDRESS:

880 POST ROAD EAST
WESTPORT, CT 06880

CONNECTICUT CODE OF COMPLIANCE

ALL WORK SHALL BE PERFORMED AND MATERIALS INSTALLED IN ACCORDANCE WITH THE CURRENT EDITIONS OF THE FOLLOWING CODES AS ADOPTED BY THE LOCAL GOVERNING AUTHORITIES. NOTHING IN THESE PLANS IS TO BE CONSTRUED TO PERMIT WORK NOT CONFORMING TO THESE CODES

CODE TYPE	CODE
BUILDING	2022 CT STATE BUILDING CODE/2021 IBC W/ CT AMENDMENTS
MECHANICAL	2022 CT STATE BUILDING CODE/2021 IMC W/ CT AMENDMENTS
ELECTRICAL	2022 CT STATE BUILDING CODE/2020 NEC W/ CT AMENDMENTS

SHEET INDEX

SCOPE OF WORK

THIS IS NOT AN ALL INCLUSIVE LIST. CONTRACTOR SHALL UTILIZE SPECIFIED EQUIPMENT PART OR ENGINEER APPROVED EQUIVALENT. CONTRACTOR SHALL VERIFY ALL NEEDED EQUIPMENT TO PROVIDE A FUNCTIONAL SITE. THE PROJECT GENERALLY CONSISTS OF THE FOLLOWING:

TOWER SCOPE OF WORK:
- INSTALL (3) PROPOSED PANEL ANTENNAS (1 PER SECTOR)
- INSTALL PROPOSED JUMPERS
- INSTALL (6) PROPOSED RRHs (2 PER SECTOR)
- INSTALL (1) PROPOSED OVER VOLTAGE PROTECTION DEVICE (OVP)
- INSTALL (1) PROPOSED HYBRID CABLE

GROUND SCOPE OF WORK:
- INSTALL (1) PROPOSED METAL PLATFORM
- INSTALL (1) PROPOSED ICE BRIDGE
- INSTALL (1) PROPOSED PPC CABINET
- INSTALL (1) PROPOSED EQUIPMENT CABINET
- INSTALL (1) PROPOSED POWER CONDUIT
- INSTALL (1) PROPOSED TELCO CONDUIT
- INSTALL (1) PROPOSED TELCO-FIBER BOX
- INSTALL (1) PROPOSED GPS UNIT
- INSTALL (1) PROPOSED SAFETY SWITCH (IF REQUIRED)
- INSTALL (1) PROPOSED FIBER NID (IF REQUIRED)

SITE PHOTO

UNDERGROUND SERVICE ALERT CBYD 811
UTILITY NOTIFICATION CENTER OF CONNECTICUT
(800) 922-4455
WWW.CBYD.COM

CALL 2 WORKING DAYS UTILITY NOTIFICATION PRIOR TO CONSTRUCTION

811

GENERAL NOTES

THE FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION. A TECHNICIAN WILL VISIT THE SITE AS REQUIRED FOR ROUTINE MAINTENANCE. THE PROJECT WILL NOT RESULT IN ANY SIGNIFICANT DISTURBANCE OR EFFECT ON DRAINAGE. NO SANITARY SEWER SERVICE, POTABLE WATER, OR TRASH DISPOSAL IS REQUIRED AND NO COMMERCIAL SIGNAGE IS PROPOSED.

11"x17" PLOT WILL BE HALF SCALE UNLESS OTHERWISE NOTED

CONTRACTOR SHALL VERIFY ALL PLANS, EXISTING DIMENSIONS, AND CONDITIONS ON THE JOB SITE, AND SHALL IMMEDIATELY NOTIFY THE ENGINEER IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK.

SITE INFORMATION

PROPERTY OWNER:	STATE OF CONNECTICUT
ADDRESS:	30 TRINITY ST. HARTFORD, CT 6106
TOWER TYPE:	SELF SUPPORT TOWER
TOWER CO SITE ID:	CT STATE POLICE SITE #32
TOWER APP NUMBER:	N/A
COUNTY:	FAIRFIELD COUNTY
LATITUDE (NAD 83):	41° 08' 14.91" N 41.137476 N
LONGITUDE (NAD 83):	73° 20' 3.73" W 73.334369 W
ZONING JURISDICTION:	CT SITING COUNCIL
ZONING DISTRICT:	GBD
PARCEL NUMBER:	F09062000
OCCUPANCY GROUP:	U
CONSTRUCTION TYPE:	II-B
POWER COMPANY:	EVERSOURCE
TELEPHONE COMPANY:	TBD

PROJECT DIRECTORY

APPLICANT:	DISH Wireless L.L.C. 5701 SOUTH SANTA FE DRIVE LITTLETON, CO 80120 (303) 706-5008
TOWER OWNER:	CT DESPP 1111 COUNTRY CLUB ROAD MIDDLETOWN, CT 06457
SITE DESIGNER:	M+K DEVELOPMENT 140 BEACH 137TH STREET ROCKAWAY, NY 11694
SITE ACQUISITION:	AUSTIN PAPPAS AUSTIN.PAPPAS@DISH.COM
CONSTRUCTION MANAGER:	OMAR ZEERBAM OMAR.ZEERBAN@DISH.COM
RF ENGINEER:	PAWAN MADAHAR PAWAN.MADAHAR@DISH.COM

DIRECTIONS

DIRECTIONS FROM 3 ADP BLVD, ROSELAND, NJ 07068, USA:
HEAD NORTHEAST TOWARD ADP BLVD, TURN LEFT, TURN LEFT TOWARD ADP BLVD, TURN LEFT TOWARD ADP BLVD, TURN LEFT ONTO ADP BLVD, TURN RIGHT TOWARD CHOCTAW WAY, SLIGHT RIGHT ONTO CHOCTAW WAY, USE THE LEFT LANE TO TURN RIGHT ONTO LIVINGSTON AVE, USE THE RIGHT LANE TO TAKE THE RAMP ONTO I-280 E, TAKE GARDEN STATE PKWY, MERGE ONTO I-280 E, TAKE EXIT 12 FOR GARDEN STATE PKWY N, KEEP LEFT, FOLLOW SIGNS FOR GARDEN STATE PARKWAY AND MERGE ONTO GARDEN STATE PKWY, CONTINUE ONTO NJ-444 N/GARDEN STATE PKWY, CONTINUE ONTO GARDEN STATE PARKWAY CONNECTOR, USE THE RIGHT 2 LANES TO TAKE EXIT 14-1 TO MERGE ONTO I-287 E/I-87 S, KEEP LEFT AT THE FORK TO CONTINUE ON I-287 E, FOLLOW SIGNS FOR WHITE PLAINS/RYE, MERGE ONTO I-95 N, TAKE EXIT 18 TOWARD SHERWOOD ISLAND CONNECTOR, TURN LEFT ONTO SHERWOOD ISLAND CONNECTOR, KEEP LEFT TO STAY ON SHERWOOD ISLAND CONNECTOR, TURN RIGHT ONTO POST RD E, TURN RIGHT.

VICINITY MAP

NO SCALE

dish wireless.

5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120

M+K DEVELOPMENT
140 BEACH 137TH STREET
ROCKAWAY, NY 11694

STATE OF CONNECTICUT
BRETT J MAGURN
33678
PROFESSIONAL ENGINEER
1/19/2023

DRAWN BY:	CHECKED BY:	APPROVED BY:
PRI	---	---

RFDS REV #: ---

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
A	08/13/2022	ISSUED FOR REVIEW
0	01/18/2023	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER

NJJER02042B

DISH Wireless L.L.C.
PROJECT INFORMATION

NJJER02042B
880 POST ROAD EAST
WESTPORT, CT 06880

SHEET TITLE

TITLE SHEET

SHEET NUMBER

T-1

NOTES

1. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS.
2. ANTENNAS AND MOUNTS OMITTED FOR CLARITY.

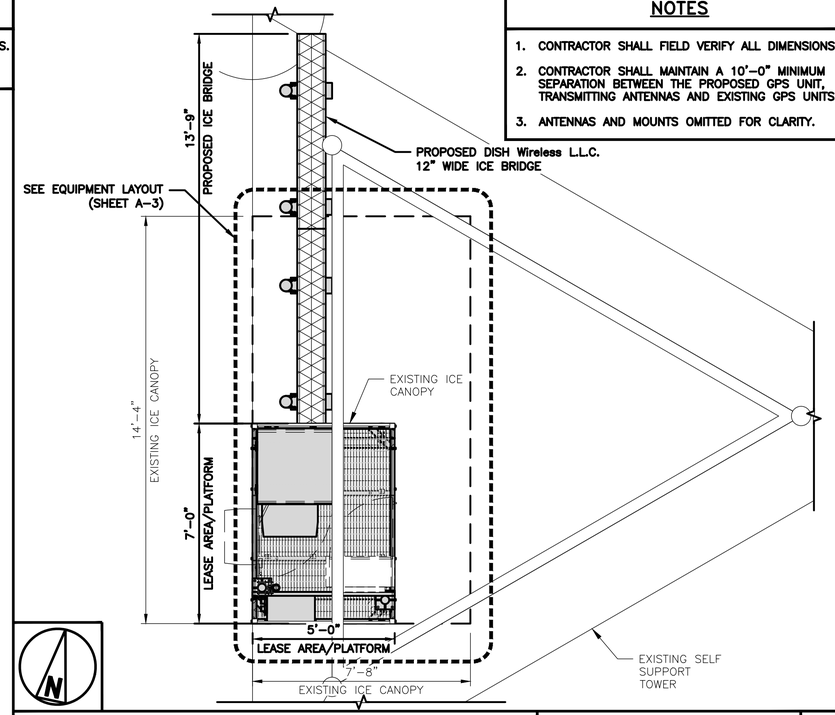
OVERALL SITE PLAN

12' 8' 4' 0 10' 20'
3/32"=1'-0"

1

NOTES

1. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS.
2. CONTRACTOR SHALL MAINTAIN A 10'-0" MINIMUM SEPARATION BETWEEN THE PROPOSED GPS UNIT, TRANSMITTING ANTENNAS AND EXISTING GPS UNITS.
3. ANTENNAS AND MOUNTS OMITTED FOR CLARITY.



ENLARGED SITE PLAN

12" 6" 0 1' 2' 3' 4' 5' 6' 7'
3/8"=1'-0"

2

AERIAL VIEW

NO SCALE

3

dish wireless.

5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120

MK DEVELOPMENT
140 BEACH 137TH STREET
ROCKAWAY, NY 11694

STATE OF CONNECTICUT
BRETT J MAGARIAN
33678
PROFESSIONAL ENGINEER
1/19/2023

DRAWN BY:	CHECKED BY:	APPROVED BY:
PRI	---	---

RFDS REV #: ---

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
A	08/13/2022	ISSUED FOR REVIEW
0	01/18/2023	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER

NJJER02042B

DISH Wireless L.L.C.
PROJECT INFORMATION

NJJER02042B
880 POST ROAD EAST
WESTPORT, CT 06880

SHEET TITLE

OVERALL AND ENLARGED SITE PLAN

SHEET NUMBER

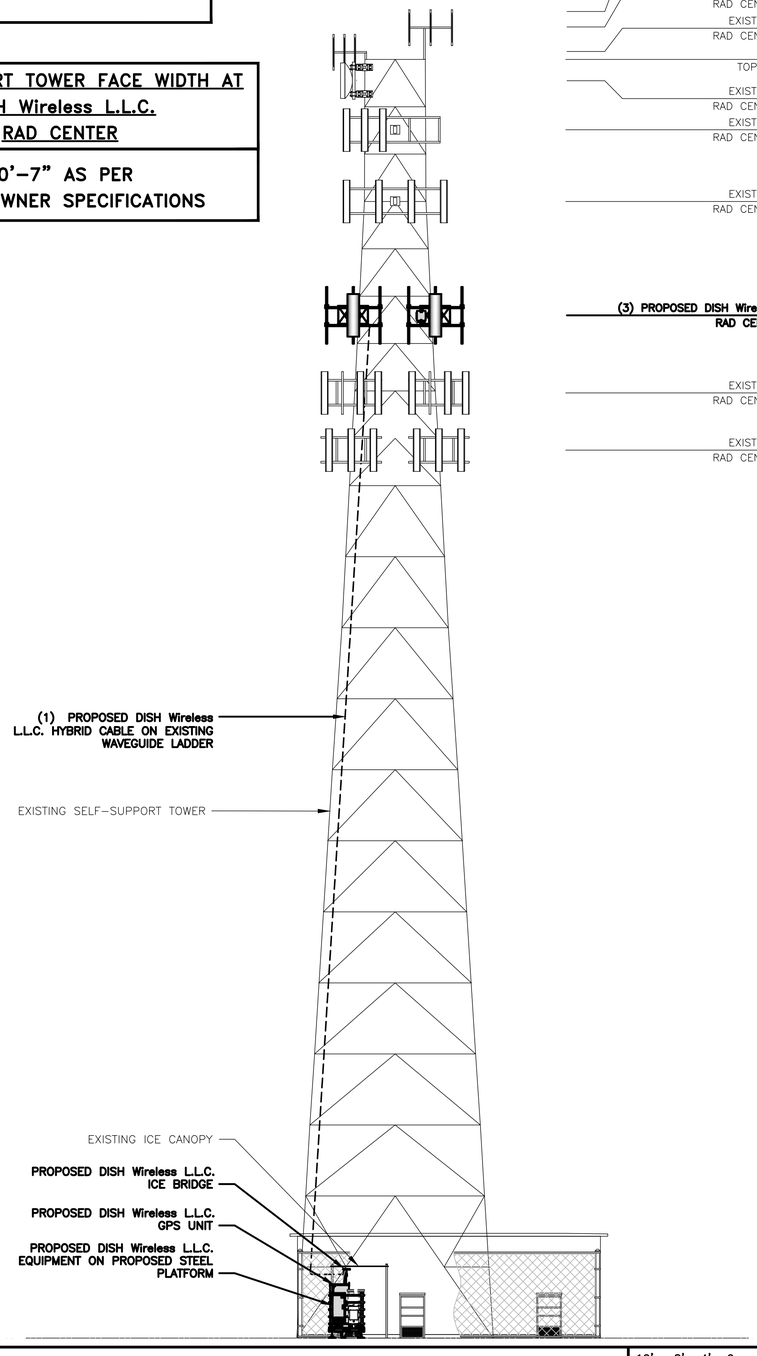
A-1

NOTES

1. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS.
2. ANTENNA AND MW DISH SPECIFICATIONS REFER TO ANTENNA SCHEDULE AND TO FINAL CONSTRUCTION RFDS FOR ALL RF DETAILS
3. EXISTING EQUIPMENT AND FENCE OMITTED FOR CLARITY.

SELF SUPPORT TOWER FACE WIDTH AT DISH Wireless L.L.C. RAD CENTER

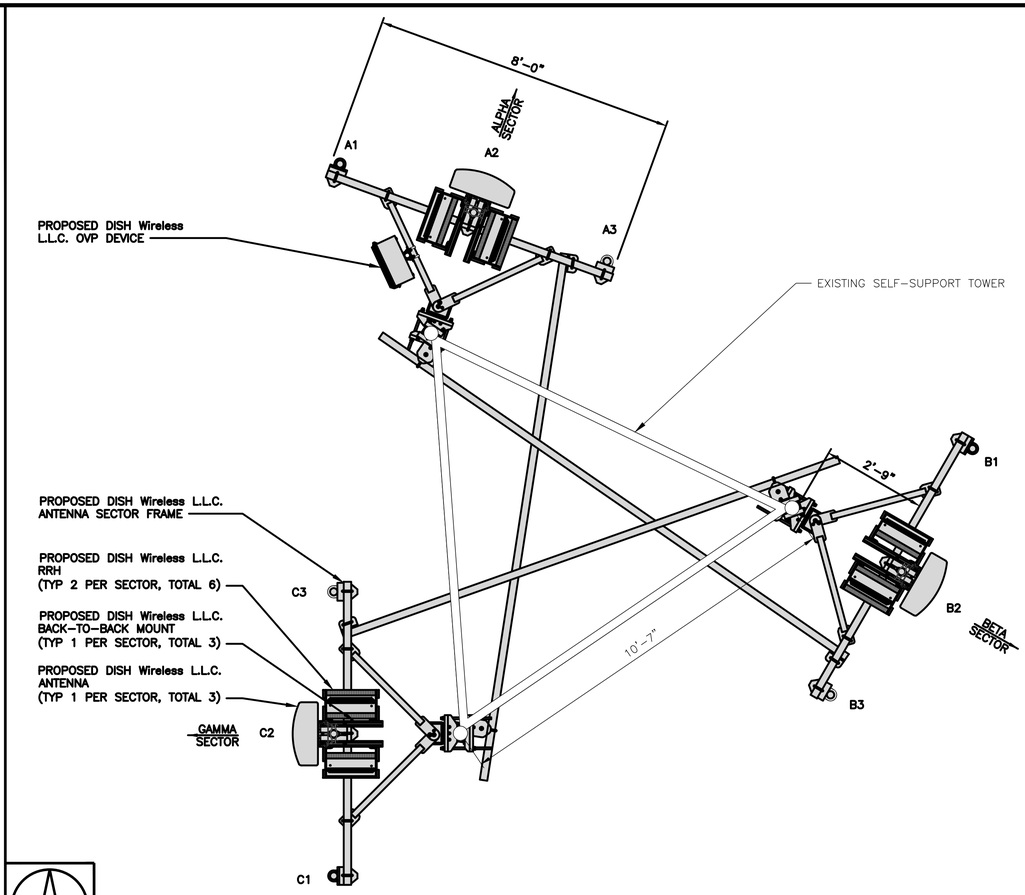
10'-7" AS PER TOWER OWNER SPECIFICATIONS



PROPOSED SOUTHEAST ELEVATION

12' 8' 4' 0 10' 20'
3/32"=1'-0"

1



ANTENNA LAYOUT

12" 6" 0 1' 2' 3'
3/4"=1'-0"

2

SECTOR POS.	ANTENNA					TRANSMISSION CABLE	RRH			OVP
	EXISTING OR PROPOSED	MANUFACTURER – MODEL NUMBER	TECH	AZIMUTH	RAD CENTER	FEED LINE TYPE AND LENGTH	MANUFACTURER – MODEL NUMBER	TECH	POS.	MANUFACTURER MODEL
A1	--	--	--	--	--	(1) HIGH-CAPACITY HYBRID CABLE (170' LONG)	FUJITSU – TA08025-B605	5G	A2	RAYCAP RDIDC -9181-PF-48
A2	PROPOSED	FFVV-65B-R2	5G	20°	144'-0"		FUJITSU – TA08025-B604	5G	A2	
A3	--	--	--	--	--		--	--	--	
B1	--	--	--	--	--	SHARED W/ALPHA (180'-7" LONG)	FUJITSU – TA08025-B605	5G	B2	SHARED W/ALPHA
B2	PROPOSED	FFVV-65B-R2	5G	120°	144'-0"		FUJITSU – TA08025-B604	5G	B2	
B3	--	--	--	--	--		--	--	--	
C1	--	--	--	--	--	SHARED W/ALPHA (180'-7" LONG)	FUJITSU – TA08025-B605	5G	C2	SHARED W/ALPHA
C2	PROPOSED	FFVV-65B-R2	5G	270°	144'-0"		FUJITSU – TA08025-B604	5G	C2	
C3	--	--	--	--	--		--	--	--	

NOTES

1. CONTRACTOR TO REFER TO FINAL CONSTRUCTION RFDS FOR ALL RF DETAILS.
2. ANTENNA AND RRH MODELS MAY CHANGE DUE TO EQUIPMENT AVAILABILITY. ALL EQUIPMENT CHANGES MUST BE APPROVED AND REMAIN IN COMPLIANCE WITH THE PROPOSED DESIGN AND STRUCTURAL ANALYSES.

ANTENNA SCHEDULE

NO SCALE

3

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5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120

MK DEVELOPMENT
140 BEACH 137TH STREET
ROCKAWAY, NY 11694

STATE OF CONNECTICUT
BRETT J MAGRUM
33678
PROFESSIONAL ENGINEER
1/19/2023

DRAWN BY:	CHECKED BY:	APPROVED BY:
PRI	---	---

RFDS REV #: ---

CONSTRUCTION DOCUMENTS

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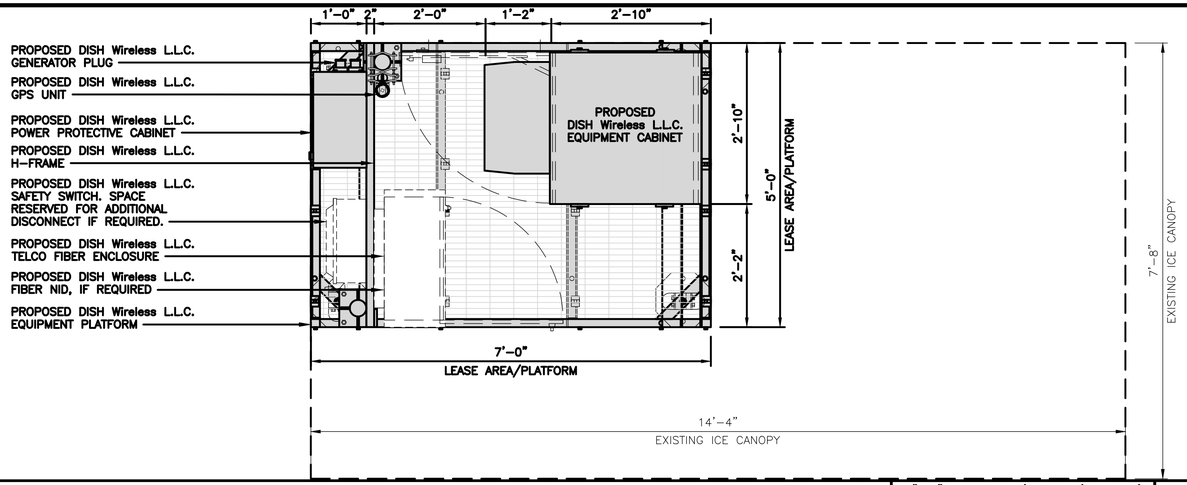
A&E PROJECT NUMBER
NJJER02042B

DISH Wireless L.L.C.
PROJECT INFORMATION
NJJER02042B
880 POST ROAD EAST
WESTPORT, CT 06880

SHEET TITLE
ELEVATION, ANTENNA LAYOUT AND SCHEDULE

SHEET NUMBER
A-2



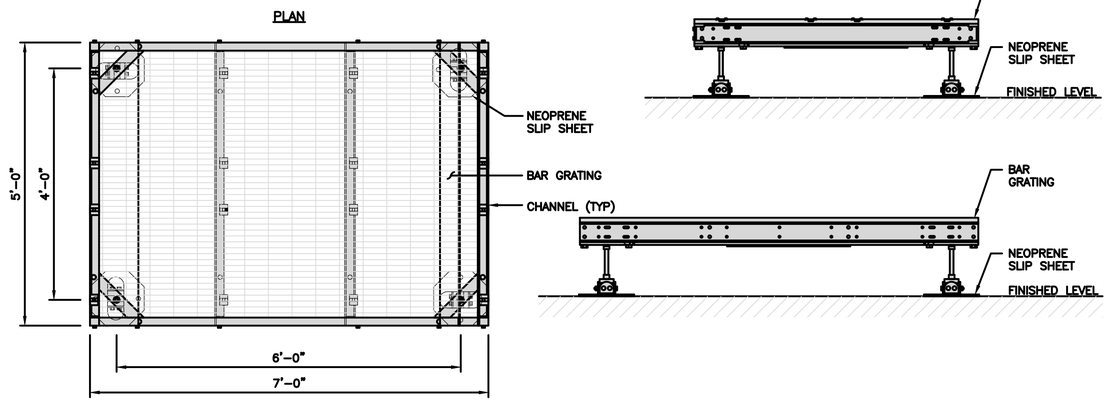
PLATFORM EQUIPMENT PLAN

12" 6" 0 1' 2' 3'
3/4"=1'-0"

1

COMMSCOPE MTC4045LP 5X7 PLATFORM	
DIMENSIONS (HxWxD)	16"x84"x60"
TOTAL WEIGHT	423 LBS

NOTE:
GC TO PROVIDE EXTENDED THREAD FOR PLATFORM IF REQUIRED HEIGHT EXCEEDS 17"

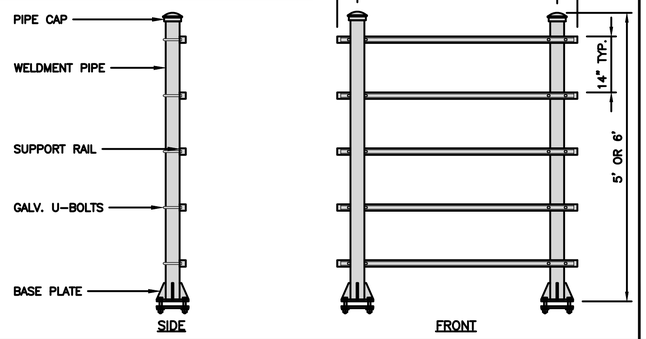


PLATFORM DETAIL

NO SCALE

2

COMMSCOPE MTC4045HFLD H-FRAME	
UNISTRUT/SUPPORT RAILS QTY	5
WEIGHT	59.74 lbs



H-FRAME DETAIL

NO SCALE

3

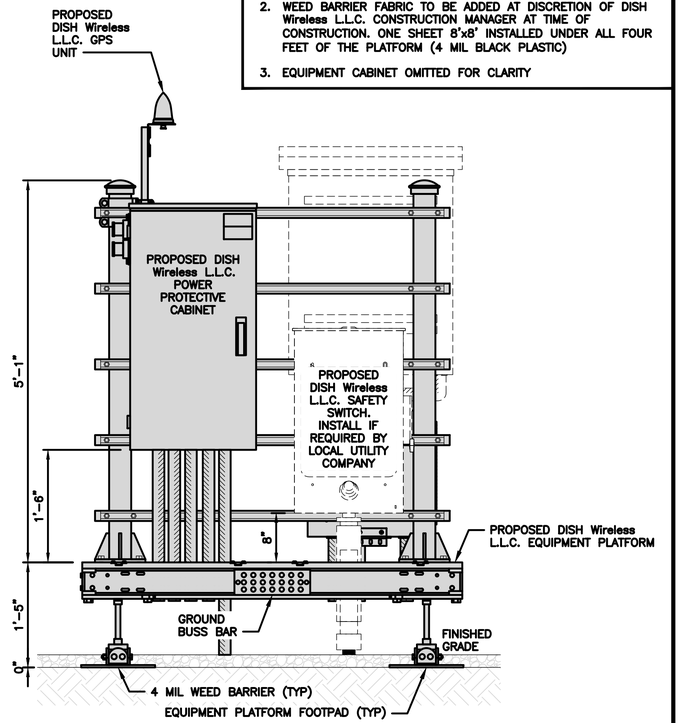
NOT USED

NO SCALE

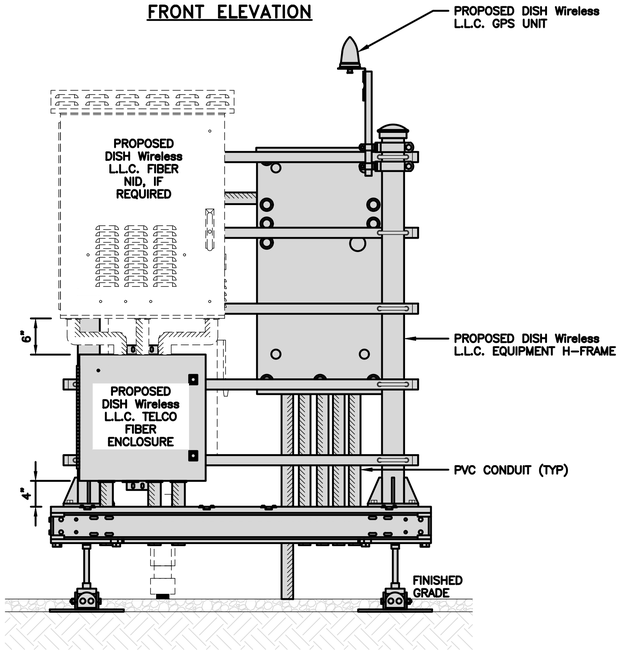
4

NOTES

1. CONTRACTOR TO BURY PLATFORM FEET WITH A MINIMUM OF 2" OF FILL PER EXISTING SITE SURFACE
2. WEED BARRIER FABRIC TO BE ADDED AT DISCRETION OF DISH Wireless L.L.C. CONSTRUCTION MANAGER AT TIME OF CONSTRUCTION. ONE SHEET 8'x8' INSTALLED UNDER ALL FOUR FEET OF THE PLATFORM (4 MIL BLACK PLASTIC)
3. EQUIPMENT CABINET OMITTED FOR CLARITY



FRONT ELEVATION



BACK ELEVATION

12" 9" 6" 3" 0 1' 2'
1"=1'-0"

5

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PROJECT INFORMATION
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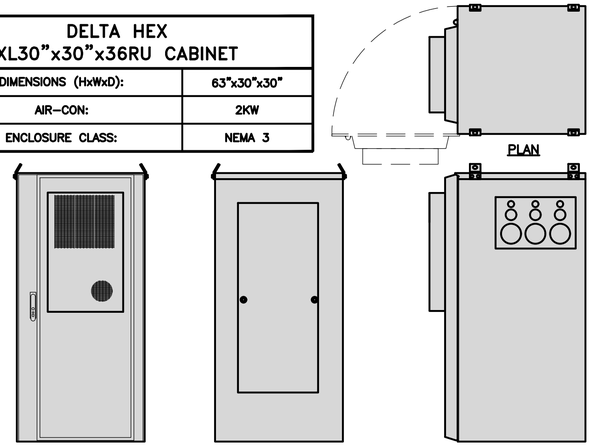
WESTPORT, CT 06880

SHEET TITLE
EQUIPMENT PLATFORM AND H-FRAME DETAILS

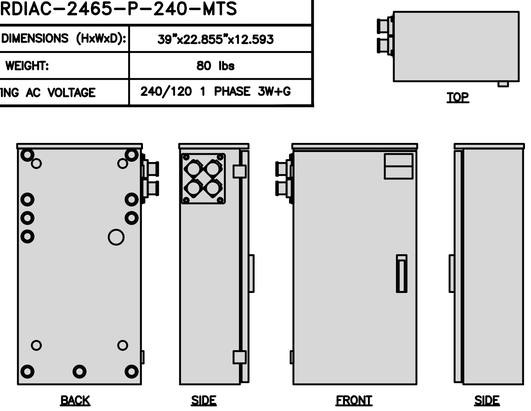
SHEET NUMBER
A-3

DELTA HEX XL30"x30"x36RU CABINET	
DIMENSIONS (HxWxD):	63"x30"x30"
AIR-CON:	2KW
ENCLOSURE CLASS:	NEMA 3



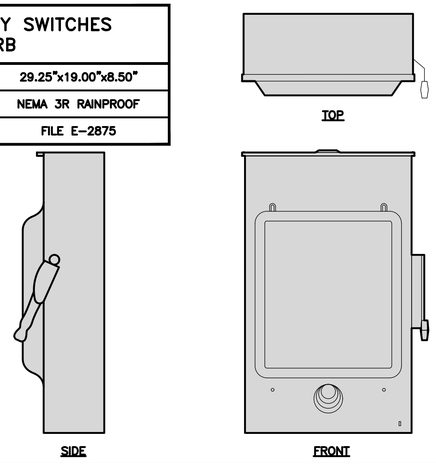
CABINET DETAIL | NO SCALE | 1

RAYCAP PPC RDIAC-2465-P-240-MTS	
ENCLOSURE DIMENSIONS (HxWxD):	39"x22.855"x12.593
WEIGHT:	80 lbs
OPERATING AC VOLTAGE	240/120 1 PHASE 3W+G



POWER PROTECTION CABINET (PPC) DETAIL | NO SCALE | 2

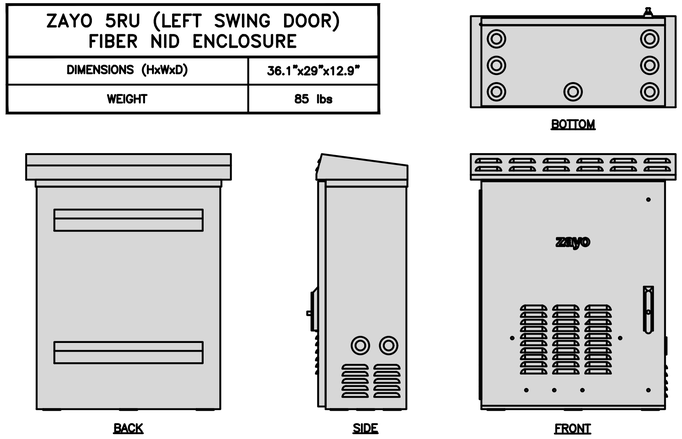
SQUARE D SAFETY SWITCHES D224NRB	
ENCLOSURE DIM (HxWxD)	29.25"x19.00"x8.50"
ENCLOSURE TYPE	NEMA 3R RAINPROOF
UL LISTED	FILE E-2875



SAFETY SWITCH DETAIL | NO SCALE | 3

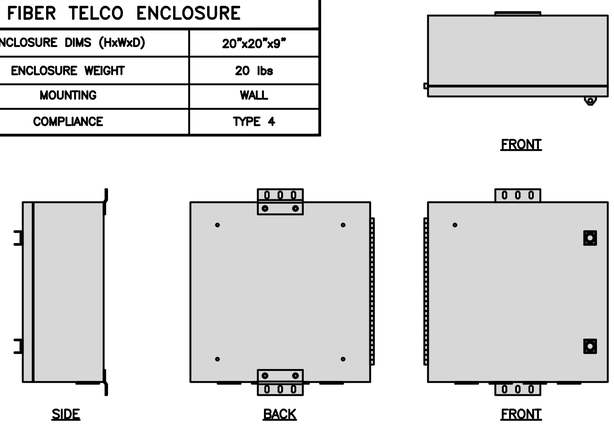
NOT USED | NO SCALE | 4

ZAYO 5RU (LEFT SWING DOOR) FIBER NID ENCLOSURE	
DIMENSIONS (HxWxD)	36.1"x29"x12.9"
WEIGHT	85 lbs



FIBER NID ENCLOSURE DETAIL | NO SCALE | 5

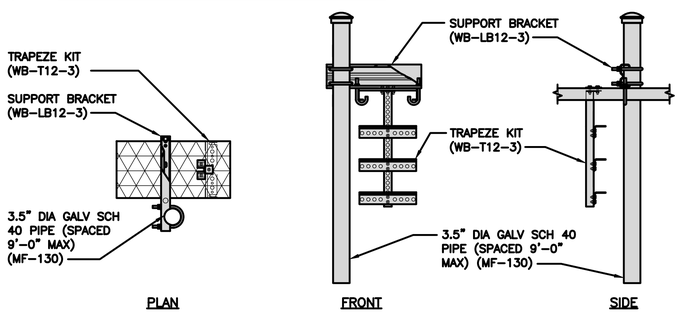
CHARLES CFIT-PF2020DSH1 FIBER TELCO ENCLOSURE	
ENCLOSURE DIMS (HxWxD)	20"x20"x9"
ENCLOSURE WEIGHT	20 lbs
MOUNTING	WALL
COMPLIANCE	TYPE 4



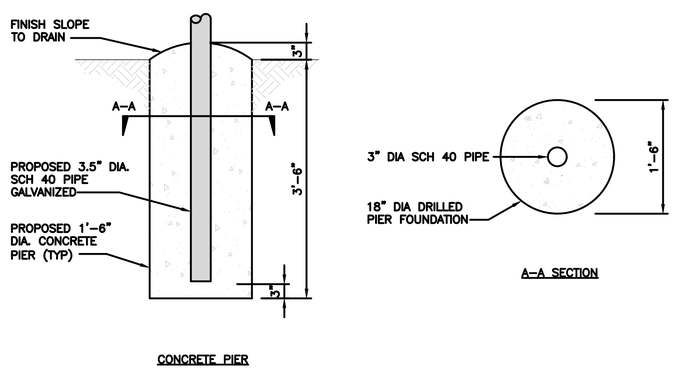
FIBER TELCO ENCLOSURE DETAIL | NO SCALE | 6

COMMSCOPE WB-K110-B WAVEGUIDE BRIDGE KIT	
DIMENSIONS (HxL)	160"x10'
WEIGHT/ VOLUME	325.0 LBS
CABLE RUN (QTY)	12

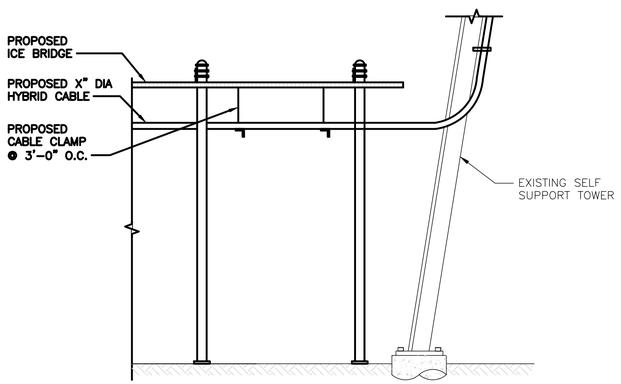
INCLUDED PRODUCTS:	
	WB-T12-3 TRAPEZE KIT, 3 RUNGS
	WB-LB12-3 SUPPORT BRACKET
	MF-130 DIRECT BURIAL PIPE COLUMN, 13'-4"



ICE BRIDGE DETAIL | NO SCALE | 7



TYPICAL ICE BRIDGE CONCRETE PIER DETAIL | NO SCALE | 8



HYBRID CABLE RUN | NO SCALE | 9

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PROFESSIONAL ENGINEER
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DISH Wireless L.L.C.
PROJECT INFORMATION

NJJER02042B
880 POST ROAD EAST
WESTPORT, CT 06880

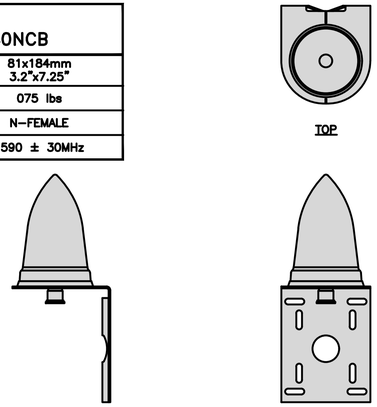
SHEET TITLE

EQUIPMENT DETAILS

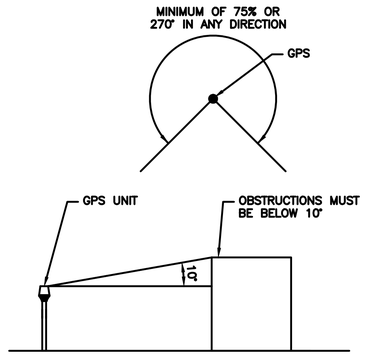
SHEET NUMBER

A-4

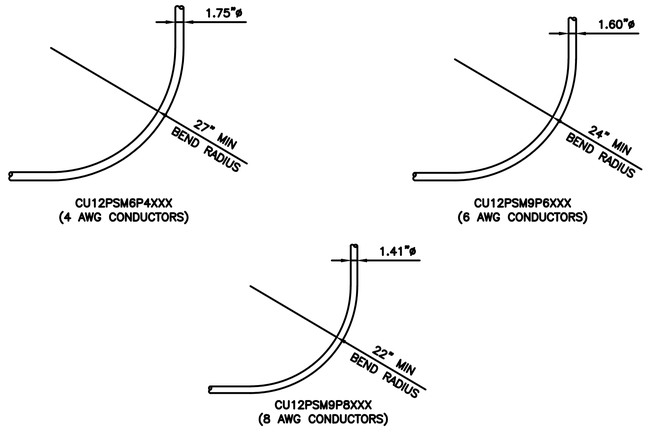
PCTEL GPSGL-TMG-SPI-40NCB	
DIMENSIONS (DIAxH) MM/INCH	81x184mm 3.2"x7.25"
WEIGHT W/ACCESSORIES	075 lbs
CONNECTOR	N-FEMALE
FREQUENCY RANGE	1590 ± 30MHz



GPS DETAIL — NO SCALE — 1



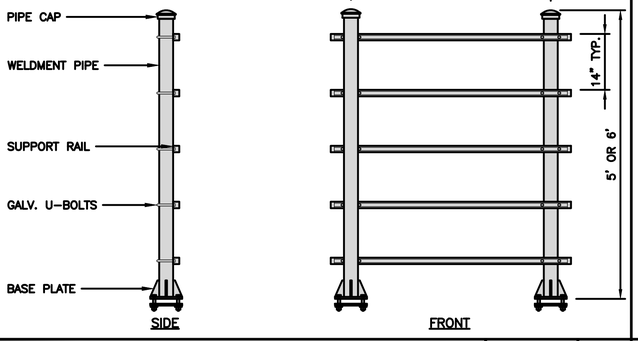
GPS MINIMUM SKY VIEW REQUIREMENTS — NO SCALE — 2



CABLES UNLIMITED HYBRID CABLE
MINIMUM BEND RADIUSES — NO SCALE — 3

COMMSCOPE MTC4045HFLD H-FRAME	
UNISTRUT/SUPPORT RAILS QTY	5
WEIGHT	±59.74 lbs

NOTE:
OR DISH Wireless L.L.C.
APPROVED EQUIVALENT



H-FRAME DETAIL — NO SCALE — 4

NOT USED — NO SCALE — 5

NOT USED — NO SCALE — 6

NOT USED — NO SCALE — 7

NOT USED — NO SCALE — 8

NOT USED — NO SCALE — 9

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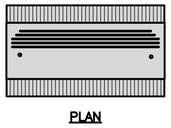
DISH Wireless L.L.C.
PROJECT INFORMATION
NJJER02042B
880 POST ROAD EAST
WESTPORT, CT 06880

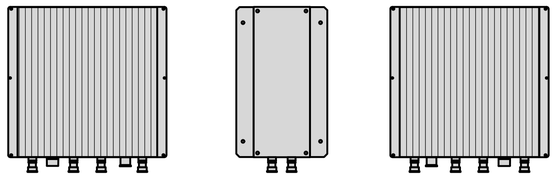
SHEET TITLE
EQUIPMENT DETAILS

SHEET NUMBER
A-5

FUJITSU TRIPLE BAND TA08025-B605

DIMENSIONS (HxWxD)	14.9"x15.7"x9"
WEIGHT	74.95 lbs
CONNECTOR TYPE	4.3-10 RF CONNECTOR
POWER SUPPLY	DC -58~-36V

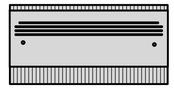

PLAN

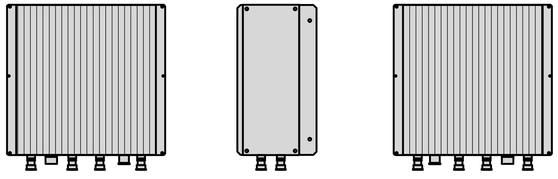

BACK SIDE FRONT

RRH DETAIL | NO SCALE | 1

FUJITSU DUAL BAND TA08025-B604

DIMENSIONS (HxWxD)	14.9"x15.7"x7.8"
WEIGHT	63.9 lbs
CONNECTOR TYPE	4.3-10 RF CONNECTOR
POWER SUPPLY	DC -58~-36V


PLAN

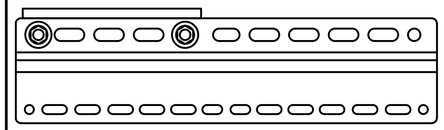

BACK SIDE FRONT

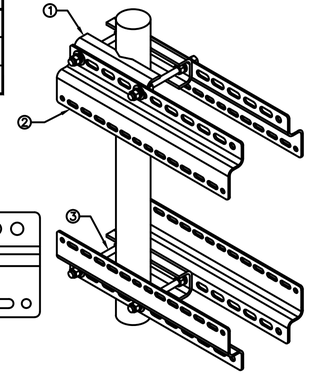
RRH DETAIL | NO SCALE | 2

SABRE DOUBLE Z-BRACKET C10123155

DIMENSIONS (HxWxD) (1 BRACKET)	5"x20"x1-13/16"
WEIGHT (FULL ASSEMBLY)	35.79 lbs
PACKAGE QUANTITY	4

#	DESCRIPTION
1	PLATE, CHANNEL BRACKET
2	RRH Z BRACKET, 3/16"
3	THREADED ROD ASSEMBLY 1/2"x12"





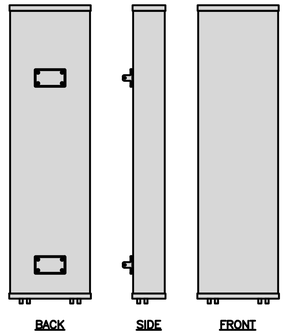
NOTE:
OR DISH Wireless L.L.C.
APPROVED EQUIVALENT

RRH MOUNT DETAIL | NO SCALE | 3

COMMSCOPE FFVV-65B-R2

DIMENSIONS (HxWxD)(MM/IN)	1828x498x197 72"x19.6"x7.8"
RF CONNECTOR INTERFACE	4.3-10 FEMALE
WEIGHT	70.8 lbs
WEIGHT WITH BRACKETS	98.1 lbs


PLAN

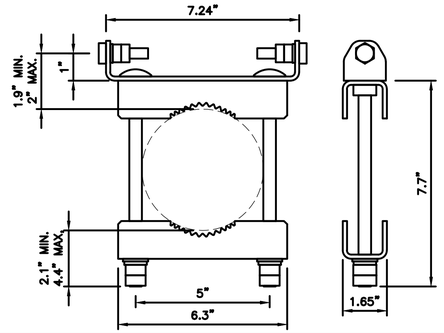

BACK SIDE FRONT

ANTENNA DETAIL | NO SCALE | 4

NOT USED | NO SCALE | 5

COMMSCOPE ANTENNA BRACKET BSAMNT-F

DIAMETER COMPATIBILITY	2.402" - 4.5"
NET WEIGHT	7.937 lbs



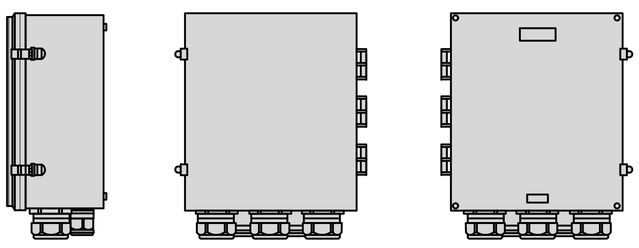
NOTE:
OR DISH Wireless L.L.C.
APPROVED EQUIVALENT

ANTENNA BRACKET DETAIL | NO SCALE | 6

RAYCAP RDIDC-9181-PF-48 DC SURGE PROTECTION (OVP)

DIMENSIONS (HxWxD)	18.98"x14.39"x8.15"
WEIGHT	21.82 LBS


PLAN


SIDE BACK FRONT

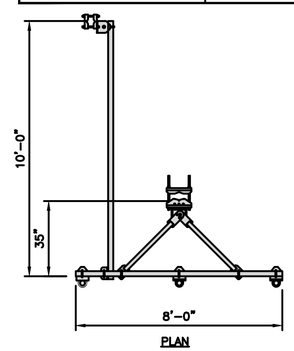
SURGE SUPPRESSION DETAIL (OVP) | NO SCALE | 7

NOT USED | NO SCALE | 8

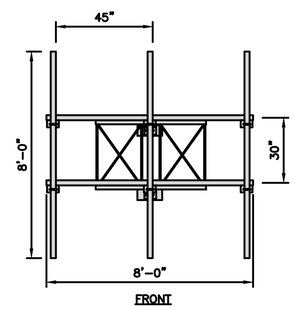
COMMSCOPE V-FRAME MTC3975083

FACE SIZE	8'-0"
WEIGHT	352.136 lbs

NOTE:
OR DISH Wireless L.L.C.
APPROVED EQUIVALENT



PLAN



FRONT

ANTENNA FRAME DETAIL | NO SCALE | 9

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SHEET TITLE
EQUIPMENT DETAILS

SHEET NUMBER
A-6

NOTES

1. CONTRACTOR SHALL FIELD VERIFY ALL PROPOSED UNDERGROUND UTILITY CONDUIT ROUTE.
2. ANTENNAS AND MOUNTS OMITTED FOR CLARITY.
3. THE GROUND LEASE PROVIDES BROAD/BLANKET UTILITY RIGHTS. "PWR" AND "FBR" PATH DEPICTED ON A-1 AND E-1 ARE BASED ON BEST AVAILABLE INFORMATION INCLUDING BUT NOT LIMITED TO FIELD VERIFICATION, PRIOR PROJECT DOCUMENTATION AND OTHER REAL PROPERTY RIGHTS DOCUMENTS. WHEN INSTALLING THE UTILITIES PLEASE LOCATE AND FOLLOW EXISTING PATH. IF EXISTING PATH IS NOT AN OPTION, PLEASE NOTIFY TOWER OWNER AS FURTHER COORDINATION MAY BE NEEDED.

UTILITY ROUTE PLAN

12' 8' 4' 0 10' 20'
3/32"=1'-0"

1

DC POWER WIRING SHALL BE COLOR CODED AT EACH END FOR IDENTIFYING +24V AND -48V CONDUCTORS. RED MARKINGS SHALL IDENTIFY +24V AND BLUE MARKINGS SHALL IDENTIFY -48V.

1. CONTRACTOR SHALL INSPECT THE EXISTING CONDITIONS PRIOR TO SUBMITTING A BID. ANY QUESTIONS ARISING DURING THE BID PERIOD IN REGARDS TO THE CONTRACTOR'S FUNCTIONS, THE SCOPE OF WORK, OR ANY OTHER ISSUE RELATED TO THIS PROJECT SHALL BE BROUGHT UP DURING THE BID PERIOD WITH THE PROJECT MANAGER FOR CLARIFICATION, NOT AFTER THE CONTRACT HAS BEEN AWARDED.
2. ALL ELECTRICAL WORK SHALL BE DONE IN ACCORDANCE WITH CURRENT NATIONAL ELECTRICAL CODES AND ALL STATE AND LOCAL CODES, LAWS, AND ORDINANCES. PROVIDE ALL COMPONENTS AND WIRING SIZES AS REQUIRED TO MEET NEC STANDARDS.
3. LOCATION OF EQUIPMENT, CONDUIT AND DEVICES SHOWN ON THE DRAWINGS ARE APPROXIMATE AND SHALL BE COORDINATED WITH FIELD CONDITIONS PRIOR TO CONSTRUCTION.
4. CONDUIT ROUGH-IN SHALL BE COORDINATED WITH THE MECHANICAL EQUIPMENT TO AVOID LOCATION CONFLICTS. VERIFY WITH THE MECHANICAL EQUIPMENT CONTRACTOR AND COMPLY AS REQUIRED.
5. CONTRACTOR SHALL PROVIDE ALL BREAKERS, CONDUITS AND CIRCUITS AS REQUIRED FOR A COMPLETE SYSTEM.
6. CONTRACTOR SHALL PROVIDE PULL BOXES AND JUNCTION BOXES AS REQUIRED BY THE NEC ARTICLE 314.
7. CONTRACTOR SHALL PROVIDE ALL STRAIN RELIEF AND CABLE SUPPORTS FOR ALL CABLE ASSEMBLIES. INSTALLATION SHALL BE IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS AND RECOMMENDATIONS.
8. ALL DISCONNECTS AND CONTROLLING DEVICES SHALL BE PROVIDED WITH ENGRAVED PHENOLIC NAMEPLATES INDICATING EQUIPMENT CONTROLLED, BRANCH CIRCUITS INSTALLED ON, AND PANEL FIELD LOCATIONS FED FROM.
9. INSTALL AN EQUIPMENT GROUNDING CONDUCTOR IN ALL CONDUITS PER THE SPECIFICATIONS AND NEC 250. THE EQUIPMENT GROUNDING CONDUCTORS SHALL BE BONDED AT ALL JUNCTION BOXES, PULL BOXES, AND ALL DISCONNECT SWITCHES, AND EQUIPMENT CABINETS.
10. ALL NEW MATERIAL SHALL HAVE A U.L. LABEL.
11. PANEL SCHEDULE LOADING AND CIRCUIT ARRANGEMENTS REFLECT POST-CONSTRUCTION EQUIPMENT.
12. CONTRACTOR SHALL BE RESPONSIBLE FOR AS-BUILT PANEL SCHEDULE AND SITE DRAWINGS.
13. ALL TRENCHES IN COMPOUND TO BE HAND DUG

ELECTRICAL NOTES

NO SCALE

2

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STATE OF CONNECTICUT
BRETT J MAGRUM
33678
PROFESSIONAL ENGINEER
1/19/2023

DRAWN BY:	CHECKED BY:	APPROVED BY:
PRI	---	---

RFDS REV #: ---

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
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A&E PROJECT NUMBER
NJJER02042B

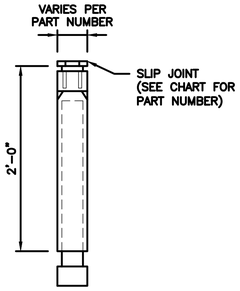
DISH Wireless L.L.C.
PROJECT INFORMATION
NJJER02042B
880 POST ROAD EAST
WESTPORT, CT 06880

SHEET TITLE
ELECTRICAL/FIBER ROUTE PLAN AND NOTES

SHEET NUMBER
E-1

CARLON EXPANSION FITTINGS

COUPLING END PART#	MALE TERMINAL ADAPTER END PART#	SIZE	STD CTN QTY.	TRAVEL LENGTH
E945D	E945DX	1/2"	20	4"
E945E	E945EX	3/4"	15	4"
E945F	E945FX	1"	10	4"
E945G	E945GX	1 1/4"	5	4"
E945H	E945HX	1 1/2"	5	4"
E945J	E945JX	2"	15	8"
E945K	E945KX	2 1/2"	10	8"
E945L	E945LX	3"	10	8"
E945M	E945MX	3 1/2"	5	8"
E945N	E945NX	4"	5	8"
E945P	E945PX	5"	1	8"
E945R	E945RX	6"	1	8"

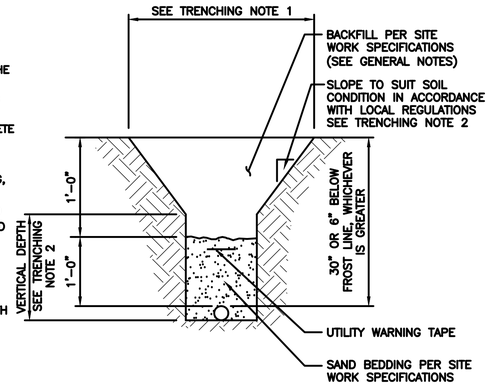


NOTE:
CONTRACTOR TO INSTALL EXPANSION FITTING SLIP JOINT AT METER CENTER CONDUIT TERMINATION, AS PER LOCAL UTILITY POLICY, ORDINANCE AND/OR SPECIFIED REQUIREMENT.

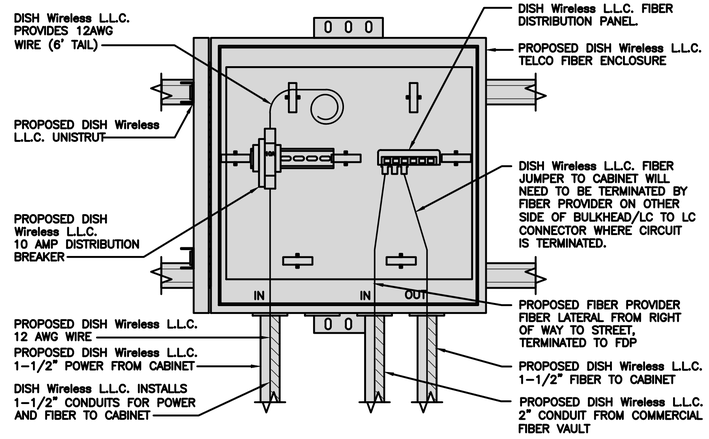
EXPANSION JOINT DETAIL | NO SCALE | 1

TRENCHING NOTES

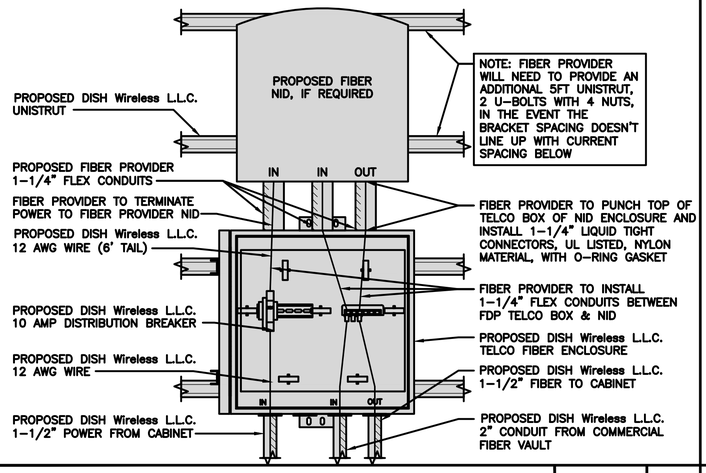
1. CONTRACTOR SHALL RESTORE THE TRENCH TO ITS ORIGINAL CONDITIONS BY EITHER SEEDING OR SODDING GRASS AREAS, OR REPLACING ASPHALT OR CONCRETE AREAS TO ITS ORIGINAL CROSS SECTION.
2. TRENCHING SAFETY; INCLUDING, BUT NOT LIMITED TO SOIL CLASSIFICATION, SLOPING, AND SHORING, SHALL BE GOVERNED BY THE CURRENT OSHA TRENCHING AND EXCAVATION SAFETY STANDARDS.
3. ALL CONDUITS SHALL BE INSTALLED IN COMPLIANCE WITH THE CURRENT NATIONAL ELECTRIC CODE (NEC) OR AS REQUIRED BY THE LOCAL JURISDICTION, WHICHEVER IS THE MOST STRINGENT.



