Transcend Wireless

10 Industrial Ave,
Suite 3
Mahwah NJ 07430

Phone: 201.684.0055
Fax: 201.684.0066

June 5, 2019

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

RE: Notice of Exempt Modification
46 Fenwood Lane, Wilton, CT 06897
Latitude: 41.1726687900
Longitude: -73.4339652000
T-Mobile Site#: CT11040D – L600

Dear Ms. Bachman:

T-Mobile currently maintains six (6) antennas at the 122-foot level of the existing 180-foot lattice tower at 46 Fenwood Lane, Wilton, CT. The 180-foot lattice tower and property are owned by the State of Connecticut (State Police). T-Mobile now intends to replace all six (6) of its existing antennas with three (3) new 600/700/1900 MHz antenna and three (3) 1900/2100 MHz antenna. The new antennas would be installed at the same 122-foot level of the tower. The scope-of-work includes the replacement of existing pipe mast with a new pipe mast to accommodate the proposed RFS antennas.

Planned Modifications:

Tower:
Remove and Replace:
(3) AIR 21 KRC118023-1 Antenna (REMOVE) – (3) AIR 32 Antennas 1900/2100 MHz (REPLACE)
(3) AIR 21 B4A/B12P Antenna (REMOVE) – (3) RFS APXVAARR24_43-U-NA20 Antennas 600/700/2100 MHz (REPLACE)
(3) RRUS11B12 (REMOVE) - (3) Radio 4449 B71+B12 (REPLACE)

Install New:
(3) 1-3/8” Hybrid Cables

Existing to Remain:
(6) 1-1/4” Coax
(3) Twin TMA
(1) 1-3/8” Hybrid Cable

Ground:
Install New: Equipment inside existing 6131 cabinet

This facility was approved by the CSC in Docket No. 128 dated April 30, 1990. This modification complies with the original approval. Please see the enclosed.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies§ 16- SOj-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.SA. § 16-SOj-73, a copy of this letter is being sent to First Selectwoman -Lynne Vanderslice, Elected Official, and Robert Nerney, Director of Planning and Land Use Management for the Town of Wilton, as well as the tower and property owner.

The planned modifications to the facility fall squarely within those activities explicitly provided for in R.C.S;A. § 16-50j-72(b)(2).

1. The proposed modifications will not result in an increase in the height of the existing structure.

2. The proposed modifications will not require the extension of the site boundary.

3. The proposed modifications 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 Communications 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, T-Mobile respectfully submits that the proposed modifications to the above referenced telecommunications facility constitute an exempt modification under R.C.S.A. § 16-50j-72(b)(2).

Sincerely,

Kyle Richers
Transcend Wireless
Cell: 908-447-4716
Email: krichers@transcendwireless.com

Attachments
cc: Lynne Vanderslice- Wilton First Selectwoman
Robert Nerney– Wilton Director of Planning and Land Use Management
State of Connecticut State Police – tower and property owner

Kyle Richers

From: UPS Quantum View <pkginfo@ups.com>
Sent: Wednesday, June 5, 2019 9:01 AM
To: krichers@transcendwireless.com
Subject: UPS Ship Notification, Reference Number 1: CT11040D CSC EO

You have a package coming.

Scheduled Delivery Date: Thursday, 06/06/2019

This message was sent to you at the request of TRANSCEND WIRELESS to notify you that the shipment information below has been transmitted to UPS. The physical package may or may not have actually been tendered to UPS for shipment. To verify the actual transit status of your shipment, click on the tracking link below.

Shipment Details

From:	TRANSCEND WIRELESS
Tracking Number:	1ZV257424292387410
Ship To:	Lynne Vanderslice Town of Wilton 238 Danbury Road WILTON, CT 068974008 US
UPS Service:	UPS GROUND
Number of Packages:	1
Scheduled Delivery:	06/06/2019
Signature Required:	A signature is required for package delivery
Weight:	1.0 LBS
Reference Number 1:	CT11040D CSC EO

Download the UPS mobile app

Kyle Richers

From: UPS Quantum View <pkginfo@ups.com>
Sent: Wednesday, June 5, 2019 9:03 AM
To: krichers@transcendwireless.com
Subject: UPS Ship Notification, Reference Number 1: CT11040D CSC ZO

You have a package coming.

Scheduled Delivery Date: Thursday, 06/06/2019

This message was sent to you at the request of TRANSCEND WIRELESS to notify you that the shipment information below has been transmitted to UPS. The physical package may or may not have actually been tendered to UPS for shipment. To verify the actual transit status of your shipment, click on the tracking link below.

Shipment Details

From:	TRANSCEND WIRELESS
Tracking Number:	1ZV257424292357425
Ship To:	Robert Nerney Town of Wilton 238 Danbury Road WILTON, CT 068974008 US
UPS Service:	UPS GROUND
Number of Packages:	1
Scheduled Delivery:	06/06/2019
Signature Required:	A signature is required for package delivery
Weight:	1.0 LBS
Reference Number 1:	CT11040D CSC ZO

Download the UPS mobile app

Kyle Richers

From: UPS Quantum View <pkginfo@ups.com>
Sent: Wednesday, June 5, 2019 9:10 AM
To: krichers@transcendwireless.com
Subject: UPS Ship Notification, Reference Number 1: CT11040D/ CT11330A CSC LL

You have a package coming.

Scheduled Delivery Date: Thursday, 06/06/2019

This message was sent to you at the request of TRANSCEND WIRELESS to notify you that the shipment information below has been transmitted to UPS. The physical package may or may not have actually been tendered to UPS for shipment. To verify the actual transit status of your shipment, click on the tracking link below.

Shipment Details

From:	TRANSCEND WIRELESS
Tracking Number:	1ZV257424291691459
Ship To:	Brian Benito Connecticut State Police 1111 Country Club Road MIDDLETOWN, CT 064572389 US
UPS Service:	UPS GROUND
Number of Packages:	1
Scheduled Delivery:	06/06/2019
Signature Required:	A signature is required for package delivery
Weight:	1.0 LBS
Reference Number 1:	CT11040D/ CT11330A CSC LL

Download the UPS mobile app

46 FENWOOD LA

Location	46 FENWOOD LA	**Mblu**	99/ / 22/ /
Acct#	006298	**Owner**	CONNECTICUT STATE OF
Assessment	$275,030	**Appraisal**	$392,900
PID	5194	**Building Count**	1

Current Value

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2016	$79,300	$313,600	$392,900
Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2016	$55,510	$219,520	$275,030

Owner of Record

Owner	CONNECTICUT STATE OF	**Sale Price**	$0
Co-Owner		**Certificate**	
Address	450 CAPITOL AVE HARTFORD, CT 06134	**Book & Page**	0049/0403
		Sale Date	01/01/1901
		Instrument	00

Ownership History

Ownership History					
Owner	**Sale Price**	**Certificate**	**Book & Page**	**Instrument**	**Sale Date**
CONNECTICUT STATE OF	$0		0049/0403	00	01/01/1901

