DEVELOPMENT

6/24/2022

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

RE: Request of DISH Wireless LLC for an Oder to Approve the Shared Use of an Existing Tower
623 Pine St, Bridgeport, CT 06605
Latitude: N41° 9' 56.69" / Longitude: W73° 12' 59.83"

Dear Ms. Bachman:

Pursuant to Connecticut General Statutes ("C.G.S.") §16-50aa, as amended, DISH Wireless LLC ("DISH") hereby requests an approval from the Connecticut Siting Council ("Council") to approve the shared use by DISH of an existing telecommunication tower at 623 Pine Street in Bridgeport. The existing 256ft - Self Support tower is owned by Radio Communication Corp. This modification/proposal includes hardware that is 5G capable. A copy of this filing is being sent to - Dennis Buckley, Zoning Administrator – City of Bridgeport, Arben Kica, Acting Building Official- City of Bridgeport, Robert Knapp Radio Communications Corp Inc.

Background

The existing Radio Communication Corp facility consists of a 256ft – Self Support tower within a 35 sq. ft leased area. DISH is licensed by the Federal Communications Commission ("FCC") to provide wireless services throughout the State of Connecticut. DISH and Radio Communication Corp have agreed to the proposed shared use of the 623 Pine Street tower pursuant to mutually acceptable terms and conditions. Likewise, DISH and Radio Communication Corp have agreed to the proposed installation of equipment cabinets on the inside of the existing building within the existing compound. Radio Communication Corp have authorized DISH to apply for all necessary permits and approvals that may be required to share the existing Self Support tower.

DISH proposes to install 3 antennas, 6 RRU radios, 1 OVP and 1 cable at the 151-foot level. In addition, DISH will install a ground equipment cabinet on a 5'x7' area on the existing concrete slab. 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 256-feet; Dish Wireless LLC proposed antennas will be located at a center line height of 151-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 3.0357% 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 Radio Communication Corp 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 Radio Communication Corp 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 Radio Communication Corp 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 Radio Communication Corp facility other than periodic maintenance. The proposed shared use of the Radio Communication Corp 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 Radio Communication Corp 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 Radio Communication Corp tower.

DEVELOPMENT

Conclusion

For the reasons discussed above, the proposed installation of the existing Radio Communication Corp Self Support tower at 623 Pine Street 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: Dennis Buckley, Zoning Administrator – City of Bridgeport,
Arben Kica, Acting Building Official- City of Bridgeport,
Robert Knapp Radio Communications Corp Inc.

MK DEVELOPMENT

EXHIBIT A

Letter of Authorization

Letter of Authorization

June 6, 2022

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

Re: Development Application Letter of Authorization- 623 Pine Street, Bridgeport, CT 06605
NJJER02044B

Dear Sir/Madam

Radio Communications Corporation (RCC Inc) owns the tower facility at 623 Pine Street, Bridgeport, CT 06605 and identified as Block #307, Lot 25 (the "Property"). RCC Inc. 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 aforementioned 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 LCC Inc. that RCC Inc. 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 RCC INC.

Please contact me at 203-640-2050 or bobk@zcall.com should you have any questions or concerns.

Sincerely,

Robert Knapp

Robert Knapp
Vice President
Radio Communications Corporation, Inc.

MK DEVELOPMENT

EXHIBIT B

Property Card

Property Location 623 PINE ST | Map ID 19/ 307/ 25/ / | Bldg Name | State Use 300
Vision ID 2504 | Account # RK-0259405 | Bldg # 1 | Sec # 1 of 1 | Card # 1 of 1 | Print Date 6/3/2021 9:14:16 PM

CURRENT OWNER

KNAPP ANDREW & LILLIAN &
ROBERT KNAPP (SURV OF THEM)
24 ROCKDALE RD
WEST HAVEN CT 06516

TOPO	UTILITIES	STRT / ROAD	LOCATION

SUPPLEMENTAL DATA

Alt Prcl ID	0307--25-------		
Census Tr	CEN703		
Heart			
Abstract	200:200		
Freeze		Special Dis	
GIS ID	307-25	Assoc Pid#	

CURRENT ASSESSMENT

Description	Code	Appraised	Assessed
Ind Land	3-1	105,880	74,120
Ind Bldg	3-2	206,510	144,560
Ind Impr	3-3	52,000	36,400
Total		364,390	255,080

6015
BRIDGEPORT, CT

VISION

RECORD OF OWNERSHIP

RECORD OF OWNERSHIP	BK-VOL/PAGE		SALE DATE	Q/U	V/I	SALE PRICE	VC
KNAPP ANDREW & LILLIAN &	2838	0116	09-24-1990	U	I	90,000	

PREVIOUS ASSESSMENTS (HISTORY)

Year	Code	Assessed	Year	Code	Assessed	Year	Code	Assessed
2020	3-1	74,120	2019	3-1	48,560	2018	3-1	48,560
	3-2	144,560		3-2	141,290		3-2	141,290
	3-3	36,400		3-3	35,000		3-3	35,000
	Total	255080		Total	224850		Total	224850

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	Nbhd Name	B	Tracing	Batch
IND				

NOTES

LOOKS TO BE AN AUTO REPAIR SHOP SUPPORT
BLDG FOR CELL TOWER. RK/5/29/2003 GARAGE
DOOR 10' UNDER CONSTRUCTION INTER BASE
FOR CELL PHONE TOWER 250'1994 TOWER GENE
RATES UNKN INCOME, USE COST 6/23/03RVH
DON'T SEE ANY NEW BLDG 2007.

APPRAISED VALUE SUMMARY

Appraised Bldg. Value (Card)	206,510
Appraised Xf (B) Value (Bldg)	0
Appraised Ob (B) Value (Bldg)	52,000
Appraised Land Value (Bldg)	105,880
Special Land Value	0
Total Appraised Parcel Value	364,390
Valuation Method	C
Total Appraised Parcel Value	364,390

BUILDING PERMIT RECORD

Permit Id	Issue Date	Type	Description	Amount	Insp Date	% Comp	Date Comp	Comments
154120	09-29-2020	OT	Other	20,000		0		ANTENNAS
119619	04-04-2019	OT		30,000		0		Antenna Replacement
107419	01-31-2019	OT	Telecommunica	25,000		0		3 NEW ANTENNAE
-357014	01-11-2019	OT		30,000		0		Replace Antennas
184618	12-14-2018	OT		15,000		0		ANTENNA REPLACEMENT
137618	06-11-2018	OT	Telecommunica	322,500	09-09-2019	100	01-22-2019	C/O # 6803 New Equipment
7802	10-17-2017		Telecommunica	15,000	05-02-2018	0		Radio Heads

VISIT / CHANGE HISTORY

Date	Id	Type	Is	Cd	Purpost/Result
09-30-2020	MVS	01	6	33	DataMailer - Drive By revie
09-09-2016	RK	06		P	Permit Activity
05-23-2016	RK	02		P	Permit Activity
06-06-2014	RK	02		P	Permit Activity
09-13-2013	RK	02		P	Permit Activity
04-11-2013	RK	02		P	Permit Activity
10-05-2011	RK	02		P	Permit Activity

LAND LINE VALUATION SECTION

B	Use Code	Description	Zone	Land Type	Land Units		Unit Price	I. Factor	Site Index	Cond.	Nbhd.	Nhbd Adj	Notes	Location Adjustment		Adj Unit Pric	Land Value
1	300	Industrial Mdl 96	ILI		4,000	SF	26.47	1.00000	I	1.00	IND	1.000			0	26.47	105,880
				Total Card Land Units	0.092	AC	Parcel Total Land Area:	0.0918								Total Land Value	105,880

Property Location	623 PINE ST		Map ID	19/ 307/ 25/ /		Bldg Name	State Use 300
Vision ID 2504		Account # RK-0259405		Bldg # 1	Sec # 1 of 1	Card # 1 of 1	Print Date 6/3/2021 9:14:17 PM

CONSTRUCTION DETAIL

Element	Cd	Description
Style:	79	Telephone Bldg
Model	96	Ind/Comm
Grade:	09	Above Ave
Stories:	1	
Occupancy:	1.00	
Exterior Wall 1:	15	Concr/CinderBl
Exterior Wall 2:		
Roof Struct:	01	Flat
Roof Cover:	02	T+G/Rubber
Interior Wall 1:	01	Minim/Masonry
Interior Wall 2:		
Interior Floor 1:	03	Concr-Finished
Interior Floor 2:		
Heating Fuel:	04	Gas
Heating Type:	04	Forced Air
AC Type:	03	Central
Bldg Use:	300	Industrial Mdl 96
Ttl Rooms:		
Ttl Bedrms:	00	
Ttl Baths:	0	
Ttl Half Baths:	0	
Ttl Xtra Fix:	0	
Heat/AC:	01	Heat/Ac Pkgs
Frame Type:	03	Masonry
Baths/Plumbing	02	Average
Ceiling/Wall:	06	Ceil & Walls
Rooms/Prtns:	02	Average
Wall Height:	14.00	
% Comn Wall:		
1st Floor Use:		

CONSTRUCTION DETAIL (CONTINUED)

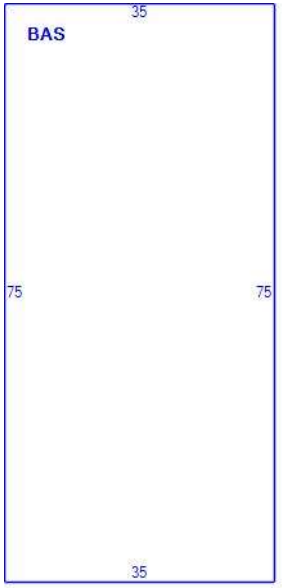
Element	Cd	Description

MIXED USE

Code	Description	Percentage
300	Industrial Mdl 96	100
		0
		0

COST / MARKET VALUATION

RCN	251,839
Year Built	1964
Effective Year Built	
Depreciation Code	E
Remodel Rating	
Year Remodeled	
Depreciation %	18
Functional Obsol	0
External Obsolescence	0
Trend Factor	1.000
Condition	
Condition %	
Percent Good	82
RCNLD	206,510
Dep % Ovr	
Dep Ovr Comment	
Misc Imp Ovr	
Misc Imp Ovr Comment	
Cost to Cure Ovr	
Cost to Cure Ovr Comment	



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

Code	Description	L/B	Units	Unit Price	Yr Blt	Cond. Cd	% Good	Grade	Grade Adj	Appr. Value
TWR	Tower	L	250	208.00	1995		100		0.00	52,000

BUILDING SUB-AREA SUMMARY SECTION

Code	Description	Living Area	Floor Area	Eff Area	Unit Cost	Undeprec Value
BAS	First Floor	2,625	2,625	2,625	95.94	251,839
	Ttl Gross Liv / Lease Area	2,625	2,625	2,625		251,839

623 PINE ST

Location	623 PINE ST	**Mblu**	19/ 307/ 25/ /
Acct#	RK-0259405	**Owner**	RADIO COMMUNICATION CORP
Assessment	$255,080	**Appraisal**	$364,390
PID	2504	**Building Count**	1

Current Value

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2021	$258,510	$105,880	$364,390

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2021	$180,960	$74,120	$255,080

Owner of Record

Owner	RADIO COMMUNICATION CORP	**Sale Price**	$0
Co-Owner		**Certificate**	
		Book & Page	10709/141

Address 623 PINE ST

BRIDGEPORT, CT 06605

Sale Date 02/15/2022

Instrument 25

Ownership History

Ownership History					
Owner	**Sale Price**	**Certificate**	**Book & Page**	**Instrument**	**Sale Date**
RADIO COMMUNICATION CORP	$0		10709/141	25	02/15/2022
KNAPP ANDREW & LILLIAN &	$90,000		2838/0116		09/24/1990

Building Information

Building 1 : Section 1

Year Built: 1964
Living Area: 2,625
Replacement Cost: $251,839
Building Percent Good: 82
Replacement Cost Less Depreciation: $206,510

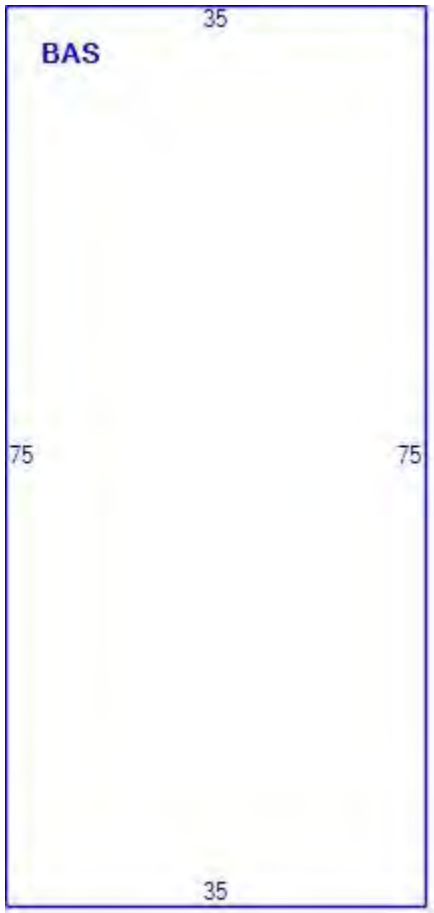
Building Attributes	
Field	**Description**
STYLE	Telephone Bldg
MODEL	Ind/Comm
Grade:	Above Ave
Stories:	1
Occupancy:	1.00

Building Photo

(https://images.vgsi.com/photos2/BridgeportCTPhotos//\0110\IMG_0180_1

Exterior Wall 1:	Concr/CinderBl
Exterior Wall 2:	
Roof Struct:	Flat
Roof Cover:	T+G/Rubber
Interior Wall 1:	Minim/Masonry
Interior Wall 2:	
Interior Floor 1:	Concr-Finished
Interior Floor 2:	
Heating Fuel:	Gas
Heating Type:	Forced Air
AC Type:	Central
Struct Class	
Bldg Use:	Industrial Mdl 96
Ttl Rooms:	
Ttl Bedrms:	00
Ttl Baths:	0
Ttl Half Baths:	0
Ttl Xtra Fix:	0
1st Floor Use:	
Heat/AC:	Heat/Ac Pkgs
Frame Type:	Masonry
Baths/Plumbing:	Average
Ceiling/Wall:	Ceil & Walls
Rooms/Prtns:	Average
Wall Height:	14.00

Building Layout



(ParcelSketch.ashx?pid=2504&bid=2504)

Building Sub-Areas (sq ft)			Legend
Code	**Description**	**Gross Area**	**Living Area**
BAS	First Floor	2,625	2,625
		2,625	2,625

% Comn Wall:	

Extra Features

Extra Features	Legend
No Data for Extra Features	

Land

Land Use

Use Code	300
Description	Industrial Mdl 96
Zone	ILI
Neighborhood	IND
Alt Land Appr	No
Category	

Land Line Valuation

Size (Acres)	0.09
Frontage	0
Depth	0
Assessed Value	$74,120
Appraised Value	$105,880

Outbuildings

Outbuildings						Legend
Code	**Description**	**Sub Code**	**Sub Description**	**Size**	**Value**	**Bldg #**
TWR	Tower			250.00 LF	$52,000	1

Valuation History

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**

2021	$258,510	$105,880	$364,390
2020	$258,510	$105,880	$364,390
2019	$251,840	$69,370	$321,210

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2021	$180,960	$74,120	$255,080
2020	$180,960	$74,120	$255,080
2019	$176,290	$48,560	$224,850

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EXHIBIT C

Construction Drawings

DISH Wireless L.L.C. SITE ID:

NJJER02044B

DISH Wireless L.L.C. SITE ADDRESS:

623 PINE ST, BRIDGEPORT, CT 06605

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	2018 CT STATE BUILDING CODE/2015 IBC W/ CT AMENDMENTS
MECHANICAL	2018 CT STATE BUILDING CODE/2015 IMC W/ CT AMENDMENTS
ELECTRICAL	2018 CT STATE BUILDING CODE/2017 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 (3) PROPOSED ANTENNA SECTOR FRAMES
- 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 ENERSYS PURCELL 6" PLINTH
- 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 FIBER NID (IF REQUIRED)
- EXISTING METER SOCKET TO BE REUSED BY DISH Wireless L.L.C.

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:	RADIO COMMUNICATIONS CORPORATION
ADDRESS:	24 ROCKDALE ROAD WEST HAVEN, CT 06516
TOWER TYPE:	SELF SUPPORT TOWER
TOWER CO SITE ID:	N/A
TOWER APP NUMBER:	N/A
COUNTY:	FAIRFIELD
LATITUDE (NAD 83):	41° 9' 56.76" N 41.165766 N
LONGITUDE (NAD 83):	73° 12' 59.95" W 73.216653 W
ZONING JURISDICTION:	CT SITING COUNCIL
ZONING DISTRICT:	ILI
PARCEL NUMBER:	307-2
OCCUPANCY GROUP:	U
CONSTRUCTION TYPE:	II-B
POWER COMPANY:	EVERSOURCE CT ELECTRIC
TELEPHONE COMPANY:	TBD

PROJECT DIRECTORY

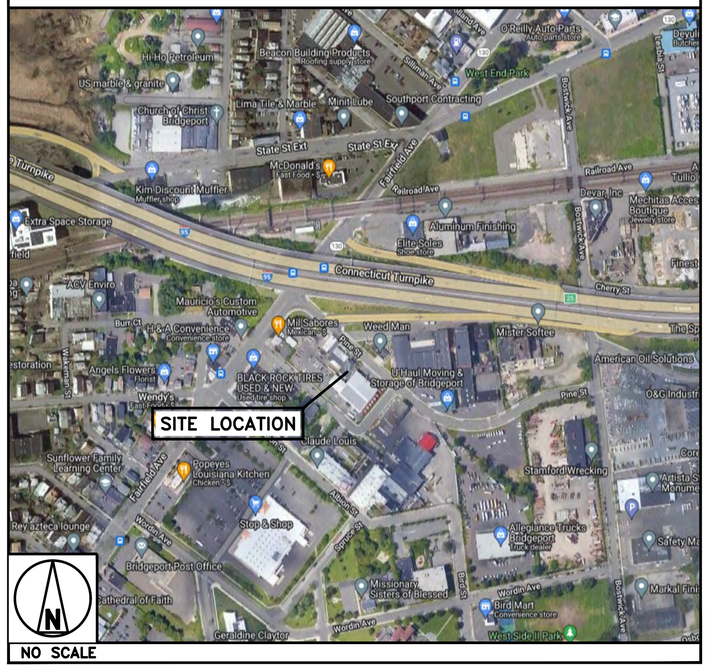
APPLICANT:	DISH Wireless L.L.C. 5701 SOUTH SANTA FE DRIVE LITTLETON, CO 80120
TOWER OWNER:	RADIO COMMUNICATIONS CORPORATION 24 ROCKDALE ROAD WEST HAVEN, CT 06516
SITE DESIGNER:	M+K DEVELOPMENT 140 BEACH 137TH STREET ROCKAWAY, NY 11694
SITE ACQUISITION:	JOE PAWALCZAK JOE.PAWALCZAK@DISH.COM
CONSTRUCTION MANAGER:	OMAR ZEERBAN OMAR.ZEERBAN@DISH.COM
RF ENGINEER:	PAWAN MADAHAR PAWAN.MADAJAR@DISH.COM

DIRECTIONS

DIRECTIONS FROM 3ADP BLVD. ROSELAND, NJ:

GET ON I-280 E FROM LIVINGSTON AVE, HEAD NORTHEAST ON ADP BLVD TOWARD CHOCTAW WAY, TURN 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, FOLLOW I-280 E AND I-95 N TO COOLIDGE ST IN FAIRFIELD. TAKE EXIT 25 FROM I-95 N, TAKE COMMERCE DR TO PINE ST IN BRIDGEPORT, MERGE ONTO COOLIDGE ST, TURN LEFT ONTO COMMERCE DR, TURN RIGHT ONTO FAIRFIELD AVE, TURN LEFT ONTO PINE ST, DESTINATION WILL BE ON THE 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
BRET J MAGNUSON
6/10/2022
33678
LICENSED PROFESSIONAL ENGINEER

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

RFDS REV #: 1

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
A	05/16/2022	ISSUED FOR REVIEW
0	06/08/2022	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER

NJJER02044B

DISH Wireless L.L.C.
PROJECT INFORMATION

NJJER02044B
623 PINE ST,
BRIDGEPORT, CT 06605

SHEET TITLE

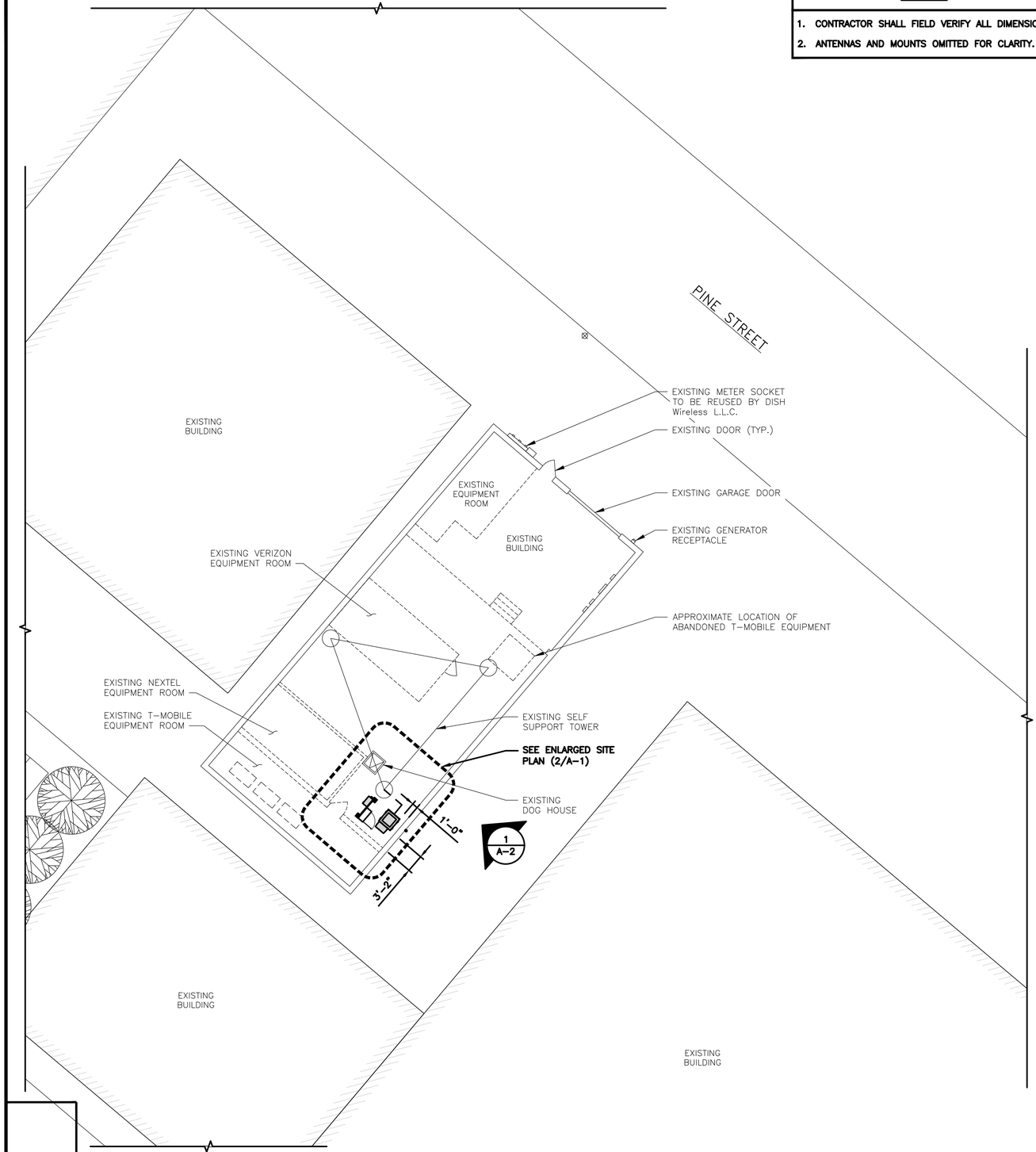
TITLE SHEET

SHEET NUMBER

T-1

NOTES

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



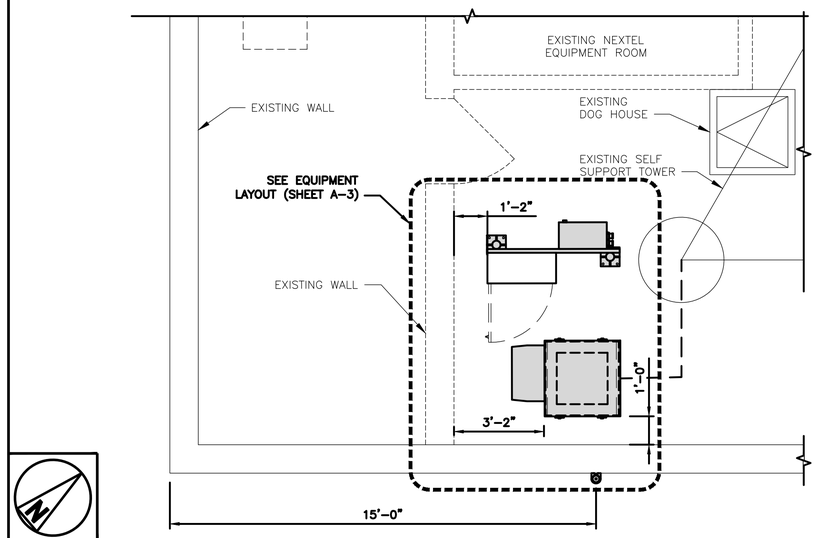
OVERALL SITE PLAN

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
BRET J MAGNUSON
6/10/2022
33678
LICENSED PROFESSIONAL ENGINEER

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

RFDS REV #: 1

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
A	05/16/2022	ISSUED FOR REVIEW
0	06/08/2022	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER

NJJER02044B

DISH Wireless L.L.C.
PROJECT INFORMATION

NJJER02044B
623 PINE ST,
BRIDGEPORT, CT 06605

SHEET TITLE

OVERALL AND ENLARGED SITE PLAN

SHEET NUMBER

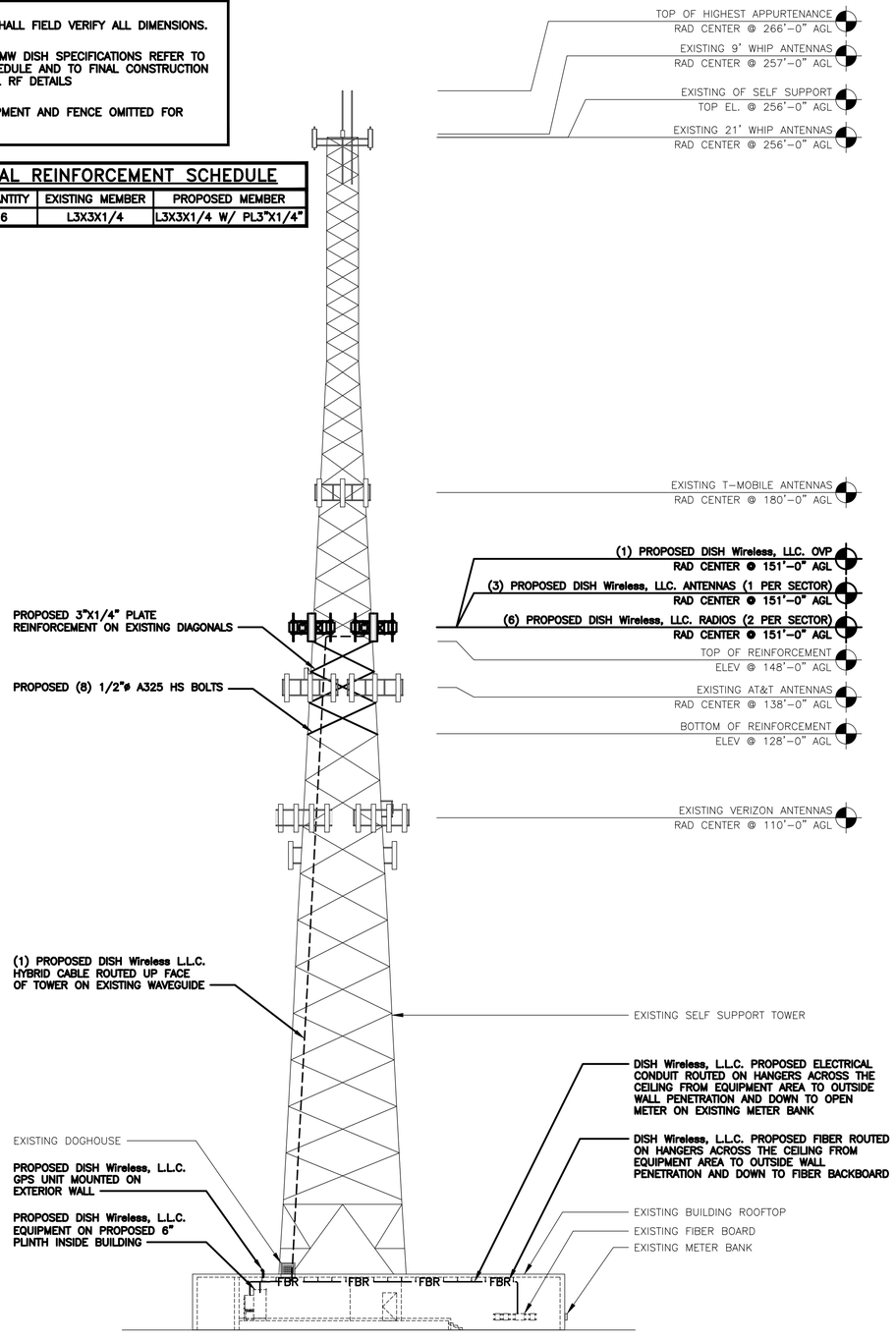
A-1

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.

DIAGONAL REINFORCEMENT SCHEDULE

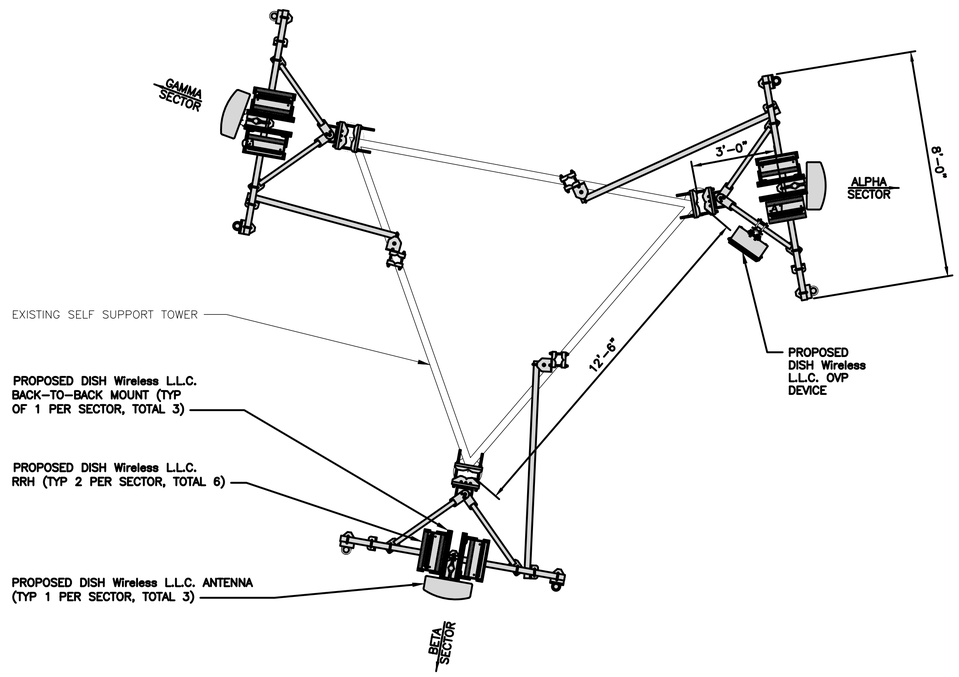
HEIGHT	QUANTITY	EXISTING MEMBER	PROPOSED MEMBER
128'–148'	6	L3X3X1/4	L3X3X1/4 W/ PL3"X1/4"



PROPOSED SOUTH EAST ELEVATION

16' 12' 8' 4' 0 16' 32'
1/16"=1'–0"

1



ANTENNA LAYOUT

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

2

SECTOR	POSITION	ANTENNA						TRANSMISSION CABLE
		EXISTING OR PROPOSED	MANUFACTURER – MODEL NUMBER	TECHNOLOGY	SIZE (HxW)	AZIMUTH	RAD CENTER	FEED LINE TYPE AND LENGTH
ALPHA	A1	PROPOSED	JMA WIRELESS – MX08FRO665–21	5G	72.0" x 20.0"	90°	151'–0"	(1) HIGH–CAPACITY CU12PSM6P4XXX_4AWG HYBRID CABLE (185' LONG)
BETA	B1	PROPOSED	JMA WIRELESS – MX08FRO665–21	5G	72.0" X 20.0"	190°	151'–0"	
GAMMA	C1	PROPOSED	JMA WIRELESS – MX08FRO665–21	5G	72.0" X 20.0"	290°	151'–0"	

SECTOR	POSITION	RRH	
		MANUFACTURER – MODEL NUMBER	TECHNOLOGY
ALPHA	A1	FUJITSU – TA08025–B604	N70/N66
	A2	FUJITSU – TA08025–B605	N71/N29
BETA	B1	FUJITSU – TA08025–B604	N70/N66
	B2	FUJITSU – TA08025–B605	N71/N29
GAMMA	C1	FUJITSU – TA08025–B604	N70/N66
	C2	FUJITSU – TA08025–B605	N71/N29

SECTOR	POSITION	OVP	
		MANUFACTURER – MODEL NUMBER	TECHNOLOGY
ALPHA	N/A	RAYCAP – RDIDC–9181–PF–48	–

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

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

MK DEVELOPMENT
140 BEACH 137TH STREET
ROCKAWAY, NY 11694

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DISH Wireless L.L.C.
PROJECT INFORMATION

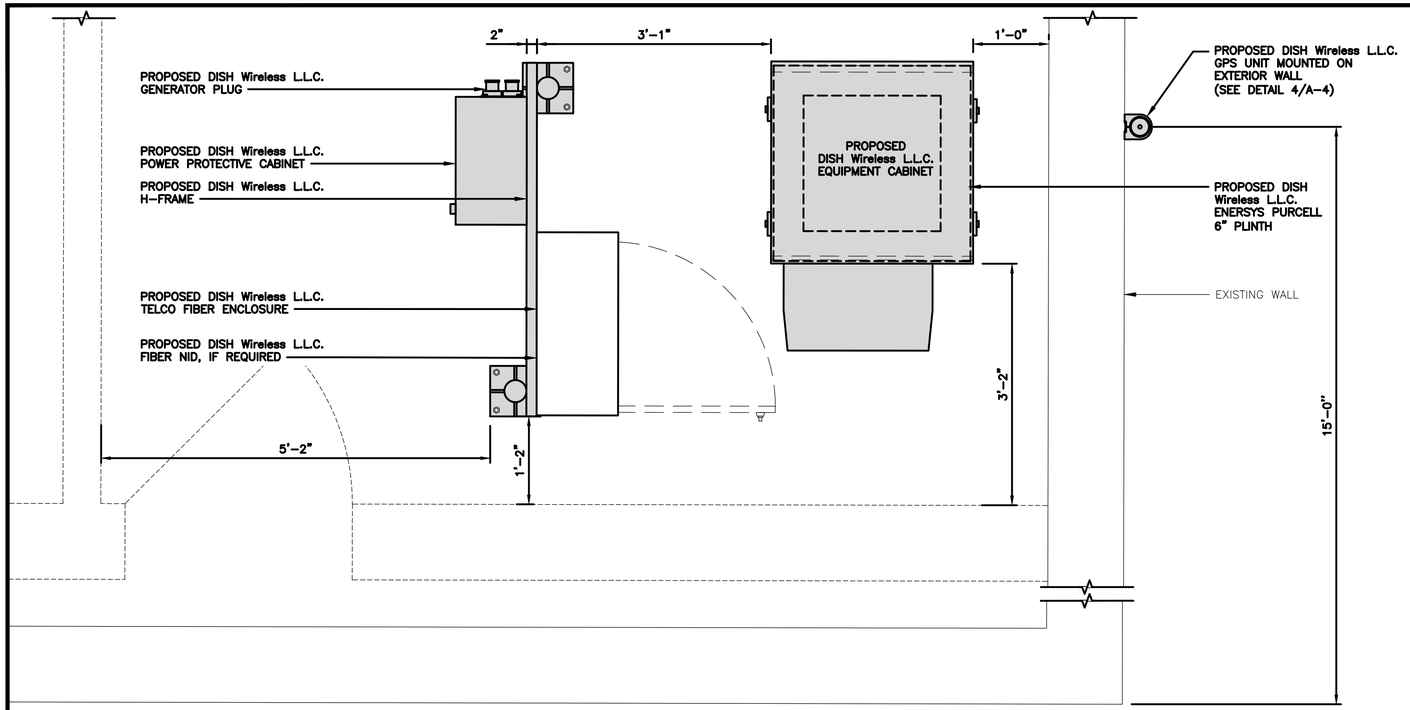
NJJER02044B
623 PINE ST,
BRIDGEPORT, CT 06605

SHEET TITLE

ELEVATION, ANTENNA LAYOUT AND SCHEDULE

SHEET NUMBER

A-2



EQUIPMENT PLAN

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

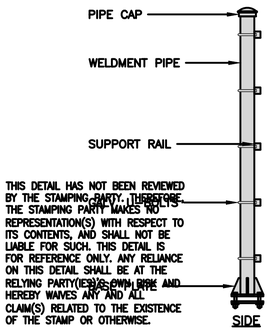
1

NOT USED

NO SCALE 2

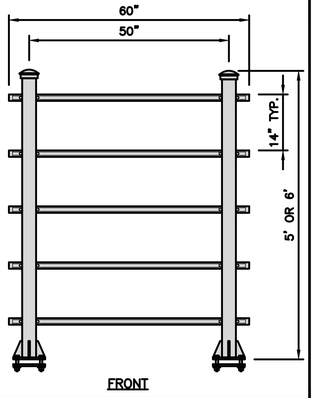
COMMSCOPE MTC4045HFLD H-FRAME

UNISTRUT/SUPPORT RAILS QTY	5
WEIGHT	59.74 lbs



SIDE

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



FRONT

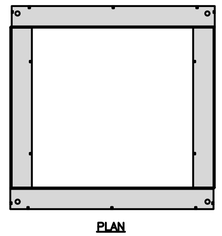
H-FRAME DETAIL

NO SCALE 3

ENERSYS PURCELL 1000034439 – PLINTH 6 INCH

DIMENSIONS (HxWxD):	6"x 30.188"x 29.982"

NOTE: GASKET AND MOUNTING HARDWARE INCLUDED



PLAN

SIDE

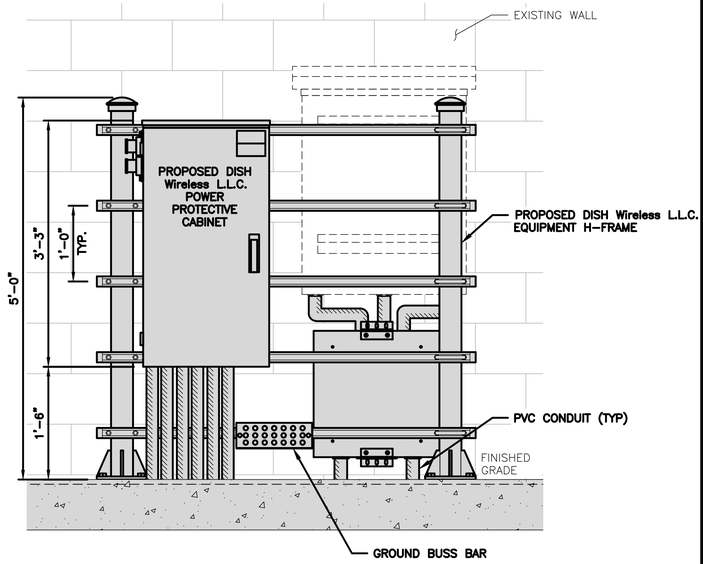
FRONT/BACK

PLINTH DETAIL

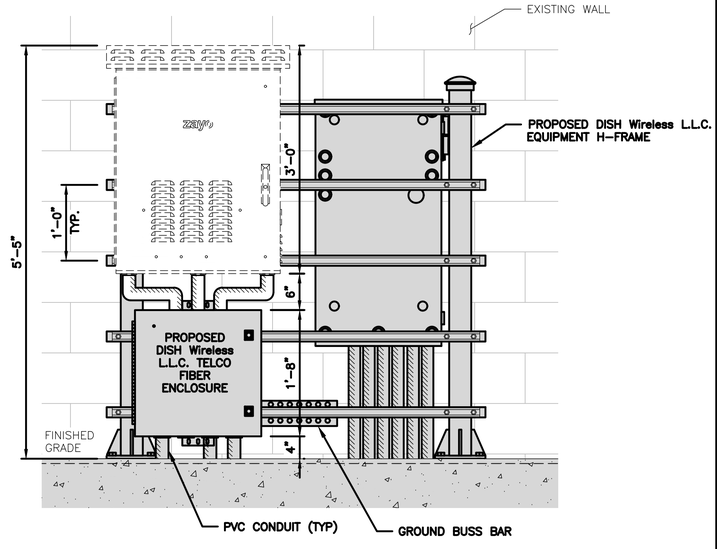
NO SCALE 4

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"

H-FRAME EQUIPMENT ELEVATION

5

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5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120

MK DEVELOPMENT
140 BEACH 137TH STREET
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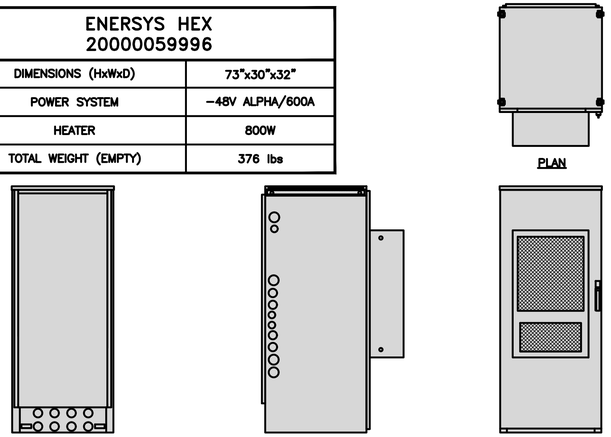
SHEET TITLE

EQUIPMENT PLATFORM AND H-FRAME DETAILS

SHEET NUMBER

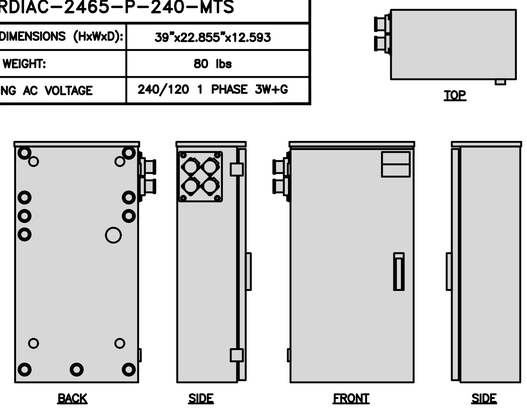
A-3

ENERSYS HEX 20000059996	
DIMENSIONS (HxWxD)	73"x30"x32"
POWER SYSTEM	-48V ALPHA/600A
HEATER	800W
TOTAL WEIGHT (EMPTY)	376 lbs



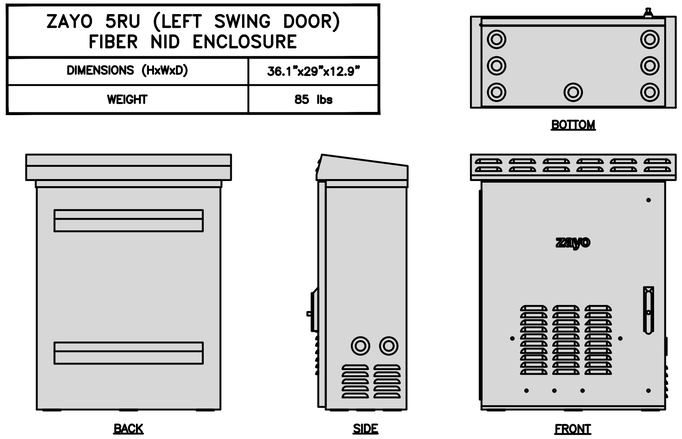
CABINET DETAIL | NO SCALE | 1

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

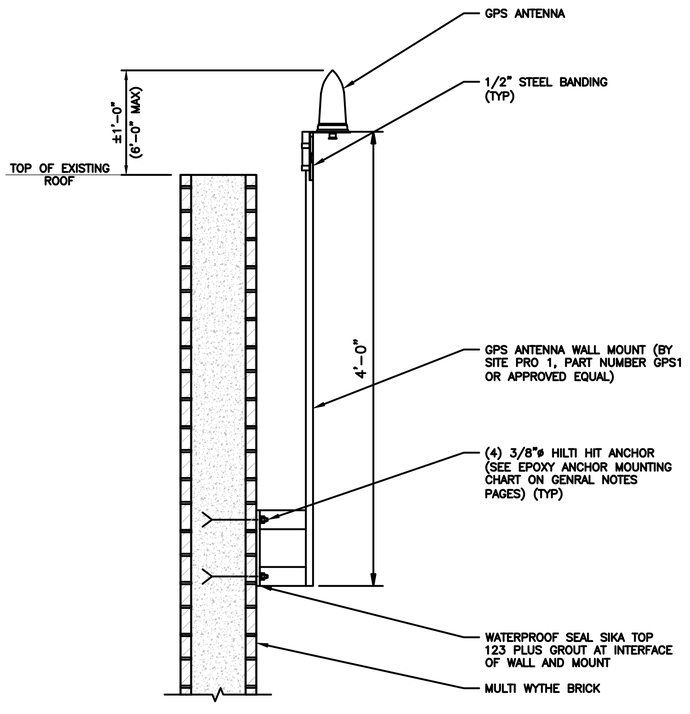


POWER PROTECTION CABINET (PPC) DETAIL | NO SCALE | 2

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

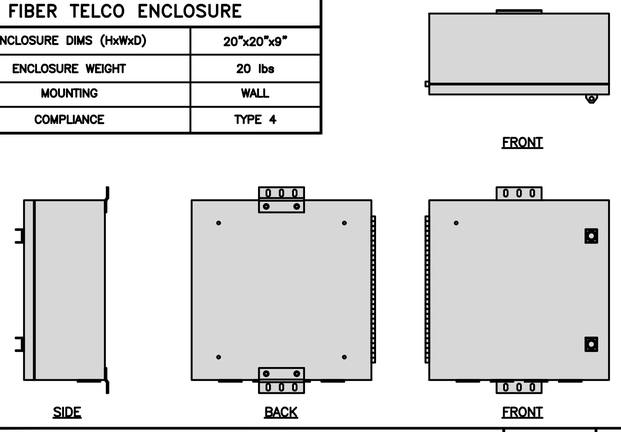


FIBER NID ENCLOSURE DETAIL | NO SCALE | 3



GPS WALL MOUNT DETAIL | NO SCALE | 4

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 | 5

NOT USED | NO SCALE | 6

NOT USED | NO SCALE | 7

NOT USED | NO SCALE | 8

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5701 SOUTH SANTA FE DRIVE
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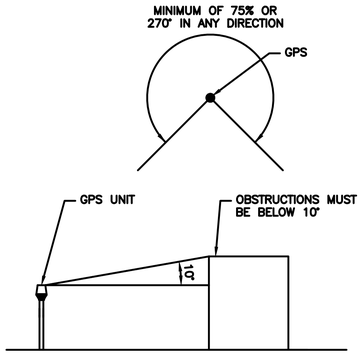
623 PINE ST,
BRIDGEPORT, CT 06605

