STATE OF CONNECTICUT
CONNECTICUT SITING COUNCIL
Ten Franklin Square, New Britain, CT 06051
Phone: (860) 827-2935 Fax: (860) 827-2950
E-Mail: siting.council@ct.gov
Web Site: portal.ct.gov/csc

VIA ELECTRONIC MAIL

September 28, 2021

Denise Sabo
Northeast Site Solutions
54 Main Street, Unit 3
Sturbridge, MA 01566-1359
denise@northeastsitesolutions.com

RE: **TS-DISH-027-210917 -** Dish Wireless LLC request for an order to approve tower sharing at an existing telecommunications facility located at 48 Cow Hill Road, Clinton, Connecticut.

Dear Ms. Sabo:

The Connecticut Siting Council (Council) is in receipt of your correspondence of September 28, 2021 submitted in response to the Council's September 27, 2021 notification of an incomplete request for tower sharing with regard to the above-referenced matter.

The submission renders the request for tower sharing complete and the Council will process the request in accordance with the Federal Communications Commission 60-day timeframe.

Thank you for your attention and cooperation.

Sincerely,

Melanie Bachman
Executive Director

MB/IN/laf

From: Victoria Masse <victoria@northeastsitesolutions.com>
Sent: Tuesday, September 28, 2021 9:38 AM
To: Robidoux, Evan <Evan.Robidoux@ct.gov>; CSC-DL Siting Council <Siting.Council@ct.gov>
Cc: Denise Sabo <denise@northeastsitesolutions.com>; Deborah Chase <deborah@northeastsitesolutions.com>
Subject: Re: FW: Council Incomplete Letter for TS-DISH-027-210917 (Cow Hill Road, Clinton)

Good Morning Council,
Please see attached revised Tower Share filing for the site referenced below, we have included the Radio Frequency emissions analysis to Exhibit F.

TS-DISH-027-210917: Cow Hill Road, Clinton

Thank you

On Mon, Sep 27, 2021 at 9:16 PM Denise Sabo <denise@northeastsitesolutions.com> wrote:

Victoria – Can we get this resubmitted with the EME. Looks like it was left out of the package we sent.

NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development

Northeast Site Solutions
Denise Sabo
4 Angela's Way, Burlington CT 06013
203-435-3640
denise@northeastsitesolutions.com

September 15, 2021

Members of the Siting Council
Connecticut Siting Council
Ten Franklin Square
New Britain, CT 06051

RE: Tower Share Application
48 Cow Hill Road, Clinton CT 06413
Latitude: 41.288944
Longitude: -72.538472
Site# 806363_Crown_Dish

Dear Ms. Bachman:

This letter and attachments are submitted on behalf of Dish Wireless LLC. Dish Wireless LLC plans to install antennas and related equipment to the tower site located at 48 Cow Hill Road in Clinton, Connecticut.

Dish Wireless LLC proposes to install three (3) 600/1900 5G MHz antenna and six (6) RRUs, at the 118-foot level of the existing 212-foot monopole tower, one (1) Fiber cables will also be installed. Dish Wireless LLC equipment cabinets will be placed within 7x5 lease area. Included are plans by Infinigy, dated September 3, 2021 Exhibit C. Also included is a structural analysis prepared by Crown Castle, dated August 21, 2021, confirming that the existing tower is structurally capable of supporting the proposed equipment. Attached as Exhibit D. This facility was approved by the CT Siting Council, Docket No. 148 on May 5, 1992. Please see attached Exhibit A.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies 16-50aa, of Dish Wireless LLC intent to share a telecommunications facility pursuant to R.C.S.A. 16-50j-88. In accordance with R.C.S.A., a copy of this letter is being sent to Christine Goupil, First Selectwoman for the Town of Clinton, Eric Knapp, Zoning Enforcement Officer, as well as the tower owner (Crown Castle) and property owner (Raymond Hesser c/o Crown Castle)

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 212-feet; Dish Wireless LLC proposed antennas will be located at a center line height of 118-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.

NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development

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 14.92% as evidenced by Exhibit F.

Connecticut General Statutes 16-50aa indicates that the Council must approve the shared use of a telecommunications facility provided it finds the shared use is technically, legally, environmentally, and economically feasible and meets public safety concerns. As demonstrated in this letter, Dish Wireless LLC respectfully indicates that the shared use of this facility satisfies these criteria.

A. Technical Feasibility. The existing monopole has been deemed structurally capable of supporting Dish Wireless LLC proposed loading. The structural analysis is included as Exhibit D.

B. Legal Feasibility. As referenced above, C.G.S. 16-50aa has been authorized to issue orders approving the shared use of an existing tower such as this support tower in Clinton. Under the authority granted to the Council, an order of the Council approving the requested shared use would permit Dish Wireless LLC to obtain a building permit for the proposed installation. Further, a Letter of Authorization is included as Exhibit G, authorizing Dish Wireless LLC to file this application for shared use.

C. Environmental Feasibility. The proposed shared use of this facility would have a minimal environmental impact. The installation of Dish Wireless LLC equipment at the 118-foot level of the existing 212-foot tower would have an insignificant visual impact on the area around the tower. Dish Wireless LLC ground equipment would be installed within the existing facility compound. Dish Wireless LLC shared use would therefore not cause any significant alteration in the physical or environmental characteristics of the existing site. Additionally, as evidenced by Exhibit F, the proposed antennas would not increase radio frequency emissions to a level at or above the Federal Communications Commission safety standard.

D. Economic Feasibility. Dish Wireless LLC will be entering into an agreement with the owner of this facility to mutually agreeable terms. As previously mentioned, the Letter of Authorization has been provided by the owner to assist Dish Wireless LLC with this tower sharing application.

E. Public Safety Concerns. As discussed above, the tower is structurally capable of supporting Dish Wireless LLC proposed loading. Dish Wireless LLC is not aware of any public safety concerns relative to the proposed sharing of the existing guyed tower. Dish Wireless LLC intentions of providing new and improved wireless service through the shared use of this facility is expected to enhance the safety and welfare of local residents and individuals traveling through Clinton.

Sincerely,

Denise Sabo

Denise Sabo
Mobile: 203-435-3640
Fax: 413-521-0558
Office: 4 Angela's Way, Burlington CT 06013
Email: denise@northeastsitesolutions.com

NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development

Attachments
cc Christine Goupil, First Selectwoman
Town of Clinton
54 E Main Street Clinton, CT 06413

Eric Knapp, Zoning Enforcement Officer
Town of Clinton
54 E Main Street Clinton, CT 06413

Raymond Hesser
c/o Crown Castle
4017 Washington Rd, McMurry, PA 15317

Crown Castle - Tower Owner

NORTHEAST SITE SOLUTIONS, LLC
1053 FARMINGTON AVE STE G
FARMINGTON, CT 06032

WEBSTER BANK
51-7010/2111

4738

08/20/2021

PAY TO THE ORDER OF Connecticut Siting Council $ *625.00

EXACTLY SIX HUNDRED TWENTY-FIVE DOLLARS DOLLARS

Connecticut Siting Council
10 Franklin Square
New Britain CT 06051

MEMO

AUTHORIZED SIGNATURE

⑈004738⑈ ⑆211170101⑆10 0010608887⑈

Photo Safe Deposit®

Details on Back.

NORTHEAST SITE SOLUTIONS, LLC

4738

Check#: 4738 **Date: 08/20/2021** **Vendor#: 10023** **Connecticut Siting Council** **Check Total: *625.00**

Invoice#	*Invoice Date*	*Job/Description*	*Balance*	*Retain*	*Discount*	*This Check*
806363 CSC	08/20/2021	117 Crown Direct Z/P	625.00			625.00

NORTHEAST SITE SOLUTIONS, LLC

4738

Check#: 4738 **Date: 08/20/2021** **Vendor#: 10023** **Connecticut Siting Council** **Check Total: *625.00**

Invoice#	*Invoice Date*	*Job/Description*	*Balance*	*Retain*	*Discount*	*This Check*
806363 CSC	08/20/2021	117 Crown Direct Z/P	625.00			625.00

Exhibit A

Original Facility Approval

DOCKET NO. 148 - An application of Metro Mobile CTS of Hartford, Inc., for a Certificate of Environmental Compatibility and Public Need for the construction, maintenance, and operation of a cellular telephone tower and associated equipment in the Town of Clinton, Connecticut. The proposed site is located on an interior portion of a 59 acre parcel off Glenwood Road approximately 3,500 feet north of I-95. The alternate site is located on a six acre parcel off Cow Hill Road, approximately 300 feet north of I-95.

Connecticut

Siting

Council

May 5, 1992

DECISION AND ORDER

Pursuant to the foregoing Findings of Fact and Opinion, the Connecticut Siting Council (Council) finds that the effects associated with the construction, operation, and maintenance of a cellular telecommunications tower and equipment building at the proposed Clinton, Connecticut, alternate site including effects on the natural environment; ecological integrity and balance; public health and safety; scenic, historic, and recreational values; forests and parks; air and water purity; and fish and wildlife are not disproportionate either alone or cumulatively with other effects when compared to need, are not in conflict with the policies of the State concerning such effects, and are not sufficient reason to deny the application and therefore directs that a Certificate of Environmental Compatibility and Public Need as provided by section 16-50k of the Connecticut General Statutes (CGS), be issued to Metro Mobile CTS of Hartford, Inc., (Metro Mobile), for the construction, operation, and maintenance of a cellular telecommunications tower, associated equipment, and equipment building at the proposed alternate site off Cow Hill Road in Clinton, Connecticut.

The facility shall be constructed, operated, and maintained substantially as specified in the Council's record in this matter, and subject to the following conditions:

1. The self-supporting lattice tower shall be no taller than necessary to provide the proposed communications service and in no event shall the tower exceed a total height of 223 feet above ground level, with antennas and appurtenances.

2. Prior to the commencement of construction, the Certificate Holder shall prepare a Development and Management (D&M) plan for this site in compliance with sections 16-50j-75 through 16-50j-77 of the Regulations of State Agencies. The D&M plan shall

include detailed plans of the tower, tower foundation, tower anti-climb sections, tower marking and lighting, and the locations of the equipment buildings, access road, and security fence, and all cellular antennas on the tower. In addition, the D&M plan shall include detailed plans for clearing; a site plan orienting the facility, utilities, and access road avoiding inland wetlands; and detailed plans for erosion and sedimentation control.

3. If and when tower marking and lighting become unnecessary pursuant to a determination by the Federal Aviation Administration, within six months of such determination, such tower marking and lighting shall be removed at the expense of the Certificate Holder.

4. The Certificate Holder shall comply with any existing and future radio frequency (RF) standard promulgated by State or federal regulatory agencies. Upon the establishment of any new governmental RF standards, the facility granted herein shall be brought into compliance with such standards.

5. The Certificate Holder shall provide the Council a recalculated report of electromagnetic radio frequency power density if and when circumstances in operation cause a change in power density above the levels originally calculated and provided in the application.

6. The Certificate Holder shall permit public or private entities, including Springwich Cellular Limited Partnership (Springwich) which by contract was allowed to share space on the tower, and the Town of Clinton, to share space on the proposed tower for fair consideration, or shall provide any requesting entity with specific legal, technical, environmental, or economic reasons precluding such tower sharing. Provisions shall also be made for the location of a separate Springwich equipment building.

7. If the facility does not initially provide, or permanently ceases to provide cellular service following completion of construction, this Decision and Order shall be void, and the tower and all associated equipment shall be dismantled and removed or reapplication for any new use shall be made to the Council before any such new use is made.

8. Unless otherwise approved by the Council, this Decision and Order shall be void if all construction authorized herein is not completed within three

years of the effective date of this Decision and Order or within three years after all appeals to this Decision and Order have been resolved.

Pursuant to CGS Section 16-50p, we hereby direct that a copy of the Findings of Fact, Opinion, and Decision and Order be served on each person listed below, and notice of issuance shall be published in the New Haven Register, Clinton Recorder, Hartford Courant, and the Middletown Press.

By this Decision and Order, the Council disposes of the legal rights, duties and privileges of each party named or admitted to the proceeding in accordance with Section 16-50j-17 of the Regulations of State Agencies.

The parties and intervenor to this proceeding are:

PARTY	ITS REPRESENTATIVE
Metro Mobile CTS of Hartford 20 Alexander Drive Wallingford, CT 06492 Attn: David S. Malko Mgr. Engr, & Reg. Serv.	Earl W. Phillips, Jr., Esq. Robinson & Cole One Commercial Plaza Hartford, CT 06103-3597 (203) 275-8200
Town of Clinton	Lynda Batter Munro Gould, Larson, Bennet and Munro 35 Plains Road P.O. Box 959 Essex, CT 06426
INTERVENOR	
Springwich Cellular Limited Partnership	Peter J. Tyrrell Senior Attorney Springwich Cellular Limited Partnership 227 Church St., Rm. 1021 New Haven, CT 06506 (203) 771-7381

CERTIFICATION

The undersigned members of the Connecticut Siting Council (Council) hereby certify that they have heard this case, or read the record thereof, in DOCKET NO. 148 - An application of Metro Mobile CTS of Hartford, Inc., for a Certificate of Environmental Compatibility and Public Need for the construction, maintenance, and operation of a cellular telephone tower and associated equipment in the Town of Clinton, Connecticut, and voted as follows to approve the proposed alternate tower site off of Cow Hill Road, approximately 300 feet north of I-95:

Council Members	Vote Cast
Mortimer A. Gelston Chairman	Yes
Commissioner Clifton A. Leonhardt Designee: Commissioner Richard G. Patterson	Yes
Commissioner Timothy R.E. Keeney Designee: Brian Emerick	Absent
Harry E. Covey	Yes
Daniel P. Lynch, Jr.	Yes
Gloria Dibble Pond	Absent
Paulann H. Sheets	Absent
William H. Smith	Yes
Colin C. Tait	Absent

Dated at New Britain, Connecticut, May 5, 1992.

6060E-2

STATE OF CONNECTICUT

CONNECTICUT SITING COUNCIL
136 Main Street, Suite 401
New Britain, Connecticut 06051
Phone: 827-7682

CERTIFICATE

OF

ENVIRONMENTAL COMPATIBILITY AND PUBLIC NEED

DOCKET NO. 148

Pursuant to section 16-50k of the General Statutes of Connecticut, as amended, the Connecticut Siting Council hereby issues a Certificate of Environmental Compatibility and Public Need to Metro Mobile CTS of Hartford, Inc., for the construction, maintenance, and operation of a cellular telephone tower and associated equipment on a six acre parcel off Cow Hill Road approximately 300 feet north of I-95, in the Town of Clinton, Connecticut. This Certificate is issued in accordance with and subject to the terms and conditions set forth in the Decision and Order of the Council on May 5, 1992.

By order of the Council,

Mortimer A. Gelston, Chairman

May 5, 1992

6060E-5

Exhibit B

Property Card

49B COW HILL RD

Location	49B COW HILL RD	**Mblu**	32/ 6/ 48/ H026570/A
Acct#	H0265701	**Owner**	HESER RAYMOND
Assessment	$561,600	**Appraisal**	$802,300
PID	106785	**Building Count**	1

Current Value

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2016	$160,800	$641,500	$802,300
Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2016	$112,500	$449,100	$561,600

Owner of Record

Owner	HESER RAYMOND	**Sale Price**	$0
Co-Owner	CROWN CASTLE ATLANTIC CO LLC	**Certificate**	
Address	4017 WASHINGTON RD PMB353 MCMURRAY, PA 15317	**Book & Page**	088/ 061
		Sale Date	

Ownership History

Ownership History				
Owner	**Sale Price**	**Certificate**	**Book & Page**	**Sale Date**
HESER RAYMOND	$0		088/ 061	
HESER RAYMOND				

Building Information

Building 1 : Section 1

Year Built:	1993
Living Area:	1104
Replacement Cost:	$176,872
Building Percent Good:	87
Replacement Cost Less Depreciation:	$153,900

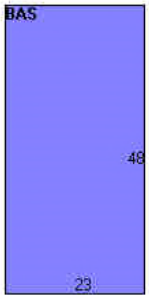
Building Photo

Building Attributes	
Field	**Description**
STYLE	Telephone Bldg
MODEL	Ind/Comm

Grade	Average
Stories:	1
Occupancy	1
Exterior Wall 1	Brick/Masonry
Exterior Wall 2	
Roof Structure	Flat
Roof Cover	Tar & Gravel
Interior Wall 1	Minim/Masonry
Interior Wall 2	
Interior Floor 1	Concr-Finished
Interior Floor 2	
Heating Fuel	Gas
Heating Type	Hot Air-no Duc
AC Type	Central
Bldg Use	TEL X STA MDL-96
Total Rooms	
Total Bedrms	00
Total Baths	0
1st Floor Use:	4300
Heat/AC	NONE
Frame Type	STEEL
Baths/Plumbing	NONE
Ceiling/Wall	NONE
Rooms/Prtns	AVERAGE
Wall Height	12
% Comn Wall	

(http://images.vgsi.com/photos/ClintonCTPhotos//\00\00\07/11.jpg)

Building Layout



Building Sub-Areas (sq ft)			Legend
Code	**Description**	**Gross Area**	**Living Area**
BAS	First Floor	1104	1104
		1104	1104

Extra Features

Extra Features	Legend
No Data for Extra Features	

Land

Land Use

Use Code	4300
Description	TEL X STA MDL-96
Zone	I-P
Neighborhood	1100
Alt Land Appr	No
Category	

Land Line Valuation

Size (Acres)	0.18
Frontage	
Depth	
Assessed Value	$449,100
Appraised Value	$641,500

Outbuildings

Outbuildings						Legend
Code	**Description**	**Sub Code**	**Sub Description**	**Size**	**Value**	**Bldg #**
FN4	FENCE-8' CHAIN			360 L.F.	$900	1
PAV2	PAVING-CONC			1296 S.F.	$2,900	1
SHD5	COMM WOOD			200 S.F.	$3,100	1

Valuation History

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2010	$131,500	$641,500	$773,000
2009	$203,500	$717,300	$920,800
2005	$203,500	$717,300	$920,800

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2010	$92,200	$449,100	$541,300
2009	$142,600	$502,100	$644,700
2005	$142,600	$502,100	$644,700

bing maps

49 Cow Hill Rd, Clinton, CT 06413

Location: 41.28688, -72.53608

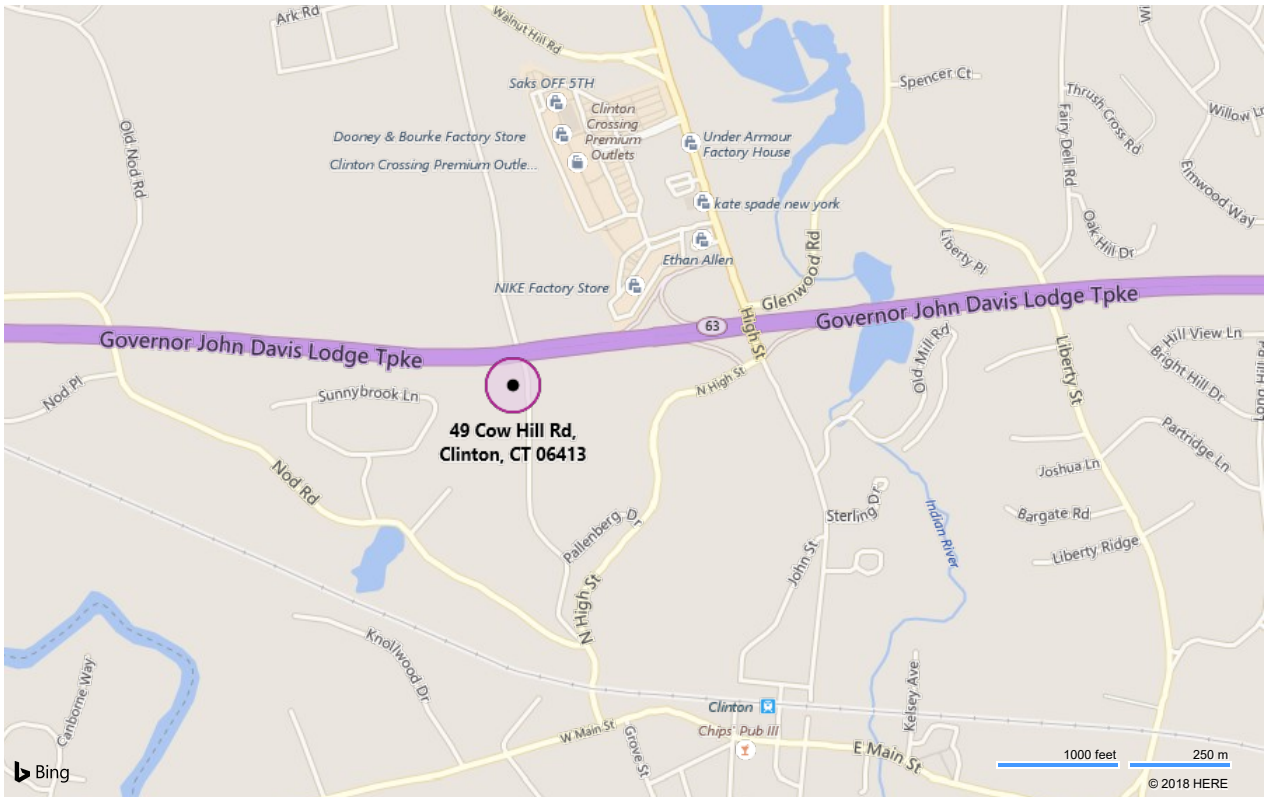


Exhibit C

Construction Drawings

DISH WIRELESS, LLC. SITE ID:

BOBDL00040A

DISH WIRELESS, LLC. SITE ADDRESS:

48 COW HILL ROAD
CLINTON, CT 06413

CONNECTICUT CODE 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 MOUNTS (1 PER SECTOR)
- INSTALL PROPOSED JUMPERS
- INSTALL (6) PROPOSED RRUs (2 PER SECTOR)
- INSTALL (1) PROPOSED OVER VOLTAGE PROTECTION DEVICE (OVP)
- INSTALL (1) PROPOSED HYBRID CABLE

GROUND SCOPE OF WORK:
- INSTALL (1) PROPOSED METAL PLATFORM
- INSTALL (1) PROPOSED ICE BRIDGE
- INSTALL (1) PROPOSED PPC CABINET
- INSTALL (1) PROPOSED EQUIPMENT CABINET
- INSTALL (1) PROPOSED POWER CONDUIT
- INSTALL (1) PROPOSED TELCO CONDUIT
- INSTALL (1) PROPOSED TELCO-FIBER BOX
- INSTALL (1) PROPOSED GPS UNIT
- EXISTING SAFETY SWITCH TO BE UTILIZED
- INSTALL (1) PROPOSED CIENA BOX (IF REQUIRED)
- EXISTING METER SOCKET ON EXISTING H-FRAME TO BE UTILIZED

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:	HESER FAMILY REVOCABLE TST DTD 9-30-2020
ADDRESS:	116 KILLINGWORTH TPKE CLINTON, CT 06413-1353
TOWER TYPE:	SELF SUPPORT TOWER
TOWER CO SITE ID:	806363
TOWER APP NUMBER:	553394
COUNTY:	MIDDLESEX
LATITUDE (NAD 83):	41° 17' 20.20" N 41.288944 N
LONGITUDE (NAD 83):	72° 32' 18.50" W 72.538472 W
ZONING JURISDICTION:	CONNECTICUT SITING COUNCIL
ZONING DISTRICT:	R-30
PARCEL NUMBER:	CLN-000032-000006-000048-B000000
OCCUPANCY GROUP:	U
CONSTRUCTION TYPE:	II-B
POWER COMPANY:	NORTHEAST UTILITIES
TELEPHONE COMPANY:	CROWN CASTLE

PROJECT DIRECTORY

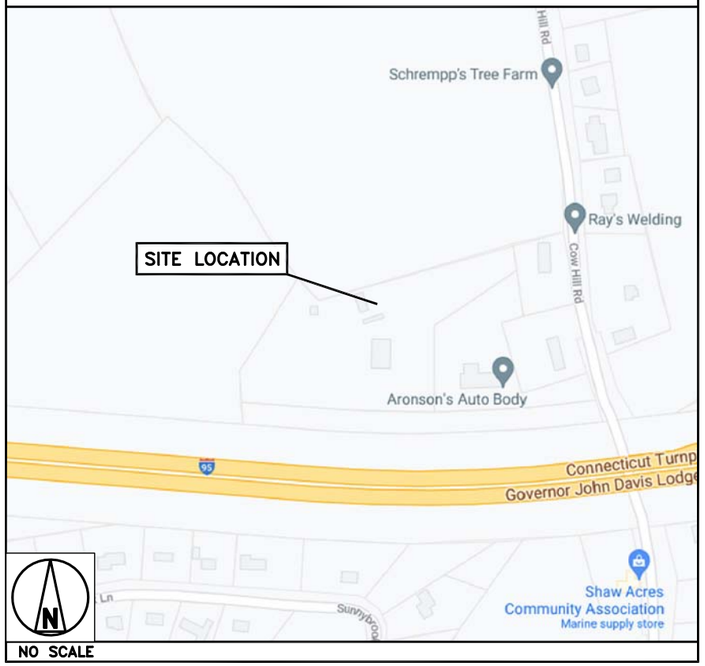
APPLICANT:	DISH WIRELESS, LLC. 5701 SOUTH SANTA FE DRIVE LITTLETON, CO 80120
TOWER OWNER:	CROWN CASTLE 2000 CORPORATE DRIVE CANONSBURG, PA 15317 (877) 486-9377
SITE DESIGNER:	INFINIGY 2500 W. HIGGINS RD. STE. 500 HOFFMAN ESTATES, IL 60169 (847) 648-4068
SITE ACQUISITION:	NICHOLAS CURRY TBD
CONSTRUCTION MANAGER:	JAVIER SOTO TBD
RF ENGINEER:	BOSSENER CHARLES TBD

DIRECTIONS

DIRECTIONS FROM TWEED NEW HAVEN AIRPORT:

DEPART AND HEAD (NORTHEAST),TURN LEFT, AVIS RENT A CAR ON THE CORNER, TURN RIGHT TOWARD BURR ST, BUDGET CAR RENTAL ON THE CORNER, TURN RIGHT ONTO BURR ST, KEEP STRAIGHT TO GET ONTO DODGE AVE, TURN LEFT ONTO THOMPSON AVE, KEEP STRAIGHT TO GET ONTO CT-100 / HIGH ST, TAKE THE RAMP ON THE RIGHT FOR I-95 NORTH AND HEAD TOWARD NEW LONDON, AT EXIT 63, HEAD RIGHT ON THE RAMP TOWARD CLINTON / KILLINGWORTH, TURN RIGHT ONTO N HIGH ST, TURN RIGHT ONTO PALLENBERG DR, TURN RIGHT ONTO COW HILL RD, TURN LEFT, ARRIVE AT, 48 COW HILL ROAD CLINTON, CT 06413

VICINITY MAP



NO SCALE

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

CROWN CASTLE
2000 CORPORATE DRIVE
CANONSBURG, PA 15317

INFINIGY
FROM ZERO TO INFINIGY
the solutions are endless
2500 W. HIGGINS RD. SUITE 500 | HOFFMAN ESTATES, IL 60169
PHONE: 847-648-4068 | FAX: 518-690-0793
WWW.INFINIGY.COM

STATE OF CONNECTICUT
SHUHEI SAKANOUE
34916
LICENSED PROFESSIONAL ENGINEER
9/14/2021

DRAWN BY:	CHECKED BY:	APPROVED BY:
RCD	SS	CJW

RFDS REV #: N/A

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
A	05/10/2021	ISSUED FOR REVIEW
0	06/12/2021	ISSUED FOR CONSTRUCTION
1	09/03/2021	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER
2039-Z5555C

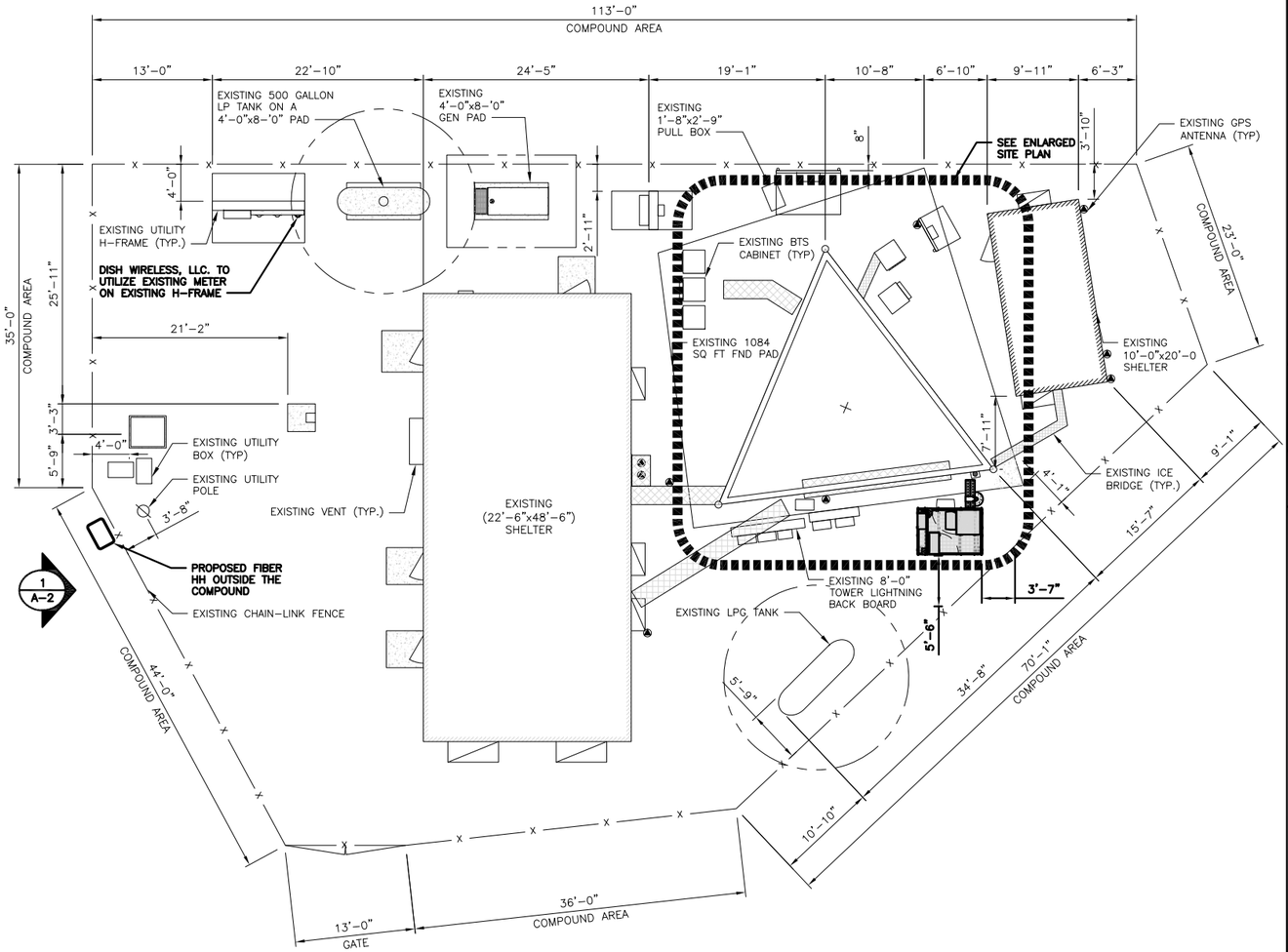
DISH WIRELESS, LLC.
PROJECT INFORMATION
BOBDL00040A
HRT 105 943201
48 COW HILL ROAD
CLINTON, CT 06413

SHEET TITLE
TITLE SHEET

SHEET NUMBER
T-1

NOTES

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



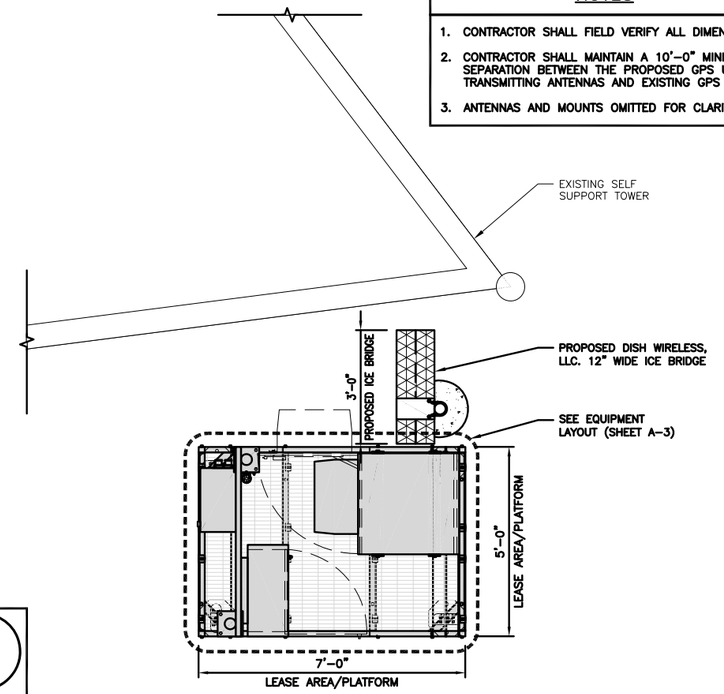
COMPOUND PLAN

8' 4' 0 8' 16'
1/8"=1'-0"

1

NOTES

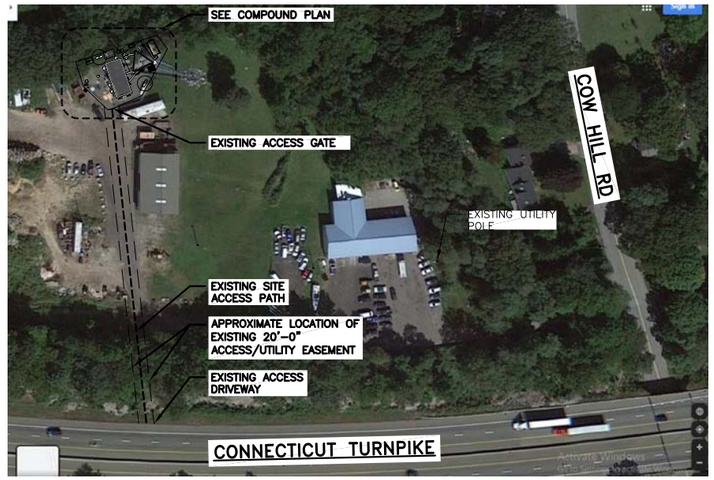
1. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS.
2. CONTRACTOR SHALL MAINTAIN A 10'-0" MINIMUM SEPARATION BETWEEN THE PROPOSED GPS UNIT, TRANSMITTING ANTENNAS AND EXISTING GPS UNITS.
3. ANTENNAS AND MOUNTS OMITTED FOR CLARITY.



ENLARGED SITE PLAN

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

2



SITE PLAN

100' 50' 0 100' 200'
1"=100'

3

dish wireless.
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2000 CORPORATE DRIVE
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STATE OF CONNECTICUT
SHUHEI SAKANOUE
34916
LICENSED PROFESSIONAL ENGINEER
9/14/2021

DRAWN BY:	CHECKED BY:	APPROVED BY:
RCD	SS	CJW

RFDS REV #: N/A

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
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1	09/03/2021	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER
2039-Z5555C

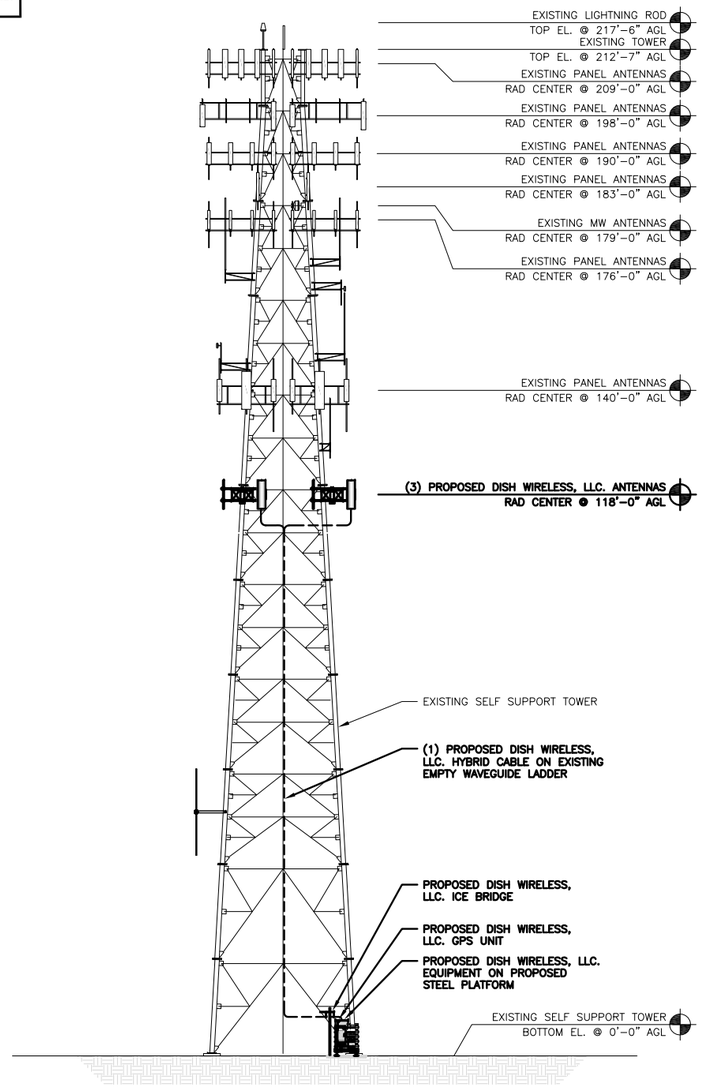
DISH WIRELESS, LLC.
PROJECT INFORMATION
BOBDL00040A
HRT 105 943201
48 COW HILL ROAD
CLINTON, CT 06413

SHEET TITLE
OVERALL AND ENLARGED SITE PLAN

SHEET NUMBER
A-1

NOTES

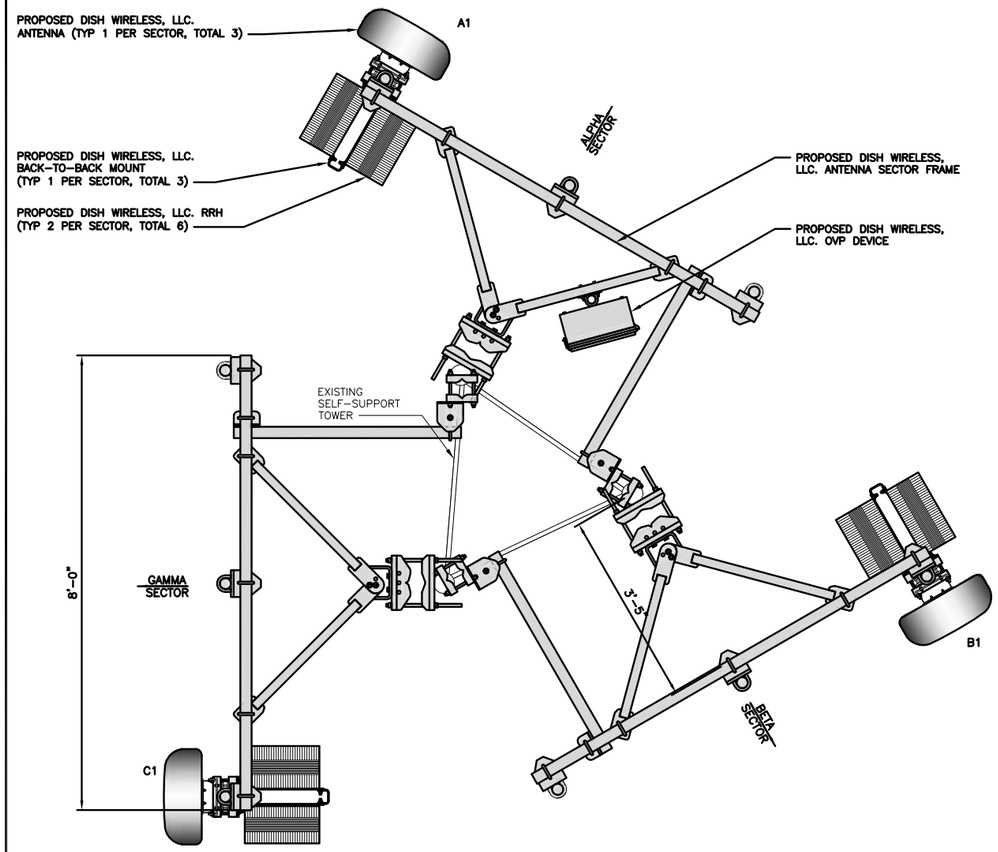
1. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS.
2. ANTENNA AND MW DISH SPECIFICATIONS REFER TO ANTENNA SCHEDULE AND TO FINAL CONSTRUCTION RFDS FOR ALL RF DETAILS
3. EXISTING EQUIPMENT AND FENCE OMITTED FOR CLARITY.
4. INFINIGY HAS NOT EVALUATED THE TOWER OR MOUNT STRUCTURE AND ASSUMES NO RESPONSIBILITY FOR THEIR STRUCTURAL INTEGRITY REGARDING PROPOSED LOADINGS. FINAL INSTALLATION SHALL COMPLY WITH RESULTS OF PASSING STRUCTURAL ANALYSES PERFORMED BY OTHERS.



PROPOSED SOUTHWEST ELEVATION

16' 12' 8' 4' 0 16' 32'
1/16"=1'-0"

1



ANTENNA LAYOUT

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

2

SECTOR	POSITION	ANTENNA						TRANSMISSION CABLE
		EXISTING OR PROPOSED	MANUFACTURER – MODEL NUMBER	TECHNOLOGY	SIZE (HxW)	AZMUITH	RAD CENTER	FEED LINE TYPE AND LENGTH
ALPHA	A1	PROPOSED	JMA WIRELESS – MX08FRO665-21	5G	72.0" x 20.0"	30°	118'-0"	(1) HIGH-CAPACITY HYBRID CABLE (168' LONG)
BETA	B1	PROPOSED	JMA WIRELESS – MX08FRO665-21	5G	72.0" x 20.0"	150°	118'-0"	
GAMMA	C1	PROPOSED	JMA WIRELESS – MX08FRO665-21	5G	72.0" x 20.0"	270°	118'-0"	

NOTES

1. CONTRACTOR TO REFER TO FINAL CONSTRUCTION RFDS FOR ALL RF DETAILS.
2. ANTENNA OR 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.