Building Information

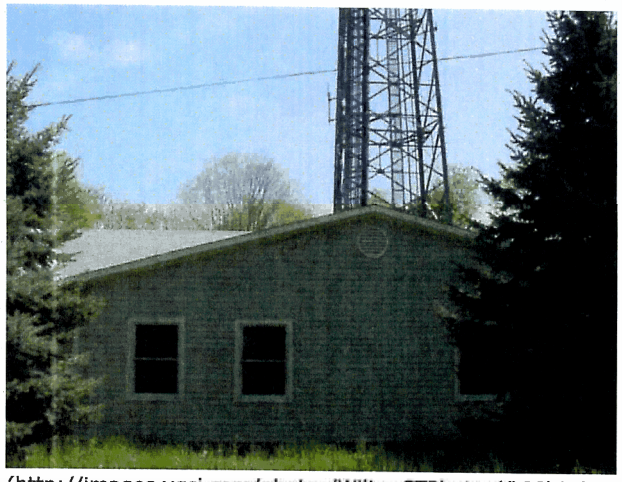
Building 1 : Section 1

Year Built:	1990
Living Area:	1,431
Replacement Cost:	$91,927
Building Percent Good:	83
Replacement Cost Less Depreciation:	$76,300

Building Attributes	
Field	**Description**

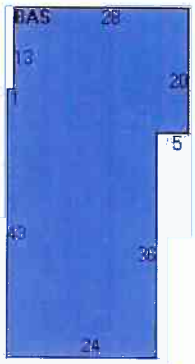
STYLE	Commercial
MODEL	Commercial
Grade	Average +10
Occupancy	1
Exterior Wall 1	Clapboard
Exterior Wall 2	
Roof Structure	Gable/Hip
Roof Cover	Asphalt Shngl.
Interior Wall 1	Minim/Masonry
Interior Wall 2	
Interior Floor 1	Concrete
Interior Floor 2	
Heating Fuel	Electric
Heating Type	Electr Basebrd
AC Type	Central
Bldg Use	Ex Com MDL-96
Fireplace	
Elevator	
Cath Ceil	
Sauna	
1st Floor Use:	21I
Heat/AC	Heat A/C Split
Frame Type	Wood Frame
Baths/Plumbing	Average
Ceiling/Wall	Ceiling Only
Rooms/Prtns	Average
Wall Height	10
% Comn Wall	0

Building Photo



(http://images.vgsi.com/photos/WiltonCTPhotos//\00\00\03/49.j

Building Layout



Building Sub-Areas (sq ft)			Legend
Code	Description	Gross Area	Living Area
BAS	First Floor	1,431	1,431
		1,431	1,431

Extra Features

Extra Features	Legend
No Data for Extra Features	

Land

Land Use

Use Code 21I
Description Ex Com MDL-96
Zone R-2
Neighborhood 4000

Land Line Valuation

Size (Acres) 0.5
Frontage
Depth
Assessed Value $219,520

Alt Land Appr No
Category

Appraised Value $313,600

Outbuildings

Outbuildings						Legend
Code	**Description**	**Sub Code**	**Sub Description**	**Size**	**Value**	**Bldg #**
FN3	Fence 6'			300 L.F.	$3,000	1

Valuation History

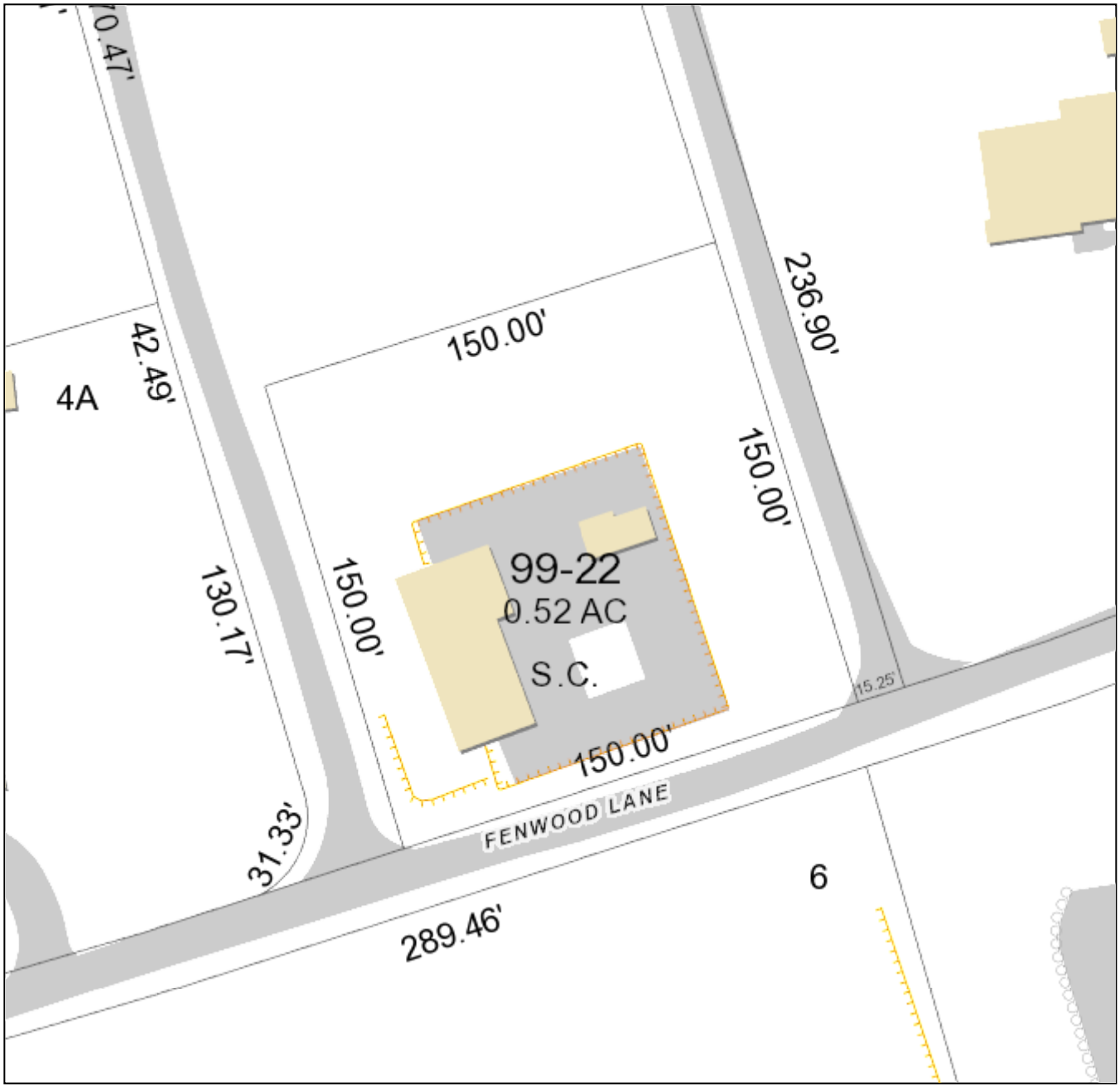
Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2016	$79,300	$313,600	$392,900
2015	$79,300	$313,600	$392,900
2014	$79,300	$313,600	$392,900

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2016	$55,510	$219,520	$275,030
2015	$55,510	$219,520	$275,030
2014	$55,510	$219,520	$275,030

Town of Wilton

Geographic Information System (GIS)

Date Printed: 5/8/2019



MAP DISCLAIMER - NOTICE OF LIABILITY

This map is for assessment purposes only. It is not for legal description or conveyances. All information is subject to verification by any user. The Town of Wilton and its mapping contractors assume no legal responsibility for the information contained herein.