SHEET TITLE

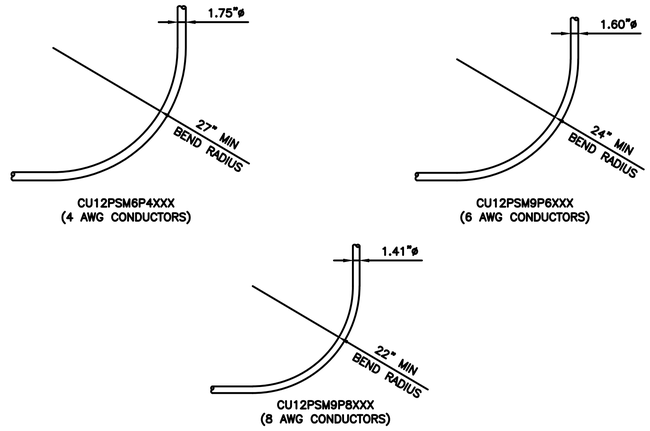
EQUIPMENT DETAILS

SHEET NUMBER

A-4



GPS MINIMUM SKY VIEW REQUIREMENTS | NO SCALE | 1



CABLES UNLIMITED HYBRID CABLE
MINIMUM BEND RADIUSES | NO SCALE | 2

NOT USED | NO SCALE | 3

NOT USED | NO SCALE | 4

NOT USED | NO SCALE | 5

NOT USED | NO SCALE | 6

NOT USED | NO SCALE | 4

NOT USED | NO SCALE | 7

NOT USED | NO SCALE | 8

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5701 SOUTH SANTA FE DRIVE
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BRIDGEPORT, CT 06605

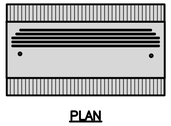
SHEET TITLE

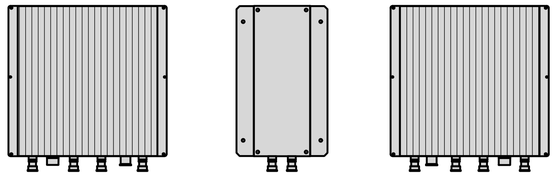
EQUIPMENT DETAILS

SHEET NUMBER

A-5

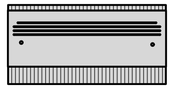
FUJITSU TRIPLE BAND TA08025-B605	
DIMENSIONS (HxWxD)	14.9"x15.7"x9"
WEIGHT	74.95 lbs
CONNECTOR TYPE	4.3-10 RF CONNECTOR
POWER SUPPLY	DC -58~-36V

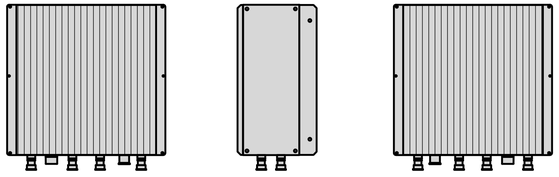

PLAN


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

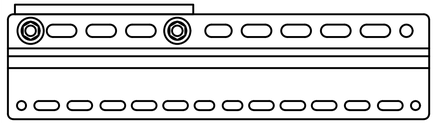

PLAN

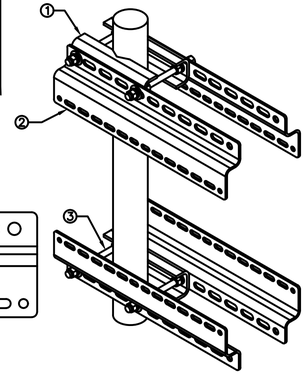

BACK SIDE FRONT

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"

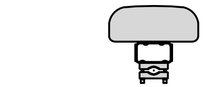


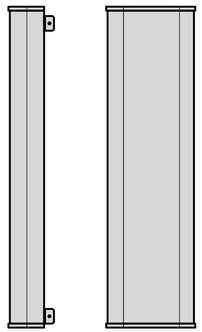


NOTE:
OR DISH Wireless L.L.C.
APPROVED EQUIVALENT

RRH MOUNT DETAIL — NO SCALE — 3

JMA MX08FRO665-21	
DIMENSIONS (HxWxD)	72"x20.0"x8.0"
RF PORTS, CONNECTOR TYPE	8 x 4.3-10 FEMALE
WEIGHT	64.5 lbs
WEIGHT WITH BRACKETS	82.5 lbs

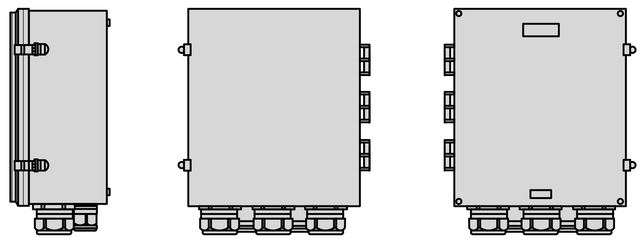

PLAN


SIDE FRONT

ANTENNA DETAIL — NO SCALE — 4

RAYCAP RDIDC-9181-PF-48 DC SURGE PROTECTION (OVP)	
DIMENSIONS (HxWxD)	18.98"x14.39"x8.15"
WEIGHT	21.82 LBS


PLAN

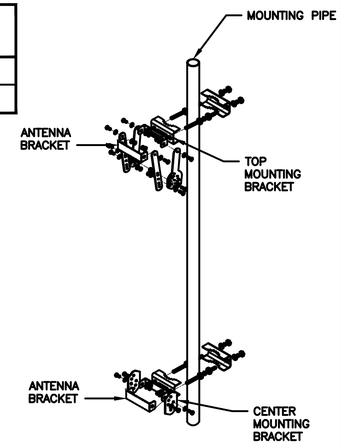

SIDE BACK FRONT

SURGE SUPPRESSION DETAIL (OVP) — NO SCALE — 5

JMA ANTENNA MOUNT BRACKET #91900318	
TOTAL WEIGHT (WITH BRACKETS)	18 lbs (8.18 Kg)
POLE DIAMETER RANGE	2.5" TO 4.5"

NOTE:
KIT #91900318: TOP AND BOTTOM BRACKETS FOR 4-,6-, AND 8-FOOT ANTENNAS

ANTENNA BRACKET NOT PART OF KIT

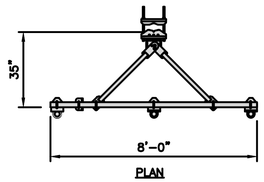


NOTE:
OR DISH Wireless L.L.C.
APPROVED EQUIVALENT

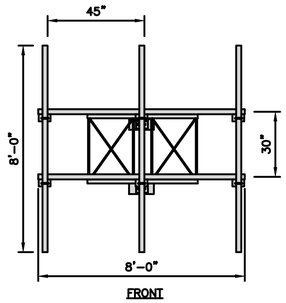
ANTENNA BRACKET DETAIL — NO SCALE — 6

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 — 4

NOT USED — NO SCALE — 7

NOT USED — NO SCALE — 8

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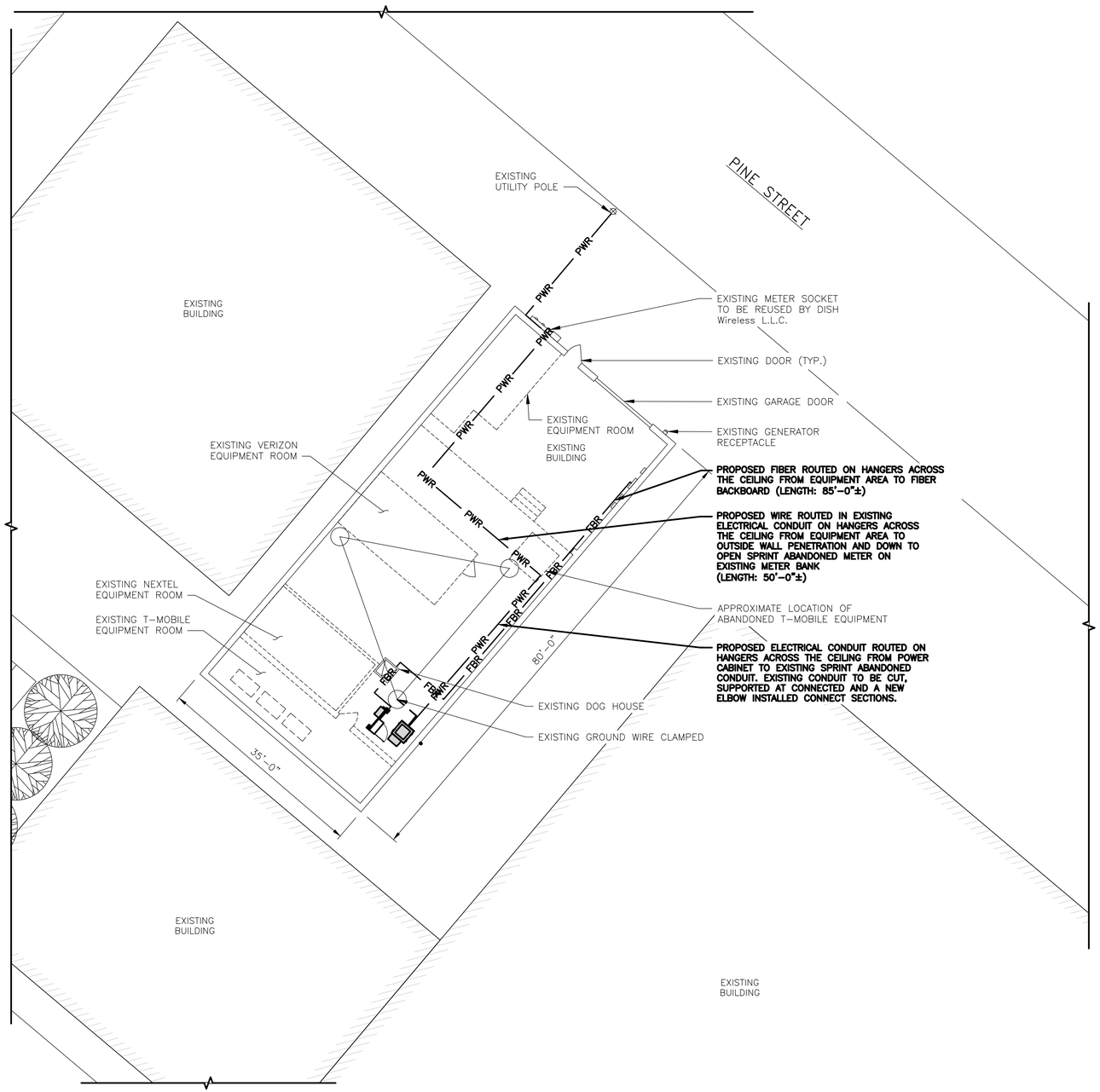
SHEET TITLE
EQUIPMENT DETAILS

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 DOES NOT SPECIFY OUR 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 PLAEASE LOCATE AND FOLLOW EXSITING PATH. IF EXISTING PATH IS NOT AN OPTION PLEASE NOTIFY TOWER OWNER AS FURTHER COORINATION 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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ROCKAWAY, NY 11694

STATE OF CONNECTICUT
BRET J MAGNUSON
6/10/2022
33678
LICENSED PROFESSIONAL ENGINEER

DRAWN BY:	CHECKED BY:	APPROVED BY:
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RFDS REV #: 1

CONSTRUCTION DOCUMENTS

SUBMITTALS

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A&E PROJECT NUMBER
NJJER02044B

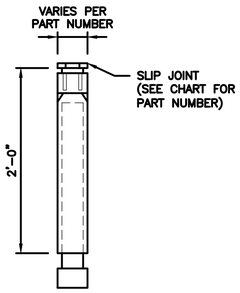
DISH Wireless L.L.C.
PROJECT INFORMATION
NJJER02044B
623 PINE ST,
BRIDGEPORT, CT 06605

SHEET TITLE
ELECTRICAL/FIBER ROUTE PLAN AND NOTES

SHEET NUMBER
E-1

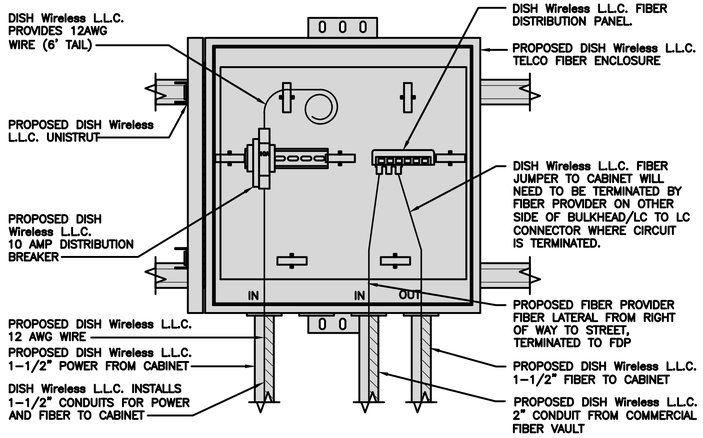
CARLON EXPANSION FITTINGS

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"

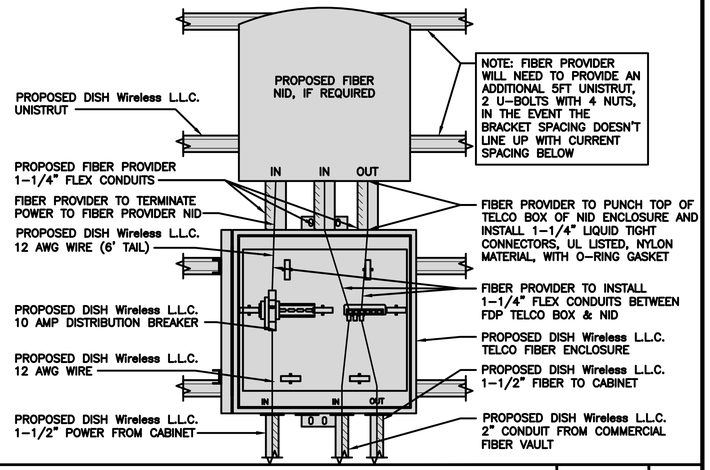


NOTE:
CONTRACTOR TO INSTALL EXPANSION FITTING SLIP JOINT AT METER CENTER CONDUIT TERMINATION, AS PER LOCAL UTILITY POLICY, ORDINANCE AND/OR SPECIFIED REQUIREMENT.

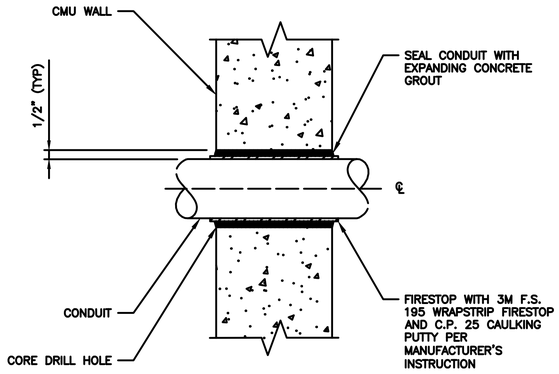
EXPANSION JOINT DETAIL | NO SCALE | 1



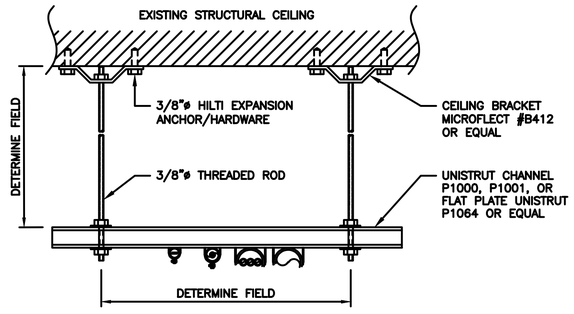
DARK TELCO BOX – INTERIOR WIRING LAYOUT | NO SCALE | 2



LIT TELCO BOX – INTERIOR WIRING LAYOUT (OPTIONAL) | NO SCALE | 3



WALL CORE DRILL DETAIL (AS REQUIRED) | NO SCALE | 4



CONDUIT SUPPORT DETAIL – CEILING | 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
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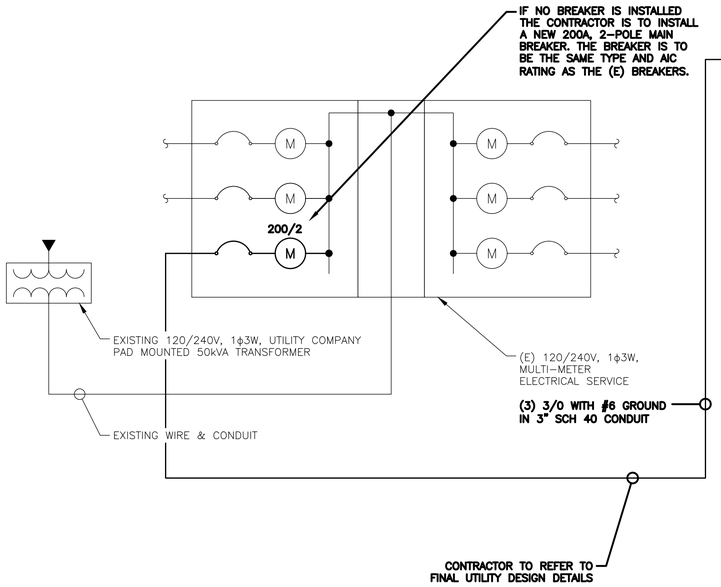
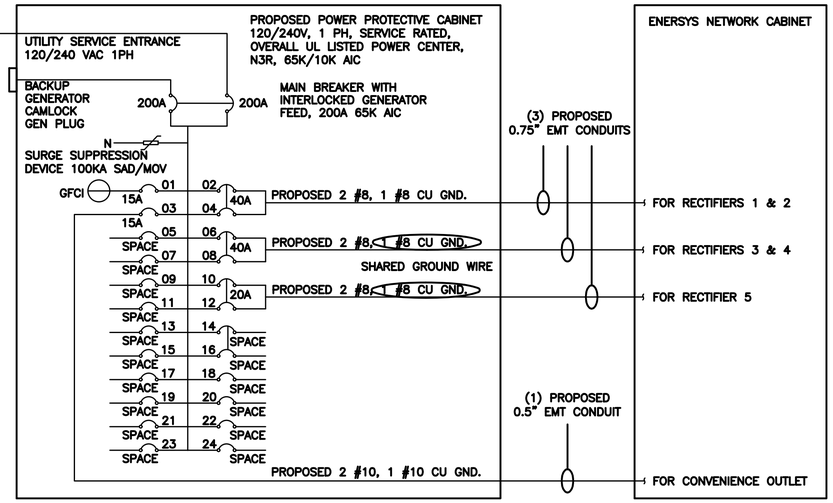
BRIDGEPORT, CT 06605

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:
(2) 40A, 2P BREAKER – SQUARE D P/N:QO240
(1) 20A, 2P BREAKER – SQUARE D P/N:QO220
(1) 20A, 1P BREAKER – SQUARE D P/N:QO120

NOTES

THE ENGINEER OF RECORD HAS PERFORMED ALL REQUIRED SHORT CIRCUIT CALCULATIONS AND THE AIC RATINGS FOR EACH DEVICE IS ADEQUATE TO PROTECT THE EQUIPMENT AND THE ELECTRICAL SYSTEM.

THE ENGINEER OF RECORD HAS PERFORMED ALL REQUIRED VOLTAGE DROP CALCULATIONS AND ALL BRANCH CIRCUIT AND FEEDERS COMPLY WITH THE NEC (LISTED ON T-1) ARTICLE 210.19(A)(1) FPN NO. 4.

CONDUIT SIZING: AT 40% FILL PER NEC CHAPTER 9, TABLE 4, ARTICLE 358.
0.5" CONDUIT – 0.122 SQ. IN AREA
0.75" CONDUIT – 0.213 SQ. IN AREA
2.0" CONDUIT – 1.316 SQ. IN AREA
3.0" CONDUIT – 2.907 SQ. IN AREA

CABINET CONVENIENCE OUTLET CONDUCTORS (1 CONDUIT): USING THWN-2, CU.

#10 – 0.0211 SQ. IN X 2 =	0.0422 SQ. IN
#10 – 0.0211 SQ. IN X 1 =	0.0211 SQ. IN <GROUND
TOTAL	= 0.0633 SQ. IN

0.5" EMT CONDUIT IS ADEQUATE TO HANDLE THE TOTAL OF (3) WIRES, INCLUDING GROUND WIRE, AS INDICATED ABOVE.

RECTIFIER CONDUCTORS (3 CONDUITS): USING UL1015, CU.

#8 – 0.0552 SQ. IN X 2 =	0.1103 SQ. IN
#8 – 0.0131 SQ. IN X 1 =	0.0131 SQ. IN <BARE GROUND
TOTAL	= 0.1234 SQ. IN

0.75" EMT CONDUIT IS ADEQUATE TO HANDLE THE TOTAL OF (3) 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.

PPC ONE-LINE DIAGRAM

NO SCALE | 1

PROPOSED ENERSYS PANEL SCHEDULE

LOAD SERVED	VOLT AMPS (WATTS) L1	VOLT AMPS (WATTS) L2	TRIP	CKT #	PHASE	CKT #	TRIP	VOLT AMPS (WATTS) L1	VOLT AMPS (WATTS) L2	LOAD SERVED
PPC GFCI OUTLET	180		15A	1	A	2	40A	3840		ENERSYS ALPHA CORDEX
ENERSYS GFCI OUTLET		180	15A	3	B	4			3840	RECTIFIERS 1 & 2
-SPACE-				5	A	6	40A	3840		ENERSYS ALPHA CORDEX
-SPACE-				7	B	8			3840	RECTIFIER 3 & 4
-SPACE-				9	A	10	20A	1920		ENERSYS ALPHA CORDEX
-SPACE-				11	B	12			1920	RECTIFIER 5
-SPACE-				13	A	14				-SPACE-
-SPACE-				15	B	16				-SPACE-
-SPACE-				17	A	18				-SPACE-
-SPACE-				19	B	20				-SPACE-
-SPACE-				21	A	22				-SPACE-
-SPACE-				23	B	24				-SPACE-
VOLTAGE AMPS	180	180						9600	9600	
200A MCB, 1ϕ, 24 SPACE, 120/240V			L1		L2					
MB RATING: 65,000 AIC			9780		9780		VOLTAGE AMPS			
			81		81		AMPS			
			81				MAX AMPS			
			102				MAX 125%			

PANEL SCHEDULE

NO SCALE | 2

NOT USED

NO SCALE | 3

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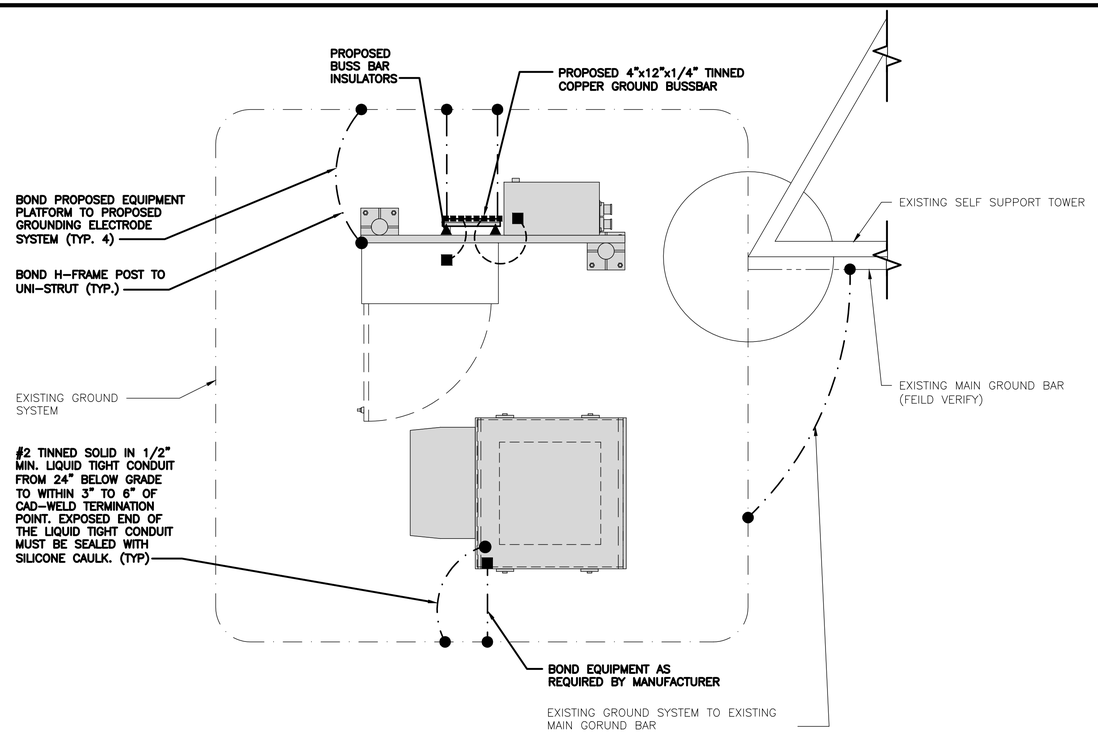
623 PINE ST,
BRIDGEPORT, CT 06605

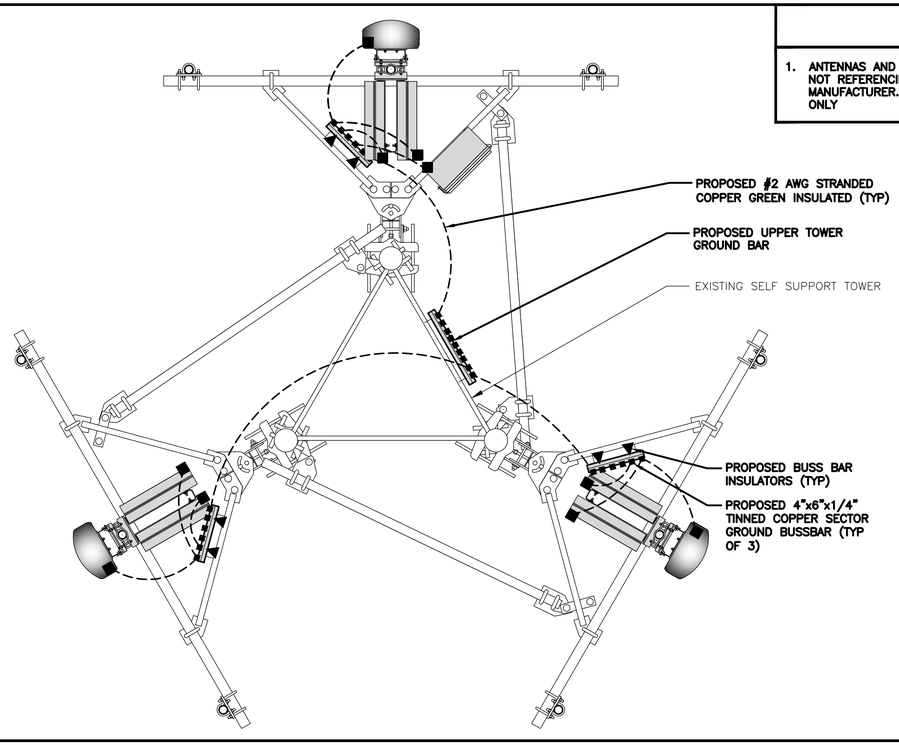
SHEET TITLE
ELECTRICAL ONE-LINE, FAULT CALCS & PANEL SCHEDULE

SHEET NUMBER
E-3



TYPICAL EQUIPMENT GROUNDING PLAN

NO SCALE | 1



TYPICAL ANTENNA GROUNDING PLAN

NO SCALE | 2

NOTES

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

- 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: #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: THE 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 GROUND SYSTEM AND THE BUILDING GROUND SYSTEM USING MINIMUM #2 AWG SOLID COPPER CONDUCTORS.

(C) INTERIOR: #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 WITH #6 AWG STRANDED GREEN INSULATED CONDUCTOR.

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

(E) 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 WITH (2) #2 SOLID TINNED COPPER CONDUCTORS.

(F) HATCH PLATE GROUND BAR: BOND TO THE INTERIOR 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 USING (2) TWO #2 AWG STRANDED GREEN INSULATED COPPER CONDUCTORS EACH.

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

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

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

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

(K) FENCE AND GATE GROUNDING: METAL FENCES WITHIN 7 FEET OF THE EXTERIORIOR OBJECTS BONDED TO THE EXTERIOR SHALL BE BONDED 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.

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

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

(N) 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.

(O) TOWER TOP COLLECTOR BUSS BAR IS TO BE MECHANICALLY BONDED TO PROPOSED ANTENNA MOUNT COLLAR.

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

GROUNDING KEY NOTES

NO SCALE | 3

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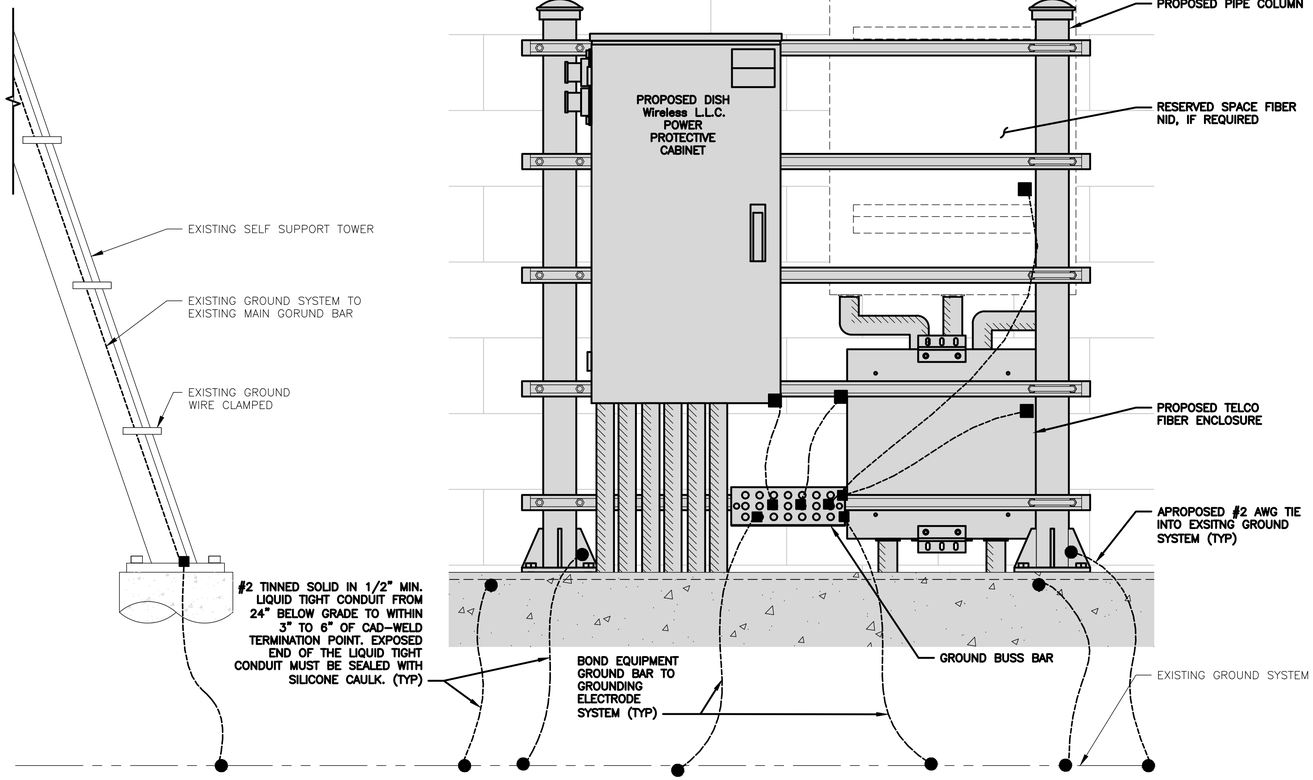
BRIDGEPORT, CT 06605

SHEET TITLE
GROUNDING PLANS AND NOTES

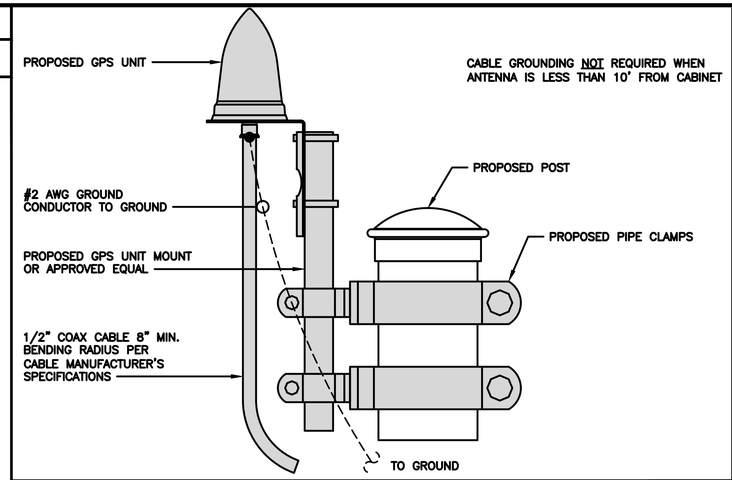
SHEET NUMBER
G-1

NOTES

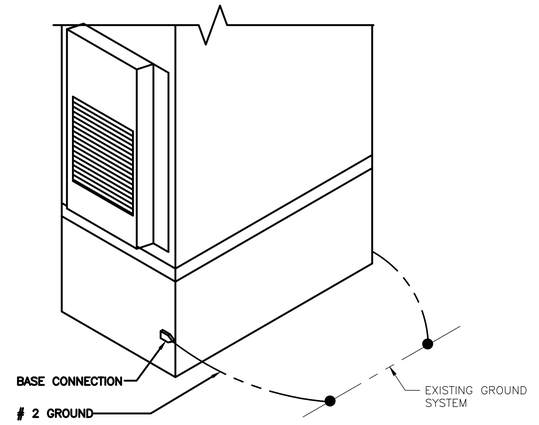
EQUIPMENT CABINET OMITTED FOR CLARITY



H-FRAME GROUNDING DETAIL | NO SCALE | 1



TYPICAL GPS UNIT GROUNDING | NO SCALE | 2



OUTDOOR CABINET GROUNDING | NO SCALE | 3

NOT USED | NO SCALE | 4

NOT USED | NO SCALE | 5

NOT USED | NO SCALE | 6

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SHEET TITLE

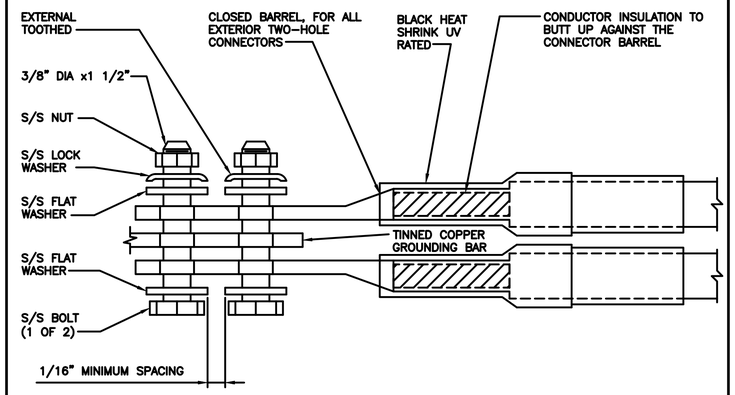
GROUNDING DETAILS

SHEET NUMBER

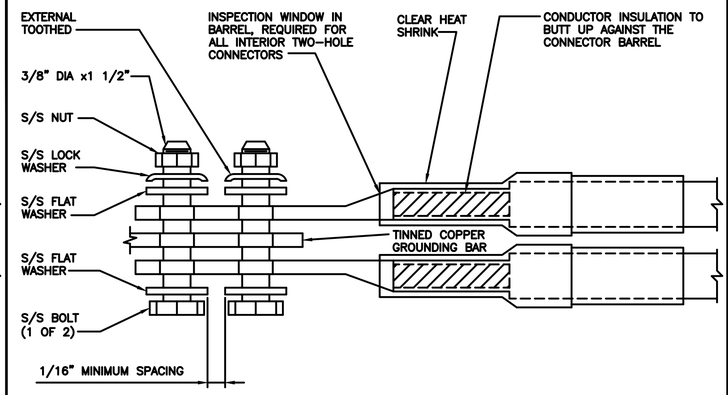
G-2

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).

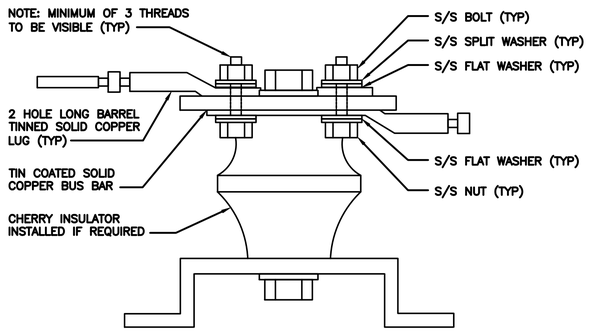
TYPICAL GROUNDING NOTES | NO SCALE | 1



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 | 4

NOT USED | NO SCALE | 7

NOT USED | NO SCALE | 8

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A	05/16/2022	ISSUED FOR REVIEW
0	06/08/2022	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER

NJJER02044B

DISH Wireless L.L.C.
PROJECT INFORMATION

NJJER02044B
623 PINE ST,
BRIDGEPORT, CT 06605

SHEET TITLE

GROUNDING DETAILS

SHEET NUMBER

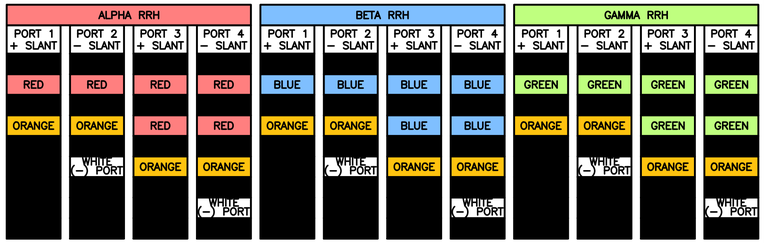
G-3

HYBRID/DISCREET CABLES

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

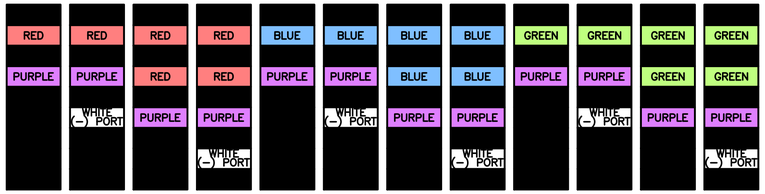
LOW–BAND RRH
(600 MHz N71 BASEBAND) +
(850 MHz N26 BAND) +
(700 MHz N29 BAND) – OPTIONAL PER MARKET

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)



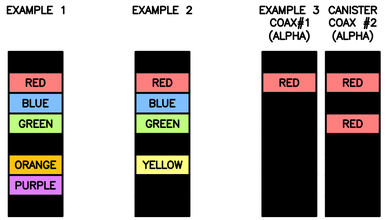
HYBRID/DISCREET CABLES

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.

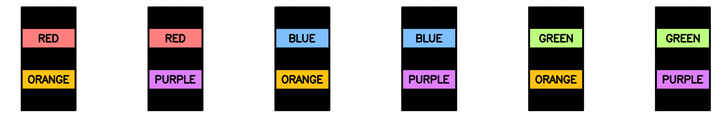


FIBER JUMPERS TO RRHs

LOW–BAND HHR FIBER CABLES HAVE SECTOR STRIPE ONLY.

POWER CABLES TO RRHs

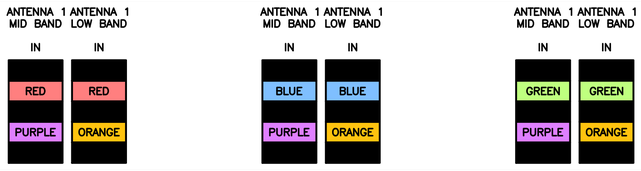
LOW–BAND RRH POWER CABLES HAVE SECTOR STRIPE ONLY



RET MOTORS AT ANTENNAS

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

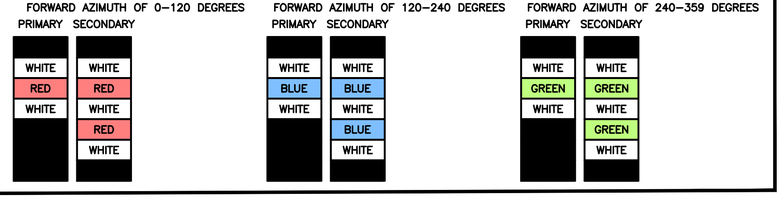
SEPARATE RET CABLES ARE USED WHEN ANTENNA PORTS PROVIDE INPUTS FOR BOTH LOW AND MID BANDS.



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.



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

NOT USED

NOT USED

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

MK DEVELOPMENT
140 BEACH 137TH STREET
ROCKAWAY, NY 11694

STATE OF CONNECTICUT
BRET J MAGNUSON
6/10/2022
33678
LICENSED PROFESSIONAL ENGINEER

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

RFDS REV #: 1

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SHEET TITLE
RF CABLE COLOR CODES

SHEET NUMBER
RF-1

EXOTHERMIC CONNECTION

MECHANICAL CONNECTION

BUSS BAR INSULATOR

CHEMICAL ELECTROLYTIC GROUNDING SYSTEM

TEST CHEMICAL ELECTROLYTIC GROUNDING SYSTEM

EXOTHERMIC WITH INSPECTION SLEEVE

GROUNDING BAR

GROUND ROD

TEST GROUND ROD WITH INSPECTION SLEEVE

SINGLE POLE SWITCH

DUPLEX RECEPTACLE

DUPLEX GFCI RECEPTACLE

FLUORESCENT LIGHTING FIXTURE (2) TWO LAMPS 48–T8

SMOKE DETECTION (DC)

EMERGENCY LIGHTING (DC)

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

CHAIN LINK FENCE

WOOD/WROUGHT IRON FENCE

WALL STRUCTURE

LEASE AREA

PROPERTY LINE (PL)

SETBACKS

ICE BRIDGE

CABLE TRAY

WATER LINE

UNDERGROUND POWER

UNDERGROUND TELCO

OVERHEAD POWER

OVERHEAD TELCO

UNDERGROUND TELCO/POWER

ABOVE GROUND POWER

ABOVE GROUND TELCO

ABOVE GROUND TELCO/POWER

WORKPOINT

SECTION REFERENCE

DETAIL REFERENCE

LEGEND

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

ABBREVIATIONS

dish wireless.

5701 SOUTH SANTA FE DRIVE
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BRIDGEPORT, CT 06605

SHEET TITLE

LEGEND AND ABBREVIATIONS

SHEET NUMBER

GN-1

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.
5701 SOUTH SANTA FE DRIVE
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BRETT J MAGRAM
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SHEET TITLE

GENERAL NOTES

SHEET NUMBER

GN-2

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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STATE OF CONNECTICUT
BRETT J MAGNUSON
6/10/2022
33678
LICENSED PROFESSIONAL ENGINEER

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

RFDS REV #: 1

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
A	05/16/2022	ISSUED FOR REVIEW
0	06/08/2022	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER

NJJER02044B

DISH Wireless L.L.C.
PROJECT INFORMATION

NJJER02044B
623 PINE ST,
BRIDGEPORT, CT 06605

SHEET TITLE

GENERAL NOTES

SHEET NUMBER

GN-3

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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DRAWN BY:	CHECKED BY:	APPROVED BY:
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DISH Wireless L.L.C.
PROJECT INFORMATION

NJJER02044B
623 PINE ST,
BRIDGEPORT, CT 06605

SHEET TITLE

GENERAL NOTES

SHEET NUMBER

GN-4

MK DEVELOPMENT

EXHIBIT D

Structural Analysis

STRUCTURAL ANALYSIS REPORT

For

dish wireless

O4 Innovations
87 Lackawanna Avenue, Suite 202
Totowa, NJ 07512

Bridgeport
Dish Site ID NJJER02044B
KM No. 220101.00

250' Self-Support Tower
623 Pine Street
Bridgeport, CT 06605

Prepared By:

KM CONSULTING ENGINEERS, INC.
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Ph: (609) 538-0400 www.kmengr.com

May 16, 2022

Prepared to ANSI/TIA-222-G-4 December 2014
Structural Standard for Antenna Supporting
Structures and Antennas

O4 Innovations
Bridgeport (NJJER02044B)

TABLE OF CONTENTS

Load Case No. 1: Existing tower superstructure with existing inventory, proposed Dish Wireless installation, and proposed tower reinforcement.

1.0 EXECUTIVE SUMMARY

Structure

Owner: Radio Communications Tower

Location: 623 Pine Street
Bridgeport, CT 06605

Manufacturer: Rohn
Eng. File No. 3767AE dated 3/25/99

Equipment

Existing tower inventory plus the proposed installation are detailed in Section 2.0 "Tower Inventory."

Synopsis

Load Case No. 1: The existing tower superstructure with the existing tower inventory, proposed Dish Wireless installation, and proposed reinforcement.

The existing tower superstructure and base foundation have sufficient capacity for the proposed installation and therefore meet the current ANSI/TIA-222-G design standards. The tower superstructure is rated at 98.7% and the foundation is rated at 75.7%.

