Crown Castle
3 Corporate Park Drive, Suite 101
Clifton Park, NY 12065

June 13, 2022

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

RE: **Notice of Exempt Modification for ATT**
Crown #806363; ATT Site ID CT2024
48 Cow Hill Road, Clinton, CT 06413
Latitude: 41.288944 / Longitude: -72.538472

Dear Ms. Bachman:

AT&T currently maintains twelve (12) antennas at the 190-foot level of the existing 212-foot monopole tower at 48 Cow Hill Road, Clinton, CT. The tower is owned by Crown Castle USA Inc. and the property is owned by Raymond E. Heser Trustee (c/o Crown Castle). AT&T now intends to replace six (6) antennas, install six (6) new antennas and ancillary equipment at the 190-foot level. This modification may include B2, B5, B17, B14, B29, B30, B66 & n77 hardware that is 4G(LTE) and/or 5GNR capable through remote software configuration and either or both services may be turned on or off at various times.

Panned Modification:

Tower:

Installed New:

(3) SITEPRO 1-VFA14-WLL-30120 Sector Mounts
(3) CCI-OPA65R-BU4DA Antennas
(3) CCI-DMP65R-BU4DA Antennas
(1) RAYCAP DC6-48-60-18-8F Squid
(3) Ericsson-4478 B14 RRUs
(3) Ericsson-4449 B5/B12 RRUs
(3) Ericsson-4415 B25 RRUs
(1) 3/8" 18-Pair Fiber Cable
(2) 7/8" 6AWG DC Cables
(6) Ericsson-SXK 107 2839 Back to Back Mounts
(6) 2-3/8" O.D. (SCH40) X 6'-0" Long Galv. Pipes w/assoc. hardware

Remove:

(6) ANDREW-SBNHH-1D65A Antennas
(3) ERICSSON-RRUS-11 B12 RRUs
(3) ERICSSON-RRUS-32 B2 RRUs
(3) SECTOR MOUNTS

Ground:

Install New:

(1) 6630(+IDLE)
(3) Ericsson-2012 B29 RRUs
(6) COMMSCOPE-APTDC-BDFDM-DB Surge Arrestors
(1) RAYCAP-DC12-48-60-RM Junction Box
(2) EMERSON Rectifiers in existing power plant

Remove:

(1) LEGACY Power Plant
(6) KATHREIN-782 10250 Diplexers

The facility was approved by the Connecticut Siting Council in Docket No. 148 on May 5, 1992. Said approval given with conditions. AT&T's proposed exempt modification complies with the conditions of approval.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies §16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to Town Manager Karl Kilduff, Zoning Enforcement Officer Kathleen King, and Crown Castle as the land/tower owner.

1. The proposed modifications will not result in an increase in the height of the existing tower.
2. The proposed modifications will not require the extension of the site boundary.
3. The proposed modification will not increase noise levels at the facility by six decibels or more, or to levels that exceed state and local criteria.
4. The operation of the replacement antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communication Commission safety standard.
5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.
6. The existing structure and its foundation can support the proposed loading.

For the foregoing reasons, ATT respectfully submits that the proposed modifications to the above-reference telecommunications facility constitutes an exempt modification under R.C.S.A. § 16-50j-72(b)(2). Please send approval/rejection letter to Attn: Domenica Tatasciore.

Sincerely,

Domenica Tatasciore
Site Acquisition Specialist
1800 W. Park Drive
Westborough, MA 01581
(508) 621-9161/ Domenica.Tatasciore@crowncastle.com

Attachments
cc:

Karl Kilduff, Town Manager
Clinton Town Hall
54 E. Main Street
Clinton, CT 06413
860-669-9333

Kathleen King, Zoning Enforcement Officer
Clinton Town Hall
54 E. Main Street
Clinton, CT 06413
860-669-6133

Raymond Heser Trustee, c/o Crown Castle
Crown Castle, Tower Owner

From: TrackingUpdates@fedex.com
To: Tatasciore, Domenica
Subject: FedEx Shipment 777108120476: Your package has been delivered
Date: Tuesday, June 14, 2022 10:25:26 AM

Hi. Your package was delivered Tue, 06/14/2022 at 10:24am.

Delivered to 54 E MAIN ST, CLINTON, CT 06413
Received by K.KILDUFF

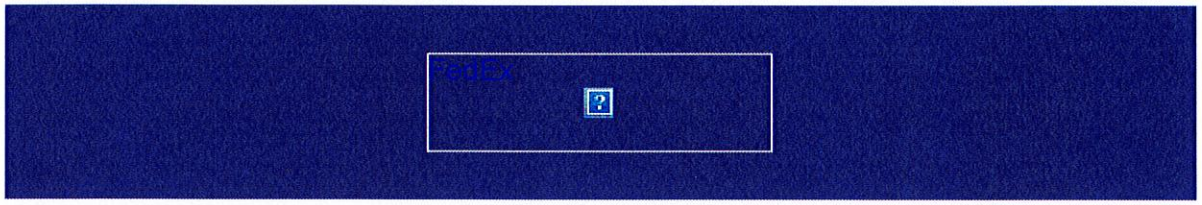
OBTAIN PROOF OF DELIVERY

TRACKING NUMBER 777108120476

FROM Domenica Tatasciore
1800 West Park Drive

	Suite 200 WESTBOROUGH, MA, US, 01581
TO	Clinton Town Hall Karl Kilduff, Town Manager 54 E. Main Street CLINTON, CT, US, 06413
REFERENCE	799001.7680
SHIPPER REFERENCE	799001.7680
SHIP DATE	Mon 6/13/2022 05:38 PM
DELIVERED TO	Receptionist/Front Desk
PACKAGING TYPE	FedEx Pak
ORIGIN	WESTBOROUGH, MA, US, 01581
DESTINATION	CLINTON, CT, US, 06413
SPECIAL HANDLING	Deliver Weekday
NUMBER OF PIECES	1
TOTAL SHIPMENT WEIGHT	1.00 LB
SERVICE TYPE	FedEx Priority Overnight

From: TrackingUpdates@fedex.com
To: Tatasciore, Domenica
Subject: FedEx Shipment 777108124840: Your package has been delivered
Date: Tuesday, June 14, 2022 10:26:21 AM



Hi. Your package was delivered Tue, 06/14/2022 at 10:25am.

Delivered to 54 E MAIN ST, CLINTON, CT 06413
Received by K.KING

OBTAIN PROOF OF DELIVERY

TRACKING NUMBER 777108124840

FROM Domenica Tatasciore
1800 West Park Drive

	Suite 200 WESTBOROUGH, MA, US, 01581
TO	Clinton Town Hall Kathleen King, Zoning Enforcement 54 E. Main Street CLINTON, CT, US, 06413
REFERENCE	799001.7680
SHIPPER REFERENCE	799001.7680
SHIP DATE	Mon 6/13/2022 05:38 PM
DELIVERED TO	Receptionist/Front Desk
PACKAGING TYPE	FedEx Pak
ORIGIN	WESTBOROUGH, MA, US, 01581
DESTINATION	CLINTON, CT, US, 06413
SPECIAL HANDLING	Deliver Weekday
NUMBER OF PIECES	1
TOTAL SHIPMENT WEIGHT	1.00 LB
SERVICE TYPE	FedEx Priority Overnight

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

49B COW HILL RD

Location	49B COW HILL RD	**Mblu**	32/ 6/ 48/ H026570/A
Acct#	H0265701	**Owner**	HESER DALE TRUSTEE
Assessment	$645,500	**Appraisal**	$922,100
PID	106785	**Building Count**	1

Current Value

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2020	$772,100	$150,000	$922,100
Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2020	$540,500	$105,000	$645,500

Owner of Record

Owner	HESER DALE TRUSTEE	**Sale Price**	$0
Co-Owner	CROWN CASTLE ATLANTIC CO LLC	**Certificate**	
Address	4017 WASHINGTON RD PMB353 MCMURRAY , PA 15317	**Book & Page**	525/568
		Sale Date	10/05/2020
		Instrument	1

Ownership History

Ownership History					
Owner	**Sale Price**	**Certificate**	**Book & Page**	**Instrument**	**Sale Date**
HESER DALE TRUSTEE	$0		525/568	1	10/05/2020
HESER RAYMOND E TRUSTEE	$0		0496/0599	4	10/17/2016
HESER RAYMOND	$0		0088/0061		08/21/1970
HESER RAYMOND	$0		/0		

Building Information

Building 1 : Section 1

Year Built:	1993
Living Area:	1,104
Replacement Cost:	$139,987

Building Percent Good: 84

Replacement Cost Less Depreciation: $117,600

Building Attributes	
Field	**Description**
STYLE	Telephone Bldg
MODEL	Ind/Comm
Grade	Average
Stories:	1
Occupancy	1.00
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
Struct Class	
Bldg Use	TEL X STA M96
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	12.00
% Comn Wall	

Building Photo

(https://images.vgsi.com/photos/ClintonCTPhotos//\00\00\71\32.jpg)

Building Layout

(https://images.vgsi.com/photos/ClintonCTPhotos//Sketches/106785_6797

Building Sub-Areas (sq ft)			Legend
Code	**Description**	**Gross Area**	**Living Area**
BAS	First Floor	1,104	1,104
		1,104	1,104

Extra Features

Extra Features	Legend
No Data for Extra Features	

Land

Land Use

Use Code	4300
Description	TEL X STA M96
Zone	I-P
Neighborhood	
Alt Land Appr	No
Category	

Land Line Valuation

Size (Acres)	0.18
Frontage	
Depth	
Assessed Value	$105,000
Appraised Value	$150,000

Outbuildings

Outbuildings						Legend
Code	**Description**	**Sub Code**	**Sub Description**	**Size**	**Value**	**Bldg #**
FN4	FENCE-8' CHAIN			360.00 L.F.	$2,500	1
PAV2	PAVING-CONC			1296.00 S.F.	$2,600	1
SHD5	COMM WOOD			200.00 S.F.	$2,500	1
MSC51	TOWER			250.00 UNIT	$140,600	1
MSC1				3.00 UNIT	$506,300	1

Valuation History

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2020	$772,100	$150,000	$922,100
2019	$234,600	$641,500	$876,100
2018	$234,600	$641,500	$876,100

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2020	$540,500	$105,000	$645,500
2019	$164,200	$449,100	$613,300
2018	$164,200	$449,100	$613,300

49B COW HILL RD

Email Map Link

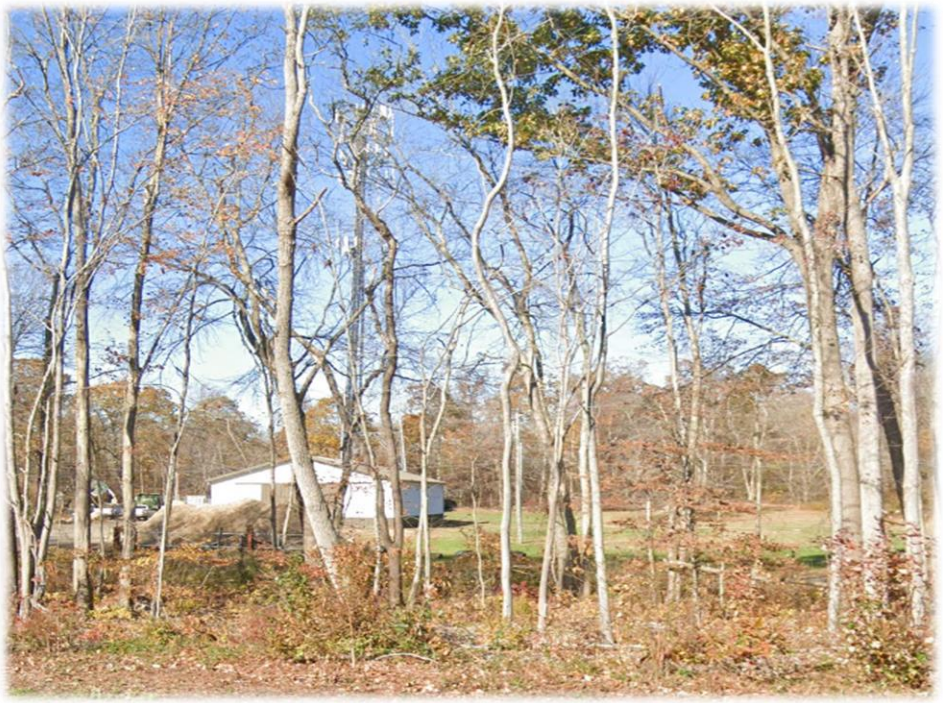
Copy a[illegible]ste the following string into an email to link to the current map view:

lat:41.2[illegible]3, long:-72.5[illegible]6

40m

Tighe&Bond

Radio Frequency Safety Survey Report Predictive (RFSSRP) Prepared For AT&T



Site Name:	CLINTON
FA#	10035028
USID:	59406
Site ID:	CTL02024
Address:	49 COW HILL ROAD CLINTON, CT 06413
County:	MIDDLESEX
Latitude:	41.2889361
Longitude:	-72.5384711
Structure Type:	SELF SUPPORT
Property Owner:	HESER RAYMOND E TRUSTEE
Pace Job:	MRCTB052688
RFDS Technology:	5G NR 1DR-1

Report Information

Report Writer: Sunita Sati

Report Generated Date: 05-25-2022

Compliance Statement

AT&T Mobility Compliance Statement: Based on the information collected, AT&T Mobility will be Compliant when the remediation recommended in section 5 or appropriate remediation determined by AT&T is implemented

Table of Contents

1. Executive Summary

1.1 Site Summary

Max Predictive Spatial Average MPE% & Location on Site (General Public)	44498.3% on Antennas Centerline Level & at AT&T Sec-A antenna no. #A4
Max Predictive Spatial Average MPE% at Ground Level (General Public)	0.1%
AT&T Mobility Site Compliance	AT&T Mobility will be Compliant by implementing remediation recommended as per section 5 in this report.

TABLE 1: Site Summary

1.2 Signage Summary (Proposed)

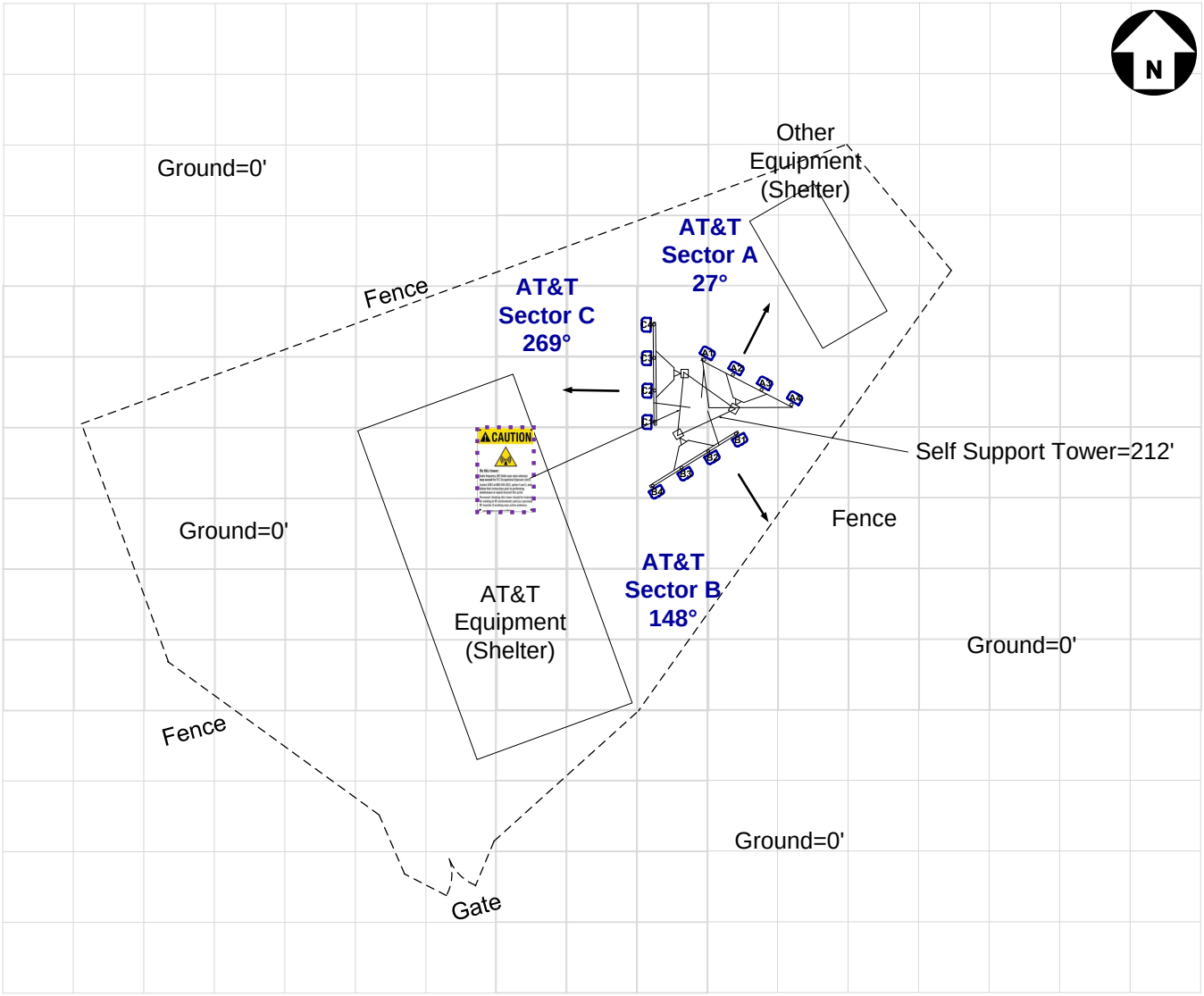
AT&T Signage Locations	Sign Type									
	Safety Instructions	Notice Sign 2	Caution Sign 2	Caution Sign 2B	Caution Sign 2C	Caution 7"x7"	Warning Sign 1B	RF Exposure Map	Lock	Barriers
Access Point(s)				1						
Alpha										
Beta										
Gamma										

TABLE 2: Signage Summary (Proposed)

1.3 List of Documents used to prepare this Report

- *CD*
- *RFDS*

2. Site Scale Map



AT&T Antenna	Proposed	Proposed Signage									
Panel	Barrier	Safety Instructions	Notice 2	Caution 2	Caution 2B	Caution 2C	Caution 7"x7"	Warning 1B	RF Exposure Map	Lock	***Map Scale = 10 ft***
OMNI	Posts										

3. Antenna Inventory

Ant ID	Operator	Antenna Mfg	Antenna Model	Antenna Type	FREQ. (MHz)	TECH.	AZ. (0)	HBW (0)	Antenna Gain (dBd)	Antenna Aperture (ft)	Transmitter Power (Watts)	Total Loss (dB)	Total ERP (Watts)	Total EIRP (Watts)
A1	AT&T	PowerWave	7770	Panel	850	UMTS	27	85	11.4	4.6	40.00	0.5	492.11	807.35
A2	AT&T	Commscope	SBNHH-1D65A	Panel	700	LTE	27	66	11.25	4.6	60.00	0.5	713.10	1169.91
A2	AT&T	Commscope	SBNHH-1D65A	Panel	2300	LTE	27	61	15.35	4.6	75.00	0.5	2291.19	3758.90
A3	AT&T	CCI	OPA65R-BU4DA	Panel	700	LTE	27	65	11.05	4	120.00	0.5	1362.01	2234.50
A3	AT&T	CCI	OPA65R-BU4DA	Panel	2100	LTE	27	65	14.55	4	120.00	0.5	3049.17	5002.43
A4	AT&T	CCI	DMP65R-BU4D	Panel	700	LTE	27	75	10.55	4	120.00	0.5	1213.90	1991.50
A4	AT&T	CCI	DMP65R-BU4D	Panel	850	5G	27	67	10.85	4	120.00	0.5	1300.71	2133.94
A4	AT&T	CCI	DMP65R-BU4D	Panel	1900	LTE	27	69	14.25	4	120.00	0.5	2845.65	4668.54
B1	AT&T	PowerWave	7770	Panel	850	UMTS	148	85	11.4	4.6	40.00	0.5	492.11	807.35
B2	AT&T	Commscope	SBNHH-1D65A	Panel	700	LTE	148	66	11.25	4.6	60.00	0.5	713.10	1169.91
B2	AT&T	Commscope	SBNHH-1D65A	Panel	2300	LTE	148	61	15.35	4.6	75.00	0.5	2291.19	3758.90
B3	AT&T	CCI	OPA65R-BU4DA	Panel	700	LTE	148	65	11.05	4	120.00	0.5	1362.01	2234.50
B3	AT&T	CCI	OPA65R-BU4DA	Panel	2100	LTE	148	65	14.55	4	120.00	0.5	3049.17	5002.43
B4	AT&T	CCI	DMP65R-BU4D	Panel	700	LTE	148	75	10.55	4	120.00	0.5	1213.90	1991.50
B4	AT&T	CCI	DMP65R-BU4D	Panel	850	5G	148	67	10.85	4	120.00	0.5	1300.71	2133.94
B4	AT&T	CCI	DMP65R-BU4D	Panel	1900	LTE	148	69	14.25	4	120.00	0.5	2845.65	4668.54
C1	AT&T	PowerWave	7770	Panel	850	UMTS	269	85	11.4	4.6	40.00	0.5	492.11	807.35
C2	AT&T	Commscope	SBNHH-1D65A	Panel	700	LTE	269	66	11.25	4.6	60.00	0.5	713.10	1169.91
C2	AT&T	Commscope	SBNHH-1D65A	Panel	2300	LTE	269	61	15.35	4.6	75.00	0.5	2291.19	3758.90
C3	AT&T	CCI	OPA65R-BU4DA	Panel	700	LTE	269	65	11.05	4	120.00	0.5	1362.01	2234.50
C3	AT&T	CCI	OPA65R-BU4DA	Panel	2100	LTE	269	65	14.55	4	120.00	0.5	3049.17	5002.43
C4	AT&T	CCI	DMP65R-BU4D	Panel	700	LTE	269	75	10.55	4	120.00	0.5	1213.90	1991.50
C4	AT&T	CCI	DMP65R-BU4D	Panel	850	5G	269	67	10.85	4	120.00	0.5	1300.71	2133.94
C4	AT&T	CCI	DMP65R-BU4D	Panel	1900	LTE	269	69	14.25	4	120.00	0.5	2845.65	4668.54

Table 3.1: Antenna Inventory Table

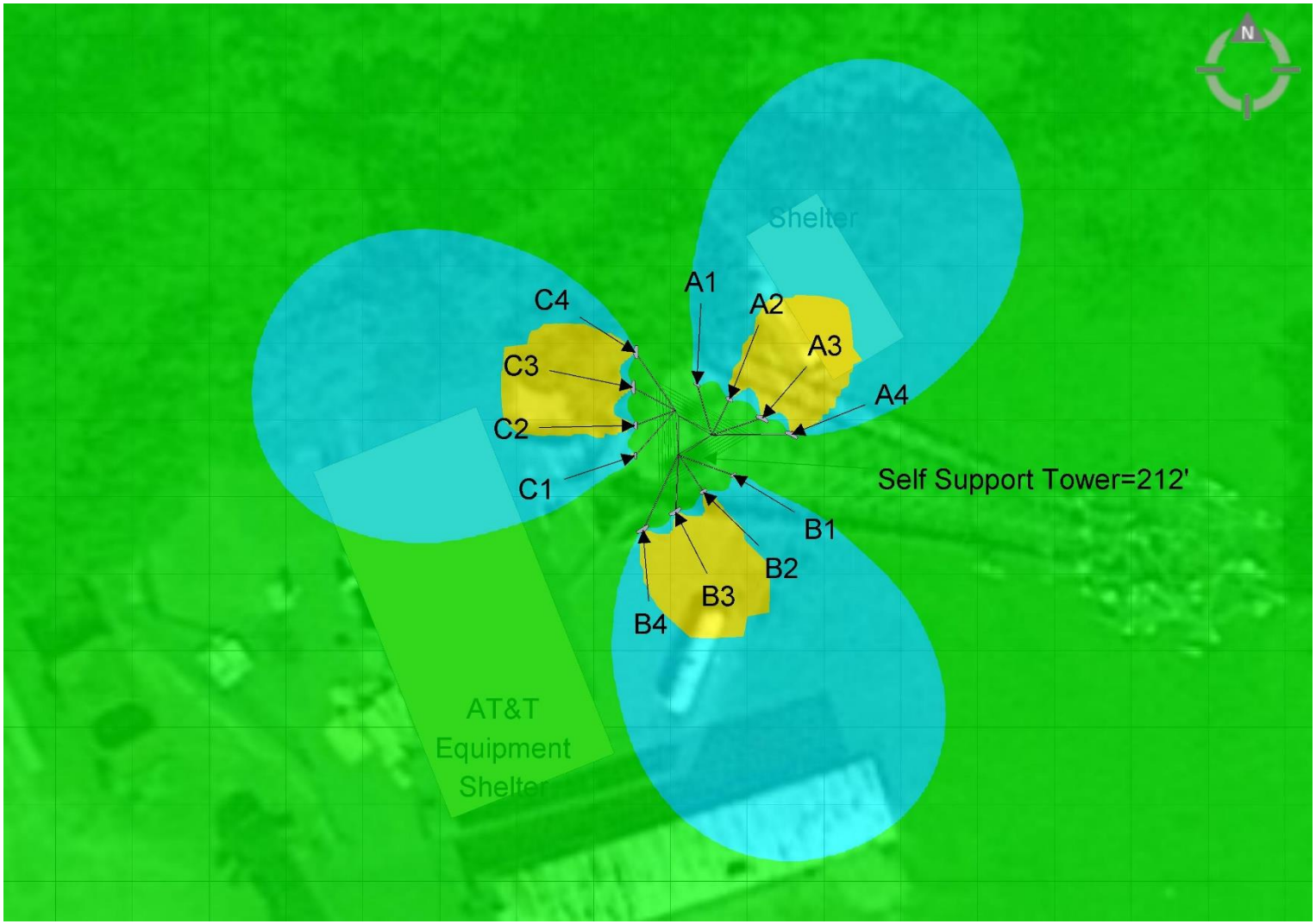
Antenna Heights (Z)

Ant ID	Operator	Antenna Radiation Centerline	Z-Height from Ground
A1	AT&T	190.00	187.70
A2	AT&T	190.00	187.70
A3	AT&T	190.00	188.00
A4	AT&T	190.00	188.00
B1	AT&T	190.00	187.70
B2	AT&T	190.00	187.70
B3	AT&T	190.00	188.00
B4	AT&T	190.00	188.00
C1	AT&T	190.00	187.70
C2	AT&T	190.00	187.70
C3	AT&T	190.00	188.00
C4	AT&T	190.00	188.00

Table 3.2: Antenna Height(s) Summary Table

4. Predicted Emission

4.1 Predictive Cumulative MPE Contribution from All Sources at Antennas Centerline Level (190 ft.)



Max. Predictive Spatial Average MPE% = **44498.3%**

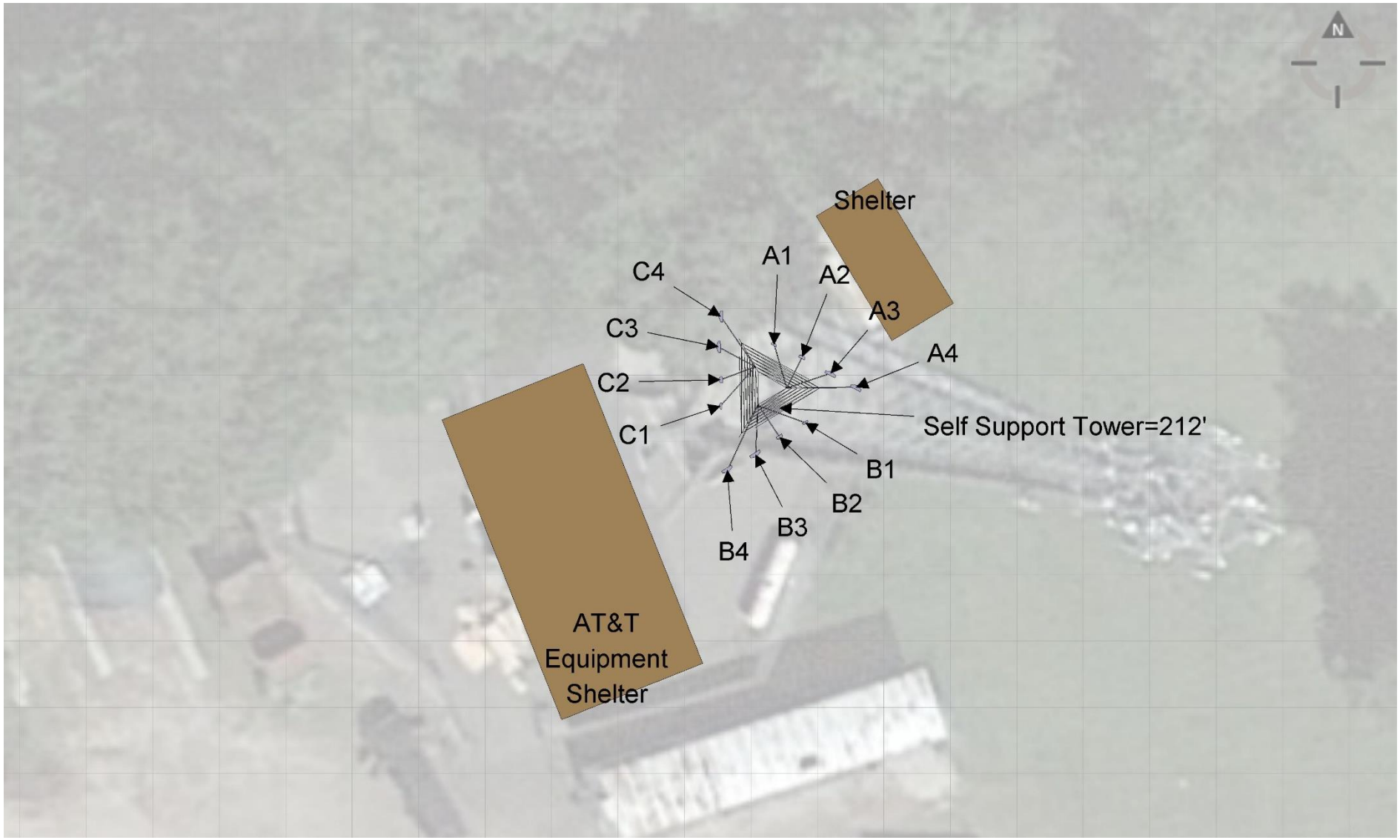
Proposed Barrier
Proposed Posts

% of FCC General Public Exposure Limit (Predictive Spatial Average)

Non-Simulated	0-1	1-100	100-500	500-5000	>5000

Map Scale = 10 ft

4.2 Predictive Cumulative MPE Contribution from All Sources at Ground Level (0 ft.)



Max. Predictive Spatial Average MPE% = **0.1%**

Proposed Barrier
Proposed Posts

% of FCC General Public Exposure Limit (Predictive Spatial Average)

Non-Simulated	0-1	1-100	100-500	500-5000	>5000

Map Scale = 10 ft

5. Statement of Compliance

5.1 Statement of AT&T Mobility Compliance

At the time of our Analysis, AT&T Mobility is required to take action to fulfill their Obligations to comply with the FCC's mandate as defined in OET-65

Recommendations

AT&T Alpha Sector:

- No Action Required

AT&T Beta Sector:

- No Action Required

AT&T Gamma Sector:

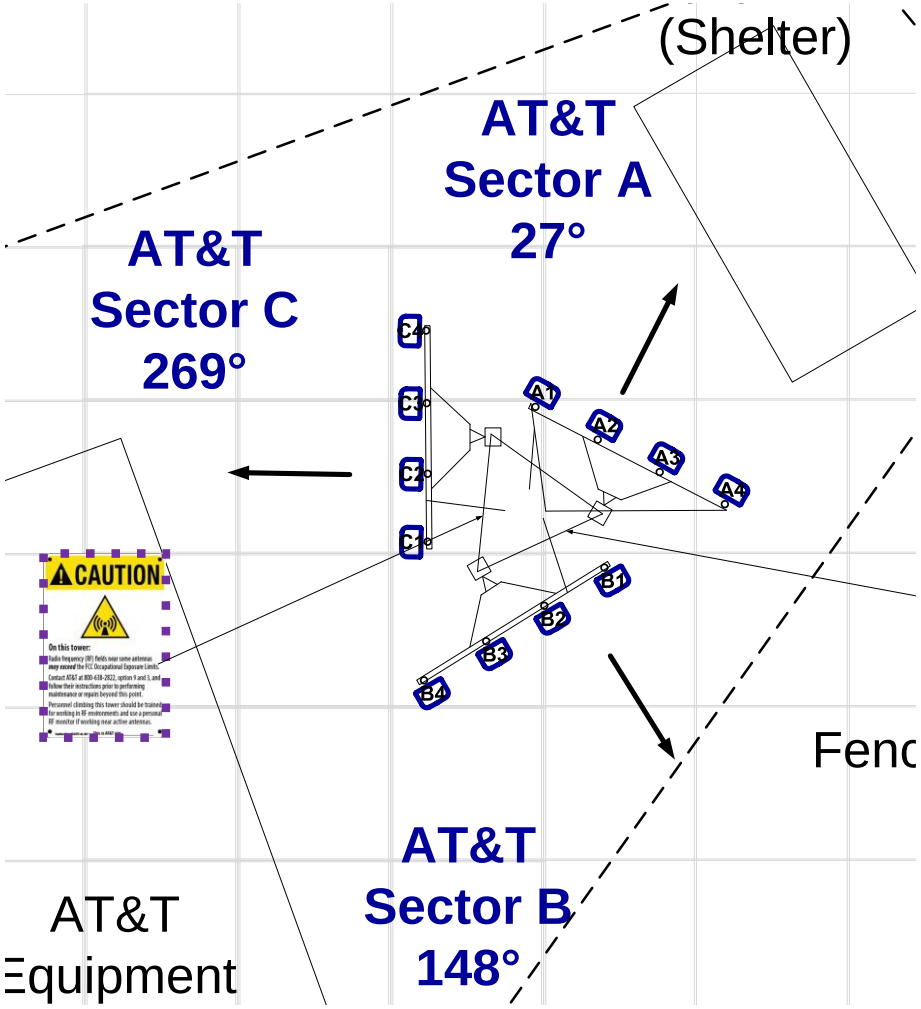
- No Action Required

Self-Support Tower:

- One Caution 2B Sign to be posted on the Tower at climbing access, facing outwards so approaching people can see as shown in "Recommendations Map – Detailed View" on page 10. (1 Total Sign)

Recommendations Map – Detailed View

AT&T Alpha, Beta & Gamma Sectors



AT&T Antenna	Proposed	Proposed Signage									
Panel	Barrier	Safety Instructions	Notice 2	Caution 2	Caution 2B	Caution 2C	Caution 7"x7"	Warning 1B	RF Exposure Map	Lock	*Map Scale = 10 ft*
OMNI	Posts										

Appendix A – Statement of Limiting Conditions

General Model Assumptions

In this site compliance report, it is assumed that all antennas are operating at full power at all times. AT&T has further recommended to assume a 75% duty cycle of maximum radiated power for all LTE & 5G carriers (& consider 100% duty cycle for all UMTS carriers).

AT&T recommended to use worst-case tilts for the simulations.

MobileComm believes these areas to be safe for entry by occupationally trained personnel utilizing appropriate personal protective equipment (in most cases, a personal monitor).

Thus, at any time, if power density measurements were made, we believe the real time measurements would indicate levels below those depicted in the RF emission diagram(s) in this report. By modelling in this way, MobileComm has conservatively shown exclusion areas – areas that should not be entered without the use of a personal monitor, carriers reducing power, or performing real-time measurements to indicate real-time exposure levels.

Use of Generic Antennas

For the purposes of this report, the use of "Generic" as an antenna model, or "Other Carrier" for an operator means the information about a carrier, their FCC license and/or antenna information was not provided and could not be obtained while on site. In the event of unknown information, MobileComm will use our industry specific knowledge of equipment, antenna models, and transmit power to model the site. Information about similar facilities is used when the service is identified and associated with a particular antenna. If no information is available regarding the transmitting service associated with an unidentified antenna, using the antenna manufacturer's published data regarding the antenna's physical characteristics makes more conservative assumptions.

Where the frequency is unknown, MobileComm uses the closest frequency in the antenna's range that corresponds to the highest Maximum Exposure Limit (MPE), resulting in a conservative analysis.

Appendix B – FCC Guidelines and Emissions Threshold Limits

All power density values used in this report were 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 (µW/cm2).The number of µW/cm2 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 public 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 public 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 (µW/cm2). The general population exposure limit for the 700 and 800 MHz Bands is approximately 467 µW/cm2 and 567 µW/cm2 respectively, and the general population exposure limit for the 1900 MHz PCS and 2100 MHz AWS bands is 1000 µW/cm2. 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, have been properly trained in RF safety 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, have been trained in RF safety and can exercise control over his or her exposure by leaving the area or by some other appropriate means. The Occupational/Controlled exposure limits all utilized frequency bands is five (5) times the FCC's General Public / Uncontrolled exposure limit.

Additional details can be found in FCC OET 65.

Table 1: Limits for Maximum Permissible Exposure (MPE)				
(A) Limits for Occupational/Controlled Exposure				
Frequency Range (MHz)	**Electric Field Strength (E) (V/m)**	**Magnetic Field Strength (H) (A/m)**	**Power Density (S) (mW/cm^2)**	**Averaging Time $[E]^2$, $[H]^2$, or S (minutes)**
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842/f	4.89/f	($900/f^2$)*	6
30-300	61.4	0.163	1.0	6
300-I,500	--	--	f/300	6
1,500-100,000	--	--	5	6
(B) Limits for General Public/Uncontrolled Exposure				
Frequency Range (MHz)	**Electric Field Strength (E) (V/m)**	**Magnetic Field Strength (H) (A/m)**	**Power Density (S) (mW/cm^2)**	**Averaging Time $[E]^2$, $[H]^2$, or S (minutes)**
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	($180/f^2$)*	30
30-300	27.5	0.073	0.2	30
300-I,500	--	--	f/1,500	30
1,500-100,000	--	--	1.0	30

Appendix C – Rules & Regulations

Explanation of Applicable Rules and Regulations

FCC has set forth guidelines in OET Bulletin 65 for human exposure to radio frequency electromagnetic fields. Currently, there are two different levels of MPE - General Public MPE and Occupational MPE. An individual classified as Occupational can be defined as an individual who has received appropriate RF training and meets the conditions outlined below. General Public is defined as anyone who does not meet the conditions of being Occupational. FCC Rules and Regulations define compliance in terms of total exposure to total RF energy, regardless of location of or proximity to the sources of energy.

It is the responsibility of all licensees to ensure these guidelines are maintained at all times. It is the ongoing responsibility of all licensees composing the site to maintain ongoing compliance with FCC rules and regulations.

A building owner or site manager can use this report as part of an overall RF Health and Safety Policy. It is important for building owners/site managers to identify areas in excess of the General Population MPE and ensure that only persons qualified as Occupational are granted access to those areas.

Occupational Environment Explained

The FCC definition of Occupational exposure limits apply to persons who:

- *are exposed to RF energy as a consequence of their employment;*
- *have been made aware of the possibility of exposure; and*
- *can exercise control over their exposure.*

FCC guidelines go further to state that persons must complete RF Safety Awareness training and must be trained in the use of appropriate personal protective equipment.

In order to consider this site an Occupational Environment, the site must be controlled to prevent access by any individuals classified as the General Public. Compliance is also maintained when any non-occupational individuals (the General Public) are prevented from accessing areas indicated as Red or Yellow in the attached RF Emissions diagram. In addition, a person must be aware of the RF environment into which they are entering. This can be accomplished by an RF Safety Awareness class, and by appropriate written documentation such as this Site Compliance Report.

Appendix D – General Safety Recommendations

The following are general recommendations appropriate for any site with accessible areas in excess of 100% General Public MPE. These recommendations are not specific to this site. These are safety recommendations appropriate for typical site management, building management, and other tenant operations.

1. All individuals needing access to the main site should be instructed to read and obey all posted placards and signs.

2. The site should be routinely inspected and this or similar report updated with the addition of any antennas or upon any changes to the RF environment including:

- *adding new antennas that may have been located on the site*
- *removing of any existing antennas*
- *changes in the radiating power or number of RF emitters*

3. Post the appropriate SAFETY INSTRUCTIONS, NOTICE, CAUTION & WARNING sign at the main site access point(s) and other locations as required. Note: Please refer to RF Exposure Diagrams in the report section above, to inform everyone who has access to this site that beyond posted signs there may be levels in excess of the limits prescribed by the FCC. The signs below are examples of signs meeting FCC guidelines.

4. Ensure that the site door remains locked (or appropriately controlled) to deny access to the general public if deemed as policy by the building/site owner.

5. For a General Public environment the five color levels identified in measured RF emission diagram can be interpreted in the following manner:

- *White represents areas predicted to be greater than or equal to 0% and less than 1% of the MPE general public limits*
- *Green represents areas predicted to be greater than or equal to 1% and less than 100% of the MPE general public limits*
- *Blue represents areas predicted to be greater than or equal to 100% and lesser than 500% of the MPE general public limits.*
- *Yellow represents areas predicted to be greater than or equal to 500% and lesser than 5000% of the MPE general public limits.*
- *Red areas indicates predicted levels greater than or equal to 5000% of the MPE general public limits.*

Appendix E – References

1 - FCC Definition

FCC defines an Occupational or Controlled environment as one where persons are exposed to RF fields as a consequence of their employment and where those persons exposed have been made fully aware of the potential for exposure and can exercise control over their exposure. Typical criteria for an Occupational or Controlled environment is restricted access (i.e. locked doors, gates, etc.) to areas where antennas are located coupled with proper RF warning signage.

FCC defines a site as a General Public or Uncontrolled environment when human exposure to RF fields occurs to the general public or in which persons who are exposed as a consequence of their employment may not be fully aware of the potential for exposure or cannot exercise control over the exposure. Typical criteria for a General Public or Uncontrolled environment are unrestricted access (i.e. unlocked or no restrictions) to areas where antennas are located without proper RF warning signage being posted.

2 - Physical Testing measurement procedure and Tools

The Narda Broadband Field Meter NBM-550 can make rapid conformance measurements with evaluation in the time domain when used in conjunction EA5091 probe. This probe is a so-called Shaped Probe, i.e. it is frequency weighted so that it automatically takes account of the FCC Occupational limit values. To collect data, the probe is pointed towards the potential source(s) of EME radiation and moved slowly from ground level up to slightly above head height (approx. 6 ft).

Spatial Average Measurement A technique used to average a minimum of ten (10) measurements taken in a ten (10) second interval from zero (0) to six (6) feet. This measurement is intended to model the average energy an average sized human body will absorb while present in an electromagnetic field of energy.

3 - Site Safety Procedures

The following items are general safety recommendations that should be administered on a site by site basis as needed by the carrier.

General Maintenance Work: *Any maintenance personnel required to work immediately in front of antennas and / or in areas indicated as above 100% of the Occupational MPE limits should coordinate with the wireless operators to disable transmitters during their work activities.*

Training and Qualification Verification: *All personnel accessing areas indicated as exceeding the General Population MPE limits should have a basic understanding of EME awareness and RF Safety procedures when working around transmitting antennas. Awareness training increases a workers understanding to potential RF exposure scenarios. Awareness can be achieved in a number of ways (e.g. videos, formal classroom lecture or internet based courses).*

Physical Access Control: *Access restrictions to transmitting antennas locations is the primary element in a site safety plan. Examples of access restrictions are as follows:*

- *Locked door or gate*
- *Alarmed door*
- *Locked ladder access*
- *Restrictive Barrier at antenna locations (e.g. Chain link with posted RF Sign)*

RF Signage: *Everyone should obey all posted signs at all times. RF signs play an important role in properly warning a worker prior to entering into a potential RF Exposure area.*

Assume all antennas are active: *Due to the nature of telecommunications transmissions, an antenna transmits intermittently. Always assume an antenna is transmitting. Never stop in front of an antenna. If you have to pass by an antenna, move through as quickly and safely as possible thereby reducing any exposure to a minimum.*

Maintain a 3 foot clearance from all antennas: *There is a direct correlation between the strength of an EME field and the distance from the transmitting antenna. The further away from an antenna, the lower the corresponding EME field is.*

Rooftop RF Emissions Diagram: *Section 4 of this report contains an RF Emissions Diagram that outlines various theoretical Maximum Permissible Exposure (MPE) areas on the rooftop. This analysis is all theoretical and assumes a duty cycle of 75% for each transmitting antenna at full power. This analysis is a worst case scenario. This analysis is based on one of two access control criteria: General Public criteria means the access to the site is uncontrolled and anyone can gain access. Occupational criteria means the access is restricted and only properly trained individuals can gain access to the antenna locations.*

4 - Definitions

Compliance- *The determination of whether a site is safe or not with regards to Human Exposure to Radio Frequency Radiation from transmitting antennas.*

Decibel (dB) – *A unit for measuring power or strength of a signal.*

Duty Cycle – *The percent of pulse duration to the pulse period of a periodic pulse train. Also, may be a measure of the temporal transmission characteristic of an intermittently transmitting RF source such as a paging antenna by dividing average transmission duration by the average period for transmission. A duty cycle of 75% corresponds to continuous operation.*

Effective (or Equivalent) Isotropic Radiated Power (EIRP) – *The product of the power supplied to the antenna and the antenna gain in a given direction relative to an isotropic antenna, this product is divided by the cable losses*

Effective Radiated Power (ERP) – *In a given direction, the relative gain of a transmitting antenna with respect to the maximum directivity of a half wave dipole multiplied by the net power accepted by the antenna from the connecting transmitter.*

Gain (of an antenna in dbd) – *The ratio of the maximum intensity in a given direction to the maximum radiation in the same direction from a reference dipole. Gain is a measure of the relative efficiency of a directional antennas as compared to a reference dipole.*

General Population/Uncontrolled Environment – *Defined by the FCC, as an area where RFR exposure may occur to persons who are unaware of the potential for exposure and who have no control of their exposure. General Population is also referenced as General Public.*

Generic Antenna – *For the purposes of this report, the use of "Generic" as an antenna model means the antenna information was not provided and could not be obtained while on site. In the event of unknown information, MobileComm will use our industry specific knowledge of antenna models to select a worst case scenario antenna to model the site.*

Isotropic Antenna – *An antenna that is completely non-directional. In other words, an antenna that radiates energy equally in all directions.*

Maximum Measurement – *This measurement represents the single largest measurement recorded when performing a spatial average measurement.*

Maximum Exposure Limit (MPE) – *The RMS and peak electric and magnetic field strength, their squares, or the plane-wave equivalent power densities associated with these fields to which a person may be exposed without harmful effect and with acceptable safety factor.*

Occupational/Controlled Environment – *Defined by the FCC, as an area where Radio Frequency Radiation (RFR) exposure may occur to persons who are aware of the potential for exposure as a condition of employment or specific activity and can exercise control over their exposure.*

Radio Frequency Radiation – *Electromagnetic waves that are propagated from antennas through space.*

Spatial Average Measurement – *A technique used to average a minimum of ten (10) measurements taken in a ten (10) second interval from zero (0) to six (6) feet. This measurement is intended to model the average energy an average sized human body will absorb while present in an electromagnetic field of energy.*

Transmitter Power Output (TPO) – *The radio frequency output power of a transmitter's final radio frequency stage as measured at the output terminal while connected to a load.*

Appendix F – Proprietary Statement

This report was prepared for the use of AT&T Mobility, LLC to meet requirements specified in AT&T's corporate RF safety guidelines. It was performed in accordance with generally accepted practices of other consultants undertaking similar studies at the same time and in the same locale under like circumstances. The conclusions provided by MobileComm are based solely on the information provided by AT&T Mobility and all observations in this report are valid on the date of the investigation. Any additional information that becomes available concerning the site should be provided to MobileComm so that our conclusions may be revised and modified, if necessary. This report has been prepared in accordance with Standard Conditions for Engagement and authorized proposal, both of which are integral parts of this report. No other warranty, expressed or implied, is made.