Zoning Effective: July 28, 2017

Planimetrics Updated: 2014

Approximate Scale: 1 inch = 50 feet

0 50 Feet

N W E S

An application of the Department of Public Safety, Division of State Police, for a Certificate of Environmental Compatibility and Public Need for the construction, operation, and maintenance of a telecommunications tower and associated equipment in the Town of Wilton, Connecticut.	:	Docket 128 Connecticut Siting Council April 30, 1990

DECISION AND ORDER

Pursuant to the foregoing Findings of Fact and Opinion, the Connecticut Siting Council finds that the effects associated with the construction, operation, and maintenance of a telecommunications tower at the proposed Wilton, Connecticut, 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 significant either alone or cumulatively with other effects, 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 General Statutes of Connecticut (CGS), be issued to Department of Public Safety, Division of State Police, for the construction, operation, and maintenance of a telecommunications tower, associated equipment, and building at the proposed site in Wilton, Connecticut.

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

1. The facility shall be constructed in accordance with the State of Connecticut Basic Building Code.

2. The self-supporting lattice tower shall be no taller than necessary to provide the proposed communications and in no event shall the tower exceed 193 feet above ground level, with antennas and all appurtenances.

3. 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 for the site's preparation, tower placement and foundation, architecture of the equipment building and fence, access road, and erosion and sedimentation controls.

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

5. The Certificate Holder shall provide the Council a recalculated report of 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 to share space on the proposed towers for fair consideration, or shall provide any requesting entity with specific legal, technical, environmental, or economic reasons precluding such tower sharing.

7. If the facility does not initially provide, or permanently ceases to provide, telecommunications 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.

Pursuant to 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 Bridgeport Post, The Hour, The Advocate, and The News-Times.

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.

CERTIFICATION

The undersigned members of the Connecticut Siting Council hereby certify that they have heard this case in Docket No. 128 or read the record thereof, and that we voted as follows:

Dated at New Britain, Connecticut the 30th day of April, 1990.

Council Members	Vote Cast
Gloria Dibble Pond Chairperson	Yes
Commissioner Peter Boucher Designee: Robert A. Pulito	Yes
Commissioner Leslie Carothers Designee: Brian Emerick	Yes
Harry E. Covey	Yes
Mortimer A. Gelston	Yes
Daniel P. Lynch, Jr.	Yes
Paulann H. Sheets	Abstain
William H. Smith	Yes
Colin C. Tait	Yes

The parties or intervenors to this proceeding are:

Party	Its Representatives
Department of Public Safety Division of State Police	Captain Ronald P. Mikulka Commanding Officer Connecticut State Police Police Support Services 294 Colony Street Building No. 5 Meriden, Connecticut 06450 L.D. McCallum and Robert F. Vachelli Assistant Attorneys General MacKenzie Hall 110 Sherman Street Hartford, Connecticut 06105
Intevenor	**Its Representative**
Steven Lauten 31 Fennwood Lane Wilton, Connecticut	Jessie F. Bennett, Esq. Davidson, Naylor, & Leepson 535 Connecticut Avenue P.O. Box 5351 Norwalk, Connecticut 06856
Intevenor	**Its Representative**
SNET Cellular, Inc. 227 Church Street New Haven, Connecticut 06506	Peter J. Tyrrell Senior Attorney SNET Cellular, Inc. 227 Church Street New Haven, Connecticut 06506
Intevenor	**Its Representative**
Metro Mobile CTS, of Fairfield County, Inc. 50 Rockland Road South Norwalk, Connecticut 06854	Henry H. Sprague, Esq. Robinson & Cole One Commercial Plaza Hartford, Connecticut 06105
Intevenor	**Its Representative**
Metro Mobile CTS, of 110 East 59th Street New York, New York 10022	Henry H. Sprague, Esq. Robinson & Cole One Commercial Plaza Hartford, Connecticut 06105

Party	Its Representative
Town of Wilton Town Hall 238 Danbury Road Wilton, Connecticut 06880	Burton L. Jones First Selectman Town Hall 238 Danbury Road Wilton, Connecticut 06897

Party

Stephen J. Farley
368 Belden Hill
Wilton, Connecticut 06897

4167E

T-Mobile

WIRELESS COMMUNICATIONS FACILITY

WILTON/STATE POLICE
SITE ID: CT11040D
46 FENWOOD LANE
WILTON, CT 06897

T-MOBILE RF CONFIGURATION

67D92DBL_1xAIR+1OP

PROJECT SUMMARY

1. THE PROPOSED SCOPE OF WORK CONSISTS OF A MODIFICATION TO THE EXISTING UNMANNED TELECOMMUNICATIONS FACILITY INCLUDING THE FOLLOWING:

   A. REMOVE (6) EXISTING ANTENNAS, TYP. (2) PER SECTOR
   B. REMOVE (3) EXISTING RRUS, TYP. (1) PER SECTOR
   C. INSTALL (3) NEW AIR32 ANTENNAS, TYP. (1) SECTOR
   D. INSTALL (3) NEW RFS ANTENNAS, TYP. (1) PER SECTOR
   E. INSTALL (3) NEW RADIO 4449 B71+B12, TYP. (1) PER SECTOR
   F. INSTALL (3) NEW 6x12 HYBRID CABLES
   G. RELOCATE (3) EXISTING TMAS, TYP. (1) PER SECTOR
   H. UPGRADE 100 AMP TO 200 AMP MAIN
   I. INSTALL NEW 125 BREAKER
   J. SWAP (1) DUS41 AND (1) XMU WITH (1) BB 6630
   K. INSTALL (1) BB 6630 FOR FUTURE 5G (N600 DARK)