TYPICAL UNDERGROUND TRENCH DETAIL | NO SCALE | 2



DARK TELCO BOX – INTERIOR WIRING LAYOUT | NO SCALE | 3



LIT TELCO BOX – INTERIOR WIRING LAYOUT (OPTIONAL) | NO SCALE | 4

NOT USED | NO SCALE | 5

NOT USED | NO SCALE | 6

NOT USED | NO SCALE | 7

NOT USED | NO SCALE | 8

NOT USED | NO SCALE | 9

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MK DEVELOPMENT
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DISH Wireless L.L.C.
PROJECT INFORMATION

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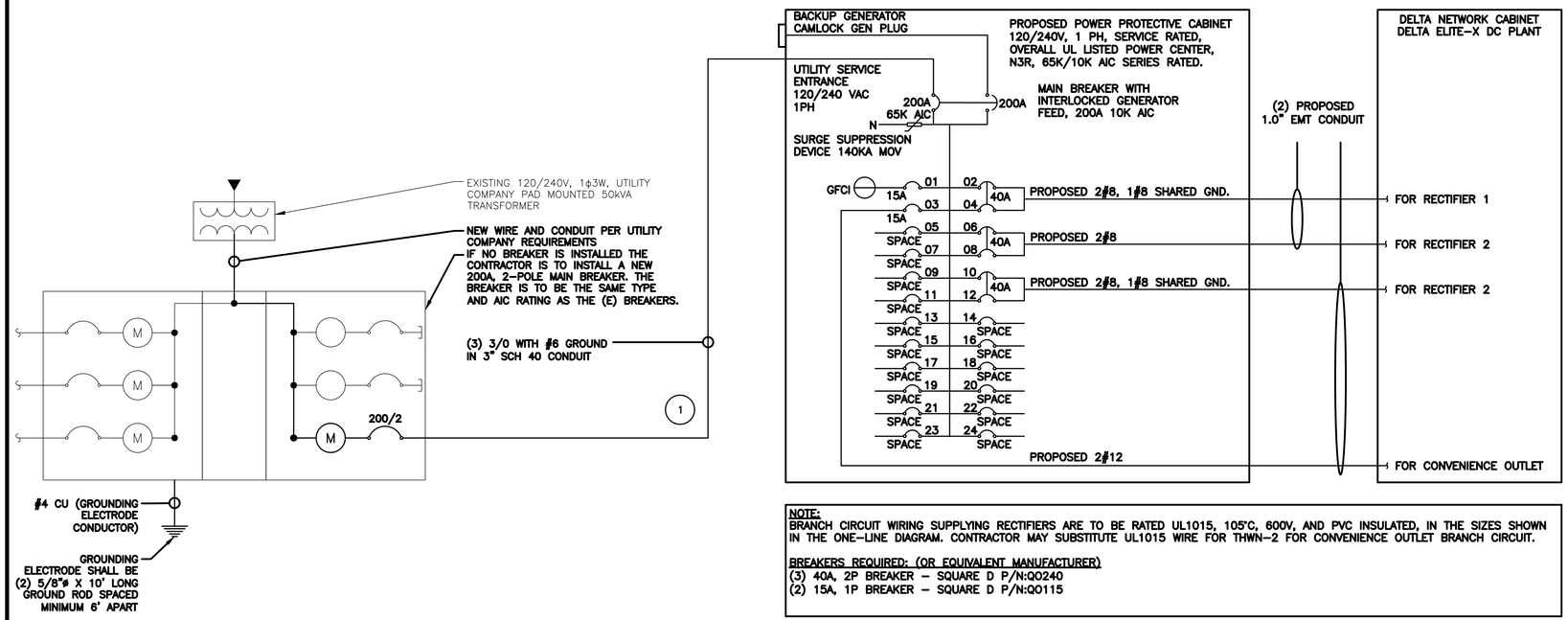
880 POST ROAD EAST
WESTPORT, CT 06880

SHEET TITLE

ELECTRICAL DETAILS

SHEET NUMBER

E-2



NOTE:
BRANCH CIRCUIT WIRING SUPPLYING RECTIFIERS ARE TO BE RATED UL1015, 105°C, 600V, AND PVC INSULATED, IN THE SIZES SHOWN IN THE ONE-LINE DIAGRAM. CONTRACTOR MAY SUBSTITUTE UL1015 WIRE FOR THWN-2 FOR CONVENIENCE OUTLET BRANCH CIRCUIT.

BREAKERS REQUIRED: (OR EQUIVALENT MANUFACTURER)
(3) 40A, 2P BREAKER – SQUARE D P/N:QO240
(2) 15A, 1P BREAKER – SQUARE D P/N:QO115

NOTES

THE (2) CONDUITS WITH (4) CURRENT CARRYING CONDUCTORS EACH, SHALL APPLY THE ADJUSTMENT FACTOR OF 80% PER 2020 NEC TABLE 310.15(C)(1) FOR UL1015 WIRE. (ALL WIRE AND TERMINATION HARDWARE TO BE RATED 75'C)

#12 FOR 20A OCPD WIRE DERATING: 0.8 x 25A = 20.0A
#8 FOR 40A OCPD WIRE DERATING: 0.8 x 50A = 40.0A

CONDUIT SIZING: AT 40% FILL PER NEC CHAPTER 9, TABLE 4, ARTICLE 358.

1.0" CONDUIT – .3460 SQ. IN AREA
3.0" CONDUIT – 3.538 SQ. IN AREA

(2 CONDUIT): USING THWN-2, CU.
RECTIFIER CONDUCTORS

#8	– 0.0366 SQ. IN X 4	= 0.1464 SQ. IN
#8	– 0.0366 SQ. IN X 1	= 0.0366 SQ. IN <GROUND
TOTAL		= 0.1830 SQ. IN

RECTIFIER & GFCI CONDUCTORS

#12	– 0.0133 SQ. IN X 2	= 0.0266 SQ. IN
#8	– 0.0366 SQ. IN X 2	= 0.0732 SQ. IN
#8	– 0.0366 SQ. IN X 1	= 0.0366 SQ. IN <GROUND
TOTAL		= 0.1364 SQ. IN

1.0" EMT CONDUIT IS ADEQUATE TO HANDLE THE TOTAL OF (5) WIRES, INCLUDING GROUND WIRE, AS INDICATED ABOVE.

PPC FEED CONDUCTORS (1 CONDUIT): USING THWN, CU.

3/0	– 0.2679 SQ. IN X 3	= 0.8037 SQ. IN
#6	– 0.0507 SQ. IN X 1	= 0.0507 SQ. IN <GROUND
TOTAL		= 0.8544 SQ. IN

3.0" SCH 40 PVC CONDUIT IS ADEQUATE TO HANDLE THE TOTAL OF (4) WIRES, INCLUDING GROUND WIRE, AS INDICATED ABOVE.

(1) OPTIONAL ALUMINUM SERVICE CONDUCTOR:
- 4/0 AL + #2 GRD MAY BE USED INSTEAD OF 3/0 CU + #6 GRD IF THE TOTAL LENGTH OF THE CONDUCTOR IS LESS THAN 300 FT FROM THE TRANSFORMER.
- ALUMINUM CONDUCTORS MUST BE 90'C TO CARRY THE FULL 200A LOAD REQUIRED
- ALUMINUM TO COPPER BUSS CONNECTIONS MUST MEET AND CONFORM TO ANSI AND BE UL LISTED. USE ANTI CORROSION CONDUCTIVE LUBRICANT ON CONNECTIONS

PPC ONE-LINE DIAGRAM

NO SCALE | 1

PANEL NAME	LOCATION	VOLTAGE: 240/120 1Ø MAIN C/B: 200 AMPS BUS RATING: 200 AMPS	MOUNTING/ENCLOSURE: SURFACE/NEMA 3R AVAIL. FAULT CURRENT: SHORT CIRCUIT RATING: 65,000 / 10,000 SERIES RATED
DELTA	EQUIPMENT PLATFORM		

AMPS POLES	WIRE & CONDUIT	TYPE	DESCRIPTION	KVA	CKT	A	B	CKT	KVA	DESCRIPTION	TYPE	WIRE & CONDUIT	AMPS POLES
15/1	2 #12, 1 #12G	R	INTERNAL GFCI	0.18	1	1.68		2	1.50	RECTIFIER	EQ	SEE ONE LINE	40/2
15/1	SEE ONE LINE	R	CONVENIENCE OUTLET	0.18	3		1.68	4	1.50		EQ		
			SPACE		5	1.50		6	1.50	RECTIFIER	EQ	SEE ONE LINE	40/2
			SPACE		7		1.50	8	1.50		EQ		
			SPACE		9	1.50		10	1.50	RECTIFIER	EQ	SEE ONE LINE	40/2
			SPACE		11		1.50	12	1.50		EQ		
			SPACE		13			14		SPACE			
			SPACE		15			16		SPACE			
			SPACE		17			18		SPACE			
			SPACE		19			20		SPACE			
			SPACE		21			22		SPACE			
			SPACE		23			24		SPACE			
			PHASED LOAD			4.7			4.7	KVA			

TOTAL CONNECTED LOAD	9.4 kVA	39 A
TOTAL DEMAND LOAD	9.4 kVA	39 A

LOAD TYPE	DESCRIPTION	CONN. LOAD KVA	CONN. LOAD AMPS	DEMAND FACTOR	DESIGN LOAD KVA	DESIGN LOAD AMPS
L	LIGHTING	0.0	0.0	1.25	0.0	0.0
R	RECEPTACLE	0.4	1.5	NEC	0.4	1.5
M	MOTOR	0.0	0.0	NEC	0.0	0.0
H	HEATING	0.0	0.0	1.00	0.0	0.0
AC	HVAC	0.0	0.0	1.00	0.0	0.0
EQ	EQUIPMENT	9.0	37.5	1.00	9.0	37.5
E	EXISTING	0.0	0.0	1.25	0.0	0.0

*ALL EQUIPMENT LOADS CONSIDERED CONTINUOUS LOADS

PANEL SCHEDULE

NO SCALE | 2

NOT USED

NO SCALE | 3

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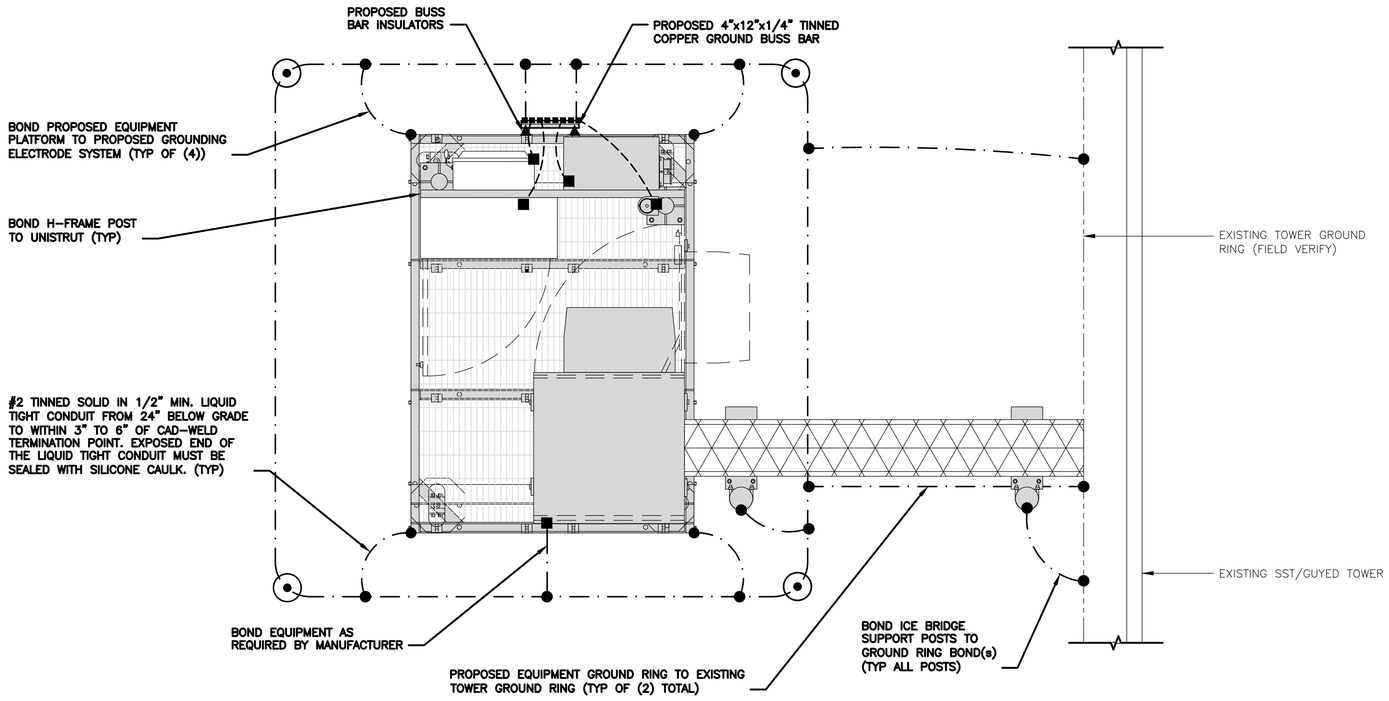
DISH Wireless L.L.C.
PROJECT INFORMATION
NJJER02042B
880 POST ROAD EAST
WESTPORT, CT 06880

SHEET TITLE
ELECTRICAL ONE-LINE, FAULT CALCS & PANEL SCHEDULE

SHEET NUMBER
E-3

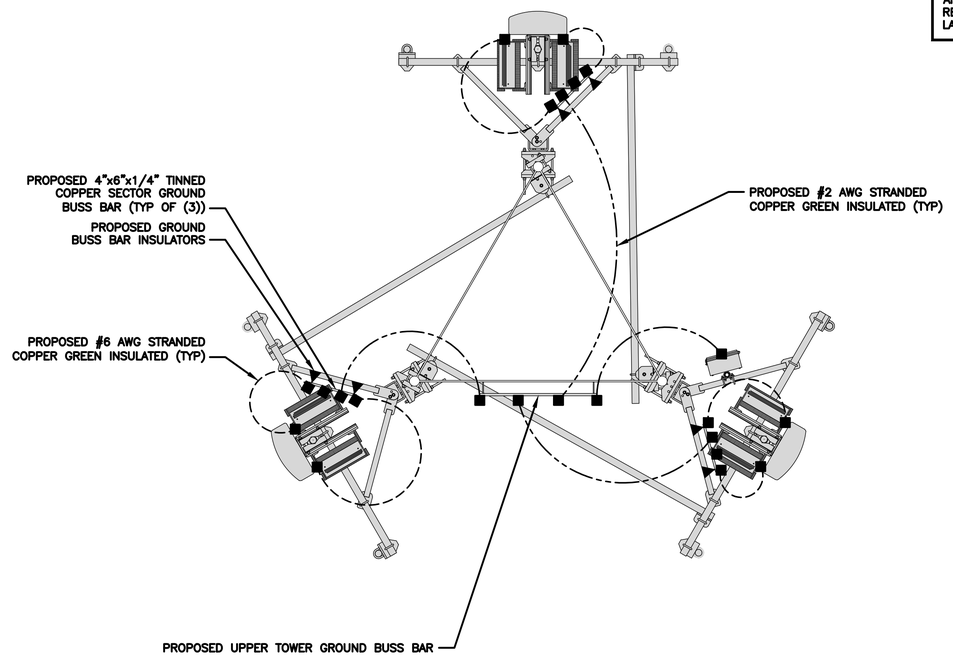


TYPICAL EQUIPMENT GROUNDING PLAN

NO SCALE | 1

NOTES

ANTENNAS AND OVP SHOWN ARE GENERIC AND NOT REFERENCING TO A SPECIFIC MANUFACTURER. THIS LAYOUT IS FOR REFERENCE PURPOSES ONLY



TYPICAL ANTENNA GROUNDING PLAN

NO SCALE | 2

- EXOTHERMIC CONNECTION
- MECHANICAL CONNECTION
- GROUND BUS BAR
- GROUND ROD
- TEST GROUND ROD WITH INSPECTION SLEEVE
- #6 AWG STRANDED & INSULATED
- #2 AWG SOLID COPPER TINNED
- #2 AWG STRANDED & INSULATED
- BUSS BAR INSULATOR

GROUNDING LEGEND

1. GROUNDING IS SHOWN DIAGRAMMATICALLY ONLY.
2. CONTRACTOR SHALL GROUND ALL EQUIPMENT AS A COMPLETE SYSTEM. GROUNDING SHALL BE IN COMPLIANCE WITH NEC SECTION 250 AND DISH Wireless L.L.C. GROUNDING AND BONDING REQUIREMENTS AND MANUFACTURER'S SPECIFICATIONS.
3. ALL GROUND CONDUCTORS SHALL BE COPPER; NO ALUMINUM CONDUCTORS SHALL BE USED.

GROUNDING KEY NOTES

(A) EXTERIOR GROUND RING: #2 AWG SOLID COPPER, BURIED AT A DEPTH OF AT LEAST 30 INCHES BELOW GRADE, OR 6 INCHES BELOW THE FROST LINE AND APPROXIMATELY 24 INCHES FROM THE EXTERIOR WALL OR FOOTING.

(B) TOWER GROUND RING: THE GROUND RING SYSTEM SHALL BE INSTALLED AROUND AN ANTENNA TOWER'S LEGS, AND/OR GUY ANCHORS. WHERE SEPARATE SYSTEMS HAVE BEEN PROVIDED FOR THE TOWER AND THE BUILDING, AT LEAST TWO BONDS SHALL BE MADE BETWEEN THE TOWER RING GROUND SYSTEM AND THE BUILDING RING GROUND SYSTEM USING MINIMUM #2 AWG SOLID COPPER CONDUCTORS.

(C) INTERIOR GROUND RING: #2 AWG STRANDED GREEN INSULATED COPPER CONDUCTOR EXTENDED AROUND THE PERIMETER OF THE EQUIPMENT AREA. ALL NON-TELECOMMUNICATIONS RELATED METALLIC OBJECTS FOUND WITHIN A SITE SHALL BE GROUNDED TO THE INTERIOR GROUND RING WITH #6 AWG STRANDED GREEN INSULATED CONDUCTOR.

(D) BOND TO INTERIOR GROUND RING: #2 AWG SOLID TINNED COPPER WIRE PRIMARY BONDS SHALL BE PROVIDED AT LEAST AT FOUR POINTS ON THE INTERIOR GROUND RING, LOCATED AT THE CORNERS OF THE BUILDING.

(E) GROUND ROD: UL LISTED COPPER CLAD STEEL. MINIMUM 1/2" DIAMETER BY EIGHT FEET LONG. GROUND RODS SHALL BE INSTALLED WITH INSPECTION SLEEVES. GROUND RODS SHALL BE DRIVEN TO THE DEPTH OF GROUND RING CONDUCTOR.

(F) CELL REFERENCE GROUND BAR: POINT OF GROUND REFERENCE FOR ALL COMMUNICATIONS EQUIPMENT FRAMES. ALL BONDS ARE MADE WITH #2 AWG UNLESS NOTED OTHERWISE STRANDED GREEN INSULATED COPPER CONDUCTORS. BOND TO GROUND RING WITH (2) #2 SOLID TINNED COPPER CONDUCTORS.

(G) HATCH PLATE GROUND BAR: BOND TO THE INTERIOR GROUND RING WITH TWO #2 AWG STRANDED GREEN INSULATED COPPER CONDUCTORS. WHEN A HATCH-PLATE AND A CELL REFERENCE GROUND BAR ARE BOTH PRESENT, THE CRGB MUST BE CONNECTED TO THE HATCH-PLATE AND TO THE INTERIOR GROUND RING USING (2) TWO #2 AWG STRANDED GREEN INSULATED COPPER CONDUCTORS EACH.

(H) EXTERIOR CABLE ENTRY PORT GROUND BARS: LOCATED AT THE ENTRANCE TO THE CELL SITE BUILDING. BOND TO GROUND RING WITH A #2 AWG SOLID TINNED COPPER CONDUCTORS WITH AN EXOTHERMIC WELD AND INSPECTION SLEEVE.

(I) TELCO GROUND BAR: BOND TO BOTH CELL REFERENCE GROUND BAR OR EXTERIOR GROUND RING.

(J) FRAME BONDING: THE BONDING POINT FOR TELECOM EQUIPMENT FRAMES SHALL BE THE GROUND BUS THAT IS NOT ISOLATED FROM THE EQUIPMENTS METAL FRAMEWORK.

(K) INTERIOR UNIT BONDS: METAL FRAMES, CABINETS AND INDIVIDUAL METALLIC UNITS LOCATED WITH THE AREA OF THE INTERIOR GROUND RING REQUIRE A #6 AWG STRANDED GREEN INSULATED COPPER BOND TO THE INTERIOR GROUND RING.

(L) FENCE AND GATE GROUNDING: METAL FENCES WITHIN 7 FEET OF THE EXTERIOR GROUND RING OR OBJECTS BONDED TO THE EXTERIOR GROUND RING SHALL BE BONDED TO THE GROUND RING WITH A #2 AWG SOLID TINNED COPPER CONDUCTOR AT AN INTERVAL NOT EXCEEDING 25 FEET. BONDS SHALL BE MADE AT EACH GATE POST AND ACROSS GATE OPENINGS.

(M) EXTERIOR UNIT BONDS: METALLIC OBJECTS, EXTERNAL TO OR MOUNTED TO THE BUILDING, SHALL BE BONDED TO THE EXTERIOR GROUND RING. USING #2 TINNED SOLID COPPER WIRE

(N) ICE BRIDGE SUPPORTS: EACH ICE BRIDGE LEG SHALL BE BONDED TO THE GROUND RING WITH #2 AWG BARE TINNED COPPER CONDUCTOR. PROVIDE EXOTHERMIC WELDS AT BOTH THE ICE BRIDGE LEG AND BURIED GROUND RING.

(O) DURING ALL DC POWER SYSTEM CHANGES INCLUDING DC SYSTEM CHANGE OUTS, RECTIFIER REPLACEMENTS OR ADDITIONS, BREAKER DISTRIBUTION CHANGES, BATTERY ADDITIONS, BATTERY REPLACEMENTS AND INSTALLATIONS OR CHANGES TO DC CONVERTER SYSTEMS IT SHALL BE REQUIRED THAT SERVICE CONTRACTORS VERIFY ALL DC POWER SYSTEMS ARE EQUIPPED WITH A MASTER DC SYSTEM RETURN GROUND CONDUCTOR FROM THE DC POWER SYSTEM COMMON RETURN BUS DIRECTLY CONNECTED TO THE CELL SITE REFERENCE GROUND BAR

(P) TOWER TOP COLLECTOR BUSS BAR IS TO BE MECHANICALLY BONDED TO TOWER STEEL.

REFER TO DISH Wireless L.L.C. GROUNDING NOTES.

GROUNDING KEY NOTES

NO SCALE | 3

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880 POST ROAD EAST
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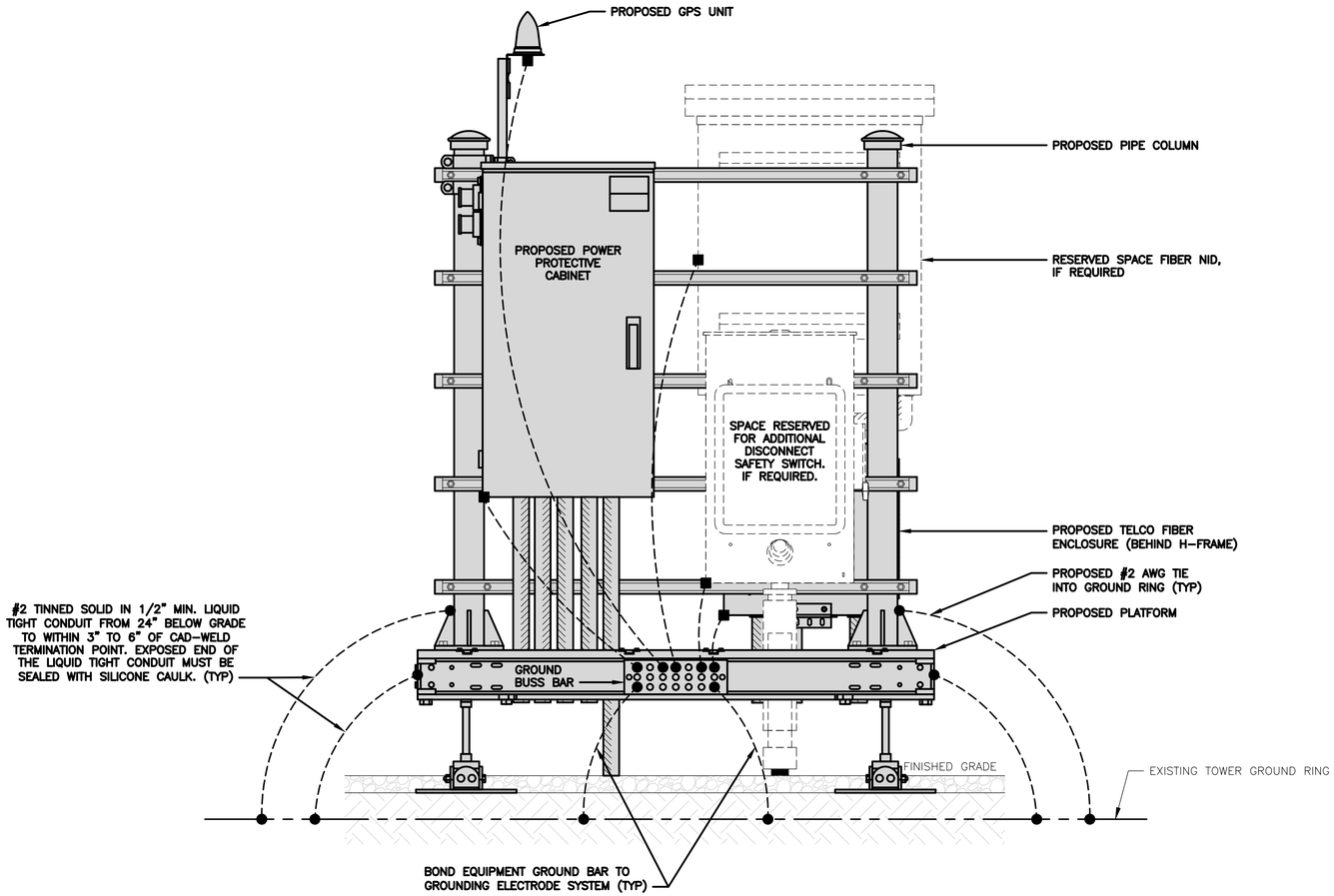
SHEET TITLE
GROUNDING PLANS AND NOTES

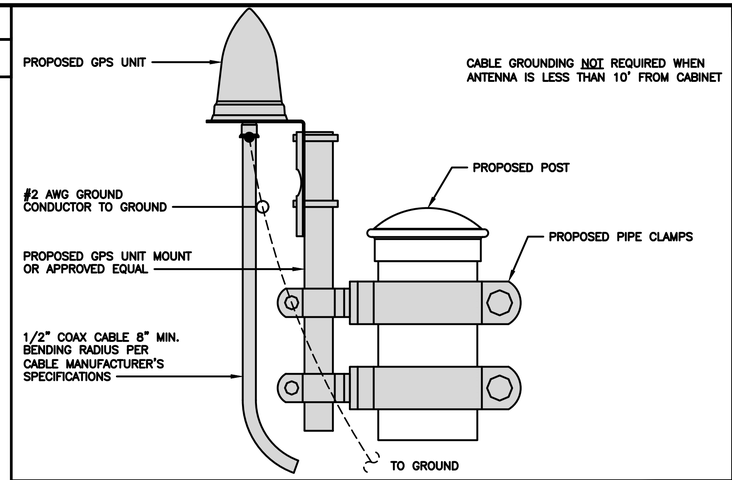
SHEET NUMBER
G-1

NOTES

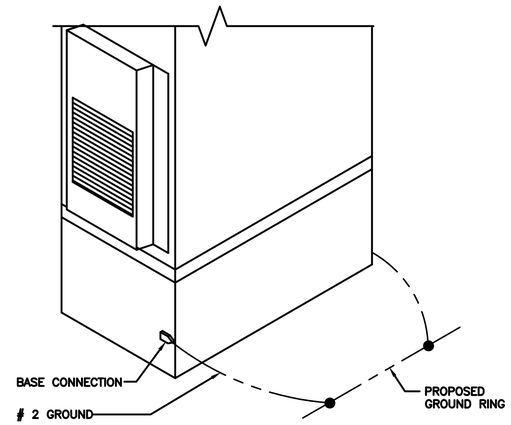
EQUIPMENT CABINET OMITTED FOR CLARITY



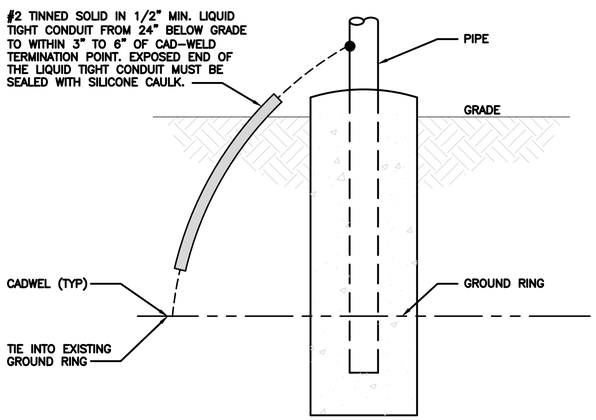
H-FRAME GROUNDING DETAIL | NO SCALE | 1



TYPICAL GPS UNIT GROUNDING | NO SCALE | 2

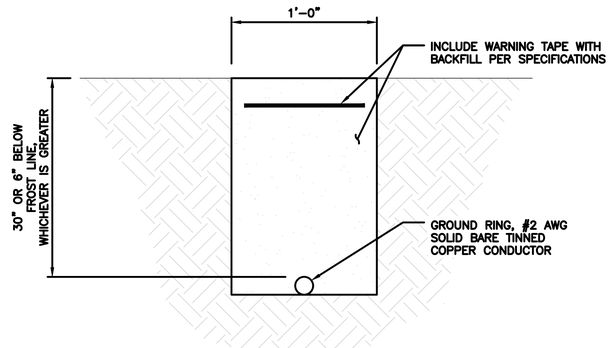


OUTDOOR CABINET GROUNDING | NO SCALE | 3



TRANSITIONING GROUND DETAIL | NO SCALE | 4

NOT USED | NO SCALE | 5



TYPICAL GROUND RING TRENCH | NO SCALE | 6

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SHEET TITLE

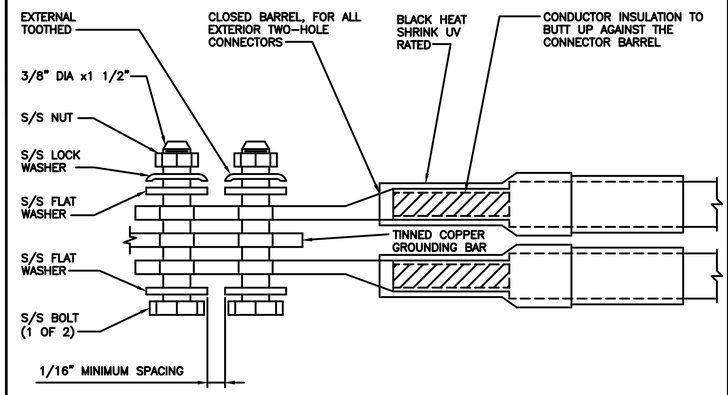
GROUNDING DETAILS

SHEET NUMBER

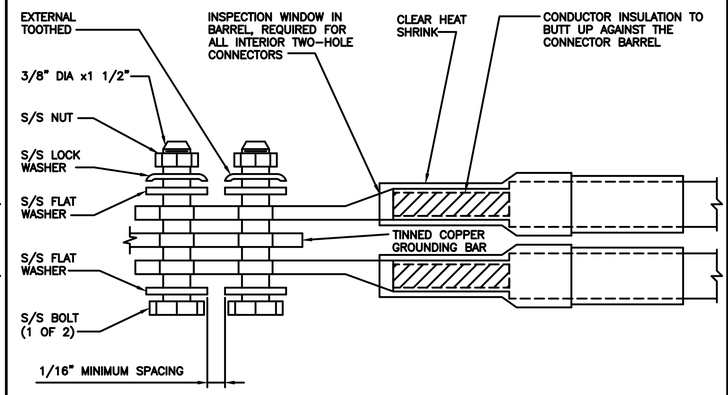
G-2

1. EXOTHERMIC WELD (2) TWO, #2 AWG BARE TINNED SOLID COPPER CONDUCTORS TO GROUND BAR, ROUTE CONDUCTORS TO BURIED GROUND RING AND PROVIDE PARALLEL EXOTHERMIC WELD.
2. ALL EXTERIOR GROUNDING HARDWARE SHALL BE STAINLESS STEEL 3/8" DIAMETER OR LARGER. ALL HARDWARE 18-8 STAINLESS STEEL INCLUDING LOCK WASHERS, COAT ALL SURFACES WITH AN ANTI-OXIDANT COMPOUND BEFORE MATING.
3. FOR GROUND BOND TO STEEL ONLY: COAT ALL SURFACES WITH AN ANTI-OXIDANT COMPOUND BEFORE MATING.
4. DO NOT INSTALL CABLE GROUNDING KIT AT A BEND AND ALWAYS DIRECT GROUND CONDUCTOR DOWN TO GROUNDING BUS.
5. NUT & WASHER SHALL BE PLACED ON THE FRONT SIDE OF THE GROUND BAR AND BOLTED ON THE BACK SIDE.
6. ALL GROUNDING PARTS AND EQUIPMENT TO BE SUPPLIED AND INSTALLED BY CONTRACTOR.
7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING ADDITIONAL GROUND BAR AS REQUIRED.
8. ENSURE THE WIRE INSULATION TERMINATION IS WITHIN 1/8" OF THE BARREL (NO SHINERS).

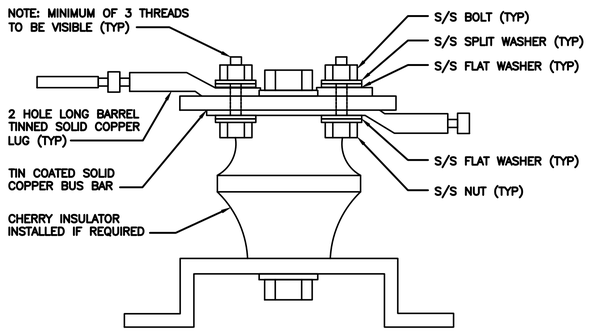
TYPICAL GROUNDING NOTES | NO SCALE | 1



TYPICAL EXTERIOR TWO HOLE LUG | NO SCALE | 2



TYPICAL INTERIOR TWO HOLE LUG | NO SCALE | 3



LUG DETAIL | NO SCALE | 4

NOT USED | NO SCALE | 5

NOT USED | NO SCALE | 6

NOT USED | NO SCALE | 7

NOT USED | NO SCALE | 8

NOT USED | NO SCALE | 9

dish wireless.
5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120

MK DEVELOPMENT
140 BEACH 137TH STREET
ROCKAWAY, NY 11694

STATE OF CONNECTICUT
BRETT J MAGARIAN
33678
PROFESSIONAL ENGINEER
1/19/2023

DRAWN BY:	CHECKED BY:	APPROVED BY:
PRI	---	---

RFDS REV #: ---

CONSTRUCTION DOCUMENTS

SUBMITTALS

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A&E PROJECT NUMBER

NJJER02042B

DISH Wireless L.L.C.
PROJECT INFORMATION

NJJER02042B
880 POST ROAD EAST
WESTPORT, CT 06880

SHEET TITLE

GROUNDING DETAILS

SHEET NUMBER

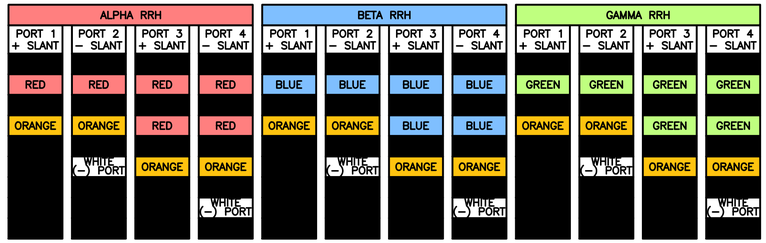
G-3

HYBRID/DISCREET CABLES

3/4" TAPE WIDTHS WITH 3/4" SPACING

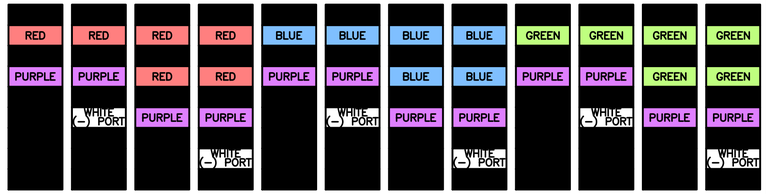
LOW–BAND RRH
(600 MHz N71 BASEBAND) +
(850 MHz N26 BAND) +
(700 MHz N29 BAND) – OPTIONAL PER MARKET

ADD FREQUENCY COLOR TO SECTOR BAND
(CBRS WILL USE YELLOW BAND)



MID–BAND RRH
(AWS BANDS N66+N70)

ADD FREQUENCY COLOR TO SECTOR BAND
(CBRS WILL USE YELLOW BANDS)



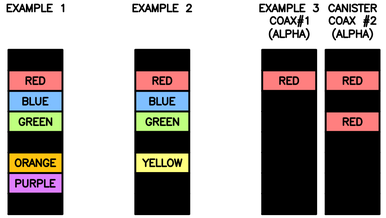
HYBRID/DISCREET CABLES

INCLUDE SECTOR BANDS BEING SUPPORTED ALONG WITH FREQUENCY BANDS.

EXAMPLE 1 – HYBRID, OR DISCREET, SUPPORTS ALL SECTORS, BOTH LOW–BANDS AND MID–BANDS.

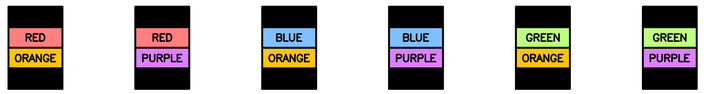
EXAMPLE 2 – HYBRID, OR DISCREET, SUPPORTS CBRS ONLY, ALL SECTORS.

EXAMPLE 3 – MAIN COAX WITH GROUND MOUNTED RRHs.



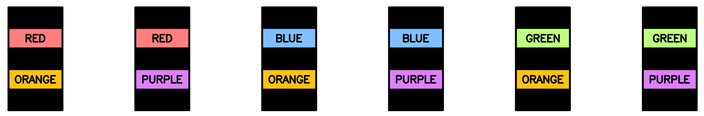
FIBER JUMPERS TO RRHs

LOW–BAND HHR FIBER CABLES HAVE SECTOR STRIPE ONLY.



POWER CABLES TO RRHs

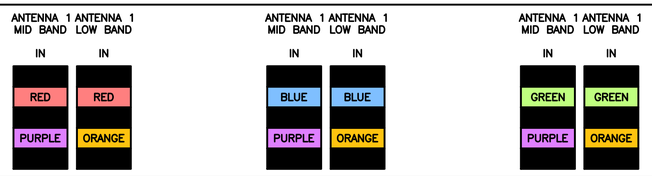
LOW–BAND RRH POWER CABLES HAVE SECTOR STRIPE ONLY



RET MOTORS AT ANTENNAS

RET CONTROL IS HANDLED BY THE MID–BAND RRH WHEN ONE SET OF RET PORTS EXIST ON ANTENNA.

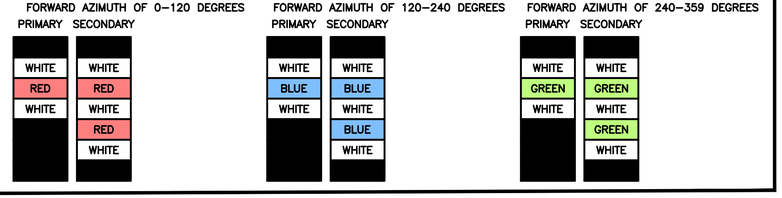
SEPARATE RET CABLES ARE USED WHEN ANTENNA PORTS PROVIDE INPUTS FOR BOTH LOW AND MID BANDS.



MICROWAVE RADIO LINKS

LINKS WILL HAVE A 1.5–2 INCH WHITE WRAP WITH THE AZIMUTH COLOR OVERLAPPING IN THE MIDDLE.
ADD ADDITIONAL SECTOR COLOR BANDS FOR EACH ADDITIONAL MW RADIO.

MICROWAVE CABLES WILL REQUIRE P–TOUCH LABELS INSIDE THE CABINET TO IDENTIFY THE LOCAL AND REMOTE SITE ID's.



RF CABLE COLOR CODES | NO SCALE | 1

LOW BANDS (N71+N26) OPTIONAL – (N29): ORANGE

AWS (N66+N70+H–BLOCK): PURPLE

CBRS TECH (3 GHz): YELLOW

NEGATIVE SLANT PORT ON ANT/RRH: WHITE

ALPHA SECTOR: RED

BETA SECTOR: BLUE

GAMMA SECTOR: GREEN

COLOR IDENTIFIER | NO SCALE | 2

NOT USED | NO SCALE | 3

NOT USED | NO SCALE | 4

---

dish wireless.
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PROJECT INFORMATION
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WESTPORT, CT 06880

SHEET TITLE
RF
CABLE COLOR CODE

SHEET NUMBER
RF-1

LEGEND

EXOTHERMIC CONNECTION

MECHANICAL CONNECTION

BUSS BAR INSULATOR

CHEMICAL ELECTROLYTIC GROUNDING SYSTEM

TEST CHEMICAL ELECTROLYTIC GROUNDING SYSTEM — T

EXOTHERMIC WITH INSPECTION SLEEVE

GROUNDING BAR

GROUND ROD

TEST GROUND ROD WITH INSPECTION SLEEVE — T

SINGLE POLE SWITCH — $

DUPLEX RECEPTACLE

DUPLEX GFCI RECEPTACLE — GFCI

FLUORESCENT LIGHTING FIXTURE (2) TWO LAMPS 48–T8 — F

SMOKE DETECTION (DC) — SD

EMERGENCY LIGHTING (DC)

SECURITY LIGHT W/PHOTOCELL LITHONIA ALXW LED–1–25A400/51K–SR4–120–PE–DDBTXD

CHAIN LINK FENCE — X — X — X — X

WOOD/WROUGHT IRON FENCE

WALL STRUCTURE

LEASE AREA

PROPERTY LINE (PL)

SETBACKS

ICE BRIDGE

CABLE TRAY

WATER LINE — W — W — W — W — W

UNDERGROUND POWER — UGP — UGP — UGP — UGP — UGP

UNDERGROUND TELCO — UGT — UGT — UGT — UGT — UGT

OVERHEAD POWER — OHP — OHP — OHP — OHP

OVERHEAD TELCO — OHT — OHT — OHT — OHT

UNDERGROUND TELCO/POWER — UGT/P — UGT/P — UGT/P — UGT/P

ABOVE GROUND POWER — AGP — AGP — AGP — AGP — AGP

ABOVE GROUND TELCO — AGT — AGT — AGT — AGT — AGT

ABOVE GROUND TELCO/POWER — AGT/P — AGT/P — AGT/P — AGT/P

WORKPOINT — W.P.

SECTION REFERENCE — XX / X–X

DETAIL REFERENCE — XX / X–X

ABBREVIATIONS

AB	ANCHOR BOLT
ABV	ABOVE
AC	ALTERNATING CURRENT
ADDL	ADDITIONAL
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AGL	ABOVE GROUND LEVEL
AIC	AMPERAGE INTERRUPTION CAPACITY
ALUM	ALUMINUM
ALT	ALTERNATE
ANT	ANTENNA
APPROX	APPROXIMATE
ARCH	ARCHITECTURAL
ATS	AUTOMATIC TRANSFER SWITCH
AWG	AMERICAN WIRE GAUGE
BATT	BATTERY
BLDG	BUILDING
BLK	BLOCK
BLKG	BLOCKING
BM	BEAM
BTC	BARE TINNED COPPER CONDUCTOR
BOF	BOTTOM OF FOOTING
CAB	CABINET
CANT	CANTILEVERED
CHG	CHARGING
CLG	CEILING
CLR	CLEAR
COL	COLUMN
COMM	COMMON
CONC	CONCRETE
CONSTR	CONSTRUCTION
DBL	DOUBLE
DC	DIRECT CURRENT
DEPT	DEPARTMENT
DF	DOUGLAS FIR
DIA	DIAMETER
DIAG	DIAGONAL
DIM	DIMENSION
DWG	DRAWING
DWL	DOWEL
EA	EACH
EC	ELECTRICAL CONDUCTOR
EL.	ELEVATION
ELEC	ELECTRICAL
EMT	ELECTRICAL METALLIC TUBING
ENG	ENGINEER
EQ	EQUAL
EXP	EXPANSION
EXT	EXTERIOR
EW	EACH WAY
FAB	FABRICATION
FF	FINISH FLOOR
FG	FINISH GRADE
FIF	FACILITY INTERFACE FRAME
FIN	FINISH(ED)
FLR	FLOOR
FDN	FOUNDATION
FOC	FACE OF CONCRETE
FOM	FACE OF MASONRY
FOS	FACE OF STUD
FOW	FACE OF WALL
FS	FINISH SURFACE
FT	FOOT
FTG	FOOTING
GA	GAUGE
GEN	GENERATOR
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
GLB	GLUE LAMINATED BEAM
GLV	GALVANIZED
GPS	GLOBAL POSITIONING SYSTEM
GND	GROUND
GSM	GLOBAL SYSTEM FOR MOBILE
HDG	HOT DIPPED GALVANIZED
HDR	HEADER
HGR	HANGER
HVAC	HEAT/VENTILATION/AIR CONDITIONING
HT	HEIGHT
IGR	INTERIOR GROUND RING
IN	INCH
INT	INTERIOR
LB(S)	POUND(S)
LF	LINEAR FEET
LTE	LONG TERM EVOLUTION
MAS	MASONRY
MAX	MAXIMUM
MB	MACHINE BOLT
MECH	MECHANICAL
MFR	MANUFACTURER
MGB	MASTER GROUND BAR
MIN	MINIMUM
MISC	MISCELLANEOUS
MTL	METAL
MTS	MANUAL TRANSFER SWITCH
MW	MICROWAVE
NEC	NATIONAL ELECTRIC CODE
NM	NEWTON METERS
NO.	NUMBER
#	NUMBER
NTS	NOT TO SCALE
OC	ON–CENTER
OSHA	OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION
OPNG	OPENING
P/C	PRECAST CONCRETE
PCS	PERSONAL COMMUNICATION SERVICES
PCU	PRIMARY CONTROL UNIT
PRC	PRIMARY RADIO CABINET
PP	POLARIZING PRESERVING
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PT	PRESSURE TREATED
PWR	POWER CABINET
QTY	QUANTITY
RAD	RADIUS
RECT	RECTIFIER
REF	REFERENCE
REINF	REINFORCEMENT
REQ'D	REQUIRED
RET	REMOTE ELECTRIC TILT
RF	RADIO FREQUENCY
RMC	RIGID METALLIC CONDUIT
RRH	REMOTE RADIO HEAD
RRU	REMOTE RADIO UNIT
RWY	RACEWAY
SCH	SCHEDULE
SHT	SHEET
SIAD	SMART INTEGRATED ACCESS DEVICE
SIM	SIMILAR
SPEC	SPECIFICATION
SQ	SQUARE
SS	STAINLESS STEEL
STD	STANDARD
STL	STEEL
TEMP	TEMPORARY
THK	THICKNESS
TMA	TOWER MOUNTED AMPLIFIER
TN	TOE NAIL
TOA	TOP OF ANTENNA
TOC	TOP OF CURB
TOF	TOP OF FOUNDATION
TOP	TOP OF PLATE (PARAPET)
TOS	TOP OF STEEL
TOW	TOP OF WALL
TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSION
TYP	TYPICAL
UG	UNDERGROUND
UL	UNDERWRITERS LABORATORY
UNO	UNLESS NOTED OTHERWISE
UMTS	UNIVERSAL MOBILE TELECOMMUNICATIONS SYSTEM
UPS	UNITERRUPTIBLE POWER SYSTEM (DC POWER PLANT)
VIF	VERIFIED IN FIELD
W	WIDE
W/	WITH
WD	WOOD
WP	WEATHERPROOF
WT	WEIGHT

dish wireless.

5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120

MK DEVELOPMENT

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BRETT J MAGRUM
33678
PROFESSIONAL ENGINEER
1/19/2023

DRAWN BY:	CHECKED BY:	APPROVED BY:
PRI	---	---

RFDS REV #: ---

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A&E PROJECT NUMBER

NJJER02042B

DISH Wireless L.L.C.
PROJECT INFORMATION

NJJER02042B
880 POST ROAD EAST
WESTPORT, CT 06880

SHEET TITLE

LEGEND AND ABBREVIATIONS

SHEET NUMBER

GN-1

SIGN TYPES		
TYPE	COLOR	COLOR CODE PURPOSE
INFORMATION	GREEN	**"INFORMATIONAL SIGN"** TO NOTIFY OTHERS OF SITE OWNERSHIP & CONTACT NUMBER AND POTENTIAL RF EXPOSURE.
NOTICE	BLUE	**"NOTICE BEYOND THIS POINT"** RF FIELDS BEYOND THIS POINT MAY EXCEED THE FCC GENERAL PUBLIC EXPOSURE LIMIT. OBEY ALL POSTED SIGNS AND SITE GUIDELINES FOR WORKING IN RF ENVIRONMENTS. IN ACCORDANCE WITH FEDERAL COMMUNICATIONS COMMISSION RULES ON RADIO FREQUENCY EMISSIONS 47 CFR-1.1307(b)
CAUTION	YELLOW	**"CAUTION BEYOND THIS POINT"** RF FIELDS BEYOND THIS POINT MAY EXCEED THE FCC GENERAL PUBLIC EXPOSURE LIMIT. OBEY ALL POSTED SIGNS AND SITE GUIDELINES FOR WORKING IN RF ENVIRONMENTS. IN ACCORDANCE WITH FEDERAL COMMUNICATIONS COMMISSION RULES ON RADIO FREQUENCY EMISSIONS 47 CFR-1.1307(b)
WARNING	ORANGE/RED	**"WARNING BEYOND THIS POINT"** RF FIELDS AT THIS SITE EXCEED FCC RULES FOR HUMAN EXPOSURE. FAILURE TO OBEY ALL POSTED SIGNS AND SITE GUIDELINES FOR WORKING IN RF ENVIRONMENTS COULD RESULT IN SERIOUS INJURY. IN ACCORDANCE WITH FEDERAL COMMUNICATIONS COMMISSION RULES ON RADIO FREQUENCY EMISSIONS 47 CFR-1.1307(b)

SIGN PLACEMENT:

- RF SIGNAGE PLACEMENT SHALL FOLLOW THE RECOMMENDATIONS OF AN EXISTING EME REPORT, CREATED BY A THIRD PARTY PREVIOUSLY AUTHORIZED BY DISH Wireless L.L.C.
- INFORMATION SIGN (GREEN) SHALL BE LOCATED ON EXISTING DISH Wireless L.L.C EQUIPMENT.
  A) IF THE INFORMATION SIGN IS A STICKER, IT SHALL BE PLACED ON EXISTING DISH Wireless L.L.C EQUIPMENT CABINET.
  B) IF THE INFORMATION SIGH IS A METAL SIGN IT SHALL BE PLACED ON EXISTING DISH Wireless L.L.C H-FRAME WITH A SECURE ATTACH METHOD.
- IF EME REPORT IS NOT AVAILABLE AT THE TIME OF CREATION OF CONSTRUCTION DOCUMENTS; PLEASE CONTACT DISH Wireless L.L.C. CONSTRUCTION MANAGER FOR FURTHER INSTRUCTION ON HOW TO PROCEED.

NOTES:

1. FOR DISH Wireless L.L.C. LOGO, SEE DISH Wireless L.L.C. DESIGN SPECIFICATIONS (PROVIDED BY DISH Wireless L.L.C.)
2. SITE ID SHALL BE APPLIED TO SIGNS USING "LASER ENGRAVING" OR ANY OTHER WEATHER RESISTANT METHOD (DISH Wireless L.L.C. APPROVAL REQUIRED)
3. TEXT FOR SIGNAGE SHALL INDICATE CORRECT SITE NAME AND NUMBER AS PER DISH Wireless L.L.C. CONSTRUCTION MANAGER RECOMMENDATIONS.
4. CABINET/SHELTER MOUNTING APPLICATION REQUIRES ANOTHER PLATE APPLIED TO THE FACE OF THE CABINET WITH WATER PROOF POLYURETHANE ADHESIVE
5. ALL SIGNS WILL BE SECURED WITH EITHER STAINLESS STEEL ZIP TIES OR STAINLESS STEEL TECH SCREWS
6. ALL SIGNS TO BE 8.5"x11" AND MADE WITH 0.04" OF ALUMINUM MATERIAL

INFORMATION

This is an access point to an area with transmitting antennas.

Obey all signs and barriers beyond this point.
Call the DISH Wireless L.L.C. NOC at 1-866-624-6874

Site ID: _____

THIS SIGN IS FOR REFERENCE PURPOSES ONLY

NOTICE

Transmitting Antenna(s)

Radio frequency fields beyond this point MAY *EXCEED* the FCC Occupational exposure limit.

Obey all posted signs and site guidelines for working in radio frequency environments.

Call the DISH Wireless L.L.C. NOC at 1-866-624-6874 prior to working beyond this point.

Site ID: _____

dish

THIS SIGN IS FOR REFERENCE PURPOSES ONLY

CAUTION

Transmitting Antenna(s)

Radio frequency fields beyond this point MAY *EXCEED* the FCC Occupational exposure limit.

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dish

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WARNING

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dish

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RF SIGNAGE

dish wireless.
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LITTLETON, CO 80120

MK DEVELOPMENT
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SHEET TITLE
RF SIGNAGE

SHEET NUMBER
GN-2

SITE ACTIVITY REQUIREMENTS:

1. NOTICE TO PROCEED – NO WORK SHALL COMMENCE PRIOR TO CONTRACTOR RECEIVING A WRITTEN NOTICE TO PROCEED (NTP) AND THE ISSUANCE OF A PURCHASE ORDER. PRIOR TO ACCESSING/ENTERING THE SITE YOU MUST CONTACT THE DISH Wireless L.L.C. AND TOWER OWNER NOC & THE DISH Wireless L.L.C. AND TOWER OWNER CONSTRUCTION MANAGER.

2. "LOOK UP" – DISH Wireless L.L.C. AND TOWER OWNER SAFETY CLIMB REQUIREMENT:

THE INTEGRITY OF THE SAFETY CLIMB AND ALL COMPONENTS OF THE CLIMBING FACILITY SHALL BE CONSIDERED DURING ALL STAGES OF DESIGN, INSTALLATION, AND INSPECTION. TOWER MODIFICATION, MOUNT REINFORCEMENTS, AND/OR EQUIPMENT INSTALLATIONS SHALL NOT COMPROMISE THE INTEGRITY OR FUNCTIONAL USE OF THE SAFETY CLIMB OR ANY COMPONENTS OF THE CLIMBING FACILITY ON THE STRUCTURE. THIS SHALL INCLUDE, BUT NOT BE LIMITED TO: PINCHING OF THE WIRE ROPE, BENDING OF THE WIRE ROPE FROM ITS SUPPORTS, DIRECT CONTACT OR CLOSE PROXIMITY TO THE WIRE ROPE WHICH MAY CAUSE FRICTIONAL WEAR, IMPACT TO THE ANCHORAGE POINTS IN ANY WAY, OR TO IMPEDE/BLOCK ITS INTENDED USE. ANY COMPROMISED SAFETY CLIMB, INCLUDING EXISTING CONDITIONS MUST BE TAGGED OUT AND REPORTED TO YOUR DISH Wireless L.L.C. AND DISH Wireless L.L.C. AND TOWER OWNER POC OR CALL THE NOC TO GENERATE A SAFETY CLIMB MAINTENANCE AND CONTRACTOR NOTICE TICKET.

3. PRIOR TO THE START OF CONSTRUCTION, ALL REQUIRED JURISDICTIONAL PERMITS SHALL BE OBTAINED. THIS INCLUDES, BUT IS NOT LIMITED TO, BUILDING, ELECTRICAL, MECHANICAL, FIRE, FLOOD ZONE, ENVIRONMENTAL, AND ZONING. AFTER ONSITE ACTIVITIES AND CONSTRUCTION ARE COMPLETED, ALL REQUIRED PERMITS SHALL BE SATISFIED AND CLOSED OUT ACCORDING TO LOCAL JURISDICTIONAL REQUIREMENTS.

4. 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) AND DISH Wireless L.L.C. AND TOWER OWNER STANDARDS, INCLUDING THE REQUIRED INVOLVEMENT OF A QUALIFIED ENGINEER FOR CLASS IV CONSTRUCTION, TO CERTIFY THE SUPPORTING STRUCTURE(S) IN ACCORDANCE WITH ANSI/TIA–322 (LATEST EDITION).

5. ALL SITE WORK TO COMPLY WITH DISH Wireless L.L.C. AND TOWER OWNER INSTALLATION STANDARDS FOR CONSTRUCTION ACTIVITIES ON DISH Wireless L.L.C. AND TOWER OWNER TOWER SITE AND LATEST VERSION OF ANSI/TIA–1019–A–2012 "STANDARD FOR INSTALLATION, ALTERATION, AND MAINTENANCE OF ANTENNA SUPPORTING STRUCTURES AND ANTENNAS."

6. IF THE SPECIFIED EQUIPMENT CAN NOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE CONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION FOR APPROVAL BY DISH Wireless L.L.C. AND TOWER OWNER PRIOR TO PROCEEDING WITH ANY SUCH CHANGE OF INSTALLATION.

7. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS AND ORDINANCES. CONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.

8. THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.

9. THE CONTRACTOR SHALL CONTACT UTILITY LOCATING SERVICES INCLUDING PRIVATE LOCATES SERVICES PRIOR TO THE START OF CONSTRUCTION.

10. ALL EXISTING ACTIVE SEWER, WATER, GAS, ELECTRIC AND OTHER UTILITIES WHERE ENCOUNTERED IN THE WORK, SHALL BE PROTECTED AT ALL TIMES AND WHERE REQUIRED FOR THE PROPER EXECUTION OF THE WORK, SHALL BE RELOCATED AS DIRECTED BY CONTRACTOR. EXTREME CAUTION SHOULD BE USED BY THE CONTRACTOR WHEN EXCAVATING OR DRILLING PIERS AROUND OR NEAR UTILITIES. CONTRACTOR SHALL PROVIDE SAFETY TRAINING FOR THE WORKING CREW. THIS WILL INCLUDE BUT NOT BE LIMITED TO A) FALL PROTECTION B) CONFINED SPACE C) ELECTRICAL SAFETY D) TRENCHING AND EXCAVATION E) CONSTRUCTION SAFETY PROCEDURES.

11. ALL SITE WORK SHALL BE AS INDICATED ON THE STAMPED CONSTRUCTION DRAWINGS AND DISH PROJECT SPECIFICATIONS, LATEST APPROVED REVISION.

12. CONTRACTOR SHALL KEEP THE SITE FREE FROM ACCUMULATING WASTE MATERIAL, DEBRIS, AND TRASH AT THE COMPLETION OF THE WORK. IF NECESSARY, RUBBISH, STUMPS, DEBRIS, STICKS, STONES AND OTHER REFUSE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF LEGALLY.

13. ALL EXISTING INACTIVE SEWER, WATER, GAS, ELECTRIC AND OTHER UTILITIES, WHICH INTERFERE WITH THE EXECUTION OF THE WORK, SHALL BE REMOVED AND/OR CAPPED, PLUGGED OR OTHERWISE DISCONTINUED AT POINTS WHICH WILL NOT INTERFERE WITH THE EXECUTION OF THE WORK, SUBJECT TO THE APPROVAL OF DISH Wireless L.L.C. AND TOWER OWNER, AND/OR LOCAL UTILITIES.

14. THE CONTRACTOR SHALL PROVIDE SITE SIGNAGE IN ACCORDANCE WITH THE TECHNICAL SPECIFICATION FOR SITE SIGNAGE REQUIRED BY LOCAL JURISDICTION AND SIGNAGE REQUIRED ON INDIVIDUAL PIECES OF EQUIPMENT, ROOMS, AND SHELTERS.