Date: February 16, 2022

B+T Group
1717 S. Boulder, Suite 300
Tulsa, OK 74119
(918) 587-4630
towersupport@btgrp.com

Subject:	**Mount Replacement Analysis Report**	
Carrier Designation:	**AT&T Mobility Equipment Change-Out**	
	Carrier Site Number:	CT2024
	Carrier Site Name:	CLINTON
	Carrier FA Number:	10035028
Crown Castle Designation:	**BU Number:**	806363
	Site Name:	HRT 105 943201
	JDE Job Number:	674881
	Order Number:	576131, Rev. 0
Engineering Firm Designation:	**B+T Group Report Designation:**	100083.005.01
Site Data:	**48 Cow Hill Road, Clinton, CT, Middlesex County, 06413** **Latitude 41° 17' 20.20" Longitude -72° 32' 18.50"**	
Structure Information:	**Tower Height & Type:**	**212.625 ft. Self- Support Tower**
	Mount Elevation:	**189 ft.**
	Mount Type:	**14.5 ft. Sector Mount**

B+T Group is pleased to submit this **"Mount Replacement Analysis Report"** to determine the structural integrity of AT&T Mobility's antenna mounting system with the proposed appurtenance and equipment addition on the above mentioned 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's stress level. Based on our analysis we have determined the stress level to be:

Sector Mount (typical) **Sufficient**
***Sufficient upon completion of the changes listed in the 'Recommendations' section of the report.**

This analysis has been performed in accordance with the 2018 International Building Code based upon an ultimate 3-second gust wind speed of 124 mph. Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria.

Mount structural analysis prepared by: Rose Denny

Respectfully submitted by: B&T Engineering, Inc.
COA: PEC.0001564 Expires: 02/10/2022

Chad E. Tuttle, P.E.

TABLE OF CONTENTS

1) INTRODUCTION

This is a proposed 3 - sector 14.5 ft. Sector Mount, designed by SitePro1 (Part# VFA14-WLL-30120).

2) ANALYSIS CRITERIA

Building Code:	2018 IBC
TIA-222 Revision:	TIA-222-H
Risk Category:	II
Ultimate Wind Speed:	124 mph
Exposure Category:	B
Topographic Factor at Base:	1
Topographic Factor at Mount:	1
Ice Thickness:	1.0 in
Wind Speed with Ice:	50 mph
Seismic S_s:	0.205
Seismic S_1:	0.054
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.)	Qty.	Manufacturer	Model / Type	Mount / Modification Details
189	190	3	Andrew	SBNHH-1D65A	14.5 ft. Sector Mount
		3	CCI Antennas	DMP65R-BU4D	
		3	CCI Antennas	OPA65R-BU4D	
		3	Powerwave	7770.00	
		3	Ericsson	RRUS 32 B30	
		3	Ericsson	RRUS 32 B66	
		3	Ericsson	RRUS 4415 B25	
		3	Ericsson	RRUS 4449 B5/B12	
		3	Ericsson	RRUS 4478 B14	
		3	Raycap	DC6-48-60-18-8F	

Table 2 - Documents Provided

Document	Remarks	Reference	Source
CCI Order	Proposed Loading Existing Loading	Date: 10/26/2021	Crown Castle
RFDS		Date: 09/24/2021	
Previous MA	B+T Group	Date: 11/05/2021	On File

3) ANALYSIS PROCEDURE

3.1) Analysis Method

RISA-3D (Version 19.0.4), 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 by B+T Group, was used to calculate wind loading on all appurtenances, dishes and mount members for various loading cases. Selected output from the analysis is included in Appendix B "Software Input Calculations".

This analysis was performed in accordance with Crown Castle's ENG-SOW-10208 *Tower Mount Analysis* (Revision D). In addition, this analysis is in accordance with *AT&T's Mount Technical Directive – R15.*

Manufacturers drawing were used to create the model.

3.2) Assumptions

1. The antenna mounting system was properly fabricated, installed and maintained in good condition in accordance with its original design, TIA Standards, and/or manufacturer's specifications.
2. The configuration of antennas, mounts, and other appurtenances are as specified in Table-1.
3. All member connections are assumed to have been designed to meet or exceed the load carrying capacity of the connected members unless otherwise specified in this report.
4. Mount areas and weights are determined from field measurements, standard material properties, and/or manufacturer product data.
5. Serviceability with respect to antenna twist, tilt, roll or lateral translation is not checked and is left to the carrier or tower owner to ensure conformance.
6. All prior structural modifications, if any are assumed to be correctly installed and fully effective.
7. 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.
8. The following material grades were assumed (Unless Noted Otherwise):
   (a) Connection Bolts : ASTM A325
   (b) Steel Pipe : ASTM A53 (GR. 35)
   (c) HSS (Round) : ASTM 500 (GR. B-42)
   (d) HSS (Rectangular) : ASTM 500 (GR. B-46)
   (e) Channel : ASTM A36 (GR. 36)
   (f) Steel Solid Rod : ASTM A36 (GR. 36)
   (g) Steel Plate : ASTM A36 (GR. 36)
   (h) Steel Angle : ASTM A36 (GR. 36)
   (i) UNISTRUT : ASTM A570 (GR. 33)

This analysis may be affected if any assumptions are not valid or have been made in error. B+T Group 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 Mount)

Notes	Component	Centerline (ft.)	Critical Member	% Capacity	Pass / Fail
1,2	Face Horizontals	189	1	54.3	Pass
	Support Arms	189	11	36.7	Pass
	Connection Plates	189	6	50.4	Pass
	Verticals	189	29	64.9	Pass
	Diagonals	189	33	18.9	Pass
	Mount Pipes	189	52	28.1	Pass
	Tiebacks	189	46	12.9	Pass
3	Connection Bolts	189	-	13.4	Pass

Structure Rating (max from all components) =	64.9%

Notes:
1) See additional documentation in "Appendix C - Software Analysis Output" for calculations supporting the % capacity consumed.
2) All sectors are typical
3) See additional documentation in "Appendix D - Additional Calculations" for calculations supporting the % capacity reported.

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[3] (lb.)	Notes
82	Proposed	1193.31	Leg	ROHN 3 EH	4694.40	1
83	Proposed	719.28				

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

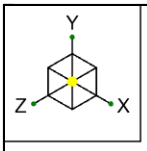
The proposed mount has sufficient capacity to support the proposed loading configuration. In order for the results of this analysis to be considered valid, the mount listed below shall be installed.

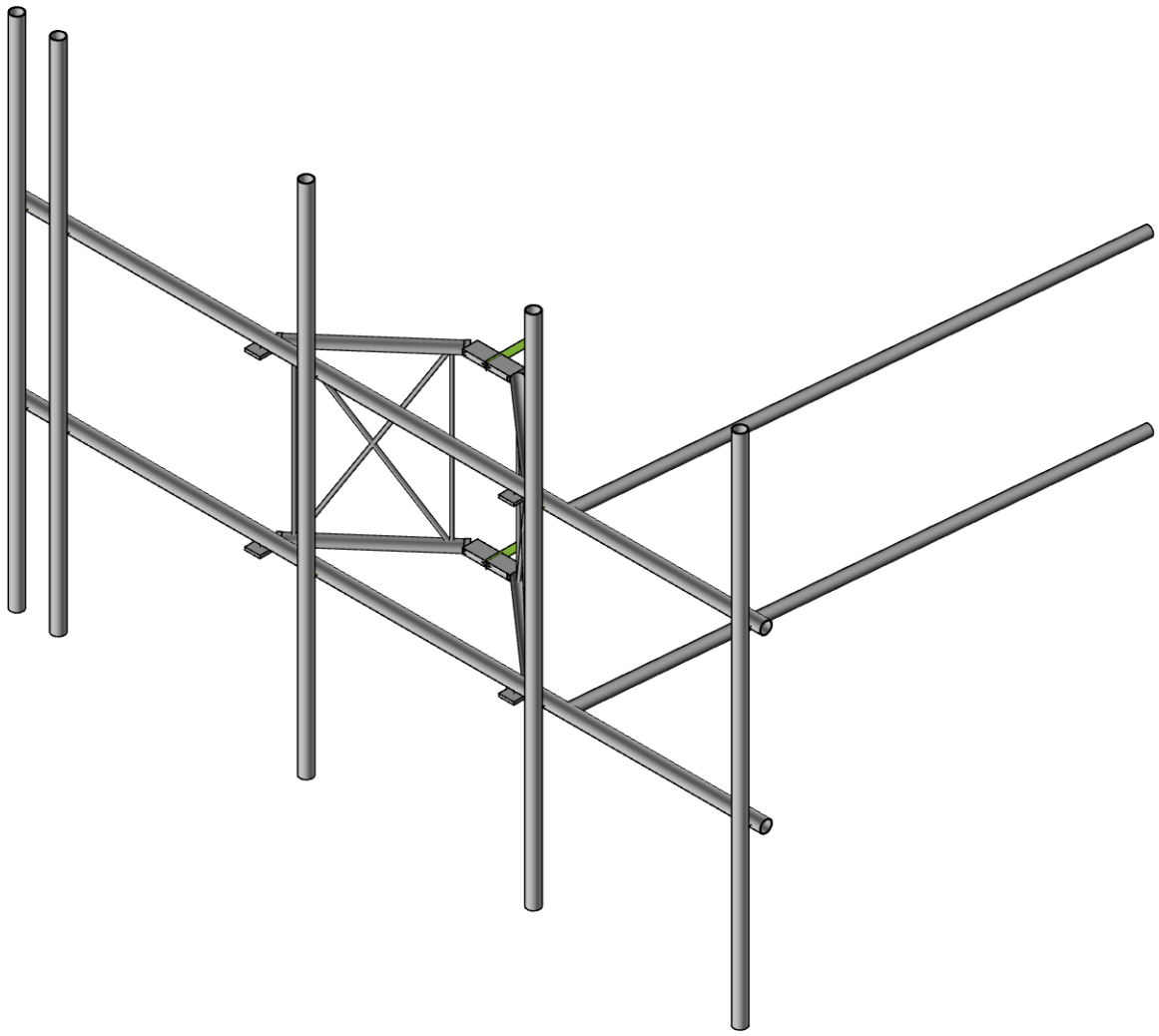
1. Mount replacement,(3)SitePro1 (Part# VFA14-WLL-30120)

Beyond the mount replacement, no structural modifications are required at this time, provided that the above-listed changes are implemented.

APPENDIX A

WIRE FRAME AND RENDERED MODELS





Envelope Only Solution

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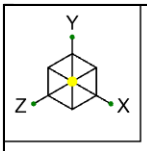

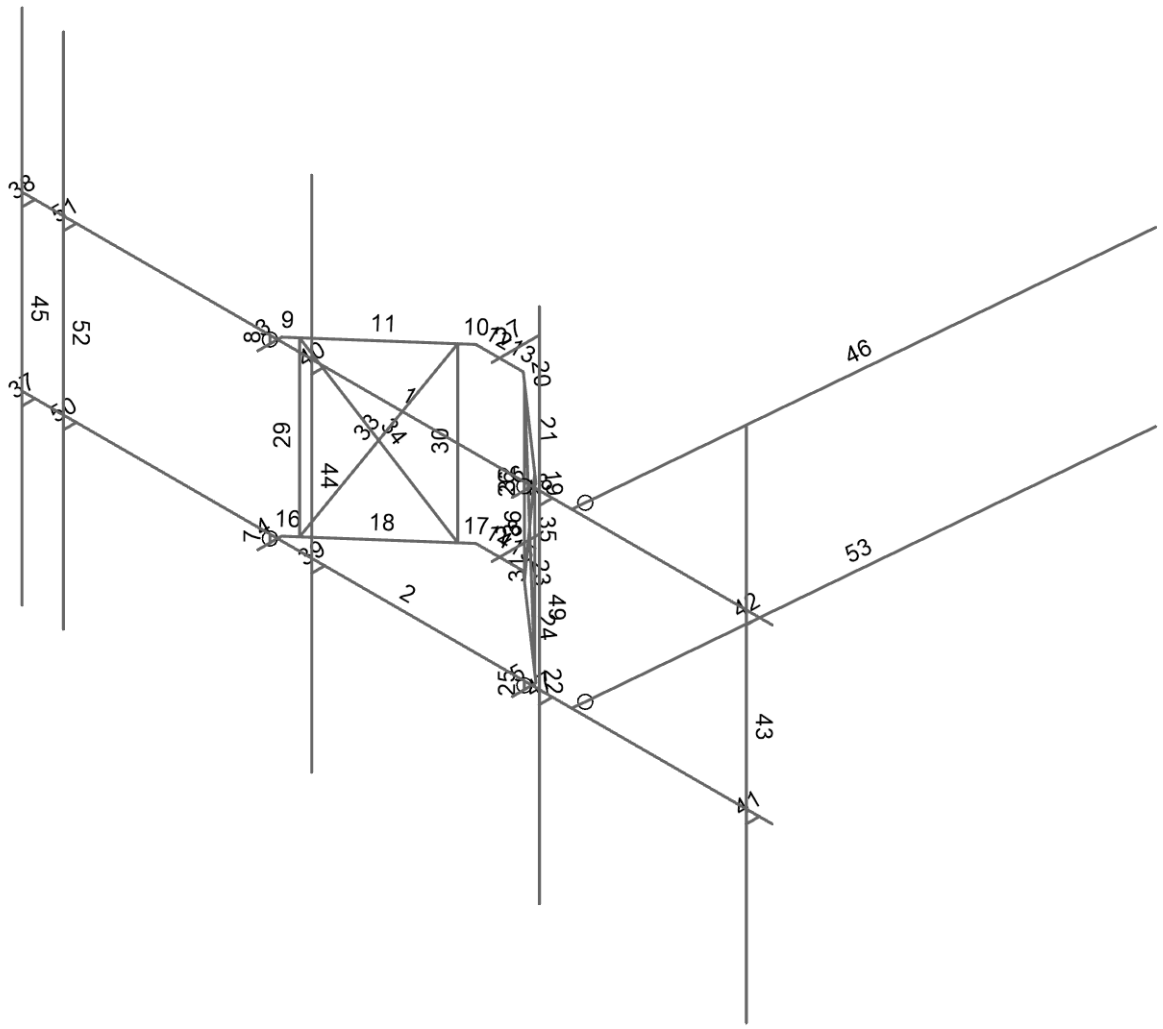

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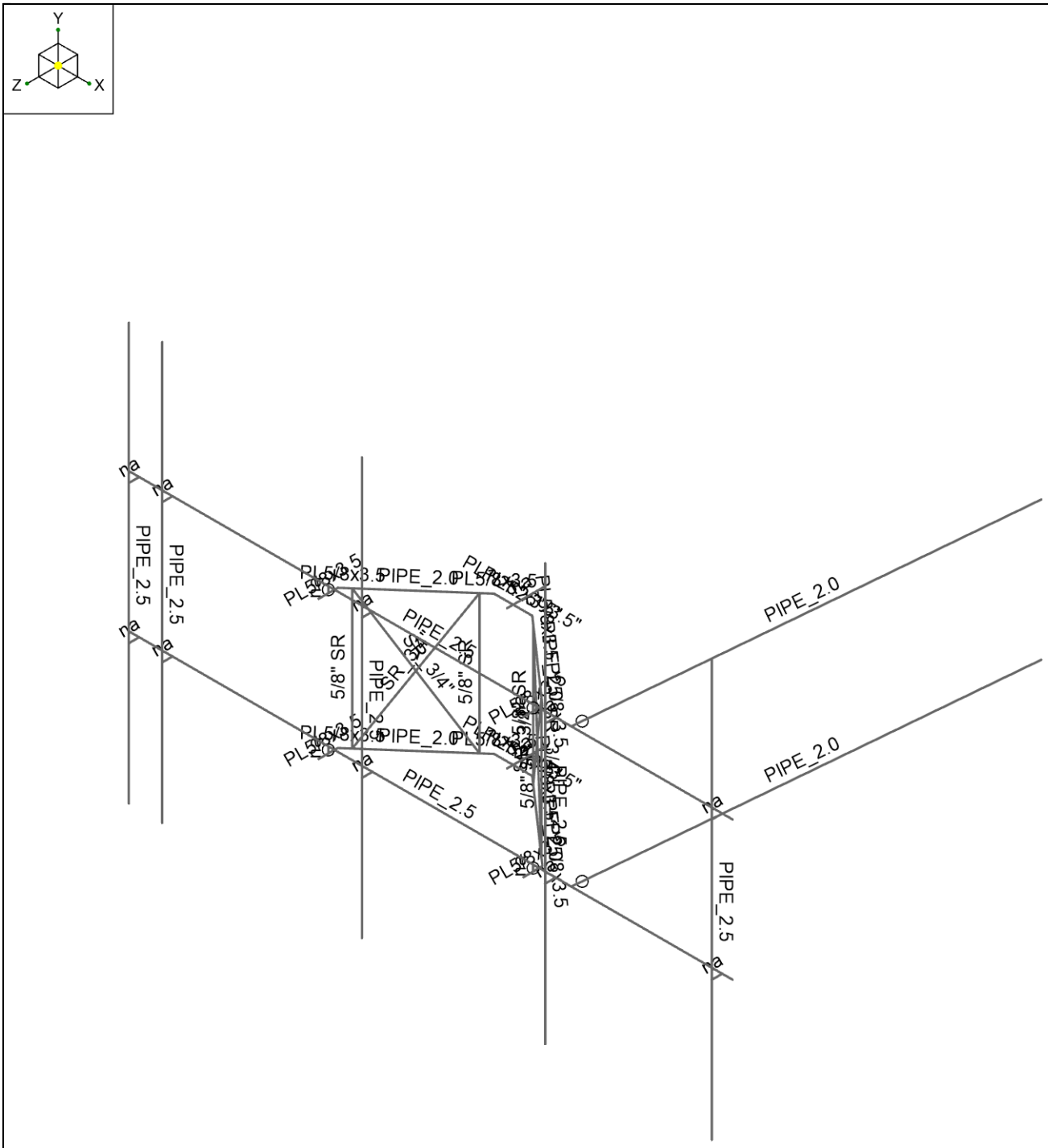

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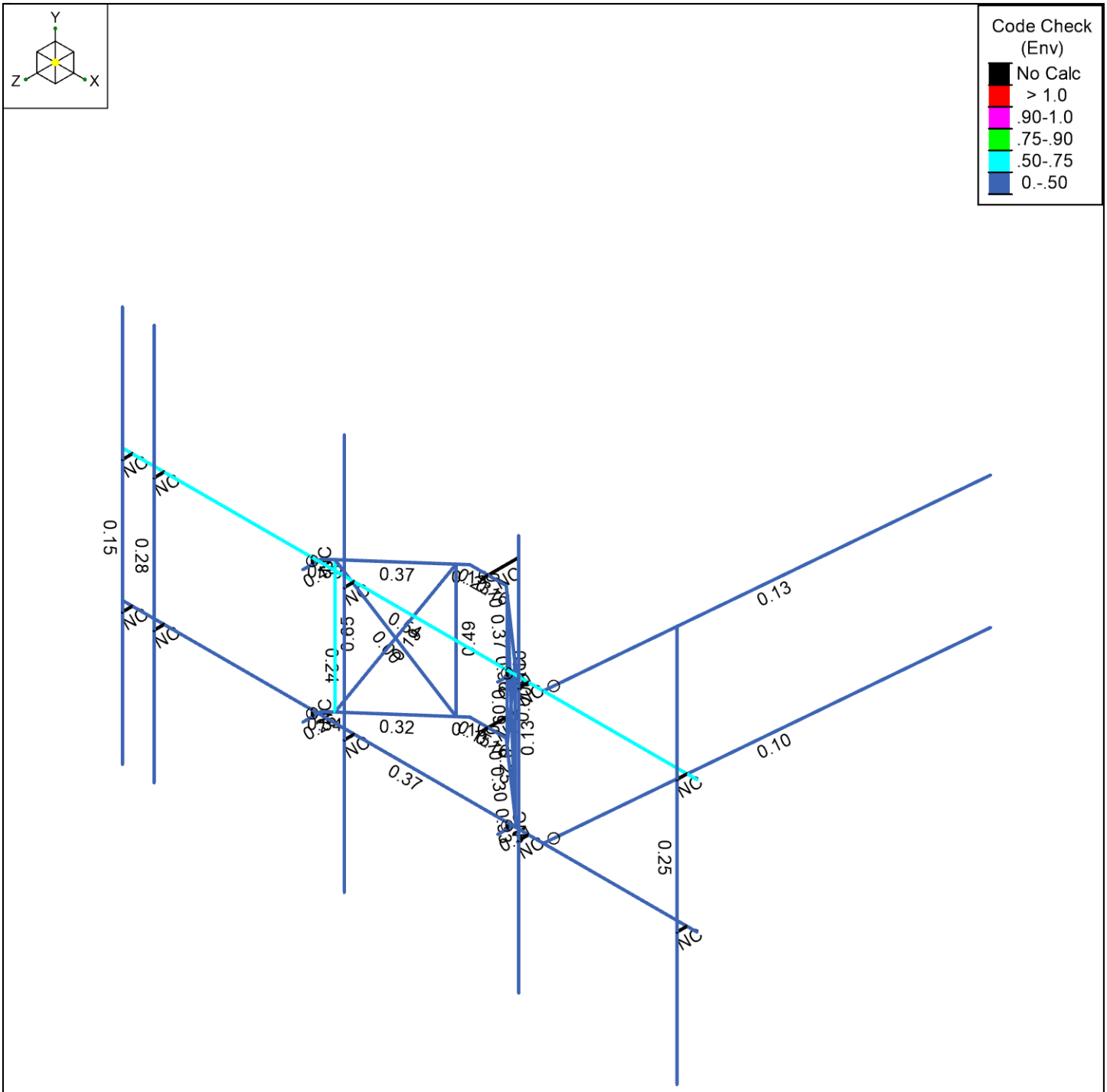

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Envelope Only Solution

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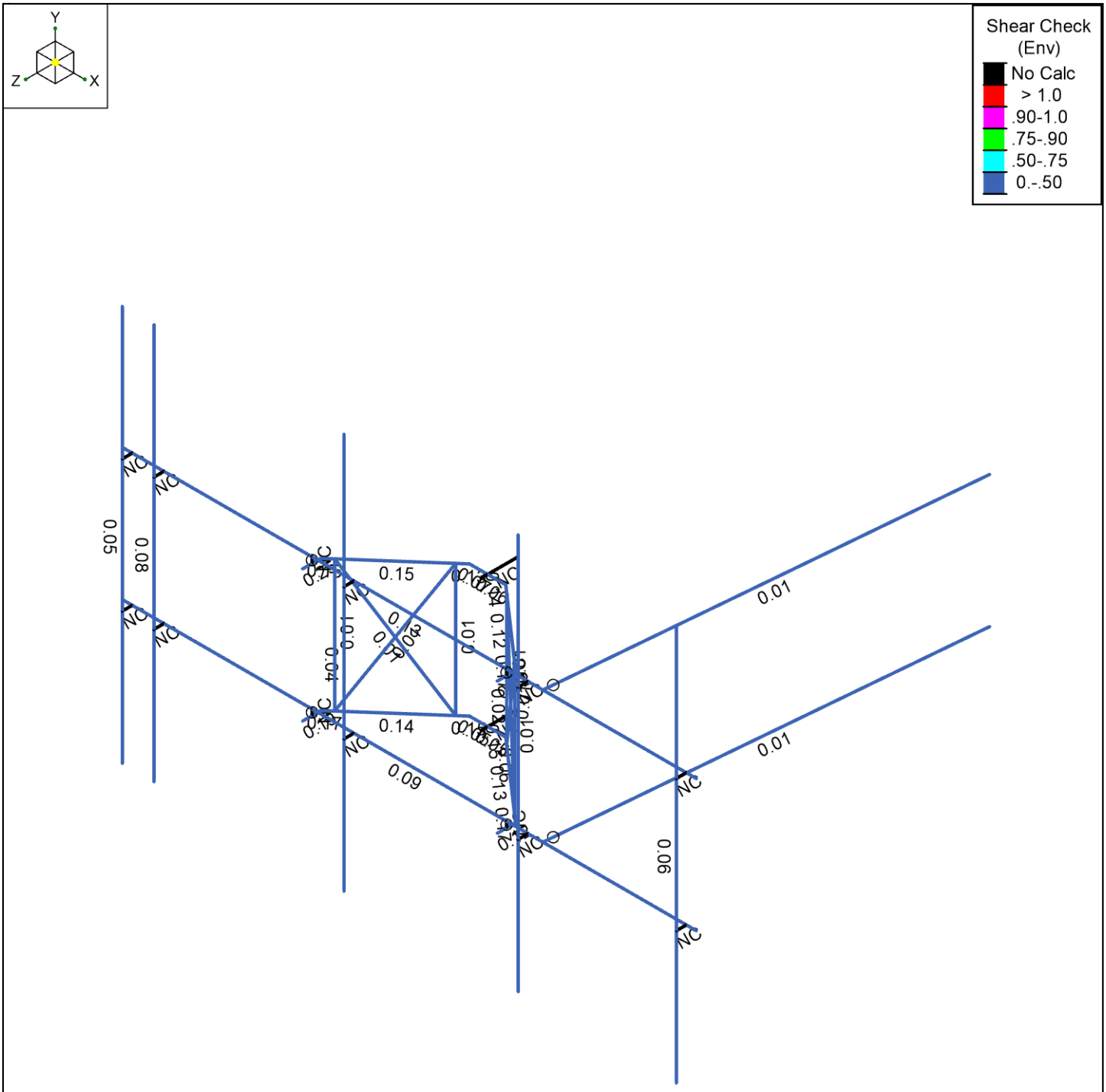

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APPENDIX B

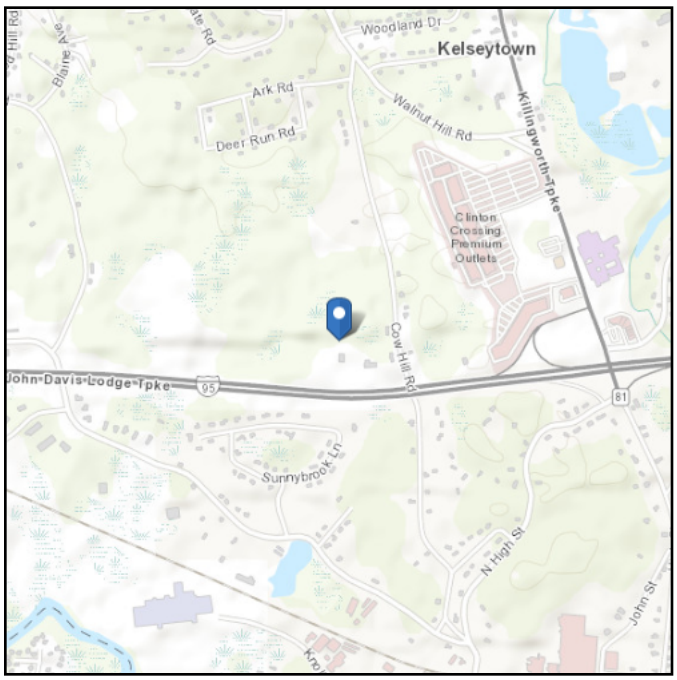
SOFTWARE INPUT CALCULATIONS

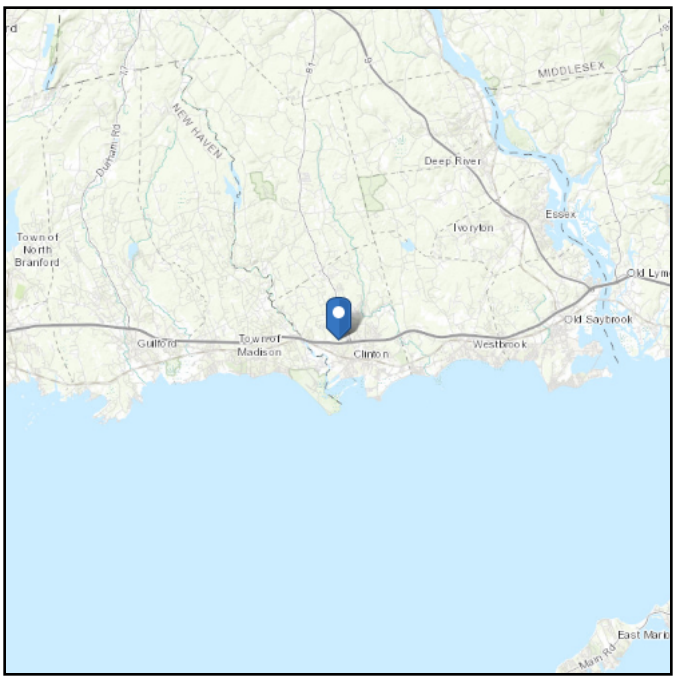
ASCE 7 Hazards Report

Address:
No Address at This Location

Standard: ASCE/SEI 7-16
Risk Category: II
Soil Class: D - Default (see Section 11.4.3)

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





Wind

Results:

Wind Speed	124 Vmph
10-year MRI	75 Vmph
25-year MRI	85 Vmph
50-year MRI	95 Vmph
100-year MRI	101 Vmph

Data Source: ASCE/SEI 7-16, Fig. 26.5-1B and Figs. CC.2-1–CC.2-4, and Section 26.5.2
Date Accessed: Tue Feb 15 2022

Value provided is 3-second gust wind speeds at 33 ft above ground for Exposure C Category, based on linear interpolation between contours. Wind speeds are interpolated in accordance with the 7-16 Standard. Wind speeds correspond to approximately a 7% probability of exceedance in 50 years (annual exceedance probability = 0.00143, MRI = 700 years).

Site is in a hurricane-prone region as defined in ASCE/SEI 7-16 Section 26.2. Glazed openings need not be protected against wind-borne debris.

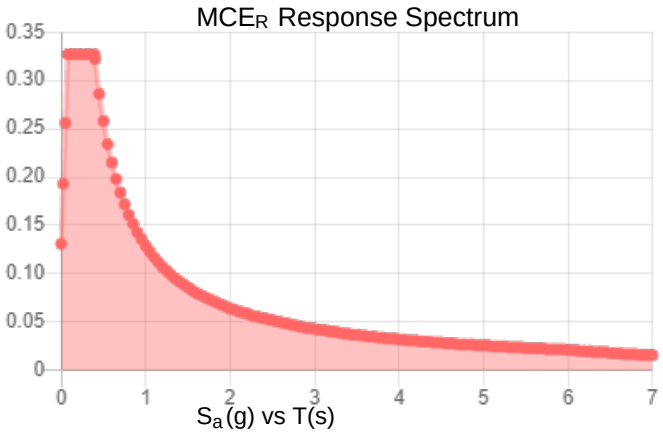
Seismic

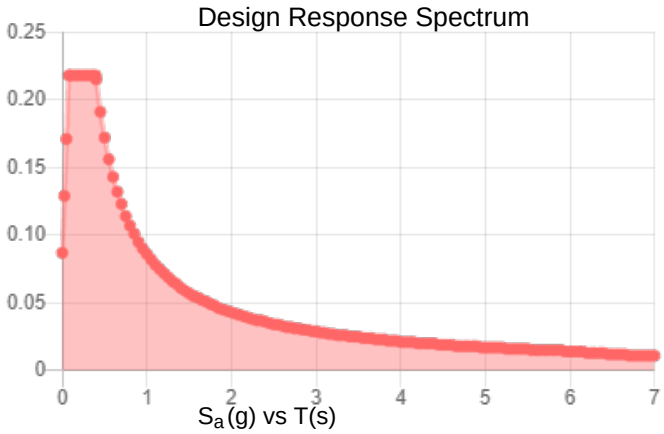
Site Soil Class: D - Default (see Section 11.4.3)

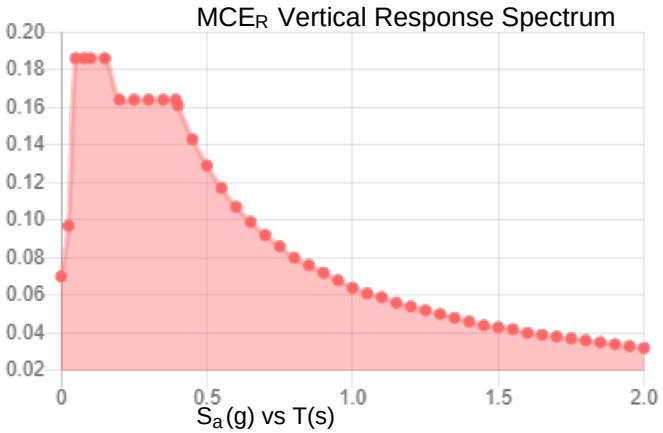
Results:

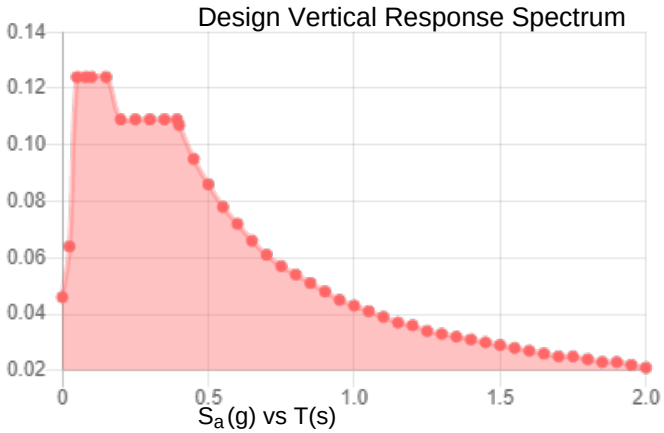
S_S :	0.205	S_{D1} :	0.086
S_1 :	0.054	T_L :	6
F_a :	1.6	PGA :	0.114
F_v :	2.4	PGA_M :	0.18
S_{MS} :	0.327	F_{PGA} :	1.571
S_{M1} :	0.129	I_e :	1
S_{DS} :	0.218	C_v :	0.709

Seismic Design Category B









Data Accessed: **Tue Feb 15 2022**

Date Source:

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

Ice

Results:

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

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

Values provided are equivalent radial ice thicknesses due to freezing rain with concurrent 3-second gust speeds, for a 500-year mean recurrence interval, and temperatures concurrent with ice thicknesses due to freezing rain. Thicknesses for ice accretions caused by other sources shall be obtained from local meteorological studies. Ice thicknesses in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

PROJECT	**100083.005.01 - HRT 105 943**	**KSC**
SUBJECT	**Sector Mount Analysis**	
DATE	**02/15/22**	PAGE OF

B+T GRP
1717 S. Boulder, Suite 300
Tulsa, OK 74119
(918) 587-4630

Tower Type		:	SST		
Ground Elevation	z_s	:	19	ft	[ASCE7 Hazard Tool]
Tower Height		:	212.63	ft	
Mount Elevation		:	189.00	ft	
Antenna Elevation		:	190.00	ft	
Crest Height		:	0	ft	
Risk Category		:	II		[Table 2-1]
Exposure Category		:	B		[Sec. 2.6.5.1.2]
Topography Category		:	1.00		[Sec. 2.6.6.2]
Wind Velocity	V	:	124	mph	[ASCE7 Hazard Tool]
Ice wind Velocity	V_i	:	50	mph	[ASCE7 Hazard Tool]
Service Velocity	V_s	:	30	mph	[ASCE7 Hazard Tool]
Base Ice thickness	t_i	:	1.00	in	[ASCE7 Hazard Tool]
Seismic Design Cat.		:	B		[ASCE7 Hazard Tool]
	S_S	:	0.21		
	S_1	:	0.05		
	S_{DS}	:	0.22		
	S_{D1}	:	0.09		

Gust Factor	G_h	:	1.00		[Sec. 16.6]
Pressure Coefficient	K_z	:	1.19		[Sec. 2.6.5.2]
Topography Factor	K_{zt}	:	1.00		[Sec. 2.6.6]
Elevation Factor	K_e	:	1.00		[Sec. 2.6.8]
Directionality Factor	K_d	:	0.95		[Sec. 16.6]
Shielding Factor	K_a	:	0.90		[Sec. 16.6]
Design Ice Thickness	t_{iz}	:	1.19	in	[Sec. 2.6.10]

Importance Factor	I_e	:	1		[Table 2-3]
Response Coefficient	C_s	:	0.109		[Sec. 2.7.7.1]
Amplification	A_s	:	2.555556		[Sec. 16.7]

	q_z	:	44.30	psf

PROJECT	**100083.005.01 - HRT 105 943**		**KSC**
SUBJECT	**Sector Mount Analysis**		
DATE	**02/15/22**	PAGE	OF

B+T GRP
1717 S. Boulder, Suite 300
Tulsa, OK 74119
(918) 587-4630

Manufacturer	Model	Qty	Aspect Ratio	C_a flat/round	EPA_N (ft^2)	EPA_T (ft^2)	$EPA_{N\text{-}Ice}$ (ft^2)	$EPA_{T\text{-}Ice}$ (ft^2)	$F_{A\ No\ Ice\ (N)}$	$F_{A\ No\ Ice\ (T)}$	$F_{A\ Ice\ (N)}$	$F_{A\ Ice\ (T)}$
/ERWAVE TECHNOLO(	7770.00	0.5	5.00	1.31	2.10	0.95	2.67	1.47	0.11	0.05	0.02	0.01
/ERWAVE TECHNOLO(	7770.00	0.5	5.00	1.31	2.10	0.95	2.67	1.47	0.11	0.05	0.02	0.01
ANDREW	SBNHH-1D65A	0.5	4.67	1.30	1.54	0.93	1.87	1.23	0.07	0.04	0.01	0.01
ANDREW	SBNHH-1D65A	0.5	4.67	1.30	1.54	0.93	1.87	1.23	0.07	0.04	0.01	0.01
ERICSSON	TME-RRUS 32 B30	1	2.25	1.20	2.29	1.32	2.97	1.93	0.11	0.06	0.02	0.01
CCI ANTENNAS	OPA65R-BU4D	0.5	2.29	1.20	4.03	1.50	4.60	1.96	0.18	0.07	0.03	0.01
CCI ANTENNAS	OPA65R-BU4D	0.5	2.29	1.20	4.03	1.50	4.60	1.96	0.18	0.07	0.03	0.01
ERICSSON	TME-RRUS 4478 B14	1	1.23	1.20	1.54	0.88	2.07	1.32	0.07	0.04	0.01	0.01
ERICSSON	TME-RRUS 32 B66	1	2.25	1.20	2.29	1.32	2.97	1.93	0.11	0.06	0.02	0.01
CCI ANTENNAS	DMP65R-BU4D	0.5	2.32	1.20	3.74	1.40	4.27	1.84	0.17	0.06	0.03	0.01
CCI ANTENNAS	DMP65R-BU4D	0.5	2.32	1.20	3.74	1.40	4.27	1.84	0.17	0.06	0.03	0.01
ERICSSON	RRUS 4449 B5/B12	1	1.36	1.20	1.64	1.17	2.19	1.66	0.08	0.06	0.01	0.01
ERICSSON	TME-RRUS 4415 B25	1	1.13	1.20	1.37	0.56	1.88	0.94	0.07	0.03	0.01	0.00
RAYCAP	TME-DC6-48-60-18-8F	1	2.18	0.50	1.83	1.83	2.45	2.45	0.04	0.04	0.01	0.01

APPENDIX C

SOFTWARE ANALYSIS OUTPUT

Node Coordinates

	Label	X [ft]	Y [ft]	Z [ft]	Detach From Diaphragm
1	1	7.25	0.145833	2.91666	
2	2	-7.25	0.145833	2.91666	
3	3	7.25	-3.1875	2.91666	
4	4	-7.25	-3.1875	2.91666	
5	5	-2.458333	0.145833	2.91666	
6	6	-2.458333	-3.1875	2.91666	
7	7	2.458333	-3.1875	2.91666	
8	8	2.458333	0.145833	2.91666	
9	9	0	0	0.16666	
10	10	-2.458333	0	2.91666	
11	11	-2.458333	-3.333334	2.91666	
12	12	2.458333	-3.333334	2.91666	
13	13	2.458333	0	2.91666	
14	14	-2.458333	0	3.151035	
15	15	-2.458333	-3.333334	3.151035	
16	16	2.458333	-3.333334	3.151035	
17	17	2.458333	0	3.151035	
18	18	-2.458333	0	2.692702	
19	19	-2.458333	-3.333334	2.692702	
20	20	2.458333	-3.333334	2.692702	
21	21	2.458333	0	2.692702	
22	22	0	-3.333334	0.16666	
23	23	0	0	1.083327	
24	24	0	-3.333334	1.083327	
25	25	0	0	0.937493	
26	26	0	-3.333334	0.937493	
27	27	0.458333	0	0.937493	
28	28	0.458333	-3.333334	0.937493	
29	29	-0.458333	0	0.937493	
30	30	-0.458333	-3.333334	0.937493	
31	31	-0.518814	0	0.990572	
32	32	-2.397829	0	2.639603	
33	33	-0.518814	-3.333334	0.990572	
34	34	-2.397829	-3.333334	2.639603	
35	35	0.518814	0	0.990572	
36	36	2.397829	0	2.639603	
37	37	0.518814	-3.333334	0.990572	
38	38	2.397829	-3.333334	2.639603	
39	39	-2.272561	0	2.529667	
40	40	-2.272561	-3.333334	2.529667	
41	41	-0.644082	0	1.100507	
42	42	-0.644082	-3.333334	1.100507	
43	43	2.272561	0	2.529667	
44	44	2.272561	-3.333334	2.529667	
45	45	0.644082	0	1.100507	
46	46	0.644082	-3.333334	1.100507	
47	47	-7.000004	0.145833	2.91666	
48	48	-7.000004	-3.1875	2.91666	
49	49	-1.4	0.145833	2.91666	
50	50	-1.4	-3.1875	2.91666	
51	51	7	0.145833	2.91666	
52	52	7	-3.1875	2.91666	
53	53	-7.000004	0.145833	3.16666	
54	54	-7.000004	-3.1875	3.16666	
55	55	-1.4	0.145833	3.16666	

Node Coordinates (Continued)

	Label	X [ft]	Y [ft]	Z [ft]	Detach From Diaphragm
56	56	-1.4	-3.1875	3.16666	
57	57	7	0.145833	3.16666	
58	58	7	-3.1875	3.16666	
59	59	-7.000004	-6.520834	3.16666	
60	60	-1.4	-6.520834	3.16666	
61	61	7	-6.520834	3.16666	
62	62	-7.000004	3.479166	3.16666	
63	63	-1.4	3.479166	3.16666	
64	64	7	3.479166	3.16666	
65	65	3.375	0.145833	2.91666	
66	66	3	0.145833	2.91666	
67	67	3	-3.1875	2.91666	
68	68	3	0.145833	3.16666	
69	69	3	-3.1875	3.16666	
70	70	3	-6.520834	3.16666	
71	71	3	3.479166	3.16666	
72	72	-6.200004	0.145833	2.91666	
73	73	-6.200004	-3.1875	2.91666	
74	74	-6.200004	0.145833	3.16666	
75	75	-6.200004	-3.1875	3.16666	
76	76	-6.200004	-6.520834	3.16666	
77	77	-6.200004	3.479166	3.16666	
78	78	0	0	0	
79	79	3.375	-3.1875	2.91666	
80	80	4.29868	0	-7.445532	
81	81	-4.29868	0	-7.445532	
82	82	4.29868	0.146	-7.445532	
83	83	4.29868	-3.18733	-7.445532	

Node Boundary Conditions

	Node Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot [k-ft/rad]	Z Rot [k-ft/rad]
1	22	Reaction	Reaction	Reaction	Reaction	Reaction
2	9	Reaction	Reaction	Reaction	Reaction	Reaction
3	78					
4	82	Reaction	Reaction	Reaction		
5	83	Reaction	Reaction	Reaction		

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm. Coeff. [1e^{5}°F^{-1}]	Density [k/ft^{3}]	Yield [ksi]	Ry	Fu [ksi]	Rt
1	A992	29000	11154	0.3	0.65	0.49	50	1.1	65	1.1
2	A36 Gr.36	29000	11154	0.3	0.65	0.49	36	1.5	58	1.2
3	A572 Gr.50	29000	11154	0.3	0.65	0.49	50	1.1	65	1.1
4	A500 Gr.B RND	29000	11154	0.3	0.65	0.527	42	1.4	58	1.3
5	A500 Gr.B Rect	29000	11154	0.3	0.65	0.527	46	1.4	58	1.3
6	A53 Gr.B	29000	11154	0.3	0.65	0.49	35	1.6	60	1.2
7	A1085	29000	11154	0.3	0.65	0.49	50	1.4	65	1.3