2.0 TOWER INVENTORY

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Yagi w/Radome	257	HPA65R-BU8A (ATI)	138
9' Whip	257	HPA65R-BU8A (ATI)	138
9' Whip	257	HPA65R-BU8A (ATI)	138
Beacon	256	AIR 6449 N77 (ATI)	138
Top Platform	256	AIR 6449 N77 (ATI)	138
18' Inverted Whip	256	AIR 6449 N77 (ATI)	138
Yagi w/Radome	256	B14 4478 RRH (ATI)	138
18' Whip	256	B14 4478 RRH (ATI)	138
21' Whip	256	B14 4478 RRH (ATI)	138
10' Whip	232	Radio 4449 B5/B12 (ATI)	138
10' Whip	232	Radio 4449 B5/B12 (ATI)	138
6' Side Arm	232	Radio 4449 B5/B12 (ATI)	138
6' Side Arm	232	B2/B66A 8843 RRH (ATI)	138
AIR 6449 B41 (T-Mobile)	181	B2/B66A 8843 RRH (ATI)	138
AIR 6449 B41 (T-Mobile)	181	B2/B66A 8843 RRH (ATI)	138
AIR 6449 B41 (T-Mobile)	181	Radio 4415 B30 (ATI)	138
AIR 3246 B66 (T-Mobile)	180	Radio 4415 B30 (ATI)	138
AIR 3246 B66 (T-Mobile)	180	Radio 4415 B30 (ATI)	138
Radio 4449 B71/B85 (T-Mobile)	180	RRUS-E2 RRH (ATI)	138
Radio 4449 B71/B85 (T-Mobile)	180	RRUS-E2 RRH (ATI)	138
Radio 4449 B71/B85 (T-Mobile)	180	RRUS-E2 RRH (ATI)	138
Radio 2212 B25 (T-Mobile)	180	DC9-48-60-24-8C-EV Squid (ATI)	138
Radio 2212 B25 (T-Mobile)	180	DC9-48-60-24-8C-EV Squid (ATI)	138
Radio 2212 B25 (T-Mobile)	180	DC9-48-60-24-8C-EV Squid (ATI)	138
Twin style 1B TMA (T-Mobile)	180	HPCPE-80BW (Sprint)	131
Twin style 1B TMA (T-Mobile)	180	VHLP1-23-2WH (Sprint)	131
Twin style 1B TMA (T-Mobile)	180	VHLP2.5-11-4WH (Sprint)	131
SBX1926Q-43 TMA (T-Mobile)	180	Yagi	112
SBX1926Q-43 TMA (T-Mobile)	180	(2) APL-866513-42T9 (Verizon)	110
SBX1926Q-43 TMA (T-Mobile)	180	(2) JAHH-65B-R3B on mount (Verizon)	110
AIR 3246 B66 (T-Mobile)	180	C-band 64T64R MMU (Verizon)	110
16' T-Frame Mount (T-Mobile)	180	(2) APL-866513-42T6 (Verizon)	110
16' T-Frame Mount (T-Mobile)	180	(2) APL-866513-42T9 (Verizon)	110
16' T-Frame Mount (T-Mobile)	180	B5/B13 Dual RRH (Verizon)	110
APXVAARR24_43-U-NA20 (T-Mobile)	179	CBC78T-DS-43-2X (Verizon)	110
APXVAARR24_43-U-NA20 (T-Mobile)	179	CBC78T-DS-43-2X (Verizon)	110
APXVAARR24_43-U-NA20 (T-Mobile)	179	CBC78T-DS-43-2X (Verizon)	110
MTC3975083 V-frame (Dish Wireless)	151	Raycap 6-OVP (Verizon)	110
MTC3975083 V-frame (Dish Wireless)	151	Raycap 6-OVP (Verizon)	110
MTC3975083 V-frame (Dish Wireless)	151	Raycap 6-OVP (Verizon)	110
MX08FRO665-21 (Dish Wireless)	151	(2) JAHH-65B-R3B on mount (Verizon)	110
MX08FRO665-21 (Dish Wireless)	151	12' V-Frame Mount (Verizon)	110
MX08FRO665-21 (Dish Wireless)	151	12' V-Frame Mount (Verizon)	110
TA08025-B605 (Dish Wireless)	151	C-band 64T64R MMU (Verizon)	110
TA08025-B605 (Dish Wireless)	151	C-band 64T64R MMU (Verizon)	110
TA08025-B605 (Dish Wireless)	151	6' pipe mount (Verizon)	110
TA08025-B604 (Dish Wireless)	151	6' pipe mount (Verizon)	110
TA08025-B604 (Dish Wireless)	151	6' pipe mount (Verizon)	110
TA08025-B604 (Dish Wireless)	151	9' pipe mount (Verizon)	110
RDIDC-9181-PF-48 (Dish Wireless)	151	9' pipe mount (Verizon)	110
C10857278C V-Frame Mount (ATI)	138	9' pipe mount (Verizon)	110
C10857278C V-Frame Mount (ATI)	138	B2/B66A Dual RRH (Verizon)	110
C10857278C V-Frame Mount (ATI)	138	B2/B66A Dual RRH (Verizon)	110
DMP65R-BU8DA-K (ATI)	138	B2/B66A Dual RRH (Verizon)	110
DMP65R-BU8DA-K (ATI)	138	B5/B13 Dual RRH (Verizon)	110
DMP65R-BU8DA-K (ATI)	138	B5/B13 Dual RRH (Verizon)	110
TPA65R-BU6DA-K (ATI)	138	GPS antenna (Verizon)	110
TPA65R-BU6DA-K (ATI)	138	(2) JAHH-65B-R3B on mount (Verizon)	110
TPA65R-BU6DA-K (ATI)	138	12' V-Frame Mount (Verizon)	110

Proposed Dish Wireless Installation:

*(3) MX08FRO665-21 panel antennas @ 151' AGL
*(3) TA08025-B605 radios @ 151' AGL
*(3) TA08025-B604 radios @ 151' AGL
*(1) RDIDC-9181-PF-48 OVP (alpha sector only) @ 151' AGL
*(3) MTC3975083 V-frames @ 151' AGL
*(1) CU12PSM6P4XXX_4AWG hybrid cable up to 151' AGL

3.0 COMMENTARY

Our scope of work is to determine if the existing structure is capable of withstanding the additional stresses/forces imposed by the installation of the proposed Dish Wireless equipment noted in the tower inventory. The tower is a 250' tall Rohn self-support tower with a triangular platform located at the top.

Tower member sizes, layout and foundation information was taken from previous structural analysis by KM Consulting Engineers, Inc. (KMCE) dated 1/27/22. Existing antenna inventory and coax cable layout was obtained from tower mapping report by Hightower Solutions dated 6/2/21 and includes proposed AT&T equipment not yet installed. Sprint equipment is scheduled to be removed from the tower and as such is removed from the tower model. Prior to installation of the Dish antennas, the Sprint equipment should be verified as removed. Proposed tower reinforcement by KMCE dated 4/22/22 are included in the tower model

The following report will provide analytical calculations and commentary regarding the capacity of the proposed tower and subsequent recommendations.

4.0 ANALYSIS PROCEDURE

KM Consulting Engineers, Inc. carried out their structural analysis by correlating field inspection and tower member data into proprietary software designed specifically for communication tower analysis.

These programs run in conjunction with the guidelines set down in the ANSI/TIA-222-G Standard entitled "Structural Standard for Antenna Supporting Structures and Antennas."

The existing tower is analyzed by placing wind forces on the structure in 30° positional increments around the tower (i.e. wind pressure directly onto the tower corners, faces and parallel to the faces). This enables the user to "create" a three-dimensional representation, yielding results for worst case scenarios. In effect, the production of these results allows the user to study the structural integrity of the tower when influenced by wind forces from any direction.

The proceeding report includes analysis for the tower with the addition of antennas in the scenarios stated. For clarity, the analysis shall include worst case loadings and a typical elevation view with maximum foundation loads tabulated.

Codes and Standards

ACI - American Concrete Institute - Building Code Requirements for Structural Concrete (ACI 318-14), 2014

AISC - American Institute of Steel Construction - Manual of Steel Construction, 14th edition, 2011

TIA - Telecommunications Industry Association – ANSI/TIA-222-G-4 Structural Standard for Antenna Supporting Structures and Antennas, 2014

CSBC - Connecticut State Building Code 2018

5.0 TOWER ANALYSIS RESULTS

The tower was analyzed for the inventory detailed in Section 2.0 “Tower Inventory”.

The basic wind speed of 97 MPH with no radial ice in accordance with ANSI/TIA-222-G is taken from Appendix N in the 2018 Connecticut State Building Code for the nominal design wind speed for the municipality of Bridgeport, CT. The basic wind speed of 50 MPH concurrent with ¾” design ice thickness is taken from the ANSI/TIA-222-G listing applicable for Fairfield County, CT. Additional criteria include Structure Class II, Exposure Category C, and Topographic Category 1.

Load Case No. 1: The proposed Dish Wireless installation consists of (3) MX08FRO665-21 panel antennas, (3) TA08025-B605 radios, (3) TA08025-B604 radios, (1) RDIDC-9181-PF-48 OVP, (3) MTC3975083 V-frames, and (1) CU12PSM6P4XXX_4AWG hybrid cable. Proposed tower reinforcement by KMCE dated 4/22/22 are included in the tower model

The existing tower superstructure and base foundation have sufficient capacity for the proposed installation and therefore meet the current ANSI/TIA-222-G design standards. The tower superstructure is rated at 98.7% and the foundation is rated at 75.7%.

Table 1. Base Foundation Rating

Force	Actual (kip·ft)	Capacity (kip·ft)	% Capacity
Overturning Moment	13,249	17,504	**75.7%**

6.0 RECOMMENDATIONS

Further to our calculations, we conclude that the existing tower superstructure with the proposed reinforcement has adequate capacity to support the proposed Dish Wireless installation and therefore meets the current ANSI/TIA-222-G design standards.

Please do not hesitate to contact our office with any questions or concerns regarding this report.

Sincerely,
KM CONSULTING ENGINEERS, INC.

Domenic Aversa, PE
Project Manager

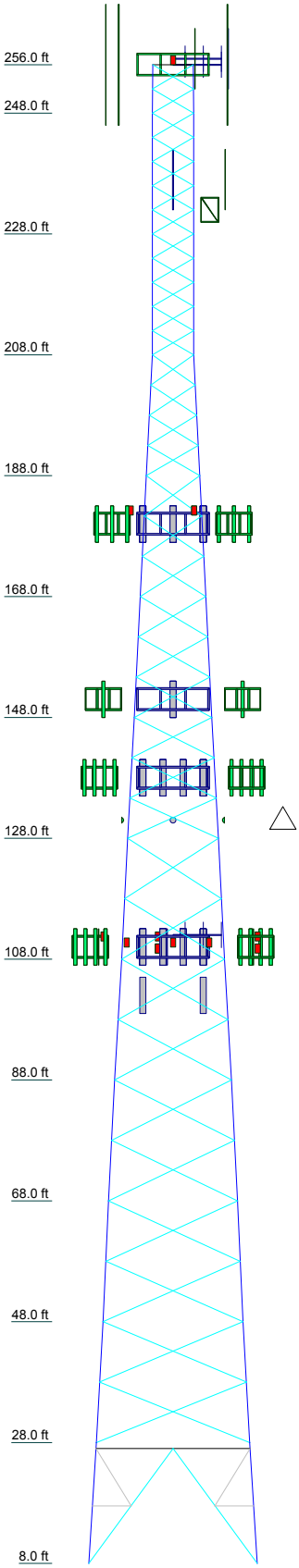
5/16/22

Reviewed and Approved by:

Michael L. Bohlinger, PE
Principal
CT License No. 20405

7.0 APPENDIX

Section	T13	T12	T11	T10	T9	T8	T7	T6	T5	T4	T3	T2	T1
Legs	P10x.5				ROHN 8 EH	ROHN 8 EHS		ROHN 6 EH		ROHN 5 EH	ROHN 4 EH	ROHN 3 EH	A
Leg Grade							A572-50						
Diagonals	D		L5x5x3/8		L4x4x0.31	L4x4x3/8	C	L3x3x1/4	L2 1/2x2 1/2x1/4		L2x2x1/4		B
Diagonal Grade				A572-50						A36			
Top Girts	ROHN 3 STD						N.A.						E
Red. Horizontals	ROHN 1.5 STD						N.A.						
Red. Diagonals	ROHN 1.5 STD						N.A.						
Red. Hips	ROHN 1.5 STD						N.A.						
Inner Bracing	ROHN 3 STD						N.A.						
Face Width (ft)	25.333	23.229	21.25	19.25	17.0833	14.989	12.916	10.916	8.916	6.833	6.9	6.604	
# Panels @ (ft)	1 @ 19			10 @ 10			9 @ 6.66667			4 @ 5		12 @ 4	
Weight (lb)	6508.8	7164.6	6887.4	6622.3	4629.8	4195.6	3673.4	2923.5	2590.2	1965.2	1660.8	1379.5	478.2



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Yagi w/Radome	257	HPA65R-BU8A (ATI)	138
9' Whip	257	HPA65R-BU8A (ATI)	138
9' Whip	257	AIR 6449 N77 (ATI)	138
Beacon	256	AIR 6449 N77 (ATI)	138
Top Platform	256	AIR 6449 N77 (ATI)	138
18' Inverted Whip	256	B14 4478 RRH (ATI)	138
Yagi w/Radome	256	B14 4478 RRH (ATI)	138
18' Whip	256	B14 4478 RRH (ATI)	138
21' Whip	256	Radio 4449 B5/B12 (ATI)	138
10' Whip	232	Radio 4449 B5/B12 (ATI)	138
10' Whip	232	Radio 4449 B5/B12 (ATI)	138
6' Side Arm	232	B2/B66A 8843 RRH (ATI)	138
6' Side Arm	232	B2/B66A 8843 RRH (ATI)	138
AIR 6449 B41 (T-Mobile)	181	B2/B66A 8843 RRH (ATI)	138
AIR 6449 B41 (T-Mobile)	181	Radio 4415 B30 (ATI)	138
AIR 6449 B41 (T-Mobile)	181	Radio 4415 B30 (ATI)	138
AIR 3246 B66 (T-Mobile)	180	Radio 4415 B30 (ATI)	138
AIR 3246 B66 (T-Mobile)	180	RRUS-E2 RRH (ATI)	138
Radio 4449 B71/B85 (T-Mobile)	180	RRUS-E2 RRH (ATI)	138
Radio 4449 B71/B85 (T-Mobile)	180	RRUS-E2 RRH (ATI)	138
Radio 4449 B71/B85 (T-Mobile)	180	DC9-48-60-24-8C-EV Squid (ATI)	138
Radio 2212 B25 (T-Mobile)	180	DC9-48-60-24-8C-EV Squid (ATI)	138
Radio 2212 B25 (T-Mobile)	180	DC9-48-60-24-8C-EV Squid (ATI)	138
Radio 2212 B25 (T-Mobile)	180	HPCPE-80BW (Sprint)	131
Twin style 1B TMA (T-Mobile)	180	VHLP1-23-2WH (Sprint)	131
Twin style 1B TMA (T-Mobile)	180	VHLP2.5-11-4WH (Sprint)	131
Twin style 1B TMA (T-Mobile)	180	Yagi	112
SBX1926Q-43 TMA (T-Mobile)	180	(2) APL-866513-42T9 (Verizon)	110
SBX1926Q-43 TMA (T-Mobile)	180	(2) JAHH-65B-R3B on mount (Verizon)	110
SBX1926Q-43 TMA (T-Mobile)	180	C-band 64T64R MMU (Verizon)	110
AIR 3246 B66 (T-Mobile)	180	(2) APL-866513-42T6 (Verizon)	110
16' T-Frame Mount (T-Mobile)	180	(2) APL-866513-42T9 (Verizon)	110
16' T-Frame Mount (T-Mobile)	180	B5/B13 Dual RRH (Verizon)	110
16' T-Frame Mount (T-Mobile)	180	CBC78T-DS-43-2X (Verizon)	110
APXVAARR24_43-U-NA20 (T-Mobile)	179	CBC78T-DS-43-2X (Verizon)	110
APXVAARR24_43-U-NA20 (T-Mobile)	179	CBC78T-DS-43-2X (Verizon)	110
APXVAARR24_43-U-NA20 (T-Mobile)	179	Raycap 6-OVP (Verizon)	110
MTC3975083 V-frame (Dish Wireless)	151	Raycap 6-OVP (Verizon)	110
MTC3975083 V-frame (Dish Wireless)	151	Raycap 6-OVP (Verizon)	110
MTC3975083 V-frame (Dish Wireless)	151	(2) JAHH-65B-R3B on mount (Verizon)	110
MX08FRO665-21 (Dish Wireless)	151	12' V-Frame Mount (Verizon)	110
MX08FRO665-21 (Dish Wireless)	151	12' V-Frame Mount (Verizon)	110
MX08FRO665-21 (Dish Wireless)	151	C-band 64T64R MMU (Verizon)	110
TA08025-B605 (Dish Wireless)	151	C-band 64T64R MMU (Verizon)	110
TA08025-B605 (Dish Wireless)	151	6' pipe mount (Verizon)	110
TA08025-B605 (Dish Wireless)	151	6' pipe mount (Verizon)	110
TA08025-B604 (Dish Wireless)	151	6' pipe mount (Verizon)	110
TA08025-B604 (Dish Wireless)	151	9' pipe mount (Verizon)	110
TA08025-B604 (Dish Wireless)	151	9' pipe mount (Verizon)	110
RDIDC-9181-PF-48 (Dish Wireless)	151	9' pipe mount (Verizon)	110
C10857278C V-Frame Mount (ATI)	138	B2/B66A Dual RRH (Verizon)	110
C10857278C V-Frame Mount (ATI)	138	B2/B66A Dual RRH (Verizon)	110
C10857278C V-Frame Mount (ATI)	138	B2/B66A Dual RRH (Verizon)	110
DMP65R-BU8DA-K (ATI)	138	B5/B13 Dual RRH (Verizon)	110
DMP65R-BU8DA-K (ATI)	138	B5/B13 Dual RRH (Verizon)	110
DMP65R-BU8DA-K (ATI)	138	GPS antenna (Verizon)	110
TPA65R-BU8DA-K (ATI)	138	(2) JAHH-65B-R3B on mount (Verizon)	110
TPA65R-BU8DA-K (ATI)	138	12' V-Frame Mount (Verizon)	110
TPA65R-BU8DA-K (ATI)	138	(2) TV 65 antenna	102
HPA65R-BU8A (ATI)	138	Sidearm Mount	102

SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	ROHN 3 STD	D	ROHN 3 STD w/L4x4x1/4
B	L1 3/4x1 3/4x3/16	E	L3x3x1/4
C	L3x3x1/4 w/3"x1/4" plate		

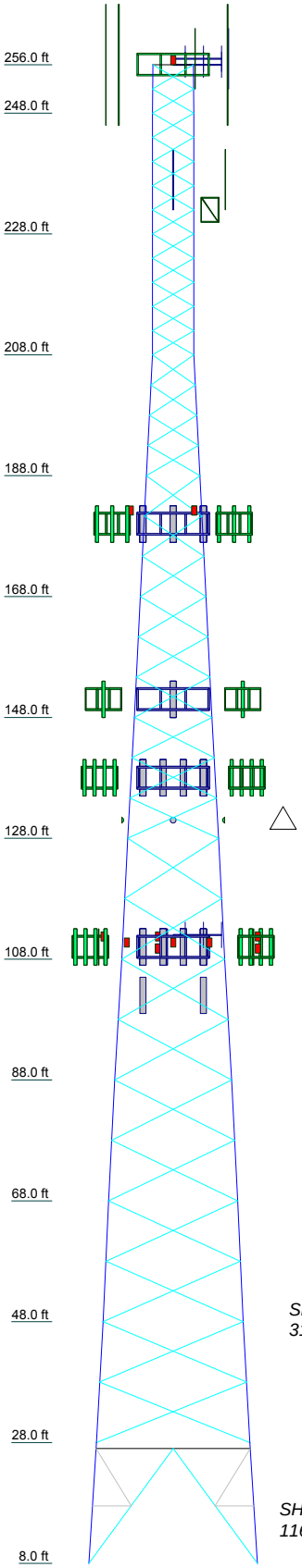
MATERIAL STRENGTH

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

KM Consulting Engineers
262 Upper Ferry Road
Ewing, NJ 08525
Phone: (609) 538-0400
FAX:
Consulting Engineers

Job: Bridgeport (NJJER02044B)			
Project: KM Project #220101.00			
Client: M+K Development	Drawn by: Domenic Aversa	App'd:	
Code: TIA-222-G	Date: 05/16/22	Scale: NTS	
Path: C:\Users\Domenic\Dropbox\Work\M&K Development\Bridgeport (NJJER02044B)\Engineering\Bridgeport (NJJER02044A) LC1.tnl		Dwg No. E-1	

Section	T13	T12	T11	T10	T9	T8	T7	T6	T5	T4	T3	T2	T1
Legs		P10x.5			ROHN 8 EH	ROHN 8 EHS		ROHN 6 EH		ROHN 5 EH	ROHN 4 EH	ROHN 3 EH	A
Leg Grade							A572-50						
Diagonals	D		L5x5x3/8		L4x4x0.31	L4x4x3/8	C	L3x3x1/4	L2 1/2x2 1/2x1/4		L2x2x1/4		B
Diagonal Grade				A572-50						A36			
Top Girts	ROHN 3 STD						N.A.						E
Red. Horizontals	ROHN 1.5 STD						N.A.						
Red. Diagonals	ROHN 1.5 STD						N.A.						
Red. Hips	ROHN 1.5 STD						N.A.						
Inner Bracing	ROHN 3 STD						N.A.						
Face Width (ft)	25.333	23.229	21.25	19.25	17.0833	14.989	12.916	10.916	8.916	6.833	6.9		6.604
# Panels @ (ft)	1 @ 19			10 @ 10			9 @ 6.66667			4 @ 5		12 @ 4	
Weight (lb)	6508.8	7164.6	6887.4	6622.3	4629.8	4195.6	3673.4	2923.5	2590.2	1965.2	1660.8	1379.5	478.2
	50679.2												



SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	ROHN 3 STD	D	ROHN 3 STD w/L4x4x1/4
B	L1 3/4x1 3/4x3/16	E	L3x3x1/4
C	L3x3x1/4 w/3"x1/4" plate		

TOWER DESIGN NOTES

1. Tower is located in Fairfield County, Connecticut.
2. Tower designed for Exposure C to the TIA-222-G Standard.
3. Tower designed for a 97 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TOWER RATING: 98.7%

ALL REACTIONS ARE FACTORED

MAX. CORNER REACTIONS AT BASE:
DOWN: 581836 lb
SHEAR: 70427 lb

UPLIFT: -499745 lb
SHEAR: 63244 lb

AXIAL 215760 lb
SHEAR 31352 lb *MOMENT 3864392 lb-ft*
TORQUE 44095 lb-ft
50 mph WIND - 0.7500 in ICE

AXIAL 96467 lb
SHEAR 116956 lb *MOMENT 13249686 lb-ft*
TORQUE 188776 lb-ft
REACTIONS - 97 mph WIND

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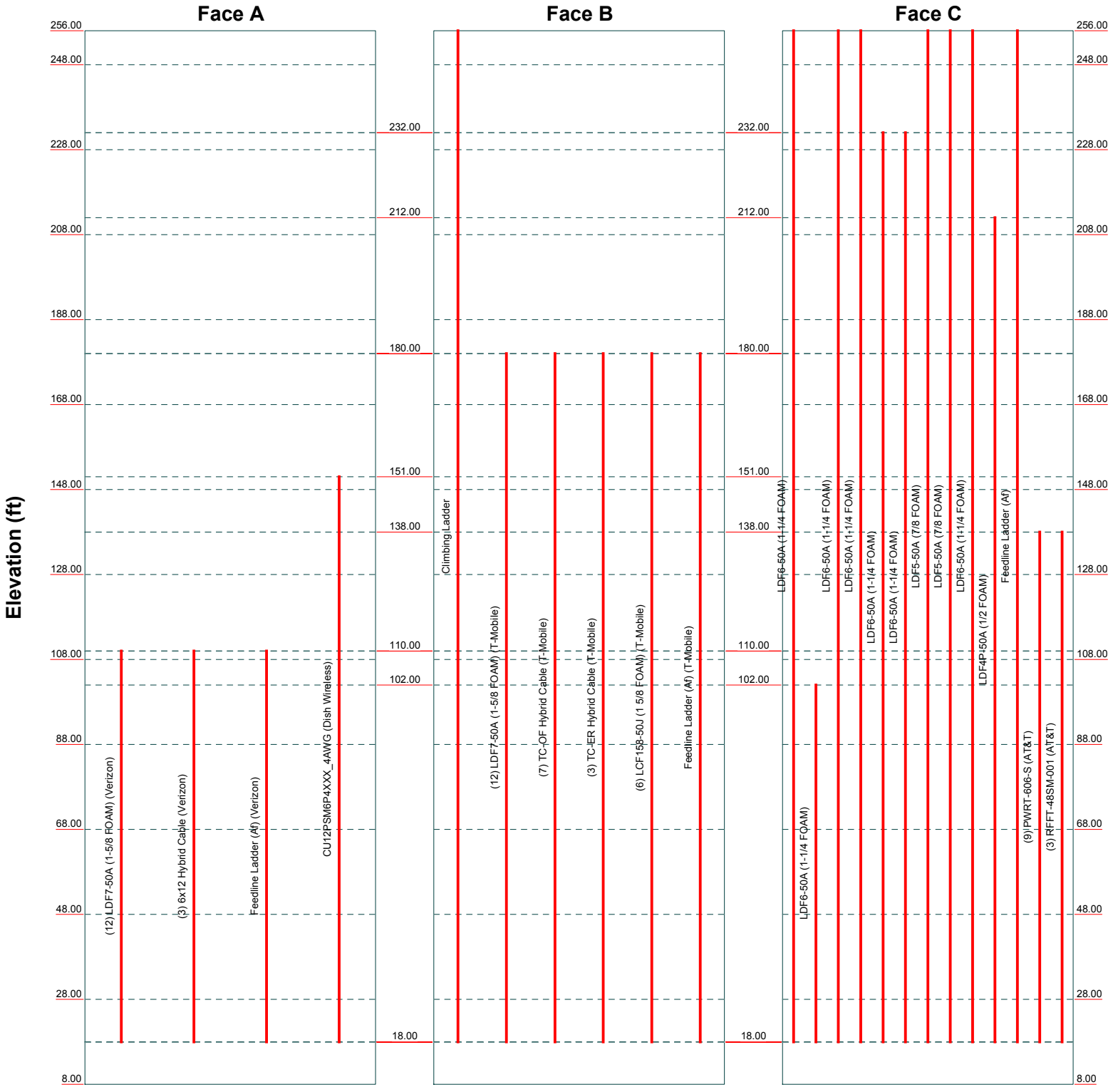
Job: Bridgeport (NJJER02044B)			
Project: KM Project #220101.00			
Client: M+K Development	Drawn by: Domenic Aversa	App'd:	
Code: TIA-222-G	Date: 05/16/22	Scale: NTS	
Path: C:\Users\Domenic\Dropbox\Work\M&K Development\Bridgeport (NJJER02044B)\Engineering\Bridgeport (NJJER02044A) LC1.tnl		Dwg No. E-1	

Feed Line Distribution Chart
8' - 256'

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



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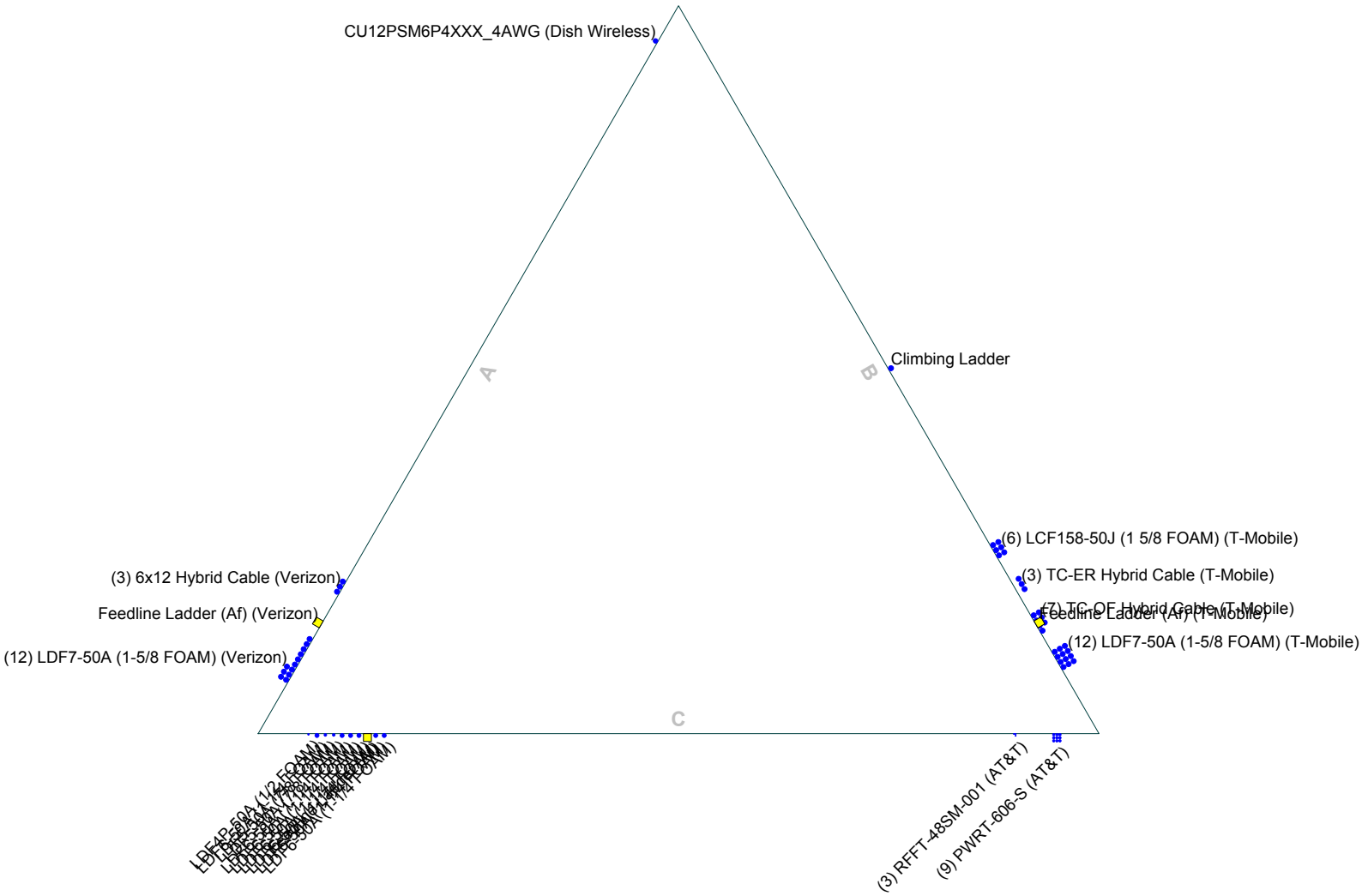
Job: ***Bridgeport (NJJER02044B)***			
Project: ***KM Project #220101.00***			
Client: M+K Development	Drawn by: Domenic Aversa		App'd:
Code: TIA-222-G	Date: 05/16/22		Scale: NTS
Path: C:\Users\Domenic\Dropbox\Work\M&K Development\Bridgeport (NJJER02044B)\Engineering\Bridgeport (NJJER02044A) LC1.prl			Dwg No. E-7

Feed Line Plan

Round Flat App In Face App Out Face



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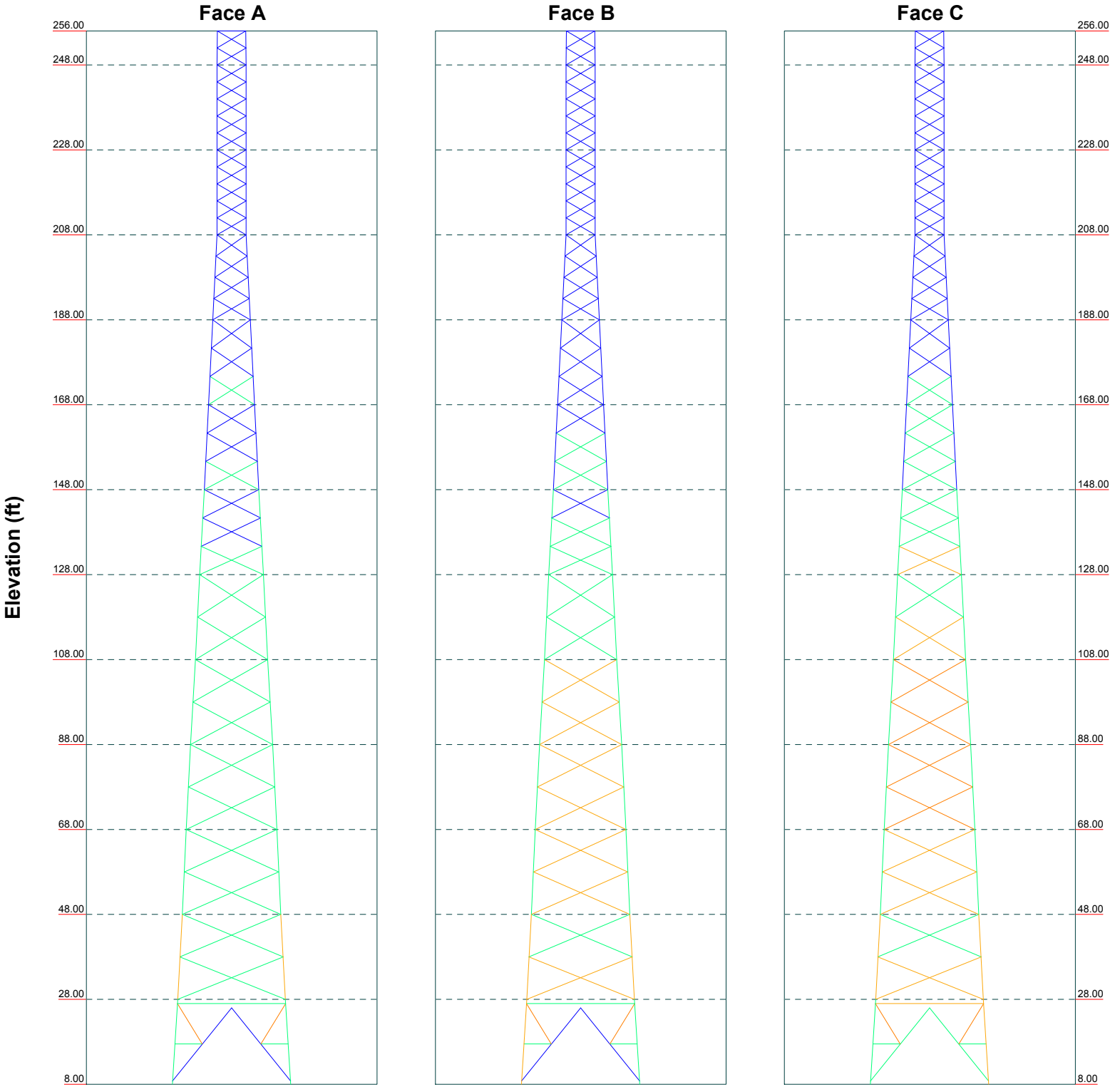
Client: M+K Development	Drawn by: Domenic Aversa	App'd:	
Code: TIA-222-G	Date: 05/16/22	Scale: NTS	
Path: C:\Users\Domenic\Dropbox\Work\M&K Development\Bridgeport (NJJER02044B)\Engineering\Bridgeport (NJJER02044A) LC1.prl		Dwg No. E-7	

Stress Distribution Chart
8' - 256'

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



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Job: *Bridgeport (NJJER02044B)*		
Project: *KM Project #220101.00*		
Client: M+K Development	Drawn by: Domenic Aversa	App'd:
Code: TIA-222-G	Date: 05/16/22	Scale: NTS
Path: C:\Users\Domenic\Dropbox\Work\M&K Development\Bridgeport (NJJER02044B)\Engineering\Bridgeport (NJJER02044A) LC1.tnl		Dwg No. E-8

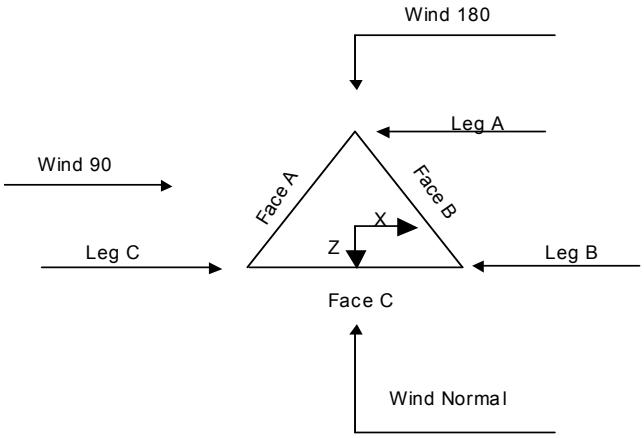
Tower Input Data

The main tower is a 3x free standing tower with an overall height of 256.00 ft above the ground line.
The base of the tower is set at an elevation of 8.00 ft above the ground line.
The face width of the tower is 6.60 ft at the top and 27.83 ft at the base.
This tower is designed using the TIA-222-G standard.
The following design criteria apply:

Tower is located in Fairfield County, Connecticut.
Basic wind speed of 97 mph.
Structure Class II.
Exposure Category C.
Topographic Category 1.
Crest Height 0.00 ft.
Nominal ice thickness of 0.7500 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.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in tower member design is 1.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

	Consider Moments - Legs		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-G Bracing Resist. Exemption
√	Include Bolts In Member Capacity	√	Autocalc Torque Arm Areas		Use TIA-222-G 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

Tower Section Geometry

Tower Section	Tower Elevation ft	Assembly Database	Description	Section Width ft	Number of Sections	Section Length ft
T1	256.00-248.00			6.60	1	8.00
T2	248.00-228.00			6.90	1	20.00
T3	228.00-208.00			6.90	1	20.00
T4	208.00-188.00			6.83	1	20.00
T5	188.00-168.00			8.92	1	20.00
T6	168.00-148.00			10.92	1	20.00
T7	148.00-128.00			12.92	1	20.00
T8	128.00-108.00			14.99	1	20.00
T9	108.00-88.00			17.08	1	20.00
T10	88.00-68.00			19.25	1	20.00
T11	68.00-48.00			21.25	1	20.00
T12	48.00-28.00			23.23	1	20.00
T13	28.00-8.00			25.33	1	20.00

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	256.00-248.00	4.00	X Brace	No	No	0.0000	0.0000
T2	248.00-228.00	4.00	X Brace	No	No	0.0000	0.0000

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
T3	228.00-208.00	4.00	X Brace	No	No	0.0000	0.0000
T4	208.00-188.00	5.00	X Brace	No	No	0.0000	0.0000
T5	188.00-168.00	6.67	X Brace	No	No	0.0000	0.0000
T6	168.00-148.00	6.67	X Brace	No	No	0.0000	0.0000
T7	148.00-128.00	6.67	X Brace	No	No	0.0000	0.0000
T8	128.00-108.00	10.00	X Brace	No	No	0.0000	0.0000
T9	108.00-88.00	10.00	X Brace	No	No	0.0000	0.0000
T10	88.00-68.00	10.00	X Brace	No	No	0.0000	0.0000
T11	68.00-48.00	10.00	X Brace	No	No	0.0000	0.0000
T12	48.00-28.00	10.00	X Brace	No	No	0.0000	0.0000
T13	28.00-8.00	19.00	K1 Down	No	Yes	12.0000	0.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 256.00-248.00	Pipe	ROHN 3 STD	A572-50 (50 ksi)	Single Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)
T2 248.00-228.00	Pipe	ROHN 3 EH	A572-50 (50 ksi)	Single Angle	L2x2x1/4	A36 (36 ksi)
T3 228.00-208.00	Pipe	ROHN 4 EH	A572-50 (50 ksi)	Single Angle	L2x2x1/4	A36 (36 ksi)
T4 208.00-188.00	Pipe	ROHN 5 EH	A572-50 (50 ksi)	Single Angle	L2x2x1/4	A36 (36 ksi)
T5 188.00-168.00	Pipe	ROHN 6 EH	A572-50 (50 ksi)	Single Angle	L2 1/2x2 1/2x1/4	A36 (36 ksi)
T6 168.00-148.00	Pipe	ROHN 6 EH	A572-50 (50 ksi)	Single Angle	L3x3x1/4	A36 (36 ksi)
T7 148.00-128.00	Pipe	ROHN 6 EH	A572-50 (50 ksi)	Arbitrary Shape	L3x3x1/4 w/3"x1/4" plate	A36 (36 ksi)
T8 128.00-108.00	Pipe	ROHN 8 EHS	A572-50 (50 ksi)	Single Angle	L4x4x3/8	A572-50 (50 ksi)
T9 108.00-88.00	Pipe	ROHN 8 EH	A572-50 (50 ksi)	Single Angle	L4x4x0.31	A572-50 (50 ksi)
T10 88.00-68.00	Pipe	P10x.5	A572-50 (50 ksi)	Single Angle	L5x5x3/8	A572-50 (50 ksi)
T11 68.00-48.00	Pipe	P10x.5	A572-50 (50 ksi)	Single Angle	L5x5x3/8	A572-50 (50 ksi)
T12 48.00-28.00	Pipe	P10x.5	A572-50 (50 ksi)	Single Angle	L5x5x3/8	A572-50 (50 ksi)
T13 28.00-8.00	Pipe	P10x.5	A572-50 (50 ksi)	Arbitrary Shape	ROHN 3 STD w/L4x4x1/4	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
T13 28.00-8.00	Pipe	ROHN 3 STD	A36 (36 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
T13 28.00-8.00	None	Flat Bar		A36 (36 ksi)	Pipe	ROHN 3 STD	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
T13 28.00-8.00	Pipe		A572-50 (50 ksi)	Pipe	ROHN 3 STD	A572-50 (50 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Redundant Bracing Grade		Redundant Type	Redundant Size	K Factor
T13 28.00-8.00	A572-50 (50 ksi)	Horizontal (1)	Pipe	ROHN 1.5 STD	1
		Diagonal (1)	Pipe	ROHN 1.5 STD	0.75
		Vertical	Solid Round	3/8	1
		Hip (1)	Pipe	ROHN 1.5 STD	1
		Hip Diagonal (1)	Pipe	ROHN 1.5 STD	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 256.00-248.00	0.00	0.0000	A36 (36 ksi)	1	1	1	0.0000	6.0000	36.0000
T2 248.00-228.00	0.00	0.0000	A36 (36 ksi)	1	1	1	0.0000	6.0000	36.0000
T3 228.00-208.00	0.00	0.0000	A36 (36 ksi)	1	1	1	0.0000	6.0000	36.0000
T4 208.00-188.00	0.00	0.0000	A36 (36 ksi)	1	1	1	0.0000	6.0000	36.0000
T5 188.00-168.00	0.00	0.0000	A36 (36 ksi)	1	1	1	0.0000	6.0000	36.0000

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
T6 168.00-148.00	0.00	0.0000	A36 (36 ksi)	1	1	1	0.0000	6.0000	36.0000
T7 148.00-128.00	0.00	0.0000	A36 (36 ksi)	1	1	1	0.0000	6.0000	36.0000
T8 128.00-108.00	0.00	0.0000	A36 (36 ksi)	1	1	1	0.0000	6.0000	36.0000
T9 108.00-88.00	0.00	0.0000	A36 (36 ksi)	1	1	1	0.0000	6.0000	36.0000
T10 88.00-68.00	0.00	0.0000	A36 (36 ksi)	1	1	1	0.0000	6.0000	36.0000
T11 68.00-48.00	0.00	0.0000	A36 (36 ksi)	1	1	1	0.0000	6.0000	36.0000
T12 48.00-28.00	0.00	0.0000	A36 (36 ksi)	1	1	1	0.0000	6.0000	36.0000
T13 28.00-8.00	0.00	0.0000	A36 (36 ksi)	1	1	1	0.0000	6.0000	36.0000

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 256.00-248.00	No	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T2 248.00-228.00	No	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T3 228.00-208.00	No	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T4 208.00-188.00	No	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T5 188.00-168.00	No	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T6 168.00-148.00	No	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T7 148.00-128.00	No	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T8 128.00-108.00	No	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T9 108.00-88.00	No	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T10 88.00-68.00	No	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T11 68.00-48.00	No	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T12 48.00-28.00	No	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T13 28.00-8.00	No	No	0.5	1 1	1 1	1 1	1 1	0.5 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.*

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 256.00-248.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T2 248.00-228.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T3 228.00-208.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T4 208.00-188.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T5 188.00-168.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T6 168.00-148.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T7 148.00-128.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T8 128.00-108.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T9 108.00-88.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T10 88.00-68.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T11 68.00-48.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T12 48.00-28.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T13 28.00-8.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	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
T1 256.00-248.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T2 248.00-228.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T3 228.00-208.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T4 208.00-188.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T5 188.00-168.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T6 168.00-148.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T7 148.00-128.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T8 128.00-108.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	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
T9 108.00-88.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T10 88.00-68.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T11 68.00-48.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T12 48.00-28.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T13 28.00-8.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

Tower Section Geometry *(cont'd)*

Tower Elevation	Connection Offsets							
	Diagonal				K-Bracing			
	Vert. Top	Horiz. Top	Vert. Bot.	Horiz. Bot.	Vert. Top	Horiz. Top	Vert. Bot.	Horiz. Bot.
ft	in	in	in	in	in	in	in	in
T1 256.00-248.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
T2 248.00-228.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
T3 228.00-208.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
T4 208.00-188.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
T5 188.00-168.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
T6 168.00-148.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
T7 148.00-128.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
T8 128.00-108.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
T9 108.00-88.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
T10 88.00-68.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
T11 68.00-48.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
T12 48.00-28.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
T13 28.00-8.00	0.0000	0.0000	0.0000	0.0000	12.0000	0.0000	9.0000	0.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T1 256.00-248.00	Flange	0.7500 A325N	4	0.6250 A325N	1	0.0000 A325N	3	0.0000 A325N	0	0.6250 A325N	0	0.0000 A325N	4	0.6250 A325N	0
T2 248.00-228.00	Flange	0.8750 A325N	4	0.6250 A325N	1	0.0000 A325N	3	0.0000 A325N	0	0.6250 A325N	0	0.0000 A325N	4	0.6250 A325N	0
T3 228.00-208.00	Flange	1.0000 A325N	4	0.6250 A325N	1	0.0000 A325N	3	0.0000 A325N	0	0.6250 A325N	0	0.0000 A325N	4	0.6250 A325N	0
T4 208.00-188.00	Flange	1.0000 A325N	6	0.6250 A325N	1	0.0000 A325N	3	0.0000 A325N	0	0.6250 A325N	0	0.0000 A325N	4	0.6250 A325N	0
T5 188.00-168.00	Flange	1.0000 A325N	6	0.7500 A325N	1	0.0000 A325N	3	0.0000 A325N	0	0.6250 A325N	0	0.0000 A325N	4	0.6250 A325N	0
T6 168.00-148.00	Flange	1.0000 A325N	6	0.7500 A325N	1	0.0000 A325N	3	0.0000 A325N	0	0.6250 A325N	0	0.0000 A325N	4	0.6250 A325N	0
T7 148.00-128.00	Flange	1.0000 A325N	8	0.7500 A325N	1	0.0000 A325N	3	0.0000 A325N	0	0.6250 A325N	0	0.0000 A325N	4	0.6250 A325N	0
T8 128.00-108.00	Flange	1.0000 A325N	8	0.7500 A325X	1	0.0000 A325N	3	0.0000 A325N	0	0.6250 A325N	0	0.0000 A325N	4	0.6250 A325N	0
T9 108.00-88.00	Flange	1.0000 A325N	12	0.8750 A325N	1	0.0000 A325N	3	0.0000 A325N	0	0.6250 A325N	0	0.0000 A325N	4	0.6250 A325N	0
T10 88.00-68.00	Flange	1.0000 A325N	12	0.8750 A325N	1	0.0000 A325N	3	0.0000 A325N	0	0.6250 A325N	0	0.0000 A325N	4	0.6250 A325N	0
T11 68.00-48.00	Flange	1.0000 A325N	12	1.0000 A325N	1	0.0000 A325N	3	0.0000 A325N	0	0.6250 A325N	0	0.0000 A325N	4	0.6250 A325N	0
T12 48.00-28.00	Flange	1.0000 A325N	12	0.8750 A325X	2	0.0000 A325N	3	0.0000 A325N	0	0.6250 A325N	0	0.0000 A325N	4	0.6250 A325N	0
T13 28.00-8.00	Flange	1.0000 A325N	16	0.6250 A325N	6	0.7500 A325N	4	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	1	0.6250 A325N	0