15. THE SITE SHALL BE GRADED TO CAUSE SURFACE WATER TO FLOW AWAY FROM THE CARRIER'S EQUIPMENT AND TOWER AREAS.

16. THE SUB GRADE SHALL BE COMPACTED AND BROUGHT TO A SMOOTH UNIFORM GRADE PRIOR TO FINISHED SURFACE APPLICATION.

17. THE AREAS OF THE OWNERS PROPERTY DISTURBED BY THE WORK AND NOT COVERED BY THE TOWER, EQUIPMENT OR DRIVEWAY, SHALL BE GRADED TO A UNIFORM SLOPE, AND STABILIZED TO PREVENT EROSION AS SPECIFIED ON THE CONSTRUCTION DRAWINGS AND/OR PROJECT SPECIFICATIONS.

18. CONTRACTOR SHALL MINIMIZE DISTURBANCE TO EXISTING SITE DURING CONSTRUCTION. EROSION CONTROL MEASURES, IF REQUIRED DURING CONSTRUCTION, SHALL BE IN CONFORMANCE WITH THE LOCAL GUIDELINES FOR EROSION AND SEDIMENT CONTROL.

19. THE CONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT CONTRACTOR'S EXPENSE TO THE SATISFACTION OF OWNER.

20. CONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY. ANTENNAS AND RADIOS REMOVED SHALL BE RETURNED TO THE OWNER'S DESIGNATED LOCATION.

21. CONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION. TRASH AND DEBRIS SHOULD BE REMOVED FROM SITE ON A DAILY BASIS.

22. NO FILL OR EMBANKMENT MATERIAL SHALL BE PLACED ON FROZEN GROUND. FROZEN MATERIALS, SNOW OR ICE SHALL NOT BE PLACED IN ANY FILL OR EMBANKMENT.

GENERAL NOTES:

1.FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:

CONTRACTOR:GENERAL CONTRACTOR RESPONSIBLE FOR CONSTRUCTION

CARRIER:DISH Wireless L.L.C.

TOWER OWNER:TOWER OWNER

2. THESE DRAWINGS HAVE BEEN PREPARED USING STANDARDS OF PROFESSIONAL CARE AND COMPLETENESS NORMALLY EXERCISED UNDER SIMILAR CIRCUMSTANCES BY REPUTABLE ENGINEERS IN THIS OR SIMILAR LOCALITIES. IT IS ASSUMED THAT THE WORK DEPICTED WILL BE PERFORMED BY AN EXPERIENCED CONTRACTOR AND/OR WORKPEOPLE WHO HAVE A WORKING KNOWLEDGE OF THE APPLICABLE CODE STANDARDS AND REQUIREMENTS AND OF INDUSTRY ACCEPTED STANDARD GOOD PRACTICE. AS NOT EVERY CONDITION OR ELEMENT IS (OR CAN BE) EXPLICITLY SHOWN ON THESE DRAWINGS, THE CONTRACTOR SHALL USE INDUSTRY ACCEPTED STANDARD GOOD PRACTICE FOR MISCELLANEOUS WORK NOT EXPLICITLY SHOWN.

3. THESE DRAWINGS REPRESENT THE FINISHED STRUCTURE. THEY DO NOT INDICATE THE MEANS OR METHODS OF CONSTRUCTION. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR THE CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES. THE CONTRACTOR SHALL PROVIDE ALL MEASURES NECESSARY FOR PROTECTION OF LIFE AND PROPERTY DURING CONSTRUCTION. SUCH MEASURES SHALL INCLUDE, BUT NOT BE LIMITED TO, BRACING, FORMWORK, SHORING, ETC. SITE VISITS BY THE ENGINEER OR HIS REPRESENTATIVE WILL NOT INCLUDE INSPECTION OF THESE ITEMS AND IS FOR STRUCTURAL OBSERVATION OF THE FINISHED STRUCTURE ONLY.

4. NOTES AND DETAILS IN THE CONSTRUCTION DRAWINGS SHALL TAKE PRECEDENCE OVER GENERAL NOTES AND TYPICAL DETAILS. WHERE NO DETAILS ARE SHOWN, CONSTRUCTION SHALL CONFORM TO SIMILAR WORK ON THE PROJECT, AND/OR AS PROVIDED FOR IN THE CONTRACT DOCUMENTS. WHERE DISCREPANCIES OCCUR BETWEEN PLANS, DETAILS, GENERAL NOTES, AND SPECIFICATIONS, THE GREATER, MORE STRICT REQUIREMENTS, SHALL GOVERN. IF FURTHER CLARIFICATION IS REQUIRED CONTACT THE ENGINEER OF RECORD.

5. SUBSTANTIAL EFFORT HAS BEEN MADE TO PROVIDE ACCURATE DIMENSIONS AND MEASUREMENTS ON THE DRAWINGS TO ASSIST IN THE FABRICATION AND/OR PLACEMENT OF CONSTRUCTION ELEMENTS BUT IT IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO FIELD VERIFY THE DIMENSIONS, MEASUREMENTS, AND/OR CLEARANCES SHOWN IN THE CONSTRUCTION DRAWINGS PRIOR TO FABRICATION OR CUTTING OF ANY NEW OR EXISTING CONSTRUCTION ELEMENTS. IF IT IS DETERMINED THAT THERE ARE DISCREPANCIES AND/OR CONFLICTS WITH THE CONSTRUCTION DRAWINGS THE ENGINEER OF RECORD IS TO BE NOTIFIED AS SOON AS POSSIBLE.

6. PRIOR TO THE SUBMISSION OF BIDS, THE BIDDING CONTRACTOR SHALL VISIT THE CELL SITE TO FAMILIARIZE WITH THE EXISTING CONDITIONS AND TO CONFIRM THAT THE WORK CAN BE ACCOMPLISHED AS SHOWN ON THE CONSTRUCTION DRAWINGS. ANY DISCREPANCY FOUND SHALL BE BROUGHT TO THE ATTENTION OF CARRIER POC AND TOWER OWNER.

7. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS AND ORDINANCES. CONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.

8. UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.

9. THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.

10. IF THE SPECIFIED EQUIPMENT CAN NOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE CONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION FOR APPROVAL BY THE CARRIER AND TOWER OWNER PRIOR TO PROCEEDING WITH ANY SUCH CHANGE OF INSTALLATION.

11. CONTRACTOR IS TO PERFORM A SITE INVESTIGATION, BEFORE SUBMITTING BIDS, TO DETERMINE THE BEST ROUTING OF ALL CONDUITS FOR POWER, AND TELCO AND FOR GROUNDING CABLES AS SHOWN IN THE POWER, TELCO, AND GROUNDING PLAN DRAWINGS.

12. THE CONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT CONTRACTOR'S EXPENSE TO THE SATISFACTION OF DISH Wireless L.L.C. AND TOWER OWNER

13. CONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY. ANTENNAS REMOVED SHALL BE RETURNED TO THE OWNER'S DESIGNATED LOCATION.

14. CONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION. TRASH AND DEBRIS SHOULD BE REMOVED FROM SITE ON A DAILY BASIS.

dish wireless.

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CONSTRUCTION DOCUMENTS

SUBMITTALS

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A&E PROJECT NUMBER

NJJER02042B

DISH Wireless L.L.C.
PROJECT INFORMATION

NJJER02042B
880 POST ROAD EAST
WESTPORT, CT 06880

SHEET TITLE

GENERAL NOTES

SHEET NUMBER

GN-3

CONCRETE, FOUNDATIONS, AND REINFORCING STEEL:

1. ALL CONCRETE WORK SHALL BE IN ACCORDANCE WITH THE ACI 301, ACI 318, ACI 336, ASTM A184, ASTM A185 AND THE DESIGN AND CONSTRUCTION SPECIFICATION FOR CAST-IN-PLACE CONCRETE.

2. UNLESS NOTED OTHERWISE, SOIL BEARING PRESSURE USED FOR DESIGN OF SLABS AND FOUNDATIONS IS ASSUMED TO BE 1000 psf.

3. ALL CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH (f'c) OF 3000 psi AT 28 DAYS, UNLESS NOTED OTHERWISE. NO MORE THAN 90 MINUTES SHALL ELAPSE FROM BATCH TIME TO TIME OF PLACEMENT UNLESS APPROVED BY THE ENGINEER OF RECORD. TEMPERATURE OF CONCRETE SHALL NOT EXCEED 90°f AT TIME OF PLACEMENT.

4. CONCRETE EXPOSED TO FREEZE-THAW CYCLES SHALL CONTAIN AIR ENTRAINING ADMIXTURES. AMOUNT OF AIR ENTRAINMENT TO BE BASED ON SIZE OF AGGREGATE AND F3 CLASS EXPOSURE (VERY SEVERE). CEMENT USED TO BE TYPE II PORTLAND CEMENT WITH A MAXIMUM WATER-TO-CEMENT RATIO (W/C) OF 0.45.

5. ALL STEEL REINFORCING SHALL CONFORM TO ASTM A615. ALL WELDED WIRE FABRIC (WWF) SHALL CONFORM TO ASTM A185. ALL SPLICES SHALL BE CLASS "B" TENSION SPLICES, UNLESS NOTED OTHERWISE. ALL HOOKS SHALL BE STANDARD 90 DEGREE HOOKS, UNLESS NOTED OTHERWISE. YIELD STRENGTH (Fy) OF STANDARD DEFORMED BARS ARE AS FOLLOWS:

#4 BARS AND SMALLER 40 ksi

#5 BARS AND LARGER 60 ksi

6. THE FOLLOWING MINIMUM CONCRETE COVER SHALL BE PROVIDED FOR REINFORCING STEEL UNLESS SHOWN OTHERWISE ON DRAWINGS:

- CONCRETE CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH 3"
- CONCRETE EXPOSED TO EARTH OR WEATHER:
- #6 BARS AND LARGER 2"
- #5 BARS AND SMALLER 1-1/2"
- CONCRETE NOT EXPOSED TO EARTH OR WEATHER:
- SLAB AND WALLS 3/4"
- BEAMS AND COLUMNS 1-1/2"

7. A TOOLED EDGE OR A 3/4" CHAMFER SHALL BE PROVIDED AT ALL EXPOSED EDGES OF CONCRETE, UNLESS NOTED OTHERWISE, IN ACCORDANCE WITH ACI 301 SECTION 4.2.4.

ELECTRICAL INSTALLATION NOTES:

1. ALL ELECTRICAL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS, NEC AND ALL APPLICABLE FEDERAL, STATE, AND LOCAL CODES/ORDINANCES.

2. CONDUIT ROUTINGS ARE SCHEMATIC. CONTRACTOR SHALL INSTALL CONDUITS SO THAT ACCESS TO EQUIPMENT IS NOT BLOCKED AND TRIP HAZARDS ARE ELIMINATED.

3. WIRING, RACEWAY AND SUPPORT METHODS AND MATERIALS SHALL COMPLY WITH THE REQUIREMENTS OF THE NEC.

4. ALL CIRCUITS SHALL BE SEGREGATED AND MAINTAIN MINIMUM CABLE SEPARATION AS REQUIRED BY THE NEC.

4.1. ALL EQUIPMENT SHALL BEAR THE UNDERWRITERS LABORATORIES LABEL OF APPROVAL, AND SHALL CONFORM TO REQUIREMENT OF THE NATIONAL ELECTRICAL CODE.

4.2. ALL OVERCURRENT DEVICES SHALL HAVE AN INTERRUPTING CURRENT RATING THAT SHALL BE GREATER THAN THE SHORT CIRCUIT CURRENT TO WHICH THEY ARE SUBJECTED, 22,000 AIC MINIMUM. VERIFY AVAILABLE SHORT CIRCUIT CURRENT DOES NOT EXCEED THE RATING OF ELECTRICAL EQUIPMENT IN ACCORDANCE WITH ARTICLE 110.24 NEC OR THE MOST CURRENT ADOPTED CODE PRE THE GOVERNING JURISDICTION.

5. EACH END OF EVERY POWER PHASE CONDUCTOR, GROUNDING CONDUCTOR, AND TELCO CONDUCTOR OR CABLE SHALL BE LABELED WITH COLOR-CODED INSULATION OR ELECTRICAL TAPE (3M BRAND, 1/2" PLASTIC ELECTRICAL TAPE WITH UV PROTECTION, OR EQUAL). THE IDENTIFICATION METHOD SHALL CONFORM WITH NEC AND OSHA.

6. ALL ELECTRICAL COMPONENTS SHALL BE CLEARLY LABELED WITH LAMICOID TAGS SHOWING THEIR RATED VOLTAGE, PHASE CONFIGURATION, WIRE CONFIGURATION, POWER OR AMPACITY RATING AND BRANCH CIRCUIT ID NUMBERS (i.e. PANEL BOARD AND CIRCUIT ID'S).

7. PANEL BOARDS (ID NUMBERS) SHALL BE CLEARLY LABELED WITH PLASTIC LABELS.

8. TIE WRAPS ARE NOT ALLOWED.

9. ALL POWER AND EQUIPMENT GROUND WIRING IN TUBING OR CONDUIT SHALL BE SINGLE COPPER CONDUCTOR (#14 OR LARGER) WITH TYPE THHW, THWN, THWN-2, XHHW, XHHW-2, THW, THW-2, RHW, OR RHW-2 INSULATION UNLESS OTHERWISE SPECIFIED.

10. SUPPLEMENTAL EQUIPMENT GROUND WIRING LOCATED INDOORS SHALL BE SINGLE COPPER CONDUCTOR (#6 OR LARGER) WITH TYPE THHW, THWN, THWN-2, XHHW, XHHW-2, THW, THW-2, RHW, OR RHW-2 INSULATION UNLESS OTHERWISE SPECIFIED.

11. POWER AND CONTROL WIRING IN FLEXIBLE CORD SHALL BE MULTI-CONDUCTOR, TYPE SOOW CORD (#14 OR LARGER) UNLESS OTHERWISE SPECIFIED.

12. POWER AND CONTROL WIRING FOR USE IN CABLE TRAY SHALL BE MULTI-CONDUCTOR, TYPE TC CABLE (#14 OR LARGER), WITH TYPE THHW, THWN, THWN-2, XHHW, XHHW-2, THW, THW-2, RHW, OR RHW-2 INSULATION UNLESS OTHERWISE SPECIFIED.

13. ALL POWER AND GROUNDING CONNECTIONS SHALL BE CRIMP-STYLE, COMPRESSION WIRE LUGS AND WIRE NUTS BY THOMAS AND BETTS (OR EQUAL). LUGS AND WIRE NUTS SHALL BE RATED FOR OPERATION NOT LESS THAN 75° C (90° C IF AVAILABLE).

14. RACEWAY AND CABLE TRAY SHALL BE LISTED OR LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE AND NEC.

15. ELECTRICAL METALLIC TUBING (EMT), INTERMEDIATE METAL CONDUIT (IMC), OR RIGID METAL CONDUIT (RMC) SHALL BE USED FOR EXPOSED INDOOR LOCATIONS.

16. ELECTRICAL METALLIC TUBING (EMT) OR METAL-CLAD CABLE (MC) SHALL BE USED FOR CONCEALED INDOOR LOCATIONS.

17. SCHEDULE 40 PVC UNDERGROUND ON STRAIGHTS AND SCHEDULE 80 PVC FOR ALL ELBOWS/90s AND ALL APPROVED ABOVE GRADE PVC CONDUIT.

18. LIQUID-TIGHT FLEXIBLE METALLIC CONDUIT (LIQUID-TITE FLEX) SHALL BE USED INDOORS AND OUTDOORS, WHERE VIBRATION OCCURS OR FLEXIBILITY IS NEEDED.

19. CONDUIT AND TUBING FITTINGS SHALL BE THREADED OR COMPRESSION-TYPE AND APPROVED FOR THE LOCATION USED. SET SCREW FITTINGS ARE NOT ACCEPTABLE.

20. CABINETS, BOXES AND WIRE WAYS SHALL BE LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE AND THE NEC.

21. WIREWAYS SHALL BE METAL WITH AN ENAMEL FINISH AND INCLUDE A HINGED COVER, DESIGNED TO SWING OPEN DOWNWARDS (WIREMOLD SPECMATE WIREWAY).

22. SLOTTED WIRING DUCT SHALL BE PVC AND INCLUDE COVER (PANDUIT TYPE E OR EQUAL).

23. CONDUITS SHALL BE FASTENED SECURELY IN PLACE WITH APPROVED NON-PERFORATED STRAPS AND HANGERS. EXPLOSIVE DEVICES (i.e. POWDER-ACTUATED) FOR ATTACHING HANGERS TO STRUCTURE WILL NOT BE PERMITTED. CLOSELY FOLLOW THE LINES OF THE STRUCTURE, MAINTAIN CLOSE PROXIMITY TO THE STRUCTURE AND KEEP CONDUITS IN TIGHT ENVELOPES. CHANGES IN DIRECTION TO ROUTE AROUND OBSTACLES SHALL BE MADE WITH CONDUIT OUTLET BODIES. CONDUIT SHALL BE INSTALLED IN A NEAT AND WORKMANLIKE MANNER. PARALLEL AND PERPENDICULAR TO STRUCTURE WALL AND CEILING LINES. ALL CONDUIT SHALL BE FISHED TO CLEAR OBSTRUCTIONS. ENDS OF CONDUITS SHALL BE TEMPORARILY CAPPED FLUSH TO FINISH GRADE TO PREVENT CONCRETE, PLASTER OR DIRT FROM ENTERING. CONDUITS SHALL BE RIGIDLY CLAMPED TO BOXES BY GALVANIZED MALLEABLE IRON BUSHING ON INSIDE AND GALVANIZED MALLEABLE IRON LOCKNUT ON OUTSIDE AND INSIDE.

24. EQUIPMENT CABINETS, TERMINAL BOXES, JUNCTION BOXES AND PULL BOXES SHALL BE GALVANIZED OR EPOXY-COATED SHEET STEEL. SHALL MEET OR EXCEED UL 50 AND BE RATED NEMA 1 (OR BETTER) FOR INTERIOR LOCATIONS AND NEMA 3 (OR BETTER) FOR EXTERIOR LOCATIONS.

25. METAL RECEPTACLE, SWITCH AND DEVICE BOXES SHALL BE GALVANIZED, EPOXY-COATED OR NON-CORRODING; SHALL MEET OR EXCEED UL 514A AND NEMA OS 1 AND BE RATED NEMA 1 (OR BETTER) FOR INTERIOR LOCATIONS AND WEATHER PROTECTED (WP OR BETTER) FOR EXTERIOR LOCATIONS.

26. NONMETALLIC RECEPTACLE, SWITCH AND DEVICE BOXES SHALL MEET OR EXCEED NEMA OS 2 (NEWEST REVISION) AND BE RATED NEMA 1 (OR BETTER) FOR INTERIOR LOCATIONS AND WEATHER PROTECTED (WP OR BETTER) FOR EXTERIOR LOCATIONS.

27. THE CONTRACTOR SHALL NOTIFY AND OBTAIN NECESSARY AUTHORIZATION FROM THE CARRIER AND/OR DISH Wireless L.L.C. AND TOWER OWNER BEFORE COMMENCING WORK ON THE AC POWER DISTRIBUTION PANELS.

28. THE CONTRACTOR SHALL PROVIDE NECESSARY TAGGING ON THE BREAKERS, CABLES AND DISTRIBUTION PANELS IN ACCORDANCE WITH THE APPLICABLE CODES AND STANDARDS TO SAFEGUARD LIFE AND PROPERTY.

29. INSTALL LAMICOID LABEL ON THE METER CENTER TO SHOW "DISH Wireless L.L.C.".

30. ALL EMPTY/SPARE CONDUITS THAT ARE INSTALLED ARE TO HAVE A METERED MULE TAPE PULL CORD INSTALLED.

dish wireless.

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MK DEVELOPMENT

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BRETT J MAGARIAN
33678
PROFESSIONAL ENGINEER
1/19/2023

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PRI	---	---

RFDS REV #: ---

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SUBMITTALS

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0	01/18/2023	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER

NJJER02042B

DISH Wireless L.L.C.
PROJECT INFORMATION

NJJER02042B
880 POST ROAD EAST
WESTPORT, CT 06880

SHEET TITLE

GENERAL NOTES

SHEET NUMBER

GN-4

GROUNDING NOTES:

1. ALL GROUND ELECTRODE SYSTEMS (INCLUDING TELECOMMUNICATION, RADIO, LIGHTNING PROTECTION AND AC POWER GES'S) SHALL BE BONDED TOGETHER AT OR BELOW GRADE, BY TWO OR MORE COPPER BONDING CONDUCTORS IN ACCORDANCE WITH THE NEC.

2. THE CONTRACTOR SHALL PERFORM IEEE FALL-OF-POTENTIAL RESISTANCE TO EARTH TESTING (PER IEEE 1100 AND 81) FOR GROUND ELECTRODE SYSTEMS, THE CONTRACTOR SHALL FURNISH AND INSTALL SUPPLEMENTAL GROUND ELECTRODES AS NEEDED TO ACHIEVE A TEST RESULT OF 5 OHMS OR LESS.

3. THE CONTRACTOR IS RESPONSIBLE FOR PROPERLY SEQUENCING GROUNDING AND UNDERGROUND CONDUIT INSTALLATION AS TO PREVENT ANY LOSS OF CONTINUITY IN THE GROUNDING SYSTEM OR DAMAGE TO THE CONDUIT AND PROVIDE TESTING RESULTS.

4. METAL CONDUIT AND TRAY SHALL BE GROUNDED AND MADE ELECTRICALLY CONTINUOUS WITH LISTED BONDING FITTINGS OR BY BONDING ACROSS THE DISCONTINUITY WITH #6 COPPER WIRE UL APPROVED GROUNDING TYPE CONDUIT CLAMPS.

5. METAL RACEWAY SHALL NOT BE USED AS THE NEC REQUIRED EQUIPMENT GROUND CONDUCTOR. STRANDED COPPER CONDUCTORS WITH GREEN INSULATION, SIZED IN ACCORDANCE WITH THE NEC, SHALL BE FURNISHED AND INSTALLED WITH THE POWER CIRCUITS TO BTS EQUIPMENT.

6. EACH CABINET FRAME SHALL BE DIRECTLY CONNECTED TO THE MASTER GROUND BAR WITH GREEN INSULATED SUPPLEMENTAL EQUIPMENT GROUND WIRES, #6 STRANDED COPPER OR LARGER FOR INDOOR BTS; #2 BARE SOLID TINNED COPPER FOR OUTDOOR BTS.

7. CONNECTIONS TO THE GROUND BUS SHALL NOT BE DOUBLED UP OR STACKED BACK TO BACK CONNECTIONS ON OPPOSITE SIDE OF THE GROUND BUS ARE PERMITTED.

8. ALL EXTERIOR GROUND CONDUCTORS BETWEEN EQUIPMENT/GROUND BARS AND THE GROUND RING SHALL BE #2 SOLID TINNED COPPER UNLESS OTHERWISE INDICATED.

9. ALUMINUM CONDUCTOR OR COPPER CLAD STEEL CONDUCTOR SHALL NOT BE USED FOR GROUNDING CONNECTIONS.

10. USE OF 90° BENDS IN THE PROTECTION GROUNDING CONDUCTORS SHALL BE AVOIDED WHEN 45° BENDS CAN BE ADEQUATELY SUPPORTED.

11. EXOTHERMIC WELDS SHALL BE USED FOR ALL GROUNDING CONNECTIONS BELOW GRADE.

12. ALL GROUND CONNECTIONS ABOVE GRADE (INTERIOR AND EXTERIOR) SHALL BE FORMED USING HIGH PRESS CRIMPS.

13. COMPRESSION GROUND CONNECTIONS MAY BE REPLACED BY EXOTHERMIC WELD CONNECTIONS.

14. ICE BRIDGE BONDING CONDUCTORS SHALL BE EXOTHERMICALLY BONDED OR BOLTED TO THE BRIDGE AND THE TOWER GROUND BAR.

15. APPROVED ANTIOXIDANT COATINGS (i.e. CONDUCTIVE GEL OR PASTE) SHALL BE USED ON ALL COMPRESSION AND BOLTED GROUND CONNECTIONS.

16. ALL EXTERIOR GROUND CONNECTIONS SHALL BE COATED WITH A CORROSION RESISTANT MATERIAL.

17. MISCELLANEOUS ELECTRICAL AND NON-ELECTRICAL METAL BOXES, FRAMES AND SUPPORTS SHALL BE BONDED TO THE GROUND RING, IN ACCORDANCE WITH THE NEC.

18. BOND ALL METALLIC OBJECTS WITHIN 6 ft OF MAIN GROUND RING WITH (1) #2 BARE SOLID TINNED COPPER GROUND CONDUCTOR.

19. GROUND CONDUCTORS USED FOR THE FACILITY GROUNDING AND LIGHTNING PROTECTION SYSTEMS SHALL NOT BE ROUTED THROUGH METALLIC OBJECTS THAT FORM A RING AROUND THE CONDUCTOR, SUCH AS METALLIC CONDUITS, METAL SUPPORT CLIPS OR SLEEVES THROUGH WALLS OR FLOORS. WHEN IT IS REQUIRED TO BE HOUSED IN CONDUIT TO MEET CODE REQUIREMENTS OR LOCAL CONDITIONS, NON-METALLIC MATERIAL SUCH AS PVC CONDUIT SHALL BE USED. WHERE USE OF METAL CONDUIT IS UNAVOIDABLE (i.e., NONMETALLIC CONDUIT PROHIBITED BY LOCAL CODE) THE GROUND CONDUCTOR SHALL BE BONDED TO EACH END OF THE METAL CONDUIT.

20. ALL GROUNDS THAT TRANSITION FROM BELOW GRADE TO ABOVE GRADE MUST BE #2 BARE SOLID TINNED COPPER IN 3/4" NON-METALLIC, FLEXIBLE CONDUIT FROM 24" BELOW GRADE TO WITHIN 3" TO 6" OF CAD-WELD TERMINATION POINT. THE EXPOSED END OF THE CONDUIT MUST BE SEALED WITH SILICONE CAULK. (ADD TRANSITIONING GROUND STANDARD DETAIL AS WELL).

21. BUILDINGS WHERE THE MAIN GROUNDING CONDUCTORS ARE REQUIRED TO BE ROUTED TO GRADE, THE CONTRACTOR SHALL ROUTE TWO GROUNDING CONDUCTORS FROM THE ROOFTOP, TOWERS, AND WATER TOWERS GROUNDING RING, TO THE EXISTING GROUNDING SYSTEM, THE GROUNDING CONDUCTORS SHALL NOT BE SMALLER THAN 2/0 COPPER. ROOFTOP GROUNDING RING SHALL BE BONDED TO THE EXISTING GROUNDING SYSTEM, THE BUILDING STEEL COLUMNS, LIGHTNING PROTECTION SYSTEM, AND BUILDING MAIN WATER LINE (FERROUS OR NONFERROUS METAL PIPING ONLY). DO NOT ATTACH GROUNDING TO FIRE SPRINKLER SYSTEM PIPES.

dish wireless.

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DISH Wireless L.L.C.
PROJECT INFORMATION

NJJER02042B
880 POST ROAD EAST
WESTPORT, CT 06880

SHEET TITLE

GENERAL NOTES

SHEET NUMBER

GN-5

MK DEVELOPMENT

EXHIBIT D

Structural Analysis

January 19, 2023

PASS

RE: **Structural Analysis for Tower**

Location: **880 Post Road East Westport, CT 06880**

Site ID: **NJJER02042B**

Dish Wireless LLC,

Per your request, we have performed a structural analysis of the existing tower. This site consists of an existing self-support tower that has multiple carriers co-located on the tower. This review determines if the tower can support the existing and proposed loads.

1.0 Assumptions:

CATEGORY	DATA	CODE
Structure Type	Self-Support	
RAD Center	144'-0"	
Structure Class	IV	ASCE 7-16
Exposure Class	C	ASCE 7-16
Kzt Factor	1.0	ASCE 7-16
Basic Wind Speed	130	2022 CSBC
Ice Thickness	1"	ASCE 7-16
Ice Windspeed	50 MPH	ASCE 7-16
Seismic Design Category	C	ASCE 7-16
S_{DS}	.244	ASCE 7-16

2.0 Existing Documents:

DOCUMENT	COMPANY	DATE
Existing Structural Analysis	AECOM	7/10/2020
Existing Structural Analysis	HPC Development	3/3/2009

3.0 Proposed Equipment:

MANUFACTURER	EQUIPMENT	WEIGHTS
CommScope	**(3) MTC3975083**	**352 lbs**
CommScope	**(3) FFVV-65B-R2**	**70.54 lbs**
Fujitsu	**(3) TA08025-B604**	**63.9 lbs**
Fujitsu	**(3) TA08025-B605**	**74.9 lbs**
RayCap	**(3) OVP RDIDC-9181-PF-48**	**32 lbs**
CommScope	**(3) HYBRID CABLE**	**N.A.**

Bold represents equipment to be added

It is assumed that all information from the previous analysis performed by AECOM on July 10, 2020 is still accurate and correct. If this assumption is not true, please contact our office for an amended report.

We are installing (3) proposed MTC-3975083 mount on the existing tower that will support all the proposed equipment. After performing an analysis on the tower in TNxTower, it has been determined that the tower is **ADEQUATE** for the existing and proposed loads on the structure which passes at 75.4% of its capacity.

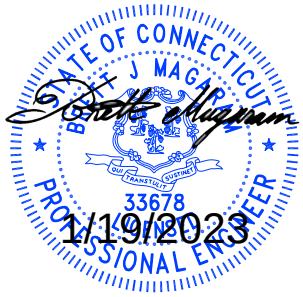
This report does not address the structural stability of any mounts, nor does it provide any warranty either express or implied, for any portion of the proposed mounts or structure.

Please note that we have not had a professional engineer perform an independent visit to confirm existing structural conditions and the outcome of this analysis is based solely on the information provided in the previous structural analysis, photos and drawing details. If the existing conditions are modified, in disrepair or not properly represented, contact our office immediately for an amended report since this analysis may be inaccurate.

If you have any questions, feel free to contact us at any time.

Sincerely,

Magaram Engineering

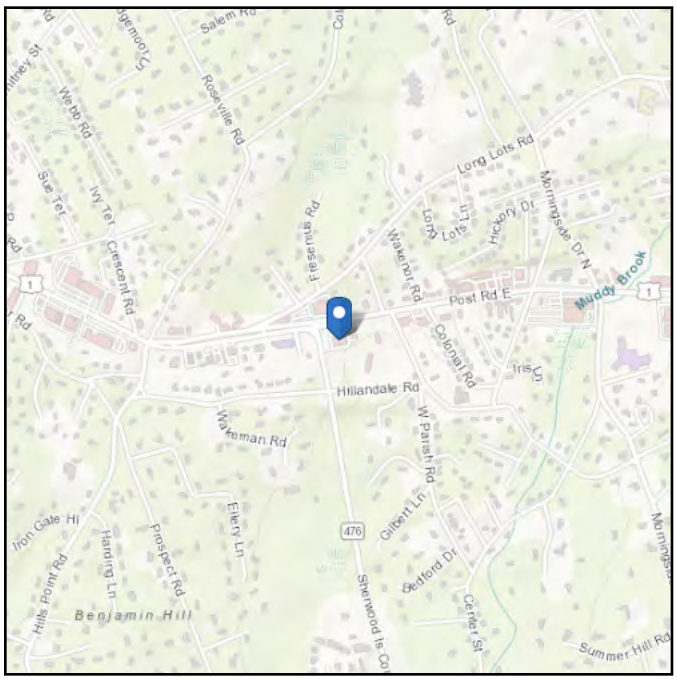


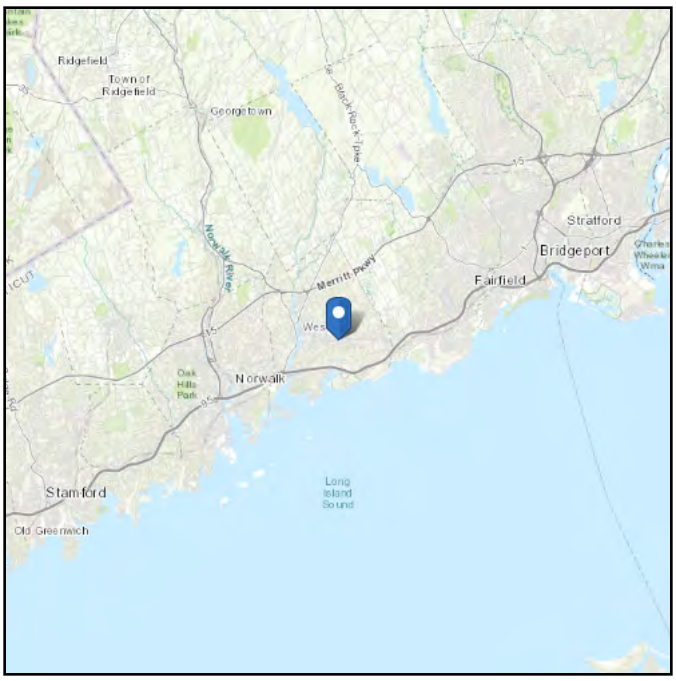
Brett Magaram
Connecticut License # 33678
Brett@MagaramEngineering.com
Phone: 914-450-8416

ASCE 7 Hazards Report

Address:
880 Post Rd E
Westport, Connecticut
06880

Standard:	ASCE/SEI 7-16	**Elevation:**	63.43 ft (NAVD 88)
Risk Category:	IV	**Latitude:**	41.137629
Soil Class:	D - Default (see Section 11.4.3)	**Longitude:**	-73.334872





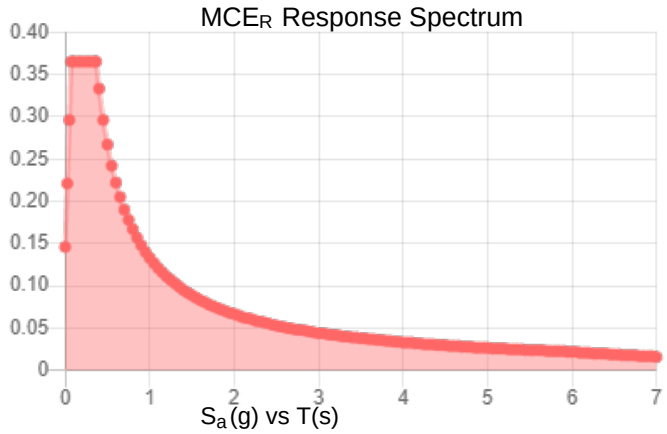
Seismic

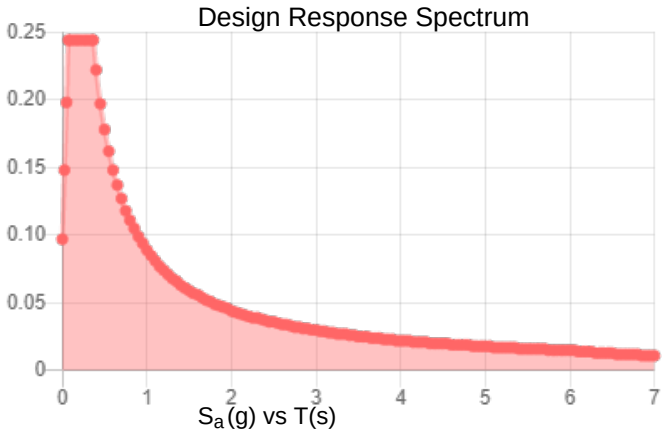
Site Soil Class: D - Default (see Section 11.4.3)

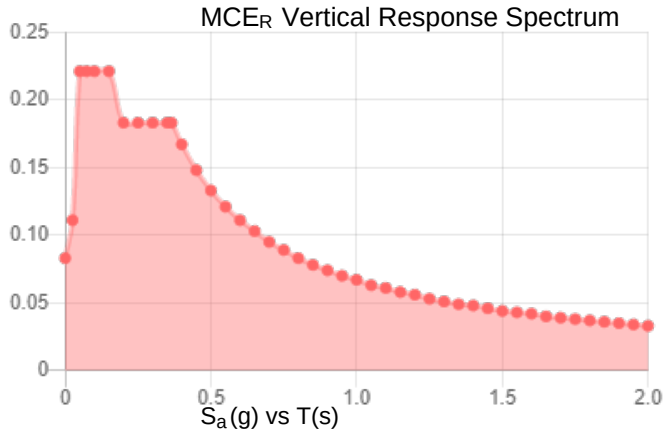
Results:

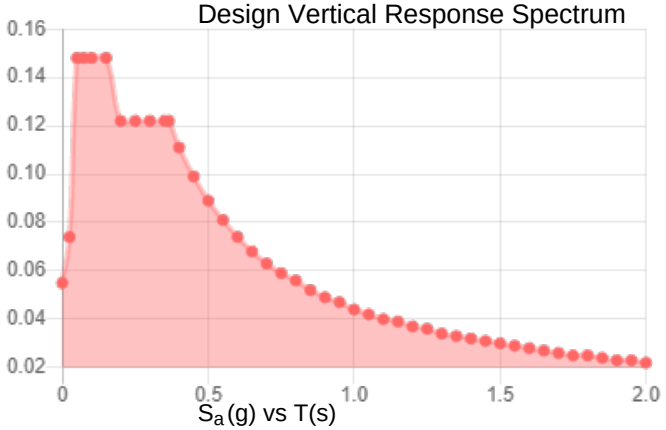
S_S :	0.228	S_{D1} :	0.089
S_1 :	0.056	T_L :	6
F_a :	1.6	PGA :	0.133
F_v :	2.4	PGA_M :	0.204
S_{MS} :	0.365	F_{PGA} :	1.534
S_{M1} :	0.133	I_e :	1.5
S_{DS} :	0.244	C_v :	0.757

Seismic Design Category C









Data Accessed: **Mon Jun 27 2022**

Date Source:

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

Ice

Results:

Ice Thickness:	1.00 in.
Concurrent Temperature:	15 F
Gust Speed	50 mph
Data Source:	Standard ASCE/SEI 7-16, Figs. 10-2 through 10-8
Date Accessed:	Mon Jun 27 2022

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.

(APPENDIX N) MUNICIPALITY - SPECIFIC STRUCTURAL DESIGN PARAMETERS												
				Wind Design Parameters								
Municipality	**Ground Snow Load** (psf)	**MCE Spectral Accelerations** (%g)		**Ultimate Design Wind Speeds,** V_{ult} (mph)			**Nominal Design Wind Speeds,** V_{asd} (mph)			**Wind-Borne Debris Regions[1]**		**Hurricane-Prone Regions**
		S_s	S_1	Risk Cat.I	Risk Cat.II	Risk Cat III-IV	Risk Cat. I	Risk Cat. II	Risk Cat. III-IV	Risk Cat. II & III except Occup I-2	Risk Cat III Occup I-2 & Risk Cat. IV	
Westport	30	0.226	0.067	110	120	130	85	93	101		Type B	Yes
Wethersfield	30	0.181	0.064	115	125	135	89	97	105			Yes
Willington	35	0.174	0.063	115	125	135	89	97	105			Yes
Wilton	30	0.231	0.068	110	120	130	85	93	101			Yes
Winchester	40	0.177	0.065	105	120	125	81	93	97			Yes
Windham	30	0.173	0.062	120	130	140	93	101	108			Yes
Windsor	35	0.179	0.064	115	125	135	89	97	105			Yes
Windsor Locks	35	0.177	0.064	110	125	130	85	97	101			Yes
Wolcott	35	0.187	0.064	110	125	130	85	97	101			Yes
Woodbridge	30	0.191	0.063	115	125	135	89	97	105			Yes
Woodbury	35	0.194	0.065	110	120	130	85	93	101			Yes
Woodstock	40	0.172	0.063	120	130	140	93	101	108			Yes

1. Wind-Borne Debris Regions:

   Type A: Full Municipality.

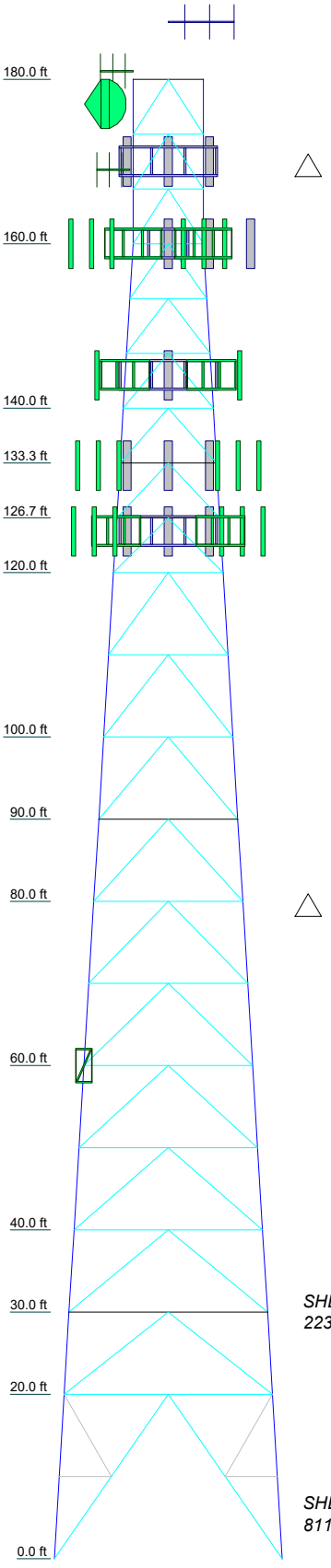
   Type B: Areas south of Interstate 95.

   Exception: Areas that are more than one mile from the coastal mean high-water line as certified by a registered design professional may be classified as being outside a wind-borne debris region.

   Type C: Areas south of Metro North/Amtrak Railroad to the west of the Quinnipiac River and areas south of Interstate 95 to the east of the Quinnipiac River.

   Exception: Areas that are more than one mile from the coastal mean high-water line as certified by a registered design professional may be classified as being outside a wind-borne debris region.

Section	T12	T11	T10	T9	T8	T7	T6	T5	T4	T3	T2	T1	L1
Legs		Rohn 8 EHS + P9.625x0.375 1/3rd Pipe				ROHN 6 EH		ROHN 6 EHS		ROHN 5 EH		ROHN 4 STD	ROHN 3 STD
Leg Grade		A572-42						A572-50					
Diagonals		ROHN 3 EH			ROHN 3 STD			ROHN 2.5 XXS	A	Rohn 2 EH		ROHN 2 STD	
Diagonal Grade					A572-50								A36
Top Girts	N.A.	C		N.A.		B		N.A.		ROHN 2 STD	B	N.A.	ROHN 1.5 STD
Horizontals	P3.5x.226	N.A.		ROHN 2.5 STD		N.A.		ROHN 2 STD		N.A.		ROHN 1.5 STD	
Red. Horizontals	ROHN 1.5 STD						N.A.						
Red. Diagonals	ROHN 2 STD						N.A.						
Red. Hips	ROHN 2.5 STD						N.A.						
Inner Bracing	ROHN 2 STD		L3 1/2x3 1/2x1/4		L3x3x3/16		L2 1/2x2 1/2x3/16					L2x2x1/8	
Face Width (ft)	25.2851	24.0892	22.8932	20.5014	18.1095	16.9136	15.7176	13.3257	12.5285	11.7312	10.9339	8.542	8.542
# Panels @ (ft)	1 @ 20				10 @ 10						6 @ 6.66667		3 @ 6.66667
Weight (lb)	37362.0	6470.3	3438.6	3243.7	6310.6	5274.5	1737.4	1700.9	3760.2	1068.8	834.6	816.2	1457.6	1248.6



SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	ROHN 2 XXS	C	ROHN 2.5 EH
B	ROHN 2 STD		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi	A572-42	42 ksi	60 ksi
A36	36 ksi	58 ksi			

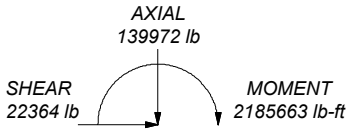
TOWER DESIGN NOTES

1. Tower designed for Exposure C to the TIA-222-H Standard.
2. Tower designed for a 130 mph basic wind in accordance with the TIA-222-H Standard.
3. Tower is also designed for a 50 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 60 mph wind.
5. Tower Risk Category IV.
6. Topographic Category 1 with Crest Height of 0.000 ft
7. Weld together tower sections have flange connections.
8. Connections use galvanized A325 bolts, nuts and locking devices. Installation per TIA/EIA-222 and AISC Specifications.
9. Tower members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards.
10. Welds are fabricated with ER-70S-6 electrodes.
11. TOWER RATING: 75.4%

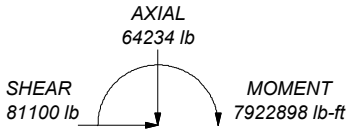
ALL REACTIONS ARE FACTORED

MAX. CORNER REACTIONS AT BASE:
DOWN: 346382 lb
SHEAR: 46759 lb

UPLIFT: -310117 lb
SHEAR: 43804 lb



TORQUE 18479 lb-ft
50 mph WIND - 1.000 in ICE

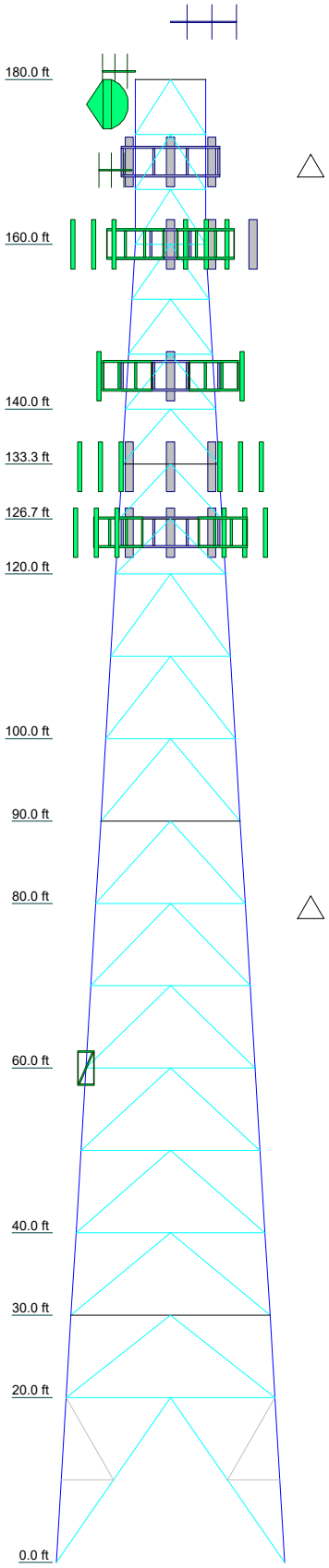


TORQUE 37837 lb-ft
REACTIONS - 130 mph WIND

Magaram Engineering
13705 Stone Shadow
Clifton VA
Phone: 914-450-8416
FAX:

Job:		
Project:		
Client:	Drawn by:	App'd:
Code: TIA-222-H	Date: 06/27/22	Scale: NTS
Path: C:\Users\Brett Laptop 2019\Desktop\Magaram Engineering\MK Development\NJJER02042B\Tower Analysis\CT11612E.eri		Dwg No. E-1

Section	T12	T11	T10	T9	T8	T7	T6	T5	T4	T3	T2	T1	L1
Legs		Rohn 8 EHS + P9.625x0.375 1/3rd Pipe				ROHN 6 EH		ROHN 6 EHS	ROHN 5 EH			ROHN 4 STD	ROHN 3 STD
Leg Grade		A572-42						A572-50					
Diagonals		ROHN 3 EH			ROHN 3 STD			ROHN 2.5 XXS	A	Rohn 2 EH		ROHN 2 STD	
Diagonal Grade					A572-50								A36
Top Girts	N.A.	C		N.A.		B		N.A.	ROHN 2 STD		B	N.A.	ROHN 1.5 STD
Horizontals	P3.5x.226	N.A.		ROHN 2.5 STD		N.A.		ROHN 2 STD	N.A.				
Red. Horizontals	ROHN 1.5 STD							N.A.					
Red. Diagonals	ROHN 2 STD							N.A.					
Red. Hips	ROHN 2.5 STD							N.A.					
Inner Bracing	ROHN 2 STD		L3 1/2x3 1/2x1/4		L3x3x3/16		L2 1/2x2 1/2x3/16		L2x2x1/8				
Face Width (ft)	25.2851	24.0892	22.8932	20.5014	18.1095	16.9136	15.7176	13.3257	12.5285	11.7312	10.9339	8.542	8.542
# Panels @ (ft)	1 @ 20				10 @ 10						6 @ 6.66667		3 @ 6.66667
Weight (lb)	6470.3	3438.6	3243.7	6310.6	5274.5	1737.4	1700.9	3760.2	1068.8	834.6	816.2	1457.6	1248.6



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
ANT940T10-WR	187	TA08025-B605 (DISH)	144
ANT940T10-WR	181	TA08025-B604 (DISH)	144
PA6-65AC	177	MTC3975083 (DISH)	144
(3) BPS7496-180-14	170	DC6 Squid (ATT)	133
432E-83I-01T TTA	170	PiROD 15' T-Frame (ATT)	133
PiROD 12' Universal T-Frame Sector Mount	170	800-10798 (ATT)	133
		P65-16-XLH-RR (ATT)	133
3' Yagi	169	HPA-65R-BUU-H6 [P2.0][96"] (ATT)	133
PiROD 15' T-Frame (VZW)	160	(3) RRUS32 (ATT)	133
(2) JAHH-65B-R3B [P2.0][96"] (VZW)	160	RRUS11 (ATT)	133
BXA-70080-4CF-EDIN [P2.0][96"] (VZW)	160	DC6 Squid (ATT)	133
		PiROD 15' T-Frame (ATT)	133
XXDWMM-12.5-65-8T-CBRS (VZW)	160	800-10798 (ATT)	133
4x40 B2/66 Dual RRH (VZW)	160	P65-16-XLH-RR (ATT)	133
DB-T1-6Z-8AB-0Z (VZW)	160	HPA-65R-BUU-H6 [P2.0][96"] (ATT)	133
RFV01U-D2A RRH (VZW)	160	(3) RRUS32 (ATT)	133
CBRS RRH (RT 4401-48A) (VZW)	160	RRUS11 (ATT)	133
PiROD 15' T-Frame (VZW)	160	DC6 Squid (ATT)	133
(2) JAHH-65B-R3B [P2.0][96"] (VZW)	160	PiROD 15' T-Frame (ATT)	133
BXA-70080-4CF-EDIN [P2.0][96"] (VZW)	160	800-10798 (ATT)	133
		P65-16-XLH-RR (ATT)	133
XXDWMM-12.5-65-8T-CBRS (VZW)	160	HPA-65R-BUU-H6 [P2.0][96"] (ATT)	133
4x40 B2/66 Dual RRH (VZW)	160	(3) RRUS32 (ATT)	133
DB-T1-6Z-8AB-0Z (VZW)	160	RRUS11 (ATT)	133
RFV01U-D2A RRH (VZW)	160	AIR32 DB [P2.0][96"] (TMO)	125
CBRS RRH (RT 4401-48A) (VZW)	160	APXVAARR24_43-U-NA20 [P2.0][96"] (TMO)	125
PiROD 15' T-Frame (VZW)	160	Radio 4449 (TMO)	125
(2) JAHH-65B-R3B [P2.0][96"] (VZW)	160	PiROD 12' Lightweight T-Frame (TMO)	125
BXA-70080-4CF-EDIN [P2.0][96"] (VZW)	160	AIR32 DB [P2.0][96"] (TMO)	125
		AIR21 [P2.0][96"] (TMO)	125
4x40 B2/66 Dual RRH (VZW)	160	APXVAARR24_43-U-NA20 [P2.0][96"] (TMO)	125
DB-T1-6Z-8AB-0Z (VZW)	160	Radio 4449 (TMO)	125
RFV01U-D2A RRH (VZW)	160	PiROD 12' Lightweight T-Frame (TMO)	125
CBRS RRH (RT 4401-48A) (VZW)	160	AIR32 DB [P2.0][96"] (TMO)	125
XXDWMM-12.5-65-8T-CBRS (VZW)	160	AIR21 [P2.0][96"] (TMO)	125
FFVV-65B-R2 [P2.0][96"] (DISH)	144	APXVAARR24_43-U-NA20 [P2.0][96"] (TMO)	125
TA08025-B605 (DISH)	144	Radio 4449 (TMO)	125
TA08025-B604 (DISH)	144	PiROD 12' Lightweight T-Frame (TMO)	125
RDIDC-9181-PF-48 (DISH)	144	AIR21 [P2.0][96"] (TMO)	125
MTC3975083 (DISH)	144	ANT150D	113
FFVV-65B-R2 [P2.0][96"] (DISH)	144	4' Standoff	60
TA08025-B605 (DISH)	144	GPS	60
TA08025-B604 (DISH)	144		
MTC3975083 (DISH)	144		
FFVV-65B-R2 [P2.0][96"] (DISH)	144		

SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	ROHN 2 XXS	C	ROHN 2.5 EH
B	ROHN 2 STD		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi	A572-42	42 ksi	60 ksi
A36	36 ksi	58 ksi			

TOWER DESIGN NOTES

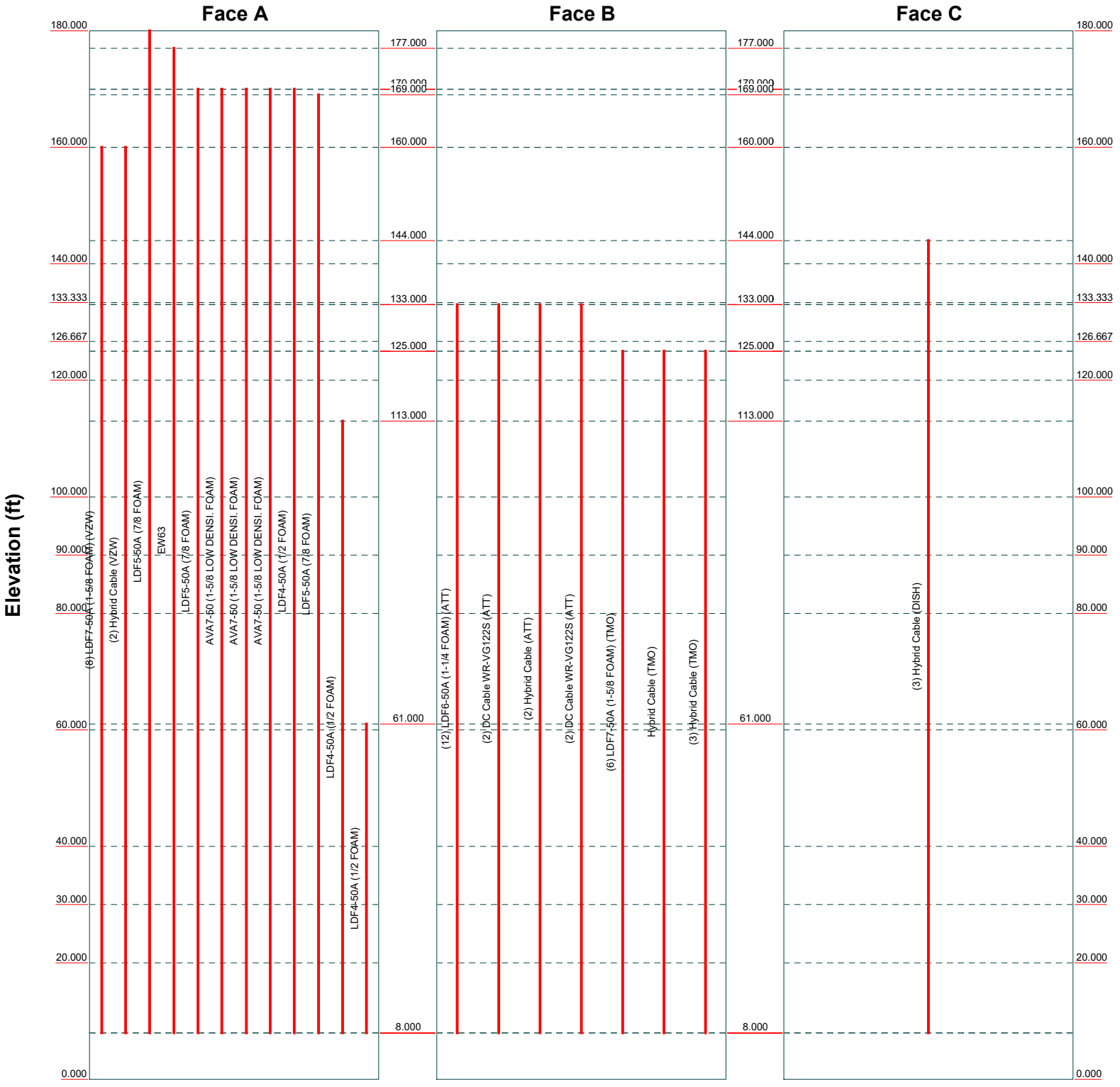
1. Tower designed for Exposure C to the TIA-222-H Standard.
2. Tower designed for a 130 mph basic wind in accordance with the TIA-222-H Standard.
3. Tower is also designed for a 50 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 60 mph wind.
5. Tower Risk Category IV.
6. Topographic Category 1 with Crest Height of 0.000 ft
7. Weld together tower sections have flange connections.
8. Connections use galvanized A325 bolts, nuts and locking devices. Installation per TIA/EIA-222 and AISC Specifications.
9. Tower members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards.
10. Welds are fabricated with ER-70S-6 electrodes.