SECTOR	POSITION	RRH	
		MANUFACTURER – MODEL NUMBER	TECHNOLOGY
ALPHA	A1	FUJITSU – TA08025-B604	5G
	A1	FUJITSU – TA08025-B605	5G
BETA	B1	FUJITSU – TA08025-B604	5G
	B1	FUJITSU – TA08025-B605	5G
GAMMA	C1	FUJITSU – TA08025-B604	5G
	C1	FUJITSU – TA08025-B605	5G

NOTES

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

ANTENNA SCHEDULE

NO SCALE

3

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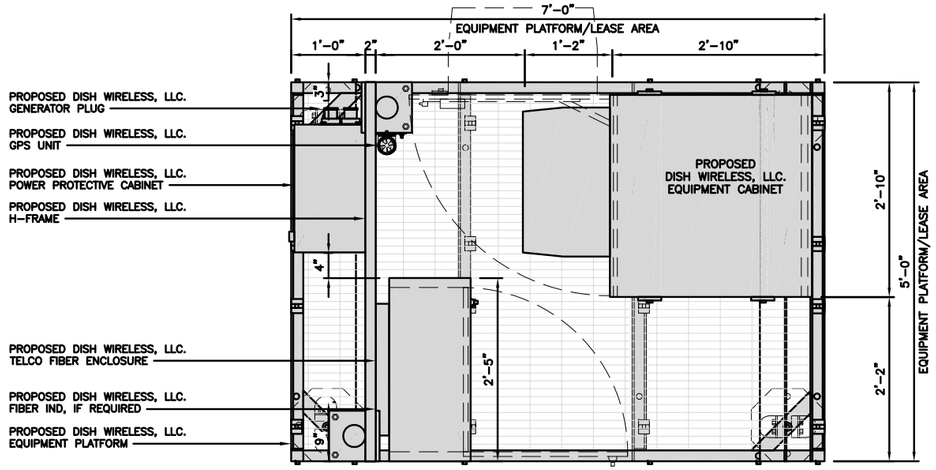
DISH WIRELESS, LLC.
PROJECT INFORMATION
BOBDL00040A
HRT 105 943201
48 COW HILL ROAD
CLINTON, CT 06413

SHEET TITLE
ELEVATION, ANTENNA LAYOUT AND SCHEDULE

SHEET NUMBER
A-2



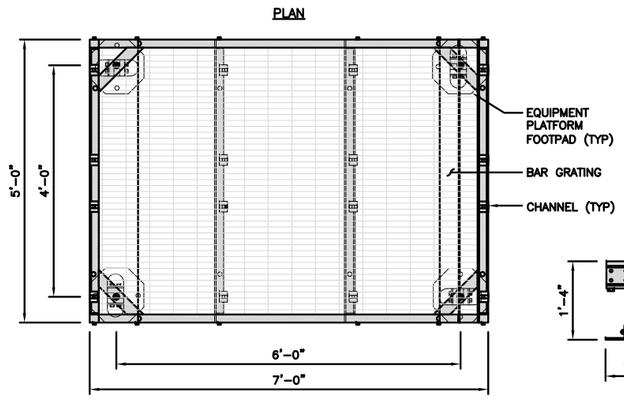
PLATFORM EQUIPMENT PLAN

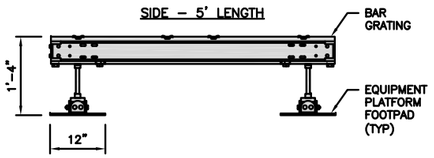
12" 9" 6" 3" 0 1' 2'
1"=1'-0"

1

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

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



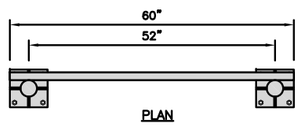


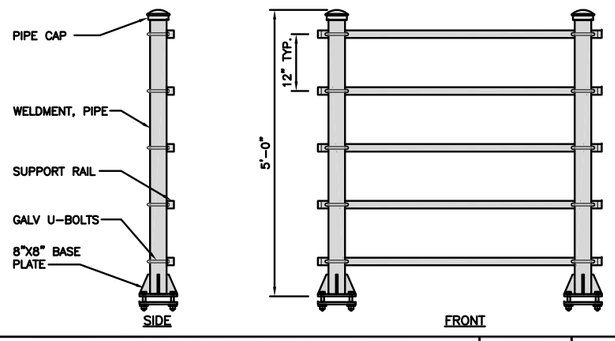
PLATFORM DETAIL

NO SCALE

2

KENWOOD T1701KT5-5S H-FRAME	
UNISTRUT/SUPPORT RAIL	5
WEIGHT/ VOLUME	173.6 LBS





H-FRAME DETAIL

NO SCALE

3

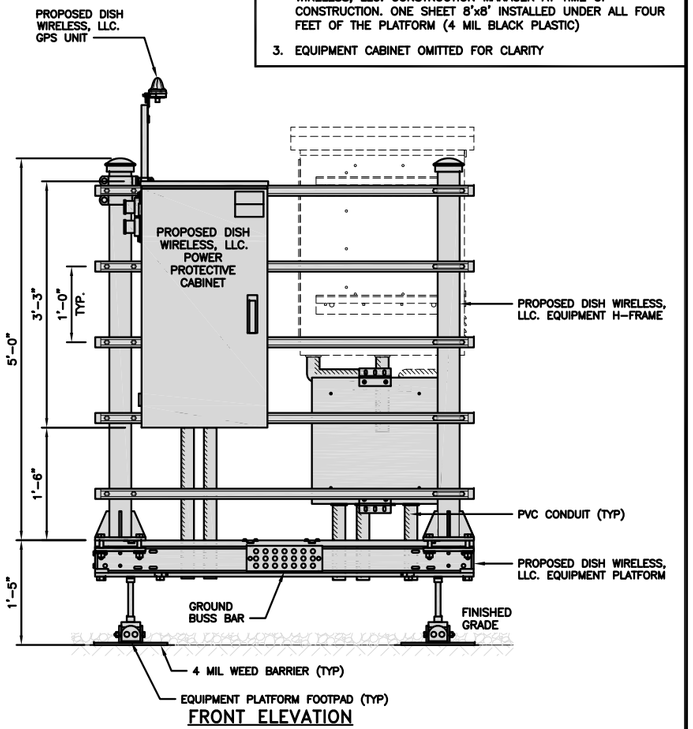
NOT USED

NO SCALE

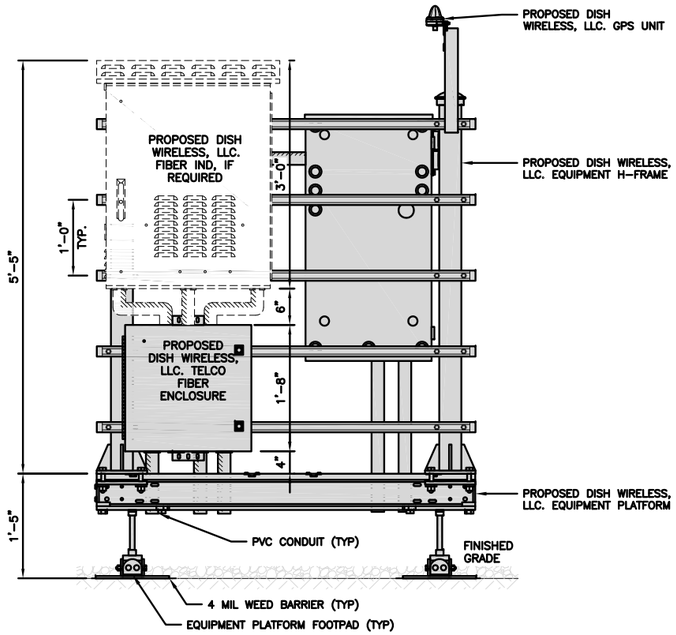
4

NOTES

1. CONTRACTOR TO BURY PLATFORM FEET WITH A MINIMUM OF 2" OF FILL PER EXISTING SITE SURFACE
2. WEED BARRIER FABRIC TO BE ADDED AT DISCRETION OF DISH WIRELESS, LLC. 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

H-FRAME EQUIPMENT ELEVATION

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

5

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SHUHEI SAKANOUE
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DRAWN BY:	CHECKED BY:	APPROVED BY:
RCD	SS	CJW

RFDS REV #: N/A

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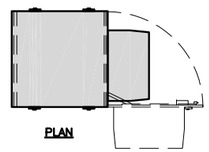
2039-Z5555C

DISH WIRELESS, LLC.
PROJECT INFORMATION
BOBDL00040A
HRT 105 943201
48 COW HILL ROAD
CLINTON, CT 06413

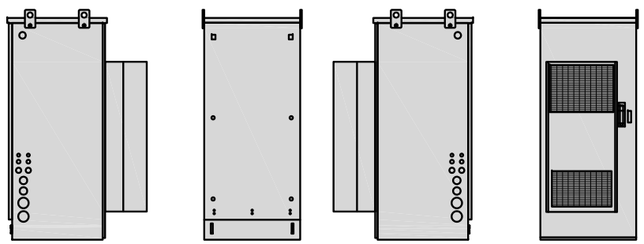
SHEET TITLE
EQUIPMENT PLATFORM AND H-FRAME DETAILS

SHEET NUMBER
A-3

CHARLES INDUSTRY HEX CUBE–PM639155N4	
DIMENSIONS (HxWxD):	74"x32"x32"
POWER PLANT:	–48VDC ABB/600W
TOTAL WEIGHT (EMPTY)	408 LBS



PLAN

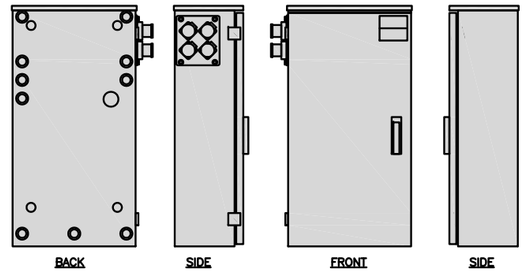


SIDE BACK SIDE FRONT

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

TOP



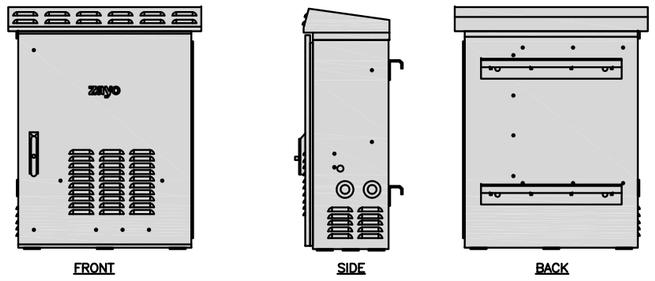
BACK SIDE FRONT SIDE

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

NOT USED — NO SCALE — 3

ZAYO 5RU CABINET ("LIT" SITES)	
DIMENSIONS (HxWxD)	36.115"x29"x12.9"
WEIGHT	85 LBS
POWER INPUT	20A, –48VDC

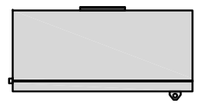
PLAN



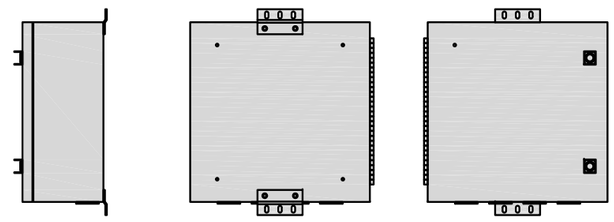
FRONT SIDE BACK

ZAYO 5RU CABINET ("LIT" SITES) — NO SCALE — 5

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



FRONT



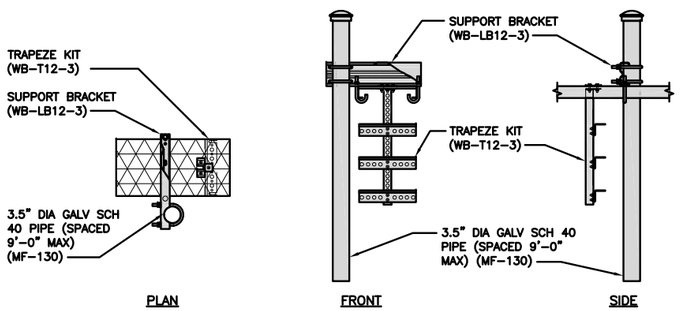
SIDE BACK FRONT

FIBER TELCO ENCLOSURE DETAIL — NO SCALE — 6

NOT USED — NO SCALE — 4

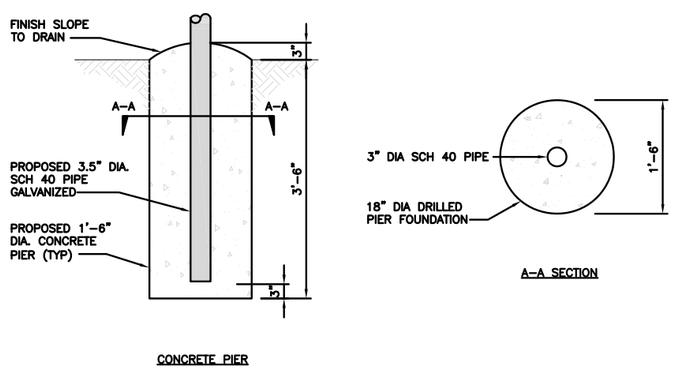
COMMSCOPE WB–K110–B WAVEGUIDE BRIDGE KIT	
DIMENSIONS (HxL)	160"x10'
WEIGHT/ VOLUME	325.0 LBS
CABLE RUN (QTY)	12

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



PLAN FRONT SIDE

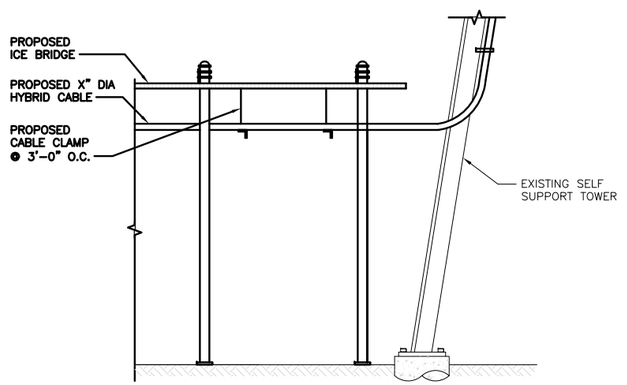
ICE BRIDGE DETAIL — NO SCALE — 7



CONCRETE PIER

A–A SECTION

TYPICAL ICE BRIDGE CONCRETE PIER DETAIL — NO SCALE — 8



HYBRID CABLE RUN — NO SCALE — 9

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RFDS REV #: N/A

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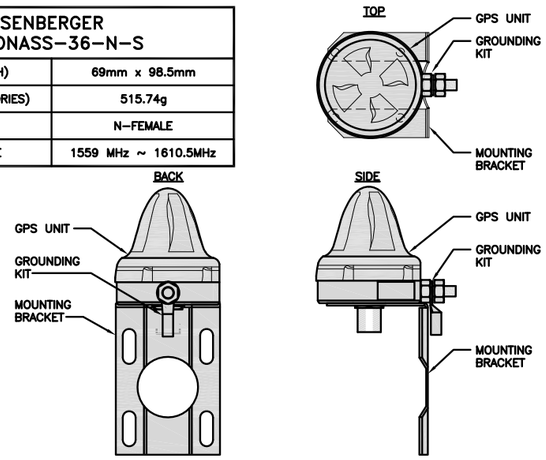
DISH WIRELESS, LLC.
PROJECT INFORMATION
BOBDL00040A
HRT 105 943201
48 COW HILL ROAD
CLINTON, CT 06413

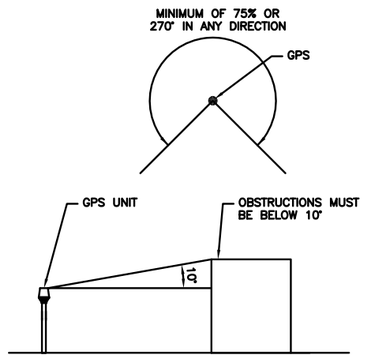
SHEET TITLE
EQUIPMENT DETAILS

SHEET NUMBER
A-4

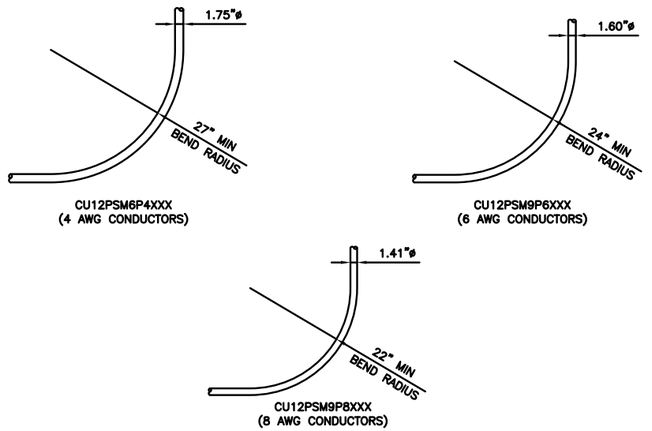
ROSENBERGER GPSGLONASS-36-N-S	
DIMENSION (DIA x H)	69mm x 98.5mm
WEIGHT (WITH ACCESSORIES)	515.74g
CONNECTOR	N-FEMALE
FREQUENCY RANGE	1559 MHz ~ 1610.5MHz



GPS ANTENNA DETAIL | NO SCALE | 1



GPS MINIMUM SKY VIEW REQUIREMENTS | NO SCALE | 2



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

NOT USED | NO SCALE | 4

NOT USED | NO SCALE | 5

NOT USED | NO SCALE | 6

NOT USED | NO SCALE | 7

NOT USED | NO SCALE | 8

NOT USED | NO SCALE | 9

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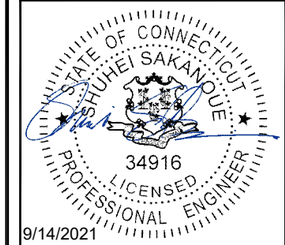

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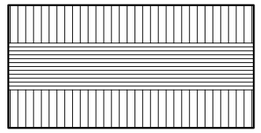
PROJECT INFORMATION
BOBDL00040A
HRT 105 943201
48 COW HILL ROAD
CLINTON, CT 06413

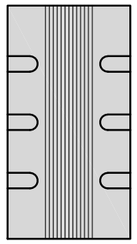
SHEET TITLE
EQUIPMENT DETAILS

SHEET NUMBER
A-5

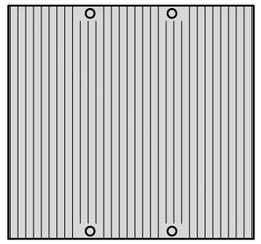
FUJITSU TA08025-B604 RRH	
DIMENSIONS (HxWxD) (KG/IN)	380x400x200/14.9"x15.7"x7.8"
WEIGHT(KG,LB)/ VOLUME	29kg,63.9lb/ 30L
POWER SUPPLY	DC-58~-36V



PLAN



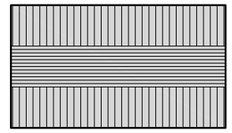
SIDE



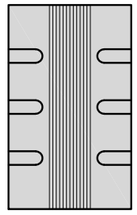
FRONT

REMOTE RADIO HEAD DETAIL | NO SCALE | 1

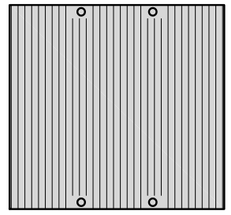
FUJITSU TA08025-B605 RRH	
DIMENSIONS (HxWxD) (KG/IN)	380x400x230/14.9"x15.7"x9.0"
WEIGHT(KG,LB)/ VOLUME	34kg,74.9lb/ 35L
POWER SUPPLY	DC-58~-36V



PLAN



SIDE

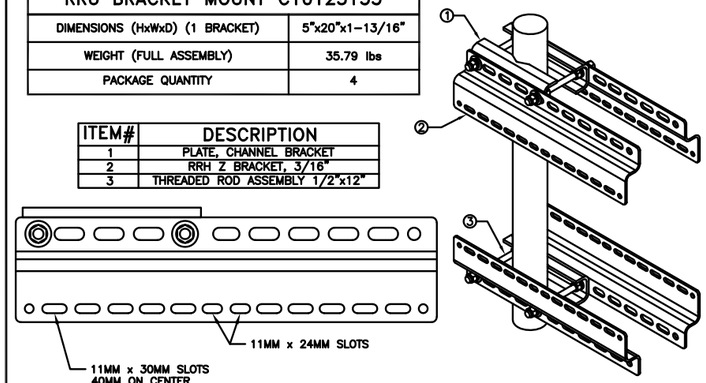


FRONT

REMOTE RADIO HEAD DETAIL | NO SCALE | 2

SABRE INDUSTRIES RRU BRACKET MOUNT C10123155	
DIMENSIONS (HxWxD) (1 BRACKET)	5"x20"x1-13/16"
WEIGHT (FULL ASSEMBLY)	35.79 lbs
PACKAGE QUANTITY	4

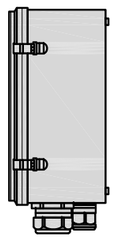
ITEM#	DESCRIPTION
1	PLATE, CHANNEL BRACKET
2	RRH Z BRACKET, 3/16"
3	THREADED ROD ASSEMBLY 1/2"x12"



REMOTE RADIO MOUNT DETAIL | NO SCALE | 3

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

PLAN



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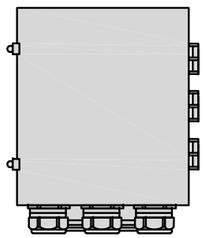

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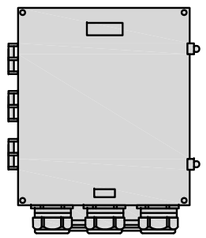
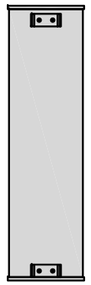


FRONT

SURGE SUPPRESSION DETAIL | NO SCALE | 4

JMA WIRELESS MX08FRO665-21 ANTENNA	
DIMENSIONS (HxWxD)	72.0"x20.0"x8.0"
TOTAL WEIGHT	64.5 LB
RF PORTS, CONNECTOR TYPE	8 x 4.3-10 FEMALE

PLAN



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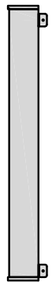

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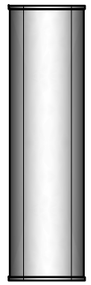


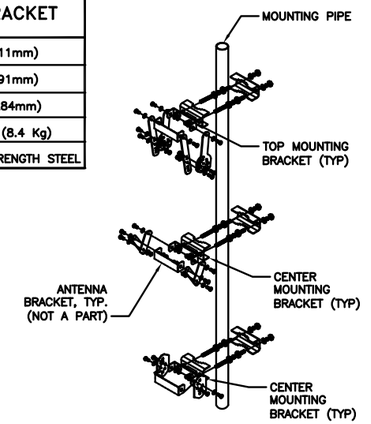
FRONT

ANTENNA DETAIL | NO SCALE | 5

NOTES

FINAL ANTENNA SPECIFICATIONS TO BE CONFIRMED BY GC

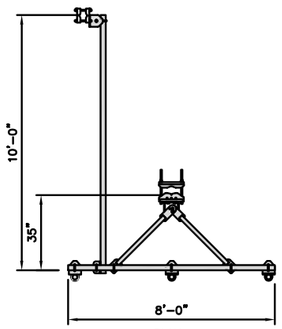
JMA 91900318 MOUNTING BRACKET	
WIDTH	8.3" (211mm)
DEPTH	7.5" (191mm)
HEIGHT	11.2" (284mm)
TOTAL WEIGHT (WITH BRACKETS)	18.5 LBS (8.4 Kg)
HOUSING MATERIAL	GALV. HIGH STRENGTH STEEL



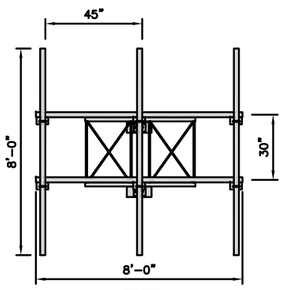
ANTENNA MOUNTING DETAIL | NO SCALE | 6

COMMSCOPE V-FRAME MTC3975083	
FACE SIZE	8'-0"
WEIGHT	352.136 lbs

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



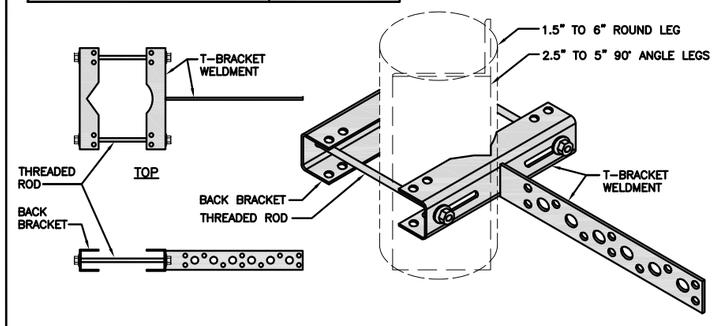
PLAN



FRONT

ANTENNA FRAME DETAIL | NO SCALE | 7

SITEPRO1 T600 UNIVERSAL T-BRACKET	
DIMENSIONS (HxWxL)	2.25"x10.0"x15.25"
WEIGHT/ VOLUME	5.60 LBS



SIDE ISOMETRIC

VERTICAL CABLE SUPPORT DETAIL | NO SCALE | 8

NOT USED | NO SCALE | 9

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SHUHEI SAKANOUE
34916
LICENSED PROFESSIONAL ENGINEER
9/14/2021

DRAWN BY:	CHECKED BY:	APPROVED BY:
RCD	SS	CJW

RFDS REV #: N/A

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A&E PROJECT NUMBER
2039-Z5555C

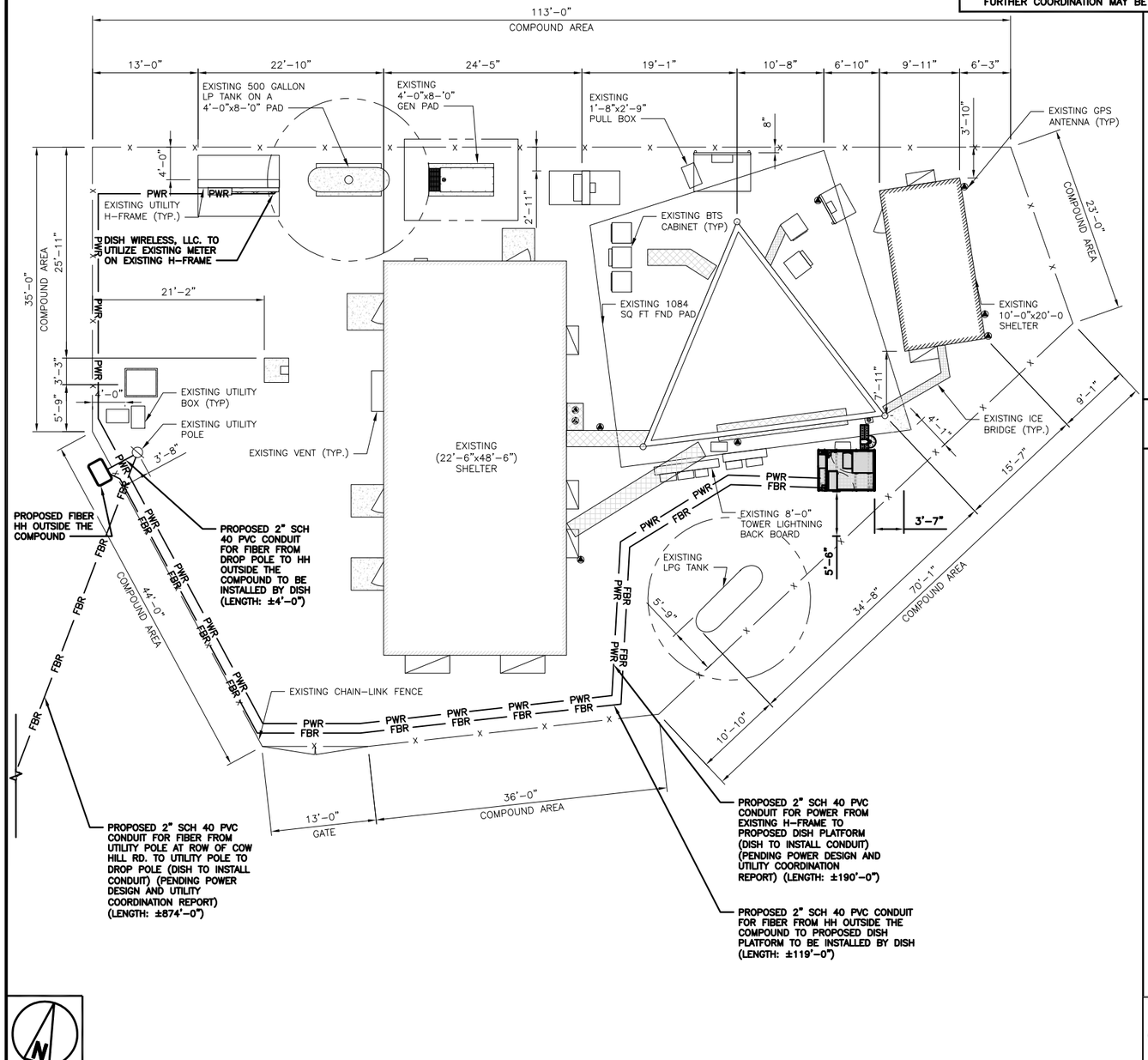
DISH WIRELESS, LLC.
PROJECT INFORMATION
BOBDL00040A
HRT 105 943201
48 COW HILL ROAD
CLINTON, CT 06413

SHEET TITLE
EQUIPMENT DETAILS

SHEET NUMBER
A-6

NOTES

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



UTILITY ROUTE PLAN

8' 4' 0 8' 16'
1/8"=1'-0"

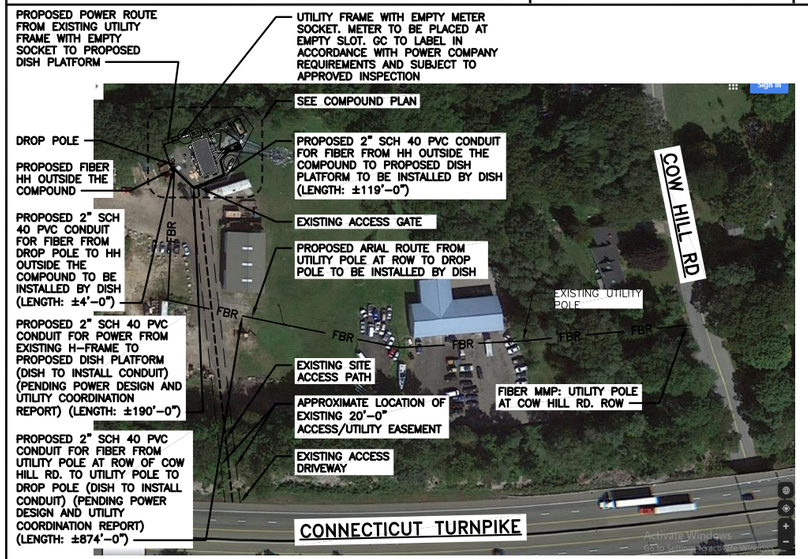
1

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. FIBER ROUTE IS PRELIMINARY, FINAL FIBER ROUTE TO BE DETERMINED ONCE UCR (UTILITY COORDINATION REPORT) HAS BEEN FINALIZED.

ELECTRICAL NOTES

2



OVERALL UTILITY ROUTE PLAN

100' 50' 0 100' 200'
1"=100'

3

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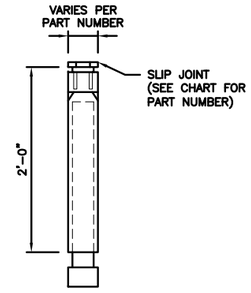
DISH WIRELESS, LLC.
PROJECT INFORMATION
BOBDL00040A
HRT 105 943201
48 COW HILL ROAD
CLINTON, CT 06413

SHEET TITLE
ELECTRICAL/FIBER ROUTE PLAN AND NOTES

SHEET NUMBER
E-1

CARLON EXPANSION FITTINGS

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

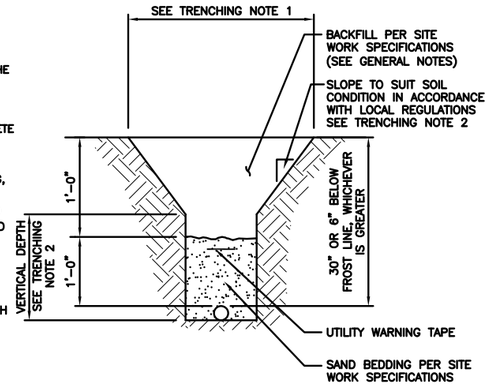


NOTE:
CONTRACTOR TO INSTALL EXPANSION FITTING SLIP JOINT AT METER CENTER CONDUIT TERMINATION, AS PER LOCAL UTILITY POLICY, ORDINANCE AND/OR SPECIFIED REQUIREMENT.

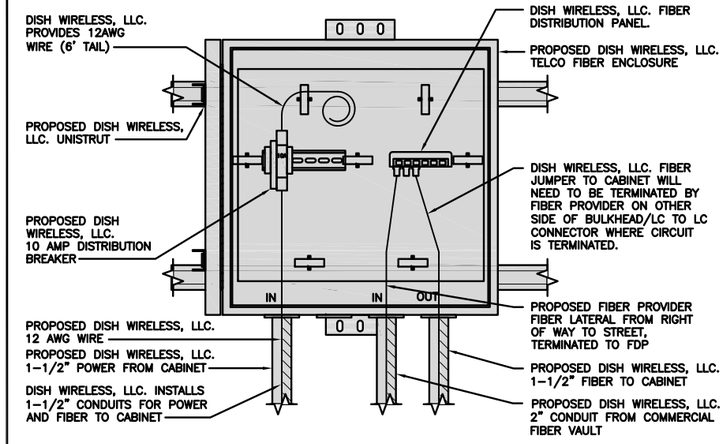
EXPANSION JOINT DETAIL | NO SCALE | 1

TRENCHING NOTES

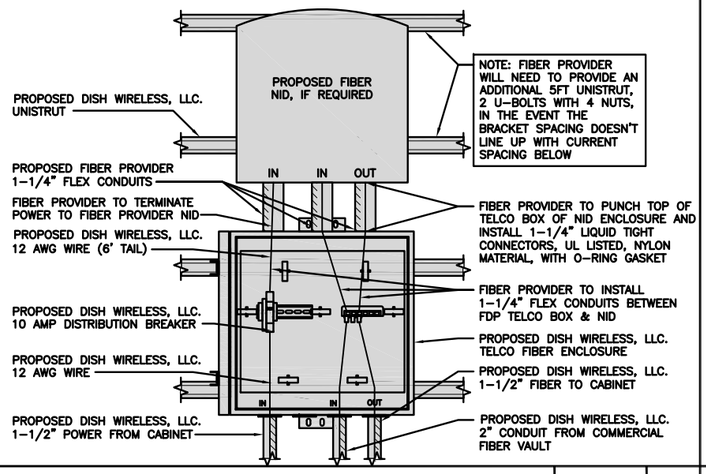
1. CONTRACTOR SHALL RESTORE THE TRENCH TO ITS ORIGINAL CONDITIONS BY EITHER SEEDING OR SODDING GRASS AREAS, OR REPLACING ASPHALT OR CONCRETE AREAS TO ITS ORIGINAL CROSS SECTION.
2. TRENCHING SAFETY; INCLUDING, BUT NOT LIMITED TO SOIL CLASSIFICATION, SLOPING, AND SHORING, SHALL BE GOVERNED BY THE CURRENT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



TYPICAL UNDERGROUND TRENCH DETAIL | NO SCALE | 2



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



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

NOT USED | NO SCALE | 5

NOT USED | NO SCALE | 6

NOT USED | NO SCALE | 7

NOT USED | NO SCALE | 8

NOT USED | NO SCALE | 9

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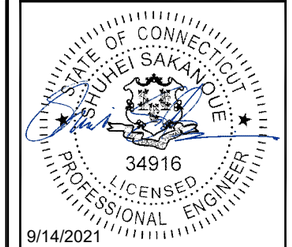

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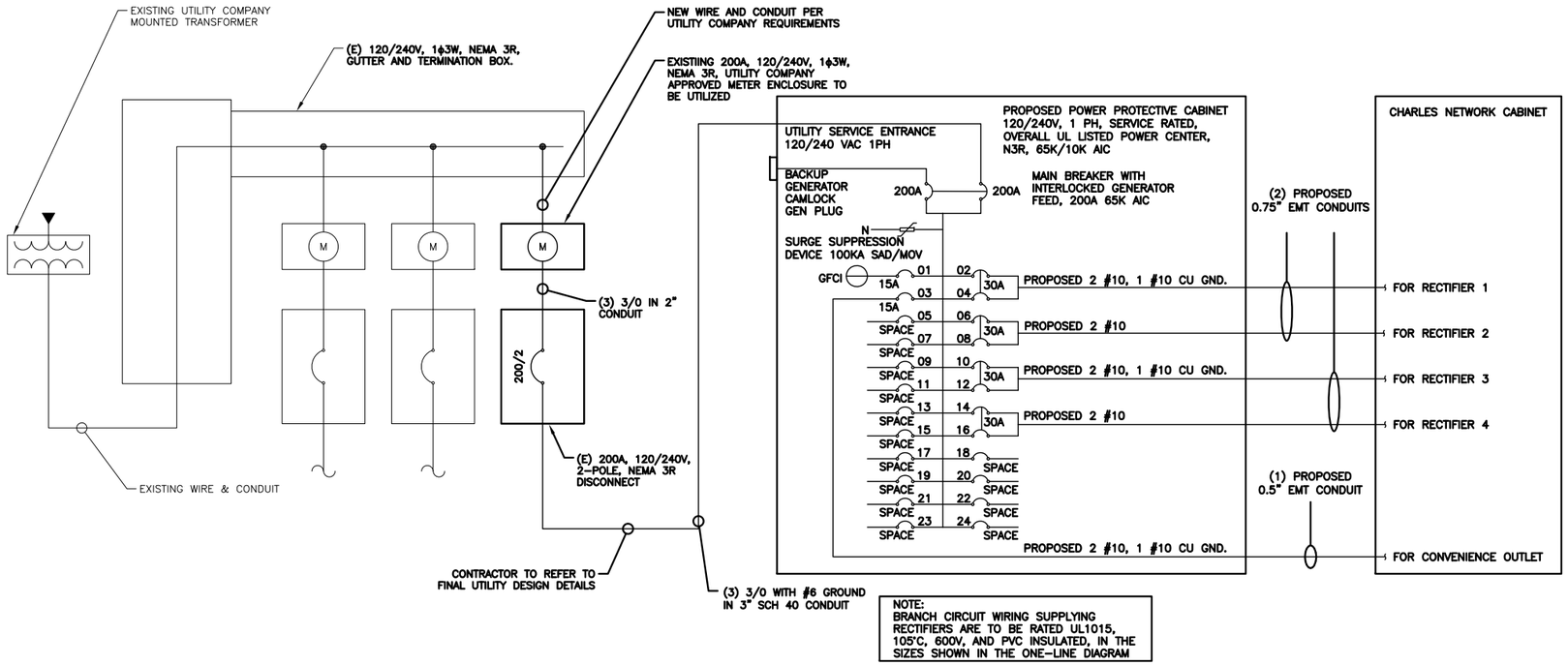
BOBDL00040A
HRT 105 943201
48 COW HILL ROAD
CLINTON, CT 06413

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

PPC ONE-LINE DIAGRAM

NO SCALE | 1

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.

THE (2) CONDUITS WITH (4) CURRENT CARRYING CONDUCTORS EACH, SHALL APPLY THE ADJUSTMENT FACTOR OF 80% PER 2014/17 NEC TABLE 310.15(B)(3)(a) OR 2020 NEC TABLE 310.15(C)(1).

#12 FOR 15A-20A/1P BREAKER: 0.8 x 30A = 24.0A
#10 FOR 25A-30A/2P BREAKER: 0.8 x 40A = 32.0A
#8 FOR 35A-40A/2P BREAKER: 0.8 x 55A = 44.0A
#6 FOR 45A-60A/2P BREAKER: 0.8 x 75A = 60.0A

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

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

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

#10 - 0.0211 SQ. IN X 4 = 0.0844 SQ. IN
#10 - 0.0211 SQ. IN X 1 = 0.0211 SQ. IN <GROUND
TOTAL = 0.1055 SQ. IN

0.75" EMT CONDUIT IS ADEQUATE TO HANDLE THE TOTAL OF (5) WIRES, INCLUDING GROUND WIRES, 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.

PROPOSED CHARLES 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	30A	2880		ABB/GE INFINITY RECTIFIER 1
CHARLES GFCI OUTLET		180	15A	3	B	4			2880	
-SPACE-				5	A	6	30A	2880		ABB/GE INFINITY RECTIFIER 2
-SPACE-				7	B	8			2880	
-SPACE-				9	A	10	30A	2880		ABB/GE INFINITY RECTIFIER 3
-SPACE-				11	B	12			2880	
-SPACE-				13	A	14	30A	2880		ABB/GE INFINITY RECTIFIER 4
-SPACE-				15	B	16			2880	
-SPACE-				17	A	18				-SPACE-
-SPACE-				19	B	20				-SPACE-
-SPACE-				21	A	22				-SPACE-
-SPACE-				23	B	24				-SPACE-
VOLTAGE AMPS	180	180						11520	11520	
200A MCB, 1ϕ, 24 SPACE, 120/240V			L1		L2					
MB RATING: 65,000 AIC			11700		11700		VOLTAGE AMPS			
			98		98		AMPS			
			98				MAX AMPS			
			123				MAX 125%			

PANEL SCHEDULE

NO SCALE | 2

NOT USED

NO SCALE | 3

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DRAWN BY:	CHECKED BY:	APPROVED BY:
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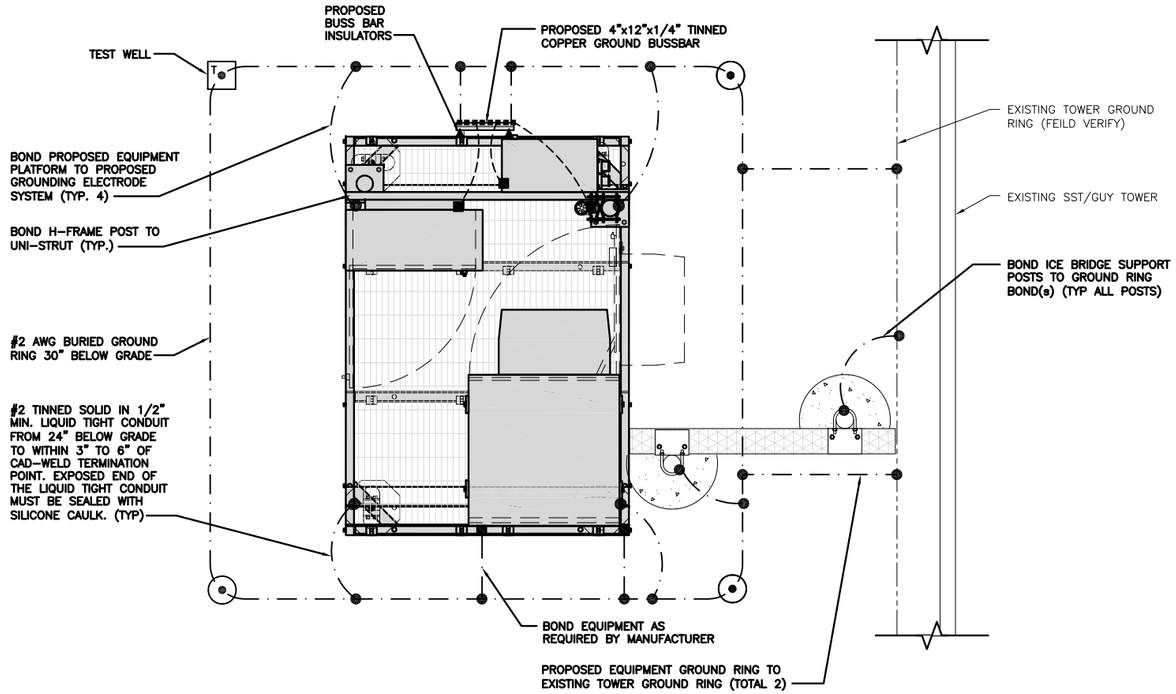
DISH WIRELESS, LLC.
PROJECT INFORMATION
BOBDL00040A
HRT 105 943201
48 COW HILL ROAD
CLINTON, CT 06413

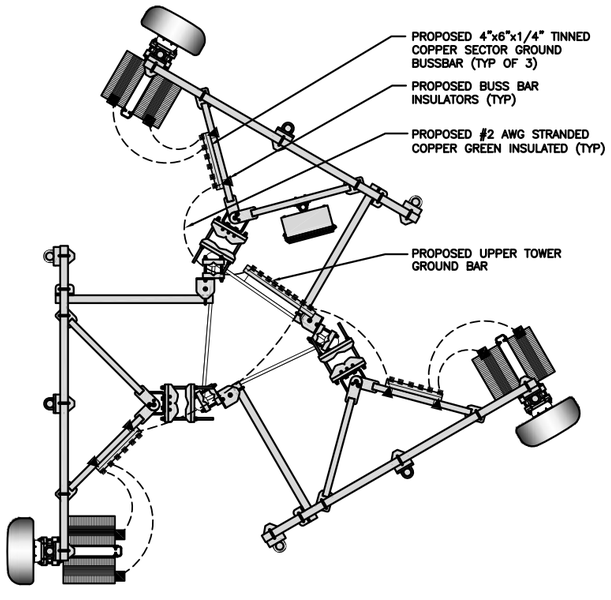
SHEET TITLE
ELECTRICAL ONE-LINE, FAULT CALCS & PANEL SCHEDULE

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
#2 AWG STRANDED & INSULATED
#2 AWG SOLID COPPER TINNED

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, LLC. GROUNDING AND BONDING REQUIREMENTS AND MANUFACTURER'S SPECIFICATIONS.
3. ALL GROUND CONDUCTORS SHALL BE COPPER; NO ALUMINUM CONDUCTORS SHALL BE USED.

GROUNDING KEY NOTES

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

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

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

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

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

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

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

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

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

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

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

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

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

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

(Q) 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

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

REFER TO DISH WIRELESS, LLC. GROUNDING NOTES.

GROUNDING KEY NOTES

NO SCALE | 3

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SHUHEI SAKANOUE
34916
LICENSED PROFESSIONAL ENGINEER
9/14/2021

DRAWN BY:	CHECKED BY:	APPROVED BY:
RCD	SS	CJW

RFDS REV #: N/A

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A&E PROJECT NUMBER
2039-Z5555C

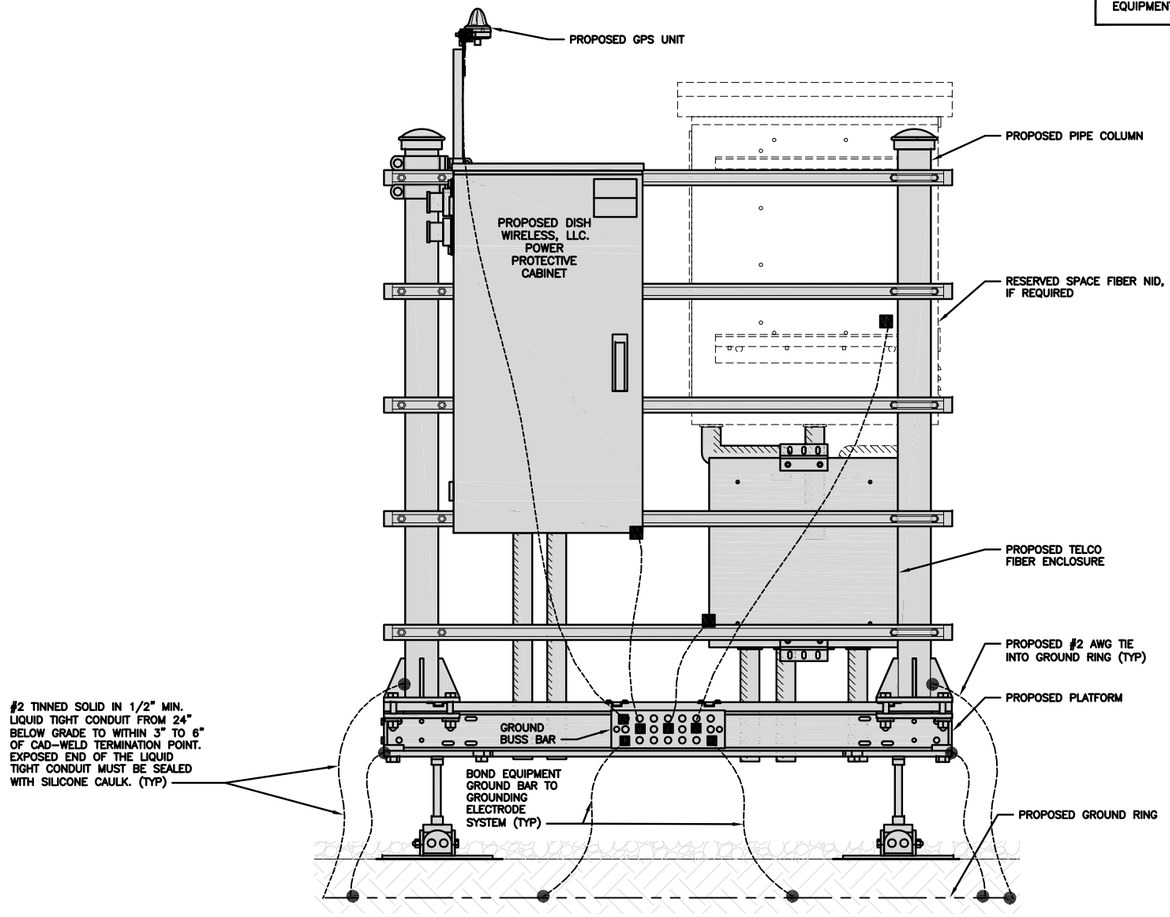
DISH WIRELESS, LLC.
PROJECT INFORMATION
BOBDL00040A
HRT 105 943201
48 COW HILL ROAD
CLINTON, CT 06413

SHEET TITLE
GROUNDING PLANS AND NOTES

SHEET NUMBER
G-1

NOTES

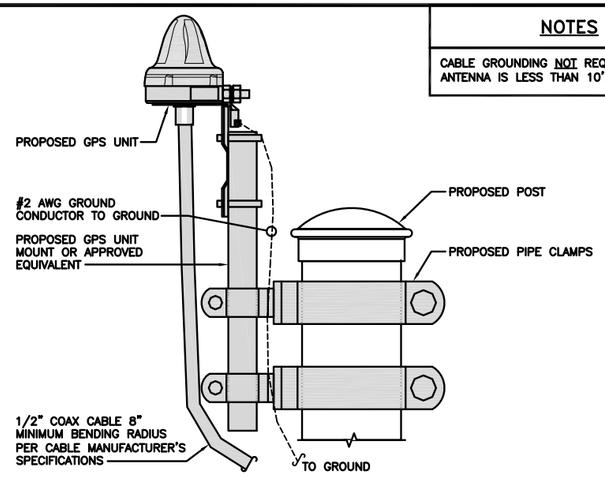
EQUIPMENT CABINET OMITTED FOR CLARITY



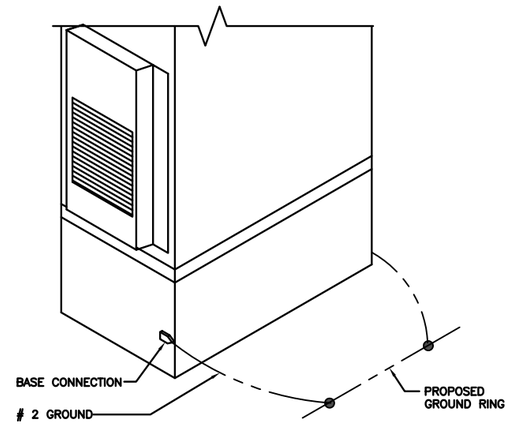
H-FRAME GROUNDING DETAIL | NO SCALE | 1

NOTES

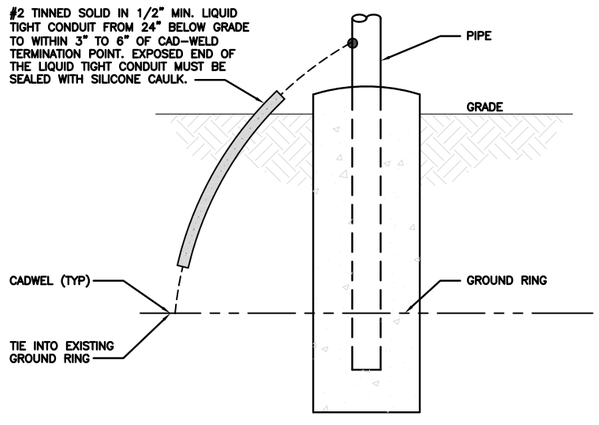
CABLE GROUNDING NOT REQUIRED WHEN ANTENNA IS LESS THAN 10' FROM CABINET



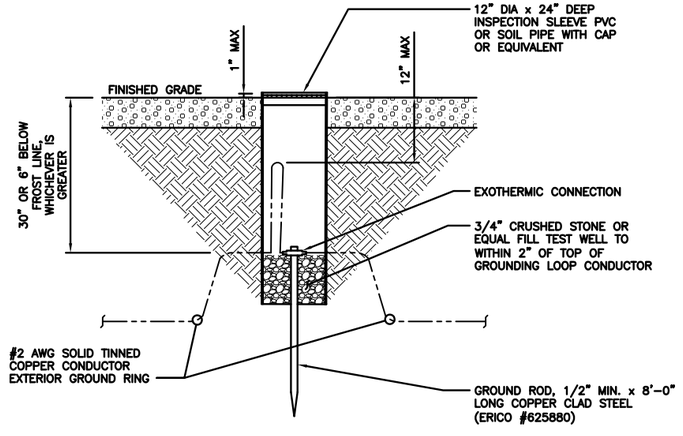
TYPICAL GPS UNIT GROUNDING | NO SCALE | 2



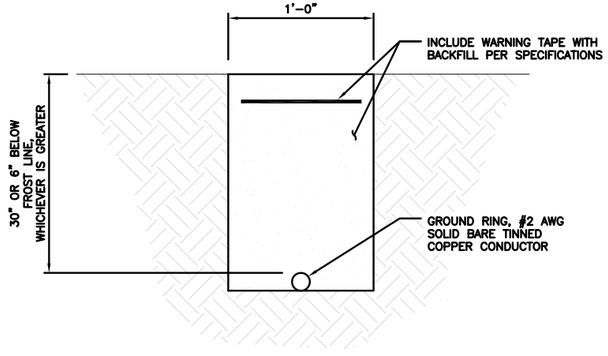
OUTDOOR CABINET GROUNDING | NO SCALE | 3