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
Climbing Ladder	B	No	No	Ar (CaAa)	256.00 - 18.00	0.0000	0	1	1	0.2500	2.0000		7.90
LDF7-50A (1-5/8 FOAM) (Verizon)	A	No	No	Ar (CaAa)	110.00 - 18.00	0.0000	-0.4	12	9	0.2500	1.9800		0.82
LDF7-50A (1-5/8 FOAM) (T-Mobile)	B	No	No	Ar (CaAa)	180.00 - 18.00	0.0000	0.4	12	4	0.2500	1.9800		0.82
TC-OF Hybrid Cable (T-Mobile)	B	No	No	Ar (CaAa)	180.00 - 18.00	0.0000	0.35	7	4	0.2500	1.9900		1.90
TC-ER Hybrid Cable (T-Mobile)	B	No	No	Ar (CaAa)	180.00 - 18.00	2.0000	0.3	3	3	0.2500	1.9900		1.90
6x12 Hybrid Cable (Verizon)	A	No	No	Ar (CaAa)	110.00 - 18.00	0.0000	-0.3	3	3	0.2500	1.9800		1.90
LCF158-50J (1 5/8 FOAM) (T-Mobile)	B	No	No	Ar (CaAa)	180.00 - 18.00	0.0000	0.25	6	3	0.2500	2.0100		0.92
Feedline	A	No	No	Af (CaAa)	110.00 -	0.0000	-0.35	1	1	3.0000	3.0000		8.40

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
Ladder (Af) (Verizon)					18.00								
Feedline	B	No	No	Af (CaAa)	180.00 - 18.00	0.0000	0.35	1	1	3.0000	3.0000		8.40
Ladder (Af) (T-Mobile)													
LDF6-50A (1-1/4 FOAM)	C	No	No	Ar (CaAa)	256.00 - 18.00	0.0000	0.35	1	1	1.5500	1.5500		0.66
LDF6-50A (1-1/4 FOAM)	C	No	No	Ar (CaAa)	102.00 - 18.00	0.0000	0.36	1	1	1.5500	1.5500		0.66
LDF6-50A (1-1/4 FOAM)	C	No	No	Ar (CaAa)	256.00 - 18.00	0.0000	0.37	1	1	1.5500	1.5500		0.66
LDF6-50A (1-1/4 FOAM)	C	No	No	Ar (CaAa)	256.00 - 18.00	0.0000	0.38	1	1	1.5500	1.5500		0.66
LDF6-50A (1-1/4 FOAM)	C	No	No	Ar (CaAa)	232.00 - 18.00	0.0000	0.39	1	1	1.5500	1.5500		0.66
LDF6-50A (1-1/4 FOAM)	C	No	No	Ar (CaAa)	232.00 - 18.00	0.0000	0.4	1	1	1.5500	1.5500		0.66
LDF5-50A (7/8 FOAM)	C	No	No	Ar (CaAa)	256.00 - 18.00	0.0000	0.41	1	1	1.0900	1.0900		0.33
LDF5-50A (7/8 FOAM)	C	No	No	Ar (CaAa)	256.00 - 18.00	0.0000	0.42	1	1	1.0900	1.0900		0.33
LDF6-50A (1-1/4 FOAM)	C	No	No	Ar (CaAa)	256.00 - 18.00	0.0000	0.43	1	1	1.5500	1.5500		0.66
LDF4P-50A (1/2 FOAM)	C	No	No	Ar (CaAa)	212.00 - 18.00	0.0000	0.44	1	1	0.6300	0.6300		0.15
Feedline Ladder (Af)	C	No	No	Af (CaAa)	256.00 - 18.00	0.0000	0.37	1	1	3.0000	3.0000		8.40
PWRT-606-S (AT&T)	C	No	No	Ar (CaAa)	138.00 - 18.00	0.0000	-0.45	9	3	0.2500	0.9200		0.89
RFFT-48SM-001 (AT&T)	C	No	No	Ar (CaAa)	138.00 - 18.00	0.0000	-0.4	3	2	0.2500	0.4000		0.20
CU12PSM6P4XXX_4AWG (Dish Wireless)	A	No	No	Ar (CaAa)	151.00 - 18.00	0.0000	0.45	1	1	0.0000	1.7500		2.72

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
T1	256.00-248.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	1.600	0.000	63.20
		C	0.000	0.000	10.704	0.000	93.60
T2	248.00-228.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	4.000	0.000	158.00
		C	0.000	0.000	28.000	0.000	239.28
T3	228.00-208.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	4.000	0.000	158.00
		C	0.000	0.000	33.212	0.000	261.00
T4	208.00-188.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	4.000	0.000	158.00
		C	0.000	0.000	34.220	0.000	263.40
T5	188.00-168.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	76.864	0.000	671.12

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
		C	0.000	0.000	34.220	0.000	263.40
T6	168.00-148.00	A	0.000	0.000	0.525	0.000	8.15
		B	0.000	0.000	125.440	0.000	1013.20
		C	0.000	0.000	34.220	0.000	263.40
T7	148.00-128.00	A	0.000	0.000	3.500	0.000	54.32
		B	0.000	0.000	125.440	0.000	1013.20
		C	0.000	0.000	43.700	0.000	349.50
T8	128.00-108.00	A	0.000	0.000	10.440	0.000	102.20
		B	0.000	0.000	125.440	0.000	1013.20
		C	0.000	0.000	53.180	0.000	435.60
T9	108.00-88.00	A	0.000	0.000	72.900	0.000	533.12
		B	0.000	0.000	125.440	0.000	1013.20
		C	0.000	0.000	55.350	0.000	444.84
T10	88.00-68.00	A	0.000	0.000	72.900	0.000	533.12
		B	0.000	0.000	125.440	0.000	1013.20
		C	0.000	0.000	56.280	0.000	448.80
T11	68.00-48.00	A	0.000	0.000	72.900	0.000	533.12
		B	0.000	0.000	125.440	0.000	1013.20
		C	0.000	0.000	56.280	0.000	448.80
T12	48.00-28.00	A	0.000	0.000	72.900	0.000	533.12
		B	0.000	0.000	125.440	0.000	1013.20
		C	0.000	0.000	56.280	0.000	448.80
T13	28.00-8.00	A	0.000	0.000	36.450	0.000	266.56
		B	0.000	0.000	62.720	0.000	506.60
		C	0.000	0.000	28.140	0.000	224.40

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
T1	256.00-248.00	A	1.838	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	4.541	0.000	132.16
		C		0.000	0.000	31.291	0.000	550.71
T2	248.00-228.00	A	1.828	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	11.311	0.000	328.94
		C		0.000	0.000	82.099	0.000	1432.51
T3	228.00-208.00	A	1.812	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	11.247	0.000	326.74
		C		0.000	0.000	99.882	0.000	1698.15
T4	208.00-188.00	A	1.794	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	11.177	0.000	324.36
		C		0.000	0.000	105.994	0.000	1764.66
T5	188.00-168.00	A	1.775	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	103.135	0.000	2071.38
		C		0.000	0.000	105.234	0.000	1740.35
T6	168.00-148.00	A	1.754	0.000	0.000	1.578	0.000	30.68
		B		0.000	0.000	163.738	0.000	3209.37
		C		0.000	0.000	104.392	0.000	1713.65
T7	148.00-128.00	A	1.731	0.000	0.000	10.423	0.000	201.52
		B		0.000	0.000	162.896	0.000	3177.66
		C		0.000	0.000	123.306	0.000	1967.73
T8	128.00-108.00	A	1.704	0.000	0.000	20.914	0.000	379.30
		B		0.000	0.000	161.935	0.000	3141.71
		C		0.000	0.000	141.708	0.000	2210.20
T9	108.00-88.00	A	1.672	0.000	0.000	115.645	0.000	1980.15
		B		0.000	0.000	160.815	0.000	3100.07
		C		0.000	0.000	146.863	0.000	2264.04

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
T10	88.00-68.00	A	1.635	0.000	0.000	114.849	0.000	1944.46
		B		0.000	0.000	159.467	0.000	3050.34
		C		0.000	0.000	147.606	0.000	2246.52
T11	68.00-48.00	A	1.587	0.000	0.000	113.844	0.000	1899.74
		B		0.000	0.000	157.763	0.000	2988.07
		C		0.000	0.000	144.831	0.000	2170.72
T12	48.00-28.00	A	1.521	0.000	0.000	112.461	0.000	1838.93
		B		0.000	0.000	155.418	0.000	2903.45
		C		0.000	0.000	141.010	0.000	2068.75
T13	28.00-8.00	A	1.412	0.000	0.000	55.079	0.000	869.76
		B		0.000	0.000	75.756	0.000	1382.64
		C		0.000	0.000	67.321	0.000	952.48

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
T1	256.00-248.00	-7.6169	6.6416	-10.3860	8.4682
T2	248.00-228.00	-8.5602	7.3830	-11.5935	9.4003
T3	228.00-208.00	-9.6126	8.1283	-13.0557	10.4338
T4	208.00-188.00	-11.1776	9.3012	-15.4588	12.1407
T5	188.00-168.00	13.4858	13.5251	1.0459	14.9068
T6	168.00-148.00	23.0561	15.6987	9.2447	16.6757
T7	148.00-128.00	26.6495	17.5246	12.3577	17.9098
T8	128.00-108.00	28.4853	21.0989	14.6157	21.9946
T9	108.00-88.00	9.6741	26.0982	-1.9113	26.5889
T10	88.00-68.00	9.5716	26.8313	-2.3443	28.0464
T11	68.00-48.00	10.2040	28.8307	-2.4832	30.0696
T12	48.00-28.00	10.8169	30.7812	-2.5850	31.9922
T13	28.00-8.00	10.1123	28.3729	-2.1010	27.0778

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T1	1	Climbing Ladder	248.00 - 256.00	0.8400	0.7800
T1	15	LDF6-50A (1-1/4 FOAM)	248.00 - 256.00	0.8400	0.7800
T1	17	LDF6-50A (1-1/4 FOAM)	248.00 - 256.00	0.8400	0.7800
T1	18	LDF6-50A (1-1/4 FOAM)	248.00 - 256.00	0.8400	0.7800
T1	21	LDF5-50A (7/8 FOAM)	248.00 - 256.00	0.8400	0.7800
T1	22	LDF5-50A (7/8 FOAM)	248.00 - 256.00	0.8400	0.7800
T1	23	LDF6-50A (1-1/4 FOAM)	248.00 - 256.00	0.8400	0.7800
T1	25	Feedline Ladder (Af)	248.00 -	0.8400	0.7800

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T2	1	Climbing Ladder	256.00 - 228.00	0.8400	0.7800
T2	15	LDF6-50A (1-1/4 FOAM)	248.00 - 228.00	0.8400	0.7800
T2	17	LDF6-50A (1-1/4 FOAM)	248.00 - 228.00	0.8400	0.7800
T2	18	LDF6-50A (1-1/4 FOAM)	248.00 - 228.00	0.8400	0.7800
T2	19	LDF6-50A (1-1/4 FOAM)	232.00 - 228.00	0.8400	0.7800
T2	20	LDF6-50A (1-1/4 FOAM)	232.00 - 228.00	0.8400	0.7800
T2	21	LDF5-50A (7/8 FOAM)	248.00 - 228.00	0.8400	0.7800
T2	22	LDF5-50A (7/8 FOAM)	248.00 - 228.00	0.8400	0.7800
T2	23	LDF6-50A (1-1/4 FOAM)	248.00 - 228.00	0.8400	0.7800
T2	25	Feedline Ladder (Af)	248.00 - 228.00	0.8400	0.7800
T3	1	Climbing Ladder	228.00 - 208.00	0.8400	0.7800
T3	15	LDF6-50A (1-1/4 FOAM)	228.00 - 208.00	0.8400	0.7800
T3	17	LDF6-50A (1-1/4 FOAM)	228.00 - 208.00	0.8400	0.7800
T3	18	LDF6-50A (1-1/4 FOAM)	228.00 - 208.00	0.8400	0.7800
T3	19	LDF6-50A (1-1/4 FOAM)	228.00 - 208.00	0.8400	0.7800
T3	20	LDF6-50A (1-1/4 FOAM)	228.00 - 208.00	0.8400	0.7800
T3	21	LDF5-50A (7/8 FOAM)	228.00 - 208.00	0.8400	0.7800
T3	22	LDF5-50A (7/8 FOAM)	228.00 - 208.00	0.8400	0.7800
T3	23	LDF6-50A (1-1/4 FOAM)	228.00 - 208.00	0.8400	0.7800
T3	24	LDF4P-50A (1/2 FOAM)	212.00 - 208.00	0.8400	0.7800
T3	25	Feedline Ladder (Af)	228.00 - 208.00	0.8400	0.7800
T4	1	Climbing Ladder	208.00 - 188.00	0.8400	0.7800
T4	15	LDF6-50A (1-1/4 FOAM)	208.00 - 188.00	0.8400	0.7800
T4	17	LDF6-50A (1-1/4 FOAM)	208.00 - 188.00	0.8400	0.7800
T4	18	LDF6-50A (1-1/4 FOAM)	208.00 - 188.00	0.8400	0.7800
T4	19	LDF6-50A (1-1/4 FOAM)	208.00 - 188.00	0.8400	0.7800
T4	20	LDF6-50A (1-1/4 FOAM)	208.00 - 188.00	0.8400	0.7800
T4	21	LDF5-50A (7/8 FOAM)	208.00 - 188.00	0.8400	0.7800
T4	22	LDF5-50A (7/8 FOAM)	208.00 - 188.00	0.8400	0.7800
T4	23	LDF6-50A (1-1/4 FOAM)	208.00 - 188.00	0.8400	0.7800
T4	24	LDF4P-50A (1/2 FOAM)	208.00 -	0.8400	0.7800

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T4	25	Feedline Ladder (Af)	208.00 188.00 - 208.00	0.8400	0.7800
T5	1	Climbing Ladder	168.00 - 188.00	0.8400	0.7800
T5	3	LDF7-50A (1-5/8 FOAM)	168.00 - 180.00	0.8400	0.7800
T5	4	TC-OF Hybrid Cable	168.00 - 180.00	0.8400	0.7800
T5	5	TC-ER Hybrid Cable	168.00 - 180.00	0.8400	0.7800
T5	7	LCF158-50J (1 5/8 FOAM)	168.00 - 180.00	0.8400	0.7800
T5	14	Feedline Ladder (Af)	168.00 - 180.00	0.8400	0.7800
T5	15	LDF6-50A (1-1/4 FOAM)	168.00 - 188.00	0.8400	0.7800
T5	17	LDF6-50A (1-1/4 FOAM)	168.00 - 188.00	0.8400	0.7800
T5	18	LDF6-50A (1-1/4 FOAM)	168.00 - 188.00	0.8400	0.7800
T5	19	LDF6-50A (1-1/4 FOAM)	168.00 - 188.00	0.8400	0.7800
T5	20	LDF6-50A (1-1/4 FOAM)	168.00 - 188.00	0.8400	0.7800
T5	21	LDF5-50A (7/8 FOAM)	168.00 - 188.00	0.8400	0.7800
T5	22	LDF5-50A (7/8 FOAM)	168.00 - 188.00	0.8400	0.7800
T5	23	LDF6-50A (1-1/4 FOAM)	168.00 - 188.00	0.8400	0.7800
T5	24	LDF4P-50A (1/2 FOAM)	168.00 - 188.00	0.8400	0.7800
T5	25	Feedline Ladder (Af)	168.00 - 188.00	0.8400	0.7800
T6	1	Climbing Ladder	148.00 - 168.00	0.8400	0.7800
T6	3	LDF7-50A (1-5/8 FOAM)	148.00 - 168.00	0.8400	0.7800
T6	4	TC-OF Hybrid Cable	148.00 - 168.00	0.8400	0.7800
T6	5	TC-ER Hybrid Cable	148.00 - 168.00	0.8400	0.7800
T6	7	LCF158-50J (1 5/8 FOAM)	148.00 - 168.00	0.8400	0.7800
T6	14	Feedline Ladder (Af)	148.00 - 168.00	0.8400	0.7800
T6	15	LDF6-50A (1-1/4 FOAM)	148.00 - 168.00	0.8400	0.7800
T6	17	LDF6-50A (1-1/4 FOAM)	148.00 - 168.00	0.8400	0.7800
T6	18	LDF6-50A (1-1/4 FOAM)	148.00 - 168.00	0.8400	0.7800
T6	19	LDF6-50A (1-1/4 FOAM)	148.00 - 168.00	0.8400	0.7800
T6	20	LDF6-50A (1-1/4 FOAM)	148.00 - 168.00	0.8400	0.7800
T6	21	LDF5-50A (7/8 FOAM)	148.00 - 168.00	0.8400	0.7800
T6	22	LDF5-50A (7/8 FOAM)	148.00 - 168.00	0.8400	0.7800
T6	23	LDF6-50A (1-1/4 FOAM)	148.00 -	0.8400	0.7800

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T6	24	LDF4P-50A (1/2 FOAM)	168.00 148.00 -	0.8400	0.7800
T6	25	Feedline Ladder (Af)	168.00 148.00 -	0.8400	0.7800
T6	28	CU12PSM6P4XXX_4AWG	168.00 148.00 -	0.8400	0.7800
T7	1	Climbing Ladder	151.00 128.00 -	0.8400	0.7800
T7	3	LDF7-50A (1-5/8 FOAM)	148.00 128.00 -	0.8400	0.7800
T7	4	TC-OF Hybrid Cable	148.00 128.00 -	0.8400	0.7800
T7	5	TC-ER Hybrid Cable	148.00 128.00 -	0.8400	0.7800
T7	7	LCF158-50J (1 5/8 FOAM)	148.00 128.00 -	0.8400	0.7800
T7	14	Feedline Ladder (Af)	148.00 128.00 -	0.8400	0.7800
T7	15	LDF6-50A (1-1/4 FOAM)	148.00 128.00 -	0.8400	0.7800
T7	17	LDF6-50A (1-1/4 FOAM)	148.00 128.00 -	0.8400	0.7800
T7	18	LDF6-50A (1-1/4 FOAM)	148.00 128.00 -	0.8400	0.7800
T7	19	LDF6-50A (1-1/4 FOAM)	148.00 128.00 -	0.8400	0.7800
T7	20	LDF6-50A (1-1/4 FOAM)	148.00 128.00 -	0.8400	0.7800
T7	21	LDF5-50A (7/8 FOAM)	148.00 128.00 -	0.8400	0.7800
T7	22	LDF5-50A (7/8 FOAM)	148.00 128.00 -	0.8400	0.7800
T7	23	LDF6-50A (1-1/4 FOAM)	148.00 128.00 -	0.8400	0.7800
T7	24	LDF4P-50A (1/2 FOAM)	148.00 128.00 -	0.8400	0.7800
T7	25	Feedline Ladder (Af)	148.00 128.00 -	0.8400	0.7800
T7	26	PWRT-606-S	148.00 128.00 -	0.8400	0.7800
T7	27	RFFT-48SM-001	138.00 128.00 -	0.8400	0.7800
T7	28	CU12PSM6P4XXX_4AWG	138.00 128.00 -	0.8400	0.7800
T8	1	Climbing Ladder	148.00 108.00 -	0.8400	0.7800
T8	2	LDF7-50A (1-5/8 FOAM)	128.00 108.00 -	0.8400	0.7800
T8	3	LDF7-50A (1-5/8 FOAM)	110.00 108.00 -	0.8400	0.7800
T8	4	TC-OF Hybrid Cable	128.00 108.00 -	0.8400	0.7800
T8	5	TC-ER Hybrid Cable	128.00 108.00 -	0.8400	0.7800
T8	6	6x12 Hybrid Cable	128.00 108.00 -	0.8400	0.7800
T8	7	LCF158-50J (1 5/8 FOAM)	110.00 108.00 -	0.8400	0.7800
T8	13	Feedline Ladder (Af)	128.00 108.00 -	0.8400	0.7800
T8	14	Feedline Ladder (Af)	110.00 108.00 -	0.8400	0.7800

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
			128.00		
T8	15	LDF6-50A (1-1/4 FOAM)	108.00 - 128.00	0.8400	0.7800
T8	17	LDF6-50A (1-1/4 FOAM)	108.00 - 128.00	0.8400	0.7800
T8	18	LDF6-50A (1-1/4 FOAM)	108.00 - 128.00	0.8400	0.7800
T8	19	LDF6-50A (1-1/4 FOAM)	108.00 - 128.00	0.8400	0.7800
T8	20	LDF6-50A (1-1/4 FOAM)	108.00 - 128.00	0.8400	0.7800
T8	21	LDF5-50A (7/8 FOAM)	108.00 - 128.00	0.8400	0.7800
T8	22	LDF5-50A (7/8 FOAM)	108.00 - 128.00	0.8400	0.7800
T8	23	LDF6-50A (1-1/4 FOAM)	108.00 - 128.00	0.8400	0.7800
T8	24	LDF4P-50A (1/2 FOAM)	108.00 - 128.00	0.8400	0.7800
T8	25	Feedline Ladder (Af)	108.00 - 128.00	0.8400	0.7800
T8	26	PWRT-606-S	108.00 - 128.00	0.8400	0.7800
T8	27	RFFT-48SM-001	108.00 - 128.00	0.8400	0.7800
T8	28	CU12PSM6P4XXX_4AWG	108.00 - 128.00	0.8400	0.7800
T9	1	Climbing Ladder	88.00 - 108.00	0.8400	0.7800
T9	2	LDF7-50A (1-5/8 FOAM)	88.00 - 108.00	0.8400	0.7800
T9	3	LDF7-50A (1-5/8 FOAM)	88.00 - 108.00	0.8400	0.7800
T9	4	TC-OF Hybrid Cable	88.00 - 108.00	0.8400	0.7800
T9	5	TC-ER Hybrid Cable	88.00 - 108.00	0.8400	0.7800
T9	6	6x12 Hybrid Cable	88.00 - 108.00	0.8400	0.7800
T9	7	LCF158-50J (1 5/8 FOAM)	88.00 - 108.00	0.8400	0.7800
T9	13	Feedline Ladder (Af)	88.00 - 108.00	0.8400	0.7800
T9	14	Feedline Ladder (Af)	88.00 - 108.00	0.8400	0.7800
T9	15	LDF6-50A (1-1/4 FOAM)	88.00 - 108.00	0.8400	0.7800
T9	16	LDF6-50A (1-1/4 FOAM)	88.00 - 102.00	0.8400	0.7800
T9	17	LDF6-50A (1-1/4 FOAM)	88.00 - 108.00	0.8400	0.7800
T9	18	LDF6-50A (1-1/4 FOAM)	88.00 - 108.00	0.8400	0.7800
T9	19	LDF6-50A (1-1/4 FOAM)	88.00 - 108.00	0.8400	0.7800
T9	20	LDF6-50A (1-1/4 FOAM)	88.00 - 108.00	0.8400	0.7800
T9	21	LDF5-50A (7/8 FOAM)	88.00 - 108.00	0.8400	0.7800
T9	22	LDF5-50A (7/8 FOAM)	88.00 - 108.00	0.8400	0.7800
T9	23	LDF6-50A (1-1/4 FOAM)	88.00 - 108.00	0.8400	0.7800
T9	24	LDF4P-50A (1/2 FOAM)	88.00 - 108.00	0.8400	0.7800
T9	25	Feedline Ladder (Af)	88.00 - 108.00	0.8400	0.7800
T9	26	PWRT-606-S	88.00 - 108.00	0.8400	0.7800
T9	27	RFFT-48SM-001	88.00 - 108.00	0.8400	0.7800
T9	28	CU12PSM6P4XXX_4AWG	88.00 - 108.00	0.8400	0.7800
T10	1	Climbing Ladder	68.00 - 88.00	0.8400	0.7800
T10	2	LDF7-50A (1-5/8 FOAM)	68.00 - 88.00	0.8400	0.7800
T10	3	LDF7-50A (1-5/8 FOAM)	68.00 - 88.00	0.8400	0.7800
T10	4	TC-OF Hybrid Cable	68.00 - 88.00	0.8400	0.7800
T10	5	TC-ER Hybrid Cable	68.00 - 88.00	0.8400	0.7800
T10	6	6x12 Hybrid Cable	68.00 - 88.00	0.8400	0.7800
T10	7	LCF158-50J (1 5/8 FOAM)	68.00 - 88.00	0.8400	0.7800
T10	13	Feedline Ladder (Af)	68.00 - 88.00	0.8400	0.7800
T10	14	Feedline Ladder (Af)	68.00 - 88.00	0.8400	0.7800
T10	15	LDF6-50A (1-1/4 FOAM)	68.00 - 88.00	0.8400	0.7800
T10	16	LDF6-50A (1-1/4 FOAM)	68.00 - 88.00	0.8400	0.7800
T10	17	LDF6-50A (1-1/4 FOAM)	68.00 - 88.00	0.8400	0.7800

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T10	18	LDF6-50A (1-1/4 FOAM)	68.00 - 88.00	0.8400	0.7800
T10	19	LDF6-50A (1-1/4 FOAM)	68.00 - 88.00	0.8400	0.7800
T10	20	LDF6-50A (1-1/4 FOAM)	68.00 - 88.00	0.8400	0.7800
T10	21	LDF5-50A (7/8 FOAM)	68.00 - 88.00	0.8400	0.7800
T10	22	LDF5-50A (7/8 FOAM)	68.00 - 88.00	0.8400	0.7800
T10	23	LDF6-50A (1-1/4 FOAM)	68.00 - 88.00	0.8400	0.7800
T10	24	LDF4P-50A (1/2 FOAM)	68.00 - 88.00	0.8400	0.7800
T10	25	Feedline Ladder (Af)	68.00 - 88.00	0.8400	0.7800
T10	26	PWRT-606-S	68.00 - 88.00	0.8400	0.7800
T10	27	RFFT-48SM-001	68.00 - 88.00	0.8400	0.7800
T10	28	CU12PSM6P4XXX_4AWG	68.00 - 88.00	0.8400	0.7800
T11	1	Climbing Ladder	48.00 - 68.00	0.8400	0.7800
T11	2	LDF7-50A (1-5/8 FOAM)	48.00 - 68.00	0.8400	0.7800
T11	3	LDF7-50A (1-5/8 FOAM)	48.00 - 68.00	0.8400	0.7800
T11	4	TC-OF Hybrid Cable	48.00 - 68.00	0.8400	0.7800
T11	5	TC-ER Hybrid Cable	48.00 - 68.00	0.8400	0.7800
T11	6	6x12 Hybrid Cable	48.00 - 68.00	0.8400	0.7800
T11	7	LCF158-50J (1 5/8 FOAM)	48.00 - 68.00	0.8400	0.7800
T11	13	Feedline Ladder (Af)	48.00 - 68.00	0.8400	0.7800
T11	14	Feedline Ladder (Af)	48.00 - 68.00	0.8400	0.7800
T11	15	LDF6-50A (1-1/4 FOAM)	48.00 - 68.00	0.8400	0.7800
T11	16	LDF6-50A (1-1/4 FOAM)	48.00 - 68.00	0.8400	0.7800
T11	17	LDF6-50A (1-1/4 FOAM)	48.00 - 68.00	0.8400	0.7800
T11	18	LDF6-50A (1-1/4 FOAM)	48.00 - 68.00	0.8400	0.7800
T11	19	LDF6-50A (1-1/4 FOAM)	48.00 - 68.00	0.8400	0.7800
T11	20	LDF6-50A (1-1/4 FOAM)	48.00 - 68.00	0.8400	0.7800
T11	21	LDF5-50A (7/8 FOAM)	48.00 - 68.00	0.8400	0.7800
T11	22	LDF5-50A (7/8 FOAM)	48.00 - 68.00	0.8400	0.7800
T11	23	LDF6-50A (1-1/4 FOAM)	48.00 - 68.00	0.8400	0.7800
T11	24	LDF4P-50A (1/2 FOAM)	48.00 - 68.00	0.8400	0.7800
T11	25	Feedline Ladder (Af)	48.00 - 68.00	0.8400	0.7800
T11	26	PWRT-606-S	48.00 - 68.00	0.8400	0.7800
T11	27	RFFT-48SM-001	48.00 - 68.00	0.8400	0.7800
T11	28	CU12PSM6P4XXX_4AWG	48.00 - 68.00	0.8400	0.7800
T12	1	Climbing Ladder	28.00 - 48.00	0.8400	0.7800
T12	2	LDF7-50A (1-5/8 FOAM)	28.00 - 48.00	0.8400	0.7800
T12	3	LDF7-50A (1-5/8 FOAM)	28.00 - 48.00	0.8400	0.7800
T12	4	TC-OF Hybrid Cable	28.00 - 48.00	0.8400	0.7800
T12	5	TC-ER Hybrid Cable	28.00 - 48.00	0.8400	0.7800
T12	6	6x12 Hybrid Cable	28.00 - 48.00	0.8400	0.7800
T12	7	LCF158-50J (1 5/8 FOAM)	28.00 - 48.00	0.8400	0.7800
T12	13	Feedline Ladder (Af)	28.00 - 48.00	0.8400	0.7800
T12	14	Feedline Ladder (Af)	28.00 - 48.00	0.8400	0.7800
T12	15	LDF6-50A (1-1/4 FOAM)	28.00 - 48.00	0.8400	0.7800
T12	16	LDF6-50A (1-1/4 FOAM)	28.00 - 48.00	0.8400	0.7800
T12	17	LDF6-50A (1-1/4 FOAM)	28.00 - 48.00	0.8400	0.7800
T12	18	LDF6-50A (1-1/4 FOAM)	28.00 - 48.00	0.8400	0.7800
T12	19	LDF6-50A (1-1/4 FOAM)	28.00 - 48.00	0.8400	0.7800
T12	20	LDF6-50A (1-1/4 FOAM)	28.00 - 48.00	0.8400	0.7800
T12	21	LDF5-50A (7/8 FOAM)	28.00 - 48.00	0.8400	0.7800
T12	22	LDF5-50A (7/8 FOAM)	28.00 - 48.00	0.8400	0.7800
T12	23	LDF6-50A (1-1/4 FOAM)	28.00 - 48.00	0.8400	0.7800
T12	24	LDF4P-50A (1/2 FOAM)	28.00 - 48.00	0.8400	0.7800
T12	25	Feedline Ladder (Af)	28.00 - 48.00	0.8400	0.7800
T12	26	PWRT-606-S	28.00 - 48.00	0.8400	0.7800
T12	27	RFFT-48SM-001	28.00 - 48.00	0.8400	0.7800
T12	28	CU12PSM6P4XXX_4AWG	28.00 - 48.00	0.8400	0.7800
T13	1	Climbing Ladder	18.00 - 28.00	0.8400	0.7800
T13	2	LDF7-50A (1-5/8 FOAM)	18.00 - 28.00	0.8400	0.7800
T13	3	LDF7-50A (1-5/8 FOAM)	18.00 - 28.00	0.8400	0.7800
T13	4	TC-OF Hybrid Cable	18.00 - 28.00	0.8400	0.7800
T13	5	TC-ER Hybrid Cable	18.00 - 28.00	0.8400	0.7800

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T13	6	6x12 Hybrid Cable	18.00 - 28.00	0.8400	0.7800
T13	7	LCF158-50J (1 5/8 FOAM)	18.00 - 28.00	0.8400	0.7800
T13	13	Feedline Ladder (Af)	18.00 - 28.00	0.8400	0.7800
T13	14	Feedline Ladder (Af)	18.00 - 28.00	0.8400	0.7800
T13	15	LDF6-50A (1-1/4 FOAM)	18.00 - 28.00	0.8400	0.7800
T13	16	LDF6-50A (1-1/4 FOAM)	18.00 - 28.00	0.8400	0.7800
T13	17	LDF6-50A (1-1/4 FOAM)	18.00 - 28.00	0.8400	0.7800
T13	18	LDF6-50A (1-1/4 FOAM)	18.00 - 28.00	0.8400	0.7800
T13	19	LDF6-50A (1-1/4 FOAM)	18.00 - 28.00	0.8400	0.7800
T13	20	LDF6-50A (1-1/4 FOAM)	18.00 - 28.00	0.8400	0.7800
T13	21	LDF5-50A (7/8 FOAM)	18.00 - 28.00	0.8400	0.7800
T13	22	LDF5-50A (7/8 FOAM)	18.00 - 28.00	0.8400	0.7800
T13	23	LDF6-50A (1-1/4 FOAM)	18.00 - 28.00	0.8400	0.7800
T13	24	LDF4P-50A (1/2 FOAM)	18.00 - 28.00	0.8400	0.7800
T13	25	Feedline Ladder (Af)	18.00 - 28.00	0.8400	0.7800
T13	26	PWRT-606-S	18.00 - 28.00	0.8400	0.7800
T13	27	RFFT-48SM-001	18.00 - 28.00	0.8400	0.7800
T13	28	CU12PSM6P4XXX 4AWG	18.00 - 28.00	0.8400	0.7800

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) APL-866513-42T9	C	From Leg	5.50	5.0000	110.00	No Ice	5.01	5.40	41.25
(Verizon)			0.00			1/2" Ice	5.69	6.49	88.20
			0.00			1" Ice	6.26	7.30	145.47
(2) APL-866513-42T6	A	From Leg	5.50	5.0000	110.00	No Ice	5.01	5.40	41.25
(Verizon)			0.00			1/2" Ice	5.69	6.49	88.20
			0.00			1" Ice	6.26	7.30	145.47
(2) APL-866513-42T9	B	From Leg	5.50	5.0000	110.00	No Ice	5.01	5.40	41.25
(Verizon)			0.00			1/2" Ice	5.69	6.49	88.20
			0.00			1" Ice	6.26	7.30	145.47
12' V-Frame Mount	A	From Leg	0.00	0.0000	110.00	No Ice	16.00	16.00	500.00
(Verizon)			0.00			1/2" Ice	25.00	25.00	650.00
			0.00			1" Ice	34.00	34.00	800.00
12' V-Frame Mount	B	From Leg	0.00	0.0000	110.00	No Ice	16.00	16.00	500.00
(Verizon)			0.00			1/2" Ice	25.00	25.00	650.00
			0.00			1" Ice	34.00	34.00	800.00
12' V-Frame Mount	C	From Leg	0.00	0.0000	110.00	No Ice	16.00	16.00	500.00
(Verizon)			0.00			1/2" Ice	25.00	25.00	650.00
			0.00			1" Ice	34.00	34.00	800.00
16' T-Frame Mount	A	From Leg	0.00	0.0000	180.00	No Ice	14.10	14.10	350.00
(T-Mobile)			0.00			1/2" Ice	18.80	18.80	473.00
			0.00			1" Ice	23.50	23.50	596.00
16' T-Frame Mount	B	From Leg	0.00	0.0000	180.00	No Ice	14.10	14.10	350.00
(T-Mobile)			0.00			1/2" Ice	18.80	18.80	473.00
			0.00			1" Ice	23.50	23.50	596.00
16' T-Frame Mount	C	From Leg	0.00	0.0000	180.00	No Ice	14.10	14.10	350.00
(T-Mobile)			0.00			1/2" Ice	18.80	18.80	473.00
			0.00			1" Ice	23.50	23.50	596.00

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
Beacon	C	From Centroid-Leg	0.00 0.00 0.00	0.0000	256.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00
Top Platform	A	None		0.0000	256.00	No Ice 1/2" Ice 1" Ice	43.98 61.58 79.18	61.58 0.00 0.00	324.00 453.00 582.00
GPS antenna (Verizon)	A	From Leg	0.00 0.00 0.00	0.0000	110.00	No Ice 1/2" Ice 1" Ice	0.15 0.20 0.25	0.15 0.20 0.25	10.00 15.00 20.00
AIR 3246 B66 (T-Mobile)	A	From Leg	1.50 3.00 0.00	0.0000	180.00	No Ice 1/2" Ice 1" Ice	8.00 8.70 9.40	5.12 5.80 6.48	200.00 265.00 330.00
AIR 3246 B66 (T-Mobile)	B	From Leg	1.50 3.00 0.00	0.0000	180.00	No Ice 1/2" Ice 1" Ice	8.00 8.70 9.40	5.12 5.80 6.48	200.00 265.00 330.00
AIR 3246 B66 (T-Mobile)	C	From Leg	1.50 3.00 0.00	0.0000	180.00	No Ice 1/2" Ice 1" Ice	8.00 8.70 9.40	5.12 5.80 6.48	200.00 265.00 330.00
APXVAARR24_43-U-NA20 (T-Mobile)	A	From Leg	1.50 7.50 0.00	0.0000	179.00	No Ice 1/2" Ice 1" Ice	20.80 21.90 23.00	9.10 10.30 11.50	154.00 290.00 426.00
APXVAARR24_43-U-NA20 (T-Mobile)	B	From Leg	1.50 7.50 0.00	0.0000	179.00	No Ice 1/2" Ice 1" Ice	20.80 21.90 23.00	9.10 10.30 11.50	154.00 290.00 426.00
APXVAARR24_43-U-NA20 (T-Mobile)	C	From Leg	1.50 7.50 0.00	0.0000	179.00	No Ice 1/2" Ice 1" Ice	20.80 21.90 23.00	9.10 10.30 11.50	154.00 290.00 426.00
(2) JAHH-65B-R3B on mount (Verizon)	A	From Leg	5.50 -2.50 0.00	5.0000	110.00	No Ice 1/2" Ice 1" Ice	18.80 12.30 13.40	13.50 10.30 12.00	225.00 360.00 510.00
(2) JAHH-65B-R3B on mount (Verizon)	B	From Leg	5.50 -2.50 0.00	5.0000	110.00	No Ice 1/2" Ice 1" Ice	18.80 12.30 13.40	13.50 10.30 12.00	225.00 360.00 510.00
(2) JAHH-65B-R3B on mount (Verizon)	C	From Leg	5.50 -2.50 0.00	5.0000	110.00	No Ice 1/2" Ice 1" Ice	18.80 12.30 13.40	13.50 10.30 12.00	225.00 360.00 510.00
AIR 6449 B41 (T-Mobile)	A	From Leg	0.50 -7.50 0.00	0.0000	181.00	No Ice 1/2" Ice 1" Ice	5.68 6.14 6.60	2.49 2.87 3.25	86.00 150.90 215.80
AIR 6449 B41 (T-Mobile)	B	From Leg	0.50 -7.50 0.00	0.0000	181.00	No Ice 1/2" Ice 1" Ice	5.68 6.14 6.60	2.49 2.87 3.25	86.00 150.90 215.80
AIR 6449 B41 (T-Mobile)	C	From Leg	0.50 -7.50 0.00	0.0000	181.00	No Ice 1/2" Ice 1" Ice	5.68 6.14 6.60	2.49 2.87 3.25	86.00 150.90 215.80
Radio 4449 B71/B85 (T-Mobile)	A	From Leg	0.50 3.50 1.50	0.0000	180.00	No Ice 1/2" Ice 1" Ice	1.65 1.90 2.15	1.70 2.00 2.30	89.00 110.00 131.00
Radio 4449 B71/B85 (T-Mobile)	B	From Leg	0.50 3.50 1.50	0.0000	180.00	No Ice 1/2" Ice 1" Ice	1.65 1.90 2.15	1.70 2.00 2.30	89.00 110.00 131.00
Radio 4449 B71/B85 (T-Mobile)	C	From Leg	0.50 3.50 1.50	0.0000	180.00	No Ice 1/2" Ice 1" Ice	1.65 1.90 2.15	1.70 2.00 2.30	89.00 110.00 131.00
Radio 2212 B25 (T-Mobile)	A	From Leg	0.50 3.50 -1.50	0.0000	180.00	No Ice 1/2" Ice 1" Ice	2.10 2.20 2.40	1.70 1.80 1.90	100.00 120.00 140.00

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
Radio 2212 B25	B	From Leg	0.50	0.0000	180.00	No Ice	2.10	1.70	100.00
(T-Mobile)			3.50			1/2" Ice	2.20	1.80	120.00
			-1.50			1" Ice	2.40	1.90	140.00
Radio 2212 B25	C	From Leg	0.50	0.0000	180.00	No Ice	2.10	1.70	100.00
(T-Mobile)			3.50			1/2" Ice	2.20	1.80	120.00
			-1.50			1" Ice	2.40	1.90	140.00
Twin style 1B TMA	A	From Leg	0.50	0.0000	180.00	No Ice	0.60	0.28	16.00
(T-Mobile)			-3.50			1/2" Ice	0.80	0.40	24.00
			0.00			1" Ice	1.00	0.52	32.00
Twin style 1B TMA	B	From Leg	0.50	0.0000	180.00	No Ice	0.60	0.28	16.00
(T-Mobile)			-3.50			1/2" Ice	0.80	0.40	24.00
			0.00			1" Ice	1.00	0.52	32.00
Twin style 1B TMA	C	From Leg	0.50	0.0000	180.00	No Ice	0.60	0.28	16.00
(T-Mobile)			-3.50			1/2" Ice	0.80	0.40	24.00
			0.00			1" Ice	1.00	0.52	32.00
SBX1926Q-43 TMA	A	From Leg	0.75	-90.0000	180.00	No Ice	0.28	0.17	7.00
(T-Mobile)			-0.25			1/2" Ice	0.31	0.20	10.00
			0.00			1" Ice	0.34	0.23	13.00
SBX1926Q-43 TMA	B	From Leg	0.75	-90.0000	180.00	No Ice	0.28	0.17	7.00
(T-Mobile)			-0.25			1/2" Ice	0.31	0.20	10.00
			0.00			1" Ice	0.34	0.23	13.00
SBX1926Q-43 TMA	C	From Leg	0.75	-90.0000	180.00	No Ice	0.28	0.17	7.00
(T-Mobile)			-0.25			1/2" Ice	0.31	0.20	10.00
			0.00			1" Ice	0.34	0.23	13.00
C-band 64T64R MMU	A	From Leg	5.50	5.0000	110.00	No Ice	5.40	3.40	135.00
(Verizon)			4.00			1/2" Ice	6.00	4.30	180.00
			0.00			1" Ice	6.60	5.20	225.00
C-band 64T64R MMU	B	From Leg	5.50	5.0000	110.00	No Ice	5.40	3.40	135.00
(Verizon)			4.00			1/2" Ice	6.00	4.30	180.00
			0.00			1" Ice	6.60	5.20	225.00
C-band 64T64R MMU	C	From Leg	5.50	5.0000	110.00	No Ice	5.40	3.40	135.00
(Verizon)			4.00			1/2" Ice	6.00	4.30	180.00
			0.00			1" Ice	6.60	5.20	225.00
6' pipe mount	A	From Leg	5.00	0.0000	110.00	No Ice	1.50	1.50	40.00
(Verizon)			-1.00			1/2" Ice	2.10	2.10	55.00
			0.00			1" Ice	2.70	2.70	70.00
6' pipe mount	B	From Leg	5.00	0.0000	110.00	No Ice	1.50	1.50	40.00
(Verizon)			-1.00			1/2" Ice	2.10	2.10	55.00
			0.00			1" Ice	2.70	2.70	70.00
6' pipe mount	C	From Leg	5.00	0.0000	110.00	No Ice	1.50	1.50	40.00
(Verizon)			-1.00			1/2" Ice	2.10	2.10	55.00
			0.00			1" Ice	2.70	2.70	70.00
9' pipe mount	A	From Leg	5.00	0.0000	110.00	No Ice	2.20	2.20	50.00
(Verizon)			0.00			1/2" Ice	3.10	3.10	75.00
			0.00			1" Ice	4.00	4.00	100.00
9' pipe mount	B	From Leg	5.00	0.0000	110.00	No Ice	2.20	2.20	50.00
(Verizon)			0.00			1/2" Ice	3.10	3.10	75.00
			0.00			1" Ice	4.00	4.00	100.00
9' pipe mount	C	From Leg	5.00	0.0000	110.00	No Ice	2.20	2.20	50.00
(Verizon)			0.00			1/2" Ice	3.10	3.10	75.00
			0.00			1" Ice	4.00	4.00	100.00
B2/B66A Dual RRH	A	From Leg	5.00	0.0000	110.00	No Ice	1.90	1.30	100.00
(Verizon)			-2.50			1/2" Ice	2.10	1.40	125.00
			-1.00			1" Ice	2.20	1.60	150.00
B2/B66A Dual RRH	B	From Leg	5.00	0.0000	110.00	No Ice	1.90	1.30	100.00
(Verizon)			-2.50			1/2" Ice	2.10	1.40	125.00
			-1.00			1" Ice	2.20	1.60	150.00

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
B2/B66A Dual RRH	A	From Leg	5.00	0.0000	110.00	No Ice	1.90	1.30	100.00
(Verizon)			-2.50			1/2" Ice	2.10	1.40	125.00
			-1.00			1" Ice	2.20	1.60	150.00
B5/B13 Dual RRH	A	From Leg	5.00	0.0000	110.00	No Ice	1.90	1.10	85.00
(Verizon)			-2.50			1/2" Ice	2.10	1.20	105.00
			1.00			1" Ice	2.20	1.30	125.00
B5/B13 Dual RRH	B	From Leg	5.00	0.0000	110.00	No Ice	1.90	1.10	85.00
(Verizon)			-2.50			1/2" Ice	2.10	1.20	105.00
			1.00			1" Ice	2.20	1.30	125.00
B5/B13 Dual RRH	C	From Leg	5.00	0.0000	110.00	No Ice	1.90	1.10	85.00
(Verizon)			-2.50			1/2" Ice	2.10	1.20	105.00
			1.00			1" Ice	2.20	1.30	125.00
CBC78T-DS-43-2X	A	From Leg	5.00	0.0000	110.00	No Ice	0.57	0.52	25.00
(Verizon)			-2.50			1/2" Ice	0.64	0.59	35.00
			2.50			1" Ice	0.71	0.66	45.00
CBC78T-DS-43-2X	B	From Leg	5.00	0.0000	110.00	No Ice	0.57	0.52	25.00
(Verizon)			-2.50			1/2" Ice	0.64	0.59	35.00
			2.50			1" Ice	0.71	0.66	45.00
CBC78T-DS-43-2X	C	From Leg	5.00	0.0000	110.00	No Ice	0.57	0.52	25.00
(Verizon)			-2.50			1/2" Ice	0.64	0.59	35.00
			2.50			1" Ice	0.71	0.66	45.00
(2) TV 65 antenna	A	From Leg	5.00	0.0000	102.00	No Ice	2.57	1.73	25.00
			0.00			1/2" Ice	2.91	2.04	45.80
			0.00			1" Ice	3.25	2.35	66.60
Sidearm Mount	A	From Leg	2.50	0.0000	102.00	No Ice	2.78	2.78	51.20
			0.00			1/2" Ice	3.97	3.97	76.40
			0.00			1" Ice	5.16	5.16	101.60
Raycap 6-OVP	A	From Face	0.50	0.0000	110.00	No Ice	3.79	2.51	32.00
(Verizon)			-6.00			1/2" Ice	4.17	2.85	64.10
			0.00			1" Ice	4.55	3.19	96.20
Raycap 6-OVP	B	From Face	0.50	0.0000	110.00	No Ice	3.79	2.51	32.00
(Verizon)			-6.00			1/2" Ice	4.17	2.85	64.10
			0.00			1" Ice	4.55	3.19	96.20
Raycap 6-OVP	C	From Face	0.50	0.0000	110.00	No Ice	3.79	2.51	32.00
(Verizon)			-6.00			1/2" Ice	4.17	2.85	64.10
			0.00			1" Ice	4.55	3.19	96.20
Yagi	A	From Leg	0.00	0.0000	112.00	No Ice	0.22	0.22	5.00
			0.00			1/2" Ice	0.86	0.86	9.10
			0.00			1" Ice	1.50	1.50	13.20
10' Whip	A	From Leg	6.00	0.0000	232.00	No Ice	2.50	2.50	20.00
			0.00			1/2" Ice	3.36	3.36	44.10
			5.00			1" Ice	4.22	4.22	68.20
10' Whip	B	From Leg	6.00	0.0000	232.00	No Ice	2.50	2.50	20.00
			0.00			1/2" Ice	3.36	3.36	44.10
			5.00			1" Ice	4.22	4.22	68.20
6' Side Arm	A	From Leg	3.00	0.0000	232.00	No Ice	5.20	2.60	150.00
			0.00			1/2" Ice	5.90	3.00	200.00
			0.00			1" Ice	6.60	3.40	250.00
6' Side Arm	B	From Leg	3.00	0.0000	232.00	No Ice	5.20	2.60	150.00
			0.00			1/2" Ice	5.90	3.00	200.00
			0.00			1" Ice	6.60	3.40	250.00
18' Inverted Whip	C	From Face	6.00	0.0000	256.00	No Ice	4.32	4.32	45.00
			-9.00			1/2" Ice	5.85	5.85	92.90
			0.00			1" Ice	7.38	7.38	140.80
Yagi w/Radome	A	From Leg	6.00	0.0000	256.00	No Ice	1.80	4.20	50.00
			0.00			1/2" Ice	2.06	4.59	111.90
			0.00			1" Ice	2.32	4.98	173.80