Magaram Engineering
13705 Stone Shadow
Clifton VA
Phone: 914-450-8416
FAX:

Job:		
Project:		
Client:	Drawn by:	App'd:
Code: TIA-222-H	Date: 06/27/22	Scale: NTS
Path: C:\Users\Brett Laptop 2019\Desktop\Magaram Engineering\MK Development\NJJER02042B\Tower Analysis\CT11612E.eri		Dwg No. E-1

Feed Line Distribution Chart
0' - 180'

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



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FAX:

Job:		
Project:		
Client:	Drawn by:	App'd:
Code: TIA-222-H	Date: 06/27/22	Scale: NTS
Path: C:\Users\Brett Laptop 2019\Desktop\Magaram Engineering\MK Development\NJJER02042B\Tower Analysis\CT11612E.eri		Dwg No. E-7

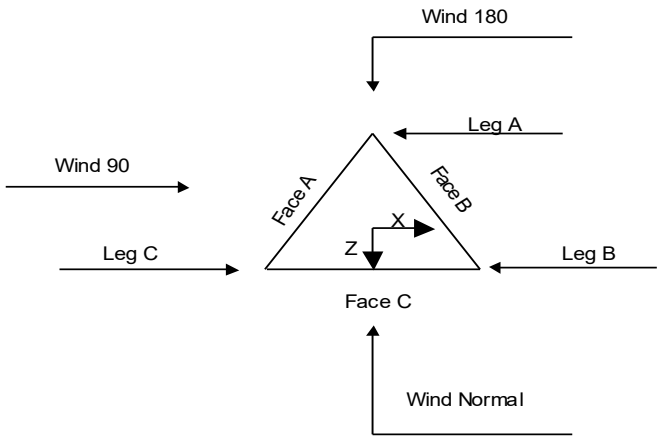
Tower Input Data

The main tower is a 3x free standing tower with an overall height of 180.000 ft above the ground line.
The base of the tower is set at an elevation of 0.000 ft above the ground line.
The face width of the tower is 8.542 ft at the top and 27.677 ft at the base.
There is a 3 sided latticed pole with a face width of 8.542 ft.
This tower is designed using the TIA-222-H standard.
The following design criteria apply:

Tower base elevation above sea level: 0.000 ft.
Basic wind speed of 130 mph.
Risk Category IV.
Exposure Category C.
Simplified Topographic Factor Procedure for wind speed-up calculations is used.
Topographic Category: 1.
Crest Height: 0.000 ft.
Nominal ice thickness of 1.000 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 50 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 60 mph.
Weld together tower sections have flange connections..
Connections use galvanized A325 bolts, nuts and locking devices. Installation per TIA/EIA-222 and AISC Specifications..
Tower members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards..
Welds are fabricated with ER-70S-6 electrodes..
Pressures are calculated at each section.
Stress ratio used in latticed pole member design is 1.
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		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



Triangular Tower

3 Sided Latticed Pole Section Geometry

Tower Section	Tower Elevation	Assembly Database	Description	Section Width	Number of Sections	Section Length
	ft			ft		ft
L1	180.000-160.000			8.542	1	20.000

3 Sided Latticed Pole 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
	ft	ft				in	in
L1	180.000-160.000	6.667	K Brace Down	No	Yes	0.000	0.000

3 Sided Latticed Pole Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
L1 180.000-160.000	Pipe	ROHN 3 STD	A572-50 (50 ksi)	Pipe	ROHN 2 STD	A36 (36 ksi)

3 Sided Latticed Pole Section Geometry *(cont'd)*

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
L1 180.000-160.000	Pipe	ROHN 1.5 STD	A572-50 (50 ksi)	Flat Bar		A36 (36 ksi)

3 Sided Latticed Pole Section Geometry *(cont'd)*

Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
L1 180.000-160.000	None	Flat Bar		A36 (36 ksi)	Pipe	ROHN 1.5 STD	A572-50 (50 ksi)

3 Sided Latticed Pole Section Geometry *(cont'd)*

Tower Elevation ft	Secondary Horizontal Type	Secondary Horizontal Size	Secondary Horizontal Grade	Inner Bracing Type	Inner Bracing Size	Inner Bracing Grade
L1 180.000-160.000	Solid Round		A572-50 (50 ksi)	Single Angle	L2x2x1/8	A36 (36 ksi)

3 Sided Latticed Pole 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
L1 180.000-160.000	0.000	0.000	A36 (36 ksi)	1	1	1	36.000	36.000	36.000

3 Sided Latticed Pole Section Geometry *(cont'd)*

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	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
L1 180.000-160.000	No	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1

[1]*Note: 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.*

3 Sided Latticed Pole Section Geometry *(cont'd)*

Tower Elevation ft	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
	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
L1 180.000-160.000	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75

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
L1 180.000-160.000	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75

Tower Section Geometry

Tower Section	Tower Elevation ft	Assembly Database	Description	Section Width ft	Number of Sections	Section Length ft
T1	160.000-140.000			8.542	1	20.000
T2	140.000-133.333			10.934	1	6.667
T3	133.333-126.667			11.731	1	6.667
T4	126.667-120.000			12.528	1	6.667
T5	120.000-100.000			13.326	1	20.000
T6	100.000-90.000			15.718	1	10.000
T7	90.000-80.000			16.914	1	10.000
T8	80.000-60.000			18.110	1	20.000
T9	60.000-40.000			20.501	1	20.000

Tower Section	Tower Elevation ft	Assembly Database	Description	Section Width ft	Number of Sections	Section Length ft
T10	40.000-30.000			22.893	1	10.000
T11	30.000-20.000			24.089	1	10.000
T12	20.000-0.000			25.285	1	20.000

Tower Section Geometry *(cont'd)*

Tower Section	Tower Elevation ft	Diagonal Spacing ft	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset in	Bottom Girt Offset in
T1	160.000-140.000	6.667	K Brace Down	No	Yes	0.000	0.000
T2	140.000-133.333	6.667	K Brace Down	No	Yes	0.000	0.000
T3	133.333-126.667	6.667	K Brace Down	No	Yes	0.000	0.000
T4	126.667-120.000	6.667	K Brace Down	No	Yes	0.000	0.000
T5	120.000-100.000	10.000	K Brace Down	No	Yes	0.000	0.000
T6	100.000-90.000	10.000	K Brace Down	No	Yes	0.000	0.000
T7	90.000-80.000	10.000	K Brace Down	No	Yes	0.000	0.000
T8	80.000-60.000	10.000	K Brace Down	No	Yes	0.000	0.000
T9	60.000-40.000	10.000	K Brace Down	No	Yes	0.000	0.000
T10	40.000-30.000	10.000	K Brace Down	No	Yes	0.000	0.000
T11	30.000-20.000	10.000	K Brace Down	No	Yes	0.000	0.000
T12	20.000-0.000	20.000	K1 Down	No	Yes	0.000	0.000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 160.000-140.000	Pipe	ROHN 4 STD	A572-50 (50 ksi)	Pipe	ROHN 2 STD	A572-50 (50 ksi)
T2 140.000-133.333	Pipe	ROHN 5 EH	A572-50 (50 ksi)	Pipe	Rohn 2 EH	A572-50 (50 ksi)
T3 133.333-126.667	Pipe	ROHN 5 EH	A572-50 (50 ksi)	Pipe	Rohn 2 EH	A572-50 (50 ksi)
T4 126.667-120.000	Pipe	ROHN 5 EH	A572-50 (50 ksi)	Pipe	ROHN 2 XXS	A572-50 (50 ksi)
T5 120.000-100.000	Pipe	ROHN 6 EHS	A572-50 (50 ksi)	Pipe	ROHN 2.5 XXS	A572-50 (50 ksi)
T6 100.000-90.000	Pipe	ROHN 6 EH	A572-50 (50 ksi)	Pipe	ROHN 3 STD	A572-50 (50 ksi)
T7 90.000-80.000	Pipe	ROHN 6 EH	A572-50 (50 ksi)	Pipe	ROHN 3 STD	A572-50 (50 ksi)
T8 80.000-60.000	Arbitrary Shape	Rohn 8 EHS + P9.625x0.375 1/3rd Pipe	A572-50 (50 ksi)	Pipe	ROHN 3 STD	A572-50 (50 ksi)
T9 60.000-40.000	Arbitrary Shape	Rohn 8 EHS + P9.625x0.375 1/3rd Pipe	A572-42 (42 ksi)	Pipe	ROHN 3 EH	A572-50 (50 ksi)
T10 40.000-30.000	Arbitrary Shape	Rohn 8 EHS + P9.625x0.375 1/3rd Pipe	A572-42 (42 ksi)	Pipe	ROHN 3 EH	A572-50 (50 ksi)
T11 30.000-20.000	Arbitrary Shape	Rohn 8 EHS + P9.625x0.375 1/3rd Pipe	A572-42 (42 ksi)	Pipe	ROHN 3 EH	A572-50 (50 ksi)
T12 20.000-0.000	Arbitrary Shape	Rohn 8 EHS + P9.625x0.375 1/3rd Pipe	A572-42 (42 ksi)	Pipe	ROHN 3 EH	A572-50 (50 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T3 133.333-126.667	Pipe	ROHN 2 STD	A572-50 (50 ksi)	Solid Round		A36 (36 ksi)
T4 126.667-120.000	Pipe	ROHN 2 STD	A572-50 (50 ksi)	Solid Round		A36 (36 ksi)
T7 90.000-80.000	Pipe	ROHN 2 STD	A572-50 (50 ksi)	Solid Round		A36 (36 ksi)
T11 30.000-20.000	Pipe	ROHN 2.5 EH	A572-50 (50 ksi)	Solid Round		A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
T1 160.000-140.000	None	Flat Bar		A36 (36 ksi)	Pipe	ROHN 1.5 STD	A572-50 (50 ksi)
T2 140.000-133.333	None	Flat Bar		A36 (36 ksi)	Pipe	ROHN 2 STD	A572-50 (50 ksi)
T3 133.333-126.667	None	Flat Bar		A36 (36 ksi)	Pipe	ROHN 2 STD	A572-50 (50 ksi)
T4 126.667-120.000	None	Flat Bar		A36 (36 ksi)	Pipe	ROHN 2 STD	A572-50 (50 ksi)
T5 120.000-100.000	None	Flat Bar		A36 (36 ksi)	Pipe	ROHN 2 STD	A572-50 (50 ksi)
T6 100.000-90.000	None	Flat Bar		A36 (36 ksi)	Pipe	ROHN 2 STD	A572-50 (50 ksi)
T7 90.000-80.000	None	Flat Bar		A36 (36 ksi)	Pipe	ROHN 2 STD	A572-50 (50 ksi)
T8 80.000-60.000	None	Flat Bar		A36 (36 ksi)	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)
T9 60.000-40.000	None	Flat Bar		A36 (36 ksi)	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)
T10 40.000-30.000	None	Flat Bar		A36 (36 ksi)	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)
T11 30.000-20.000	None	Flat Bar		A36 (36 ksi)	Pipe	ROHN 2.5 EH	A572-50 (50 ksi)
T12 20.000-0.000	None	Flat Bar		A36 (36 ksi)	Pipe	P3.5x.226	A572-50 (50 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Secondary Horizontal Type	Secondary Horizontal Size	Secondary Horizontal Grade	Inner Bracing Type	Inner Bracing Size	Inner Bracing Grade
T1 160.000-140.000	Solid Round		A572-50 (50 ksi)	Single Angle	L2x2x1/8	A36 (36 ksi)
T2 140.000-133.333	Solid Round		A572-50 (50 ksi)	Single Angle	L2x2x1/8	A36 (36 ksi)
T3 133.333-126.667	Solid Round		A572-50 (50 ksi)	Single Angle	L2x2x1/8	A36 (36 ksi)
T4 126.667-120.000	Solid Round		A572-50 (50 ksi)	Single Angle	L2x2x1/8	A36 (36 ksi)
T5 120.000-100.000	Solid Round		A572-50 (50 ksi)	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T6 100.000-90.000	Solid Round		A572-50 (50 ksi)	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T7 90.000-80.000	Solid Round		A572-50 (50 ksi)	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T8 80.000-60.000	Solid Round		A572-50 (50 ksi)	Single Angle	L3x3x3/16	A36 (36 ksi)
T9 60.000-40.000	Solid Round		A572-50 (50 ksi)	Single Angle	L3 1/2x3 1/2x1/4	A36 (36 ksi)
T10 40.000-30.000	Solid Round		A572-50 (50 ksi)	Single Angle	L3 1/2x3 1/2x1/4	A36 (36 ksi)
T11 30.000-20.000	Solid Round		A572-50 (50 ksi)	Single Angle	L3 1/2x3 1/2x1/4	A36 (36 ksi)
T12 20.000-0.000	Solid Round		A572-50 (50 ksi)	Pipe	ROHN 2 STD	A572-50 (50 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Redundant Bracing Grade		Redundant Type	Redundant Size	K Factor
T12 20.000-0.000	A36 (36 ksi)	Horizontal (1) Diagonal (1) Hip (1)	Pipe Pipe Pipe	ROHN 1.5 STD ROHN 2 STD ROHN 2.5 STD	1 1 1

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 160.000-140.000	0.000	0.000	A36 (36 ksi)	1	1	1	36.000	36.000	36.000
T2 140.000-133.333	0.000	0.000	A36 (36 ksi)	1	1	1	36.000	36.000	36.000
T3 133.333-126.667	0.000	0.000	A36 (36 ksi)	1	1	1	36.000	36.000	36.000
T4	0.000	0.000	A36	1	1	1	36.000	36.000	36.000

Tower Elevation ft	Gusset Area (per face) ft²	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
126.667-120.000			(36 ksi)						
T5 120.000-100.000	0.000	0.000	A36 (36 ksi)	1	1	1	36.000	36.000	36.000
T6 100.000-90.000	0.000	0.000	A36 (36 ksi)	1	1	1	36.000	36.000	36.000
T7 90.000-80.000	0.000	0.000	A36 (36 ksi)	1	1	1	36.000	36.000	36.000
T8 80.000-60.000	0.000	0.000	A36 (36 ksi)	1	1	1	36.000	36.000	36.000
T9 60.000-40.000	0.000	0.000	A36 (36 ksi)	1	1	1	36.000	36.000	36.000
T10 40.000-30.000	0.000	0.000	A36 (36 ksi)	1	1	1	36.000	36.000	36.000
T11 30.000-20.000	0.000	0.000	A36 (36 ksi)	1	1	1	36.000	36.000	36.000
T12 20.000-0.000	0.000	0.000	A36 (36 ksi)	1	1.05	1.05	36.000	36.000	36.000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X	X Brace Diags Y	K Single Diags X	K Single Diags Y	Girts X	Girts Y	Horiz. X	Horiz. Y	Sec. Horiz. X	Sec. Horiz. Y	Inner Brace X	Inner Brace Y
T1 160.000-140.000	No	No	1	1	1	1	1	1	1	1	1	1	1	1	1
T2 140.000-133.333	No	No	1	1	1	1	1	1	1	1	1	1	1	1	1
T3 133.333-126.667	No	No	1	1	1	1	1	1	1	1	1	1	1	1	1
T4 126.667-120.000	No	No	1	1	1	1	1	1	1	1	1	1	1	1	1
T5 120.000-100.000	No	No	1	1	1	1	1	1	1	1	1	1	1	1	1
T6 100.000-90.000	No	No	1	1	1	1	1	1	1	1	1	1	1	1	1
T7 90.000-80.000	No	No	1	1	1	1	1	1	1	1	1	1	1	1	1
T8 80.000-60.000	No	No	1	1	1	1	1	1	1	1	1	1	1	1	1
T9 60.000-40.000	No	No	1	1	1	1	1	1	1	1	1	1	1	1	1
T10 40.000-30.000	No	No	1	1	1	1	1	1	1	1	1	1	1	1	1

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	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
T11	No	No	1	1	1	1	1	1	1	1
30.000-20.000				1	1	1	1	1	1	1
T12	No	No	1	1	0.5	1	1	1	1	1
20.000-0.000				1	0.5	1	1	1	1	1

[1]*Note: 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	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
	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	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
160.000-140.000														
T2	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
140.000-133.333														
T3	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
133.333-126.667														
T4	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
126.667-120.000														
T5	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
120.000-100.000														
T6	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
100.000-90.000														
T7	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
90.000-80.000														
T8	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
80.000-60.000														
T9	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
60.000-40.000														
T10	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
40.000-30.000														
T11	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
30.000-20.000														
T12	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
20.000-0.000														

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 160.000-140.000	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T2 140.000-133.333	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T3 133.333-126.667	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T4 126.667-120.000	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T5 120.000-100.000	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T6 100.000-90.000	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T7 90.000-80.000	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T8 80.000-60.000	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T9 60.000-40.000	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T10 40.000-30.000	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T11 30.000-20.000	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T12 20.000-0.000	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75

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
LDF6-50A (1-1/4 FOAM) (ATT)	B	No	No	Ar (CaAa)	133.000 - 8.000	0.000	0.46	12	6	1.550	1.550		0.660
DC Cable WR-VG122S (ATT)	B	No	No	Ar (CaAa)	133.000 - 8.000	0.000	0.43	2	2	0.400	0.400		0.250
Hybrid Cable (ATT)	B	No	No	Ar (CaAa)	133.000 - 8.000	0.000	0.41	2	1	1.625	1.980		0.820
DC Cable WR-VG122S (ATT) *	B	No	No	Ar (CaAa)	133.000 - 8.000	0.000	0.42	2	2	0.400	0.400		0.250
LDF7-50A (1-5/8 FOAM) (TMO)	B	No	No	Ar (CaAa)	125.000 - 8.000	0.000	-0.41	6	3	1.980	1.980		0.820

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
Hybrid Cable (TMO)	B	No	No	Ar (CaAa)	125.000 - 8.000	0.000	-0.385	1	1	0.709	0.709		0.480
Hybrid Cable (TMO) *	B	No	No	Ar (CaAa)	125.000 - 8.000	0.000	-0.365	3	3	1.980	1.980		0.820
LDF7-50A (1-5/8 FOAM) (VZW)	A	No	No	Ar (CaAa)	160.000 - 8.000	0.000	-0.42	8	8	1.980	1.980		0.820
Hybrid Cable (VZW) *	A	No	No	Ar (CaAa)	160.000 - 8.000	0.000	-0.48	2	2	2.013	2.013		3.040
LDF5-50A (7/8 FOAM)	A	No	No	Ar (CaAa)	180.000 - 8.000	0.000	0.48	1	1	1.090	1.090		0.330
EW63	A	No	No	Ar (CaAa)	177.000 - 8.000	0.000	0.44	1	1	1.574	1.574		0.510
LDF5-50A (7/8 FOAM)	A	No	No	Ar (CaAa)	170.000 - 8.000	0.000	0.42	1	1	1.090	1.090		0.330
AVA7-50 (1-5/8 LOW DENSI. FOAM)	A	No	No	Ar (CaAa)	170.000 - 8.000	0.000	0.4	1	1	1.980	1.980		0.720
AVA7-50 (1-5/8 LOW DENSI. FOAM)	A	No	No	Ar (CaAa)	170.000 - 8.000	0.000	0.38	1	1	1.980	1.980		0.720
AVA7-50 (1-5/8 LOW DENSI. FOAM)	A	No	No	Ar (CaAa)	170.000 - 8.000	0.000	0.36	1	1	1.980	1.980		0.720
LDF4-50A (1/2 FOAM)	A	No	No	Ar (CaAa)	170.000 - 8.000	0.000	0.34	1	1	0.630	0.630		0.150
LDF5-50A (7/8 FOAM)	A	No	No	Ar (CaAa)	169.000 - 8.000	0.000	0.32	1	1	1.090	1.090		0.330
LDF4-50A (1/2 FOAM)	A	No	No	Ar (CaAa)	113.000 - 8.000	0.000	0.3	1	1	0.630	0.630		0.150
LDF4-50A (1/2 FOAM) *	A	No	No	Ar (CaAa)	61.000 - 8.000	0.000	0.28	1	1	0.630	0.630		0.150
Hybrid Cable (DISH)	C	No	No	Ar (CaAa)	144.000 - 8.000	0.000	0	3	3	1.980	1.980		0.820

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
L1	180.000-160.000	A	0.000	0.000	13.497	0.000	44.640
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000	0.000
T1	160.000-140.000	A	0.000	0.000	62.559	0.000	329.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	2.376	0.000	9.840
T2	140.000-133.333	A	0.000	0.000	20.853	0.000	109.667
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	3.960	0.000	16.400
T3	133.333-126.667	A	0.000	0.000	20.853	0.000	109.667

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
		B	0.000	0.000	15.301	0.000	66.880
		C	0.000	0.000	3.960	0.000	16.400
T4	126.667-120.000	A	0.000	0.000	20.853	0.000	109.667
		B	0.000	0.000	25.371	0.000	109.700
		C	0.000	0.000	3.960	0.000	16.400
T5	120.000-100.000	A	0.000	0.000	63.378	0.000	330.950
		B	0.000	0.000	85.377	0.000	368.400
		C	0.000	0.000	11.880	0.000	49.200
T6	100.000-90.000	A	0.000	0.000	31.909	0.000	166.000
		B	0.000	0.000	42.689	0.000	184.200
		C	0.000	0.000	5.940	0.000	24.600
T7	90.000-80.000	A	0.000	0.000	31.909	0.000	166.000
		B	0.000	0.000	42.689	0.000	184.200
		C	0.000	0.000	5.940	0.000	24.600
T8	80.000-60.000	A	0.000	0.000	63.882	0.000	332.150
		B	0.000	0.000	85.377	0.000	368.400
		C	0.000	0.000	11.880	0.000	49.200
T9	60.000-40.000	A	0.000	0.000	65.079	0.000	335.000
		B	0.000	0.000	85.377	0.000	368.400
		C	0.000	0.000	11.880	0.000	49.200
T10	40.000-30.000	A	0.000	0.000	32.539	0.000	167.500
		B	0.000	0.000	42.689	0.000	184.200
		C	0.000	0.000	5.940	0.000	24.600
T11	30.000-20.000	A	0.000	0.000	32.539	0.000	167.500
		B	0.000	0.000	42.689	0.000	184.200
		C	0.000	0.000	5.940	0.000	24.600
T12	20.000-0.000	A	0.000	0.000	39.047	0.000	201.000
		B	0.000	0.000	51.226	0.000	221.040
		C	0.000	0.000	7.128	0.000	29.520

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
L1	180.000-160.000	A	1.473	0.000	0.000	41.772	0.000	541.843
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	0.000	0.000
T1	160.000-140.000	A	1.454	0.000	0.000	177.327	0.000	2409.016
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	6.855	0.000	84.898
T2	140.000-133.333	A	1.441	0.000	0.000	58.909	0.000	795.918
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	11.396	0.000	140.408
T3	133.333-126.667	A	1.434	0.000	0.000	58.803	0.000	792.150
		B		0.000	0.000	32.828	0.000	498.245
		C		0.000	0.000	11.380	0.000	139.829
T4	126.667-120.000	A	1.426	0.000	0.000	58.691	0.000	788.213
		B		0.000	0.000	54.472	0.000	844.781
		C		0.000	0.000	11.364	0.000	139.223
T5	120.000-100.000	A	1.410	0.000	0.000	179.837	0.000	2386.908
		B		0.000	0.000	182.675	0.000	2833.268
		C		0.000	0.000	33.988	0.000	413.762
T6	100.000-90.000	A	1.389	0.000	0.000	90.629	0.000	1189.472
		B		0.000	0.000	90.879	0.000	1401.884
		C		0.000	0.000	16.928	0.000	204.419
T7	90.000-80.000	A	1.374	0.000	0.000	90.256	0.000	1176.959
		B		0.000	0.000	90.535	0.000	1390.890

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
		C		0.000	0.000	16.879	0.000	202.581
T8	80.000-60.000	A	1.348	0.000	0.000	179.566	0.000	2314.596
		B		0.000	0.000	179.890	0.000	2744.197
		C		0.000	0.000	33.587	0.000	398.873
T9	60.000-40.000	A	1.303	0.000	0.000	183.546	0.000	2304.477
		B		0.000	0.000	177.899	0.000	2681.388
		C		0.000	0.000	33.301	0.000	388.334
T10	40.000-30.000	A	1.257	0.000	0.000	90.576	0.000	1114.530
		B		0.000	0.000	87.931	0.000	1308.940
		C		0.000	0.000	16.504	0.000	188.822
T11	30.000-20.000	A	1.216	0.000	0.000	89.487	0.000	1080.702
		B		0.000	0.000	87.003	0.000	1280.360
		C		0.000	0.000	16.371	0.000	183.996
T12	20.000-0.000	A	1.109	0.000	0.000	104.040	0.000	1195.749
		B		0.000	0.000	101.560	0.000	1450.529
		C		0.000	0.000	19.238	0.000	206.207

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	180.000-160.000	-1.439	-13.279	-2.009	-18.792
T1	160.000-140.000	-18.526	-2.052	-14.791	-6.913
T2	140.000-133.333	-18.535	-0.807	-14.473	-5.781
T3	133.333-126.667	-1.478	8.627	1.756	2.620
T4	126.667-120.000	0.607	-2.548	3.383	-6.632
T5	120.000-100.000	0.966	-6.628	3.720	-10.999
T6	100.000-90.000	0.956	-7.315	3.886	-12.330
T7	90.000-80.000	0.988	-7.741	4.099	-13.017
T8	80.000-60.000	0.972	-8.003	4.248	-13.683
T9	60.000-40.000	0.851	-9.243	4.084	-16.019
T10	40.000-30.000	0.879	-9.829	4.306	-16.798
T11	30.000-20.000	0.898	-10.213	4.439	-17.203
T12	20.000-0.000	0.723	-8.567	3.633	-14.082

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L1	13	LDF5-50A (7/8 FOAM)	160.00 - 180.00	1.0000	1.0000
L1	14	EW63	160.00 - 177.00	1.0000	1.0000
L1	15	LDF5-50A (7/8 FOAM)	160.00 - 170.00	1.0000	1.0000
L1	16	AVA7-50 (1-5/8 LOW DENSI. FOAM)	160.00 - 170.00	1.0000	1.0000
L1	17	AVA7-50 (1-5/8 LOW DENSI. FOAM)	160.00 - 170.00	1.0000	1.0000
L1	18	AVA7-50 (1-5/8 LOW	160.00 -	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
		DENSI. FOAM)	170.00		
L1	19	LDF4-50A (1/2 FOAM)	160.00 - 170.00	1.0000	1.0000
L1	20	LDF5-50A (7/8 FOAM)	160.00 - 169.00	1.0000	1.0000
T1	10	LDF7-50A (1-5/8 FOAM)	140.00 - 160.00	1.0000	1.0000
T1	11	Hybrid Cable	140.00 - 160.00	1.0000	1.0000
T1	13	LDF5-50A (7/8 FOAM)	140.00 - 160.00	1.0000	1.0000
T1	14	EW63	140.00 - 160.00	1.0000	1.0000
T1	15	LDF5-50A (7/8 FOAM)	140.00 - 160.00	1.0000	1.0000
T1	16	AVA7-50 (1-5/8 LOW DENSI. FOAM)	140.00 - 160.00	1.0000	1.0000
T1	17	AVA7-50 (1-5/8 LOW DENSI. FOAM)	140.00 - 160.00	1.0000	1.0000
T1	18	AVA7-50 (1-5/8 LOW DENSI. FOAM)	140.00 - 160.00	1.0000	1.0000
T1	19	LDF4-50A (1/2 FOAM)	140.00 - 160.00	1.0000	1.0000
T1	20	LDF5-50A (7/8 FOAM)	140.00 - 160.00	1.0000	1.0000
T1	24	Hybrid Cable	140.00 - 144.00	1.0000	1.0000
T2	10	LDF7-50A (1-5/8 FOAM)	133.33 - 140.00	1.0000	1.0000
T2	11	Hybrid Cable	133.33 - 140.00	1.0000	1.0000
T2	13	LDF5-50A (7/8 FOAM)	133.33 - 140.00	1.0000	1.0000
T2	14	EW63	133.33 - 140.00	1.0000	1.0000
T2	15	LDF5-50A (7/8 FOAM)	133.33 - 140.00	1.0000	1.0000
T2	16	AVA7-50 (1-5/8 LOW DENSI. FOAM)	133.33 - 140.00	1.0000	1.0000
T2	17	AVA7-50 (1-5/8 LOW DENSI. FOAM)	133.33 - 140.00	1.0000	1.0000
T2	18	AVA7-50 (1-5/8 LOW DENSI. FOAM)	133.33 - 140.00	1.0000	1.0000
T2	19	LDF4-50A (1/2 FOAM)	133.33 - 140.00	1.0000	1.0000
T2	20	LDF5-50A (7/8 FOAM)	133.33 - 140.00	1.0000	1.0000
T2	24	Hybrid Cable	133.33 - 140.00	1.0000	1.0000
T3	1	LDF6-50A (1-1/4 FOAM)	126.67 - 133.00	1.0000	1.0000
T3	2	DC Cable WR-VG122S	126.67 - 133.00	1.0000	1.0000
T3	3	Hybrid Cable	126.67 - 133.00	1.0000	1.0000
T3	4	DC Cable WR-VG122S	126.67 - 133.00	1.0000	1.0000
T3	10	LDF7-50A (1-5/8 FOAM)	126.67 - 133.33	1.0000	1.0000
T3	11	Hybrid Cable	126.67 - 133.33	1.0000	1.0000
T3	13	LDF5-50A (7/8 FOAM)	126.67 -	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T3	14	EW63	126.67 - 133.33	1.0000	1.0000
T3	15	LDF5-50A (7/8 FOAM)	126.67 - 133.33	1.0000	1.0000
T3	16	AVA7-50 (1-5/8 LOW DENSI. FOAM)	126.67 - 133.33	1.0000	1.0000
T3	17	AVA7-50 (1-5/8 LOW DENSI. FOAM)	126.67 - 133.33	1.0000	1.0000
T3	18	AVA7-50 (1-5/8 LOW DENSI. FOAM)	126.67 - 133.33	1.0000	1.0000
T3	19	LDF4-50A (1/2 FOAM)	126.67 - 133.33	1.0000	1.0000
T3	20	LDF5-50A (7/8 FOAM)	126.67 - 133.33	1.0000	1.0000
T3	24	Hybrid Cable	126.67 - 133.33	1.0000	1.0000
T4	1	LDF6-50A (1-1/4 FOAM)	120.00 - 126.67	1.0000	1.0000
T4	2	DC Cable WR-VG122S	120.00 - 126.67	1.0000	1.0000
T4	3	Hybrid Cable	120.00 - 126.67	1.0000	1.0000
T4	4	DC Cable WR-VG122S	120.00 - 126.67	1.0000	1.0000
T4	6	LDF7-50A (1-5/8 FOAM)	120.00 - 125.00	1.0000	1.0000
T4	7	Hybrid Cable	120.00 - 125.00	1.0000	1.0000
T4	8	Hybrid Cable	120.00 - 125.00	1.0000	1.0000
T4	10	LDF7-50A (1-5/8 FOAM)	120.00 - 126.67	1.0000	1.0000
T4	11	Hybrid Cable	120.00 - 126.67	1.0000	1.0000
T4	13	LDF5-50A (7/8 FOAM)	120.00 - 126.67	1.0000	1.0000
T4	14	EW63	120.00 - 126.67	1.0000	1.0000
T4	15	LDF5-50A (7/8 FOAM)	120.00 - 126.67	1.0000	1.0000
T4	16	AVA7-50 (1-5/8 LOW DENSI. FOAM)	120.00 - 126.67	1.0000	1.0000
T4	17	AVA7-50 (1-5/8 LOW DENSI. FOAM)	120.00 - 126.67	1.0000	1.0000
T4	18	AVA7-50 (1-5/8 LOW DENSI. FOAM)	120.00 - 126.67	1.0000	1.0000
T4	19	LDF4-50A (1/2 FOAM)	120.00 - 126.67	1.0000	1.0000
T4	20	LDF5-50A (7/8 FOAM)	120.00 - 126.67	1.0000	1.0000
T4	24	Hybrid Cable	120.00 - 126.67	1.0000	1.0000
T5	1	LDF6-50A (1-1/4 FOAM)	100.00 - 120.00	1.0000	1.0000
T5	2	DC Cable WR-VG122S	100.00 - 120.00	1.0000	1.0000
T5	3	Hybrid Cable	100.00 - 120.00	1.0000	1.0000
T5	4	DC Cable WR-VG122S	100.00 - 120.00	1.0000	1.0000
T5	6	LDF7-50A (1-5/8 FOAM)	100.00 -	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
			120.00		
T5	7	Hybrid Cable	100.00 - 120.00	1.0000	1.0000
T5	8	Hybrid Cable	100.00 - 120.00	1.0000	1.0000
T5	10	LDF7-50A (1-5/8 FOAM)	100.00 - 120.00	1.0000	1.0000
T5	11	Hybrid Cable	100.00 - 120.00	1.0000	1.0000
T5	13	LDF5-50A (7/8 FOAM)	100.00 - 120.00	1.0000	1.0000
T5	14	EW63	100.00 - 120.00	1.0000	1.0000
T5	15	LDF5-50A (7/8 FOAM)	100.00 - 120.00	1.0000	1.0000
T5	16	AVA7-50 (1-5/8 LOW DENSI. FOAM)	100.00 - 120.00	1.0000	1.0000
T5	17	AVA7-50 (1-5/8 LOW DENSI. FOAM)	100.00 - 120.00	1.0000	1.0000
T5	18	AVA7-50 (1-5/8 LOW DENSI. FOAM)	100.00 - 120.00	1.0000	1.0000
T5	19	LDF4-50A (1/2 FOAM)	100.00 - 120.00	1.0000	1.0000
T5	20	LDF5-50A (7/8 FOAM)	100.00 - 120.00	1.0000	1.0000
T5	21	LDF4-50A (1/2 FOAM)	100.00 - 113.00	1.0000	1.0000
T5	24	Hybrid Cable	100.00 - 120.00	1.0000	1.0000
T6	1	LDF6-50A (1-1/4 FOAM)	90.00 - 100.00	1.0000	1.0000
T6	2	DC Cable WR-VG122S	90.00 - 100.00	1.0000	1.0000
T6	3	Hybrid Cable	90.00 - 100.00	1.0000	1.0000
T6	4	DC Cable WR-VG122S	90.00 - 100.00	1.0000	1.0000
T6	6	LDF7-50A (1-5/8 FOAM)	90.00 - 100.00	1.0000	1.0000
T6	7	Hybrid Cable	90.00 - 100.00	1.0000	1.0000
T6	8	Hybrid Cable	90.00 - 100.00	1.0000	1.0000
T6	10	LDF7-50A (1-5/8 FOAM)	90.00 - 100.00	1.0000	1.0000
T6	11	Hybrid Cable	90.00 - 100.00	1.0000	1.0000
T6	13	LDF5-50A (7/8 FOAM)	90.00 - 100.00	1.0000	1.0000
T6	14	EW63	90.00 - 100.00	1.0000	1.0000
T6	15	LDF5-50A (7/8 FOAM)	90.00 - 100.00	1.0000	1.0000
T6	16	AVA7-50 (1-5/8 LOW DENSI. FOAM)	90.00 - 100.00	1.0000	1.0000
T6	17	AVA7-50 (1-5/8 LOW DENSI. FOAM)	90.00 - 100.00	1.0000	1.0000
T6	18	AVA7-50 (1-5/8 LOW DENSI. FOAM)	90.00 - 100.00	1.0000	1.0000
T6	19	LDF4-50A (1/2 FOAM)	90.00 - 100.00	1.0000	1.0000
T6	20	LDF5-50A (7/8 FOAM)	90.00 - 100.00	1.0000	1.0000
T6	21	LDF4-50A (1/2 FOAM)	90.00 - 100.00	1.0000	1.0000
T6	24	Hybrid Cable	90.00 - 100.00	1.0000	1.0000
T7	1	LDF6-50A (1-1/4 FOAM)	80.00 - 90.00	1.0000	1.0000
T7	2	DC Cable WR-VG122S	80.00 - 90.00	1.0000	1.0000
T7	3	Hybrid Cable	80.00 - 90.00	1.0000	1.0000
T7	4	DC Cable WR-VG122S	80.00 - 90.00	1.0000	1.0000
T7	6	LDF7-50A (1-5/8 FOAM)	80.00 - 90.00	1.0000	1.0000
T7	7	Hybrid Cable	80.00 - 90.00	1.0000	1.0000
T7	8	Hybrid Cable	80.00 - 90.00	1.0000	1.0000
T7	10	LDF7-50A (1-5/8 FOAM)	80.00 - 90.00	1.0000	1.0000
T7	11	Hybrid Cable	80.00 - 90.00	1.0000	1.0000
T7	13	LDF5-50A (7/8 FOAM)	80.00 - 90.00	1.0000	1.0000
T7	14	EW63	80.00 - 90.00	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T7	15	LDF5-50A (7/8 FOAM)	80.00 - 90.00	1.0000	1.0000
T7	16	AVA7-50 (1-5/8 LOW DENSI. FOAM)	80.00 - 90.00	1.0000	1.0000
T7	17	AVA7-50 (1-5/8 LOW DENSI. FOAM)	80.00 - 90.00	1.0000	1.0000
T7	18	AVA7-50 (1-5/8 LOW DENSI. FOAM)	80.00 - 90.00	1.0000	1.0000
T7	19	LDF4-50A (1/2 FOAM)	80.00 - 90.00	1.0000	1.0000
T7	20	LDF5-50A (7/8 FOAM)	80.00 - 90.00	1.0000	1.0000
T7	21	LDF4-50A (1/2 FOAM)	80.00 - 90.00	1.0000	1.0000
T7	24	Hybrid Cable	80.00 - 90.00	1.0000	1.0000
T8	1	LDF6-50A (1-1/4 FOAM)	60.00 - 80.00	1.0000	1.0000
T8	2	DC Cable WR-VG122S	60.00 - 80.00	1.0000	1.0000
T8	3	Hybrid Cable	60.00 - 80.00	1.0000	1.0000
T8	4	DC Cable WR-VG122S	60.00 - 80.00	1.0000	1.0000
T8	6	LDF7-50A (1-5/8 FOAM)	60.00 - 80.00	1.0000	1.0000
T8	7	Hybrid Cable	60.00 - 80.00	1.0000	1.0000
T8	8	Hybrid Cable	60.00 - 80.00	1.0000	1.0000
T8	10	LDF7-50A (1-5/8 FOAM)	60.00 - 80.00	1.0000	1.0000
T8	11	Hybrid Cable	60.00 - 80.00	1.0000	1.0000
T8	13	LDF5-50A (7/8 FOAM)	60.00 - 80.00	1.0000	1.0000
T8	14	EW63	60.00 - 80.00	1.0000	1.0000
T8	15	LDF5-50A (7/8 FOAM)	60.00 - 80.00	1.0000	1.0000
T8	16	AVA7-50 (1-5/8 LOW DENSI. FOAM)	60.00 - 80.00	1.0000	1.0000
T8	17	AVA7-50 (1-5/8 LOW DENSI. FOAM)	60.00 - 80.00	1.0000	1.0000
T8	18	AVA7-50 (1-5/8 LOW DENSI. FOAM)	60.00 - 80.00	1.0000	1.0000
T8	19	LDF4-50A (1/2 FOAM)	60.00 - 80.00	1.0000	1.0000
T8	20	LDF5-50A (7/8 FOAM)	60.00 - 80.00	1.0000	1.0000
T8	21	LDF4-50A (1/2 FOAM)	60.00 - 80.00	1.0000	1.0000
T8	22	LDF4-50A (1/2 FOAM)	60.00 - 61.00	1.0000	1.0000
T8	24	Hybrid Cable	60.00 - 80.00	1.0000	1.0000
T9	1	LDF6-50A (1-1/4 FOAM)	40.00 - 60.00	1.0000	1.0000
T9	2	DC Cable WR-VG122S	40.00 - 60.00	1.0000	1.0000
T9	3	Hybrid Cable	40.00 - 60.00	1.0000	1.0000
T9	4	DC Cable WR-VG122S	40.00 - 60.00	1.0000	1.0000
T9	6	LDF7-50A (1-5/8 FOAM)	40.00 - 60.00	1.0000	1.0000
T9	7	Hybrid Cable	40.00 - 60.00	1.0000	1.0000
T9	8	Hybrid Cable	40.00 - 60.00	1.0000	1.0000
T9	10	LDF7-50A (1-5/8 FOAM)	40.00 - 60.00	1.0000	1.0000
T9	11	Hybrid Cable	40.00 - 60.00	1.0000	1.0000
T9	13	LDF5-50A (7/8 FOAM)	40.00 - 60.00	1.0000	1.0000
T9	14	EW63	40.00 - 60.00	1.0000	1.0000
T9	15	LDF5-50A (7/8 FOAM)	40.00 - 60.00	1.0000	1.0000
T9	16	AVA7-50 (1-5/8 LOW DENSI. FOAM)	40.00 - 60.00	1.0000	1.0000
T9	17	AVA7-50 (1-5/8 LOW DENSI. FOAM)	40.00 - 60.00	1.0000	1.0000
T9	18	AVA7-50 (1-5/8 LOW DENSI. FOAM)	40.00 - 60.00	1.0000	1.0000
T9	19	LDF4-50A (1/2 FOAM)	40.00 - 60.00	1.0000	1.0000
T9	20	LDF5-50A (7/8 FOAM)	40.00 - 60.00	1.0000	1.0000
T9	21	LDF4-50A (1/2 FOAM)	40.00 - 60.00	1.0000	1.0000
T9	22	LDF4-50A (1/2 FOAM)	40.00 - 60.00	1.0000	1.0000
T9	24	Hybrid Cable	40.00 - 60.00	1.0000	1.0000
T10	1	LDF6-50A (1-1/4 FOAM)	30.00 - 40.00	1.0000	1.0000
T10	2	DC Cable WR-VG122S	30.00 - 40.00	1.0000	1.0000
T10	3	Hybrid Cable	30.00 - 40.00	1.0000	1.0000
T10	4	DC Cable WR-VG122S	30.00 - 40.00	1.0000	1.0000
T10	6	LDF7-50A (1-5/8 FOAM)	30.00 - 40.00	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T10	7	Hybrid Cable	30.00 - 40.00	1.0000	1.0000
T10	8	Hybrid Cable	30.00 - 40.00	1.0000	1.0000
T10	10	LDF7-50A (1-5/8 FOAM)	30.00 - 40.00	1.0000	1.0000
T10	11	Hybrid Cable	30.00 - 40.00	1.0000	1.0000
T10	13	LDF5-50A (7/8 FOAM)	30.00 - 40.00	1.0000	1.0000
T10	14	EW63	30.00 - 40.00	1.0000	1.0000
T10	15	LDF5-50A (7/8 FOAM)	30.00 - 40.00	1.0000	1.0000
T10	16	AVA7-50 (1-5/8 LOW DENSI. FOAM)	30.00 - 40.00	1.0000	1.0000
T10	17	AVA7-50 (1-5/8 LOW DENSI. FOAM)	30.00 - 40.00	1.0000	1.0000
T10	18	AVA7-50 (1-5/8 LOW DENSI. FOAM)	30.00 - 40.00	1.0000	1.0000
T10	19	LDF4-50A (1/2 FOAM)	30.00 - 40.00	1.0000	1.0000
T10	20	LDF5-50A (7/8 FOAM)	30.00 - 40.00	1.0000	1.0000
T10	21	LDF4-50A (1/2 FOAM)	30.00 - 40.00	1.0000	1.0000
T10	22	LDF4-50A (1/2 FOAM)	30.00 - 40.00	1.0000	1.0000
T10	24	Hybrid Cable	30.00 - 40.00	1.0000	1.0000
T11	1	LDF6-50A (1-1/4 FOAM)	20.00 - 30.00	1.0000	1.0000
T11	2	DC Cable WR-VG122S	20.00 - 30.00	1.0000	1.0000
T11	3	Hybrid Cable	20.00 - 30.00	1.0000	1.0000
T11	4	DC Cable WR-VG122S	20.00 - 30.00	1.0000	1.0000
T11	6	LDF7-50A (1-5/8 FOAM)	20.00 - 30.00	1.0000	1.0000
T11	7	Hybrid Cable	20.00 - 30.00	1.0000	1.0000
T11	8	Hybrid Cable	20.00 - 30.00	1.0000	1.0000
T11	10	LDF7-50A (1-5/8 FOAM)	20.00 - 30.00	1.0000	1.0000
T11	11	Hybrid Cable	20.00 - 30.00	1.0000	1.0000
T11	13	LDF5-50A (7/8 FOAM)	20.00 - 30.00	1.0000	1.0000
T11	14	EW63	20.00 - 30.00	1.0000	1.0000
T11	15	LDF5-50A (7/8 FOAM)	20.00 - 30.00	1.0000	1.0000
T11	16	AVA7-50 (1-5/8 LOW DENSI. FOAM)	20.00 - 30.00	1.0000	1.0000
T11	17	AVA7-50 (1-5/8 LOW DENSI. FOAM)	20.00 - 30.00	1.0000	1.0000
T11	18	AVA7-50 (1-5/8 LOW DENSI. FOAM)	20.00 - 30.00	1.0000	1.0000
T11	19	LDF4-50A (1/2 FOAM)	20.00 - 30.00	1.0000	1.0000
T11	20	LDF5-50A (7/8 FOAM)	20.00 - 30.00	1.0000	1.0000
T11	21	LDF4-50A (1/2 FOAM)	20.00 - 30.00	1.0000	1.0000
T11	22	LDF4-50A (1/2 FOAM)	20.00 - 30.00	1.0000	1.0000
T11	24	Hybrid Cable	20.00 - 30.00	1.0000	1.0000
T12	1	LDF6-50A (1-1/4 FOAM)	8.00 - 20.00	1.0000	1.0000
T12	2	DC Cable WR-VG122S	8.00 - 20.00	1.0000	1.0000
T12	3	Hybrid Cable	8.00 - 20.00	1.0000	1.0000
T12	4	DC Cable WR-VG122S	8.00 - 20.00	1.0000	1.0000
T12	6	LDF7-50A (1-5/8 FOAM)	8.00 - 20.00	1.0000	1.0000
T12	7	Hybrid Cable	8.00 - 20.00	1.0000	1.0000
T12	8	Hybrid Cable	8.00 - 20.00	1.0000	1.0000
T12	10	LDF7-50A (1-5/8 FOAM)	8.00 - 20.00	1.0000	1.0000
T12	11	Hybrid Cable	8.00 - 20.00	1.0000	1.0000
T12	13	LDF5-50A (7/8 FOAM)	8.00 - 20.00	1.0000	1.0000
T12	14	EW63	8.00 - 20.00	1.0000	1.0000
T12	15	LDF5-50A (7/8 FOAM)	8.00 - 20.00	1.0000	1.0000
T12	16	AVA7-50 (1-5/8 LOW DENSI. FOAM)	8.00 - 20.00	1.0000	1.0000
T12	17	AVA7-50 (1-5/8 LOW DENSI. FOAM)	8.00 - 20.00	1.0000	1.0000
T12	18	AVA7-50 (1-5/8 LOW DENSI. FOAM)	8.00 - 20.00	1.0000	1.0000
T12	19	LDF4-50A (1/2 FOAM)	8.00 - 20.00	1.0000	1.0000
T12	20	LDF5-50A (7/8 FOAM)	8.00 - 20.00	1.0000	1.0000
T12	21	LDF4-50A (1/2 FOAM)	8.00 - 20.00	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T12	22	LDF4-50A (1/2 FOAM)	8.00 - 20.00	1.0000	1.0000
T12	24	Hybrid Cable	8.00 - 20.00	1.0000	1.0000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
(2) JAHH-65B-R3B	A	From Leg	3.000	0.000	160.000	No Ice	9.573	7.874	93.575
[P2.0][96"]			5.000			1/2" Ice	10.246	9.161	172.646
(VZW)			0.000			1" Ice	10.887	10.300	260.082
BXA-70080-4CF-EDIN	A	From Leg	3.000	0.000	160.000	No Ice	4.565	4.728	39.200
[P2.0][96"]			-6.000			1/2" Ice	5.284	5.866	85.489
(VZW)			0.000			1" Ice	5.933	6.850	138.066
XXDWMM-12.5-65-8T-CBR	A	From Leg	3.000	0.000	160.000	No Ice	4.800	2.400	20.000
S			-3.000			1/2" Ice	5.070	2.600	59.310
(VZW)			0.000			1" Ice	5.350	2.810	102.700
4x40 B2/66 Dual RRH	A	From Leg	3.000	0.000	160.000	No Ice	2.190	1.460	100.000
(VZW)			0.000			1/2" Ice	2.390	1.620	115.840
			0.000			1" Ice	2.590	1.800	136.970
DB-T1-6Z-8AB-0Z	A	From Leg	3.000	0.000	160.000	No Ice	5.600	2.330	50.000
(VZW)			0.000			1/2" Ice	5.920	2.560	81.130
			0.000			1" Ice	6.240	2.790	121.220
RFV01U-D2A RRH	A	From Leg	3.000	0.000	160.000	No Ice	1.880	1.010	82.000
(VZW)			0.000			1/2" Ice	2.050	1.140	98.430
			0.000			1" Ice	2.220	1.280	117.530
CBRS RRH (RT 4401-48A)	A	From Leg	3.000	0.000	160.000	No Ice	0.520	1.530	20.000
(VZW)			0.000			1/2" Ice	0.610	1.690	31.930
			0.000			1" Ice	0.720	1.850	46.200
PiROD 15' T-Frame	A	From Leg	0.000	0.000	160.000	No Ice	15.000	15.000	500.000
(VZW)			0.000			1/2" Ice	20.600	20.600	650.000
			0.000			1" Ice	26.200	26.200	800.000
*									
(2) JAHH-65B-R3B	B	From Leg	3.000	0.000	160.000	No Ice	9.573	7.874	93.575
[P2.0][96"]			5.000			1/2" Ice	10.246	9.161	172.646
(VZW)			0.000			1" Ice	10.887	10.300	260.082
BXA-70080-4CF-EDIN	B	From Leg	3.000	0.000	160.000	No Ice	4.565	4.728	39.200
[P2.0][96"]			-6.000			1/2" Ice	5.284	5.866	85.489
(VZW)			0.000			1" Ice	5.933	6.850	138.066
XXDWMM-12.5-65-8T-CBR	B	From Leg	3.000	0.000	160.000	No Ice	4.800	2.400	20.000
S			-3.000			1/2" Ice	5.070	2.600	59.310
(VZW)			0.000			1" Ice	5.350	2.810	102.700
4x40 B2/66 Dual RRH	B	From Leg	3.000	0.000	160.000	No Ice	2.190	1.460	100.000
(VZW)			0.000			1/2" Ice	2.390	1.620	115.840
			0.000			1" Ice	2.590	1.800	136.970
DB-T1-6Z-8AB-0Z	B	From Leg	3.000	0.000	160.000	No Ice	5.600	2.330	50.000
(VZW)			0.000			1/2" Ice	5.920	2.560	81.130
			0.000			1" Ice	6.240	2.790	121.220
RFV01U-D2A RRH	B	From Leg	3.000	0.000	160.000	No Ice	1.880	1.010	82.000
(VZW)			0.000			1/2" Ice	2.050	1.140	98.430
			0.000			1" Ice	2.220	1.280	117.530

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
CBRS RRH (RT 4401-48A)	B	From Leg	3.000	0.000	160.000	No Ice	0.520	1.530	20.000
(VZW)			0.000			1/2" Ice	0.610	1.690	31.930
			0.000			1" Ice	0.720	1.850	46.200
PiROD 15' T-Frame	B	From Leg	0.000	0.000	160.000	No Ice	15.000	15.000	500.000
(VZW)			0.000			1/2" Ice	20.600	20.600	650.000
			0.000			1" Ice	26.200	26.200	800.000
*									
(2) JAHH-65B-R3B	C	From Leg	3.000	0.000	160.000	No Ice	9.573	7.874	93.575
[P2.0][96"]			5.000			1/2" Ice	10.246	9.161	172.646
(VZW)			0.000			1" Ice	10.887	10.300	260.082
BXA-70080-4CF-EDIN	C	From Leg	3.000	0.000	160.000	No Ice	4.565	4.728	39.200
[P2.0][96"]			-6.000			1/2" Ice	5.284	5.866	85.489
(VZW)			0.000			1" Ice	5.933	6.850	138.066
XXDWMM-12.5-65-8T-CBR	C	From Leg	3.000	0.000	160.000	No Ice	4.800	2.400	20.000
S			-3.000			1/2" Ice	5.070	2.600	59.310
(VZW)			0.000			1" Ice	5.350	2.810	102.700
4x40 B2/66 Dual RRH	C	From Leg	3.000	0.000	160.000	No Ice	2.190	1.460	100.000
(VZW)			0.000			1/2" Ice	2.390	1.620	115.840
			0.000			1" Ice	2.590	1.800	136.970
DB-T1-6Z-8AB-0Z	C	From Leg	3.000	0.000	160.000	No Ice	5.600	2.330	50.000
(VZW)			0.000			1/2" Ice	5.920	2.560	81.130
			0.000			1" Ice	6.240	2.790	121.220
RFV01U-D2A RRH	C	From Leg	3.000	0.000	160.000	No Ice	1.880	1.010	82.000
(VZW)			0.000			1/2" Ice	2.050	1.140	98.430
			0.000			1" Ice	2.220	1.280	117.530
CBRS RRH (RT 4401-48A)	C	From Leg	3.000	0.000	160.000	No Ice	0.520	1.530	20.000
(VZW)			0.000			1/2" Ice	0.610	1.690	31.930
			0.000			1" Ice	0.720	1.850	46.200
PiROD 15' T-Frame	C	From Leg	0.000	0.000	160.000	No Ice	15.000	15.000	500.000
(VZW)			0.000			1/2" Ice	20.600	20.600	650.000
			0.000			1" Ice	26.200	26.200	800.000
***									
AIR32 DB [P2.0][96"]	A	From Leg	3.000	0.000	125.000	No Ice	7.290	6.569	161.400
(TMO)			0.000			1/2" Ice	8.007	7.753	228.094
			0.000			1" Ice	8.667	8.788	302.126
AIR21 [P2.0][96"]	A	From Leg	3.000	0.000	125.000	No Ice	6.831	6.156	121.500
(TMO)			0.000			1/2" Ice	7.545	7.337	183.987
			0.000			1" Ice	8.202	8.365	253.656
APXVAARR24_43-U-NA20	A	From Leg	3.000	0.000	125.000	No Ice	20.267	10.644	182.500
[P2.0][96"]			0.000			1/2" Ice	20.915	12.070	315.518
(TMO)			0.000			1" Ice	21.570	13.348	459.140
Radio 4449	A	From Leg	3.000	0.000	125.000	No Ice	1.660	1.160	80.000
(TMO)			0.000			1/2" Ice	1.820	1.290	96.160
			0.000			1" Ice	1.980	1.440	114.940
PiROD 12' Lightweight	A	From Leg	0.000	0.000	125.000	No Ice	10.200	10.200	253.000
T-Frame			0.000			1/2" Ice	16.200	16.200	355.000
(TMO)			0.000			1" Ice	22.200	22.200	457.000
*									
AIR32 DB [P2.0][96"]	B	From Leg	3.000	0.000	125.000	No Ice	7.290	6.569	161.400
(TMO)			0.000			1/2" Ice	8.007	7.753	228.094
			0.000			1" Ice	8.667	8.788	302.126
AIR21 [P2.0][96"]	B	From Leg	3.000	0.000	125.000	No Ice	6.831	6.156	121.500
(TMO)			0.000			1/2" Ice	7.545	7.337	183.987
			0.000			1" Ice	8.202	8.365	253.656
APXVAARR24_43-U-NA20	B	From Leg	3.000	0.000	125.000	No Ice	20.267	10.644	182.500
[P2.0][96"]			0.000			1/2" Ice	20.915	12.070	315.518
(TMO)			0.000			1" Ice	21.570	13.348	459.140

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
Radio 4449	B	From Leg	3.000	0.000	125.000	No Ice	1.660	1.160	80.000
(TMO)			0.000			1/2" Ice	1.820	1.290	96.160
			0.000			1" Ice	1.980	1.440	114.940
PiROD 12' Lightweight T-Frame (TMO) *	B	From Leg	0.000	0.000	125.000	No Ice	10.200	10.200	253.000
			0.000			1/2" Ice	16.200	16.200	355.000
			0.000			1" Ice	22.200	22.200	457.000
AIR32 DB [P2.0][96"] (TMO)	C	From Leg	3.000	0.000	125.000	No Ice	7.290	6.569	161.400
			0.000			1/2" Ice	8.007	7.753	228.094
			0.000			1" Ice	8.667	8.788	302.126
AIR21 [P2.0][96"] (TMO)	C	From Leg	3.000	0.000	125.000	No Ice	6.831	6.156	121.500
			0.000			1/2" Ice	7.545	7.337	183.987
			0.000			1" Ice	8.202	8.365	253.656
APXVAARR24_43-U-NA20 [P2.0][96"] (TMO)	C	From Leg	3.000	0.000	125.000	No Ice	20.267	10.644	182.500
			0.000			1/2" Ice	20.915	12.070	315.518
			0.000			1" Ice	21.570	13.348	459.140
Radio 4449 (TMO)	C	From Leg	3.000	0.000	125.000	No Ice	1.660	1.160	80.000
			0.000			1/2" Ice	1.820	1.290	96.160
			0.000			1" Ice	1.980	1.440	114.940
PiROD 12' Lightweight T-Frame (TMO) *	C	From Leg	0.000	0.000	125.000	No Ice	10.200	10.200	253.000
			0.000			1/2" Ice	16.200	16.200	355.000
			0.000			1" Ice	22.200	22.200	457.000
800-10798 (ATT)	A	From Leg	3.000	0.000	133.000	No Ice	11.310	7.250	110.000
			0.000			1/2" Ice	11.920	8.370	188.920
			0.000			1" Ice	12.540	9.270	275.980
P65-16-XLH-RR (ATT)	A	From Leg	3.000	0.000	133.000	No Ice	8.400	4.700	60.000
			0.000			1/2" Ice	8.950	5.150	111.280
			0.000			1" Ice	9.510	5.600	164.590
HPA-65R-BUU-H6 [P2.0][96"] (ATT)	A	From Leg	3.000	0.000	133.000	No Ice	9.955	7.386	72.100
			0.000			1/2" Ice	10.630	8.670	150.528
			0.000			1" Ice	11.273	9.806	237.325
(3) RRUS32 (ATT)	A	From Leg	3.000	0.000	133.000	No Ice	3.200	1.850	60.000
			0.000			1/2" Ice	3.460	2.080	81.110
			0.000			1" Ice	3.730	2.310	105.420
RRUS11 (ATT)	A	From Leg	3.000	0.000	133.000	No Ice	2.791	1.192	50.700
			0.000			1/2" Ice	2.998	1.340	71.572
			0.000			1" Ice	3.213	1.496	95.483
DC6 Squid (ATT)	A	From Leg	3.000	0.000	133.000	No Ice	0.784	0.784	32.000
			0.000			1/2" Ice	1.251	1.251	48.395
			0.000			1" Ice	1.415	1.415	67.127
PiROD 15' T-Frame (ATT) *	A	From Leg	0.000	0.000	133.000	No Ice	15.000	15.000	500.000
			0.000			1/2" Ice	20.600	20.600	650.000
			0.000			1" Ice	26.200	26.200	800.000
800-10798 (ATT)	B	From Leg	3.000	0.000	133.000	No Ice	11.310	7.250	110.000
			0.000			1/2" Ice	11.920	8.370	188.920
			0.000			1" Ice	12.540	9.270	275.980
P65-16-XLH-RR (ATT)	B	From Leg	3.000	0.000	133.000	No Ice	8.400	4.700	60.000
			0.000			1/2" Ice	8.950	5.150	111.280
			0.000			1" Ice	9.510	5.600	164.590
HPA-65R-BUU-H6 [P2.0][96"] (ATT)	B	From Leg	3.000	0.000	133.000	No Ice	9.955	7.386	72.100
			0.000			1/2" Ice	10.630	8.670	150.528
			0.000			1" Ice	11.273	9.806	237.325
(3) RRUS32 (ATT)	B	From Leg	3.000	0.000	133.000	No Ice	3.200	1.850	60.000
			0.000			1/2" Ice	3.460	2.080	81.110
			0.000			1" Ice	3.730	2.310	105.420