TRANSITIONING GROUND DETAIL | NO SCALE | 4



TYPICAL TEST GROUND ROD WITH INSPECTION SLEEVE | NO SCALE | 5



TYPICAL GROUND RING TRENCH | NO SCALE | 6

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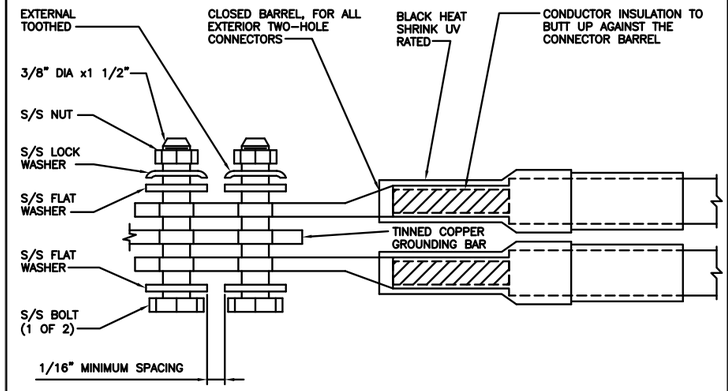
PROJECT INFORMATION
BOBDL00040A
HRT 105 943201
48 COW HILL ROAD
CLINTON, CT 06413

SHEET TITLE
GROUNDING DETAILS

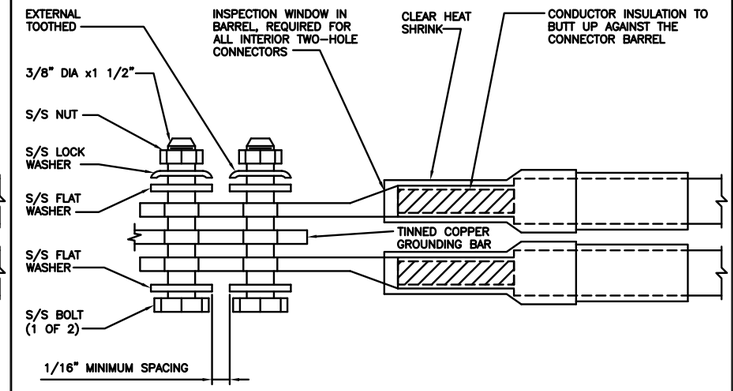
SHEET NUMBER
G-2

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

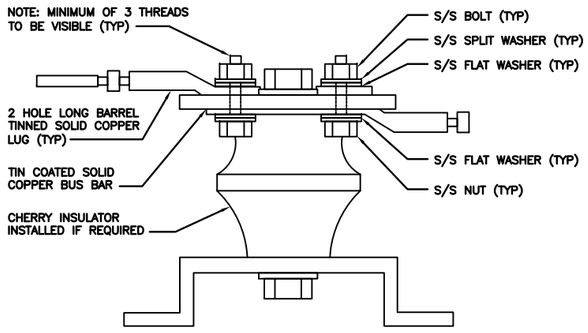
TYPICAL GROUNDING NOTES | NO SCALE | 1



TYPICAL EXTERIOR TWO HOLE LUG | NO SCALE | 2



TYPICAL INTERIOR TWO HOLE LUG | NO SCALE | 3



LUG DETAIL | NO SCALE | 4

NOT USED | NO SCALE | 5

NOT USED | NO SCALE | 6

NOT USED | NO SCALE | 7

NOT USED | NO SCALE | 8

NOT USED | NO SCALE | 9

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48 COW HILL ROAD
CLINTON, CT 06413

SHEET TITLE
GROUNDING DETAILS

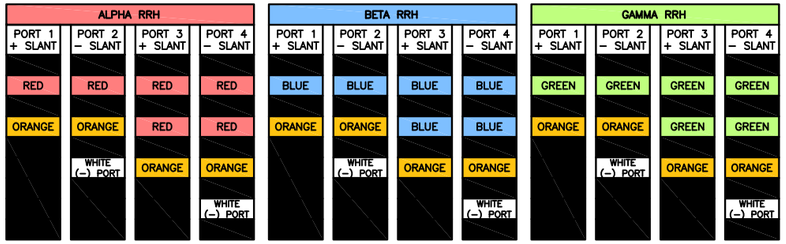
SHEET NUMBER
G-3

RF JUMPER COLOR CODING

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

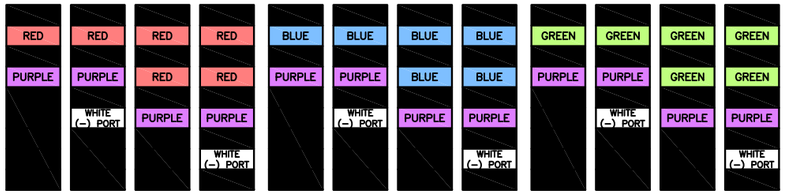
LOW–BAND RRH –
(600MHz N71 BASEBAND) +
(850MHz N26 BAND) +
(700MHz N29 BAND) – OPTIONAL PER MARKET

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



MID–BAND RRH –
(AWS BANDS N66+N70)

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

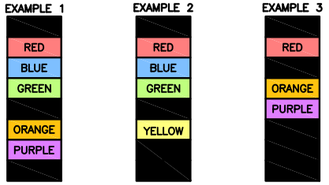


HYBRID/DISCREET CABLES

INCLUDE SECTOR BANDS BEING SUPPORTED
ALONG WITH FREQUENCY BANDS

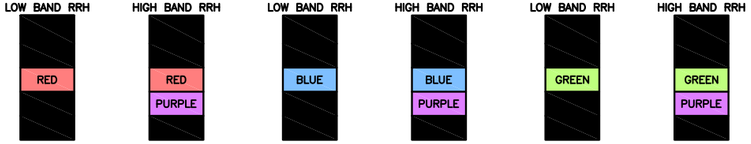
EXAMPLE 1 – HYBRID, OR DISCREET, SUPPORTS
ALL SECTORS, BOTH LOW–BANDS AND MID–BANDS

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



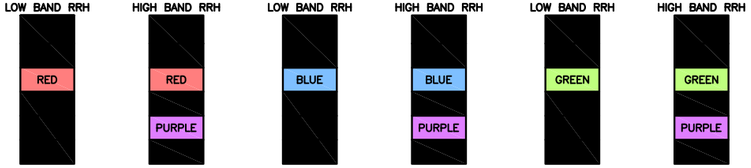
FIBER JUMPERS TO RRHs

LOW–BAND RRH FIBER CABLES HAVE SECTOR
STRIPE ONLY

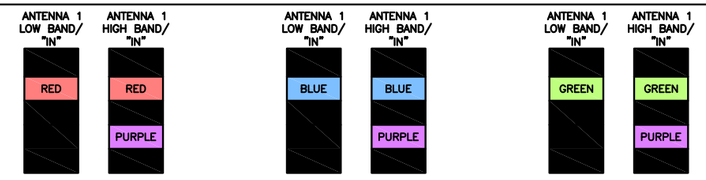


POWER CABLES TO RRHs

LOW–BAND RRH POWER CABLES HAVE SECTOR
STRIPE ONLY



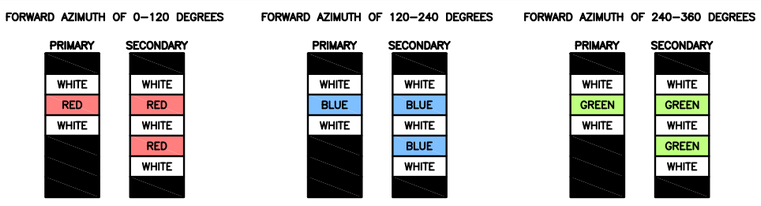
RET MOTORS AT ANTENNAS



MICROWAVE RADIO LINKS

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

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



RF CABLE COLOR CODES | NO SCALE | 1

LOW BANDS (N71–N28)
OPTIONAL – (N29)
ORANGE

AWS
(N65+N70+H–BLOCK)
PURPLE

CBRS TECH
(3 GHz)
YELLOW

NEGATIVE SLANT PORT
ON ANTRRH
WHITE

ALPHA SECTOR
RED

BETA SECTOR
BLUE

GAMMA SECTOR
GREEN

COLOR IDENTIFIER | NO SCALE | 2

NOT USED | NO SCALE | 3

NOT USED | NO SCALE | 4

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PROJECT INFORMATION
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HRT 105 943201
48 COW HILL ROAD
CLINTON, CT 06413

SHEET TITLE
RF
CABLE COLOR CODE

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.

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LITTLETON, CO 80120

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STATE OF CONNECTICUT
SHUHEI SAKANOUE
34916
LICENSED PROFESSIONAL ENGINEER
9/14/2021

DRAWN BY:	CHECKED BY:	APPROVED BY:
RCD	SS	CJW

RFDS REV #: N/A

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
A	05/10/2021	ISSUED FOR REVIEW
0	06/12/2021	ISSUED FOR CONSTRUCTION
1	09/03/2021	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER

2039–Z5555C

DISH WIRELESS, LLC.
PROJECT INFORMATION
BOBDL00040A
HRT 105 943201
48 COW HILL ROAD
CLINTON, CT 06413

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, LLC. AND TOWER OWNER NOC & THE DISH WIRELESS, LLC. AND TOWER OWNER CONSTRUCTION MANAGER.

2. "LOOK UP" – DISH WIRELESS, LLC. 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, LLC. AND DISH WIRELESS, LLC. 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, LLC. 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, LLC. AND TOWER OWNER INSTALLATION STANDARDS FOR CONSTRUCTION ACTIVITIES ON DISH WIRELESS, LLC. 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, LLC. 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, LLC. 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, LLC.

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, LLC. 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.

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9/14/2021

DRAWN BY:	CHECKED BY:	APPROVED BY:
RCD	SS	CJW

RFDS REV #: N/A

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
A	05/10/2021	ISSUED FOR REVIEW
0	08/12/2021	ISSUED FOR CONSTRUCTION
1	09/03/2021	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER
2039–Z5555C

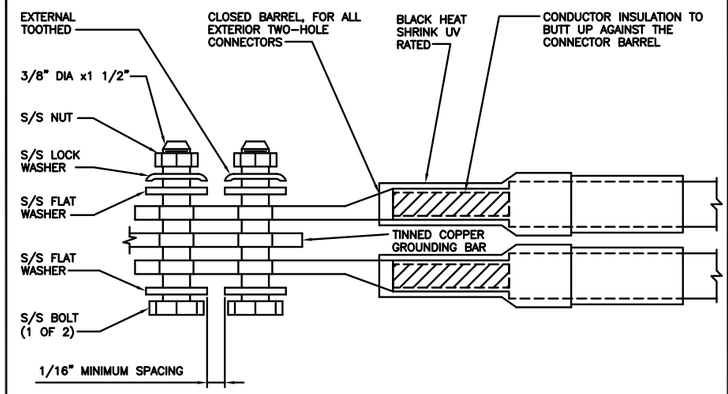
DISH WIRELESS, LLC.
PROJECT INFORMATION
BOBDL00040A
HRT 105 943201
48 COW HILL ROAD
CLINTON, CT 06413

SHEET TITLE
GENERAL NOTES

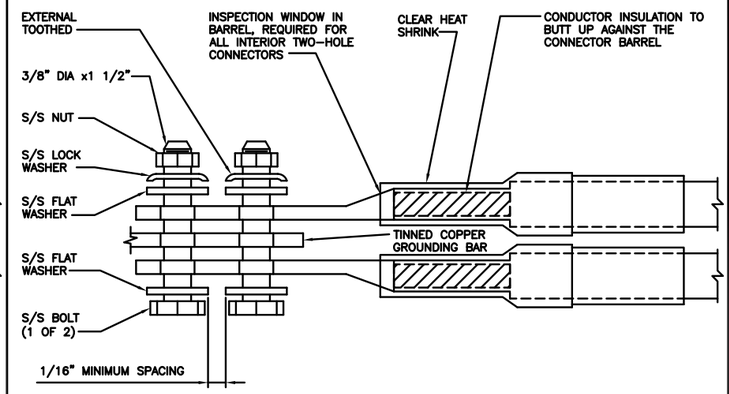
SHEET NUMBER
GN-2

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

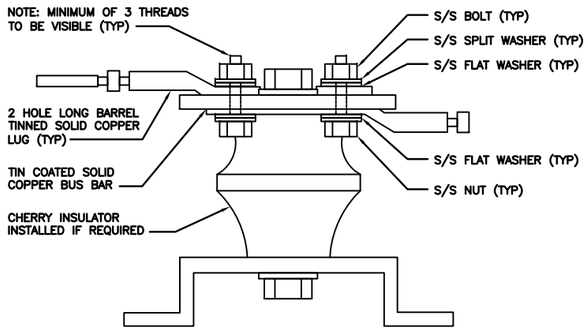
TYPICAL GROUNDING NOTES | NO SCALE | 1



TYPICAL EXTERIOR TWO HOLE LUG | NO SCALE | 2



TYPICAL INTERIOR TWO HOLE LUG | NO SCALE | 3



LUG DETAIL | NO SCALE | 4

NOT USED | NO SCALE | 5

NOT USED | NO SCALE | 6

NOT USED | NO SCALE | 7

NOT USED | NO SCALE | 8

NOT USED | NO SCALE | 9

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A&E PROJECT NUMBER
2039-Z5555C

DISH WIRELESS, LLC.
PROJECT INFORMATION
BOBDL00040A
HRT 105 943201
48 COW HILL ROAD
CLINTON, CT 06413

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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DISH WIRELESS, LLC.
PROJECT INFORMATION
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HRT 105 943201
48 COW HILL ROAD
CLINTON, CT 06413

SHEET TITLE
GENERAL NOTES

SHEET NUMBER
GN-4

Exhibit D

Structural Analysis Report

Date: **August 21, 2021**

Crown Castle
2000 Corporate Drive
Canonsburg, PA 15317
(724) 416-2000

Subject:	**Structural Analysis Report**	
Carrier Designation:	***DISH Network* Co-Locate**	
	Site Number:	BOBDL00040A
	Site Name:	CT-CCI-T-806363
Crown Castle Designation:	**BU Number:**	806363
	Site Name:	HRT 105 943201
	JDE Job Number:	645647
	Work Order Number:	2010266
	Order Number:	553394 Rev. 0
Engineering Firm Designation:	**Crown Castle Project Number:**	2010266
Site Data:	**48 COW HILL ROAD, CLINTON, MIDDLESEX County, CT** **Latitude *41° 17' 20.2"*, Longitude *-72° 32' 18.5"*** **212.625 Foot - Self Support Tower**	

Crown Castle is pleased to submit this **"Structural Analysis Report"** to determine the structural integrity of the above-mentioned tower.

The purpose of the analysis is to determine acceptability of the tower stress level. Based on our analysis we have determined the tower stress level for the structure and foundation, under the following load case, to be:

LC5: Proposed Equipment Configuration **Sufficient Capacity**

This analysis has been performed in accordance with the 2018 Connecticut State Building Code based upon an ultimate 3-second gust wind speed of 130 mph. Applicable Standard references and design criteria are listed in Section 2 - "Analysis Criteria".

Structural analysis prepared by: Michael Lopienski

Respectfully submitted by:

Digitally signed by Maham Barimani
Date: 2021.08.22 11:52:28 -04'00'

STATE OF CONNECTICUT
MAHAM BARIMANI
30501
LICENSED
PROFESSIONAL ENGINEER

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Senior Project Engineer

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1) INTRODUCTION

This tower is a 212.625 ft Self Support tower designed by ROHN.

2) ANALYSIS CRITERIA

TIA-222 Revision:	TIA-222-H
Risk Category:	II
Wind Speed:	130 mph
Exposure Category:	B
Topographic Factor:	1
Ice Thickness:	1.5 in
Wind Speed with Ice:	50 mph
Service Wind Speed:	60 mph

Table 1 - Proposed Equipment Configuration

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
118.0	118.0	3	fujitsu	TA08025-B604	1	1-1/2
		3	fujitsu	TA08025-B605		
		3	jma wireless	MX08FRO665-20 w/ Mount Pipe		
		1	raycap	RDIDC-9181-PF-48		
		1	tower mounts	Commscope MTC3975083 (3)		

Table 2 - Other Considered Equipment

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
208.0	209.0	3	andrew	SBNHH-1D65B w/ Mount Pipe	2	1-5/8
		6	antel	LPA-80080/6CF w/ Mount Pipe		
		3	commscope	CBC1923T-DS-43		
		6	commscope	JAHH-65B-R3B w/ Mount Pipe		
		2	rfs celwave	DB-B1-6C-12AB-0Z		
		3	samsung telecom	RFV01U-D1A		
		3	samsung telecom	RFV01U-D2A		
	208.0	1	tower mounts	Sector Mount [SM 510-3]		
199.0	199.0	1	tower mounts	Sector Mount [SM 505-3]	4	1-1/4
	198.0	3	alcatel lucent	1900MHz RRH (65MHz)		
		3	alcatel lucent	800MHz 2X50W RRH W/FILTER		
		3	alcatel lucent	TD-RRH8x20-25		
		3	rfs celwave	APXVSPP18-C-A20 w/ Mount Pipe		
		3	rfs celwave	APXVTM14-C-120 w/ Mount Pipe		
189.0	190.0	6	adc	DUAL BAND 800/1900 FULL BAND MASTHEAD	2 2 4 12	13/16 3/8 3/4 1-5/8
		6	andrew	SBNHH-1D65A w/ Mount Pipe		
		3	andrew	SBNHH-1D65A w/ Mount Pipe		
		3	ericsson	RRUS 11		

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
		3	ericsson	RRUS 32		
		3	ericsson	RRUS 32 B2		
		3	ericsson	RRUS 32 B66		
		3	powerwave technologies	7020.00		
		3	powerwave technologies	7770.00 w/ Mount Pipe		
		2	raycap	DC6-48-60-18-8F		
	189.0	1	tower mounts	Sector Mount [SM 510-3]		
183.0	183.0	3	rfs celwave	APXV18-206517LS	-	-
		1	tower mounts	Pipe Mount [PM 601-3]		
175.0	179.0	2		HPD2-23	12	1-1/4
		2	tower mounts (crown)	6' x 2" Mount Pipe		
	176.0	12	decibel	DB844H90E-XY w/ Mount Pipe		
	175.0	1	tower mounts	Sector Mount		
167.0	173.0	1	rfs celwave	1151-3	1	7/8
	167.0	1	tower mounts	Side Arm Mount [SO 306-1]		
	160.0	1	sinclair	SD310-HL		
164.0	173.0	1	rfs celwave	1151-3	1	7/8
	164.0	1	tower mounts	Side Arm Mount [SO 306-1]		
147.0	153.0	1	rfs celwave	1151-3	1	7/8
	147.0	1	tower mounts	Side Arm Mount [SO 306-1]		
145.0	148.0	1	sinclair	SD310-HL	1	7/8
	145.0	1	tower mounts	Side Arm Mount [SO 306-1]		
139.0	140.0	3	ericsson	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	6 3 9	1-1/4 1-3/8 1-5/8
		3	ericsson	ERICSSON AIR 21 B4A B2P w/ Mount Pipe		
		3	ericsson	KRY 112 144/1		
		3	ericsson	RADIO 4449 B12/B71		
		3	rfs celwave	APXVAARR24_43-U-NA20 w/ Mount Pipe		
	139.0	1		(3) Site Pro 1 VFA12-HD		
128.0	132.0	1	rfs celwave	1142-2C	1	7/8
	128.0	1		Side Arm Mount		
51.0	51.0	1		Side Arm Mount	1	1/2
		1	gps	GPS_A		

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Reference	Source
4-GEOTECHNICAL REPORTS	262276	CCISITES
4-POST-MODIFICATION INSPECTION	2146143	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	262273	CCISITES
4-TOWER MANUFACTURER DRAWINGS	262274	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	2169576	CCISITES

3.1) Analysis Method

tnxTower (version 8.0.9.0), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A. When applicable, Crown Castle has calculated and provided the effective area for panel antennas using approved methods following the intent of the TIA-222 standard.

3.2) Assumptions

1) Tower and structures were maintained in accordance with the TIA-222 Standard.
2) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.

This analysis may be affected if any assumptions are not valid or have been made in error. Crown Castle should be notified to determine the effect on the structural integrity of the tower.

4) ANALYSIS RESULTS

Table 4 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
T1	212.625 - 202.458	Leg	ROHN 2.5 STD	2	-4.854	59.463	8.2	Pass
T2	202.458 - 182.292	Leg	ROHN 3 EH	28	-23.458	98.582	23.8	Pass
T3	182.292 - 162.104	Leg	ROHN 4 EH	69	-68.578	167.222	41.0	Pass
T4	162.104 - 141.896	Leg	ROHN 5 EH	107	-99.947	250.620	39.9	Pass
T5	141.896 - 121.688	Leg	ROHN 6 EHS	146	-126.881	255.080	49.7	Pass
T6	121.688 - 101.479	Leg	ROHN 6 EH	173	-158.665	317.349	50.0	Pass
T7	101.479 - 81.2708	Leg	ROHN 6 EH	200	-188.671	317.349	59.5	Pass
T8	81.2708 - 61	Leg	ROHN 8 EHS	227	-217.042	404.230	53.7	Pass
T9	61 - 40.6667	Leg	ROHN 8 EHS	254	-244.630	403.942	60.6	Pass
T10	40.6667 - 20.3333	Leg	ROHN 8 EH	281	-257.392	528.398	48.7	Pass
T11	20.3333 - 0	Leg	ROHN 8 EH	314	-283.019	528.520	53.5	Pass
T1	212.625 - 202.458	Diagonal	ROHN 2 STD	12	-2.643	25.020	10.6	Pass
T2	202.458 - 182.292	Diagonal	ROHN 2 STD	38	-7.837	18.418	42.6	Pass
T3	182.292 - 162.104	Diagonal	ROHN 2 STD	78	-8.155	15.917	51.2	Pass
T4	162.104 - 141.896	Diagonal	ROHN 2 STD	110	-7.736	13.677	56.6	Pass
T5	141.896 - 121.688	Diagonal	ROHN 2.5 STD	156	-11.004	17.101	64.3	Pass
T6	121.688 - 101.479	Diagonal	ROHN 2.5 STD	183	-11.211	14.992	74.8	Pass
T7	101.479 - 81.2708	Diagonal	ROHN 3 STD	210	-11.266	25.935	43.4	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
T8	81.2708 - 61	Diagonal	ROHN 3 STD	237	-11.166	22.903	48.8	Pass
T9	61 - 40.6667	Diagonal	ROHN 3 STD	264	-11.969	20.104	59.5	Pass
T10	40.6667 - 20.3333	Diagonal	ROHN 3 STD	303	-16.799	32.714	51.4	Pass
T11	20.3333 - 0	Diagonal	ROHN 3 STD	336	-19.055	31.089	61.3	Pass
T1	212.625 - 202.458	Horizontal	ROHN 1.5 STD	10	-1.846	23.711	7.8	Pass
T2	202.458 - 182.292	Horizontal	ROHN 1.5 STD	37	-4.183	23.646	17.7	Pass
T3	182.292 - 162.104	Horizontal	ROHN 1.5 STD	76	-5.220	20.100	26.0	Pass
T4	162.104 - 141.896	Horizontal	ROHN 2 STD	109	-5.375	28.570	18.8	Pass
T5	141.896 - 121.688	Horizontal	ROHN 2 STD	154	-6.543	23.772	27.5	Pass
T6	121.688 - 101.479	Horizontal	ROHN 2 STD	181	-7.287	17.707	41.2	Pass
T7	101.479 - 81.2708	Horizontal	ROHN 2.5 STD	208	-7.767	30.294	25.6	Pass
T8	81.2708 - 61	Horizontal	ROHN 2.5 STD	235	-8.072	23.656	34.1	Pass
T9	61 - 40.6667	Horizontal	ROHN 2.5 STD	262	-8.961	18.711	47.9	Pass
T10	40.6667 - 20.3333	Horizontal	ROHN 3 STD	299	-9.125	33.233	27.5	Pass
T11	20.3333 - 0	Horizontal	ROHN 3 STD	332	-10.756	27.041	39.8	Pass
T1	212.625 - 202.458	Top Girt	ROHN 1.5 STD	5	-0.222	23.767	0.9	Pass
T10	40.6667 - 20.3333	Redund Horz 1 Bracing	ROHN 1.5 STD	288	-4.468	13.657	32.7	Pass
T11	20.3333 - 0	Redund Horz 1 Bracing	ROHN 1.5 STD	321	-4.909	11.606	42.3	Pass
T10	40.6667 - 20.3333	Redund Diag 1 Bracing	ROHN 2 STD	289	-4.127	9.252	44.6	Pass
T11	20.3333 - 0	Redund Diag 1 Bracing	ROHN 2 STD	326	-4.240	8.517	49.8	Pass
T10	40.6667 - 20.3333	Redund Hip 1 Bracing	ROHN 1.5 STD	306	-0.044	12.533	0.4	Pass
T11	20.3333 - 0	Redund Hip 1 Bracing	ROHN 1.5 STD	339	-0.045	10.543	0.4	Pass
T10	40.6667 - 20.3333	Redund Hip Diagonal 1 Bracing	ROHN 2.5 STD	309	-0.078	10.900	0.7	Pass
T11	20.3333 - 0	Redund Hip Diagonal 1 Bracing	ROHN 2.5 STD	342	-0.072	9.815	0.7	Pass
T1	212.625 - 202.458	Inner Bracing	L2x2x1/8	16	-0.003	8.802	0.4	Pass
T2	202.458 - 182.292	Inner Bracing	L2x2x1/8	41	-0.005	8.646	0.4	Pass
T3	182.292 - 162.104	Inner Bracing	L2x2x1/8	80	-0.005	6.373	0.5	Pass
T4	162.104 - 141.896	Inner Bracing	L2x2x1/8	120	-0.006	4.367	0.6	Pass
T5	141.896 - 121.688	Inner Bracing	L2x2x1/8	157	-0.009	3.300	0.7	Pass
T6	121.688 - 101.479	Inner Bracing	L2 1/2x2 1/2x3/16	184	-0.010	6.951	0.5	Pass
T7	101.479 - 81.2708	Inner Bracing	L3x3x3/16	213	-0.013	9.153	0.6	Pass
T8	81.2708 - 61	Inner Bracing	L3 1/2x3 1/2x1/4	240	-0.015	14.894	0.4	Pass
T9	61 - 40.6667	Inner Bracing	L3 1/2x3 1/2x1/4	267	-0.015	11.869	0.4	Pass
T10	40.6667 - 20.3333	Inner Bracing	ROHN 3 STD	311	-0.019	31.363	0.3	Pass
T11	20.3333 - 0	Inner Bracing	ROHN 3 STD	345	-0.016	25.662	0.4	Pass
							Summary	
						Leg (T9)	60.6	Pass
						Diagonal (T6)	74.8	Pass
						Horizontal (T9)	47.9	Pass
						Top Girt	0.9	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
						(T1)		
						Redund Horz 1 Bracing (T11)	42.3	Pass
						Redund Diag 1 Bracing (T11)	49.8	Pass
						Redund Hip 1 Bracing (T11)	0.4	Pass
						Redund Hip Diagonal 1 Bracing (T11)	0.7	Pass
						Inner Bracing (T5)	0.7	Pass
						Bolt Checks	44.5	Pass
						Rating =	74.8	Pass

Table 5 - Tower Component Stresses vs. Capacity - LC5

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	41.9	Pass
1	Base Foundation (Structure)	0	19.8	Pass
1	Base Foundation (Soil Interaction)	0	42.5	Pass

Structure Rating (max from all components) =	74.8%

Notes:
1) See additional documentation in “Appendix C – Additional Calculations” for calculations supporting the % capacity consumed.

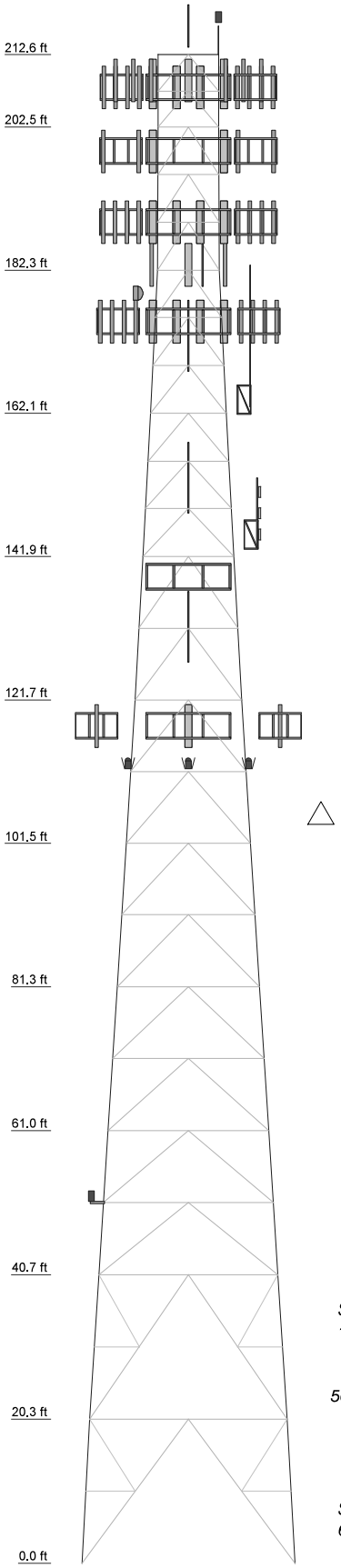
4.1) Recommendations

The tower and its foundation have sufficient capacity to carry the proposed load configuration. No modifications are required at this time.

APPENDIX A

TNXTOWER OUTPUT

Section	T11	T10	T9	T8	T7	T6	T5	T4	T3	T2	T1
Legs	ROHN 8 EH		ROHN 8 EHS		ROHN 6 EH		ROHN 6 EHS	ROHN 5 EH	ROHN 4 EH	ROHN 3 EH	A
Leg Grade	A572-50										
Diagonals	ROHN 3 STD			ROHN 2.5 STD				ROHN 2 STD			
Diagonal Grade	A572-50										
Top Girts	N.A.										B
Horizontals	ROHN 3 STD			ROHN 2.5 STD			ROHN 2 STD		ROHN 1.5 STD		
Red. Horizontals	ROHN 1.5 STD						N.A.				
Red. Diagonals	ROHN 2 STD						N.A.				
Red. Hips	ROHN 1.5 STD						N.A.				
Inner Bracing	ROHN 3 STD		L3 1/2x3 1/2x1/4		L3x3x3/16	L2 1/2x2 1/2x3/16		L2x2x1/8			
Face Width (ft) 30.0417	27.8333	25.1771	22.6771	20.0417	17.5417	15.0417	12.7917	10.7083	8.625	8.54167	8.5
# Panels @ (ft)	2 @ 20.3333		2 @ 10.1667	2 @ 10.1354		6 @ 10.1042		3 @ 6.73611	3 @ 6.72917	3 @ 6.72222	2 @ 5.08333
Weight (K) 35.7	5.5	5.3	4.7	4.5	3.8	3.1	2.6	2.3	1.8	1.4	0.6



SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	ROHN 2.5 STD	B	ROHN 1.5 STD

MATERIAL STRENGTH

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

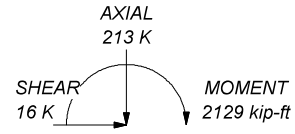
TOWER DESIGN NOTES

1. Tower is located in Middlesex County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-H Standard.
3. Tower designed for a 130 mph basic wind in accordance with the TIA-222-H Standard.
4. Tower is also designed for a 50 mph basic wind with 1.50 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Risk Category II.
7. Topographic Category 1 with Crest Height of 0.000 ft
8. TIA-222-H Annex S
9. TOWER RATING: 74.8%

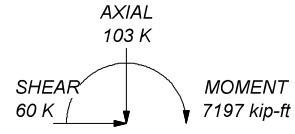
ALL REACTIONS ARE FACTORED

MAX. CORNER REACTIONS AT BASE:
DOWN: 311 K
SHEAR: 36 K

UPLIFT: -250 K
SHEAR: 32 K



TORQUE 20 kip-ft
50 mph WIND - 1.500 in ICE



TORQUE 61 kip-ft
REACTIONS - 130 mph WIND

CROWN CASTLE
The Pathway to Possible

Crown Castle
2000 Corporate Drive
Canonsburg, PA 15317
Phone: (724) 416-2000
FAX:

Job: *BU# 806869*			
Project:			
Client: Crown Castle	Drawn by: MLopienski		App'd:
Code: TIA-222-H	Date: 08/21/21		Scale: NTS
Path: C:\Work Area\806363\WO 2010266 - SA\Prod\806363_RPA.eri			Dwg No. E-1

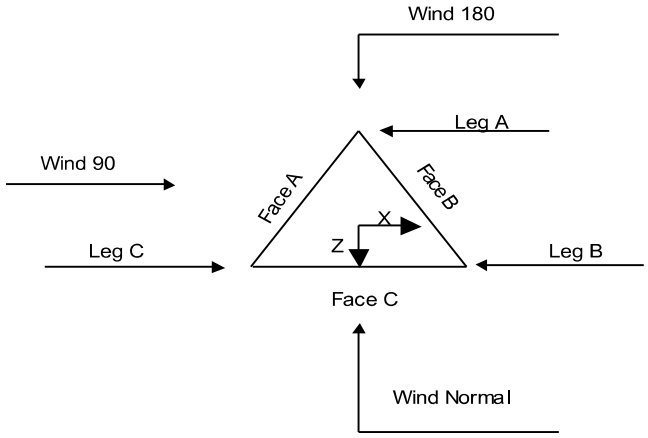
Tower Input Data

The main tower is a 3x free standing tower with an overall height of 212.625 ft above the ground line.
The base of the tower is set at an elevation of 0.000 ft above the ground line.
The face width of the tower is 8.500 ft at the top and 30.042 ft at the base.
This tower is designed using the TIA-222-H standard.
The following design criteria apply:

- Tower is located in Middlesex County, Connecticut.
- Tower base elevation above sea level: 18.950 ft.
- Basic wind speed of 130 mph.
- Risk Category II.
- Exposure Category B.
- Simplified Topographic Factor Procedure for wind speed-up calculations is used.
- Topographic Category: 1.
- Crest Height: 0.000 ft.
- Nominal ice thickness of 1.500 in.
- Ice thickness is considered to increase with height.
- Ice density of 56.000 pcf.
- A wind speed of 50 mph is used in combination with ice.
- Temperature drop of 50.000 °F.
- Deflections calculated using a wind speed of 60 mph.
- TIA-222-H Annex S.
- A non-linear (P-delta) analysis was used.
- Pressures are calculated at each section.
- Stress ratio used in tower member design is 1.
- Tower analysis based on target reliabilities in accordance with Annex S.
- Load Modification Factors used: $K_{es}(F_w) = 0.95$, $K_{es}(t_i) = 0.85$.
- Maximum demand-capacity ratio is: 1.05.
- Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

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



Triangular Tower

Tower Section Geometry

Tower Section	Tower Elevation	Assembly Database	Description	Section Width	Number of Sections	Section Length
	ft			ft		ft
T1	212.625-202.458			8.500	1	10.167
T2	202.458-182.292			8.542	1	20.167
T3	182.292-162.104			8.625	1	20.188
T4	162.104-141.896			10.708	1	20.208
T5	141.896-121.688			12.792	1	20.208
T6	121.688-101.479			15.042	1	20.208
T7	101.479-81.271			17.542	1	20.208
T8	81.271-61.000			20.042	1	20.271
T9	61.000-40.667			22.677	1	20.333
T10	40.667-20.333			25.177	1	20.333
T11	20.333-0.000			27.833	1	20.333

Tower Section Geometry *(cont'd)*

Tower Section	Tower Elevation	Diagonal Spacing	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset	Bottom Girt Offset
	ft	ft				in	in
T1	212.625-202.458	5.083	K Brace Down	No	Yes	0.000	0.000
T2	202.458-182.292	6.722	K Brace Down	No	Yes	0.000	0.000
T3	182.292-162.104	6.729	K Brace Down	No	Yes	0.000	0.000

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
T4	162.104-141.896	6.736	K Brace Down	No	Yes	0.000	0.000
T5	141.896-121.688	10.104	K Brace Down	No	Yes	0.000	0.000
T6	121.688-101.479	10.104	K Brace Down	No	Yes	0.000	0.000
T7	101.479-81.271	10.104	K Brace Down	No	Yes	0.000	0.000
T8	81.271-61.000	10.135	K Brace Down	No	Yes	0.000	0.000
T9	61.000-40.667	10.167	K Brace Down	No	Yes	0.000	0.000
T10	40.667-20.333	20.333	K1 Down	No	Yes	0.000	0.000
T11	20.333-0.000	20.333	K1 Down	No	Yes	0.000	0.000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 212.625-202.458	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)	Pipe	ROHN 2 STD	A572-50 (50 ksi)
T2 202.458-182.292	Pipe	ROHN 3 EH	A572-50 (50 ksi)	Pipe	ROHN 2 STD	A572-50 (50 ksi)
T3 182.292-162.104	Pipe	ROHN 4 EH	A572-50 (50 ksi)	Pipe	ROHN 2 STD	A572-50 (50 ksi)
T4 162.104-141.896	Pipe	ROHN 5 EH	A572-50 (50 ksi)	Pipe	ROHN 2 STD	A572-50 (50 ksi)
T5 141.896-121.688	Pipe	ROHN 6 EHS	A572-50 (50 ksi)	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)
T6 121.688-101.479	Pipe	ROHN 6 EH	A572-50 (50 ksi)	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)
T7 101.479-81.271	Pipe	ROHN 6 EH	A572-50 (50 ksi)	Pipe	ROHN 3 STD	A572-50 (50 ksi)
T8 81.271-61.000	Pipe	ROHN 8 EHS	A572-50 (50 ksi)	Pipe	ROHN 3 STD	A572-50 (50 ksi)
T9 61.000-40.667	Pipe	ROHN 8 EHS	A572-50 (50 ksi)	Pipe	ROHN 3 STD	A572-50 (50 ksi)
T10 40.667-20.333	Pipe	ROHN 8 EH	A572-50 (50 ksi)	Pipe	ROHN 3 STD	A572-50 (50 ksi)
T11 20.333-0.000	Pipe	ROHN 8 EH	A572-50 (50 ksi)	Pipe	ROHN 3 STD	A572-50 (50 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
T1 212.625-202.458	None	Single Angle		A572-50 (50 ksi)	Pipe	ROHN 1.5 STD	A572-50 (50 ksi)
T2 202.458-182.292	None	Single Angle		A572-50 (50 ksi)	Pipe	ROHN 1.5 STD	A572-50 (50 ksi)
T3 182.292-162.104	None	Single Angle		A572-50 (50 ksi)	Pipe	ROHN 1.5 STD	A572-50 (50 ksi)
T4 162.104-141.896	None	Single Angle		A572-50 (50 ksi)	Pipe	ROHN 2 STD	A572-50 (50 ksi)
T5 141.896-121.688	None	Single Angle		A572-50 (50 ksi)	Pipe	ROHN 2 STD	A572-50 (50 ksi)
T6 121.688-101.479	None	Single Angle		A572-50 (50 ksi)	Pipe	ROHN 2 STD	A572-50 (50 ksi)
T7 101.479-81.271	None	Single Angle		A572-50 (50 ksi)	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)

Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
T8 81.271-61.000	None	Single Angle		A572-50 (50 ksi)	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)
T9 61.000-40.667	None	Single Angle		A572-50 (50 ksi)	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)
T10 40.667-20.333	None	Single Angle		A572-50 (50 ksi)	Pipe	ROHN 3 STD	A572-50 (50 ksi)
T11 20.333-0.000	None	Single Angle		A572-50 (50 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
T1 212.625-202.458	Single Angle		A572-50 (50 ksi)	Equal Angle	L2x2x1/8	A36 (36 ksi)
T2 202.458-182.292	Single Angle		A572-50 (50 ksi)	Equal Angle	L2x2x1/8	A36 (36 ksi)
T3 182.292-162.104	Single Angle		A572-50 (50 ksi)	Equal Angle	L2x2x1/8	A36 (36 ksi)
T4 162.104-141.896	Single Angle		A572-50 (50 ksi)	Equal Angle	L2x2x1/8	A36 (36 ksi)
T5 141.896-121.688	Single Angle		A572-50 (50 ksi)	Equal Angle	L2x2x1/8	A36 (36 ksi)
T6 121.688-101.479	Single Angle		A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T7 101.479-81.271	Single Angle		A572-50 (50 ksi)	Equal Angle	L3x3x3/16	A36 (36 ksi)
T8 81.271-61.000	Single Angle		A572-50 (50 ksi)	Equal Angle	L3 1/2x3 1/2x1/4	A572-50 (50 ksi)
T9 61.000-40.667	Single Angle		A572-50 (50 ksi)	Equal Angle	L3 1/2x3 1/2x1/4	A572-50 (50 ksi)
T10 40.667-20.333	Single Angle		A572-50 (50 ksi)	Pipe	ROHN 3 STD	A572-50 (50 ksi)
T11 20.333-0.000	Single Angle		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
T10 40.667-20.333	A36 (36 ksi)	Horizontal (1)	Pipe	ROHN 1.5 STD	1
		Diagonal (1)	Pipe	ROHN 2 STD	1
		Hip (1)	Pipe	ROHN 1.5 STD	1
		Hip Diagonal (1)	Pipe	ROHN 2.5 STD	1
T11 20.333-0.000	A36 (36 ksi)	Horizontal (1)	Pipe	ROHN 1.5 STD	1
		Diagonal (1)	Pipe	ROHN 2 STD	1
		Hip (1)	Pipe	ROHN 1.5 STD	1
		Hip Diagonal (1)	Pipe	ROHN 2.5 STD	1

Tower Section Geometry *(cont'd)*

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals	Double Angle Stitch Bolt Spacing Horizontals	Double Angle Stitch Bolt Spacing Redundants
ft	ft^2	in					in	in	in
T1 212.625-202.458	0.000	0.000	A36 (36 ksi)	1	1	1	Mid-Pt	Mid-Pt	Mid-Pt
T2 202.458-182.292	0.000	0.000	A36 (36 ksi)	1	1	1	Mid-Pt	Mid-Pt	Mid-Pt
T3 182.292-162.104	0.000	0.000	A36 (36 ksi)	1	1	1	Mid-Pt	Mid-Pt	Mid-Pt
T4 162.104-141.896	0.000	0.000	A36 (36 ksi)	1	1	1	Mid-Pt	Mid-Pt	Mid-Pt
T5 141.896-121.688	0.000	0.000	A36 (36 ksi)	1	1	1	Mid-Pt	Mid-Pt	Mid-Pt
T6 121.688-101.479	0.000	0.000	A36 (36 ksi)	1	1	1	Mid-Pt	Mid-Pt	Mid-Pt
T7 101.479-81.271	0.000	0.000	A36 (36 ksi)	1	1	1	Mid-Pt	Mid-Pt	Mid-Pt
T8 81.271-61.000	0.000	0.000	A36 (36 ksi)	1	1	1	Mid-Pt	Mid-Pt	Mid-Pt
T9 61.000-40.667	0.000	0.000	A36 (36 ksi)	1	1	1	Mid-Pt	Mid-Pt	Mid-Pt
T10 40.667-20.333	0.000	0.000	A36 (36 ksi)	1	1	1	Mid-Pt	Mid-Pt	Mid-Pt
T11 20.333-0.000	0.000	0.000	A36 (36 ksi)	1	1	1	Mid-Pt	Mid-Pt	Mid-Pt

Tower Section Geometry *(cont'd)*

Tower Elevation	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X	X Brace Diags Y	K Brace Diags X	K Brace Diags Y	Single Diags X	Single Diags Y	Girts X	Girts Y	Horiz. X	Horiz. Y	Sec. Horiz. X	Sec. Horiz. Y	Inner Brace X	Inner Brace Y
ft																	
T1 212.625-202.458	Yes	No	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T2 202.458-182.292	Yes	No	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T3 182.292-162.104	Yes	No	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T4 162.104-141.896	Yes	No	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T5 141.896-121.688	Yes	No	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T6 121.688-101.479	Yes	No	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T7 101.479-81.271	Yes	No	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T8 81.271-61.000	Yes	No	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T9 61.000-40.667	Yes	No	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T10 40.667-20.333	No	No	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T11 20.333-0.000	No	No	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

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

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 212.625-202.458	0.000	1	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	1	0.000	0.75
T2 202.458-182.292	0.000	1	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	1	0.000	0.75
T3 182.292-162.104	0.000	1	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	1	0.000	0.75
T4 162.104-141.896	0.000	1	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	1	0.000	0.75
T5 141.896-121.688	0.000	1	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	1	0.000	0.75
T6 121.688-101.479	0.000	1	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	1	0.000	0.75
T7 101.479-81.271	0.000	1	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	1	0.000	0.75
T8 81.271-61.000	0.000	1	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	1	0.000	0.75
T9 61.000-40.667	0.000	1	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	1	0.000	0.75
T10 40.667-20.333	0.000	1	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	1	0.000	0.75
T11 20.333-0.000	0.000	1	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	1	0.000	0.75

Tower Elevation ft	Redundant Horizontal		Redundant Diagonal		Redundant Sub-Diagonal		Redundant Sub-Horizontal		Redundant Vertical		Redundant Hip		Redundant Hip Diagonal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T1 212.625-202.458	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T2 202.458-182.292	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T3 182.292-162.104	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T4 162.104-141.896	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T5 141.896-121.688	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T6 121.688-101.479	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T7 101.479-81.271	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T8 81.271-61.000	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T9 61.000-40.667	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T10 40.667-20.333	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T11 20.333-0.000	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75

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 212.625-202.458	Flange	0.750 A325N	4	0.625 A325N	3	0.625 A325N	0	0.625 A325X	0	0.625 A325X	0	0.625 A325N	2	0.625 A325X	0
T2 202.458-182.292	Flange	0.875 A325N	4	0.625 A325N	3	0.625 A325N	0	0.625 A325X	0	0.625 A325X	0	0.625 A325N	2	0.625 A325X	0
T3 182.292-162.104	Flange	1.000 A325N	4	0.625 A325N	3	0.625 A325N	0	0.625 A325X	0	0.625 A325X	0	0.625 A325N	2	0.625 A325X	0
T4 162.104-141.896	Flange	1.000 A325N	6	0.625 A325N	3	0.625 A325N	0	0.625 A325X	0	0.625 A325X	0	0.625 A325N	2	0.625 A325X	0
T5 141.896-121.688	Flange	1.000 A325N	6	0.625 A325N	3	0.625 A325N	0	0.625 A325X	0	0.625 A325X	0	0.625 A325N	2	0.625 A325X	0
T6 121.688-101.479	Flange	1.000 A325N	6	0.625 A325N	3	0.625 A325N	0	0.625 A325X	0	0.625 A325X	0	0.625 A325N	2	0.625 A325X	0
T7 101.479-81.271	Flange	1.000 A325N	8	0.625 A325N	3	0.625 A325N	0	0.625 A325X	0	0.625 A325X	0	0.625 A325N	2	0.625 A325X	0
T8 81.271-61.000	Flange	1.000 A325N	8	0.625 A325N	3	0.625 A325N	0	0.625 A325X	0	0.625 A325X	0	0.625 A325N	2	0.625 A325X	0
T9 61.000-40.667	Flange	1.000 A325N	8	0.625 A325N	3	0.625 A325N	0	0.625 A325X	0	0.625 A325X	0	0.625 A325N	2	0.625 A325X	0
T10 40.667-20.333	Flange	1.000 A325N	8	0.750 A325N	3	0.625 A325N	0	0.625 A325X	0	0.625 A325X	0	0.750 A325N	2	0.625 A325X	0
T11 20.333-0.000	Flange	1.000 A354-BC	0	0.750 A325N	3	0.625 A325N	0	0.625 A325X	0	0.625 A325X	0	0.750 A325N	2	0.625 A325X	0

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Redundant Horizontal		Redundant Diagonal		Redundant Sub-Diagonal		Redundant Sub-Horizontal		Redundant Vertical		Redundant Hip		Redundant Hip Diagonal	
	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 212.625-202.458	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0
T2 202.458-182.292	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0
T3 182.292-162.104	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0
T4 162.104-141.896	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0
T5 141.896-121.688	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0
T6 121.688-101.479	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0
T7 101.479-81.271	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0
T8 81.271-61.000	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0
T9 61.000-40.667	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0
T10 40.667-20.333	0.625 A325N	1	0.625 A325N	1	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0
T11 20.333-0.000	0.625 A325N	1	0.625 A325N	1	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 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 klf