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design Rule	Area [in^{2}]	Iyy [in^{4}]	Izz [in^{4}]	J [in^{4}]
1	MF-H1	PIPE_2.5	Beam	None	A53 Gr.B	Typical	1.61	1.45	1.45	2.89
2	SF-H1	PIPE_2.0	Beam	None	A53 Gr.B	Typical	1.02	0.627	0.627	1.25
3	MF-CP1	PL5/8x3.5	Beam	None	A36 Gr.36	Typical	2.205	0.073	2.251	0.259

Hot Rolled Steel Section Sets (Continued)

	Label	Shape	Type	Design List	Material	Design Rule	Area [in²]	Iyy [in⁴]	Izz [in⁴]	J [in⁴]
4	MF-CP2	PL1.25"x3.5"	Beam	None	A36 Gr.36	Typical	4.375	0.57	4.466	1.767
5	SF-V1	5/8" SR	Column	None	A36 Gr.36	Typical	0.307	0.007	0.007	0.015
6	SF-D1	SR_3/4"	VBrace	None	A36 Gr.36	Typical	0.442	0.016	0.016	0.031
7	MF-P1	PIPE_2.5	Column	None	A53 Gr.B	Typical	1.61	1.45	1.45	2.89
8	Tieback	PIPE_2.0	Beam	None	A53 Gr.B	Typical	1.02	0.627	0.627	1.25

Member Primary Data

	Label	I Node	J Node	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rule
1	1	1	2		MF-H1	Beam	None	A53 Gr.B	Typical
2	2	3	4		MF-H1	Beam	None	A53 Gr.B	Typical
3	3	14	18	90	MF-CP1	Beam	None	A36 Gr.36	Typical
4	4	15	19	90	MF-CP1	Beam	None	A36 Gr.36	Typical
5	5	16	20	90	MF-CP1	Beam	None	A36 Gr.36	Typical
6	6	17	21	90	MF-CP1	Beam	None	A36 Gr.36	Typical
7	7	11	6		RIGID	None	None	RIGID	Typical
8	8	10	5		RIGID	None	None	RIGID	Typical
9	9	18	32	90	MF-CP1	Beam	None	A36 Gr.36	Typical
10	10	31	29	90	MF-CP1	Beam	None	A36 Gr.36	Typical
11	11	32	31		SF-H1	Beam	None	A53 Gr.B	Typical
12	12	29	25	90	MF-CP2	Beam	None	A36 Gr.36	Typical
13	13	25	27	90	MF-CP2	Beam	None	A36 Gr.36	Typical
14	14	30	26	90	MF-CP2	Beam	None	A36 Gr.36	Typical
15	15	26	28	90	MF-CP2	Beam	None	A36 Gr.36	Typical
16	16	19	34	90	MF-CP1	Beam	None	A36 Gr.36	Typical
17	17	33	30	90	MF-CP1	Beam	None	A36 Gr.36	Typical
18	18	34	33		SF-H1	Beam	None	A53 Gr.B	Typical
19	19	21	36	90	MF-CP1	Beam	None	A36 Gr.36	Typical
20	20	35	27	90	MF-CP1	Beam	None	A36 Gr.36	Typical
21	21	36	35		SF-H1	Beam	None	A53 Gr.B	Typical
22	22	20	38	90	MF-CP1	Beam	None	A36 Gr.36	Typical
23	23	37	28	90	MF-CP1	Beam	None	A36 Gr.36	Typical
24	24	38	37		SF-H1	Beam	None	A53 Gr.B	Typical
25	25	12	7		RIGID	None	None	RIGID	Typical
26	26	13	8		RIGID	None	None	RIGID	Typical
27	27	23	9		RIGID	None	None	RIGID	Typical
28	28	24	22		RIGID	None	None	RIGID	Typical
29	29	40	39		SF-V1	Column	None	A36 Gr.36	Typical
30	30	42	41		SF-V1	Column	None	A36 Gr.36	Typical
31	31	44	43		SF-V1	Column	None	A36 Gr.36	Typical
32	32	46	45		SF-V1	Column	None	A36 Gr.36	Typical
33	33	40	41		SF-D1	VBrace	None	A36 Gr.36	Typical
34	34	39	42		SF-D1	VBrace	None	A36 Gr.36	Typical
35	35	45	44		SF-D1	VBrace	None	A36 Gr.36	Typical
36	36	46	43		SF-D1	VBrace	None	A36 Gr.36	Typical
37	37	54	48		RIGID	None	None	RIGID	Typical
38	38	53	47		RIGID	None	None	RIGID	Typical
39	39	56	50		RIGID	None	None	RIGID	Typical
40	40	55	49		RIGID	None	None	RIGID	Typical
41	41	58	52		RIGID	None	None	RIGID	Typical
42	42	57	51		RIGID	None	None	RIGID	Typical
43	43	64	61		MF-P1	Column	None	A53 Gr.B	Typical
44	44	63	60		MF-P1	Column	None	A53 Gr.B	Typical
45	45	62	59		MF-P1	Column	None	A53 Gr.B	Typical
46	46	65	82		Tieback	Beam	None	A53 Gr.B	Typical
47	47	69	67		RIGID	None	None	RIGID	Typical

Member Primary Data (Continued)

	Label	I Node	J Node	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rule
48	48	68	66		RIGID	None	None	RIGID	Typical
49	49	71	70		MF-P1	Column	None	A53 Gr.B	Typical
50	50	75	73		RIGID	None	None	RIGID	Typical
51	51	74	72		RIGID	None	None	RIGID	Typical
52	52	77	76		MF-P1	Column	None	A53 Gr.B	Typical
53	53	79	83		Tieback	Beam	None	A53 Gr.B	Typical

Member Advanced Data

	Label	I Release	J Release	T/C Only	Physical	Deflection Ratio Options	Seismic DR
1	1				Yes	N/A	None
2	2				Yes	N/A	None
3	3				Yes	N/A	None
4	4				Yes	N/A	None
5	5				Yes	N/A	None
6	6				Yes	N/A	None
7	7		OOOOXO		Yes	** NA **	None
8	8		OOOOXO		Yes	** NA **	None
9	9				Yes	N/A	None
10	10				Yes	N/A	None
11	11				Yes	N/A	None
12	12				Yes	N/A	None
13	13				Yes	N/A	None
14	14				Yes	N/A	None
15	15				Yes	N/A	None
16	16				Yes	N/A	None
17	17				Yes	N/A	None
18	18				Yes	Default	None
19	19				Yes	N/A	None
20	20				Yes	N/A	None
21	21				Yes	N/A	None
22	22				Yes	N/A	None
23	23				Yes	N/A	None
24	24				Yes	N/A	None
25	25		OOOOXO		Yes	** NA **	None
26	26		OOOOXO		Yes	** NA **	None
27	27				Yes	** NA **	None
28	28				Yes	** NA **	None
29	29				Yes	** NA **	None
30	30				Yes	** NA **	None
31	31				Yes	** NA **	None
32	32				Yes	** NA **	None
33	33				Yes	** NA **	None
34	34			Euler Buckling	Yes	** NA **	None
35	35				Yes	** NA **	None
36	36			Euler Buckling	Yes	** NA **	None
37	37				Yes	** NA **	None
38	38				Yes	** NA **	None
39	39				Yes	** NA **	None
40	40				Yes	** NA **	None
41	41				Yes	** NA **	None
42	42				Yes	** NA **	None
43	43				Yes	** NA **	None
44	44				Yes	** NA **	None
45	45				Yes	** NA **	None
46	46	BenPIN			Yes	Default	None

Member Advanced Data (Continued)

	Label	I Release	J Release	T/C Only	Physical	Deflection Ratio Options	Seismic DR
47	47				Yes	** NA **	None
48	48				Yes	** NA **	None
49	49				Yes	** NA **	None
50	50				Yes	** NA **	None
51	51				Yes	** NA **	None
52	52				Yes	** NA **	None
53	53	BenPIN			Yes	Default	None

Hot Rolled Steel Design Parameters

	Label	Shape	Length [ft]	Lb y-y [ft]	Lb z-z [ft]	Lcomp top [ft]	Function
1	1	MF-H1	14.5			Lbyy	Lateral
2	2	MF-H1	14.5			Lbyy	Lateral
3	3	MF-CP1	0.458			Lbyy	Lateral
4	4	MF-CP1	0.458			Lbyy	Lateral
5	5	MF-CP1	0.458			Lbyy	Lateral
6	6	MF-CP1	0.458			Lbyy	Lateral
7	9	MF-CP1	0.08			Lbyy	Lateral
8	10	MF-CP1	0.08			Lbyy	Lateral
9	11	SF-H1	2.5			Lbyy	Lateral
10	12	MF-CP2	0.458			Lbyy	Lateral
11	13	MF-CP2	0.458			Lbyy	Lateral
12	14	MF-CP2	0.458			Lbyy	Lateral
13	15	MF-CP2	0.458			Lbyy	Lateral
14	16	MF-CP1	0.08			Lbyy	Lateral
15	17	MF-CP1	0.08			Lbyy	Lateral
16	18	SF-H1	2.5			Lbyy	Lateral
17	19	MF-CP1	0.08			Lbyy	Lateral
18	20	MF-CP1	0.08			Lbyy	Lateral
19	21	SF-H1	2.5			Lbyy	Lateral
20	22	MF-CP1	0.08			Lbyy	Lateral
21	23	MF-CP1	0.08			Lbyy	Lateral
22	24	SF-H1	2.5			Lbyy	Lateral
23	29	SF-V1	3.333	2.5	2.5	Lbyy	Lateral
24	30	SF-V1	3.333	2.5	2.5	Lbyy	Lateral
25	31	SF-V1	3.333	2.5	2.5	Lbyy	Lateral
26	32	SF-V1	3.333	2.5	2.5	Lbyy	Lateral
27	33	SF-D1	3.976			Lbyy	Lateral
28	34	SF-D1	3.976			Lbyy	Lateral
29	35	SF-D1	3.976			Lbyy	Lateral
30	36	SF-D1	3.976			Lbyy	Lateral
31	43	MF-P1	10			Lbyy	Lateral
32	44	MF-P1	10			Lbyy	Lateral
33	45	MF-P1	10			Lbyy	Lateral
34	46	Tieback	10.403			Lbyy	Lateral
35	49	MF-P1	10			Lbyy	Lateral
36	52	MF-P1	10			Lbyy	Lateral
37	53	Tieback	10.403			Lbyy	Lateral

Member Point Loads (BLC 1 : Dead)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	43	Y	-0.018	%5
2	43	Y	-0.018	%45
3	43	Y	0	0

Member Point Loads (BLC 1 : Dead) (Continued)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
4	43	Y	0	0
5	43	Y	0	0
6	49	Y	-0.017	%5
7	49	Y	-0.017	%45
8	49	Y	-0.053	%20
9	49	Y	0	0
10	49	Y	0	0
11	44	Y	-0.031	%5
12	44	Y	-0.031	%45
13	44	Y	-0.06	%20
14	44	Y	-0.053	%40
15	44	Y	0	0
16	52	Y	-0.038	%5
17	52	Y	-0.038	%45
18	52	Y	-0.071	%20
19	52	Y	-0.044	%40
20	52	Y	0	0
21	11	Y	-0.019	%50
22	11	Y	0	0
23	11	Y	0	0
24	11	Y	0	0
25	11	Y	0	0

Member Point Loads (BLC 2 : 0 Wind - No Ice)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	43	Z	-0.11	%5
2	43	Z	-0.11	%45
3	43	Z	0	0
4	43	Z	0	0
5	43	Z	0	0
6	49	Z	-0.068	%5
7	49	Z	-0.068	%45
8	49	Z	-0.11	%20
9	49	Z	0	0
10	49	Z	0	0
11	44	Z	-0.179	%5
12	44	Z	-0.179	%45
13	44	Z	-0.074	%20
14	44	Z	-0.11	%40
15	44	Z	0	0
16	52	Z	-0.166	%5
17	52	Z	-0.166	%45
18	52	Z	-0.079	%20
19	52	Z	-0.066	%40
20	52	Z	0	0
21	11	Z	-0.037	%50
22	11	Z	0	0
23	11	Z	0	0
24	11	Z	0	0
25	11	Z	0	0

Member Point Loads (BLC 3 : 90 Wind - No Ice)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	43	X	-0.05	%5
2	43	X	-0.05	%45
3	43	X	0	0
4	43	X	0	0
5	43	X	0	0
6	49	X	-0.041	%5
7	49	X	-0.041	%45
8	49	X	-0.063	%20
9	49	X	0	0
10	49	X	0	0
11	44	X	-0.066	%5
12	44	X	-0.066	%45
13	44	X	-0.042	%20
14	44	X	-0.063	%40
15	44	X	0	0
16	52	X	-0.062	%5
17	52	X	-0.062	%45
18	52	X	-0.056	%20
19	52	X	-0.027	%40
20	52	X	0	0
21	11	X	-0.037	%50
22	11	X	0	0
23	11	X	0	0
24	11	X	0	0
25	11	X	0	0

Member Point Loads (BLC 4 : 0 Wind - Ice)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	43	Z	-0.018	%5
2	43	Z	-0.018	%45
3	43	Z	0	0
4	43	Z	0	0
5	43	Z	0	0
6	49	Z	-0.014	%5
7	49	Z	-0.014	%45
8	49	Z	-0.018	%20
9	49	Z	0	0
10	49	Z	0	0
11	44	Z	-0.033	%5
12	44	Z	-0.033	%45
13	44	Z	-0.012	%20
14	44	Z	-0.018	%40
15	44	Z	0	0
16	52	Z	-0.031	%5
17	52	Z	-0.031	%45
18	52	Z	-0.013	%20
19	52	Z	-0.011	%40
20	52	Z	0	0
21	11	Z	-0.006	%50
22	11	Z	0	0
23	11	Z	0	0
24	11	Z	0	0
25	11	Z	0	0

Member Point Loads (BLC 5 : 90 Wind - Ice)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	43	X	-0.008	%5
2	43	X	-0.008	%45
3	43	X	0	0
4	43	X	0	0
5	43	X	0	0
6	49	X	-0.009	%5
7	49	X	-0.009	%45
8	49	X	-0.01	%20
9	49	X	0	0
10	49	X	0	0
11	44	X	-0.014	%5
12	44	X	-0.014	%45
13	44	X	-0.007	%20
14	44	X	-0.01	%40
15	44	X	0	0
16	52	X	-0.013	%5
17	52	X	-0.013	%45
18	52	X	-0.009	%20
19	52	X	-0.004	%40
20	52	X	0	0
21	11	X	-0.006	%50
22	11	X	0	0
23	11	X	0	0
24	11	X	0	0
25	11	X	0	0

Member Point Loads (BLC 6 : 0 Wind - Service)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	43	Z	-0.006	%5
2	43	Z	-0.006	%45
3	43	Z	0	0
4	43	Z	0	0
5	43	Z	0	0
6	49	Z	-0.004	%5
7	49	Z	-0.004	%45
8	49	Z	-0.006	%20
9	49	Z	0	0
10	49	Z	0	0
11	44	Z	-0.011	%5
12	44	Z	-0.011	%45
13	44	Z	-0.004	%20
14	44	Z	-0.006	%40
15	44	Z	0	0
16	52	Z	-0.01	%5
17	52	Z	-0.01	%45
18	52	Z	-0.005	%20
19	52	Z	-0.004	%40
20	52	Z	0	0
21	11	Z	-0.002	%50
22	11	Z	0	0
23	11	Z	0	0
24	11	Z	0	0
25	11	Z	0	0

Member Point Loads (BLC 7 : 90 Wind - Service)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	43	X	-0.003	%5
2	43	X	-0.003	%45
3	43	X	0	0
4	43	X	0	0
5	43	X	0	0
6	49	X	-0.002	%5
7	49	X	-0.002	%45
8	49	X	-0.004	%20
9	49	X	0	0
10	49	X	0	0
11	44	X	-0.004	%5
12	44	X	-0.004	%45
13	44	X	-0.003	%20
14	44	X	-0.004	%40
15	44	X	0	0
16	52	X	-0.004	%5
17	52	X	-0.004	%45
18	52	X	-0.003	%20
19	52	X	-0.002	%40
20	52	X	0	0
21	11	X	-0.002	%50
22	11	X	0	0
23	11	X	0	0
24	11	X	0	0
25	11	X	0	0

Member Point Loads (BLC 8 : Ice)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	43	Y	-0.044	%5
2	43	Y	-0.044	%45
3	43	Y	0	0
4	43	Y	0	0
5	43	Y	0	0
6	49	Y	-0.059	%5
7	49	Y	-0.059	%45
8	49	Y	-0.05	%20
9	49	Y	0	0
10	49	Y	0	0
11	44	Y	-0.086	%5
12	44	Y	-0.086	%45
13	44	Y	-0.033	%20
14	44	Y	-0.05	%40
15	44	Y	0	0
16	52	Y	-0.093	%5
17	52	Y	-0.093	%45
18	52	Y	-0.038	%20
19	52	Y	-0.028	%40
20	52	Y	0	0
21	11	Y	-0.036	%50
22	11	Y	0	0
23	11	Y	0	0
24	11	Y	0	0
25	11	Y	0	0

Member Point Loads (BLC 9 : 0 Seismic)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	43	Z	-0.01	%5
2	43	Z	-0.01	%45
3	43	Z	0	0
4	43	Z	0	0
5	43	Z	0	0
6	49	Z	-0.009	%5
7	49	Z	-0.009	%45
8	49	Z	-0.015	%20
9	49	Z	0	0
10	49	Z	0	0
11	44	Z	-0.017	%5
12	44	Z	-0.017	%45
13	44	Z	-0.017	%20
14	44	Z	-0.015	%40
15	44	Z	0	0
16	52	Z	-0.021	%5
17	52	Z	-0.021	%45
18	52	Z	-0.02	%20
19	52	Z	-0.012	%40
20	52	Z	0	0
21	11	Z	-0.005	%50
22	11	Z	0	0
23	11	Z	0	0
24	11	Z	0	0
25	11	Z	0	0

Member Point Loads (BLC 10 : 90 Seismic)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	43	X	-0.01	%5
2	43	X	-0.01	%45
3	43	X	0	0
4	43	X	0	0
5	43	X	0	0
6	49	X	-0.009	%5
7	49	X	-0.009	%45
8	49	X	-0.015	%20
9	49	X	0	0
10	49	X	0	0
11	44	X	-0.017	%5
12	44	X	-0.017	%45
13	44	X	-0.017	%20
14	44	X	-0.015	%40
15	44	X	0	0
16	52	X	-0.021	%5
17	52	X	-0.021	%45
18	52	X	-0.02	%20
19	52	X	-0.012	%40
20	52	X	0	0
21	11	X	-0.005	%50
22	11	X	0	0
23	11	X	0	0
24	11	X	0	0
25	11	X	0	0

Member Point Loads (BLC 15 : Maint LL 1)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	11	Y	-0.25	%50

Member Point Loads (BLC 16 : Maint LL 2)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	21	Y	-0.25	%50

Member Point Loads (BLC 17 : Maint LL 3)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	24	Y	-0.25	%50

Member Point Loads (BLC 18 : Maint LL 4)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	18	Y	-0.25	%50

Member Point Loads (BLC 19 : Maint LL 5)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	1	Y	-0.25	%95

Member Point Loads (BLC 20 : Maint LL 6)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	2	Y	-0.25	%95

Member Distributed Loads (BLC 2 : 0 Wind - No Ice)

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
1	1	Z	-0.012	-0.012	0	%100
2	2	Z	-0.012	-0.012	0	%100
3	3	Z	-0.003	-0.003	0	%100
4	4	Z	-0.003	-0.003	0	%100
5	5	Z	-0.003	-0.003	0	%100
6	6	Z	-0.003	-0.003	0	%100
7	9	Z	-0.003	-0.003	0	%100
8	10	Z	-0.003	-0.003	0	%100
9	11	Z	-0.007	-0.007	0	%100
10	12	Z	-0.005	-0.005	0	%100
11	13	Z	-0.005	-0.005	0	%100
12	14	Z	-0.005	-0.005	0	%100
13	15	Z	-0.005	-0.005	0	%100
14	16	Z	-0.003	-0.003	0	%100
15	17	Z	-0.003	-0.003	0	%100
16	18	Z	-0.007	-0.007	0	%100
17	19	Z	-0.003	-0.003	0	%100
18	20	Z	-0.003	-0.003	0	%100
19	21	Z	-0.007	-0.007	0	%100
20	22	Z	-0.003	-0.003	0	%100
21	23	Z	-0.003	-0.003	0	%100
22	24	Z	-0.007	-0.007	0	%100

Member Distributed Loads (BLC 2 : 0 Wind - No Ice) (Continued)

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
23	29	Z	-0.003	-0.003	0	%100
24	30	Z	-0.003	-0.003	0	%100
25	31	Z	-0.003	-0.003	0	%100
26	32	Z	-0.003	-0.003	0	%100
27	33	Z	-0.003	-0.003	0	%100
28	34	Z	-0.003	-0.003	0	%100
29	35	Z	-0.003	-0.003	0	%100
30	36	Z	-0.003	-0.003	0	%100
31	43	Z	-0.012	-0.012	0	%100
32	44	Z	-0.012	-0.012	0	%100
33	45	Z	-0.012	-0.012	0	%100
34	46	Z	-0.01	-0.01	0	%100
35	49	Z	-0.012	-0.012	0	%100
36	52	Z	-0.012	-0.012	0	%100
37	53	Z	-0.01	-0.01	0	%100

Member Distributed Loads (BLC 3 : 90 Wind - No Ice)

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
1	1	X	-0.012	-0.012	0	%100
2	2	X	-0.012	-0.012	0	%100
3	3	X	-0.003	-0.003	0	%100
4	4	X	-0.003	-0.003	0	%100
5	5	X	-0.003	-0.003	0	%100
6	6	X	-0.003	-0.003	0	%100
7	9	X	-0.003	-0.003	0	%100
8	10	X	-0.003	-0.003	0	%100
9	11	X	-0.007	-0.007	0	%100
10	12	X	-0.005	-0.005	0	%100
11	13	X	-0.005	-0.005	0	%100
12	14	X	-0.005	-0.005	0	%100
13	15	X	-0.005	-0.005	0	%100
14	16	X	-0.003	-0.003	0	%100
15	17	X	-0.003	-0.003	0	%100
16	18	X	-0.007	-0.007	0	%100
17	19	X	-0.003	-0.003	0	%100
18	20	X	-0.003	-0.003	0	%100
19	21	X	-0.007	-0.007	0	%100
20	22	X	-0.003	-0.003	0	%100
21	23	X	-0.003	-0.003	0	%100
22	24	X	-0.007	-0.007	0	%100
23	29	X	-0.003	-0.003	0	%100
24	30	X	-0.003	-0.003	0	%100
25	31	X	-0.003	-0.003	0	%100
26	32	X	-0.003	-0.003	0	%100
27	33	X	-0.003	-0.003	0	%100
28	34	X	-0.003	-0.003	0	%100
29	35	X	-0.003	-0.003	0	%100
30	36	X	-0.003	-0.003	0	%100
31	43	X	-0.012	-0.012	0	%100
32	44	X	-0.012	-0.012	0	%100
33	45	X	-0.012	-0.012	0	%100
34	46	X	-0.01	-0.01	0	%100
35	49	X	-0.012	-0.012	0	%100
36	52	X	-0.012	-0.012	0	%100
37	53	X	-0.01	-0.01	0	%100

Member Distributed Loads (BLC 4 : 0 Wind - Ice)

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
1	1	Z	-0.002	-0.002	0	%100
2	2	Z	-0.002	-0.002	0	%100
3	3	Z	-0.003	-0.003	0	%100
4	4	Z	-0.003	-0.003	0	%100
5	5	Z	-0.003	-0.003	0	%100
6	6	Z	-0.003	-0.003	0	%100
7	9	Z	-0.007	-0.007	0	%100
8	10	Z	-0.007	-0.007	0	%100
9	11	Z	-0.002	-0.002	0	%100
10	12	Z	-0.004	-0.004	0	%100
11	13	Z	-0.004	-0.004	0	%100
12	14	Z	-0.004	-0.004	0	%100
13	15	Z	-0.004	-0.004	0	%100
14	16	Z	-0.007	-0.007	0	%100
15	17	Z	-0.007	-0.007	0	%100
16	18	Z	-0.002	-0.002	0	%100
17	19	Z	-0.007	-0.007	0	%100
18	20	Z	-0.007	-0.007	0	%100
19	21	Z	-0.002	-0.002	0	%100
20	22	Z	-0.007	-0.007	0	%100
21	23	Z	-0.007	-0.007	0	%100
22	24	Z	-0.002	-0.002	0	%100
23	29	Z	-0.002	-0.002	0	%100
24	30	Z	-0.002	-0.002	0	%100
25	31	Z	-0.002	-0.002	0	%100
26	32	Z	-0.002	-0.002	0	%100
27	33	Z	-0.002	-0.002	0	%100
28	34	Z	-0.002	-0.002	0	%100
29	35	Z	-0.002	-0.002	0	%100
30	36	Z	-0.002	-0.002	0	%100
31	43	Z	-0.002	-0.002	0	%100
32	44	Z	-0.002	-0.002	0	%100
33	45	Z	-0.002	-0.002	0	%100
34	46	Z	-0.002	-0.002	0	%100
35	49	Z	-0.002	-0.002	0	%100
36	52	Z	-0.002	-0.002	0	%100
37	53	Z	-0.002	-0.002	0	%100

Member Distributed Loads (BLC 5 : 90 Wind - Ice)

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
1	1	X	-0.002	-0.002	0	%100
2	2	X	-0.002	-0.002	0	%100
3	3	X	-0.003	-0.003	0	%100
4	4	X	-0.003	-0.003	0	%100
5	5	X	-0.003	-0.003	0	%100
6	6	X	-0.003	-0.003	0	%100
7	9	X	-0.007	-0.007	0	%100
8	10	X	-0.007	-0.007	0	%100
9	11	X	-0.002	-0.002	0	%100
10	12	X	-0.004	-0.004	0	%100
11	13	X	-0.004	-0.004	0	%100
12	14	X	-0.004	-0.004	0	%100
13	15	X	-0.004	-0.004	0	%100
14	16	X	-0.007	-0.007	0	%100

Member Distributed Loads (BLC 5 : 90 Wind - Ice) (Continued)

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
15	17	X	-0.007	-0.007	0	%100
16	18	X	-0.002	-0.002	0	%100
17	19	X	-0.007	-0.007	0	%100
18	20	X	-0.007	-0.007	0	%100
19	21	X	-0.002	-0.002	0	%100
20	22	X	-0.007	-0.007	0	%100
21	23	X	-0.007	-0.007	0	%100
22	24	X	-0.002	-0.002	0	%100
23	29	X	-0.002	-0.002	0	%100
24	30	X	-0.002	-0.002	0	%100
25	31	X	-0.002	-0.002	0	%100
26	32	X	-0.002	-0.002	0	%100
27	33	X	-0.002	-0.002	0	%100
28	34	X	-0.002	-0.002	0	%100
29	35	X	-0.002	-0.002	0	%100
30	36	X	-0.002	-0.002	0	%100
31	43	X	-0.002	-0.002	0	%100
32	44	X	-0.002	-0.002	0	%100
33	45	X	-0.002	-0.002	0	%100
34	46	X	-0.002	-0.002	0	%100
35	49	X	-0.002	-0.002	0	%100
36	52	X	-0.002	-0.002	0	%100
37	53	X	-0.002	-0.002	0	%100

Member Distributed Loads (BLC 6 : 0 Wind - Service)

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
1	1	Z	-0.0003	-0.0003	0	%100
2	2	Z	-0.0003	-0.0003	0	%100
3	3	Z	-0.0002	-0.0002	0	%100
4	4	Z	-0.0002	-0.0002	0	%100
5	5	Z	-0.0002	-0.0002	0	%100
6	6	Z	-0.0002	-0.0002	0	%100
7	9	Z	-1e-04	-1e-04	0	%100
8	10	Z	-1e-04	-1e-04	0	%100
9	11	Z	-0.0003	-0.0003	0	%100
10	12	Z	-0.0003	-0.0003	0	%100
11	13	Z	-0.0003	-0.0003	0	%100
12	14	Z	-0.0003	-0.0003	0	%100
13	15	Z	-0.0003	-0.0003	0	%100
14	16	Z	-1e-04	-1e-04	0	%100
15	17	Z	-1e-04	-1e-04	0	%100
16	18	Z	-0.0003	-0.0003	0	%100
17	19	Z	-1e-04	-1e-04	0	%100
18	20	Z	-1e-04	-1e-04	0	%100
19	21	Z	-0.0003	-0.0003	0	%100
20	22	Z	-1e-04	-1e-04	0	%100
21	23	Z	-1e-04	-1e-04	0	%100
22	24	Z	-0.0003	-0.0003	0	%100
23	29	Z	-1e-04	-1e-04	0	%100
24	30	Z	-1e-04	-1e-04	0	%100
25	31	Z	-1e-04	-1e-04	0	%100
26	32	Z	-1e-04	-1e-04	0	%100
27	33	Z	-1e-04	-1e-04	0	%100
28	34	Z	-1e-04	-1e-04	0	%100
29	35	Z	-1e-04	-1e-04	0	%100

Member Distributed Loads (BLC 6 : 0 Wind - Service) (Continued)

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
30	36	Z	-1e-04	-1e-04	0	%100
31	43	Z	-0.0003	-0.0003	0	%100
32	44	Z	-0.0003	-0.0003	0	%100
33	45	Z	-0.0003	-0.0003	0	%100
34	46	Z	-0.0003	-0.0003	0	%100
35	49	Z	-0.0003	-0.0003	0	%100
36	52	Z	-0.0003	-0.0003	0	%100
37	53	Z	-0.0003	-0.0003	0	%100

Member Distributed Loads (BLC 7 : 90 Wind - Service)

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
1	1	X	-0.0003	-0.0003	0	%100
2	2	X	-0.0003	-0.0003	0	%100
3	3	X	-0.0002	-0.0002	0	%100
4	4	X	-0.0002	-0.0002	0	%100
5	5	X	-0.0002	-0.0002	0	%100
6	6	X	-0.0002	-0.0002	0	%100
7	9	X	-1e-04	-1e-04	0	%100
8	10	X	-1e-04	-1e-04	0	%100
9	11	X	-0.0003	-0.0003	0	%100
10	12	X	-0.0003	-0.0003	0	%100
11	13	X	-0.0003	-0.0003	0	%100
12	14	X	-0.0003	-0.0003	0	%100
13	15	X	-0.0003	-0.0003	0	%100
14	16	X	-1e-04	-1e-04	0	%100
15	17	X	-1e-04	-1e-04	0	%100
16	18	X	-0.0003	-0.0003	0	%100
17	19	X	-1e-04	-1e-04	0	%100
18	20	X	-1e-04	-1e-04	0	%100
19	21	X	-0.0003	-0.0003	0	%100
20	22	X	-1e-04	-1e-04	0	%100
21	23	X	-1e-04	-1e-04	0	%100
22	24	X	-0.0003	-0.0003	0	%100
23	29	X	-1e-04	-1e-04	0	%100
24	30	X	-1e-04	-1e-04	0	%100
25	31	X	-1e-04	-1e-04	0	%100
26	32	X	-1e-04	-1e-04	0	%100
27	33	X	-1e-04	-1e-04	0	%100
28	34	X	-1e-04	-1e-04	0	%100
29	35	X	-1e-04	-1e-04	0	%100
30	36	X	-1e-04	-1e-04	0	%100
31	43	X	-0.0003	-0.0003	0	%100
32	44	X	-0.0003	-0.0003	0	%100
33	45	X	-0.0003	-0.0003	0	%100
34	46	X	-0.0003	-0.0003	0	%100
35	49	X	-0.0003	-0.0003	0	%100
36	52	X	-0.0003	-0.0003	0	%100
37	53	X	-0.0003	-0.0003	0	%100

Member Distributed Loads (BLC 8 : Ice)

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
1	1	Y	-0.006	-0.006	0	%100
2	2	Y	-0.006	-0.006	0	%100

Member Distributed Loads (BLC 8 : Ice) (Continued)

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
3	3	Y	-0.012	-0.012	0	%100
4	4	Y	-0.012	-0.012	0	%100
5	5	Y	-0.012	-0.012	0	%100
6	6	Y	-0.012	-0.012	0	%100
7	9	Y	-0.012	-0.012	0	%100
8	10	Y	-0.012	-0.012	0	%100
9	11	Y	-0.005	-0.005	0	%100
10	12	Y	-0.007	-0.007	0	%100
11	13	Y	-0.007	-0.007	0	%100
12	14	Y	-0.007	-0.007	0	%100
13	15	Y	-0.007	-0.007	0	%100
14	16	Y	-0.012	-0.012	0	%100
15	17	Y	-0.012	-0.012	0	%100
16	18	Y	-0.005	-0.005	0	%100
17	19	Y	-0.012	-0.012	0	%100
18	20	Y	-0.012	-0.012	0	%100
19	21	Y	-0.005	-0.005	0	%100
20	22	Y	-0.012	-0.012	0	%100
21	23	Y	-0.012	-0.012	0	%100
22	24	Y	-0.005	-0.005	0	%100
23	29	Y	-0.003	-0.003	0	%100
24	30	Y	-0.003	-0.003	0	%100
25	31	Y	-0.003	-0.003	0	%100
26	32	Y	-0.003	-0.003	0	%100
27	33	Y	-0.003	-0.003	0	%100
28	34	Y	-0.003	-0.003	0	%100
29	35	Y	-0.003	-0.003	0	%100
30	36	Y	-0.003	-0.003	0	%100
31	43	Y	-0.006	-0.006	0	%100
32	44	Y	-0.006	-0.006	0	%100
33	45	Y	-0.006	-0.006	0	%100
34	46	Y	-0.005	-0.005	0	%100
35	49	Y	-0.006	-0.006	0	%100
36	52	Y	-0.006	-0.006	0	%100
37	53	Y	-0.005	-0.005	0	%100

Member Distributed Loads (BLC 9 : 0 Seismic)

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
1	1	Z	-0.002	-0.002	0	%100
2	2	Z	-0.002	-0.002	0	%100
3	3	Z	-0.002	-0.002	0	%100
4	4	Z	-0.002	-0.002	0	%100
5	5	Z	-0.002	-0.002	0	%100
6	6	Z	-0.002	-0.002	0	%100
7	9	Z	-0.002	-0.002	0	%100
8	10	Z	-0.002	-0.002	0	%100
9	11	Z	-0.001	-0.001	0	%100
10	12	Z	-0.004	-0.004	0	%100
11	13	Z	-0.004	-0.004	0	%100
12	14	Z	-0.004	-0.004	0	%100
13	15	Z	-0.004	-0.004	0	%100
14	16	Z	-0.002	-0.002	0	%100
15	17	Z	-0.002	-0.002	0	%100
16	18	Z	-0.001	-0.001	0	%100
17	19	Z	-0.002	-0.002	0	%100

Member Distributed Loads (BLC 9 : 0 Seismic) (Continued)

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
18	20	Z	-0.002	-0.002	0	%100
19	21	Z	-0.001	-0.001	0	%100
20	22	Z	-0.002	-0.002	0	%100
21	23	Z	-0.002	-0.002	0	%100
22	24	Z	-0.001	-0.001	0	%100
23	29	Z	-0.0005	-0.0005	0	%100
24	30	Z	-0.0005	-0.0005	0	%100
25	31	Z	-0.0005	-0.0005	0	%100
26	32	Z	-0.0005	-0.0005	0	%100
27	33	Z	-0.0007	-0.0007	0	%100
28	34	Z	-0.0007	-0.0007	0	%100
29	35	Z	-0.0007	-0.0007	0	%100
30	36	Z	-0.0007	-0.0007	0	%100
31	43	Z	-0.002	-0.002	0	%100
32	44	Z	-0.002	-0.002	0	%100
33	45	Z	-0.002	-0.002	0	%100
34	46	Z	-0.001	-0.001	0	%100
35	49	Z	-0.002	-0.002	0	%100
36	52	Z	-0.002	-0.002	0	%100
37	53	Z	-0.001	-0.001	0	%100

Member Distributed Loads (BLC 10 : 90 Seismic)

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
1	1	X	-0.002	-0.002	0	%100
2	2	X	-0.002	-0.002	0	%100
3	3	X	-0.002	-0.002	0	%100
4	4	X	-0.002	-0.002	0	%100
5	5	X	-0.002	-0.002	0	%100
6	6	X	-0.002	-0.002	0	%100
7	9	X	-0.002	-0.002	0	%100
8	10	X	-0.002	-0.002	0	%100
9	11	X	-0.001	-0.001	0	%100
10	12	X	-0.004	-0.004	0	%100
11	13	X	-0.004	-0.004	0	%100
12	14	X	-0.004	-0.004	0	%100
13	15	X	-0.004	-0.004	0	%100
14	16	X	-0.002	-0.002	0	%100
15	17	X	-0.002	-0.002	0	%100
16	18	X	-0.001	-0.001	0	%100
17	19	X	-0.002	-0.002	0	%100
18	20	X	-0.002	-0.002	0	%100
19	21	X	-0.001	-0.001	0	%100
20	22	X	-0.002	-0.002	0	%100
21	23	X	-0.002	-0.002	0	%100
22	24	X	-0.001	-0.001	0	%100
23	29	X	-0.0005	-0.0005	0	%100
24	30	X	-0.0005	-0.0005	0	%100
25	31	X	-0.0005	-0.0005	0	%100
26	32	X	-0.0005	-0.0005	0	%100
27	33	X	-0.0007	-0.0007	0	%100
28	34	X	-0.0007	-0.0007	0	%100
29	35	X	-0.0007	-0.0007	0	%100
30	36	X	-0.0007	-0.0007	0	%100
31	43	X	-0.002	-0.002	0	%100
32	44	X	-0.002	-0.002	0	%100

Member Distributed Loads (BLC 10 : 90 Seismic) (Continued)

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
33	45	X	-0.002	-0.002	0	%100
34	46	X	-0.001	-0.001	0	%100
35	49	X	-0.002	-0.002	0	%100
36	52	X	-0.002	-0.002	0	%100
37	53	X	-0.001	-0.001	0	%100

Member Area Loads

No Data to Print...

Node Loads and Enforced Displacements (BLC 11 : Live Load a)

	Node Label	L, D, M	Direction	Magnitude [(k, k-ft), (in, rad), (k*s²/ft, k*s²*ft)]
1	48	L	Y	-0.5

Node Loads and Enforced Displacements (BLC 12 : Live Load b)

	Node Label	L, D, M	Direction	Magnitude [(k, k-ft), (in, rad), (k*s²/ft, k*s²*ft)]
1	73	L	Y	-0.5

Node Loads and Enforced Displacements (BLC 13 : Live Load c)

	Node Label	L, D, M	Direction	Magnitude [(k, k-ft), (in, rad), (k*s²/ft, k*s²*ft)]
1	50	L	Y	-0.5

Node Loads and Enforced Displacements (BLC 14 : Live Load d)

	Node Label	L, D, M	Direction	Magnitude [(k, k-ft), (in, rad), (k*s²/ft, k*s²*ft)]
1	67	L	Y	-0.5

Node Loads and Enforced Displacements (BLC 21 : Live Load e)

	Node Label	L, D, M	Direction	Magnitude [(k, k-ft), (in, rad), (k*s²/ft, k*s²*ft)]
1	52	L	Y	-0.5

Basic Load Cases

	BLC Description	Category	Y Gravity	Nodal	Point	Distributed
1	Dead	DL	-1		25	
2	0 Wind - No Ice	WLZ			25	37
3	90 Wind - No Ice	WLX			25	37
4	0 Wind - Ice	WLZ			25	37
5	90 Wind - Ice	WLX			25	37
6	0 Wind - Service	WLZ			25	37
7	90 Wind - Service	WLX			25	37
8	Ice	OL1			25	37
9	0 Seismic	ELZ			25	37
10	90 Seismic	ELX			25	37
11	Live Load a	LL		1		
12	Live Load b	LL		1		
13	Live Load c	LL		1		
14	Live Load d	LL		1		
15	Maint LL 1	LL			1	
16	Maint LL 2	LL			1	

Basic Load Cases (Continued)

	BLC Description	Category	Y Gravity	Nodal	Point	Distributed
17	Maint LL 3	LL			1	
18	Maint LL 4	LL			1	
19	Maint LL 5	LL			1	
20	Maint LL 6	LL			1	
21	Live Load e	None		1		

Load Combinations

	Description	Solve	P-Delta	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
1	1.4 Dead	Yes	Y	1	1.4						
2	1.2 D + 1.0 - 0 W	Yes	Y	1	1.2	2	1				
3	1.2 D + 1.0 - 30 W	Yes	Y	1	1.2	2	0.866	3	0.5		
4	1.2 D + 1.0 - 60 W	Yes	Y	1	1.2	3	0.866	2	0.5		
5	1.2 D + 1.0 - 90 W	Yes	Y	1	1.2	3	1				
6	1.2 D + 1.0 - 120 W	Yes	Y	1	1.2	3	0.866	2	-0.5		
7	1.2 D + 1.0 - 150 W	Yes	Y	1	1.2	2	-0.866	3	0.5		
8	1.2 D + 1.0 - 180 W	Yes	Y	1	1.2	2	-1				
9	1.2 D + 1.0 - 210 W	Yes	Y	1	1.2	2	-0.866	3	-0.5		
10	1.2 D + 1.0 - 240 W	Yes	Y	1	1.2	3	-0.866	2	-0.5		
11	1.2 D + 1.0 - 270 W	Yes	Y	1	1.2	3	-1				
12	1.2 D + 1.0 - 300 W	Yes	Y	1	1.2	3	-0.866	2	0.5		
13	1.2 D + 1.0 - 330 W	Yes	Y	1	1.2	2	0.866	3	-0.5		
14	1.2 D + 1.0 - 0 W/Ice	Yes	Y	1	1.2	4	1			8	1
15	1.2 D + 1.0 - 30 W/Ice	Yes	Y	1	1.2	4	0.866	5	0.5	8	1
16	1.2 D + 1.0 - 60 W/Ice	Yes	Y	1	1.2	5	0.866	4	0.5	8	1
17	1.2 D + 1.0 - 90 W/Ice	Yes	Y	1	1.2	5	1			8	1
18	1.2 D + 1.0 - 120 W/Ice	Yes	Y	1	1.2	5	0.866	4	-0.5	8	1
19	1.2 D + 1.0 - 150 W/Ice	Yes	Y	1	1.2	4	-0.866	5	0.5	8	1
20	1.2 D + 1.0 - 180 W/Ice	Yes	Y	1	1.2	4	-1			8	1
21	1.2 D + 1.0 - 210 W/Ice	Yes	Y	1	1.2	4	-0.866	5	-0.5	8	1
22	1.2 D + 1.0 - 240 W/Ice	Yes	Y	1	1.2	5	-0.866	4	-0.5	8	1
23	1.2 D + 1.0 - 270 W/Ice	Yes	Y	1	1.2	5	-1			8	1
24	1.2 D + 1.0 - 300 W/Ice	Yes	Y	1	1.2	5	-0.866	4	0.5	8	1
25	1.2 D + 1.0 - 330 W/Ice	Yes	Y	1	1.2	4	0.866	5	-0.5	8	1
26	1.2 D + 1.0 E - 0	Yes	Y	1	1.2	9	1				
27	1.2 D + 1.0 E - 30	Yes	Y	1	1.2	9	0.866	10	0.5		
28	1.2 D + 1.0 E - 60	Yes	Y	1	1.2	10	0.866	9	0.5		
29	1.2 D + 1.0 E - 90	Yes	Y	1	1.2	10	1				
30	1.2 D + 1.0 E - 120	Yes	Y	1	1.2	10	0.866	9	-0.5		
31	1.2 D + 1.0 E - 150	Yes	Y	1	1.2	9	-0.866	10	0.5		
32	1.2 D + 1.0 E - 180	Yes	Y	1	1.2	9	-1				
33	1.2 D + 1.0 E - 210	Yes	Y	1	1.2	9	-0.866	10	-0.5		
34	1.2 D + 1.0 E - 240	Yes	Y	1	1.2	10	-0.866	9	-0.5		
35	1.2 D + 1.0 E - 270	Yes	Y	1	1.2	10	-1				
36	1.2 D + 1.0 E - 300	Yes	Y	1	1.2	10	-0.866	9	0.5		
37	1.2 D + 1.0 E - 330	Yes	Y	1	1.2	9	0.866	10	-0.5		
38	1.2 D + 1.5 LL a + Service - 0 W	Yes	Y	1	1.2	6	1			11	1.5
39	1.2 D + 1.5 LL a + Service - 30 W	Yes	Y	1	1.2	6	0.866	7	0.5	11	1.5
40	1.2 D + 1.5 LL a + Service - 60 W	Yes	Y	1	1.2	7	0.866	6	0.5	11	1.5
41	1.2 D + 1.5 LL a + Service - 90 W	Yes	Y	1	1.2	7	1			11	1.5
42	1.2 D + 1.5 LL a + Service - 120 W	Yes	Y	1	1.2	7	0.866	6	-0.5	11	1.5
43	1.2 D + 1.5 LL a + Service - 150 W	Yes	Y	1	1.2	6	-0.866	7	0.5	11	1.5
44	1.2 D + 1.5 LL a + Service - 180 W	Yes	Y	1	1.2	6	-1			11	1.5
45	1.2 D + 1.5 LL a + Service - 210 W	Yes	Y	1	1.2	6	-0.866	7	-0.5	11	1.5
46	1.2 D + 1.5 LL a + Service - 240 W	Yes	Y	1	1.2	7	-0.866	6	-0.5	11	1.5
47	1.2 D + 1.5 LL a + Service - 270 W	Yes	Y	1	1.2	7	-1			11	1.5

Load Combinations (Continued)