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
RRUS11	B	From Leg	3.000	0.000	133.000	No Ice	2.791	1.192	50.700
(ATT)			0.000			1/2" Ice	2.998	1.340	71.572
			0.000			1" Ice	3.213	1.496	95.483
DC6 Squid	B	From Leg	3.000	0.000	133.000	No Ice	0.784	0.784	32.000
(ATT)			0.000			1/2" Ice	1.251	1.251	48.395
			0.000			1" Ice	1.415	1.415	67.127
PiROD 15' T-Frame	B	From Leg	0.000	0.000	133.000	No Ice	15.000	15.000	500.000
(ATT)			0.000			1/2" Ice	20.600	20.600	650.000
			0.000			1" Ice	26.200	26.200	800.000
*									
800-10798	C	From Leg	3.000	0.000	133.000	No Ice	11.310	7.250	110.000
(ATT)			0.000			1/2" Ice	11.920	8.370	188.920
			0.000			1" Ice	12.540	9.270	275.980
P65-16-XLH-RR	C	From Leg	3.000	0.000	133.000	No Ice	8.400	4.700	60.000
(ATT)			0.000			1/2" Ice	8.950	5.150	111.280
			0.000			1" Ice	9.510	5.600	164.590
HPA-65R-BUU-H6	C	From Leg	3.000	0.000	133.000	No Ice	9.955	7.386	72.100
[P2.0][96"]			0.000			1/2" Ice	10.630	8.670	150.528
(ATT)			0.000			1" Ice	11.273	9.806	237.325
(3) RRUS32	C	From Leg	3.000	0.000	133.000	No Ice	3.200	1.850	60.000
(ATT)			0.000			1/2" Ice	3.460	2.080	81.110
			0.000			1" Ice	3.730	2.310	105.420
RRUS11	C	From Leg	3.000	0.000	133.000	No Ice	2.791	1.192	50.700
(ATT)			0.000			1/2" Ice	2.998	1.340	71.572
			0.000			1" Ice	3.213	1.496	95.483
DC6 Squid	C	From Leg	3.000	0.000	133.000	No Ice	0.784	0.784	32.000
(ATT)			0.000			1/2" Ice	1.251	1.251	48.395
			0.000			1" Ice	1.415	1.415	67.127
PiROD 15' T-Frame	C	From Leg	0.000	0.000	133.000	No Ice	15.000	15.000	500.000
(ATT)			0.000			1/2" Ice	20.600	20.600	650.000
			0.000			1" Ice	26.200	26.200	800.000
***									
ANT940T10-WR	A	From Leg	0.000	0.000	187.000	No Ice	0.190	0.190	2.500
			0.000			1/2" Ice	0.340	0.340	3.250
			0.000			1" Ice	0.490	0.490	4.000
ANT940T10-WR	C	From Leg	0.000	0.000	181.000	No Ice	0.190	0.190	2.500
			0.000			1/2" Ice	0.340	0.340	3.250
			0.000			1" Ice	0.490	0.490	4.000
(3) BPS7496-180-14	A	From Leg	4.000	0.000	170.000	No Ice	5.830	3.750	20.000
			0.000			1/2" Ice	6.210	4.130	56.420
			0.000			1" Ice	6.590	4.510	92.840
432E-83I-01T TTA	A	From Leg	0.000	0.000	170.000	No Ice	2.850	0.970	25.000
			0.000			1/2" Ice	3.060	1.110	44.700
			0.000			1" Ice	3.270	1.250	64.400
PiROD 12' Universal	A	From Leg	0.000	0.000	170.000	No Ice	13.600	13.600	465.000
T-Frame Sector Mount			0.000			1/2" Ice	18.400	18.400	600.000
			0.000			1" Ice	23.200	23.200	735.000
***									
3' Yagi	C	From Leg	0.500	0.000	169.000	No Ice	2.080	2.080	30.950
			0.000			1/2" Ice	3.790	3.790	52.870
			0.000			1" Ice	5.520	5.520	85.270
ANT150D	A	From Leg	0.000	0.000	113.000	No Ice	0.800	0.800	5.500
			0.000			1/2" Ice	1.440	1.440	7.150
			0.000			1" Ice	2.080	2.080	8.800
GPS	C	From Leg	4.000	0.000	60.000	No Ice	1.000	1.000	10.000
			0.000			1/2" Ice	1.500	1.500	15.000
			0.000			1" Ice	2.000	2.000	20.000

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
4' Standoff	C	From Leg	0.000	0.000	60.000	No Ice	3.420	3.420	110.000
			0.000			1/2" Ice	3.670	3.670	147.190
			0.000			1" Ice	3.920	3.920	187.070
***									
FFVV-65B-R2 [P2.0][96"] (DISH)	A	From Leg	4.000	0.000	144.000	No Ice	12.744	7.621	99.748
			0.000			1/2" Ice	13.446	8.906	192.843
			0.000			1" Ice	14.116	10.043	294.653
TA08025-B605 (DISH)	A	From Leg	4.000	0.000	144.000	No Ice	1.964	1.129	74.950
			0.000			1/2" Ice	2.138	1.267	92.924
			0.000			1" Ice	2.320	1.411	113.670
TA08025-B604 (DISH)	A	From Leg	4.000	0.000	144.000	No Ice	1.964	0.981	63.930
			0.000			1/2" Ice	2.138	1.112	80.681
			0.000			1" Ice	2.320	1.250	100.127
RDIDC-9181-PF-48 (DISH)	A	From Leg	4.000	0.000	144.000	No Ice	2.561	1.524	21.850
			0.000			1/2" Ice	2.760	1.687	44.281
			0.000			1" Ice	2.967	1.857	69.811
MTC3975083 (DISH)	A	From Leg	0.000	0.000	144.000	No Ice	12.200	12.200	360.000
			0.000			1/2" Ice	17.600	17.600	490.000
			0.000			1" Ice	23.000	23.000	620.000
*									
FFVV-65B-R2 [P2.0][96"] (DISH)	B	From Leg	4.000	0.000	144.000	No Ice	12.744	7.621	99.748
			0.000			1/2" Ice	13.446	8.906	192.843
			0.000			1" Ice	14.116	10.043	294.653
TA08025-B605 (DISH)	B	From Leg	4.000	0.000	144.000	No Ice	1.964	1.129	74.950
			0.000			1/2" Ice	2.138	1.267	92.924
			0.000			1" Ice	2.320	1.411	113.670
TA08025-B604 (DISH)	B	From Leg	4.000	0.000	144.000	No Ice	1.964	0.981	63.930
			0.000			1/2" Ice	2.138	1.112	80.681
			0.000			1" Ice	2.320	1.250	100.127
MTC3975083 (DISH)	B	From Leg	0.000	0.000	144.000	No Ice	12.200	12.200	360.000
			0.000			1/2" Ice	17.600	17.600	490.000
			0.000			1" Ice	23.000	23.000	620.000
*									
FFVV-65B-R2 [P2.0][96"] (DISH)	C	From Leg	4.000	0.000	144.000	No Ice	12.744	7.621	99.748
			0.000			1/2" Ice	13.446	8.906	192.843
			0.000			1" Ice	14.116	10.043	294.653
TA08025-B605 (DISH)	C	From Leg	4.000	0.000	144.000	No Ice	1.964	1.129	74.950
			0.000			1/2" Ice	2.138	1.267	92.924
			0.000			1" Ice	2.320	1.411	113.670
TA08025-B604 (DISH)	C	From Leg	4.000	0.000	144.000	No Ice	1.964	0.981	63.930
			0.000			1/2" Ice	2.138	1.112	80.681
			0.000			1" Ice	2.320	1.250	100.127
MTC3975083 (DISH)	C	From Leg	0.000	0.000	144.000	No Ice	12.200	12.200	360.000
			0.000			1/2" Ice	17.600	17.600	490.000
			0.000			1" Ice	23.000	23.000	620.000

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight lb
PA6-65AC	C	Paraboloid w/Radome	From Leg	1.000 0.000 0.000	0.000		177.000	6.000	No Ice 1/2" Ice 1" Ice	28.270 29.050 29.830	90.000 240.000 390.000

Tower Pressures - No Ice

G_H = 0.850 (base tower), 0.850 (upper structure)

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft^2	Face	A_F ft^2	A_R ft^2	A_{leg} ft^2	Leg % 	C_AA_A In Face ft^2	C_AA_A Out Face ft^2
L1	170.000	1.415	52.043	176.673	A	0.000	24.667	11.667	47.30	13.497	0.000
180.000-160.000					B	0.000	24.667		47.30	0.000	0.000
					C	0.000	24.667		47.30	0.000	0.000
T1	150.000	1.378	50.690	202.272	A	0.000	28.878	15.036	52.07	62.559	0.000
160.000-140.000					B	0.000	28.878		52.07	0.000	0.000
					C	0.000	28.878		52.07	2.376	0.000
T2	136.667	1.352	49.706	78.646	A	0.000	11.645	6.196	53.20	20.853	0.000
140.000-133.333					B	0.000	11.645		53.20	0.000	0.000
					C	0.000	11.645		53.20	3.960	0.000
T3	130.000	1.337	49.185	83.961	A	0.000	11.914	6.196	52.00	20.853	0.000
133.333-126.667					B	0.000	11.914		52.00	15.301	0.000
					C	0.000	11.914		52.00	3.960	0.000
T4	123.333	1.323	48.643	89.277	A	0.000	12.186	6.196	50.84	20.853	0.000
126.667-120.000					B	0.000	12.186		50.84	25.371	0.000
					C	0.000	12.186		50.84	3.960	0.000
T5	110.000	1.291	47.486	301.495	A	0.000	39.010	22.136	56.74	63.378	0.000
120.000-100.000					B	0.000	39.010		56.74	85.377	0.000
					C	0.000	39.010		56.74	11.880	0.000
T6	95.000	1.252	46.042	168.687	A	0.000	21.462	11.068	51.57	31.909	0.000
100.000-90.000					B	0.000	21.462		51.57	42.689	0.000
					C	0.000	21.462		51.57	5.940	0.000
T7	85.000	1.223	44.977	180.646	A	0.000	21.938	11.068	50.45	31.909	0.000
90.000-80.000					B	0.000	21.938		50.45	42.689	0.000
					C	0.000	21.938		50.45	5.940	0.000
T8	70.000	1.174	43.176	405.048	A	0.000	54.563	30.071	55.11	63.882	0.000
80.000-60.000					B	0.000	54.563		55.11	85.377	0.000
					C	0.000	54.563		55.11	11.880	0.000
T9	50.000	1.094	40.223	452.886	A	0.000	56.752	30.071	52.99	65.079	0.000
60.000-40.000					B	0.000	56.752		52.99	85.377	0.000
					C	0.000	56.752		52.99	11.880	0.000
T10	35.000	1.015	37.313	244.382	A	0.000	29.210	15.036	51.47	32.539	0.000
40.000-30.000					B	0.000	29.210		51.47	42.689	0.000
					C	0.000	29.210		51.47	5.940	0.000
T11	25.000	0.945	34.762	256.341	A	0.000	29.773	15.036	50.50	32.539	0.000
30.000-20.000					B	0.000	29.773		50.50	42.689	0.000
					C	0.000	29.773		50.50	5.940	0.000
T12	10.000	0.85	31.258	548.561	A	0.000	61.162	30.071	49.17	39.047	0.000
20.000-0.000					B	0.000	61.162		49.17	51.226	0.000
					C	0.000	61.162		49.17	7.128	0.000

Tower Pressure - With Ice

G_H = 0.850 (base tower), 0.850 (upper structure)

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1	170.000	1.415	7.699	1.473	181.582	A	0.000	51.821	21.484	41.46	41.772	0.000
180.000-160.000						B	0.000	51.821		41.46	0.000	0.000
						C	0.000	51.821		41.46	0.000	0.000
T1	150.000	1.378	7.498	1.454	207.129	A	0.000	56.854	24.754	43.54	177.327	0.000
160.000-140.000						B	0.000	56.854		43.54	0.000	0.000
						C	0.000	56.854		43.54	6.855	0.000
T2	136.667	1.352	7.353	1.441	80.250	A	0.000	21.467	9.405	43.81	58.909	0.000
140.000-133.333						B	0.000	21.467		43.81	0.000	0.000
						C	0.000	21.467		43.81	11.396	0.000
T3	130.000	1.337	7.276	1.434	85.557	A	0.000	22.011	9.389	42.66	58.803	0.000
133.333-126.667						B	0.000	22.011		42.66	32.828	0.000
						C	0.000	22.011		42.66	11.380	0.000
T4	123.333	1.323	7.196	1.426	90.864	A	0.000	22.557	9.373	41.55	58.691	0.000
126.667-120.000						B	0.000	22.557		41.55	54.472	0.000
						C	0.000	22.557		41.55	11.364	0.000
T5	110.000	1.291	7.025	1.410	306.203	A	0.000	66.076	31.558	47.76	179.837	0.000
120.000-100.000						B	0.000	66.076		47.76	182.675	0.000
						C	0.000	66.076		47.76	33.988	0.000
T6	95.000	1.252	6.811	1.389	171.006	A	0.000	35.486	15.710	44.27	90.629	0.000
100.000-90.000						B	0.000	35.486		44.27	90.879	0.000
						C	0.000	35.486		44.27	16.928	0.000
T7	85.000	1.223	6.653	1.374	182.940	A	0.000	36.269	15.659	43.17	90.256	0.000
90.000-80.000						B	0.000	36.269		43.17	90.535	0.000
						C	0.000	36.269		43.17	16.879	0.000
T8	70.000	1.174	6.387	1.348	409.549	A	0.000	83.871	39.077	46.59	179.566	0.000
80.000-60.000						B	0.000	83.871		46.59	179.890	0.000
						C	0.000	83.871		46.59	33.587	0.000
T9	50.000	1.094	5.950	1.303	457.237	A	0.000	86.906	38.779	44.62	183.546	0.000
60.000-40.000						B	0.000	86.906		44.62	177.899	0.000
						C	0.000	86.906		44.62	33.301	0.000
T10	35.000	1.015	5.520	1.257	246.481	A	0.000	44.425	19.237	43.30	90.576	0.000
40.000-30.000						B	0.000	44.425		43.30	87.931	0.000
						C	0.000	44.425		43.30	16.504	0.000
T11	25.000	0.945	5.142	1.216	258.371	A	0.000	44.919	19.098	42.52	89.487	0.000
30.000-20.000						B	0.000	44.919		42.52	87.003	0.000
						C	0.000	44.919		42.52	16.371	0.000
T12	10.000	0.85	4.624	1.109	552.265	A	0.000	89.427	37.485	41.92	104.040	0.000
20.000-0.000						B	0.000	89.427		41.92	101.560	0.000
						C	0.000	89.427		41.92	19.238	0.000

Tower Pressure - Service

G_H = 0.850 (base tower), 0.850 (upper structure)

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1	170.000	1.415	11.08	176.673	A	0.000	24.667	11.667	47.30	13.497	0.000
180.000-160.0			6		B	0.000	24.667		47.30	0.000	0.000

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
00					C	0.000	24.667		47.30	0.000	0.000
T1	150.000	1.378	10.79	202.272	A	0.000	28.878	15.036	52.07	62.559	0.000
160.000-140.0			8		B	0.000	28.878		52.07	0.000	0.000
00					C	0.000	28.878		52.07	2.376	0.000
T2	136.667	1.352	10.58	78.646	A	0.000	11.645	6.196	53.20	20.853	0.000
140.000-133.3			8		B	0.000	11.645		53.20	0.000	0.000
33					C	0.000	11.645		53.20	3.960	0.000
T3	130.000	1.337	10.47	83.961	A	0.000	11.914	6.196	52.00	20.853	0.000
133.333-126.6			7		B	0.000	11.914		52.00	15.301	0.000
67					C	0.000	11.914		52.00	3.960	0.000
T4	123.333	1.323	10.36	89.277	A	0.000	12.186	6.196	50.84	20.853	0.000
126.667-120.0			2		B	0.000	12.186		50.84	25.371	0.000
00					C	0.000	12.186		50.84	3.960	0.000
T5	110.000	1.291	10.11	301.495	A	0.000	39.010	22.136	56.74	63.378	0.000
120.000-100.0			5		B	0.000	39.010		56.74	85.377	0.000
00					C	0.000	39.010		56.74	11.880	0.000
T6	95.000	1.252	9.808	168.687	A	0.000	21.462	11.068	51.57	31.909	0.000
100.000-90.00					B	0.000	21.462		51.57	42.689	0.000
0					C	0.000	21.462		51.57	5.940	0.000
T7	85.000	1.223	9.581	180.646	A	0.000	21.938	11.068	50.45	31.909	0.000
90.000-80.000					B	0.000	21.938		50.45	42.689	0.000
					C	0.000	21.938		50.45	5.940	0.000
T8	70.000	1.174	9.197	405.048	A	0.000	54.563	30.071	55.11	63.882	0.000
80.000-60.000					B	0.000	54.563		55.11	85.377	0.000
					C	0.000	54.563		55.11	11.880	0.000
T9	50.000	1.094	8.568	452.886	A	0.000	56.752	30.071	52.99	65.079	0.000
60.000-40.000					B	0.000	56.752		52.99	85.377	0.000
					C	0.000	56.752		52.99	11.880	0.000
T10	35.000	1.015	7.948	244.382	A	0.000	29.210	15.036	51.47	32.539	0.000
40.000-30.000					B	0.000	29.210		51.47	42.689	0.000
					C	0.000	29.210		51.47	5.940	0.000
T11	25.000	0.945	7.405	256.341	A	0.000	29.773	15.036	50.50	32.539	0.000
30.000-20.000					B	0.000	29.773		50.50	42.689	0.000
					C	0.000	29.773		50.50	5.940	0.000
T12	10.000	0.85	6.659	548.561	A	0.000	61.162	30.071	49.17	39.047	0.000
20.000-0.000					B	0.000	61.162		49.17	51.226	0.000
					C	0.000	61.162		49.17	7.128	0.000

Tower Forces - No Ice - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1	44.640	1248.562	A	0.14	2.81	52.04	1	1	13.696	2299.545	114.977	C
180.000-160.0			B	0.14	2.81	3	1	1	13.696			
00			C	0.14	2.81		1	1	13.696			
T1	338.840	1457.569	A	0.143	2.798	50.69	1	1	15.302	4625.708	231.285	A
160.000-140.0			B	0.143	2.798	0	1	1	15.302			
00			C	0.143	2.798		1	1	15.302			
T2	126.067	816.245	A	0.148	2.779	49.70	1	1	5.868	1709.404	256.411	A
140.000-133.3			B	0.148	2.779	6	1	1	5.868			
33			C	0.148	2.779		1	1	5.868			
T3	192.947	834.579	A	0.142	2.802	49.18	1	1	6.011	2176.080	326.412	B
133.333-126.6			B	0.142	2.802	5	1	1	6.011			
67			C	0.142	2.802		1	1	6.011			
T4	235.767	1068.782	A	0.136	2.822	48.64	1	1	6.158	2588.602	388.290	B

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
126.667-120.0			B	0.136	2.822	3	1	1	6.158			
00			C	0.136	2.822		1	1	6.158			
T5	748.550	3760.231	A	0.129	2.849	47.48	1	1	18.590	8021.530	401.077	B
120.000-100.0			B	0.129	2.849	6	1	1	18.590			
00			C	0.129	2.849		1	1	18.590			
T6	374.800	1700.895	A	0.127	2.857	46.04	1	1	10.287	4011.387	401.139	B
100.000-90.00			B	0.127	2.857	2	1	1	10.287			
0			C	0.127	2.857		1	1	10.287			
T7	374.800	1737.433	A	0.121	2.879	44.97	1	1	10.532	3954.352	395.435	B
90.000-80.000			B	0.121	2.879	7	1	1	10.532			
			C	0.121	2.879		1	1	10.532			
T8	749.750	5274.520	A	0.135	2.829	43.17	1	1	26.096	8077.362	403.868	B
80.000-60.000			B	0.135	2.829	6	1	1	26.096			
			C	0.135	2.829		1	1	26.096			
T9	752.600	6310.621	A	0.125	2.864	40.22	1	1	27.268	7712.688	385.634	B
60.000-40.000			B	0.125	2.864	3	1	1	27.268			
			C	0.125	2.864		1	1	27.268			
T10	376.300	3243.716	A	0.12	2.887	37.31	1	1	14.083	3628.131	362.813	B
40.000-30.000			B	0.12	2.887	3	1	1	14.083			
			C	0.12	2.887		1	1	14.083			
T11	376.300	3438.563	A	0.116	2.9	34.76	1	1	14.375	3410.512	341.051	B
30.000-20.000			B	0.116	2.9	2	1	1	14.375			
			C	0.116	2.9		1	1	14.375			
T12	451.560	6470.251	A	0.111	2.918	31.25	1	1	29.310	4623.661	231.183	B
20.000-0.000			B	0.111	2.918	8	1	1	29.310			
			C	0.111	2.918		1	1	29.310			
Sum Weight:	5142.920	37361.968						OTM	4729652.4 19 lb-ft	56838.962		

Tower Forces - No Ice - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1	44.640	1248.562	A	0.14	2.81	52.04	0.8	1	13.696	2299.545	114.977	C
180.000-160.0			B	0.14	2.81	3	0.8	1	13.696			
00			C	0.14	2.81		0.8	1	13.696			
T1	338.840	1457.569	A	0.143	2.798	50.69	0.8	1	15.302	4625.708	231.285	B
160.000-140.0			B	0.143	2.798	0	0.8	1	15.302			
00			C	0.143	2.798		0.8	1	15.302			
T2	126.067	816.245	A	0.148	2.779	49.70	0.8	1	5.868	1709.404	256.411	B
140.000-133.3			B	0.148	2.779	6	0.8	1	5.868			
33			C	0.148	2.779		0.8	1	5.868			
T3	192.947	834.579	A	0.142	2.802	49.18	0.8	1	6.011	2176.080	326.412	C
133.333-126.6			B	0.142	2.802	5	0.8	1	6.011			
67			C	0.142	2.802		0.8	1	6.011			
T4	235.767	1068.782	A	0.136	2.822	48.64	0.8	1	6.158	2588.602	388.290	C
126.667-120.0			B	0.136	2.822	3	0.8	1	6.158			
00			C	0.136	2.822		0.8	1	6.158			
T5	748.550	3760.231	A	0.129	2.849	47.48	0.8	1	18.590	8021.530	401.077	C
120.000-100.0			B	0.129	2.849	6	0.8	1	18.590			
00			C	0.129	2.849		0.8	1	18.590			
T6	374.800	1700.895	A	0.127	2.857	46.04	0.8	1	10.287	4011.387	401.139	C

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
100.000-90.00			B	0.127	2.857	2	0.8	1	10.287			
0			C	0.127	2.857		0.8	1	10.287			
T7	374.800	1737.433	A	0.121	2.879	44.97	0.8	1	10.532	3954.352	395.435	C
90.000-80.000			B	0.121	2.879	7	0.8	1	10.532			
			C	0.121	2.879		0.8	1	10.532			
T8	749.750	5274.520	A	0.135	2.829	43.17	0.8	1	26.096	8077.362	403.868	C
80.000-60.000			B	0.135	2.829	6	0.8	1	26.096			
			C	0.135	2.829		0.8	1	26.096			
T9	752.600	6310.621	A	0.125	2.864	40.22	0.8	1	27.268	7712.688	385.634	C
60.000-40.000			B	0.125	2.864	3	0.8	1	27.268			
			C	0.125	2.864		0.8	1	27.268			
T10	376.300	3243.716	A	0.12	2.887	37.31	0.8	1	14.083	3628.131	362.813	C
40.000-30.000			B	0.12	2.887	3	0.8	1	14.083			
			C	0.12	2.887		0.8	1	14.083			
T11	376.300	3438.563	A	0.116	2.9	34.76	0.8	1	14.375	3410.512	341.051	C
30.000-20.000			B	0.116	2.9	2	0.8	1	14.375			
			C	0.116	2.9		0.8	1	14.375			
T12	451.560	6470.251	A	0.111	2.918	31.25	0.8	1	29.310	4623.661	231.183	C
20.000-0.000			B	0.111	2.918	8	0.8	1	29.310			
			C	0.111	2.918		0.8	1	29.310			
Sum Weight:	5142.920	37361.968						OTM	4729652.419 lb-ft	56838.962		

Tower Forces - No Ice - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1	44.640	1248.562	A	0.14	2.81	52.04	0.85	1	13.696	2299.545	114.977	C
180.000-160.0			B	0.14	2.81	3	0.85	1	13.696			
00			C	0.14	2.81		0.85	1	13.696			
T1	338.840	1457.569	A	0.143	2.798	50.69	0.85	1	15.302	4642.771	232.139	B
160.000-140.0			B	0.143	2.798	0	0.85	1	15.302			
00			C	0.143	2.798		0.85	1	15.302			
T2	126.067	816.245	A	0.148	2.779	49.70	0.85	1	5.868	1737.289	260.593	B
140.000-133.3			B	0.148	2.779	6	0.85	1	5.868			
33			C	0.148	2.779		0.85	1	5.868			
T3	192.947	834.579	A	0.142	2.802	49.18	0.85	1	6.011	2244.224	336.634	C
133.333-126.6			B	0.142	2.802	5	0.85	1	6.011			
67			C	0.142	2.802		0.85	1	6.011			
T4	235.767	1068.782	A	0.136	2.822	48.64	0.85	1	6.158	2640.596	396.089	C
126.667-120.0			B	0.136	2.822	3	0.85	1	6.158			
00			C	0.136	2.822		0.85	1	6.158			
T5	748.550	3760.231	A	0.129	2.849	47.48	0.85	1	18.590	8158.815	407.941	C
120.000-100.0			B	0.129	2.849	6	0.85	1	18.590			
00			C	0.129	2.849		0.85	1	18.590			
T6	374.800	1700.895	A	0.127	2.857	46.04	0.85	1	10.287	4077.944	407.794	C
100.000-90.00			B	0.127	2.857	2	0.85	1	10.287			
0			C	0.127	2.857		0.85	1	10.287			
T7	374.800	1737.433	A	0.121	2.879	44.97	0.85	1	10.532	4019.368	401.937	C
90.000-80.000			B	0.121	2.879	7	0.85	1	10.532			
			C	0.121	2.879		0.85	1	10.532			
T8	749.750	5274.520	A	0.135	2.829	43.17	0.85	1	26.096	8202.186	410.109	C

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
80.000-60.000			B	0.135	2.829	6	0.85	1	26.096			
			C	0.135	2.829		0.85	1	26.096			
T9	752.600	6310.621	A	0.125	2.864	40.22	0.85	1	27.268	7828.976	391.449	C
60.000-40.000			B	0.125	2.864	3	0.85	1	27.268			
			C	0.125	2.864		0.85	1	27.268			
T10	376.300	3243.716	A	0.12	2.887	37.31	0.85	1	14.083	3682.069	368.207	C
40.000-30.000			B	0.12	2.887	3	0.85	1	14.083			
			C	0.12	2.887		0.85	1	14.083			
T11	376.300	3438.563	A	0.116	2.9	34.76	0.85	1	14.375	3460.761	346.076	C
30.000-20.000			B	0.116	2.9	2	0.85	1	14.375			
			C	0.116	2.9		0.85	1	14.375			
T12	451.560	6470.251	A	0.111	2.918	31.25	0.85	1	29.310	4677.883	233.894	C
20.000-0.000			B	0.111	2.918	8	0.85	1	29.310			
			C	0.111	2.918		0.85	1	29.310			
Sum Weight:	5142.920	37361.968						OTM	4796483.0 19 lb-ft	57672.427		

Tower Forces - With Ice - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1	541.843	3535.916	A	0.285	2.336	7.699	1	1	30.808	744.221	37.211	C
180.000-160.0			B	0.285	2.336		1	1	30.808			
00			C	0.285	2.336		1	1	30.808			
T1	2493.914	3941.172	A	0.274	2.366	7.498	1	1	33.623	1633.236	81.662	A
160.000-140.0			B	0.274	2.366		1	1	33.623			
00			C	0.274	2.366		1	1	33.623			
T2	936.327	1765.022	A	0.268	2.386	7.353	1	1	12.655	584.122	87.618	A
140.000-133.3			B	0.268	2.386		1	1	12.655			
33			C	0.268	2.386		1	1	12.655			
T3	1430.225	1812.698	A	0.257	2.416	7.276	1	1	12.917	706.465	105.970	A
133.333-126.6			B	0.257	2.416		1	1	12.917			
67			C	0.257	2.416		1	1	12.917			
T4	1772.218	2075.819	A	0.248	2.443	7.196	1	1	13.186	784.524	117.679	A
126.667-120.0			B	0.248	2.443		1	1	13.186			
00			C	0.248	2.443		1	1	13.186			
T5	5633.938	6604.126	A	0.216	2.544	7.025	1	1	38.154	2391.656	119.583	A
120.000-100.0			B	0.216	2.544		1	1	38.154			
00			C	0.216	2.544		1	1	38.154			
T6	2795.774	3260.813	A	0.208	2.571	6.811	1	1	20.434	1184.611	118.461	A
100.000-90.00			B	0.208	2.571		1	1	20.434			
0			C	0.208	2.571		1	1	20.434			
T7	2770.430	3332.163	A	0.198	2.602	6.653	1	1	20.825	1162.797	116.280	A
90.000-80.000			B	0.198	2.602		1	1	20.825			
			C	0.198	2.602		1	1	20.825			
T8	5457.666	8833.874	A	0.205	2.58	6.387	1	1	48.254	2309.658	115.483	A
80.000-60.000			B	0.205	2.58		1	1	48.254			
			C	0.205	2.58		1	1	48.254			
T9	5374.199	10037.850	A	0.19	2.63	5.950	1	1	49.780	2195.957	109.798	A
60.000-40.000			B	0.19	2.63		1	1	49.780			
			C	0.19	2.63		1	1	49.780			
T10	2612.292	5118.603	A	0.18	2.663	5.520	1	1	25.380	1019.091	101.909	A

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
40.000-30.000			B	0.18	2.663		1	1	25.380			
			C	0.18	2.663		1	1	25.380			
T11	2545.057	5296.993	A	0.174	2.686	5.142	1	1	25.621	946.615	94.662	A
30.000-20.000			B	0.174	2.686		1	1	25.621			
			C	0.174	2.686		1	1	25.621			
T12	2852.485	9419.943	A	0.162	2.728	4.624	1	1	50.871	1220.041	61.002	A
20.000-0.000			B	0.162	2.728		1	1	50.871			
			C	0.162	2.728		1	1	50.871			
Sum Weight:	37216.368	65034.994						OTM	1457397.2 60 lb-ft	16882.994		

Tower Forces - With Ice - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1	541.843	3535.916	A	0.285	2.336	7.699	0.8	1	30.808	744.221	37.211	C
180.000-160.0			B	0.285	2.336		0.8	1	30.808			
00			C	0.285	2.336		0.8	1	30.808			
T1	2493.914	3941.172	A	0.274	2.366	7.498	0.8	1	33.623	1633.236	81.662	B
160.000-140.0			B	0.274	2.366		0.8	1	33.623			
00			C	0.274	2.366		0.8	1	33.623			
T2	936.327	1765.022	A	0.268	2.386	7.353	0.8	1	12.655	584.122	87.618	B
140.000-133.3			B	0.268	2.386		0.8	1	12.655			
33			C	0.268	2.386		0.8	1	12.655			
T3	1430.225	1812.698	A	0.257	2.416	7.276	0.8	1	12.917	706.465	105.970	B
133.333-126.6			B	0.257	2.416		0.8	1	12.917			
67			C	0.257	2.416		0.8	1	12.917			
T4	1772.218	2075.819	A	0.248	2.443	7.196	0.8	1	13.186	784.524	117.679	B
126.667-120.0			B	0.248	2.443		0.8	1	13.186			
00			C	0.248	2.443		0.8	1	13.186			
T5	5633.938	6604.126	A	0.216	2.544	7.025	0.8	1	38.154	2391.656	119.583	B
120.000-100.0			B	0.216	2.544		0.8	1	38.154			
00			C	0.216	2.544		0.8	1	38.154			
T6	2795.774	3260.813	A	0.208	2.571	6.811	0.8	1	20.434	1184.611	118.461	B
100.000-90.00			B	0.208	2.571		0.8	1	20.434			
0			C	0.208	2.571		0.8	1	20.434			
T7	2770.430	3332.163	A	0.198	2.602	6.653	0.8	1	20.825	1162.797	116.280	B
90.000-80.000			B	0.198	2.602		0.8	1	20.825			
			C	0.198	2.602		0.8	1	20.825			
T8	5457.666	8833.874	A	0.205	2.58	6.387	0.8	1	48.254	2309.658	115.483	B
80.000-60.000			B	0.205	2.58		0.8	1	48.254			
			C	0.205	2.58		0.8	1	48.254			
T9	5374.199	10037.850	A	0.19	2.63	5.950	0.8	1	49.780	2195.957	109.798	B
60.000-40.000			B	0.19	2.63		0.8	1	49.780			
			C	0.19	2.63		0.8	1	49.780			
T10	2612.292	5118.603	A	0.18	2.663	5.520	0.8	1	25.380	1019.091	101.909	B
40.000-30.000			B	0.18	2.663		0.8	1	25.380			
			C	0.18	2.663		0.8	1	25.380			
T11	2545.057	5296.993	A	0.174	2.686	5.142	0.8	1	25.621	946.615	94.662	B
30.000-20.000			B	0.174	2.686		0.8	1	25.621			
			C	0.174	2.686		0.8	1	25.621			
T12	2852.485	9419.943	A	0.162	2.728	4.624	0.8	1	50.871	1220.041	61.002	B

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
20.000-0.000			B	0.162	2.728		0.8	1	50.871			
			C	0.162	2.728		0.8	1	50.871			
Sum Weight:	37216.368	65034.994						OTM	1457397.2 60 lb-ft	16882.994		

Tower Forces - With Ice - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1	541.843	3535.916	A	0.285	2.336	7.699	0.85	1	30.808	744.221	37.211	C
180.000-160.0			B	0.285	2.336		0.85	1	30.808			
00			C	0.285	2.336		0.85	1	30.808			
T1	2493.914	3941.172	A	0.274	2.366	7.498	0.85	1	33.623	1519.397	75.970	B
160.000-140.0			B	0.274	2.366		0.85	1	33.623			
00			C	0.274	2.366		0.85	1	33.623			
T2	936.327	1765.022	A	0.268	2.386	7.353	0.85	1	12.655	563.412	84.512	B
140.000-133.3			B	0.268	2.386		0.85	1	12.655			
33			C	0.268	2.386		0.85	1	12.655			
T3	1430.225	1812.698	A	0.257	2.416	7.276	0.85	1	12.917	680.806	102.121	C
133.333-126.6			B	0.257	2.416		0.85	1	12.917			
67			C	0.257	2.416		0.85	1	12.917			
T4	1772.218	2075.819	A	0.248	2.443	7.196	0.85	1	13.186	783.179	117.477	C
126.667-120.0			B	0.248	2.443		0.85	1	13.186			
00			C	0.248	2.443		0.85	1	13.186			
T5	5633.938	6604.126	A	0.216	2.544	7.025	0.85	1	38.154	2409.885	120.494	C
120.000-100.0			B	0.216	2.544		0.85	1	38.154			
00			C	0.216	2.544		0.85	1	38.154			
T6	2795.774	3260.813	A	0.208	2.571	6.811	0.85	1	20.434	1193.449	119.345	C
100.000-90.00			B	0.208	2.571		0.85	1	20.434			
0			C	0.208	2.571		0.85	1	20.434			
T7	2770.430	3332.163	A	0.198	2.602	6.653	0.85	1	20.825	1171.430	117.143	C
90.000-80.000			B	0.198	2.602		0.85	1	20.825			
			C	0.198	2.602		0.85	1	20.825			
T8	5457.666	8833.874	A	0.205	2.58	6.387	0.85	1	48.254	2326.232	116.312	C
80.000-60.000			B	0.205	2.58		0.85	1	48.254			
			C	0.205	2.58		0.85	1	48.254			
T9	5374.199	10037.850	A	0.19	2.63	5.950	0.85	1	49.780	2211.398	110.570	C
60.000-40.000			B	0.19	2.63		0.85	1	49.780			
			C	0.19	2.63		0.85	1	49.780			
T10	2612.292	5118.603	A	0.18	2.663	5.520	0.85	1	25.380	1026.253	102.625	C
40.000-30.000			B	0.18	2.663		0.85	1	25.380			
			C	0.18	2.663		0.85	1	25.380			
T11	2545.057	5296.993	A	0.174	2.686	5.142	0.85	1	25.621	953.287	95.329	C
30.000-20.000			B	0.174	2.686		0.85	1	25.621			
			C	0.174	2.686		0.85	1	25.621			
T12	2852.485	9419.943	A	0.162	2.728	4.624	0.85	1	50.871	1227.241	61.362	C
20.000-0.000			B	0.162	2.728		0.85	1	50.871			
			C	0.162	2.728		0.85	1	50.871			
Sum Weight:	37216.368	65034.994						OTM	1439989.7 52 lb-ft	16810.190		

Tower Forces - Service - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
L1	44.640	1248.562	A	0.14	2.81	11.08	1	1	13.975	497.248	24.862	C
180.000-160.0			B	0.14	2.81	6	1	1	13.975			
00			C	0.14	2.81		1	1	13.975			
T1	338.840	1457.569	A	0.143	2.798	10.79	1	1	16.369	1012.764	50.638	A
160.000-140.0			B	0.143	2.798	8	1	1	16.369			
00			C	0.143	2.798		1	1	16.369			
T2	126.067	816.245	A	0.148	2.779	10.58	1	1	6.607	382.600	57.390	A
140.000-133.3			B	0.148	2.779	8	1	1	6.607			
33			C	0.148	2.779		1	1	6.607			
T3	192.947	834.579	A	0.142	2.802	10.47	1	1	6.753	482.055	72.308	B
133.333-126.6			B	0.142	2.802	7	1	1	6.753			
67			C	0.142	2.802		1	1	6.753			
T4	235.767	1068.782	A	0.136	2.822	10.36	1	1	6.901	569.891	85.484	B
126.667-120.0			B	0.136	2.822	2	1	1	6.901			
00			C	0.136	2.822		1	1	6.901			
T5	748.550	3760.231	A	0.129	2.849	10.11	1	1	22.071	1793.987	89.699	B
120.000-100.0			B	0.129	2.849	5	1	1	22.071			
00			C	0.129	2.849		1	1	22.071			
T6	374.800	1700.895	A	0.127	2.857	9.808	1	1	12.139	898.629	89.863	B
100.000-90.00			B	0.127	2.857		1	1	12.139			
0			C	0.127	2.857		1	1	12.139			
T7	374.800	1737.433	A	0.121	2.879	9.581	1	1	12.401	886.161	88.616	B
90.000-80.000			B	0.121	2.879		1	1	12.401			
			C	0.121	2.879		1	1	12.401			
T8	749.750	5274.520	A	0.135	2.829	9.197	1	1	29.724	1800.844	90.042	B
80.000-60.000			B	0.135	2.829		1	1	29.724			
			C	0.135	2.829		1	1	29.724			
T9	752.600	6310.621	A	0.125	2.864	8.568	1	1	31.104	1722.964	86.148	B
60.000-40.000			B	0.125	2.864		1	1	31.104			
			C	0.125	2.864		1	1	31.104			
T10	376.300	3243.716	A	0.12	2.887	7.948	1	1	16.114	812.478	81.248	B
40.000-30.000			B	0.12	2.887		1	1	16.114			
			C	0.12	2.887		1	1	16.114			
T11	376.300	3438.563	A	0.116	2.9	7.405	1	1	16.523	765.705	76.570	B
30.000-20.000			B	0.116	2.9		1	1	16.523			
			C	0.116	2.9		1	1	16.523			
T12	451.560	6470.251	A	0.111	2.918	6.659	1	1	34.210	1065.844	53.292	B
20.000-0.000			B	0.111	2.918		1	1	34.210			
			C	0.111	2.918		1	1	34.210			
Sum Weight:	5142.920	37361.968						OTM	1050166.2 66 lb-ft	12691.171		

Tower Forces - Service - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
L1	44.640	1248.562	A	0.14	2.81	11.08	0.8	1	13.975	497.248	24.862	C

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
180.000-160.0			B	0.14	2.81	6	0.8	1	13.975			
00			C	0.14	2.81		0.8	1	13.975			
T1	338.840	1457.569	A	0.143	2.798	10.79	0.8	1	16.369	1012.764	50.638	B
160.000-140.0			B	0.143	2.798	8	0.8	1	16.369			
00			C	0.143	2.798		0.8	1	16.369			
T2	126.067	816.245	A	0.148	2.779	10.58	0.8	1	6.607	382.600	57.390	B
140.000-133.3			B	0.148	2.779	8	0.8	1	6.607			
33			C	0.148	2.779		0.8	1	6.607			
T3	192.947	834.579	A	0.142	2.802	10.47	0.8	1	6.753	482.055	72.308	C
133.333-126.6			B	0.142	2.802	7	0.8	1	6.753			
67			C	0.142	2.802		0.8	1	6.753			
T4	235.767	1068.782	A	0.136	2.822	10.36	0.8	1	6.901	569.891	85.484	C
126.667-120.0			B	0.136	2.822	2	0.8	1	6.901			
00			C	0.136	2.822		0.8	1	6.901			
T5	748.550	3760.231	A	0.129	2.849	10.11	0.8	1	22.071	1793.987	89.699	C
120.000-100.0			B	0.129	2.849	5	0.8	1	22.071			
00			C	0.129	2.849		0.8	1	22.071			
T6	374.800	1700.895	A	0.127	2.857	9.808	0.8	1	12.139	898.629	89.863	C
100.000-90.00			B	0.127	2.857		0.8	1	12.139			
0			C	0.127	2.857		0.8	1	12.139			
T7	374.800	1737.433	A	0.121	2.879	9.581	0.8	1	12.401	886.161	88.616	C
90.000-80.000			B	0.121	2.879		0.8	1	12.401			
			C	0.121	2.879		0.8	1	12.401			
T8	749.750	5274.520	A	0.135	2.829	9.197	0.8	1	29.724	1800.844	90.042	C
80.000-60.000			B	0.135	2.829		0.8	1	29.724			
			C	0.135	2.829		0.8	1	29.724			
T9	752.600	6310.621	A	0.125	2.864	8.568	0.8	1	31.104	1722.964	86.148	C
60.000-40.000			B	0.125	2.864		0.8	1	31.104			
			C	0.125	2.864		0.8	1	31.104			
T10	376.300	3243.716	A	0.12	2.887	7.948	0.8	1	16.114	812.478	81.248	C
40.000-30.000			B	0.12	2.887		0.8	1	16.114			
			C	0.12	2.887		0.8	1	16.114			
T11	376.300	3438.563	A	0.116	2.9	7.405	0.8	1	16.523	765.705	76.570	C
30.000-20.000			B	0.116	2.9		0.8	1	16.523			
			C	0.116	2.9		0.8	1	16.523			
T12	451.560	6470.251	A	0.111	2.918	6.659	0.8	1	34.210	1065.844	53.292	C
20.000-0.000			B	0.111	2.918		0.8	1	34.210			
			C	0.111	2.918		0.8	1	34.210			
Sum Weight:	5142.920	37361.968						OTM	1050166.2 66 lb-ft	12691.171		

Tower Forces - Service - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
L1	44.640	1248.562	A	0.14	2.81	11.08	0.85	1	13.975	497.248	24.862	C
180.000-160.0			B	0.14	2.81	6	0.85	1	13.975			
00			C	0.14	2.81		0.85	1	13.975			
T1	338.840	1457.569	A	0.143	2.798	10.79	0.85	1	16.369	1016.398	50.820	B
160.000-140.0			B	0.143	2.798	8	0.85	1	16.369			
00			C	0.143	2.798		0.85	1	16.369			
T2	126.067	816.245	A	0.148	2.779	10.58	0.85	1	6.607	388.540	58.281	B

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
140.000-133.3			B	0.148	2.779	8	0.85	1	6.607			
33			C	0.148	2.779		0.85	1	6.607			
T3	192.947	834.579	A	0.142	2.802	10.47	0.85	1	6.753	496.571	74.486	C
133.333-126.6			B	0.142	2.802	7	0.85	1	6.753			
67			C	0.142	2.802		0.85	1	6.753			
T4	235.767	1068.782	A	0.136	2.822	10.36	0.85	1	6.901	580.966	87.145	C
126.667-120.0			B	0.136	2.822	2	0.85	1	6.901			
00			C	0.136	2.822		0.85	1	6.901			
T5	748.550	3760.231	A	0.129	2.849	10.11	0.85	1	22.071	1823.231	91.162	C
120.000-100.0			B	0.129	2.849	5	0.85	1	22.071			
00			C	0.129	2.849		0.85	1	22.071			
T6	374.800	1700.895	A	0.127	2.857	9.808	0.85	1	12.139	912.807	91.281	C
100.000-90.00			B	0.127	2.857		0.85	1	12.139			
0			C	0.127	2.857		0.85	1	12.139			
T7	374.800	1737.433	A	0.121	2.879	9.581	0.85	1	12.401	900.011	90.001	C
90.000-80.000			B	0.121	2.879		0.85	1	12.401			
			C	0.121	2.879		0.85	1	12.401			
T8	749.750	5274.520	A	0.135	2.829	9.197	0.85	1	29.724	1827.434	91.372	C
80.000-60.000			B	0.135	2.829		0.85	1	29.724			
			C	0.135	2.829		0.85	1	29.724			
T9	752.600	6310.621	A	0.125	2.864	8.568	0.85	1	31.104	1747.736	87.387	C
60.000-40.000			B	0.125	2.864		0.85	1	31.104			
			C	0.125	2.864		0.85	1	31.104			
T10	376.300	3243.716	A	0.12	2.887	7.948	0.85	1	16.114	823.968	82.397	C
40.000-30.000			B	0.12	2.887		0.85	1	16.114			
			C	0.12	2.887		0.85	1	16.114			
T11	376.300	3438.563	A	0.116	2.9	7.405	0.85	1	16.523	776.409	77.641	C
30.000-20.000			B	0.116	2.9		0.85	1	16.523			
			C	0.116	2.9		0.85	1	16.523			
T12	451.560	6470.251	A	0.111	2.918	6.659	0.85	1	34.210	1077.395	53.870	C
20.000-0.000			B	0.111	2.918		0.85	1	34.210			
			C	0.111	2.918		0.85	1	34.210			
Sum Weight:	5142.920	37361.968						OTM	1064402.3 70 lb-ft	12868.713		

Force Totals

Load Case	Vertical Forces lb	Sum of Forces X lb	Sum of Forces Z lb	Sum of Overturning Moments, M_x lb-ft	Sum of Overturning Moments, M_z lb-ft	Sum of Torques lb-ft
Leg Weight	18810.266					
Bracing Weight	18551.701					
Total Member Self-Weight	37361.968			-293.552	5379.744	
Total Weight	53528.722			-293.552	5379.744	
Wind 0 deg - No Ice		141.223	-75363.061	-7718663.989	-19616.750	-12348.670
Wind 30 deg - No Ice		37248.020	-64800.194	-6596225.428	-3775674.429	25359.638
Wind 60 deg - No Ice		69156.957	-40129.538	-4051388.484	-6952914.741	-28063.590
Wind 90 deg - No Ice		81100.017	-32.355	-6020.463	-8157334.538	-37836.961
Wind 120 deg - No Ice		66978.659	38708.827	3942198.067	-6814801.271	-11908.301
Wind 150 deg - No Ice		37124.383	64315.743	6619486.660	-3817066.144	33764.182
Wind 180 deg - No Ice		40.039	75036.543	7660283.106	-1707.186	12409.085
Wind 210 deg - No Ice		-37069.704	64498.132	6542173.390	3754872.034	-25173.459
Wind 240 deg - No Ice		-68969.223	40021.150	4031616.721	6930445.423	28063.590

Load Case	Vertical Forces lb	Sum of Forces X lb	Sum of Forces Z lb	Sum of Overturning Moments, M_x lb-ft	Sum of Overturning Moments, M_z lb-ft	Sum of Torques lb-ft
Wind 270 deg - No Ice		-80749.266	28.960	4832.434	8106011.093	37650.782
Wind 300 deg - No Ice		-66605.255	-38702.546	-3941673.340	6759468.165	11847.886
Wind 330 deg - No Ice		-36834.250	-64483.252	-6649722.783	3776472.022	-33764.182
Member Ice	27673.026					
Total Weight Ice	129266.503			-32028.289	8335.539	
Wind 0 deg - Ice		22.255	-20474.934	-2103856.820	4396.466	521.986
Wind 30 deg - Ice		10171.830	-17661.367	-1811423.393	-1014889.655	-2466.699
Wind 60 deg - Ice		18395.106	-10651.272	-1097925.686	-1828930.877	-17841.357
Wind 90 deg - Ice		22270.103	-5.099	-32930.764	-2214340.432	-18479.411
Wind 120 deg - Ice		19365.499	11185.831	1089368.998	-1932937.652	-1118.999
Wind 150 deg - Ice		10720.533	18569.154	1840292.253	-1072893.132	6580.975
Wind 180 deg - Ice		6.310	20423.479	2030692.809	7218.745	-512.466
Wind 210 deg - Ice		-10143.730	17613.767	1738941.543	1026587.054	2496.038
Wind 240 deg - Ice		-18365.522	10634.192	1030845.893	1840365.594	17841.357
Wind 270 deg - Ice		-22214.830	4.564	-31220.510	2221228.171	18450.072
Wind 300 deg - Ice		-19306.656	-11184.841	-1153250.368	1939193.529	1109.479
Wind 330 deg - Ice		-10674.813	-18595.551	-1909021.072	1081471.652	-6580.975
Total Weight	53528.722			-293.552	5379.744	
Wind 0 deg - Service		30.083	-16637.132	-1688957.971	-3441.375	-2630.486
Wind 30 deg - Service		8226.221	-14308.885	-1444142.426	-824881.507	5402.053
Wind 60 deg - Service		15236.953	-8840.035	-886430.017	-1517307.059	-5978.043
Wind 90 deg - Service		17859.206	-6.892	-3361.646	-1779586.062	-8059.944
Wind 120 deg - Service		14772.937	8537.399	859012.159	-1487886.439	-2536.680
Wind 150 deg - Service		8199.884	14205.688	1444939.120	-833698.677	7192.370
Wind 180 deg - Service		8.529	16567.578	1672363.445	373.681	2643.355
Wind 210 deg - Service		-8188.236	14244.540	1428470.021	821924.910	-5362.394
Wind 240 deg - Service		-15196.962	8816.947	878059.919	1513995.379	5978.043
Wind 270 deg - Service		-17784.490	6.169	-1049.786	1770127.940	8020.285
Wind 300 deg - Service		-14693.395	-8536.061	-863058.744	1477574.188	2523.810
Wind 330 deg - Service		-8138.080	-14241.371	-1455538.312	826526.092	-7192.370

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

Comb. No.	Description
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+1.0 Temp
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service
41	Dead+Wind 60 deg - Service
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
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 Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
L1	180 - 160	Latticed Pole Leg	Max Tension	7	2608.948	-60.128	358.923
			Max. Compression	2	-3823.862	-50.828	-57.804
			Max. Mx	21	-129.515	-1062.099	-5.781
			Max. My	12	-449.716	-18.034	805.371
			Max. Vy	9	-541.484	-650.424	7.078
			Max. Vx	5	440.878	-125.941	667.067
		Latticed Pole Diagonal	Max Tension	5	3714.749	0.000	0.000
			Max. Compression	4	-3781.766	0.000	0.000
			Max. Mx	26	-70.317	47.808	0.000
			Max. Vy	26	-24.153	0.000	0.000
		Latticed Pole Horizontal	Max Tension	6	2019.166	-6.612	1.494
			Max. Compression	5	-2016.421	-6.224	-0.146
			Max. Mx	37	71.352	-24.188	-0.889
			Max. My	3	586.327	-2.704	3.374
			Max. Vy	37	25.593	-24.188	-0.889
			Max. Vx	3	-0.793	0.000	0.000
		Latticed Pole Top Girt	Max Tension	8	262.881	0.000	0.000
			Max. Compression	10	-282.406	0.000	0.000
			Max. Mx	37	-25.746	-21.253	-0.046
			Max. My	6	-98.552	-7.869	-0.552
			Max. Vy	37	24.906	-21.253	-0.046

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Max. Vx	7	0.132	0.000	0.000
		Latticed Pole Inner Bracing	Max Tension	2	1.842	0.000	0.000
			Max. Compression	7	-1.775	0.000	0.000
			Max. Mx	26	0.017	-22.155	0.000
			Max. Vy	26	-20.749	0.000	0.000
T1	160 - 140	Leg	Max Tension	7	21884.654	-652.689	54.683
			Max. Compression	2	-27236.792	870.574	86.777
			Max. Mx	14	18782.716	1194.408	-85.952
			Max. My	21	-2646.494	-29.807	1171.795
			Max. Vy	6	-2269.262	34.380	-26.657
			Max. Vx	12	-2242.563	-15.032	15.184
		Diagonal	Max Tension	5	7866.125	0.000	0.000
			Max. Compression	4	-7945.363	0.000	0.000
			Max. Mx	26	-179.439	66.020	0.000
			Max. Vy	26	-30.619	0.000	0.000
		Horizontal	Max Tension	5	4993.927	-9.203	-0.044
			Max. Compression	5	-5003.916	-9.190	-0.044
			Max. Mx	37	-261.234	-35.610	-2.261
			Max. My	2	1729.397	-6.005	9.878
			Max. Vy	37	30.403	-35.610	-2.261
			Max. Vx	2	-2.315	0.000	0.000
		Inner Bracing	Max Tension	3	4.311	0.000	0.000
			Max. Compression	6	-6.532	0.000	0.000
			Max. Mx	26	-4.045	-30.785	0.000
			Max. Vy	26	-24.296	0.000	0.000
T2	140 - 133.333	Leg	Max Tension	7	30681.038	-932.089	100.136
			Max. Compression	2	-37048.634	-106.129	18.659
			Max. Mx	14	27997.276	-947.101	-85.943
			Max. My	24	-2332.810	-47.082	1021.225
			Max. Vy	14	-225.079	-947.101	-85.943
			Max. Vx	12	-302.348	-35.578	-1020.605
		Diagonal	Max Tension	5	8700.802	0.000	0.000
			Max. Compression	4	-8810.516	0.000	0.000
			Max. Mx	26	-207.068	80.812	0.000
			Max. Vy	26	-36.391	0.000	0.000
		Horizontal	Max Tension	5	5762.382	-13.643	-0.071
			Max. Compression	5	-5765.608	-13.662	-0.071
			Max. Mx	37	-216.400	-48.448	-3.958
			Max. My	10	669.831	-7.624	14.521
			Max. Vy	37	39.218	-48.448	-3.958
			Max. Vx	10	-2.660	-7.624	14.521
		Inner Bracing	Max Tension	11	4.615	0.000	0.000
			Max. Compression	22	-7.732	0.000	0.000
			Max. Mx	26	-4.702	-35.466	0.000
			Max. Vy	26	-25.950	0.000	0.000
T3	133.333 - 126.667	Leg	Max Tension	7	40687.354	102.396	-20.575
			Max. Compression	2	-49096.580	1301.442	38.319
			Max. Mx	6	38457.953	-1382.206	13.623
			Max. My	24	-4024.207	-49.761	1348.908
			Max. Vy	6	-1909.258	101.825	-20.146
			Max. Vx	17	1904.610	-1.252	-101.554
		Diagonal	Max Tension	5	10760.813	0.000	0.000
			Max. Compression	4	-10880.154	0.000	0.000
			Max. Mx	26	-207.786	88.571	0.000
			Max. Vy	26	-38.716	0.000	0.000
		Top Girt	Max Tension	7	7466.956	-9.854	9.281
			Max. Compression	18	-7461.239	0.000	0.000
			Max. Mx	37	-339.716	-55.805	-4.909
			Max. My	10	1311.804	-9.182	19.000

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Max. Vy	37	41.948	-55.805	-4.909
			Max. Vx	10	-3.241	0.000	0.000
		Inner Bracing	Max Tension	11	5.873	0.000	0.000
			Max. Compression	22	-9.171	0.000	0.000
			Max. Mx	26	-4.954	-40.612	0.000
			Max. Vy	26	-27.695	0.000	0.000
T4	126.667 - 120	Leg	Max Tension	7	52561.747	-1371.345	13.490
			Max. Compression	2	-63567.438	873.543	3.255
			Max. Mx	6	51168.651	-1382.204	13.625
			Max. My	24	-4141.818	-49.764	1348.903
			Max. Vy	22	-1440.272	-1380.970	20.205
			Max. Vx	16	1409.370	-41.216	1287.705
		Diagonal	Max Tension	5	12816.984	0.000	0.000
			Max. Compression	4	-13003.055	0.000	0.000
			Max. Mx	26	-227.469	132.612	0.000
			Max. Vy	26	-56.262	0.000	0.000
		Top Girt	Max Tension	7	9093.714	-11.913	10.787
			Max. Compression	4	-9095.448	-23.842	-0.036
			Max. Mx	37	-335.264	-62.756	-5.747
			Max. My	10	1220.786	-11.897	21.852
			Max. Vy	37	44.505	-62.756	-5.747
			Max. Vx	10	-3.489	0.000	0.000
		Inner Bracing	Max Tension	11	5.750	0.000	0.000
			Max. Compression	22	-10.720	0.000	0.000
			Max. Mx	26	-6.049	-46.063	0.000
			Max. Vy	26	29.414	0.000	0.000
T5	120 - 100	Leg	Max Tension	7	89810.712	-520.538	49.957
			Max. Compression	2	-103651.206	208.910	-30.548
			Max. Mx	6	65377.870	-930.934	33.739
			Max. My	9	-5534.197	-21.153	1013.457
			Max. Vy	6	-154.603	-930.934	33.739
			Max. Vx	4	-202.538	-34.359	-1004.717
		Diagonal	Max Tension	5	16411.168	0.000	0.000
			Max. Compression	4	-16705.122	0.000	0.000
			Max. Mx	26	-266.443	287.106	0.000
			Max. Vy	26	-90.262	0.000	0.000
		Horizontal	Max Tension	8	10029.320	0.000	0.000
			Max. Compression	9	-9920.789	0.000	0.000
			Max. Mx	37	-140.931	-84.389	-5.530
			Max. My	6	-1317.572	-44.713	-20.668
			Max. Vy	37	-51.221	-84.389	-5.530
			Max. Vx	6	-3.102	-44.713	-20.668
		Inner Bracing	Max Tension	11	3.141	0.000	0.000
			Max. Compression	6	-11.999	0.000	0.000
			Max. Mx	26	-9.553	-80.411	0.000
			Max. Vy	26	-44.298	0.000	0.000
T6	100 - 90	Leg	Max Tension	7	111850.922	-231.466	-0.056
			Max. Compression	10	-126991.730	637.513	31.076
			Max. Mx	6	109290.623	-672.570	35.162
			Max. My	9	-7137.866	-12.372	668.704
			Max. Vy	6	154.368	-672.570	35.162
			Max. Vx	5	184.817	-17.509	-664.529
		Diagonal	Max Tension	9	16080.980	0.000	0.000
			Max. Compression	8	-16315.465	0.000	0.000
			Max. Mx	26	-265.825	241.165	0.000
			Max. Vy	26	-73.632	0.000	0.000
		Horizontal	Max Tension	8	10487.192	0.000	0.000
			Max. Compression	9	-10365.550	0.000	0.000
			Max. Mx	37	-128.375	-92.931	-5.379