GENERAL NOTES

1. ALL WORK SHALL BE IN ACCORDANCE WITH THE 2015 INTERNATIONAL BUILDING CODE AS MODIFIED BY THE 2018 CONNECTICUT SUPPLEMENT, INCLUDING THE TIA/EIA-222 REVISION "G" "STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND SUPPORTING STRUCTURES." 2018 CONNECTICUT FIRE SAFETY CODE, 2017 NATIONAL ELECTRICAL CODE AND LOCAL CODES.
2. CONTRACTOR SHALL REVIEW ALL DRAWINGS AND SPECIFICATIONS IN THE CONTRACT DOCUMENT SET. CONTRACTOR SHALL COORDINATE ALL WORK SHOWN IN THE SET OF DRAWINGS. THE CONTRACTOR SHALL PROVIDE A COMPLETE SET OF DRAWINGS TO ALL SUBCONTRACTORS AND ALL RELATED PARTIES. THE SUBCONTRACTORS SHALL EXAMINE ALL THE DRAWINGS AND SPECIFICATIONS FOR THE INFORMATION THAT AFFECTS THEIR WORK.
3. CONTRACTOR SHALL PROVIDE A COMPLETE BUILD-OUT WITH ALL FINISHES, STRUCTURAL, MECHANICAL, AND ELECTRICAL COMPONENTS AND PROVIDE ALL ITEMS AS SHOWN OR INDICATED ON THE DRAWINGS OR IN THE WRITTEN SPECIFICATIONS.
4. CONTRACTOR SHALL FURNISH ALL MATERIAL, LABOR AND EQUIPMENT TO COMPLETE THE WORK AND FURNISH A COMPLETED JOB ALL IN ACCORDANCE WITH LOCAL AND STATE GOVERNING AUTHORITIES AND OTHER AUTHORITIES HAVING LAWFUL JURISDICTION OVER THE WORK.
5. CONTRACTOR SHALL SECURE AND PAY FOR ALL PERMITS AND ALL INSPECTIONS REQUIRED AND SHALL ALSO PAY FEES REQUIRED FOR THE GENERAL CONSTRUCTION, PLUMBING, ELECTRICAL AND HVAC. PERMITS SHALL BE PAID FOR BY THE RESPECTIVE SUBCONTRACTORS.
6. CONTRACTOR SHALL MAINTAIN A CURRENT SET OF DRAWINGS AND SPECIFICATIONS ON SITE AT ALL TIMES AND INSURE DISTRIBUTION OF NEW DRAWINGS TO SUBCONTRACTORS AND OTHER RELEVANT PARTIES AS SOON AS THEY ARE MADE AVAILABLE. ALL OLD DRAWINGS SHALL BE MARKED VOID AND REMOVED FROM THE CONTRACT AREA. THE CONTRACTOR SHALL FURNISH AN 'AS-BUILT' SET OF DRAWINGS TO OWNER UPON COMPLETION OF PROJECT.
7. LOCATION OF EQUIPMENT, AND WORK SUPPLIED BY OTHERS THAT IS DIAGRAMMATICALLY INDICATED ON THE DRAWINGS SHALL BE DETERMINED BY THE CONTRACTOR. THE CONTRACTOR SHALL DETERMINE LOCATIONS AND DIMENSIONS SUBJECT TO STRUCTURAL CONDITIONS AND WORK OF THE SUBCONTRACTORS.
8. THE CONTRACTOR IS SOLELY RESPONSIBLE TO DETERMINE CONSTRUCTION PROCEDURE AND SEQUENCE, AND TO ENSURE THE SAFETY OF THE EXISTING STRUCTURES AND ITS COMPONENT PARTS DURING CONSTRUCTION. THIS INCLUDES THE ADDITION OF WHATEVER SHORING, BRACING, UNDERPINNING, ETC. THAT MAY BE NECESSARY.
9. DRAWINGS INDICATE THE MINIMUM STANDARDS, BUT IF ANY WORK SHOULD BE INDICATED TO BE SUBSTANDARD TO ANY ORDINANCES, LAWS, CODES, RULES, OR REGULATIONS BEARING ON THE WORK, THE CONTRACTOR SHALL INCLUDE IN HIS WORK AND SHALL EXECUTE THE WORK CORRECTLY IN ACCORDANCE WITH SUCH ORDINANCES, LAWS, CODES, RULES OR REGULATIONS WITH NO INCREASE IN COSTS.
10. ALL UTILITY WORK SHALL BE IN ACCORDANCE WITH LOCAL UTILITY COMPANY REQUIREMENTS AND SPECIFICATIONS.
11. ALL EQUIPMENT AND PRODUCTS PURCHASED ARE TO BE REVIEWED BY CONTRACTOR AND ALL APPLICABLE SUBCONTRACTORS FOR ANY CONDITION PER MFR.'S RECOMMENDATIONS. CONTRACTOR TO SUPPLY THESE ITEMS AT NO COST TO OWNER OR CONSTRUCTION MANAGER.
12. ANY AND ALL ERRORS, DISCREPANCIES, AND 'MISSED" ITEMS ARE TO BE BROUGHT TO THE ATTENTION OF THE T-MOBILE CONSTRUCTION MANAGER DURING THE BIDDING PROCESS BY THE CONTRACTOR. ALL THESE ITEMS ARE TO BE INCLUDED IN THE BID. NO 'EXTRA' WILL BE ALLOWED FOR MISSED ITEMS.
13. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL ON-SITE SAFETY FROM THE TIME THE JOB IS AWARDED UNTIL ALL WORK IS COMPLETE AND ACCEPTED BY THE OWNER.
14. CONTRACTOR TO REVIEW ALL SHOP DRAWINGS AND SUBMIT COPY TO ENGINEER FOR APPROVAL. DRAWINGS MUST BEAR THE CHECKER'S INITIALS BEFORE SUBMITTING TO THE CONSTRUCTION MANAGER FOR REVIEW.
15. THE CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS, ELEVATIONS, ANGLES, AND EXISTING CONDITIONS AT THE SITE, PRIOR TO FABRICATION AND/OR INSTALLATION OF ANY WORK IN THE CONTRACT AREA.
16. COORDINATION, LAYOUT, FURNISHING AND INSTALLATION OF CONDUIT AND ALL APPURTENANCES REQUIRED FOR PROPER INSTALLATION OF ELECTRICAL AND TELECOMMUNICATION SERVICE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
17. ALL DAMAGE CAUSED TO ANY EXISTING STRUCTURE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR WILL BE HELD LIABLE FOR ALL REPAIRS REQUIRED FOR EXISTING STRUCTURES IF DAMAGED DURING CONSTRUCTION ACTIVITIES.
18. THE CONTRACTOR SHALL CONTACT "CALL BEFORE YOU DIG" AT LEAST 48 HOURS PRIOR TO ANY EXCAVATIONS AT 1-800-922-4455. ALL UTILITIES SHALL BE IDENTIFIED AND CLEARLY MARKED. CONTRACTOR SHALL MAINTAIN AND PROTECT MARKED UTILITIES THROUGHOUT PROJECT COMPLETION.
19. CONTRACTOR SHALL COMPLY WITH OWNERS ENVIRONMENTAL ENGINEER ON ALL METHODS AND PROVISIONS FOR ALL EXCAVATION ACTIVITIES INCLUDING SOIL DISPOSAL. ALL BACKFILL MATERIALS TO BE PROVIDED BY THE CONTRACTOR.