	Description	Solve	P-Delta	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
48	1.2 D + 1.5 LL a + Service - 300 W	Yes	Y	1	1.2	7	-0.866	6	0.5	11	1.5
49	1.2 D + 1.5 LL a + Service - 330 W	Yes	Y	1	1.2	6	0.866	7	-0.5	11	1.5
50	1.2 D + 1.5 LL b + Service - 0 W	Yes	Y	1	1.2	6	1			12	1.5
51	1.2 D + 1.5 LL b + Service - 30 W	Yes	Y	1	1.2	6	0.866	7	0.5	12	1.5
52	1.2 D + 1.5 LL b + Service - 60 W	Yes	Y	1	1.2	7	0.866	6	0.5	12	1.5
53	1.2 D + 1.5 LL b + Service - 90 W	Yes	Y	1	1.2	7	1			12	1.5
54	1.2 D + 1.5 LL b + Service - 120 W	Yes	Y	1	1.2	7	0.866	6	-0.5	12	1.5
55	1.2 D + 1.5 LL b + Service - 150 W	Yes	Y	1	1.2	6	-0.866	7	0.5	12	1.5
56	1.2 D + 1.5 LL b + Service - 180 W	Yes	Y	1	1.2	6	-1			12	1.5
57	1.2 D + 1.5 LL b + Service - 210 W	Yes	Y	1	1.2	6	-0.866	7	-0.5	12	1.5
58	1.2 D + 1.5 LL b + Service - 240 W	Yes	Y	1	1.2	7	-0.866	6	-0.5	12	1.5
59	1.2 D + 1.5 LL b + Service - 270 W	Yes	Y	1	1.2	7	-1			12	1.5
60	1.2 D + 1.5 LL b + Service - 300 W	Yes	Y	1	1.2	7	-0.866	6	0.5	12	1.5
61	1.2 D + 1.5 LL b + Service - 330 W	Yes	Y	1	1.2	6	0.866	7	-0.5	12	1.5
62	1.2 D + 1.5 LL c + Service - 0 W	Yes	Y	1	1.2	6	1			13	1.5
63	1.2 D + 1.5 LL c + Service - 30 W	Yes	Y	1	1.2	6	0.866	7	0.5	13	1.5
64	1.2 D + 1.5 LL c + Service - 60 W	Yes	Y	1	1.2	7	0.866	6	0.5	13	1.5
65	1.2 D + 1.5 LL c + Service - 90 W	Yes	Y	1	1.2	7	1			13	1.5
66	1.2 D + 1.5 LL c + Service - 120 W	Yes	Y	1	1.2	7	0.866	6	-0.5	13	1.5
67	1.2 D + 1.5 LL c + Service - 150 W	Yes	Y	1	1.2	6	-0.866	7	0.5	13	1.5
68	1.2 D + 1.5 LL c + Service - 180 W	Yes	Y	1	1.2	6	-1			13	1.5
69	1.2 D + 1.5 LL c + Service - 210 W	Yes	Y	1	1.2	6	-0.866	7	-0.5	13	1.5
70	1.2 D + 1.5 LL c + Service - 240 W	Yes	Y	1	1.2	7	-0.866	6	-0.5	13	1.5
71	1.2 D + 1.5 LL c + Service - 270 W	Yes	Y	1	1.2	7	-1			13	1.5
72	1.2 D + 1.5 LL c + Service - 300 W	Yes	Y	1	1.2	7	-0.866	6	0.5	13	1.5
73	1.2 D + 1.5 LL c + Service - 330 W	Yes	Y	1	1.2	6	0.866	7	-0.5	13	1.5
74	1.2 D + 1.5 LL d + Service - 0 W	Yes	Y	1	1.2	6	1			14	1.5
75	1.2 D + 1.5 LL d + Service - 30 W	Yes	Y	1	1.2	6	0.866	7	0.5	14	1.5
76	1.2 D + 1.5 LL d + Service - 60 W	Yes	Y	1	1.2	7	0.866	6	0.5	14	1.5
77	1.2 D + 1.5 LL d + Service - 90 W	Yes	Y	1	1.2	7	1			14	1.5
78	1.2 D + 1.5 LL d + Service - 120 W	Yes	Y	1	1.2	7	0.866	6	-0.5	14	1.5
79	1.2 D + 1.5 LL d + Service - 150 W	Yes	Y	1	1.2	6	-0.866	7	0.5	14	1.5
80	1.2 D + 1.5 LL d + Service - 180 W	Yes	Y	1	1.2	6	-1			14	1.5
81	1.2 D + 1.5 LL d + Service - 210 W	Yes	Y	1	1.2	6	-0.866	7	-0.5	14	1.5
82	1.2 D + 1.5 LL d + Service - 240 W	Yes	Y	1	1.2	7	-0.866	6	-0.5	14	1.5
83	1.2 D + 1.5 LL d + Service - 270 W	Yes	Y	1	1.2	7	-1			14	1.5
84	1.2 D + 1.5 LL d + Service - 300 W	Yes	Y	1	1.2	7	-0.866	6	0.5	14	1.5
85	1.2 D + 1.5 LL d + Service - 330 W	Yes	Y	1	1.2	6	0.866	7	-0.5	14	1.5
86	1.2 D + 1.5 LL Maint (1)	Yes	Y	1	1.2					15	1.5
87	1.2 D + 1.5 LL Maint (2)	Yes	Y	1	1.2					16	1.5
88	1.2 D + 1.5 LL Maint (3)	Yes	Y	1	1.2					17	1.5
89	1.2 D + 1.5 LL Maint (4)	Yes	Y	1	1.2					18	1.5
90	1.2 D + 1.5 LL Maint (5)	Yes	Y	1	1.2					19	1.5
91	1.2 D + 1.5 LL Maint (6)	Yes	Y	1	1.2					20	1.5
92	1.2 D + 1.5 LL e + Service - 0 W	Yes	Y	1	1.2					21	1.5
93	1.2 D + 1.5 LL e + Service - 30 W	Yes	Y	1	1.2					21	1.5
94	1.2 D + 1.5 LL e + Service - 60 W	Yes	Y	1	1.2					21	1.5
95	1.2 D + 1.5 LL e + Service - 90 W	Yes	Y	1	1.2					21	1.5
96	1.2 D + 1.5 LL e + Service - 120 W	Yes	Y	1	1.2					21	1.5
97	1.2 D + 1.5 LL e + Service - 150 W	Yes	Y	1	1.2					21	1.5
98	1.2 D + 1.5 LL e + Service - 180 W	Yes	Y	1	1.2					21	1.5
99	1.2 D + 1.5 LL e + Service - 210 W	Yes	Y	1	1.2					21	1.5
100	1.2 D + 1.5 LL e + Service - 240 W	Yes	Y	1	1.2					21	1.5
101	1.2 D + 1.5 LL e + Service - 270 W	Yes	Y	1	1.2					21	1.5
102	1.2 D + 1.5 LL e + Service - 300 W	Yes	Y	1	1.2					21	1.5

Load Combinations (Continued)

	Description	Solve	P-Delta	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
103	1.2 D + 1.5 LL e + Service - 330 W	Yes	Y	1	1.2					21	1.5

Envelope Node Reactions

	Node Label		X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	22	max	1.028	103	1.2	15	1.718	103	-0.55	3	0	103	0.177	103
2		min	-1.678	47	0.609	9	0.184	9	-1.066	20	0	1	-0.251	38
3	9	max	1.771	5	1.627	21	2.338	3	-0.46	3	0	103	0.186	103
4		min	-1.114	11	0.601	3	-3.656	9	-1.412	22	0	1	-0.519	39
5	82	max	0.155	5	0.048	17	0.99	11	0	103	0	103	0	103
6		min	-0.137	11	0.021	10	-1.183	5	0	1	0	1	0	1
7	83	max	0.075	5	0.048	16	0.716	46	0	103	0	103	0	103
8		min	-0.092	11	0.021	10	-0.531	92	0	1	0	1	0	1
9	Totals:	max	2.005	5	2.914	14	2.797	2						
10		min	-2.005	11	1.357	8	-2.797	8						

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

	Member	Shape	Code Check	Loc[ft]	LC	Shear Check	Loc[ft]	Dir	LC	phi*Pnc [k]	phi*Pnt [k]	phi*Mn y-y [k-ft]	phi*Mn z-z [k-ft]	Cb	Eqn
1	29	5/8" SR	0.649	0	39	0.006	3.333		8	1.88	9.94	0.104	0.104	2.268	H1-1a
2	1	PIPE_2.5	0.543	9.818	8	0.131	4.682		3	10.82	50.715	3.596	3.596	2.891	H1-1b
3	6	PL5/8x3.5	0.504	0.239	3	0.217	0.458	y	9	68.084	71.442	0.938	5.209	2.596	H1-1b
4	30	5/8" SR	0.489	0	40	0.014	0		40	1.88	9.94	0.104	0.104	1	H1-1a
5	3	PL5/8x3.5	0.432	0.239	8	0.251	0.458	y	8	68.084	71.442	0.938	5.209	2.569	H1-1b
6	9	PL5/8x3.5	0.389	0.08	8	0.154	0	y	8	71.336	71.442	0.938	5.209	1.02	H1-1b
7	2	PIPE_2.5	0.373	13.443	56	0.085	9.818		8	10.82	50.715	3.596	3.596	3	H1-1b
8	11	PIPE_2.0	0.367	0	8	0.155	2.5		18	29.81	32.13	1.872	1.872	2.17	H1-1b
9	21	PIPE_2.0	0.366	0	9	0.117	2.5		103	29.81	32.13	1.872	1.872	2.177	H1-1b
10	19	PL5/8x3.5	0.36	0	9	0.172	0.08	y	10	71.336	71.442	0.938	5.209	1.019	H1-1b
11	16	PL5/8x3.5	0.337	0.08	44	0.168	0.003	y	68	71.336	71.442	0.938	5.209	1.034	H1-1b
12	22	PL5/8x3.5	0.328	0.08	9	0.175	0	y	9	71.336	71.442	0.938	5.209	1.017	H1-1b
13	18	PIPE_2.0	0.316	0	8	0.145	0.156		68	29.81	32.13	1.872	1.872	2.047	H1-1b
14	5	PL5/8x3.5	0.307	0.458	9	0.118	0.458	y	9	68.084	71.442	0.938	5.209	2.465	H1-1b
15	24	PIPE_2.0	0.299	0.156	9	0.13	0.156		103	29.81	32.13	1.872	1.872	2.037	H1-1b
16	52	PIPE_2.5	0.281	6.667	43	0.083	3.333		8	22.373	50.715	3.596	3.596	3	H1-1b
17	4	PL5/8x3.5	0.261	0.458	8	0.192	0.458	y	44	68.084	71.442	0.938	5.209	2.392	H1-1b
18	49	PIPE_2.5	0.248	6.667	103	0.058	6.667		39	22.373	50.715	3.596	3.596	3	H1-1b
19	43	PIPE_2.5	0.246	3.333	103	0.057	3.333		2	22.373	50.715	3.596	3.596	3	H1-1b
20	44	PIPE_2.5	0.237	3.333	8	0.04	3.333		42	22.373	50.715	3.596	3.596	3	H1-1b
21	12	PL1.25"x3.5"	0.232	0.458	42	0.066	0.458	y	19	140.027	141.75	3.691	10.336	1.352	H1-1b
22	33	SR_3/4"	0.189	3.976	41	0.014	3.976		7	1.542	14.314	0.179	0.179	2.467	H1-1b*
23	13	PL1.25"x3.5"	0.165	0	103	0.064	0	y	10	140.027	141.75	3.691	10.336	1.489	H1-1b
24	15	PL1.25"x3.5"	0.16	0	103	0.045	0.458	y	103	140.027	141.75	3.691	10.336	1.523	H1-1b
25	14	PL1.25"x3.5"	0.155	0.458	44	0.054	0	y	68	140.027	141.75	3.691	10.336	1.376	H1-1b
26	10	PL5/8x3.5	0.151	0.08	40	0.131	0.08	y	67	71.336	71.442	0.938	5.209	1.018	H1-1b
27	45	PIPE_2.5	0.147	6.667	41	0.049	6.667		2	22.373	50.715	3.596	3.596	3	H1-1b
28	46	PIPE_2.0	0.129	5.202	11	0.006	10.403		11	9.089	32.13	1.872	1.872	1.136	H1-1b
29	31	5/8" SR	0.127	0	39	0.005	0		41	1.88	9.94	0.104	0.104	1	H1-1b*
30	20	PL5/8x3.5	0.105	0	8	0.142	0.08	y	10	71.336	71.442	0.938	5.209	1.032	H1-1b
31	53	PIPE_2.0	0.101	5.202	11	0.006	10.403		11	9.089	32.13	1.872	1.872	1.136	H1-1b
32	32	5/8" SR	0.1	0	9	0.015	0		40	1.88	9.94	0.104	0.104	2.593	H1-1b*
33	17	PL5/8x3.5	0.098	0	9	0.148	0.003	y	68	71.336	71.442	0.938	5.209	1.031	H1-1b
34	23	PL5/8x3.5	0.095	0.08	2	0.149	0	y	9	71.336	71.442	0.938	5.209	1.03	H1-1b
35	35	SR_3/4"	0.088	3.976	103	0.021	0		9	1.542	14.314	0.179	0.179	2.67	H1-1b
36	34	SR_3/4"	0	3.976	103	0.014	0		2	1.542	14.314	0.179	0.179	2.798	H1-1a

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

	Member	Shape	Code Check	Loc[ft]	LC	Shear Check	Loc[ft]	Dir	LC	phi*Pnc [k]	phi*Pnt [k]	phi*Mn y-y [k-ft]	phi*Mn z-z [k-ft]	Cb	Eqn
37	36	SR_3/4"	0	3.976	103	0.009	3.976		3	1.542	14.314	0.179	0.179	2.759	H1-1a

APPENDIX D

ADDITIONAL CALCULATIONS

PROJECT	**100083.005.01 - HRT 105 943201, CT**				**KSC**
SUBJECT	**Sector Mount Analysis**				
DATE	**02/16/22**	PAGE	1	OF	1

B+T Group
1717 S. Boulder, Suite 300
Tulsa, OK 74119
(918) 587-4630

[REF: AISC 360-05]

Reactions at Bolted Connection

Tension	:	1.771	k
Vertical Shear	:	1.627	k
Horizontal Shear	:	2.338	k
Torsion	:	-0.46	k.ft
Moment from Horizontal Forces	:	0	k.ft
Moment from Vertical Forces	:	0.186	k.ft

Bolt Parameters

Bolt Grade	:	A325	
Bolt Diameter	:	0.625	in
Nominal Bolt Area	:	0.307	in^2
Bolt spacing, Horizontal	:	6	in
Bolt spacing, Vertical	:	6	in
Bolt edge distance, plate height	:	1.5	in
Bolt edge distance, plate width	:	1.5	in
Total Number of Bolts	:	4	bolts

Summary of Forces

Shear Resultant Force	:	2.85	k
Force from Horz. Moment	:	0.00	k
Force from Vert. Moment	:	0.34	k
Shear Load / Bolt	:	0.71	k
Tension Load / Bolt	:	0.44	k
Resultant from Moments / Bolt	:	0.17	k

Bolt Checks

Nominal Tensile Stress, F_{nt}	:	90.00	ksi	[AISC Table J3.2]
Available Tensile Stress, ΦR_{nt}	:	20.72	k/bolt	[Eq. J3-1]
Unity Check, Bolt Tension	:	**2.95%**		**OKAY**
Nominal Shear Stress, F_{nv}	:	48.00	ksi	[AISC Table J3.2]
Available Shear Stress, ΦR_{nv}	:	11.05	k/bolt	[Eq. J3-1]
Unity Check, Bolt Shear	:	**10.45%**		**OKAY**
Unity Check, Combined	:	**13.40%**		**OKAY**
Available Bearing Strength, ΦR_n	:	34.66	k/bolt	
Unity Check, Bolt Bearing	:	**2.05%**		**OKAY**

Date: **February 23, 2022**

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

Subject:	**Structural Analysis Report**	
Carrier Designation:	***AT&T Mobility* Co-Locate**	
	Site Number:	CT2024
	Site Name:	CLINTON
	FA Number:	10035028
Crown Castle Designation:	**BU Number:**	806363
	Site Name:	HRT 105 943201
	JDE Job Number:	674881
	Work Order Number:	2037508
	Order Number:	576131 Rev. 0
Engineering Firm Designation:	**Crown Castle Project Number:**	2037508
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.

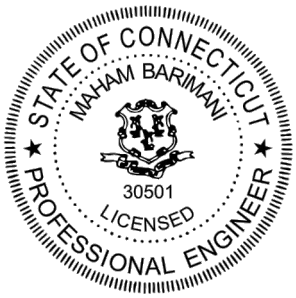
The purpose of the analysis is to determine acceptability of the tower stress level. Based on our analysis we have determined the tower stress level for the structure and foundation, under the following load case, to be:

LC7: 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:



Maham Barimani, P.E.
Senior Project Engineer

TABLE OF CONTENTS

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)
189.0	190.0	3	andrew	SBNHH-1D65A w/ Mount Pipe	12 2 4 3	1-5/8 7/8 13/16 3/8
		3	cci antennas	DMP65R-BU4D w/ Mount Pipe		
		3	cci antennas	OPA65R-BU4D w/ Mount Pipe		
		3	ericsson	RRUS 32 B30		
		3	ericsson	RRUS 32 B66		
		3	ericsson	RRUS 4415 B25		
		3	ericsson	RRUS 4449 B5/B12		
		3	ericsson	RRUS 4478 B14		
		3	powerwave technologies	7770.00 w/ Mount Pipe		
		3	raycap	DC6-48-60-18-8F		
	189.0	-	-	(3)SitePro1 Part# VFA14-WLL-30120		

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 telecommunications	RFV01U-D1A		
		3	samsung telecommunications	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)		

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
		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		
183.0	183.0	3	rfs celwave	APXV18-206517LS	-	-
		1	tower mounts	Pipe Mount [PM 601-3]		
175.0	179.0	2	andrrew	HPD2-23	12	1-1/4
		2	tower mounts	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-/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	tower mounts	Side Arm Mount		
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)		
51.0	51.0	1	tower mounts	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 8.1.1.0), 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	-23.299	98.582	23.6	Pass
T3	182.292 - 162.104	Leg	ROHN 4 EH	69	-68.036	167.222	40.7	Pass
T4	162.104 - 141.896	Leg	ROHN 5 EH	107	-99.039	250.620	39.5	Pass
T5	141.896 - 121.688	Leg	ROHN 6 EHS	146	-125.749	255.080	49.3	Pass
T6	121.688 - 101.479	Leg	ROHN 6 EH	173	-157.311	317.349	49.6	Pass
T7	101.479 - 81.2708	Leg	ROHN 6 EH	200	-187.128	317.349	59.0	Pass
T8	81.2708 - 61	Leg	ROHN 8 EHS	227	-215.333	404.230	53.3	Pass
T9	61 - 40.6667	Leg	ROHN 8 EHS	254	-242.768	403.942	60.1	Pass
T10	40.6667 - 20.3333	Leg	ROHN 8 EH	281	-255.464	528.398	48.3	Pass
T11	20.3333 - 0	Leg	ROHN 8 EH	314	-280.959	528.520	53.2	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	-7.751	18.418	42.1	Pass
T3	182.292 - 162.104	Diagonal	ROHN 2 STD	78	-8.052	15.917	50.6	Pass
T4	162.104 - 141.896	Diagonal	ROHN 2 STD	110	-7.629	13.677	55.8	Pass
T5	141.896 - 121.688	Diagonal	ROHN 2.5 STD	149	-10.865	17.101	63.5	Pass
T6	121.688 - 101.479	Diagonal	ROHN 2.5 STD	183	-11.041	14.992	73.6	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
T7	101.479 - 81.2708	Diagonal	ROHN 3 STD	210	-11.087	25.935	42.8	Pass
T8	81.2708 - 61	Diagonal	ROHN 3 STD	237	-10.985	22.903	48.0	Pass
T9	61 - 40.6667	Diagonal	ROHN 3 STD	264	-11.777	20.104	58.6	Pass
T10	40.6667 - 20.3333	Diagonal	ROHN 3 STD	303	-16.532	32.714	50.5	Pass
T11	20.3333 - 0	Diagonal	ROHN 3 STD	336	-18.756	31.089	60.3	Pass
T1	212.625 - 202.458	Horizontal	ROHN 1.5 STD	10	-1.845	23.711	7.8	Pass
T2	202.458 - 182.292	Horizontal	ROHN 1.5 STD	37	-4.136	23.646	17.5	Pass
T3	182.292 - 162.104	Horizontal	ROHN 1.5 STD	76	-5.156	20.100	25.7	Pass
T4	162.104 - 141.896	Horizontal	ROHN 2 STD	109	-5.302	28.570	18.6	Pass
T5	141.896 - 121.688	Horizontal	ROHN 2 STD	154	-6.443	23.772	27.1	Pass
T6	121.688 - 101.479	Horizontal	ROHN 2 STD	181	-7.175	17.707	40.5	Pass
T7	101.479 - 81.2708	Horizontal	ROHN 2.5 STD	208	-7.640	30.294	25.2	Pass
T8	81.2708 - 61	Horizontal	ROHN 2.5 STD	235	-7.936	23.656	33.5	Pass
T9	61 - 40.6667	Horizontal	ROHN 2.5 STD	262	-8.810	18.711	47.1	Pass
T10	40.6667 - 20.3333	Horizontal	ROHN 3 STD	299	-8.971	33.233	27.0	Pass
T11	20.3333 - 0	Horizontal	ROHN 3 STD	332	-10.576	27.041	39.1	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	-4.434	13.657	32.5	Pass
T11	20.3333 - 0	Redund Horz 1 Bracing	ROHN 1.5 STD	321	-4.874	11.606	42.0	Pass
T10	40.6667 - 20.3333	Redund Diag 1 Bracing	ROHN 2 STD	289	-4.096	9.252	44.3	Pass
T11	20.3333 - 0	Redund Diag 1 Bracing	ROHN 2 STD	322	-4.210	8.517	49.4	Pass
T10	40.6667 - 20.3333	Redund Hip 1 Bracing	ROHN 1.5 STD	306	-0.043	12.533	0.3	Pass
T11	20.3333 - 0	Redund Hip 1 Bracing	ROHN 1.5 STD	339	-0.044	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	42	-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)	60.1	Pass
						Diagonal (T6)	73.6	Pass
						Horizontal (T9)	47.1	Pass
						Top Girt (T1)	0.9	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
						Redund Horz 1 Bracing (T11)	42.0	Pass
						Redund Diag 1 Bracing (T11)	49.4	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	44.2	Pass
						Rating =	73.6	Pass

Table 5 - Tower Component Stresses vs. Capacity - LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	41.6	Pass
1	Base Foundation (Structure)	0	19.7	Pass
1	Base Foundation (Soil Interaction)	0	42.2	Pass

Structure Rating (max from all components) =	**73.6%**

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

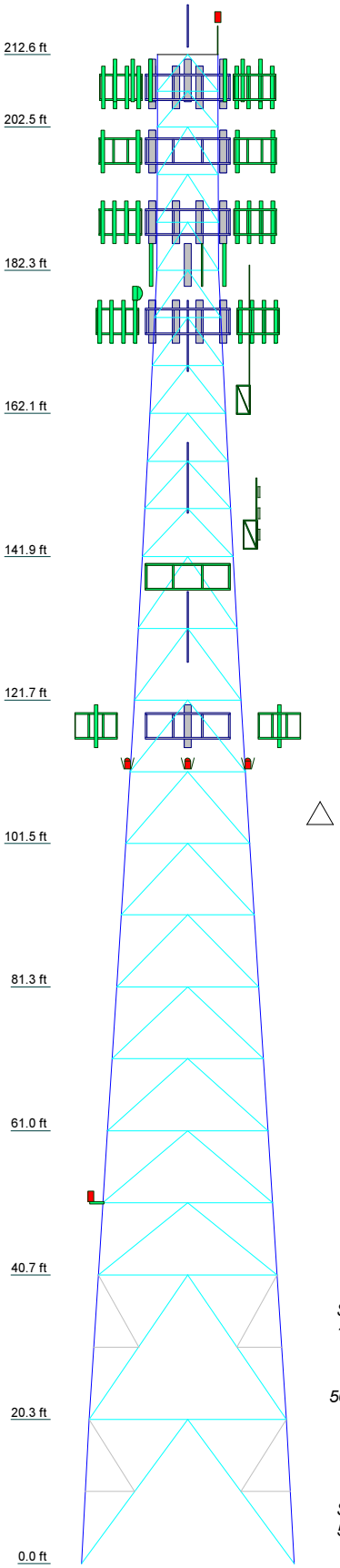
4.1) Recommendations

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			ROHN 1.5 STD	B
Diagonal Grade	A572-50										
Top Girts	N.A.										
Horizontals	ROHN 3 STD		ROHN 2.5 STD		L3x3x3/16	L2 1/2x2 1/2x3/16	L2x2x1/8				
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								
Face Width (ft)	30.0417	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	5.3	2 @ 10.1667	4.7	2 @ 10.1354	4.5	6 @ 10.1042	3.1	3 @ 6.73611	2.6	3 @ 6.72917	2.3	3 @ 6.72222	1.8	2 @ 5.08333	1.4	0.6
Weight (K)	35.7	5.5															



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: 73.6%

ALL REACTIONS ARE FACTORED

MAX. CORNER REACTIONS AT BASE:
DOWN: 309 K
SHEAR: 36 K

UPLIFT: -248 K
SHEAR: 32 K

AXIAL 212 K
SHEAR 16 K *MOMENT 2122 kip-ft*
TORQUE 19 kip-ft
50 mph WIND - 1.500 in ICE

AXIAL 103 K
SHEAR 59 K *MOMENT 7143 kip-ft*
TORQUE 60 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: 02/23/22	Scale: NTS	
Path: C:\Work Area\806363\WO 2037508 - SA\Prod\806363.eri		Dwg No. E-1	

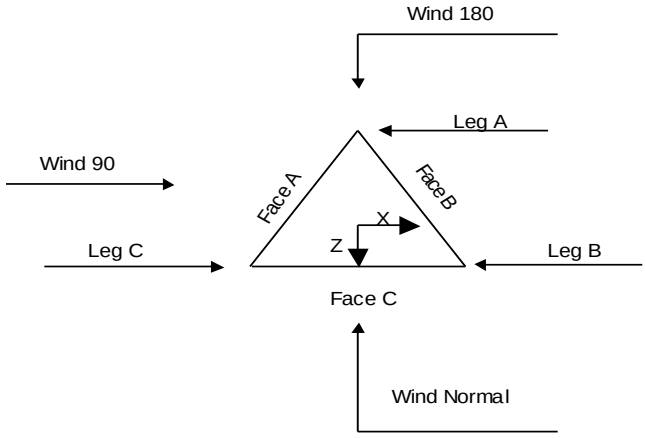
Tower Input Data

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 ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
T1 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 ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X Y	K Brace Diags X Y	Single Diags X Y	Girts X Y	Horiz. X Y	Sec. Horiz. X Y	Inner Brace X Y
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	4	2	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	3	3	0.440	0.440		0.000
PWRT-606-S(7/8) ***	A	No	No	Ar (CaAa)	189.000 - 0.000	0.000	-0.34	2	2	0.920	0.920		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
LDF4-50A(1/2")	C	No	No	Ar (CaAa)	212.625 - 0.000	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
***													
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 - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	C_AA_A ft^2/ft	Weight klf
***								

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	45.029	0.000	0.389
		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	102.922	0.000	0.785
		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	109.480	0.000	0.803
		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	113.683	0.000	0.815
		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	115.860	0.000	0.821
		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	116.471	0.000	0.823
		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	116.831	0.000	0.825
		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	117.842	0.000	0.830
		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	118.472	0.000	0.831
		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	118.472	0.000	0.831
		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	91.126	0.000	1.464
		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	199.751	0.000	3.139
		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	228.838	0.000	3.386
		B		0.000	0.000	16.108	0.000	0.375
		C		0.000	0.000	65.242	0.000	1.141
T5	141.896-121.688	A	1.464	0.000	0.000	236.514	0.000	3.470
		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	241.984	0.000	3.507
		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	243.334	0.000	3.485
		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	241.568	0.000	3.425
		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	242.424	0.000	3.378
		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	240.654	0.000	3.274
		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	230.621	0.000	3.012
		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	-13.192	-0.838	-15.004	-1.827
T3	182.292-162.104	-15.764	5.668	-17.451	4.516
T4	162.104-141.896	-17.980	7.505	-21.120	7.077
T5	141.896-121.688	-15.958	-8.746	-19.746	-6.701
T6	121.688-101.479	-16.670	-11.262	-20.628	-8.140
T7	101.479-81.271	-17.932	-11.829	-22.929	-8.368
T8	81.271-61.000	-19.339	-12.732	-24.699	-9.084
T9	61.000-40.667	-21.126	-14.190	-26.760	-10.884
T10	40.667-20.333	-23.615	-16.119	-29.333	-13.021
T11	20.333-0.000	-25.368	-17.285	-31.112	-14.229

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-	202.46 -	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
		5/8)	208.00		
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 - 189.00	0.6000	0.6000
T2	13	PWRT-608-S(13/16)	182.29 - 189.00	0.0000	0.0000
T2	14	LDF2-50(3/8")	182.29 - 189.00	0.6000	0.6000
T2	15	PWRT-606-S(7/8)	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	PWRT-606-S(7/8)	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

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
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
T4	14	LDF2-50(3/8")	141.90 - 162.10	0.6000	0.6000
T4	15	PWRT-606-S(7/8)	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	PWRT-606-S(7/8)	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

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
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
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	PWRT-606-S(7/8)	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

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T7	14	LDF2-50(3/8")	81.27 - 101.48	0.6000	0.6000
T7	15	PWRT-606-S(7/8)	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
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	PWRT-606-S(7/8)	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 -	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
			81.27		
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 - 81.27	0.6000	0.6000
T9	1	LDF4-50A(1/2")	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	PWRT-606-S(7/8)	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 -	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
			40.67		
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	PWRT-606-S(7/8)	20.33 - 40.67	0.6000	0.6000
T10	17	LDF1-50A(1/4")	20.33 - 40.67	0.6000	0.6000
T10	18	LDF2-50(3/8")	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	PWRT-606-S(7/8)	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 ft Vert ft ft	Azimuth Adjustment °	Placement ft
Lightning Rod 5/8" x 6'	A	From Leg	0.000 0.000 3.000	0.000	213.625
Climb Leg Extension	A	From Leg	0.000 0.000 2.000	0.000	212.625
Flash Beacon Lighting	B	From Leg	0.000 0.000 0.500	0.000	216.625
4' x 2" Pipe Mount	B	From Leg	0.000 0.000 2.000	0.000	212.625
Side Lighting	A	From Leg	0.500 0.000 0.000	0.000	112.000
Side Lighting	B	From Leg	0.500 0.000 0.000	0.000	112.000
Side Lighting	C	From Leg	0.500 0.000 0.000	0.000	112.000
***					
Sector Mount [SM 510-3]	C	None		0.000	208.000
(2) LPA-80080/6CF w/ Mount Pipe	A	From Leg	4.000 0.000 1.000	0.000	208.000
(2) LPA-80080/6CF w/ Mount Pipe	B	From Leg	4.000 0.000 1.000	0.000	208.000
(2) LPA-80080/6CF w/ Mount Pipe	C	From Leg	4.000 0.000 1.000	0.000	208.000
(2) JAHH-65B-R3B w/ Mount Pipe	A	From Leg	4.000 0.000 1.000	0.000	208.000
(2) JAHH-65B-R3B w/ Mount Pipe	B	From Leg	4.000 0.000 1.000	0.000	208.000
(2) JAHH-65B-R3B w/ Mount Pipe	C	From Leg	4.000 0.000 1.000	0.000	208.000
SBNHH-1D65B w/ Mount Pipe	A	From Leg	4.000 0.000 1.000	0.000	208.000
SBNHH-1D65B w/ Mount Pipe	B	From Leg	4.000 0.000 1.000	0.000	208.000
SBNHH-1D65B w/ Mount Pipe	C	From Leg	4.000 0.000 1.000	0.000	208.000
RFV01U-D2A	A	From Leg	4.000 0.000 1.000	0.000	208.000
RFV01U-D2A	B	From Leg	4.000 0.000 1.000	0.000	208.000

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft ft	Azimuth Adjustment °	Placement ft
RFV01U-D2A	C	From Leg	4.000 0.000 1.000	0.000	208.000
CBC1923T-DS-43	A	From Leg	4.000 0.000 1.000	0.000	208.000
CBC1923T-DS-43	B	From Leg	4.000 0.000 1.000	0.000	208.000
CBC1923T-DS-43	C	From Leg	4.000 0.000 1.000	0.000	208.000
DB-B1-6C-12AB-0Z	A	From Leg	4.000 0.000 1.000	0.000	208.000
DB-B1-6C-12AB-0Z	B	From Leg	4.000 0.000 1.000	0.000	208.000
RFV01U-D1A	A	From Leg	4.000 0.000 1.000	0.000	208.000
RFV01U-D1A	B	From Leg	4.000 0.000 1.000	0.000	208.000
RFV01U-D1A	C	From Leg	4.000 0.000 1.000	0.000	208.000
***					
Sector Mount [SM 505-3]	C	None		0.000	199.000
APXVSPP18-C-A20 w/ Mount Pipe	A	From Leg	4.000 0.000 -1.000	0.000	199.000
APXVSPP18-C-A20 w/ Mount Pipe	B	From Leg	4.000 0.000 -1.000	0.000	199.000
APXVSPP18-C-A20 w/ Mount Pipe	C	From Leg	4.000 0.000 -1.000	0.000	199.000
APXVTM14-C-120 w/ Mount Pipe	A	From Leg	4.000 0.000 -1.000	0.000	199.000
APXVTM14-C-120 w/ Mount Pipe	B	From Leg	4.000 0.000 -1.000	0.000	199.000
APXVTM14-C-120 w/ Mount Pipe	C	From Leg	4.000 0.000 -1.000	0.000	199.000
800MHz 2X50W RRH W/FILTER	A	From Leg	4.000 0.000 -1.000	0.000	199.000
800MHz 2X50W RRH W/FILTER	B	From Leg	4.000 0.000 -1.000	0.000	199.000
800MHz 2X50W RRH W/FILTER	C	From Leg	4.000 0.000 -1.000	0.000	199.000
1900MHz RRH (65MHz)	A	From Leg	4.000 0.000 -1.000	0.000	199.000
1900MHz RRH (65MHz)	B	From Leg	4.000 0.000 -1.000	0.000	199.000
1900MHz RRH (65MHz)	C	From Leg	4.000 0.000 -1.000	0.000	199.000

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft
TD-RRH8x20-25	A	From Leg	4.000 0.000 -1.000	0.000	199.000
TD-RRH8x20-25	B	From Leg	4.000 0.000 -1.000	0.000	199.000
TD-RRH8x20-25	C	From Leg	4.000 0.000 -1.000	0.000	199.000
(3) Empty Mount Pipes	A	From Leg	4.000 0.000 0.000	0.000	199.000
(3) Empty Mount Pipes	B	From Leg	4.000 0.000 0.000	0.000	199.000
(3) Empty Mount Pipes	C	From Leg	4.000 0.000 0.000	0.000	199.000
***					
Sector Mount [SM 502-3]	C	None		0.000	189.000
DMP65R-BU4D w/ Mount Pipe	A	From Leg	4.000 0.000 1.000	0.000	189.000
DMP65R-BU4D w/ Mount Pipe	B	From Leg	4.000 0.000 1.000	0.000	189.000
DMP65R-BU4D w/ Mount Pipe	C	From Leg	4.000 0.000 1.000	0.000	189.000
OPA65R-BU4D w/ Mount Pipe	A	From Leg	4.000 0.000 1.000	0.000	189.000
OPA65R-BU4D w/ Mount Pipe	B	From Leg	4.000 0.000 1.000	0.000	189.000
OPA65R-BU4D w/ Mount Pipe	C	From Leg	4.000 0.000 1.000	0.000	189.000
RRUS 32 B30	A	From Leg	4.000 0.000 1.000	0.000	189.000
RRUS 32 B30	B	From Leg	4.000 0.000 1.000	0.000	189.000
RRUS 32 B30	C	From Leg	4.000 0.000 1.000	0.000	189.000
RRUS 4415 B25	A	From Leg	4.000 0.000 1.000	0.000	189.000
RRUS 4415 B25	B	From Leg	4.000 0.000 1.000	0.000	189.000
RRUS 4415 B25	C	From Leg	4.000 0.000 1.000	0.000	189.000
RRUS 4449 B5/B12	A	From Leg	4.000 0.000 1.000	0.000	189.000
RRUS 4449 B5/B12	B	From Leg	4.000 0.000 1.000	0.000	189.000
RRUS 4449 B5/B12	C	From Leg	4.000 0.000 1.000	0.000	189.000

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft ft	Azimuth Adjustment °	Placement ft
RRUS 4478 B14	A	From Leg	4.000 0.000 1.000	0.000	189.000
RRUS 4478 B14	B	From Leg	4.000 0.000 1.000	0.000	189.000
RRUS 4478 B14	C	From Leg	4.000 0.000 1.000	0.000	189.000
DC6-48-60-18-8F	A	From Leg	4.000 0.000 1.000	0.000	189.000
SBNHH-1D65A w/ Mount Pipe	A	From Leg	4.000 0.000 1.000	0.000	189.000
SBNHH-1D65A w/ Mount Pipe	B	From Leg	4.000 0.000 1.000	0.000	189.000
SBNHH-1D65A w/ Mount Pipe	C	From Leg	4.000 0.000 1.000	0.000	189.000
7770.00 w/ Mount Pipe	A	From Leg	4.000 0.000 1.000	0.000	189.000
7770.00 w/ Mount Pipe	B	From Leg	4.000 0.000 1.000	0.000	189.000
7770.00 w/ Mount Pipe	C	From Leg	4.000 0.000 1.000	0.000	189.000
RRUS 32 B66	A	From Leg	4.000 0.000 1.000	0.000	189.000
RRUS 32 B66	B	From Leg	4.000 0.000 1.000	0.000	189.000
RRUS 32 B66	C	From Leg	4.000 0.000 1.000	0.000	189.000
DC6-48-60-18-8F	A	From Leg	4.000 0.000 1.000	0.000	189.000
DC6-48-60-18-8F	C	From Leg	4.000 0.000 1.000	0.000	189.000
***					
Pipe Mount [PM 601-3]	C	None		0.000	183.000
APXV18-206517LS	A	From Leg	1.000 0.000 0.000	0.000	183.000
APXV18-206517LS	B	From Leg	1.000 0.000 0.000	0.000	183.000
APXV18-206517LS	C	From Leg	1.000 0.000 0.000	0.000	183.000
***					
Sector Mount	C	None		0.000	175.000
(4) DB844H90E-XY w/ Mount Pipe	A	From Leg	4.000 0.000 1.000	0.000	175.000
(4) DB844H90E-XY w/ Mount Pipe	B	From Leg	4.000 0.000 1.000	0.000	175.000
(4) DB844H90E-XY w/ Mount Pipe	C	From Leg	4.000	0.000	175.000

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft
			0.000 1.000		
6' x 2" Mount Pipe	C	From Face	2.000 0.000 4.000	0.000	175.000
6' x 2" Mount Pipe	C	From Face	2.000 0.000 4.000	0.000	175.000
***					
Side Arm Mount [SO 306-1]	A	From Leg	3.000 0.000 0.000	0.000	167.000
1151-3	A	From Leg	4.000 0.000 6.000	0.000	167.000
SD310-HL	A	From Leg	4.000 0.000 -7.000	0.000	167.000
***					
Side Arm Mount [SO 306-1]	B	From Leg	3.000 0.000 0.000	0.000	164.000
1151-3	B	From Leg	4.000 0.000 9.000	0.000	164.000
***					
Side Arm Mount [SO 306-1]	A	From Leg	3.000 0.000 0.000	0.000	147.000
1151-3	A	From Leg	4.000 0.000 6.000	0.000	147.000
***					
Side Arm Mount [SO 306-1]	B	From Leg	3.000 0.000 0.000	0.000	145.000
SD310-HL	B	From Leg	4.000 0.000 3.000	0.000	145.000
***					
(3) Site Pro 1 VFA12-HD	C	None		0.000	139.000
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	A	From Leg	4.000 0.000 1.000	0.000	139.000
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	B	From Leg	4.000 0.000 1.000	0.000	139.000
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	C	From Leg	4.000 0.000 1.000	0.000	139.000
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	A	From Leg	4.000 0.000 1.000	0.000	139.000
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	B	From Leg	4.000 0.000 1.000	0.000	139.000
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	C	From Leg	4.000 0.000 1.000	0.000	139.000
APXVAARR24_43-U-NA20 w/ Mount Pipe	A	From Leg	4.000 0.000 1.000	0.000	139.000
APXVAARR24_43-U-NA20 w/ Mount Pipe	B	From Leg	4.000 0.000 1.000	0.000	139.000

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft
APXVAARR24_43-U-NA20 w/ Mount Pipe	C	From Leg	4.000 0.000 1.000	0.000	139.000
KRY 112 144/1	A	From Leg	4.000 0.000 1.000	0.000	139.000
KRY 112 144/1	B	From Leg	4.000 0.000 1.000	0.000	139.000
KRY 112 144/1	C	From Leg	4.000 0.000 1.000	0.000	139.000
RADIO 4449 B12/B71	A	From Leg	4.000 0.000 1.000	0.000	139.000
RADIO 4449 B12/B71	B	From Leg	4.000 0.000 1.000	0.000	139.000
RADIO 4449 B12/B71	C	From Leg	4.000 0.000 1.000	0.000	139.000
***					
Side Arm Mount	A	From Leg	3.000 0.000 0.000	0.000	128.000
1142-2C	A	From Leg	6.000 0.000 4.000	0.000	128.000
***					
Side Arm Mount	C	From Leg	1.000 0.000 0.000	0.000	51.000
GPS_A	C	From Leg	2.000 0.000 0.000	0.000	51.000
***					
MX08FRO665-20 w/ Mount Pipe	A	From Leg	4.000 0.000 0.000	0.000	118.000
MX08FRO665-20 w/ Mount Pipe	B	From Leg	4.000 0.000 0.000	0.000	118.000
MX08FRO665-20 w/ Mount Pipe	C	From Leg	4.000 0.000 0.000	0.000	118.000
TA08025-B604	A	From Leg	4.000 0.000 0.000	0.000	118.000
TA08025-B604	B	From Leg	4.000 0.000 0.000	0.000	118.000
TA08025-B604	C	From Leg	4.000 0.000 0.000	0.000	118.000
TA08025-B605	A	From Leg	4.000 0.000 0.000	0.000	118.000
TA08025-B605	B	From Leg	4.000 0.000 0.000	0.000	118.000
TA08025-B605	C	From Leg	4.000 0.000 0.000	0.000	118.000
RDIDC-9181-PF-48	A	From Leg	4.000 0.000	0.000	118.000

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft
(2) 8' x 2" Mount Pipe	A	From Leg	0.000 4.000 0.000	0.000	118.000
(2) 8' x 2" Mount Pipe	B	From Leg	0.000 4.000 0.000	0.000	118.000
(2) 8' x 2" Mount Pipe	C	From Leg	0.000 4.000 0.000	0.000	118.000
Commscope MTC3975083 (3)	C	None	0.000	0.000	118.000
*					
*					

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft
HPD2-23	C	Paraboloid w/Shroud (HP)	From Leg	2.000 0.000 4.000	50.000		175.000	2.000
HPD2-23	C	Paraboloid w/Shroud (HP)	From Leg	2.000 0.000 4.000	-90.000		175.000	2.000
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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
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

Comb. No.	Description
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	-1.845	-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
			Max. Vx	27	0.000	0.000	0.000
T2	202.458 - 182.292	Leg	Max Tension	23	14.997	0.094	0.007
			Max. Compression	18	-23.299	0.227	-0.025

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Mx	6	0.690	1.085	0.016
			Max. My	24	-3.271	-0.001	-1.095
			Max. Vy	6	-1.072	0.092	0.010
			Max. Vx	8	1.105	0.003	-0.092
		Diagonal	Max Tension	4	7.677	0.000	0.000
			Max. Compression	4	-7.751	0.000	0.000
			Max. Mx	38	1.874	0.050	0.000
			Max. My	2	-0.035	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	4.174	-0.012	-0.000
			Max. Compression	4	-4.136	-0.012	-0.000
			Max. Mx	37	-0.112	-0.035	-0.002
			Max. My	22	-0.715	-0.019	-0.010
			Max. Vy	37	-0.029	-0.035	-0.002
			Max. Vx	22	0.002	-0.019	-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	45.598	-0.199	-0.006
			Max. Compression	2	-68.036	-0.056	-0.009
			Max. Mx	14	41.506	0.637	-0.011
			Max. My	12	-5.998	-0.048	-0.382
			Max. Vy	6	-0.811	-0.304	-0.042
			Max. Vx	12	-0.827	-0.048	-0.382
		Diagonal	Max Tension	16	7.962	0.000	0.000
			Max. Compression	16	-8.052	0.000	0.000
			Max. Mx	38	1.533	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	4.863	-0.013	-0.000
			Max. Compression	16	-5.156	-0.015	0.000
			Max. Mx	37	-0.290	-0.041	-0.002
			Max. My	22	-1.041	-0.021	-0.009
			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	74.830	-0.317	-0.002
			Max. Compression	10	-99.039	0.854	-0.072
			Max. Mx	22	62.447	-1.633	0.024
			Max. My	12	-7.162	-0.062	-1.258
			Max. Vy	22	0.646	-1.633	0.024
			Max. Vx	13	0.260	-0.046	-1.252
		Diagonal	Max Tension	16	7.814	0.000	0.000
			Max. Compression	16	-7.920	0.000	0.000
			Max. Mx	38	1.544	0.085	0.000
			Max. My	2	0.526	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	5.188	-0.021	-0.001
			Max. Compression	20	-5.302	-0.024	-0.000
			Max. Mx	29	0.129	-0.068	-0.003
			Max. My	10	0.763	-0.006	0.013
			Max. Vy	29	-0.046	-0.068	-0.003
			Max. Vx	10	-0.003	-0.006	0.013
		Inner Bracing	Max Tension	11	0.005	0.000	0.000
			Max. Compression	14	-0.007	0.000	0.000
			Max. Mx	26	-0.004	-0.045	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. 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	93.445	-0.887	0.129
			Max. Compression	10	-125.749	0.818	-0.007
			Max. Mx	22	71.488	-1.633	0.024
			Max. My	12	-7.741	-0.062	-1.257
			Max. Vy	22	-0.786	-1.633	0.024
			Max. Vx	12	-0.738	-0.062	-1.257
		Diagonal	Max Tension	20	10.684	0.000	0.000
			Max. Compression	20	-10.865	0.000	0.000
			Max. Mx	38	2.433	0.175	0.000
			Max. My	6	-0.350	0.000	0.001
			Max. Vy	38	-0.056	0.000	0.000
			Max. Vx	6	-0.000	0.000	0.000
		Horizontal	Max Tension	22	6.465	-0.021	0.006
			Max. Compression	16	-6.443	-0.033	-0.000
			Max. Mx	29	0.044	-0.089	-0.003
			Max. My	22	-1.098	-0.053	-0.014
			Max. Vy	29	-0.052	-0.089	-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	37	0.000	0.000	0.000
T6	121.688 - 101.479	Leg	Max Tension	7	118.308	-0.912	0.078
			Max. Compression	10	-157.310	0.743	-0.064
			Max. Mx	6	115.075	-0.936	0.078
			Max. My	8	-20.198	-0.045	0.943
			Max. Vy	14	-0.484	-0.893	-0.073
			Max. Vx	20	-0.477	-0.043	-0.911
		Diagonal	Max Tension	16	10.812	0.000	0.000
			Max. Compression	16	-11.041	0.000	0.000
			Max. Mx	38	2.328	0.214	0.000
			Max. My	6	-0.872	0.000	0.001
			Max. Vy	38	-0.064	0.000	0.000
			Max. Vx	6	-0.000	0.000	0.000
		Horizontal	Max Tension	16	7.096	-0.041	-0.000
			Max. Compression	16	-7.175	-0.041	-0.000
			Max. Mx	29	0.149	-0.106	-0.003
			Max. My	22	-1.159	-0.054	-0.014
			Max. Vy	29	-0.058	-0.106	-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	144.672	-0.539	0.011
			Max. Compression	10	-187.128	0.682	-0.042
			Max. Mx	10	-172.153	0.743	-0.064
			Max. My	24	-16.254	-0.017	0.866
			Max. Vy	14	-0.107	-0.709	-0.111
			Max. Vx	12	-0.152	-0.022	-0.864
		Diagonal	Max Tension	16	10.746	0.000	0.000
			Max. Compression	16	-11.087	0.000	0.000
			Max. Mx	38	2.139	0.314	0.000
			Max. My	6	-1.131	0.000	0.001
			Max. Vy	38	-0.088	0.000	0.000
			Max. Vx	6	-0.000	0.000	0.000
		Horizontal	Max Tension	16	7.642	-0.085	-0.000
			Max. Compression	16	-7.640	-0.085	-0.000
			Max. Mx	37	0.006	-0.187	-0.005