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Max. My	6	-85.494	-52.357	-19.140
			Max. Vy	37	54.175	-92.931	-5.379
			Max. Vx	6	2.437	0.000	0.000
		Inner Bracing	Max Tension	19	2.563	0.000	0.000
			Max. Compression	37	-10.054	0.000	0.000
			Max. Mx	26	-8.528	-92.975	0.000
			Max. Vy	26	-47.323	0.000	0.000
T7	90 - 80	Leg	Max Tension	7	133332.599	-667.884	34.943
			Max. Compression	10	-149647.693	591.727	32.786
			Max. Mx	6	130904.321	-672.559	35.180
			Max. My	9	-7757.834	-16.563	744.198
			Max. Vy	6	-112.918	-672.559	35.180
			Max. Vx	16	-154.074	-21.259	705.675
		Diagonal	Max Tension	9	16315.068	0.000	0.000
			Max. Compression	8	-16566.548	0.000	0.000
			Max. Mx	26	-284.116	264.152	0.000
			Max. Vy	26	-78.298	0.000	0.000
		Top Girt	Max Tension	8	11042.376	0.000	0.000
			Max. Compression	9	-10952.672	0.000	0.000
			Max. Mx	37	-151.397	-104.960	-5.314
			Max. My	6	-1308.642	-57.604	-18.792
			Max. Vy	37	-57.576	-104.960	-5.314
			Max. Vx	6	-2.222	0.000	0.000
		Inner Bracing	Max Tension	19	1.953	0.000	0.000
			Max. Compression	37	-10.300	0.000	0.000
			Max. Mx	26	-8.900	-106.605	0.000
			Max. Vy	26	50.423	0.000	0.000
T8	80 - 60	Leg	Max Tension	7	175077.921	-1272.331	11.810
			Max. Compression	18	-194974.454	2143.149	-75.837
			Max. Mx	6	171510.876	-2209.359	77.066
			Max. My	9	-9509.936	-21.053	1579.044
			Max. Vy	6	238.586	-2209.359	77.066
			Max. Vx	8	-234.039	-28.640	1578.717
		Diagonal	Max Tension	9	16739.598	0.000	0.000
			Max. Compression	8	-17076.669	0.000	0.000
			Max. Mx	26	-369.329	313.693	0.000
			Max. Vy	26	87.595	0.000	0.000
		Horizontal	Max Tension	8	12124.432	0.000	0.000
			Max. Compression	9	-11997.035	0.000	0.000
			Max. Mx	37	-98.472	-172.833	-7.425
			Max. My	6	-1310.351	-94.707	-26.553
			Max. Vy	37	85.042	-172.833	-7.425
			Max. Vx	6	2.934	0.000	0.000
		Inner Bracing	Max Tension	19	2.880	0.000	0.000
			Max. Compression	37	-12.529	0.000	0.000
			Max. Mx	26	-10.828	-159.036	0.000
			Max. Vy	26	65.903	0.000	0.000
T9	60 - 40	Leg	Max Tension	7	215485.672	-1338.634	16.199
			Max. Compression	18	-240211.147	1160.994	-24.214
			Max. Mx	6	192076.160	-2209.329	77.117
			Max. My	9	-9957.573	-21.106	1578.952
			Max. Vy	6	-289.505	-2209.329	77.117
			Max. Vx	12	-303.268	-27.464	-1471.985
		Diagonal	Max Tension	9	17508.014	0.000	0.000
			Max. Compression	8	-18001.464	0.000	0.000
			Max. Mx	26	-474.071	434.426	0.000
			Max. Vy	26	-114.297	0.000	0.000
		Horizontal	Max Tension	8	13434.510	0.000	0.000

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Max. Compression	9	-13197.250	0.000	0.000
			Max. Mx	37	1.940	-210.495	-7.310
			Max. My	6	-1347.053	-114.193	-26.152
			Max. Vy	37	-93.225	-210.495	-7.310
			Max. Vx	6	2.552	0.000	0.000
		Inner Bracing	Max Tension	19	0.590	0.000	0.000
			Max. Compression	37	-14.820	0.000	0.000
			Max. Mx	26	-13.346	-247.965	0.000
			Max. Vy	26	91.427	0.000	0.000
T10	40 - 30	Leg	Max Tension	7	235354.561	-1289.419	25.597
			Max. Compression	18	-262552.206	3019.419	-23.910
			Max. Mx	18	-262552.206	3019.419	-23.910
			Max. My	9	-12082.039	-50.715	1054.386
			Max. Vy	6	284.926	-2819.737	24.871
			Max. Vx	5	-171.969	-57.860	-1019.821
		Diagonal	Max Tension	9	17701.942	0.000	0.000
			Max. Compression	8	-18229.905	0.000	0.000
			Max. Mx	26	-503.050	462.812	0.000
			Max. Vy	26	118.226	0.000	0.000
		Horizontal	Max Tension	8	13887.895	0.000	0.000
			Max. Compression	9	-13642.445	0.000	0.000
			Max. Mx	37	2.790	-227.668	-7.243
			Max. My	6	-69.399	-134.822	-24.994
			Max. Vy	37	-96.046	-227.668	-7.243
			Max. Vx	6	-2.183	0.000	0.000
		Inner Bracing	Max Tension	1	0.000	0.000	0.000
			Max. Compression	37	-15.025	0.000	0.000
			Max. Mx	26	-13.644	-269.192	0.000
			Max. Vy	26	94.069	0.000	0.000
T11	30 - 20	Leg	Max Tension	7	254791.106	-2846.829	24.785
			Max. Compression	18	-284528.828	-3134.966	-136.551
			Max. Mx	10	-281163.597	-3140.819	68.299
			Max. My	9	-13679.325	-528.549	4389.979
			Max. Vy	18	693.780	3019.400	-23.943
			Max. Vx	9	-491.681	-528.549	4389.979
		Diagonal	Max Tension	9	18165.636	0.000	0.000
			Max. Compression	8	-18777.458	0.000	0.000
			Max. Mx	26	-556.676	492.441	0.000
			Max. Vy	26	-122.170	0.000	0.000
		Top Girt	Max Tension	8	14633.137	0.000	0.000
			Max. Compression	9	-14236.763	0.000	0.000
			Max. Mx	37	198.906	-289.690	-6.546
			Max. My	6	-544.681	-194.795	-22.588
			Max. Vy	37	-116.061	-289.690	-6.546
			Max. Vx	6	-1.875	0.000	0.000
		Inner Bracing	Max Tension	1	0.000	0.000	0.000
			Max. Compression	37	-15.796	0.000	0.000
			Max. Mx	26	-14.629	-291.210	0.000
			Max. Vy	26	96.711	0.000	0.000
T12	20 - 0	Leg	Max Tension	7	272085.950	1923.343	140.361
			Max. Compression	18	-305428.948	0.000	-0.127
			Max. Mx	18	-304703.308	9711.029	195.543
			Max. My	9	-14467.199	-528.805	4389.537
			Max. Vy	18	-1349.942	9711.029	195.543
			Max. Vx	9	843.754	-528.805	4389.537

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
		Diagonal	Max Tension	9	26487.807	-172.232	37.410
			Max. Compression	8	-27302.913	0.000	0.000
			Max. Mx	6	23240.437	-237.089	40.440
			Max. My	18	-26135.090	-16.571	51.704
			Max. Vy	38	-83.162	-203.542	1.663
			Max. Vx	18	4.250	0.000	0.000
		Horizontal	Max Tension	8	14852.291	0.000	0.000
			Max. Compression	9	-14789.235	0.000	0.000
			Max. Mx	37	-116.855	-380.194	-14.323
			Max. My	6	-1927.505	-356.222	-50.035
			Max. Vy	37	146.468	-380.194	-14.323
			Max. Vx	6	-3.958	-354.553	-50.035
		Redund Horz 1 Bracing	Max Tension	8	1582.032	0.000	0.000
			Max. Compression	9	-1376.217	0.000	0.000
			Max. Mx	26	163.126	37.492	0.000
			Max. Vy	26	23.724	0.000	0.000
		Redund Diag 1 Bracing	Max Tension	8	1438.958	0.000	0.000
			Max. Compression	9	-1334.658	0.000	0.000
			Max. Mx	26	142.070	77.076	0.000
			Max. Vy	26	-26.746	0.000	0.000
		Redund Hip 1 Bracing	Max Tension	11	3.219	0.000	0.000
			Max. Compression	6	-19.078	0.000	0.000
			Max. Mx	26	-13.705	63.465	0.000
			Max. Vy	26	-40.159	0.000	0.000
		Inner Bracing	Max Tension	1	0.000	0.000	0.000
			Max. Compression	33	-13.835	0.000	0.000
			Max. Mx	26	-12.826	186.394	0.000
			Max. Vy	26	-58.974	0.000	0.000

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Leg C	Max. Vert	18	346381.552	40193.489	-23893.325
	Max. H_x	18	346381.552	40193.489	-23893.325
	Max. H_z	7	-310116.941	-37636.114	22411.485
	Min. Vert	7	-310116.941	-37636.114	22411.485
	Min. H_x	7	-310116.941	-37636.114	22411.485
	Min. H_z	18	346381.552	40193.489	-23893.325
Leg B	Max. Vert	10	340812.916	-39281.643	-22966.976
	Max. H_x	23	-301352.651	36432.719	21332.175
	Max. H_z	23	-301352.651	36432.719	21332.175
	Min. Vert	23	-301352.651	36432.719	21332.175
	Min. H_x	10	340812.916	-39281.643	-22966.976
	Min. H_z	10	340812.916	-39281.643	-22966.976
Leg A	Max. Vert	2	334875.504	-267.050	44419.440
	Max. H_x	21	15855.786	9070.297	1304.393
	Max. H_z	2	334875.504	-267.050	44419.440
	Min. Vert	15	-294968.475	253.743	-41126.792
	Min. H_x	8	21665.124	-9094.654	1784.112
	Min. H_z	15	-294968.475	253.743	-41126.792

Tower Mast Reaction Summary

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	lb	lb	lb	lb-ft	lb-ft	lb-ft
Dead Only	53528.722	0.000	0.000	-293.717	5379.394	0.000
1.2 Dead+1.0 Wind 0 deg - No Ice	64234.466	141.223	-75363.060	-7513414.332	-18541.224	-12348.201
0.9 Dead+1.0 Wind 0 deg - No Ice	48175.850	141.223	-75363.060	-7513326.217	-20155.042	-12348.201
1.2 Dead+1.0 Wind 30 deg - No Ice	64234.466	37248.019	-64800.193	-6420061.899	-3672856.820	25359.981
0.9 Dead+1.0 Wind 30 deg - No Ice	48175.849	37248.019	-64800.193	-6419973.784	-3674470.638	25359.981
1.2 Dead+1.0 Wind 60 deg - No Ice	64234.466	69156.956	-40129.538	-3936722.634	-6753130.085	-28063.479
0.9 Dead+1.0 Wind 60 deg - No Ice	48175.849	69156.956	-40129.538	-3936634.519	-6754743.903	-28063.479
1.2 Dead+1.0 Wind 90 deg - No Ice	64234.466	81100.016	-32.355	-6079.373	-7921282.414	-37837.106
0.9 Dead+1.0 Wind 90 deg - No Ice	48175.849	81100.016	-32.355	-5991.258	-7922896.232	-37837.106
1.2 Dead+1.0 Wind 120 deg - No Ice	64234.466	66978.658	38708.827	3834038.614	-6626490.093	-11908.658
0.9 Dead+1.0 Wind 120 deg - No Ice	48175.849	66978.658	38708.827	3834126.730	-6628103.911	-11908.658
1.2 Dead+1.0 Wind 150 deg - No Ice	64234.466	37124.382	64315.742	6445866.514	-3715784.974	33763.711
0.9 Dead+1.0 Wind 150 deg - No Ice	48175.849	37124.382	64315.742	6445954.629	-3717398.792	33763.711
1.2 Dead+1.0 Wind 180 deg - No Ice	64234.466	40.039	75036.542	7454915.632	-631.654	12408.616
0.9 Dead+1.0 Wind 180 deg - No Ice	48175.850	40.039	75036.542	7455003.747	-2245.472	12408.616
1.2 Dead+1.0 Wind 210 deg - No Ice	64234.466	-37069.703	64498.131	6365892.044	3654205.483	-25173.802
0.9 Dead+1.0 Wind 210 deg - No Ice	48175.850	-37069.703	64498.131	6365980.160	3652591.664	-25173.802
1.2 Dead+1.0 Wind 240 deg - No Ice	64234.466	-68969.222	40021.150	3916833.053	6732811.825	28063.479
0.9 Dead+1.0 Wind 240 deg - No Ice	48175.850	-68969.222	40021.150	3916921.168	6731198.007	28063.479
1.2 Dead+1.0 Wind 270 deg - No Ice	64234.466	-80749.265	28.960	4773.526	7872110.027	37650.927
0.9 Dead+1.0 Wind 270 deg - No Ice	48175.850	-80749.265	28.960	4861.641	7870496.209	37650.927
1.2 Dead+1.0 Wind 300 deg - No Ice	64234.466	-66605.254	-38702.545	-3833631.706	6573308.045	11848.243
0.9 Dead+1.0 Wind 300 deg - No Ice	48175.850	-66605.254	-38702.545	-3833543.591	6571694.227	11848.243
1.2 Dead+1.0 Wind 330 deg - No Ice	64234.466	-36834.249	-64483.251	-6476220.455	3677341.910	-33763.711
0.9 Dead+1.0 Wind 330 deg - No Ice	48175.850	-36834.249	-64483.251	-6476132.340	3675728.092	-33763.711
1.2 Dead+1.0 Ice+1.0 Temp	139972.247	0.000	0.000	-32087.303	9410.726	-0.001
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	139972.247	22.255	-20474.933	-2041555.918	5471.652	522.091
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	139972.247	10171.829	-17661.367	-1757671.986	-982747.005	-2466.617
1.2 Dead+1.0 Wind 60 deg+1.0	139972.247	18395.105	-10651.272	-1064687.994	-1770184.100	-17841.322

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	lb	lb	lb	lb-ft	lb-ft	lb-ft
Ice+1.0 Temp 1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	139972.247	22270.103	-5.099	-32989.778	-2141988.345	-18479.431
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	139972.247	19365.498	11185.831	1053559.039	-1869940.007	-1119.066
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	139972.247	10720.533	18569.153	1782171.952	-1038296.242	6580.877
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	139972.247	6.310	20423.479	1968273.880	8293.933	-512.572
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	139972.247	-10143.729	17613.766	1685072.108	996594.777	2495.954
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	139972.248	-18365.521	10634.192	997490.174	1783769.190	17841.321
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	139972.248	-22214.830	4.564	-31279.524	2151026.457	18450.090
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	139972.248	-19306.655	-11184.841	-1117558.436	1878346.257	1109.544
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	139972.247	-10674.813	-18595.550	-1851018.798	1049025.135	-6580.879
Dead+Wind 0 deg - Service	53528.722	30.083	-16637.132	-1641857.634	54.696	-2630.386
Dead+Wind 30 deg - Service	53528.722	8226.221	-14308.885	-1403441.322	-798953.580	5402.126
Dead+Wind 60 deg - Service	53528.722	15236.953	-8840.035	-859384.625	-1470167.814	-5978.019
Dead+Wind 90 deg - Service	53528.722	17859.206	-6.892	-1513.651	-1724517.833	-8059.975
Dead+Wind 120 deg - Service	53528.722	14772.937	8537.398	837073.832	-1443191.249	-2536.756
Dead+Wind 150 deg - Service	53528.722	8199.884	14205.688	1408500.889	-808098.039	7192.270
Dead+Wind 180 deg - Service	53528.722	8.529	16567.578	1628959.099	3869.752	2643.256
Dead+Wind 210 deg - Service	53528.722	-8188.236	14244.540	1391464.907	802989.126	-5362.467
Dead+Wind 240 deg - Service	53528.722	-15196.962	8816.947	854710.518	1473848.276	5978.019
Dead+Wind 270 deg - Service	53528.722	-17784.489	6.169	798.209	1722051.854	8020.316
Dead+Wind 300 deg - Service	53528.722	-14693.395	-8536.060	-837424.428	1439871.141	2523.886
Dead+Wind 330 deg - Service	53528.722	-8138.080	-14241.370	-1415404.091	807917.596	-7192.270

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX lb	PY lb	PZ lb	PX lb	PY lb	PZ lb	% Error
1	0.000	-53528.722	0.000	-0.000	53528.722	-0.000	0.000%
2	141.223	-64234.466	-75363.061	-141.223	64234.466	75363.060	0.000%
3	141.223	-48175.850	-75363.061	-141.223	48175.850	75363.060	0.000%
4	37248.020	-64234.466	-64800.194	-37248.019	64234.466	64800.193	0.000%
5	37248.020	-48175.850	-64800.194	-37248.019	48175.849	64800.193	0.000%
6	69156.957	-64234.466	-40129.538	-69156.956	64234.466	40129.538	0.000%
7	69156.957	-48175.850	-40129.538	-69156.956	48175.849	40129.538	0.000%
8	81100.017	-64234.466	-32.355	-81100.016	64234.466	32.355	0.000%
9	81100.017	-48175.850	-32.355	-81100.016	48175.849	32.355	0.000%
10	66978.659	-64234.466	38708.827	-66978.658	64234.466	-38708.827	0.000%
11	66978.659	-48175.850	38708.827	-66978.658	48175.849	-38708.827	0.000%
12	37124.383	-64234.466	64315.743	-37124.382	64234.466	-64315.742	0.000%
13	37124.383	-48175.850	64315.743	-37124.382	48175.849	-64315.742	0.000%
14	40.039	-64234.466	75036.543	-40.039	64234.466	-75036.542	0.000%
15	40.039	-48175.850	75036.543	-40.039	48175.850	-75036.542	0.000%
16	-37069.704	-64234.466	64498.132	37069.703	64234.466	-64498.131	0.000%
17	-37069.704	-48175.850	64498.132	37069.703	48175.850	-64498.131	0.000%
18	-68969.223	-64234.466	40021.150	68969.222	64234.466	-40021.150	0.000%
19	-68969.223	-48175.850	40021.150	68969.222	48175.850	-40021.150	0.000%
20	-80749.266	-64234.466	28.960	80749.265	64234.466	-28.960	0.000%
21	-80749.266	-48175.850	28.960	80749.265	48175.850	-28.960	0.000%

Load Comb.	Sum of Applied Forces PX lb	PY lb	PZ lb	Sum of Reactions PX lb	PY lb	PZ lb	% Error
22	-66605.255	-64234.466	-38702.546	66605.254	64234.466	38702.545	0.000%
23	-66605.255	-48175.850	-38702.546	66605.254	48175.850	38702.545	0.000%
24	-36834.250	-64234.466	-64483.252	36834.249	64234.466	64483.251	0.000%
25	-36834.250	-48175.850	-64483.252	36834.249	48175.850	64483.251	0.000%
26	0.000	-139972.248	0.000	-0.000	139972.247	-0.000	0.000%
27	22.255	-139972.248	-20474.934	-22.255	139972.247	20474.933	0.000%
28	10171.830	-139972.248	-17661.367	-10171.829	139972.247	17661.367	0.000%
29	18395.106	-139972.248	-10651.272	-18395.105	139972.247	10651.272	0.000%
30	22270.103	-139972.248	-5.099	-22270.103	139972.247	5.099	0.000%
31	19365.499	-139972.248	11185.831	-19365.498	139972.247	-11185.831	0.000%
32	10720.533	-139972.248	18569.154	-10720.533	139972.247	-18569.153	0.000%
33	6.310	-139972.248	20423.479	-6.310	139972.247	-20423.479	0.000%
34	-10143.730	-139972.248	17613.767	10143.729	139972.247	-17613.766	0.000%
35	-18365.522	-139972.248	10634.192	18365.521	139972.248	-10634.192	0.000%
36	-22214.830	-139972.248	4.564	22214.830	139972.248	-4.564	0.000%
37	-19306.656	-139972.248	-11184.841	19306.655	139972.248	11184.841	0.000%
38	-10674.813	-139972.248	-18595.551	10674.813	139972.247	18595.550	0.000%
39	30.083	-53528.722	-16637.132	-30.083	53528.722	16637.132	0.000%
40	8226.221	-53528.722	-14308.885	-8226.221	53528.722	14308.885	0.000%
41	15236.953	-53528.722	-8840.035	-15236.953	53528.722	8840.035	0.000%
42	17859.206	-53528.722	-6.892	-17859.206	53528.722	6.892	0.000%
43	14772.937	-53528.722	8537.399	-14772.937	53528.722	-8537.398	0.000%
44	8199.884	-53528.722	14205.688	-8199.884	53528.722	-14205.688	0.000%
45	8.529	-53528.722	16567.578	-8.529	53528.722	-16567.578	0.000%
46	-8188.236	-53528.722	14244.541	8188.236	53528.722	-14244.540	0.000%
47	-15196.962	-53528.722	8816.947	15196.962	53528.722	-8816.947	0.000%
48	-17784.490	-53528.722	6.169	17784.489	53528.722	-6.169	0.000%
49	-14693.395	-53528.722	-8536.061	14693.395	53528.722	8536.060	0.000%
50	-8138.080	-53528.722	-14241.371	8138.080	53528.722	14241.370	0.000%

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	180 - 160	1.852	42	0.077	0.028
T1	160 - 140	1.531	42	0.075	0.023
T2	140 - 133.333	1.203	42	0.069	0.014
T3	133.333 - 126.667	1.100	42	0.067	0.012
T4	126.667 - 120	0.998	42	0.065	0.011
T5	120 - 100	0.901	42	0.061	0.010
T6	100 - 90	0.652	42	0.049	0.008
T7	90 - 80	0.539	42	0.044	0.007
T8	80 - 60	0.440	42	0.037	0.006
T9	60 - 40	0.268	42	0.029	0.004
T10	40 - 30	0.137	42	0.020	0.003
T11	30 - 20	0.084	42	0.015	0.002
T12	20 - 0	0.043	42	0.010	0.001

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
187.000	ANT940T10-WR	42	1.852	0.077	0.028	559048
181.000	ANT940T10-WR	42	1.852	0.077	0.028	559048
177.000	PA6-65AC	42	1.804	0.077	0.027	559048
170.000	(3) BPS7496-180-14	42	1.693	0.077	0.026	279524
169.000	3' Yagi	42	1.677	0.076	0.026	254112
160.000	(2) JAHH-65B-R3B [P2.0][96"]	42	1.531	0.075	0.023	164833
144.000	FFVV-65B-R2 [P2.0][96"]	42	1.267	0.070	0.016	103683
133.000	800-10798	42	1.095	0.067	0.012	579118
125.000	AIR32 DB [P2.0][96"]	42	0.973	0.064	0.011	70951
113.000	ANT150D	42	0.808	0.057	0.009	83221
60.000	GPS	42	0.268	0.029	0.004	111262

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	180 - 160	8.597	9	0.353	0.131
T1	160 - 140	7.094	9	0.349	0.108
T2	140 - 133.333	5.561	9	0.321	0.067
T3	133.333 - 126.667	5.082	9	0.312	0.057
T4	126.667 - 120	4.604	9	0.301	0.051
T5	120 - 100	4.154	9	0.286	0.047
T6	100 - 90	2.997	9	0.229	0.038
T7	90 - 80	2.478	9	0.202	0.034
T8	80 - 60	2.018	9	0.171	0.029
T9	60 - 40	1.228	9	0.134	0.020
T10	40 - 30	0.623	9	0.093	0.013
T11	30 - 20	0.381	8	0.070	0.010
T12	20 - 0	0.196	8	0.047	0.007

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
187.000	ANT940T10-WR	9	8.597	0.353	0.131	140289
181.000	ANT940T10-WR	9	8.597	0.353	0.131	140289
177.000	PA6-65AC	9	8.374	0.354	0.128	140289
170.000	(3) BPS7496-180-14	9	7.852	0.354	0.122	70144
169.000	3' Yagi	9	7.777	0.354	0.121	63768
160.000	(2) JAHH-65B-R3B [P2.0][96"]	9	7.094	0.349	0.108	42011
144.000	FFVV-65B-R2 [P2.0][96"]	9	5.858	0.327	0.075	22414
133.000	800-10798	9	5.058	0.311	0.057	144741
125.000	AIR32 DB [P2.0][96"]	9	4.488	0.297	0.050	15368
113.000	ANT150D	9	3.722	0.267	0.044	17963
60.000	GPS	9	1.228	0.134	0.020	23983

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	Mast Stability Index	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
L1	180 - 160	ROHN 3 STD	20.000	6.667	68.8 K=1.00	2.228	1.00	-3823.860	70976.602	0.054 [1] ✔
T1	160 - 140	ROHN 4 STD	20.048	6.683	52.9 K=1.00	2.971	1.00	-27236.801	108922.000	0.250 [1] ✔
T2	140 - 133.333	ROHN 5 EH	6.683	6.683	43.6 K=1.00	6.112	1.00	-37048.602	239340.000	0.155 [1] ✔
T3	133.333 - 126.667	ROHN 5 EH	6.683	6.683	43.6 K=1.00	6.112	1.00	-49096.602	239340.000	0.205 [1] ✔
T4	126.667 - 120	ROHN 5 EH	6.683	6.683	43.6 K=1.00	6.112	1.00	-63567.398	239340.000	0.266 [1] ✔
T5	120 - 100	ROHN 6 EHS	20.048	10.024	54.1 K=1.00	6.713	1.00	-103651.000	243988.000	0.425 [1] ✔
T6	100 - 90	ROHN 6 EH	10.024	10.024	54.8 K=1.00	8.405	1.00	-126992.000	303653.000	0.418 [1] ✔
T7	90 - 80	ROHN 6 EH	10.024	10.024	54.8 K=1.00	8.405	1.00	-149648.000	303653.000	0.493 [1] ✔
T8	80 - 60	Rohn 8 EHS + P9.625x0.375 1/3rd Pipe	20.048	10.024	42.7 K=1.00	15.300	1.00	-194974.000	602560.000	0.324 [1] ✔
T9	60 - 40	Rohn 8 EHS + P9.625x0.375 1/3rd Pipe	20.048	10.024	42.7 K=1.00	15.300	1.00	-240211.000	517064.000	0.465 [1] ✔
T10	40 - 30	Rohn 8 EHS + P9.625x0.375 1/3rd Pipe	10.024	10.024	42.7 K=1.00	15.300	1.00	-262552.000	517064.000	0.508 [1] ✔
T11	30 - 20	Rohn 8 EHS + P9.625x0.375 1/3rd Pipe	10.024	10.024	42.7 K=1.00	15.300	1.00	-284529.000	517064.000	0.550 [1] ✔
T12	20 - 0	Rohn 8 EHS + P9.625x0.375 1/3rd Pipe	20.048	10.024	42.7 K=1.00	15.300	1.00	-305429.000	517064.000	0.591 [1] ✔

[1] P_u / ϕP_n controls

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 $\frac{P_u}{\phi P_n}$
L1	180 - 160	ROHN 2 STD	7.917	7.647	116.6 K=1.00	1.075	-3781.770	17022.400	0.222 [1] ✔
T1	160 - 140	ROHN 2 STD	8.625	8.329	127.0 K=1.00	1.075	-7945.360	15055.200	0.528 [1] ✔
T2	140 - 133.333	Rohn 2 EH	8.883	8.532	132.8 K=1.00	1.391	-8810.520	17822.400	0.494 [1] ✔

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	133.333 - 126.667	Rohn 2 EH	9.151	8.813	137.2 K=1.00	1.391	-10880.200	16705.900	0.651 [1] ✔
T4	126.667 - 120	ROHN 2 XXS	9.428	9.100	153.6 K=1.00	2.511	-13003.100	24035.900	0.541 [1] ✔
T5	120 - 100	ROHN 2.5 XXS	12.723	12.277	172.4 K=1.00	3.812	-16389.801	28962.301	0.566 [1] ✔
T6	100 - 90	ROHN 3 STD	13.101	12.674	130.7 K=1.00	2.228	-16315.500	29469.100	0.554 [1] ✔
T7	90 - 80	ROHN 3 STD	13.495	13.084	134.9 K=1.00	2.228	-16566.500	27651.500	0.599 [1] ✔
T8	80 - 60	ROHN 3 STD	14.325	13.823	142.6 K=1.00	2.228	-17076.699	24773.500	0.689 [1] ✔
T9	60 - 40	ROHN 3 EH	15.203	14.726	155.5 K=1.00	3.016	-18001.500	28172.100	0.639 [1] ✔
T10	40 - 30	ROHN 3 EH	15.659	15.192	160.4 K=1.00	3.016	-18229.900	26473.000	0.689 [1] ✔
T11	30 - 20	ROHN 3 EH	16.123	15.665	165.4 K=1.00	3.016	-18777.500	24897.301	0.754 [1] ✔
T12	20 - 0	ROHN 3 EH	24.331	23.700	125.1 K=0.50	3.016	-27302.900	43509.801	0.628 [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 $\frac{P_u}{\phi P_n}$
L1	180 - 160	ROHN 1.5 STD	8.542	4.125	79.5 K=1.00	0.799	-2016.420	22660.500	0.089 [1] ✔
T1	160 - 140	ROHN 1.5 STD	10.137	4.881	94.1 K=1.00	0.799	-5003.920	18836.199	0.266 [1] ✔
T2	140 - 133.333	ROHN 2 STD	10.934	5.235	79.8 K=1.00	1.075	-5765.610	30350.100	0.190 [1] ✔
T5	120 - 100	ROHN 2 STD	14.522	6.985	106.5 K=1.00	1.075	-9920.790	21103.900	0.470 [1] ✔
T6	100 - 90	ROHN 2 STD	15.718	7.583	115.6 K=1.00	1.075	-10365.500	18164.801	0.571 [1] ✔
T8	80 - 60	ROHN 2.5 STD	19.305	9.293	117.7 K=1.00	1.704	-11997.000	27784.199	0.432 [1] ✔
T9	60 - 40	ROHN 2.5 STD	21.697	10.489	132.9 K=1.00	1.704	-13197.300	21809.801	0.605 [1] ✔
T10	40 - 30	ROHN 2.5 STD	22.893	11.087	140.4 K=1.00	1.704	-13642.400	19520.699	0.699 [1] ✔
T12	20 - 0	P3.5x.226	25.285	12.283	110.3 K=1.00	2.680	-14789.200	49562.602	0.298 [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 $\frac{P_u}{\phi P_n}$
L1	180 - 160	ROHN 1.5 STD	8.542	4.125	79.5 K=1.00	0.799	-282.406	22660.500	0.012 [1] ✔
T3	133.333 - 126.667	ROHN 2 STD	11.731	5.634	85.9 K=1.00	1.075	-7461.240	28195.699	0.265 [1] ✔
T4	126.667 - 120	ROHN 2 STD	12.528	6.032	92.0 K=1.00	1.075	-9095.450	26053.100	0.349 [1] ✔
T7	90 - 80	ROHN 2 STD	16.914	8.181	124.7 K=1.00	1.075	-10952.700	15606.400	0.702 [1] ✔
T11	30 - 20	ROHN 2.5 EH	24.089	11.685	151.7 K=1.00	2.254	-14236.800	22108.600	0.644 [1] ✔

[1] P_u / ϕP_n controls

Redundant Horizontal (1) 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 $\frac{P_u}{\phi P_n}$
T12	20 - 0	ROHN 1.5 STD	6.321	5.962	114.9 K=1.00	0.799	-5299.620	12925.500	0.410 [1] ✔

[1] P_u / ϕP_n controls

Redundant Diagonal (1) 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 $\frac{P_u}{\phi P_n}$
T12	20 - 0	ROHN 2 STD	11.527	10.805	164.7 K=1.00	1.075	-4832.060	8946.720	0.540 [1] ✔

[1] P_u / ϕP_n controls

Redundant Hip (1) 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 $\frac{P_u}{\phi P_n}$
T12	20 - 0	ROHN 2.5 STD	6.321	6.321	80.1	1.704	-19.078	39397.000	0.000 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
					K=1.00				✔

[1] P_u / ϕP_n controls

Inner Bracing 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 $\frac{P_u}{\phi P_n}$
L1	180 - 160	L2x2x1/8	4.271	4.271	128.9 K=1.00	0.484	-1.775	8341.120	0.000 [1] ✔
T1	160 - 140	L2x2x1/8	5.068	5.068	153.0 K=1.00	0.484	-5.082	5923.250	0.001 [1] ✔
T2	140 - 133.333	L2x2x1/8	5.467	5.467	165.0 K=1.00	0.484	-7.732	5090.910	0.002 [1] ✔
T3	133.333 - 126.667	L2x2x1/8	5.866	5.866	177.1 K=1.00	0.484	-9.171	4422.430	0.002 [1] ✔
T4	126.667 - 120	L2x2x1/8	6.264	6.264	189.1 K=1.00	0.484	-10.720	3877.470	0.003 [1] ✔
T5	120 - 100	L2 1/2x2 1/2x3/16	7.261	7.261	176.0 K=1.00	0.902	-11.372	8332.550	0.001 [1] ✔
T6	100 - 90	L2 1/2x2 1/2x3/16	7.859	7.859	190.5 K=1.00	0.902	-10.054	7112.760	0.001 [1] ✔
T7	90 - 80	L2 1/2x2 1/2x3/16	8.457	8.457	205.0 K=1.00	0.902	-10.300	6142.460	0.002 [1] ✔
T8	80 - 60	L3x3x3/16	9.653	9.653	194.4 K=1.00	1.090	-12.529	8259.520	0.002 [1] ✔
T9	60 - 40	L3 1/2x3 1/2x1/4	10.849	10.849	187.6 K=1.00	1.690	-14.820	13746.400	0.001 [1] ✔
T10	40 - 30	L3 1/2x3 1/2x1/4	11.447	11.447	197.9 K=1.00	1.690	-15.025	12347.700	0.001 [1] ✔
T11	30 - 20	L3 1/2x3 1/2x1/4	12.045	12.045	208.3 K=1.00	1.690	-15.796	11152.100	0.001 [1] ✔
T12	20 - 0	ROHN 2 STD	12.643	12.643	192.7 K=1.00	1.075	-13.835	6534.560	0.002 [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 $\frac{P_u}{\phi P_n}$

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
L1	180 - 160	ROHN 3 STD	20.000	6.667	68.8	2.228	2608.950	100281.000	0.026 [1] ✔
T1	160 - 140	ROHN 4 STD	20.048	6.683	52.9	2.971	21884.699	133689.000	0.164 [1] ✔
T2	140 - 133.333	ROHN 5 EH	6.683	6.683	43.6	6.112	30681.000	275039.000	0.112 [1] ✔
T3	133.333 - 126.667	ROHN 5 EH	6.683	6.683	43.6	6.112	40687.398	275039.000	0.148 [1] ✔
T4	126.667 - 120	ROHN 5 EH	6.683	6.683	43.6	6.112	52561.699	275039.000	0.191 [1] ✔
T5	120 - 100	ROHN 6 EHS	20.048	10.024	54.1	6.713	89810.703	302097.000	0.297 [1] ✔
T6	100 - 90	ROHN 6 EH	10.024	10.024	54.8	8.405	111851.000	378222.000	0.296 [1] ✔
T7	90 - 80	ROHN 6 EH	10.024	10.024	54.8	8.405	133333.000	378222.000	0.353 [1] ✔
T8	80 - 60	Rohn 8 EHS + P9.625x0.375 1/3rd Pipe	20.048	10.024	42.7	15.300	175078.000	688500.000	0.254 [1] ✔
T9	60 - 40	Rohn 8 EHS + P9.625x0.375 1/3rd Pipe	20.048	10.024	42.7	15.300	215486.000	578340.000	0.373 [1] ✔
T10	40 - 30	Rohn 8 EHS + P9.625x0.375 1/3rd Pipe	10.024	10.024	42.7	15.300	235355.000	578340.000	0.407 [1] ✔
T11	30 - 20	Rohn 8 EHS + P9.625x0.375 1/3rd Pipe	10.024	10.024	42.7	15.300	254791.000	578340.000	0.441 [1] ✔
T12	20 - 0	Rohn 8 EHS + P9.625x0.375 1/3rd Pipe	20.048	10.024	42.7	15.300	272086.000	578340.000	0.470 [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 $\frac{P_u}{\phi P_n}$
L1	180 - 160	ROHN 2 STD	7.917	7.647	116.6	1.075	3714.750	34814.801	0.107 [1] ✔
T1	160 - 140	ROHN 2 STD	8.625	8.329	127.0	1.075	7866.130	48353.898	0.163 [1] ✔
T2	140 - 133.333	Rohn 2 EH	8.883	8.532	132.8	1.391	8700.800	62611.301	0.139 [1] ✔
T3	133.333 - 126.667	Rohn 2 EH	9.151	8.813	137.2	1.391	10760.800	62611.301	0.172 [1] ✔
T4	126.667 - 120	ROHN 2 XXS	9.428	9.100	153.6	2.511	12817.000	113014.000	0.113 [1] ✔
T5	120 - 100	ROHN 2.5 XXS	12.363	11.916	167.4	3.812	16411.199	171562.000	0.096 [1] ✔
T6	100 - 90	ROHN 3 STD	13.101	12.674	130.7	2.228	16081.000	100281.000	0.160 [1] ✔
T7	90 - 80	ROHN 3 STD	13.495	13.084	134.9	2.228	16315.100	100281.000	0.163 [1] ✔

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T8	80 - 60	ROHN 3 STD	14.325	13.823	142.6	2.228	16739.600	100281.000	0.167 [1]
T9	60 - 40	ROHN 3 EH	15.203	14.726	155.5	3.016	17508.000	135717.000	0.129 [1]
T10	40 - 30	ROHN 3 EH	15.659	15.192	160.4	3.016	17701.900	135717.000	0.130 [1]
T11	30 - 20	ROHN 3 EH	16.123	15.665	165.4	3.016	18165.600	135717.000	0.134 [1]
T12	20 - 0	ROHN 3 EH	24.331	23.700	250.3	3.016	26487.801	135717.000	0.195 [1]

[1] $P_u / \phi P_n$ controls

Horizontal 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 $\frac{P_u}{\phi P_n}$
L1	180 - 160	ROHN 1.5 STD	8.542	4.125	79.5	0.799	2019.170	35975.602	0.056 [1]
T1	160 - 140	ROHN 1.5 STD	10.137	4.881	94.1	0.799	4993.930	35975.602	0.139 [1]
T2	140 - 133.333	ROHN 2 STD	10.934	5.235	79.8	1.075	5762.380	48353.898	0.119 [1]
T5	120 - 100	ROHN 2 STD	14.522	6.985	106.5	1.075	10029.300	48353.898	0.207 [1]
T6	100 - 90	ROHN 2 STD	15.718	7.583	115.6	1.075	10487.200	48353.898	0.217 [1]
T8	80 - 60	ROHN 2.5 STD	19.305	9.293	117.7	1.704	12124.400	76682.297	0.158 [1]
T9	60 - 40	ROHN 2.5 STD	21.697	10.489	132.9	1.704	13434.500	76682.297	0.175 [1]
T10	40 - 30	ROHN 2.5 STD	22.893	11.087	140.4	1.704	13887.900	76682.297	0.181 [1]
T12	20 - 0	P3.5x.226	25.285	12.283	110.3	2.680	14852.300	120579.000	0.123 [1]

[1] $P_u / \phi P_n$ 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 $\frac{P_u}{\phi P_n}$
L1	180 - 160	ROHN 1.5 STD	8.542	4.125	79.5	0.799	262.881	35975.602	0.007 [1]

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	133.333 - 126.667	ROHN 2 STD	11.731	5.634	85.9	1.075	7466.960	48353.898	0.154 [1]
T4	126.667 - 120	ROHN 2 STD	12.528	6.032	92.0	1.075	9093.710	48353.898	0.188 [1]
T7	90 - 80	ROHN 2 STD	16.914	8.181	124.7	1.075	11042.400	48353.898	0.228 [1]
T11	30 - 20	ROHN 2.5 EH	24.089	11.685	151.7	2.254	14633.100	101409.000	0.144 [1]

[1] P_u / ϕP_n controls

Redundant Horizontal (1) 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 $\frac{P_u}{\phi P_n}$
T12	20 - 0	ROHN 1.5 STD	6.321	5.962	114.9	0.799	5299.620	25902.400	0.205 [1]

[1] P_u / ϕP_n controls

Redundant Diagonal (1) 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 $\frac{P_u}{\phi P_n}$
T12	20 - 0	ROHN 2 STD	11.527	10.805	164.7	1.075	4832.060	34814.801	0.139 [1]

[1] P_u / ϕP_n controls

Redundant Hip (1) 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 $\frac{P_u}{\phi P_n}$
T12	20 - 0	ROHN 2.5 STD	6.321	6.321	80.1	1.704	3.219	55211.199	0.000 [1]

[1] P_u / ϕP_n controls

Inner Bracing 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 $\frac{P_u}{\phi P_n}$
L1	180 - 160	L2x2x1/8	4.271	4.271	81.8	0.484	1.842	15693.800	0.000 [1] ✔
T1	160 - 140	L2x2x1/8	4.271	4.271	81.8	0.484	4.311	15693.800	0.000 [1] ✔
T2	140 - 133.333	L2x2x1/8	5.467	5.467	104.8	0.484	4.615	15693.800	0.000 [1] ✔
T3	133.333 - 126.667	L2x2x1/8	5.866	5.866	112.4	0.484	5.873	15693.800	0.000 [1] ✔
T4	126.667 - 120	L2x2x1/8	6.264	6.264	120.0	0.484	5.750	15693.800	0.000 [1] ✔
T5	120 - 100	L2 1/2x2 1/2x3/16	6.663	6.663	102.8	0.902	3.141	29224.801	0.000 [1] ✔
T6	100 - 90	L2 1/2x2 1/2x3/16	7.859	7.859	121.2	0.902	2.563	29224.801	0.000 [1] ✔
T7	90 - 80	L2 1/2x2 1/2x3/16	8.457	8.457	130.4	0.902	1.953	29224.801	0.000 [1] ✔
T8	80 - 60	L3x3x3/16	9.055	9.055	115.7	1.090	2.880	35316.000	0.000 [1] ✔
T9	60 - 40	L3 1/2x3 1/2x1/4	10.251	10.251	112.9	1.690	0.590	54756.000	0.000 [1] ✔

[1] $P_u / \phi P_n$ controls

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
L1	180 - 160	Latticed Pole Leg	ROHN 3 STD	3	-3823.860	70976.602	5.4	Pass
		Latticed Pole Diagonal	ROHN 2 STD	14	-3781.770	17022.400	22.2	Pass
		Latticed Pole Horizontal	ROHN 1.5 STD	13	-2016.420	22660.500	8.9	Pass
		Latticed Pole Top Girt	ROHN 1.5 STD	4	-282.406	22660.500	1.2	Pass
		Latticed Pole Inner Bracing	L2x2x1/8	18	-1.775	8341.120	0.4	Pass
T1	160 - 140	Leg	ROHN 4 STD	42	-27236.801	108922.000	25.0	Pass
		Diagonal	ROHN 2 STD	50	-7945.360	15055.200	52.8	Pass
		Horizontal	ROHN 1.5 STD	49	-5003.920	18836.199	26.6	Pass
		Inner Bracing	L2x2x1/8	54	-5.081	5923.250	0.5	Pass
T2	140 - 133.333	Leg	ROHN 5 EH	81	-37048.602	239340.000	15.5	Pass
		Diagonal	Rohn 2 EH	89	-8810.520	17822.400	49.4	Pass
		Horizontal	ROHN 2 STD	88	-5765.610	30350.100	19.0	Pass
		Inner Bracing	L2x2x1/8	93	-7.694	5090.910	0.5	Pass
T3	133.333 - 126.667	Leg	ROHN 5 EH	96	-49096.602	239340.000	20.5	Pass
		Diagonal	Rohn 2 EH	104	-10880.200	16705.900	65.1	Pass
		Top Girt	ROHN 2 STD	99	-7461.240	28195.699	26.5	Pass
		Inner Bracing	L2x2x1/8	106	-9.171	4422.430	0.6	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
T4	126.667 - 120	Leg	ROHN 5 EH	111	-63567.398	239340.000	26.6	Pass
		Diagonal	ROHN 2 XXS	119	-13003.100	24035.900	54.1	Pass
		Top Girt	ROHN 2 STD	114	-9095.450	26053.100	34.9	Pass
		Inner Bracing	L2x2x1/8	121	-10.720	3877.470	0.6	Pass
T5	120 - 100	Leg	ROHN 6 EHS	126	-103651.000	243988.000	42.5	Pass
		Diagonal	ROHN 2.5 XXS	129	-16389.801	28962.301	56.6	Pass
		Horizontal	ROHN 2 STD	127	-9920.790	21103.900	47.0	Pass
		Inner Bracing	L2 1/2x2 1/2x3/16	138	-11.372	8332.550	0.5	Pass
T6	100 - 90	Leg	ROHN 6 EH	152	-126992.000	303653.000	41.8	Pass
		Diagonal	ROHN 3 STD	156	-16315.500	29469.100	55.4	Pass
		Horizontal	ROHN 2 STD	154	-10365.500	18164.801	57.1	Pass
		Inner Bracing	L2 1/2x2 1/2x3/16	163	-10.054	7112.760	0.5	Pass
T7	90 - 80	Leg	ROHN 6 EH	167	-149648.000	303653.000	49.3	Pass
		Diagonal	ROHN 3 STD	173	-16566.500	27651.500	59.9	Pass
		Top Girt	ROHN 2 STD	169	-10952.700	15606.400	70.2	Pass
		Inner Bracing	L2 1/2x2 1/2x3/16	179	-10.218	6142.460	0.6	Pass
T8	80 - 60	Leg	Rohn 8 EHS + P9.625x0.375 1/3rd Pipe	181	-194974.000	602560.000	32.4	Pass
		Diagonal	ROHN 3 STD	186	-17076.699	24773.500	68.9	Pass
		Horizontal	ROHN 2.5 STD	184	-11997.000	27784.199	43.2	Pass
		Inner Bracing	L3x3x3/16	193	-12.529	8259.520	0.6	Pass
T9	60 - 40	Leg	Rohn 8 EHS + P9.625x0.375 1/3rd Pipe	208	-240211.000	517064.000	46.5	Pass
		Diagonal	ROHN 3 EH	213	-18001.500	28172.100	63.9	Pass
		Horizontal	ROHN 2.5 STD	211	-13197.300	21809.801	60.5	Pass
		Inner Bracing	L3 1/2x3 1/2x1/4	222	-14.763	13746.400	0.5	Pass
T10	40 - 30	Leg	Rohn 8 EHS + P9.625x0.375 1/3rd Pipe	235	-262552.000	517064.000	50.8	Pass
		Diagonal	ROHN 3 EH	240	-18229.900	26473.000	68.9	Pass
		Horizontal	ROHN 2.5 STD	238	-13642.400	19520.699	69.9	Pass
		Inner Bracing	L3 1/2x3 1/2x1/4	249	-14.970	12347.700	0.6	Pass
T11	30 - 20	Leg	Rohn 8 EHS + P9.625x0.375 1/3rd Pipe	250	-284529.000	517064.000	55.0	Pass
		Diagonal	ROHN 3 EH	257	-18777.500	24897.301	75.4	Pass
		Top Girt	ROHN 2.5 EH	253	-14236.800	22108.600	64.4	Pass
		Inner Bracing	L3 1/2x3 1/2x1/4	264	-15.750	11152.100	0.6	Pass
T12	20 - 0	Leg	Rohn 8 EHS + P9.625x0.375 1/3rd Pipe	265	-305429.000	517064.000	59.1	Pass
		Diagonal	ROHN 3 EH	272	-27302.900	43509.801	62.8	Pass
		Horizontal	P3.5x.226	268	-14789.200	49562.602	29.8	Pass
		Redund Horz 1 Bracing	ROHN 1.5 STD	270	-5299.620	12925.500	41.0	Pass
		Redund Diag 1 Bracing	ROHN 2 STD	271	-4832.060	8946.720	54.0	Pass
		Redund Hip 1 Bracing	ROHN 2.5 STD	290	-18.846	39397.000	0.2	Pass
		Inner Bracing	ROHN 2 STD	292	-13.831	6534.560	0.4	Pass
							Summary	
						Latticed Pole Leg (L1)	5.4	Pass
						Latticed Pole Diagonal (L1)	22.2	Pass
						Latticed Pole Horizontal (L1)	8.9	Pass
						Latticed Pole Top	1.2	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
						Girt (L1)		
						Latticed Pole Inner Bracing (L1)	0.4	Pass
						Leg (T12)	59.1	Pass
						Diagonal (T11)	75.4	Pass
						Horizontal (T10)	69.9	Pass
						Top Girt (T7)	70.2	Pass
						Redund Horz 1 Bracing (T12)	41.0	Pass
						Redund Diag 1 Bracing (T12)	54.0	Pass
						Redund Hip 1 Bracing (T12)	0.2	Pass
						Inner Bracing (T4)	0.6	Pass
						RATING =	**75.4**	**Pass**

MK DEVELOPMENT

EXHIBIT E

Antenna Mount Analysis

January 19, 2023

PASS

RE: **Structural Analysis for Antenna Mounts**

Location: **880 Post Road East Westport, CT 06880**

Site ID: **NJJER02042B**

Dish Wireless LLC,

Per your request, we have performed a structural analysis of the proposed antenna mounts. This site consists of three (3) proposed antenna mounts that will be installed on the existing self-support tower. This review determines if the antenna mounts can support the proposed loads.

1.0 Assumptions:

CATEGORY	DATA	CODE
Structure Type	Self-Support	
RAD Center	144'-0"	
Structure Class	IV	ASCE 7-16
Exposure Class	C	ASCE 7-16
Kzt Factor	1.0	ASCE 7-16
Basic Wind Speed	130	2022 CSBC
Ice Thickness	1"	ASCE 7-16
Ice Windspeed	50 MPH	ASCE 7-16
Seismic Design Category	C	ASCE 7-16
S_{DS}	.244	ASCE 7-16

2.0 Existing Documents:

DOCUMENT	COMPANY	DATE
Proposed Drawings	M&K Development	11/6/2021
Site Visit Photos	M&K Development	9/14/2021

3.0 Proposed Equipment:

MANUFACTURER	EQUIPMENT	WEIGHTS
CommScope	**(3) MTC3975083**	**352 lbs**
CommScope	**(3) FFVV-65B-R2**	**70.54 lbs**
Fujitsu	**(3) TA08025-B604**	**63.9 lbs**
Fujitsu	**(3) TA08025-B605**	**74.9 lbs**
RayCap	**(3) OVP RDIDC-9181-PF-48**	**32 lbs**
CommScope	**(3) HYBRID CABLE**	**N.A.**

Bold represents equipment to be added

We are installing (3) proposed MTC3975083 mounts on the existing self-support tower. After performing an analysis on the proposed mounts, it has been determined that they are **ADEQUATE** for the proposed loads and the mounts are at 21% of their capacity.

This report does not address the structural stability of any other mounts, or portion of the structure, nor does it provide any warranty either express or implied, for any portion of the proposed mounts or structure.

Please note that we have not had a professional engineer perform an independent visit to confirm existing structural conditions and the outcome of this analysis is based solely on the information provided in the previous photos and drawing details. If the existing conditions are modified, in disrepair or not properly represented, contact our office immediately for an amended report since this analysis may be inaccurate.

If you have any questions, feel free to contact us at any time.

Sincerely,

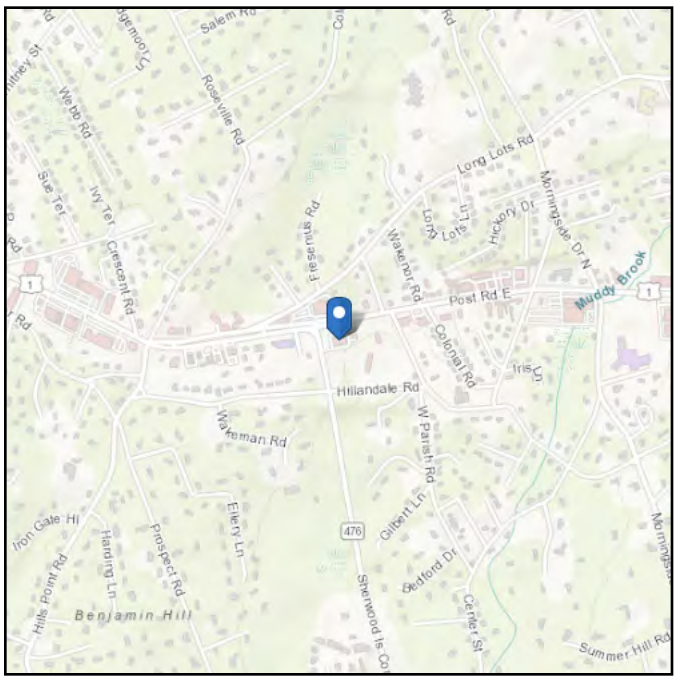
Magaram Engineering

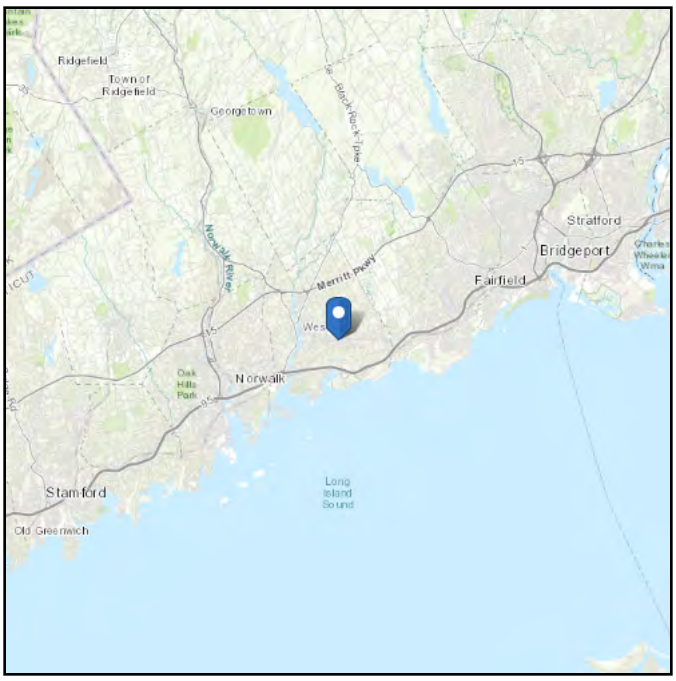
Brett Magaram
Connecticut License # 33678
Brett@MagaramEngineering.com
Phone: 914-450-8416

ASCE 7 Hazards Report

Address:
880 Post Rd E
Westport, Connecticut
06880

Standard:	ASCE/SEI 7-16	**Elevation:**	63.43 ft (NAVD 88)
Risk Category:	IV	**Latitude:**	41.137629
Soil Class:	D - Default (see Section 11.4.3)	**Longitude:**	-73.334872





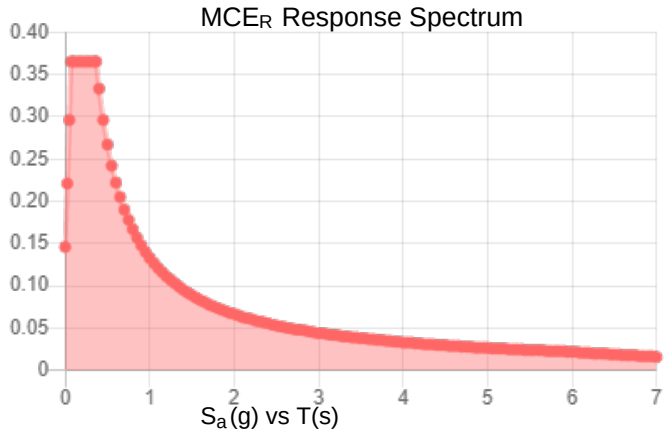
Seismic

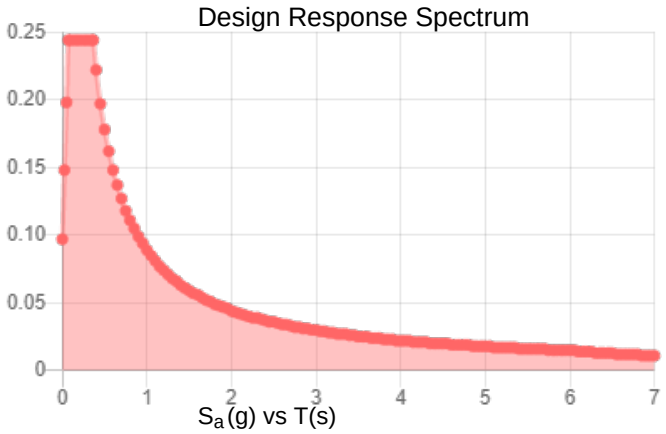
Site Soil Class: D - Default (see Section 11.4.3)

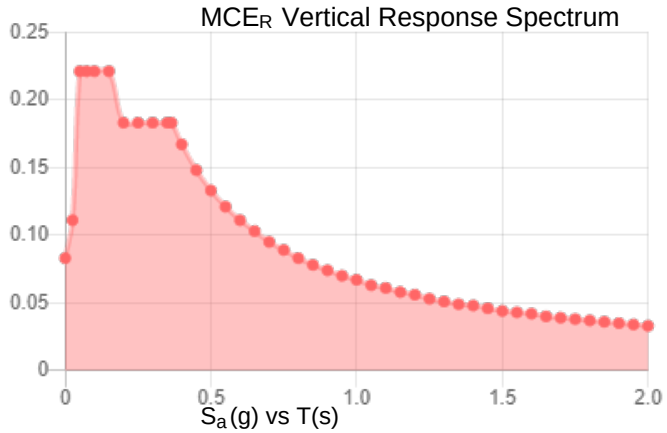
Results:

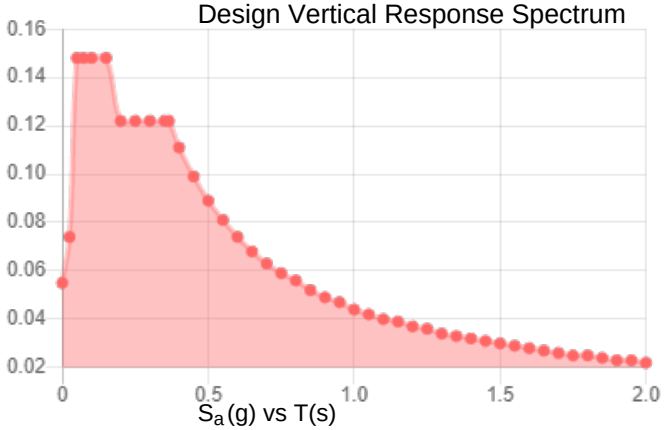
S_S :	0.228	S_{D1} :	0.089
S_1 :	0.056	T_L :	6
F_a :	1.6	PGA :	0.133
F_v :	2.4	PGA_M :	0.204
S_{MS} :	0.365	F_{PGA} :	1.534
S_{M1} :	0.133	I_e :	1.5
S_{DS} :	0.244	C_v :	0.757

Seismic Design Category C









Data Accessed: **Mon Jun 27 2022**

Date Source:

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

Ice

Results:

Ice Thickness:	1.00 in.
Concurrent Temperature:	15 F
Gust Speed	50 mph
Data Source:	Standard ASCE/SEI 7-16, Figs. 10-2 through 10-8
Date Accessed:	Mon Jun 27 2022

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.