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 klf
LDF4-50A(1/2")	A	No	No	Ar (CaAa)	51.000 - 0.000	0.000	0.46	1	1	0.630	0.630		0.000
HB114-1-08U4-M5J(1 1/4")	A	No	No	Ar (CaAa)	199.000 - 0.000	0.000	0.42	4	4	0.850 0.750	1.540		0.001
Feedline Ladder (Af) ***	A	No	No	Af (CaAa)	199.000 - 0.000	0.000	0.43	1	1	3.000	3.000		0.008
LDF5-50A(7/8")	A	No	No	Ar (CaAa)	128.000 - 0.000	0.000	-0.4	5	5	1.000	1.090		0.000
LDF5-50A(7/8")	A	No	No	Ar (CaAa)	145.000 - 128.000	0.000	-0.4	4	4	1.000	1.090		0.000
LDF5-50A(7/8")	A	No	No	Ar (CaAa)	147.000 - 145.000	0.000	-0.4	3	3	1.000	1.090		0.000
LDF5-50A(7/8")	A	No	No	Ar (CaAa)	164.000 - 147.000	0.000	-0.4	2	2	1.000	1.090		0.000
LDF5-50A(7/8") ***	A	No	No	Ar (CaAa)	167.000 - 164.000	0.000	-0.4	1	1	1.000	1.090		0.000
CR 50 1873(1-5/8")	A	No	No	Ar (CaAa)	189.000 - 0.000	0.000	-0.44	12	6	0.850 0.750	1.980		0.001
3" Conduit	A	No	No	Ar (CaAa)	189.000 - 0.000	0.000	-0.4	1	1	3.000	3.000		0.003
PWRT-608-S(13/16)	A	No	No	Ar (CaAa)	189.000 - 0.000	0.000	-0.36	2	1	0.850 0.750	0.820		0.001
LDF2-50(3/8")	A	No	No	Ar (CaAa)	189.000 - 0.000	0.000	-0.36	2	2	0.440	0.440		0.000
WR-VG86ST-BRD(3/4) ***	A	No	No	Ar (CaAa)	189.000 - 0.000	0.000	-0.35	4	2	0.850 0.750	0.795		0.001
LDF1-50A(1/4")	A	No	No	Ar (CaAa)	175.000 - 0.000	0.000	-0.47	4	2	0.345	0.345		0.000
LDF2-50(3/8")	A	No	No	Ar (CaAa)	162.000 - 0.000	0.000	-0.48	1	1	0.440	0.440		0.000
Feedline Ladder (Af) ***	A	No	No	Af (CaAa)	189.000 - 0.000	0.000	-0.4	1	1	3.000	3.000		0.008
Safety Line 3/8 ***	A	No	No	Ar (CaAa)	212.625 - 0.000	0.000	0.5	1	1	0.375	0.375		0.000
LDF6-50A(1 1/4")	B	No	No	Ar (CaAa)	139.000 - 0.000	0.000	-0.41	6	3	1.550	1.550		0.001
HCS 6X12 6AWG(1-3/8")	B	No	No	Ar (CaAa)	139.000 - 0.000	6.000	-0.41	3	3	1.380	1.380		0.002
MLE HYBRID 9POWER/18 FIBER RL 2(1-5/8)	B	No	No	Ar (CaAa)	139.000 - 0.000	0.000	-0.44	9	3	1.625	1.625		0.001
Feedline Ladder (Af) ***	B	No	No	Af (CaAa)	139.000 - 0.000	0.000	-0.45	1	1	3.000	3.000		0.008
Feedline Ladder (Af) ***	B	No	No	Af (CaAa)	175.000 - 0.000	0.000	0.4	1	1	3.000	3.000		0.008
HB158-1-08U8-S8J18(1-5/8)	C	No	No	Ar (CaAa)	208.000 - 0.000	2.000	0.45	2	2	1.980	1.980		0.001
Feedline Ladder (Af)	C	No	No	Af (CaAa)	208.000 - 0.000	0.000	0.43	1	1	3.000	3.000		0.008
Feedline Ladder (Af) ***	C	No	No	Af (CaAa)	183.000 - 0.000	0.000	-0.45	1	1	3.000	3.000		0.008
LDF4-50A(1/2")	A	No	No	Ar (CaAa)	112.000 - 0.000	0.000	-0.49	1	1	0.300	0.630		0.000
LDF4-	C	No	No	Ar (CaAa)	212.625 -	0.000	0.49	1	1	0.300	0.630		0.000

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 klf
50A(1/2") ***					0.000								
CU12PSM9P6XXX(1-1/2)	C	No	No	Ar (CaAa)	118.000 - 0.000	0.000	-0.49	1	1	1.600	1.600		0.002

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 K
T1	212.625-202.458	A	0.000	0.000	0.381	0.000	0.002
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	5.606	0.000	0.062
T2	202.458-182.292	A	0.000	0.000	44.532	0.000	0.384
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	19.694	0.000	0.231
T3	182.292-162.104	A	0.000	0.000	101.429	0.000	0.769
		B	0.000	0.000	6.448	0.000	0.108
		C	0.000	0.000	29.454	0.000	0.395
T4	162.104-141.896	A	0.000	0.000	107.984	0.000	0.787
		B	0.000	0.000	10.104	0.000	0.170
		C	0.000	0.000	29.484	0.000	0.395
T5	141.896-121.688	A	0.000	0.000	112.188	0.000	0.800
		B	0.000	0.000	67.348	0.000	0.639
		C	0.000	0.000	29.484	0.000	0.395
T6	121.688-101.479	A	0.000	0.000	114.365	0.000	0.806
		B	0.000	0.000	76.923	0.000	0.717
		C	0.000	0.000	32.127	0.000	0.434
T7	101.479-81.271	A	0.000	0.000	114.975	0.000	0.807
		B	0.000	0.000	76.923	0.000	0.717
		C	0.000	0.000	32.717	0.000	0.443
T8	81.271-61.000	A	0.000	0.000	115.331	0.000	0.810
		B	0.000	0.000	77.161	0.000	0.719
		C	0.000	0.000	32.818	0.000	0.444
T9	61.000-40.667	A	0.000	0.000	116.337	0.000	0.814
		B	0.000	0.000	77.399	0.000	0.722
		C	0.000	0.000	32.920	0.000	0.445
T10	40.667-20.333	A	0.000	0.000	116.967	0.000	0.815
		B	0.000	0.000	77.399	0.000	0.722
		C	0.000	0.000	32.920	0.000	0.445
T11	20.333-0.000	A	0.000	0.000	116.968	0.000	0.815
		B	0.000	0.000	77.399	0.000	0.722
		C	0.000	0.000	32.920	0.000	0.445

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 K
T1	212.625-202.458	A	1.532	0.000	0.000	3.497	0.000	0.039
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	15.375	0.000	0.235
T2	202.458-182.292	A	1.521	0.000	0.000	90.167	0.000	1.461
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	50.131	0.000	0.794
T3	182.292-162.104	A	1.504	0.000	0.000	196.864	0.000	3.129
		B		0.000	0.000	10.327	0.000	0.242
		C		0.000	0.000	65.528	0.000	1.152
T4	162.104-141.896	A	1.485	0.000	0.000	225.946	0.000	3.375
		B		0.000	0.000	16.108	0.000	0.375
		C		0.000	0.000	65.242	0.000	1.141

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 K
T5	141.896-121.688	A	1.464	0.000	0.000	233.619	0.000	3.459
		B		0.000	0.000	115.140	0.000	2.348
		C		0.000	0.000	64.842	0.000	1.128
T6	121.688-101.479	A	1.440	0.000	0.000	239.086	0.000	3.494
		B		0.000	0.000	131.020	0.000	2.652
		C		0.000	0.000	71.785	0.000	1.240
T7	101.479-81.271	A	1.412	0.000	0.000	240.433	0.000	3.471
		B		0.000	0.000	130.197	0.000	2.620
		C		0.000	0.000	72.781	0.000	1.247
T8	81.271-61.000	A	1.377	0.000	0.000	238.653	0.000	3.409
		B		0.000	0.000	129.587	0.000	2.589
		C		0.000	0.000	72.200	0.000	1.225
T9	61.000-40.667	A	1.331	0.000	0.000	239.493	0.000	3.360
		B		0.000	0.000	128.664	0.000	2.547
		C		0.000	0.000	71.369	0.000	1.196
T10	40.667-20.333	A	1.265	0.000	0.000	237.714	0.000	3.254
		B		0.000	0.000	126.738	0.000	2.474
		C		0.000	0.000	69.834	0.000	1.150
T11	20.333-0.000	A	1.133	0.000	0.000	227.660	0.000	2.987
		B		0.000	0.000	122.918	0.000	2.334
		C		0.000	0.000	66.790	0.000	1.060

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
T1	212.625-202.458	-5.814	2.795	-7.987	1.868
T2	202.458-182.292	-13.390	-0.764	-15.107	-1.855
T3	182.292-162.104	-16.203	5.777	-17.685	4.480
T4	162.104-141.896	-18.459	7.620	-21.364	7.048
T5	141.896-121.688	-16.450	-8.532	-20.006	-6.771
T6	121.688-101.479	-17.217	-11.023	-20.918	-8.216
T7	101.479-81.271	-18.525	-11.575	-23.249	-8.448
T8	81.271-61.000	-19.983	-12.459	-25.051	-9.170
T9	61.000-40.667	-21.829	-13.892	-27.147	-10.981
T10	40.667-20.333	-24.397	-15.783	-29.766	-13.132
T11	20.333-0.000	-26.208	-16.925	-31.594	-14.356

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T1	21	Safety Line 3/8	202.46 - 212.63	0.6000	0.6000
T1	31	HB158-1-08U8-S8J18(1-5/8)	202.46 - 208.00	0.6000	0.6000
T1	32	Feedline Ladder (Af)	202.46 - 208.00	0.6000	0.6000
T1	36	LDF4-50A(1/2")	202.46 - 212.63	0.6000	0.6000
T2	2	HB114-1-08U4-M5J(1 1/4")	182.29 - 199.00	0.6000	0.6000
T2	3	Feedline Ladder (Af)	182.29 - 199.00	0.6000	0.6000
T2	11	CR 50 1873(1-5/8")	182.29 - 189.00	0.6000	0.6000
T2	12	3" Conduit	182.29 -	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T2	13	PWRT-608-S(13/16)	189.00 182.29 - 189.00	0.0000	0.0000
T2	14	LDF2-50(3/8")	182.29 - 189.00	0.6000	0.6000
T2	15	WR-VG86ST-BRD(3/4)	182.29 - 189.00	0.6000	0.6000
T2	19	Feedline Ladder (Af)	182.29 - 189.00	0.6000	0.6000
T2	21	Safety Line 3/8	182.29 - 202.46	0.6000	0.6000
T2	31	HB158-1-08U8-S8J18(1-5/8)	182.29 - 202.46	0.6000	0.6000
T2	32	Feedline Ladder (Af)	182.29 - 202.46	0.6000	0.6000
T2	33	Feedline Ladder (Af)	182.29 - 183.00	0.6000	0.6000
T2	36	LDF4-50A(1/2")	182.29 - 202.46	0.6000	0.6000
T3	2	HB114-1-08U4-M5J(1 1/4")	162.10 - 182.29	0.6000	0.6000
T3	3	Feedline Ladder (Af)	162.10 - 182.29	0.6000	0.6000
T3	8	LDF5-50A(7/8")	162.10 - 164.00	0.6000	0.6000
T3	9	LDF5-50A(7/8")	164.00 - 167.00	0.6000	0.6000
T3	11	CR 50 1873(1-5/8")	162.10 - 182.29	0.6000	0.6000
T3	12	3" Conduit	162.10 - 182.29	0.6000	0.6000
T3	13	PWRT-608-S(13/16)	162.10 - 182.29	0.0000	0.0000
T3	14	LDF2-50(3/8")	162.10 - 182.29	0.6000	0.6000
T3	15	WR-VG86ST-BRD(3/4)	162.10 - 182.29	0.6000	0.6000
T3	17	LDF1-50A(1/4")	162.10 - 175.00	0.6000	0.6000
T3	19	Feedline Ladder (Af)	162.10 - 182.29	0.6000	0.6000
T3	21	Safety Line 3/8	162.10 - 182.29	0.6000	0.6000
T3	29	Feedline Ladder (Af)	162.10 - 175.00	0.6000	0.6000
T3	31	HB158-1-08U8-S8J18(1-5/8)	162.10 - 182.29	0.6000	0.6000
T3	32	Feedline Ladder (Af)	162.10 - 182.29	0.6000	0.6000
T3	33	Feedline Ladder (Af)	162.10 - 182.29	0.6000	0.6000
T3	36	LDF4-50A(1/2")	162.10 - 182.29	0.6000	0.6000
T4	2	HB114-1-08U4-M5J(1 1/4")	141.90 - 162.10	0.6000	0.6000
T4	3	Feedline Ladder (Af)	141.90 - 162.10	0.6000	0.6000
T4	6	LDF5-50A(7/8")	141.90 - 145.00	0.6000	0.6000
T4	7	LDF5-50A(7/8")	145.00 - 147.00	0.6000	0.6000
T4	8	LDF5-50A(7/8")	147.00 - 162.10	0.6000	0.6000
T4	11	CR 50 1873(1-5/8")	141.90 - 162.10	0.6000	0.6000
T4	12	3" Conduit	141.90 - 162.10	0.6000	0.6000
T4	13	PWRT-608-S(13/16)	141.90 - 162.10	0.0000	0.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T4	14	LDF2-50(3/8")	141.90 - 162.10	0.6000	0.6000
T4	15	WR-VG86ST-BRD(3/4)	141.90 - 162.10	0.6000	0.6000
T4	17	LDF1-50A(1/4")	141.90 - 162.10	0.6000	0.6000
T4	18	LDF2-50(3/8")	141.90 - 162.00	0.6000	0.6000
T4	19	Feedline Ladder (Af)	141.90 - 162.10	0.6000	0.6000
T4	21	Safety Line 3/8	141.90 - 162.10	0.6000	0.6000
T4	29	Feedline Ladder (Af)	141.90 - 162.10	0.6000	0.6000
T4	31	HB158-1-08U8-S8J18(1-5/8)	141.90 - 162.10	0.6000	0.6000
T4	32	Feedline Ladder (Af)	141.90 - 162.10	0.6000	0.6000
T4	33	Feedline Ladder (Af)	141.90 - 162.10	0.6000	0.6000
T4	36	LDF4-50A(1/2")	141.90 - 162.10	0.6000	0.6000
T5	2	HB114-1-08U4-M5J(1 1/4")	121.69 - 141.90	0.6000	0.6000
T5	3	Feedline Ladder (Af)	121.69 - 141.90	0.6000	0.6000
T5	5	LDF5-50A(7/8")	121.69 - 128.00	0.6000	0.6000
T5	6	LDF5-50A(7/8")	128.00 - 141.90	0.6000	0.6000
T5	11	CR 50 1873(1-5/8")	121.69 - 141.90	0.6000	0.6000
T5	12	3" Conduit	121.69 - 141.90	0.6000	0.6000
T5	13	PWRT-608-S(13/16)	121.69 - 141.90	0.0000	0.0000
T5	14	LDF2-50(3/8")	121.69 - 141.90	0.6000	0.6000
T5	15	WR-VG86ST-BRD(3/4)	121.69 - 141.90	0.6000	0.6000
T5	17	LDF1-50A(1/4")	121.69 - 141.90	0.6000	0.6000
T5	18	LDF2-50(3/8")	121.69 - 141.90	0.6000	0.6000
T5	19	Feedline Ladder (Af)	121.69 - 141.90	0.6000	0.6000
T5	21	Safety Line 3/8	121.69 - 141.90	0.6000	0.6000
T5	24	LDF6-50A(1 1/4")	121.69 - 139.00	0.6000	0.6000
T5	25	HCS 6X12 6AWG(1-3/8")	121.69 - 139.00	0.6000	0.6000
T5	26	MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	121.69 - 139.00	0.6000	0.6000
T5	27	Feedline Ladder (Af)	121.69 - 139.00	0.6000	0.6000
T5	29	Feedline Ladder (Af)	121.69 - 141.90	0.6000	0.6000
T5	31	HB158-1-08U8-S8J18(1-5/8)	121.69 - 141.90	0.6000	0.6000
T5	32	Feedline Ladder (Af)	121.69 - 141.90	0.6000	0.6000
T5	33	Feedline Ladder (Af)	121.69 - 141.90	0.6000	0.6000
T5	36	LDF4-50A(1/2")	121.69 - 141.90	0.6000	0.6000
T6	2	HB114-1-08U4-M5J(1 1/4")	101.48 - 121.69	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T6	3	Feedline Ladder (Af)	101.48 - 121.69	0.6000	0.6000
T6	5	LDF5-50A(7/8")	101.48 - 121.69	0.6000	0.6000
T6	11	CR 50 1873(1-5/8")	101.48 - 121.69	0.6000	0.6000
T6	12	3" Conduit	101.48 - 121.69	0.6000	0.6000
T6	13	PWRT-608-S(13/16)	101.48 - 121.69	0.0000	0.0000
T6	14	LDF2-50(3/8")	101.48 - 121.69	0.6000	0.6000
T6	15	WR-VG86ST-BRD(3/4)	101.48 - 121.69	0.6000	0.6000
T6	17	LDF1-50A(1/4")	101.48 - 121.69	0.6000	0.6000
T6	18	LDF2-50(3/8")	101.48 - 121.69	0.6000	0.6000
T6	19	Feedline Ladder (Af)	101.48 - 121.69	0.6000	0.6000
T6	21	Safety Line 3/8	101.48 - 121.69	0.6000	0.6000
T6	24	LDF6-50A(1 1/4")	101.48 - 121.69	0.6000	0.6000
T6	25	HCS 6X12 6AWG(1-3/8")	101.48 - 121.69	0.6000	0.6000
T6	26	MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	101.48 - 121.69	0.6000	0.6000
T6	27	Feedline Ladder (Af)	101.48 - 121.69	0.6000	0.6000
T6	29	Feedline Ladder (Af)	101.48 - 121.69	0.6000	0.6000
T6	31	HB158-1-08U8-S8J18(1-5/8)	101.48 - 121.69	0.6000	0.6000
T6	32	Feedline Ladder (Af)	101.48 - 121.69	0.6000	0.6000
T6	33	Feedline Ladder (Af)	101.48 - 121.69	0.6000	0.6000
T6	35	LDF4-50A(1/2")	101.48 - 112.00	0.6000	0.6000
T6	36	LDF4-50A(1/2")	101.48 - 121.69	0.6000	0.6000
T6	38	CU12PSM9P6XXX(1-1/2)	101.48 - 118.00	0.6000	0.6000
T7	2	HB114-1-08U4-M5J(1 1/4")	81.27 - 101.48	0.6000	0.6000
T7	3	Feedline Ladder (Af)	81.27 - 101.48	0.6000	0.6000
T7	5	LDF5-50A(7/8")	81.27 - 101.48	0.6000	0.6000
T7	11	CR 50 1873(1-5/8")	81.27 - 101.48	0.6000	0.6000
T7	12	3" Conduit	81.27 - 101.48	0.6000	0.6000
T7	13	PWRT-608-S(13/16)	81.27 - 101.48	0.0000	0.0000
T7	14	LDF2-50(3/8")	81.27 - 101.48	0.6000	0.6000
T7	15	WR-VG86ST-BRD(3/4)	81.27 - 101.48	0.6000	0.6000
T7	17	LDF1-50A(1/4")	81.27 - 101.48	0.6000	0.6000
T7	18	LDF2-50(3/8")	81.27 - 101.48	0.6000	0.6000
T7	19	Feedline Ladder (Af)	81.27 - 101.48	0.6000	0.6000
T7	21	Safety Line 3/8	81.27 - 101.48	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T7	24	LDF6-50A(1 1/4")	81.27 - 101.48	0.6000	0.6000
T7	25	HCS 6X12 6AWG(1-3/8")	81.27 - 101.48	0.6000	0.6000
T7	26	MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	81.27 - 101.48	0.6000	0.6000
T7	27	Feedline Ladder (Af)	81.27 - 101.48	0.6000	0.6000
T7	29	Feedline Ladder (Af)	81.27 - 101.48	0.6000	0.6000
T7	31	HB158-1-08U8-S8J18(1-5/8)	81.27 - 101.48	0.6000	0.6000
T7	32	Feedline Ladder (Af)	81.27 - 101.48	0.6000	0.6000
T7	33	Feedline Ladder (Af)	81.27 - 101.48	0.6000	0.6000
T7	35	LDF4-50A(1/2")	81.27 - 101.48	0.6000	0.6000
T7	36	LDF4-50A(1/2")	81.27 - 101.48	0.6000	0.6000
T7	38	CU12PSM9P6XXX(1-1/2)	81.27 - 101.48	0.6000	0.6000
T8	2	HB114-1-08U4-M5J(1 1/4")	61.00 - 81.27	0.6000	0.6000
T8	3	Feedline Ladder (Af)	61.00 - 81.27	0.6000	0.6000
T8	5	LDF5-50A(7/8")	61.00 - 81.27	0.6000	0.6000
T8	11	CR 50 1873(1-5/8")	61.00 - 81.27	0.6000	0.6000
T8	12	3" Conduit	61.00 - 81.27	0.6000	0.6000
T8	13	PWRT-608-S(13/16)	61.00 - 81.27	0.0000	0.0000
T8	14	LDF2-50(3/8")	61.00 - 81.27	0.6000	0.6000
T8	15	WR-VG86ST-BRD(3/4)	61.00 - 81.27	0.6000	0.6000
T8	17	LDF1-50A(1/4")	61.00 - 81.27	0.6000	0.6000
T8	18	LDF2-50(3/8")	61.00 - 81.27	0.6000	0.6000
T8	19	Feedline Ladder (Af)	61.00 - 81.27	0.6000	0.6000
T8	21	Safety Line 3/8	61.00 - 81.27	0.6000	0.6000
T8	24	LDF6-50A(1 1/4")	61.00 - 81.27	0.6000	0.6000
T8	25	HCS 6X12 6AWG(1-3/8")	61.00 - 81.27	0.6000	0.6000
T8	26	MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	61.00 - 81.27	0.6000	0.6000
T8	27	Feedline Ladder (Af)	61.00 - 81.27	0.6000	0.6000
T8	29	Feedline Ladder (Af)	61.00 - 81.27	0.6000	0.6000
T8	31	HB158-1-08U8-S8J18(1-5/8)	61.00 - 81.27	0.6000	0.6000
T8	32	Feedline Ladder (Af)	61.00 - 81.27	0.6000	0.6000
T8	33	Feedline Ladder (Af)	61.00 - 81.27	0.6000	0.6000
T8	35	LDF4-50A(1/2")	61.00 - 81.27	0.6000	0.6000
T8	36	LDF4-50A(1/2")	61.00 - 81.27	0.6000	0.6000
T8	38	CU12PSM9P6XXX(1-1/2)	61.00 -	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T9	1	LDF4-50A(1/2")	81.27 40.67 - 51.00	0.6000	0.6000
T9	2	HB114-1-08U4-M5J(1 1/4")	40.67 - 61.00	0.6000	0.6000
T9	3	Feedline Ladder (Af)	40.67 - 61.00	0.6000	0.6000
T9	5	LDF5-50A(7/8")	40.67 - 61.00	0.6000	0.6000
T9	11	CR 50 1873(1-5/8")	40.67 - 61.00	0.6000	0.6000
T9	12	3" Conduit	40.67 - 61.00	0.6000	0.6000
T9	13	PWRT-608-S(13/16)	40.67 - 61.00	0.0000	0.0000
T9	14	LDF2-50(3/8")	40.67 - 61.00	0.6000	0.6000
T9	15	WR-VG86ST-BRD(3/4)	40.67 - 61.00	0.6000	0.6000
T9	17	LDF1-50A(1/4")	40.67 - 61.00	0.6000	0.6000
T9	18	LDF2-50(3/8")	40.67 - 61.00	0.6000	0.6000
T9	19	Feedline Ladder (Af)	40.67 - 61.00	0.6000	0.6000
T9	21	Safety Line 3/8	40.67 - 61.00	0.6000	0.6000
T9	24	LDF6-50A(1 1/4")	40.67 - 61.00	0.6000	0.6000
T9	25	HCS 6X12 6AWG(1-3/8")	40.67 - 61.00	0.6000	0.6000
T9	26	MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	40.67 - 61.00	0.6000	0.6000
T9	27	Feedline Ladder (Af)	40.67 - 61.00	0.6000	0.6000
T9	29	Feedline Ladder (Af)	40.67 - 61.00	0.6000	0.6000
T9	31	HB158-1-08U8-S8J18(1-5/8)	40.67 - 61.00	0.6000	0.6000
T9	32	Feedline Ladder (Af)	40.67 - 61.00	0.6000	0.6000
T9	33	Feedline Ladder (Af)	40.67 - 61.00	0.6000	0.6000
T9	35	LDF4-50A(1/2")	40.67 - 61.00	0.6000	0.6000
T9	36	LDF4-50A(1/2")	40.67 - 61.00	0.6000	0.6000
T9	38	CU12PSM9P6XXX(1-1/2)	40.67 - 61.00	0.6000	0.6000
T10	1	LDF4-50A(1/2")	20.33 - 40.67	0.6000	0.6000
T10	2	HB114-1-08U4-M5J(1 1/4")	20.33 - 40.67	0.6000	0.6000
T10	3	Feedline Ladder (Af)	20.33 - 40.67	0.6000	0.6000
T10	5	LDF5-50A(7/8")	20.33 - 40.67	0.6000	0.6000
T10	11	CR 50 1873(1-5/8")	20.33 - 40.67	0.6000	0.6000
T10	12	3" Conduit	20.33 - 40.67	0.6000	0.6000
T10	13	PWRT-608-S(13/16)	20.33 - 40.67	0.0000	0.0000
T10	14	LDF2-50(3/8")	20.33 - 40.67	0.6000	0.6000
T10	15	WR-VG86ST-BRD(3/4)	20.33 - 40.67	0.6000	0.6000
T10	17	LDF1-50A(1/4")	20.33 -	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T10	18	LDF2-50(3/8")	40.67 20.33 - 40.67	0.6000	0.6000
T10	19	Feedline Ladder (Af)	20.33 - 40.67	0.6000	0.6000
T10	21	Safety Line 3/8	20.33 - 40.67	0.6000	0.6000
T10	24	LDF6-50A(1 1/4")	20.33 - 40.67	0.6000	0.6000
T10	25	HCS 6X12 6AWG(1-3/8")	20.33 - 40.67	0.6000	0.6000
T10	26	MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	20.33 - 40.67	0.6000	0.6000
T10	27	Feedline Ladder (Af)	20.33 - 40.67	0.6000	0.6000
T10	29	Feedline Ladder (Af)	20.33 - 40.67	0.6000	0.6000
T10	31	HB158-1-08U8-S8J18(1-5/8)	20.33 - 40.67	0.6000	0.6000
T10	32	Feedline Ladder (Af)	20.33 - 40.67	0.6000	0.6000
T10	33	Feedline Ladder (Af)	20.33 - 40.67	0.6000	0.6000
T10	35	LDF4-50A(1/2")	20.33 - 40.67	0.6000	0.6000
T10	36	LDF4-50A(1/2")	20.33 - 40.67	0.6000	0.6000
T10	38	CU12PSM9P6XXX(1-1/2)	20.33 - 40.67	0.6000	0.6000
T11	1	LDF4-50A(1/2")	0.00 - 20.33	0.6000	0.6000
T11	2	HB114-1-08U4-M5J(1 1/4")	0.00 - 20.33	0.6000	0.6000
T11	3	Feedline Ladder (Af)	0.00 - 20.33	0.6000	0.6000
T11	5	LDF5-50A(7/8")	0.00 - 20.33	0.6000	0.6000
T11	11	CR 50 1873(1-5/8")	0.00 - 20.33	0.6000	0.6000
T11	12	3" Conduit	0.00 - 20.33	0.6000	0.6000
T11	13	PWRT-608-S(13/16)	0.00 - 20.33	0.0000	0.0000
T11	14	LDF2-50(3/8")	0.00 - 20.33	0.6000	0.6000
T11	15	WR-VG86ST-BRD(3/4)	0.00 - 20.33	0.6000	0.6000
T11	17	LDF1-50A(1/4")	0.00 - 20.33	0.6000	0.6000
T11	18	LDF2-50(3/8")	0.00 - 20.33	0.6000	0.6000
T11	19	Feedline Ladder (Af)	0.00 - 20.33	0.6000	0.6000
T11	21	Safety Line 3/8	0.00 - 20.33	0.6000	0.6000
T11	24	LDF6-50A(1 1/4")	0.00 - 20.33	0.6000	0.6000
T11	25	HCS 6X12 6AWG(1-3/8")	0.00 - 20.33	0.6000	0.6000
T11	26	MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	0.00 - 20.33	0.6000	0.6000
T11	27	Feedline Ladder (Af)	0.00 - 20.33	0.6000	0.6000
T11	29	Feedline Ladder (Af)	0.00 - 20.33	0.6000	0.6000
T11	31	HB158-1-08U8-S8J18(1-5/8)	0.00 - 20.33	0.6000	0.6000
T11	32	Feedline Ladder (Af)	0.00 - 20.33	0.6000	0.6000
T11	33	Feedline Ladder (Af)	0.00 - 20.33	0.6000	0.6000
T11	35	LDF4-50A(1/2")	0.00 - 20.33	0.6000	0.6000
T11	36	LDF4-50A(1/2")	0.00 - 20.33	0.6000	0.6000
T11	38	CU12PSM9P6XXX(1-1/2)	0.00 - 20.33	0.6000	0.6000

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 K
Lightning Rod 5/8" x 6'	A	From Leg	0.000 0.000 3.000	0.000	213.625	No Ice 1/2" Ice 1" Ice 2" Ice	0.375 0.989 1.619 2.464	0.375 0.989 1.619 2.464	0.006 0.010 0.019 0.047
Climb Leg Extension	A	From Leg	0.000 0.000 2.000	0.000	212.625	No Ice 1/2" Ice 1" Ice 2" Ice	1.473 1.803 2.119 2.780	1.473 1.803 2.119 2.780	0.025 0.038 0.054 0.098
Flash Beacon Lighting	B	From Leg	0.000 0.000 0.500	0.000	216.625	No Ice 1/2" Ice 1" Ice 2" Ice	2.700 3.100 3.500 4.300	2.700 3.100 3.500 4.300	0.050 0.070 0.090 0.130
4' x 2" Pipe Mount	B	From Leg	0.000 0.000 2.000	0.000	212.625	No Ice 1/2" Ice 1" Ice 2" Ice	0.785 1.028 1.281 1.814	0.785 1.028 1.281 1.814	0.029 0.035 0.044 0.072
Side Lighting	A	From Leg	0.500 0.000 0.000	0.000	112.000	No Ice 1/2" Ice 1" Ice 2" Ice	0.110 0.170 0.233 0.389	0.110 0.170 0.233 0.389	0.005 0.007 0.010 0.019
Side Lighting	B	From Leg	0.500 0.000 0.000	0.000	112.000	No Ice 1/2" Ice 1" Ice 2" Ice	0.110 0.170 0.233 0.389	0.110 0.170 0.233 0.389	0.005 0.007 0.010 0.019
Side Lighting	C	From Leg	0.500 0.000 0.000	0.000	112.000	No Ice 1/2" Ice 1" Ice 2" Ice	0.110 0.170 0.233 0.389	0.110 0.170 0.233 0.389	0.005 0.007 0.010 0.019
***									
Sector Mount [SM 510-3]	C	None		0.000	208.000	No Ice 1/2" Ice 1" Ice 2" Ice	39.970 56.450 72.590 104.060	39.970 56.450 72.590 104.060	2.396 3.077 3.960 6.296
(2) LPA-80080/6CF w/ Mount Pipe	A	From Leg	4.000 0.000 1.000	0.000	208.000	No Ice 1/2" Ice 1" Ice 2" Ice	4.564 5.105 5.612 6.651	10.259 11.427 12.312 14.129	0.046 0.113 0.187 0.363
(2) LPA-80080/6CF w/ Mount Pipe	B	From Leg	4.000 0.000 1.000	0.000	208.000	No Ice 1/2" Ice 1" Ice 2" Ice	4.564 5.105 5.612 6.651	10.259 11.427 12.312 14.129	0.046 0.113 0.187 0.363
(2) LPA-80080/6CF w/ Mount Pipe	C	From Leg	4.000 0.000 1.000	0.000	208.000	No Ice 1/2" Ice 1" Ice 2" Ice	4.564 5.105 5.612 6.651	10.259 11.427 12.312 14.129	0.046 0.113 0.187 0.363
(2) JAHH-65B-R3B w/ Mount Pipe	A	From Leg	4.000 0.000 1.000	0.000	208.000	No Ice 1/2" Ice 1" Ice 2" Ice	5.500 5.970 6.450 7.440	4.380 4.840 5.300 6.260	0.096 0.169 0.254 0.457
(2) JAHH-65B-R3B w/ Mount Pipe	B	From Leg	4.000 0.000 1.000	0.000	208.000	No Ice 1/2" Ice 1" Ice	5.500 5.970 6.450 7.440	4.380 4.840 5.300 6.260	0.096 0.169 0.254 0.457

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 K
						2" Ice			
(2) JAHH-65B-R3B w/ Mount Pipe	C	From Leg	4.000 0.000 1.000	0.000	208.000	No Ice 1/2" Ice 1" Ice 2" Ice	5.500 5.970 6.450 7.440	4.380 4.840 5.300 6.260	0.096 0.169 0.254 0.457
SBNHH-1D65B w/ Mount Pipe	A	From Leg	4.000 0.000 1.000	0.000	208.000	No Ice 1/2" Ice 1" Ice 2" Ice	4.090 4.490 4.890 5.720	3.300 3.680 4.070 4.870	0.066 0.130 0.204 0.386
SBNHH-1D65B w/ Mount Pipe	B	From Leg	4.000 0.000 1.000	0.000	208.000	No Ice 1/2" Ice 1" Ice 2" Ice	4.090 4.490 4.890 5.720	3.300 3.680 4.070 4.870	0.066 0.130 0.204 0.386
SBNHH-1D65B w/ Mount Pipe	C	From Leg	4.000 0.000 1.000	0.000	208.000	No Ice 1/2" Ice 1" Ice 2" Ice	4.090 4.490 4.890 5.720	3.300 3.680 4.070 4.870	0.066 0.130 0.204 0.386
RFV01U-D2A	A	From Leg	4.000 0.000 1.000	0.000	208.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.875 2.045 2.223 2.601	1.013 1.145 1.284 1.585	0.070 0.087 0.106 0.153
RFV01U-D2A	B	From Leg	4.000 0.000 1.000	0.000	208.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.875 2.045 2.223 2.601	1.013 1.145 1.284 1.585	0.070 0.087 0.106 0.153
RFV01U-D2A	C	From Leg	4.000 0.000 1.000	0.000	208.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.875 2.045 2.223 2.601	1.013 1.145 1.284 1.585	0.070 0.087 0.106 0.153
CBC1923T-DS-43	A	From Leg	4.000 0.000 1.000	0.000	208.000	No Ice 1/2" Ice 1" Ice 2" Ice	0.316 0.389 0.469 0.651	0.230 0.294 0.366 0.531	0.008 0.012 0.016 0.030
CBC1923T-DS-43	B	From Leg	4.000 0.000 1.000	0.000	208.000	No Ice 1/2" Ice 1" Ice 2" Ice	0.316 0.389 0.469 0.651	0.230 0.294 0.366 0.531	0.008 0.012 0.016 0.030
CBC1923T-DS-43	C	From Leg	4.000 0.000 1.000	0.000	208.000	No Ice 1/2" Ice 1" Ice 2" Ice	0.316 0.389 0.469 0.651	0.230 0.294 0.366 0.531	0.008 0.012 0.016 0.030
DB-B1-6C-12AB-0Z	A	From Leg	4.000 0.000 1.000	0.000	208.000	No Ice 1/2" Ice 1" Ice 2" Ice	3.364 3.597 3.838 4.343	2.192 2.395 2.606 3.049	0.021 0.050 0.082 0.158
DB-B1-6C-12AB-0Z	B	From Leg	4.000 0.000 1.000	0.000	208.000	No Ice 1/2" Ice 1" Ice 2" Ice	3.364 3.597 3.838 4.343	2.192 2.395 2.606 3.049	0.021 0.050 0.082 0.158
RFV01U-D1A	A	From Leg	4.000 0.000 1.000	0.000	208.000	No Ice 1/2" Ice 1" Ice	1.875 2.045 2.223 2.601	1.250 1.393 1.543 1.865	0.084 0.103 0.124 0.175

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 K
						2" Ice			
RFV01U-D1A	B	From Leg	4.000 0.000 1.000	0.000	208.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.875 2.045 2.223 2.601	1.250 1.393 1.543 1.865	0.084 0.103 0.124 0.175
RFV01U-D1A	C	From Leg	4.000 0.000 1.000	0.000	208.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.875 2.045 2.223 2.601	1.250 1.393 1.543 1.865	0.084 0.103 0.124 0.175
***									
Sector Mount [SM 505-3]	C	None		0.000	199.000	No Ice 1/2" Ice 1" Ice 2" Ice	31.660 44.640 57.440 82.680	31.660 44.640 57.440 82.680	1.725 2.356 3.189 5.447
APXVSPP18-C-A20 w/ Mount Pipe	A	From Leg	4.000 0.000 -1.000	0.000	199.000	No Ice 1/2" Ice 1" Ice 2" Ice	4.600 5.050 5.500 6.440	4.010 4.450 4.890 5.820	0.095 0.160 0.235 0.419
APXVSPP18-C-A20 w/ Mount Pipe	B	From Leg	4.000 0.000 -1.000	0.000	199.000	No Ice 1/2" Ice 1" Ice 2" Ice	4.600 5.050 5.500 6.440	4.010 4.450 4.890 5.820	0.095 0.160 0.235 0.419
APXVSPP18-C-A20 w/ Mount Pipe	C	From Leg	4.000 0.000 -1.000	0.000	199.000	No Ice 1/2" Ice 1" Ice 2" Ice	4.600 5.050 5.500 6.440	4.010 4.450 4.890 5.820	0.095 0.160 0.235 0.419
APXVTM14-C-120 w/ Mount Pipe	A	From Leg	4.000 0.000 -1.000	0.000	199.000	No Ice 1/2" Ice 1" Ice 2" Ice	4.090 4.480 4.880 5.710	2.860 3.230 3.610 4.400	0.077 0.127 0.185 0.331
APXVTM14-C-120 w/ Mount Pipe	B	From Leg	4.000 0.000 -1.000	0.000	199.000	No Ice 1/2" Ice 1" Ice 2" Ice	4.090 4.480 4.880 5.710	2.860 3.230 3.610 4.400	0.077 0.127 0.185 0.331
APXVTM14-C-120 w/ Mount Pipe	C	From Leg	4.000 0.000 -1.000	0.000	199.000	No Ice 1/2" Ice 1" Ice 2" Ice	4.090 4.480 4.880 5.710	2.860 3.230 3.610 4.400	0.077 0.127 0.185 0.331
800MHz 2X50W RRH W/FILTER	A	From Leg	4.000 0.000 -1.000	0.000	199.000	No Ice 1/2" Ice 1" Ice 2" Ice	2.058 2.240 2.429 2.829	1.932 2.109 2.293 2.684	0.064 0.086 0.111 0.172
800MHz 2X50W RRH W/FILTER	B	From Leg	4.000 0.000 -1.000	0.000	199.000	No Ice 1/2" Ice 1" Ice 2" Ice	2.058 2.240 2.429 2.829	1.932 2.109 2.293 2.684	0.064 0.086 0.111 0.172
800MHz 2X50W RRH W/FILTER	C	From Leg	4.000 0.000 -1.000	0.000	199.000	No Ice 1/2" Ice 1" Ice 2" Ice	2.058 2.240 2.429 2.829	1.932 2.109 2.293 2.684	0.064 0.086 0.111 0.172
1900MHz RRH (65MHz)	A	From Leg	4.000 0.000 -1.000	0.000	199.000	No Ice 1/2" Ice Ice	2.313 2.517 2.728	2.375 2.581 2.794	0.060 0.084 0.111

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 K
						1" Ice	3.174	3.243	0.176
						2" Ice			
1900MHz RRH (65MHz)	B	From Leg	4.000 0.000 -1.000	0.000	199.000	No Ice	2.313	2.375	0.060
						1/2" Ice	2.517	2.581	0.084
						1" Ice	2.728	2.794	0.111
						2" Ice	3.174	3.243	0.176
1900MHz RRH (65MHz)	C	From Leg	4.000 0.000 -1.000	0.000	199.000	No Ice	2.313	2.375	0.060
						1/2" Ice	2.517	2.581	0.084
						1" Ice	2.728	2.794	0.111
						2" Ice	3.174	3.243	0.176
TD-RRH8x20-25	A	From Leg	4.000 0.000 -1.000	0.000	199.000	No Ice	4.045	1.535	0.070
						1/2" Ice	4.298	1.714	0.097
						1" Ice	4.557	1.901	0.128
						2" Ice	5.098	2.295	0.201
TD-RRH8x20-25	B	From Leg	4.000 0.000 -1.000	0.000	199.000	No Ice	4.045	1.535	0.070
						1/2" Ice	4.298	1.714	0.097
						1" Ice	4.557	1.901	0.128
						2" Ice	5.098	2.295	0.201
TD-RRH8x20-25	C	From Leg	4.000 0.000 -1.000	0.000	199.000	No Ice	4.045	1.535	0.070
						1/2" Ice	4.298	1.714	0.097
						1" Ice	4.557	1.901	0.128
						2" Ice	5.098	2.295	0.201
(3) Empty Mount Pipes	A	From Leg	4.000 0.000 0.000	0.000	199.000	No Ice	0.785	0.785	0.029
						1/2" Ice	1.028	1.028	0.035
						1" Ice	1.281	1.281	0.044
						2" Ice	1.814	1.814	0.072
(3) Empty Mount Pipes	B	From Leg	4.000 0.000 0.000	0.000	199.000	No Ice	0.785	0.785	0.029
						1/2" Ice	1.028	1.028	0.035
						1" Ice	1.281	1.281	0.044
						2" Ice	1.814	1.814	0.072
(3) Empty Mount Pipes	C	From Leg	4.000 0.000 0.000	0.000	199.000	No Ice	0.785	0.785	0.029
						1/2" Ice	1.028	1.028	0.035
						1" Ice	1.281	1.281	0.044
						2" Ice	1.814	1.814	0.072
***									
Sector Mount [SM 510-3]	C	None		0.000	189.000	No Ice	39.970	39.970	2.396
						1/2" Ice	56.450	56.450	3.077
						1" Ice	72.590	72.590	3.960
						2" Ice	104.060	104.060	6.296
7770.00 w/ Mount Pipe	A	From Leg	4.000 0.000 1.000	0.000	189.000	No Ice	5.746	4.254	0.055
						1/2" Ice	6.179	5.014	0.103
						1" Ice	6.607	5.711	0.157
						2" Ice	7.488	7.155	0.287
7770.00 w/ Mount Pipe	B	From Leg	4.000 0.000 1.000	0.000	189.000	No Ice	5.746	4.254	0.055
						1/2" Ice	6.179	5.014	0.103
						1" Ice	6.607	5.711	0.157
						2" Ice	7.488	7.155	0.287
7770.00 w/ Mount Pipe	C	From Leg	4.000 0.000 1.000	0.000	189.000	No Ice	5.746	4.254	0.055
						1/2" Ice	6.179	5.014	0.103
						1" Ice	6.607	5.711	0.157
						2" Ice	7.488	7.155	0.287
(2) SBNHH-1D65A w/ Mount Pipe	A	From Leg	4.000 0.000	0.000	189.000	No Ice	3.040	2.450	0.054
						1/2" Ice	3.340	2.750	0.104

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 K
			1.000			Ice	3.650	3.050	0.162
						1" Ice	4.310	3.680	0.307
						2" Ice			
(2) SBNHH-1D65A w/ Mount Pipe	B	From Leg	4.000 0.000 1.000	0.000	189.000	No Ice 1/2" Ice 1" Ice 2" Ice	3.040 3.340 3.650 4.310	2.450 2.750 3.050 3.680	0.054 0.104 0.162 0.307
(2) SBNHH-1D65A w/ Mount Pipe	C	From Leg	4.000 0.000 1.000	0.000	189.000	No Ice 1/2" Ice 1" Ice 2" Ice	3.040 3.340 3.650 4.310	2.450 2.750 3.050 3.680	0.054 0.104 0.162 0.307
7020.00	A	From Leg	4.000 0.000 1.000	0.000	189.000	No Ice 1/2" Ice 1" Ice 2" Ice	0.102 0.147 0.199 0.326	0.175 0.239 0.311 0.476	0.002 0.005 0.009 0.022
7020.00	B	From Leg	4.000 0.000 1.000	0.000	189.000	No Ice 1/2" Ice 1" Ice 2" Ice	0.102 0.147 0.199 0.326	0.175 0.239 0.311 0.476	0.002 0.005 0.009 0.022
7020.00	C	From Leg	4.000 0.000 1.000	0.000	189.000	No Ice 1/2" Ice 1" Ice 2" Ice	0.102 0.147 0.199 0.326	0.175 0.239 0.311 0.476	0.002 0.005 0.009 0.022
(2) DUAL BAND 800/1900 FULL BAND MASTHEAD	A	From Leg	4.000 0.000 1.000	0.000	189.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.328 1.473 1.625 1.951	0.693 0.808 0.930 1.197	0.027 0.038 0.052 0.086
(2) DUAL BAND 800/1900 FULL BAND MASTHEAD	B	From Leg	4.000 0.000 1.000	0.000	189.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.328 1.473 1.625 1.951	0.693 0.808 0.930 1.197	0.027 0.038 0.052 0.086
(2) DUAL BAND 800/1900 FULL BAND MASTHEAD	C	From Leg	4.000 0.000 1.000	0.000	189.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.328 1.473 1.625 1.951	0.693 0.808 0.930 1.197	0.027 0.038 0.052 0.086
RRUS 11	A	From Leg	4.000 0.000 1.000	0.000	189.000	No Ice 1/2" Ice 1" Ice 2" Ice	2.784 2.992 3.207 3.658	1.187 1.334 1.490 1.833	0.048 0.068 0.092 0.150
RRUS 11	B	From Leg	4.000 0.000 1.000	0.000	189.000	No Ice 1/2" Ice 1" Ice 2" Ice	2.784 2.992 3.207 3.658	1.187 1.334 1.490 1.833	0.048 0.068 0.092 0.150
RRUS 11	C	From Leg	4.000 0.000 1.000	0.000	189.000	No Ice 1/2" Ice 1" Ice 2" Ice	2.784 2.992 3.207 3.658	1.187 1.334 1.490 1.833	0.048 0.068 0.092 0.150
DC6-48-60-18-8F	A	From Leg	1.000 0.000 1.000	0.000	189.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.212 1.892 2.105 2.570	1.212 1.892 2.105 2.570	0.020 0.042 0.067 0.126
DC6-48-60-18-8F	C	From Leg	1.000 0.000	0.000	189.000	No Ice 1/2"	1.212 1.892	1.212 1.892	0.020 0.042

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 K
			1.000			Ice	2.105	2.105	0.067
						1" Ice	2.570	2.570	0.126
						2" Ice			
SBNHH-1D65A w/ Mount Pipe	A	From Leg	4.000 0.000 1.000	0.000	189.000	No Ice 1/2" Ice 1" Ice 2" Ice	3.040 3.340 3.650 4.310	2.450 2.750 3.050 3.680	0.054 0.104 0.162 0.307
SBNHH-1D65A w/ Mount Pipe	B	From Leg	4.000 0.000 1.000	0.000	189.000	No Ice 1/2" Ice 1" Ice 2" Ice	3.040 3.340 3.650 4.310	2.450 2.750 3.050 3.680	0.054 0.104 0.162 0.307
SBNHH-1D65A w/ Mount Pipe	C	From Leg	4.000 0.000 1.000	0.000	189.000	No Ice 1/2" Ice 1" Ice 2" Ice	3.040 3.340 3.650 4.310	2.450 2.750 3.050 3.680	0.054 0.104 0.162 0.307
RRUS 32	A	From Leg	4.000 0.000 1.000	0.000	189.000	No Ice 1/2" Ice 1" Ice 2" Ice	2.857 3.083 3.316 3.805	1.777 1.968 2.166 2.583	0.055 0.077 0.103 0.165
RRUS 32	B	From Leg	4.000 0.000 1.000	0.000	189.000	No Ice 1/2" Ice 1" Ice 2" Ice	2.857 3.083 3.316 3.805	1.777 1.968 2.166 2.583	0.055 0.077 0.103 0.165
RRUS 32	C	From Leg	4.000 0.000 1.000	0.000	189.000	No Ice 1/2" Ice 1" Ice 2" Ice	2.857 3.083 3.316 3.805	1.777 1.968 2.166 2.583	0.055 0.077 0.103 0.165
RRUS 32 B66	A	From Leg	4.000 0.000 1.000	0.000	189.000	No Ice 1/2" Ice 1" Ice 2" Ice	2.743 2.965 3.194 3.675	1.668 1.855 2.049 2.458	0.053 0.074 0.098 0.157
RRUS 32 B66	B	From Leg	4.000 0.000 1.000	0.000	189.000	No Ice 1/2" Ice 1" Ice 2" Ice	2.743 2.965 3.194 3.675	1.668 1.855 2.049 2.458	0.053 0.074 0.098 0.157
RRUS 32 B66	C	From Leg	4.000 0.000 1.000	0.000	189.000	No Ice 1/2" Ice 1" Ice 2" Ice	2.743 2.965 3.194 3.675	1.668 1.855 2.049 2.458	0.053 0.074 0.098 0.157
RRUS 32 B2	A	From Leg	4.000 0.000 1.000	0.000	189.000	No Ice 1/2" Ice 1" Ice 2" Ice	2.731 2.953 3.182 3.663	1.668 1.855 2.049 2.458	0.053 0.074 0.098 0.157
RRUS 32 B2	B	From Leg	4.000 0.000 1.000	0.000	189.000	No Ice 1/2" Ice 1" Ice 2" Ice	2.731 2.953 3.182 3.663	1.668 1.855 2.049 2.458	0.053 0.074 0.098 0.157
RRUS 32 B2	C	From Leg	4.000 0.000 1.000	0.000	189.000	No Ice 1/2" Ice 1" Ice 2" Ice	2.731 2.953 3.182 3.663	1.668 1.855 2.049 2.458	0.053 0.074 0.098 0.157
***									
Pipe Mount [PM 601-3]	C	None		0.000	183.000	No Ice	3.170	3.170	0.195