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
Yagi w/Radome	A	From Leg	6.00 0.00 0.00	90.0000	257.00	No Ice 1/2" Ice 1" Ice	1.80 2.06 2.32	4.20 4.59 4.98	50.00 111.90 173.80
18' Whip	C	From Face	6.00 9.00 0.00	0.0000	256.00	No Ice 1/2" Ice 1" Ice	4.32 5.85 7.38	4.32 5.85 7.38	45.00 92.90 140.80
21' Whip	C	From Leg	3.00 10.50 0.00	0.0000	256.00	No Ice 1/2" Ice 1" Ice	5.04 6.82 8.60	5.04 6.82 8.60	55.00 99.30 143.60
9' Whip	B	From Leg	3.00 4.50 0.00	0.0000	257.00	No Ice 1/2" Ice 1" Ice	2.16 2.94 3.72	2.16 2.94 3.72	15.00 33.90 52.80
9' Whip	B	From Face	6.00 4.50 0.00	0.0000	257.00	No Ice 1/2" Ice 1" Ice	2.16 2.94 3.72	2.16 2.94 3.72	15.00 33.90 52.80
C10857278C V-Frame Mount (AT&T)	A	From Leg	1.50 0.00 0.00	0.0000	138.00	No Ice 1/2" Ice 1" Ice	15.00 20.60 26.20	15.00 20.60 26.20	788.00 933.00 1078.00
C10857278C V-Frame Mount (AT&T)	B	From Leg	1.50 0.00 0.00	0.0000	138.00	No Ice 1/2" Ice 1" Ice	15.00 20.60 26.20	15.00 20.60 26.20	788.00 933.00 1078.00
C10857278C V-Frame Mount (AT&T)	C	From Leg	1.50 0.00 0.00	0.0000	138.00	No Ice 1/2" Ice 1" Ice	15.00 20.60 26.20	15.00 20.60 26.20	788.00 933.00 1078.00
DMP65R-BU8DA-K (AT&T)	A	From Leg	3.00 -6.00 0.00	0.0000	138.00	No Ice 1/2" Ice 1" Ice	17.36 18.42 19.48	8.12 9.27 10.42	96.00 193.30 290.60
DMP65R-BU8DA-K (AT&T)	B	From Leg	3.00 -6.00 0.00	0.0000	138.00	No Ice 1/2" Ice 1" Ice	17.36 18.42 19.48	8.12 9.27 10.42	96.00 193.30 290.60
DMP65R-BU8DA-K (AT&T)	C	From Leg	3.00 -6.00 0.00	0.0000	138.00	No Ice 1/2" Ice 1" Ice	17.36 18.42 19.48	8.12 9.27 10.42	96.00 193.30 290.60
TPA65R-BU8DA-K (AT&T)	A	From Leg	3.00 2.00 0.00	0.0000	138.00	No Ice 1/2" Ice 1" Ice	17.36 18.42 19.48	8.12 9.27 10.42	87.00 184.30 281.60
TPA65R-BU8DA-K (AT&T)	B	From Leg	3.00 2.00 0.00	0.0000	138.00	No Ice 1/2" Ice 1" Ice	17.36 18.42 19.48	8.12 9.27 10.42	87.00 184.30 281.60
TPA65R-BU8DA-K (AT&T)	C	From Leg	3.00 2.00 0.00	0.0000	138.00	No Ice 1/2" Ice 1" Ice	17.36 18.42 19.48	8.12 9.27 10.42	87.00 184.30 281.60
HPA65R-BU8A (AT&T)	A	From Leg	3.00 -2.00 0.00	0.0000	138.00	No Ice 1/2" Ice 1" Ice	11.23 12.32 13.41	8.04 9.20 10.36	54.00 122.20 190.40
HPA65R-BU8A (AT&T)	B	From Leg	3.00 -2.00 0.00	0.0000	138.00	No Ice 1/2" Ice 1" Ice	11.23 12.32 13.41	8.04 9.20 10.36	54.00 122.20 190.40
HPA65R-BU8A (AT&T)	C	From Leg	3.00 -2.00 0.00	0.0000	138.00	No Ice 1/2" Ice 1" Ice	11.23 12.32 13.41	8.04 9.20 10.36	54.00 122.20 190.40
AIR 6449 N77 (AT&T)	A	From Leg	3.00 -6.00 0.00	0.0000	138.00	No Ice 1/2" Ice 1" Ice	4.03 4.42 4.81	2.72 3.08 3.44	96.00 130.20 164.40
AIR 6449 N77 (AT&T)	B	From Leg	3.00 -6.00 0.00	0.0000	138.00	No Ice 1/2" Ice 1" Ice	4.03 4.42 4.81	2.72 3.08 3.44	96.00 130.20 164.40

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
AIR 6449 N77	C	From Leg	3.00	0.0000	138.00	No Ice	4.03	2.72	96.00
(AT&T)			-6.00			1/2" Ice	4.42	3.08	130.20
			0.00			1" Ice	4.81	3.44	164.40
B14 4478 RRH	A	From Leg	1.50	0.0000	138.00	No Ice	2.02	1.25	60.00
(AT&T)			2.00			1/2" Ice	2.29	1.48	78.10
			0.00			1" Ice	2.56	1.71	96.20
B14 4478 RRH	B	From Leg	1.50	0.0000	138.00	No Ice	2.02	1.25	60.00
(AT&T)			2.00			1/2" Ice	2.29	1.48	78.10
			0.00			1" Ice	2.56	1.71	96.20
B14 4478 RRH	C	From Leg	1.50	0.0000	138.00	No Ice	2.02	1.25	60.00
(AT&T)			2.00			1/2" Ice	2.29	1.48	78.10
			0.00			1" Ice	2.56	1.71	96.20
Radio 4449 B5/B12	A	From Leg	1.50	0.0000	138.00	No Ice	1.97	1.40	71.00
(AT&T)			1.00			1/2" Ice	2.24	1.64	89.90
			0.00			1" Ice	2.51	1.88	108.80
Radio 4449 B5/B12	B	From Leg	1.50	0.0000	138.00	No Ice	1.97	1.40	71.00
(AT&T)			1.00			1/2" Ice	2.24	1.64	89.90
			0.00			1" Ice	2.51	1.88	108.80
Radio 4449 B5/B12	C	From Leg	1.50	0.0000	138.00	No Ice	1.97	1.40	71.00
(AT&T)			1.00			1/2" Ice	2.24	1.64	89.90
			0.00			1" Ice	2.51	1.88	108.80
B2/B66A 8843 RRH	A	From Leg	1.50	0.0000	138.00	No Ice	1.64	1.35	72.00
(AT&T)			-1.00			1/2" Ice	1.88	1.58	90.00
			0.00			1" Ice	2.12	1.81	108.00
B2/B66A 8843 RRH	B	From Leg	1.50	0.0000	138.00	No Ice	1.64	1.35	72.00
(AT&T)			-1.00			1/2" Ice	1.88	1.58	90.00
			0.00			1" Ice	2.12	1.81	108.00
B2/B66A 8843 RRH	C	From Leg	1.50	0.0000	138.00	No Ice	1.64	1.35	72.00
(AT&T)			-1.00			1/2" Ice	1.88	1.58	90.00
			0.00			1" Ice	2.12	1.81	108.00
Radio 4415 B30	A	From Leg	1.50	0.0000	138.00	No Ice	1.84	0.82	48.00
(AT&T)			-2.00			1/2" Ice	2.10	1.02	62.40
			0.00			1" Ice	2.36	1.22	76.80
Radio 4415 B30	B	From Leg	1.50	0.0000	138.00	No Ice	1.84	0.82	48.00
(AT&T)			-2.00			1/2" Ice	2.10	1.02	62.40
			0.00			1" Ice	2.36	1.22	76.80
Radio 4415 B30	C	From Leg	1.50	0.0000	138.00	No Ice	1.84	0.82	48.00
(AT&T)			-2.00			1/2" Ice	2.10	1.02	62.40
			0.00			1" Ice	2.36	1.22	76.80
RRUS-E2 RRH	A	From Leg	1.50	0.0000	138.00	No Ice	3.15	1.29	53.00
(AT&T)			-3.00			1/2" Ice	3.48	1.53	76.80
			0.00			1" Ice	3.81	1.77	100.60
RRUS-E2 RRH	B	From Leg	1.50	0.0000	138.00	No Ice	3.15	1.29	53.00
(AT&T)			-3.00			1/2" Ice	3.48	1.53	76.80
			0.00			1" Ice	3.81	1.77	100.60
RRUS-E2 RRH	C	From Leg	1.50	0.0000	138.00	No Ice	3.15	1.29	53.00
(AT&T)			-3.00			1/2" Ice	3.48	1.53	76.80
			0.00			1" Ice	3.81	1.77	100.60
DC9-48-60-24-8C-EV Squid	A	From Leg	1.50	0.0000	138.00	No Ice	4.79	2.73	16.00
(AT&T)			3.00			1/2" Ice	5.21	3.09	53.90
			0.00			1" Ice	5.63	3.45	91.80
DC9-48-60-24-8C-EV Squid	B	From Leg	1.50	0.0000	138.00	No Ice	4.79	2.73	16.00
(AT&T)			3.00			1/2" Ice	5.21	3.09	53.90
			0.00			1" Ice	5.63	3.45	91.80
DC9-48-60-24-8C-EV Squid	C	From Leg	1.50	0.0000	138.00	No Ice	4.79	2.73	16.00
(AT&T)			3.00			1/2" Ice	5.21	3.09	53.90
			0.00			1" Ice	5.63	3.45	91.80

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
MTC3975083 V-frame	A	From Leg	1.00	0.0000	151.00	No Ice	10.90	7.00	400.60
(Dish Wireless)			0.00			1/2" Ice	15.90	11.30	493.60
			0.00			1" Ice	20.90	15.60	586.60
MTC3975083 V-frame	B	From Leg	1.00	0.0000	151.00	No Ice	10.90	7.00	400.60
(Dish Wireless)			0.00			1/2" Ice	15.90	11.30	493.60
			0.00			1" Ice	20.90	15.60	586.60
MTC3975083 V-frame	C	From Leg	1.00	0.0000	151.00	No Ice	10.90	7.00	400.60
(Dish Wireless)			0.00			1/2" Ice	15.90	11.30	493.60
			0.00			1" Ice	20.90	15.60	586.60
MX08FRO665-21	A	From Leg	2.00	0.0000	151.00	No Ice	12.49	5.87	64.50
(Dish Wireless)			0.00			1/2" Ice	13.30	6.69	139.90
			0.00			1" Ice	14.11	7.51	215.30
MX08FRO665-21	B	From Leg	2.00	0.0000	151.00	No Ice	12.49	5.87	64.50
(Dish Wireless)			0.00			1/2" Ice	13.30	6.69	139.90
			0.00			1" Ice	14.11	7.51	215.30
MX08FRO665-21	C	From Leg	2.00	0.0000	151.00	No Ice	12.49	5.87	64.50
(Dish Wireless)			0.00			1/2" Ice	13.30	6.69	139.90
			0.00			1" Ice	14.11	7.51	215.30
TA08025-B605	A	From Leg	1.50	0.0000	151.00	No Ice	1.96	1.19	74.95
(Dish Wireless)			-2.00			1/2" Ice	2.23	1.41	93.33
			0.00			1" Ice	2.50	1.63	111.71
TA08025-B605	B	From Leg	1.50	0.0000	151.00	No Ice	1.96	1.19	74.95
(Dish Wireless)			-2.00			1/2" Ice	2.23	1.41	93.33
			0.00			1" Ice	2.50	1.63	111.71
TA08025-B605	C	From Leg	1.50	0.0000	151.00	No Ice	1.96	1.19	74.95
(Dish Wireless)			-2.00			1/2" Ice	2.23	1.41	93.33
			0.00			1" Ice	2.50	1.63	111.71
TA08025-B604	A	From Leg	1.50	0.0000	151.00	No Ice	1.96	1.03	63.93
(Dish Wireless)			2.00			1/2" Ice	2.23	1.24	81.06
			0.00			1" Ice	2.50	1.45	98.19
TA08025-B604	B	From Leg	1.50	0.0000	151.00	No Ice	1.96	1.03	63.93
(Dish Wireless)			2.00			1/2" Ice	2.23	1.24	81.06
			0.00			1" Ice	2.50	1.45	98.19
TA08025-B604	C	From Leg	1.50	0.0000	151.00	No Ice	1.96	1.03	63.93
(Dish Wireless)			2.00			1/2" Ice	2.23	1.24	81.06
			0.00			1" Ice	2.50	1.45	98.19
RDIDC-9181-PF-48	A	From Leg	0.00	0.0000	151.00	No Ice	1.67	1.07	21.85
(Dish Wireless)			0.00			1/2" Ice	2.13	1.28	38.53
			0.00			1" Ice	2.59	1.49	55.21

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight lb
HPCPE-80BW	A	Paraboloid w/o	From	1.00	0.0000		131.00	1.10	No Ice	1.07	35.00
(Sprint)		Radome	Leg	0.00					1/2" Ice	1.23	65.00
				0.00					1" Ice	1.39	95.00
VHLP1-23-2WH	B	Paraboloid w/o	From	1.00	0.0000		131.00	1.00	No Ice	0.78	25.00

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
(Sprint)		Radome	Leg	0.00					1/2" Ice	1.07	40.00
				0.00					1" Ice	1.36	55.00
VHLP2.5-11-4WH	C	Paraboloid w/o	From	1.00	0.0000		131.00	1.00	No Ice	4.91	49.00
(Sprint)		Radome	Leg	0.00					1/2" Ice	5.59	77.00
				0.00					1" Ice	6.27	105.00

Tower Pressures - No Ice

$G_H = 0.850$

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
T1	252.00	1.537	31	56.350	A	5.958	4.668	4.668	43.93	0.000	0.000
256.00-248.00					B	5.958	4.668		43.93	1.600	0.000
					C	5.958	4.668		43.93	10.704	0.000
T2	238.00	1.519	31	143.833	A	12.731	11.667	11.667	47.82	0.000	0.000
248.00-228.00					B	12.731	11.667		47.82	4.000	0.000
					C	12.731	11.667		47.82	28.000	0.000
T3	218.00	1.491	31	144.830	A	12.521	15.000	15.000	54.50	0.000	0.000
228.00-208.00					B	12.521	15.000		54.50	4.000	0.000
					C	12.521	15.000		54.50	33.212	0.000
T4	198.00	1.461	30	166.774	A	11.712	18.577	18.577	61.33	0.000	0.000
208.00-188.00					B	11.712	18.577		61.33	4.000	0.000
					C	11.712	18.577		61.33	34.220	0.000
T5	178.00	1.429	29	209.375	A	14.110	22.120	22.120	61.05	0.000	0.000
188.00-168.00					B	14.110	22.120		61.05	76.864	0.000
					C	14.110	22.120		61.05	34.220	0.000
T6	158.00	1.394	29	249.375	A	19.538	22.120	22.120	53.10	0.525	0.000
168.00-148.00					B	19.538	22.120		53.10	125.440	0.000
					C	19.538	22.120		53.10	34.220	0.000
T7	138.00	1.354	28	290.106	A	24.139	22.123	22.123	47.82	3.500	0.000
148.00-128.00					B	24.139	22.123		47.82	125.440	0.000
					C	24.139	22.123		47.82	43.700	0.000
T8	118.00	1.31	27	335.118	A	24.074	28.802	28.802	54.47	10.440	0.000
128.00-108.00					B	24.074	28.802		54.47	125.440	0.000
					C	24.074	28.802		54.47	53.180	0.000
T9	98.00	1.26	26	377.729	A	26.561	28.806	28.806	52.03	72.900	0.000
108.00-88.00					B	26.561	28.806		52.03	125.440	0.000
					C	26.561	28.806		52.03	55.350	0.000
T10	78.00	1.201	25	422.939	A	35.980	35.893	35.893	49.94	72.900	0.000
88.00-68.00					B	35.980	35.893		49.94	125.440	0.000
					C	35.980	35.893		49.94	56.280	0.000
T11	58.00	1.128	23	462.729	A	39.008	35.892	35.892	47.92	72.900	0.000
68.00-48.00					B	39.008	35.892		47.92	125.440	0.000
					C	39.008	35.892		47.92	56.280	0.000
T12	38.00	1.032	21	503.561	A	42.155	35.899	35.899	45.99	72.900	0.000
48.00-28.00					B	42.155	35.899		45.99	125.440	0.000
					C	42.155	35.899		45.99	56.280	0.000
T13 28.00-8.00	18.00	0.882	18	549.615	A	14.782	48.213	35.927	57.03	36.450	0.000
					B	14.782	48.213		57.03	62.720	0.000
					C	14.782	48.213		57.03	28.140	0.000

Tower Pressure - With Ice

G_H = 0.850

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
T1	252.00	1.537	8	1.8381	58.801	A	5.958	20.706	9.571	35.89	0.000	0.000
256.00-248.00						B	5.958	20.706		35.89	4.541	0.000
						C	5.958	20.706		35.89	31.291	0.000
T2	238.00	1.519	8	1.8277	149.926	A	12.731	47.119	23.851	39.85	0.000	0.000
248.00-228.00						B	12.731	47.119		39.85	11.311	0.000
						C	12.731	47.119		39.85	82.099	0.000
T3	218.00	1.491	8	1.8117	150.869	A	12.521	49.762	27.078	43.48	0.000	0.000
228.00-208.00						B	12.521	49.762		43.48	11.247	0.000
						C	12.521	49.762		43.48	99.882	0.000
T4	198.00	1.461	8	1.7943	172.763	A	11.712	51.576	30.561	48.29	0.000	0.000
208.00-188.00						B	11.712	51.576		48.29	11.177	0.000
						C	11.712	51.576		48.29	105.994	0.000
T5	178.00	1.429	8	1.7753	215.301	A	14.110	54.016	33.975	49.87	0.000	0.000
188.00-168.00						B	14.110	54.016		49.87	103.135	0.000
						C	14.110	54.016		49.87	105.234	0.000
T6	158.00	1.394	8	1.7543	255.230	A	19.538	56.685	33.835	44.39	1.578	0.000
168.00-148.00						B	19.538	56.685		44.39	163.738	0.000
						C	19.538	56.685		44.39	104.392	0.000
T7	138.00	1.354	7	1.7307	295.883	A	41.278	33.682	33.682	44.93	10.423	0.000
148.00-128.00						B	41.278	33.682		44.93	162.896	0.000
						C	41.278	33.682		44.93	123.306	0.000
T8	118.00	1.31	7	1.7038	340.805	A	24.074	60.691	40.182	47.40	20.914	0.000
128.00-108.00						B	24.074	60.691		47.40	161.935	0.000
						C	24.074	60.691		47.40	141.708	0.000
T9 108.00-88.00	98.00	1.26	7	1.6725	383.312	A	26.561	62.189	39.978	45.05	115.645	0.000
						B	26.561	62.189		45.05	160.815	0.000
						C	26.561	62.189		45.05	146.863	0.000
T10 88.00-68.00	78.00	1.201	7	1.6347	428.395	A	35.980	70.337	46.809	44.03	114.849	0.000
						B	35.980	70.337		44.03	159.467	0.000
						C	35.980	70.337		44.03	147.606	0.000
T11 68.00-48.00	58.00	1.128	6	1.5870	468.025	A	39.008	71.251	46.489	42.16	113.844	0.000
						B	39.008	71.251		42.16	157.763	0.000
						C	39.008	71.251		42.16	144.831	0.000
T12 48.00-28.00	38.00	1.032	6	1.5213	508.639	A	42.155	71.713	46.060	40.45	112.461	0.000
						B	42.155	71.713		40.45	155.418	0.000
						C	42.155	71.713		40.45	141.010	0.000
T13 28.00-8.00	18.00	0.882	5	1.4118	554.330	A	21.739	71.041	45.363	48.89	55.079	0.000
						B	21.739	71.041		48.89	75.756	0.000
						C	21.739	71.041		48.89	67.321	0.000

Tower Pressure - Service

G_H = 0.850

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

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
T1	252.00	1.537	12	56.350	A	5.958	4.668	4.668	43.93	0.000	0.000
256.00-248.00					B	5.958	4.668		43.93	1.600	0.000
					C	5.958	4.668		43.93	10.704	0.000
T2	238.00	1.519	12	143.833	A	12.731	11.667	11.667	47.82	0.000	0.000
248.00-228.00					B	12.731	11.667		47.82	4.000	0.000
					C	12.731	11.667		47.82	28.000	0.000
T3	218.00	1.491	12	144.830	A	12.521	15.000	15.000	54.50	0.000	0.000
228.00-208.00					B	12.521	15.000		54.50	4.000	0.000
					C	12.521	15.000		54.50	33.212	0.000
T4	198.00	1.461	11	166.774	A	11.712	18.577	18.577	61.33	0.000	0.000
208.00-188.00					B	11.712	18.577		61.33	4.000	0.000
					C	11.712	18.577		61.33	34.220	0.000
T5	178.00	1.429	11	209.375	A	14.110	22.120	22.120	61.05	0.000	0.000
188.00-168.00					B	14.110	22.120		61.05	76.864	0.000
					C	14.110	22.120		61.05	34.220	0.000
T6	158.00	1.394	11	249.375	A	19.538	22.120	22.120	53.10	0.525	0.000
168.00-148.00					B	19.538	22.120		53.10	125.440	0.000
					C	19.538	22.120		53.10	34.220	0.000
T7	138.00	1.354	11	290.106	A	24.139	22.123	22.123	47.82	3.500	0.000
148.00-128.00					B	24.139	22.123		47.82	125.440	0.000
					C	24.139	22.123		47.82	43.700	0.000
T8	118.00	1.31	10	335.118	A	24.074	28.802	28.802	54.47	10.440	0.000
128.00-108.00					B	24.074	28.802		54.47	125.440	0.000
					C	24.074	28.802		54.47	53.180	0.000
T9	98.00	1.26	10	377.729	A	26.561	28.806	28.806	52.03	72.900	0.000
108.00-88.00					B	26.561	28.806		52.03	125.440	0.000
					C	26.561	28.806		52.03	55.350	0.000
T10	78.00	1.201	9	422.939	A	35.980	35.893	35.893	49.94	72.900	0.000
88.00-68.00					B	35.980	35.893		49.94	125.440	0.000
					C	35.980	35.893		49.94	56.280	0.000
T11	58.00	1.128	9	462.729	A	39.008	35.892	35.892	47.92	72.900	0.000
68.00-48.00					B	39.008	35.892		47.92	125.440	0.000
					C	39.008	35.892		47.92	56.280	0.000
T12	38.00	1.032	8	503.561	A	42.155	35.899	35.899	45.99	72.900	0.000
48.00-28.00					B	42.155	35.899		45.99	125.440	0.000
					C	42.155	35.899		45.99	56.280	0.000
T13 28.00-8.00	18.00	0.882	7	549.615	A	14.782	48.213	35.927	57.03	36.450	0.000
					B	14.782	48.213		57.03	62.720	0.000
					C	14.782	48.213		57.03	28.140	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
T1	156.80	478.15	A	0.189	2.635	31	1	1	8.571	880.74	110.09	C
256.00-248.00			B	0.189	2.635		1	1	8.571			
			C	0.189	2.635		1	1	8.571			
T2	397.28	1379.45	A	0.17	2.701	31	1	1	19.231	2083.62	104.18	C
248.00-228.00			B	0.17	2.701		1	1	19.231			
			C	0.17	2.701		1	1	19.231			
T3	419.00	1660.78	A	0.19	2.63	31	1	1	20.341	2199.39	109.97	C
228.00-208.00			B	0.19	2.63		1	1	20.341			
			C	0.19	2.63		1	1	20.341			
T4	421.40	1965.15	A	0.182	2.659	30	1	1	20.562	2206.76	110.34	C
208.00-188.00			B	0.182	2.659		1	1	20.562			

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
			C	0.182	2.659		1	1	20.562			
T5	934.52	2590.18	A	0.173	2.689	29	1	1	23.639	3900.92	195.05	C
188.00-168.00			B	0.173	2.689		1	1	23.639			
			C	0.173	2.689		1	1	23.639			
T6	1284.75	2923.52	A	0.167	2.71	29	1	1	29.072	5173.75	258.69	C
168.00-148.00			B	0.167	2.71		1	1	29.072			
			C	0.167	2.71		1	1	29.072			
T7	1417.02	3673.43	A	0.159	2.737	28	1	1	33.677	5590.77	279.54	C
148.00-128.00			B	0.159	2.737		1	1	33.677			
			C	0.159	2.737		1	1	33.677			
T8	1551.00	4195.56	A	0.158	2.743	27	1	1	36.249	5889.61	294.48	C
128.00-108.00			B	0.158	2.743		1	1	36.249			
			C	0.158	2.743		1	1	36.249			
T9	1991.16	4629.82	A	0.147	2.784	26	1	1	38.572	7028.94	351.45	C
108.00-88.00			B	0.147	2.784		1	1	38.572			
			C	0.147	2.784		1	1	38.572			
T10	1995.12	6622.30	A	0.17	2.699	25	1	1	51.382	7370.08	368.50	C
88.00-68.00			B	0.17	2.699		1	1	51.382			
			C	0.17	2.699		1	1	51.382			
T11	1995.12	6887.43	A	0.162	2.728	23	1	1	54.255	7107.49	355.37	C
68.00-48.00			B	0.162	2.728		1	1	54.255			
			C	0.162	2.728		1	1	54.255			
T12	1995.12	7164.56	A	0.155	2.753	21	1	1	57.278	6675.86	333.79	C
48.00-28.00			B	0.155	2.753		1	1	57.278			
			C	0.155	2.753		1	1	57.278			
T13	997.56	6508.82	A	0.115	2.906	18	1	1	36.151	3254.32	162.72	C
28.00-8.00			B	0.115	2.906		1	1	36.151			
			C	0.115	2.906		1	1	36.151			
Sum Weight:	15555.85	50679.16						OTM	6125870.16 lb-ft	59362.26		

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
T1	156.80	478.15	A	0.189	2.635	31	0.8	1	7.379	796.74	99.59	C
256.00-248.00			B	0.189	2.635		0.8	1	7.379			
			C	0.189	2.635		0.8	1	7.379			
T2	397.28	1379.45	A	0.17	2.701	31	0.8	1	16.685	1901.84	95.09	C
248.00-228.00			B	0.17	2.701		0.8	1	16.685			
			C	0.17	2.701		0.8	1	16.685			
T3	419.00	1660.78	A	0.19	2.63	31	0.8	1	17.836	2028.49	101.42	C
228.00-208.00			B	0.19	2.63		0.8	1	17.836			
			C	0.19	2.63		0.8	1	17.836			
T4	421.40	1965.15	A	0.182	2.659	30	0.8	1	18.220	2048.39	102.42	C
208.00-188.00			B	0.182	2.659		0.8	1	18.220			
			C	0.182	2.659		0.8	1	18.220			
T5	934.52	2590.18	A	0.173	2.689	29	0.8	1	20.817	3712.24	185.61	C
188.00-168.00			B	0.173	2.689		0.8	1	20.817			
			C	0.173	2.689		0.8	1	20.817			
T6	1284.75	2923.52	A	0.167	2.71	29	0.8	1	25.165	4916.97	245.85	C
168.00-148.00			B	0.167	2.71		0.8	1	25.165			

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
			C	0.167	2.71		0.8	1	25.165			
T7	1417.02	3673.43	A	0.159	2.737	28	0.8	1	28.849	5279.32	263.97	C
148.00-128.00			B	0.159	2.737		0.8	1	28.849			
			C	0.159	2.737		0.8	1	28.849			
T8	1551.00	4195.56	A	0.158	2.743	27	0.8	1	31.434	5588.40	279.42	C
128.00-108.00			B	0.158	2.743		0.8	1	31.434			
			C	0.158	2.743		0.8	1	31.434			
T9	1991.16	4629.82	A	0.147	2.784	26	0.8	1	33.260	6704.57	335.23	C
108.00-88.00			B	0.147	2.784		0.8	1	33.260			
			C	0.147	2.784		0.8	1	33.260			
T10	1995.12	6622.30	A	0.17	2.699	25	0.8	1	44.186	6964.03	348.20	C
88.00-68.00			B	0.17	2.699		0.8	1	44.186			
			C	0.17	2.699		0.8	1	44.186			
T11	1995.12	6887.43	A	0.162	2.728	23	0.8	1	46.454	6689.47	334.47	C
68.00-48.00			B	0.162	2.728		0.8	1	46.454			
			C	0.162	2.728		0.8	1	46.454			
T12	1995.12	7164.56	A	0.155	2.753	21	0.8	1	48.847	6258.82	312.94	C
48.00-28.00			B	0.155	2.753		0.8	1	48.847			
			C	0.155	2.753		0.8	1	48.847			
T13	997.56	6508.82	A	0.115	2.906	18	0.8	1	33.194	3122.44	156.12	C
28.00-8.00			B	0.115	2.906		0.8	1	33.194			
			C	0.115	2.906		0.8	1	33.194			
Sum Weight:	15555.85	50679.16						OTM	5761020.3 5 lb-ft	56011.71		

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
T1	156.80	478.15	A	0.189	2.635	31	0.85	1	7.677	817.74	102.22	C
256.00-248.00			B	0.189	2.635		0.85	1	7.677			
			C	0.189	2.635		0.85	1	7.677			
T2	397.28	1379.45	A	0.17	2.701	31	0.85	1	17.322	1947.28	97.36	C
248.00-228.00			B	0.17	2.701		0.85	1	17.322			
			C	0.17	2.701		0.85	1	17.322			
T3	419.00	1660.78	A	0.19	2.63	31	0.85	1	18.462	2071.21	103.56	C
228.00-208.00			B	0.19	2.63		0.85	1	18.462			
			C	0.19	2.63		0.85	1	18.462			
T4	421.40	1965.15	A	0.182	2.659	30	0.85	1	18.806	2087.98	104.40	C
208.00-188.00			B	0.182	2.659		0.85	1	18.806			
			C	0.182	2.659		0.85	1	18.806			
T5	934.52	2590.18	A	0.173	2.689	29	0.85	1	21.522	3759.41	187.97	C
188.00-168.00			B	0.173	2.689		0.85	1	21.522			
			C	0.173	2.689		0.85	1	21.522			
T6	1284.75	2923.52	A	0.167	2.71	29	0.85	1	26.141	4981.16	249.06	C
168.00-148.00			B	0.167	2.71		0.85	1	26.141			
			C	0.167	2.71		0.85	1	26.141			
T7	1417.02	3673.43	A	0.159	2.737	28	0.85	1	30.056	5357.18	267.86	C
148.00-128.00			B	0.159	2.737		0.85	1	30.056			
			C	0.159	2.737		0.85	1	30.056			
T8	1551.00	4195.56	A	0.158	2.743	27	0.85	1	32.638	5663.70	283.19	C
128.00-108.00			B	0.158	2.743		0.85	1	32.638			

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
			C	0.158	2.743		0.85	1	32.638			
T9	1991.16	4629.82	A	0.147	2.784	26	0.85	1	34.588	6785.66	339.28	C
108.00-88.00			B	0.147	2.784		0.85	1	34.588			
			C	0.147	2.784		0.85	1	34.588			
T10	1995.12	6622.30	A	0.17	2.699	25	0.85	1	45.985	7065.54	353.28	C
88.00-68.00			B	0.17	2.699		0.85	1	45.985			
			C	0.17	2.699		0.85	1	45.985			
T11	1995.12	6887.43	A	0.162	2.728	23	0.85	1	48.404	6793.97	339.70	C
68.00-48.00			B	0.162	2.728		0.85	1	48.404			
			C	0.162	2.728		0.85	1	48.404			
T12	1995.12	7164.56	A	0.155	2.753	21	0.85	1	50.955	6363.08	318.15	C
48.00-28.00			B	0.155	2.753		0.85	1	50.955			
			C	0.155	2.753		0.85	1	50.955			
T13	997.56	6508.82	A	0.115	2.906	18	0.85	1	33.933	3155.41	157.77	C
28.00-8.00			B	0.115	2.906		0.85	1	33.933			
			C	0.115	2.906		0.85	1	33.933			
Sum Weight:	15555.85	50679.16						OTM	5852232.8 1 lb-ft	56849.35		

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
T1	682.87	1948.66	A	0.453	1.968	8	1	1	19.645	473.53	59.19	C
256.00-248.00			B	0.453	1.968		1	1	19.645			
			C	0.453	1.968		1	1	19.645			
T2	1761.45	4580.82	A	0.399	2.066	8	1	1	42.693	1131.23	56.56	C
248.00-228.00			B	0.399	2.066		1	1	42.693			
			C	0.399	2.066		1	1	42.693			
T3	2024.88	4947.47	A	0.413	2.039	8	1	1	44.463	1222.92	61.15	C
228.00-208.00			B	0.413	2.039		1	1	44.463			
			C	0.413	2.039		1	1	44.463			
T4	2089.02	5204.89	A	0.366	2.135	8	1	1	43.809	1249.47	62.47	C
208.00-188.00			B	0.366	2.135		1	1	43.809			
			C	0.366	2.135		1	1	43.809			
T5	3811.73	6163.86	A	0.316	2.253	8	1	1	46.746	1769.89	88.49	C
188.00-168.00			B	0.316	2.253		1	1	46.746			
			C	0.316	2.253		1	1	46.746			
T6	4953.69	7162.77	A	0.299	2.3	8	1	1	53.463	2147.84	107.39	C
168.00-148.00			B	0.299	2.3		1	1	53.463			
			C	0.299	2.3		1	1	53.463			
T7	5346.90	6562.35	A	0.253	2.428	7	1	1	61.009	2376.54	118.83	C
148.00-128.00			B	0.253	2.428		1	1	61.009			
			C	0.253	2.428		1	1	61.009			
T8	5731.22	8963.61	A	0.249	2.441	7	1	1	59.560	2415.17	120.76	C
128.00-108.00			B	0.249	2.441		1	1	59.560			
			C	0.249	2.441		1	1	59.560			
T9	7344.27	9622.24	A	0.232	2.494	7	1	1	62.674	2835.05	141.75	C
108.00-88.00			B	0.232	2.494		1	1	62.674			
			C	0.232	2.494		1	1	62.674			
T10	7241.31	12821.72	A	0.248	2.443	7	1	1	77.096	2873.87	143.69	C
88.00-68.00			B	0.248	2.443		1	1	77.096			

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
			C	0.248	2.443		1	1	77.096			
T11	7058.53	13237.66	A	0.236	2.481	6	1	1	80.448	2736.65	136.83	C
68.00-48.00			B	0.236	2.481		1	1	80.448			
			C	0.236	2.481		1	1	80.448			
T12	6811.13	13568.45	A	0.224	2.518	6	1	1	83.682	2528.44	126.42	C
48.00-28.00			B	0.224	2.518		1	1	83.682			
			C	0.224	2.518		1	1	83.682			
T13	3204.88	11182.77	A	0.167	2.709	5	1	1	62.199	1317.60	65.88	C
28.00-8.00			B	0.167	2.709		1	1	62.199			
			C	0.167	2.709		1	1	62.199			
Sum Weight:	58061.88	105967.27						OTM	2749800.0 9 lb-ft	25078.20		

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 ft^2	F lb	w plf	Ctrl. Face
T1	682.87	1948.66	A	0.453	1.968	8	0.8	1	18.453	456.86	57.11	C
256.00-248.00			B	0.453	1.968		0.8	1	18.453			
			C	0.453	1.968		0.8	1	18.453			
T2	1761.45	4580.82	A	0.399	2.066	8	0.8	1	40.147	1094.29	54.71	C
248.00-228.00			B	0.399	2.066		0.8	1	40.147			
			C	0.399	2.066		0.8	1	40.147			
T3	2024.88	4947.47	A	0.413	2.039	8	0.8	1	41.959	1187.71	59.39	C
228.00-208.00			B	0.413	2.039		0.8	1	41.959			
			C	0.413	2.039		0.8	1	41.959			
T4	2089.02	5204.89	A	0.366	2.135	8	0.8	1	41.467	1215.68	60.78	C
208.00-188.00			B	0.366	2.135		0.8	1	41.467			
			C	0.366	2.135		0.8	1	41.467			
T5	3811.73	6163.86	A	0.316	2.253	8	0.8	1	43.924	1727.87	86.39	C
188.00-168.00			B	0.316	2.253		0.8	1	43.924			
			C	0.316	2.253		0.8	1	43.924			
T6	4953.69	7162.77	A	0.299	2.3	8	0.8	1	49.556	2089.94	104.50	C
168.00-148.00			B	0.299	2.3		0.8	1	49.556			
			C	0.299	2.3		0.8	1	49.556			
T7	5346.90	6562.35	A	0.253	2.428	7	0.8	1	52.754	2251.03	112.55	C
148.00-128.00			B	0.253	2.428		0.8	1	52.754			
			C	0.253	2.428		0.8	1	52.754			
T8	5731.22	8963.61	A	0.249	2.441	7	0.8	1	54.745	2343.94	117.20	C
128.00-108.00			B	0.249	2.441		0.8	1	54.745			
			C	0.249	2.441		0.8	1	54.745			
T9	7344.27	9622.24	A	0.232	2.494	7	0.8	1	57.362	2757.85	137.89	C
108.00-88.00			B	0.232	2.494		0.8	1	57.362			
			C	0.232	2.494		0.8	1	57.362			
T10	7241.31	12821.72	A	0.248	2.443	7	0.8	1	69.900	2776.23	138.81	C
88.00-68.00			B	0.248	2.443		0.8	1	69.900			
			C	0.248	2.443		0.8	1	69.900			
T11	7058.53	13237.66	A	0.236	2.481	6	0.8	1	72.647	2635.64	131.78	C
68.00-48.00			B	0.236	2.481		0.8	1	72.647			
			C	0.236	2.481		0.8	1	72.647			
T12	6811.13	13568.45	A	0.224	2.518	6	0.8	1	75.251	2427.09	121.35	C
48.00-28.00			B	0.224	2.518		0.8	1	75.251			

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
			C	0.224	2.518		0.8	1	75.251			
T13	3204.88	11182.77	A	0.167	2.709	5	0.8	1	57.851	1269.56	63.48	C
28.00-8.00			B	0.167	2.709		0.8	1	57.851			
			C	0.167	2.709		0.8	1	57.851			
Sum Weight:	58061.88	105967.27						OTM	2661086.8 0 lb-ft	24233.68		

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
T1	682.87	1948.66	A	0.453	1.968	8	0.85	1	18.751	461.03	57.63	C
256.00-248.00			B	0.453	1.968		0.85	1	18.751			
			C	0.453	1.968		0.85	1	18.751			
T2	1761.45	4580.82	A	0.399	2.066	8	0.85	1	40.784	1103.52	55.18	C
248.00-228.00			B	0.399	2.066		0.85	1	40.784			
			C	0.399	2.066		0.85	1	40.784			
T3	2024.88	4947.47	A	0.413	2.039	8	0.85	1	42.585	1196.52	59.83	C
228.00-208.00			B	0.413	2.039		0.85	1	42.585			
			C	0.413	2.039		0.85	1	42.585			
T4	2089.02	5204.89	A	0.366	2.135	8	0.85	1	42.052	1224.13	61.21	C
208.00-188.00			B	0.366	2.135		0.85	1	42.052			
			C	0.366	2.135		0.85	1	42.052			
T5	3811.73	6163.86	A	0.316	2.253	8	0.85	1	44.630	1738.38	86.92	C
188.00-168.00			B	0.316	2.253		0.85	1	44.630			
			C	0.316	2.253		0.85	1	44.630			
T6	4953.69	7162.77	A	0.299	2.3	8	0.85	1	50.533	2104.41	105.22	C
168.00-148.00			B	0.299	2.3		0.85	1	50.533			
			C	0.299	2.3		0.85	1	50.533			
T7	5346.90	6562.35	A	0.253	2.428	7	0.85	1	54.818	2282.40	114.12	C
148.00-128.00			B	0.253	2.428		0.85	1	54.818			
			C	0.253	2.428		0.85	1	54.818			
T8	5731.22	8963.61	A	0.249	2.441	7	0.85	1	55.949	2361.75	118.09	C
128.00-108.00			B	0.249	2.441		0.85	1	55.949			
			C	0.249	2.441		0.85	1	55.949			
T9	7344.27	9622.24	A	0.232	2.494	7	0.85	1	58.690	2777.15	138.86	C
108.00-88.00			B	0.232	2.494		0.85	1	58.690			
			C	0.232	2.494		0.85	1	58.690			
T10	7241.31	12821.72	A	0.248	2.443	7	0.85	1	71.699	2800.64	140.03	C
88.00-68.00			B	0.248	2.443		0.85	1	71.699			
			C	0.248	2.443		0.85	1	71.699			
T11	7058.53	13237.66	A	0.236	2.481	6	0.85	1	74.597	2660.89	133.04	C
68.00-48.00			B	0.236	2.481		0.85	1	74.597			
			C	0.236	2.481		0.85	1	74.597			
T12	6811.13	13568.45	A	0.224	2.518	6	0.85	1	77.358	2452.43	122.62	C
48.00-28.00			B	0.224	2.518		0.85	1	77.358			
			C	0.224	2.518		0.85	1	77.358			
T13	3204.88	11182.77	A	0.167	2.709	5	0.85	1	58.938	1281.57	64.08	C
28.00-8.00			B	0.167	2.709		0.85	1	58.938			
			C	0.167	2.709		0.85	1	58.938			
Sum Weight:	58061.88	105967.27						OTM	2683265.1 2 lb-ft	24444.81		

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 ft²	F lb	w plf	Ctrl. Face
T1	156.80	478.15	A	0.189	2.635	12	1	1	8.631	338.60	42.32	C
256.00-248.00			B	0.189	2.635		1	1	8.631			
			C	0.189	2.635		1	1	8.631			
T2	397.28	1379.45	A	0.17	2.701	12	1	1	19.379	801.24	40.06	C
248.00-228.00			B	0.17	2.701		1	1	19.379			
			C	0.17	2.701		1	1	19.379			
T3	419.00	1660.78	A	0.19	2.63	12	1	1	21.113	861.69	43.08	C
228.00-208.00			B	0.19	2.63		1	1	21.113			
			C	0.19	2.63		1	1	21.113			
T4	421.40	1965.15	A	0.182	2.659	11	1	1	22.200	886.70	44.34	C
208.00-188.00			B	0.182	2.659		1	1	22.200			
			C	0.182	2.659		1	1	22.200			
T5	934.52	2590.18	A	0.173	2.689	11	1	1	25.992	1552.74	77.64	C
188.00-168.00			B	0.173	2.689		1	1	25.992			
			C	0.173	2.689		1	1	25.992			
T6	1284.75	2923.52	A	0.167	2.71	11	1	1	31.438	2039.03	101.95	C
168.00-148.00			B	0.167	2.71		1	1	31.438			
			C	0.167	2.71		1	1	31.438			
T7	1417.02	3673.43	A	0.159	2.737	11	1	1	36.060	2197.92	109.90	C
148.00-128.00			B	0.159	2.737		1	1	36.060			
			C	0.159	2.737		1	1	36.060			
T8	1551.00	4195.56	A	0.158	2.743	10	1	1	38.168	2299.36	114.97	C
128.00-108.00			B	0.158	2.743		1	1	38.168			
			C	0.158	2.743		1	1	38.168			
T9	1991.16	4629.82	A	0.147	2.784	10	1	1	40.680	2738.61	136.93	C
108.00-88.00			B	0.147	2.784		1	1	40.680			
			C	0.147	2.784		1	1	40.680			
T10	1995.12	6622.30	A	0.17	2.699	9	1	1	52.186	2837.24	141.86	C
88.00-68.00			B	0.17	2.699		1	1	52.186			
			C	0.17	2.699		1	1	52.186			
T11	1995.12	6887.43	A	0.162	2.728	9	1	1	55.370	2742.27	137.11	C
68.00-48.00			B	0.162	2.728		1	1	55.370			
			C	0.162	2.728		1	1	55.370			
T12	1995.12	7164.56	A	0.155	2.753	8	1	1	58.824	2583.52	129.18	C
48.00-28.00			B	0.155	2.753		1	1	58.824			
			C	0.155	2.753		1	1	58.824			
T13	997.56	6508.82	A	0.115	2.906	7	1	1	38.629	1287.44	64.37	C
28.00-8.00			B	0.115	2.906		1	1	38.629			
			C	0.115	2.906		1	1	38.629			
Sum Weight:	15555.85	50679.16						OTM	2397386.8 8 lb-ft	23166.37		