(APPENDIX N) MUNICIPALITY - SPECIFIC STRUCTURAL DESIGN PARAMETERS												
				Wind Design Parameters								
Municipality	**Ground Snow Load** (psf)	**MCE Spectral Accelerations** (%g)		**Ultimate Design Wind Speeds,** V_{ult} (mph)			**Nominal Design Wind Speeds,** V_{asd} (mph)			**Wind-Borne Debris Regions[1]**		**Hurricane-Prone Regions**
		S_s	S_1	Risk Cat.I	Risk Cat.II	Risk Cat III-IV	Risk Cat. I	Risk Cat. II	Risk Cat. III-IV	Risk Cat. II & III except Occup I-2	Risk Cat III Occup I-2 & Risk Cat. IV	
Westport	30	0.226	0.067	110	120	130	85	93	101		Type B	Yes
Wethersfield	30	0.181	0.064	115	125	135	89	97	105			Yes
Willington	35	0.174	0.063	115	125	135	89	97	105			Yes
Wilton	30	0.231	0.068	110	120	130	85	93	101			Yes
Winchester	40	0.177	0.065	105	120	125	81	93	97			Yes
Windham	30	0.173	0.062	120	130	140	93	101	108			Yes
Windsor	35	0.179	0.064	115	125	135	89	97	105			Yes
Windsor Locks	35	0.177	0.064	110	125	130	85	97	101			Yes
Wolcott	35	0.187	0.064	110	125	130	85	97	101			Yes
Woodbridge	30	0.191	0.063	115	125	135	89	97	105			Yes
Woodbury	35	0.194	0.065	110	120	130	85	93	101			Yes
Woodstock	40	0.172	0.063	120	130	140	93	101	108			Yes

1. Wind-Borne Debris Regions:

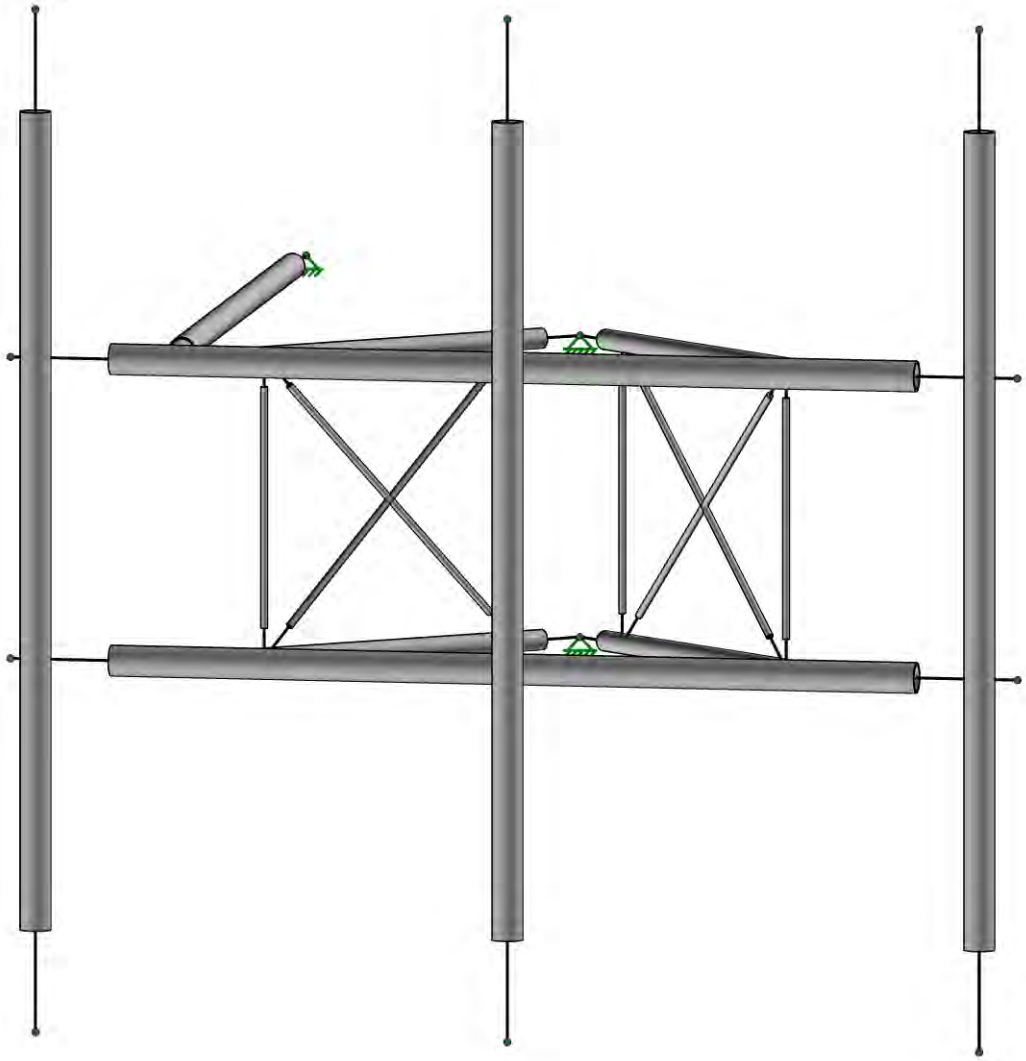
   Type A: Full Municipality.

   Type B: Areas south of Interstate 95.

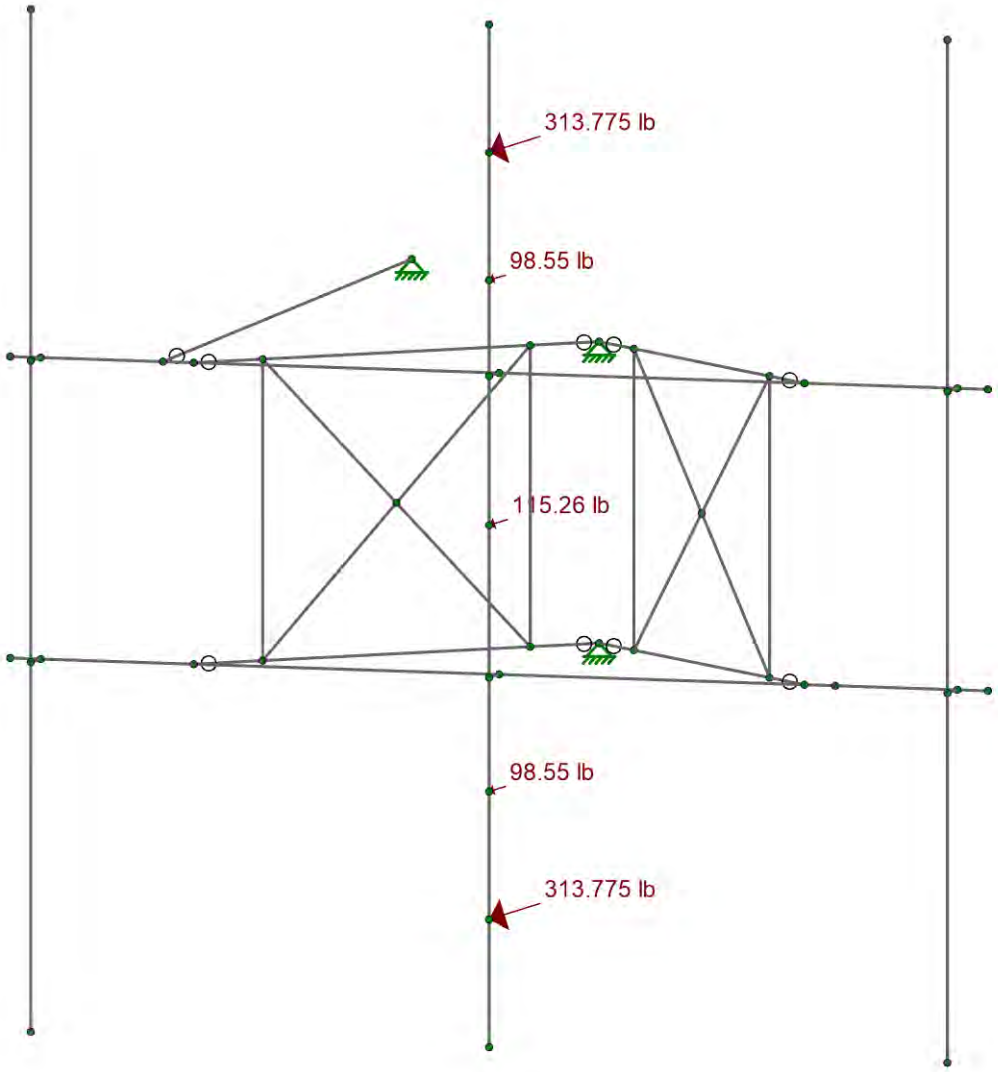
   Exception: Areas that are more than one mile from the coastal mean high-water line as certified by a registered design professional may be classified as being outside a wind-borne debris region.

   Type C: Areas south of Metro North/Amtrak Railroad to the west of the Quinnipiac River and areas south of Interstate 95 to the east of the Quinnipiac River.

   Exception: Areas that are more than one mile from the coastal mean high-water line as certified by a registered design professional may be classified as being outside a wind-borne debris region.

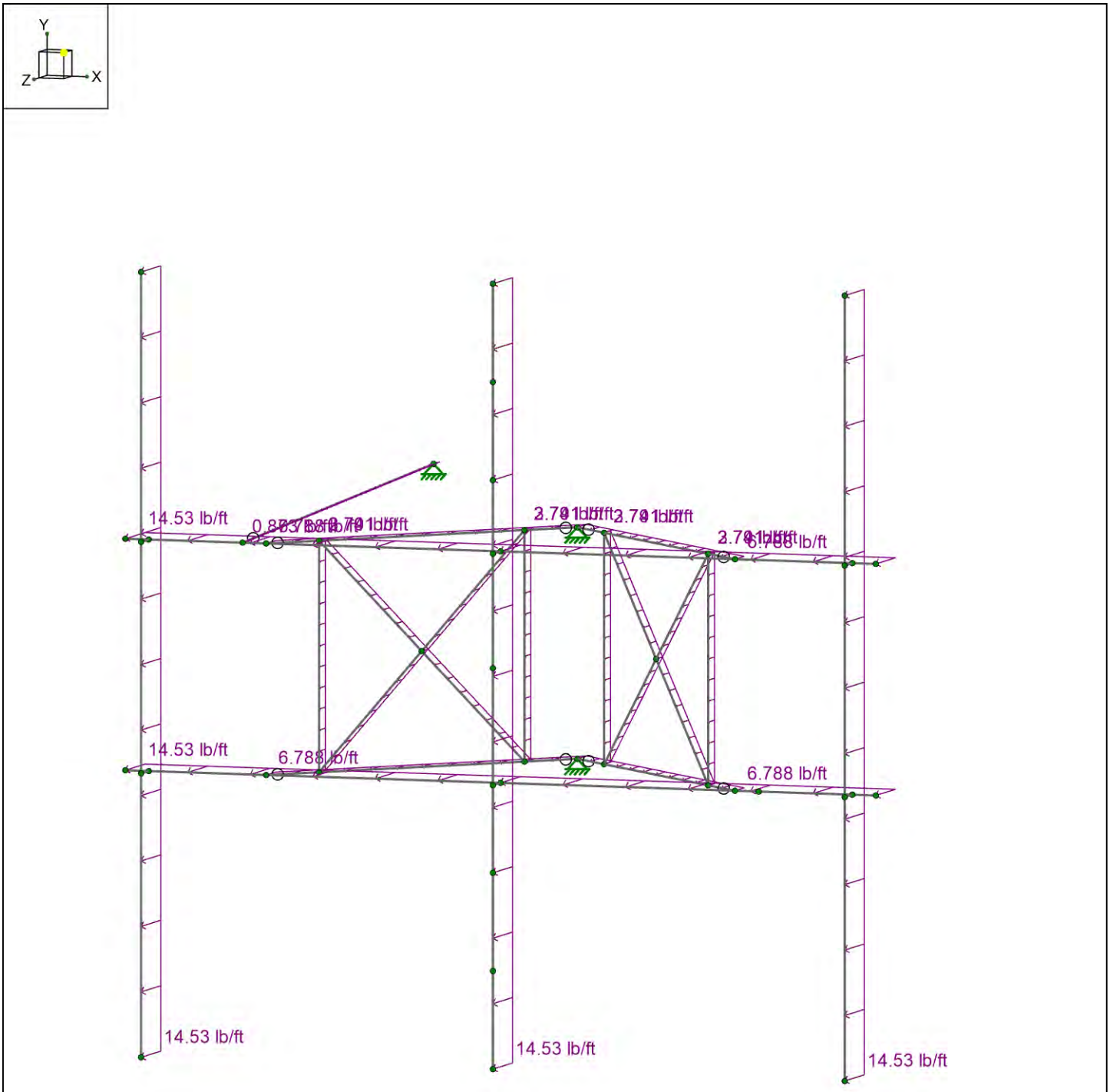


Magaram Engineering	NJJER02042B	SK-1
BJM		Jul 03, 2022
		MTC3975083.r3d



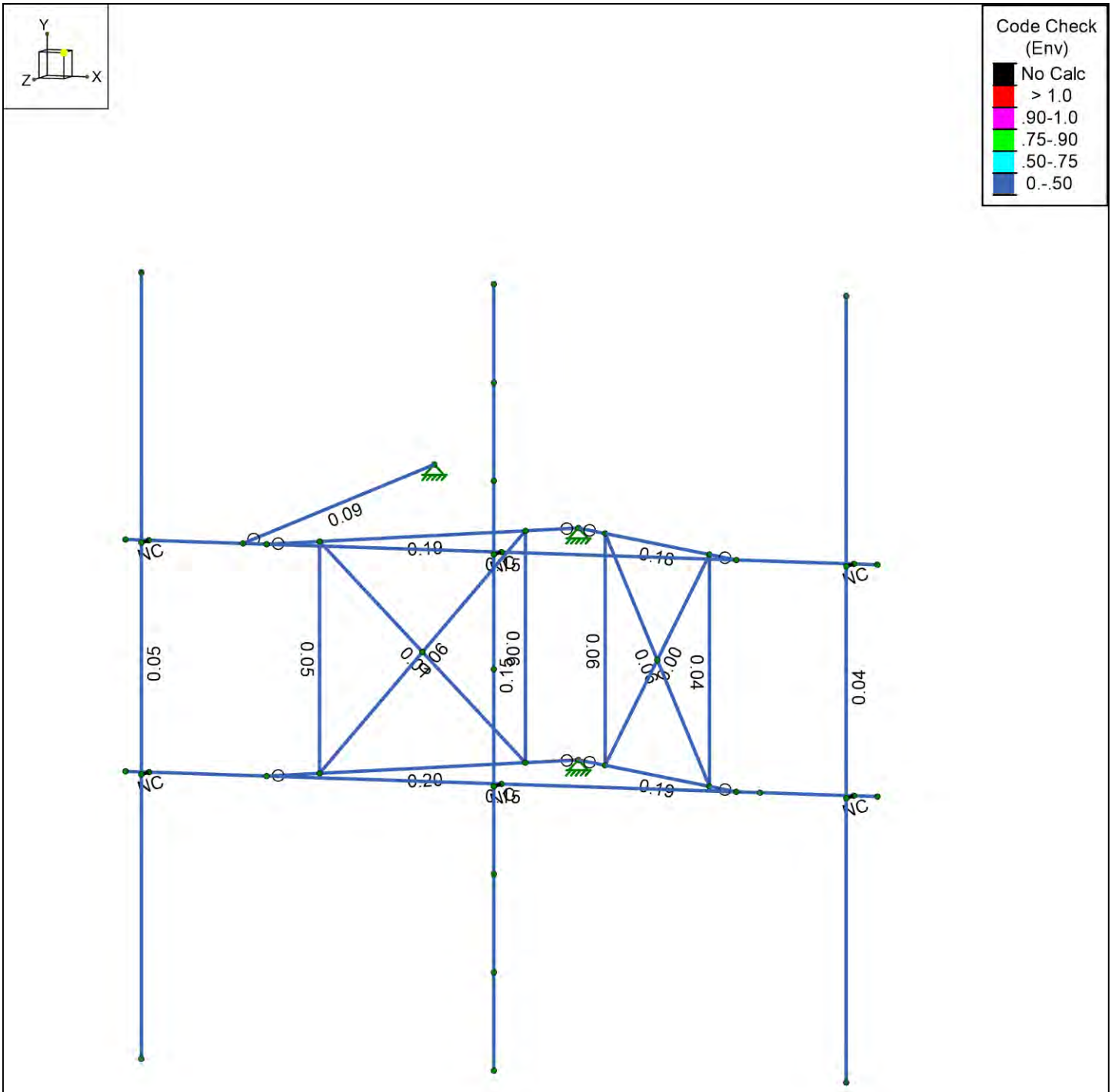
Loads: BLC 4, Telco Wz

Magaram Engineering	NJJER02042B	SK-2
BJM		Jul 03, 2022
		MTC3975083.r3d



Loads: BLC 13, Mount Wz

Magaram Engineering	NJJER02042B	SK-3
BJM		Jul 03, 2022
		MTC3975083.r3d



Member Code Checks Displayed (Enveloped)
Envelope Only Solution

Magaram Engineering	NJJER02042B	SK-4
BJM		Jul 03, 2022
		MTC3975083.r3d

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm. Coeff. [1e⁵°F⁻¹]	Density [k/ft³]	Yield [ksi]	Ry	Fu [ksi]	Rt
1	A36 Gr.36	29000	11154	0.3	0.65	0.49	36	1.5	58	1.2
2	A529 Gr.50	29000	11154	0.3	0.65	0.49	50	1.1	65	1.1
3	A992	29000	11154	0.3	0.65	0.49	50	1.1	65	1.1
4	A500 Gr.42	29000	11154	0.3	0.65	0.49	42	1.4	58	1.3
5	A500 Gr.46	29000	11154	0.3	0.65	0.49	46	1.4	58	1.3
6	A53 Gr B	29000	11154	0.3	0.65	0.49	35	1.5	58	1.2

General Materials Properties

	Label	E [ksi]	G [ksi]	Nu	Therm. Coeff. [1e⁵°F⁻¹]	Density [k/ft³]	Plate Methodology
1	gen_Conc3NW	3155	1372	0.15	0.6	0.145	Isotropic
2	gen_Conc4NW	3644	1584	0.15	0.6	0.145	Isotropic
3	gen_Conc3LW	2085	906	0.15	0.6	0.11	Isotropic
4	gen_Conc4LW	2408	1047	0.15	0.6	0.11	Isotropic
5	gen_Alum	10100	4077	0.3	1.29	0.173	Isotropic
6	gen_Steel	29000	11154	0.3	0.65	0.49	Isotropic
7	gen_Plywood	1800	38	0	0.3	0.035	Isotropic
8	RIGID	1e+6		0.3	0	0	Isotropic

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design Rule	Area [in²]	Iyy [in⁴]	Izz [in⁴]	J [in⁴]
1	Face Horizontal	PIPE_2.5	None	None	A500 Gr.46	Typical	1.61	1.45	1.45	2.89
2	Standoff Arms	PIPE_1.5	VBrace	None	A500 Gr.46	Typical	0.749	0.293	0.293	0.586
3	Diagonal	BAR0.625	HBrace	None	A529 Gr.50	Typical	0.307	0.007	0.007	0.015
4	Mount Pipe	PIPE_2.5	HBrace	Pipe	A500 Gr.46	Typical	1.61	1.45	1.45	2.89
5	Tie Back	PIPE_2.0	VBrace	None	A500 Gr.46	Typical	1.02	0.627	0.627	1.25
6	Standoff Vertical	BAR0.625	HBrace	None	A529 Gr.50	Typical	0.307	0.007	0.007	0.015

General Section Sets

	Label	Shape	Type	Material	Area [in²]	Iyy [in⁴]	Izz [in⁴]	J [in⁴]
1	GEN1A	RE4X4	Beam	gen_Conc3NW	16	21.333	21.333	31.573
2	RIGID		None	RIGID	1e+06	1e+06	1e+06	1e+06

Member Primary Data

	Label	I Node	J Node	Section/Shape	Type	Design List	Material	Design Rule
1	M1	N2	N1	Standoff Arms	VBrace	None	A500 Gr.46	Typical
2	M2	N7	N6	Standoff Arms	VBrace	None	A500 Gr.46	Typical
3	M3	N3	N8	Standoff Vertical	HBrace	None	A529 Gr.50	Typical
4	M4	N4	N9	Standoff Vertical	HBrace	None	A529 Gr.50	Typical
5	M5	N4	N8	Diagonal	HBrace	None	A529 Gr.50	Typical
6	M6	N3	N9	Diagonal	HBrace	None	A529 Gr.50	Typical
7	M7	N10	N1	Standoff Arms	VBrace	None	A500 Gr.46	Typical
8	M8	N14	N6	Standoff Arms	VBrace	None	A500 Gr.46	Typical
9	M9	N11	N15	Standoff Vertical	HBrace	None	A529 Gr.50	Typical
10	M10	N12	N16	Standoff Vertical	HBrace	None	A529 Gr.50	Typical
11	M11	N12	N15	Diagonal	HBrace	None	A529 Gr.50	Typical
12	M12	N11	N16	Diagonal	HBrace	None	A529 Gr.50	Typical
13	M13	N16A	N15A	Face Horizontal	None	None	A500 Gr.46	Typical
14	M14	N18	N17	Face Horizontal	None	None	A500 Gr.46	Typical
15	MP1	N22	N21	Mount Pipe	HBrace	Pipe	A500 Gr.46	Typical

Member Primary Data (Continued)

	Label	I Node	J Node	Section/Shape	Type	Design List	Material	Design Rule
16	MP3	N20	N19	Mount Pipe	HBrace	Pipe	A500 Gr.46	Typical
17	MP2	N34	N33	Mount Pipe	HBrace	Pipe	A500 Gr.46	Typical
18	M27A	N37	N38	Tie Back	VBrace	None	A500 Gr.46	Typical
19	M29	N25	N67	RIGID	None	None	RIGID	Typical
20	M30	N27	N69	RIGID	None	None	RIGID	Typical
21	M33	N35	N73	RIGID	None	None	RIGID	Typical
22	M34	N36	N74	RIGID	None	None	RIGID	Typical
23	M35	N26	N68	RIGID	None	None	RIGID	Typical
24	M36	N28	N70	RIGID	None	None	RIGID	Typical

Member Advanced Data

	Label	I Release	J Release	T/C Only	Physical	Deflection Ratio Options	Seismic DR
1	M1	BenPIN	BenPIN		Yes	** NA **	None
2	M2	BenPIN	BenPIN		Yes	** NA **	None
3	M3				Yes	** NA **	None
4	M4				Yes	** NA **	None
5	M5			Euler Buckling	Yes	** NA **	None
6	M6			Euler Buckling	Yes	** NA **	None
7	M7	BenPIN	BenPIN		Yes	** NA **	None
8	M8	BenPIN	BenPIN		Yes	** NA **	None
9	M9				Yes	** NA **	None
10	M10				Yes	** NA **	None
11	M11			Euler Buckling	Yes	** NA **	None
12	M12			Euler Buckling	Yes	** NA **	None
13	M13				Yes	** NA **	None
14	M14				Yes	** NA **	None
15	MP1				Yes	** NA **	None
16	MP3				Yes	** NA **	None
17	MP2				Yes	** NA **	None
18	M27A	BenPIN			Yes	** NA **	None
19	M29				Yes	** NA **	None
20	M30				Yes	** NA **	None
21	M33				Yes	** NA **	None
22	M34				Yes	** NA **	None
23	M35				Yes	** NA **	None
24	M36				Yes	** NA **	None

Hot Rolled Steel Design Parameters

	Label	Shape	Length [in]	Lb y-y [in]	Lb z-z [in]	Lcomp top [in]	Lcomp bot [in]	L-Torque [in]	K y-y	K z-z	Function
1	M1	Standoff Arms	42.4			Lbyy					Lateral
2	M2	Standoff Arms	42.4			Lbyy					Lateral
3	M3	Standoff Vertical	28.3			Lbyy			0.65	0.65	Lateral
4	M4	Standoff Vertical	28.3			Lbyy			0.65	0.65	Lateral
5	M5	Diagonal	39.811			Lbyy			0.7	0.7	Lateral
6	M6	Diagonal	39.811			Lbyy			0.5	0.5	Lateral
7	M7	Standoff Arms	42.4			Lbyy					Lateral
8	M8	Standoff Arms	42.4			Lbyy					Lateral
9	M9	Standoff Vertical	28.3			Lbyy			0.65	0.65	Lateral
10	M10	Standoff Vertical	28.3			Lbyy			0.65	0.65	Lateral
11	M11	Diagonal	39.811			Lbyy			0.7	0.7	Lateral
12	M12	Diagonal	39.811			Lbyy			0.5	0.5	Lateral
13	M13	Face Horizontal	96	Segment	Segment	Segment	Segment	Segment			Lateral
14	M14	Face Horizontal	96			Lbyy					Lateral

Hot Rolled Steel Design Parameters (Continued)

	Label	Shape	Length [in]	Lb y-y [in]	Lb z-z [in]	Lcomp top [in]	Lcomp bot [in]	L-Torque [in]	K y-y	K z-z	Function
15	MP1	Mount Pipe	96			Lbyy					Lateral
16	MP3	Mount Pipe	96			Lbyy					Lateral
17	MP2	Mount Pipe	96			Lbyy					Lateral
18	M27A	Tie Back	96.255								Lateral

Member RISAConnection Properties

	Label	Shape	Start Conn	End Conn	Start Release	End Release
1	M1	PIPE_1.5	None	None	Pinned	Pinned
2	M2	PIPE_1.5	None	None	Pinned	Pinned
3	M3	BAR0.625	None	None	Fixed	Fixed
4	M4	BAR0.625	None	None	Fixed	Fixed
5	M5	BAR0.625	None	None	Fixed	Fixed
6	M6	BAR0.625	None	None	Fixed	Fixed
7	M7	PIPE_1.5	None	None	Pinned	Pinned
8	M8	PIPE_1.5	None	None	Pinned	Pinned
9	M9	BAR0.625	None	None	Fixed	Fixed
10	M10	BAR0.625	None	None	Fixed	Fixed
11	M11	BAR0.625	None	None	Fixed	Fixed
12	M12	BAR0.625	None	None	Fixed	Fixed
13	M13	PIPE_2.5	None	None	Fixed	Fixed
14	M14	PIPE_2.5	None	None	Fixed	Fixed
15	MP1	PIPE_2.5	None	None	Fixed	Fixed
16	MP3	PIPE_2.5	None	None	Fixed	Fixed
17	MP2	PIPE_2.5	None	None	Fixed	Fixed
18	M27A	PIPE_2.0	None	None	Pinned	Fixed

Design Size and Code Check Parameters

	Label	Max Axial/Bending Chk	Max Shear Chk
1	Typical	1	1

Concrete Rebar Parameters

	Label	Optimize Rebar ?	Min Flex Bar	Max Flex Bar	Shear Bar	Legs per Stirrup	Top (Column) Cover [in]	Bottom Cover [in]	Side Cover [in]	Top/Bottom Bars	Add'l Side Bars	Shear Bar Spacing [in]
1	Typical	Optimize	#6	#10	#4	2	1.5	1.5	1.5	2	1	12

Deflection Design

	Label	LC	Ratio	LC	Ratio	LC	Ratio
1	Typical	None	N/A	None	N/A	None	N/A

Wall Panel U.C. Parameters

	Label	Max Bending Chk	Max Shear Chk
1	Typical	1	1

Frame / HR Column Seismic Design Rule

	Label	Frame Ductility	Overstrength Reqd
1	OCBF	Minimal	Yes
2	SCBF	High	Yes
3	OMF	Minimal	Yes

Frame / HR Column Seismic Design Rule (Continued)

	Label	Frame Ductility	Overstrength Reqd
4	IMF	Moderate	Yes
5	SMF-RBS	High	Yes
6	SMF-Kaiser	High	Yes

HR Beam Seismic Design Rule

	Label	Connection	Overstrength Reqd	Z Factor	Hinge Location [in]
1	OCBF	Other/None			
2	SCBF	Other/None	Yes		
3	OMF	BUEEP			12
4	IMF	BFP			12
5	SMF-RBS	RBS		0.685	14.625
6	SMF-Kaiser	KBB-B			12

HR Brace Seismic Design Rule

	Label	Overstrength Reqd	KL/r
1	OCBF		
2	SCBF		Yes
3	OMF		
4	IMF		
5	SMF-RBS		
6	SMF-Kaiser		

Connection Design Rules

	Label	Conn Type	Type	Beam Conn	Col/Girder Conn	Eccentricity
1	Col/Bm Single Angle Shear	Shear	Column/Beam Clip Single Angle Shear	Bolted	Bolted	1.5
2	Col/Bm Double Angle Shear	Shear	Column/Beam Clip Double Angle Shear	Bolted	Bolted	0
3	Col/Bm Two Side Clip Angle Shear	Shear	Column/Beam Clip Double Angle (Both Side) Shear	Bolted	Bolted	N/A
4	Col/Bm End Plate Shear	Shear	Column/Beam End-Plate Shear	N/A	Bolted	N/A
5	Col/Bm Shear Tab Shear	Shear	Column/Beam Shear Tab Shear	Bolted	N/A	0
6	Girder/Bm Single Angle Shear	Shear	Girder/Beam Clip Single Angle Shear	Bolted	Bolted	N/A
7	Girder/Bm Double Angle Shear	Shear	Girder/Beam Clip Double Angle Shear	Bolted	Bolted	N/A
8	Grd/Bm Two Side Clip Angle Shear	Shear	Girder/Beam Clip Double Angle (Both Side) Shear	Bolted	Bolted	N/A
9	Girder/Bm End Plate Shear	Shear	Girder/Beam End-Plate Shear	N/A	Bolted	N/A
10	Girder/Bm Shear Tab Shear	Shear	Girder/Beam Shear Tab Shear	Bolted	N/A	N/A
11	Beam Shear Splice	Shear	Beam Shear Tab Splice	Bolted	N/A	N/A
12	Column Shear Splice	Shear	Column Shear Tab Splice	N/A	Bolted	N/A
13	Col/Bm Ext. End Plate Moment	Moment	Column/Beam Extended End-Plate Moment	N/A	N/A	N/A
14	Col/Bm PartExt. End Plate Moment	Moment	Column/Beam Partially Extended End-Plate Moment (Tension side)	N/A	N/A	N/A
15	Col/Bm Flush End Plate Moment	Moment	Column/Beam Flush End-Plate Moment	N/A	N/A	N/A
16	Col/Bm Flange Plate Moment	Moment	Column/Beam Flange Plate Moment	Bolted	N/A	N/A
17	Col/Bm Direct Weld Moment	Moment	Column/Beam Direct Weld Moment	Bolted	N/A	N/A
18	Col/Bm Seismic Moment	Moment	Column/Beam Seismic Moment	N/A	N/A	N/A
19	Beam Moment Plate Splice	Moment	Beam Moment Plate Splice	Bolted	N/A	N/A
20	Column Moment Plate Splice	Moment	Column Moment Plate Splice	N/A	N/A	N/A
21	Beam Direct Weld Moment Splice	Moment	Beam Direct Weld Splice	Bolted	N/A	N/A
22	Col Direct Weld Moment Splice	Moment	Column Direct Weld Splice	N/A	Bolted	N/A
23	Bm Ext. End Plate Moment Splice	Moment	Beam Extended End Plate Splice	Bolted	N/A	N/A
24	Col Ext. End Plate Moment Splice	Moment	Column Extended End Plate Splice	N/A	Bolted	N/A
25	Diagonal Vertical Brace	Brace	Diagonal Vertical Brace	N/A	N/A	N/A
26	Chevron Vertical Brace	Brace	Chevron Vertical Brace	N/A	N/A	N/A
27	Seismic Diagonal Brace	Brace	Diagonal Brace Seismic	N/A	N/A	N/A
28	Seismic Chevron Brace	Brace	Chevron Brace Seismic	N/A	N/A	N/A

Connection Design Rules (Continued)

	Label	Conn Type	Type	Beam Conn	Col/Girder Conn	Eccentricity
29	Knee Brace	Brace	Knee Brace	N/A	N/A	N/A
30	Single Column Base Plate	Baseplate	Single Column Baseplate	N/A	N/A	N/A
31	Base Plate with Vertical Brace	Baseplate	Brace to Column Base Plate	N/A	N/A	N/A
32	HSS Truss Connection	Truss	HSS T-Connection	N/A	N/A	N/A

Node Loads and Enforced Displacements (BLC 1 : Telco DL)

	Node Label	L, D, M	Direction	Magnitude [(lb, k-ft), (in, rad), (lb*s²/in, lb*s²*in)]
1	N42	L	Y	-62.3
2	N43	L	Y	-62.3
3	N44	L	Y	-75
4	N45	L	Y	-63.9
5	N47	L	Y	-21.8

Node Loads and Enforced Displacements (BLC 2 : Telco DLi)

	Node Label	L, D, M	Direction	Magnitude [(lb, k-ft), (in, rad), (lb*s²/in, lb*s²*in)]
1	N42	L	Y	-119.57
2	N43	L	Y	-119.57
3	N44	L	Y	-42.95
4	N45	L	Y	-41.7
5	N47	L	Y	-50.49

Node Loads and Enforced Displacements (BLC 3 : Telco Wx)

	Node Label	L, D, M	Direction	Magnitude [(lb, k-ft), (in, rad), (lb*s²/in, lb*s²*in)]
1	N42	L	X	313.775
2	N43	L	X	313.775
3	N44	L	X	98.55
4	N45	L	X	98.55
5	N47	L	X	115.26

Node Loads and Enforced Displacements (BLC 4 : Telco Wz)

	Node Label	L, D, M	Direction	Magnitude [(lb, k-ft), (in, rad), (lb*s²/in, lb*s²*in)]
1	N42	L	Z	313.775
2	N43	L	Z	313.775
3	N44	L	Z	98.55
4	N45	L	Z	98.55
5	N47	L	Z	115.26

Node Loads and Enforced Displacements (BLC 5 : Telco Wxi)

	Node Label	L, D, M	Direction	Magnitude [(lb, k-ft), (in, rad), (lb*s²/in, lb*s²*in)]
1	N42	L	X	28.575
2	N43	L	X	28.575
3	N44	L	X	9.29
4	N45	L	X	9.29
5	N47	L	X	10.95

Node Loads and Enforced Displacements (BLC 6 : Telco Wzi)

	Node Label	L, D, M	Direction	Magnitude [(lb, k-ft), (in, rad), (lb*s²/in, lb*s²*in)]
1	N42	L	Z	28.575
2	N43	L	Z	28.575
3	N44	L	Z	9.29
4	N45	L	Z	9.29
5	N47	L	Z	10.95

Node Loads and Enforced Displacements (BLC 7 : Telco Wxm)

	Node Label	L, D, M	Direction	Magnitude [(lb, k-ft), (in, rad), (lb*s²/in, lb*s²*in)]
1	N44	L	X	5.25
2	N45	L	X	5.25
3	N47	L	X	6.14
4	N42	L	X	16.71
5	N43	L	X	16.71

Node Loads and Enforced Displacements (BLC 8 : Telco Wzm)

	Node Label	L, D, M	Direction	Magnitude [(lb, k-ft), (in, rad), (lb*s²/in, lb*s²*in)]
1	N44	L	Z	5.25
2	N45	L	Z	5.25
3	N47	L	Z	6.14
4	N42	L	Z	16.71
5	N43	L	Z	16.71

Node Loads and Enforced Displacements (BLC 19 : Lm)

	Node Label	L, D, M	Direction	Magnitude [(lb, k-ft), (in, rad), (lb*s²/in, lb*s²*in)]
1	N42	L	Y	-250
2	N43	L	Y	-250

Node Loads and Enforced Displacements (BLC 20 : Lv)

	Node Label	L, D, M	Direction	Magnitude [(lb, k-ft), (in, rad), (lb*s²/in, lb*s²*in)]
1	N17	L	Y	-250

Member Point Loads

No Data to Print...

Basic Load Cases

	BLC Description	Category	Y Gravity	Nodal	Distributed
1	Telco DL	DL		5	
2	Telco DLi	OL1		5	
3	Telco Wx	WLX		5	
4	Telco Wz	WLZ		5	
5	Telco Wxi	WLXP1		5	
6	Telco Wzi	WLZP1		5	
7	Telco Wxm	WLXP2		5	
8	Telco Wzm	WLZP2		5	
9	-	None			
10	Mount DL	DL	-1.1		
11	Mount DLi	OL1			18

Basic Load Cases (Continued)

	BLC Description	Category	Y Gravity	Nodal	Distributed
12	Mount Wx	WLX			18
13	Mount Wz	WLZ			18
14	Mount Wxi	WLXP1			18
15	Mount Wzi	WLZP1			18
16	Mount Wxm	WLXP2			18
17	Mount Wzm	WLZP2			18
18	-	None			
19	Lm	None		2	
20	Lv	None		1	

Load Combinations

	Description	Solve	P-Delta	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
1	1.4D	Yes	Y	DL	1.4						
2	Wind LCs (Case 1)										
3	1.2D +1.0W (0)	Yes	Y	DL	1.2			WLX	1	WLZ	
4	1.2D + 1.0W (30)	Yes	Y	DL	1.2			WLX	0.866	WLZ	0.5
5	1.2D + 1.0W (45)	Yes	Y	DL	1.2			WLX	0.707	WLZ	0.707
6	1.2D + 1.0W (60)	Yes	Y	DL	1.2			WLX	0.5	WLZ	0.866
7	1.2D + 1.0W (90)	Yes	Y	DL	1.2			WLX		WLZ	1
8	1.2D + 1.0W (120)	Yes	Y	DL	1.2			WLX	-0.5	WLZ	0.866
9	1.2D + 1.0W (135)	Yes	Y	DL	1.2			WLX	-0.707	WLZ	0.707
10	1.2D + 1.0W (150)	Yes	Y	DL	1.2			WLX	-0.866	WLZ	0.5
11	1.2D + 1.0W (180)	Yes	Y	DL	1.2			WLX	-1	WLZ	
12	1.2D + 1.0W (210)	Yes	Y	DL	1.2			WLX	-0.866	WLZ	-0.5
13	1.2D + 1.0W (225)	Yes	Y	DL	1.2			WLX	-0.707	WLZ	-0.707
14	1.2D + 1.0W (240)	Yes	Y	DL	1.2			WLX	-0.5	WLZ	-0.866
15	1.2D + 1.0W (270)	Yes	Y	DL	1.2			WLX		WLZ	-1
16	1.2D + 1.0W (300)	Yes	Y	DL	1.2			WLX	0.5	WLZ	-0.866
17	1.2D + 1.0W (315)	Yes	Y	DL	1.2			WLX	0.707	WLZ	-0.707
18	1.2D + 1.0W (330)	Yes	Y	DL	1.2			WLX	0.866	WLZ	-0.5
19	Uplift LCs (Case 2)										
20	1.2D +1.0W (0)	Yes	Y	DL	0.9			WLX	1	WLZ	
21	1.2D + 1.0W (30)	Yes	Y	DL	0.9			WLX	0.866	WLZ	0.5
22	1.2D + 1.0W (45)	Yes	Y	DL	0.9			WLX	0.707	WLZ	0.707
23	1.2D + 1.0W (60)	Yes	Y	DL	0.9			WLX	0.5	WLZ	0.866
24	1.2D + 1.0W (90)	Yes	Y	DL	0.9			WLX		WLZ	1
25	1.2D + 1.0W (120)	Yes	Y	DL	0.9			WLX	-0.5	WLZ	0.866
26	1.2D + 1.0W (135)	Yes	Y	DL	0.9			WLX	-0.707	WLZ	0.707
27	1.2D + 1.0W (150)	Yes	Y	DL	0.9			WLX	-0.866	WLZ	0.5
28	1.2D + 1.0W (180)	Yes	Y	DL	0.9			WLX	-1	WLZ	
29	1.2D + 1.0W (210)	Yes	Y	DL	0.9			WLX	-0.866	WLZ	-0.5
30	1.2D + 1.0W (225)	Yes	Y	DL	0.9			WLX	-0.707	WLZ	-0.707
31	1.2D + 1.0W (240)	Yes	Y	DL	0.9			WLX	-0.5	WLZ	-0.866
32	1.2D + 1.0W (270)	Yes	Y	DL	0.9			WLX		WLZ	-1
33	1.2D + 1.0W (300)	Yes	Y	DL	0.9			WLX	0.5	WLZ	-0.866
34	1.2D + 1.0W (315)	Yes	Y	DL	0.9			WLX	0.707	WLZ	-0.707
35	1.2D + 1.0W (330)	Yes	Y	DL	0.9			WLX	0.866	WLZ	-0.5
36	Ice LCs (Case 3)										
37	1.2D + 1.0Di +1.0Wi (0)	Yes	Y	DL	1.2	OL1	1	WLXP1	1	WLZP1	
38	1.2D + 1.0W (30)	Yes	Y	DL	1.2	OL1	1	WLXP1	0.866	WLZP1	0.5
39	1.2D + 1.0W (45)	Yes	Y	DL	1.2	OL1	1	WLXP1	0.707	WLZP1	0.707
40	1.2D + 1.0W (60)	Yes	Y	DL	1.2	OL1	1	WLXP1	0.5	WLZP1	0.866
41	1.2D + 1.0W (90)	Yes	Y	DL	1.2	OL1	1	WLXP1		WLZP1	1
42	1.2D + 1.0W (120)	Yes	Y	DL	1.2	OL1	1	WLXP1	-0.5	WLZP1	0.866
43	1.2D + 1.0W (135)	Yes	Y	DL	1.2	OL1	1	WLXP1	-0.707	WLZP1	0.707

Load Combinations (Continued)

	Description	Solve	P-Delta	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
44	1.2D + 1.0W (150)	Yes	Y	DL	1.2	OL1	1	WLXP1	-0.866	WLZP1	0.5
45	1.2D + 1.0W (180)	Yes	Y	DL	1.2	OL1	1	WLXP1	-1	WLZP1	
46	1.2D + 1.0W (210)	Yes	Y	DL	1.2	OL1	1	WLXP1	-0.866	WLZP1	-0.5
47	1.2D + 1.0W (225)	Yes	Y	DL	1.2	OL1	1	WLXP1	-0.707	WLZP1	-0.707
48	1.2D + 1.0W (240)	Yes	Y	DL	1.2	OL1	1	WLXP1	-0.5	WLZP1	-0.866
49	1.2D + 1.0W (270)	Yes	Y	DL	1.2	OL1	1	WLXP1		WLZP1	-1
50	1.2D + 1.0W (300)	Yes	Y	DL	1.2	OL1	1	WLXP1	0.5	WLZP1	-0.866
51	1.2D + 1.0W (315)	Yes	Y	DL	1.2	OL1	1	WLXP1	0.707	WLZP1	-0.707
52	1.2D + 1.0W (330)	Yes	Y	DL	1.2	OL1	1	WLXP1	0.866	WLZP1	-0.5
53	Maintenance LCs (Case 3)										
54	1.2D + 1.0Di +1.0Wi (0)	Yes	Y	DL	1.2	19	1.5	WLXP2	1	WLZP2	
55	1.2D + 1.0W (30)	Yes	Y	DL	1.2	19	1.5	WLXP2	0.866	WLZP2	0.5
56	1.2D + 1.0W (45)	Yes	Y	DL	1.2	19	1.5	WLXP2	0.707	WLZP2	0.707
57	1.2D + 1.0W (60)	Yes	Y	DL	1.2	19	1.5	WLXP2	0.5	WLZP2	0.866
58	1.2D + 1.0W (90)	Yes	Y	DL	1.2	19	1.5	WLXP2		WLZP2	1
59	1.2D + 1.0W (120)	Yes	Y	DL	1.2	19	1.5	WLXP2	-0.5	WLZP2	0.866
60	1.2D + 1.0W (135)	Yes	Y	DL	1.2	19	1.5	WLXP2	-0.707	WLZP2	0.707
61	1.2D + 1.0W (150)	Yes	Y	DL	1.2	19	1.5	WLXP2	-0.866	WLZP2	0.5
62	1.2D + 1.0W (180)	Yes	Y	DL	1.2	19	1.5	WLXP2	-1	WLZP2	
63	1.2D + 1.0W (210)	Yes	Y	DL	1.2	19	1.5	WLXP2	-0.866	WLZP2	-0.5
64	1.2D + 1.0W (225)	Yes	Y	DL	1.2	19	1.5	WLXP2	-0.707	WLZP2	-0.707
65	1.2D + 1.0W (240)	Yes	Y	DL	1.2	19	1.5	WLXP2	-0.5	WLZP2	-0.866
66	1.2D + 1.0W (270)	Yes	Y	DL	1.2	19	1.5	WLXP2		WLZP2	-1
67	1.2D + 1.0W (300)	Yes	Y	DL	1.2	19	1.5	WLXP2	0.5	WLZP2	-0.866
68	1.2D + 1.0W (315)	Yes	Y	DL	1.2	19	1.5	WLXP2	0.707	WLZP2	-0.707
69	1.2D + 1.0W (330)	Yes	Y	DL	1.2	19	1.5	WLXP2	0.866	WLZP2	-0.5
70	1.2D + 1.5Lv	Yes	Y	DL	1.2	20	1.5				

Load Combination Design

	Description	Service	Hot Rolled	Cold Formed	Wood	Concrete	Masonry	Aluminum	Stainless	Connection
1	1.4D		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
2	Wind LCs (Case 1)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
3	1.2D +1.0W (0)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
4	1.2D + 1.0W (30)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
5	1.2D + 1.0W (45)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
6	1.2D + 1.0W (60)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
7	1.2D + 1.0W (90)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
8	1.2D + 1.0W (120)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
9	1.2D + 1.0W (135)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
10	1.2D + 1.0W (150)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
11	1.2D + 1.0W (180)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
12	1.2D + 1.0W (210)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
13	1.2D + 1.0W (225)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
14	1.2D + 1.0W (240)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
15	1.2D + 1.0W (270)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
16	1.2D + 1.0W (300)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
17	1.2D + 1.0W (315)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
18	1.2D + 1.0W (330)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
19	Uplift LCs (Case 2)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
20	1.2D +1.0W (0)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
21	1.2D + 1.0W (30)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
22	1.2D + 1.0W (45)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
23	1.2D + 1.0W (60)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
24	1.2D + 1.0W (90)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
25	1.2D + 1.0W (120)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Load Combination Design (Continued)

	Description	Service	Hot Rolled	Cold Formed	Wood	Concrete	Masonry	Aluminum	Stainless	Connection
26	1.2D + 1.0W (135)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
27	1.2D + 1.0W (150)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
28	1.2D + 1.0W (180)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
29	1.2D + 1.0W (210)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
30	1.2D + 1.0W (225)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
31	1.2D + 1.0W (240)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
32	1.2D + 1.0W (270)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
33	1.2D + 1.0W (300)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
34	1.2D + 1.0W (315)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
35	1.2D + 1.0W (330)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
36	Ice LCs (Case 3)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
37	1.2D + 1.0Di +1.0Wi (0)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
38	1.2D + 1.0W (30)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
39	1.2D + 1.0W (45)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
40	1.2D + 1.0W (60)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
41	1.2D + 1.0W (90)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
42	1.2D + 1.0W (120)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
43	1.2D + 1.0W (135)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
44	1.2D + 1.0W (150)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
45	1.2D + 1.0W (180)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
46	1.2D + 1.0W (210)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
47	1.2D + 1.0W (225)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
48	1.2D + 1.0W (240)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
49	1.2D + 1.0W (270)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
50	1.2D + 1.0W (300)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
51	1.2D + 1.0W (315)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
52	1.2D + 1.0W (330)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
53	Maintenance LCs (Case 3)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
54	1.2D + 1.0Di +1.0Wi (0)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
55	1.2D + 1.0W (30)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
56	1.2D + 1.0W (45)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
57	1.2D + 1.0W (60)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
58	1.2D + 1.0W (90)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
59	1.2D + 1.0W (120)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
60	1.2D + 1.0W (135)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
61	1.2D + 1.0W (150)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
62	1.2D + 1.0W (180)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
63	1.2D + 1.0W (210)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
64	1.2D + 1.0W (225)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
65	1.2D + 1.0W (240)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
66	1.2D + 1.0W (270)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
67	1.2D + 1.0W (300)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
68	1.2D + 1.0W (315)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
69	1.2D + 1.0W (330)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
70	1.2D + 1.5Lv		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

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

No Data to Print...

Envelope Node Reactions

	Node Label		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N1	max	666.825	11	814.128	48	958.5	35	0	70	LOCKED		0	70
2		min	-629.482	20	253.247	24	-2333.162	10	0	1	LOCKED		0	1
3	N6	max	747.226	28	794.429	40	1825.189	49	0	70	LOCKED		0	70

Envelope Node Reactions (Continued)

	Node Label		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
4		min	-784.146	3	250.244	32	-290.834	24	0	1	LOCKED		0	1
5	N38	max	144.096	28	45.633	37	1319.868	28	0	70	0	70	0	70
6		min	-144.525	20	13.666	30	-1320.936	20	0	1	0	1	0	1
7	Totals:	max	1552.784	11	1651.006	45	1696.194	15						
8		min	-1552.784	20	560.407	20	-1696.194	24						

Envelope Node Displacements

	Node Label		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [rad]	LC	Y Rotation [rad]	LC	Z Rotation [rad]	LC
1	N1	max	0	20	0	24	0	10	1.381e-3	58	0	70	1.888e-3	3
2		min	0	11	0	48	0	35	-3.472e-4	33	0	1	-1.835e-3	28
3	N2	max	0.014	21	-0.006	21	0.017	11	1.565e-3	6	3.265e-3	23	1.538e-3	54
4		min	-0.016	12	-0.055	70	-0.014	20	-1.298e-3	31	-3.274e-3	14	-5.951e-4	70
5	N3	max	0.013	20	-0.002	20	0.016	11	2.179e-3	55	4.527e-4	23	1.053e-3	21
6		min	-0.014	11	-0.035	45	-0.013	20	-3.452e-5	29	-4.929e-4	14	-1.767e-3	70
7	N4	max	0.004	20	-0.002	20	0.005	11	2.356e-3	37	7.123e-4	20	9.087e-4	20
8		min	-0.004	11	-0.027	45	-0.004	20	2.327e-4	30	-8.464e-4	11	-1.906e-3	70
9	N6	max	0	3	0	32	0	24	1.384e-3	66	0	70	8.963e-4	3
10		min	0	28	0	40	0	49	-4.166e-4	24	0	1	-9.58e-4	70
11	N7	max	0.05	20	0.001	20	0.049	28	1.669e-3	16	3.594e-3	23	1.511e-3	55
12		min	-0.051	11	-0.055	70	-0.05	3	-1.394e-3	25	-3.648e-3	14	-6.33e-4	70
13	N8	max	0.043	20	-0.002	20	0.042	28	2.164e-3	65	1.397e-3	21	1.195e-3	35
14		min	-0.044	11	-0.035	45	-0.043	3	3.169e-4	23	-1.433e-3	12	-1.883e-3	70
15	N9	max	0.01	3	-0.002	20	0.01	28	2.314e-3	45	1.978e-3	3	4.193e-4	35
16		min	-0.01	11	-0.027	45	-0.01	3	3.377e-4	24	-1.937e-3	28	-2.044e-3	70
17	N10	max	0.014	21	-0.009	27	0.011	5	1.809e-3	9	2.81e-3	31	5.497e-4	20
18		min	-0.015	12	-0.056	52	-0.011	30	-1.58e-3	34	-2.899e-3	6	-1.499e-3	62
19	N11	max	0.013	21	-0.006	28	0.012	5	2.208e-3	62	6.689e-5	34	1.748e-3	18
20		min	-0.015	12	-0.036	37	-0.011	30	-2.654e-4	20	-1.686e-4	40	-1.141e-3	27
21	N12	max	0.004	21	-0.003	28	0.004	5	2.408e-3	45	8.085e-4	5	2.032e-3	3
22		min	-0.005	12	-0.028	37	-0.004	30	4.772e-5	35	-7.743e-4	30	-9.82e-4	28
23	N14	max	0.05	20	-0.003	28	0.048	20	1.912e-3	13	2.721e-3	32	-2.951e-6	35
24		min	-0.051	11	-0.056	37	-0.051	11	-1.663e-3	22	-2.744e-3	7	-1.465e-3	61
25	N15	max	0.043	20	-0.005	28	0.042	20	2.155e-3	65	1.362e-3	20	1.83e-3	4
26		min	-0.044	11	-0.036	37	-0.044	11	3.515e-4	23	-1.391e-3	11	-1.282e-3	29
27	N16	max	0.01	20	-0.003	28	0.01	21	2.314e-3	52	1.932e-3	20	1.529e-3	4
28		min	-0.011	11	-0.028	37	-0.011	12	3.229e-4	23	-2.025e-3	11	-5.017e-4	29
29	N15A	max	0.014	21	0.017	20	0.072	14	1.477e-3	4	3.244e-3	23	1.312e-3	3
30		min	-0.016	12	-0.07	70	-0.068	23	-1.251e-3	29	-3.343e-3	14	-1.11e-3	28
31	N16A	max	0.014	21	0.014	28	0.038	15	1.976e-3	10	2.489e-3	15	1.208e-3	20
32		min	-0.015	12	-0.051	3	-0.038	24	-1.811e-3	35	-2.488e-3	24	-1.365e-3	11
33	N17	max	0.05	20	0.017	20	0.097	29	1.57e-3	18	3.296e-3	6	1.133e-3	3
34		min	-0.051	11	-0.072	70	-0.097	4	-1.34e-3	27	-3.263e-3	31	-1.019e-3	70
35	N18	max	0.05	20	0.013	28	0.063	35	2.081e-3	12	2.426e-3	32	1.04e-3	20
36		min	-0.051	11	-0.051	3	-0.067	10	-1.891e-3	21	-2.548e-3	7	-1.165e-3	11
37	N19	max	0.024	70	0.01	20	0.026	15	1.588e-3	5	3.244e-3	23	1.097e-3	3
38		min	-0.026	17	-0.067	70	-0.014	24	-1.363e-3	30	-3.344e-3	14	-8.946e-4	28
39	N20	max	0.101	3	0.01	20	0.114	28	1.7e-3	17	3.296e-3	6	1.384e-3	3
40		min	-0.095	28	-0.067	70	-0.123	3	-1.47e-3	26	-3.263e-3	31	-1.179e-3	28
41	N21	max	0.027	11	0.004	28	0.066	11	2.084e-3	10	2.489e-3	15	9.925e-4	20
42		min	-0.023	20	-0.05	37	-0.06	20	-1.919e-3	35	-2.488e-3	24	-1.15e-3	11
43	N22	max	0.093	20	0.004	28	0.113	20	2.206e-3	12	2.426e-3	32	1.29e-3	20
44		min	-0.098	11	-0.05	37	-0.123	11	-2.016e-3	21	-2.548e-3	7	-1.416e-3	11
45	N23	max	0.025	3	-0.002	20	0.026	11	5.837e-4	20	1.033e-3	20	7.197e-4	3
46		min	-0.026	11	-0.03	45	-0.025	3	-1.02e-3	11	-1.072e-3	11	-2.916e-4	28
47	N24	max	0.025	4	-0.003	28	0.025	4	6.871e-4	28	9.614e-4	20	2.909e-4	20

Envelope Node Displacements (Continued)

	Node Label		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [rad]	LC	Y Rotation [rad]	LC	Z Rotation [rad]	LC
48		min	-0.025	12	-0.032	37	-0.025	12	-1.163e-3	3	-1.005e-3	11	-7.257e-4	11
49	N25	max	0.014	21	0.01	28	0.031	15	1.976e-3	10	2.489e-3	15	1.208e-3	20
50		min	-0.015	12	-0.051	37	-0.031	24	-1.811e-3	35	-2.488e-3	24	-1.366e-3	11
51	N26	max	0.014	21	0.013	20	0.062	13	1.477e-3	4	3.244e-3	23	1.312e-3	3
52		min	-0.016	12	-0.068	70	-0.058	22	-1.251e-3	29	-3.344e-3	14	-1.11e-3	28
53	N27	max	0.05	20	0.01	28	0.059	35	2.081e-3	12	2.426e-3	32	1.04e-3	20
54		min	-0.051	11	-0.05	37	-0.063	10	-1.891e-3	21	-2.548e-3	7	-1.165e-3	11
55	N28	max	0.05	20	0.014	20	0.088	29	1.57e-3	18	3.296e-3	6	1.133e-3	3
56		min	-0.051	11	-0.069	70	-0.089	4	-1.34e-3	27	-3.263e-3	31	-9.684e-4	70
57	N33	max	0.082	20	-0.028	20	0.211	7	4.836e-3	7	8.958e-4	20	2.509e-3	11
58		min	-0.085	11	-0.096	62	-0.193	32	-4.439e-3	32	-9.475e-4	11	-2.469e-3	20
59	N34	max	0.198	3	-0.028	20	0.221	24	5.482e-3	15	1.824e-3	20	4.684e-3	3
60		min	-0.198	11	-0.096	62	-0.239	15	-5.075e-3	24	-1.854e-3	11	-4.658e-3	28
61	N35	max	0.014	21	-0.022	23	0.067	7	2.442e-3	7	8.958e-4	20	1.167e-4	11
62		min	-0.016	12	-0.094	65	-0.062	32	-2.046e-3	32	-9.475e-4	11	-5.571e-4	70
63	N36	max	0.05	20	-0.023	33	0.065	24	2.664e-3	15	1.824e-3	20	1.866e-3	3
64		min	-0.051	11	-0.094	59	-0.068	15	-2.257e-3	24	-1.854e-3	11	-1.839e-3	28
65	N37	max	0.014	21	-0.006	28	0.005	3	1.814e-3	9	2.747e-3	31	7.234e-4	20
66		min	-0.015	12	-0.054	37	-0.004	28	-1.599e-3	34	-2.806e-3	6	-1.355e-3	11
67	N38	max	0	20	0	30	0	20	2.928e-3	37	2.67e-3	20	5.554e-4	20
68		min	0	28	0	37	0	28	7.098e-4	28	-2.686e-3	11	-1.339e-3	62
69	N65	max	0.05	20	0.003	20	0.055	28	1.612e-3	17	3.483e-3	23	1.273e-3	55
70		min	-0.051	11	-0.057	70	-0.055	3	-1.346e-3	26	-3.51e-3	14	-8.154e-4	70
71	N67	max	0.011	20	0.004	28	0.031	15	1.976e-3	10	2.489e-3	15	1.208e-3	20
72		min	-0.013	11	-0.05	37	-0.031	24	-1.811e-3	35	-2.488e-3	24	-1.366e-3	11
73	N68	max	0.023	21	0.01	20	0.062	13	1.477e-3	4	3.244e-3	23	1.312e-3	3
74		min	-0.025	12	-0.067	70	-0.058	22	-1.251e-3	29	-3.344e-3	14	-1.11e-3	28
75	N69	max	0.05	20	0.004	28	0.059	35	2.081e-3	12	2.426e-3	32	1.04e-3	20
76		min	-0.051	11	-0.05	37	-0.063	10	-1.891e-3	21	-2.548e-3	7	-1.165e-3	11
77	N70	max	0.055	20	0.01	20	0.088	29	1.57e-3	18	3.296e-3	6	1.133e-3	3
78		min	-0.056	11	-0.067	70	-0.089	4	-1.34e-3	27	-3.263e-3	31	-9.684e-4	70
79	N73	max	0.017	21	-0.028	20	0.067	7	2.442e-3	7	8.958e-4	20	1.167e-4	11
80		min	-0.018	12	-0.096	62	-0.062	32	-2.046e-3	32	-9.475e-4	11	-5.571e-4	70
81	N74	max	0.056	20	-0.028	20	0.065	24	2.664e-3	15	1.824e-3	20	1.866e-3	3
82		min	-0.057	11	-0.096	62	-0.068	15	-2.257e-3	24	-1.854e-3	11	-1.839e-3	28
83	N42	max	0.052	20	-0.028	20	0.153	7	4.826e-3	7	8.958e-4	20	2.499e-3	11
84		min	-0.055	11	-0.096	62	-0.14	32	-4.429e-3	32	-9.475e-4	11	-2.459e-3	20
85	N43	max	0.142	20	-0.028	20	0.16	24	5.471e-3	15	1.824e-3	20	4.674e-3	3
86		min	-0.142	11	-0.096	62	-0.173	15	-5.065e-3	24	-1.854e-3	11	-4.648e-3	28
87	N44	max	0.025	20	-0.028	20	0.097	7	4.081e-3	7	8.958e-4	20	1.754e-3	11
88		min	-0.027	11	-0.096	62	-0.089	32	-3.684e-3	32	-9.475e-4	11	-1.714e-3	20
89	N45	max	0.089	20	-0.028	20	0.102	24	4.728e-3	15	1.824e-3	20	3.931e-3	3
90		min	-0.089	11	-0.096	62	-0.11	15	-4.322e-3	24	-1.854e-3	11	-3.904e-3	28
91	N47	max	0.029	20	-0.028	20	0.05	7	3.682e-4	69	1.355e-3	20	1.626e-3	3
92		min	-0.031	11	-0.096	62	-0.049	32	2.38e-5	27	-1.396e-3	11	-1.597e-3	28

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

	Member	Shape	Code Check	Loc[in]	LC	Shear Check	Loc[in]	LC	phi*Pnc [lb]	phi*Pnt [lb]	phi*Mn y-y [k-ft]	phi*Mn z-z [k-ft]	Cb	Eqn
1	M1	PIPE_1.5	0.182	35.333	45	0.045	7.067	62	22762.755	31008.6	1.452	1.452	1.794	H1-1b
2	M2	PIPE_1.5	0.191	35.333	45	0.045	7.067	62	22762.755	31008.6	1.452	1.452	1.799	H1-1b
3	M3	BAR0.625	0.045	28.3	12	0.006	28.3	11	5000.693	13805.827	0.144	0.144	2.132	H1-1b
4	M4	BAR0.625	0.06	28.3	47	0.007	28.3	3	5000.693	13805.827	0.144	0.144	2.288	H1-1b
5	M5	BAR0.625	0.059	0	70	0.008	19.905	14	2178.887	13805.827	0.144	0.144	2.154	H1-1b*
6	M6	BAR0.625	0	39.811	70	0.007	0	8	4270.618	13805.827	0.144	0.144	2.16	H1-1a
7	M7	PIPE_1.5	0.189	35.333	38	0.047	7.067	38	22762.755	31008.6	1.452	1.452	1.796	H1-1b

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

	Member	Shape	Code Check	Loc[in]	LC	Shear Check	Loc[in]	LC	phi*Pnc [lb]	phi*Pnt [lb]	phi*Mn y-y [k-ft]	phi*Mn z-z [k-ft]	Cb	Eqn
8	M8	PIPE_1.5	0.201	35.333	37	0.046	42.4	37	22762.755	31008.6	1.452	1.452	1.8	H1-1b
9	M9	BAR0.625	0.048	28.3	18	0.007	28.3	3	5000.693	13805.827	0.144	0.144	2.147	H1-1b
10	M10	BAR0.625	0.063	28.3	51	0.007	28.3	11	5000.693	13805.827	0.144	0.144	2.289	H1-1b
11	M11	BAR0.625	0.06	0	39	0.007	0	9	2178.887	13805.827	0.144	0.144	1.957	H1-1b*
12	M12	BAR0.625	0.005	39.811	28	0.008	39.811	13	4270.618	13805.827	0.144	0.144	1.787	H1-1b*
13	M13	PIPE_2.5	0.146	48	6	0.088	18	3	62325.909	66654	4.727	4.727	2.754	H1-1b
14	M14	PIPE_2.5	0.155	48	6	0.056	19	17	33487.322	66654	4.727	4.727	1.743	H1-1b
15	MP1	PIPE_2.5	0.048	35	17	0.018	63	3	33487.322	66654	4.727	4.727	3	H1-1b
16	MP3	PIPE_2.5	0.044	35	13	0.013	63	62	33487.322	66654	4.727	4.727	3	H1-1b
17	MP2	PIPE_2.5	0.153	34	11	0.044	63	3	33487.322	66654	4.727	4.727	2.023	H1-1b
18	M27A	PIPE_2.0	0.087	96.255	28	0.004	96.255	11	15288.397	42228	2.46	2.46	1.136	H1-1b*

Material Take-Off

	Material	Size	Pieces	Length[in]	Weight[K]
1	General Members				
2	RIGID		6	18	0
3	Total General		6	18	0
4					
5	Hot Rolled Steel				
6	A500 Gr.46	PIPE_1.5	4	169.6	0.036
7	A500 Gr.46	PIPE_2.5	5	480	0.219
8	A500 Gr.46	PIPE_2.0	1	96.3	0.028
9	A529 Gr.50	BAR0.625	8	272.4	0.024
10	Total HR Steel		18	1018.3	0.307

Warning Log

No Data to Print...