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 K
						1/2" Ice	3.790	3.790	0.232
						1" Ice	4.420	4.420	0.279
						2" Ice	5.760	5.760	0.401
APXV18-206517LS	A	From Leg	1.000 0.000 0.000	0.000	183.000	No Ice 1/2" Ice 1" Ice 2" Ice	3.830 4.430 5.050 6.320	1.810 2.380 2.970 4.180	0.028 0.054 0.085 0.166
APXV18-206517LS	B	From Leg	1.000 0.000 0.000	0.000	183.000	No Ice 1/2" Ice 1" Ice 2" Ice	3.830 4.430 5.050 6.320	1.810 2.380 2.970 4.180	0.028 0.054 0.085 0.166
APXV18-206517LS	C	From Leg	1.000 0.000 0.000	0.000	183.000	No Ice 1/2" Ice 1" Ice 2" Ice	3.830 4.430 5.050 6.320	1.810 2.380 2.970 4.180	0.028 0.054 0.085 0.166
***									
Sector Mount	C	None		0.000	175.000	No Ice 1/2" Ice 1" Ice 2" Ice	40.100 57.330 74.560 109.020	40.100 57.330 74.560 109.020	2.396 3.089 3.782 5.167
(4) DB844H90E-XY w/ Mount Pipe	A	From Leg	4.000 0.000 1.000	0.000	175.000	No Ice 1/2" Ice 1" Ice 2" Ice	2.240 2.610 2.990 3.780	3.340 3.730 4.130 4.970	0.043 0.079 0.122 0.232
(4) DB844H90E-XY w/ Mount Pipe	B	From Leg	4.000 0.000 1.000	0.000	175.000	No Ice 1/2" Ice 1" Ice 2" Ice	2.240 2.610 2.990 3.780	3.340 3.730 4.130 4.970	0.043 0.079 0.122 0.232
(4) DB844H90E-XY w/ Mount Pipe	C	From Leg	4.000 0.000 1.000	0.000	175.000	No Ice 1/2" Ice 1" Ice 2" Ice	2.240 2.610 2.990 3.780	3.340 3.730 4.130 4.970	0.043 0.079 0.122 0.232
6' x 2" Mount Pipe	C	From Face	2.000 0.000 4.000	0.000	175.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.425 1.925 2.294 3.060	1.425 1.925 2.294 3.060	0.022 0.033 0.048 0.090
6' x 2" Mount Pipe	C	From Face	2.000 0.000 4.000	0.000	175.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.425 1.925 2.294 3.060	1.425 1.925 2.294 3.060	0.022 0.033 0.048 0.090
***									
Side Arm Mount [SO 306-1]	A	From Leg	3.000 0.000 0.000	0.000	167.000	No Ice 1/2" Ice 1" Ice 2" Ice	0.410 0.810 1.230 2.080	2.260 3.830 5.480 9.370	0.042 0.062 0.094 0.187
1151-3	A	From Leg	4.000 0.000 6.000	0.000	167.000	No Ice 1/2" Ice 1" Ice 2" Ice	4.180 5.731 7.299 10.485	4.180 5.731 7.299 10.485	0.016 0.047 0.087 0.197
SD310-HL	A	From Leg	4.000 0.000 -7.000	0.000	167.000	No Ice 1/2" Ice 1" Ice	1.078 1.357 1.617 2.163	1.078 1.357 1.617 2.163	6.500 6.510 6.524 6.559

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 K
						2" Ice			
***									
Side Arm Mount [SO 306-1]	B	From Leg	3.000 0.000 0.000	0.000	164.000	No Ice 1/2" Ice 1" Ice 2" Ice	0.410 0.810 1.230 2.080	2.260 3.830 5.480 9.370	0.042 0.062 0.094 0.187
1151-3	B	From Leg	4.000 0.000 9.000	0.000	164.000	No Ice 1/2" Ice 1" Ice 2" Ice	4.180 5.731 7.299 10.485	4.180 5.731 7.299 10.485	0.016 0.047 0.087 0.197
***									
Side Arm Mount [SO 306-1]	A	From Leg	3.000 0.000 0.000	0.000	147.000	No Ice 1/2" Ice 1" Ice 2" Ice	0.410 0.810 1.230 2.080	2.260 3.830 5.480 9.370	0.042 0.062 0.094 0.187
1151-3	A	From Leg	4.000 0.000 6.000	0.000	147.000	No Ice 1/2" Ice 1" Ice 2" Ice	4.180 5.731 7.299 10.485	4.180 5.731 7.299 10.485	0.016 0.047 0.087 0.197
***									
Side Arm Mount [SO 306-1]	B	From Leg	3.000 0.000 0.000	0.000	145.000	No Ice 1/2" Ice 1" Ice 2" Ice	0.410 0.810 1.230 2.080	2.260 3.830 5.480 9.370	0.042 0.062 0.094 0.187
SD310-HL	B	From Leg	4.000 0.000 3.000	0.000	145.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.093 1.357 1.617 2.163	1.093 1.357 1.617 2.163	6.500 6.510 6.524 6.559
***									
(3) Site Pro 1 VFA12-HD	C	None		0.000	139.000	No Ice 1/2" Ice 1" Ice 2" Ice	33.640 48.170 62.700 91.760	33.640 48.170 62.700 91.760	1.690 2.255 2.820 3.949
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	A	From Leg	4.000 0.000 1.000	0.000	139.000	No Ice 1/2" Ice 1" Ice 2" Ice	3.140 3.450 3.770 4.430	2.590 2.880 3.190 3.840	0.112 0.164 0.225 0.375
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	B	From Leg	4.000 0.000 1.000	0.000	139.000	No Ice 1/2" Ice 1" Ice 2" Ice	3.140 3.450 3.770 4.430	2.590 2.880 3.190 3.840	0.112 0.164 0.225 0.375
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	C	From Leg	4.000 0.000 1.000	0.000	139.000	No Ice 1/2" Ice 1" Ice 2" Ice	3.140 3.450 3.770 4.430	2.590 2.880 3.190 3.840	0.112 0.164 0.225 0.375
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	A	From Leg	4.000 0.000 1.000	0.000	139.000	No Ice 1/2" Ice 1" Ice 2" Ice	3.140 3.450 3.770 4.430	2.590 2.880 3.190 3.840	0.111 0.163 0.224 0.374
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	B	From Leg	4.000 0.000 1.000	0.000	139.000	No Ice 1/2" Ice 1" Ice 2" Ice	3.140 3.450 3.770 4.430	2.590 2.880 3.190 3.840	0.111 0.163 0.224 0.374

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 K
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	C	From Leg	4.000 0.000 1.000	0.000	139.000	No Ice 1/2" Ice 1" Ice 2" Ice	3.140 3.450 3.770 4.430	2.590 2.880 3.190 3.840	0.111 0.163 0.224 0.374
APXVAARR24_43-U-NA20 w/ Mount Pipe	A	From Leg	4.000 0.000 1.000	0.000	139.000	No Ice 1/2" Ice 1" Ice 2" Ice	14.690 15.460 16.230 17.820	6.870 7.550 8.250 9.670	0.186 0.315 0.458 0.788
APXVAARR24_43-U-NA20 w/ Mount Pipe	B	From Leg	4.000 0.000 1.000	0.000	139.000	No Ice 1/2" Ice 1" Ice 2" Ice	14.690 15.460 16.230 17.820	6.870 7.550 8.250 9.670	0.186 0.315 0.458 0.788
APXVAARR24_43-U-NA20 w/ Mount Pipe	C	From Leg	4.000 0.000 1.000	0.000	139.000	No Ice 1/2" Ice 1" Ice 2" Ice	14.690 15.460 16.230 17.820	6.870 7.550 8.250 9.670	0.186 0.315 0.458 0.788
KRY 112 144/1	A	From Leg	4.000 0.000 1.000	0.000	139.000	No Ice 1/2" Ice 1" Ice 2" Ice	0.350 0.426 0.509 0.698	0.175 0.234 0.301 0.456	0.011 0.014 0.019 0.032
KRY 112 144/1	B	From Leg	4.000 0.000 1.000	0.000	139.000	No Ice 1/2" Ice 1" Ice 2" Ice	0.350 0.426 0.509 0.698	0.175 0.234 0.301 0.456	0.011 0.014 0.019 0.032
KRY 112 144/1	C	From Leg	4.000 0.000 1.000	0.000	139.000	No Ice 1/2" Ice 1" Ice 2" Ice	0.350 0.426 0.509 0.698	0.175 0.234 0.301 0.456	0.011 0.014 0.019 0.032
RADIO 4449 B12/B71	A	From Leg	4.000 0.000 1.000	0.000	139.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.650 1.810 1.978 2.336	1.163 1.301 1.447 1.762	0.074 0.090 0.109 0.155
RADIO 4449 B12/B71	B	From Leg	4.000 0.000 1.000	0.000	139.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.650 1.810 1.978 2.336	1.163 1.301 1.447 1.762	0.074 0.090 0.109 0.155
RADIO 4449 B12/B71	C	From Leg	4.000 0.000 1.000	0.000	139.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.650 1.810 1.978 2.336	1.163 1.301 1.447 1.762	0.074 0.090 0.109 0.155
***									
Side Arm Mount	A	From Leg	3.000 0.000 0.000	0.000	128.000	No Ice 1/2" Ice 1" Ice 2" Ice	0.980 1.700 2.420 3.860	3.030 5.220 7.410 11.790	0.053 0.079 0.105 0.156
1142-2C	A	From Leg	6.000 0.000 4.000	0.000	128.000	No Ice 1/2" Ice 1" Ice 2" Ice	2.092 3.374 4.673 7.320	2.092 3.374 4.673 7.320	0.024 0.041 0.066 0.140
***									
Side Arm Mount	C	From Leg	1.000 0.000 0.000	0.000	51.000	No Ice 1/2" Ice	0.850 1.140 1.430	1.670 2.340 3.010	0.065 0.079 0.093

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 K
						1" Ice	2.010	4.350	0.121
						2" Ice			
GPS_A	C	From Leg	2.000 0.000 0.000	0.000	51.000	No Ice	0.255	0.255	0.001
						1/2" Ice	0.320	0.320	0.005
						1" Ice	0.393	0.393	0.010
						2" Ice	0.561	0.561	0.025
***									
MX08FRO665-20 w/ Mount Pipe	A	From Leg	4.000 0.000 0.000	0.000	118.000	No Ice	8.010	4.230	0.098
						1/2" Ice	8.520	4.690	0.184
						1" Ice	9.040	5.160	0.281
						2" Ice	10.110	6.120	0.512
MX08FRO665-20 w/ Mount Pipe	B	From Leg	4.000 0.000 0.000	0.000	118.000	No Ice	8.010	4.230	0.098
						1/2" Ice	8.520	4.690	0.184
						1" Ice	9.040	5.160	0.281
						2" Ice	10.110	6.120	0.512
MX08FRO665-20 w/ Mount Pipe	C	From Leg	4.000 0.000 0.000	0.000	118.000	No Ice	8.010	4.230	0.098
						1/2" Ice	8.520	4.690	0.184
						1" Ice	9.040	5.160	0.281
						2" Ice	10.110	6.120	0.512
TA08025-B604	A	From Leg	4.000 0.000 0.000	0.000	118.000	No Ice	1.964	0.981	0.064
						1/2" Ice	2.138	1.112	0.081
						1" Ice	2.320	1.250	0.100
						2" Ice	2.705	1.548	0.148
TA08025-B604	B	From Leg	4.000 0.000 0.000	0.000	118.000	No Ice	1.964	0.981	0.064
						1/2" Ice	2.138	1.112	0.081
						1" Ice	2.320	1.250	0.100
						2" Ice	2.705	1.548	0.148
TA08025-B604	C	From Leg	4.000 0.000 0.000	0.000	118.000	No Ice	1.964	0.981	0.064
						1/2" Ice	2.138	1.112	0.081
						1" Ice	2.320	1.250	0.100
						2" Ice	2.705	1.548	0.148
TA08025-B605	A	From Leg	4.000 0.000 0.000	0.000	118.000	No Ice	1.964	1.129	0.075
						1/2" Ice	2.138	1.267	0.093
						1" Ice	2.320	1.411	0.114
						2" Ice	2.705	1.723	0.164
TA08025-B605	B	From Leg	4.000 0.000 0.000	0.000	118.000	No Ice	1.964	1.129	0.075
						1/2" Ice	2.138	1.267	0.093
						1" Ice	2.320	1.411	0.114
						2" Ice	2.705	1.723	0.164
TA08025-B605	C	From Leg	4.000 0.000 0.000	0.000	118.000	No Ice	1.964	1.129	0.075
						1/2" Ice	2.138	1.267	0.093
						1" Ice	2.320	1.411	0.114
						2" Ice	2.705	1.723	0.164
RDIDC-9181-PF-48	A	From Leg	4.000 0.000 0.000	0.000	118.000	No Ice	2.312	1.293	0.022
						1/2" Ice	2.502	1.448	0.041
						1" Ice	2.700	1.610	0.063
						2" Ice	3.118	1.957	0.117
(2) 8' x 2" Mount Pipe	A	From Leg	4.000 0.000 0.000	0.000	118.000	No Ice	1.900	1.900	0.029
						1/2" Ice	2.728	2.728	0.044
						1" Ice	3.401	3.401	0.063
						2" Ice	4.396	4.396	0.119
(2) 8' x 2" Mount Pipe	B	From Leg	4.000 0.000	0.000	118.000	No Ice	1.900	1.900	0.029
						1/2" Ice	2.728	2.728	0.044

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 K
			0.000			Ice	3.401	3.401	0.063
						1" Ice	4.396	4.396	0.119
						2" Ice			
(2) 8' x 2" Mount Pipe	C	From Leg	4.000	0.000	118.000	No Ice	1.900	1.900	0.029
			0.000			1/2" Ice	2.728	2.728	0.044
			0.000				3.401	3.401	0.063
						1" Ice	4.396	4.396	0.119
						2" Ice			
Commscope MTC3975083 (3)	C	None		0.000	118.000	No Ice	23.850	23.850	1.260
						1/2" Ice	34.120	34.120	1.803
							44.390	44.390	2.345
						1" Ice	64.930	64.930	3.431
						2" Ice			
*									
*									

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight K
HPD2-23	C	Paraboloid w/Shroud (HP)	From Leg	2.000	50.000		175.000	2.000	No Ice	3.142	0.027
				0.000					1/2" Ice	3.409	0.044
				4.000					1" Ice	3.676	0.062
									2" Ice	4.211	0.097
HPD2-23	C	Paraboloid w/Shroud (HP)	From Leg	2.000	-90.000		175.000	2.000	No Ice	3.142	0.027
				0.000					1/2" Ice	3.409	0.044
				4.000					1" Ice	3.676	0.062
									2" Ice	4.211	0.097
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Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.0 Wind 0 deg - No Ice
3	0.9 Dead+1.0 Wind 0 deg - No Ice
4	1.2 Dead+1.0 Wind 30 deg - No Ice
5	0.9 Dead+1.0 Wind 30 deg - No Ice
6	1.2 Dead+1.0 Wind 60 deg - No Ice
7	0.9 Dead+1.0 Wind 60 deg - No Ice
8	1.2 Dead+1.0 Wind 90 deg - No Ice
9	0.9 Dead+1.0 Wind 90 deg - No Ice
10	1.2 Dead+1.0 Wind 120 deg - No Ice
11	0.9 Dead+1.0 Wind 120 deg - No Ice
12	1.2 Dead+1.0 Wind 150 deg - No Ice
13	0.9 Dead+1.0 Wind 150 deg - No Ice
14	1.2 Dead+1.0 Wind 180 deg - No Ice
15	0.9 Dead+1.0 Wind 180 deg - No Ice
16	1.2 Dead+1.0 Wind 210 deg - No Ice
17	0.9 Dead+1.0 Wind 210 deg - No Ice
18	1.2 Dead+1.0 Wind 240 deg - No Ice
19	0.9 Dead+1.0 Wind 240 deg - No Ice

Comb. No.	Description
20	1.2 Dead+1.0 Wind 270 deg - No Ice
21	0.9 Dead+1.0 Wind 270 deg - No Ice
22	1.2 Dead+1.0 Wind 300 deg - No Ice
23	0.9 Dead+1.0 Wind 300 deg - No Ice
24	1.2 Dead+1.0 Wind 330 deg - No Ice
25	0.9 Dead+1.0 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice+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 K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
T1	212.625 - 202.458	Leg	Max Tension	7	0.077	-0.000	-0.000
			Max. Compression	31	-4.854	0.054	-0.003
			Max. Mx	2	-2.126	-0.377	-0.002
			Max. My	8	-1.660	-0.002	-0.393
			Max. Vy	22	1.341	-0.237	-0.001
			Max. Vx	8	-1.347	-0.002	0.223
		Diagonal	Max Tension	24	2.570	0.000	0.000
			Max. Compression	24	-2.643	0.000	0.000
			Max. Mx	38	0.564	0.042	0.000
			Max. My	2	-0.090	0.000	0.000
			Max. Vy	38	-0.025	0.000	0.000
			Max. Vx	2	-0.000	0.000	0.000
		Horizontal	Max Tension	14	1.889	-0.009	0.002
			Max. Compression	3	-1.846	-0.007	-0.002
			Max. Mx	29	-0.143	-0.027	-0.001
			Max. My	22	-0.784	-0.010	-0.005
			Max. Vy	29	-0.027	-0.027	-0.001
			Max. Vx	22	0.001	-0.010	-0.005
		Top Girt	Max Tension	14	0.223	-0.007	0.000
			Max. Compression	2	-0.222	-0.008	-0.000
			Max. Mx	29	-0.027	-0.022	-0.000
			Max. My	6	-0.080	-0.009	-0.001
			Max. Vy	29	-0.026	-0.022	-0.000
			Max. Vx	6	0.000	-0.009	-0.001
		Inner Bracing	Max Tension	2	0.003	0.000	0.000
			Max. Compression	22	-0.003	0.000	0.000
			Max. Mx	26	-0.000	-0.023	0.000
			Max. My	27	0.001	0.000	-0.000
			Max. Vy	26	0.022	0.000	0.000

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vx	27	0.000	0.000	0.000
T2	202.458 - 182.292	Leg	Max Tension	23	15.002	0.095	0.006
			Max. Compression	18	-23.458	0.228	-0.024
			Max. Mx	6	0.692	1.085	0.016
			Max. My	24	-3.270	-0.001	-1.095
			Max. Vy	6	-1.126	0.094	0.011
			Max. Vx	12	-1.146	-0.000	0.087
		Diagonal	Max Tension	4	7.763	0.000	0.000
			Max. Compression	4	-7.837	0.000	0.000
			Max. Mx	38	1.922	0.050	0.000
			Max. My	2	-0.034	0.000	0.000
			Max. Vy	38	-0.025	0.000	0.000
			Max. Vx	2	-0.000	0.000	0.000
		Horizontal	Max Tension	4	4.220	-0.012	-0.000
			Max. Compression	4	-4.183	-0.012	-0.000
			Max. Mx	37	-0.123	-0.035	-0.003
			Max. My	22	-0.765	-0.020	-0.010
			Max. Vy	37	-0.029	-0.035	-0.003
			Max. Vx	22	0.002	-0.020	-0.010
		Inner Bracing	Max Tension	10	0.005	0.000	0.000
			Max. Compression	22	-0.005	0.000	0.000
			Max. Mx	26	-0.000	-0.023	0.000
			Max. My	27	0.001	0.000	-0.000
			Max. Vy	26	0.022	0.000	0.000
			Max. Vx	27	0.000	0.000	0.000
T3	182.292 - 162.104	Leg	Max Tension	23	45.841	-0.200	-0.004
			Max. Compression	2	-68.578	-0.055	-0.007
			Max. Mx	14	41.766	0.637	-0.013
			Max. My	12	-6.173	-0.048	-0.383
			Max. Vy	6	-0.811	-0.304	-0.042
			Max. Vx	12	-0.828	-0.048	-0.383
		Diagonal	Max Tension	16	8.065	0.000	0.000
			Max. Compression	16	-8.155	0.000	0.000
			Max. Mx	38	1.571	0.067	0.000
			Max. My	2	0.405	0.000	0.000
			Max. Vy	38	-0.031	0.000	0.000
			Max. Vx	2	-0.000	0.000	0.000
		Horizontal	Max Tension	8	4.937	-0.013	-0.000
			Max. Compression	16	-5.220	-0.015	0.000
			Max. Mx	37	-0.284	-0.041	-0.002
			Max. My	22	-1.064	-0.021	-0.010
			Max. Vy	37	-0.032	-0.041	-0.002
			Max. Vx	10	-0.002	-0.002	0.009
		Inner Bracing	Max Tension	25	0.004	0.000	0.000
			Max. Compression	22	-0.006	0.000	0.000
			Max. Mx	26	-0.004	-0.031	0.000
			Max. My	27	-0.002	0.000	-0.000
			Max. Vy	26	0.025	0.000	0.000
			Max. Vx	27	0.000	0.000	0.000
T4	162.104 - 141.896	Leg	Max Tension	23	75.403	-0.318	-0.001
			Max. Compression	10	-99.947	0.859	-0.075
			Max. Mx	22	62.977	-1.638	0.027
			Max. My	12	-7.315	-0.062	-1.266
			Max. Vy	22	0.647	-1.638	0.027
			Max. Vx	13	0.262	-0.046	-1.260
		Diagonal	Max Tension	16	7.925	0.000	0.000
			Max. Compression	16	-8.031	0.000	0.000
			Max. Mx	38	1.572	0.085	0.000
			Max. My	2	0.540	0.000	0.000
			Max. Vy	38	0.037	0.000	0.000
			Max. Vx	2	-0.000	0.000	0.000
		Horizontal	Max Tension	8	5.261	-0.021	-0.001
			Max. Compression	20	-5.375	-0.024	-0.000
			Max. Mx	29	0.121	-0.068	-0.003
			Max. My	10	0.787	-0.006	0.013
			Max. Vy	29	-0.046	-0.068	-0.003

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vx	10	-0.003	-0.006	0.013
		Inner Bracing	Max Tension	11	0.005	0.000	0.000
			Max. Compression	22	-0.007	0.000	0.000
			Max. Mx	26	-0.004	-0.045	0.000
			Max. My	27	-0.003	0.000	-0.000
			Max. Vy	26	-0.030	0.000	0.000
			Max. Vx	27	0.000	0.000	0.000
T5	141.896 - 121.688	Leg	Max Tension	7	94.325	-0.890	0.130
			Max. Compression	10	-126.881	0.822	-0.010
			Max. Mx	22	72.118	-1.638	0.027
			Max. My	12	-7.893	-0.062	-1.265
			Max. Vy	22	-0.787	-1.638	0.027
			Max. Vx	12	-0.740	-0.062	-1.265
		Diagonal	Max Tension	16	10.822	0.000	0.000
			Max. Compression	16	-11.004	0.000	0.000
			Max. Mx	38	2.460	0.175	0.000
			Max. My	2	1.230	0.000	0.001
			Max. Vy	38	-0.056	0.000	0.000
			Max. Vx	2	-0.000	0.000	0.000
		Horizontal	Max Tension	22	6.538	-0.021	0.006
			Max. Compression	16	-6.543	-0.033	-0.000
			Max. Mx	29	0.038	-0.090	-0.003
			Max. My	22	-1.126	-0.053	-0.014
			Max. Vy	29	-0.052	-0.090	-0.003
			Max. Vx	22	0.002	-0.053	-0.014
		Inner Bracing	Max Tension	13	0.004	0.000	0.000
			Max. Compression	37	-0.009	0.000	0.000
			Max. Mx	26	-0.007	-0.058	0.000
			Max. My	37	-0.009	0.000	0.000
			Max. Vy	26	-0.034	0.000	0.000
			Max. Vx	27	0.000	0.000	0.000
T6	121.688 - 101.479	Leg	Max Tension	7	119.448	-0.916	0.079
			Max. Compression	10	-158.665	0.748	-0.068
			Max. Mx	6	116.192	-0.940	0.079
			Max. My	8	-20.336	-0.045	0.945
			Max. Vy	14	-0.484	-0.898	-0.076
			Max. Vx	20	-0.477	-0.043	-0.913
		Diagonal	Max Tension	16	10.982	0.000	0.000
			Max. Compression	16	-11.211	0.000	0.000
			Max. Mx	38	2.346	0.214	0.000
			Max. My	2	1.275	0.000	0.001
			Max. Vy	38	-0.064	0.000	0.000
			Max. Vx	2	-0.000	0.000	0.000
		Horizontal	Max Tension	16	7.206	-0.041	-0.000
			Max. Compression	16	-7.287	-0.041	-0.000
			Max. Mx	29	0.143	-0.107	-0.003
			Max. My	22	-1.190	-0.054	-0.014
			Max. Vy	29	-0.058	-0.107	-0.003
			Max. Vx	22	0.002	-0.054	-0.014
		Inner Bracing	Max Tension	25	0.002	0.000	0.000
			Max. Compression	37	-0.010	0.000	0.000
			Max. Mx	26	-0.008	-0.103	0.000
			Max. My	10	0.000	0.000	-0.000
			Max. Vy	26	0.051	0.000	0.000
			Max. Vx	10	0.000	0.000	0.000
T7	101.479 - 81.2708	Leg	Max Tension	23	145.899	-0.542	0.013
			Max. Compression	10	-188.671	0.687	-0.044
			Max. Mx	10	-173.600	0.748	-0.068
			Max. My	24	-16.379	-0.017	0.876
			Max. Vy	14	-0.107	-0.715	-0.116
			Max. Vx	12	-0.154	-0.022	-0.874
		Diagonal	Max Tension	16	10.921	0.000	0.000
			Max. Compression	16	-11.266	0.000	0.000
			Max. Mx	38	2.153	0.314	0.000
			Max. My	6	-1.122	0.000	0.001
			Max. Vy	38	-0.088	0.000	0.000

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vx	6	-0.000	0.000	0.000
		Horizontal	Max Tension	16	7.767	-0.086	-0.000
			Max. Compression	16	-7.767	-0.086	-0.000
			Max. Mx	37	0.005	-0.187	-0.005
			Max. My	22	-0.673	-0.114	-0.018
			Max. Vy	37	-0.087	-0.187	-0.005
			Max. Vx	22	0.002	-0.114	-0.018
		Inner Bracing	Max Tension	25	0.001	0.000	0.000
			Max. Compression	37	-0.013	0.000	0.000
			Max. Mx	26	-0.011	-0.157	0.000
			Max. My	10	-0.001	0.000	-0.000
			Max. Vy	26	0.067	0.000	0.000
			Max. Vx	10	0.000	0.000	0.000
T8	81.2708 - 61	Leg	Max Tension	23	170.775	-1.107	0.007
			Max. Compression	10	-217.042	0.645	-0.040
			Max. Mx	10	-203.275	1.114	-0.040
			Max. My	24	-19.895	-0.038	1.079
			Max. Vy	14	0.143	-1.077	-0.038
			Max. Vx	24	-0.167	-0.038	1.079
		Diagonal	Max Tension	17	10.699	0.000	0.000
			Max. Compression	16	-11.166	0.000	0.000
			Max. Mx	38	1.932	0.374	0.000
			Max. My	6	-1.316	0.000	0.000
			Max. Vy	38	-0.098	0.000	0.000
			Max. Vx	6	-0.000	0.000	0.000
		Horizontal	Max Tension	16	8.151	-0.105	-0.000
			Max. Compression	16	-8.072	-0.105	-0.000
			Max. Mx	37	0.097	-0.222	-0.004
			Max. My	22	-0.893	-0.124	-0.016
			Max. Vy	37	-0.096	-0.222	-0.004
			Max. Vx	22	0.002	-0.124	-0.016
		Inner Bracing	Max Tension	1	0.000	0.000	0.000
			Max. Compression	37	-0.015	0.000	0.000
			Max. Mx	26	-0.014	-0.250	0.000
			Max. My	10	-0.002	0.000	-0.000
			Max. Vy	26	0.094	0.000	0.000
			Max. Vx	10	-0.000	0.000	0.000
T9	61 - 40.6667	Leg	Max Tension	23	194.543	-1.538	-0.015
			Max. Compression	10	-244.630	-2.473	-0.142
			Max. Mx	10	-244.630	-2.473	-0.142
			Max. My	24	-24.713	-0.640	3.158
			Max. Vy	10	0.493	1.843	-0.008
			Max. Vx	24	-0.379	-0.640	3.158
		Diagonal	Max Tension	17	11.448	0.000	0.000
			Max. Compression	16	-11.969	0.000	0.000
			Max. Mx	38	2.056	0.432	0.000
			Max. My	6	-1.471	0.000	0.000
			Max. Vy	38	-0.107	0.000	0.000
			Max. Vx	6	-0.000	0.000	0.000
		Horizontal	Max Tension	16	9.183	-0.130	-0.000
			Max. Compression	17	-8.961	-0.098	-0.000
			Max. Mx	37	0.428	-0.267	-0.004
			Max. My	22	-0.444	-0.143	-0.016
			Max. Vy	37	-0.105	-0.267	-0.004
			Max. Vx	22	0.001	-0.143	-0.016
		Inner Bracing	Max Tension	1	0.000	0.000	0.000
			Max. Compression	37	-0.015	0.000	0.000
			Max. Mx	26	-0.014	-0.306	0.000
			Max. My	10	-0.003	0.000	-0.000
			Max. Vy	26	0.102	0.000	0.000
			Max. Vx	10	0.000	0.000	0.000
T10	40.6667 - 20.3333	Leg	Max Tension	23	204.382	1.108	0.112
			Max. Compression	10	-257.392	-7.187	-0.279
			Max. Mx	10	-257.144	8.191	0.204
			Max. My	24	-26.953	-1.338	5.176
			Max. Vy	10	1.562	8.191	0.204
			Max. Vx	24	-0.900	-1.338	5.176
		Diagonal	Max Tension	17	15.902	-0.123	0.083

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Compression	16	-16.799	0.000	0.000
			Max. Mx	6	11.695	-0.179	0.051
			Max. My	4	-16.336	-0.011	-0.099
			Max. Vy	37	-0.071	-0.171	0.003
			Max. Vx	4	-0.008	0.000	0.000
		Horizontal	Max Tension	16	8.802	-0.196	-0.000
			Max. Compression	16	-9.125	-0.198	-0.000
			Max. Mx	37	-0.425	-0.381	-0.006
			Max. My	10	1.516	-0.126	0.023
			Max. Vy	37	0.134	-0.381	-0.006
			Max. Vx	10	-0.002	-0.126	0.023
		Redund Horz 1 Bracing	Max Tension	22	1.746	0.000	0.000
			Max. Compression	5	-1.521	0.000	0.000
			Max. Mx	26	0.402	0.040	0.000
			Max. Vy	26	-0.026	0.000	0.000
		Redund Diag 1 Bracing	Max Tension	5	1.538	0.000	0.000
			Max. Compression	22	-1.490	0.000	0.000
			Max. Mx	38	-0.199	0.082	0.000
			Max. My	16	-1.361	0.000	-0.000
			Max. Vy	38	-0.028	0.000	0.000
			Max. Vx	16	0.000	0.000	0.000
		Redund Hip 1 Bracing	Max Tension	1	0.000	0.000	0.000
			Max. Compression	16	-0.044	0.000	0.000
			Max. Mx	26	-0.013	0.040	0.000
			Max. Vy	26	-0.026	0.000	0.000
		Redund Hip Diagonal 1 Bracing	Max Tension	16	0.085	0.000	0.000
			Max. Compression	38	-0.078	0.000	0.000
			Max. Mx	38	0.067	0.287	0.000
			Max. My	24	0.029	0.000	0.000
			Max. Vy	38	-0.076	0.000	0.000
			Max. Vx	24	-0.000	0.000	0.000
		Inner Bracing	Max Tension	17	0.000	0.000	0.000
			Max. Compression	34	-0.019	0.000	0.000
			Max. Mx	26	-0.016	0.326	0.000
			Max. My	10	-0.004	0.000	0.000
			Max. Vy	26	-0.104	0.000	0.000
			Max. Vx	10	-0.000	0.000	0.000
T11	20.3333 - 0	Leg	Max Tension	23	225.276	4.209	0.273
			Max. Compression	10	-283.019	-0.000	0.000
			Max. Mx	10	-282.715	7.491	0.185
			Max. My	24	-29.188	-1.339	5.174
			Max. Vy	10	-1.498	7.491	0.185
			Max. Vx	24	0.876	-1.339	5.174
		Diagonal	Max Tension	17	18.184	-0.120	0.081
			Max. Compression	16	-19.055	0.000	0.000
			Max. Mx	6	13.384	-0.180	0.050
			Max. My	4	-18.676	-0.034	-0.098
			Max. Vy	37	-0.072	-0.178	0.003
			Max. Vx	4	-0.008	0.000	0.000
		Horizontal	Max Tension	16	10.803	-0.234	-0.000
			Max. Compression	17	-10.756	-0.178	-0.000
			Max. Mx	37	0.444	-0.394	-0.006
			Max. My	22	-0.432	-0.297	-0.023
			Max. Vy	37	-0.136	-0.394	-0.006
			Max. Vx	22	0.002	-0.297	-0.023
		Redund Horz 1 Bracing	Max Tension	22	1.288	0.000	0.000
			Max. Compression	5	-1.267	0.000	0.000
			Max. Mx	34	0.409	0.045	0.000
			Max. Vy	34	-0.026	0.000	0.000
		Redund Diag 1 Bracing	Max Tension	8	1.253	0.000	0.000
			Max. Compression	23	-0.989	0.000	0.000
			Max. Mx	27	-0.203	0.089	0.000
			Max. My	18	-0.724	0.000	-0.000

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vy	27	-0.030	0.000	0.000
			Max. Vx	18	0.000	0.000	0.000
		Redund Hip 1 Bracing	Max Tension	1	0.000	0.000	0.000
			Max. Compression	16	-0.045	0.000	0.000
			Max. Mx	26	-0.010	0.045	0.000
			Max. Vy	26	-0.026	0.000	0.000
		Redund Hip Diagonal 1 Bracing	Max Tension	16	0.088	0.000	0.000
			Max. Compression	38	-0.072	0.000	0.000
			Max. Mx	37	0.063	0.310	0.000
			Max. My	2	0.042	0.000	0.000
			Max. Vy	37	-0.077	0.000	0.000
			Max. Vx	2	-0.000	0.000	0.000
		Inner Bracing	Max Tension	17	0.002	0.000	0.000
			Max. Compression	16	-0.018	0.000	0.000
			Max. Mx	26	-0.013	0.376	0.000
			Max. My	2	-0.004	0.000	0.000
			Max. Vy	26	-0.108	0.000	0.000
			Max. Vx	2	-0.000	0.000	0.000

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Leg C	Max. Vert	18	293.798	28.970	-18.033
	Max. H_x	18	293.798	28.970	-18.033
	Max. H_z	7	-237.792	-25.501	16.050
	Min. Vert	7	-237.792	-25.501	16.050
	Min. H_x	7	-237.792	-25.501	16.050
	Min. H_z	18	293.798	28.970	-18.033
Leg B	Max. Vert	10	310.904	-31.517	-17.670
	Max. H_x	23	-250.148	28.066	15.556
	Max. H_z	23	-250.148	28.066	15.556
	Min. Vert	23	-250.148	28.066	15.556
	Min. H_x	10	310.904	-31.517	-17.670
	Min. H_z	10	310.904	-31.517	-17.670
Leg A	Max. Vert	2	296.917	-1.062	33.864
	Max. H_x	21	27.815	6.462	1.935
	Max. H_z	2	296.917	-1.062	33.864
	Min. Vert	15	-232.439	1.162	-29.705
	Min. H_x	9	27.096	-6.423	1.875
	Min. H_z	15	-232.439	1.162	-29.705

Tower Mast Reaction Summary

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead Only	85.713	-0.000	0.000	-48.416	-32.879	-0.000
1.2 Dead+1.0 Wind 0 deg - No Ice	102.856	-0.047	-55.339	-6832.840	-30.706	-58.212
0.9 Dead+1.0 Wind 0 deg - No Ice	77.142	-0.047	-55.344	-6808.237	-20.652	-58.313
1.2 Dead+1.0 Wind 30 deg - No Ice	102.856	26.703	-46.257	-5754.050	-3326.159	-54.045
0.9 Dead+1.0 Wind 30 deg - No Ice	77.142	26.705	-46.261	-5730.994	-3311.256	-54.083
1.2 Dead+1.0 Wind 60 deg - No Ice	102.856	48.513	-27.901	-3453.257	-5952.462	-59.284

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
0.9 Dead+1.0 Wind 60 deg - No Ice	77.142	48.518	-27.904	-3433.625	-5933.748	-59.249
1.2 Dead+1.0 Wind 90 deg - No Ice	102.856	58.609	0.040	-50.629	-7117.406	-32.307
0.9 Dead+1.0 Wind 90 deg - No Ice	77.142	58.614	0.040	-35.965	-7097.059	-32.207
1.2 Dead+1.0 Wind 120 deg - No Ice	102.856	51.589	29.758	3534.771	-6269.272	26.568
0.9 Dead+1.0 Wind 120 deg - No Ice	77.142	51.594	29.760	3544.245	-6250.181	26.708
1.2 Dead+1.0 Wind 150 deg - No Ice	102.856	29.037	50.153	6038.501	-3573.614	60.482
0.9 Dead+1.0 Wind 150 deg - No Ice	77.142	29.040	50.158	6044.302	-3558.434	60.620
1.2 Dead+1.0 Wind 180 deg - No Ice	102.856	0.053	55.314	6711.553	-49.890	58.032
0.9 Dead+1.0 Wind 180 deg - No Ice	77.142	0.054	55.319	6716.331	-39.841	58.133
1.2 Dead+1.0 Wind 210 deg - No Ice	102.856	-26.729	46.240	5634.151	3251.332	53.828
0.9 Dead+1.0 Wind 210 deg - No Ice	77.142	-26.731	46.244	5640.478	3256.521	53.867
1.2 Dead+1.0 Wind 240 deg - No Ice	102.856	-48.480	27.930	3341.520	5866.957	59.603
0.9 Dead+1.0 Wind 240 deg - No Ice	77.142	-48.484	27.932	3351.252	5868.353	59.569
1.2 Dead+1.0 Wind 270 deg - No Ice	102.856	-58.588	-0.057	-69.388	7033.925	32.320
0.9 Dead+1.0 Wind 270 deg - No Ice	77.142	-58.592	-0.057	-54.675	7033.683	32.220
1.2 Dead+1.0 Wind 300 deg - No Ice	102.856	-51.583	-29.768	-3653.293	6188.609	-26.591
0.9 Dead+1.0 Wind 300 deg - No Ice	77.142	-51.587	-29.771	-3633.390	6189.619	-26.732
1.2 Dead+1.0 Wind 330 deg - No Ice	102.856	-29.031	-50.162	-6156.676	3493.111	-60.539
0.9 Dead+1.0 Wind 330 deg - No Ice	77.142	-29.034	-50.166	-6133.103	3498.033	-60.676
1.2 Dead+1.0 Ice+1.0 Temp	213.078	0.000	0.001	-125.720	112.747	0.002
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	213.078	0.004	-15.267	-2005.686	112.564	-19.690
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	213.078	7.529	-13.000	-1728.599	-815.347	-18.031
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	213.078	13.325	-7.664	-1064.081	-1519.415	-16.261
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	213.078	15.960	-0.005	-126.971	-1827.372	-7.696
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	213.078	14.042	8.079	854.180	-1592.508	7.755
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	213.078	7.945	13.719	1549.236	-858.018	18.595
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	213.078	-0.003	15.257	1751.218	113.337	19.657
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	213.078	-7.534	12.998	1475.489	1042.380	17.992
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	213.078	-13.318	7.670	812.527	1744.450	16.321
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	213.078	-15.956	0.003	-126.128	2052.773	7.696
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	213.078	-14.041	-8.080	-1106.944	1818.326	-7.759
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	213.078	-7.943	-13.720	-1802.039	1083.941	-18.608
Dead+Wind 0 deg - Service	85.713	-0.011	-12.908	-1604.196	-30.996	-13.073
Dead+Wind 30 deg - Service	85.713	6.237	-10.805	-1357.425	-788.271	-12.127
Dead+Wind 60 deg - Service	85.713	11.311	-6.506	-828.097	-1390.555	-13.298
Dead+Wind 90 deg - Service	85.713	13.641	0.009	-46.799	-1656.615	-7.235
Dead+Wind 120 deg - Service	85.713	12.000	6.923	775.402	-1461.515	5.976

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
Dead+Wind 150 deg - Service	85.713	6.761	11.679	1350.202	-843.748	13.583
Dead+Wind 180 deg - Service	85.713	0.012	12.903	1506.072	-35.331	13.029
Dead+Wind 210 deg - Service	85.713	-6.243	10.801	1259.620	723.229	12.079
Dead+Wind 240 deg - Service	85.713	-11.304	6.513	732.096	1323.098	13.366
Dead+Wind 270 deg - Service	85.713	-13.637	-0.013	-50.994	1589.638	7.238
Dead+Wind 300 deg - Service	85.713	-11.999	-6.924	-872.903	1395.160	-5.983
Dead+Wind 330 deg - Service	85.713	-6.760	-11.680	-1447.640	777.384	-13.595

Solution Summary

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX	PY	PZ	PX	PY	PZ	
	K	K	K	K	K	K	
1	0.000	-85.713	0.000	0.000	85.713	-0.000	0.000%
2	-0.047	-102.856	-55.358	0.047	102.856	55.339	0.016%
3	-0.047	-77.142	-55.358	0.047	77.142	55.344	0.015%
4	26.712	-102.856	-46.273	-26.703	102.856	46.257	0.016%
5	26.712	-77.142	-46.273	-26.705	77.142	46.261	0.014%
6	48.529	-102.856	-27.910	-48.513	102.856	27.901	0.016%
7	48.529	-77.142	-27.910	-48.518	77.142	27.904	0.014%
8	58.628	-102.856	0.040	-58.609	102.856	-0.040	0.016%
9	58.628	-77.142	0.040	-58.614	77.142	-0.040	0.015%
10	51.606	-102.856	29.767	-51.589	102.856	-29.758	0.016%
11	51.606	-77.142	29.767	-51.594	77.142	-29.760	0.015%
12	29.047	-102.856	50.169	-29.037	102.856	-50.153	0.016%
13	29.047	-77.142	50.169	-29.040	77.142	-50.158	0.014%
14	0.054	-102.856	55.332	-0.053	102.856	-55.314	0.015%
15	0.054	-77.142	55.332	-0.054	77.142	-55.319	0.014%
16	-26.738	-102.856	46.255	26.729	102.856	-46.240	0.015%
17	-26.738	-77.142	46.255	26.731	77.142	-46.244	0.014%
18	-48.496	-102.856	27.939	48.480	102.856	-27.930	0.015%
19	-48.496	-77.142	27.939	48.484	77.142	-27.932	0.014%
20	-58.606	-102.856	-0.057	58.588	102.856	0.057	0.016%
21	-58.606	-77.142	-0.057	58.592	77.142	0.057	0.014%
22	-51.599	-102.856	-29.778	51.583	102.856	29.768	0.016%
23	-51.599	-77.142	-29.778	51.587	77.142	29.771	0.014%
24	-29.040	-102.856	-50.179	29.031	102.856	50.162	0.016%
25	-29.040	-77.142	-50.179	29.034	77.142	50.166	0.015%
26	0.000	-213.078	0.000	-0.000	213.078	-0.001	0.000%
27	0.004	-213.078	-15.272	-0.004	213.078	15.267	0.002%
28	7.531	-213.078	-13.005	-7.529	213.078	13.000	0.002%
29	13.328	-213.078	-7.666	-13.325	213.078	7.664	0.002%
30	15.965	-213.078	-0.006	-15.960	213.078	0.005	0.002%
31	14.046	-213.078	8.081	-14.042	213.078	-8.079	0.002%
32	7.947	-213.078	13.723	-7.945	213.078	-13.719	0.002%
33	-0.003	-213.078	15.267	0.003	213.078	-15.257	0.005%
34	-7.536	-213.078	13.001	7.534	213.078	-12.998	0.002%
35	-13.322	-213.078	7.672	13.318	213.078	-7.670	0.002%
36	-15.961	-213.078	0.002	15.956	213.078	-0.003	0.002%
37	-14.045	-213.078	-8.083	14.041	213.078	8.080	0.002%
38	-7.946	-213.078	-13.725	7.943	213.078	13.720	0.002%
39	-0.010	-85.713	-12.912	0.011	85.713	12.908	0.004%
40	6.239	-85.713	-10.808	-6.237	85.713	10.805	0.004%
41	11.314	-85.713	-6.508	-11.311	85.713	6.506	0.004%
42	13.645	-85.713	0.009	-13.641	85.713	-0.009	0.004%
43	12.004	-85.713	6.924	-12.000	85.713	-6.923	0.004%
44	6.763	-85.713	11.682	-6.761	85.713	-11.679	0.004%
45	0.012	-85.713	12.906	-0.012	85.713	-12.903	0.004%
46	-6.245	-85.713	10.804	6.243	85.713	-10.801	0.003%

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
47	-11.306	-85.713	6.514	11.304	85.713	-6.513	0.004%
48	-13.640	-85.713	-0.013	13.637	85.713	0.013	0.004%
49	-12.002	-85.713	-6.927	11.999	85.713	6.924	0.004%
50	-6.761	-85.713	-11.684	6.760	85.713	11.680	0.004%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00008149
2	Yes	4	0.00036003	0.00088966
3	Yes	4	0.00026909	0.00067269
4	Yes	4	0.00035338	0.00087389
5	Yes	4	0.00026238	0.00065651
6	Yes	4	0.00034494	0.00085297
7	Yes	4	0.00025412	0.00063551
8	Yes	4	0.00035196	0.00086953
9	Yes	4	0.00026120	0.00065243
10	Yes	4	0.00035929	0.00088677
11	Yes	4	0.00026865	0.00067052
12	Yes	4	0.00035062	0.00086468
13	Yes	4	0.00026043	0.00064992
14	Yes	4	0.00034223	0.00084308
15	Yes	4	0.00025237	0.00062972
16	Yes	4	0.00035100	0.00086374
17	Yes	4	0.00026085	0.00065065
18	Yes	4	0.00035929	0.00088364
19	Yes	4	0.00026885	0.00066991
20	Yes	4	0.00035072	0.00086321
21	Yes	4	0.00026065	0.00064945
22	Yes	4	0.00034142	0.00084176
23	Yes	4	0.00025162	0.00062763
24	Yes	4	0.00035055	0.00086550
25	Yes	4	0.00026022	0.00064988
26	Yes	4	0.00000001	0.00011352
27	Yes	5	0.00000001	0.00045816
28	Yes	5	0.00000001	0.00044881
29	Yes	5	0.00000001	0.00043858
30	Yes	5	0.00000001	0.00043042
31	Yes	5	0.00000001	0.00041999
32	Yes	5	0.00000001	0.00040532
33	Yes	4	0.00070195	0.00099524
34	Yes	5	0.00000001	0.00040103
35	Yes	5	0.00000001	0.00041861
36	Yes	5	0.00000001	0.00043778
37	Yes	5	0.00000001	0.00045210
38	Yes	5	0.00000001	0.00045968
39	Yes	4	0.00000001	0.00061263
40	Yes	4	0.00000001	0.00061257
41	Yes	4	0.00000001	0.00061325
42	Yes	4	0.00000001	0.00061521
43	Yes	4	0.00000001	0.00061019
44	Yes	4	0.00000001	0.00059103
45	Yes	4	0.00000001	0.00056798
46	Yes	4	0.00000001	0.00055815
47	Yes	4	0.00000001	0.00056737
48	Yes	4	0.00000001	0.00057694
49	Yes	4	0.00000001	0.00058745
50	Yes	4	0.00000001	0.00060250

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	212.625 - 202.458	3.361	42	0.140	0.032
T2	202.458 - 182.292	3.067	42	0.139	0.032
T3	182.292 - 162.104	2.479	42	0.133	0.031
T4	162.104 - 141.896	1.927	42	0.119	0.026
T5	141.896 - 121.688	1.435	42	0.103	0.021
T6	121.688 - 101.479	1.035	42	0.083	0.017
T7	101.479 - 81.2708	0.704	42	0.067	0.013
T8	81.2708 - 61	0.451	43	0.050	0.010
T9	61 - 40.6667	0.258	43	0.036	0.008
T10	40.6667 - 20.3333	0.122	49	0.021	0.005
T11	20.3333 - 0	0.041	49	0.011	0.003