SITE DIRECTIONS

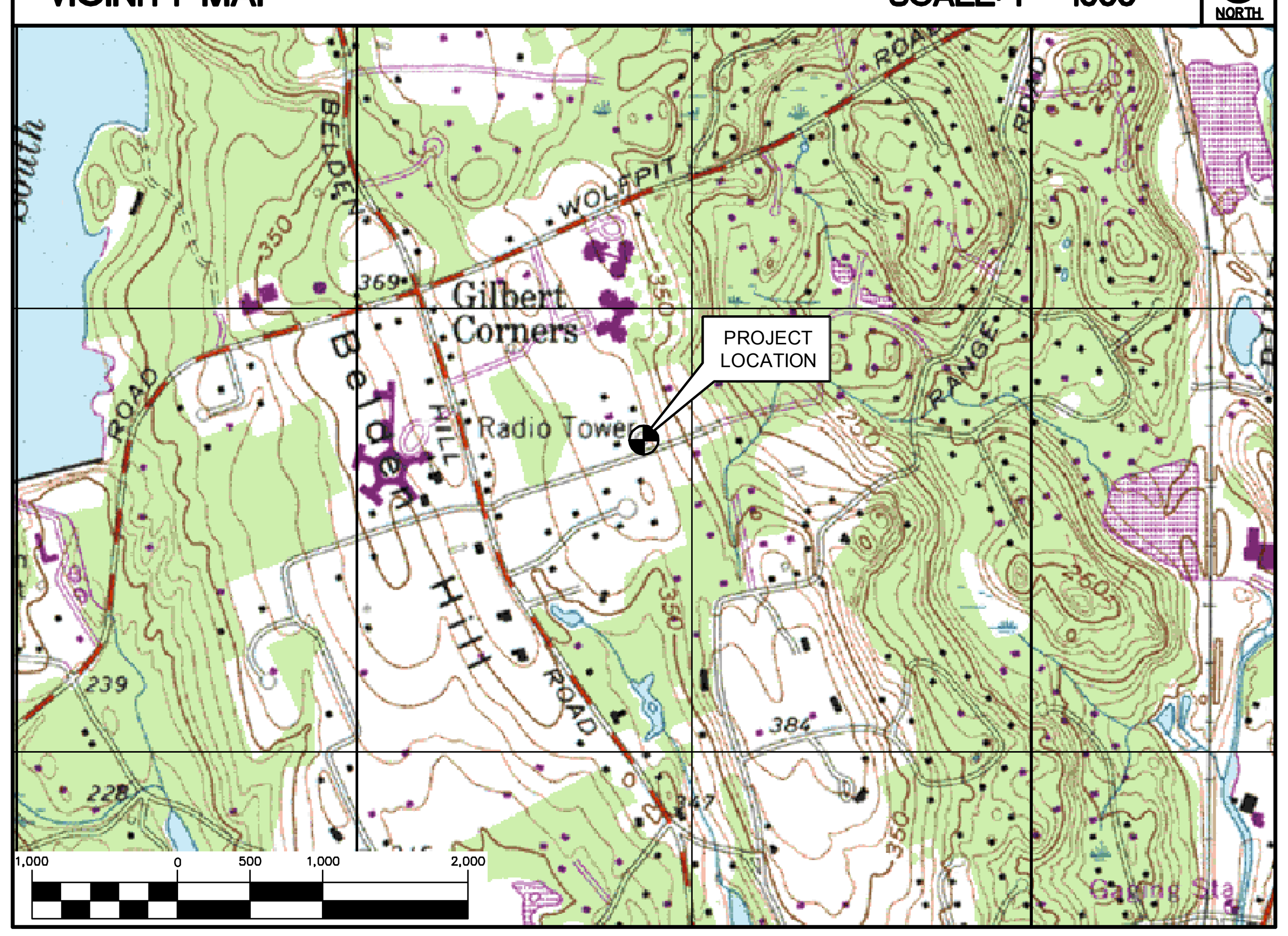
FROM: 35 GRIFFIN ROAD SOUTH, BLOOMFIELD, CT 06002
TO: 46 FENWOOD LANE, WILTON, CT 06897

1.	HEAD NORTH ON GRIFFIN ROAD S. TOWARD HARTMAN RD.	0.30 MI.
2.	TAKE THE 2ND RIGHT ONTO DAY HILL RD.	3.64 MI.
3.	MERGE ONTO I-91 S TOWARD HARTFORD.	26.38 MI.
4.	MERGE ONTO CT-15 S VIA EXIT 17 TOWARD E MAIN ST.	44.27 MI.
5.	TAKE THE CT-33 EXIT, EXIT 41, TOWARD WESTPORT/WILTON.	0.08 MI.
6.	KEEP RIGHT AT THE FORK IN THE RAMP.	0.03 MI.
7.	TURN LEFT ONTO CT-33/WILTON RD. CONTINUE TO FOLLOW CT-33.	2.66 MI.
8.	TURN LEFT ONTO WOLFPIT RD/CT-106.	1.22 MI.
9.	TURN LEFT ONTO BELDEN HILL RD.	0.29 MI.
10.	TAKE THE 1ST LEFT ONTO FENWOOD LN.	0.13 MI.

VICINITY MAP

SCALE: 1" = 1000'

NORTH



PROJECT INFORMATION

SITE NAME:	WILTON/STATE POLICE
SITE ID:	CT11040D
SITE ADDRESS:	46 FENWOOD LANE WILTON, CT 06897
APPLICANT:	T-MOBILE NORTHEAST, LLC 35 GRIFFIN ROAD SOUTH BLOOMFIELD, CT 06002
CONTACT PERSON:	DAN REID (PROJECT MANAGER) TRANSCEND WIRELESS, LLC (203) 592-8291
ENGINEER:	CENTEK ENGINEERING, INC. 63-2 NORTH BRANFORD RD. BRANFORD, CT 06405
PROJECT COORDINATES:	LATITUDE: 41°-10'-21.54" N LONGITUDE: 73°-26'-02.28" W GROUND ELEVATION: 376'± AMSL SITE COORDINATES AND GROUND ELEVATION REFERENCED FROM GOOGLE EARTH.