MK DEVELOPMENT

EXHIBIT F

NIERS Study

Pinnacle Telecom Group

Professional and Technical Services

Antenna Site FCC RF Compliance Assessment and Report for Municipal Submission

Prepared for:	DISH Wireless, LLC
Site ID:	NJJER02042B
Site Address:	880 Post Road East Westport, CT
Latitude:	N 41.137476
Longitude:	W 73.334369
Structure type:	Lattice tower
Report date:	December 16, 2022
Compliance Conclusion:	DISH Wireless, LLC will be in compliance with the rules and regulations as described in OET Bulletin 65, following the implementation of the proposed mitigation as detailed in the report.

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Contents

Introduction and Summary

At the request of DISH Wireless, LLC ("DISH"), Pinnacle Telecom Group has performed an independent expert assessment of radiofrequency (RF) levels and related FCC compliance for proposed wireless base station antenna operations on an existing lattice tower located at 880 Post Road East in Westport, CT. DISH refers to the antenna site by the code "NJJER02042B", and its proposed operation involves directional panel antennas and transmission in the 600 MHz, 2000 MHz and 2100 MHz frequency bands licensed to it by the FCC.

The FCC requires all wireless antenna operators to perform an assessment of potential human exposure to radiofrequency (RF) fields emanating from all the transmitting antennas at a site whenever antenna operations are added or modified, and to ensure compliance with the Maximum Permissible Exposure (MPE) limit in the FCC's regulations. In this case, the compliance assessment needs to take into account the RF effects of other existing antenna operations at the site by AT&T, T-Mobile, Verizon Wireless, and the State of Connecticut. Note that FCC regulations require any future antenna collocators to assess and assure continuing compliance based on the cumulative effects of all then-proposed and then-existing antennas at the site.

This report describes a mathematical analysis of RF levels resulting around the site in areas of unrestricted public access, that is, at street level around the site. The compliance analysis employs a standard FCC formula for calculating the effects of the antennas in a very conservative manner, in order to overstate the RF levels and to ensure "safe-side" conclusions regarding compliance with the FCC limit for safe continuous exposure of the general public.

The results of a compliance assessment can be described in layman's terms by expressing the calculated RF levels as simple percentages of the FCC MPE limit. If the normalized reference for that limit is 100 percent, then calculated RF levels higher than 100 percent indicate the MPE limit is exceeded and there is a need to mitigate the potential exposure. On the other hand, calculated RF levels consistently below 100 percent serve as a clear and sufficient demonstration of

compliance with the MPE limit. We can (and will) also describe the overall worst-case result via the “plain-English” equivalent “times-below-the-limit” factor.

The result of the RF compliance assessment in this case is as follows:

- At street level, the conservatively calculated maximum RF level from the combination of proposed and existing antenna operations at the site is 3.5119 percent of the FCC general population MPE limit – well below the 100-percent reference for compliance. In other words, the worst-case calculated RF level – intentionally and significantly overstated by the calculations – is still more than 28 times below the FCC limit for safe, continuous exposure of the general public.
- A supplemental analysis of the RF levels at the same height as the DISH antennas indicate that the FCC MPE limit is potentially exceeded. Therefore, it is recommended that three Caution signs and NOC Information signs be installed at the base of the tower.
- The results of the calculations, along with the proposed mitigation, combine to satisfy the FCC requirements and associated guidelines on RF compliance at street level around the site. Moreover, because of the significant conservatism incorporated in the analysis, RF levels actually caused by the antennas will be lower than these calculations indicate.

The remainder of this report provides the following:

- relevant technical data on the proposed DISH antenna operations at the site, as well as on the other existing antenna operations;
- a description of the applicable FCC mathematical model for calculating RF levels, and application of the relevant technical data to that model;
- analysis of the results of the calculations against the FCC MPE limit, and the compliance conclusion for the site.

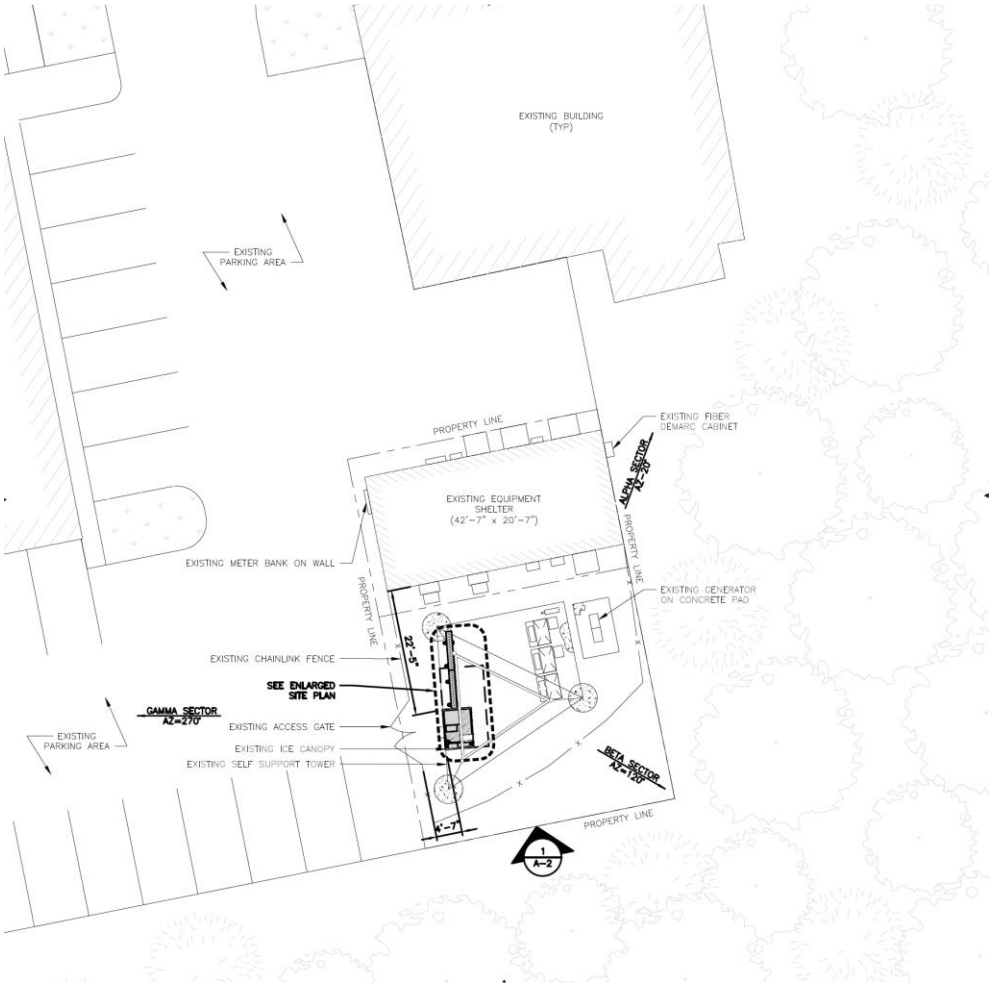
In addition, four Appendices are included. Appendix A provides information on the documents used to prepare the analysis. Appendix B provides background on the FCC MPE limit. Appendix C details the proposed mitigation to satisfy the FCC

requirements and associated guidelines on RF compliance. Appendix D provides a summary of the qualifications of the expert certifying FCC compliance for this site.

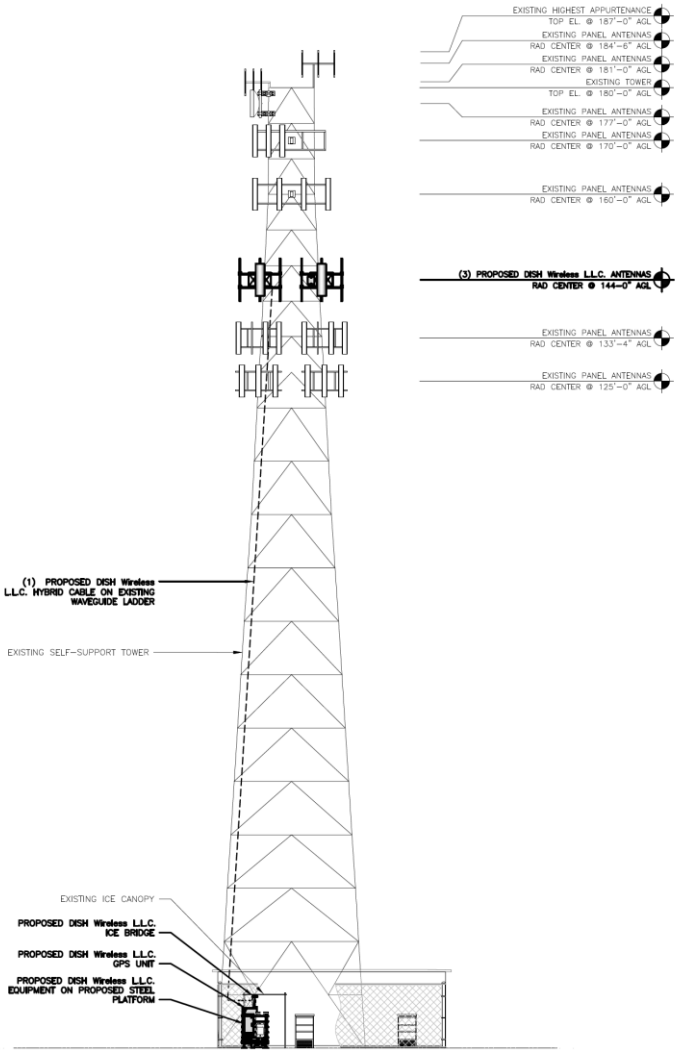
Antenna and Transmission Data

The plan and elevation views that follow, extracted from the site drawings, illustrate the mounting positions of the DISH antennas at the site.

Plan View:



Elevation View:



The table that follows summarizes the relevant data for the proposed DISH antenna operations. Note that the "Z" height references the centerline of the antenna.

Ant. ID	Carrier	Antenna Manufacturer	Antenna Model	Type	Freq (MHz)	Ant. Dim. (ft.)	Total Input Power (watts)	Total ERP (watts)	Z AGL (ft)	Ant. Gain (dBd)	B/W	Azimuth	EDT	MDT
❶	DISH	Commscope	FFVV-65B-R2	Panel	600	6	120	2110	144.0	12.46	64	20	2	0
❶	DISH	Commscope	FFVV-65B-R2	Panel	2000	6	160	7396	144.0	16.66	67	20	2	0
❶	DISH	Commscope	FFVV-65B-R2	Panel	2100	6	160	7396	144.0	16.66	67	20	2	0
❷	DISH	Commscope	FFVV-65B-R2	Panel	600	6	120	2110	144.0	12.46	64	120	2	0
❷	DISH	Commscope	FFVV-65B-R2	Panel	2000	6	160	7396	144.0	16.66	67	120	2	0
❷	DISH	Commscope	FFVV-65B-R2	Panel	2100	6	160	7396	144.0	16.66	67	120	2	0
❸	DISH	Commscope	FFVV-65B-R2	Panel	600	6	120	2110	144.0	12.46	64	270	2	0
❸	DISH	Commscope	FFVV-65B-R2	Panel	2000	6	160	7396	144.0	16.66	67	270	2	0
❸	DISH	Commscope	FFVV-65B-R2	Panel	2100	6	160	7396	144.0	16.66	67	270	2	0

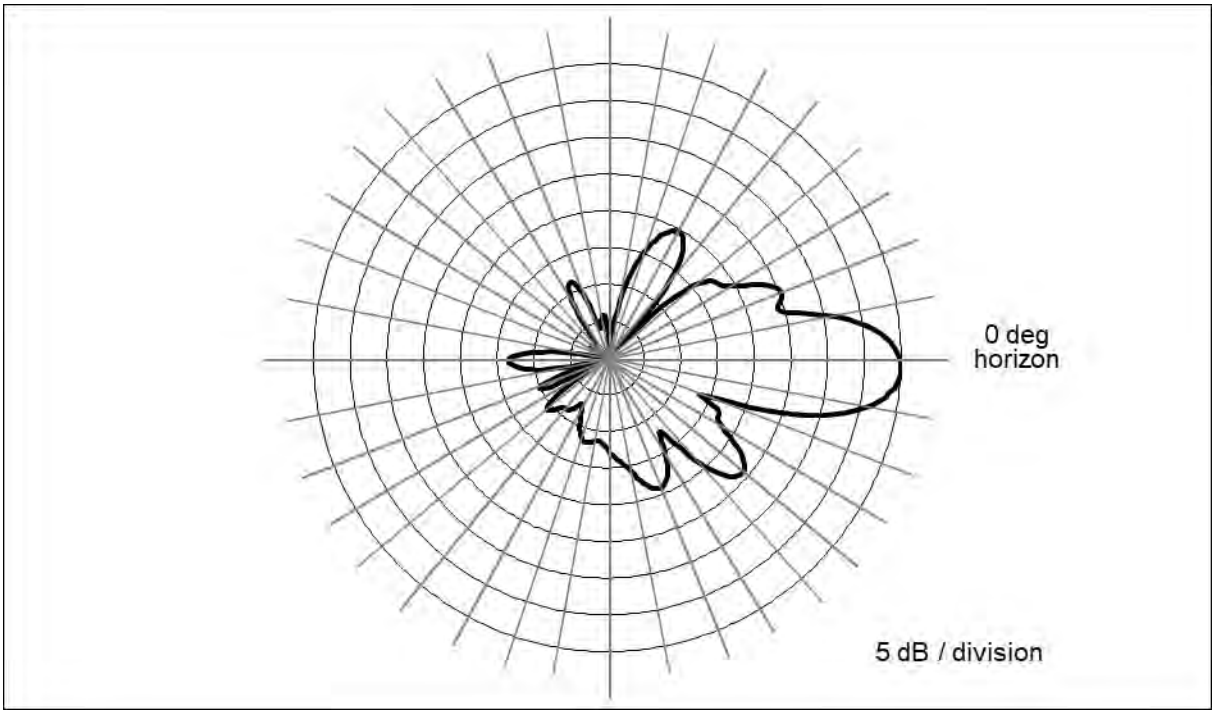
The area below the antennas, at street level, is of interest in terms of potential "uncontrolled" exposure of the general public, so the antenna's vertical-plane emission characteristic is used in the calculations, as it is a key determinant of the relative amount of RF emissions in the "downward" direction.

By way of illustration, Figure 1 that follows shows the vertical-plane radiation pattern of the proposed antenna model in the 600 MHz frequency band. In this type of antenna radiation pattern diagram, the antenna is effectively pointed at the three o'clock position (the horizon) and the relative strength of the pattern at different angles is described using decibel units.

Note that the use of a decibel scale to describe the relative pattern at different angles actually serves to significantly understate the actual focusing effects of the antenna. Where the antenna pattern reads 20 dB the relative RF energy emitted at the corresponding downward angle is 1/100th of the maximum that occurs in the main beam (at 0 degrees); at 30 dB, the energy is only 1/1000th of the maximum.

Finally, note that the automatic pattern-scaling feature of our internal software may skew side-by-side visual comparisons of different antenna models, or even different parties' depictions of the same antenna model.

Figure 1. Commscope FFVV-65B-R2 – 600 MHz Vertical-plane Pattern



As noted at the outset, there are existing antenna operations to include in the compliance assessment. For each of the wireless operators, we will conservatively assume operation with maximum channel capacity and at maximum transmitter power per channel to be used by each wireless operator in each of their respective FCC-licensed frequency bands. For the other operator, we will rely on the transmission parameters in its associated FCC licenses.

The table that follows summarizes the relevant data for the collocated antenna operations.

Carrier	*Antenna Manufacturer*	*Antenna Model*	*Type*	*Freq (MHz)*	*Total ERP (watts)*	*Ant. Gain (dBd)*	*Azimuth*
AT&T	Generic	Generic	Panel	700	4945	11.26	N/A
AT&T	Generic	Generic	Panel	850	2400	11.76	N/A
AT&T	Generic	Generic	Panel	1900	5756	15.56	N/A
AT&T	Generic	Generic	Panel	2100	5890	15.66	N/A
AT&T	Generic	Generic	Panel	2300	4131	16.16	N/A
T-Mobile	Generic	Generic	Panel	600	3163	12.96	N/A
T-Mobile	Generic	Generic	Panel	700	867	13.36	N/A
T-Mobile	Generic	Generic	Panel	1900	4123	15.36	N/A
T-Mobile	Generic	Generic	Panel	1900	1452	15.60	N/A
T-Mobile	Generic	Generic	Panel	2100	4626	15.86	N/A
T-Mobile	Generic	Generic	Panel	1900	1419	15.50	N/A
T-Mobile	Generic	Generic	Panel	2500	12804	22.35	N/A
Verizon Wireless	Generic	Generic	Panel	746	2400	11.76	N/A
Verizon Wireless	Generic	Generic	Panel	869	5166	12.36	N/A
Verizon Wireless	Generic	Generic	Panel	1900	5372	15.26	N/A
Verizon Wireless	Generic	Generic	Panel	2100	5625	15.46	N/A
State of Connecticut	Generic	Generic	Dish	6000	1305	36.86	N/A
State of Connecticut	Generic	Generic	Panel	851	105	8.36	N/A
State of Connecticut	Generic	Generic	Panel	769	105	8.36	N/A

Compliance Analysis

FCC Office of Engineering and Technology Bulletin 65 ("OET Bulletin 65") provides guidelines for mathematical models to calculate the RF levels at various points around transmitting antennas. Different models apply in different areas around antennas, with one model applying to street level around a site, and another applying to the same height as the antennas. We will address each area of interest in turn in the subsections that follow.

Street Level Analysis

At street-level around an antenna site (in what is called the "far field" of the antennas), the RF levels are directly proportional to the total antenna input power and the relative antenna gain in the downward direction of interest – and the levels are otherwise inversely proportional to the square of the straight-line distance to the antenna.

Conservative calculations also assume the potential RF exposure is enhanced by reflection of the RF energy from the intervening ground. Our calculations will assume a 100% "perfect", mirror-like reflection, which is the absolute worst-case scenario.

The formula for street-level compliance assessment for any given wireless antenna operation is as follows:

$$MPE\% = (100 * Chans * TxPower * 10^{(Gmax-Vdisc/10)} * 4) / (MPE * 4\pi * R^2)$$

where

MPE%	=	RF level, expressed as a percentage of the MPE limit applicable to continuous exposure of the general public
100	=	factor to convert the raw result to a percentage
Chans	=	maximum number of RF channels per sector
TxPower	=	maximum transmitter power per channel, in milliwatts

$10^{(Gmax-Vdisc/10)}$	=	numeric equivalent of the relative antenna gain in the downward direction of interest; data on the antenna vertical-plane pattern is taken from manufacturer specifications
4	=	factor to account for a 100-percent-efficient energy reflection from the ground, and the squared relationship between RF field strength and power density ($2^2 = 4$)
MPE	=	FCC general population MPE limit
R	=	straight-line distance from the RF source to the point of interest, centimeters

The MPE% calculations are performed out to a distance of 500 feet from the facility to points 6.5 feet (approximately two meters, the FCC-recommended standing height) off the ground, as illustrated in Figure 2, below.

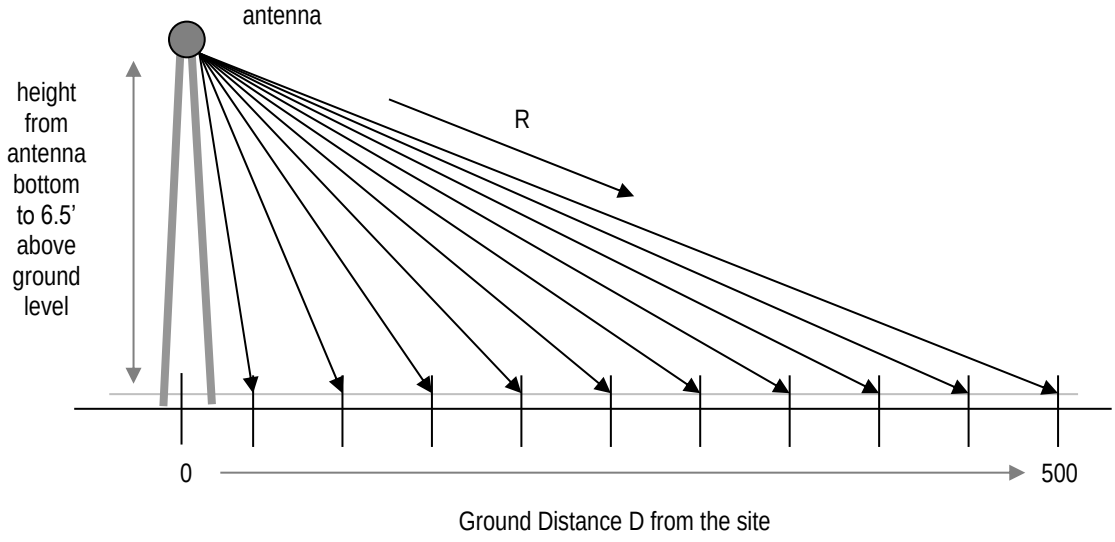


Figure 2. Street-level MPE% Calculation Geometry

It is popularly understood that the farther away one is from an antenna, the lower the RF level – which is generally but not universally correct. The results of MPE% calculations fairly close to the site will reflect the variations in the vertical-plane antenna pattern as well as the variation in straight-line distance to the antenna.

Therefore, RF levels may actually increase slightly with increasing distance within the range of zero to 500 feet from the site. As the distance approaches 500 feet and beyond, though, the antenna pattern factor becomes less significant, the RF levels become primarily distance-controlled and, as a result, the RF levels generally decrease with increasing distance. In any case, the RF levels more than 500 feet from a wireless antenna site are well understood to be sufficiently low to be comfortably in compliance.

According to the FCC, when directional antennas (such as panels) are used, compliance assessments are based on the RF effect of a single (facing) antenna sector, as the effects of directional antennas pointed away from the point(s) of interest are considered insignificant. If the different parameters apply in the different sectors, compliance is based on the worst-case parameters.

Street level FCC compliance for a collocated antenna site is assessed in the following manner. At each distance point along the ground, an MPE% calculation is made for each antenna operation (including each frequency band), and the sum of the individual MPE% contributions at each point is compared to 100 percent, the normalized reference for compliance with the MPE limit. We refer to the sum of the individual MPE% contributions as “total MPE%”, and any calculated total MPE% result exceeding 100 percent is, by definition, higher than the FCC limit and represents non-compliance and a need to mitigate the potential exposure. If all results are consistently below 100 percent, on the other hand, that set of results serves as a clear and sufficient demonstration of compliance with the MPE limit.

Note that the following conservative methodology and assumptions are incorporated into the MPE% calculations on a general basis:

1. The antennas are assumed to be operating continuously at maximum power and maximum channel capacity.
2. The power-attenuation effects of shadowing or other obstructions to the line-of-sight path from the antenna to the point of interest are ignored.
3. The calculations intentionally minimize the distance factor (R) by assuming a 6’6” human and performing the calculations from the bottom (rather than

the centerline) of each operator's lowest-mounted antenna, as applicable.

4. The calculations also conservatively take into account, when applicable, the different technical characteristics and related RF effects of the use of multiple antennas for transmission in the same frequency band.
5. The RF exposure at ground level is assumed to be 100-percent enhanced (increased) via a "perfect" field reflection from the intervening ground.

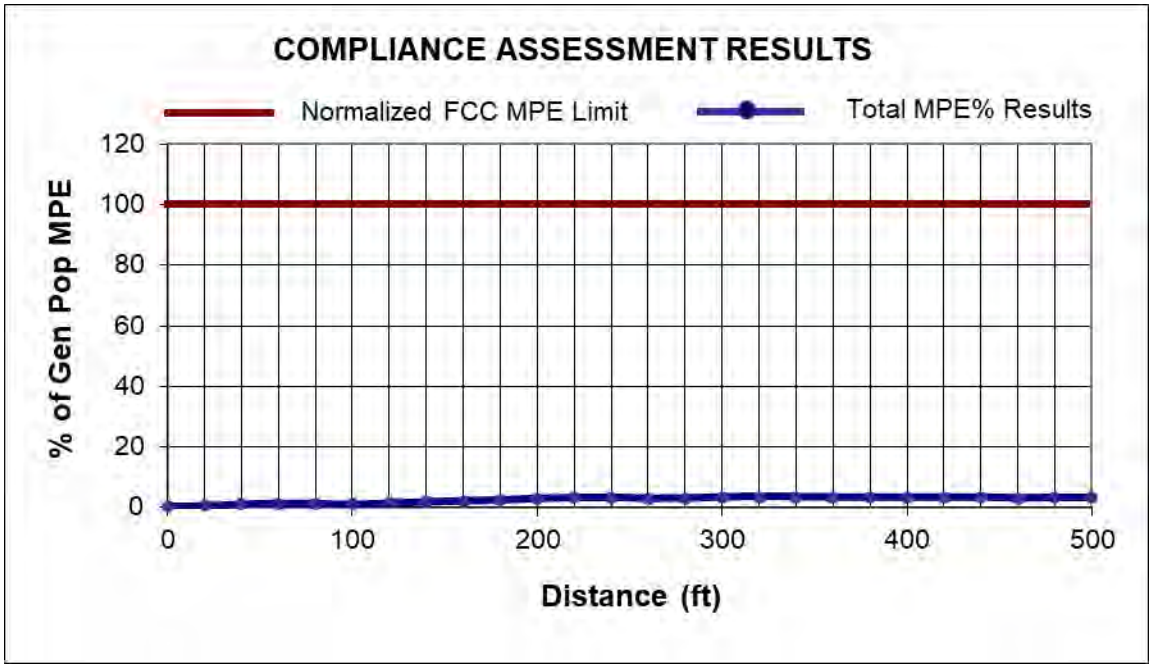
The net result of these assumptions is to intentionally and significantly overstate the calculated RF levels relative to the levels that will actually result from the antenna operations – and the purpose of this conservatism is to allow very "safe-side" conclusions about compliance.

The table that follows provides the results of the MPE% calculations for each antenna operation, with the overall worst-case calculated result highlighted in bold in the last column. Note that the transmission parameters for each DISH antenna sector are identical, and the calculations reflect the worst-case result for any/all sectors.

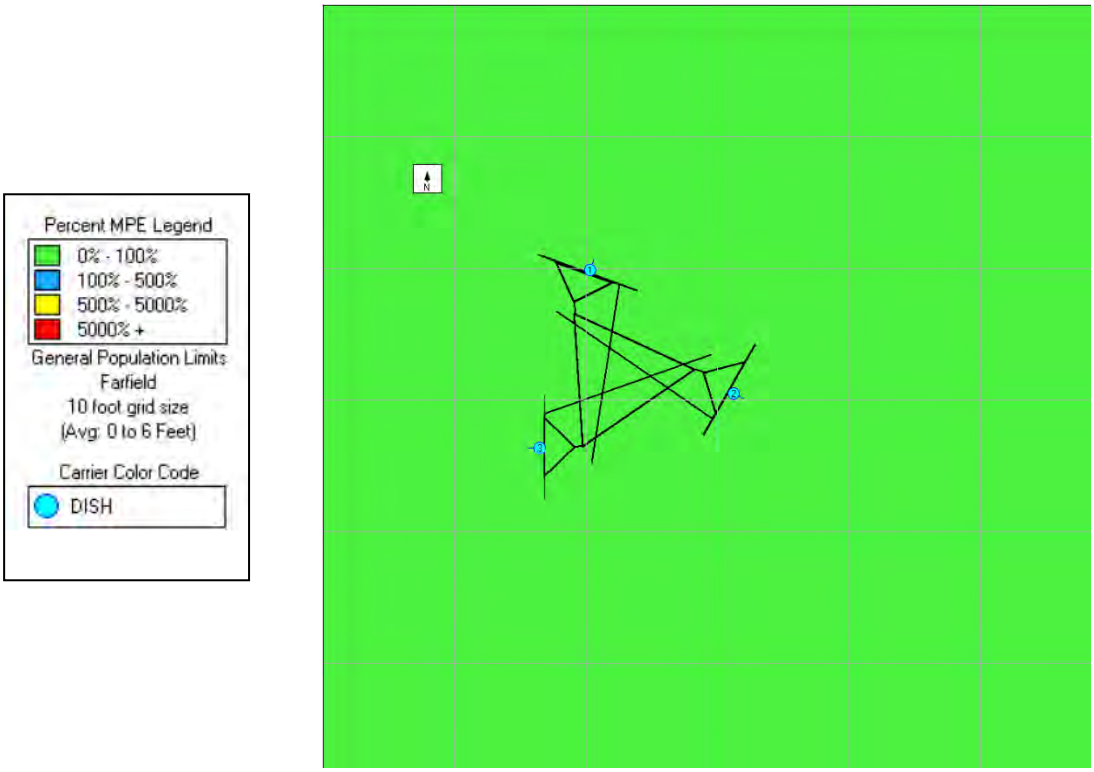
Ground Distance (ft)	DISH 600 MHz MPE%	DISH 2000 MHz MPE%	DISH 2100 MHz MPE%	AT&T MPE%	T-Mobile MPE%	Verizon Wireless MPE%	State of CT MPE%	Total MPE%
0	0.0269	0.0013	0.0002	0.0722	0.2989	0.0042	0.0010	0.4047
20	0.0453	0.0013	0.0014	0.0818	0.4357	0.0084	0.0006	0.5745
40	0.0914	0.0076	0.0194	0.1616	0.8133	0.0158	0.0020	1.1111
60	0.0955	0.0356	0.0071	0.2505	0.9688	0.0151	0.0056	1.3782
80	0.0381	0.0099	0.0785	0.4246	0.6925	0.0211	0.0170	1.2817
100	0.0211	0.0967	0.0037	0.3896	0.4019	0.1412	0.0241	1.0783
120	0.0843	0.1315	0.2099	0.2057	0.4543	0.3464	0.0181	1.4502
140	0.1731	0.1252	0.1856	0.2138	0.7254	0.4266	0.0090	1.8587
160	0.1663	0.1511	0.1851	0.4649	0.8745	0.2967	0.0079	2.1465
180	0.1007	0.0347	0.1126	0.6787	1.3136	0.1488	0.0130	2.4021
200	0.0471	0.0156	0.0027	0.7822	1.9629	0.0827	0.0185	2.9117
220	0.0267	0.0140	0.0340	0.7001	2.2988	0.0366	0.0221	3.1323
240	0.0191	0.0021	0.0246	0.5977	2.5600	0.0239	0.0201	3.2475
260	0.0166	0.0469	0.0190	0.5143	2.2669	0.0429	0.0153	2.9219
280	0.0129	0.0451	0.0768	0.4055	2.3817	0.0730	0.0103	3.0053
300	0.0096	0.0185	0.0716	0.3063	2.8573	0.1033	0.0054	3.3720
320	**0.0053**	**0.0214**	**0.0146**	**0.2051**	**3.1570**	**0.1057**	**0.0028**	**3.5119**
340	0.0059	0.0500	0.0139	0.1250	3.1329	0.1037	0.0013	3.4327
360	0.0104	0.0666	0.0401	0.0937	3.0143	0.0971	0.0011	3.3233
380	0.0201	0.0578	0.0656	0.1328	2.8929	0.0840	0.0022	3.2554
400	0.0361	0.0327	0.0669	0.2259	2.8054	0.0661	0.0025	3.2356
420	0.0595	0.0106	0.0453	0.3595	2.7198	0.0451	0.0054	3.2452
440	0.0903	0.0029	0.0204	0.5068	2.6575	0.0296	0.0076	3.3151
460	0.0832	0.0027	0.0188	0.4666	2.4546	0.0274	0.0088	3.0621
480	0.1191	0.0026	0.0060	0.5971	2.4207	0.0275	0.0111	3.1841
500	0.1104	0.0024	0.0056	0.7244	2.2672	0.0409	0.0124	3.1633

As indicated, the maximum calculated overall RF level is 3.5119 percent of the FCC MPE limit – well below the 100-percent reference for compliance.

A graph of the overall calculation results, shown below, perhaps provides a clearer *visual* illustration of the relative compliance of the calculated RF levels. The line representing the overall calculation results shows an obviously clear, consistent margin to the FCC MPE limit.



The graphic output for the areas at street level surrounding the site is reproduced on the next page.

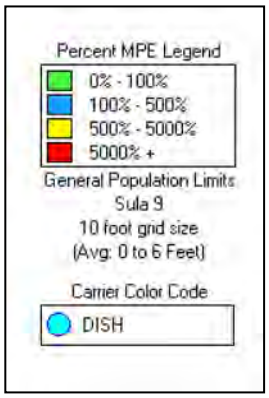


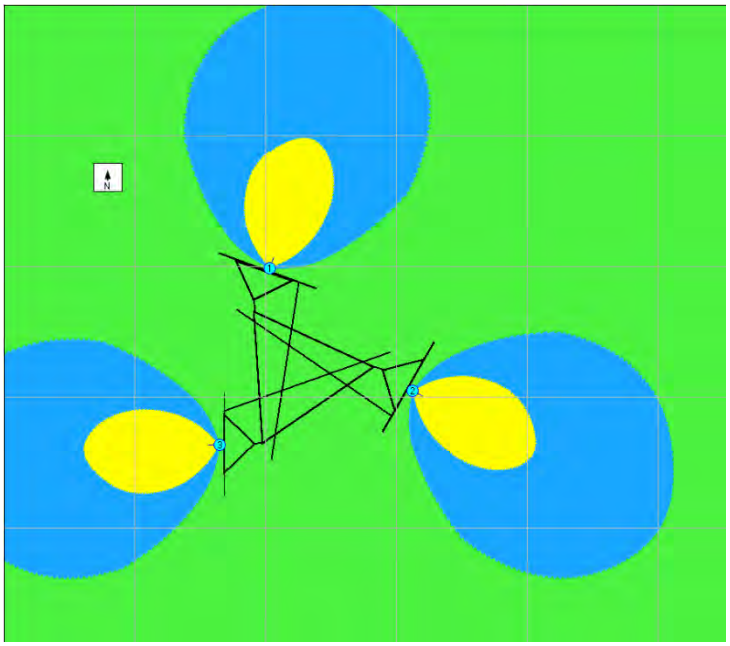
Near-field Analysis

The compliance analysis for the same height as the antennas is performed using the RoofMaster program by Waterford Consultants.

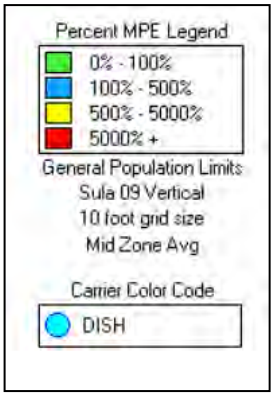
RF levels in the near field of an antenna depend on the power input to the antenna, the antenna's length and horizontal beamwidth, the mounting height of the antenna above nearby standing level, and one's position and distance from the antenna. RF levels in front of a directional antenna are higher than they are to the sides or rear, and in any given horizontal direction are inversely proportional to the straight-line distance to the antenna.

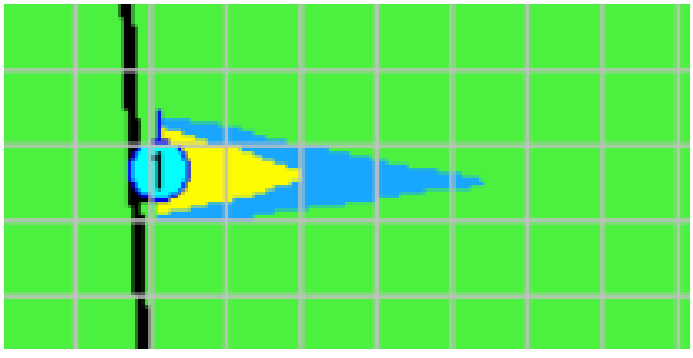
The RoofMaster graphic outputs for the same height as the DISH antennas are reproduced on the next page.





RoofMaster – Same Height as the Antennas – Alpha / Beta / Gamma sectors





RoofMaster – Same Height as the Antennas – Alpha / Beta / Gamma sectors

Compliance Conclusion

According to the FCC, the MPE limit has been constructed in such a manner that continuous human exposure to RF fields up to and including 100 percent of the MPE limit is acceptable and safe.

The conservative analysis in this case shows that the maximum calculated RF level from the combination of proposed and existing antenna operations at street level around the site is 3.5119 percent of the FCC general population MPE limit. At the same height as the antennas, the analysis shows that the calculated RF levels potentially exceed the FCC MPE limit. Per DISH guidelines, and consistent with FCC guidance on compliance, it is recommended that three Caution signs and NOC Information signs be installed at the base of the tower.

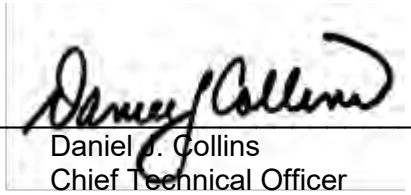
The results of the calculations, along with the described RF mitigation, combine to satisfy the FCC's RF compliance requirements and associated guidelines on compliance.

Moreover, because of the extremely conservative calculation methodology and operational assumptions we applied in the analysis, RF levels actually caused by the antennas will be significantly lower than the calculation results here indicate.

Certification

It is the policy of Pinnacle Telecom Group that all FCC RF compliance assessments are reviewed, approved, and signed by the firm's Chief Technical Officer who certifies as follows:

1. I have read and fully understand the FCC regulations concerning RF safety and the control of human exposure to RF fields (47 CFR 1.1301 *et seq*).
2. To the best of my knowledge, the statements and information disclosed in this report are true, complete and accurate.
3. The analysis of site RF compliance provided herein is consistent with the applicable FCC regulations, additional guidelines issued by the FCC, and industry practice.
4. The results of the analysis indicate that the subject antenna operations will be in compliance with the FCC regulations concerning the control of potential human exposure to the RF emissions from antennas.



Daniel J. Collins
Chief Technical Officer
Pinnacle Telecom Group, LLC

12/16/22
Date

Appendix A. Documents Used to Prepare the Analysis

RFDS: RFDS-NJJER02042B-Final-20220912-v.0_20220912141308

CD: NJJER02042B_FinalStampedCDs_20221102152614

Appendix B. Background on the FCC MPE Limit

As directed by the Telecommunications Act of 1996, the FCC has established limits for maximum continuous human exposure to RF fields.

The FCC maximum permissible exposure (MPE) limits represent the consensus of federal agencies and independent experts responsible for RF safety matters. Those agencies include the National Council on Radiation Protection and Measurements (NCRP), the Occupational Safety and Health Administration (OSHA), the National Institute for Occupational Safety and Health (NIOSH), the American National Standards Institute (ANSI), the Environmental Protection Agency (EPA), and the Food and Drug Administration (FDA). In formulating its guidelines, the FCC also considered input from the public and technical community – notably the Institute of Electrical and Electronics Engineers (IEEE).

The FCC's RF exposure guidelines are incorporated in Section 1.301 *et seq* of its Rules and Regulations (47 CFR 1.1301-1.1310). Those guidelines specify MPE limits for both occupational and general population exposure.

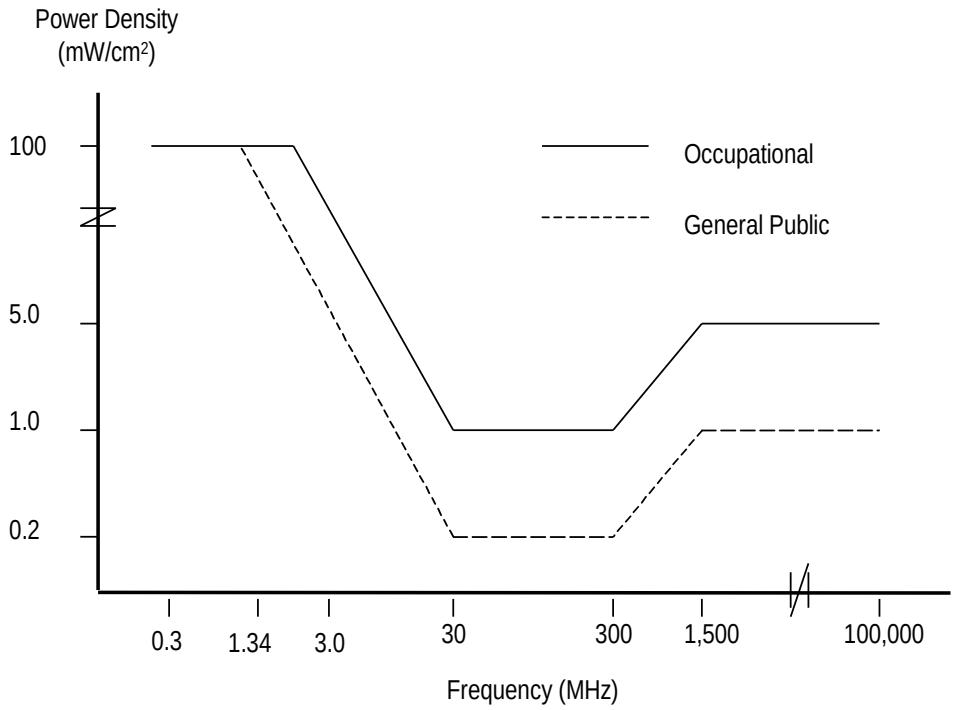
The specified continuous exposure MPE limits are based on known variation of human body susceptibility in different frequency ranges, and a Specific Absorption Rate (SAR) of 4 watts per kilogram, which is universally considered to accurately represent human capacity to dissipate incident RF energy (in the form of heat). The occupational MPE guidelines incorporate a safety factor of 10 or greater with respect to RF levels known to represent a health hazard, and an additional safety factor of five is applied to the MPE limits for general population exposure. Thus, the general population MPE limit has a built-in safety factor of more than 50. The limits were constructed to appropriately protect humans of both sexes and all ages and sizes and under all conditions – and continuous exposure at levels equal to or below the applicable MPE limits is considered to result in no adverse health effects or even health risk.

The reason for *two* tiers of MPE limits is based on an understanding and assumption that members of the general public are unlikely to have had appropriate RF safety training and may not be aware of the exposures they receive; occupational exposure in controlled environments, on the other hand, is assumed to involve individuals who have had such training, are aware of the exposures, and know how to maintain a safe personal work environment.

The FCC's RF exposure limits are expressed in two equivalent forms, using alternative units of field strength (expressed in volts per meter, or V/m), and power density (expressed in milliwatts per square centimeter, or mW/cm^2). The table on the next page lists the FCC limits for both occupational and general population exposures, using the mW/cm^2 reference, for the different radio frequency ranges.

Frequency Range (F) (MHz)	Occupational Exposure (mW/cm^2)	General Public Exposure (mW/cm^2)
0.3 - 1.34	100	100
1.34 - 3.0	100	$180 / F^2$
3.0 - 30	$900 / F^2$	$180 / F^2$
30 - 300	1.0	0.2
300 - 1,500	F / 300	F / 1500
1,500 - 100,000	5.0	1.0

The diagram below provides a graphical illustration of both the FCC's occupational and general population MPE limits.



Because the FCC's RF exposure limits are frequency-shaped, the exact MPE limits applicable to the instant situation depend on the frequency range used by the systems of interest.

The most appropriate method of determining RF compliance is to calculate the RF power density attributable to a particular system and compare that to the MPE limit applicable to the operating frequency in question. The result is usually expressed as a percentage of the MPE limit.

For potential exposure from multiple systems, the respective percentages of the MPE limits are added, and the total percentage compared to 100 (percent of the limit). If the result is less than 100, the total exposure is in compliance; if it is more than 100, exposure mitigation measures are necessary to achieve compliance.

Note that the FCC "categorically excludes" all "non-building-mounted" wireless antenna operations whose mounting heights are more than 10 meters (32.8 feet) from the routine requirement to demonstrate compliance with the MPE limit, because such operations "are deemed, individually and cumulatively, to have no significant effect on the human environment". The categorical exclusion also applies to *all* point-to-point antenna operations, regardless of the type of structure they're mounted on. Note that the FCC considers any facility qualifying for the categorical exclusion to be automatically in compliance.

In addition, FCC Rules and Regulations Section 1.1307(b)(3) describes a provision known in the industry as "the 5% rule". It describes that when a specific location – like a spot on a rooftop – is subject to an overall exposure level exceeding the applicable MPE limit, operators with antennas whose MPE% contributions at the point of interest are less than 5% are exempted from the obligation otherwise shared by all operators to bring the site into compliance, and those antennas are automatically deemed by the FCC to satisfy the rooftop compliance requirement.

FCC References on RF Compliance

47 CFR, FCC Rules and Regulations, Part 1 (Practice and Procedure), Section 1.1310 (Radiofrequency radiation exposure limits).

FCC Second Memorandum Opinion and Order and Notice of Proposed Rulemaking (FCC 97-303), *In the Matter of Procedures for Reviewing Requests for Relief From State and Local Regulations Pursuant to Section 332(c)(7)(B)(v) of the Communications Act of 1934 (WT Docket 97-192), Guidelines for Evaluating the Environmental Effects of Radiofrequency Radiation (ET Docket 93-62), and Petition for Rulemaking of the Cellular Telecommunications Industry Association Concerning Amendment of the Commission's Rules to Preempt State and Local Regulation of Commercial Mobile Radio Service Transmitting Facilities*, released August 25, 1997.

FCC First Memorandum Opinion and Order, ET Docket 93-62, *In the Matter of Guidelines for Evaluating the Environmental Effects of Radiofrequency Radiation*, released December 24, 1996.

FCC Report and Order, ET Docket 93-62, *In the Matter of Guidelines for Evaluating the Environmental Effects of Radiofrequency Radiation*, released August 1, 1996.

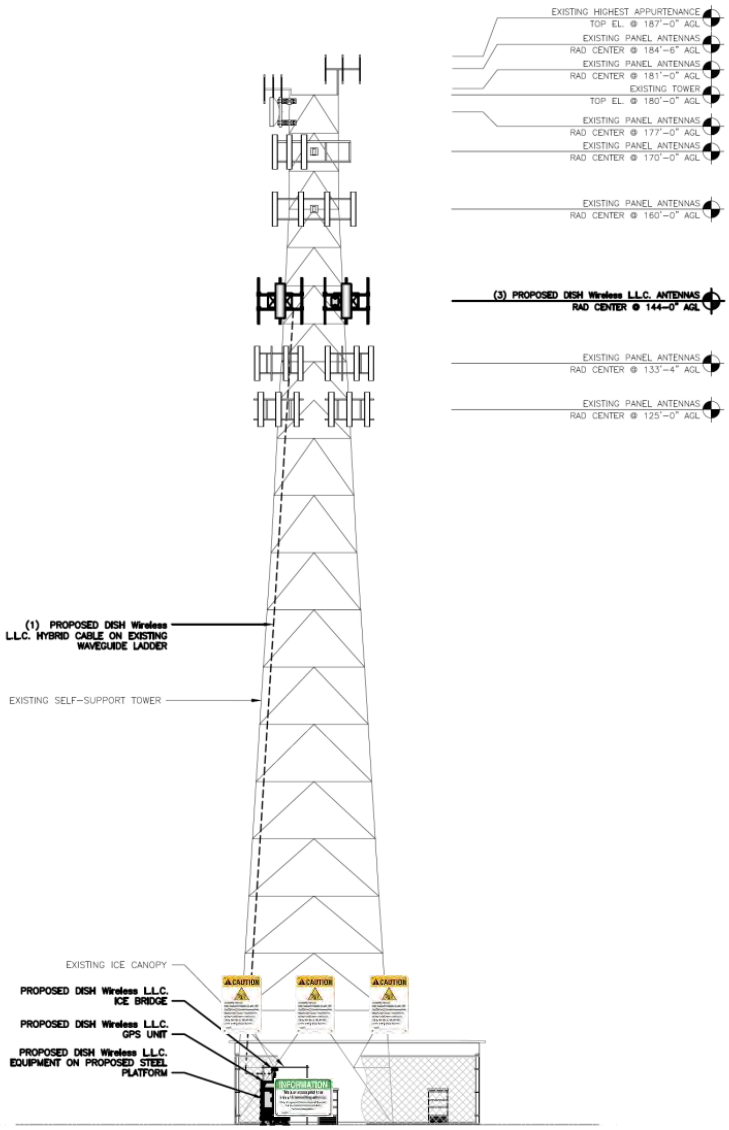
FCC Report and Order, Notice of Proposed Rulemaking, Memorandum Opinion and Order (FCC 19-126), *Proposed Changes in the Commission's Rules Regarding Human Exposure to Radiofrequency Electromagnetic Fields; Reassessment of Federal Communications Commission Radiofrequency Exposure Limits and Policies,* released December 4, 2019.

FCC Office of Engineering and Technology (OET) Bulletin 65, “Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields”, Edition 97-01, August 1997.

FCC Office of Engineering and Technology (OET) Bulletin 56, “Questions and Answers About Biological Effects and Potential Hazards of RF Radiation”, edition 4, August 1999.

Appendix C. Proposed Signage

Final Compliance Configuration							
	GUIDELINES	**NOTICE**	**CAUTION**	**WARNING**	**NOC INFO**		
Access Point(s)	0	0	0	0	1	0	
Alpha	0	0	1	0	0	0	
Beta	0	0	1	0	0	0	
Gamma	0	0	1	0	0	0	



Appendix D. Summary of Expert Qualifications

Daniel J. Collins, Chief Technical Officer, Pinnacle Telecom Group, LLC

Synopsis:	• 40+ years of experience in all aspects of wireless system engineering, related regulation, and RF exposure • Has performed or led RF exposure compliance assessments on more than 20,000 antenna sites since the latest FCC regulations went into effect in 1997 • Has provided testimony as an RF compliance expert more than 1,500 times since 1997 • Have been accepted as an FCC compliance expert in New York, New Jersey, Connecticut, Pennsylvania and more than 40 other states, as well as by the FCC
Education:	• B.E.E., City College of New York (Sch. Of Eng.), 1971 • M.B.A., 1982, Fairleigh Dickinson University, 1982 • Bronx High School of Science, 1966
Current Responsibilities:	• Leads all PTG staff work involving RF safety and FCC compliance, microwave and satellite system engineering, and consulting on wireless technology and regulation
Prior Experience:	• Edwards & Kelcey, VP – RF Engineering and Chief Information Technology Officer, 1996-99 • Bellcore (a Bell Labs offshoot after AT&T's 1984 divestiture), Executive Director – Regulation and Public Policy, 1983-96 • AT&T (Corp. HQ), Division Manager – RF Engineering, and Director – Radio Spectrum Management, 1977-83 • AT&T Long Lines, Group Supervisor – Microwave Radio System Design, 1972-77
Specific RF Safety / Compliance Experience:	• Involved in RF exposure matters since 1972 • Have had lead corporate responsibility for RF safety and compliance at AT&T, Bellcore, Edwards & Kelcey, and PTG • While at AT&T, helped develop the mathematical models for calculating RF exposure levels • Have been relied on for compliance by all major wireless carriers, as well as by the federal government, several state and local governments, equipment manufacturers, system integrators, and other consulting / engineering firms
Other Background:	• Author, *Microwave System Engineering* (AT&T, 1974) • Co-author and executive editor, *A Guide to New Technologies and Services* (Bellcore, 1993) • National Spectrum Management Association (NSMA) – former three-term President and Chairman of the Board of Directors; was founding member, twice-elected Vice President, long-time member of the Board, and was named an NSMA Fellow in 1991 • Have published more than 35 articles in industry magazines

MK DEVELOPMENT

EXHIBIT G

Proof of Notification

January 27, 2023

Dear Customer,

The following is the proof-of-delivery for tracking number: 771118999842

Delivery Information:

Status:	Delivered	**Delivered To:**	Receptionist/Front Desk
Signed for by:	J.GARCIA	**Delivery Location:**	1111 COUNTRY CLUB RD
Service type:	FedEx 2Day		
Special Handling:	Deliver Weekday; Adult Signature Required		MIDDLETOWN, CT, 06457
		Delivery date:	Jan 27, 2023 09:59

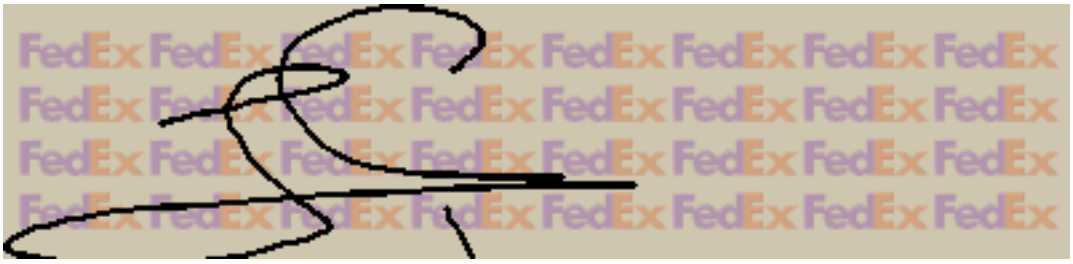
Shipping Information:

Tracking number:	771118999842	**Ship Date:**	Jan 25, 2023
		Weight:	1.0 LB/0.45 KG

Recipient:
Carey Thompson, CT DESPP-CTS Unit
1111 Country Club Road
MIDDLETOWN, CT, US, 06457

Shipper:
Michael Jones,
140 Beach 137th Street
ROCKAWAY PARK, NY, US, 11694

Purchase Order NJJER02042B



Thank you for choosing FedEx

January 26, 2023

Dear Customer,

The following is the proof-of-delivery for tracking number: 771119102822

Delivery Information:

Status:	Delivered	**Delivered To:**	Receptionist/Front Desk
Signed for by:	F.RICHARD	**Delivery Location:**	110 MYRTLE AVE
Service type:	FedEx 2Day		
Special Handling:	Deliver Weekday; Adult Signature Required		Westpoort, CT, 06880
		Delivery date:	Jan 26, 2023 10:25

Shipping Information:

Tracking number:	771119102822	**Ship Date:**	Jan 25, 2023
		Weight:	1.0 LB/0.45 KG

Recipient:
Mary Young, Westport Planning & Zoning Dept
110 Myrtle Ave
Room 203
Westpoort, CT, US, 06880

Shipper:
Michael Jones,
140 Beach 137th Street
ROCKAWAY PARK, NY, US, 11694

Purchase Order NJJER02042B

Thank you for choosing FedEx

January 26, 2023

Dear Customer,

The following is the proof-of-delivery for tracking number: 771119170057

Delivery Information:

Status:	Delivered	**Delivered To:**	Receptionist/Front Desk
Signed for by:	S.WRIGHT	**Delivery Location:**	515 POST RD E
Service type:	FedEx 2Day		
Special Handling:	Deliver Weekday; Adult Signature Required		WESTPORT, CT, 06880
		Delivery date:	Jan 26, 2023 11:21

Shipping Information:

Tracking number:	771119170057	**Ship Date:**	Jan 25, 2023
		Weight:	1.0 LB/0.45 KG

Recipient:
Steve Smith, Westport Buiding Department
515 Post Road East
2nd Floor
WESTPORT, CT, US, 06880

Shipper:
Michael Jones,
140 Beach 137th Street
ROCKAWAY PARK, NY, US, 11694

Purchase Order NJJER02042B

Thank you for choosing FedEx