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
216.625	Flash Beacon Lighting	42	3.361	0.140	0.032	340128
213.625	Lightning Rod 5/8" x 6'	42	3.361	0.140	0.032	340128
212.625	Climb Leg Extension	42	3.361	0.140	0.032	340128
208.000	Sector Mount [SM 510-3]	42	3.228	0.140	0.032	340128
199.000	Sector Mount [SM 505-3]	42	2.966	0.139	0.032	332936
189.000	Sector Mount [SM 510-3]	42	2.673	0.136	0.032	176315
183.000	Pipe Mount [PM 601-3]	42	2.499	0.134	0.031	98068
179.000	HPD2-23	42	2.386	0.132	0.031	85756
175.000	Sector Mount	42	2.274	0.129	0.030	72437
167.000	Side Arm Mount [SO 306-1]	42	2.056	0.123	0.028	54862
164.000	Side Arm Mount [SO 306-1]	42	1.977	0.121	0.027	50626
147.000	Side Arm Mount [SO 306-1]	42	1.551	0.107	0.022	50235
145.000	Side Arm Mount [SO 306-1]	42	1.505	0.105	0.022	48577
139.000	(3) Site Pro 1 VFA12-HD	42	1.372	0.100	0.021	48105
128.000	Side Arm Mount	42	1.151	0.089	0.018	67981
118.000	MX08FRO665-20 w/ Mount Pipe	42	0.969	0.080	0.016	78888
112.000	Side Lighting	42	0.867	0.075	0.015	69535
51.000	Side Arm Mount	49	0.184	0.028	0.007	84857

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	212.625 - 202.458	14.140	10	0.570	0.142
T2	202.458 - 182.292	12.920	10	0.569	0.143
T3	182.292 - 162.104	10.474	10	0.541	0.139
T4	162.104 - 141.896	8.193	10	0.484	0.117
T5	141.896 -	6.160	10	0.421	0.095

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
	121.688				
T6	121.688 - 101.479	4.469	10	0.347	0.076
T7	101.479 - 81.2708	3.051	10	0.283	0.058
T8	81.2708 - 61	1.955	10	0.215	0.046
T9	61 - 40.6667	1.117	10	0.154	0.035
T10	40.6667 - 20.3333	0.523	22	0.092	0.023
T11	20.3333 - 0	0.175	23	0.046	0.011

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
216.625	Flash Beacon Lighting	10	14.140	0.570	0.142	77912
213.625	Lightning Rod 5/8" x 6'	10	14.140	0.570	0.142	77912
212.625	Climb Leg Extension	10	14.140	0.570	0.142	77912
208.000	Sector Mount [SM 510-3]	10	13.587	0.570	0.142	77912
199.000	Sector Mount [SM 505-3]	10	12.500	0.567	0.143	74684
189.000	Sector Mount [SM 510-3]	10	11.280	0.554	0.142	42229
183.000	Pipe Mount [PM 601-3]	10	10.558	0.543	0.140	22884
179.000	HPD2-23	10	10.087	0.533	0.137	20490
175.000	Sector Mount	10	9.625	0.523	0.133	19145
167.000	Side Arm Mount [SO 306-1]	10	8.726	0.499	0.123	16975
164.000	Side Arm Mount [SO 306-1]	10	8.398	0.490	0.120	16295
147.000	Side Arm Mount [SO 306-1]	10	6.642	0.438	0.100	13478
145.000	Side Arm Mount [SO 306-1]	10	6.450	0.431	0.098	12937
139.000	(3) Site Pro 1 VFA12-HD	10	5.897	0.411	0.092	13005
128.000	Side Arm Mount	10	4.965	0.370	0.081	17672
118.000	MX08FRO665-20 w/ Mount Pipe	10	4.190	0.335	0.072	19903
112.000	Side Lighting	10	3.753	0.316	0.067	16961
51.000	Side Arm Mount	22	0.794	0.122	0.029	19696

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load per Bolt K	Ratio Load / Allowable	Allowable Ratio	Criteria
T1	212.625	Leg	A325N	0.750	4	0.405	30.101	0.013	1.05	Bolt Tension
		Diagonal	A325N	0.625	3	0.881	13.806	0.064	1.05	Bolt Shear
		Horizontal	A325N	0.625	2	0.945	13.806	0.068	1.05	Bolt Shear
T2	202.458	Leg	A325N	0.875	4	3.751	41.556	0.090	1.05	Bolt Tension
		Diagonal	A325N	0.625	3	2.612	13.806	0.189	1.05	Bolt Shear
		Horizontal	A325N	0.625	2	2.110	13.806	0.153	1.05	Bolt Shear
T3	182.292	Leg	A325N	1.000	4	11.460	54.517	0.210	1.05	Bolt Tension
		Diagonal	A325N	0.625	3	2.718	13.806	0.197	1.05	Bolt Shear
		Horizontal	A325N	0.625	2	2.610	13.806	0.189	1.05	Bolt Shear
T4	162.104	Leg	A325N	1.000	6	12.567	54.517	0.231	1.05	Bolt Tension
		Diagonal	A325N	0.625	3	2.677	13.806	0.194	1.05	Bolt Shear
		Horizontal	A325N	0.625	2	2.688	13.806	0.195	1.05	Bolt Shear
T5	141.896	Leg	A325N	1.000	6	15.721	54.517	0.288	1.05	Bolt Tension
		Diagonal	A325N	0.625	3	3.668	13.806	0.266	1.05	Bolt Shear
		Horizontal	A325N	0.625	2	3.272	13.806	0.237	1.05	Bolt Shear
T6	121.688	Leg	A325N	1.000	6	19.908	54.517	0.365	1.05	Bolt Tension
		Diagonal	A325N	0.625	3	3.737	13.806	0.271	1.05	Bolt Shear
		Horizontal	A325N	0.625	2	3.643	13.806	0.264	1.05	Bolt Shear
T7	101.479	Leg	A325N	1.000	8	18.237	54.517	0.335	1.05	Bolt Tension
		Diagonal	A325N	0.625	3	3.755	13.806	0.272	1.05	Bolt Shear

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load per Bolt K	Ratio Load / Allowable	Allowable Ratio	Criteria
		Horizontal	A325N	0.625	2	3.883	13.806	0.281	1.05	Bolt Shear
T8	81.2708	Leg	A325N	1.000	8	21.347	54.517	0.392	1.05	Bolt Tension
		Diagonal	A325N	0.625	3	3.722	13.806	0.270	1.05	Bolt Shear
		Horizontal	A325N	0.625	2	4.076	13.806	0.295	1.05	Bolt Shear
T9	61	Leg	A325N	1.000	8	24.318	54.517	0.446	1.05	Bolt Tension
		Diagonal	A325N	0.625	3	3.990	13.806	0.289	1.05	Bolt Shear
		Horizontal	A325N	0.625	2	4.591	13.806	0.333	1.05	Bolt Shear
T10	40.6667	Leg	A325N	1.000	8	25.492	54.517	0.468	1.05	Bolt Tension
		Diagonal	A325N	0.750	3	5.600	19.880	0.282	1.05	Bolt Shear
		Horizontal	A325N	0.750	2	4.563	19.880	0.229	1.05	Bolt Shear
		Redund Horz 1 Bracing	A325N	0.625	1	4.468	12.110	0.369	1.05	Member Bearing
		Redund Diag 1 Bracing	A325N	0.625	1	4.127	12.862	0.321	1.05	Member Bearing
T11	20.3333	Diagonal	A325N	0.750	3	6.352	19.880	0.319	1.05	Bolt Shear
		Horizontal	A325N	0.750	2	5.402	19.880	0.272	1.05	Bolt Shear
		Redund Horz 1 Bracing	A325N	0.625	1	4.909	12.110	0.405	1.05	Member Bearing
		Redund Diag 1 Bracing	A325N	0.625	1	4.240	12.862	0.330	1.05	Member Bearing

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	212.625 - 202.458	ROHN 2.5 STD	10.167	5.083	64.4 K=1.00	1.704	-4.854	56.631	0.086 [1]
T2	202.458 - 182.292	ROHN 3 EH	20.167	6.722	71.0 K=1.00	3.016	-23.458	93.888	0.250 [1]
T3	182.292 - 162.104	ROHN 4 EH	20.223	6.741	54.8 K=1.00	4.407	-68.578	159.259	0.431 [1]
T4	162.104 - 141.896	ROHN 5 EH	20.244	6.748	44.0 K=1.00	6.112	-99.947	238.686	0.419 [1]
T5	141.896 - 121.688	ROHN 6 EHS	20.250	10.125	54.6 K=1.00	6.713	-126.881	242.933	0.522 [1]
T6	121.688 - 101.479	ROHN 6 EH	20.260	10.130	55.4 K=1.00	8.405	-158.665	302.237	0.525 [1]
T7	101.479 - 81.2708	ROHN 6 EH	20.260	10.130	55.4 K=1.00	8.405	-188.671	302.237	0.624 [1]
T8	81.2708 - 61	ROHN 8 EHS	20.328	10.164	41.8 K=1.00	9.719	-217.042	384.981	0.564 [1]
T9	61 - 40.6667	ROHN 8 EHS	20.384	10.192	41.9 K=1.00	9.719	-244.630	384.707	0.636 [1]
T10	40.6667 - 20.3333	ROHN 8 EH	20.391	10.196	42.5 K=1.00	12.763	-257.392	503.236	0.511 [1]
T11	20.3333 - 0	ROHN 8 EH	20.373	10.187	42.5 K=1.00	12.763	-283.019	503.352	0.562 [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 K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	212.625 - 202.458	ROHN 2 STD	6.639	6.453	98.4 K=1.00	1.075	-2.643	23.829	0.111 [1]
T2	202.458 - 182.292	ROHN 2 STD	7.987	7.717	117.6 K=1.00	1.075	-7.837	17.541	0.447 [1]
T3	182.292 - 162.104	ROHN 2 STD	8.602	8.301	126.5 K=1.00	1.075	-8.155	15.159	0.538 [1]
T4	162.104 - 141.896	ROHN 2 STD	9.291	8.954	136.5 K=1.00	1.075	-7.736	13.026	0.594 [1]
T5	141.896 - 121.688	ROHN 2.5 STD	12.600	12.138	153.7 K=1.00	1.704	-11.004	16.287	0.676 [1]
T6	121.688 - 101.479	ROHN 2.5 STD	13.385	12.964	164.2 K=1.00	1.704	-11.211	14.278	0.785 [1]
T7	101.479 - 81.2708	ROHN 3 STD	14.235	13.843	142.8 K=1.00	2.228	-11.266	24.700	0.456 [1]
T8	81.2708 - 61	ROHN 3 STD	15.213	14.731	151.9 K=1.00	2.228	-11.166	21.813	0.512 [1]
T9	61 - 40.6667	ROHN 3 STD	16.185	15.723	162.2 K=1.00	2.228	-11.969	19.146	0.625 [1]
T10	40.6667 - 20.3333	ROHN 3 STD	24.652	12.326	127.1 K=1.00	2.228	-16.799	31.156	0.539 [1]
T11	20.3333 - 0	ROHN 3 STD	25.288	12.644	130.4 K=1.00	2.228	-19.055	29.608	0.644 [1]

[1] P_u / ϕP_n controls

Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	212.625 - 202.458	ROHN 1.5 STD	8.521	4.141	79.8 K=1.00	0.799	-1.846	22.582	0.082 [1]
T2	202.458 - 182.292	ROHN 1.5 STD	8.597	4.153	80.0 K=1.00	0.799	-4.183	22.520	0.186 [1]
T3	182.292 - 162.104	ROHN 1.5 STD	10.014	4.819	92.9 K=1.00	0.799	-5.220	19.143	0.273 [1]
T4	162.104 - 141.896	ROHN 2 STD	12.097	5.817	88.7 K=1.00	1.075	-5.375	27.209	0.198 [1]
T5	141.896 - 121.688	ROHN 2 STD	13.917	6.682	101.9 K=1.00	1.075	-6.543	22.640	0.289 [1]
T6	121.688 - 101.479	ROHN 2 STD	16.292	7.870	120.0 K=1.00	1.075	-7.287	16.864	0.432 [1]
T7	101.479 - 81.2708	ROHN 2.5 STD	18.792	9.120	115.5 K=1.00	1.704	-7.767	28.852	0.269 [1]
T8	81.2708 - 61	ROHN 2.5 STD	21.359	10.320	130.7 K=1.00	1.704	-8.072	22.530	0.358 [1]
T9	61 - 40.6667	ROHN 2.5 STD	23.927	11.604	147.0 K=1.00	1.704	-8.961	17.820	0.503 [1]
T10	40.6667 - 20.3333	ROHN 3 STD	25.177	12.229	126.1 K=1.00	2.228	-9.125	31.651	0.288 [1]
T11	20.3333 - 0	ROHN 3 STD	27.833	13.557	139.8 K=1.00	2.228	-10.756	25.753	0.418 [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 K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	212.625 - 202.458	ROHN 1.5 STD	8.500	4.130	79.6 K=1.00	0.799	-0.222	22.635	0.010 [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 K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T10	40.6667 - 20.3333	ROHN 1.5 STD	6.294	5.935	114.4 K=1.00	0.799	-4.468	13.007	0.343 [1]
T11	20.3333 - 0	ROHN 1.5 STD	6.958	6.599	127.2 K=1.00	0.799	-4.909	11.053	0.444 [1]

[1] P_u / ϕP_n controls

Redundant Diagonal (1) Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T10	40.6667 - 20.3333	ROHN 2 STD	11.628	10.887	166.0 K=1.00	1.075	-4.127	8.811	0.468 [1]
T11	20.3333 - 0	ROHN 2 STD	12.021	11.347	173.0 K=1.00	1.075	-4.240	8.111	0.523 [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 K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T10	40.6667 - 20.3333	ROHN 1.5 STD	6.294	6.294	121.3 K=1.00	0.799	-0.044	11.936	0.004 [1]
T11	20.3333 - 0	ROHN 1.5 STD	6.958	6.958	134.1 K=1.00	0.799	-0.045	10.041	0.004 [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 K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T10	40.6667 - 20.3333	ROHN 2.5 STD	15.204	15.204	192.6 K=1.00	1.704	-0.078	10.381	0.008 [1]
T11	20.3333 - 0	ROHN 2.5 STD	16.022	16.022	202.9 K=1.00	1.704	-0.072	9.348	0.008 [1]

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

[1] $P_u / \phi P_n$ controls

Inner Bracing Design Data (Compression)

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	K	K	
T1	212.625 - 202.458	L2x2x1/8	4.260	4.260	128.6 K=1.00	0.484	-0.003	8.383	0.000 [1]
T2	202.458 - 182.292	L2x2x1/8	4.299	4.299	129.8 K=1.00	0.484	-0.005	8.234	0.001 [1]
T3	182.292 - 162.104	L2x2x1/8	5.007	5.007	151.1 K=1.00	0.484	-0.006	6.069	0.001 [1]
T4	162.104 - 141.896	L2x2x1/8	6.049	6.049	182.6 K=1.00	0.484	-0.006	4.159	0.001 [1]
T5	141.896 - 121.688	L2x2x1/8	6.958	6.958	210.0 K=1.00	0.484	-0.009	3.142	0.003 [1]
T6	121.688 - 101.479	L2 1/2x2 1/2x3/16	8.146	8.146	197.5 K=1.00	0.902	-0.010	6.620	0.002 [1]
T7	101.479 - 81.2708	L3x3x3/16	9.396	9.396	189.2 K=1.00	1.090	-0.013	8.717	0.002 [1]
T8	81.2708 - 61	L3 1/2x3 1/2x1/4	10.680	10.680	184.7 K=1.00	1.690	-0.015	14.185	0.001 [1]
T9	61 - 40.6667	L3 1/2x3 1/2x1/4	11.964	11.964	206.9 K=1.00	1.690	-0.015	11.304	0.001 [1]
T10	40.6667 - 20.3333	ROHN 3 STD	12.589	12.589	129.8 K=1.00	2.228	-0.019	29.869	0.001 [1]
T11	20.3333 - 0	ROHN 3 STD	13.917	13.917	143.5 K=1.00	2.228	-0.018	24.440	0.001 [1]

[1] $P_u / \phi P_n$ controls

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	K	K	
T1	212.625 - 202.458	ROHN 2.5 STD	10.167	5.083	64.4	1.704	0.078	76.682	0.001 [1]
T2	202.458 - 182.292	ROHN 3 EH	20.167	6.722	71.0	3.016	15.002	135.717	0.111 [1]
T3	182.292 - 162.104	ROHN 4 EH	20.223	6.741	54.8	4.407	45.841	198.335	0.231 [1]
T4	162.104 - 141.896	ROHN 5 EH	20.244	6.748	44.0	6.112	75.403	275.039	0.274 [1]
T5	141.896 - 121.688	ROHN 6 EHS	20.250	10.125	54.6	6.713	94.325	302.097	0.312 [1]
T6	121.688 - 101.479	ROHN 6 EH	20.260	10.130	55.4	8.405	119.448	378.222	0.316 [1]
T7	101.479 - 81.2708	ROHN 6 EH	20.260	10.130	55.4	8.405	145.899	378.222	0.386 [1]
T8	81.2708 - 61	ROHN 8 EHS	20.328	10.164	41.8	9.719	170.775	437.369	0.390 [1]
T9	61 - 40.6667	ROHN 8 EHS	20.384	10.192	41.9	9.719	194.543	437.369	0.445 [1]
T10	40.6667 -	ROHN 8 EH	20.391	10.196	42.5	12.763	204.382	574.322	0.356 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T11	20.3333 20.3333 - 0	ROHN 8 EH	20.373	10.187	42.5	12.763	225.276	574.322	0.392 [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 K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	212.625 - 202.458	ROHN 2 STD	6.639	6.453	98.4	1.075	2.570	48.354	0.053 [1]
T2	202.458 - 182.292	ROHN 2 STD	7.987	7.717	117.6	1.075	7.763	48.354	0.161 [1]
T3	182.292 - 162.104	ROHN 2 STD	8.602	8.301	126.5	1.075	8.065	48.354	0.167 [1]
T4	162.104 - 141.896	ROHN 2 STD	8.827	8.491	129.4	1.075	7.925	48.354	0.164 [1]
T5	141.896 - 121.688	ROHN 2.5 STD	12.600	12.138	153.7	1.704	10.822	76.682	0.141 [1]
T6	121.688 - 101.479	ROHN 2.5 STD	13.385	12.964	164.2	1.704	10.982	76.682	0.143 [1]
T7	101.479 - 81.2708	ROHN 3 STD	13.802	13.410	138.3	2.228	10.921	100.281	0.109 [1]
T8	81.2708 - 61	ROHN 3 STD	15.213	14.731	151.9	2.228	10.699	100.281	0.107 [1]
T9	61 - 40.6667	ROHN 3 STD	16.185	15.723	162.2	2.228	11.448	100.281	0.114 [1]
T10	40.6667 - 20.3333	ROHN 3 STD	24.652	12.326	127.1	2.228	15.902	100.281	0.159 [1]
T11	20.3333 - 0	ROHN 3 STD	25.288	12.644	130.4	2.228	18.184	100.281	0.181 [1]

[1] P_u / ϕP_n controls

Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	212.625 - 202.458	ROHN 1.5 STD	8.521	4.141	79.8	0.799	1.889	35.976	0.053 [1]
T2	202.458 - 182.292	ROHN 1.5 STD	8.597	4.153	80.0	0.799	4.220	35.976	0.117 [1]
T3	182.292 - 162.104	ROHN 1.5 STD	10.014	4.819	92.9	0.799	4.937	35.976	0.137 [1]
T4	162.104 - 141.896	ROHN 2 STD	11.403	5.470	83.4	1.075	5.261	48.354	0.109 [1]
T5	141.896 - 121.688	ROHN 2 STD	13.917	6.682	101.9	1.075	6.538	48.354	0.135 [1]
T6	121.688 - 101.479	ROHN 2 STD	16.292	7.870	120.0	1.075	7.206	48.354	0.149 [1]
T7	101.479 - 81.2708	ROHN 2.5 STD	18.792	9.120	115.5	1.704	7.767	76.682	0.101 [1]
T8	81.2708 - 61	ROHN 2.5 STD	21.359	10.320	130.7	1.704	8.151	76.682	0.106 [1]
T9	61 - 40.6667	ROHN 2.5 STD	23.927	11.604	147.0	1.704	9.183	76.682	0.120 [1]
T10	40.6667 - 20.3333	ROHN 3 STD	25.177	12.229	126.1	2.228	8.802	100.281	0.088 [1]
T11	20.3333 - 0	ROHN 3 STD	27.833	13.557	139.8	2.228	10.803	100.281	0.108 [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 K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	212.625 - 202.458	ROHN 1.5 STD	8.500	4.130	79.6	0.799	0.223	35.976	0.006 [1]

[1] $P_u / \phi P_n$ controls

Redundant Horizontal (1) Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T10	40.6667 - 20.3333	ROHN 1.5 STD	6.294	5.935	114.4	0.799	4.468	25.902	0.172 [1]
T11	20.3333 - 0	ROHN 1.5 STD	6.958	6.599	127.2	0.799	4.909	25.902	0.190 [1]

[1] $P_u / \phi P_n$ controls

Redundant Diagonal (1) Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T10	40.6667 - 20.3333	ROHN 2 STD	11.628	10.887	166.0	1.075	4.127	34.815	0.119 [1]
T11	20.3333 - 0	ROHN 2 STD	12.021	11.347	173.0	1.075	4.240	34.815	0.122 [1]

[1] $P_u / \phi P_n$ 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 K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T10	40.6667 - 20.3333	ROHN 2.5 STD	15.204	15.204	192.6	1.704	0.085	55.211	0.002 [1]
T11	20.3333 - 0	ROHN 2.5 STD	16.022	16.022	202.9	1.704	0.088	55.211	0.002 [1]

[1] $P_u / \phi P_n$ controls

Inner Bracing Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	212.625 - 202.458	L2x2x1/8	4.260	4.260	81.6	0.484	0.003	15.694	0.000 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T2	202.458 - 182.292	L2x2x1/8	4.299	4.299	82.4	0.484	0.005	15.694	0.000 [1]
T3	182.292 - 162.104	L2x2x1/8	4.660	4.660	89.3	0.484	0.004	15.694	0.000 [1]
T4	162.104 - 141.896	L2x2x1/8	5.354	5.354	102.6	0.484	0.005	15.694	0.000 [1]
T5	141.896 - 121.688	L2x2x1/8	6.396	6.396	122.6	0.484	0.004	15.694	0.000 [1]
T6	121.688 - 101.479	L2 1/2x2 1/2x3/16	7.521	7.521	116.0	0.902	0.002	29.225	0.000 [1]
T7	101.479 - 81.2708	L3x3x3/16	8.771	8.771	112.1	1.090	0.001	35.316	0.000 [1]
T10	40.6667 - 20.3333	ROHN 3 STD	12.589	12.589	129.8	2.228	0.000	100.281	0.000 [1]
T11	20.3333 - 0	ROHN 3 STD	13.917	13.917	143.5	2.228	0.002	100.281	0.000 [1]

[1] P_u / ϕP_n controls

Section Capacity Table

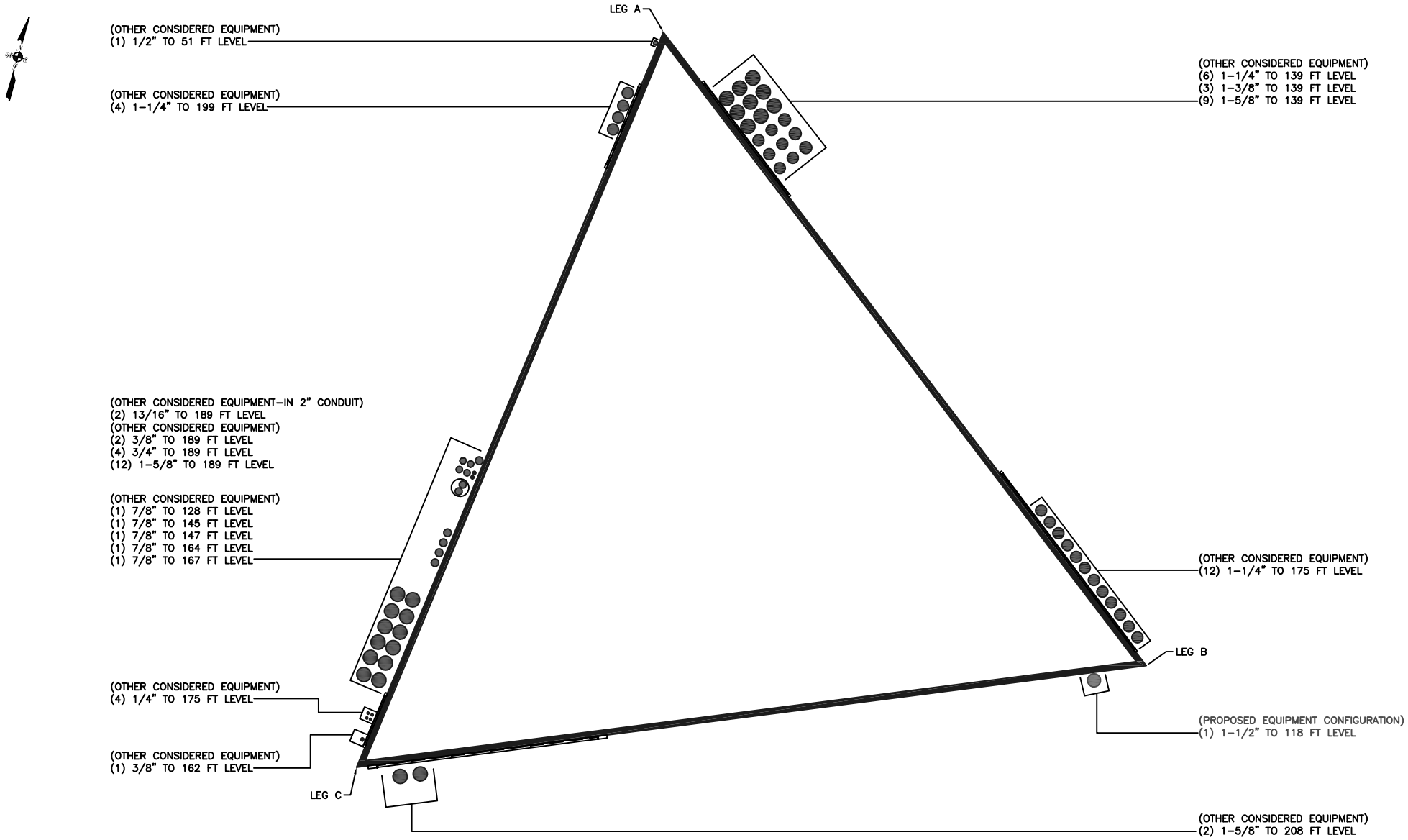
Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
T1	212.625 - 202.458	Leg	ROHN 2.5 STD	2	-4.854	59.463	8.2	Pass
T2	202.458 - 182.292	Leg	ROHN 3 EH	28	-23.458	98.582	23.8	Pass
T3	182.292 - 162.104	Leg	ROHN 4 EH	69	-68.578	167.222	41.0	Pass
T4	162.104 - 141.896	Leg	ROHN 5 EH	107	-99.947	250.620	39.9	Pass
T5	141.896 - 121.688	Leg	ROHN 6 EHS	146	-126.881	255.080	49.7	Pass
T6	121.688 - 101.479	Leg	ROHN 6 EH	173	-158.665	317.349	50.0	Pass
T7	101.479 - 81.2708	Leg	ROHN 6 EH	200	-188.671	317.349	59.5	Pass
T8	81.2708 - 61	Leg	ROHN 8 EHS	227	-217.042	404.230	53.7	Pass
T9	61 - 40.6667	Leg	ROHN 8 EHS	254	-244.630	403.942	60.6	Pass
T10	40.6667 - 20.3333	Leg	ROHN 8 EH	281	-257.392	528.398	48.7	Pass
T11	20.3333 - 0	Leg	ROHN 8 EH	314	-283.019	528.520	53.5	Pass
T1	212.625 - 202.458	Diagonal	ROHN 2 STD	12	-2.643	25.020	10.6	Pass
T2	202.458 - 182.292	Diagonal	ROHN 2 STD	38	-7.837	18.418	42.6	Pass
T3	182.292 - 162.104	Diagonal	ROHN 2 STD	78	-8.155	15.917	51.2	Pass
T4	162.104 - 141.896	Diagonal	ROHN 2 STD	110	-7.736	13.677	56.6	Pass
T5	141.896 - 121.688	Diagonal	ROHN 2.5 STD	156	-11.004	17.101	64.3	Pass
T6	121.688 - 101.479	Diagonal	ROHN 2.5 STD	183	-11.211	14.992	74.8	Pass
T7	101.479 - 81.2708	Diagonal	ROHN 3 STD	210	-11.266	25.935	43.4	Pass
T8	81.2708 - 61	Diagonal	ROHN 3 STD	237	-11.166	22.903	48.8	Pass
T9	61 - 40.6667	Diagonal	ROHN 3 STD	264	-11.969	20.104	59.5	Pass
T10	40.6667 - 20.3333	Diagonal	ROHN 3 STD	303	-16.799	32.714	51.4	Pass
T11	20.3333 - 0	Diagonal	ROHN 3 STD	336	-19.055	31.089	61.3	Pass
T1	212.625 - 202.458	Horizontal	ROHN 1.5 STD	10	-1.846	23.711	7.8	Pass
T2	202.458 - 182.292	Horizontal	ROHN 1.5 STD	37	-4.183	23.646	17.7	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
T3	182.292 - 162.104	Horizontal	ROHN 1.5 STD	76	-5.220	20.100	26.0	Pass
T4	162.104 - 141.896	Horizontal	ROHN 2 STD	109	-5.375	28.570	18.8	Pass
T5	141.896 - 121.688	Horizontal	ROHN 2 STD	154	-6.543	23.772	27.5	Pass
T6	121.688 - 101.479	Horizontal	ROHN 2 STD	181	-7.287	17.707	41.2	Pass
T7	101.479 - 81.2708	Horizontal	ROHN 2.5 STD	208	-7.767	30.294	25.6	Pass
T8	81.2708 - 61	Horizontal	ROHN 2.5 STD	235	-8.072	23.656	34.1	Pass
T9	61 - 40.6667	Horizontal	ROHN 2.5 STD	262	-8.961	18.711	47.9	Pass
T10	40.6667 - 20.3333	Horizontal	ROHN 3 STD	299	-9.125	33.233	27.5	Pass
T11	20.3333 - 0	Horizontal	ROHN 3 STD	332	-10.756	27.041	39.8	Pass
T1	212.625 - 202.458	Top Girt	ROHN 1.5 STD	5	-0.222	23.767	0.9	Pass
T10	40.6667 - 20.3333	Redund Horz 1 Bracing	ROHN 1.5 STD	288	-4.468	13.657	32.7	Pass
T11	20.3333 - 0	Redund Horz 1 Bracing	ROHN 1.5 STD	321	-4.909	11.606	42.3	Pass
T10	40.6667 - 20.3333	Redund Diag 1 Bracing	ROHN 2 STD	289	-4.127	9.252	44.6	Pass
T11	20.3333 - 0	Redund Diag 1 Bracing	ROHN 2 STD	326	-4.240	8.517	49.8	Pass
T10	40.6667 - 20.3333	Redund Hip 1 Bracing	ROHN 1.5 STD	306	-0.044	12.533	0.4	Pass
T11	20.3333 - 0	Redund Hip 1 Bracing	ROHN 1.5 STD	339	-0.045	10.543	0.4	Pass
T10	40.6667 - 20.3333	Redund Hip Diagonal 1 Bracing	ROHN 2.5 STD	309	-0.078	10.900	0.7	Pass
T11	20.3333 - 0	Redund Hip Diagonal 1 Bracing	ROHN 2.5 STD	342	-0.072	9.815	0.7	Pass
T1	212.625 - 202.458	Inner Bracing	L2x2x1/8	16	-0.003	8.802	0.4	Pass
T2	202.458 - 182.292	Inner Bracing	L2x2x1/8	41	-0.005	8.646	0.4	Pass
T3	182.292 - 162.104	Inner Bracing	L2x2x1/8	80	-0.005	6.373	0.5	Pass
T4	162.104 - 141.896	Inner Bracing	L2x2x1/8	120	-0.006	4.367	0.6	Pass
T5	141.896 - 121.688	Inner Bracing	L2x2x1/8	157	-0.009	3.300	0.7	Pass
T6	121.688 - 101.479	Inner Bracing	L2 1/2x2 1/2x3/16	184	-0.010	6.951	0.5	Pass
T7	101.479 - 81.2708	Inner Bracing	L3x3x3/16	213	-0.013	9.153	0.6	Pass
T8	81.2708 - 61	Inner Bracing	L3 1/2x3 1/2x1/4	240	-0.015	14.894	0.4	Pass
T9	61 - 40.6667	Inner Bracing	L3 1/2x3 1/2x1/4	267	-0.015	11.869	0.4	Pass
T10	40.6667 - 20.3333	Inner Bracing	ROHN 3 STD	311	-0.019	31.363	0.3	Pass
T11	20.3333 - 0	Inner Bracing	ROHN 3 STD	345	-0.016	25.662	0.4	Pass
							Summary	
						Leg (T9)	60.6	Pass
						Diagonal (T6)	74.8	Pass
						Horizontal (T9)	47.9	Pass
						Top Girt (T1)	0.9	Pass
						Redund Horz 1 Bracing (T11)	42.3	Pass
						Redund Diag 1 Bracing (T11)	49.8	Pass
						Redund Hip 1	0.4	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$øP_{allow}$ K	% Capacity	Pass Fail
						Bracing (T11)		
						Redund Hip Diagonal 1	0.7	Pass
						Bracing (T11)		
						Inner Bracing (T5)	0.7	Pass
						Bolt Checks	44.5	Pass
						RATING =	**74.8**	**Pass**

APPENDIX B

BASE LEVEL DRAWING


LEG A
(OTHER CONSIDERED EQUIPMENT)
(1) 1/2" TO 51 FT LEVEL
(OTHER CONSIDERED EQUIPMENT)
(4) 1-1/4" TO 199 FT LEVEL
(OTHER CONSIDERED EQUIPMENT)
(6) 1-1/4" TO 139 FT LEVEL
(3) 1-3/8" TO 139 FT LEVEL
(9) 1-5/8" TO 139 FT LEVEL
(OTHER CONSIDERED EQUIPMENT-IN 2" CONDUIT)
(2) 13/16" TO 189 FT LEVEL
(OTHER CONSIDERED EQUIPMENT)
(2) 3/8" TO 189 FT LEVEL
(4) 3/4" TO 189 FT LEVEL
(12) 1-5/8" TO 189 FT LEVEL
(OTHER CONSIDERED EQUIPMENT)
(1) 7/8" TO 128 FT LEVEL
(1) 7/8" TO 145 FT LEVEL
(1) 7/8" TO 147 FT LEVEL
(1) 7/8" TO 164 FT LEVEL
(1) 7/8" TO 167 FT LEVEL
(OTHER CONSIDERED EQUIPMENT)
(12) 1-1/4" TO 175 FT LEVEL
LEG B
(OTHER CONSIDERED EQUIPMENT)
(4) 1/4" TO 175 FT LEVEL
(OTHER CONSIDERED EQUIPMENT)
(1) 3/8" TO 162 FT LEVEL
(PROPOSED EQUIPMENT CONFIGURATION)
(1) 1-1/2" TO 118 FT LEVEL
LEG C
(OTHER CONSIDERED EQUIPMENT)
(2) 1-5/8" TO 208 FT LEVEL

APPENDIX C

ADDITIONAL CALCULATIONS

Self Support Anchor Rod Capacity

Site Info	
BU #	806363
Site Name	HRT 105 943201
Order #	553394 Rev. 0

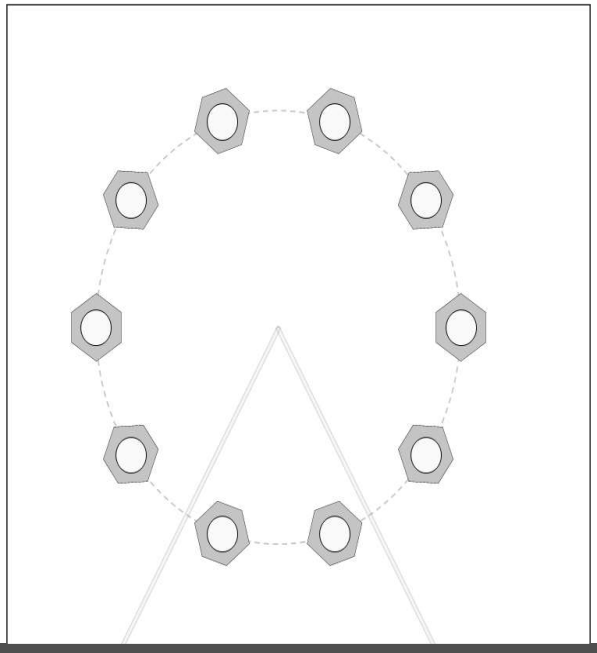
Analysis Considerations	
TIA-222 Revision	H
Grout Considered:	Yes
l_{ar} (in)	1.25

Applied Loads		
	Comp.	Uplift
Axial Force (kips)	310.90	250.15
Shear Force (kips)	36.13	32.09

**TIA-222-H Section 15.5 Applied*

Considered Eccentricity	
Leg Mod Eccentricity (in)	0.000
Anchor Rod N.A Shift (in)	0.000
Total Eccentricity (in)	0.000

**Anchor Rod Eccentricity Applied*



Connection Properties

Anchor Rod Data

(10) 1" ø bolts (A354-BC N; Fy=109 ksi, Fu=125 ksi)

l_{ar} (in): 1.25

Analysis Results

Anchor Rod Summary *(units of kips, kip-in)*

Pu_t = 25.01	ϕPn_t = 56.81	**Stress Rating**
Vu = 3.21	ϕVn = 36.82	**41.9%**
Mu = n/a	ϕMn = n/a	**Pass**

SST Unit Base Foundation

BU # :	806363
Site Name:	HRT 105 943201
App. Number:	553394 Rev. 0

TIA-222 Revision: H

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

Superstructure Analysis Reactions		
Global Moment, **M**:	7197.11	ft-kips
Global Axial, **P**:	102.86	kips
Global Shear, **V**:	59.56	kips
Leg Compression, P_{comp}:	310.9	kips
Leg Comp. Shear, V_{u_comp}:	36.13	kips
Leg Uplift, P_{uplift}:	250.15	kips
Leg Uplift. Shear, V_{u_uplift}:	32.09	kips
Tower Height, **H**:	212.62	ft
Base Face Width, **BW**:	30.04	ft
BP Dist. Above Fdn, bp_{dist}:	3	in
Anchor Bolt Circle, **BC**:	12	in

Foundation Analysis Checks				
	Capacity	**Demand**	**Rating***	**Check**
Lateral (Sliding) (kips)	336.38	59.56	**16.9%**	**Pass**
Bearing Pressure (ksf)	6.00	1.28	**20.4%**	**Pass**
*Overturning (kip*ft)*	17584.41	7480.02	**42.5%**	**Pass**
*Pad Flexure (kip*ft)*	7259.23	1512.31	**19.8%**	**Pass**
Pad Shear - 1-way (kips)	1971.72	173.98	**8.4%**	**Pass**
Pad Shear - Comp 2-way (ksi)	0.164	0.032	**18.4%**	**Pass**
*Flexural 2-way (Comp) (kip*ft)*	3668.31	0.00	**0.0%**	**Pass**
Pad Shear - Tension 2-way (ksi)	0.164	0.026	**14.8%**	**Pass**
*Flexural 2-way (Tension) (kip*ft)*	3668.31	0.00	**0.0%**	**Pass**

**Rating per TIA-222-H Section 15.5*

Structural Rating*:	**19.8%**
Soil Rating*:	**42.5%**

Pad Properties		
Depth, **D**:	4.00	ft
Pad Width, W_1:	40.25	ft
Pad Thickness, **T**:	4.50	ft
Pad Rebar Size (Bottom dir. 2), Sp_2:	7	
Pad Rebar Quantity (Bottom dir. 2), mp_2:	55	
Pad Clear Cover, cc_{pad}:	3	in

Material Properties		
Rebar Grade, **Fy**:	60	ksi
Concrete Compressive Strength, **F'c**:	3	ksi
Dry Concrete Density, δ**c**:	150	pcf

Soil Properties		
Total Soil Unit Weight, γ:	120	pcf
Ultimate Gross Bearing, Qult:	8.000	ksf
Cohesion, **Cu**:	0.000	ksf
Friction Angle, φ:	35	degrees
SPT Blow Count, N_{blows}:	11	
Base Friction, μ:		
Neglected Depth, **N**:	3.5	ft
Foundation Bearing on Rock?	No	
Groundwater Depth, **gw**:	3	ft

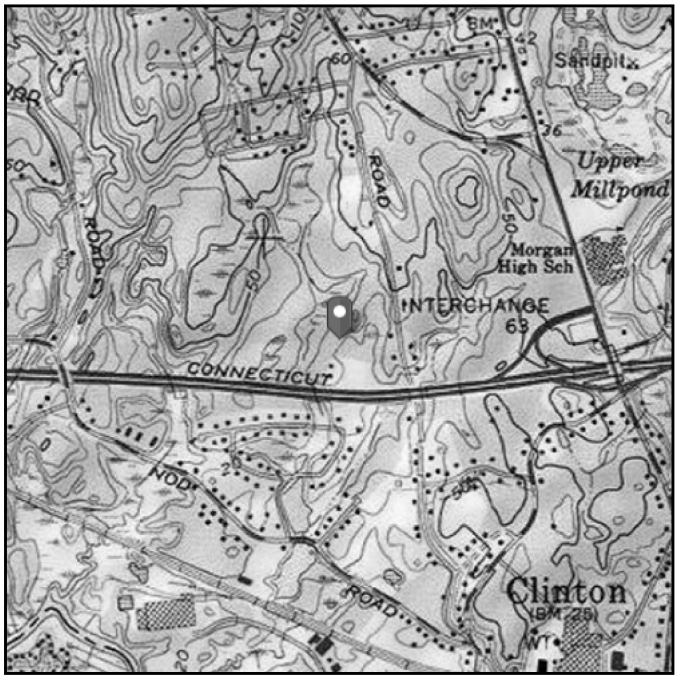
<-- Toggle between Gross and Net

ASCE 7 Hazards Report

Address:
No Address at This Location

Standard: ASCE/SEI 7-10
Risk Category: II
Soil Class: D - Stiff Soil

Elevation: 18.95 ft (NAVD 88)
Latitude: 41.288944
Longitude: -72.538472



Wind

Results:

Wind Speed:	130 Vmph
10-year MRI	78 Vmph
25-year MRI	88 Vmph
50-year MRI	97 Vmph
100-year MRI	106 Vmph

Data Source: ASCE/SEI 7-10, Fig. 26.5-1A and Figs. CC-1–CC-4, and Section 26.5.2, incorporating errata of March 12, 2014

Date Accessed: Tue Apr 13 2021

Value provided is 3-second gust wind speeds at 33 ft above ground for Exposure C Category, based on linear interpolation between contours. Wind speeds are interpolated in accordance with the 7-10 Standard. Wind speeds correspond to approximately a 7% probability of exceedance in 50 years (annual exceedance probability = 0.00143, MRI = 700 years).

Site is in a hurricane-prone region as defined in ASCE/SEI 7-10 Section 26.2. Glazed openings need not be protected against wind-borne debris.

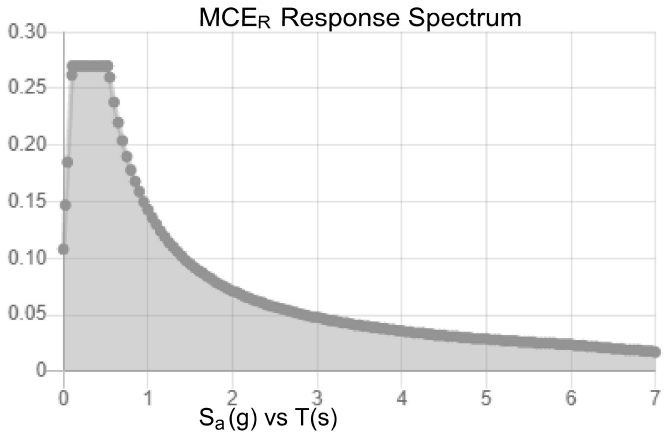
Seismic

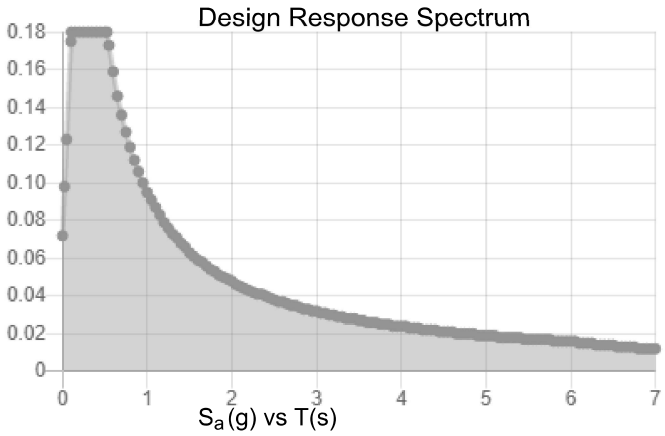
Site Soil Class: D - Stiff Soil

Results:

S_S :	0.169	S_{DS} :	0.18
S_1 :	0.059	S_{D1} :	0.095
F_a :	1.6	T_L :	6
F_v :	2.4	PGA :	0.085
S_{MS} :	0.27	PGA_M :	0.137
S_{M1} :	0.143	F_{PGA} :	1.6
		I_e :	1

Seismic Design Category B





Data Accessed: Tue Apr 13 2021

Date Source: USGS Seismic Design Maps based on ASCE/SEI 7-10, incorporating Supplement 1 and errata of March 31, 2013, and ASCE/SEI 7-10 Table 1.5-2. Additional data for site-specific ground motion procedures in accordance with ASCE/SEI 7-10 Ch. 21 are available from USGS.

Ice

Results:

Ice Thickness:	0.75 in.
Concurrent Temperature:	15 F
Gust Speed:	50 mph
Data Source:	Standard ASCE/SEI 7-10, Figs. 10-2 through 10-8
Date Accessed:	Tue Apr 13 2021

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 50-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.

Exhibit E

Mount Analysis

Date: **August 4, 2021**

Darcy Tarr
Crown Castle
3530 Toringdon Way, Suite 300
Charlotte, NC 28277
704-405-6589

Trylon
1825 W. Walnut Hill Lane,
Suite 302
Irving, TX 75038
214-930-1730

Subject:	**Mount Replacement Analysis Report**	
Carrier Designation:	**Dish Network Equipment Change Out**	
	Carrier Site Number:	BOBDL00040A
	Carrier Site Name:	CT-CCI-T-806363
Crown Castle Designation:	**Crown Castle BU Number:**	806363
	Crown Castle Site Name:	HRT 105 943201
	Crown Castle JDE Job Number:	645647
	Crown Castle Order Number:	553394 Rev. 0
Engineering Firm Designation:	**Trylon Report Designation:**	188193
Site Data:	**48 Cow Hill Road, Clinton, Middlesex County, CT, 06413**	
	Latitude 41°17'20.20" Longitude -72°32'18.50"	
Structure Information:	**Tower Height & Type:**	**212.0 ft Self Support Tower**
	Mount Elevation:	**118.0 ft**
	Mount Type:	**8.0 ft Sector Frames**

Dear Darcy Tarr,

Trylon is pleased to submit this **"Mount Replacement Analysis Report"** to determine the structural integrity of Dish Network's antenna mounting system with the proposed appurtenance and equipment addition on the abovementioned supporting tower structure. Analysis of the existing supporting tower structure is to be completed by others and therefore is not part of this analysis. Analysis of the antenna mounting system as a tie-off point for fall protection or rigging is not part of this document.

The purpose of the analysis is to determine acceptability of the mount stress level. Based on our analysis we have determined the mount stress level to be:

Sector Frames **Sufficient***

***Sufficient upon completion of the changes listed in the 'Recommendations' section of this report.**

This analysis utilizes an ultimate 3-second gust wind speed of 135 mph as required by the 2018 Connecticut State Building Code. Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria.

Mount analysis prepared by: Steve Mustaro, P.E.

Respectfully Submitted by:
Cliff Abernathy, P.E.

08/05/2021

TABLE OF CONTENTS

1) INTRODUCTION

This is a proposed three sector 8.0 ft Sector Frames, designed by Commscope.

2) ANALYSIS CRITERIA

Building Code:	2015 IBC / 2018 CTSBC
TIA-222 Revision:	TIA-222-H
Risk Category:	II
Ultimate Wind Speed:	135 mph
Exposure Category:	B
Topographic Factor at Base:	1.0
Topographic Factor at Mount:	1.0
Ice Thickness:	1.5 in
Wind Speed with Ice:	50 mph
Seismic S_s:	0.169
Seismic S_1:	0.059
Live Loading Wind Speed:	30 mph
Man Live Load at Mid/End-Points:	250 lb
Man Live Load at Mount Pipes:	500 lb

Table 1 - Proposed Equipment Configuration

Mount Centerline (ft)	Antenna Centerline (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Mount / Modification Details
118.0	118.0	3	JMA WIRELESS	MX08FRO665-20	8.0 ft Sector Frames [Commscope MTC3975083]
		3	FUJITSU	TA08025-B604	
		3	FUJITSU	TA08025-B605	
		1	RAYCAP	RDIDC-9181-PF-48	

3) ANALYSIS PROCEDURE

Table 2 - Documents Provided

Document	Remarks	Reference	Source
Crown Application	Dish Network Application	553394 Rev. 0	CCI Sites
Construction Drawings	Infinigy	BOBDL00040A	TSA
Mount Manufacturer Drawings	Commscope	MTC3975083	Trylon

3.1) Analysis Method

RISA-3D (Version 17.0.4), a commercially available analysis software package, was used to create a three-dimensional model of the antenna mounting system and calculate member stresses for various loading cases.