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. My	22	-0.642	-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	169.376	-1.099	0.005
			Max. Compression	10	-215.333	0.640	-0.038
			Max. Mx	10	-201.644	1.106	-0.039
			Max. My	24	-19.786	-0.038	1.070
			Max. Vy	14	0.143	-1.068	-0.036
			Max. Vx	24	-0.166	-0.038	1.070
		Diagonal	Max Tension	17	10.518	0.000	0.000
			Max. Compression	16	-10.985	0.000	0.000
			Max. Mx	38	1.922	0.374	0.000
			Max. My	6	-1.322	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	8.018	-0.105	-0.000
			Max. Compression	16	-7.936	-0.105	-0.000
			Max. Mx	37	0.099	-0.222	-0.004
			Max. My	22	-0.861	-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	192.984	-1.526	-0.014
			Max. Compression	10	-242.768	-2.451	-0.133
			Max. Mx	10	-242.768	-2.451	-0.133
			Max. My	24	-24.622	-0.638	3.129
			Max. Vy	10	0.490	1.829	-0.008
			Max. Vx	24	-0.376	-0.638	3.129
		Diagonal	Max Tension	17	11.256	0.000	0.000
			Max. Compression	16	-11.777	0.000	0.000
			Max. Mx	38	2.047	0.432	0.000
			Max. My	6	-1.474	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	9.034	-0.130	-0.000
			Max. Compression	17	-8.810	-0.098	-0.000
			Max. Mx	37	0.430	-0.267	-0.004
			Max. My	22	-0.413	-0.143	-0.015
			Max. Vy	37	-0.105	-0.267	-0.004
			Max. Vx	22	0.001	-0.143	-0.015
		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	202.762	1.096	0.104
			Max. Compression	10	-255.464	-7.127	-0.260
			Max. Mx	10	-255.218	8.124	0.189
			Max. My	24	-26.875	-1.334	5.126
			Max. Vy	10	1.550	8.124	0.189
			Max. Vx	24	-0.891	-1.334	5.126
		Diagonal	Max Tension	17	15.634	-0.122	0.081
			Max. Compression	16	-16.532	0.000	0.000
			Max. Mx	6	11.591	-0.178	0.051
			Max. My	4	-16.073	-0.012	-0.097
			Max. Vy	37	-0.071	-0.171	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	4	-0.008	0.000	0.000
		Horizontal	Max Tension	16	8.654	-0.195	-0.000
			Max. Compression	16	-8.971	-0.197	-0.000
			Max. Mx	37	-0.430	-0.381	-0.006
			Max. My	10	1.476	-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	1.731	0.000	0.000
			Max. Compression	5	-1.496	0.000	0.000
			Max. Mx	26	0.399	0.040	0.000
			Max. Vy	26	-0.026	0.000	0.000
		Redund Diag 1 Bracing	Max Tension	9	1.515	0.000	0.000
			Max. Compression	22	-1.476	0.000	0.000
			Max. Mx	38	-0.196	0.082	0.000
			Max. My	16	-1.343	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	-0.043	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	0.084	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	223.518	4.170	0.256
			Max. Compression	10	-280.959	-0.000	0.000
			Max. Mx	10	-280.658	7.432	0.171
			Max. My	24	-29.113	-1.336	5.124
			Max. Vy	10	-1.486	7.432	0.171
			Max. Vx	24	0.867	-1.336	5.124
		Diagonal	Max Tension	17	17.884	-0.119	0.080
			Max. Compression	16	-18.756	0.000	0.000
			Max. Mx	6	13.268	-0.179	0.049
			Max. My	4	-18.380	-0.035	-0.096
			Max. Vy	37	-0.072	-0.178	0.003
			Max. Vx	4	-0.008	0.000	0.000
		Horizontal	Max Tension	16	10.628	-0.234	-0.000
			Max. Compression	17	-10.576	-0.178	-0.000
			Max. Mx	37	0.447	-0.394	-0.006
			Max. My	22	-0.400	-0.296	-0.023
			Max. Vy	37	-0.136	-0.394	-0.006
			Max. Vx	22	0.002	-0.296	-0.023
		Redund Horz 1 Bracing	Max Tension	22	1.278	0.000	0.000
			Max. Compression	9	-1.251	0.000	0.000
			Max. Mx	34	0.406	0.045	0.000
			Max. Vy	34	-0.026	0.000	0.000
		Redund Diag 1 Bracing	Max Tension	8	1.241	0.000	0.000
			Max. Compression	22	-0.982	0.000	0.000
			Max. Mx	27	-0.200	0.089	0.000
			Max. My	18	-0.719	0.000	-0.000
			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

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	-0.044	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	0.087	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	18	-0.017	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	291.474	28.744	-17.902
	Max. H_x	18	291.474	28.744	-17.902
	Max. H_z	7	-235.584	-25.282	15.921
	Min. Vert	7	-235.584	-25.282	15.921
	Min. H_x	7	-235.584	-25.282	15.921
	Min. H_z	18	291.474	28.744	-17.902
Leg B	Max. Vert	10	308.699	-31.300	-17.582
	Max. H_x	23	-248.226	27.857	15.475
	Max. H_z	23	-248.226	27.857	15.475
	Min. Vert	23	-248.226	27.857	15.475
	Min. H_x	10	308.699	-31.300	-17.582
	Min. H_z	10	308.699	-31.300	-17.582
Leg A	Max. Vert	2	294.531	-1.022	33.602
	Max. H_x	21	27.722	6.447	1.929
	Max. H_z	2	294.531	-1.022	33.602
	Min. Vert	15	-230.279	1.118	-29.452
	Min. H_x	9	27.003	-6.410	1.868
	Min. H_z	15	-230.279	1.118	-29.452

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	85.426	-0.000	0.000	-48.205	-31.689	-0.000
1.2 Dead+1.0 Wind 0 deg - No Ice	102.511	-0.047	-54.893	-6773.765	-29.273	-56.054
0.9 Dead+1.0 Wind 0 deg - No Ice	76.883	-0.047	-54.898	-6749.408	-19.581	-56.152
1.2 Dead+1.0 Wind 30 deg - No Ice	102.511	26.356	-45.656	-5681.584	-3283.031	-51.504
0.9 Dead+1.0 Wind 30 deg - No Ice	76.883	26.358	-45.660	-5658.778	-3268.594	-51.538
1.2 Dead+1.0 Wind 60 deg - No Ice	102.511	48.127	-27.678	-3423.589	-5900.082	-59.223
0.9 Dead+1.0 Wind 60 deg - No Ice	76.883	48.131	-27.680	-3404.113	-5881.887	-59.188
1.2 Dead+1.0 Wind 90 deg - No Ice	102.511	58.229	0.040	-50.373	-7063.663	-33.298

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 90 deg - No Ice	76.883	58.234	0.040	-35.774	-7043.854	-33.199
1.2 Dead+1.0 Wind 120 deg - No Ice	102.511	51.252	29.563	3508.401	-6221.724	24.819
0.9 Dead+1.0 Wind 120 deg - No Ice	76.883	51.256	29.565	3517.898	-6203.150	24.958
1.2 Dead+1.0 Wind 150 deg - No Ice	102.511	28.847	49.824	5993.456	-3546.031	58.544
0.9 Dead+1.0 Wind 150 deg - No Ice	76.883	28.850	49.828	5999.344	-3531.300	58.680
1.2 Dead+1.0 Wind 180 deg - No Ice	102.511	0.053	54.868	6652.987	-48.461	55.874
0.9 Dead+1.0 Wind 180 deg - No Ice	76.883	0.054	54.873	6657.881	-38.773	55.972
1.2 Dead+1.0 Wind 210 deg - No Ice	102.511	-26.382	45.639	5562.199	3211.070	51.286
0.9 Dead+1.0 Wind 210 deg - No Ice	76.883	-26.384	45.643	5568.641	3216.003	51.323
1.2 Dead+1.0 Wind 240 deg - No Ice	102.511	-48.094	27.707	3312.365	5817.449	59.543
0.9 Dead+1.0 Wind 240 deg - No Ice	76.883	-48.098	27.709	3322.122	5818.641	59.508
1.2 Dead+1.0 Wind 270 deg - No Ice	102.511	-58.207	-0.057	-69.134	6983.053	33.311
0.9 Dead+1.0 Wind 270 deg - No Ice	76.883	-58.212	-0.057	-54.485	6982.626	33.212
1.2 Dead+1.0 Wind 300 deg - No Ice	102.511	-51.245	-29.573	-3626.416	6143.925	-24.843
0.9 Dead+1.0 Wind 300 deg - No Ice	76.883	-51.249	-29.576	-3606.668	6144.729	-24.981
1.2 Dead+1.0 Wind 330 deg - No Ice	102.511	-28.841	-49.832	-6111.125	3468.388	-58.601
0.9 Dead+1.0 Wind 330 deg - No Ice	76.883	-28.843	-49.837	-6087.770	3473.037	-58.735
1.2 Dead+1.0 Ice+1.0 Temp	212.448	0.000	0.001	-126.354	114.343	0.001
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	212.448	0.004	-15.144	-1986.471	114.147	-19.361
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	212.448	7.449	-12.862	-1708.878	-802.025	-17.679
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	212.448	13.218	-7.602	-1054.779	-1500.658	-16.304
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	212.448	15.911	-0.005	-127.583	-1813.268	-7.738
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	212.448	14.031	8.072	849.133	-1583.240	8.049
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	212.448	7.920	13.676	1537.781	-850.173	18.761
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	212.448	-0.003	15.135	1730.808	114.919	19.328
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	212.448	-7.451	12.855	1453.664	1031.614	17.640
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	212.448	-13.212	7.608	802.003	1728.864	16.364
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	212.448	-15.906	0.003	-126.740	2041.836	7.737
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	212.448	-14.029	-8.073	-1103.122	1812.228	-8.054
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	212.448	-7.918	-13.677	-1791.807	1079.262	-18.775
Dead+Wind 0 deg - Service	85.426	-0.011	-12.809	-1591.010	-29.803	-12.592
Dead+Wind 30 deg - Service	85.426	6.160	-10.671	-1341.211	-777.838	-11.564
Dead+Wind 60 deg - Service	85.426	11.225	-6.456	-821.397	-1378.124	-13.294
Dead+Wind 90 deg - Service	85.426	13.557	0.009	-46.587	-1643.906	-7.468
Dead+Wind 120 deg - Service	85.426	11.926	6.879	769.751	-1450.167	5.576
Dead+Wind 150 deg - Service	85.426	6.719	11.606	1340.442	-836.797	13.145
Dead+Wind 180 deg - Service	85.426	0.012	12.804	1493.310	-34.138	12.547

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 210 deg - Service	85.426	-6.166	10.667	1243.826	715.184	11.519
Dead+Wind 240 deg - Service	85.426	-11.218	6.463	725.821	1313.056	13.363
Dead+Wind 270 deg - Service	85.426	-13.553	-0.013	-50.782	1579.317	7.471
Dead+Wind 300 deg - Service	85.426	-11.924	-6.881	-866.829	1386.199	-5.583
Dead+Wind 330 deg - Service	85.426	-6.717	-11.607	-1437.456	772.820	-13.158

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX	PY	PZ	PX	PY	PZ	% Error
	K	K	K	K	K	K	
1	0.000	-85.426	0.000	0.000	85.426	-0.000	0.000%
2	-0.047	-102.511	-54.912	0.047	102.511	54.893	0.016%
3	-0.047	-76.883	-54.912	0.047	76.883	54.898	0.015%
4	26.365	-102.511	-45.672	-26.356	102.511	45.656	0.015%
5	26.365	-76.883	-45.672	-26.358	76.883	45.660	0.014%
6	48.143	-102.511	-27.687	-48.127	102.511	27.678	0.016%
7	48.143	-76.883	-27.687	-48.131	76.883	27.680	0.014%
8	58.247	-102.511	0.040	-58.229	102.511	-0.040	0.016%
9	58.247	-76.883	0.040	-58.234	76.883	-0.040	0.014%
10	51.268	-102.511	29.572	-51.252	102.511	-29.563	0.016%
11	51.268	-76.883	29.572	-51.256	76.883	-29.565	0.015%
12	28.857	-102.511	49.840	-28.847	102.511	-49.824	0.016%
13	28.857	-76.883	49.840	-28.850	76.883	-49.828	0.014%
14	0.054	-102.511	54.885	-0.053	102.511	-54.868	0.015%
15	0.054	-76.883	54.885	-0.054	76.883	-54.873	0.014%
16	-26.391	-102.511	45.654	26.382	102.511	-45.639	0.015%
17	-26.391	-76.883	45.654	26.384	76.883	-45.643	0.014%
18	-48.110	-102.511	27.716	48.094	102.511	-27.707	0.015%
19	-48.110	-76.883	27.716	48.098	76.883	-27.709	0.014%
20	-58.225	-102.511	-0.057	58.207	102.511	0.057	0.015%
21	-58.225	-76.883	-0.057	58.212	76.883	0.057	0.014%
22	-51.261	-102.511	-29.583	51.245	102.511	29.573	0.015%
23	-51.261	-76.883	-29.583	51.249	76.883	29.576	0.014%
24	-28.850	-102.511	-49.849	28.841	102.511	49.832	0.016%
25	-28.850	-76.883	-49.849	28.843	76.883	49.837	0.014%
26	0.000	-212.448	0.000	-0.000	212.448	-0.001	0.000%
27	0.004	-212.448	-15.149	-0.004	212.448	15.144	0.002%
28	7.451	-212.448	-12.866	-7.449	212.448	12.862	0.002%
29	13.222	-212.448	-7.605	-13.218	212.448	7.602	0.002%
30	15.915	-212.448	-0.006	-15.911	212.448	0.005	0.002%
31	14.035	-212.448	8.074	-14.031	212.448	-8.072	0.002%
32	7.922	-212.448	13.680	-7.920	212.448	-13.676	0.002%
33	-0.003	-212.448	15.144	0.003	212.448	-15.135	0.005%
34	-7.456	-212.448	12.863	7.451	212.448	-12.855	0.005%
35	-13.216	-212.448	7.610	13.212	212.448	-7.608	0.002%
36	-15.911	-212.448	0.002	15.906	212.448	-0.003	0.002%
37	-14.033	-212.448	-8.076	14.029	212.448	8.073	0.002%
38	-7.921	-212.448	-13.681	7.918	212.448	13.677	0.002%
39	-0.010	-85.426	-12.813	0.011	85.426	12.809	0.004%
40	6.162	-85.426	-10.674	-6.160	85.426	10.671	0.004%
41	11.228	-85.426	-6.458	-11.225	85.426	6.456	0.004%
42	13.561	-85.426	0.009	-13.557	85.426	-0.009	0.004%
43	11.929	-85.426	6.881	-11.926	85.426	-6.879	0.004%
44	6.721	-85.426	11.608	-6.719	85.426	-11.606	0.004%
45	0.012	-85.426	12.807	-0.012	85.426	-12.804	0.004%
46	-6.168	-85.426	10.670	6.166	85.426	-10.667	0.003%
47	-11.221	-85.426	6.465	11.218	85.426	-6.463	0.004%
48	-13.556	-85.426	-0.013	13.553	85.426	0.013	0.004%
49	-11.927	-85.426	-6.883	11.924	85.426	6.881	0.004%
50	-6.719	-85.426	-11.611	6.717	85.426	11.607	0.004%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00008069
2	Yes	4	0.00035558	0.00087875
3	Yes	4	0.00026580	0.00066454
4	Yes	4	0.00034904	0.00086324
5	Yes	4	0.00025918	0.00064862
6	Yes	4	0.00034065	0.00084244
7	Yes	4	0.00025098	0.00062772
8	Yes	4	0.00034761	0.00085884
9	Yes	4	0.00025800	0.00064448
10	Yes	4	0.00035488	0.00087593
11	Yes	4	0.00026539	0.00066242
12	Yes	4	0.00034628	0.00085403
13	Yes	4	0.00025725	0.00064199
14	Yes	4	0.00033799	0.00083265
15	Yes	4	0.00024927	0.00062201
16	Yes	4	0.00034671	0.00085319
17	Yes	4	0.00025769	0.00064283
18	Yes	4	0.00035488	0.00087279
19	Yes	4	0.00026558	0.00066178
20	Yes	4	0.00034640	0.00085259
21	Yes	4	0.00025747	0.00064153
22	Yes	4	0.00033718	0.00083136
23	Yes	4	0.00024852	0.00061992
24	Yes	4	0.00034621	0.00085484
25	Yes	4	0.00025703	0.00064193
26	Yes	4	0.00000001	0.00012706
27	Yes	5	0.00000001	0.00045207
28	Yes	5	0.00000001	0.00044216
29	Yes	5	0.00000001	0.00043205
30	Yes	5	0.00000001	0.00042438
31	Yes	5	0.00000001	0.00041406
32	Yes	5	0.00000001	0.00039888
33	Yes	4	0.00069293	0.00097748
34	Yes	4	0.00069941	0.00099070
35	Yes	5	0.00000001	0.00041213
36	Yes	5	0.00000001	0.00043240
37	Yes	5	0.00000001	0.00044720
38	Yes	5	0.00000001	0.00045443
39	Yes	4	0.00000001	0.00060476
40	Yes	4	0.00000001	0.00060421
41	Yes	4	0.00000001	0.00060528
42	Yes	4	0.00000001	0.00060734
43	Yes	4	0.00000001	0.00060235
44	Yes	4	0.00000001	0.00058334
45	Yes	4	0.00000001	0.00056039
46	Yes	4	0.00000001	0.00054998
47	Yes	4	0.00000001	0.00055990
48	Yes	4	0.00000001	0.00056968
49	Yes	4	0.00000001	0.00058010
50	Yes	4	0.00000001	0.00059495

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	212.625 - 202.458	3.334	42	0.139	0.031
T2	202.458 -	3.043	42	0.138	0.031

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
	182.292				
T3	182.292 - 162.104	2.459	42	0.132	0.030
T4	162.104 - 141.896	1.912	42	0.118	0.025
T5	141.896 - 121.688	1.424	42	0.102	0.021
T6	121.688 - 101.479	1.027	42	0.082	0.016
T7	101.479 - 81.2708	0.698	42	0.066	0.013
T8	81.2708 - 61	0.447	43	0.050	0.010
T9	61 - 40.6667	0.256	43	0.035	0.008
T10	40.6667 - 20.3333	0.121	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	3.334	0.139	0.031	343577
213.625	Lightning Rod 5/8" x 6'	42	3.334	0.139	0.031	343577
212.625	Climb Leg Extension	42	3.334	0.139	0.031	343577
208.000	Sector Mount [SM 510-3]	42	3.202	0.139	0.031	343577
199.000	Sector Mount [SM 505-3]	42	2.942	0.138	0.031	338059
189.000	Sector Mount [SM 502-3]	42	2.652	0.135	0.031	175503
183.000	Pipe Mount [PM 601-3]	42	2.479	0.133	0.030	97903
179.000	HPD2-23	42	2.366	0.130	0.030	85174
175.000	Sector Mount	42	2.256	0.128	0.029	72260
167.000	Side Arm Mount [SO 306-1]	42	2.040	0.122	0.027	55052
164.000	Side Arm Mount [SO 306-1]	42	1.961	0.120	0.026	50872
147.000	Side Arm Mount [SO 306-1]	42	1.539	0.106	0.022	50653
145.000	Side Arm Mount [SO 306-1]	42	1.493	0.105	0.021	48978
139.000	(3) Site Pro 1 VFA12-HD	42	1.362	0.099	0.020	48489
128.000	Side Arm Mount	42	1.142	0.088	0.018	68591
118.000	MX08FRO665-20 w/ Mount Pipe	42	0.962	0.079	0.016	79635
112.000	Side Lighting	42	0.861	0.074	0.015	70174
51.000	Side Arm Mount	49	0.182	0.028	0.006	85588

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	212.625 - 202.458	14.024	10	0.566	0.137
T2	202.458 - 182.292	12.814	10	0.565	0.138
T3	182.292 - 162.104	10.388	10	0.537	0.135
T4	162.104 - 141.896	8.127	10	0.480	0.113
T5	141.896 - 121.688	6.111	10	0.418	0.091
T6	121.688 - 101.479	4.434	10	0.345	0.073
T7	101.479 - 81.2708	3.028	10	0.281	0.057
T8	81.2708 - 61	1.941	10	0.213	0.045

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T9	61 - 40.6667	1.109	10	0.152	0.034
T10	40.6667 - 20.3333	0.520	22	0.091	0.023
T11	20.3333 - 0	0.174	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	14.024	0.566	0.137	78659
213.625	Lightning Rod 5/8" x 6'	10	14.024	0.566	0.137	78659
212.625	Climb Leg Extension	10	14.024	0.566	0.137	78659
208.000	Sector Mount [SM 510-3]	10	13.475	0.566	0.137	78659
199.000	Sector Mount [SM 505-3]	10	12.397	0.563	0.138	75979
189.000	Sector Mount [SM 502-3]	10	11.187	0.550	0.138	41854
183.000	Pipe Mount [PM 601-3]	10	10.471	0.538	0.135	22793
179.000	HPD2-23	10	10.004	0.529	0.132	20426
175.000	Sector Mount	10	9.545	0.518	0.128	19152
167.000	Side Arm Mount [SO 306-1]	10	8.655	0.495	0.119	17082
164.000	Side Arm Mount [SO 306-1]	10	8.330	0.486	0.116	16428
147.000	Side Arm Mount [SO 306-1]	10	6.589	0.434	0.096	13608
145.000	Side Arm Mount [SO 306-1]	10	6.399	0.428	0.094	13059
139.000	(3) Site Pro 1 VFA12-HD	10	5.850	0.408	0.089	13125
128.000	Side Arm Mount	10	4.926	0.367	0.079	17846
118.000	MX08FRO665-20 w/ Mount Pipe	10	4.157	0.332	0.070	20101
112.000	Side Lighting	10	3.724	0.314	0.065	17118
51.000	Side Arm Mount	22	0.788	0.121	0.028	19862

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	3.749	41.556	0.090	1.05	Bolt Tension
		Diagonal	A325N	0.625	3	2.584	13.806	0.187	1.05	Bolt Shear
		Horizontal	A325N	0.625	2	2.087	13.806	0.151	1.05	Bolt Shear
T3	182.292	Leg	A325N	1.000	4	11.399	54.517	0.209	1.05	Bolt Tension
		Diagonal	A325N	0.625	3	2.684	13.806	0.194	1.05	Bolt Shear
		Horizontal	A325N	0.625	2	2.578	13.806	0.187	1.05	Bolt Shear
T4	162.104	Leg	A325N	1.000	6	12.472	54.517	0.229	1.05	Bolt Tension
		Diagonal	A325N	0.625	3	2.640	13.806	0.191	1.05	Bolt Shear
		Horizontal	A325N	0.625	2	2.651	13.806	0.192	1.05	Bolt Shear
T5	141.896	Leg	A325N	1.000	6	15.574	54.517	0.286	1.05	Bolt Tension
		Diagonal	A325N	0.625	3	3.622	13.806	0.262	1.05	Bolt Shear
		Horizontal	A325N	0.625	2	3.233	13.806	0.234	1.05	Bolt Shear
T6	121.688	Leg	A325N	1.000	6	19.718	54.517	0.362	1.05	Bolt Tension
		Diagonal	A325N	0.625	3	3.680	13.806	0.267	1.05	Bolt Shear
		Horizontal	A325N	0.625	2	3.587	13.806	0.260	1.05	Bolt Shear
T7	101.479	Leg	A325N	1.000	8	18.084	54.517	0.332	1.05	Bolt Tension
		Diagonal	A325N	0.625	3	3.696	13.806	0.268	1.05	Bolt Shear
		Horizontal	A325N	0.625	2	3.821	13.806	0.277	1.05	Bolt Shear
T8	81.2708	Leg	A325N	1.000	8	21.172	54.517	0.388	1.05	Bolt Tension
		Diagonal	A325N	0.625	3	3.662	13.806	0.265	1.05	Bolt Shear
		Horizontal	A325N	0.625	2	4.009	13.806	0.290	1.05	Bolt Shear
T9	61	Leg	A325N	1.000	8	24.123	54.517	0.442	1.05	Bolt Tension
		Diagonal	A325N	0.625	3	3.926	13.806	0.284	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	4.517	13.806	0.327	1.05	Bolt Shear
T10	40.6667	Leg	A325N	1.000	8	25.290	54.517	0.464	1.05	Bolt Tension
		Diagonal	A325N	0.750	3	5.511	19.880	0.277	1.05	Bolt Shear
		Horizontal	A325N	0.750	2	4.486	19.880	0.226	1.05	Bolt Shear
		Redund Horz 1 Bracing	A325N	0.625	1	4.434	12.110	0.366	1.05	Member Bearing
		Redund Diag 1 Bracing	A325N	0.625	1	4.096	12.862	0.318	1.05	Member Bearing
T11	20.3333	Diagonal	A325N	0.750	3	6.252	19.880	0.314	1.05	Bolt Shear
		Horizontal	A325N	0.750	2	5.314	19.880	0.267	1.05	Bolt Shear
		Redund Horz 1 Bracing	A325N	0.625	1	4.874	12.110	0.402	1.05	Member Bearing
		Redund Diag 1 Bracing	A325N	0.625	1	4.210	12.862	0.327	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	-23.299	93.888	0.248 [1]
T3	182.292 - 162.104	ROHN 4 EH	20.223	6.741	54.8 K=1.00	4.407	-68.036	159.259	0.427 [1]
T4	162.104 - 141.896	ROHN 5 EH	20.244	6.748	44.0 K=1.00	6.112	-99.039	238.686	0.415 [1]
T5	141.896 - 121.688	ROHN 6 EHS	20.250	10.125	54.6 K=1.00	6.713	-125.749	242.933	0.518 [1]
T6	121.688 - 101.479	ROHN 6 EH	20.260	10.130	55.4 K=1.00	8.405	-157.311	302.237	0.520 [1]
T7	101.479 - 81.2708	ROHN 6 EH	20.260	10.130	55.4 K=1.00	8.405	-187.128	302.237	0.619 [1]
T8	81.2708 - 61	ROHN 8 EHS	20.328	10.164	41.8 K=1.00	9.719	-215.333	384.981	0.559 [1]
T9	61 - 40.6667	ROHN 8 EHS	20.384	10.192	41.9 K=1.00	9.719	-242.768	384.707	0.631 [1]
T10	40.6667 - 20.3333	ROHN 8 EH	20.391	10.196	42.5 K=1.00	12.763	-255.464	503.236	0.508 [1]
T11	20.3333 - 0	ROHN 8 EH	20.373	10.187	42.5 K=1.00	12.763	-280.959	503.352	0.558 [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	-7.751	17.541	0.442 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T3	182.292 - 162.104	ROHN 2 STD	8.602	8.301	126.5 K=1.00	1.075	-8.052	15.159	0.531 [1]
T4	162.104 - 141.896	ROHN 2 STD	9.291	8.954	136.5 K=1.00	1.075	-7.629	13.026	0.586 [1]
T5	141.896 - 121.688	ROHN 2.5 STD	12.600	12.138	153.7 K=1.00	1.704	-10.865	16.287	0.667 [1]
T6	121.688 - 101.479	ROHN 2.5 STD	13.385	12.964	164.2 K=1.00	1.704	-11.041	14.278	0.773 [1]
T7	101.479 - 81.2708	ROHN 3 STD	14.235	13.843	142.8 K=1.00	2.228	-11.087	24.700	0.449 [1]
T8	81.2708 - 61	ROHN 3 STD	15.213	14.731	151.9 K=1.00	2.228	-10.985	21.813	0.504 [1]
T9	61 - 40.6667	ROHN 3 STD	16.185	15.723	162.2 K=1.00	2.228	-11.777	19.146	0.615 [1]
T10	40.6667 - 20.3333	ROHN 3 STD	24.652	12.326	127.1 K=1.00	2.228	-16.532	31.156	0.531 [1]
T11	20.3333 - 0	ROHN 3 STD	25.288	12.644	130.4 K=1.00	2.228	-18.756	29.608	0.633 [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	-1.845	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	-4.136	22.520	0.184 [1]
T3	182.292 - 162.104	ROHN 1.5 STD	10.014	4.819	92.9 K=1.00	0.799	-5.156	19.143	0.269 [1]
T4	162.104 - 141.896	ROHN 2 STD	12.097	5.817	88.7 K=1.00	1.075	-5.302	27.209	0.195 [1]
T5	141.896 - 121.688	ROHN 2 STD	13.917	6.682	101.9 K=1.00	1.075	-6.443	22.640	0.285 [1]
T6	121.688 - 101.479	ROHN 2 STD	16.292	7.870	120.0 K=1.00	1.075	-7.175	16.864	0.425 [1]
T7	101.479 - 81.2708	ROHN 2.5 STD	18.792	9.120	115.5 K=1.00	1.704	-7.640	28.852	0.265 [1]
T8	81.2708 - 61	ROHN 2.5 STD	21.359	10.320	130.7 K=1.00	1.704	-7.936	22.530	0.352 [1]
T9	61 - 40.6667	ROHN 2.5 STD	23.927	11.604	147.0 K=1.00	1.704	-8.810	17.820	0.494 [1]
T10	40.6667 - 20.3333	ROHN 3 STD	25.177	12.229	126.1 K=1.00	2.228	-8.971	31.651	0.283 [1]
T11	20.3333 - 0	ROHN 3 STD	27.833	13.557	139.8 K=1.00	2.228	-10.576	25.753	0.411 [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 $\frac{P_u}{\phi P_n}$
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	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	
T10	40.6667 - 20.3333	ROHN 1.5 STD	6.294	5.935	114.4 K=1.00	0.799	-4.434	13.007	0.341 [1]
T11	20.3333 - 0	ROHN 1.5 STD	6.958	6.599	127.2 K=1.00	0.799	-4.874	11.053	0.441 [1]

[1] P_u / ϕP_n controls

Redundant Diagonal (1) 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	
T10	40.6667 - 20.3333	ROHN 2 STD	11.628	10.887	166.0 K=1.00	1.075	-4.096	8.811	0.465 [1]
T11	20.3333 - 0	ROHN 2 STD	12.021	11.347	173.0 K=1.00	1.075	-4.210	8.111	0.519 [1]

[1] P_u / ϕP_n controls

Redundant Hip (1) 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	
T10	40.6667 - 20.3333	ROHN 1.5 STD	6.294	6.294	121.3 K=1.00	0.799	-0.043	11.936	0.004 [1]
T11	20.3333 - 0	ROHN 1.5 STD	6.958	6.958	134.1 K=1.00	0.799	-0.044	10.041	0.004 [1]

[1] P_u / ϕP_n controls

Redundant Hip Diagonal (1) 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	
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]

[1] P_u / ϕP_n controls

Inner Bracing Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
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	-0.017	24.440	0.001 [1]

[1] P_u / ϕP_n controls

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u 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	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	14.997	135.717	0.111 [1]
T3	182.292 - 162.104	ROHN 4 EH	20.223	6.741	54.8	4.407	45.597	198.335	0.230 [1]
T4	162.104 - 141.896	ROHN 5 EH	20.244	6.748	44.0	6.112	74.830	275.039	0.272 [1]
T5	141.896 - 121.688	ROHN 6 EHS	20.250	10.125	54.6	6.713	93.445	302.097	0.309 [1]
T6	121.688 - 101.479	ROHN 6 EH	20.260	10.130	55.4	8.405	118.308	378.222	0.313 [1]
T7	101.479 - 81.2708	ROHN 6 EH	20.260	10.130	55.4	8.405	144.672	378.222	0.383 [1]
T8	81.2708 - 61	ROHN 8 EHS	20.328	10.164	41.8	9.719	169.376	437.369	0.387 [1]
T9	61 - 40.6667	ROHN 8 EHS	20.384	10.192	41.9	9.719	192.984	437.369	0.441 [1]
T10	40.6667 - 20.3333	ROHN 8 EH	20.391	10.196	42.5	12.763	202.762	574.322	0.353 [1]
T11	20.3333 - 0	ROHN 8 EH	20.373	10.187	42.5	12.763	223.518	574.322	0.389 [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	7.677	48.354	0.159 [1]
T3	182.292 - 162.104	ROHN 2 STD	8.602	8.301	126.5	1.075	7.962	48.354	0.165 [1]
T4	162.104 - 141.896	ROHN 2 STD	8.827	8.491	129.4	1.075	7.814	48.354	0.162 [1]
T5	141.896 - 121.688	ROHN 2.5 STD	12.600	12.138	153.7	1.704	10.684	76.682	0.139 [1]
T6	121.688 - 101.479	ROHN 2.5 STD	13.385	12.964	164.2	1.704	10.813	76.682	0.141 [1]
T7	101.479 - 81.2708	ROHN 3 STD	13.802	13.410	138.3	2.228	10.746	100.281	0.107 [1]
T8	81.2708 - 61	ROHN 3 STD	15.213	14.731	151.9	2.228	10.518	100.281	0.105 [1]
T9	61 - 40.6667	ROHN 3 STD	16.185	15.723	162.2	2.228	11.257	100.281	0.112 [1]
T10	40.6667 - 20.3333	ROHN 3 STD	24.652	12.326	127.1	2.228	15.634	100.281	0.156 [1]
T11	20.3333 - 0	ROHN 3 STD	25.288	12.644	130.4	2.228	17.884	100.281	0.178 [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	4.174	35.976	0.116 [1]
T3	182.292 - 162.104	ROHN 1.5 STD	10.014	4.819	92.9	0.799	4.863	35.976	0.135 [1]
T4	162.104 - 141.896	ROHN 2 STD	11.403	5.470	83.4	1.075	5.188	48.354	0.107 [1]
T5	141.896 - 121.688	ROHN 2 STD	13.917	6.682	101.9	1.075	6.465	48.354	0.134 [1]
T6	121.688 - 101.479	ROHN 2 STD	16.292	7.870	120.0	1.075	7.096	48.354	0.147 [1]
T7	101.479 - 81.2708	ROHN 2.5 STD	18.792	9.120	115.5	1.704	7.642	76.682	0.100 [1]
T8	81.2708 - 61	ROHN 2.5 STD	21.359	10.320	130.7	1.704	8.018	76.682	0.105 [1]
T9	61 - 40.6667	ROHN 2.5 STD	23.927	11.604	147.0	1.704	9.034	76.682	0.118 [1]
T10	40.6667 - 20.3333	ROHN 3 STD	25.177	12.229	126.1	2.228	8.654	100.281	0.086 [1]
T11	20.3333 - 0	ROHN 3 STD	27.833	13.557	139.8	2.228	10.628	100.281	0.106 [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 / ϕP_n controls

Redundant Horizontal (1) Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u 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	4.434	25.902	0.171 [1]
T11	20.3333 - 0	ROHN 1.5 STD	6.958	6.599	127.2	0.799	4.874	25.902	0.188 [1]

[1] P_u / ϕP_n controls

Redundant Diagonal (1) Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u 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	4.096	34.815	0.118 [1]
T11	20.3333 - 0	ROHN 2 STD	12.021	11.347	173.0	1.075	4.210	34.815	0.121 [1]

[1] P_u / ϕP_n controls

Redundant Hip Diagonal (1) Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u 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	0.084	55.211	0.002 [1]
T11	20.3333 - 0	ROHN 2.5 STD	16.022	16.022	202.9	1.704	0.087	55.211	0.002 [1]

[1] P_u / ϕP_n controls

Inner Bracing Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u 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]
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 -	ROHN 3 STD	12.589	12.589	129.8	2.228	0.000	100.281	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 $\frac{P_u}{\phi P_n}$
	20.3333								
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

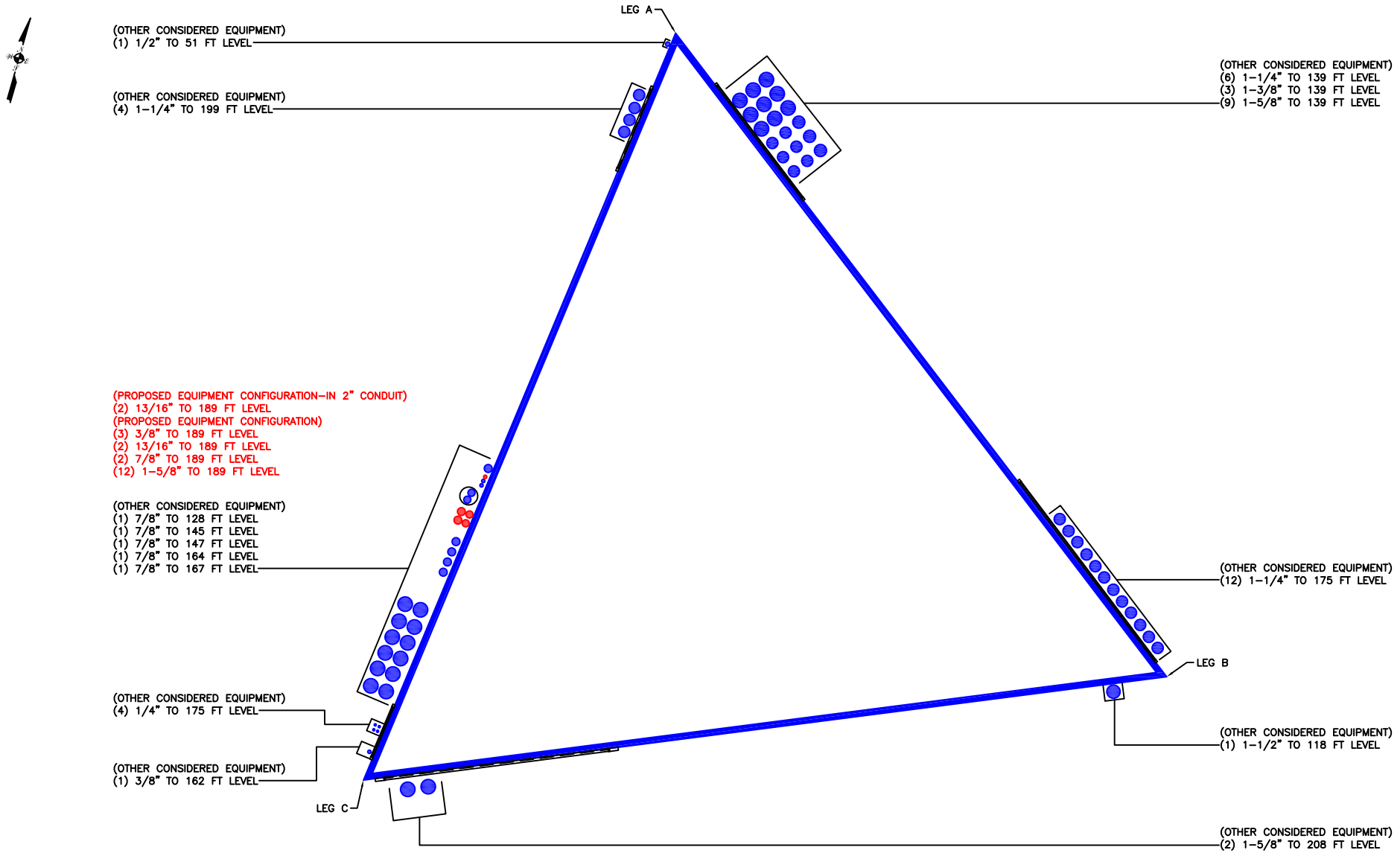
Section Capacity Table

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	-23.299	98.582	23.6	Pass
T3	182.292 - 162.104	Leg	ROHN 4 EH	69	-68.036	167.222	40.7	Pass
T4	162.104 - 141.896	Leg	ROHN 5 EH	107	-99.039	250.620	39.5	Pass
T5	141.896 - 121.688	Leg	ROHN 6 EHS	146	-125.749	255.080	49.3	Pass
T6	121.688 - 101.479	Leg	ROHN 6 EH	173	-157.311	317.349	49.6	Pass
T7	101.479 - 81.2708	Leg	ROHN 6 EH	200	-187.128	317.349	59.0	Pass
T8	81.2708 - 61	Leg	ROHN 8 EHS	227	-215.333	404.230	53.3	Pass
T9	61 - 40.6667	Leg	ROHN 8 EHS	254	-242.768	403.942	60.1	Pass
T10	40.6667 - 20.3333	Leg	ROHN 8 EH	281	-255.464	528.398	48.3	Pass
T11	20.3333 - 0	Leg	ROHN 8 EH	314	-280.959	528.520	53.2	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	-7.751	18.418	42.1	Pass
T3	182.292 - 162.104	Diagonal	ROHN 2 STD	78	-8.052	15.917	50.6	Pass
T4	162.104 - 141.896	Diagonal	ROHN 2 STD	110	-7.629	13.677	55.8	Pass
T5	141.896 - 121.688	Diagonal	ROHN 2.5 STD	149	-10.865	17.101	63.5	Pass
T6	121.688 - 101.479	Diagonal	ROHN 2.5 STD	183	-11.041	14.992	73.6	Pass
T7	101.479 - 81.2708	Diagonal	ROHN 3 STD	210	-11.087	25.935	42.8	Pass
T8	81.2708 - 61	Diagonal	ROHN 3 STD	237	-10.985	22.903	48.0	Pass
T9	61 - 40.6667	Diagonal	ROHN 3 STD	264	-11.777	20.104	58.6	Pass
T10	40.6667 - 20.3333	Diagonal	ROHN 3 STD	303	-16.532	32.714	50.5	Pass
T11	20.3333 - 0	Diagonal	ROHN 3 STD	336	-18.756	31.089	60.3	Pass
T1	212.625 - 202.458	Horizontal	ROHN 1.5 STD	10	-1.845	23.711	7.8	Pass
T2	202.458 - 182.292	Horizontal	ROHN 1.5 STD	37	-4.136	23.646	17.5	Pass
T3	182.292 - 162.104	Horizontal	ROHN 1.5 STD	76	-5.156	20.100	25.7	Pass
T4	162.104 - 141.896	Horizontal	ROHN 2 STD	109	-5.302	28.570	18.6	Pass
T5	141.896 - 121.688	Horizontal	ROHN 2 STD	154	-6.443	23.772	27.1	Pass
T6	121.688 - 101.479	Horizontal	ROHN 2 STD	181	-7.175	17.707	40.5	Pass
T7	101.479 - 81.2708	Horizontal	ROHN 2.5 STD	208	-7.640	30.294	25.2	Pass
T8	81.2708 - 61	Horizontal	ROHN 2.5 STD	235	-7.936	23.656	33.5	Pass
T9	61 - 40.6667	Horizontal	ROHN 2.5 STD	262	-8.810	18.711	47.1	Pass
T10	40.6667 -	Horizontal	ROHN 3 STD	299	-8.971	33.233	27.0	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
	20.3333							
T11	20.3333 - 0	Horizontal	ROHN 3 STD	332	-10.576	27.041	39.1	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	-4.434	13.657	32.5	Pass
T11	20.3333 - 0	Redund Horz 1 Bracing	ROHN 1.5 STD	321	-4.874	11.606	42.0	Pass
T10	40.6667 - 20.3333	Redund Diag 1 Bracing	ROHN 2 STD	289	-4.096	9.252	44.3	Pass
T11	20.3333 - 0	Redund Diag 1 Bracing	ROHN 2 STD	322	-4.210	8.517	49.4	Pass
T10	40.6667 - 20.3333	Redund Hip 1 Bracing	ROHN 1.5 STD	306	-0.043	12.533	0.3	Pass
T11	20.3333 - 0	Redund Hip 1 Bracing	ROHN 1.5 STD	339	-0.044	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	42	-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)	60.1	Pass
						Diagonal (T6)	73.6	Pass
						Horizontal (T9)	47.1	Pass
						Top Girt (T1)	0.9	Pass
						Redund Horz 1 Bracing (T11)	42.0	Pass
						Redund Diag 1 Bracing (T11)	49.4	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	44.2	Pass
						RATING =	**73.6**	**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
(PROPOSED EQUIPMENT CONFIGURATION-IN 2" CONDUIT)
(2) 13/16" TO 189 FT LEVEL
(PROPOSED EQUIPMENT CONFIGURATION)
(3) 3/8" TO 189 FT LEVEL
(2) 13/16" TO 189 FT LEVEL
(2) 7/8" 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
(OTHER CONSIDERED EQUIPMENT)
(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