SHEET INDEX

SHT. NO.	DESCRIPTION	REV.
T-1	TITLE SHEET	0
N-1	DESIGN BASIS AND SITE NOTES	0
C-1	SITE LOCATION PLAN	0
C-2	COMPOUND PLAN AND TOWER ELEVATION	0
C-3	ANTENNA CONFIG. & ELEVATION	0
E-1	TYPICAL ELECTRICAL DETAILS	0
E-2	TYPICAL ELECTRICAL DETAILS	0

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	05/21/19	KAWJR	CAG	CONSTRUCTION DRAWINGS – ISSUED FOR CONSTRUCTION

PROFESSIONAL ENGINEER SEAL

STATE OF CONNECTICUT · CARLO F. GAGNON · 27517 · LICENSED · PROFESSIONAL ENGINEER

T-Mobile

Transcend Wireless

CENTEK engineering
Centered on Solutions™
(203) 488-0580
(203) 488-8587 Fax
63-2 North Branford Road
Branford, CT 06405
www.CentekEng.com

T-MOBILE NORTHEAST LLC
WIRELESS COMMUNICATIONS FACILITY
WILTON/STATE POLICE
SITE ID: CT11040D
46 FENWOOD LANE
WILTON, CT 06897

DATE:	04/30/19
SCALE:	AS NOTED
JOB NO.	19027.02

TITLE SHEET

T-1

Sheet No. 1 of 7

DESIGN BASIS:

GOVERNING CODE: 2015 INTERNATIONAL BUILDING (IBC) AS MODIFIED BY THE 2018 CT STATE BUILDING CODE AND AMENDMENTS.

1. DESIGN CRITERIA:

- WIND LOAD: PER TIA 222 G (ANTENNA MOUNTS): 90–110 MPH (3 SECOND GUST)
- RISK CATEGORY: II (BASED ON IBC APPENDIX N)
- NOMINAL DESIGN SPEED (TOWER): 93 MPH (Vasd) (EXPOSURE C/IMPORTANCE FACTOR 1.0 BASED ON ASCE 7–10) PER 2015 INTERNATIONAL BUILDING CODE (IBC) AS MODIFIED BY THE 2018 CONNECTICUT STATE BUILDING CODE.
- SEISMIC LOAD (DOES NOT CONTROL): PER ASCE 7–10 MINIMUM DESIGN LOADS FOR BUILDING AND OTHER STRUCTURES.

GENERAL NOTES:

1. ALL CONSTRUCTION SHALL BE IN COMPLIANCE WITH THE GOVERNING BUILDING CODE.
2. DRAWINGS INDICATE THE MINIMUM STANDARDS, BUT IF ANY WORK SHOULD BE INDICATED TO BE SUBSTANDARD TO ANY ORDINANCES, LAWS, CODES, RULES, OR REGULATIONS BEARING ON THE WORK, THE CONTRACTOR SHALL INCLUDE IN HIS WORK AND SHALL EXECUTE THE WORK CORRECTLY IN ACCORDANCE WITH SUCH ORDINANCES, LAWS, CODES, RULES OR REGULATIONS WITH NO INCREASE IN COSTS.
3. BEFORE BEGINNING THE WORK, THE CONTRACTOR IS RESPONSIBLE FOR MAKING SUCH INVESTIGATIONS CONCERNING PHYSICAL CONDITIONS (SURFACE AND SUBSURFACE) AT OR CONTIGUOUS TO THE SITE WHICH MAY AFFECT PERFORMANCE AND COST OF THE WORK.
4. DIMENSIONS AND DETAILS SHALL BE CHECKED AGAINST EXISTING FIELD CONDITIONS.
5. THE CONTRACTOR SHALL VERIFY AND COORDINATE THE SIZE AND LOCATION OF ALL OPENINGS, SLEEVES AND ANCHOR BOLTS AS REQUIRED BY ALL TRADES.
6. ALL DIMENSIONS, ELEVATIONS, AND OTHER REFERENCES TO EXISTING STRUCTURES, SURFACE, AND SUBSURFACE CONDITIONS ARE APPROXIMATE. NO GUARANTEE IS MADE FOR THE ACCURACY OR COMPLETENESS OF THE INFORMATION SHOWN. THE CONTRACTOR SHALL VERIFY AND COORDINATE ALL DIMENSIONS, ELEVATIONS, ANGLES WITH EXISTING CONDITIONS AND WITH ARCHITECTURAL AND SITE DRAWINGS BEFORE PROCEEDING WITH ANY WORK.
7. AS THE WORK PROGRESSES, THE CONTRACTOR SHALL NOTIFY THE OWNER OF ANY CONDITIONS WHICH ARE IN CONFLICT OR OTHERWISE NOT CONSISTENT WITH THE CONSTRUCTION DOCUMENTS AND SHALL NOT PROCEED WITH SUCH WORK UNTIL THE CONFLICT IS SATISFACTORILY RESOLVED.
8. THE CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE SAFETY CODES AND REGULATIONS DURING ALL PHASES OF CONSTRUCTION. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR PROVIDING AND MAINTAINING ADEQUATE SHORING, BRACING, AND BARRICADES AS MAY BE REQUIRED FOR THE PROTECTION OF EXISTING PROPERTY, CONSTRUCTION WORKERS, AND FOR PUBLIC SAFETY.
9. THE CONTRACTOR IS SOLELY RESPONSIBLE TO DETERMINE CONSTRUCTION PROCEDURE AND SEQUENCE, AND TO ENSURE THE SAFETY OF THE EXISTING STRUCTURES AND ITS COMPONENT PARTS DURING CONSTRUCTION. THIS INCLUDES THE ADDITION OF WHATEVER SHORING, BRACING, UNDERPINNING, ETC. THAT MAY BE NECESSARY. MAINTAIN EXISTING SITE OPERATIONS, COORDINATE WORK WITH NORTHEAST UTILITIES
10. THE STRUCTURE IS DESIGNED TO BE SELF-SUPPORTING AND STABLE AFTER FOUNDATION REMEDIATION WORK IS COMPLETE. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO DETERMINE ERECTION PROCEDURE AND SEQUENCE AND TO ENSURE THE SAFETY OF THE STRUCTURE AND ITS COMPONENT PARTS DURING ERECTION. THIS INCLUDES THE ADDITION OF WHATEVER SHORING, TEMPORARY BRACING, GUYS OR TIEDOWNS, WHICH MIGHT BE NECESSARY.
11. ALL DAMAGE CAUSED TO ANY EXISTING STRUCTURE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR WILL BE HELD LIABLE FOR ALL REPAIRS REQUIRED FOR EXISTING STRUCTURES IF DAMAGED DURING CONSTRUCTION ACTIVITIES.
12. SHOP DRAWINGS, CONCRETE MIX DESIGNS, TEST REPORTS, AND OTHER SUBMITTALS PERTAINING TO STRUCTURAL WORK SHALL BE FORWARDED TO THE OWNER FOR REVIEW BEFORE FABRICATION AND/OR INSTALLATION IS MADE. SHOP DRAWINGS SHALL INCLUDE ERECTION DRAWINGS AND COMPLETE DETAILS OF CONNECTIONS AS WELL AS MANUFACTURER'S SPECIFICATION DATA WHERE APPROPRIATE. SHOP DRAWINGS SHALL BE CHECKED BY THE CONTRACTOR AND BEAR THE CHECKER'S INITIALS BEFORE BEING SUBMITTED FOR REVIEW.
13. NO DRILLING WELDING OR TAPING ON EVERSOURCE OWNED EQUIPMENT.
14. REFER TO DRAWING T1 FOR ADDITIONAL NOTES AND REQUIREMENTS.