A tool internally developed, using Microsoft Excel, by Trylon was used to calculate wind loading on all appurtenances, dishes, and mount members for various load cases. Selected output from the analysis is included in Appendix B.

This analysis was performed in accordance with Crown Castle's ENG-SOW-10208 *Tower Mount Analysis* (Revision B).

3.2) Assumptions

1) The antenna mounting system was properly fabricated, installed and maintained in good condition in accordance with its original design and manufacturer's specifications.
2) The configuration of antennas, mounts, and other appurtenances are as specified in Table 1 and the referenced drawings.
3) All member connections are assumed to have been designed to meet or exceed the load carrying capacity of the connected member unless otherwise specified in this report.
4) The analysis will be required to be revised if the existing conditions in the field differ from those shown in the above-referenced documents or assumed in this analysis. No allowance was made for any damaged, missing, or rusted members.
5) Prior structural modifications to the tower mounting system are assumed to be installed as shown per available data.
6) Steel grades have been assumed as follows, unless noted otherwise:

Channel, Solid Round, Angle, Plate	ASTM A36 (GR 36)
HSS (Rectangular)	ASTM A500 (GR B-46)
Pipe	ASTM A53 (GR 35)
Connection Bolts	ASTM A325

This analysis may be affected if any assumptions are not valid or have been made in error. Trylon should be notified to determine the effect on the structural integrity of the antenna mounting system.

4) ANALYSIS RESULTS

Table 3 - Mount Component Stresses vs. Capacity (Sector Frames, Worst Case Sector)

Notes	Component	Critical Member	Centerline (ft)	% Capacity	Pass / Fail
1, 2	Mount Pipe(s)	MP3	118.0	18.6	Pass
	Horizontal(s)	H1		16.4	Pass
	Standoff(s)	M4		20.6	Pass
	Bracing(s)	M24		37.6	Pass
	Tieback(s)	M31A		8.6	Pass
	Mount Connection(s)	-		16.1	Pass

Structure Rating (max from all components) =	37.6%

Notes:
1) See additional documentation in "Appendix C - Software Analysis Output" for calculations supporting the % capacity consumed.
2) Rating per TIA-222-H, Section 15.5

Table 4 - Tieback Connection Data Table

Tower Connection Node No.	Existing / Proposed	Resultant End Reaction (lb)	Connected Member Type	Connected Member Size	Member Compressive Capacity (lb)[3]	Notes
N52A	Proposed	796.1	Leg	ROHN 6 EH	4,533.6	2

Notes:
1) Tieback connection point is within 25% of either end of the connected tower member
2) Tieback connection point is NOT within 25% of either end of the connected tower member
3) Reduced member compressive capacity according to CED-STD-10294 *Standard for Installation of Mounts and Appurtenances*

4.1) Recommendations

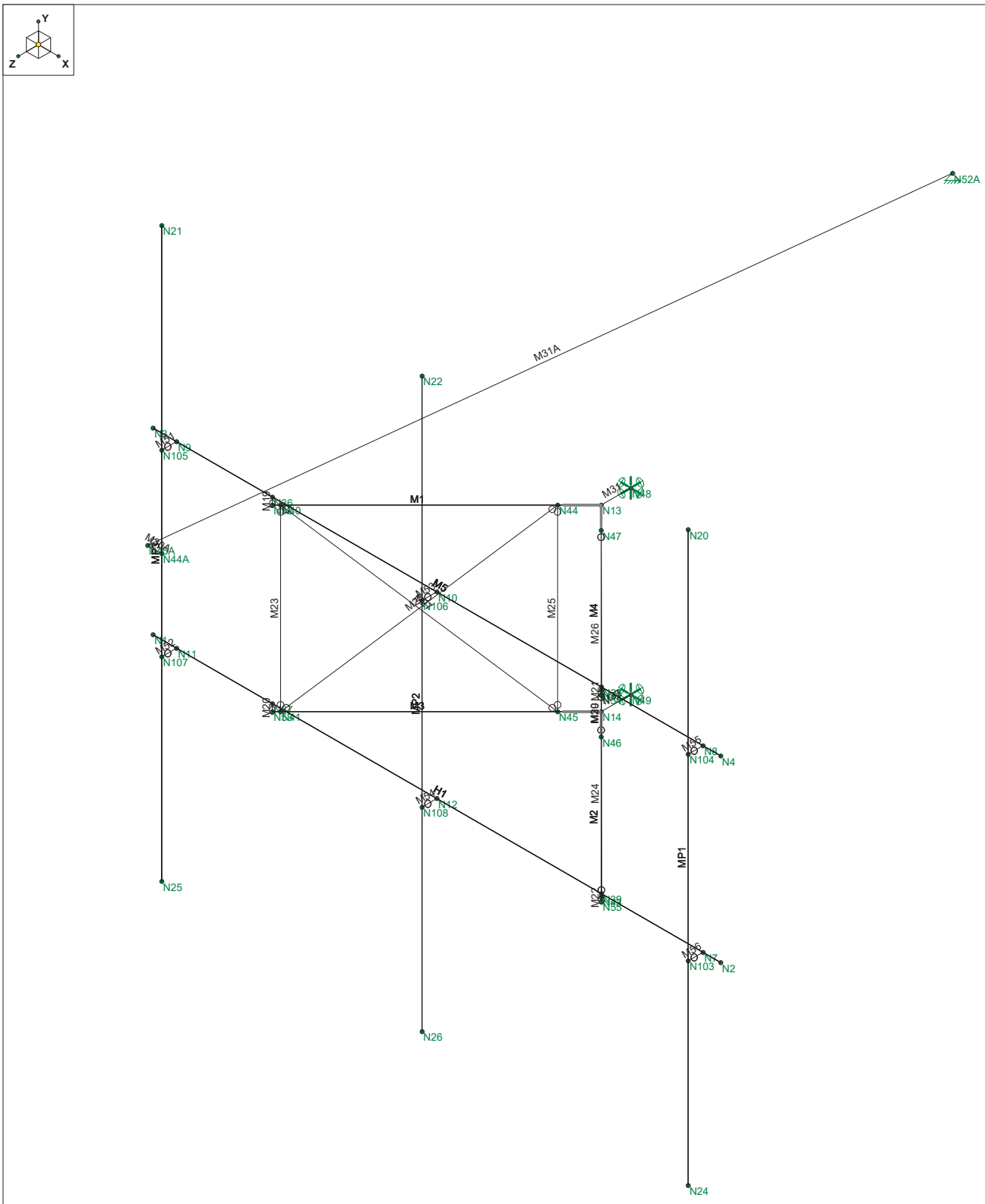
The mount has sufficient capacity to carry the proposed loading configuration. In order for the results of the analysis to be considered valid, the proposed mount listed below must be installed.

1. Commscope MTC3975083.

No structural modifications are required at this time, provided that the above-listed changes are implemented.

APPENDIX A

WIRE FRAME AND RENDERED MODELS



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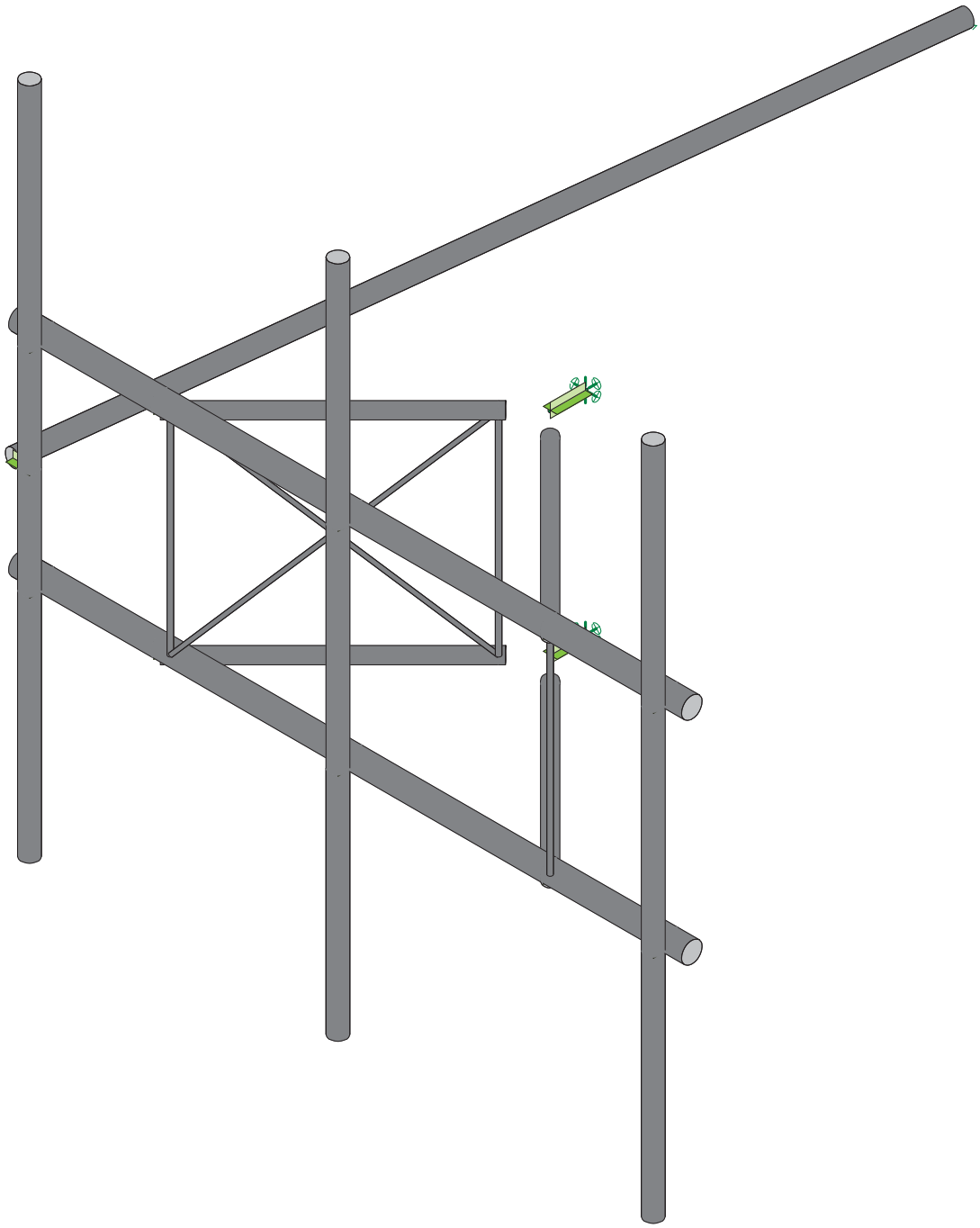

Trylon	806363	Render
SMM		Aug 4, 2021 at 12:26 PM
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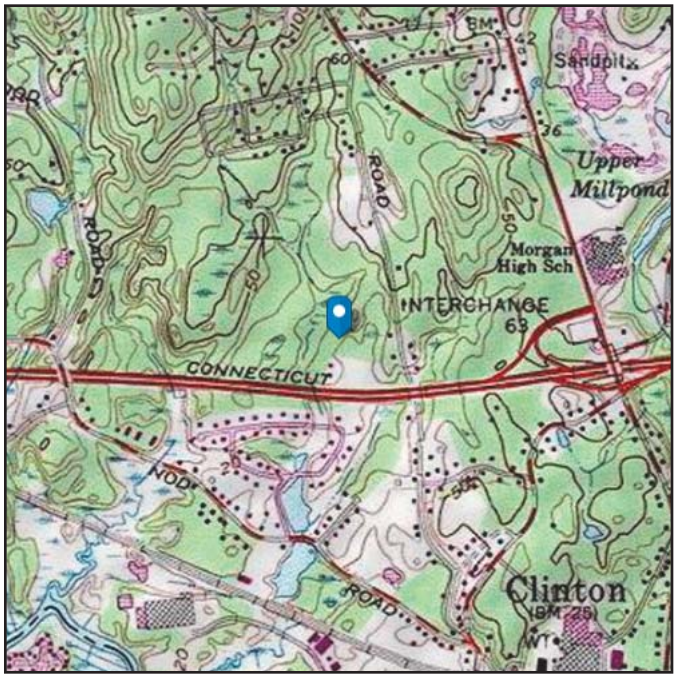
APPENDIX B

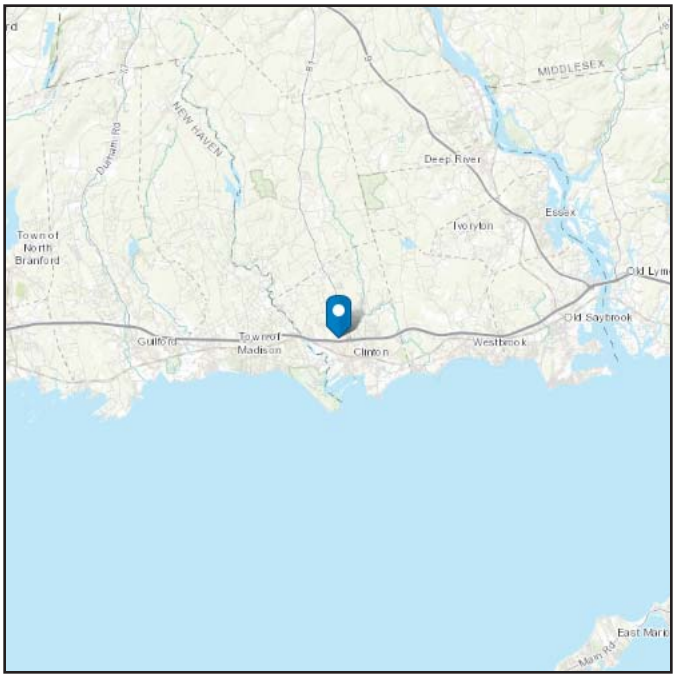
SOFTWARE INPUT CALCULATIONS

ASCE 7 Hazards Report

Address:
No Address at This Location

Standard:	ASCE/SEI 7-10	**Elevation:**	18.95 ft (NAVD 88)
Risk Category:	II	**Latitude:**	41.288944
Soil Class:	D - Stiff Soil	**Longitude:**	-72.538472





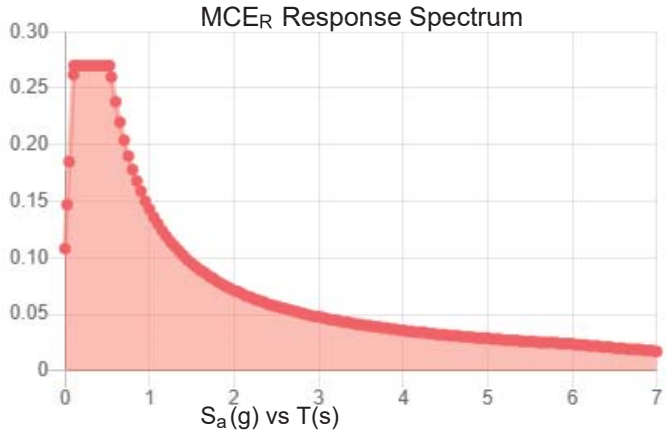
Seismic

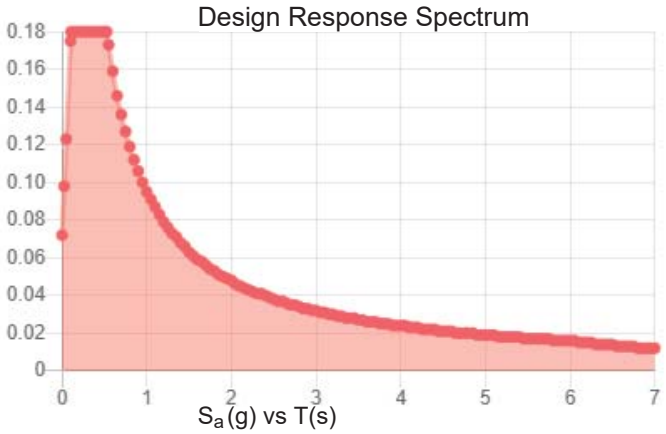
Site Soil Class: D - Stiff Soil

Results:

S_S :	0.169	S_{DS} :	0.18
S_1 :	0.059	S_{D1} :	0.095
F_a :	1.6	T_L :	6
F_v :	2.4	PGA :	0.085
S_{MS} :	0.27	PGA_M :	0.137
S_{M1} :	0.143	F_{PGA} :	1.6
		I_e :	1

Seismic Design Category B





Data Accessed: Wed Jul 21 2021

Date Source: USGS Seismic Design Maps based on ASCE/SEI 7-10, incorporating Supplement 1 and errata of March 31, 2013, and ASCE/SEI 7-10 Table 1.5-2. Additional data for site-specific ground motion procedures in accordance with ASCE/SEI 7-10 Ch. 21 are available from USGS.

Ice

Results:

Ice Thickness:	0.75 in.
Concurrent Temperature:	15 F
Gust Speed:	50 mph
Data Source:	Standard ASCE/SEI 7-10, Figs. 10-2 through 10-8
Date Accessed:	Wed Jul 21 2021

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 50-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.

CONNECTICUT DESIGN CRITERIA - STATE

Revison: R-397 7/2/2021

CT is NOT a Home Rule State; Tab added only for Design Criteria

(APPENDIX N) MUNICIPALITY - SPECIFIC STRUCTURAL DESIGN PARAMETERS

				Wind Design Parameters								
Municipality	**Ground Snow Load**	**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	
Clinton	30	0.169	0.059	120	135	140	93	105	108	Type B	Type A	Yes

1. Wind-Borne Debris Regions:

Type A: Full Municipality.

Type B: Areas south of Interstate 95.

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

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

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

Trylon
1825 W. Walnut Hill Lane Suite 120
Irving, TX 75038

TIA LOAD CALCULATOR 2.0

PROJECT DATA	
Job Code:	188193
Carrier Site ID:	BU# 806363
Carrier Site Name:	HRT 105 943201

CODES AND STANDARDS	
Building Code:	2015 IBC
Local Building Code:	2018 CSBC
Design Standard:	TIA-222-H

STRUCTURE DETAILS		
Mount Type:	Sector Frame	--
Mount Elevation:	118.0	ft.
Number of Sectors:	3	--
Structure Type:	Self Support Tower	--
Structure Height:	212.0	ft.

ANALYSIS CRITERIA		
Structure Risk Category:	II	--
Exposure Category:	B	--
Site Class:	D - Default	--
Ground Elevation:	18.95	ft.

TOPOGRAPHIC DATA		
Topographic Category:	1.00	--
Topographic Feature:	N/A	--
Crest Point Elevation:	0.00	ft.
Base Point Elevation:	0.00	ft.
Crest to Mid-Height (L/2):	0.00	ft.
Distance from Crest (x):	0.00	ft.
Base Topo Factor (K_{zt}):	1.00	--
Mount Topo Factor (K_{zt}):	1.00	--

WIND PARAMETERS		
Design Wind Speed:	135	mph
Wind Escalation Factor (K_s):	1.00	--
Velocity Coefficient (K_z):	1.04	--
Directionality Factor (K_d):	0.95	--
Gust Effect Factor (Gh):	1.00	--
Shielding Factor (K_a):	0.90	--
Velocity Pressure (q_z):	45.89	psf

ICE PARAMETERS		
Design Ice Wind Speed:	50	mph
Design Ice Thickness (t_i):	1.50	in
Importance Factor (I_i):	1.00	--
Ice Velocity Pressure (q_{zi}):	45.89	psf
Mount Ice Thickness (t_{iz}):	1.70	in

WIND STRUCTURE CALCULATIONS		
Flat Member Pressure:	82.60	psf
Round Member Pressure:	49.56	psf
Ice Wind Pressure:	7.45	psf

SEISMIC PARAMETERS		
Importance Factor (I_e):	1.00	--
Short Period Accel .(S_s):	0.17	g
1 Second Accel (S_1):	0.06	g
Short Period Des. (S_{DS}):	0.18	g
1 Second Des. (S_{D1}):	0.09	g
Short Period Coeff. (F_a):	1.60	--
1 Second Coeff. (F_v):	2.40	--
Response Coefficient (Cs):	0.09	--
Amplification Factor (A_S):	1.20	--

LOAD COMBINATIONS [LRFD]

#	Description
1	1.4DL
2	1.2DL + 1WL 0 AZI
3	1.2DL + 1WL 30 AZI
4	1.2DL + 1WL 45 AZI
5	1.2DL + 1WL 60 AZI
6	1.2DL + 1WL 90 AZI
7	1.2DL + 1WL 120 AZI
8	1.2DL + 1WL 135 AZI
9	1.2DL + 1WL 150 AZI
10	1.2DL + 1WL 180 AZI
11	1.2DL + 1WL 210 AZI
12	1.2DL + 1WL 225 AZI
13	1.2DL + 1WL 240 AZI
14	1.2DL + 1WL 270 AZI
15	1.2DL + 1WL 300 AZI
16	1.2DL + 1WL 315 AZI
17	1.2DL + 1WL 330 AZI
18	0.9DL + 1WL 0 AZI
19	0.9DL + 1WL 30 AZI
20	0.9DL + 1WL 45 AZI
21	0.9DL + 1WL 60 AZI
22	0.9DL + 1WL 90 AZI
23	0.9DL + 1WL 120 AZI
24	0.9DL + 1WL 135 AZI
25	0.9DL + 1WL 150 AZI
26	0.9DL + 1WL 180 AZI
27	0.9DL + 1WL 210 AZI
28	0.9DL + 1WL 225 AZI
29	0.9DL + 1WL 240 AZI
30	0.9DL + 1WL 270 AZI
31	0.9DL + 1WL 300 AZI
32	0.9DL + 1WL 315 AZI
33	0.9DL + 1WL 330 AZI
34	1.2DL + 1DLi + 1WLi 0 AZI
35	1.2DL + 1DLi + 1WLi 30 AZI
36	1.2DL + 1DLi + 1WLi 45 AZI
37	1.2DL + 1DLi + 1WLi 60 AZI
38	1.2DL + 1DLi + 1WLi 90 AZI
39	1.2DL + 1DLi + 1WLi 120 AZI
40	1.2DL + 1DLi + 1WLi 135 AZI
41	1.2DL + 1DLi + 1WLi 150 AZI

#	Description
42	1.2DL + 1DLi + 1WLi 180 AZI
43	1.2DL + 1DLi + 1WLi 210 AZI
44	1.2DL + 1DLi + 1WLi 225 AZI
45	1.2DL + 1DLi + 1WLi 240 AZI
46	1.2DL + 1DLi + 1WLi 270 AZI
47	1.2DL + 1DLi + 1WLi 300 AZI
48	1.2DL + 1DLi + 1WLi 315 AZI
49	1.2DL + 1DLi + 1WLi 330 AZI
50	(1.2+0.2Sds) + 1.0E 0 AZI
51	(1.2+0.2Sds) + 1.0E 30 AZI
52	(1.2+0.2Sds) + 1.0E 45 AZI
53	(1.2+0.2Sds) + 1.0E 60 AZI
54	(1.2+0.2Sds) + 1.0E 90 AZI
55	(1.2+0.2Sds) + 1.0E 120 AZI
56	(1.2+0.2Sds) + 1.0E 135 AZI
57	(1.2+0.2Sds) + 1.0E 150 AZI
58	(1.2+0.2Sds) + 1.0E 180 AZI
59	(1.2+0.2Sds) + 1.0E 210 AZI
60	(1.2+0.2Sds) + 1.0E 225 AZI
61	(1.2+0.2Sds) + 1.0E 240 AZI
62	(1.2+0.2Sds) + 1.0E 270 AZI
63	(1.2+0.2Sds) + 1.0E 300 AZI
64	(1.2+0.2Sds) + 1.0E 315 AZI
65	(1.2+0.2Sds) + 1.0E 330 AZI
66	(0.9-0.2Sds) + 1.0E 0 AZI
67	(0.9-0.2Sds) + 1.0E 30 AZI
68	(0.9-0.2Sds) + 1.0E 45 AZI
69	(0.9-0.2Sds) + 1.0E 60 AZI
70	(0.9-0.2Sds) + 1.0E 90 AZI
71	(0.9-0.2Sds) + 1.0E 120 AZI
72	(0.9-0.2Sds) + 1.0E 135 AZI
73	(0.9-0.2Sds) + 1.0E 150 AZI
74	(0.9-0.2Sds) + 1.0E 180 AZI
75	(0.9-0.2Sds) + 1.0E 210 AZI
76	(0.9-0.2Sds) + 1.0E 225 AZI
77	(0.9-0.2Sds) + 1.0E 240 AZI
78	(0.9-0.2Sds) + 1.0E 270 AZI
79	(0.9-0.2Sds) + 1.0E 300 AZI
80	(0.9-0.2Sds) + 1.0E 315 AZI
81	(0.9-0.2Sds) + 1.0E 330 AZI
82-88	1.2D + 1.5 Lv1

#	Description
89	1.2D + 1.5Lm + 1.0Wm 0 AZI - MP1
90	1.2D + 1.5Lm + 1.0Wm 30 AZI - MP1
91	1.2D + 1.5Lm + 1.0Wm 45 AZI - MP1
92	1.2D + 1.5Lm + 1.0Wm 60 AZI - MP1
93	1.2D + 1.5Lm + 1.0Wm 90 AZI - MP1
94	1.2D + 1.5Lm + 1.0Wm 120 AZI - MP1
95	1.2D + 1.5Lm + 1.0Wm 135 AZI - MP1
96	1.2D + 1.5Lm + 1.0Wm 150 AZI - MP1
97	1.2D + 1.5Lm + 1.0Wm 180 AZI - MP1
98	1.2D + 1.5Lm + 1.0Wm 210 AZI - MP1
99	1.2D + 1.5Lm + 1.0Wm 225 AZI - MP1
100	1.2D + 1.5Lm + 1.0Wm 240 AZI - MP1
101	1.2D + 1.5Lm + 1.0Wm 270 AZI - MP1
102	1.2D + 1.5Lm + 1.0Wm 300 AZI - MP1
103	1.2D + 1.5Lm + 1.0Wm 315 AZI - MP1
104	1.2D + 1.5Lm + 1.0Wm 330 AZI - MP1
105	1.2D + 1.5Lm + 1.0Wm 0 AZI - MP2
106	1.2D + 1.5Lm + 1.0Wm 30 AZI - MP2
107	1.2D + 1.5Lm + 1.0Wm 45 AZI - MP2
108	1.2D + 1.5Lm + 1.0Wm 60 AZI - MP2
109	1.2D + 1.5Lm + 1.0Wm 90 AZI - MP2
110	1.2D + 1.5Lm + 1.0Wm 120 AZI - MP2
111	1.2D + 1.5Lm + 1.0Wm 135 AZI - MP2
112	1.2D + 1.5Lm + 1.0Wm 150 AZI - MP2
113	1.2D + 1.5Lm + 1.0Wm 180 AZI - MP2
114	1.2D + 1.5Lm + 1.0Wm 210 AZI - MP2
115	1.2D + 1.5Lm + 1.0Wm 225 AZI - MP2
116	1.2D + 1.5Lm + 1.0Wm 240 AZI - MP2
117	1.2D + 1.5Lm + 1.0Wm 270 AZI - MP2
118	1.2D + 1.5Lm + 1.0Wm 300 AZI - MP2
119	1.2D + 1.5Lm + 1.0Wm 315 AZI - MP2
120	1.2D + 1.5Lm + 1.0Wm 330 AZI - MP2

#	Description
121	1.2D + 1.5Lm + 1.0Wm 0 AZI - MP3
122	1.2D + 1.5Lm + 1.0Wm 30 AZI - MP3
123	1.2D + 1.5Lm + 1.0Wm 45 AZI - MP3
124	1.2D + 1.5Lm + 1.0Wm 60 AZI - MP3
125	1.2D + 1.5Lm + 1.0Wm 90 AZI - MP3
126	1.2D + 1.5Lm + 1.0Wm 120 AZI - MP3
127	1.2D + 1.5Lm + 1.0Wm 135 AZI - MP3
128	1.2D + 1.5Lm + 1.0Wm 150 AZI - MP3
129	1.2D + 1.5Lm + 1.0Wm 180 AZI - MP3
130	1.2D + 1.5Lm + 1.0Wm 210 AZI - MP3
131	1.2D + 1.5Lm + 1.0Wm 225 AZI - MP3
132	1.2D + 1.5Lm + 1.0Wm 240 AZI - MP3
133	1.2D + 1.5Lm + 1.0Wm 270 AZI - MP3
134	1.2D + 1.5Lm + 1.0Wm 300 AZI - MP3
135	1.2D + 1.5Lm + 1.0Wm 315 AZI - MP3
136	1.2D + 1.5Lm + 1.0Wm 330 AZI - MP3
137	1.2D + 1.5Lm + 1.0Wm 0 AZI - MP4
138	1.2D + 1.5Lm + 1.0Wm 30 AZI - MP4
139	1.2D + 1.5Lm + 1.0Wm 45 AZI - MP4
140	1.2D + 1.5Lm + 1.0Wm 60 AZI - MP4
141	1.2D + 1.5Lm + 1.0Wm 90 AZI - MP4
142	1.2D + 1.5Lm + 1.0Wm 120 AZI - MP4
143	1.2D + 1.5Lm + 1.0Wm 135 AZI - MP4
144	1.2D + 1.5Lm + 1.0Wm 150 AZI - MP4
145	1.2D + 1.5Lm + 1.0Wm 180 AZI - MP4
146	1.2D + 1.5Lm + 1.0Wm 210 AZI - MP4
147	1.2D + 1.5Lm + 1.0Wm 225 AZI - MP4
148	1.2D + 1.5Lm + 1.0Wm 240 AZI - MP4
149	1.2D + 1.5Lm + 1.0Wm 270 AZI - MP4
150	1.2D + 1.5Lm + 1.0Wm 300 AZI - MP4
151	1.2D + 1.5Lm + 1.0Wm 315 AZI - MP4
152	1.2D + 1.5Lm + 1.0Wm 330 AZI - MP4

*This page shows an example of maintenance loads for (4) pipes, the number of mount pipe LCs may vary per site

EQUIPMENT LOADING

Appurtenance Name/Location	Qty.	Elevation [ft]	--	EPA $_N$ (ft2)	EPA $_T$ (ft2)	Weight (lbs)
MX08FRO665-20	1	118	No Ice	8.01	3.21	82.50
MP1, 0	--	--	w/ Ice	9.63	4.63	281.99
TA08025-B604	1	118	No Ice	1.96	0.98	63.90
MP1, 90	--	--	w/ Ice	2.38	1.31	68.51
TA08025-B605	1	118	No Ice	1.96	1.13	75.00
MP1, 90	--	--	w/ Ice	2.38	1.47	73.00
RDIDC-9181-PF-48	1	118	No Ice	2.01	1.17	21.85
MP1, 45	--	--	w/ Ice	2.43	1.52	71.94
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
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EQUIPMENT WIND CALCULATIONS

Appurtenance Name	Qty.	Elevation [ft]	K_{zt}	K_z	K_d	t_d	q_z [psf]	q_{zi} [psf]
MX08FRO665-20	1	118	1.00	1.04	0.95	1.70	45.89	6.30
TA08025-B604	1	118	1.00	1.04	0.95	1.70	45.89	6.30
TA08025-B605	1	118	1.00	1.04	0.95	1.70	45.89	6.30
RDIDC-9181-PF-48	1	118	1.00	1.04	0.95	1.70	45.89	6.30

EQUIPMENT LATERAL WIND FORCE CALCULATIONS

Appurtenance Name	Qty.	--	0° 180°	30° 210°	60° 240°	90° 270°	120° 300°	150° 330°
MX08FRO665-20	1	No Ice	330.83	182.14	281.27	132.58	281.27	182.14
MP1, 0	--	w/ Ice	54.58	33.33	47.49	26.25	47.49	33.33
TA08025-B604	1	No Ice	81.10	50.67	70.95	40.52	70.95	50.67
MP1, 90	--	w/ Ice	13.49	8.92	11.96	7.39	11.96	8.92
TA08025-B605	1	No Ice	81.10	55.26	72.48	46.65	72.48	55.26
MP1, 90	--	w/ Ice	13.49	9.61	12.19	8.31	12.19	9.61
RDIDC-9181-PF-48	1	No Ice	83.09	56.96	74.38	48.25	74.38	56.96
MP1, 45	--	w/ Ice	13.80	9.91	12.50	8.61	12.50	9.91
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						
		No Ice						
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		No Ice						
--	--	w/ Ice						

EQUIPMENT SEISMIC FORCE CALCULATIONS

Appurtenance Name	*Qty.*	*Elevation [ft]*	*Weight [lbs]*	F_p [lbs]
MX08FRO665-20	1	118	82.5	8.92
TA08025-B604	1	118	63.9	6.91
TA08025-B605	1	118	75	8.11
RDIDC-9181-PF-48	1	118	21.85	2.36

APPENDIX C

SOFTWARE ANALYSIS OUTPUT

(Global) Model Settings

Display Sections for Member Calcs	5
Max Internal Sections for Member Calcs	97
Include Shear Deformation?	Yes
Increase Nailing Capacity for Wind?	Yes
Include Warping?	Yes
Trans Load Btwn Intersecting Wood Wall?	Yes
Area Load Mesh (in^2)	144
Merge Tolerance (in)	.12
P-Delta Analysis Tolerance	0.50%
Include P-Delta for Walls?	Yes
Automatically Iterate Stiffness for Walls?	Yes
Max Iterations for Wall Stiffness	3
Gravity Acceleration (in/sec^2)	386.4
Wall Mesh Size (in)	24
Eigensolution Convergence Tol. (1.E-)	4
Vertical Axis	Y
Global Member Orientation Plane	XZ
Static Solver	Sparse Accelerated
Dynamic Solver	Accelerated Solver

Hot Rolled Steel Code	AISC 15th(360-16): LRFD
Adjust Stiffness?	Yes(Iterative)
RISAConnection Code	AISC 15th(360-16): LRFD
Cold Formed Steel Code	AISI S100-16: LRFD
Wood Code	AWC NDS-15: ASD
Wood Temperature	< 100F
Concrete Code	ACI 318-14
Masonry Code	ACI 530-13: Strength
Aluminum Code	AA ADM1-10: LRFD - Building
Stainless Steel Code	AISC 14th(360-10): ASD
Adjust Stiffness?	Yes(Iterative)

Number of Shear Regions	4
Region Spacing Increment (in)	4
Biaxial Column Method	Exact Integration
Parme Beta Factor (PCA)	.65
Concrete Stress Block	Rectangular
Use Cracked Sections?	Yes
Use Cracked Sections Slab?	Yes
Bad Framing Warnings?	No
Unused Force Warnings?	Yes
Min 1 Bar Diam. Spacing?	No
Concrete Rebar Set	REBAR_SET_ASTMA615
Min % Steel for Column	1
Max % Steel for Column	8

(Global) Model Settings, Continued

Seismic Code	ASCE 7-10
Seismic Base Elevation (in)	Not Entered
Add Base Weight?	Yes
Ct X	.02
Ct Z	.02
T X (sec)	Not Entered
T Z (sec)	Not Entered
R X	3
R Z	3
Ct Exp. X	.75
Ct Exp. Z	.75
SD1	1
SDS	1
S1	1
TL (sec)	5
Risk Cat	I or II
Drift Cat	Other
Om Z	1
Om X	1
Cd Z	1
Cd X	1
Rho Z	1
Rho X	1

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (/1E5 F)	Density[k...	Yield[ksi]	Ry	Fu[ksi]	Rt
1	A992	29000	11154	.3	.65	.49	50	1.1	65	1.1
2	A36 Gr.36	29000	11154	.3	.65	.49	36	1.5	58	1.2
3	A572 Gr.50	29000	11154	.3	.65	.49	50	1.1	65	1.1
4	A500 Gr.B RND	29000	11154	.3	.65	.527	42	1.4	58	1.3
5	A500 Gr.B Rect	29000	11154	.3	.65	.527	46	1.4	58	1.3
6	A53 Gr.B	29000	11154	.3	.65	.49	35	1.6	60	1.2
7	A1085	29000	11154	.3	.65	.49	50	1.4	65	1.3
8	A500 Gr. C - 46	29000	11154	.3	.65	.49	46	1.3	62	1.4
9	A529 Gr. 50	29000	11154	.3	.65	.49	50	1.3	65	1.4

Cold Formed Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (/1E5 F)	Density[k/ft^3]	Yield[ksi]	Fu[ksi]
1	A653 SS Gr33	29500	11346	.3	.65	.49	33	45
2	A653 SS Gr50/1	29500	11346	.3	.65	.49	50	65

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design R...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	Horizontals	PIPE_2.5	Beam	None	A500 Gr. C - 46	Typical	1.61	1.45	1.45	2.89
2	Standoffs	PIPE_1.5	Beam	None	A500 Gr. C - 46	Typical	.749	.293	.293	.586
3	Tie Backs	PIPE_2.0	Beam	None	A500 Gr. C - 46	Typical	1.02	.627	.627	1.25
4	Mount Pipes	PIPE_2.0	Beam	None	A500 Gr. C - 46	Typical	1.02	.627	.627	1.25
5	Standoff Bracin...	SR 5/8_HRA	Beam	None	A529 Gr. 50	Typical	.307	.007	.007	.015

Hot Rolled Steel Section Sets (Continued)

	Label	Shape	Type	Design List	Material	Design R...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
6	Vertical pipes	PIPE_3.0	Beam	None	A500 Gr. C - 46	Typical	2.07	2.85	2.85	5.69
7	Standoff Bracin...	SR 1/2"	Beam	None	A529 Gr. 50	Typical	.196	.003	.003	.006

Cold Formed Steel Section Sets

	Label	Shape	Type	Design List	Material	Design Rules	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	CF1A	8CU1.25X0...	Beam	None	A653 SS Gr33	Typical	.581	.057	4.41	.00063

Joint Boundary Conditions

	Joint Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot.[k-ft/rad]	Y Rot.[k-ft/rad]	Z Rot.[k-ft/rad]
1	N13						
2	N14						
3	N48	Reaction	Reaction	Reaction	Reaction		Reaction
4	N49	Reaction	Reaction	Reaction	Reaction		Reaction
5	N52A	Reaction	Reaction	Reaction			

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed	Area(Me...	Surface(P...
1	Self Weight	DL		-1			5			
2	Structure Wind Z	WLZ						18		
3	Structure Wind X	WLX						18		
4	Wind Load 0 AZI	WLZ					5			
5	Wind Load 30 AZI	None					10			
6	Wind Load 45 AZI	None					10			
7	Wind Load 60 AZI	None					10			
8	Wind Load 90 AZI	WLX					5			
9	Wind Load 120 AZI	None					10			
10	Wind Load 135 AZI	None					10			
11	Wind Load 150 AZI	None					10			
12	Ice Weight	OL1					5	18		
13	Ice Structure Wind Z	OL2						18		
14	Ice Structure Wind X	OL3						18		
15	Ice Wind Load 0 AZI	OL2					5			
16	Ice Wind Load 30 AZI	None					10			
17	Ice Wind Load 45 AZI	None					10			
18	Ice Wind Load 60 AZI	None					10			
19	Ice Wind Load 90 AZI	OL3					5			
20	Ice Wind Load 120 AZI	None					10			
21	Ice Wind Load 135 AZI	None					10			
22	Ice Wind Load 150 AZI	None					10			
23	Seismic Load Z	ELZ			-.108		5			
24	Seismic Load X	ELX	-.108				5			
25	Live Load 1 (Lv)	None					1			
26	Live Load 2 (Lv)	None					1			
27	Live Load 3 (Lv)	None					1			
28	Maintenance Load 1 (...	None					1			
29	Maintenance Load 2 (...	None					1			
30	Maintenance Load 3 (...	None					1			

Load Combinations

	Description	So..	P...	S...	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac...
1	1.4DL	Yes	Y		DL	1.4																		
2	1.2DL + 1WL 0 AZI	Yes	Y		DL	1.2	2	1	3		4	1												
3	1.2DL + 1WL 30 AZI	Yes	Y		DL	1.2	2	.866	3	.5	5	1												
4	1.2DL + 1WL 45 AZI	Yes	Y		DL	1.2	2	.707	3	.707	6	1												
5	1.2DL + 1WL 60 AZI	Yes	Y		DL	1.2	2	.5	3	.866	7	1												
6	1.2DL + 1WL 90 AZI	Yes	Y		DL	1.2	2		3	1	8	1												
7	1.2DL + 1WL 120 AZI	Yes	Y		DL	1.2	2	-.5	3	.866	9	1												
8	1.2DL + 1WL 135 AZI	Yes	Y		DL	1.2	2	-.707	3	.707	10	1												
9	1.2DL + 1WL 150 AZI	Yes	Y		DL	1.2	2	-.866	3	.5	11	1												
10	1.2DL + 1WL 180 AZI	Yes	Y		DL	1.2	2	-1	3		4	-1												
11	1.2DL + 1WL 210 AZI	Yes	Y		DL	1.2	2	-.866	3	-.5	5	-1												
12	1.2DL + 1WL 225 AZI	Yes	Y		DL	1.2	2	-.707	3	-.707	6	-1												
13	1.2DL + 1WL 240 AZI	Yes	Y		DL	1.2	2	-.5	3	-.866	7	-1												
14	1.2DL + 1WL 270 AZI	Yes	Y		DL	1.2	2		3	-1	8	-1												
15	1.2DL + 1WL 300 AZI	Yes	Y		DL	1.2	2	.5	3	-.866	9	-1												
16	1.2DL + 1WL 315 AZI	Yes	Y		DL	1.2	2	.707	3	-.707	10	-1												
17	1.2DL + 1WL 330 AZI	Yes	Y		DL	1.2	2	.866	3	-.5	11	-1												
18	0.9DL + 1WL 0 AZI	Yes	Y		DL	.9	2	1	3		4	1												
19	0.9DL + 1WL 30 AZI	Yes	Y		DL	.9	2	.866	3	.5	5	1												
20	0.9DL + 1WL 45 AZI	Yes	Y		DL	.9	2	.707	3	.707	6	1												
21	0.9DL + 1WL 60 AZI	Yes	Y		DL	.9	2	.5	3	.866	7	1												
22	0.9DL + 1WL 90 AZI	Yes	Y		DL	.9	2		3	1	8	1												
23	0.9DL + 1WL 120 AZI	Yes	Y		DL	.9	2	-.5	3	.866	9	1												
24	0.9DL + 1WL 135 AZI	Yes	Y		DL	.9	2	-.707	3	.707	10	1												
25	0.9DL + 1WL 150 AZI	Yes	Y		DL	.9	2	-.866	3	.5	11	1												
26	0.9DL + 1WL 180 AZI	Yes	Y		DL	.9	2	-1	3		4	-1												
27	0.9DL + 1WL 210 AZI	Yes	Y		DL	.9	2	-.866	3	-.5	5	-1												
28	0.9DL + 1WL 225 AZI	Yes	Y		DL	.9	2	-.707	3	-.707	6	-1												
29	0.9DL + 1WL 240 AZI	Yes	Y		DL	.9	2	-.5	3	-.866	7	-1												
30	0.9DL + 1WL 270 AZI	Yes	Y		DL	.9	2		3	-1	8	-1												
31	0.9DL + 1WL 300 AZI	Yes	Y		DL	.9	2	.5	3	-.866	9	-1												
32	0.9DL + 1WL 315 AZI	Yes	Y		DL	.9	2	.707	3	-.707	10	-1												
33	0.9DL + 1WL 330 AZI	Yes	Y		DL	.9	2	.866	3	-.5	11	-1												
34	1.2DL + 1DLi + 1WL..	Yes	Y		DL	1.2	OL1	1	13	1	14		15	1										
35	1.2DL + 1DLi + 1WL..	Yes	Y		DL	1.2	OL1	1	13	.866	14	.5	16	1										
36	1.2DL + 1DLi + 1WL..	Yes	Y		DL	1.2	OL1	1	13	.707	14	.707	17	1										
37	1.2DL + 1DLi + 1WL..	Yes	Y		DL	1.2	OL1	1	13	.5	14	.866	18	1										
38	1.2DL + 1DLi + 1WL..	Yes	Y		DL	1.2	OL1	1	13		14	1	19	1										
39	1.2DL + 1DLi + 1WL..	Yes	Y		DL	1.2	OL1	1	13	-.5	14	.866	20	1										
40	1.2DL + 1DLi + 1WL..	Yes	Y		DL	1.2	OL1	1	13	-.707	14	.707	21	1										
41	1.2DL + 1DLi + 1WL..	Yes	Y		DL	1.2	OL1	1	13	-.866	14	.5	22	1										
42	1.2DL + 1DLi + 1WL..	Yes	Y		DL	1.2	OL1	1	13	-1	14		15	-1										
43	1.2DL + 1DLi + 1WL..	Yes	Y		DL	1.2	OL1	1	13	-.866	14	-.5	16	-1										
44	1.2DL + 1DLi + 1WL..	Yes	Y		DL	1.2	OL1	1	13	-.707	14	-.707	17	-1										
45	1.2DL + 1DLi + 1WL..	Yes	Y		DL	1.2	OL1	1	13	-.5	14	-.866	18	-1										
46	1.2DL + 1DLi + 1WL..	Yes	Y		DL	1.2	OL1	1	13		14	-1	19	-1										
47	1.2DL + 1DLi + 1WL..	Yes	Y		DL	1.2	OL1	1	13	.5	14	-.866	20	-1										
48	1.2DL + 1DLi + 1WL..	Yes	Y		DL	1.2	OL1	1	13	.707	14	-.707	21	-1										
49	1.2DL + 1DLi + 1WL..	Yes	Y		DL	1.2	OL1	1	13	.866	14	-.5	22	-1										
50	(1.2+0.2Sds)DL + 1...	Yes	Y		DL	1.2...	23	1	24															
51	(1.2+0.2Sds)DL + 1...	Yes	Y		DL	1.2...	23	.866	24	.5														

Load Combinations (Continued)

	Description	So..	P...	S...	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac...
52	(1.2+0.2Sds)DL + 1...	Yes	Y		DL	1.2...	23	.707	24	.707																
53	(1.2+0.2Sds)DL + 1...	Yes	Y		DL	1.2...	23	.5	24	.866																
54	(1.2+0.2Sds)DL + 1...	Yes	Y		DL	1.2...	23		24	1																
55	(1.2+0.2Sds)DL + 1...	Yes	Y		DL	1.2...	23	-.5	24	.866																
56	(1.2+0.2Sds)DL + 1...	Yes	Y		DL	1.2...	23	-.707	24	.707																
57	(1.2+0.2Sds)DL + 1...	Yes	Y		DL	1.2...	23	-.866	24	.5																
58	(1.2+0.2Sds)DL + 1...	Yes	Y		DL	1.2...	23	-1	24																	
59	(1.2+0.2Sds)DL + 1...	Yes	Y		DL	1.2...	23	-.866	24	-.5																
60	(1.2+0.2Sds)DL + 1...	Yes	Y		DL	1.2...	23	-.707	24	-.707																
61	(1.2+0.2Sds)DL + 1...	Yes	Y		DL	1.2...	23	-.5	24	-.866																
62	(1.2+0.2Sds)DL + 1...	Yes	Y		DL	1.2...	23		24	-1																
63	(1.2+0.2Sds)DL + 1...	Yes	Y		DL	1.2...	23	.5	24	-.866																
64	(1.2+0.2Sds)DL + 1...	Yes	Y		DL	1.2...	23	.707	24	-.707																
65	(1.2+0.2Sds)DL + 1...	Yes	Y		DL	1.2...	23	.866	24	-.5																
66	(0.9-0.2Sds)DL + 1E...	Yes	Y		DL	.864	23	1	24																	
67	(0.9-0.2Sds)DL + 1E...	Yes	Y		DL	.864	23	.866	24	.5																
68	(0.9-0.2Sds)DL + 1E...	Yes	Y		DL	.864	23	.707	24	.707																
69	(0.9-0.2Sds)DL + 1E...	Yes	Y		DL	.864	23	.5	24	.866																
70	(0.9-0.2Sds)DL + 1E...	Yes	Y		DL	.864	23		24	1																
71	(0.9-0.2Sds)DL + 1E...	Yes	Y		DL	.864	23	-.5	24	.866																
72	(0.9-0.2Sds)DL + 1E...	Yes	Y		DL	.864	23	-.707	24	.707																
73	(0.9-0.2Sds)DL + 1E...	Yes	Y		DL	.864	23	-.866	24	.5																
74	(0.9-0.2Sds)DL + 1E...	Yes	Y		DL	.864	23	-1	24																	
75	(0.9-0.2Sds)DL + 1E...	Yes	Y		DL	.864	23	-.866	24	-.5																
76	(0.9-0.2Sds)DL + 1E...	Yes	Y		DL	.864	23	-.707	24	-.707																
77	(0.9-0.2Sds)DL + 1E...	Yes	Y		DL	.864	23	-.5	24	-.866																
78	(0.9-0.2Sds)DL + 1E...	Yes	Y		DL	.864	23		24	-1																
79	(0.9-0.2Sds)DL + 1E...	Yes	Y		DL	.864	23	.5	24	-.866																
80	(0.9-0.2Sds)DL + 1E...	Yes	Y		DL	.864	23	.707	24	-.707																
81	(0.9-0.2Sds)DL + 1E...	Yes	Y		DL	.864	23	.866	24	-.5																
82	1.2DL + 1Lv1	Yes	Y		DL	1.2	25	1.5																		
83	1.2DL + 1Lv2	Yes	Y		DL	1.2	26	1.5																		
84	1.2DL + 1Lv3	Yes	Y		DL	1.2	27	1.5																		
85	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	28	1.5	2	.049	3		4	.049												
86	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	28	1.5	2	.043	3	.025	5	.049												
87	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	28	1.5	2	.035	3	.035	6	.049												
88	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	28	1.5	2	.025	3	.043	7	.049												
89	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	28	1.5	2		3	.049	8	.049												
90	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	28	1.5	2	-.025	3	.043	9	.049												
91	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	28	1.5	2	-.035	3	.035	10	.049												
92	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	28	1.5	2	-.043	3	.025	11	.049												
93	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	28	1.5	2	-.049	3		4	-.049												
94	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	28	1.5	2	-.043	3	-.025	5	-.049												
95	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	28	1.5	2	-.035	3	-.035	6	-.049												
96	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	28	1.5	2	-.025	3	-.043	7	-.049												
97	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	28	1.5	2		3	-.049	8	-.049												
98	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	28	1.5	2	.025	3	-.043	9	-.049												
99	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	28	1.5	2	.035	3	-.035	10	-.049												
100	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	28	1.5	2	.043	3	-.025	11	-.049												
101	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	29	1.5	2	.049	3		4	.049												
102	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	29	1.5	2	.043	3	.025	5	.049												
103	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	29	1.5	2	.035	3	.035	6	.049												