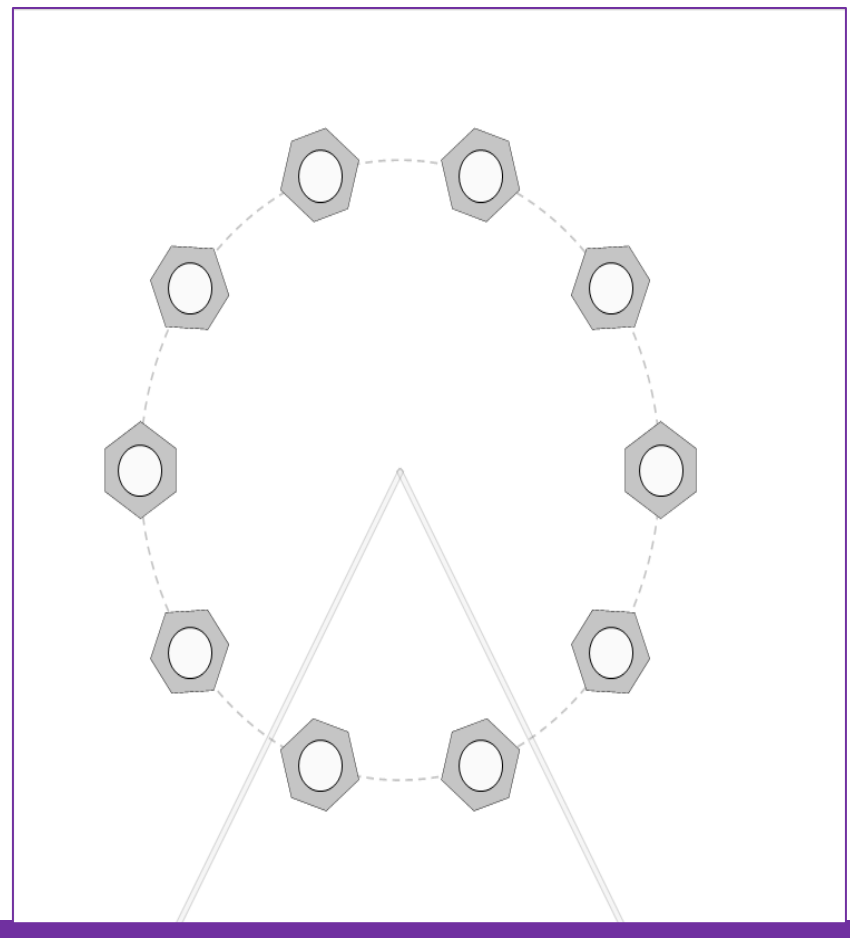
Analysis Considerations	
TIA-222 Revision	H
Grout Considered:	Yes
l_{ar} (in)	1.25

Applied Loads		
	Comp.	Uplift
Axial Force (kips)	308.70	248.23
Shear Force (kips)	35.90	31.87

**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 = 24.82	ϕPn_t = 56.81	**Stress Rating**
Vu = 3.19	ϕVn = 36.82	**41.6%**
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**:	7142.74	ft-kips
Global Axial, **P**:	102.51	kips
Global Shear, **V**:	59.17	kips
Leg Compression, $\mathbf{P_{comp}}$:	308.7	kips
Leg Comp. Shear, $\mathbf{V_{u\_comp}}$:	35.9	kips
Leg Uplift, $\mathbf{P_{uplift}}$:	248.23	kips
Leg Uplift. Shear, $\mathbf{V_{u\_uplift}}$:	31.87	kips
Tower Height, **H**:	212.62	ft
Base Face Width, **BW**:	30.04	ft
BP Dist. Above Fdn, $\mathbf{bp_{dist}}$:	3	in
Anchor Bolt Circle, **BC**:	12	in

Foundation Analysis Checks	Capacity	Demand	Rating*	Check
Lateral (Sliding) (kips)	336.30	59.17	**16.8%**	**Pass**
Bearing Pressure (ksf)	6.00	1.28	**20.3%**	**Pass**
*Overturning (kip*ft)*	17580.18	7423.80	**42.2%**	**Pass**
*Pad Flexure (kip*ft)*	7259.23	1501.57	**19.7%**	**Pass**
Pad Shear - 1-way (kips)	1971.72	172.74	**8.3%**	**Pass**
Pad Shear - Comp 2-way (ksi)	0.164	0.032	**18.3%**	**Pass**
*Flexural 2-way (Comp) (kip*ft)*	3668.31	0.00	**0.0%**	**Pass**
Pad Shear - Tension 2-way (ksi)	0.164	0.025	**14.7%**	**Pass**
*Flexural 2-way (Tension) (kip*ft)*	3668.31	0.00	**0.0%**	**Pass**

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

Structural Rating*:	**19.7%**
Soil Rating*:	**42.2%**

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

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

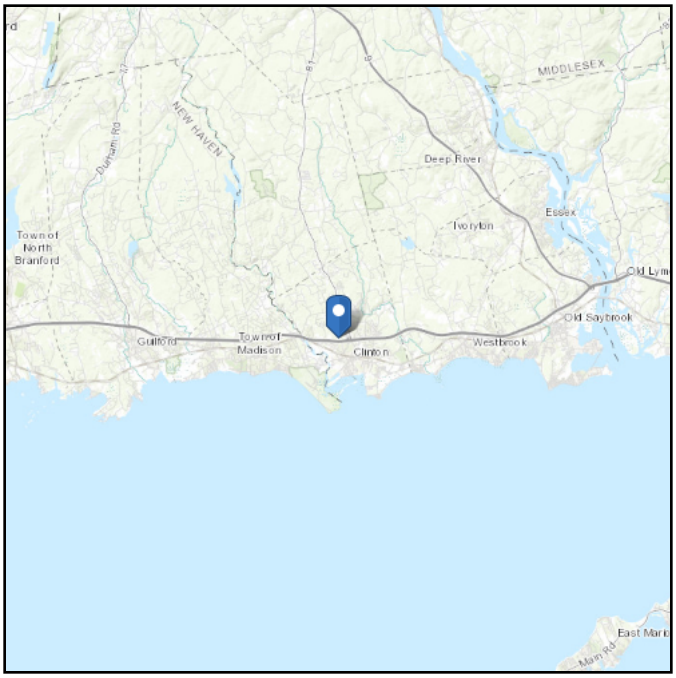
Soil Properties		
Total Soil Unit Weight, γ:	120	pcf
Ultimate Gross Bearing, Qult:	8.000	ksf
Cohesion, **Cu**:	0.000	ksf
Friction Angle, φ:	35	degrees
SPT Blow Count, $\mathbf{N_{blows}}$:	11	
Base Friction, μ:		
Neglected Depth, **N**:	3.5	ft
Foundation Bearing on Rock?	No	
Groundwater Depth, **gw**: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

<-- Toggle between Gross and Net

ASCE 7 Hazards Report

Address:
No Address at This Location

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

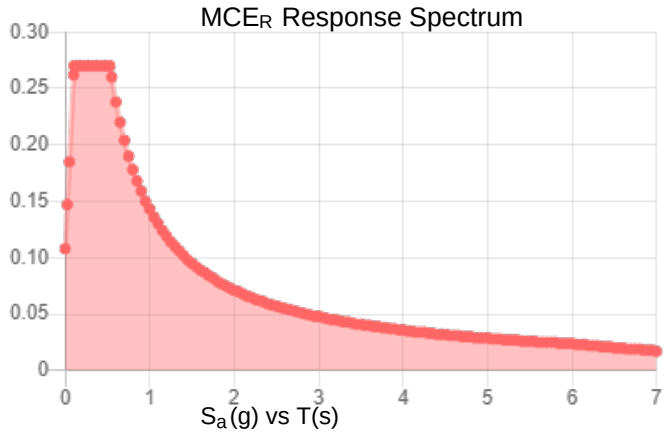
Seismic

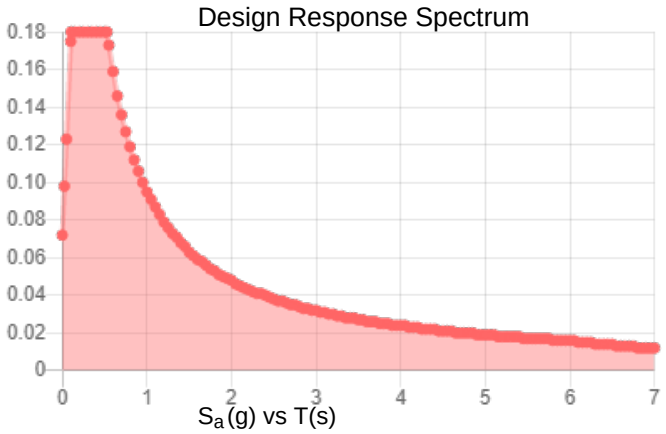
Site Soil Class: D - Stiff Soil

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.

AT&T

575 MOROSGO DRIVE
ATLANTA, GA 30324-3300

CROWN CASTLE
3 CORPORATE PARK DRIVE, SUITE 101
CLIFTON PARK, NY 12065

B+T GRP
1717 S. BOULDER
SUITE 300
TULSA, OK 74119
PH: (918) 587-4630
www.btgrp.com

AT&T SITE NUMBER: CTL02024
AT&T SITE NAME: CLINTON
AT&T FA CODE: 10035028
AT&T PACE NUMBER: MRCTB052688, MRCTB052731, MRCTB052724, MRCTB052715, MRCTB052720
AT&T PROJECT: 5G NR 1DR-1, BWE TOWER TOP RRU SWAP, LTE 6C, 4TX4RX, LTE 5C

BUSINESS UNIT #: 806363
SITE ADDRESS: 48 COW HILL ROAD, CLINTON, CT 06413
COUNTY: MIDDLESEX
SITE TYPE: SELF-SUPPORT TOWER
TOWER HEIGHT: 212'-0"

SITE INFORMATION

CROWN CASTLE USA INC. SITE NAME:	HRT 105 943201
SITE ADDRESS:	48 COW HILL ROAD CLINTON, CT 06413
COUNTY:	MIDDLESEX
MAP/PARCEL #:	32/6/48
AREA OF CONSTRUCTION:	EXISTING
LATITUDE:	41.288944°
LONGITUDE:	-72.538472°
LAT/LONG TYPE:	NAD83
GROUND ELEVATION:	27'-0"
CURRENT ZONING:	I-P (INDUSTRIAL PARK DISTRICT)
JURISDICTION:	CONNECTICUT SITING COUNCIL
OCCUPANCY CLASSIFICATION:	U
TYPE OF CONSTRUCTION:	IIB
A.D.A. COMPLIANCE:	FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION
PROPERTY OWNER:	HESER RAYMOND E TRUSTEE 110 KILLINGWORTH TPKE CLINTON, CT 06413
TOWER OWNER:	CROWN CASTLE USA INC 2000 CORPORATE DRIVE CANONSBURG, PA 15317
CARRIER/APPLICANT:	AT&T TOWER ASSET GROUP 575 MOROSGO DRIVE ATLANTA, GA 30324-3300
ELECTRIC PROVIDER:	NORTHEAST UTILITIES (800) 286-5000
TELCO PROVIDER:	LIGHTOWER (855) 91-FIBER

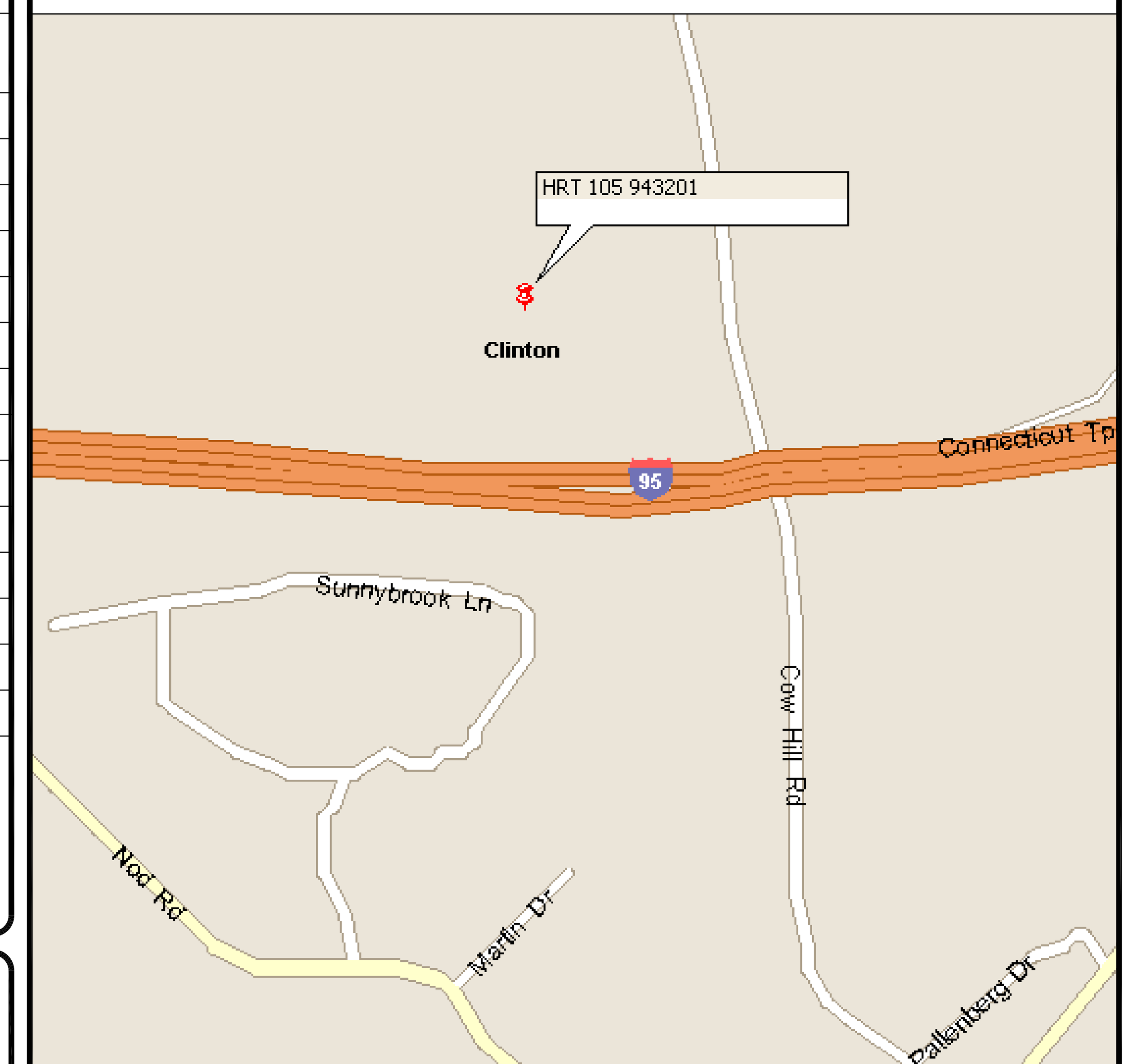
DRAWING INDEX

SHEET #	SHEET DESCRIPTION
T-1	TITLE SHEET
T-2	GENERAL NOTES
C-1.1	SITE PLAN
C-1.2	EXISTING & FINAL EQUIPMENT PLANS
C-2	FINAL ELEVATION & ANTENNA PLANS
C-3	FINAL EQUIPMENT SCHEDULE
C-4	EQUIPMENT MOUNTING DETAILS
C-5	EQUIPMENT SPECS
G-1	GROUNDING SCHEMATIC
G-2	GROUNDING DETAILS
ATTACHED	PLUMBING DIAGRAM
ATTACHED	MOUNT SPECS

ALL DRAWINGS CONTAINED HEREIN ARE FORMATTED FOR FULL SIZE. CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE ENGINEER IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.

CALL CONNECTICUT ONE CALL
(800) 922-4455 CBYD.COM
CALL 2 WORKING DAYS
BEFORE YOU DIG!

LOCATION MAP



NO SCALE

SITE PHOTO

AT&T SITE NUMBER: **CTL02024**

BU #: **806363**
HRT 105 943201

48 COW HILL ROAD
CLINTON, CT 06413

EXISTING
212'-0" SELF-SUPPORT TOWER

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
A	3/16/22	JHW	PRELIMINARY REVIEW	KT
B	3/31/22	JHW	PRELIMINARY REVIEW	KT
0	4/25/22	JHW	CONSTRUCTION	KT

PROJECT TEAM

A&E FIRM:	B+T GROUP 1717 S. BOULDER AVE. TULSA, OK 74119 MARVIN PHILLIPS marvin.phillips@btgrp.com
CROWN CASTLE USA INC. DISTRICT CONTACTS:	3 CORPORATE PARK DRIVE, SUITE 101 CLIFTON PARK, NY 12065 VERONICA CHAPMAN - PROJECT MANAGER VERONICA.CHAPMAN@BTGRP.COM JASON D'AMICO - CONSTRUCTION MANAGER JASON.DAMICO@CROWNCASTLE.COM

NOTE:
PRIOR TO ACCESSING/ENTERING THE SITE YOU MUST CONTACT THE CROWN NOC AT (800) 788-7011 & CROWN CONSTRUCTION MANAGER.

PROJECT DESCRIPTION

THE PURPOSE OF THIS PROJECT IS TO ENHANCE BROADBAND CONNECTIVITY AND CAPACITY TO THE EXISTING ELIGIBLE WIRELESS FACILITY.

TOWER SCOPE OF WORK:
- REMOVE (6) ANDREW - SBNHH-1D65A ANTENNAS
- REMOVE (3) ERICSSON - RRUS-11 B12 RRUS
- REMOVE (3) ERICSSON - RRUS-32 B2 RRUS
- REMOVE (3) SECTOR MOUNTS
- INSTALL (3) SITEPRO 1 - VFA14-WLL-30120 SECTOR MOUNTS PER MOUNT REPLACEMENT ANALYSIS BY B+T GROUP DATED 2/16/22
- INSTALL (3) CCI - OPA65R-BU4DA ANTENNAS
- INSTALL (3) CCI - DMP65R-BU4DA ANTENNAS
- INSTALL (1) RAYCAP - DC6-48-60-18-8F SQUID
- INSTALL (3) ERICSSON - 4478 B14 RRUS
- INSTALL (3) ERICSSON - 4449 B5/B12 RRUS
- INSTALL (3) ERICSSON - RRUS 4415 B25 RRUS
- INSTALL (1) 3/8" 18-PAIR FIBER CABLE
- INSTALL (2) 7/8" 6AWG DC CABLES
- INSTALL (6) ERICSSON - SXK 107 2839 BACK TO BACK MOUNTS
- INSTALL (6) 2-3/8" O.D. (SCH 40) X 6'-0" LONG GALV. PIPES W/ASSOCIATED HARDWARE

GROUND SCOPE OF WORK:
- REMOVE (1) LEGACY POWER PLANT
- REMOVE (6) KATHREIN - 782 10250 DIPLEXERS
- INSTALL (1) 6630(+IDLE)
- INSTALL (3) ERICSSON - 2012 B29 RRUS
- INSTALL (6) COMMSCOPE - APTDC-BDFDM-DB SURGE ARRESTORS
- INSTALL (1) RAYCAP - DC12-48-60-RM JUNCTION BOX
- INSTALL (2) EMERSON RECTIFIERS IN EXISTING POWER PLANT

NOTE:
THE POWER DESIGN FOR ANY AC ELECTRICAL POWER CHANGES IS TO BE PERFORMED BY OTHERS AND IS SHOWN HERE FOR REFERENCE PURPOSES ONLY. AT&T IS SOLELY RESPONSIBLE FOR THE ELECTRICAL POWER DESIGN.

APPLICABLE CODES/ REFERENCE DOCUMENTS

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 CONNECTICUT SBC/2015 IBC
MECHANICAL	2018 CONNECTICUT SBC/2015 IMC
ELECTRICAL	2018 CONNECTICUT SBC/2017 NEC

REFERENCE DOCUMENTS:

STRUCTURAL ANALYSIS:	CROWN CASTLE
DATED:	2/23/22
MOUNT ANALYSIS:	B+T GROUP
DATED:	2/16/22
AC ELECTRICAL POWER DESIGN:	N/A
DATED:	
RFDS REVISION:	PRELIMINARY
DATED:	12/31/21
ORDER ID:	576131
REVISION:	0

B&T ENGINEERING, INC.
PEC.0001564
Expires 2/10/23

SHEET NUMBER: T-1
REVISION: 0

100083.006.01_HRT 105 943201.dwg — Sheet:T-1 — User: kevin.turkall — Apr 25, 2022 — 6:46pm

CROWN CASTLE USA INC. SITE ACTIVITY REQUIREMENTS:

1. NOTICE TO PROCEED– NO WORK SHALL COMMENCE PRIOR TO CROWN CASTLE USA INC. WRITTEN NOTICE TO PROCEED (NTP) AND THE ISSUANCE OF A PURCHASE ORDER. PRIOR TO ACCESSING/ENTERING THE SITE YOU MUST CONTACT THE CROWN CASTLE USA INC. NOC AT 800–788–7011 & THE CROWN CASTLE USA INC. CONSTRUCTION MANAGER.
2. "LOOK UP" – CROWN CASTLE USA INC. 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 CROWN CASTLE USA INC. 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 CROWN CASTLE USA INC. STANDARD CED–STD–10253, 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 QAS–STD–10068 "INSTALLATION STANDARDS FOR CONSTRUCTION ACTIVITIES ON CROWN CASTLE USA INC. TOWER SITE," CED–STD–10294 "STANDARD FOR INSTALLATION OF MOUNTS AND APPURTENANCES," 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 CROWN CASTLE USA INC. 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 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 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 CONTRACTOR, TOWER OWNER, CROWN CASTLE USA INC., 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 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: AT&T
TOWER OWNER: CROWN CASTLE USA INC.
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 CROWN CASTLE.
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 CROWN CASTLE PRIOR TO PROCEEDING WITH ANY SUCH CHANGE OF INSTALLATION.
11. CONTRACTOR IS TO PERFORM A SITE INVESTIGATION AND IS 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 CROWN CASTLE USA INC.
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.

CONCRETE, FOUNDATIONS, AND REINFORCING STEEL:

1. ALL CONCRETE WORK SHALL BE IN ACCORDANCE WITH THE ACI 301, ACI 318, ACI 336, ASTM A184, ASTM A185 AND THE DESIGN AND CONSTRUCTION SPECIFICATION FOR CAST–IN–PLACE CONCRETE.
2. UNLESS NOTED OTHERWISE, SOIL BEARING PRESSURE USED FOR DESIGN OF SLABS AND FOUNDATIONS IS ASSUMED TO BE 1000 psf.
3. ALL CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH (f'c) OF 3000 psi AT 28 DAYS, UNLESS NOTED OTHERWISE. NO MORE THAN 90 MINUTES SHALL ELAPSE FROM BATCH TIME TO TIME OF PLACEMENT UNLESS APPROVED BY THE ENGINEER OF RECORD. TEMPERATURE OF CONCRETE SHALL NOT EXCEED 90°F AT TIME OF PLACEMENT.
4. CONCRETE EXPOSED TO FREEZE–THAW CYCLES SHALL CONTAIN AIR ENTRAINING ADMIXTURES. AMOUNT OF AIR ENTRAINMENT TO BE BASED ON SIZE OF AGGREGATE AND F3 CLASS EXPOSURE (VERY SEVERE). CEMENT USED TO BE TYPE II PORTLAND CEMENT WITH A MAXIMUM WATER–TO–CEMENT RATIO (W/C) OF 0.45.
5. ALL STEEL REINFORCING SHALL CONFORM TO ASTM A615. ALL WELDED WIRE FABRIC (WWF) SHALL CONFORM TO ASTM A185. ALL SPLICES SHALL BE CLASS "B" TENSION SPLICES, UNLESS NOTED OTHERWISE. ALL HOOKS SHALL BE STANDARD 90 DEGREE HOOKS, UNLESS NOTED OTHERWISE. YIELD STRENGTH (Fy) OF STANDARD DEFORMED BARS ARE AS FOLLOWS:
#4 BARS AND SMALLER..40 ksi
#5 BARS AND LARGER..60 ksi
6. THE FOLLOWING MINIMUM CONCRETE COVER SHALL BE PROVIDED FOR REINFORCING STEEL UNLESS SHOWN OTHERWISE ON DRAWINGS:
CONCRETE CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH........................3"
CONCRETE EXPOSED TO EARTH OR WEATHER:
#6 BARS AND LARGER..2"
#5 BARS AND SMALLER...1–1/2"
CONCRETE NOT EXPOSED TO EARTH OR WEATHER:
SLAB AND WALLS..3/4"
BEAMS AND COLUMNS..1–1/2"
7. A TOOLED EDGE OR A 3/4" CHAMFER SHALL BE PROVIDED AT ALL EXPOSED EDGES OF CONCRETE, UNLESS NOTED OTHERWISE, IN ACCORDANCE WITH ACI 301 SECTION 4.2.4.

ELECTRICAL INSTALLATION NOTES:

1. ALL ELECTRICAL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS, NEC AND ALL APPLICABLE FEDERAL, STATE, AND LOCAL CODES/ORDINANCES.
2. CONDUIT ROUTINGS ARE SCHEMATIC. CONTRACTOR SHALL INSTALL CONDUITS SO THAT ACCESS TO EQUIPMENT IS NOT BLOCKED AND TRIP HAZARDS ARE ELIMINATED.
3. WIRING, RACEWAY AND SUPPORT METHODS AND MATERIALS SHALL COMPLY WITH THE REQUIREMENTS OF THE NEC.
4. ALL CIRCUITS SHALL BE SEGREGATED AND MAINTAIN MINIMUM CABLE SEPARATION AS REQUIRED BY THE NEC.
4.1. ALL EQUIPMENT SHALL BEAR THE UNDERWRITERS LABORATORIES LABEL OF APPROVAL, AND SHALL CONFORM TO REQUIREMENT OF THE NATIONAL ELECTRICAL CODE.
4.2. ALL OVERCURRENT DEVICES SHALL HAVE AN INTERRUPTING CURRENT RATING THAT SHALL BE GREATER THAN THE SHORT CIRCUIT CURRENT TO WHICH THEY ARE SUBJECTED, 22,000 AIC MINIMUM. VERYIFY AVAILABLE SHORT CIRCUIT CURRENT DOES NOT EXCEED THE RATING OF ELECTRICAL EQUIPMENT IN ACCORDANCE WITH ARTICLE 110.24 NEC OR THE MOST CURRENT ADOPTED CODE PRE THE GOVERNING JURISDICTION.
5. EACH END OF EVERY POWER PHASE CONDUCTOR, GROUNDING CONDUCTOR, AND TELCO CONDUCTOR OR CABLE SHALL BE LABELED WITH COLOR–CODED INSULATION OR ELECTRICAL TAPE (3M BRAND, 1/2" PLASTIC ELECTRICAL TAPE WITH UV PROTECTION, OR EQUAL). THE IDENTIFICATION METHOD SHALL CONFORM WITH NEC AND OSHA.
6. ALL ELECTRICAL COMPONENTS SHALL BE CLEARLY LABELED WITH LAMICOID TAGS SHOWING THEIR RATED VOLTAGE, PHASE CONFIGURATION, WIRE CONFIGURATION, POWER OR AMPACITY RATING AND BRANCH CIRCUIT ID NUMBERS (i.e. PANEL BOARD AND CIRCUIT ID'S).
7. PANEL BOARDS (ID NUMBERS) SHALL BE CLEARLY LABELED WITH PLASTIC LABELS.
8. ALL TIE WRAPS SHALL BE CUT FLUSH WITH APPROVED CUTTING TOOL TO REMOVE SHARP EDGES.
9. ALL POWER AND EQUIPMENT GROUND WIRING IN TUBING OR CONDUIT SHALL BE SINGLE COPPER CONDUCTOR (#14 OR LARGER) WITH TYPE THHW, THWN, THWN–2, XHHW, XHHW–2, THW, THW–2, RHW, OR RHW–2 INSULATION UNLESS OTHERWISE SPECIFIED.
10. SUPPLEMENTAL EQUIPMENT GROUND WIRING LOCATED INDOORS SHALL BE SINGLE COPPER CONDUCTOR (#6 OR LARGER) WITH TYPE THHW, THWN, THWN–2, XHHW, XHHW–2, THW, THW–2, RHW, OR RHW–2 INSULATION UNLESS OTHERWISE SPECIFIED.
11. POWER AND CONTROL WIRING IN FLEXIBLE CORD SHALL BE MULTI–CONDUCTOR, TYPE SOOW CORD (#14 OR LARGER) UNLESS OTHERWISE SPECIFIED.
12. POWER AND CONTROL WIRING FOR USE IN CABLE TRAY SHALL BE MULTI–CONDUCTOR, TYPE TC CABLE (#14 OR LARGER), WITH TYPE THHW, THWN, THWN–2, XHHW, XHHW–2, THW, THW–2, RHW, OR RHW–2 INSULATION UNLESS OTHERWISE SPECIFIED.
13. ALL POWER AND GROUNDING CONNECTIONS SHALL BE CRIMP–STYLE, COMPRESSION WIRE LUGS AND WIRE NUTS BY THOMAS AND BETTS (OR EQUAL). LUGS AND WIRE NUTS SHALL BE RATED FOR OPERATION NOT LESS THAN 75° C (90° C IF AVAILABLE).
14. RACEWAY AND CABLE TRAY SHALL BE LISTED OR LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE AND NEC.
15. ELECTRICAL METALLIC TUBING (EMT), INTERMEDIATE METAL CONDUIT (IMC), OR RIGID METAL CONDUIT (RMC) SHALL BE USED FOR EXPOSED INDOOR LOCATIONS.
16. ELECTRICAL METALLIC TUBING (EMT) OR METAL–CLAD CABLE (MC) SHALL BE USED FOR CONCEALED INDOOR LOCATIONS.
17. SCHEDULE 40 PVC UNDERGROUND ON STRAIGHTS AND SCHEDULE 80 PVC FOR ALL ELBOWS/90s AND ALL APPROVED ABOVE GRADE PVC CONDUIT.
18. LIQUID–TIGHT FLEXIBLE METALLIC CONDUIT (LIQUID–TITE FLEX) SHALL BE USED INDOORS AND OUTDOORS, WHERE VIBRATION OCCURS OR FLEXIBILITY IS NEEDED.
19. CONDUIT AND TUBING FITTINGS SHALL BE THREADED OR COMPRESSION–TYPE AND APPROVED FOR THE LOCATION USED. SET SCREW FITTINGS ARE NOT ACCEPTABLE.
20. CABINETS, BOXES AND WIRE WAYS SHALL BE LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE AND THE NEC.
21. WIREWAYS SHALL BE METAL WITH AN ENAMEL FINISH AND INCLUDE A HINGED COVER, DESIGNED TO SWING OPEN DOWNWARDS (WIREMOLD SPECMATE WIREWAY).
22. SLOTTED WIRING DUCT SHALL BE PVC AND INCLUDE COVER (PANDUIT TYPE E OR EQUAL).
23. CONDUITS SHALL BE FASTENED SECURELY IN PLACE WITH APPROVED NON–PERFORATED STRAPS AND HANGERS. EXPLOSIVE DEVICES (i.e. POWDER–ACTUATED) FOR ATTACHING HANGERS TO STRUCTURE WILL NOT BE PERMITTED. CLOSELY FOLLOW THE LINES OF THE STRUCTURE, MAINTAIN CLOSE PROXIMITY TO THE STRUCTURE AND KEEP CONDUITS IN TIGHT ENVELOPES. CHANGES IN DIRECTION TO ROUTE AROUND OBSTACLES SHALL BE MADE WITH CONDUIT OUTLET BODIES. CONDUIT SHALL BE INSTALLED IN A NEAT AND WORKMANLIKE MANNER. PARALLEL AND PERPENDICULAR TO STRUCTURE WALL AND CEILING LINES. ALL CONDUIT SHALL BE FISHED TO CLEAR OBSTRUCTIONS. ENDS OF CONDUITS SHALL BE TEMPORARILY CAPPED FLUSH TO FINISH GRADE TO PREVENT CONCRETE, PLASTER OR DIRT FROM ENTERING. CONDUITS SHALL BE RIGIDLY CLAMPED TO BOXES BY GALVANIZED MALLEABLE IRON BUSHING ON INSIDE AND GALVANIZED MALLEABLE IRON LOCKNUT ON OUTSIDE AND INSIDE.
24. EQUIPMENT CABINETS, TERMINAL BOXES, JUNCTION BOXES AND PULL BOXES SHALL BE GALVANIZED OR EPOXY–COATED SHEET STEEL. SHALL MEET OR EXCEED UL 50 AND BE RATED NEMA 1 (OR BETTER) FOR INTERIOR LOCATIONS AND NEMA 3R (OR BETTER) FOR EXTERIOR LOCATIONS.
25. METAL RECEPTACLE, SWITCH AND DEVICE BOXES SHALL BE GALVANIZED, EPOXY–COATED OR NON–CORRODING; SHALL MEET OR EXCEED UL 514A AND NEMA OS 1 AND BE RATED NEMA 1 (OR BETTER) FOR INTERIOR LOCATIONS AND WEATHER PROTECTED (WP OR BETTER) FOR EXTERIOR LOCATIONS.
26. NONMETALLIC RECEPTACLE, SWITCH AND DEVICE BOXES SHALL MEET OR EXCEED NEMA OS 2 (NEWEST REVISION) AND BE RATED NEMA 1 (OR BETTER) FOR INTERIOR LOCATIONS AND WEATHER PROTECTED (WP OR BETTER) FOR EXTERIOR LOCATIONS.
27. THE CONTRACTOR SHALL NOTIFY AND OBTAIN NECESSARY AUTHORIZATION FROM THE CARRIER AND/OR CROWN CASTLE USA INC. BEFORE COMMENCING WORK ON THE AC POWER DISTRIBUTION PANELS.
28. THE CONTRACTOR SHALL PROVIDE NECESSARY TAGGING ON THE BREAKERS, CABLES AND DISTRIBUTION PANELS IN ACCORDANCE WITH THE APPLICABLE CODES AND STANDARDS TO SAFEGUARD LIFE AND PROPERTY.
29. INSTALL LAMICOID LABEL ON THE METER CENTER TO SHOW "AT&T".
30. ALL EMPTY/SPARE CONDUITS THAT ARE INSTALLED ARE TO HAVE A METERED MULE TAPE PULL CORD INSTALLED.

CONDUCTOR COLOR CODE

SYSTEM	CONDUCTOR	COLOR
120/240V, 1Ø	A PHASE	BLACK
	B PHASE	RED
	NEUTRAL	WHITE
	GROUND	GREEN
120/208V, 3Ø	A PHASE	BLACK
	B PHASE	RED
	C PHASE	BLUE
	NEUTRAL	WHITE
	GROUND	GREEN
277/480V, 3Ø	A PHASE	BROWN
	B PHASE	ORANGE OR PURPLE
	C PHASE	YELLOW
	NEUTRAL	GREY
	GROUND	GREEN
DC VOLTAGE	POS (+)	RED**
	NEG (–)	BLACK**

* SEE NEC 210.5(C)(1) AND (2)
** POLARITY MARKED AT TERMINATION

APWA UNIFORM COLOR CODE:

WHITE	PROPOSED EXCAVATION
PINK	TEMPORARY SURVEY MARKINGS
RED	ELECTRIC POWER LINES, CABLES, CONDUIT, AND LIGHTING CABLES
YELLOW	GAS, OIL, STEAM, PETROLEUM, OR GASEOUS MATERIALS
ORANGE	COMMUNICATION, ALARM OR SIGNAL LINES, CABLES, OR CONDUIT AND TRAFFIC LOOPS
BLUE	POTABLE WATER
PURPLE	RECLAIMED WATER, IRRIGATION, AND SLURRY LINES
GREEN	SEWERS AND DRAIN LINES

GREENFIELD 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).

ABBREVIATIONS:

ANT	ANTENNA
(E)	EXISTING
FIF	FACILITY INTERFACE FRAME
GEN	GENERATOR
GPS	GLOBAL POSITIONING SYSTEM
GSM	GLOBAL SYSTEM FOR MOBILE
LTE	LONG TERM EVOLUTION
MGB	MASTER GROUND BAR
MW	MICROWAVE
(N)	NEW
NEC	NATIONAL ELECTRIC CODE
(P)	PROPOSED
PP	POWER PLANT
QTY	QUANTITY
RECT	RECTIFIER
RBS	RADIO BASE STATION
RET	REMOTE ELECTRIC TILT
RFDS	RADIO FREQUENCY DATA SHEET
RRH	REMOTE RADIO HEAD
RRU	REMOTE RADIO UNIT
SIAD	SMART INTEGRATED DEVICE
TMA	TOWER MOUNTED AMPLIFIER
TYP	TYPICAL
UMTS	UNIVERSAL MOBILE TELECOMMUNICATIONS SYSTEM
W.P.	WORK POINT

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AT&T SITE NUMBER: **CTL02024**

BU #: **806363**
HRT 105 943201

48 COW HILL ROAD
CLINTON, CT 06413

EXISTING
212'-0" SELF-SUPPORT TOWER

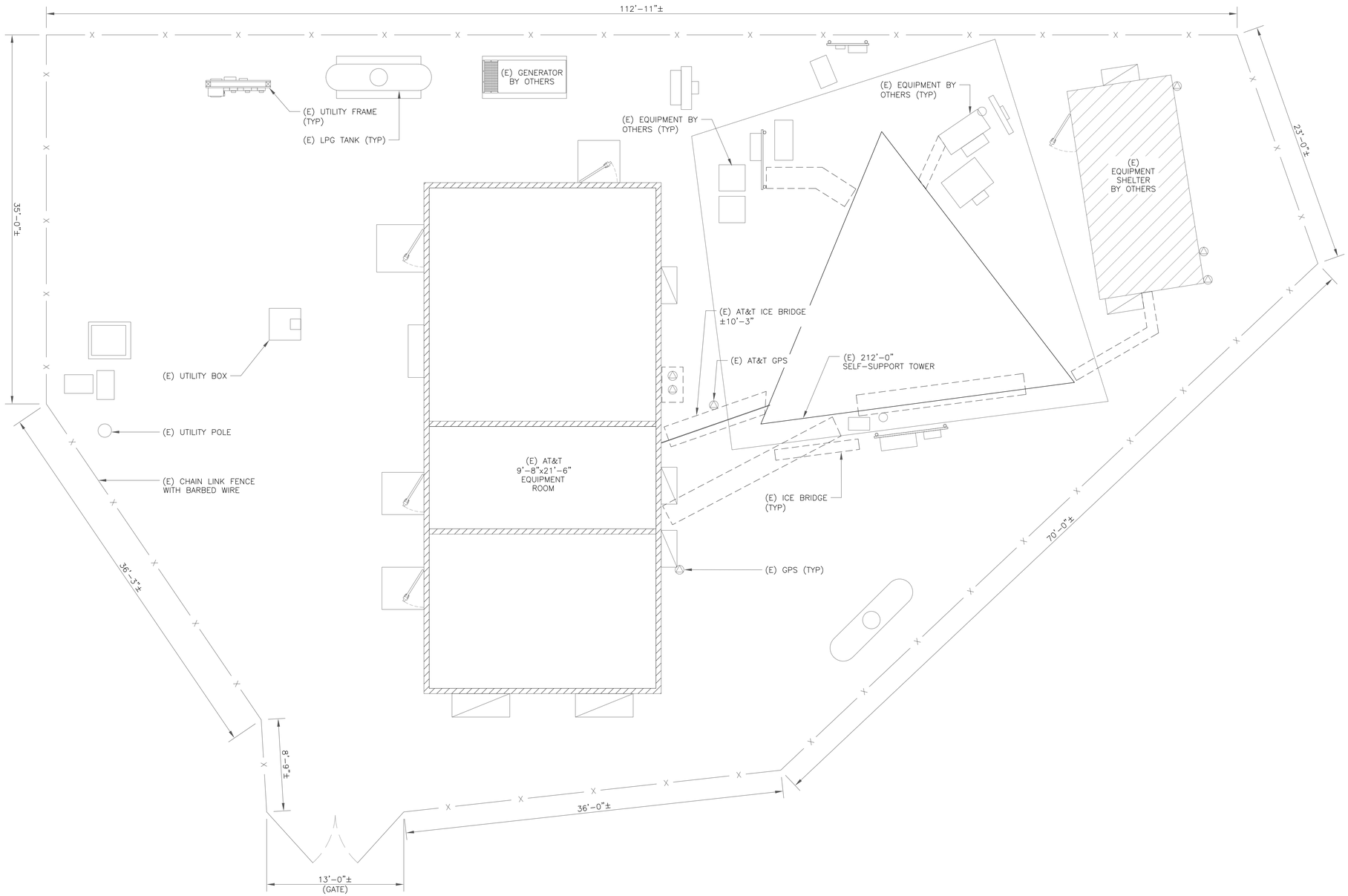
ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
A	3/16/22	JHW	PRELIMINARY REVIEW	KT
B	3/31/22	JHW	PRELIMINARY REVIEW	KT
0	4/25/22	JHW	CONSTRUCTION	KT

STATE OF CONNECTICUT No. 23924 LICENSED PROFESSIONAL ENGINEER
4/25/22

B&T ENGINEERING, INC.
PEC.0001564
Expires 2/10/23

SHEET NUMBER: T-2
REVISION: 0



1 SITE PLAN

SCALE: 4' 2' 0 4' 3/16"=1'-0" (FULL SIZE) 3/32"=1'-0" (11x17)

N

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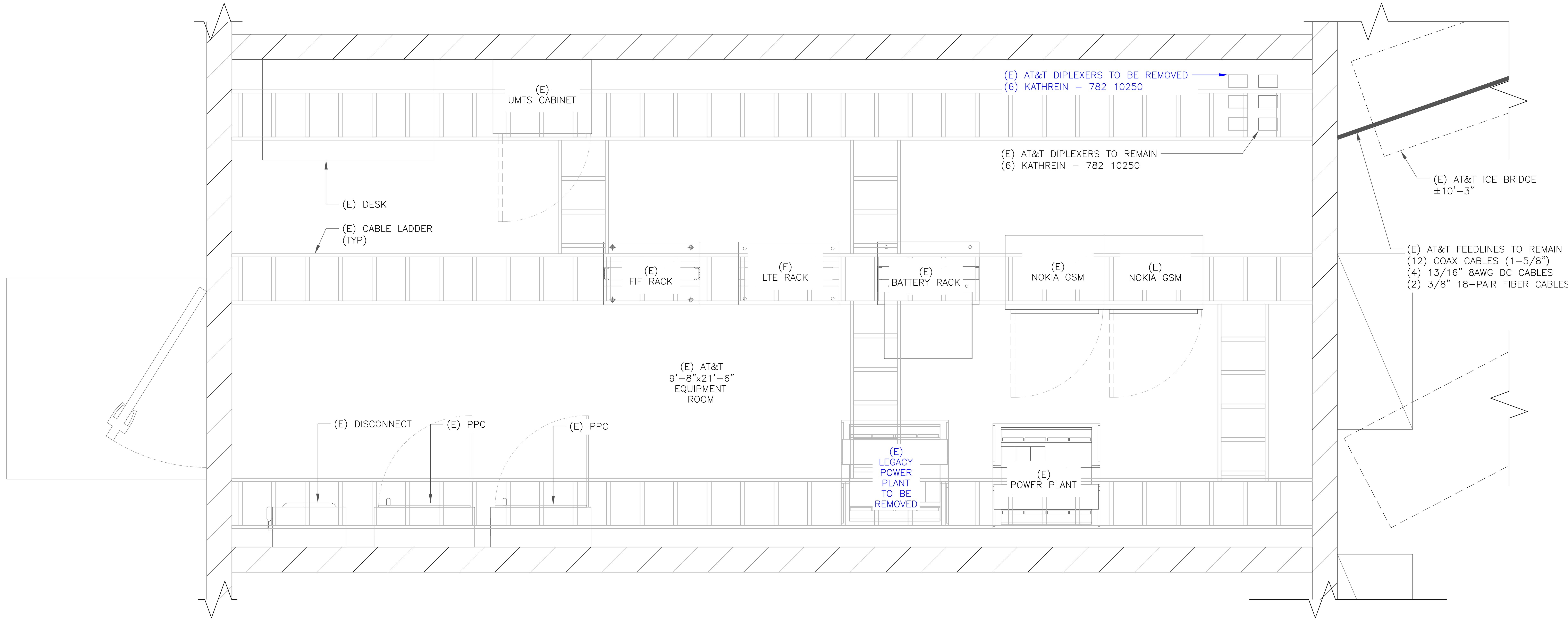
STATE OF CONNECTICUT
KEVIN C. TURKALL
No. 23924
LICENSED PROFESSIONAL ENGINEER
4/25/22

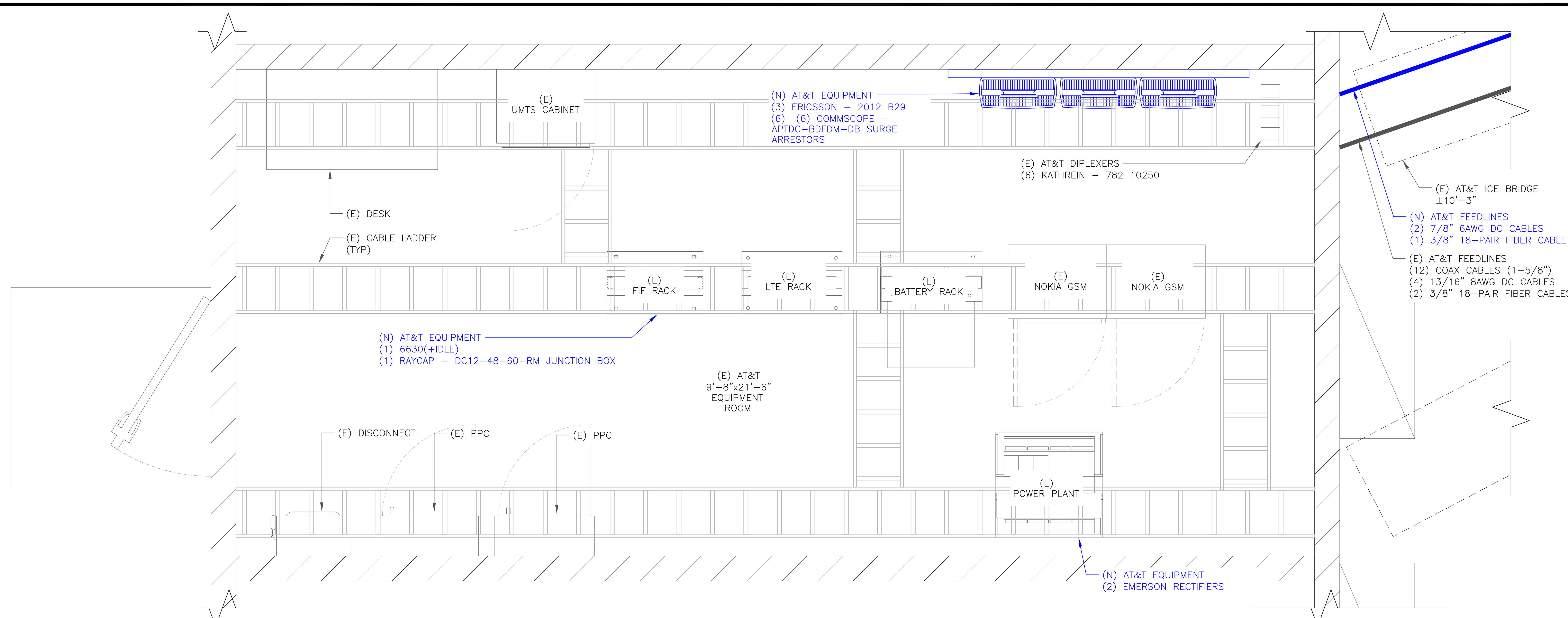
B&T ENGINEERING, INC.
PEC.0001564
Expires 2/10/23

SHEET NUMBER: C-1.1

REVISION: 0



1 EXISTING EQUIPMENT PLAN
SCALE: 3/4"=1'-0" (FULL SIZE) 3/8"=1'-0" (11x17)



2 FINAL EQUIPMENT PLAN
SCALE: 3/4"=1'-0" (FULL SIZE) 3/8"=1'-0" (11x17)

GROUND SCOPE OF WORK:

- REMOVE (1) LEGACY POWER PLANT
- REMOVE (6) KATHREIN – 782 10250 DIPLEXERS
- INSTALL (1) 6630(+IDLE)
- INSTALL (3) ERICSSON – 2012 B29 RRUS
- INSTALL (6) COMMSCOPE – APTDC-BDFDM-DB SURGE ARRESTORS
- INSTALL (1) RAYCAP – DC12-48-60-RM JUNCTION BOX
- INSTALL (2) EMERSON RECTIFIERS IN EXISTING POWER PLANT

NOTE:

THE POWER DESIGN FOR ANY AC ELECTRICAL POWER CHANGES IS TO BE PERFORMED BY OTHERS AND IS SHOWN HERE FOR REFERENCE PURPOSES ONLY. AT&T IS SOLELY RESPONSIBLE FOR THE ELECTRICAL POWER DESIGN.