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
T1	156.80	478.15	A	0.189	2.635	12	0.8	1	7.439	306.46	38.31	C
256.00-248.00			B	0.189	2.635		0.8	1	7.439			
			C	0.189	2.635		0.8	1	7.439			
T2	397.28	1379.45	A	0.17	2.701	12	0.8	1	16.833	731.69	36.58	C
248.00-228.00			B	0.17	2.701		0.8	1	16.833			
			C	0.17	2.701		0.8	1	16.833			
T3	419.00	1660.78	A	0.19	2.63	12	0.8	1	18.609	796.30	39.81	C
228.00-208.00			B	0.19	2.63		0.8	1	18.609			
			C	0.19	2.63		0.8	1	18.609			
T4	421.40	1965.15	A	0.182	2.659	11	0.8	1	19.858	826.11	41.31	C
208.00-188.00			B	0.182	2.659		0.8	1	19.858			
			C	0.182	2.659		0.8	1	19.858			
T5	934.52	2590.18	A	0.173	2.689	11	0.8	1	23.170	1480.55	74.03	C
188.00-168.00			B	0.173	2.689		0.8	1	23.170			
			C	0.173	2.689		0.8	1	23.170			
T6	1284.75	2923.52	A	0.167	2.71	11	0.8	1	27.530	1940.78	97.04	C
168.00-148.00			B	0.167	2.71		0.8	1	27.530			
			C	0.167	2.71		0.8	1	27.530			
T7	1417.02	3673.43	A	0.159	2.737	11	0.8	1	31.233	2078.75	103.94	C
148.00-128.00			B	0.159	2.737		0.8	1	31.233			
			C	0.159	2.737		0.8	1	31.233			
T8	1551.00	4195.56	A	0.158	2.743	10	0.8	1	33.353	2184.11	109.21	C
128.00-108.00			B	0.158	2.743		0.8	1	33.353			
			C	0.158	2.743		0.8	1	33.353			
T9	1991.16	4629.82	A	0.147	2.784	10	0.8	1	35.368	2614.50	130.73	C
108.00-88.00			B	0.147	2.784		0.8	1	35.368			
			C	0.147	2.784		0.8	1	35.368			
T10	1995.12	6622.30	A	0.17	2.699	9	0.8	1	44.990	2681.88	134.09	C
88.00-68.00			B	0.17	2.699		0.8	1	44.990			
			C	0.17	2.699		0.8	1	44.990			
T11	1995.12	6887.43	A	0.162	2.728	9	0.8	1	47.569	2582.33	129.12	C
68.00-48.00			B	0.162	2.728		0.8	1	47.569			
			C	0.162	2.728		0.8	1	47.569			
T12	1995.12	7164.56	A	0.155	2.753	8	0.8	1	50.393	2423.96	121.20	C
48.00-28.00			B	0.155	2.753		0.8	1	50.393			
			C	0.155	2.753		0.8	1	50.393			
T13	997.56	6508.82	A	0.115	2.906	7	0.8	1	35.672	1236.98	61.85	C
28.00-8.00			B	0.115	2.906		0.8	1	35.672			
			C	0.115	2.906		0.8	1	35.672			
Sum Weight:	15555.85	50679.16						OTM	2257790.8 2 lb-ft	21884.41		

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
T1	156.80	478.15	A	0.189	2.635	12	0.85	1	7.737	314.49	39.31	C
256.00-248.00			B	0.189	2.635		0.85	1	7.737			
			C	0.189	2.635		0.85	1	7.737			
T2	397.28	1379.45	A	0.17	2.701	12	0.85	1	17.469	749.08	37.45	C
248.00-228.00			B	0.17	2.701		0.85	1	17.469			
			C	0.17	2.701		0.85	1	17.469			

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
T3	419.00	1660.78	A	0.19	2.63	12	0.85	1	19.235	812.64	40.63	C
228.00-208.00			B	0.19	2.63		0.85	1	19.235			
			C	0.19	2.63		0.85	1	19.235			
T4	421.40	1965.15	A	0.182	2.659	11	0.85	1	20.444	841.26	42.06	C
208.00-188.00			B	0.182	2.659		0.85	1	20.444			
			C	0.182	2.659		0.85	1	20.444			
T5	934.52	2590.18	A	0.173	2.689	11	0.85	1	23.876	1498.60	74.93	C
188.00-168.00			B	0.173	2.689		0.85	1	23.876			
			C	0.173	2.689		0.85	1	23.876			
T6	1284.75	2923.52	A	0.167	2.71	11	0.85	1	28.507	1965.34	98.27	C
168.00-148.00			B	0.167	2.71		0.85	1	28.507			
			C	0.167	2.71		0.85	1	28.507			
T7	1417.02	3673.43	A	0.159	2.737	11	0.85	1	32.439	2108.55	105.43	C
148.00-128.00			B	0.159	2.737		0.85	1	32.439			
			C	0.159	2.737		0.85	1	32.439			
T8	1551.00	4195.56	A	0.158	2.743	10	0.85	1	34.557	2212.93	110.65	C
128.00-108.00			B	0.158	2.743		0.85	1	34.557			
			C	0.158	2.743		0.85	1	34.557			
T9	1991.16	4629.82	A	0.147	2.784	10	0.85	1	36.696	2645.53	132.28	C
108.00-88.00			B	0.147	2.784		0.85	1	36.696			
			C	0.147	2.784		0.85	1	36.696			
T10	1995.12	6622.30	A	0.17	2.699	9	0.85	1	46.789	2720.72	136.04	C
88.00-68.00			B	0.17	2.699		0.85	1	46.789			
			C	0.17	2.699		0.85	1	46.789			
T11	1995.12	6887.43	A	0.162	2.728	9	0.85	1	49.519	2622.31	131.12	C
68.00-48.00			B	0.162	2.728		0.85	1	49.519			
			C	0.162	2.728		0.85	1	49.519			
T12	1995.12	7164.56	A	0.155	2.753	8	0.85	1	52.501	2463.85	123.19	C
48.00-28.00			B	0.155	2.753		0.85	1	52.501			
			C	0.155	2.753		0.85	1	52.501			
T13	997.56	6508.82	A	0.115	2.906	7	0.85	1	36.412	1249.60	62.48	C
28.00-8.00			B	0.115	2.906		0.85	1	36.412			
			C	0.115	2.906		0.85	1	36.412			
Sum Weight:	15555.85	50679.16						OTM	2292689.8 3 lb-ft	22204.90		

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	25877.78					
Bracing Weight	24801.39					
Total Member Self-Weight	50679.16			32989.39	-32837.66	
Total Weight	80385.50			32989.39	-32837.66	
Wind 0 deg - No Ice		91.50	-73069.31	-8211612.97	-41204.95	61380.29
Wind 30 deg - No Ice		35284.77	-61055.40	-6862692.81	-4015438.37	103544.91
Wind 60 deg - No Ice		60307.71	-34851.17	-3903375.85	-6844726.34	117712.90
Wind 90 deg - No Ice		70467.61	-57.23	28837.94	-7990502.80	100343.55
Wind 120 deg - No Ice		63267.08	36462.97	4148973.38	-7170681.51	56348.45
Wind 150 deg - No Ice		35201.52	61065.91	6932851.02	-4010199.94	-2815.03
Wind 180 deg - No Ice		18.16	69676.79	7907578.95	-37958.97	-61162.20
Wind 210 deg - No Ice		-35172.28	61072.21	6930739.15	3935926.94	-103173.95

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 240 deg - No Ice		-63171.66	36513.53	4150191.85	7090382.06	-117728.74
Wind 270 deg - No Ice		-70422.79	-43.66	24731.73	7919314.09	-100742.82
Wind 300 deg - No Ice		-60272.79	-34851.98	-3908476.74	6777643.40	-56550.70
Wind 330 deg - No Ice		-35230.53	-61045.54	-6864366.71	3948092.53	2843.36
Member Ice	55288.11					
Total Weight Ice	199682.10			153899.89	-29879.69	
Wind 0 deg - Ice		31.90	-31348.11	-3571930.54	-32701.95	439.34
Wind 30 deg - Ice		15360.67	-26578.95	-3012037.10	-1858431.75	22290.35
Wind 60 deg - Ice		26390.59	-15248.10	-1663250.22	-3174979.09	38073.52
Wind 90 deg - Ice		30681.38	-23.31	152134.72	-3683975.79	43654.40
Wind 120 deg - Ice		27144.64	15645.35	2014238.37	-3255697.52	37632.23
Wind 150 deg - Ice		15327.24	26583.91	3321548.00	-1856226.95	21499.32
Wind 180 deg - Ice		6.74	30485.66	3788812.00	-31810.06	-362.49
Wind 210 deg - Ice		-15316.35	26585.79	3320678.00	1793220.16	-22145.83
Wind 240 deg - Ice		-27110.68	15662.58	2014449.62	3190659.50	-38071.57
Wind 270 deg - Ice		-30665.59	-19.21	150436.11	3622273.80	-43795.09
Wind 300 deg - Ice		-26378.63	-15248.97	-1665265.56	3114849.65	-37711.03
Wind 330 deg - Ice		-15342.15	-26575.82	-3012752.80	1798301.84	-21503.15
Total Weight	80385.50			32989.39	-32837.66	
Wind 0 deg - Service		35.01	-28410.86	-3213265.13	-4564.30	23484.86
Wind 30 deg - Service		13727.21	-23753.42	-2689976.82	-1551931.78	39617.56
Wind 60 deg - Service		23467.34	-13561.31	-1538103.70	-2654054.19	45038.42
Wind 90 deg - Service		27415.42	-21.90	-6813.46	-3099617.21	38392.68
Wind 120 deg - Service		24599.63	14178.00	1596377.94	-2778768.67	21559.61
Wind 150 deg - Service		13695.36	23757.43	2681125.80	-1549927.49	-1077.07
Wind 180 deg - Service		6.95	27112.84	3061243.53	-3322.35	-23401.42
Wind 210 deg - Service		-13684.17	23759.85	2680317.77	1543912.17	-39475.63
Wind 240 deg - Service		-24563.12	14197.35	1596844.14	2770447.56	-45044.48
Wind 270 deg - Service		-27398.27	-16.71	-8384.55	3094781.97	-38545.45
Wind 300 deg - Service		-23453.98	-13561.62	-1540055.37	2650789.87	-21637.00
Wind 330 deg - Service		-13706.46	-23749.64	-2690617.27	1548566.87	1087.90

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice
3	0.9 Dead+1.6 Wind 0 deg - No Ice
4	1.2 Dead+1.6 Wind 30 deg - No Ice
5	0.9 Dead+1.6 Wind 30 deg - No Ice
6	1.2 Dead+1.6 Wind 60 deg - No Ice
7	0.9 Dead+1.6 Wind 60 deg - No Ice
8	1.2 Dead+1.6 Wind 90 deg - No Ice
9	0.9 Dead+1.6 Wind 90 deg - No Ice
10	1.2 Dead+1.6 Wind 120 deg - No Ice
11	0.9 Dead+1.6 Wind 120 deg - No Ice
12	1.2 Dead+1.6 Wind 150 deg - No Ice
13	0.9 Dead+1.6 Wind 150 deg - No Ice
14	1.2 Dead+1.6 Wind 180 deg - No Ice
15	0.9 Dead+1.6 Wind 180 deg - No Ice
16	1.2 Dead+1.6 Wind 210 deg - No Ice
17	0.9 Dead+1.6 Wind 210 deg - No Ice
18	1.2 Dead+1.6 Wind 240 deg - No Ice
19	0.9 Dead+1.6 Wind 240 deg - No Ice
20	1.2 Dead+1.6 Wind 270 deg - No Ice

Comb. No.	Description
21	0.9 Dead+1.6 Wind 270 deg - No Ice
22	1.2 Dead+1.6 Wind 300 deg - No Ice
23	0.9 Dead+1.6 Wind 300 deg - No Ice
24	1.2 Dead+1.6 Wind 330 deg - No Ice
25	0.9 Dead+1.6 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice+1.0 Temp
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service
41	Dead+Wind 60 deg - Service
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
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
T1	256 - 248	Leg	Max Tension	23	4081.08	-20.15	18.60
			Max. Compression	2	-4849.13	53.58	17.33
			Max. Mx	2	-4849.13	53.58	17.33
			Max. My	2	1685.49	-25.18	56.98
			Max. Vy	14	-1260.98	-0.00	0.00
			Max. Vx	12	-1360.95	-0.00	-0.00
		Diagonal	Max Tension	16	1903.65	0.00	0.00
			Max. Compression	4	-1899.49	0.00	0.00
			Max. Mx	36	199.32	21.17	1.75
			Max. My	31	-13.43	20.26	-1.94
			Max. Vy	37	26.42	21.11	1.60
			Max. Vx	31	0.77	0.00	0.00
		Top Girt	Max Tension	11	665.71	0.00	0.00
			Max. Compression	22	-682.74	0.00	0.00
			Max. Mx	26	-45.89	-106.49	0.00
			Max. My	31	-151.41	0.00	1.14
			Max. Vy	26	64.50	0.00	0.00
			Max. Vx	31	-0.69	0.00	0.00
T2	248 - 228	Leg	Max Tension	23	24417.50	66.63	9.75
			Max. Compression	2	-27581.12	-8.01	87.02
			Max. Mx	8	-1285.08	-110.02	-0.88
			Max. My	2	11964.09	17.49	121.71
			Max. Vy	10	-279.06	-23.74	-33.46

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Max. Vx	2	308.13	15.89	40.21
		Diagonal	Max Tension	16	3391.37	0.00	0.00
			Max. Compression	4	-3399.53	0.00	0.00
			Max. Mx	35	938.12	28.56	-0.30
			Max. My	12	-1732.05	8.56	-2.41
			Max. Vy	35	-31.77	28.56	-0.30
			Max. Vx	12	-0.63	0.00	0.00
T3	228 - 208	Leg	Max Tension	23	57245.91	64.72	10.04
			Max. Compression	2	-63535.54	-750.50	36.79
			Max. Mx	2	-63535.54	-750.50	36.79
			Max. My	20	-1991.70	23.56	480.88
			Max. Vy	2	222.40	-750.50	36.79
			Max. Vx	24	162.77	25.20	-467.79
		Diagonal	Max Tension	16	4840.04	0.00	0.00
			Max. Compression	2	-5029.85	0.00	0.00
			Max. Mx	35	1180.92	32.42	0.36
			Max. My	24	-3973.83	-5.19	6.25
			Max. Vy	35	-32.37	32.42	0.36
			Max. Vx	24	1.58	0.00	0.00
T4	208 - 188	Leg	Max Tension	23	78801.97	-426.72	8.22
			Max. Compression	2	-88242.30	379.52	32.60
			Max. Mx	2	-70572.55	750.50	-36.70
			Max. My	24	-3123.23	-12.12	767.75
			Max. Vy	2	161.31	750.50	-36.70
			Max. Vx	24	-206.10	-31.47	744.66
		Diagonal	Max Tension	10	3437.61	0.00	0.00
			Max. Compression	10	-3495.42	0.00	0.00
			Max. Mx	37	453.68	42.44	6.56
			Max. My	32	-940.69	38.58	-7.54
			Max. Vy	33	39.42	42.43	-6.39
			Max. Vx	32	2.59	0.00	0.00
T5	188 - 168	Leg	Max Tension	15	102210.61	-876.78	45.92
			Max. Compression	10	-117625.17	762.54	-40.91
			Max. Mx	3	-102797.22	1193.92	-71.13
			Max. My	16	-5698.29	-44.03	1150.22
			Max. Vy	22	-1265.02	-1192.69	8.72
			Max. Vx	16	1207.91	-15.80	851.78
		Diagonal	Max Tension	20	6893.90	0.00	0.00
			Max. Compression	20	-6960.62	0.00	0.00
			Max. Mx	33	1293.14	75.87	-10.84
			Max. My	31	-418.09	72.49	-12.46
			Max. Vy	33	56.53	75.87	-10.84
			Max. Vx	31	3.52	0.00	0.00
T6	168 - 148	Leg	Max Tension	15	135968.03	-977.16	91.58
			Max. Compression	10	-156944.90	1170.53	-43.52
			Max. Mx	2	-155932.11	1176.72	-163.74
			Max. My	16	-9173.62	10.17	1255.50
			Max. Vy	22	500.24	-1092.63	43.14
			Max. Vx	16	-645.93	10.17	1255.50
		Diagonal	Max Tension	20	8971.88	0.00	0.00
			Max. Compression	20	-9133.39	0.00	0.00
			Max. Mx	33	1701.79	116.02	-15.09
			Max. My	31	-437.37	110.32	-17.73
			Max. Vy	33	76.43	116.02	-15.09
			Max. Vx	31	4.46	0.00	0.00
T7	148 - 128	Leg	Max Tension	15	176046.72	-1755.41	70.89
			Max. Compression	10	-206268.16	1320.67	-102.94
			Max. Mx	22	156354.20	1989.48	5.11
			Max. My	16	-10403.69	-89.65	-2115.51
			Max. Vy	22	1170.31	-1763.18	5.11
			Max. Vx	16	1323.48	-89.65	1893.02

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	20	13382.85	0.00	0.00
			Max. Compression	20	-13513.70	0.00	0.00
			Max. Mx	31	2551.47	-123.96	14.18
			Max. My	6	-12075.19	-43.73	29.52
			Max. Vy	33	-71.10	-122.81	-14.29
			Max. Vx	6	-4.73	0.00	0.00
T8	128 - 108	Leg	Max Tension	15	220271.30	-1965.36	348.33
			Max. Compression	10	-257910.59	2896.46	-4.57
			Max. Mx	3	-251832.20	2900.70	-152.15
			Max. My	16	-14705.56	-143.07	3472.70
			Max. Vy	14	1654.95	-2845.47	158.30
			Max. Vx	4	1554.30	-1.42	-1787.04
		Diagonal	Max Tension	20	16548.84	0.00	0.00
			Max. Compression	20	-16826.43	0.00	0.00
			Max. Mx	31	4002.60	328.13	36.15
			Max. My	6	-13785.17	44.37	-57.63
			Max. Vy	33	146.81	313.58	-41.54
			Max. Vx	30	8.77	0.00	0.00
T9	108 - 88	Leg	Max Tension	15	272535.48	-1009.10	44.84
			Max. Compression	10	-318280.74	3045.02	-265.13
			Max. Mx	2	-315986.58	3055.70	-306.71
			Max. My	4	-19847.76	41.26	-3216.17
			Max. Vy	3	384.23	2900.70	-152.16
			Max. Vx	18	-478.20	-1461.82	3007.99
		Diagonal	Max Tension	20	19488.35	0.00	0.00
			Max. Compression	20	-19808.40	0.00	0.00
			Max. Mx	33	3764.82	338.63	-44.53
			Max. My	6	-16863.44	70.86	-58.58
			Max. Vy	33	149.98	338.63	-44.53
			Max. Vx	35	8.87	0.00	0.00
T10	88 - 68	Leg	Max Tension	15	328551.06	-2716.81	44.83
			Max. Compression	10	-382477.49	2967.64	-125.01
			Max. Mx	2	-346841.18	3055.70	-306.74
			Max. My	4	-20716.69	41.25	-3216.22
			Max. Vy	3	220.07	3043.75	-308.22
			Max. Vx	18	428.82	-1461.83	3008.04
		Diagonal	Max Tension	20	22953.70	0.00	0.00
			Max. Compression	20	-23243.97	0.00	0.00
			Max. Mx	31	4160.55	527.50	-63.94
			Max. My	6	-20538.43	143.60	-82.12
			Max. Vy	33	215.37	526.90	-61.65
			Max. Vx	29	11.57	0.00	0.00
T11	68 - 48	Leg	Max Tension	15	386186.63	-2831.25	100.28
			Max. Compression	10	-448909.79	2940.50	-81.30
			Max. Mx	10	-415032.03	2967.65	-125.01
			Max. My	16	-26083.80	-205.89	3865.25
			Max. Vy	22	-226.76	-2868.97	151.58
			Max. Vx	18	578.01	-1620.16	3548.18
		Diagonal	Max Tension	20	25375.96	0.00	0.00
			Max. Compression	20	-25909.89	0.00	0.00
			Max. Mx	31	4336.49	607.55	-74.70
			Max. My	6	-21832.93	160.63	-86.73
			Max. Vy	33	230.79	605.46	-71.44
			Max. Vx	30	-11.96	0.00	0.00
T12	48 - 28	Leg	Max Tension	15	442718.17	-6534.89	172.65
			Max. Compression	10	-514834.95	-17806.94	286.62
			Max. Mx	2	-511182.24	-17877.56	482.36
			Max. My	16	-29921.51	1.35	5694.70
			Max. Vy	2	2648.84	7056.65	-133.37
			Max. Vx	19	785.15	-3448.23	5227.59
		Diagonal	Max Tension	20	27975.23	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Max. Compression	8	-28296.30	0.00	0.00
			Max. Mx	31	6550.24	693.12	81.45
			Max. My	6	-22746.00	214.86	-112.15
			Max. Vy	32	244.93	689.49	-90.32
			Max. Vx	36	13.23	0.00	0.00
T13	28 - 8	Leg	Max Tension	15	459889.63	14054.77	-450.70
			Max. Compression	10	-534609.55	10556.71	-1747.73
			Max. Mx	2	-528977.01	-26013.49	1822.68
			Max. My	4	-31805.48	-1364.54	-16531.04
			Max. Vy	2	-28530.01	10716.82	-1823.73
			Max. Vx	4	14204.96	-448.81	-14951.39
		Diagonal	Max Tension	21	40229.99	-427.13	-171.53
			Max. Compression	20	-40504.15	0.00	0.00
			Max. Mx	6	23588.54	-668.21	-61.75
			Max. My	20	-40357.47	224.14	-322.80
			Max. Vy	33	-127.25	-326.38	56.67
			Max. Vx	20	-32.79	0.00	0.00
		Top Girt	Max Tension	9	23392.73	21572.92	853.72
			Max. Compression	20	-24631.55	-22057.99	-850.17
			Max. Mx	20	-24631.55	-22057.99	-850.17
			Max. My	18	-24247.09	-20662.46	-1158.55
			Max. Vy	20	1790.79	-22057.99	-850.17
			Max. Vx	18	91.90	-20662.46	-1158.55
		Redund Horz 1 Bracing	Max Tension	4	3152.89	0.00	0.00
			Max. Compression	7	-3705.41	0.00	0.00
			Max. Mx	36	941.32	45.45	0.00
			Max. My	20	-2443.80	0.00	0.00
			Max. Vy	36	-28.57	0.00	0.00
			Max. Vx	20	-0.00	0.00	0.00
		Redund Diag 1 Bracing	Max Tension	7	3362.25	0.00	0.00
			Max. Compression	13	-2458.24	0.00	0.00
			Max. Mx	31	-655.50	72.20	0.00
			Max. My	8	-2327.26	0.00	-0.07
			Max. Vy	31	-25.97	0.00	0.00
			Max. Vx	8	0.02	0.00	0.00
		Redund Hip 1 Bracing	Max Tension	9	7.70	0.00	0.00
			Max. Compression	8	-136.34	0.00	0.00
			Max. Mx	26	-13.42	45.45	0.00
			Max. My	18	-10.80	0.00	0.00
			Max. Vy	26	28.57	0.00	0.00
			Max. Vx	18	-0.00	0.00	0.00
		Redund Hip Diagonal 1 Bracing	Max Tension	8	158.18	0.00	0.00
			Max. Compression	18	-101.55	0.00	0.00
			Max. Mx	33	50.71	189.38	0.00
			Max. My	18	32.96	0.00	0.07
			Max. Vy	33	-51.10	0.00	0.00
			Max. Vx	18	-0.02	0.00	0.00
		Inner Bracing	Max Tension	3	17.15	0.00	0.00
			Max. Compression	4	-34.27	0.00	0.00
			Max. Mx	32	-23.44	355.88	0.00
			Max. My	2	-2.99	0.00	22.04
			Max. Vy	32	-111.83	0.00	0.00
			Max. Vx	2	-6.93	0.00	0.00

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Leg C	Max. Vert	18	578153.13	62748.11	-31841.56
	Max. H_x	18	578153.13	62748.11	-31841.56
	Max. H_z	5	-434110.76	-46984.75	28792.46
	Min. Vert	7	-498495.97	-56705.43	28140.99
	Min. H_x	7	-498495.97	-56705.43	28140.99
	Min. H_z	18	578153.13	62748.11	-31841.56
Leg B	Max. Vert	10	581835.99	-61902.62	-33585.92
	Max. H_x	23	-496440.01	55621.68	29875.17
	Max. H_z	25	-431901.55	45140.68	31844.47
	Min. Vert	23	-496440.01	55621.68	29875.17
	Min. H_x	10	581835.99	-61902.62	-33585.92
	Min. H_z	12	492438.70	-49025.39	-33727.76
Leg A	Max. Vert	2	578280.03	2033.39	70374.95
	Max. H_x	21	23389.15	6217.69	2173.32
	Max. H_z	2	578280.03	2033.39	70374.95
	Min. Vert	15	-499744.51	-2084.85	-63209.86
	Min. H_x	11	-250397.87	-6802.44	-32053.64
	Min. H_z	15	-499744.51	-2084.85	-63209.86

Tower Mast Reaction Summary

Load Combination	Vertical lb	$Shear_x$ lb	$Shear_z$ lb	Overturning Moment, M_x lb-ft	Overturning Moment, M_z lb-ft	Torque lb-ft
Dead Only	80385.57	1.26	1.80	33020.00	-32858.16	3.74
1.2 Dead+1.6 Wind 0 deg - No Ice	96467.13	241.31	-116955.25	-13163969.00	-54793.17	99816.78
0.9 Dead+1.6 Wind 0 deg - No Ice	72349.88	57.23	-116910.99	-13160788.09	-41959.35	97720.08
1.2 Dead+1.6 Wind 30 deg - No Ice	96461.83	56488.37	-97672.78	-11002043.82	-6417976.77	166060.96
0.9 Dead+1.6 Wind 30 deg - No Ice	72346.20	56491.48	-97671.12	-11001639.91	-6402146.42	166035.35
1.2 Dead+1.6 Wind 60 deg - No Ice	96461.96	96518.09	-55721.83	-6262519.90	-10948112.85	188775.67
0.9 Dead+1.6 Wind 60 deg - No Ice	72346.28	96519.93	-55718.48	-6266524.97	-10928019.96	188759.31
1.2 Dead+1.6 Wind 90 deg - No Ice	96462.47	112750.80	-57.84	33994.88	-12782382.47	160905.87
0.9 Dead+1.6 Wind 90 deg - No Ice	72346.80	112750.37	-54.60	24103.74	-12760537.47	160896.84
1.2 Dead+1.6 Wind 120 deg - No Ice	96467.24	101215.20	58453.05	6633040.33	-11469827.57	91377.54
0.9 Dead+1.6 Wind 120 deg - No Ice	72348.47	101191.37	58456.85	6616980.92	-11448814.78	91435.76
1.2 Dead+1.6 Wind 150 deg - No Ice	96462.71	56310.53	97787.28	11090081.54	-6408373.88	-4926.50
0.9 Dead+1.6 Wind 150 deg - No Ice	72343.88	56298.97	97770.58	11069528.75	-6392297.83	-4859.65
1.2 Dead+1.6 Wind 180 deg - No Ice	96466.57	-28.82	111473.57	12649161.06	-47066.21	-98276.64
0.9 Dead+1.6 Wind 180 deg - No Ice	72351.42	-28.81	111469.02	12627341.89	-37151.87	-98154.23
1.2 Dead+1.6 Wind 210 deg -	96462.50	-56244.72	97727.91	11085747.13	6314708.89	-165343.50

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
No Ice 0.9 Dead+1.6 Wind 210 deg - No Ice	72346.83	-56243.19	97728.21	11065466.78	6318665.94	-165302.19
1.2 Dead+1.6 Wind 240 deg - No Ice	96462.54	-101048.46	58460.99	6634131.96	11366734.59	-188737.63
0.9 Dead+1.6 Wind 240 deg - No Ice	72346.94	-101046.90	58463.69	6618047.08	11365965.45	-188714.44
1.2 Dead+1.6 Wind 270 deg - No Ice	96462.60	-112676.88	-38.07	27427.87	12694368.08	-161473.77
0.9 Dead+1.6 Wind 270 deg - No Ice	72347.00	-112676.69	-35.77	17512.17	12692378.26	-161461.65
1.2 Dead+1.6 Wind 300 deg - No Ice	96466.57	-96403.94	-55799.52	-6272218.28	10865577.17	-90696.33
0.9 Dead+1.6 Wind 300 deg - No Ice	72351.42	-96399.94	-55797.33	-6276226.42	10865242.20	-90636.37
1.2 Dead+1.6 Wind 330 deg - No Ice	96466.42	-56367.96	-97656.12	-11004981.85	6335091.79	4330.78
0.9 Dead+1.6 Wind 330 deg - No Ice	72351.24	-56367.41	-97650.56	-11004516.39	6339042.93	4282.16
1.2 Dead+1.0 Ice+1.0 Temp	215759.94	1.31	5.69	161390.20	-36637.37	4.29
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	215759.24	32.67	-31351.88	-3589751.88	-39624.34	489.12
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	215759.23	15360.35	-26583.50	-3026022.16	-1878043.36	22477.74
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	215759.23	26390.78	-15253.31	-1667874.10	-3203767.13	38349.68
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	215759.21	30683.93	-27.39	160148.87	-3716319.07	43941.05
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	215759.21	27149.19	15644.19	2035188.22	-3285047.55	37851.74
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	215759.23	15331.00	26585.55	3351624.14	-1875885.29	21584.84
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	215759.71	7.39	30505.31	3822431.40	-38758.16	-473.92
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	215759.26	-15320.29	26586.45	3350721.10	1799012.84	-22350.45
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	215759.24	-27116.46	15660.19	2035365.52	3206155.23	-38371.17
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	215759.23	-30669.46	-23.38	158414.50	3640806.06	-44095.35
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	215759.25	-26379.45	-15253.19	-1669901.73	3129846.62	-37939.92
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	215759.26	-15341.17	-26579.50	-3026736.84	1804116.25	-21605.17
Dead+Wind 0 deg - Service	80385.65	33.90	-28409.79	-3175795.24	-36162.89	23526.34
Dead+Wind 30 deg - Service	80385.67	13724.74	-23754.95	-2652269.08	-1583796.09	39670.24
Dead+Wind 60 deg - Service	80385.65	23463.60	-13563.76	-1500128.22	-2686122.15	45080.70
Dead+Wind 90 deg - Service	80385.65	27413.28	-24.31	31465.01	-3131834.18	38419.64
Dead+Wind 120 deg - Service	80385.65	24599.23	14176.58	1635085.59	-2811072.30	21558.51
Dead+Wind 150 deg - Service	80385.26	13692.33	23751.57	2719914.36	-1581803.79	-1130.38
Dead+Wind 180 deg - Service	80385.69	6.05	27112.22	3100102.31	-34958.68	-23455.36
Dead+Wind 210 deg - Service	80385.73	-13686.32	23757.40	2719150.12	1512669.29	-39541.27
Dead+Wind 240 deg - Service	80385.68	-24564.47	14193.39	1635528.07	2739614.25	-45110.08
Dead+Wind 270 deg - Service	80385.64	-27397.48	-18.96	29904.97	3063838.73	-38585.77
Dead+Wind 300 deg - Service	80385.69	-23452.80	-13561.77	-1502004.25	2619702.34	-21647.53
Dead+Wind 330 deg - Service	80385.65	-13705.09	-23747.91	-2652870.09	1517287.54	1105.77

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	0.00	-80385.50	0.00	-1.26	80385.57	-1.80	0.003%
2	146.40	-96462.60	-116910.90	-241.31	96467.13	116955.25	0.069%
3	146.40	-72346.95	-116910.90	-57.23	72349.88	116910.99	0.065%
4	56455.63	-96462.61	-97688.65	-56488.37	96461.83	97672.78	0.025%
5	56455.63	-72346.96	-97688.65	-56491.48	72346.20	97671.12	0.030%
6	96492.33	-96462.61	-55761.87	-96518.09	96461.96	55721.83	0.032%
7	96492.33	-72346.96	-55761.87	-96519.93	72346.28	55718.48	0.039%
8	112748.18	-96462.61	-91.56	-112750.80	96462.47	57.84	0.023%
9	112748.18	-72346.96	-91.56	-112750.37	72346.80	54.60	0.028%
10	101227.32	-96462.60	58340.75	-101215.20	96467.24	-58453.05	0.075%
11	101227.32	-72346.95	58340.75	-101191.37	72348.47	-58456.85	0.088%
12	56322.44	-96462.60	97705.46	-56310.53	96462.71	-97787.28	0.056%
13	56322.44	-72346.95	97705.46	-56298.97	72343.88	-97770.58	0.052%
14	29.06	-96462.60	111482.86	28.82	96466.57	-111473.57	0.040%
15	29.06	-72346.95	111482.86	28.81	72351.42	-111469.02	0.045%
16	-56275.65	-96462.59	97715.54	56244.72	96462.50	-97727.91	0.022%
17	-56275.65	-72346.94	97715.54	56243.19	72346.83	-97728.21	0.026%
18	-101074.65	-96462.59	58421.65	101048.46	96462.54	-58460.99	0.031%
19	-101074.65	-72346.94	58421.65	101046.90	72346.94	-58463.69	0.037%
20	-112676.46	-96462.59	-69.86	112676.88	96462.60	38.07	0.021%
21	-112676.46	-72346.94	-69.86	112676.69	72347.00	35.77	0.025%
22	-96436.46	-96462.60	-55763.16	96403.94	96466.57	55799.52	0.033%
23	-96436.46	-72346.95	-55763.16	96399.94	72351.42	55797.33	0.038%
24	-56368.85	-96462.60	-97672.86	56367.96	96466.42	97656.12	0.012%
25	-56368.85	-72346.95	-97672.86	56367.41	72351.24	97650.56	0.017%
26	0.00	-215759.20	0.00	-1.31	215759.94	-5.69	0.003%
27	31.90	-215759.20	-31348.11	-32.67	215759.24	31351.88	0.002%
28	15360.67	-215759.20	-26578.95	-15360.35	215759.23	26583.50	0.002%
29	26390.59	-215759.20	-15248.10	-26390.78	215759.23	15253.31	0.002%
30	30681.38	-215759.20	-23.31	-30683.93	215759.21	27.39	0.002%
31	27144.64	-215759.20	15645.35	-27149.19	215759.21	-15644.19	0.002%
32	15327.24	-215759.20	26583.91	-15331.00	215759.23	-26585.55	0.002%
33	6.74	-215759.20	30485.66	-7.39	215759.71	-30505.31	0.009%
34	-15316.35	-215759.20	26585.79	15320.29	215759.26	-26586.45	0.002%
35	-27110.68	-215759.20	15662.58	27116.46	215759.24	-15660.19	0.003%
36	-30665.59	-215759.20	-19.21	30669.46	215759.23	23.38	0.003%
37	-26378.63	-215759.20	-15248.97	26379.45	215759.25	15253.19	0.002%
38	-15342.15	-215759.20	-26575.82	15341.17	215759.26	26579.50	0.002%
39	35.01	-80385.50	-28410.86	-33.90	80385.65	28409.79	0.002%
40	13727.21	-80385.50	-23753.42	-13724.74	80385.67	23754.95	0.003%
41	23467.34	-80385.50	-13561.31	-23463.60	80385.65	13563.76	0.005%
42	27415.42	-80385.50	-21.90	-27413.28	80385.65	24.31	0.004%
43	24599.63	-80385.50	14178.00	-24599.23	80385.65	-14176.58	0.002%
44	13695.36	-80385.50	23757.43	-13692.33	80385.26	-23751.57	0.008%
45	6.95	-80385.50	27112.84	-6.05	80385.69	-27112.22	0.001%
46	-13684.17	-80385.50	23759.85	13686.32	80385.73	-23757.40	0.004%
47	-24563.12	-80385.50	14197.35	24564.47	80385.68	-14193.39	0.005%
48	-27398.27	-80385.50	-16.71	27397.48	80385.64	18.96	0.003%
49	-23453.98	-80385.50	-13561.62	23452.80	80385.69	13561.77	0.001%
50	-13706.46	-80385.50	-23749.64	13705.09	80385.65	23747.91	0.003%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance

1	Yes	4	0.00000001	0.00058511
2	Yes	5	0.00006517	0.00089230
3	Yes	6	0.00000001	0.00092772
4	Yes	7	0.00000001	0.00024628
5	Yes	7	0.00000001	0.00026012
6	Yes	7	0.00000001	0.00032186
7	Yes	7	0.00000001	0.00034128
8	Yes	7	0.00000001	0.00021717
9	Yes	7	0.00000001	0.00024149
10	Yes	5	0.00006004	0.00077456
11	Yes	5	0.00006490	0.00098885
12	Yes	5	0.00000001	0.00074816
13	Yes	5	0.00000001	0.00073976
14	Yes	6	0.00000001	0.00090310
15	Yes	6	0.00000001	0.00087231
16	Yes	7	0.00000001	0.00029352
17	Yes	7	0.00000001	0.00028895
18	Yes	7	0.00000001	0.00035458
19	Yes	7	0.00000001	0.00036295
20	Yes	7	0.00000001	0.00024708
21	Yes	7	0.00000001	0.00026036
22	Yes	6	0.00000001	0.00077989
23	Yes	6	0.00000001	0.00076083
24	Yes	6	0.00000001	0.00040202
25	Yes	6	0.00000001	0.00045251
26	Yes	4	0.00000001	0.00070220
27	Yes	6	0.00000001	0.00023149
28	Yes	6	0.00000001	0.00027905
29	Yes	6	0.00000001	0.00033593
30	Yes	6	0.00000001	0.00031446
31	Yes	6	0.00000001	0.00028275
32	Yes	6	0.00000001	0.00023408
33	Yes	5	0.00000001	0.00067931
34	Yes	6	0.00000001	0.00026864
35	Yes	6	0.00000001	0.00041562
36	Yes	6	0.00000001	0.00041046
37	Yes	6	0.00000001	0.00032736
38	Yes	6	0.00000001	0.00025930
39	Yes	6	0.00000001	0.00012007
40	Yes	6	0.00000001	0.00021928
41	Yes	6	0.00000001	0.00030798
42	Yes	6	0.00000001	0.00022916
43	Yes	6	0.00000001	0.00011421
44	Yes	5	0.00000001	0.00099907
45	Yes	6	0.00000001	0.00011021
46	Yes	6	0.00000001	0.00024765
47	Yes	6	0.00000001	0.00028547
48	Yes	6	0.00000001	0.00017457
49	Yes	6	0.00000001	0.00012838
50	Yes	6	0.00000001	0.00017313

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	256 - 248	6.873	43	0.2491	0.0435
T2	248 - 228	6.451	43	0.2481	0.0434
T3	228 - 208	5.419	43	0.2356	0.0419
T4	208 - 188	4.458	43	0.2104	0.0402

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T5	188 - 168	3.616	43	0.1849	0.0395
T6	168 - 148	2.862	43	0.1656	0.0373
T7	148 - 128	2.189	43	0.1438	0.0328
T8	128 - 108	1.611	43	0.1191	0.0278
T9	108 - 88	1.141	43	0.0949	0.0238
T10	88 - 68	0.750	43	0.0750	0.0184
T11	68 - 48	0.444	43	0.0578	0.0146
T12	48 - 28	0.208	43	0.0392	0.0104
T13	28 - 8	0.050	39	0.0196	0.0058

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
257.00	Yagi w/Radome	43	6.873	0.2491	0.0435	269675
256.00	Beacon	43	6.873	0.2491	0.0435	269675
232.00	10' Whip	43	5.622	0.2393	0.0423	81156
181.00	AIR 6449 B41	43	3.343	0.1778	0.0390	61207
180.00	16' T-Frame Mount	43	3.305	0.1768	0.0389	61198
179.00	APXVAARR24_43-U-NA20	43	3.267	0.1759	0.0388	61188
151.00	MTC3975083 V-frame	43	2.285	0.1473	0.0336	53462
138.00	C10857278C V-Frame Mount	43	1.887	0.1316	0.0302	44822
131.00	HPCPE-80BW	43	1.691	0.1229	0.0285	40808
112.00	Yagi	43	1.228	0.0995	0.0247	62309
110.00	(2) APL-866513-42T9	43	1.184	0.0971	0.0242	66588
102.00	(2) TV 65 antenna	43	1.015	0.0884	0.0222	64893

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	256 - 248	28.050	10	1.0228	0.1820
T2	248 - 228	26.319	10	1.0184	0.1814
T3	228 - 208	22.085	10	0.9648	0.1751
T4	208 - 188	18.152	10	0.8595	0.1682
T5	188 - 168	14.714	10	0.7532	0.1654
T6	168 - 148	11.647	10	0.6736	0.1562
T7	148 - 128	8.911	10	0.5841	0.1372
T8	128 - 108	6.562	10	0.4836	0.1165
T9	108 - 88	4.650	10	0.3854	0.0994
T10	88 - 68	3.061	10	0.3048	0.0772
T11	68 - 48	1.815	10	0.2348	0.0609
T12	48 - 28	0.855	10	0.1594	0.0434
T13	28 - 8	0.206	3	0.0798	0.0245

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
257.00	Yagi w/Radome	10	28.050	1.0228	0.1820	68448
256.00	Beacon	10	28.050	1.0228	0.1820	68448
232.00	10' Whip	10	22.915	0.9807	0.1769	19628
181.00	AIR 6449 B41	10	13.604	0.7237	0.1632	14766
180.00	16' T-Frame Mount	10	13.448	0.7198	0.1629	14772
179.00	APXVAARR24_43-U-NA20	10	13.294	0.7159	0.1624	14779
151.00	MTC3975083 V-frame	10	9.299	0.5985	0.1404	13122
138.00	C10857278C V-Frame Mount	10	7.682	0.5345	0.1263	11022
131.00	HPCPE-80BW	10	6.886	0.4989	0.1192	10037
112.00	Yagi	10	5.004	0.4039	0.1032	15452
110.00	(2) APL-866513-42T9	10	4.826	0.3946	0.1014	16538
102.00	(2) TV 65 antenna	10	4.140	0.3593	0.0929	16071

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt lb	Allowable Load per Bolt lb	Ratio Load / Allowable	Allowable Ratio	Criteria
T1	256	Leg	A325N	0.7500	4	307.66	29820.60	0.010 ✔	1	Bolt Tension
		Diagonal	A325N	0.6250	1	1903.65	7830.00	0.243 ✔	1	Member Bearing
T2	248	Leg	A325N	0.8750	4	1820.12	40589.10	0.045 ✔	1	Bolt Tension
		Diagonal	A325N	0.6250	1	3391.37	10440.00	0.325 ✔	1	Member Bearing
T3	228	Leg	A325N	1.0000	4	7539.91	53014.40	0.142 ✔	1	Bolt Tension
		Diagonal	A325N	0.6250	1	4840.04	10440.00	0.464 ✔	1	Member Bearing
T4	208	Leg	A325N	1.0000	6	10610.60	53014.40	0.200 ✔	1	Bolt Tension
		Diagonal	A325N	0.6250	1	3437.61	10440.00	0.329 ✔	1	Member Bearing
T5	188	Leg	A325N	1.0000	6	14042.00	53014.40	0.265 ✔	1	Bolt Tension
		Diagonal	A325N	0.7500	1	6893.90	12615.00	0.546 ✔	1	Member Bearing
T6	168	Leg	A325N	1.0000	6	18856.80	53014.40	0.356 ✔	1	Bolt Tension
		Diagonal	A325N	0.7500	1	8971.88	12615.00	0.711 ✔	1	Member Bearing
T7	148	Leg	A325N	1.0000	8	18493.20	53014.40	0.349 ✔	1	Bolt Tension
		Diagonal	A325N	0.7500	1	13513.70	17892.40	0.755 ✔	1	Bolt Shear
T8	128	Leg	A325N	1.0000	8	24518.60	53014.40	0.462 ✔	1	Bolt Tension
		Diagonal	A325X	0.7500	1	16548.80	21206.30	0.780 ✔	1	Member Bearing
T9	108	Leg	A325N	1.0000	12	20439.60	53014.40	0.386 ✔	1	Bolt Tension
		Diagonal	A325N	0.8750	1	19488.40	20553.00	0.948 ✔	1	Member Bearing
T10	88	Leg	A325N	1.0000	12	25017.40	53014.40	0.472 ✔	1	Bolt Tension
		Diagonal	A325N	0.8750	1	23244.00	24353.50	0.954 ✔	1	Bolt Shear
T11	68	Leg	A325N	1.0000	12	29789.50	53014.40	0.562 ✔	1	Bolt Tension
		Diagonal	A325N	1.0000	1	25376.00	28518.80	0.890 ✔	1	Member Bearing
T12	48	Leg	A325N	1.0000	12	34579.50	53014.40	0.652 ✔	1	Bolt Tension
		Diagonal	A325X	0.8750	2	14148.10	29765.40	0.475 ✔	1	Bolt Shear
T13	28	Leg	A325N	1.0000	16	28743.10	53014.40	0.542 ✔	1	Bolt Tension

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt lb	Allowable Load per Bolt lb	Ratio Load / Allowable	Allowable Ratio	Criteria
		Diagonal	A325N	0.6250	6	6750.69	12425.20	0.543 ✔	1	Bolt Shear
		Top Girt	A325N	0.7500	4	6157.89	17892.40	0.344 ✔	1	Bolt Shear

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	256 - 248	ROHN 3 STD	8.00	4.00	41.3 K=1.00	2.2285	-4849.13	88543.60	0.055 [1] ✔
T2	248 - 228	ROHN 3 EH	20.00	4.00	42.2 K=1.00	3.0159	-27581.10	119117.00	0.232 [1] ✔
T3	228 - 208	ROHN 4 EH	20.00	4.00	32.5 K=1.00	4.4074	-63535.50	183589.00	0.346 [1] ✔
T4	208 - 188	ROHN 5 EH	20.04	5.01	32.7 K=1.00	6.1120	-88242.30	254372.00	0.347 [1] ✔
T5	188 - 168	ROHN 6 EH	20.03	6.68	36.5 K=1.00	8.4049	-117625.00	343100.00	0.343 [1] ✔
T6	168 - 148	ROHN 6 EH	20.03	6.68	36.5 K=1.00	8.4049	-156945.00	343100.00	0.457 [1] ✔
T7	148 - 128	ROHN 6 EH	20.04	6.68	36.5 K=1.00	8.4049	-206268.00	343092.00	0.601 [1] ✔
T8	128 - 108	ROHN 8 EHS	20.04	10.02	41.2 K=1.00	9.7193	-257911.00	386381.00	0.668 [1] ✔
T9	108 - 88	ROHN 8 EH	20.04	10.02	41.8 K=1.00	12.7627	-318281.00	505517.00	0.630 [1] ✔
T10	88 - 68	P10x.5	20.03	10.02	33.1 K=1.00	16.1007	-382478.00	668659.00	0.572 [1] ✔
T11	68 - 48	P10x.5	20.03	10.02	33.1 K=1.00	16.1007	-448910.00	668663.00	0.671 [1] ✔
T12	48 - 28	P10x.5	20.04	10.02	33.1 K=1.00	16.1007	-514835.00	668640.00	0.770 [1] ✔
T13	28 - 8	P10x.5	20.05	9.52	15.8 K=0.50	16.1007	-534610.00	711505.00	0.751 [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 $\frac{P_u}{\phi P_n}$
T1	256 - 248	L1 3/4x1 3/4x3/16	7.91	3.83	133.8 K=1.00	0.6211	-1899.49	7836.45	0.242 [1] ✔
T2	248 - 228	L2x2x1/4	7.98	3.82	117.2 K=1.00	0.9380	-3399.53	14744.40	0.231 [1] ✔
T3	228 - 208	L2x2x1/4	7.92	3.75	115.0 K=1.00	0.9380	-5029.85	15141.50	0.332 [1] ✔
T4	208 - 188	L2x2x1/4	10.00	4.88	149.8 K=1.00	0.9380	-3386.59	9442.17	0.359 [1] ✔
T5	188 - 168	L2 1/2x2 1/2x1/4	12.51	6.13	149.7 K=1.00	1.1900	-6960.62	11996.10	0.580 [1] ✔
T6	168 - 148	L3x3x1/4	14.24	7.00	141.8 K=1.00	1.4400	-9133.38	16173.10	0.565 [1] ✔
T7	148 - 128	L3x3x1/4 w/3"x1/4" plate	16.09	7.93	106.3 K=1.00	2.0630	-13513.70	36890.50	0.366 [1] ✔
T8	128 - 108	L4x4x3/8	19.35	9.56	145.6 K=1.00	2.8600	-16826.40	30486.60	0.552 [1] ✔
T9	108 - 88	L4x4x0.31	21.22	10.51	159.4 K=1.00	2.3839	-19808.40	21205.70	0.934 [1] ✔
T10	88 - 68	L5x5x3/8	23.04	11.30	136.9 K=1.00	3.6100	-23244.00	43484.70	0.535 [1] ✔
T11	68 - 48	L5x5x3/8	24.84	12.20	147.9 K=1.00	3.6100	-25909.90	37294.00	0.695 [1] ✔
T12	48 - 28	L5x5x3/8	26.75	13.17	159.7 K=1.00	3.6100	-28296.30	31978.80	0.885 [1] ✔
T13	28 - 8	ROHN 3 STD w/L4x4x1/4	22.17	11.09	103.3 K=1.00	4.1660	-40504.10	85927.60	0.471 [1] ✔