Load Combinations (Continued)

	Description	So..	P...	S...	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac...
104	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	29	1.5	2	.025	3	.043	7	.049										
105	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	29	1.5	2		3	.049	8	.049										
106	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	29	1.5	2	-.025	3	.043	9	.049										
107	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	29	1.5	2	-.035	3	.035	10	.049										
108	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	29	1.5	2	-.043	3	.025	11	.049										
109	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	29	1.5	2	-.049	3		4	-.049										
110	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	29	1.5	2	-.043	3	-.025	5	-.049										
111	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	29	1.5	2	-.035	3	-.035	6	-.049										
112	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	29	1.5	2	-.025	3	-.043	7	-.049										
113	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	29	1.5	2		3	-.049	8	-.049										
114	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	29	1.5	2	.025	3	-.043	9	-.049										
115	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	29	1.5	2	.035	3	-.035	10	-.049										
116	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	29	1.5	2	.043	3	-.025	11	-.049										
117	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	30	1.5	2	.049	3		4	.049										
118	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	30	1.5	2	.043	3	.025	5	.049										
119	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	30	1.5	2	.035	3	.035	6	.049										
120	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	30	1.5	2	.025	3	.043	7	.049										
121	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	30	1.5	2		3	.049	8	.049										
122	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	30	1.5	2	-.025	3	.043	9	.049										
123	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	30	1.5	2	-.035	3	.035	10	.049										
124	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	30	1.5	2	-.043	3	.025	11	.049										
125	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	30	1.5	2	-.049	3		4	-.049										
126	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	30	1.5	2	-.043	3	-.025	5	-.049										
127	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	30	1.5	2	-.035	3	-.035	6	-.049										
128	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	30	1.5	2	-.025	3	-.043	7	-.049										
129	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	30	1.5	2		3	-.049	8	-.049										
130	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	30	1.5	2	.025	3	-.043	9	-.049										
131	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	30	1.5	2	.035	3	-.035	10	-.049										
132	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	30	1.5	2	.043	3	-.025	11	-.049										

Envelope Joint Reactions

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [lb-ft]	LC	MY [lb-ft]	LC	MZ [lb-ft]	LC
1	N48	max	566.517	89	1520.231	41	596.952	33	-92.347	33	0	132	651.75	131
2		min	-1196.568	129	135.457	33	-1607.408	41	-1051.392	40	0	1	-185.609	91
3	N49	max	1189.013	121	667.718	116	1546.996	49	113.763	124	0	132	282.289	84
4		min	-558.595	97	-53.53	124	-299.524	25	-521.456	116	0	1	-187.082	91
5	N52A	max	58.7	17	65.042	39	775.99	8	0	132	0	132	0	132
6		min	-59.598	9	15.394	79	-779.704	16	0	1	0	1	0	1
7	Totals:	max	782.219	22	1743.37	40	1032.402	2						
8		min	-782.228	14	431.927	71	-1032.397	26						

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

	Member	Shape	Code Check	Loc[in]	LC	Shea...	Loc.....	L..	phi*Pn...	phi*Pn...	phi*Mn...	phi*Mn.....	Eqn
1	M24	SR 5/8_H...	.395	27.099	124	.019	0	16	1849.1...	13805...	143.808	143.808	1	H1-1a
2	M29	SR 1/2"	.346	22.427	37	.011	44....	15	1432.0...	8835.75	73.632	73.632	1	H1-1a
3	M4	PIPE_1.5	.216	34.81	129	.198	34.81	1...	23485...	31008.6	1452.45	1452.45	1	H1-1b
4	MP3	PIPE_2.0	.195	48	16	.130	33	16	15369....	42228	2459.85	2459.85	1...	H1-1b
5	M2	PIPE_1.5	.193	34.81	120	.123	.725	1...	23485...	31008.6	1452.45	1452.45	1...	H1-1b
6	M3	PIPE_1.5	.183	34.81	122	.084	34.81	1...	23485...	31008.6	1452.45	1452.45	1	H1-1b

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

	Member	Shape	Code Check	Loc[in]	LC	Shea...	Loc.....		L...	phi*Pn...	phi*Pn...	phi*Mn...	phi*Mn.....		Eqn
7	H1	PIPE_2.5	.172	76	132	.056	76		1...	45255....	66654	4726.5	4726.5	1...	H1-1b
8	M1	PIPE_1.5	.171	34.81	130	.083	34.81		90	23485....	31008.6	1452.45	1452.45	1	H1-1b
9	MP1	PIPE_2.0	.168	33	2	.092	33		16	15369....	42228	2459.85	2459.85	1...	H1-1b
10	M5	PIPE_2.5	.165	21	16	.053	76		1...	45255....	66654	4726.5	4726.5	1	H1-1b
11	M28	SR 1/2"	.135	22.427	48	.014	0		16	1432.0...	8835.75	73.632	73.632	1	H1-1b
12	M31A	PIPE_2.0	.090	61.625	7	.005	123...		46	9324.69	42228	2459.85	2459.85	1...	H1-1b
13	M26	SR 5/8_H...	.034	30.25	41	.056	0		1...	1849.1...	13805....	143.808	143.808	1	H1-1b*
14	M23	SR 5/8_H...	.029	30.25	8	.019	0		16	1849.1...	13805....	143.808	143.808	1	H1-1b*
15	MP2	PIPE_2.0	.025	63	108	.100	33		1...	15369....	42228	2459.85	2459.85	1...	H1-1b*
16	M25	SR 5/8_H...	.015	15.44	10	.056	0		1...	1849.1...	13805....	143.808	143.808	1	H1-1b
17	M27	SR 1/2"	.001	44.854	24	.010	0		1...	1432.0...	8835.75	73.632	73.632	1	H1-1b*
18	M30	SR 1/2"	.000	0	132	.007	0		1...	1432.0...	8835.75	73.632	73.632	1	H1-1a

Envelope AISI S100-16: LRFD Cold Formed Steel Code Checks

Mem...	Shape	Code Check	Loc[in]	LC	She...	Lo...	...	...	phi*...	phi*T...	phi*...	phi*...	phi...	phi...	Cb	Eqn
No Data to Print ...																

APPENDIX D

ADDITIONAL CALCUATIONS

Trylon

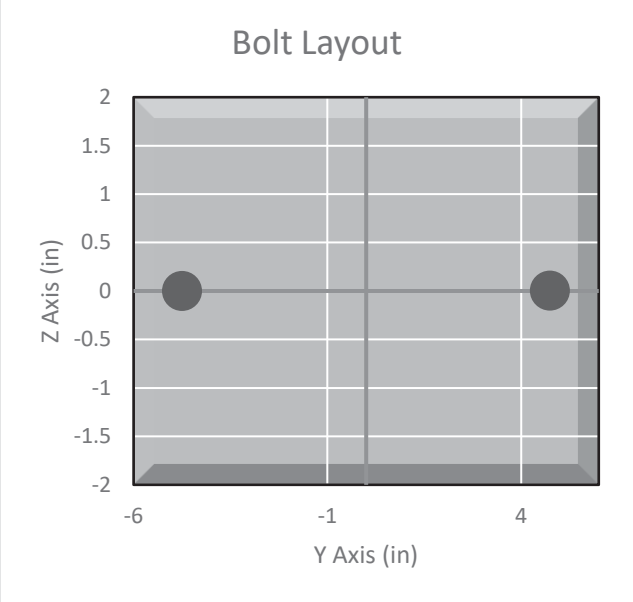
Analysis date: 8/4/2021

BOLT TOOL 1.5.2

Project Data	
Job Code:	188193
Carrier Site ID:	BU# 806363
Carrier Site Name:	HRT 105 943201

Code	
Design Standard:	TIA-222-H
Slip Check:	Yes
Pretension Standard:	TIA-222-H

Bolt Properties		
Connection Type:	Threaded Rod	
Diameter:	0.75	in
Grade:	A36	--
Yield Strength (Fy):	36	ksi
Ultimate Strength (Fu):	58	ksi
Number of Bolts:	2	--
Threads Included:	Yes	--
Double Shear:	No	--
Connection Pipe Size:	9.5	in



Connection Description
Standoff to Leg Connection

Bolt Check*		
Tensile Capacity (ϕT_n):	14549.0	lbs
Shear Capacity (ϕV_n):	9608.9	lbs
Tension Force (T_u):	576.6	lbs
Shear Force (V_u):	1622.7	lbs
Tension Usage:	3.8%	--
Shear Usage:	16.1%	--
Interaction:	16.1%	Pass
Controlling Member:	M31	--
Controlling LC:	130	--

**Rating per TIA-222-H Section 15.5*

Slip Check*		
Sliding Capacity (ϕR_{ns}):	9638.4	lbs
Torsion Capacity (ϕR_{nr}):	3815.2	lb-ft
Sliding Force (V_{us}):	1520.2	lbs
Torsional Force (T_{ur}):	0.0	lb-ft
Sliding Usage:	15.0%	--
Torsion Usage:	0.0%	--
Interaction:	15.0%	Pass
Controlling Member:	M31	--
Controlling LC:	41	--

**Rating per TIA-222-H Section 15.5*

APPENDIX E

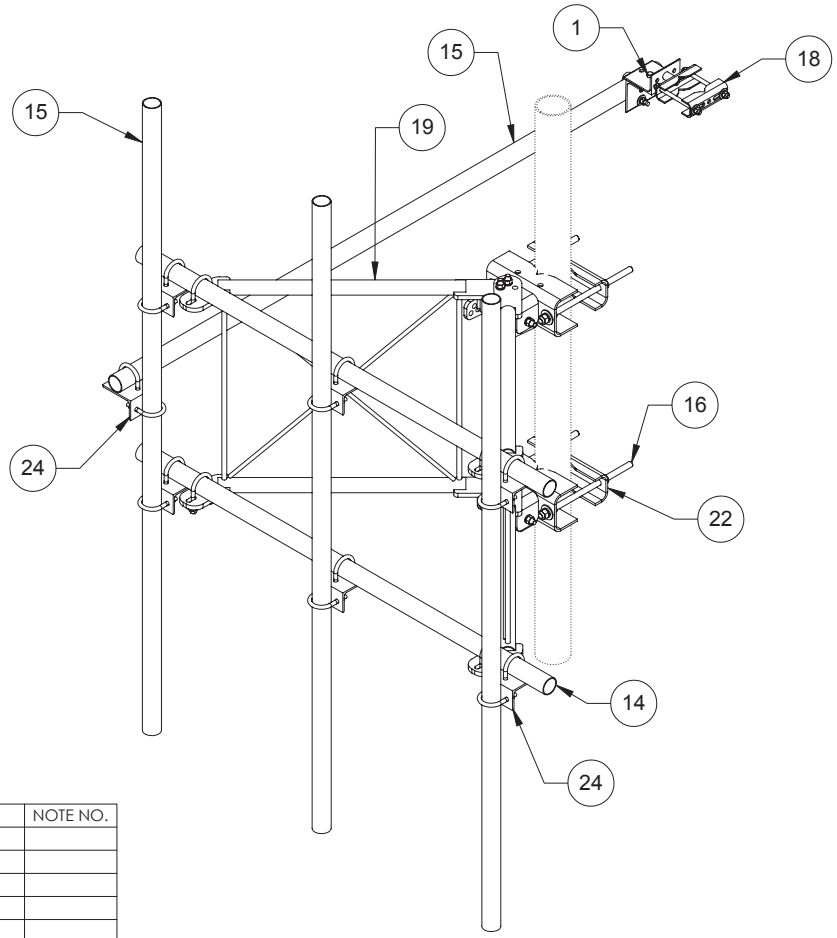
SUPPLEMENTAL DRAWINGS

NOTES:
1.0 ALL METRIC DIMENSIONS ARE IN BRACKETS.

REVISIONS				
REV.	ECN	DESCRIPTION	BY	DATE
PRE		REVIEW	DRH	01/28/21

www.Talleycom.com | Sales@Talleycom.com | 800.949.7079

TALLEY®



ITEM	PART NO.	DESCRIPTION	QTY.	WEIGHT	NOTE NO.
1	GB-04125	1/2" X 1-1/4" GALV BOLT KIT	1	0.12 LBS	
2	GB-04265	1/2" X 2-3/4" GALV BOLT KIT	1	0.20 LBS	
3	GB-05225	5/8" X 2-1/4" GALV BOLT KIT	8	0.28 LBS	
4	GB-05305	5/8" X 3" GALV BOLT KIT	4	0.35 LBS	
5	GN-04	1/2" GALV HEX NUT	4	0.04 LBS	
6	GN-06	3/4" GALV HEX NUT	12	0.15 LBS	
7	GUB-4240	1/2" X 2-1/2" X 4" GALV U-BOLT	19	0.56 LBS	
8	GWF-04	1/2" GALV FLAT WASHER	4	0.03 LBS	
9	GWF-05	5/8" GALV FLAT WASHER	4	0.06 LBS	
10	GWF-06	3/4" GALV FLAT WASHER	8	0.10 LBS	
11	GWL-04	1/2" GALV LOCK WASHER	4	0.01 LBS	
12	GWL-06	3/4" GALV LOCK WASHER	8	0.04 LBS	
13	MT-379-8	1/2" X 8" GALV THREADED ROD	2	0.44 LBS	
14	MT-651-96	2.375" OD x 96" PIPE	2	17.29 LBS	
15	MT-651-96	Ø2.375" OD X 96" PIPE	4	23.05 LBS	
16	MT38416	Threaded Rod Galv 3/4" x 16"	4	1.99 LBS	
17	OS15034	3/4" X 1-1/2" OFFSET COLLAR	1	0.14 LBS	
18	SAB01	FORMED CLAMP	2	1.35 LBS	
19	SFV01	WELDMENT, SF-V STANDOFF ARM	2	36.81 LBS	
20	SFV02	SFV AZIMUTH BRACKET	3	6.70 LBS	
21	SFV03	SFV TAPER BRACKET	1	7.49 LBS	
22	SMU2080.06	CLAMP PLATE	2	6.96 LBS	
23	SMU208004	MOUNT	2	12.15 LBS	
24	XA2020.01	ANTENNA MOUNT ANGLE	9	2.65 LBS	

DENSITY	0.28	lbs/in³
MASS	400.61	lbs
VOLUME	1421.66	in³
SURFACE AREA		in²
HEIGHT		
LENGTH		
WIDTH		

COMMSCOPE, INC. OF NORTH CAROLINA

TOLERANCES
0 PLACE X ± .25
1 PLACE .X ± .12
2 PLACE .XX ± .06
ANGLES ± 2°

SAP MATERIAL MASTER: MTC3975083

FINISH: GALV A123

MATERIAL: A1011/A1018, A500, A529

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS INTERPRET PER ASME Y14.5M-1994 HANDBOOK TECHNICAL DRAWINGS, VOLUMES 1 & 2, THIRD EDITION (2002)

	NAME	DATE
CE	RDLS	7/14/17
RW		
RV		
AD		
RE	TP	7/14/17
ECN		

TITLE: SECTOR FRAME, 8' FACE, (3) 96" PIPES

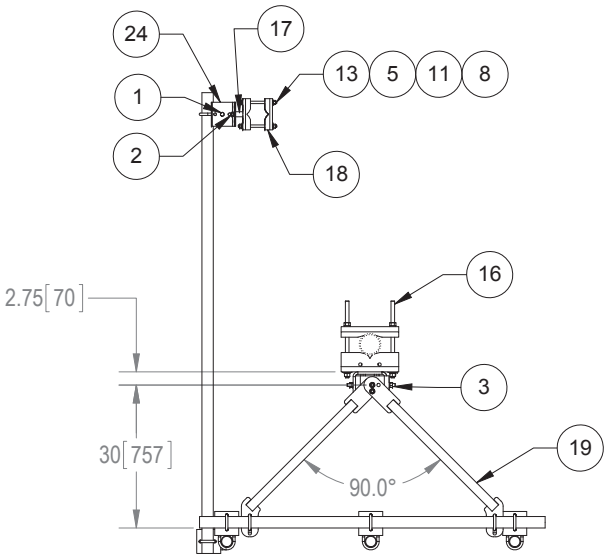
SCALE: 1:12

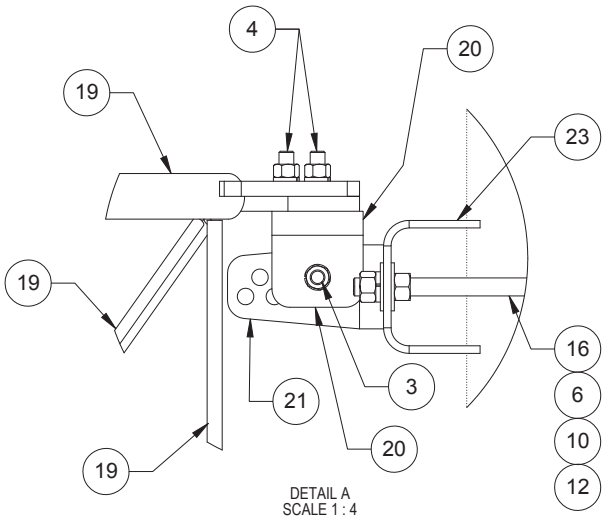
DOCUMENT NO.: MTC3975083

SIZE	WORK AREA	MODEL			DRAWING			SHEET
		VERSION	STATUS	REVISION	VERSION	STATUS	REVISION	
C							PRE	1 OF 2

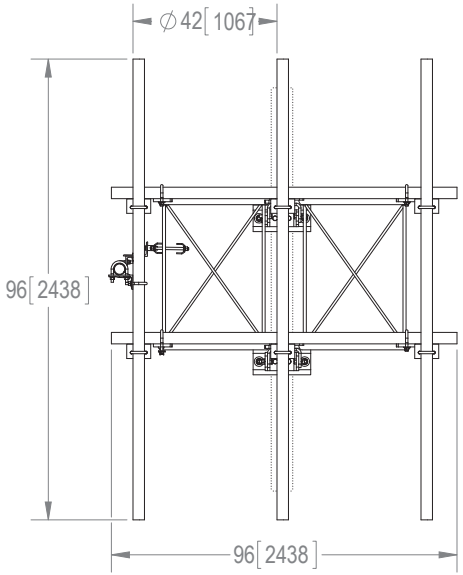
NOTES:

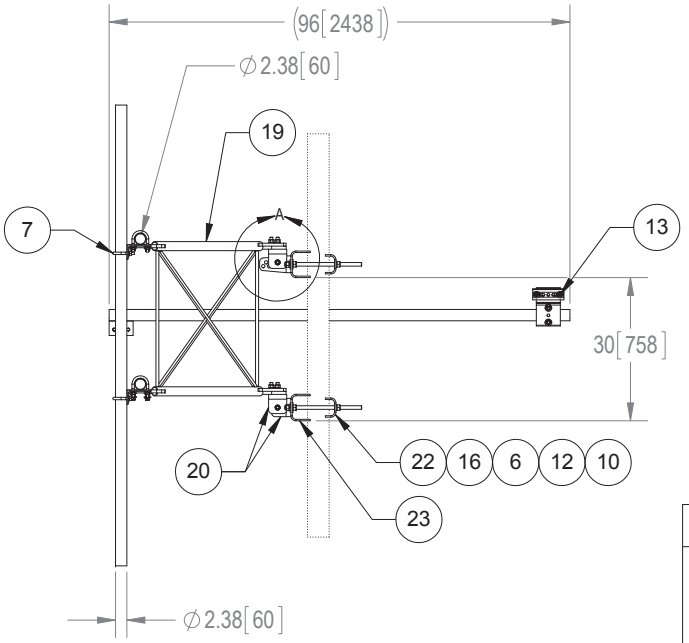
1.0 ALL METRIC DIMENSIONS ARE IN BRACKETS.





DETAIL A
SCALE 1 : 4





COMMSCOPE, INC. OF NORTH CAROLINA			
TITLE: **SECTOR FRAME, 8' FACE, (3) 96" PIPES**			
SIZE: C	SCALE: 1:20	DOCUMENT NO.: **MTC3975083**	
		DRAWING VERSION / STATUS / REVISION: PRE	SHEET: 2 OF 2

Exhibit F

Power Density/RF Emissions Report

EBI Consulting

environmental | engineering | due diligence

RADIO FREQUENCY EMISSIONS ANALYSIS REPORT
EVALUATION OF HUMAN EXPOSURE POTENTIAL TO NON-IONIZING EMISSIONS

Dish Wireless Existing Facility

Site ID: BOBDL00040A

806363
48 Cow Hill Road
Clinton, Connecticut 06413

August 31, 2021

EBI Project Number: 6221004808

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**14.92%**

21 B Street, Burlington, MA 01803 · Tel: (781) 273.2500 · Fax: (781) 273.3311

August 31, 2021

Dish Wireless

Emissions Analysis for Site: BOBDL00040A - 806363

EBI Consulting was directed to analyze the proposed Dish Wireless facility located at **48 Cow Hill Road** in **Clinton, Connecticut** for the purpose of determining whether the emissions from the Proposed Dish Wireless Antenna Installation located on this property are within specified federal limits.

All information used in this report was analyzed as a percentage of current Maximum Permissible Exposure (% MPE) as listed in the FCC OET Bulletin 65 Edition 97-01and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter ($\mu W/cm^2$). The number of $\mu W/cm^2$ calculated at each sample point is called the power density. The exposure limit for power density varies depending upon the frequencies being utilized. Wireless Carriers and Paging Services use different frequency bands each with different exposure limits; therefore, it is necessary to report results and limits in terms of percent MPE rather than power density.

All results were compared to the FCC (Federal Communications Commission) radio frequency exposure rules, 47 CFR 1.1307(b)(1) – (b)(3), to determine compliance with the Maximum Permissible Exposure (MPE) limits for General Population/Uncontrolled environments as defined below.

General population/uncontrolled exposure limits apply to situations in which the general population may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Therefore, members of the general population would always be considered under this category when exposure is not employment related, for example, in the case of a telecommunications tower that exposes persons in a nearby residential area.

Public exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu W/cm^2$). The general population exposure limits for the 600 MHz and 700 MHz frequency bands are approximately 400 $\mu W/cm^2$ and 467 $\mu W/cm^2$, respectively. The general population exposure limit for the 1900 MHz (PCS), 2100 MHz (AWS) and 11 GHz frequency bands is 1000 $\mu W/cm^2$. Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.

Occupational/controlled exposure limits apply to situations in which persons are exposed as a consequence of their employment and in which those persons who are exposed have been made fully aware of the potential for exposure and can exercise control over their exposure.

Occupational/controlled exposure limits also apply where exposure is of a transient nature as a result of incidental passage through a location where exposure levels may be above general population/uncontrolled limits (see below), as long as the exposed person has been made fully aware of the potential for exposure and can exercise control over his or her exposure by leaving the area or by some other appropriate means.

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed Dish Wireless Wireless antenna facility located at 48 Cow Hill Road in Clinton, Connecticut using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since Dish Wireless is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 20 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was focused at the base of the tower. For this report, the sample point is the top of a 6-foot person standing at the base of the tower.

For all calculations, all equipment was calculated using the following assumptions:

1) 4 n71 channels (600 MHz Band) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

2) 4 n70 channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 40 Watts per Channel.

3) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.

4) For the following calculations, the sample point was the top of a 6-foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 20 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was used in this direction. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

5) The antennas used in this modeling are the JMA MX08FRO665-20 for the 600 MHz / 1900 MHz channel(s) in Sector A, the JMA MX08FRO665-20 for the 600 MHz / 1900 MHz channel(s) in Sector B, the JMA MX08FRO665-20 for the 600 MHz / 1900 MHz channel(s) in Sector C. This is based on feedback from the carrier with regard to anticipated antenna selection. All Antenna gain values and associated transmit power levels are shown in the Site Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 20 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

6) The antenna mounting height centerline of the proposed antennas is 118 feet above ground level (AGL).

7) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.

8) All calculations were done with respect to uncontrolled / general population threshold limits.

Dish Wireless Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	1	Antenna #:	1	Antenna #:	1
Make / Model:	JMA MX08FRO665-20	Make / Model:	JMA MX08FRO665-20	Make / Model:	JMA MX08FRO665-20
Frequency Bands:	600 MHz / 1900 MHz	Frequency Bands:	600 MHz / 1900 MHz	Frequency Bands:	600 MHz / 1900 MHz
Gain:	17.45 dBd / 22.65 dBd	Gain:	17.45 dBd / 22.65 dBd	Gain:	17.45 dBd / 22.65 dBd
Height (AGL):	118 feet	Height (AGL):	118 feet	Height (AGL):	118 feet
Channel Count:	8	Channel Count:	8	Channel Count:	8
Total TX Power (W):	280 Watts	Total TX Power (W):	280 Watts	Total TX Power (W):	280 Watts
ERP (W):	3,065.51	ERP (W):	3,065.51	ERP (W):	3,065.51
Antenna A1 MPE %:	**1.26%**	Antenna B1 MPE %:	**1.26%**	Antenna C1 MPE %:	**1.26%**

Site Composite MPE %	
Carrier	**MPE %**
Dish Wireless (Max at Sector A):	1.26%
AT&T	1.13%
T-Mobile	3.15%
Metro PCS	0.22%
Sprint	0.41%
Verizon	1.36%
Town	0.76%
MediaFLO	6.63%
Site Total MPE % :	14.92%

Dish Wireless MPE % Per Sector	
Dish Wireless Sector A Total:	1.26%
Dish Wireless Sector B Total:	1.26%
Dish Wireless Sector C Total:	1.26%
Site Total MPE % :	14.92%

Dish Wireless Maximum MPE Power Values (Sector A)

Dish Wireless Frequency Band / Technology (Sector A)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density (μW/cm²)	Frequency (MHz)	Allowable MPE (μW/cm²)	Calculated % MPE
Dish Wireless 600 MHz n71	4	223.68	118.0	2.56	600 MHz n71	400	0.64%
Dish Wireless 1900 MHz n70	4	542.70	118.0	6.22	1900 MHz n70	1000	0.62%
						Total:	**1.26%**

• NOTE: Totals may vary by approximately 0.01% due to summation of remainders in calculations.

Summary

All calculations performed for this analysis yielded results that were **within** the allowable limits for general population exposure to RF Emissions.

The anticipated maximum composite contributions from the Dish Wireless facility as well as the site composite emissions value with regards to compliance with FCC's allowable limits for general population exposure to RF Emissions are shown here:

Dish Wireless Sector	Power Density Value (%)
Sector A:	1.26%
Sector B:	1.26%
Sector C:	1.26%
Dish Wireless Maximum MPE % (Sector A):	1.26%
Site Total:	14.92%
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **14.92%** of the allowable FCC established general population limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

FCC guidelines state that if a site is found to be out of compliance (over allowable thresholds), that carriers over a 5% contribution to the composite value will require measures to bring the site into compliance. For this facility, the composite values calculated were well within the allowable 100% threshold standard per the federal government.

Exhibit G

Letter of Authorization

4545 E River Rd, Suite 320
West Henrietta, NY 14586

Phone: (585) 445-5896
Fax: (724) 416-4461
www.crowncastle.com

Crown Castle Letter of Authorization

CT - CONNECTICUT SITING COUNCIL
Melanie A. Bachman
Executive Director
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

Re: Tower Share Application
Crown Castle telecommunications site at:
48 COW HILL ROAD, CLINTON, CT 06413

CROWN ATLANTIC COMPANY LLC ("Crown Castle") hereby authorizes DISH WIRELESS, LLC, including their Agent, to act as our Agent in the processing of all zoning applications, building permits and approvals through the CT - CONNECTICUT SITING COUNCIL for the existing wireless communications site described below:

Crown Site ID/Name: 806363/HRT 105 943201
Customer Site ID: BOBDL00040A/CT-CCI-T-806363
Site Address: 48 COW HILL ROAD, CLINTON, CT 06413

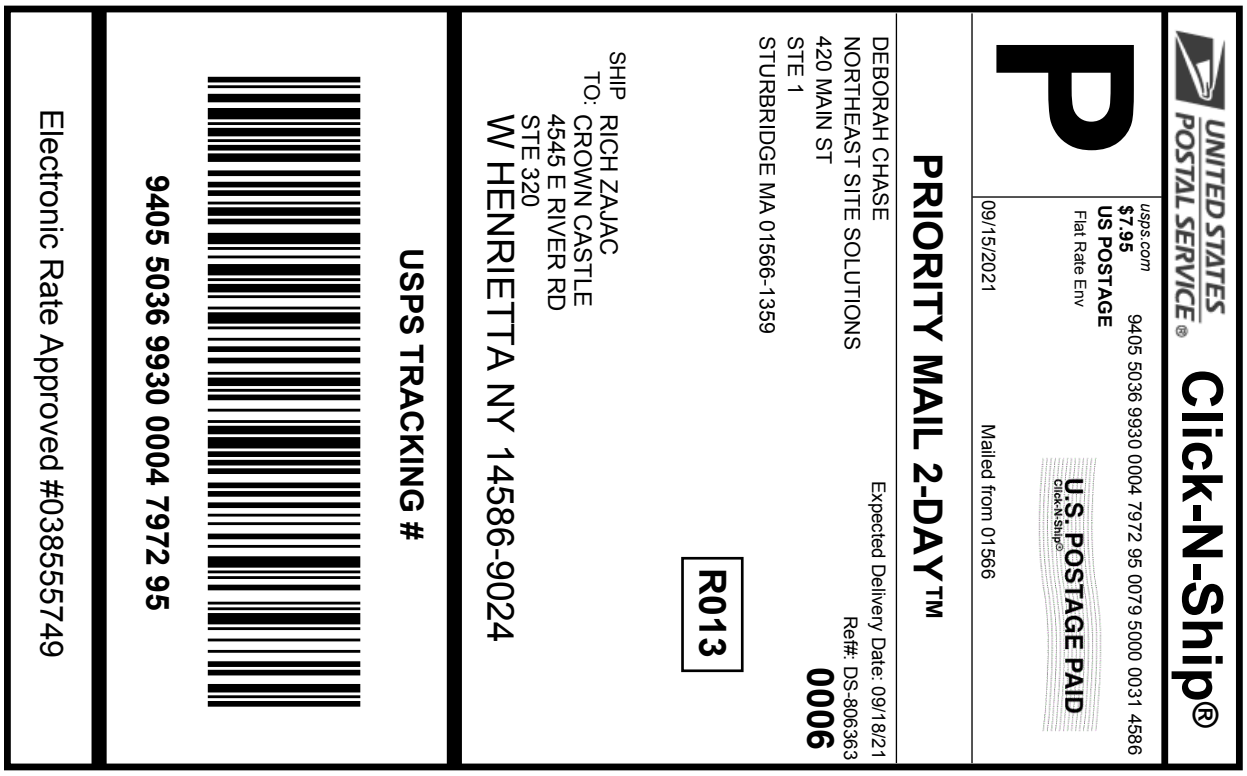
Crown Castle

By: _____ Date: 8/18/2021

Richard Zajac
Site Acquisition Specialist

Exhibit H

Recipient Mailings



Cut on dotted line.

Instructions

1. **Each Click-N-Ship® label is unique. Labels are to be used as printed and used only once. DO NOT PHOTO COPY OR ALTER LABEL.**
2. **Place your label so it does not wrap around the edge of the package.**
3. **Adhere your label to the package. A self-adhesive label is recommended. If tape or glue is used, DO NOT TAPE OVER BARCODE. Be sure all edges are secure.**
4. **To mail your package with PC Postage®, you may schedule a Package Pickup online, hand to your letter carrier, take to a Post Office™, or drop in a USPS collection box.**
5. **Mail your package on the "Ship Date" you selected when creating this label.**

Click-N-Ship® Label Record

USPS TRACKING # :
9405 5036 9930 0004 7972 95

Trans. #:	543668305
Print Date:	09/15/2021
Ship Date:	09/15/2021
Expected Delivery Date:	09/18/2021

Priority Mail® Postage:	**$7.95**
Total:	**$7.95**

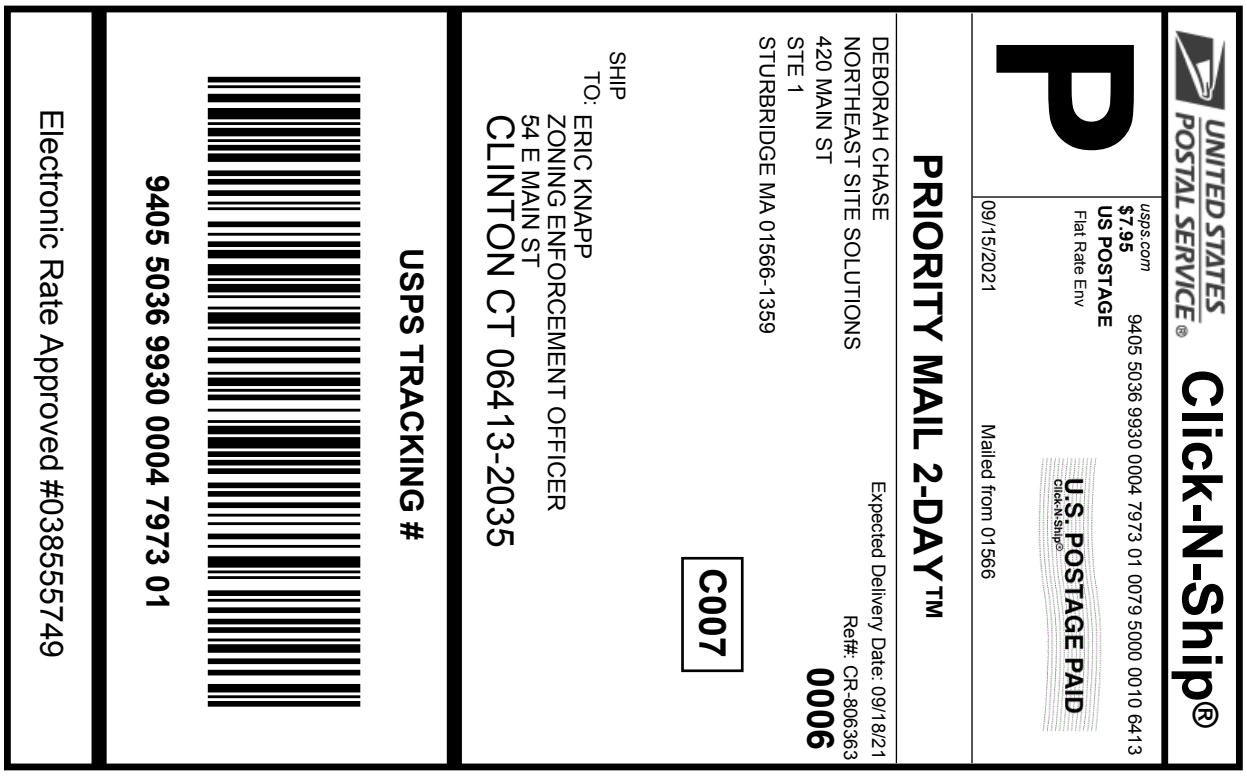
From: DEBORAH CHASE
NORTHEAST SITE SOLUTIONS
420 MAIN ST
STE 1
STURBRIDGE MA 01566-1359

Ref#: DS-806363

To: RICH ZAJAC
CROWN CASTLE
4545 E RIVER RD
STE 320
W HENRIETTA NY 14586-9024

* Retail Pricing Priority Mail rates apply. There is no fee for USPS Tracking® service on Priority Mail service with use of this electronic rate shipping label. Refunds for unused postage paid labels can be requested online 30 days from the print date.

Thank you for shipping with the United States Postal Service!
Check the status of your shipment on the USPS Tracking® page at usps.com



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2. **Place your label so it does not wrap around the edge of the package.**
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4. **To mail your package with PC Postage®, you may schedule a Package Pickup online, hand to your letter carrier, take to a Post Office™, or drop in a USPS collection box.**
5. **Mail your package on the "Ship Date" you selected when creating this label.**

Click-N-Ship® Label Record

USPS TRACKING # :
9405 5036 9930 0004 7973 01

Trans. #:	543668305
Print Date:	09/15/2021
Ship Date:	09/15/2021
Expected Delivery Date:	09/18/2021

Priority Mail® Postage:	**$7.95**
Total:	**$7.95**

From: DEBORAH CHASE
NORTHEAST SITE SOLUTIONS
420 MAIN ST
STE 1
STURBRIDGE MA 01566-1359

Ref#: CR-806363

To: ERIC KNAPP
ZONING ENFORCEMENT OFFICER
54 E MAIN ST
CLINTON CT 06413-2035

* Retail Pricing Priority Mail rates apply. There is no fee for USPS Tracking® service on Priority Mail service with use of this electronic rate shipping label. Refunds for unused postage paid labels can be requested online 30 days from the print date.

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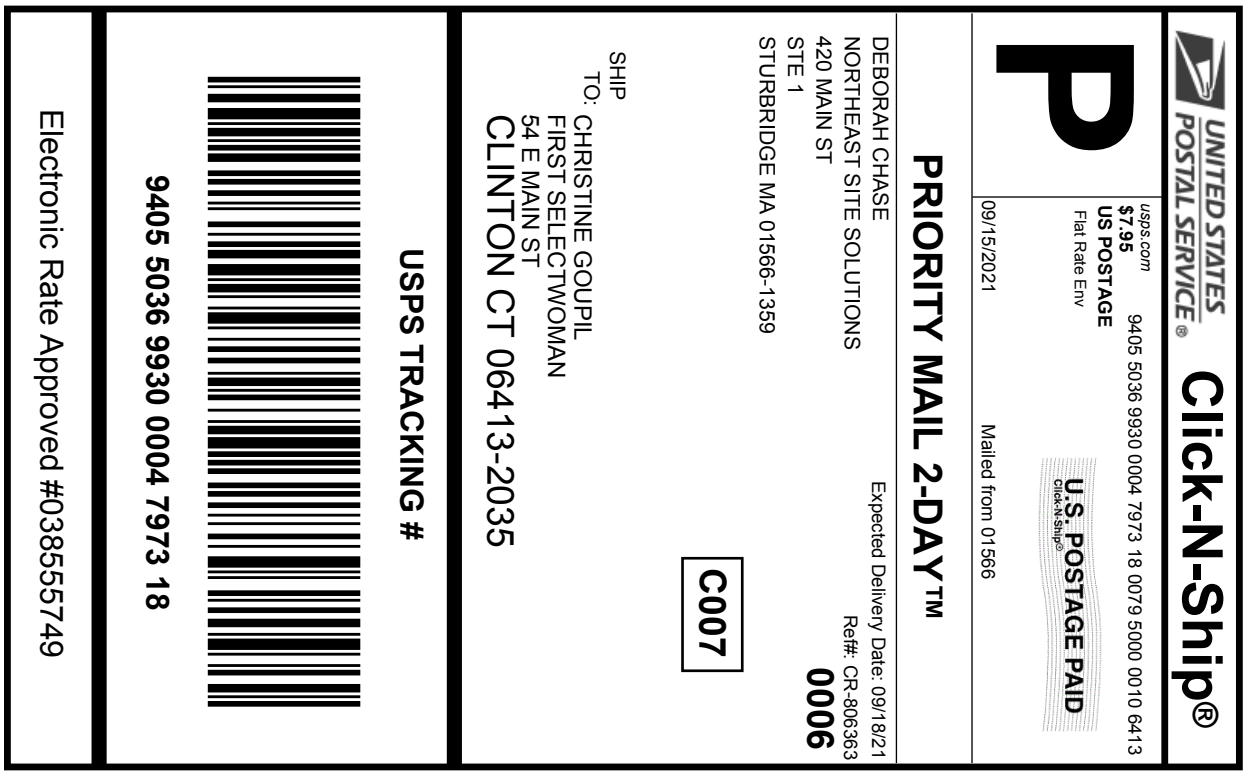
Check the status of your shipment on the USPS Tracking® page at usps.com



Cut on dotted line.

Instructions

1. **Each Click-N-Ship® label is unique. Labels are to be used as printed and used only once. DO NOT PHOTO COPY OR ALTER LABEL.**
2. **Place your label so it does not wrap around the edge of the package.**
3. **Adhere your label to the package. A self-adhesive label is recommended. If tape or glue is used, DO NOT TAPE OVER BARCODE. Be sure all edges are secure.**
4. **To mail your package with PC Postage®, you may schedule a Package Pickup online, hand to your letter carrier, take to a Post Office™, or drop in a USPS collection box.**
5. **Mail your package on the "Ship Date" you selected when creating this label.**

Click-N-Ship® Label Record

USPS TRACKING # :
9405 5036 9930 0004 7973 18

Trans. #:	543668305
Print Date:	09/15/2021
Ship Date:	09/15/2021
Expected Delivery Date:	09/18/2021

Priority Mail® Postage:	**$7.95**
Total:	**$7.95**

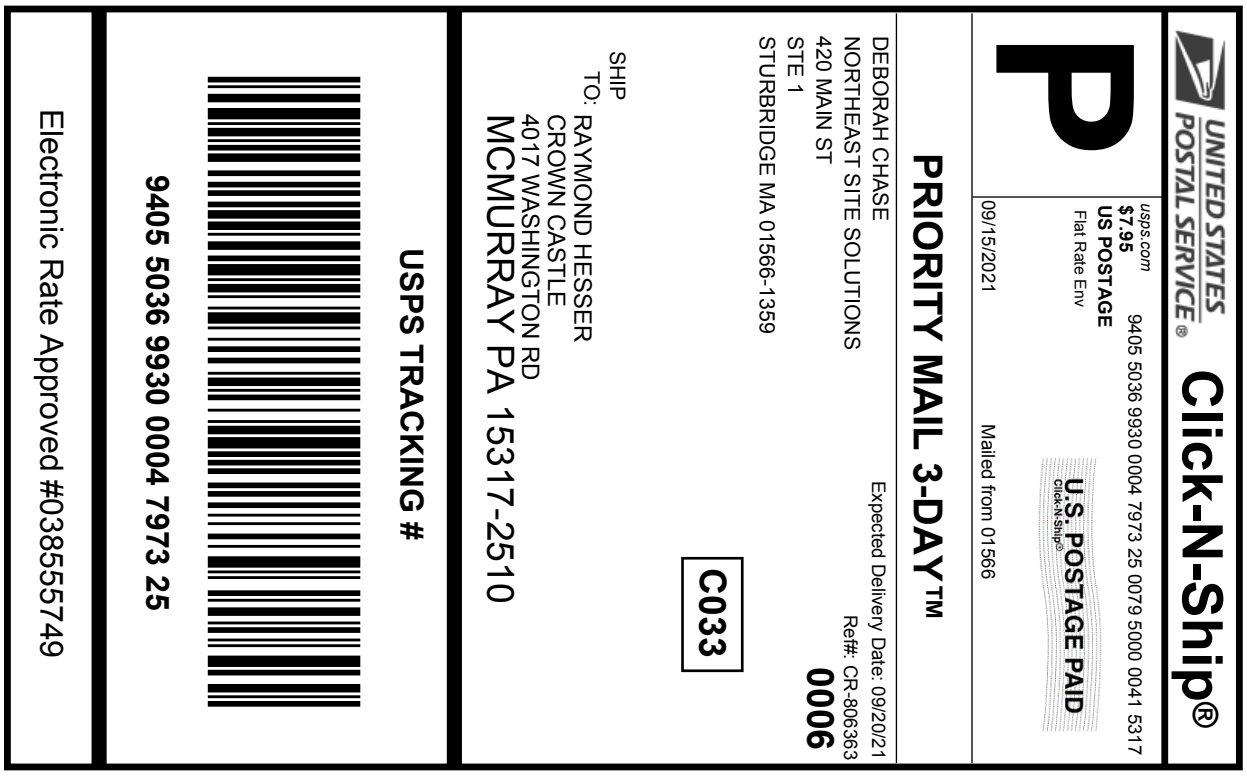
From: DEBORAH CHASE
NORTHEAST SITE SOLUTIONS
420 MAIN ST
STE 1
STURBRIDGE MA 01566-1359

Ref#: CR-806363

To: CHRISTINE GOUPIL
FIRST SELECTWOMAN
54 E MAIN ST
CLINTON CT 06413-2035

* Retail Pricing Priority Mail rates apply. There is no fee for USPS Tracking® service on Priority Mail service with use of this electronic rate shipping label. Refunds for unused postage paid labels can be requested online 30 days from the print date.

Thank you for shipping with the United States Postal Service!
Check the status of your shipment on the USPS Tracking® page at usps.com



Cut on dotted line.

Instructions

1. **Each Click-N-Ship® label is unique. Labels are to be used as printed and used only once. DO NOT PHOTO COPY OR ALTER LABEL.**
2. **Place your label so it does not wrap around the edge of the package.**
3. **Adhere your label to the package. A self-adhesive label is recommended. If tape or glue is used, DO NOT TAPE OVER BARCODE. Be sure all edges are secure.**
4. **To mail your package with PC Postage®, you may schedule a Package Pickup online, hand to your letter carrier, take to a Post Office™, or drop in a USPS collection box.**
5. **Mail your package on the "Ship Date" you selected when creating this label.**

Click-N-Ship® Label Record

USPS TRACKING # :
9405 5036 9930 0004 7973 25

Trans. #:	543668305
Print Date:	09/15/2021
Ship Date:	09/15/2021
Expected Delivery Date:	09/20/2021

Priority Mail® Postage:	**$7.95**
Total:	**$7.95**

From: DEBORAH CHASE
NORTHEAST SITE SOLUTIONS
420 MAIN ST
STE 1
STURBRIDGE MA 01566-1359

Ref#: CR-806363

To: RAYMOND HESSER
CROWN CASTLE
4017 WASHINGTON RD
MCMURRAY PA 15317-2510

* Retail Pricing Priority Mail rates apply. There is no fee for USPS Tracking® service on Priority Mail service with use of this electronic rate shipping label. Refunds for unused postage paid labels can be requested online 30 days from the print date.

Thank you for shipping with the United States Postal Service!
Check the status of your shipment on the USPS Tracking® page at usps.com

8[illegible]363

UNITED STATES POSTAL SERVICE.

FISKDALE
458 MAIN ST
FISKDALE, MA 01518-9998
(800)275-8777

09/16/2021 03:17 PM

Product	Qty	Unit Price	Price
Prepaid Mail Clinton, CT 06413 Weight: 1 lb 8.10 oz Acceptance Date: Thu 09/16/2021 Tracking #: 9405 5036 9930 0004 7973 18	1		$0.00
Prepaid Mail West Henrietta, NY 14586 Weight: 0 lb 2.10 oz Acceptance Date: Thu 09/16/2021 Tracking #: 9405 5036 9930 0004 7972 95	1		$0.00
Prepaid Mail Canonsburg, PA 15317 Weight: 1 lb 8.30 oz Acceptance Date: Thu 09/16/2021 Tracking #: 9405 5036 9930 0004 7973 25	1		$0.00
Prepaid Mail Clinton, CT 06413 Weight: 1 lb 8.20 oz Acceptance Date: Thu 09/16/2021 Tracking #: 9405 5036 9930 0004 7973 01	1		$0.00
Grand Total:			$0.00