STRUCTURAL STEEL

1. ALL STRUCTURAL STEEL IS DESIGNED BY ALLOWABLE STRESS DESIGN (ASD)

   A. STRUCTURAL STEEL (W SHAPES)–––ASTM A992 (FY = 50 KSI)
   B. STRUCTURAL STEEL (OTHER SHAPES)–––ASTM A36 (FY = 36 KSI)
   C. STRUCTURAL HSS (RECTANGULAR SHAPES)–––ASTM A500 GRADE B, (FY = 46 KSI)
   D. STRUCTURAL HSS (ROUND SHAPES)–––ASTM A500 GRADE B, (FY = 42 KSI)
   E. PIPE–––ASTM A53 (FY = 35 KSI)
   F. CONNECTION BOLTS–––ASTM A325–N
   G. U–BOLTS–––ASTM A36
   H. ANCHOR RODS–––ASTM F 1554
   I. WELDING ELECTRODE–––ASTM E 70XX

2. CONTRACTOR TO REVIEW ALL SHOP DRAWINGS AND SUBMIT COPY TO ENGINEER FOR APPROVAL. DRAWINGS MUST BEAR THE CHECKER'S INITIALS BEFORE SUBMITTING TO THE ENGINEER FOR REVIEW. SHOP DRAWINGS SHALL INCLUDE THE FOLLOWING: SECTION PROFILES, SIZES, CONNECTION ATTACHMENTS, REINFORCING, ANCHORAGE, SIZE AND TYPE OF FASTENERS AND ACCESSORIES. INCLUDE ERECTION DRAWINGS, ELEVATIONS AND DETAILS.
3. STRUCTURAL STEEL SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH THE LATEST PROVISIONS OF AISC MANUAL OF STEEL CONSTRUCTION.
4. PROVIDE ALL PLATES, CLIP ANGLES, CLOSURE PIECES, STRAP ANCHORS, MISCELLANEOUS PIECES AND HOLES REQUIRED TO COMPLETE THE STRUCTURE.
5. FIT AND SHOP ASSEMBLE FABRICATIONS IN THE LARGEST PRACTICAL SECTIONS FOR DELIVERY TO SITE.
6. INSTALL FABRICATIONS PLUMB AND LEVEL, ACCURATELY FITTED, AND FREE FROM DISTORTIONS OR DEFECTS.
7. AFTER ERECTION OF STRUCTURES, TOUCHUP ALL WELDS, ABRASIONS AND NON–GALVANIZED SURFACES WITH A 95% ORGANIC ZINC RICH PAINT IN ACCORDANCE WITH ASTM 780.
8. ALL STEEL MATERIAL (EXPOSED TO WEATHER) SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123 "ZINC (HOT DIPPED GALVANIZED) COATINGS" ON IRONS AND STEEL PRODUCTS.
9. ALL BOLTS, ANCHORS AND MISCELLANEOUS HARDWARE SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153 "ZINC COATING (HOT–DIP) ON IRON AND STEEL HARDWARE".
10. THE ENGINEER SHALL BE NOTIFIED OF ANY INCORRECTLY FABRICATED, DAMAGED OR OTHERWISE MISFITTING OR NON CONFORMING MATERIALS OR CONDITIONS TO REMEDIAL OR CORRECTIVE ACTION. ANY SUCH ACTION SHALL REQUIRE ENGINEER REVIEW.
11. CONNECTION ANGLES SHALL HAVE A MINIMUM THICKNESS OF 1/4 INCHES.
12. STRUCTURAL CONNECTION BOLTS SHALL CONFORM TO ASTM A325. ALL BOLTS SHALL BE 3/4" DIAMETER MINIMUM AND SHALL HAVE A MINIMUM OF TWO BOLTS, UNLESS OTHERWISE ON THE DRAWINGS.
13. LOCK WASHER ARE NOT PERMITTED FOR A325 STEEL ASSEMBLIES.
14. SHOP CONNECTIONS SHALL BE WELDED OR HIGH STRENGTH BOLTED.
15. MILL BEARING ENDS OF COLUMNS, STIFFENERS, AND OTHER BEARING SURFACES TO TRANSFER LOAD OVER ENTIRE CROSS SECTION.
16. FABRICATE BEAMS WITH MILL CAMBER UP.
17. LEVEL AND PLUMB INDIVIDUAL MEMBERS OF THE STRUCTURE TO AN ACCURACY OF 1:500, BUT NOT TO EXCEED 1/4" IN THE FULL HEIGHT OF THE COLUMN.
18. COMMENCEMENT OF STRUCTURAL STEEL WORK WITHOUT NOTIFYING THE ENGINEER OF ANY DISCREPANCIES WILL BE CONSIDERED ACCEPTANCE OF PRECEDING WORK.
19. INSPECTION AND TESTING OF ALL WELDING AND HIGH STRENGTH BOLTING SHALL BE PERFORMED BY AN INDEPENDENT TESTING LABORATORY.
20. FOUR COPIES OF ALL INSPECTION TEST REPORTS SHALL BE SUBMITTED TO THE ENGINEER WITHIN TEN (10) WORKING DAYS OF THE DATE OF INSPECTION.

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0	05/21/19	KAMJR	CAG	CONSTRUCTION DRAWINGS – ISSUED FOR CONSTRUCTION