[1] P_u / ϕP_n controls

Top Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	256 - 248	L3x3x1/4	6.60	6.31	128.0 K=1.00	1.4400	-682.73	19705.80	0.035 [1] ✔
T13	28 - 8	ROHN 3 STD	25.46	12.28	126.7 K=1.00	2.2285	-24631.50	31030.70	0.794 [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 $\frac{P_u}{\phi P_n}$
T13	28 - 8	ROHN 1.5 STD	6.36	5.92	114.0	0.7995	-9277.76	13888.30	0.668 [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

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 $\frac{P_u}{\phi P_n}$
T13	28 - 8	ROHN 1.5 STD	11.12	10.26	148.3 K=0.75	0.7995	-8105.46	8212.23	0.987 [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 $\frac{P_u}{\phi P_n}$
T13	28 - 8	ROHN 1.5 STD	6.36	6.36	122.7 K=1.00	0.7995	-136.34	12002.20	0.011 [1] ✔

[1] P_u / ϕP_n controls

Redundant Hip 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 $\frac{P_u}{\phi P_n}$
T13	28 - 8	ROHN 1.5 STD	14.83	14.83	285.7 K=1.00	0.7995	-101.55	2211.89	0.046 [1] ✔
		KL/R > 250 (C) - 269							

[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 $\frac{P_u}{\phi P_n}$
T13	28 - 8	ROHN 3 STD	12.73	12.73	131.3	2.2285	-34.27	29213.70	0.001 [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

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	256 - 248	ROHN 3 STD	8.00	4.00	41.3	2.2285	4081.08	100281.00	0.041 [1] ✔
T2	248 - 228	ROHN 3 EH	20.00	4.00	42.2	3.0159	24443.90	135717.00	0.180 [1] ✔
T3	228 - 208	ROHN 4 EH	20.00	4.00	32.5	4.4074	57245.90	198335.00	0.289 [1] ✔
T4	208 - 188	ROHN 5 EH	20.04	5.01	32.7	6.1120	78802.00	275039.00	0.287 [1] ✔
T5	188 - 168	ROHN 6 EH	20.03	6.68	36.5	8.4049	102211.00	378222.00	0.270 [1] ✔
T6	168 - 148	ROHN 6 EH	20.03	6.68	36.5	8.4049	135968.00	378222.00	0.359 [1] ✔
T7	148 - 128	ROHN 6 EH	20.04	6.68	36.5	8.4049	176047.00	378222.00	0.465 [1] ✔
T8	128 - 108	ROHN 8 EHS	20.04	10.02	41.2	9.7193	220271.00	437369.00	0.504 [1] ✔
T9	108 - 88	ROHN 8 EH	20.04	10.02	41.8	12.7627	272535.00	574322.00	0.475 [1] ✔
T10	88 - 68	P10x.5	20.03	10.02	33.1	16.1007	328551.00	724530.00	0.453 [1] ✔
T11	68 - 48	P10x.5	20.03	10.02	33.1	16.1007	386187.00	724530.00	0.533 [1] ✔
T12	48 - 28	P10x.5	20.04	10.02	33.1	16.1007	442718.00	724530.00	0.611 [1] ✔
T13	28 - 8	P10x.5	20.05	9.52	31.5	16.1007	459890.00	724530.00	0.635 [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 $\frac{P_u}{\phi P_n}$

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	256 - 248	L1 3/4x1 3/4x3/16	7.91	3.83	85.6	0.3604	1903.65	15675.30	0.121 [1]
T2	248 - 228	L2x2x1/4	7.98	3.82	75.3	0.5629	3391.37	24485.10	0.139 [1]
T3	228 - 208	L2x2x1/4	7.92	3.75	73.9	0.5629	4840.04	24485.10	0.198 [1]
T4	208 - 188	L2x2x1/4	10.00	4.88	96.2	0.5629	3437.61	24485.10	0.140 [1]
T5	188 - 168	L2 1/2x2 1/2x1/4	12.51	6.13	95.6	0.7284	6893.90	31687.00	0.218 [1]
T6	168 - 148	L3x3x1/4	14.24	7.00	90.3	0.9159	8971.88	39843.30	0.225 [1]
T7	148 - 128	L3x3x1/4 w/3"x1/4" plate	16.09	7.93	106.3	2.0630	13382.80	66841.20	0.200 [1]
T8	128 - 108	L4x4x3/8	19.35	9.56	93.3	1.8989	16548.80	92571.70	0.179 [1]
T9	108 - 88	L4x4x0.31	21.22	10.51	101.4	1.5554	19488.40	75827.00	0.257 [1]
T10	88 - 68	L5x5x3/8	23.04	11.30	86.9	2.4262	22953.70	118280.00	0.194 [1]
T11	68 - 48	L5x5x3/8	24.84	12.20	93.8	2.3911	25376.00	116566.00	0.218 [1]
T12	48 - 28	L5x5x3/8	26.75	13.17	101.3	2.4262	27975.20	118280.00	0.237 [1]
T13	28 - 8	ROHN 3 STD w/L4x4x1/4	22.17	11.09	103.3	4.1660	40230.00	187470.00	0.215 [1]

[1] P_u / ϕP_n controls

Top Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	256 - 248	L3x3x1/4	6.60	6.31	81.4	1.4400	665.71	46656.00	0.014 [1]
T13	28 - 8	ROHN 3 STD	25.46	12.28	126.7	2.2285	23392.70	72202.40	0.324 [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 $\frac{P_u}{\phi P_n}$
T13	28 - 8	ROHN 1.5 STD	6.36	5.92	114.0	0.7995	9277.76	35975.60	0.258 [1]

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

[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 $\frac{P_u}{\phi P_n}$
T13	28 - 8	ROHN 1.5 STD	11.12	10.26	197.7	0.7995	8105.46	35975.60	0.225 [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 $\frac{P_u}{\phi P_n}$
T13	28 - 8	ROHN 1.5 STD	6.36	6.36	122.7	0.7995	7.70	35975.60	0.000 [1] ✔

[1] P_u / ϕP_n controls

Redundant Hip 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 $\frac{P_u}{\phi P_n}$
T13	28 - 8	ROHN 1.5 STD	14.83	14.83	285.7	0.7995	158.18	35975.60	0.004 [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 $\frac{P_u}{\phi P_n}$
T13	28 - 8	ROHN 3 STD	12.73	12.73	131.3	2.2285	17.15	100281.00	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 $\frac{P_u}{\phi P_n}$
									✔

[1] P_u / ϕP_n controls

Section Capacity Table

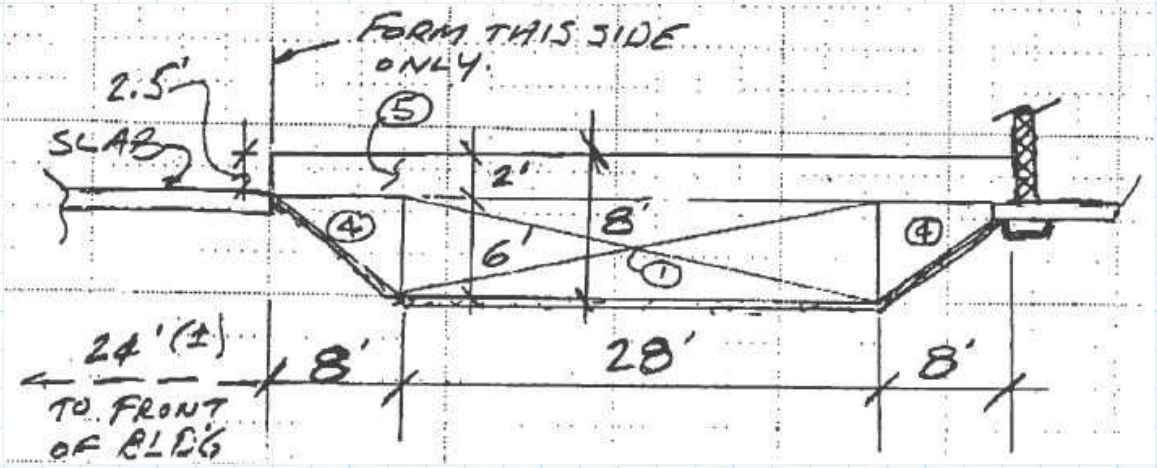
Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
T1	256 - 248	Leg	ROHN 3 STD	3	-4849.13	88543.60	5.5	Pass
		Diagonal	L1 3/4x1 3/4x3/16	11	-1899.49	7836.45	24.2	Pass
							24.3 (b)	
		Top Girt	L3x3x1/4	6	-682.73	19705.80	3.5	Pass
T2	248 - 228	Leg	ROHN 3 EH	21	-27581.10	119117.00	23.2	Pass
		Diagonal	L2x2x1/4	26	-3399.53	14744.40	23.1	Pass
							32.5 (b)	
T3	228 - 208	Leg	ROHN 4 EH	54	-63535.50	183589.00	34.6	Pass
		Diagonal	L2x2x1/4	59	-5029.85	15141.50	33.2	Pass
							46.4 (b)	
T4	208 - 188	Leg	ROHN 5 EH	87	-88242.30	254372.00	34.7	Pass
		Diagonal	L2x2x1/4	89	-3386.59	9442.17	35.9	Pass
T5	188 - 168	Leg	ROHN 6 EH	113	-117625.00	343100.00	34.3	Pass
		Diagonal	L2 1/2x2 1/2x1/4	115	-6960.62	11996.10	58.0	Pass
T6	168 - 148	Leg	ROHN 6 EH	134	-156945.00	343100.00	45.7	Pass
		Diagonal	L3x3x1/4	136	-9133.38	16173.10	56.5	Pass
							71.1 (b)	
T7	148 - 128	Leg	ROHN 6 EH	155	-206268.00	343092.00	60.1	Pass
		Diagonal	L3x3x1/4 w/3"x1/4" plate	157	-13513.70	36890.50	36.6	Pass
							75.5 (b)	
T8	128 - 108	Leg	ROHN 8 EHS	176	-257911.00	386381.00	66.8	Pass
		Diagonal	L4x4x3/8	178	-16826.40	30486.60	55.2	Pass
							78.0 (b)	
T9	108 - 88	Leg	ROHN 8 EH	191	-318281.00	505517.00	63.0	Pass
		Diagonal	L4x4x0.31	193	-19808.40	21205.70	93.4	Pass
							94.8 (b)	
T10	88 - 68	Leg	P10x.5	206	-382478.00	668659.00	57.2	Pass
		Diagonal	L5x5x3/8	208	-23244.00	43484.70	53.5	Pass
							95.4 (b)	
T11	68 - 48	Leg	P10x.5	221	-448910.00	668663.00	67.1	Pass
		Diagonal	L5x5x3/8	223	-25909.90	37294.00	69.5	Pass
							89.0 (b)	
T12	48 - 28	Leg	P10x.5	236	-514835.00	668640.00	77.0	Pass
		Diagonal	L5x5x3/8	239	-28296.30	31978.80	88.5	Pass
T13	28 - 8	Leg	P10x.5	251	-534610.00	711505.00	75.1	Pass
		Diagonal	ROHN 3 STD w/L4x4x1/4	256	-40504.10	85927.60	47.1	Pass
							54.3 (b)	
		Top Girt	ROHN 3 STD	253	-24631.50	31030.70	79.4	Pass
		Redund Horz 1 Bracing	ROHN 1.5 STD	260	-9277.76	13888.30	66.8	Pass
		Redund Diag 1 Bracing	ROHN 1.5 STD	261	-8105.46	8212.23	98.7	Pass
		Redund Hip 1 Bracing	ROHN 1.5 STD	278	-136.34	12002.20	1.1	Pass
		Redund Hip Diagonal 1 Bracing	ROHN 1.5 STD	269	-101.55	2211.89	4.6	Pass
		Inner Bracing	ROHN 3 STD	280	-34.27	29213.70	28.5	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
							Summary	
							Leg (T12)	77.0 Pass
							Diagonal (T10)	95.4 Pass
							Top Girt (T13)	79.4 Pass
							Redund Horz 1 Bracing (T13)	66.8 Pass
							Redund Diag 1 Bracing (T13)	98.7 Pass
							Redund Hip 1 Bracing (T13)	1.1 Pass
							Redund Hip Diagonal 1 Bracing (T13)	4.6 Pass
							Inner Bracing (T13)	28.5 Pass
							Bolt Checks	95.4 Pass
							RATING =	**98.7** **Pass**

KM Consulting Engineers, Inc.
262 Upper Ferry Road
Ewing, NJ 08628

Tel.: (609) 538-0400
www.kmengr.com

Foundation Calculations



Volume of Foundation:

$V_1 := 6\ \text{ft} \cdot 28\ \text{ft} \cdot 31\ \text{ft} = 5208.0\ \text{ft}^3$

$V_2 := -1 \cdot \frac{1}{2} \cdot 2.83\ \text{ft} \cdot 4\ \text{ft} \cdot 28\ \text{ft} \cdot 2 = -317.0\ \text{ft}^3$

$V_3 := 1\ \text{ft} \cdot 1.67\ \text{ft} \cdot 44\ \text{ft} \cdot 2 = 147.0\ \text{ft}^3$

$V_4 := \frac{1}{2} \cdot 6\ \text{ft} \cdot 8\ \text{ft} \cdot 31\ \text{ft} \cdot 2 = 1488.0\ \text{ft}^3$

$V_5 := 2\ \text{ft} \cdot 33\ \text{ft} \cdot 44\ \text{ft} = 2904.0\ \text{ft}^3$

$V_{total} := V_1 + V_2 + V_3 + V_4 + V_5 = 9430.0\ \text{ft}^3$

Weight of Foundation:

$W_{found} := V_{total} \cdot 150\ \frac{\text{lbf}}{\text{ft}^3} = 1414.5\ \text{kip}$

Resisting Moment:

$\phi := 0.75$

$M_{found} := W_{found} \cdot 16.5\ \text{ft} \cdot \phi = 17504.4\ \text{kip} \cdot \text{ft}$

By: Domenic Aversa, PE
Approved by: Michael Bohlinger, PE

O4 Innovations
Bridgeport (NJJER02044B)
KM #220101.00

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MK DEVELOPMENT

EXHIBIT E

Antenna Mount Analysis

April 22, 2022

PASS

RE: **Structural Analysis for Antenna Mounts**

Location: **623 Pine Street Bridgeport, CT 06605**

Site ID: **NJJER02044B**

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	151'-0"	
Structure Class	II	ASCE 7-16
Exposure Class	C	ASCE 7-16
Kzt Factor	1.0	ASCE 7-16
Basic Wind Speed	125	ASCE 7-16
Ice Thickness	1"	ASCE 7-16
Ice Windspeed	50 MPH	ASCE 7-16
Seismic Design Category	B	ASCE 7-16
S_{DS}	.228	ASCE 7-16

2.0 Existing Documents:

DOCUMENT	COMPANY	DATE
Proposed Drawings	M&K Development	9/28/2021
Site Visit Photos	M&K Development	8/2/2021

3.0 Proposed Equipment:

MANUFACTURER	EQUIPMENT	WEIGHTS
CommScope	**(3) MTC3975083**	**352 lbs**
JMA Wireless	**(3) MX08FRO665**	**64.5 lbs**
Fujitsu	**(3) TA08025-B604**	**63.9 lbs**
Fujitsu	**(3) TA08025-B605**	**74.9 lbs**
RayCap	**(3) OVP RDIDC-9181-PF-48**	**32 lbs**

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.

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

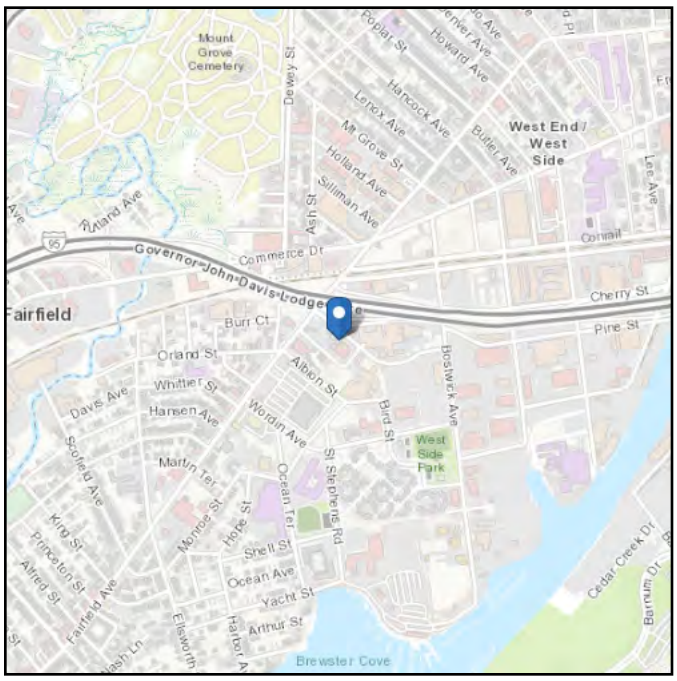
(Add) **APPENDIX N MUNICIPALITY – SPECIFIC STRUCTURAL DESIGN PARAMETERS**

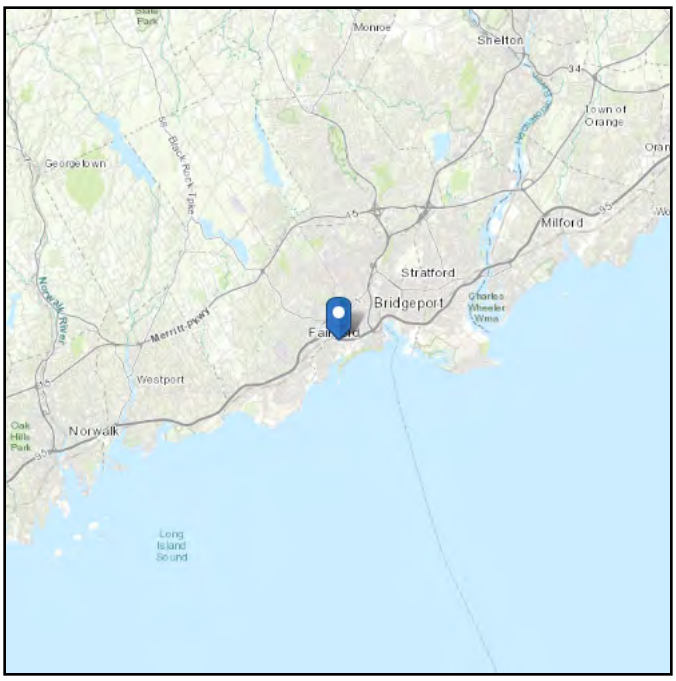
(APPENDIX N) MUNICIPALITY - SPECIFIC STRUCTURAL DESIGN PARAMETERS												
				Wind Design Parameters								
Municipality	**Ground Snow Load** (psf)	**MCE Spectral Accelerations** (%g)		**Ultimate Design Wind Speeds,** V_{ult} (mph)			**Nominal Design Wind Speeds,** V_{asd} (mph)			**Wind-Borne Debris 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	
Andover	30	0.176	0.063	120	130	140	93	101	108			Yes
Ansonia	30	0.195	0.064	115	125	135	89	97	105			Yes
Ashford	35	0.173	0.063	120	130	140	93	101	108			Yes
Avon	35	0.181	0.064	110	120	130	85	93	101			Yes
Barkhamsted	40	0.177	0.065	110	120	125	85	93	97			Yes
Beacon Falls	30	0.192	0.064	115	125	135	89	97	105			Yes
Berlin	30	0.183	0.063	115	125	135	89	97	105			Yes
Bethany	30	0.189	0.063	115	125	135	89	97	105			Yes
Bethel	30	0.215	0.066	110	120	125	85	93	97			Yes
Bethlehem	35	0.190	0.065	110	120	125	85	93	97			Yes
Bloomfield	35	0.180	0.064	115	125	130	89	97	101			Yes
Bolton	30	0.177	0.063	115	125	135	89	97	105			Yes
Bozrah	30	0.170	0.061	120	135	145	93	105	112		Type A	Yes
Branford	30	0.180	0.061	120	130	140	93	101	108		Type B	Yes
Bridgeport	30	0.209	0.064	115	125	135	89	97	105		Type B	Yes
Bridgewater	35	0.201	0.066	110	120	125	85	93	97			Yes
Bristol	35	0.185	0.064	110	120	130	85	93	101			Yes
Brookfield	35	0.208	0.066	110	120	125	85	93	97			Yes
Brooklyn	35	0.171	0.062	120	130	140	93	101	108			Yes
Burlington	35	0.182	0.064	110	120	130	85	93	101			Yes
Canaan	40	0.173	0.065	105	115	120	81	89	93			
Canterbury	35	0.171	0.061	120	130	140	93	101	108		Type A	Yes
Canton	35	0.180	0.064	110	120	130	85	93	101			Yes
Chaplin	35	0.173	0.062	120	130	140	93	101	108			Yes
Cheshire	30	0.186	0.063	115	125	135	89	97	105			Yes
Chester	30	0.172	0.060	120	130	140	93	101	108		Type A	Yes
Clinton	30	0.169	0.059	120	135	140	93	105	108	Type B	Type A	Yes
Colchester	30	0.174	0.061	120	130	140	93	101	108			Yes
Colebrook	40	0.174	0.065	105	115	125	81	89	97			
Columbia	30	0.175	0.062	120	130	140	93	101	108			Yes
Cornwall	40	0.180	0.065	105	115	120	81	89	93			
Coventry	30	0.176	0.063	120	130	140	93	101	108			Yes
Cromwell	30	0.181	0.063	115	125	135	89	97	105			Yes
Danbury	30	0.217	0.067	110	120	125	85	93	97			Yes
Darien	30	0.242	0.068	110	120	130	85	93	101			Yes
Deep River	30	0.170	0.060	120	130	140	93	101	108		Type A	Yes
Derby	30	0.195	0.064	115	125	135	89	97	105			Yes
Durham	30	0.179	0.062	115	130	140	89	101	108			Yes
Eastford	40	0.172	0.063	120	130	140	93	101	108			Yes

ASCE 7 Hazards Report

Address:
623 Pine St
Bridgeport, Connecticut
06605

Standard:	ASCE/SEI 7-16	**Elevation:**	12.8 ft (NAVD 88)
Risk Category:	II	**Latitude:**	41.16574
Soil Class:	D - Default (see Section 11.4.3)	**Longitude:**	-73.216641





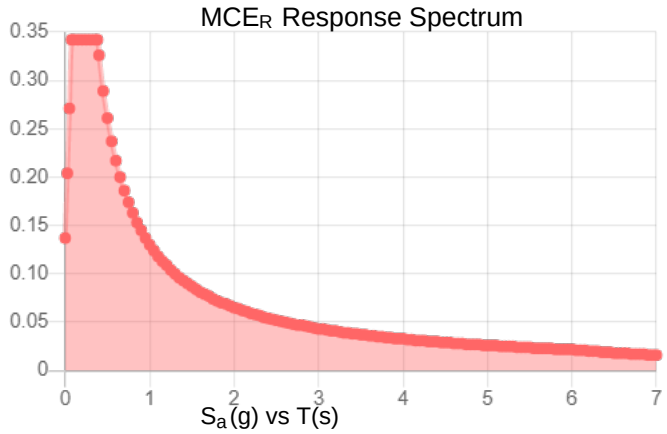
Seismic

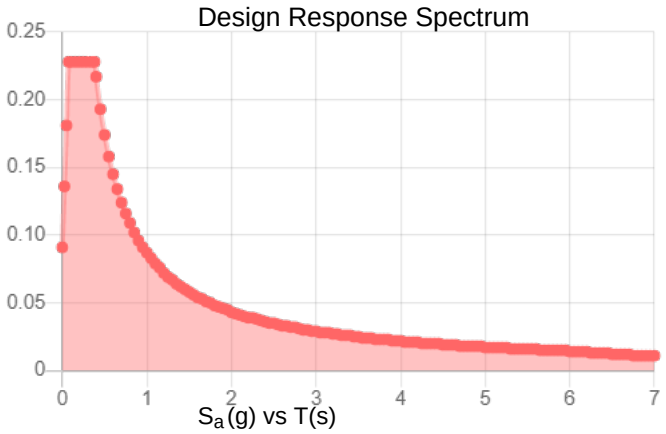
Site Soil Class: D - Default (see Section 11.4.3)

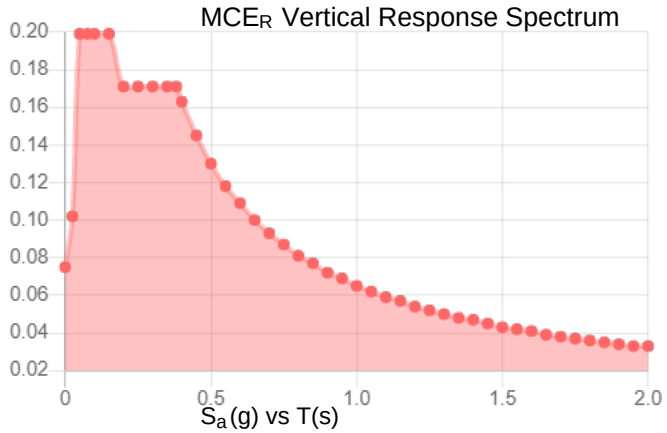
Results:

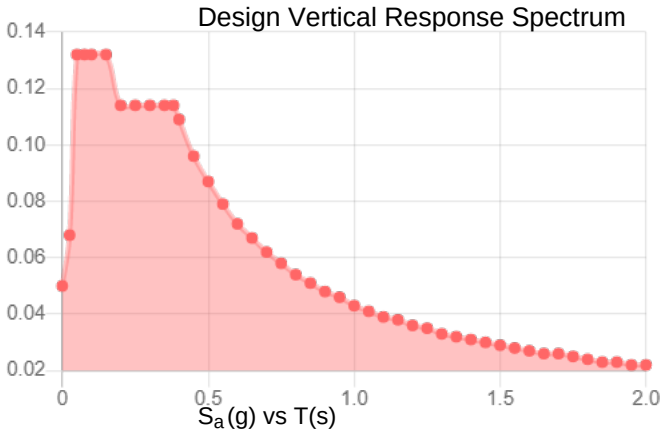
S_S :	0.214	S_{D1} :	0.087
S_1 :	0.054	T_L :	6
F_a :	1.6	PGA :	0.122
F_v :	2.4	PGA_M :	0.19
S_{MS} :	0.342	F_{PGA} :	1.556
S_{M1} :	0.13	I_e :	1
S_{DS} :	0.228	C_v :	0.727

Seismic Design Category B









Data Accessed: **Fri Apr 22 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.

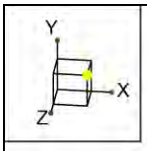
Ice

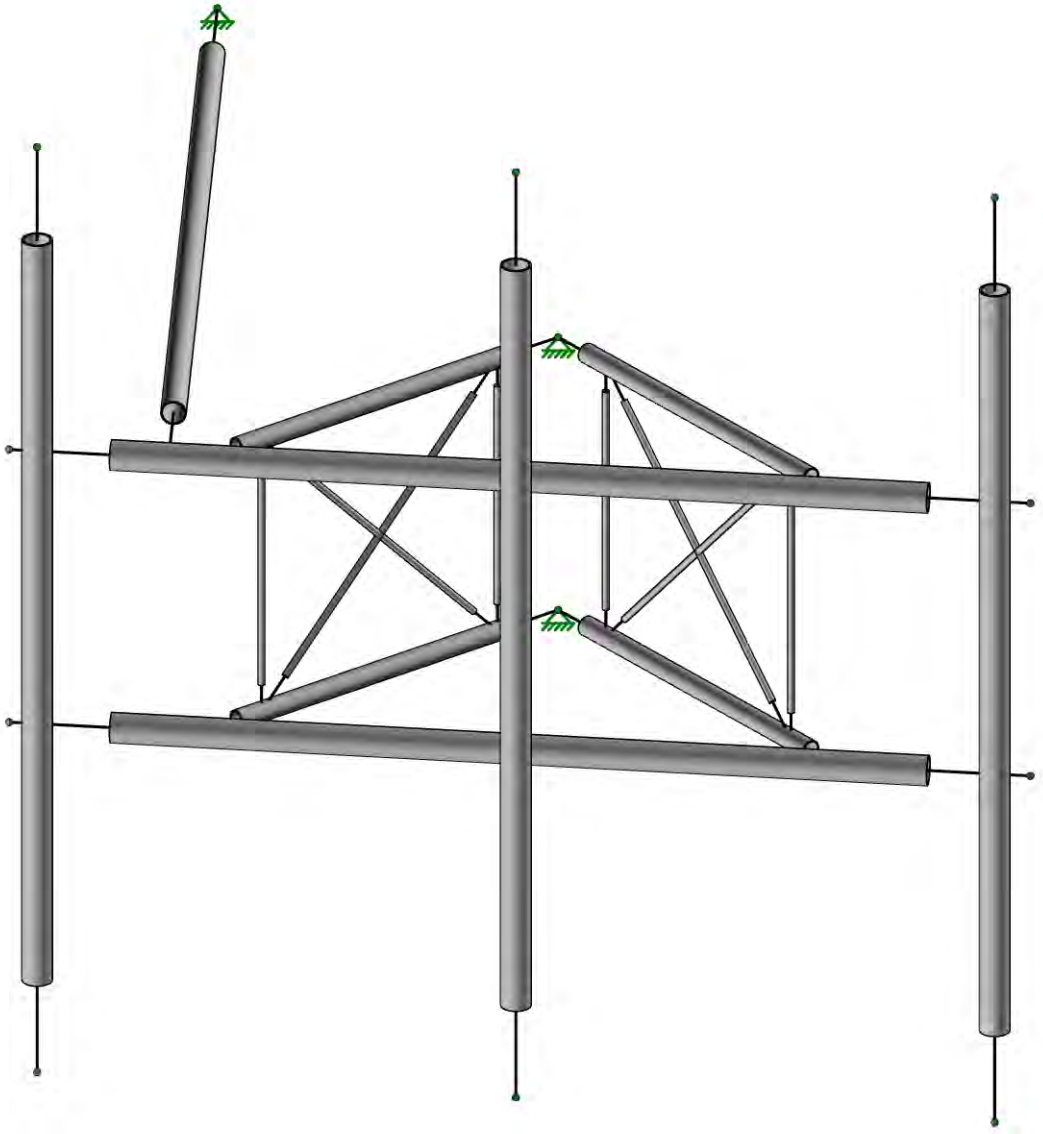
Results:

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:	Fri Apr 22 2022

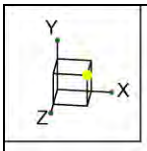
Ice thicknesses on structures in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

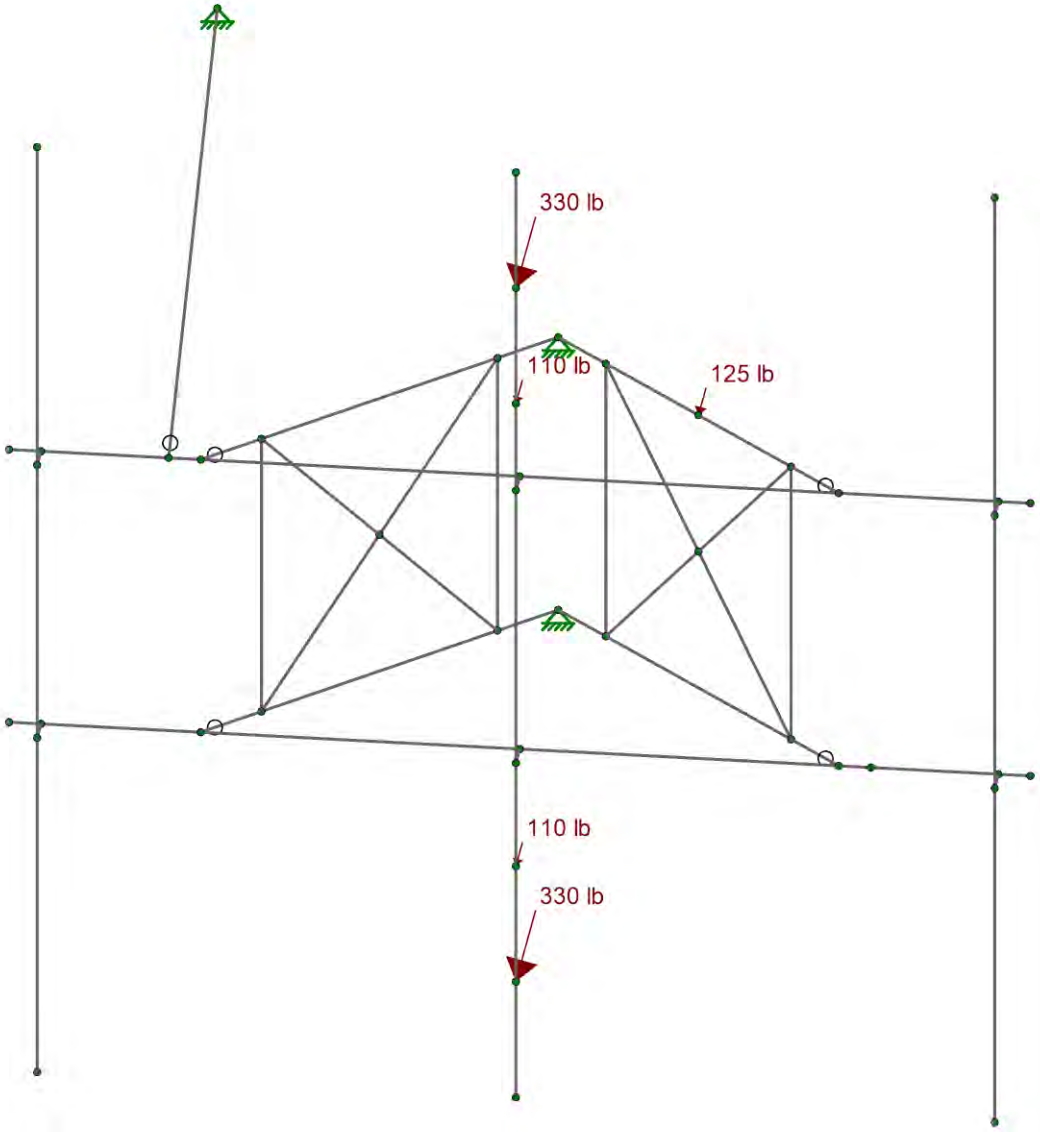
Values provided are equivalent radial ice thicknesses due to freezing rain with concurrent 3-second gust speeds, for a 500-year mean recurrence interval, and temperatures concurrent with ice thicknesses due to freezing rain. Thicknesses for ice accretions caused by other sources shall be obtained from 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.





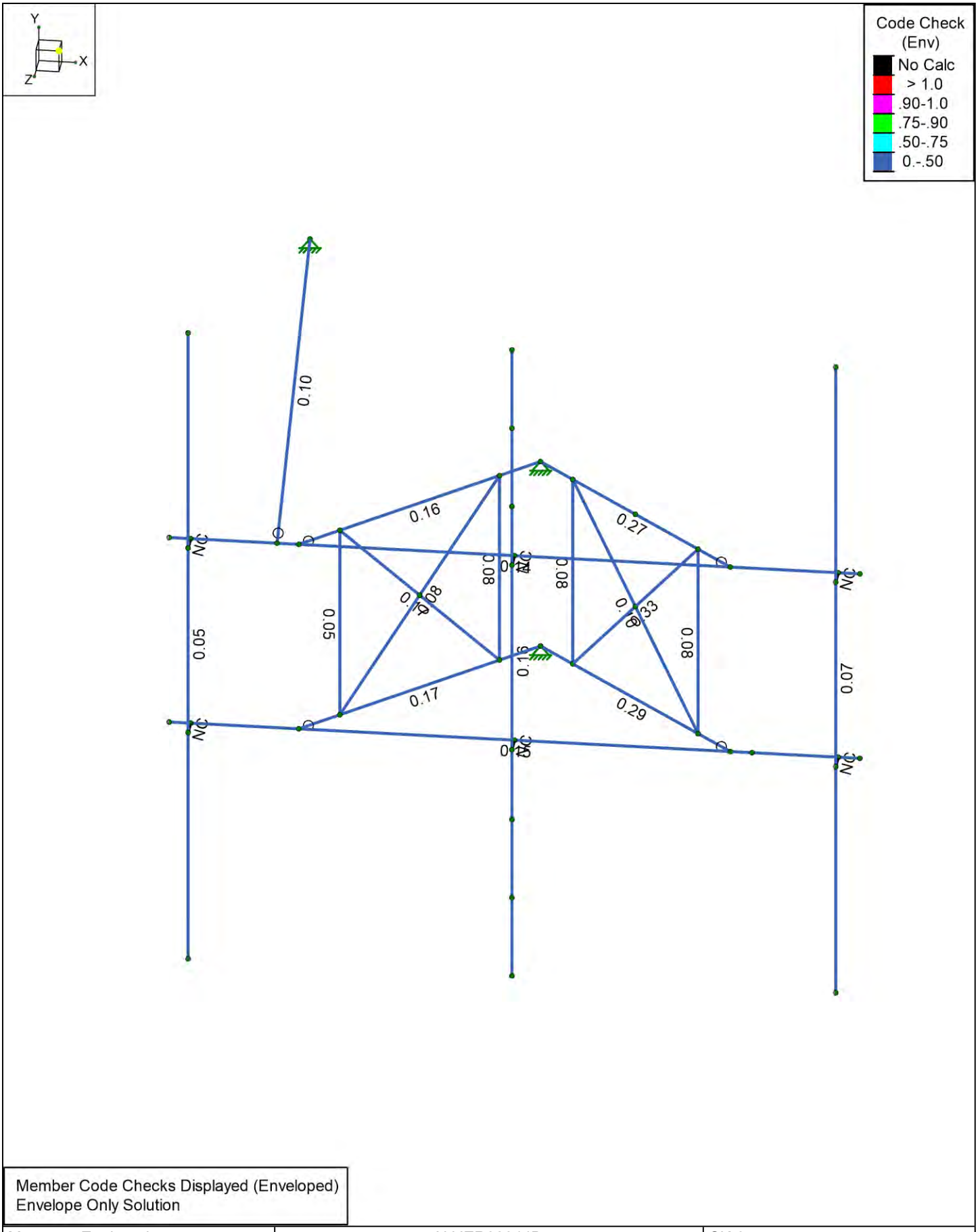
Magaram Engineering	NJJER02044B	SK-1
BJM		Apr 22, 2022
		NJJER02044B.r3d





Loads: BLC 4, Telco Wz

Magaram Engineering	NJJER02044B	SK-2
BJM		Apr 22, 2022
		NJJER02044B.r3d



Member Code Checks Displayed (Enveloped)
Envelope Only Solution

Magaram Engineering	NJJER02044B	SK-3
BJM		Apr 22, 2022
		NJJER02044B.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	1.9" ODx0.12"	None	None	A500 Gr.46	Typical	0.671	0.267	0.267	0.534
3	Diagonal	0.63" SR	None	None	A529 Gr.50	Typical	0.312	0.008	0.008	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	Pipe2.38X0.12	None	None	A500 Gr.46	Typical	0.852	0.545	0.545	1.091
6	End Support Pipe	3.5"x0.120	None	None	A500 Gr.46	Typical	1.274	1.822	1.822	3.644
7	Standoff Vertical	0.63" SR	None	None	A529 Gr.50	Typical	0.312	0.008	0.008	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	None	None	A500 Gr.46	Typical
2	M2	N7	N6	Standoff Arms	None	None	A500 Gr.46	Typical
3	M3	N3	N8	Standoff Vertical	None	None	A529 Gr.50	Typical
4	M4	N4	N9	Standoff Vertical	None	None	A529 Gr.50	Typical
5	M5	N4	N8	Diagonal	None	None	A529 Gr.50	Typical
6	M6	N3	N9	Diagonal	None	None	A529 Gr.50	Typical
7	M7	N10	N1	Standoff Arms	None	None	A500 Gr.46	Typical
8	M8	N14	N6	Standoff Arms	None	None	A500 Gr.46	Typical
9	M9	N11	N15	Standoff Vertical	None	None	A529 Gr.50	Typical
10	M10	N12	N16	Standoff Vertical	None	None	A529 Gr.50	Typical
11	M11	N12	N15	Diagonal	None	None	A529 Gr.50	Typical
12	M12	N11	N16	Diagonal	None	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

Member Primary Data (Continued)

	Label	I Node	J Node	Section/Shape	Type	Design List	Material	Design Rule
15	MP1	N22	N21	Mount Pipe	HBrace	Pipe	A500 Gr.46	Typical
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	None	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	Physical	Deflection Ratio Options	Seismic DR
1	M1	BenPIN	Yes	** NA **	None
2	M2	BenPIN	Yes	** NA **	None
3	M3		Yes	** NA **	None
4	M4		Yes	** NA **	None
5	M5		Yes	** NA **	None
6	M6		Yes	** NA **	None
7	M7	BenPIN	Yes	** NA **	None
8	M8	BenPIN	Yes	** NA **	None
9	M9		Yes	** NA **	None
10	M10		Yes	** NA **	None
11	M11		Yes	** NA **	None
12	M12		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

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
14	M14	Face Horizontal	96			Lbyy					Lateral
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	1.9" ODx0.12"	None	None	Pinned	Fixed
2	M2	1.9" ODx0.12"	None	None	Pinned	Fixed
3	M3	0.63" SR	None	None	Fixed	Fixed
4	M4	0.63" SR	None	None	Fixed	Fixed
5	M5	0.63" SR	None	None	Fixed	Fixed
6	M6	0.63" SR	None	None	Fixed	Fixed
7	M7	1.9" ODx0.12"	None	None	Pinned	Fixed
8	M8	1.9" ODx0.12"	None	None	Pinned	Fixed
9	M9	0.63" SR	None	None	Fixed	Fixed
10	M10	0.63" SR	None	None	Fixed	Fixed
11	M11	0.63" SR	None	None	Fixed	Fixed
12	M12	0.63" SR	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	Pipe2.38X0.12	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

Frame / HR Column Seismic Design Rule (Continued)

	Label	Frame Ductility	Overstrength Reqd
3	OMF	Minimal	Yes
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

Connection Design Rules (Continued)

	Label	Conn Type	Type	Beam Conn	Col/Girder Conn	Eccentricity
28	Seismic Chevron Brace	Brace	Chevron Brace Seismic	N/A	N/A	N/A
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	-45
2	N43	L	Y	-45
3	N44	L	Y	-80
4	N45	L	Y	-80
5	N46	L	Y	-32

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	-90
2	N43	L	Y	-90
3	N44	L	Y	-30
4	N45	L	Y	-30
5	N46	L	Y	-40

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	330
2	N43	L	X	330
3	N44	L	X	110
4	N45	L	X	110
5	N46	L	X	125

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	330
2	N43	L	Z	330
3	N44	L	Z	110
4	N45	L	Z	110
5	N46	L	Z	125

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	120
2	N43	L	X	120
3	N44	L	X	25
4	N45	L	X	25
5	N46	L	X	25

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	120
2	N43	L	Z	120
3	N44	L	Z	25
4	N45	L	Z	25
5	N46	L	Z	25

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	N33	L	Y	-500

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	N15A	L	Y	-250
2	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			
8	Telco Wzm	WLZP2			
9	-	None			
10	Mount DL	DL	-1.1		
11	Mount DLi	OL1			18
12	Mount Wx	WLX			18
13	Mount Wz	WLZ			18
14	Mount Wxi	WLXP1			18
15	Mount Wzi	WLZP1			18
16	Mount Wxm	WLXP2			
17	Mount Wzm	WLZP2			
18	-	None			
19	Lm	None		1	
20	Lv	None		2	

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

Load Combinations (Continued)

	Description	Solve	P-Delta	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
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
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

Load Combinations (Continued)

	Description	Solve	P-Delta	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
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
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

Load Combination Design (Continued)

	Description	Service	Hot Rolled	Cold Formed	Wood	Concrete	Masonry	Aluminum	Stainless	Connection
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	752.141	28	735.434	70	1081.473	35	0	70	0	70	0	70
2		min	-1273.762	70	221.302	24	-2395.405	10	0	1	0	1	0	1
3	N6	max	1273.734	70	735.093	69	1724.624	49	0	70	0	70	0	70
4		min	-746.952	20	231.013	32	-306.621	24	0	1	0	1	0	1
5	N38	max	149.33	28	35.618	37	1337.674	28	0	70	0	70	0	70
6		min	-149.796	20	11.41	30	-1338.607	20	0	1	0	1	0	1
7	Totals:	max	1652.723	11	1482.752	69	1796.304	32						
8		min	-1652.723	20	549.56	28	-1796.304	7						