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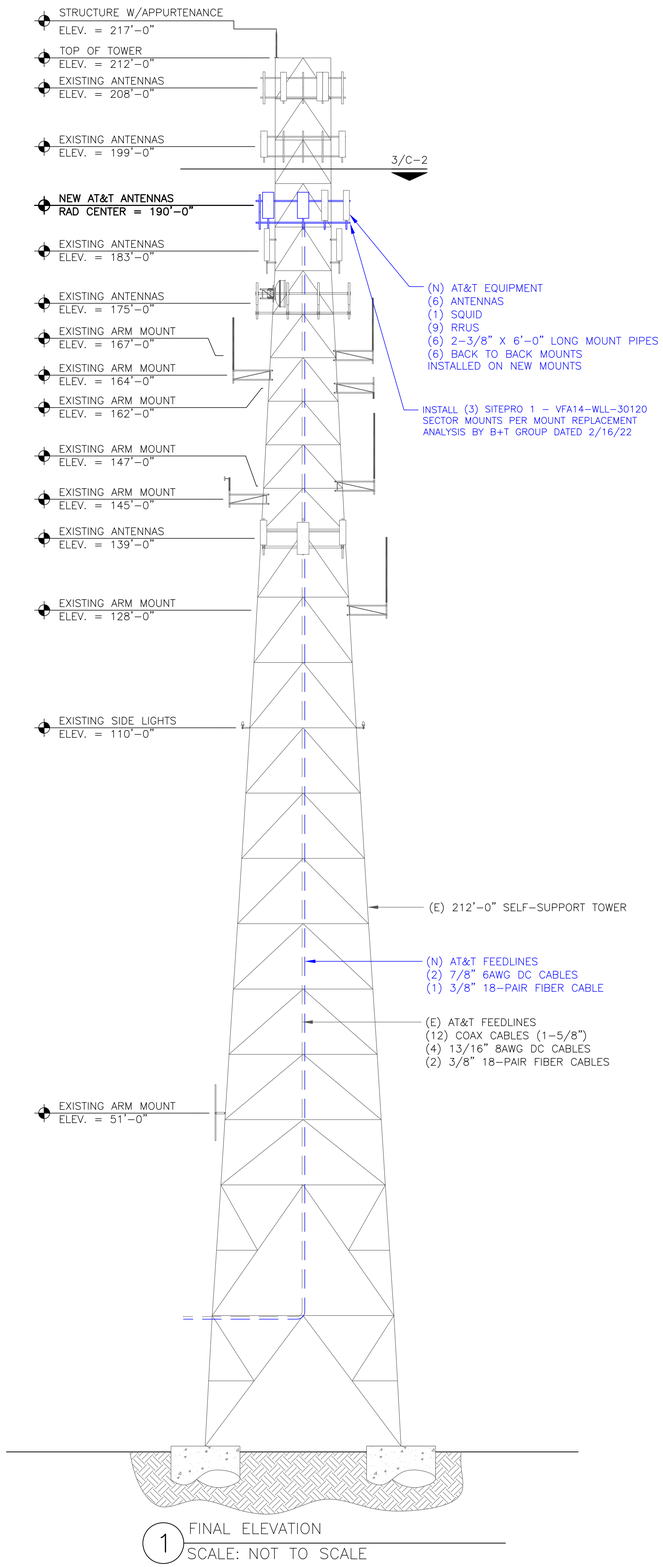
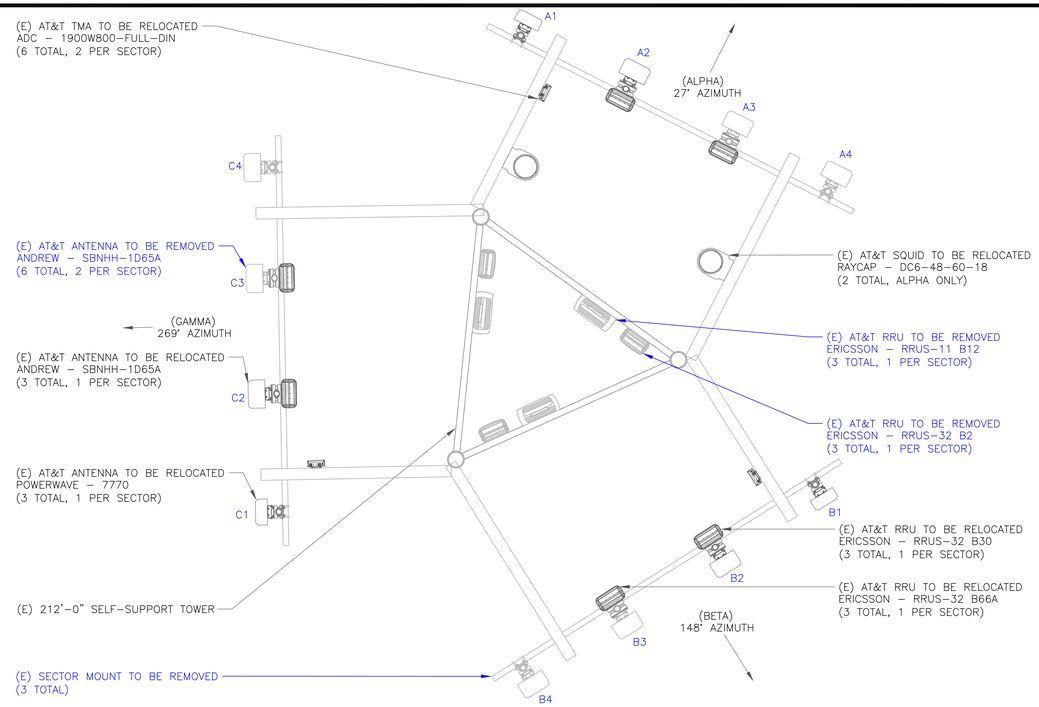
4/25/22

B&T ENGINEERING, INC.
PEC.0001564
Expires 2/10/23

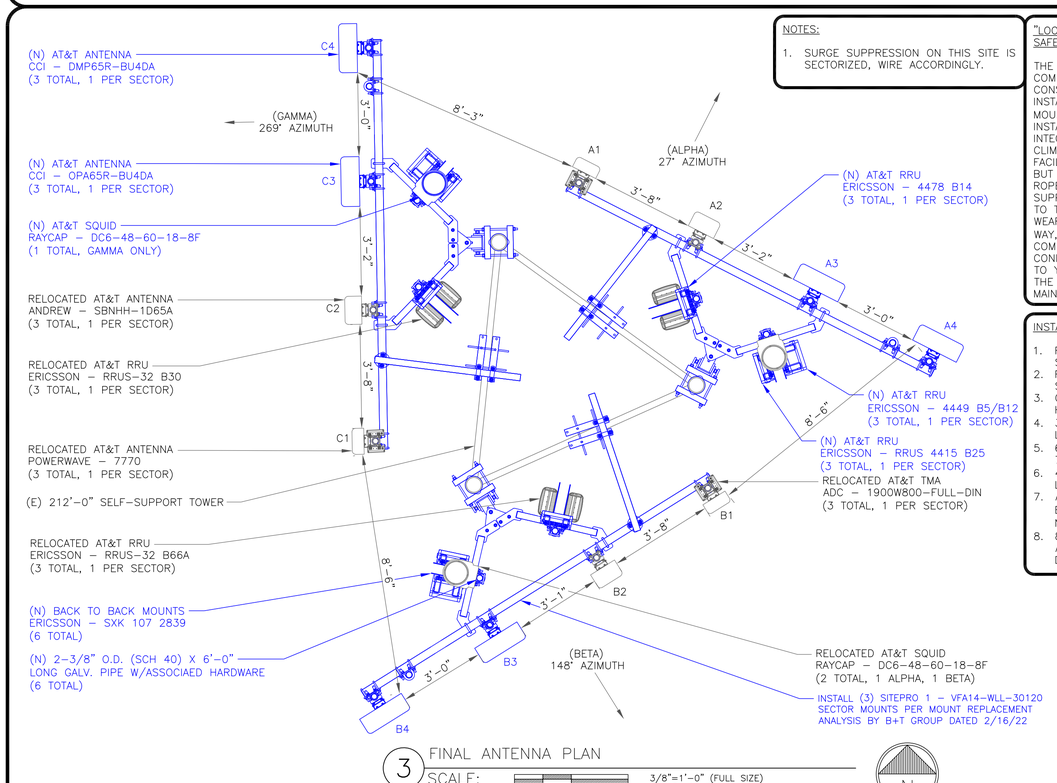
SHEET NUMBER: C-1.2
REVISION: 0



1 FINAL ELEVATION
SCALE: NOT TO SCALE



2 EXISTING ANTENNA PLAN
SCALE: 2' 1' 0 2' 3/8"=1'-0" (FULL SIZE) 3/16"=1'-0" (11x17)



3 FINAL ANTENNA PLAN
SCALE: 2' 1' 0 2' 3/8"=1'-0" (FULL SIZE) 3/16"=1'-0" (11x17)

NOTES:

1. SURGE SUPPRESSION ON THIS SITE IS SECTORIZED, WIRE ACCORDINGLY.

"LOOK UP" - CROWN CASTLE USA INC.
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 CROWN CASTLE USA INC. POC OR CALL THE NOC TO GENERATE A SAFETY CLIMB MAINTENANCE AND CONTRACTOR NOTICE TICKET.

INSTALLER NOTES:

1. REFERENCE C-3 FOR FINAL EQUIPMENT SCHEDULE.
2. REFERENCE C-4 & C-5 FOR NEW EQUIPMENT SPECIFICATIONS.
3. CONTRACTOR TO VERIFY ALL ANTENNA TIP HEIGHTS DO NOT EXCEED BEACON BASE HEIGHT.
4. 3'-0" MINIMUM DISTANCE REQUIRED BETWEEN LTE ANTENNAS ON SAME SECTOR.
5. 6'-0" MINIMUM DISTANCE REQUIRED BETWEEN 700BC & 700DE ANTENNAS ON SAME SECTOR.
6. 4'-0" MINIMUM DISTANCE REQUIRED BETWEEN LTE 700 ANTENNAS ON OPPOSING SECTORS.
7. ALL ANTENNA MEASUREMENT DISTANCES MUST BE EDGE TO EDGE (RELOCATE ANTENNAS AS NEEDED).
8. 8" MINIMUM DISTANCE REQUIRED BETWEEN ANTENNA & RADIO. SEE GENERIC EXAMPLE DETAIL ON SHEET C-4.

AT&T
575 MOROSGO DRIVE
ATLANTA, GA 30324-3300

CROWN CASTLE
3 CORPORATE PARK DRIVE, SUITE 101
CLIFTON PARK, NY 12065

B+T GRP
1717 S. BOULDER
SUITE 300
TULSA, OK 74119
PH: (918) 587-4630
www.btgrp.com

AT&T SITE NUMBER: **CTL02024**

BU #: **806363**
HRT 105 943201

48 COW HILL ROAD
CLINTON, CT 06413

EXISTING
212'-0" SELF-SUPPORT TOWER

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
A	3/16/22	JHW	PRELIMINARY REVIEW	KT
B	3/31/22	JHW	PRELIMINARY REVIEW	KT
0	4/25/22	JHW	CONSTRUCTION	KT

STATE OF CONNECTICUT
GREGORY THOMAS KNIGHT
No. 23924
LICENSED
PROFESSIONAL ENGINEER
4/25/22

B&T ENGINEERING, INC.
PEC.0001564
Expires 2/10/23

SHEET NUMBER: C-2

REVISION: 0

NOTE: RFDS BEING USED DATED 12/31/21 V PRELIMINARY

FINAL ANTENNA AND FEEDLINE SCHEDULE

POS.	TECH	STATUS	AZIMUTH	ANTENNA TYPE	ANTENNA RAD CENTER	MECHANICAL DOWNTILT	ELECTRICAL DOWNTILT	MAIN COAX SIZE	MAIN COAX LENGTH	COAX QTY	TMA QTY AND MODEL	SURGE PROTECTION	DC/FIBER CABLES	RRUs QTY & MODEL	LOCATION	DIPLEXER ON TOWER	DIPLEXER ON GROUND	RET CABLE
ALPHA SECTOR																		
A1	UMTS	EXISTING	27°	POWERWAVE – 7770	190'–0"	0°	6°	1–5/8"	240'–0"	2	(2) CG–1900W80 0–FULL–DIN	(1) (E) DC6–48–60–18–8F SQUID	(2) (E) 13/16" 8AWG DC (1) (E) 3/8" 18–PAIR FIBER	–	–	N	Y	N
A2	LTE	EXISTING	27°	ANDREW – SBNHH–1D65A	190'–0"	0°	2°/2°	1–5/8"	240'–0"	2	–			(1) ERICSSON – RRUS–32 B30 (1) ERICSSON – 2012 B29	TOWER GROUND	N	N	N
A3	LTE	NEW	27°	CCI – OPA65R–BU4DA	190'–0"	0°	2°/2°	–	–	–	–			(1) ERICSSON – 4478 B14 (1) ERICSSON – RRUS–32 B66A	TOWER	N	N	N
A4	LTE / 5G	NEW	27°	CCI – DMP65R–BU4DA	190'–0"	0°	2°/2°/2°/2°	–	–	–	–			(1) ERICSSON – 4449 B5/B12 (1) ERICSSON – RRUS 4415 B25	TOWER	N	N	N
BETA SECTOR																		
B1	UMTS	EXISTING	148°	POWERWAVE – 7770	190'–0"	0°	4°	1–5/8"	240'–0"	2	(2) CG–1900W80 0–FULL–DIN	(1) (E) DC6–48–60–18–8F SQUID	(2) (E) 13/16" 8AWG DC (1) (E) 3/8" 18–PAIR FIBER	–	–	N	Y	N
B2	LTE	EXISTING	148°	ANDREW – SBNHH–1D65A	190'–0"	0°	6°/6°	1–5/8"	240'–0"	2	–			(1) ERICSSON – RRUS–32 B30 (1) ERICSSON – 2012 B29	TOWER GROUND	N	N	N
B3	LTE	NEW	148°	CCI – OPA65R–BU4DA	190'–0"	0°	2°/2°	–	–	–	–			(1) ERICSSON – 4478 B14 (1) ERICSSON – RRUS–32 B66A	TOWER	N	N	N
B4	LTE / 5G	NEW	148°	CCI – DMP65R–BU4DA	190'–0"	0°	2°/6°/6°/2°	–	–	–	–			(1) ERICSSON – 4449 B5/B12 (1) ERICSSON – RRUS 4415 B25	TOWER	N	N	N
GAMMA SECTOR																		
C1	UMTS	EXISTING	269°	POWERWAVE – 7770	190'–0"	0°	4°	1–5/8"	240'–0"	2	(2) CG–1900W80 0–FULL–DIN	(1) (N) DC6–48–60–18–8F SQUID	(2) (N) 7/8" 6AWG DC (1) (N) 3/8" 18–PAIR FIBER	–	–	N	Y	N
C2	LTE	EXISTING	269°	ANDREW – SBNHH–1D65A	190'–0"	0°	5°/5°	1–5/8"	240'–0"	2	–			(1) ERICSSON – RRUS–32 B30 (1) ERICSSON – 2012 B29	TOWER GROUND	N	N	N
C3	LTE	NEW	269°	CCI – OPA65R–BU4DA	190'–0"	0°	2°/2°	–	–	–	–			(1) ERICSSON – 4478 B14 (1) ERICSSON – RRUS–32 B66A	TOWER	N	N	N
C4	LTE / 5G	NEW	269°	CCI – DMP65R–BU4DA	190'–0"	0°	2°/5°/5°/2°	–	–	–	–			(1) ERICSSON – 4449 B5/B12 (1) ERICSSON – RRUS 4415 B25	TOWER	N	N	N

NOTE: BLUE DENOTES NEW EQUIPMENT

1 FINAL ANTENNA AND FEEDLINE SCHEDULE
SCALE: NOT TO SCALE

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AT&T SITE NUMBER: **CTL02024**

BU #: **806363**
HRT 105 943201

48 COW HILL ROAD
CLINTON, CT 06413

EXISTING
212'-0" SELF-SUPPORT TOWER

ISSUED FOR:

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0	4/25/22	JHW	CONSTRUCTION	KT

STATE OF CONNECTICUT — KEVIN J. TURKOLL — No. 23924 LICENSED PROFESSIONAL ENGINEER
4/25/22

B&T ENGINEERING, INC.
PEC.0001564
Expires 2/10/23

SHEET NUMBER: C-3

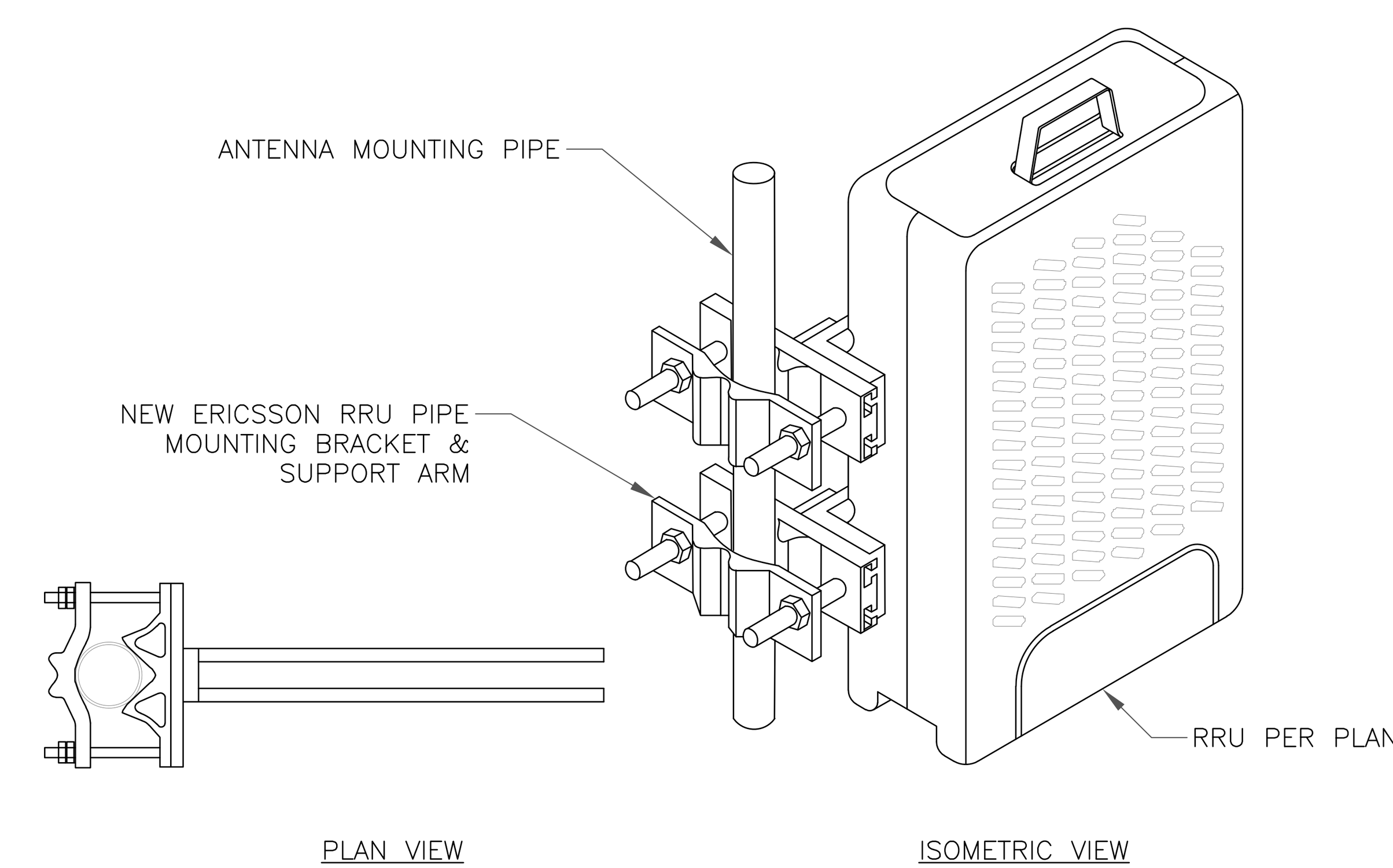
REVISION: 0

ERICSSON RRU MOUNTING KIT:

SXK 107 2839/1: SINGLE RRU SUPPORT KIT (PART # 5335) (OR ENGINEER APPROVED EQUIVALENT)
SXK 107 2839/2: EXPANSION KIT (PART # 5336) (OR ENGINEER APPROVED EQUIVALENT)

MOUNTING NOTES:

REFER TO PRODUCT SPECS FOR BOLT SIZE & PIPE DIAMETER TOLERANCES. THE PART NO. SXK107-2839/2 IS REQUIRED FOR (2) RRUS.



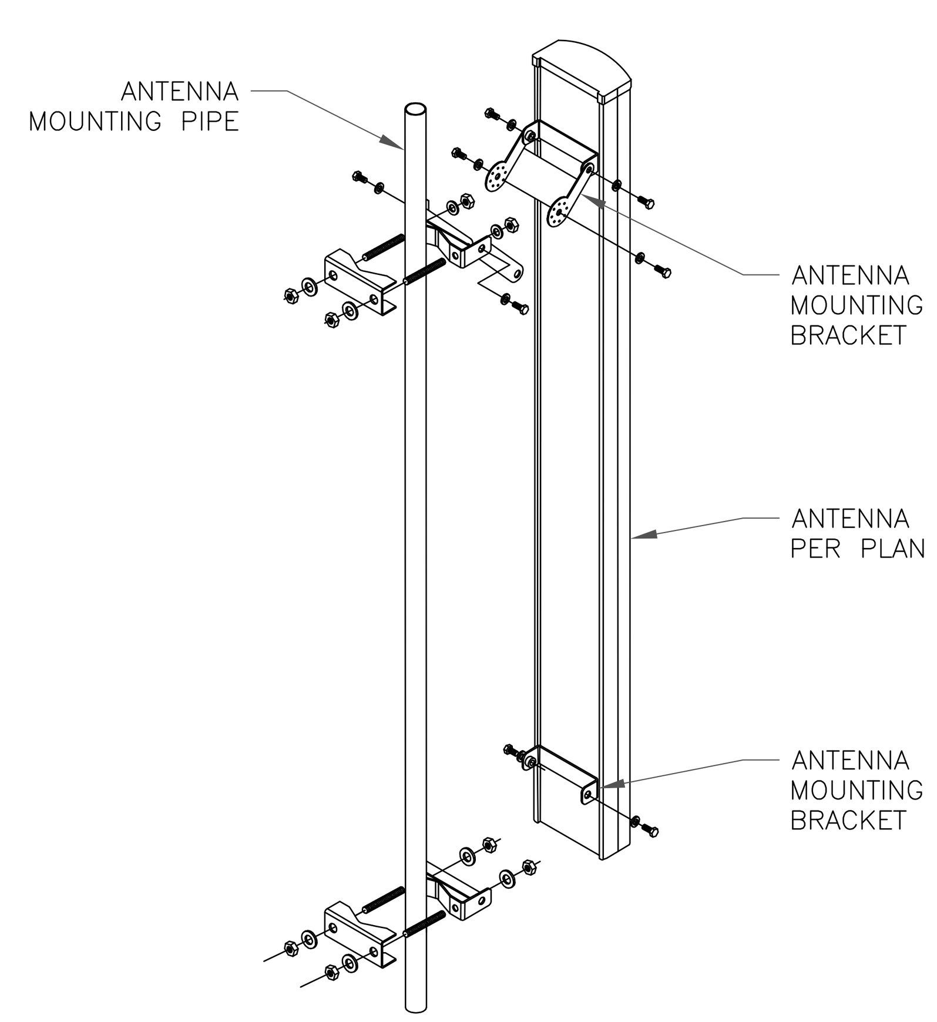
1 NOT USED
SCALE: NOT TO SCALE

2 ERICSSON – SXK 107 2839
SCALE: NOT TO SCALE

3 NOT USED
SCALE: NOT TO SCALE

INSTALLER NOTES:

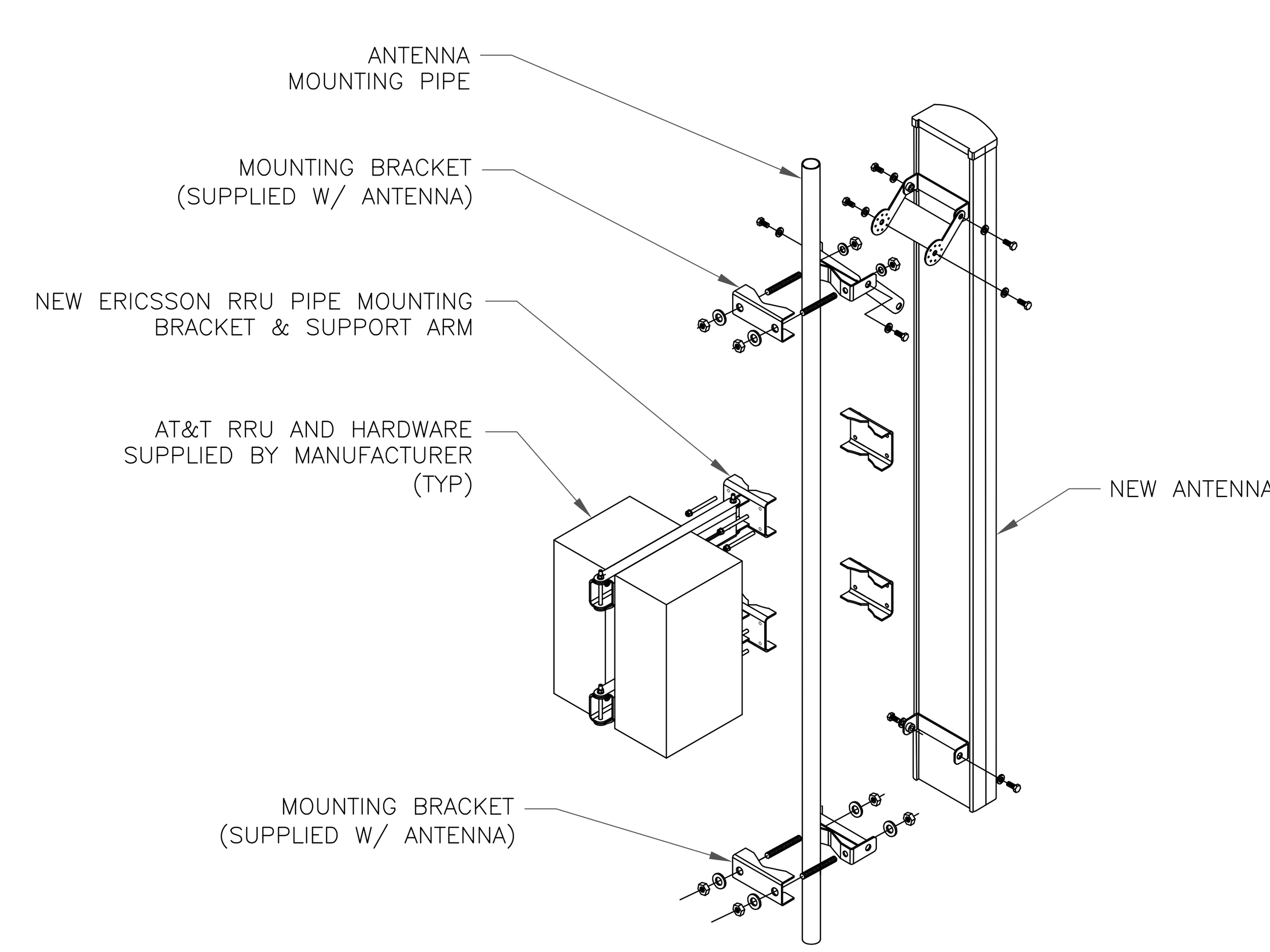
1. COMPLY WITH MANUFACTURERS INSTRUCTIONS TO ENSURE THAT ALL RRUs RECEIVE ELECTRICAL POWER WITHIN 24 HOURS OF BEING REMOVED FROM THE MANUFACTURER'S PACKAGING.
2. DO NOT OPEN RRU PACKAGES IN THE RAIN.
3. ALL PIPES, BRACKETS, AND MISCELLANEOUS HARDWARE TO BE GALVANIZED UNLESS NOTED OTHERWISE.



4 ANTENNA MOUNTING DETAIL
SCALE: NOT TO SCALE

INSTALLER NOTES:

1. COMPLY WITH MANUFACTURERS INSTRUCTIONS TO ENSURE THAT ALL RRUs RECEIVE ELECTRICAL POWER WITHIN 24 HOURS OF BEING REMOVED FROM THE MANUFACTURER'S PACKAGING.
2. DO NOT OPEN RRU PACKAGES IN THE RAIN.
3. ALL PIPES, BRACKETS, AND MISCELLANEOUS HARDWARE TO BE GALVANIZED UNLESS NOTED OTHERWISE.
4. EQUIPMENT MOUNTED BEHIND ANTENNAS TO MAINTAIN AN 8" SEPARATION

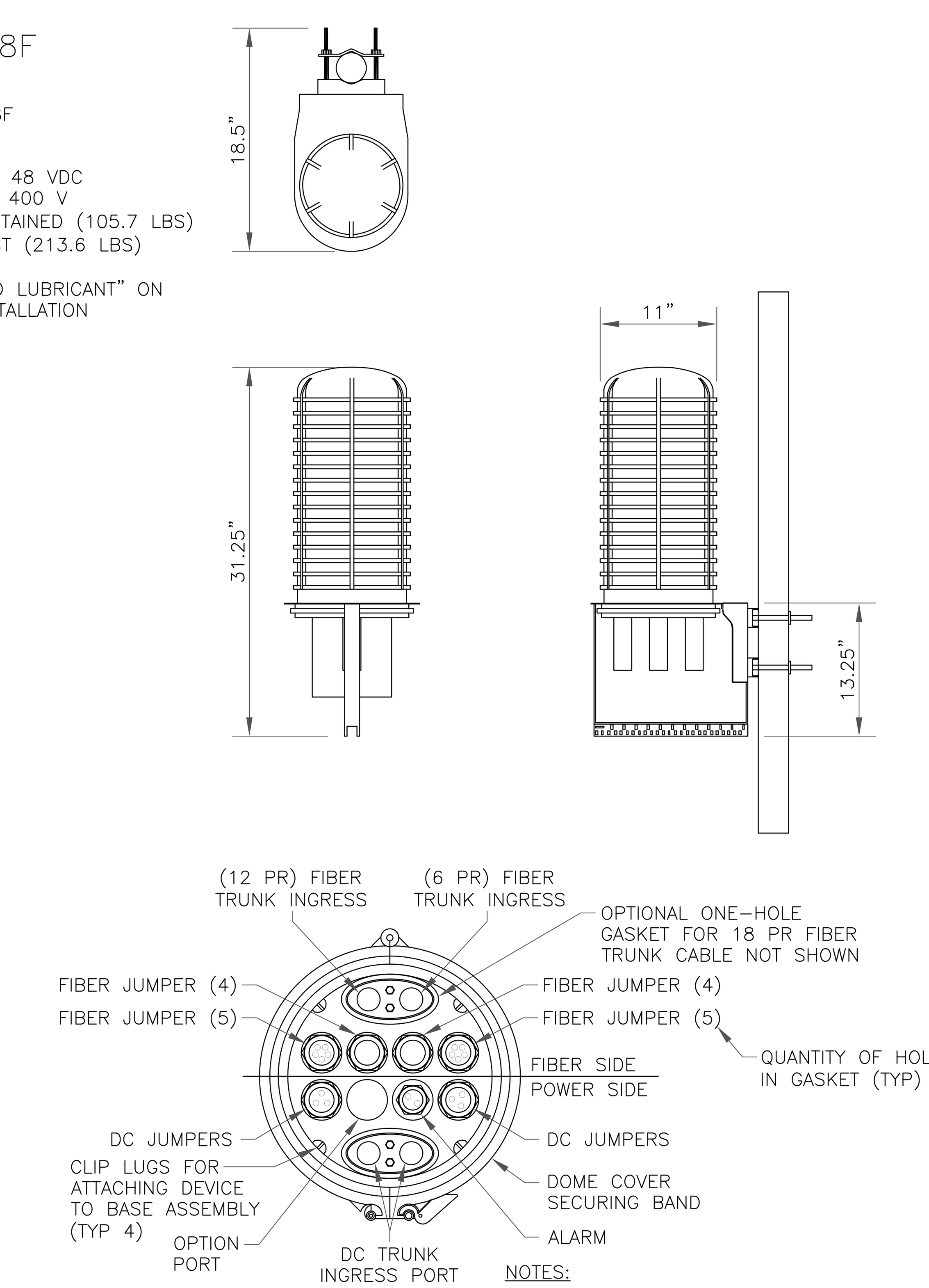


5 ANTENNA WITH DUAL RRU MOUNTING DETAIL
SCALE: NOT TO SCALE

RAYCAP
DC6-48-60-18-8F

RAYCAP – DC6-48-60-18-8F
SIZE: 11x31.25 IN.
WEIGHT: 32.8 LBS
NOMINAL OPERATING VOLTAGE: 48 VDC
VOLTAGE PROTECTION RATING: 400 V
WIND LOADING: 150 MPH SUSTAINED (105.7 LBS)
WIND LOADING: 195 MPH GUST (213.6 LBS)

CONTRACTOR TO USE "THREAD LUBRICANT" ON MOUNTING BOLTS DURING INSTALLATION



NOTES:

1. REMOVE CABLE SEALING GLAND AND INSTALL M32x1.5 METRIC-TO-1" NPT ADAPTER (COOPER CROUSE-HINES P/N CAP 740 994 OR EQUIVALENT MFR) WHEN CONNECTING CONDUIT TO OVP.

6 SQUID MOUNTING DETAIL
SCALE: NOT TO SCALE

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AT&T SITE NUMBER: **CTL02024**

BU #: **806363**
HRT 105 943201

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CLINTON, CT 06413

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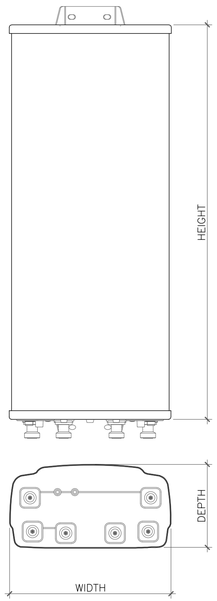
STATE OF CONNECTICUT No. 23924 LICENSED PROFESSIONAL ENGINEER
4/25/22

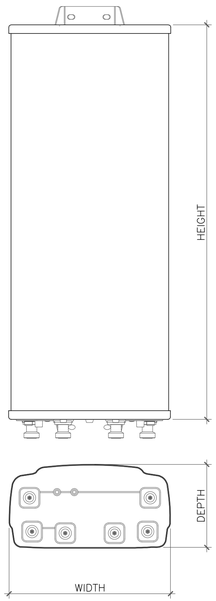
B&T ENGINEERING, INC.
PEC.0001564
Expires 2/10/23

SHEET NUMBER: C-4
REVISION: 0



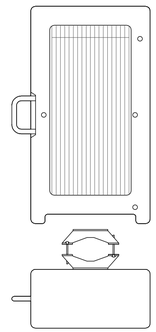
ANTENNA DIMENSIONS (INCHES)				
MODEL	HEIGHT	WIDTH	DEPTH	WEIGHT
OPA65R-BU4DA	48"	21.0"	7.80"	62.30 lbs

1 ANTENNA DETAIL
SCALE: NOT TO SCALE



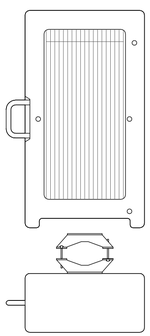
ANTENNA DIMENSIONS (INCHES)				
MODEL	HEIGHT	WIDTH	DEPTH	WEIGHT
DMP65R-BU4DA	55"	11.0"	5.0"	35.0 lbs

2 ANTENNA DETAIL
SCALE: NOT TO SCALE



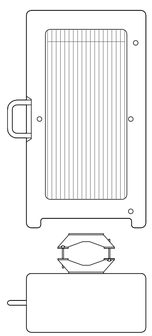
ERICSSON - 4478 B14
WEIGHT (FULLY EQUIPPED): 59.90 LBS
SIZE (HxWxD): 16.5x13.4x7.7 IN.
CONNECTOR TYPE: 4.3-10 FEMALE (4 TOTAL PORTS)

3 RRU DETAIL
SCALE: NOT TO SCALE



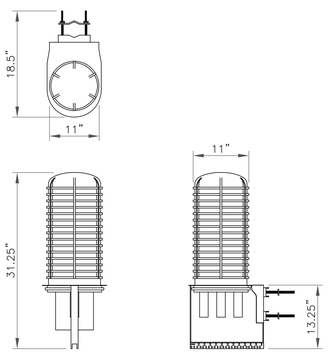
ERICSSON - 4449 B5/B12
WEIGHT (FULLY EQUIPPED): 71.0 LBS
SIZE (HxWxD): 17.9x13.19x9.44 IN.
CONNECTOR TYPE: 4.3-10 FEMALE (4 TOTAL PORTS)

4 RRU DETAIL
SCALE: NOT TO SCALE



ERICSSON - RRUS 4415 B25
WEIGHT (FULLY EQUIPPED): 44.0 LBS
SIZE (HxWxD): 14.96x13.19x5.39 IN.
CONNECTOR TYPE: 4.3-10 FEMALE (4 TOTAL PORTS)

5 RRU DETAIL
SCALE: NOT TO SCALE



RAYCAP - DC6-48-60-18-8F
WEIGHT (WITHOUT MOUNTING HARDWARE): 20.0 LBS
SIZE (HxWxD): 31.25x11.0x11.0 IN.

6 RAYCAP - DC6-48-60-18-8F
SCALE: NOT TO SCALE

7 NOT USED
SCALE: NOT TO SCALE

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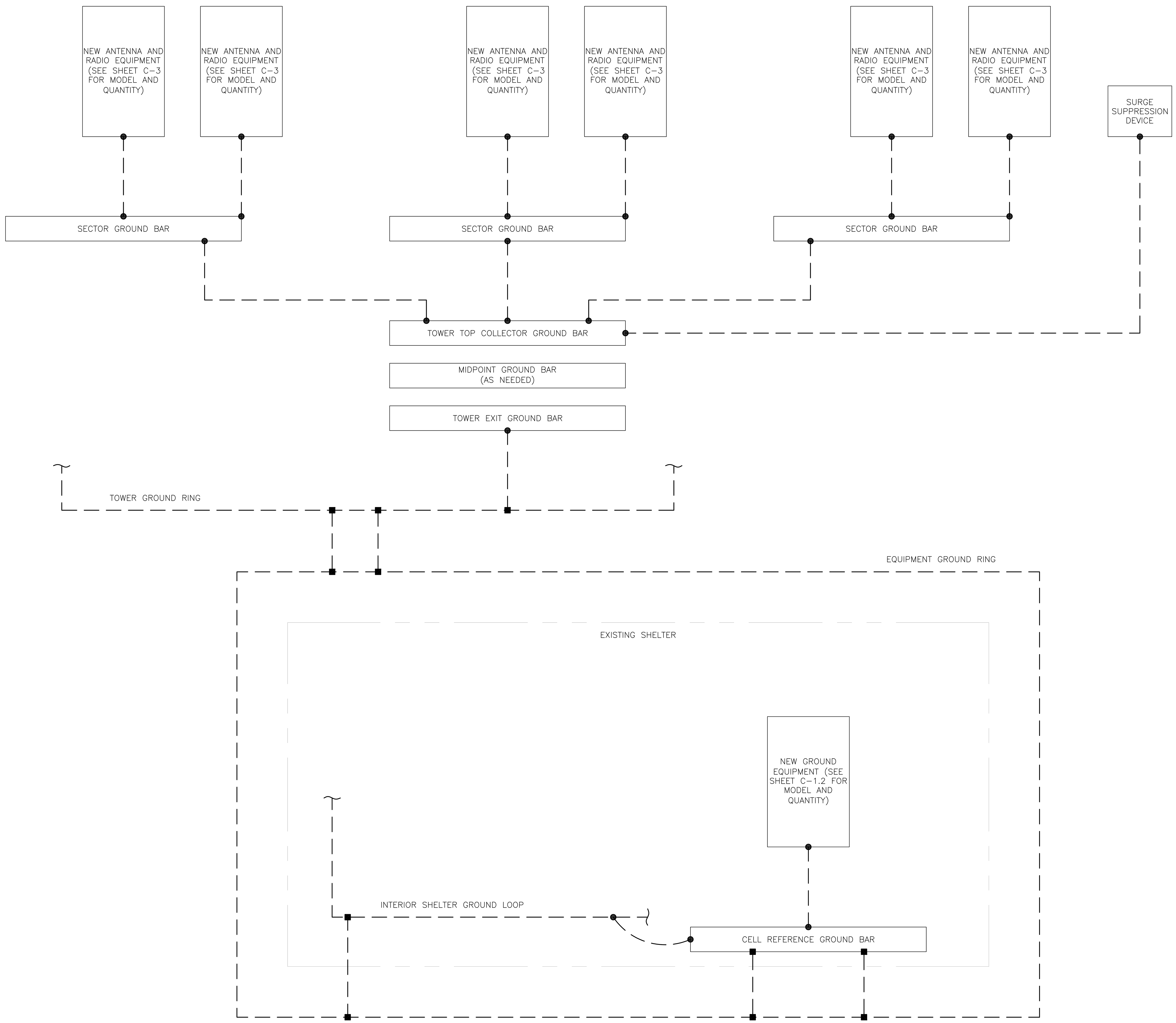
STATE OF CONNECTICUT
KEVIN C. TURKALL
No. 23924
LICENSED PROFESSIONAL ENGINEER
4/25/22

B&T ENGINEERING, INC.
PEC.0001564
Expires 2/10/23

SHEET NUMBER: C-5

REVISION: 0



1 GROUNDING SCHEMATIC
SCALE: NOT TO SCALE

GROUNDING PLAN LEGEND:

- --- GROUND WIRE
- ■ EXOTHERMIC WELD
- ● MECHANICAL CONNECTION
- COPPER GROUND ROD
- GROUND ROD W/ TEST WELL

CELL REFERENCE GROUND BAR: POINT OF GROUND REFERENCE FOR ALL COMMUNICATIONS EQUIPMENT FRAMES. ALL BONDS ARE MADE WITH #2 STRANDED GREEN INSULATED COPPER CONDUCTORS. BOND TO GROUND RING WITH (2) #2 SOLID TINNED COPPER CONDUITS (ATT–TP–76416 7.6.7).

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

EXTERIOR CABLE ENTRY PORT GROUND BARS: LOCATED AT THE ENTRANCE TO THE CELL SITE BUILDING. BOND TO GROUND RING WITH A #2 SOLID TINNED COPPER CONDUCTORS WITH AN EXOTHERMIC WELD AND INSPECTION SLEEVE (ATT–TP–76416 7.6.7.2).

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 SERVICES CONTRACTORS VERIFY ALL DC POWER SYSTEMS ARE EQUIPPED WITH MASTER DC SYSTEM RETURN GROUND CONDUCTOR FROM THE DC POWER SYSTEM COMMON RETURN BUS DIRECTLY CONNECTED TO THE CELL SITE REFERENCE GROUND BAR PER TP76300 SECTION H 6 AND TP76416 FIGURE 7–11 REQUIREMENTS.