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	70	0	24	0	10	4.263e-3	69	1.703e-3	35	1.286e-3	20
2		min	0	28	0	70	0	35	1.456e-3	35	-1.689e-3	10	-3.257e-3	70
3	N2	max	0.015	20	-0.005	21	0.019	11	1.683e-3	6	3.039e-3	23	1.481e-3	69
4		min	-0.017	11	-0.086	70	-0.015	20	-1.345e-3	31	-3.075e-3	14	-1.787e-3	70
5	N3	max	0.02	20	-0.002	20	0.023	11	2.432e-3	69	1.384e-3	25	1.149e-3	21
6		min	-0.021	11	-0.047	70	-0.02	20	3.347e-5	29	-1.495e-3	16	-3.462e-3	70
7	N4	max	0.01	35	-0.001	20	0.01	10	3.322e-3	38	1.977e-3	35	1.165e-3	3
8		min	-0.01	10	-0.034	70	-0.01	35	9.874e-4	30	-2.045e-3	10	-2.245e-3	70
9	N6	max	0	20	0	32	0	24	4.271e-3	69	2.137e-3	20	1.273e-3	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
10		min	0	70	0	54	0	49	1.492e-3	22	-2.205e-3	11	-3.265e-3	70
11	N7	max	0.051	20	0.003	20	0.05	28	1.772e-3	16	3.381e-3	23	1.483e-3	69
12		min	-0.053	11	-0.087	70	-0.05	3	-1.439e-3	25	-3.446e-3	14	-1.776e-3	70
13	N8	max	0.044	20	-0.001	20	0.044	28	2.483e-3	69	1.293e-3	20	1.337e-3	35
14		min	-0.046	11	-0.047	70	-0.044	3	4.298e-4	22	-1.342e-3	11	-3.515e-3	70
15	N9	max	0.011	20	-0.002	20	0.011	28	3.213e-3	52	2.09e-3	3	1.034e-3	3
16		min	-0.011	11	-0.034	70	-0.011	3	9.866e-4	27	-2.091e-3	11	-2.199e-3	70
17	N10	max	0.014	21	-0.008	27	0.011	4	1.943e-3	9	2.599e-3	31	5.79e-4	20
18		min	-0.016	12	-0.051	54	-0.011	29	-1.597e-3	34	-2.679e-3	6	-1.487e-3	54
19	N11	max	0.016	20	-0.004	28	0.013	4	2.659e-3	69	4.338e-4	25	1.627e-3	18
20		min	-0.017	11	-0.027	37	-0.012	29	-4.873e-5	20	-5.342e-4	17	-1.169e-3	27
21	N12	max	0.007	20	-0.001	28	0.007	3	3.276e-3	45	1.18e-3	3	9.631e-4	20
22		min	-0.008	11	-0.021	37	-0.006	28	7.584e-4	35	-1.124e-3	28	-2.768e-3	70
23	N14	max	0.051	20	-0.001	28	0.049	20	2.054e-3	13	2.509e-3	32	-1.956e-5	35
24		min	-0.053	11	-0.05	54	-0.053	11	-1.694e-3	22	-2.573e-3	7	-1.474e-3	54
25	N15	max	0.044	20	-0.003	28	0.043	20	2.631e-3	69	1.3e-3	20	1.817e-3	4
26		min	-0.046	11	-0.028	37	-0.046	11	6.042e-4	23	-1.36e-3	11	-1.414e-3	29
27	N16	max	0.011	20	-0.001	28	0.01	20	3.244e-3	46	2.03e-3	20	7.862e-4	20
28		min	-0.011	11	-0.021	37	-0.011	11	8.184e-4	21	-2.16e-3	11	-2.772e-3	70
29	N15A	max	0.015	20	0.018	20	0.07	13	1.486e-3	4	3.011e-3	23	1.288e-3	3
30		min	-0.017	11	-0.124	70	-0.064	22	-1.236e-3	29	-3.142e-3	14	-1.951e-3	70
31	N16A	max	0.014	21	0.015	28	0.035	15	2.046e-3	10	2.258e-3	15	1.204e-3	20
32		min	-0.016	12	-0.049	3	-0.035	24	-1.803e-3	35	-2.254e-3	24	-1.387e-3	11
33	N17	max	0.051	20	0.018	20	0.095	12	1.578e-3	18	3.08e-3	6	1.081e-3	3
34		min	-0.053	11	-0.124	70	-0.095	4	-1.339e-3	27	-3.052e-3	31	-1.932e-3	70
35	N18	max	0.051	20	0.015	28	0.062	35	2.153e-3	12	2.195e-3	32	9.895e-4	20
36		min	-0.053	11	-0.048	3	-0.068	10	-1.889e-3	21	-2.353e-3	7	-1.256e-3	70
37	N19	max	0.063	70	0.01	20	0.019	14	1.623e-3	5	3.011e-3	23	1.066e-3	3
38		min	-0.023	17	-0.115	70	-0.027	70	-1.374e-3	30	-3.142e-3	14	-1.901e-3	70
39	N20	max	0.1	3	0.01	20	0.116	28	1.723e-3	17	3.08e-3	6	1.339e-3	3
40		min	-0.102	70	-0.115	70	-0.124	3	-1.485e-3	26	-3.052e-3	31	-1.881e-3	70
41	N21	max	0.041	70	0.005	28	0.065	11	2.157e-3	10	2.258e-3	15	9.813e-4	20
42		min	-0.021	20	-0.045	37	-0.057	20	-1.915e-3	35	-2.254e-3	24	-1.274e-3	70
43	N22	max	0.092	20	0.005	28	0.113	20	2.282e-3	12	2.195e-3	32	1.248e-3	20
44		min	-0.099	11	-0.045	37	-0.128	11	-2.018e-3	21	-2.353e-3	7	-1.402e-3	11
45	N23	max	0.031	20	-0.002	20	0.032	11	3.057e-4	22	1.177e-3	20	5.356e-4	7
46		min	-0.032	11	-0.04	70	-0.032	35	-1.53e-3	70	-1.238e-3	11	-2.945e-4	32
47	N24	max	0.029	20	-0.002	28	0.028	20	4.664e-4	28	1.019e-3	20	2.16e-4	21
48		min	-0.029	11	-0.024	37	-0.027	11	-1.053e-3	3	-1.079e-3	11	-4.94e-4	70
49	N25	max	0.014	21	0.011	28	0.028	15	2.046e-3	10	2.258e-3	15	1.204e-3	20
50		min	-0.016	12	-0.046	37	-0.028	24	-1.803e-3	35	-2.254e-3	24	-1.387e-3	11
51	N26	max	0.015	20	0.014	20	0.061	13	1.486e-3	4	3.011e-3	23	1.289e-3	3
52		min	-0.017	11	-0.118	70	-0.055	22	-1.236e-3	29	-3.142e-3	14	-1.901e-3	70
53	N27	max	0.051	20	0.011	28	0.059	35	2.153e-3	12	2.195e-3	32	9.894e-4	20
54		min	-0.053	11	-0.046	37	-0.064	10	-1.889e-3	21	-2.353e-3	7	-1.256e-3	70
55	N28	max	0.051	20	0.014	20	0.087	12	1.578e-3	18	3.08e-3	6	1.081e-3	3
56		min	-0.053	11	-0.118	70	-0.087	4	-1.339e-3	27	-3.052e-3	31	-1.882e-3	70
57	N33	max	0.091	20	-0.026	20	0.218	7	5.215e-3	7	9.233e-4	20	2.736e-3	11
58		min	-0.093	11	-0.095	54	-0.2	32	-4.802e-3	32	-9.817e-4	11	-2.723e-3	20
59	N34	max	0.206	20	-0.026	20	0.229	24	5.884e-3	15	1.833e-3	20	4.925e-3	20
60		min	-0.209	11	-0.094	54	-0.247	15	-5.471e-3	24	-1.892e-3	11	-4.937e-3	11
61	N35	max	0.015	21	-0.02	23	0.063	7	2.694e-3	7	9.233e-4	20	2.17e-4	11
62		min	-0.017	12	-0.093	54	-0.058	32	-2.282e-3	32	-9.817e-4	11	-1.183e-3	70
63	N36	max	0.051	20	-0.02	33	0.06	24	2.914e-3	15	1.833e-3	20	1.954e-3	20
64		min	-0.053	11	-0.092	54	-0.064	15	-2.5e-3	24	-1.892e-3	11	-1.967e-3	11

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
65	N37	max	0.014	21	-0.005	28	0.006	3	1.939e-3	9	2.532e-3	31	7.5e-4	20
66		min	-0.016	12	-0.046	54	-0.005	28	-1.614e-3	34	-2.58e-3	6	-1.393e-3	11
67	N38	max	0	20	0	30	0	20	2.611e-3	37	3.31e-3	20	5.9e-4	20
68		min	0	28	0	37	0	28	6.688e-4	28	-3.327e-3	11	-1.354e-3	11
69	N65	max	0.051	20	0.005	20	0.056	11	1.699e-3	16	3.271e-3	23	1.244e-3	69
70		min	-0.053	11	-0.092	70	-0.056	3	-1.385e-3	25	-3.304e-3	14	-2.016e-3	70
71	N67	max	0.013	20	0.005	28	0.028	15	2.046e-3	10	2.258e-3	15	1.204e-3	20
72		min	-0.014	11	-0.045	37	-0.028	24	-1.803e-3	35	-2.254e-3	24	-1.387e-3	11
73	N68	max	0.023	21	0.01	20	0.061	13	1.486e-3	4	3.011e-3	23	1.289e-3	3
74		min	-0.025	12	-0.115	70	-0.055	22	-1.236e-3	29	-3.142e-3	14	-1.901e-3	70
75	N69	max	0.051	20	0.005	28	0.059	35	2.153e-3	12	2.195e-3	32	9.894e-4	20
76		min	-0.053	11	-0.045	37	-0.064	10	-1.889e-3	21	-2.353e-3	7	-1.256e-3	70
77	N70	max	0.056	20	0.01	20	0.087	12	1.578e-3	18	3.08e-3	6	1.081e-3	3
78		min	-0.058	11	-0.115	70	-0.087	4	-1.339e-3	27	-3.052e-3	31	-1.882e-3	70
79	N73	max	0.018	20	-0.026	20	0.063	7	2.694e-3	7	9.233e-4	20	2.17e-4	11
80		min	-0.019	11	-0.095	54	-0.058	32	-2.282e-3	32	-9.817e-4	11	-1.183e-3	70
81	N74	max	0.056	20	-0.026	20	0.06	24	2.914e-3	15	1.833e-3	20	1.954e-3	20
82		min	-0.058	11	-0.094	54	-0.064	15	-2.5e-3	24	-1.892e-3	11	-1.967e-3	11
83	N42	max	0.058	20	-0.026	20	0.156	7	5.204e-3	7	9.233e-4	20	2.726e-3	11
84		min	-0.06	11	-0.095	54	-0.142	32	-4.791e-3	32	-9.817e-4	11	-2.713e-3	20
85	N43	max	0.147	20	-0.026	20	0.164	24	5.873e-3	15	1.833e-3	20	4.915e-3	20
86		min	-0.149	11	-0.094	54	-0.177	15	-5.46e-3	24	-1.892e-3	11	-4.927e-3	11
87	N44	max	0.028	20	-0.026	20	0.096	7	4.422e-3	7	9.233e-4	20	1.944e-3	11
88		min	-0.031	11	-0.095	54	-0.088	32	-4.009e-3	32	-9.817e-4	11	-1.931e-3	20
89	N45	max	0.091	20	-0.026	20	0.101	24	5.093e-3	15	1.833e-3	20	4.134e-3	20
90		min	-0.093	11	-0.094	54	-0.109	15	-4.68e-3	24	-1.892e-3	11	-4.146e-3	11
91	N46	max	0.024	35	-0.002	20	0.027	10	1.302e-3	4	6.108e-4	20	1.779e-3	69
92		min	-0.025	10	-0.04	70	-0.025	35	-1.069e-3	70	-7.209e-4	11	-1.178e-4	29

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	1.9" ODx0.12"	0.27	7.508	70	0.096	42.4	70	20499.094	27779.4	1.314	1.314	1.869	H1-1b
2	M2	1.9" ODx0.12"	0.29	35.333	70	0.098	42.4	70	20499.094	27779.4	1.314	1.314	1.828	H1-1b
3	M3	0.63" SR	0.076	28.3	70	0.011	28.3	18	5162.835	14027.625	0.147	0.147	2.271	H1-1b
4	M4	0.63" SR	0.083	0	41	0.007	28.3	70	5162.835	14027.625	0.147	0.147	1.763	H1-1b
5	M5	0.63" SR	0.097	39.811	70	0.014	19.905	69	2249.534	14027.625	0.147	0.147	2.331	H1-1b
6	M6	0.63" SR	0.326	0	70	0.016	39.811	52	4409.088	14027.625	0.147	0.147	2.299	H1-1a
7	M7	1.9" ODx0.12"	0.16	35.333	69	0.079	42.4	37	20499.094	27779.4	1.314	1.314	1.835	H1-1b
8	M8	1.9" ODx0.12"	0.173	35.333	37	0.078	42.4	38	20499.094	27779.4	1.314	1.314	1.836	H1-1b
9	M9	0.63" SR	0.054	28.3	51	0.009	28.3	3	5162.835	14027.625	0.147	0.147	2.217	H1-1b
10	M10	0.63" SR	0.084	0	70	0.008	28.3	70	5162.835	14027.625	0.147	0.147	2.273	H1-1b
11	M11	0.63" SR	0.078	0	40	0.021	19.905	70	2249.534	14027.625	0.147	0.147	2.145	H1-1b
12	M12	0.63" SR	0.175	39.811	52	0.022	19.905	70	4409.088	14027.625	0.147	0.147	2.096	H1-1b*
13	M13	PIPE_2.5	0.138	48	6	0.09	18	3	62325.909	66654	4.727	4.727	2.831	H1-1b
14	M14	PIPE_2.5	0.148	48	6	0.057	19	17	33487.322	66654	4.727	4.727	1.775	H1-1b
15	MP1	PIPE_2.5	0.05	35	17	0.018	63	11	33487.322	66654	4.727	4.727	3	H1-1b
16	MP3	PIPE_2.5	0.074	63	70	0.026	63	70	33487.322	66654	4.727	4.727	3	H1-1b
17	MP2	PIPE_2.5	0.161	34	3	0.045	63	3	33487.322	66654	4.727	4.727	1.96	H1-1b
18	M27A	Pipe2.38X0.12	0.101	96.255	28	0.005	96.255	11	13288.958	35272.8	2.115	2.115	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	1.9" ODx0.12"	4	169.6	0.032
7	A500 Gr.46	PIPE_2.5	5	480	0.219
8	A500 Gr.46	Pipe2.38X0.12	1	96.3	0.023
9	A529 Gr.50	0.63" SR	8	272.4	0.024
10	Total HR Steel		18	1018.3	0.299

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:	NJJER02044B
Site Address:	623 Pine Street Bridgeport, CT
Latitude:	N 41.165766
Longitude:	W 73.216653
Structure type:	Lattice Tower
Report date:	June 2, 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 623 Pine Street in Bridgeport, CT. DISH refers to the antenna site by the code "NJJER02044B", 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, Paging Associates Inc. and Radio Communications Corporation. 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 3.0357 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 32 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 a NOC Information sign 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.

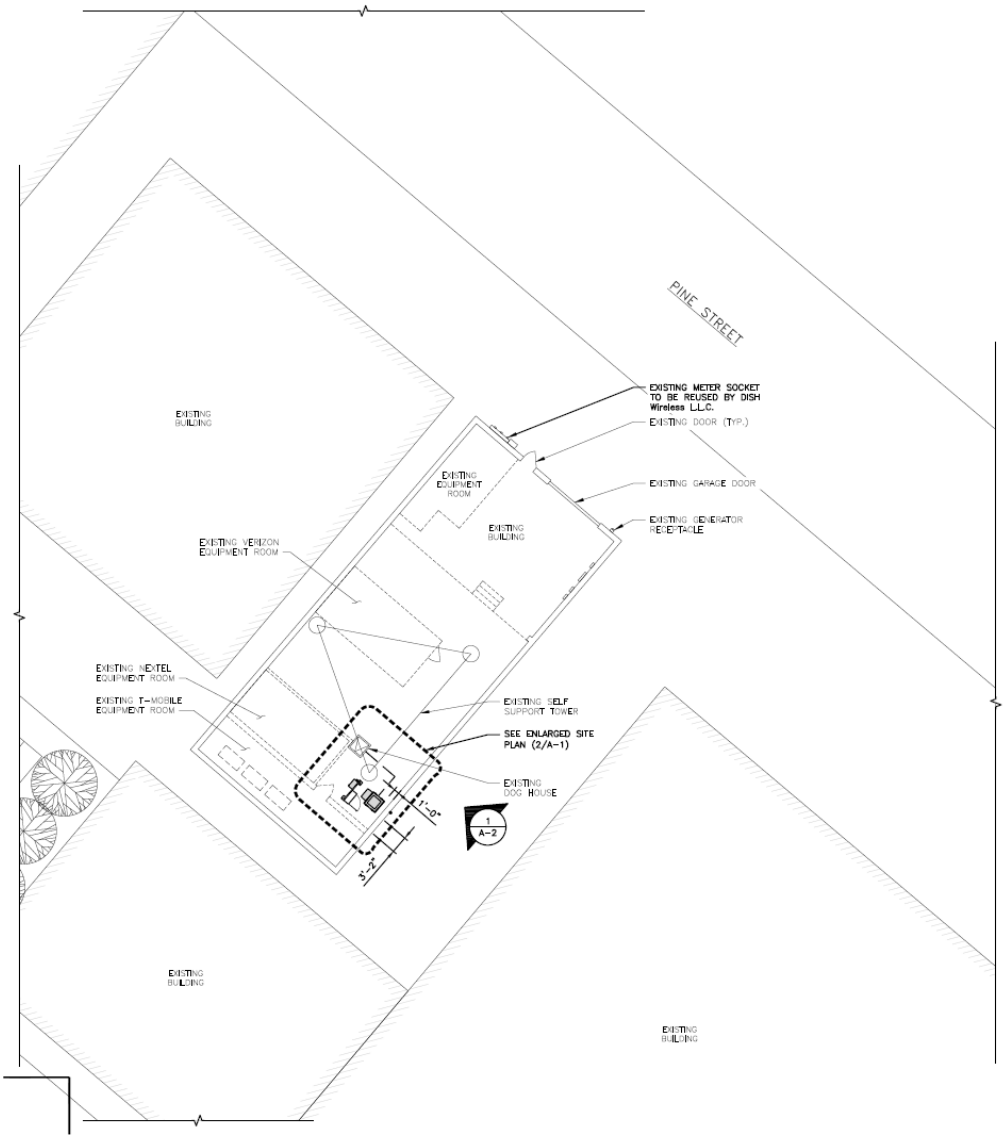
In addition, four Appendices are included. Appendix A provides information on the documents used to prepare the analysis. Appendix B provides background on the FCC MPE limit. Appendix C details the proposed mitigation to satisfy the FCC requirements and associated guidelines on RF compliance. Appendix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

a summary of the qualifications of the expert certifying FCC compliance for this site.

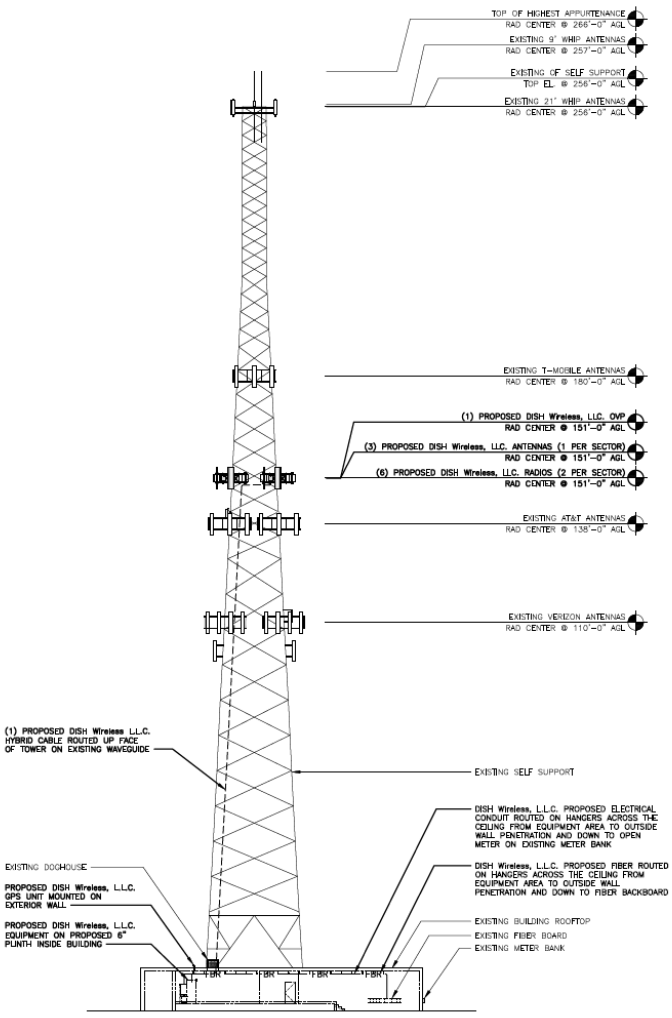
Antenna and Transmission Data

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	JMA Wireless	MX08FRO665-21	Panel	600	6	120	1637	151	11.46	68	90	2	0
❶	DISH	JMA Wireless	MX08FRO665-21	Panel	2000	6	160	6011	151	16.16	62	90	4	0
❶	DISH	JMA Wireless	MX08FRO665-21	Panel	2100	6	160	7567	151	16.66	64	90	4	0
❷	DISH	JMA Wireless	MX08FRO665-21	Panel	600	6	120	1637	151	11.46	68	190	2	0
❷	DISH	JMA Wireless	MX08FRO665-21	Panel	2000	6	160	6011	151	16.16	62	190	2	0
❷	DISH	JMA Wireless	MX08FRO665-21	Panel	2100	6	160	7567	151	16.66	64	190	2	0
❸	DISH	JMA Wireless	MX08FRO665-21	Panel	600	6	120	1637	151	11.46	68	290	2	0
❸	DISH	JMA Wireless	MX08FRO665-21	Panel	2000	6	160	6011	151	16.16	62	290	4	0
❸	DISH	JMA Wireless	MX08FRO665-21	Panel	2100	6	160	7567	151	16.66	64	290	4	0

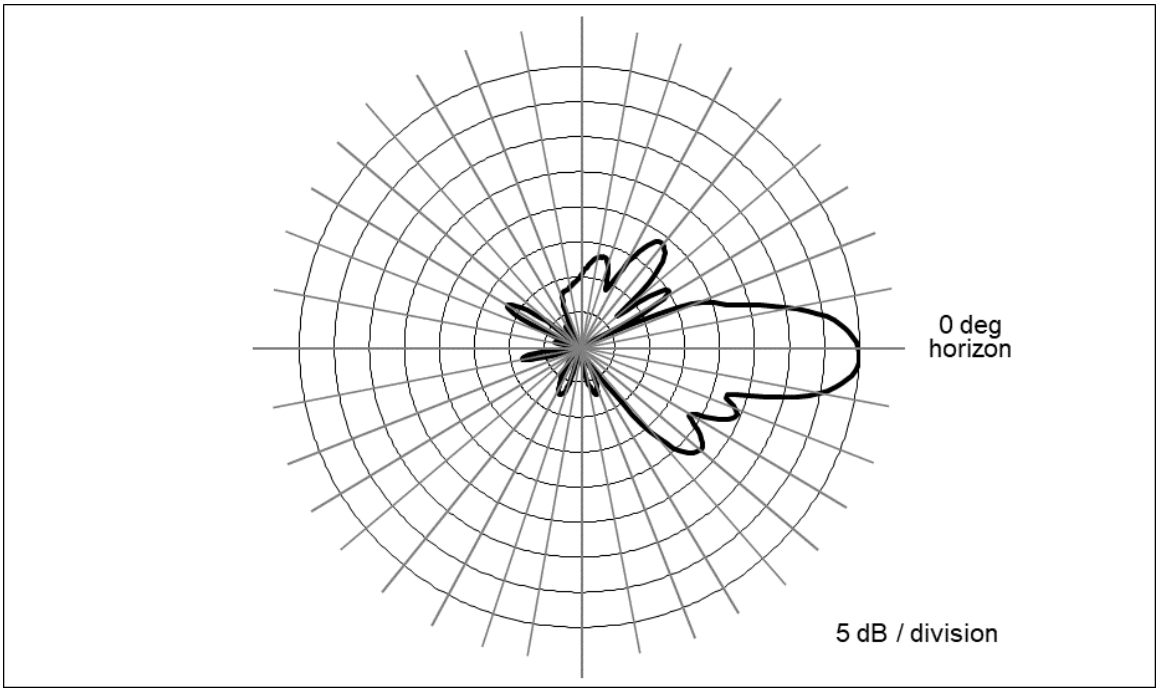
The area below the antennas, at street level, is of interest in terms of potential "uncontrolled" exposure of the general public, so the antenna's vertical-plane emission characteristic is used in the calculations, as it is a key determinant of the relative amount of RF emissions in the "downward" direction.

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. JMA Wireless MX08FRO665-21– 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 each of the other operators, we will rely on the transmission parameters in their respective 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
Paging Associates, Inc.	Generic	Generic	Omnidirectional	454	676	4.5	N/A
Radio Communications Corp.	Generic	Generic	Omnidirectional	451	500	3.0	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 area directly in front of 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.

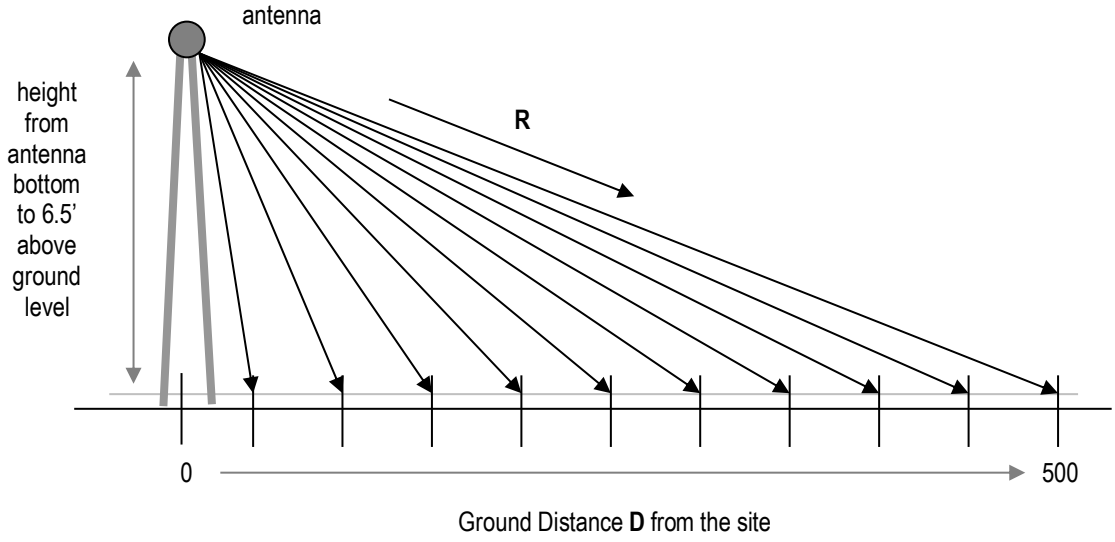


Figure 2. Street-level MPE% Calculation Geometry

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.

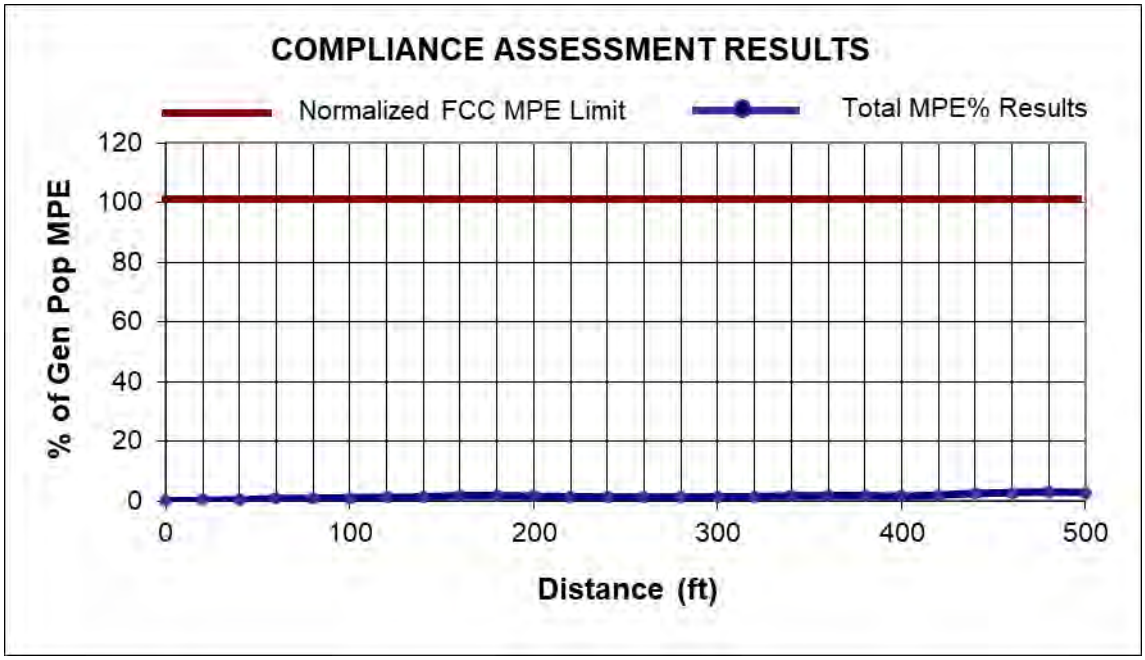
The tables that follow provide the results of the MPE% calculations for each antenna operation, with the overall worst-case calculated result highlighted in bold in the last column. Note that the transmission parameters for each DISH antenna sector are identical, and the calculations reflect the worst-case 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%	Subtotal MPE%
0	0.0007	0.0002	0.0009	0.0694	0.1384	0.2096
20	0.0019	0.0004	0.0083	0.0673	0.1926	0.2705
40	0.0045	0.0046	0.0136	0.1494	0.2095	0.3816
60	0.0042	0.0095	0.0020	0.2266	0.4051	0.6474
80	0.0014	0.0005	0.0041	0.3077	0.4685	0.7822
100	0.0042	0.0133	0.0159	0.3769	0.4002	0.8105
120	0.0344	0.0593	0.0837	0.3305	0.3205	0.8284
140	0.0734	0.0605	0.0762	0.5693	0.1964	0.9758
160	0.0879	0.0814	0.0979	0.7009	0.2095	1.1776
180	0.0698	0.0447	0.0759	0.6932	0.2387	1.1223
200	0.0412	0.0001	0.0071	0.7474	0.3041	1.0999
220	0.0228	0.0064	0.0067	0.7689	0.3315	1.1363
240	0.0247	0.0027	0.0002	0.7420	0.4971	1.2667
260	0.0364	0.0169	0.0157	0.5995	0.6317	1.3002
280	0.0490	0.0169	0.0233	0.3789	0.8218	1.2899
300	0.0503	0.0077	0.0131	0.2699	1.0317	1.3727
320	0.0496	0.0013	0.0163	0.1854	1.0781	1.3307
340	0.0418	0.0019	0.0261	0.1713	1.2644	1.5055
360	0.0338	0.0016	0.0248	0.1691	1.2028	1.4321
380	0.0261	0.0040	0.0130	0.1772	1.0568	1.2771
400	0.0203	0.0160	0.0054	0.2082	0.8617	1.1116
420	0.0186	0.0386	0.0143	0.1905	1.0723	1.3343
440	0.0226	0.0589	0.0331	0.2607	1.3194	1.6947
460	0.0208	0.0543	0.0305	0.3881	1.5001	1.9938
480	0.0305	0.0590	0.0390	0.3586	1.5570	2.0441
500	0.0481	0.0425	0.0268	0.3299	1.4508	1.8981

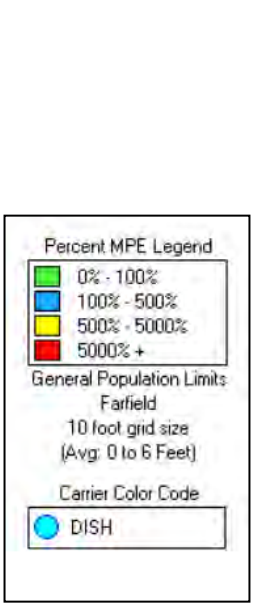
Ground Distance (ft)	Subtotal MPE%	Verizon Wireless MPE%	Paging Assoc. Inc. MPE%	Radio Comm. Corp. MPE%	Total MPE%
0	0.2096	0.0329	0.0006	0.0000	0.2431
20	0.2705	0.0507	0.0087	0.0015	0.3314
40	0.3816	0.1600	0.0291	0.0053	0.576
60	0.6474	0.2305	0.0468	0.0094	0.9341
80	0.7822	0.2008	0.0664	0.0139	1.0633
100	0.8105	0.2666	0.0776	0.0170	1.1717
120	0.8284	0.4415	0.0802	0.0180	1.3681
140	0.9758	0.4242	0.0734	0.0150	1.4884
160	1.1776	0.6137	0.0609	0.0099	1.8621
180	1.1223	0.7064	0.0429	0.0048	1.8764
200	1.0999	0.5505	0.0256	0.0011	1.6771
220	1.1363	0.3507	0.0119	0.0006	1.4995
240	1.2667	0.1593	0.0058	0.0025	1.4343
260	1.3002	0.0798	0.0014	0.0085	1.3899
280	1.2899	0.0434	0.0022	0.0136	1.3491
300	1.3727	0.0776	0.0060	0.0181	1.4744
320	1.3307	0.1480	0.0126	0.0226	1.5139
340	1.5055	0.2475	0.0158	0.0229	1.7917
360	1.4321	0.3776	0.0238	0.0244	1.8579
380	1.2771	0.5291	0.0271	0.0232	1.8565
400	1.1116	0.4806	0.0391	0.0211	1.6524
420	1.3343	0.6447	0.0427	0.0183	2.04
440	1.6947	0.8160	0.0479	0.0156	2.5742
460	1.9938	0.7498	0.0538	0.0127	2.8101
480	**2.0441**	**0.9239**	**0.0578**	**0.0099**	**3.0357**
500	1.8981	0.8543	0.0637	0.0072	2.8233

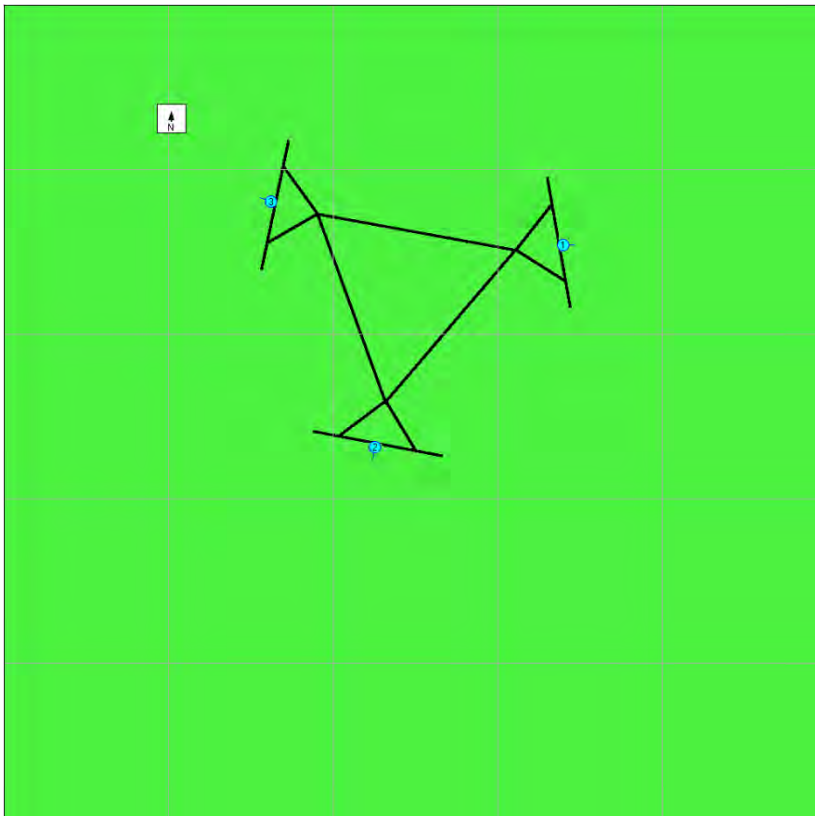
As indicated, the maximum calculated overall RF level is 3.0357 percent of the FCC MPE limit – well below the 100-percent reference for compliance.

A graph of the overall calculation results, provided on the next page, 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 below.



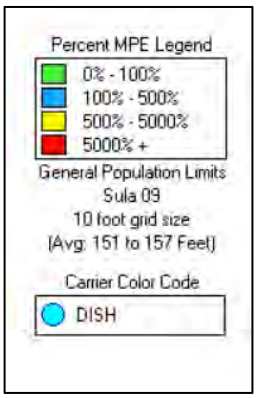


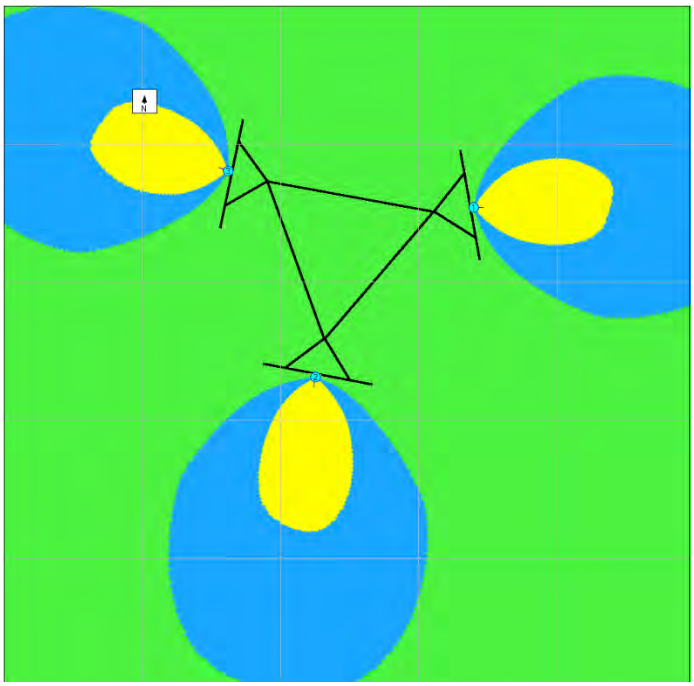
Near-field Analysis

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

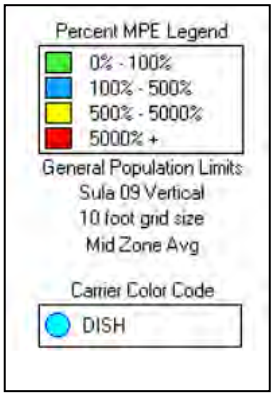
RF levels in the near field of an antenna depend on the power input to the antenna, the antenna's length and horizontal beamwidth, the mounting height of the antenna above the area of interest, and one's position and distance from the antenna. RF levels in front of a directional antenna are higher than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

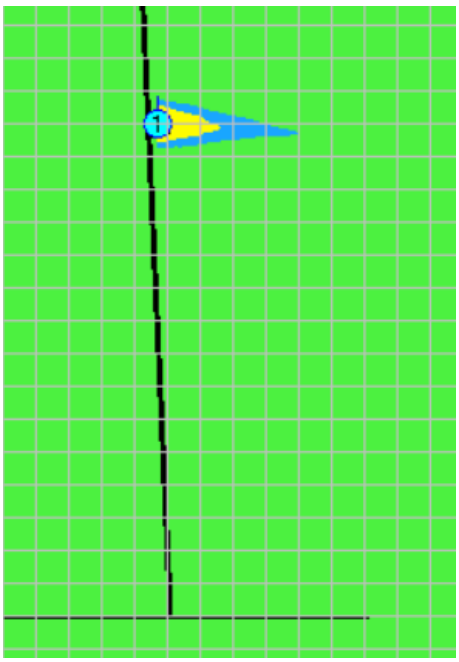
The RoofMaster graphic outputs for the same height as the DISH antennas are reproduced on the next page.





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 3.0357 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 a NOC Information sign be installed at the base of the tower.

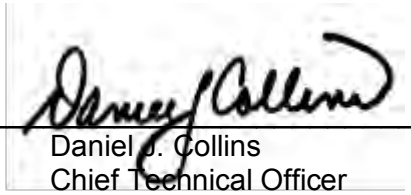
The results of the calculations, along with the described RF mitigation, combine to satisfy the FCC's RF compliance requirements and associated guidelines on compliance.

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

6/1/22
Date

Appendix A. Documents Used to Prepare the Analysis

RFDS: RFDS-NJJER02044B-Preliminary-20211202-v.1_20211203200450

CD: NJJER02044B_PrelimCD_20220504203559

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.

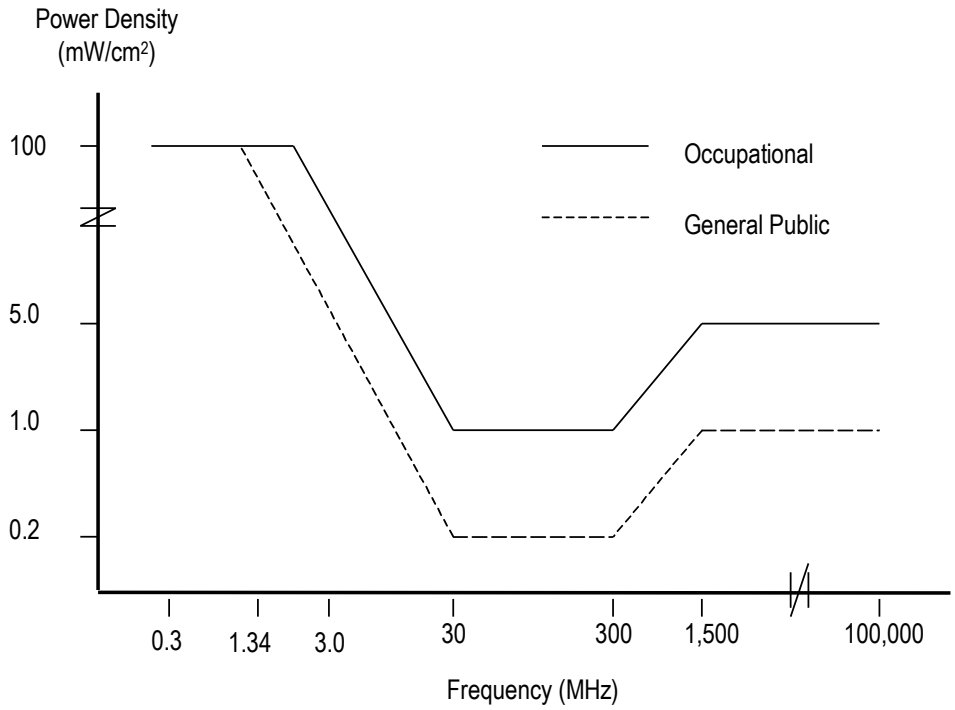
The specified continuous exposure MPE limits are based on known variation of human body susceptibility in different frequency ranges, and a Specific Absorption Rate (SAR) of 4 watts per kilogram, which is universally considered to accurately represent human capacity to dissipate incident RF energy (in 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.

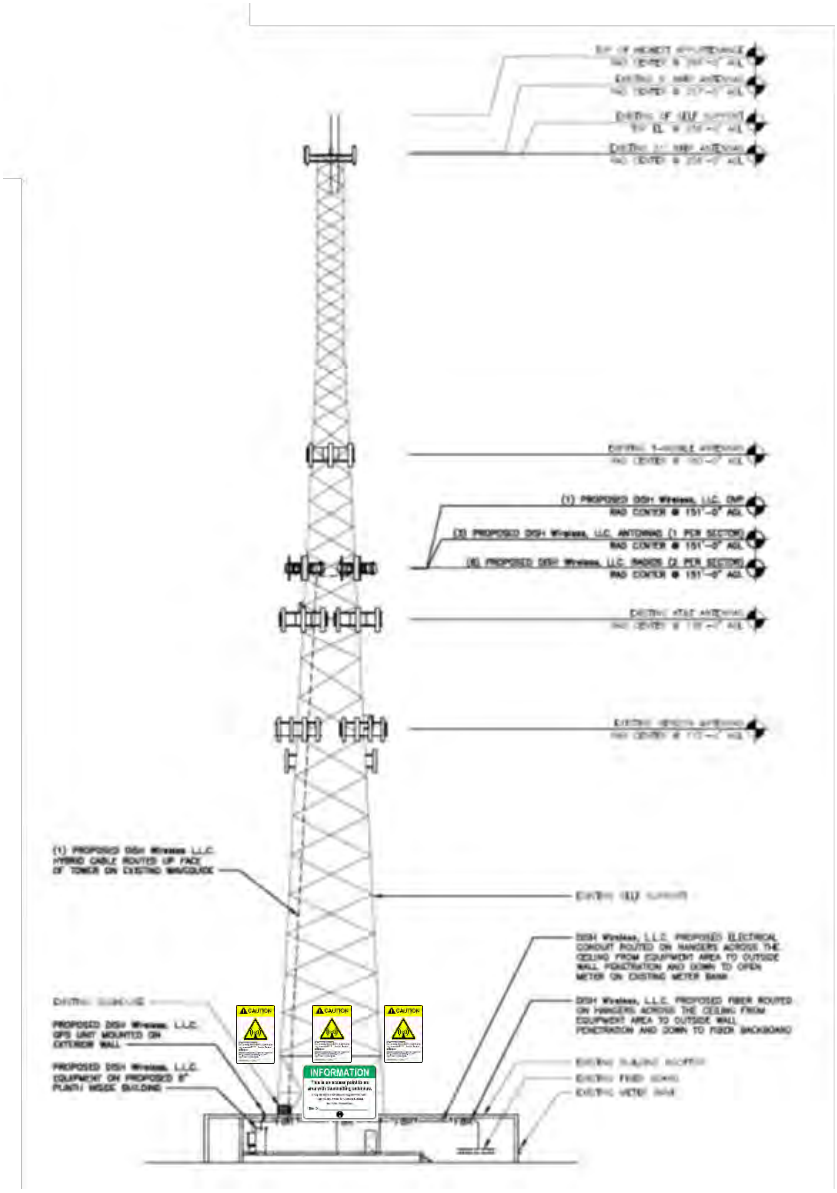
FCC Report and Order, ET Docket 93-62, *In the Matter of Guidelines for Evaluating the Environmental Effects of Radiofrequency Radiation*, released August 1, 1996.

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



NOC Information Sign		Caution Sign	
Guidelines Sign		Warning Sign	
Notice Sign			

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 Connecticut, New York, New Jersey, 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

ORIGIN ID:HTOA (732) 677-8881
MICHAEL JONES
140 BEACH 137TH STREET

ROCKAWAY PARK, NY 11694
UNITED STATES US

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CAD: 254794505/INET4490

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CITY OF BRIDGEPORT ZONING DEPARTMEN
45 LYON TERRACE,
ROOM 210
BRIDGEPORT CT 06604
(203) 576-7217 REF: NJJER020444B
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PO: DEPT:

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ORIGIN ID:HTOA (732) 677-8881
MICHAEL JONES
140 BEACH 137TH STREET
ROCKAWAY PARK, NY 11694
UNITED STATES US

SHIP DATE: 27JUN22
ACTWGT: 2.00 LB
CAD: 254794505/INET4490

BILL SENDER

TO ARBEN KICA
BRIDGEPORT BUILDING DEPARTMENT
45 LYON TERRACE,
ROOM 222
BRIDGEPORT CT 06604
(203) 576-7227 REF: NJJER020444B
INV
PO. DEPT.

581J2/274F/FE4A

FedEx Express

E

J222022041201uv

TRK# 0201 7772 2994 7810

WED - 29 JUN 4:30P
** 2DAY **

K7 BCCA

06604
CT-US BDL

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MICHAEL JONES
140 BEACH 137TH STREET
ROCKAWAY PARK, NY 11694
UNITED STATES US

SHIP DATE: 27JUN22
ACTWGT: 2.00 LB
CAD: 254794505/INET4490

BILL SENDER

TO ROBERT KNAPP
RADIO COMMUNICATION CORP
24 ROCKDALE ROAD

WEST HAVEN CT 06516
(203) 640-2050 REF: NJJER02044B
INV
PO: DEPT:

581J2/274F/FE4A

FedEx Express

J222022041201uv

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** 2DAY **

TRK# 0201 7772 2997 1150

06516
CT-US BDL

K7 EFBA

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