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B	3/31/22	JHW	PRELIMINARY REVIEW	KT
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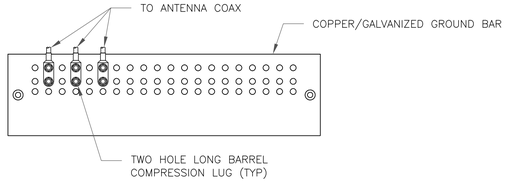
STATE OF CONNECTICUT No. 23924 LICENSED PROFESSIONAL ENGINEER
4/25/22

B&T ENGINEERING, INC.
PEC.0001564
Expires 2/10/23

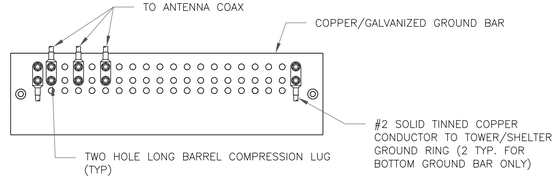
SHEET NUMBER: G-1
REVISION: 0



NOTES:

1. DOUBLING UP "OR STACKING" OF CONNECTIONS IS NOT PERMITTED.
2. EXTERIOR ANTIOXIDANT JOINT COMPOUND TO BE USED ON ALL EXTERIOR CONNECTIONS.
3. GROUND BAR SHALL NOT BE ISOLATED FROM TOWER. MOUNT DIRECTLY TO ANTENNA MOUNT STEEL.

1 ANTENNA SECTOR GROUND BAR DETAIL
SCALE: NOT TO SCALE

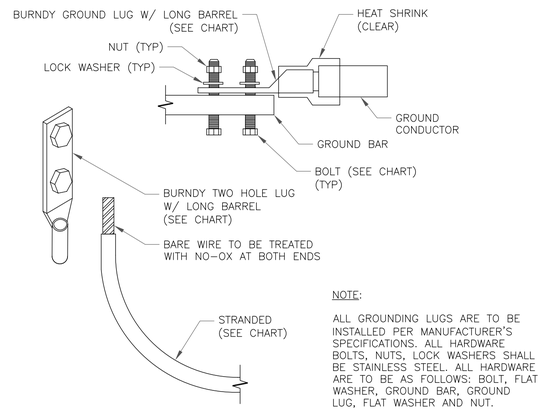


NOTES:

1. EXTERIOR ANTIOXIDANT JOINT COMPOUND TO BE USED ON ALL EXTERIOR CONNECTIONS.
2. GROUND BAR SHALL NOT BE ISOLATED FROM TOWER. MOUNT DIRECTLY TO TOWER STEEL (TOWER ONLY).
3. GROUND BAR SHALL BE ISOLATED FROM BUILDING OR SHELTER.

2 TOWER/SHELTER GROUND BAR DETAIL
SCALE: NOT TO SCALE

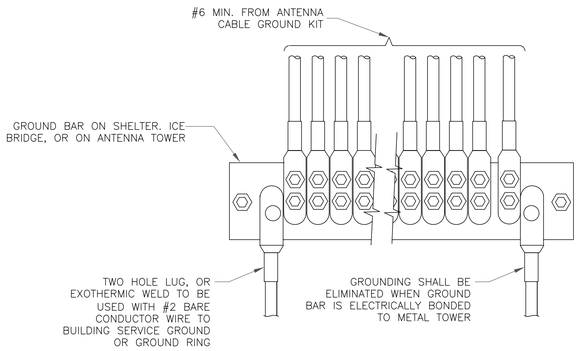
WIRE SIZE	BURNDY LUG	BOLT SIZE
#6 GREEN INSULATED	YA6C-2TC38	3/8" - 16 NC SS 2 BOLT
#2 SOLID TINNED	YA3C-2TC38	3/8" - 16 NC SS 2 BOLT
#2 STRANDED	YA2C-2TC38	3/8" - 16 NC SS 2 BOLT
#2/0 STRANDED	YA26-2TC38	3/8" - 16 NC SS 2 BOLT
#4/0 STRANDED	YA28-2N	1/2" - 16 NC SS 2 BOLT



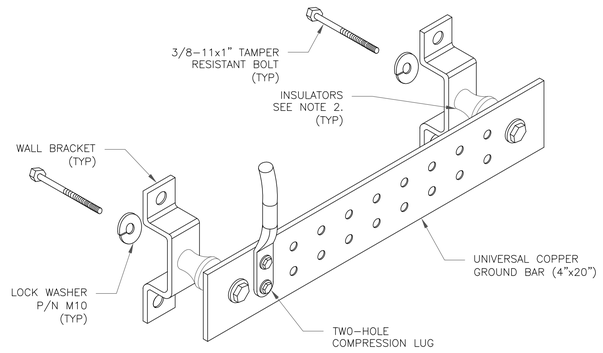
NOTE:

ALL GROUNDING LUGS ARE TO BE INSTALLED PER MANUFACTURER'S SPECIFICATIONS. ALL HARDWARE BOLTS, NUTS, LOCK WASHERS SHALL BE STAINLESS STEEL. ALL HARDWARE ARE TO BE AS FOLLOWS: BOLT, FLAT WASHER, GROUND BAR, GROUND LUG, FLAT WASHER AND NUT.

3 MECHANICAL LUG CONNECTION
SCALE: NOT TO SCALE



4 GROUNDWIRE INSTALLATION
SCALE: NOT TO SCALE

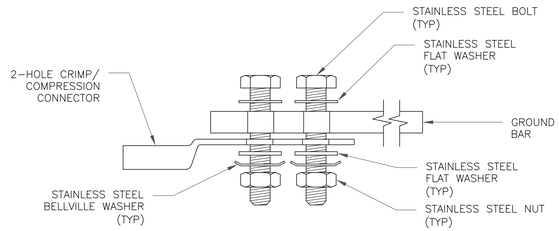


NOTES:

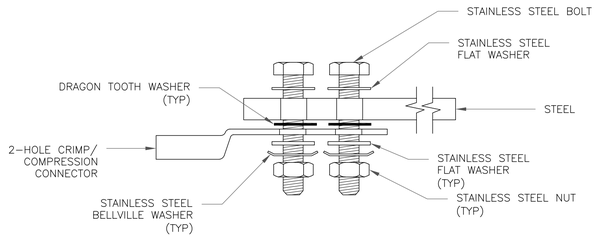
1. DOWN LEAD (HOME RUN) CONDUCTORS ARE NOT TO BE INSTALLED ON CROWN CASTLE USA INC. TOWER, PER THE GROUNDING DOWN CONDUCTOR POLICY QAS-STD-10091. NO MODIFICATION OR DRILLING TO TOWER STEEL IS ALLOWED IN ANY FORM OR FASHION, CAD-WELDING ON THE TOWER AND/OR IN THE AIR ARE NOT PERMITTED.

2. OMIT INSULATOR WHEN MOUNTING TO TOWER STEEL OR PLATFORM STEEL USE INSULATORS WHEN ATTACHING TO BUILDING OR SHELTERS.

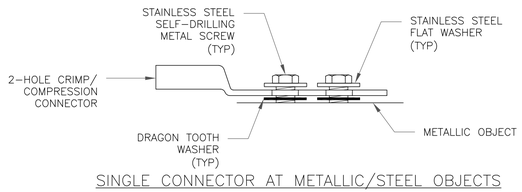
5 GROUND BAR DETAIL
SCALE: NOT TO SCALE



SINGLE CONNECTOR AT GROUND BARS

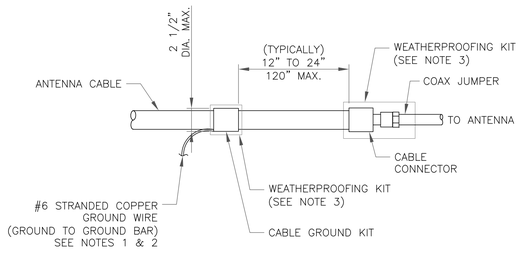


SINGLE CONNECTOR AT STEEL OBJECTS



SINGLE CONNECTOR AT METALLIC/STEEL OBJECTS

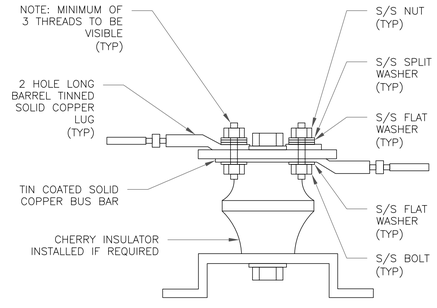
8 HARDWARE DETAIL FOR EXTERIOR CONNECTIONS
SCALE: NOT TO SCALE



NOTES:

1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO GROUND BAR.
2. GROUNDING KIT SHALL BE TYPE AND PART NUMBER AS SUPPLIED OR RECOMMENDED BY CABLE MANUFACTURER.
3. WEATHER PROOFING SHALL BE TWO-PART TAPE KIT, COLD SHRINK SHALL NOT BE USED.

6 CABLE GROUND KIT CONNECTION
SCALE: NOT TO SCALE



7 LUG DETAIL
SCALE: NOT TO SCALE

AT&T
575 MOROSGO DRIVE
ATLANTA, GA 30324-3300

CROWN CASTLE
3 CORPORATE PARK DRIVE, SUITE 101
CLIFTON PARK, NY 12065

B+T GRP
1717 S. BOULDER
SUITE 300
TULSA, OK 74119
PH: (918) 587-4630
www.btgrp.com

AT&T SITE NUMBER: **CTL02024**

BU #: **806363**
HRT 105 943201

48 COW HILL ROAD
CLINTON, CT 06413

EXISTING
212'-0" SELF-SUPPORT TOWER

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
A	3/16/22	JHW	PRELIMINARY REVIEW	KT
B	3/31/22	JHW	PRELIMINARY REVIEW	KT
0	4/25/22	JHW	CONSTRUCTION	KT

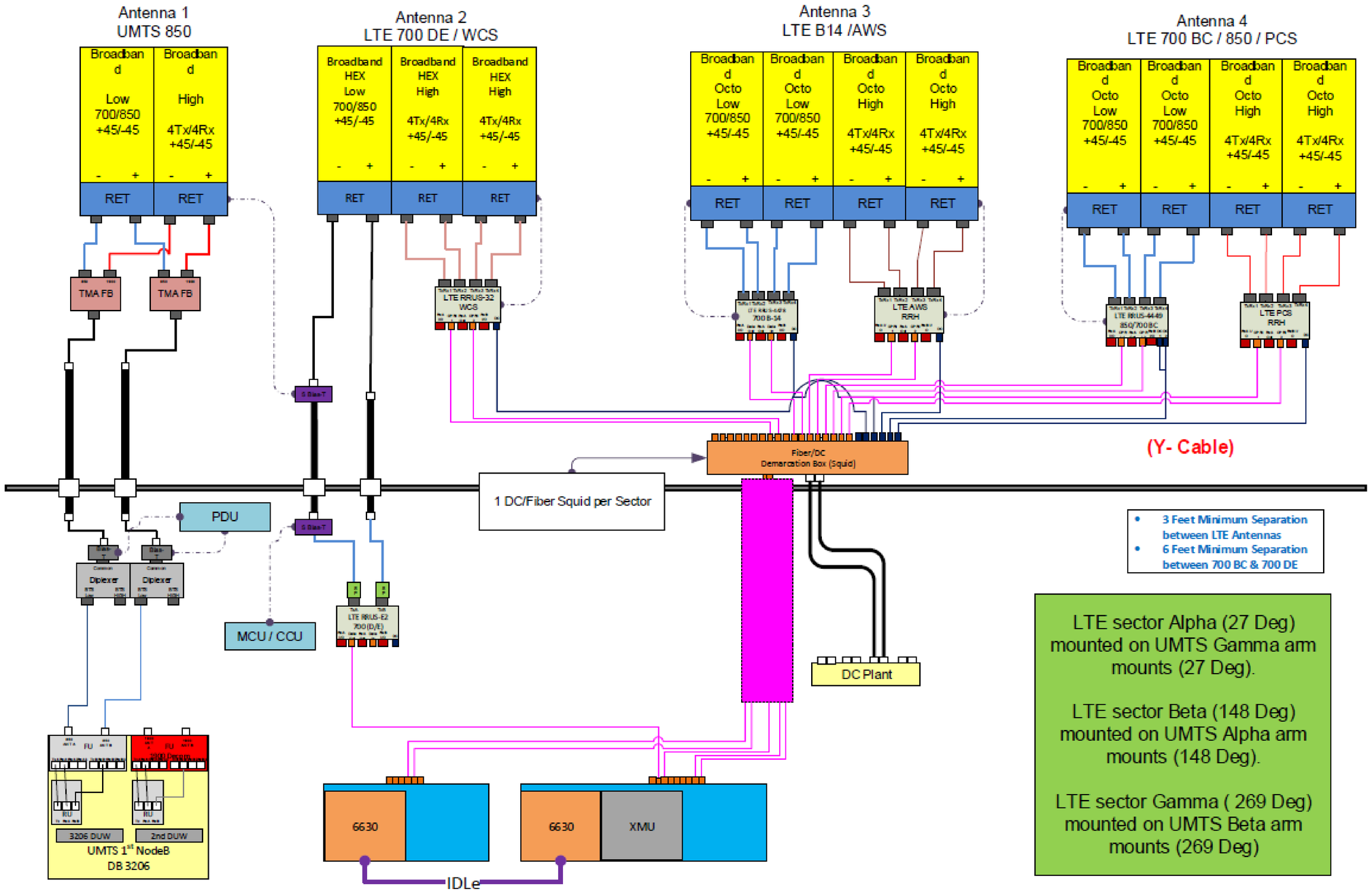
4/25/22

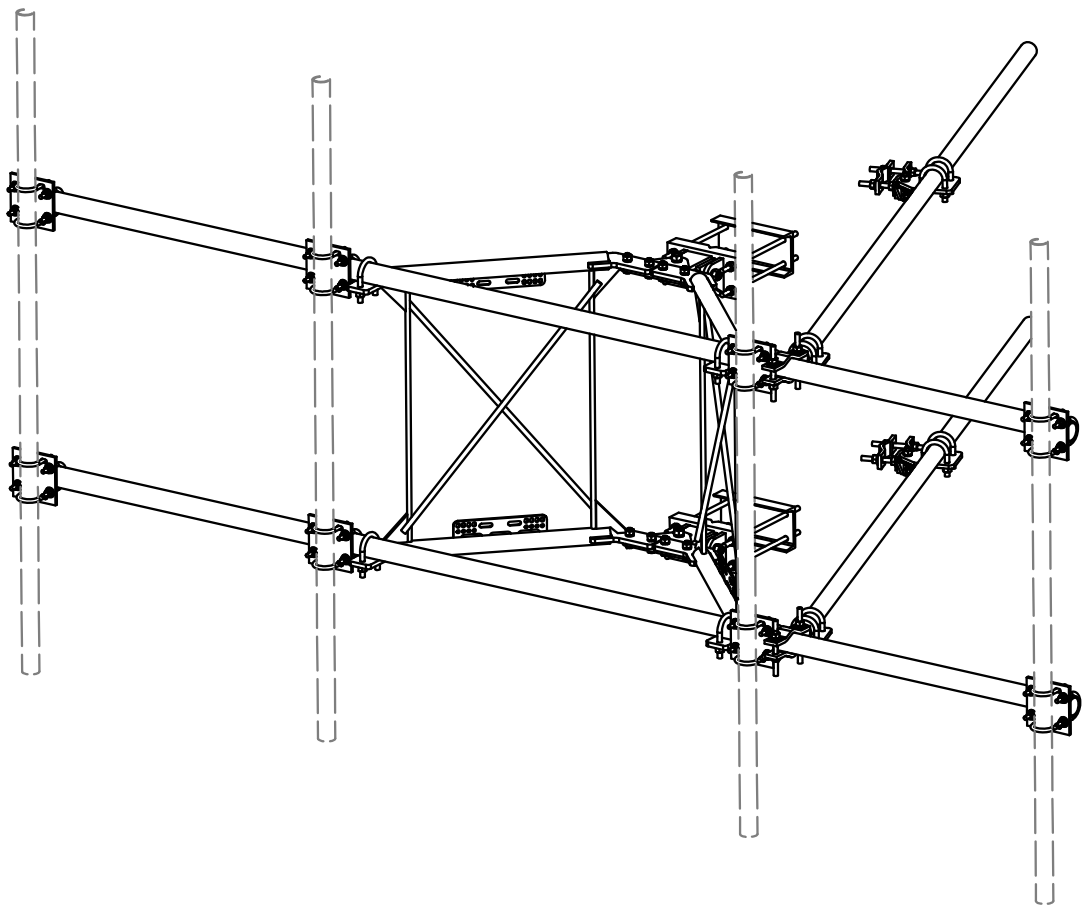
B&T ENGINEERING, INC.
PEC.0001564
Expires 2/10/23

SHEET NUMBER: G-2

REVISION: 0

Diagram - Sector	A	Diagram File Name - CT2024_A_B_C_700B14_700DE_5G850_700BC4T4R_Rev2.vsd							
Atoll Site Name -	CTL02024	Location Name -	CLINTON-COW HILL ROAD		Market -	CONNECTICUT		Market Cluster -	NEW ENGLAND
Comments: Important Note: For detailed radio to antenna wiring refer to the latest 4T4R Antenna/ radio Port connections Field Notice (RF-HW-2016-265)									





PARTS LIST						
ITEM	QTY	PART NO.	PART DESCRIPTION	LENGTH	UNIT WT.	NET WT.
1	2	X-VFAW	SUPPORT ARM		71.41	142.81
2	2	X-HDPMW	HEAVY DUTY PIPE MOUNT WELDMENT		18.61	37.21
3	2	X-HDPMBP	HEAVY DUTY PIPE MOUNT BACKING PLATE	12 in	13.44	26.89
4	2	X-VFAPL3	VFA-HD PIVOT PLATE	24 in	9.69	19.38
5	1	X-LPB	LOWER PIVOT BRACKET		8.84	8.84
6	1	X-UPB	UPPER PIVOT BRACKET		8.84	8.84
7	4	X-SPTB	SLIDING PIPE TIE BACK PLATE	5 1/2 in	5.87	23.49
8	4	X-TBCA	TIE BACK CLIP ANGLE		2.01	8.02
9	8	SCX2	CROSSOVER PLATE	7 in	4.80	38.37
10	4	MCP	CLAMP HALF 1/2" THICK, 11-5/8" LONG	12 1/16 in	3.59	14.37
11	8	DCP	1/2" THICK, 5-3/4" CNTER TO CENTER CLAMP HALF	8 1/8 in	2.42	19.36
13	2	P2126	2-3/8" X 126" (2" SCH. 40) GALVANIZED PIPE	126 in	40.75	81.50
12	2	P30174	2-7/8" O.D. x 174" SCH. 40 PIPE	174 in	84.20	168.39
14	6	A34212	3/4" x 2-1/2" UNC HEX BOLT (A325)	2 1/2 in	0.48	2.87
15	6	G34LW	3/4" HDG LOCKWASHER		0.04	0.26
16	6	G34NUT	3/4" HDG HEAVY 2H HEX NUT		0.21	1.27
19	8	G58R-18	5/8" x 18" THREADED ROD (HDG.)	18 in	0.40	3.19
20	4	G58R-12	5/8" x 12" THREADED ROD (HDG.)		1.05	4.18
21	8	G58R-8	5/8" x 8" THREADED ROD (HDG.)		0.70	5.58
17	4	X-UB5300	5/8" X 3" X 5-1/4" X 2-1/2" U-BOLT (HDG.)		1.15	4.60
18	8	X-UB5258	5/8" X 2-5/8" X 4-1/2" X 2" U-BOLT (HDG.)		1.00	8.00
23	8	A582114	5/8" x 2-1/4" HDG A325 HEX BOLT	2 1/4 in	0.31	2.50
22	8	G5804	5/8" x 4" HDG HEX BOLT GR5		0.44	3.55
24	4	G5802	5/8" x 2" HDG HEX BOLT GR5		0.27	1.08
25	20	G58FW	5/8" HDG USS FLATWASHER	1/8 in	0.07	1.41
26	66	G58LW	5/8" HDG LOCKWASHER		0.03	1.72
27	70	G58NUT	5/8" HDG HEAVY 2H HEX NUT		0.13	9.09
28	32	X-UB1300	1/2" X 3" X 5" X 2" GALV U-BOLT		0.74	23.64
29	16	X-UB1212	1/2" X 2-1/2" X 4-1/2" X 2" U-BOLT (HDG.)		0.63	10.00
30	64	G12FW	1/2" HDG USS FLATWASHER	3/32 in	0.03	2.18
31	64	G12LW	1/2" HDG LOCKWASHER	1/8 in	0.01	0.89
32	64	G12NUT	1/2" HDG HEAVY 2H HEX NUT		0.07	4.58
					TOTAL WT. #	700.78

TOLERANCE NOTES

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LASER CUT EDGES AND HOLES *(± 0.010")* - NO CONING OF HOLES
BENDS ARE ± 1/2 DEGREE
ALL OTHER MACHINING *(± 0.030")*
ALL OTHER ASSEMBLY *(± 0.060")*

REV	DESCRIPTION OF REVISIONS	CPD	BY	DATE
B	CHANGED TIE-BACK BACK CONNECTION		CEK	7/31/2017
A	CHANGED TIE-BACK FRONT CONNECTION		CEK	2/2/2017

REVISION HISTORY

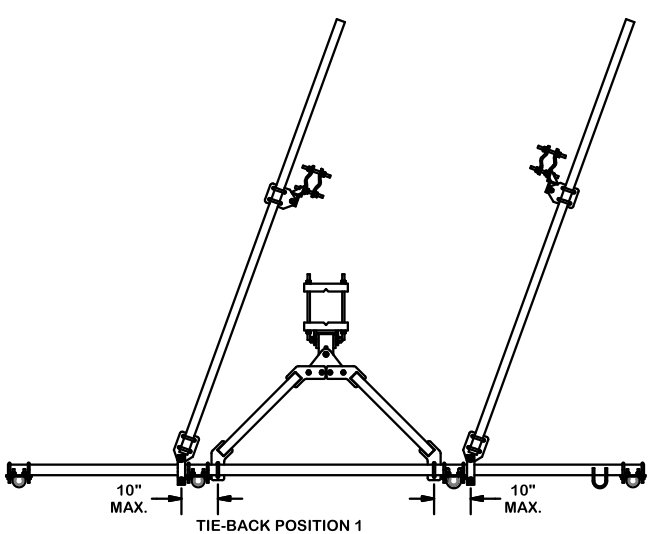
DESCRIPTION
14' 6" HEAVY DUTY
V-FRAME ASSEMBLY
WITH TWO STIFF ARMS

SITE PRO 1
A valmont COMPANY
Engineering Support Team: 1-888-753-7446
Locations: New York, NY; Atlanta, GA; Los Angeles, CA; Plymouth, IN; Salem, OR; Dallas, TX

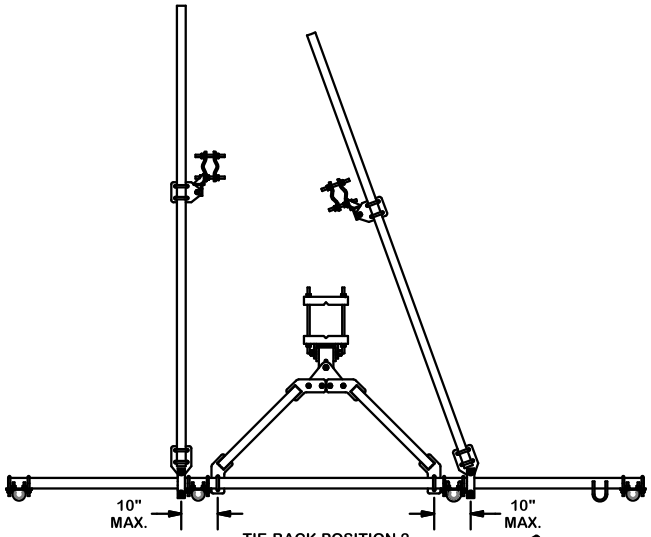
CPD NO.	DRAWN BY	ENG. APPROVAL	PART NO.	PAGE
	CEK 1/25/2017		VFA14-HD	1 OF 5

CLASS	SUB	DRAWING USAGE	CHECKED BY	DWG. NO.
81	02	CUSTOMER	BMC 8/4/2017	VFA14-HD

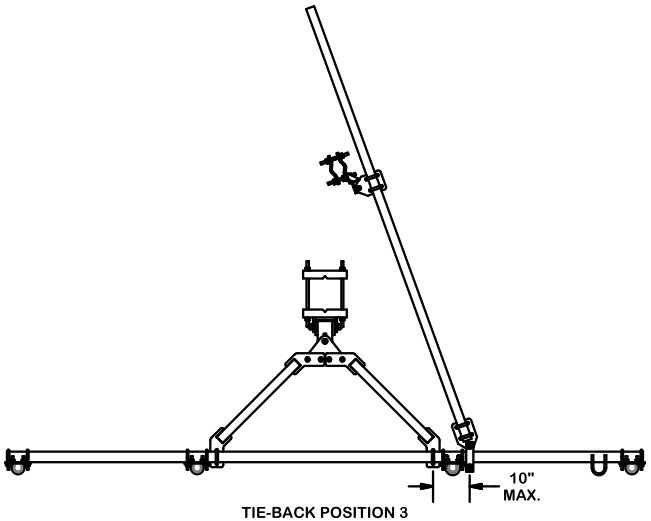
TIE-BACK POSITIONS



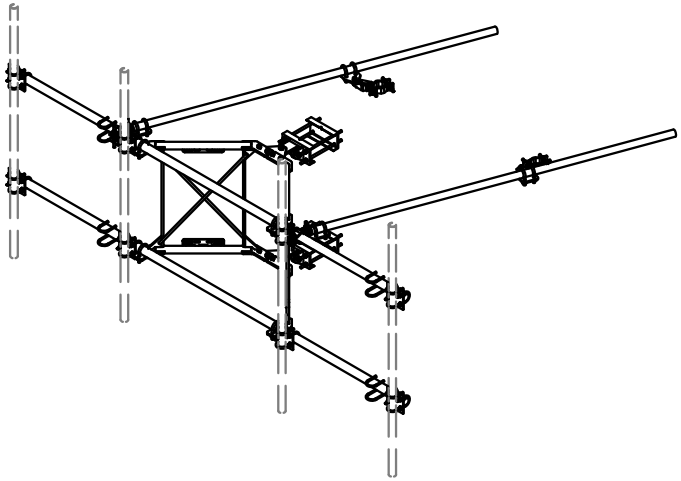
TIE-BACK POSITION 1
-20° / +20° TOP PARALLEL

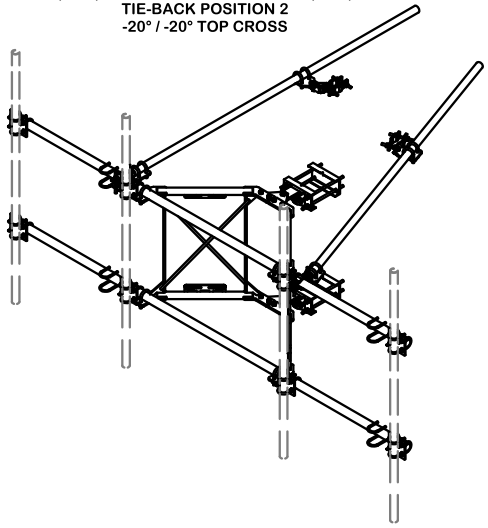


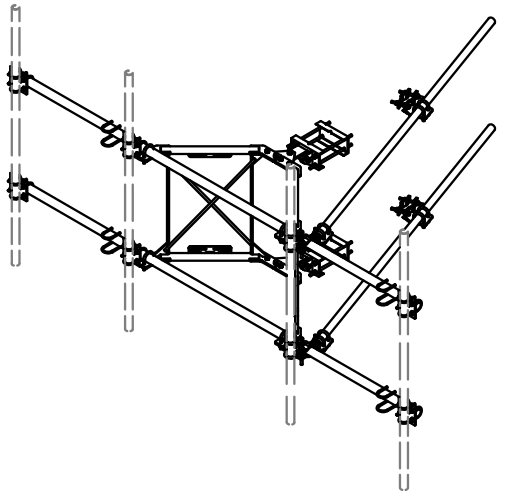
TIE-BACK POSITION 2
-20° / -20° TOP CROSS



TIE-BACK POSITION 3
-20° SAME SIDE STACKED







REV	DESCRIPTION OF REVISIONS	CPD	BY	DATE
B	CHANGED TIE-BACK BACK CONNECTION		CEK	7/31/2017
A	CHANGED TIE-BACK FRONT CONNECTION		CEK	2/2/2017

REVISION HISTORY

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V-FRAME ASSEMBLY
WITH TWO STIFF ARMS

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Los Angeles, CA
Plymouth, IN
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Dallas, TX

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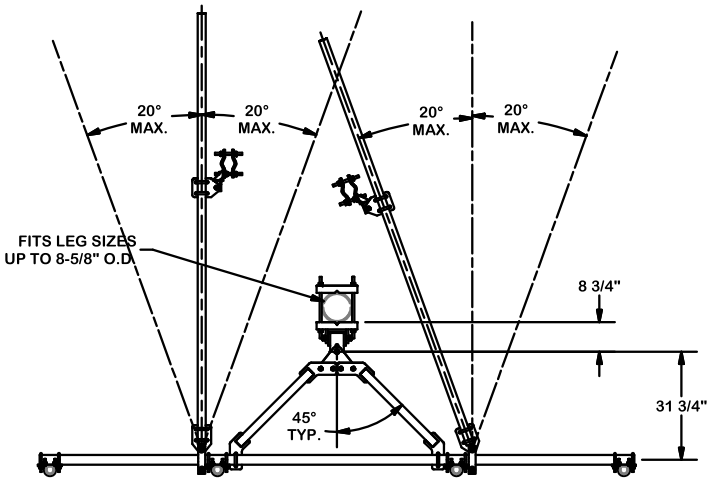
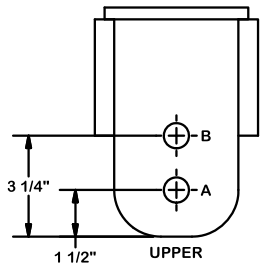
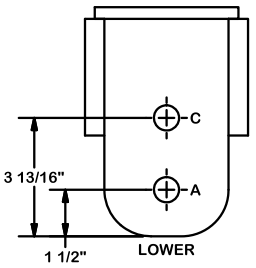
	CEK 1/25/2017		VFA14-HD

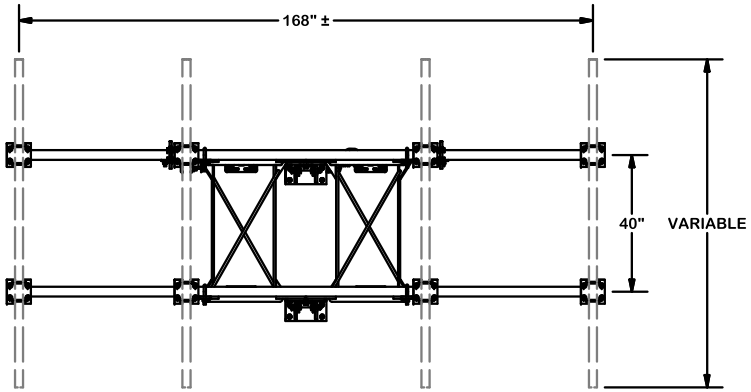
CLASS	SUB	DRAWING USAGE	CHECKED BY	DWG. NO.
81	02	CUSTOMER	BMC 8/4/2017	VFA14-HD

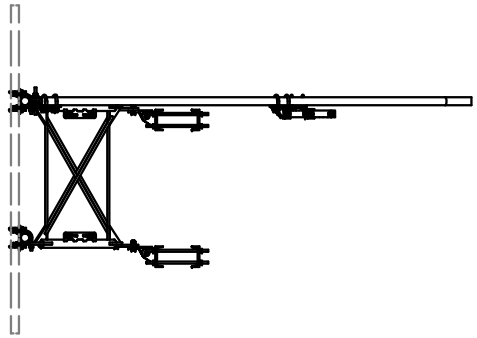






NOTES:
1. USE HOLE "A' IN UPPER AND LOWER BRACKETS FOR STRAIGHT LEGS.
2. USE HOLE "A" IN UPPER BRACKET AND HOLE "C" IN LOWER BRACKET FOR 2" IN 20' TAPER LEGS (3.309°)
3. USE HOLE "B" IN UPPER BRACKET AND HOLE "C" IN LOWER BRACKET FOR 6" IN 20' TAPER LEGS. (0.827°)





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REV	DESCRIPTION OF REVISIONS	CPD	BY	DATE
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A	CHANGED TIE-BACK FRONT CONNECTION		CEK	2/2/2017

REVISION HISTORY

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14' 6" HEAVY DUTY
V-FRAME ASSEMBLY
WITH TWO STIFF ARMS

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A valmont COMPANY

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	CEK 1/25/2017		VFA14-HD

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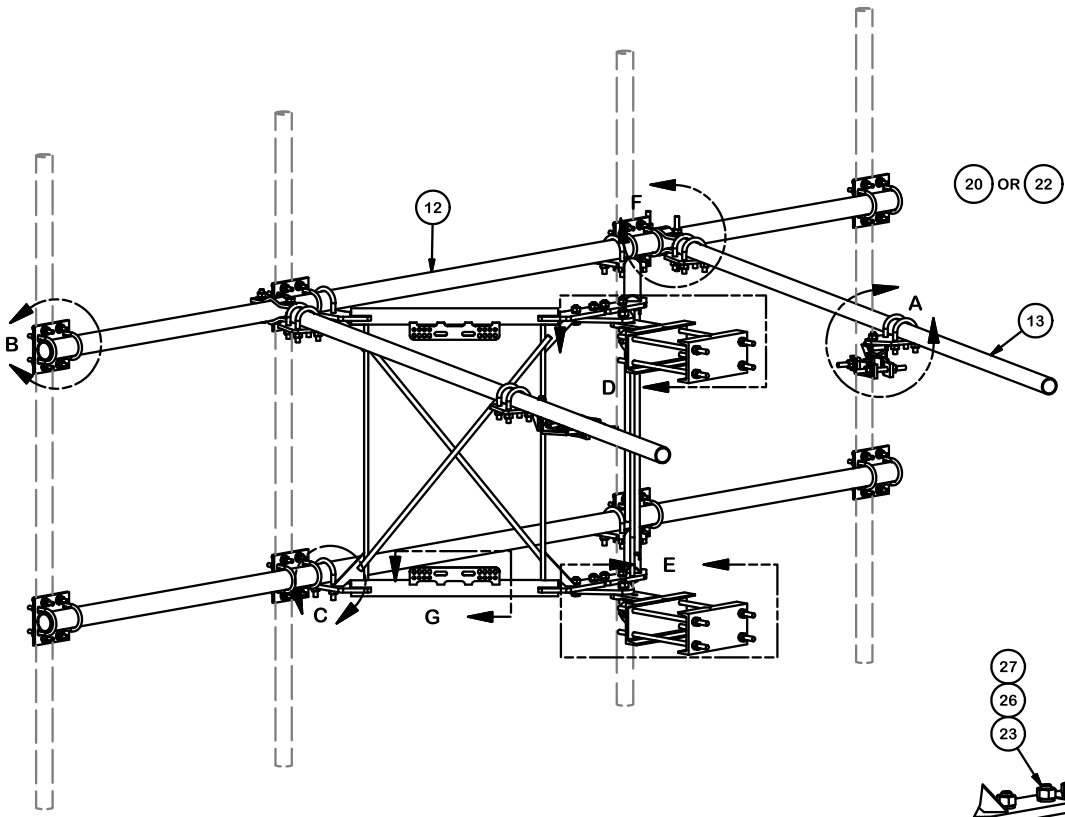
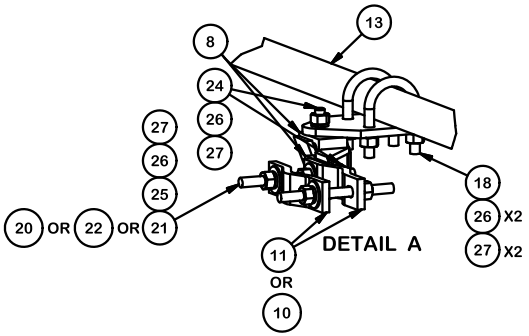
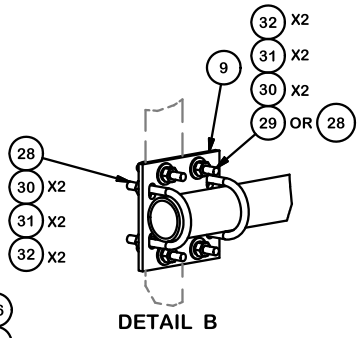
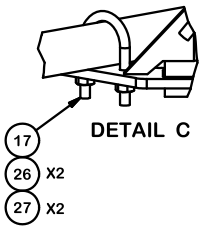
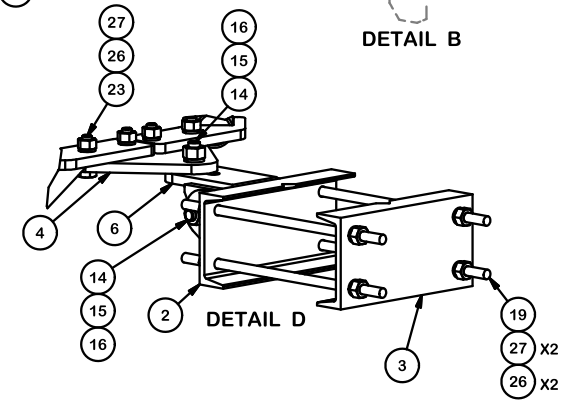
81	02	CUSTOMER	BMC 8/4/2017	VFA14-HD

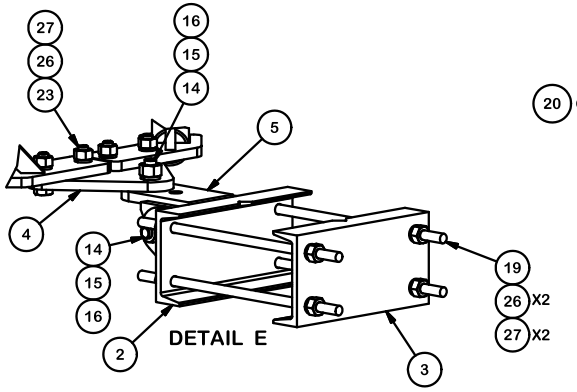


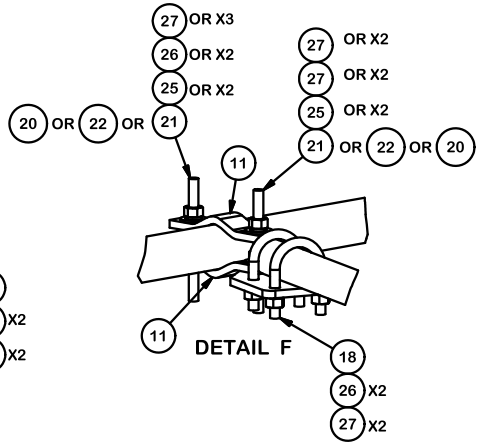


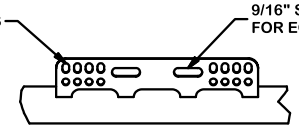












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V-FRAME ASSEMBLY
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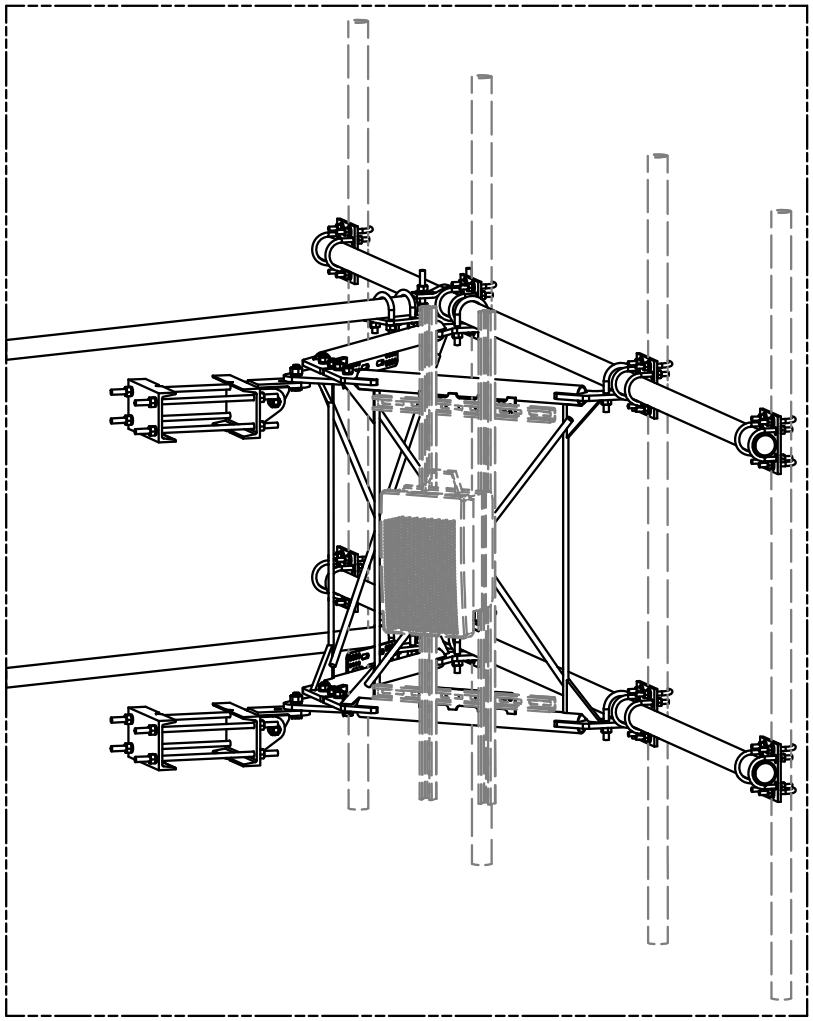
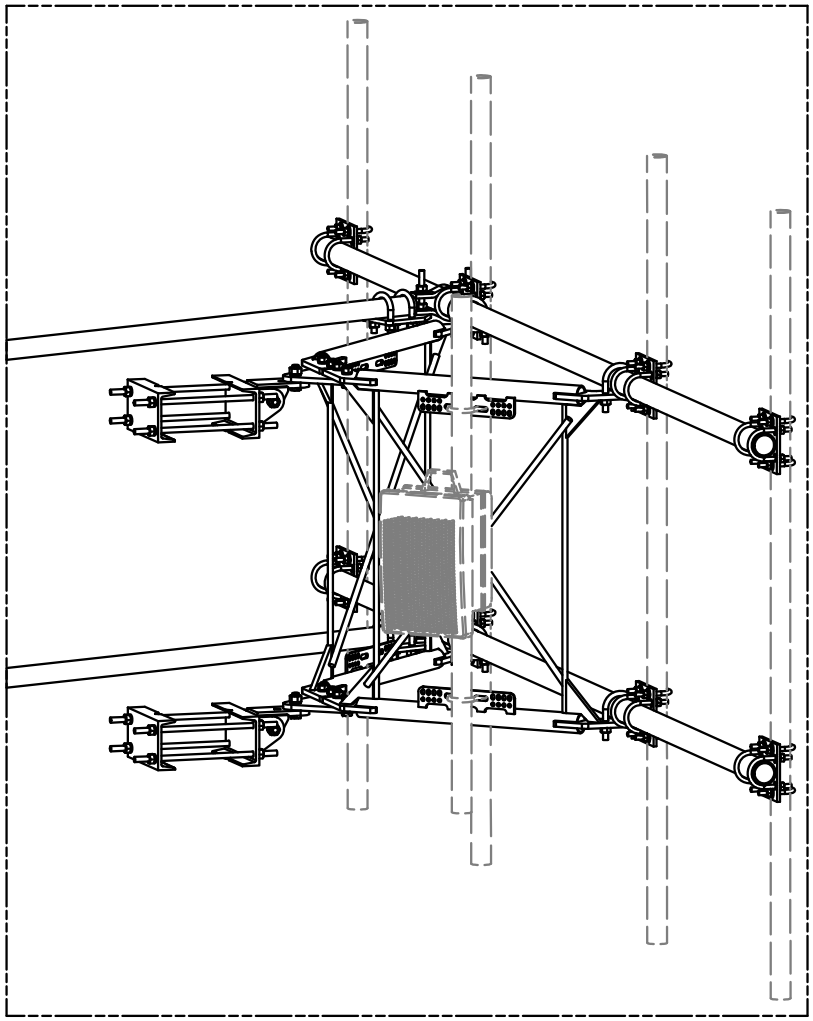
CPD NO.	DRAWN BY	ENG. APPROVAL	PART NO.
	CEK 1/25/2017		VFA14-HD

CLASS	SUB	DRAWING USAGE	CHECKED BY	DWG. NO.
81	02	CUSTOMER	BMC 8/4/2017	VFA14-HD



UNISTRUT AND HARDWARE
SOLD SEPARATELY.

REQUIRES 3/8" HARDWARE



EQUIPMENT PIPE AND HARDWARE
SOLD SEPARATELY.

REQUIRES 1/2" HARDWARE
AND 2-3/8" TO 4-1/2" O.D. PIPE

REV	DESCRIPTION OF REVISIONS	CPD	BY	DATE
B	CHANGED TIE-BACK BACK CONNECTION		CEK	7/31/2017
A	CHANGED TIE-BACK FRONT CONNECTION		CEK	2/2/2017

REVISION HISTORY

TOLERANCE NOTES

TOLERANCES ON DIMENSIONS, UNLESS OTHERWISE NOTED ARE:
SAWED, SHEARED AND GAS CUT EDGES *(± 0.030")*
DRILLED AND GAS CUT HOLES *(± 0.030")* - NO CONING OF HOLES
LASER CUT EDGES AND HOLES *(± 0.010")* - NO CONING OF HOLES
BENDS ARE ± 1/2 DEGREE
ALL OTHER MACHINING *(± 0.030")*
ALL OTHER ASSEMBLY *(± 0.060")*

DESCRIPTION
14' 6" HEAVY DUTY
V-FRAME ASSEMBLY
WITH TWO STIFF ARMS

SITE PRO 1
A valmont COMPANY
Engineering Support Team:
1-888-753-7446

Locations:
New York, NY
Atlanta, GA
Los Angeles, CA
Plymouth, IN
Salem, OR
Dallas, TX

CPD NO.	DRAWN BY	ENG. APPROVAL	PART NO.
	CEK 1/25/2017		VFA14-HD

CLASS	SUB	DRAWING USAGE	CHECKED BY	DWG. NO.
81	02	CUSTOMER	BMC 8/4/2017	VFA14-HD