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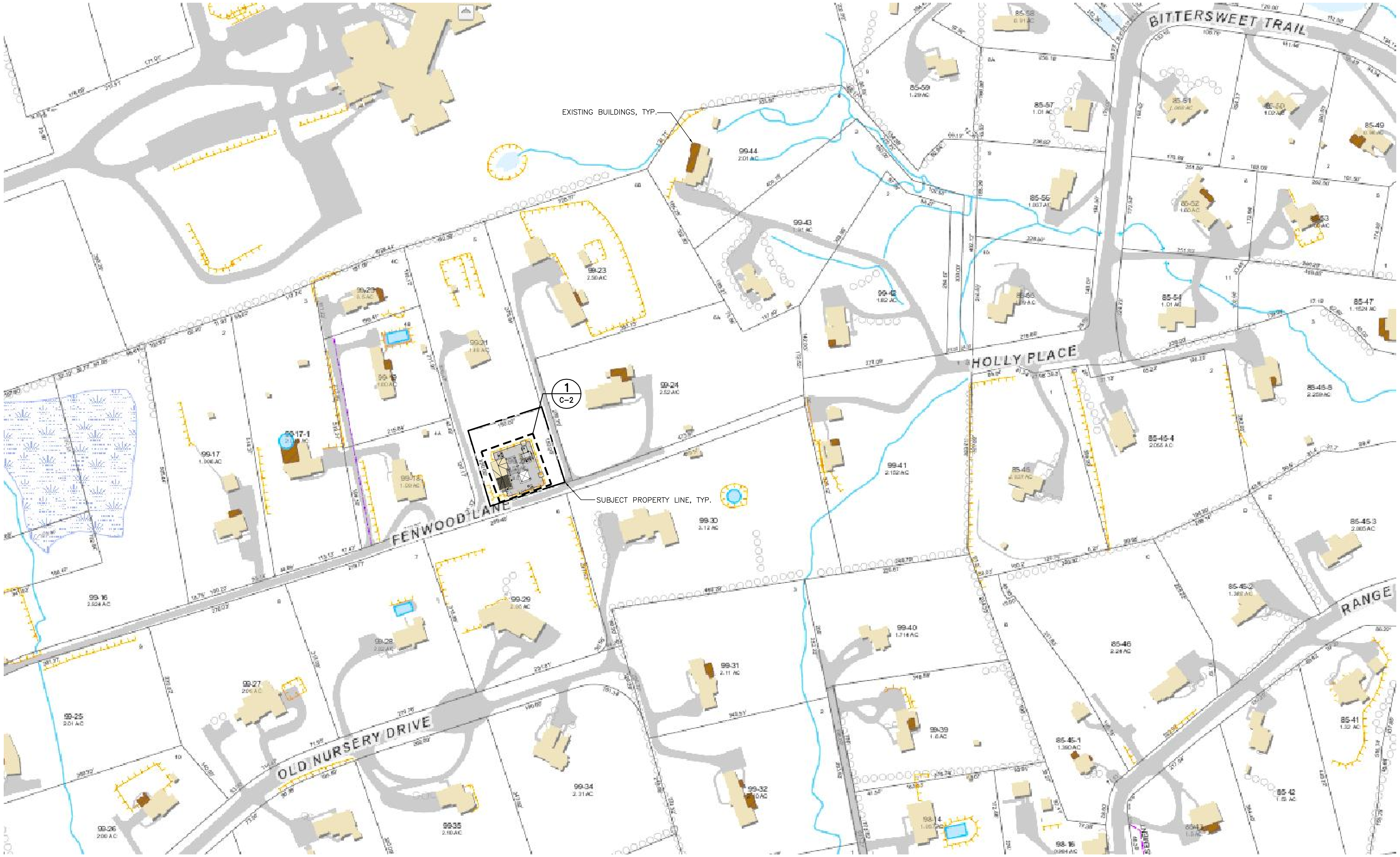
T-MOBILE NORTHEAST LLC
WIRELESS COMMUNICATIONS FACILITY
WILTON/STATE POLICE
SITE ID: CT11040D
46 FENWOOD LANE
WILTON, CT 06897

DATE: 04/30/19
SCALE: AS NOTED
JOB NO. 19027.02

DESIGN BASIS AND SITE NOTES

N-1

Sheet No. 2 of 7



1 / C-1 SITE LOCATION PLAN
SCALE: 1" = 100'

APPROX. NORTH

GRAPHIC SCALE
100 0 50 100 200 400
(IN FEET)
1 inch = 100 ft.

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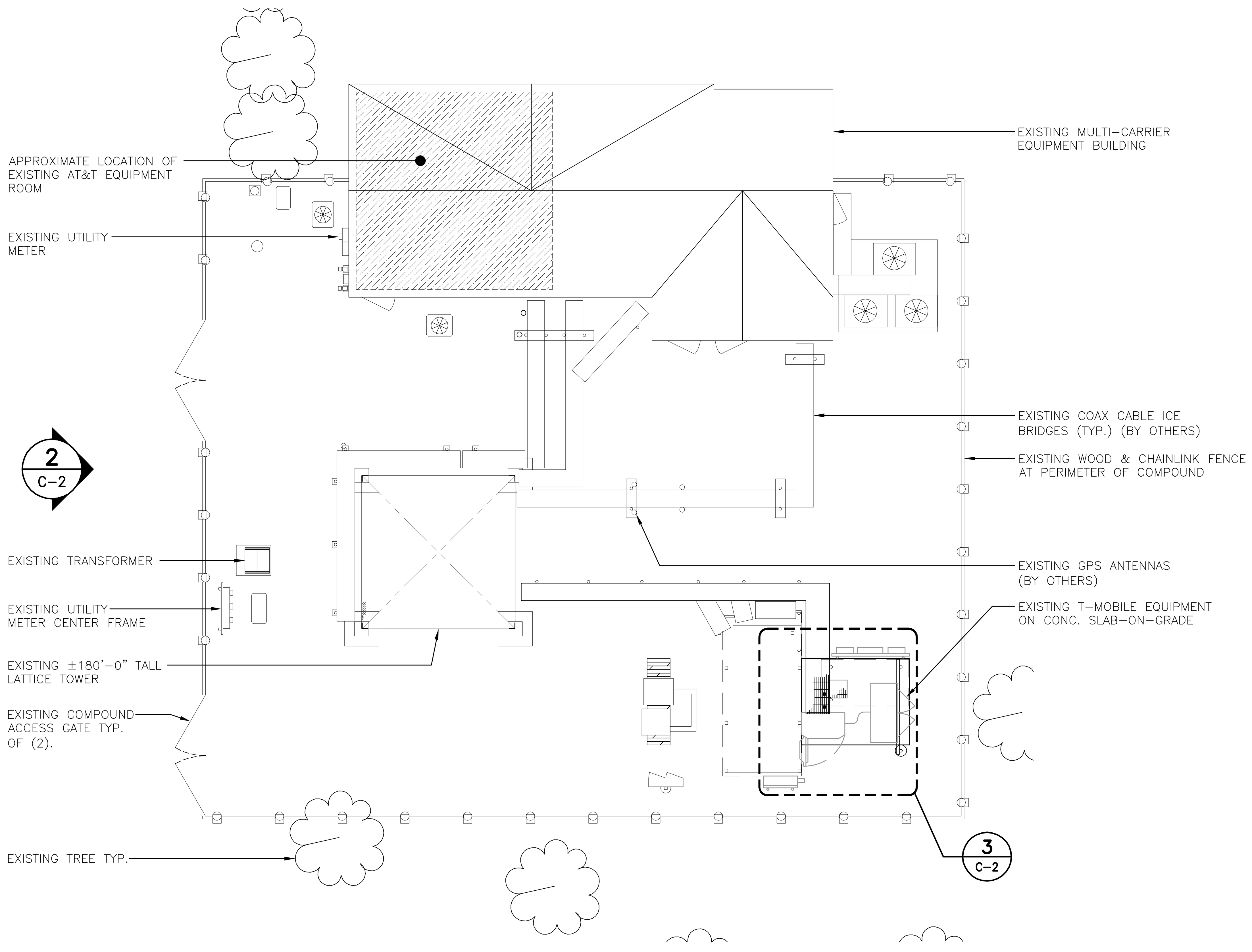
SITE LOCATION PLAN

C-1

Sheet No. 3 of 7

T-MOBILE RAN TEMPLATE:
67D92DBL OUTDOOR

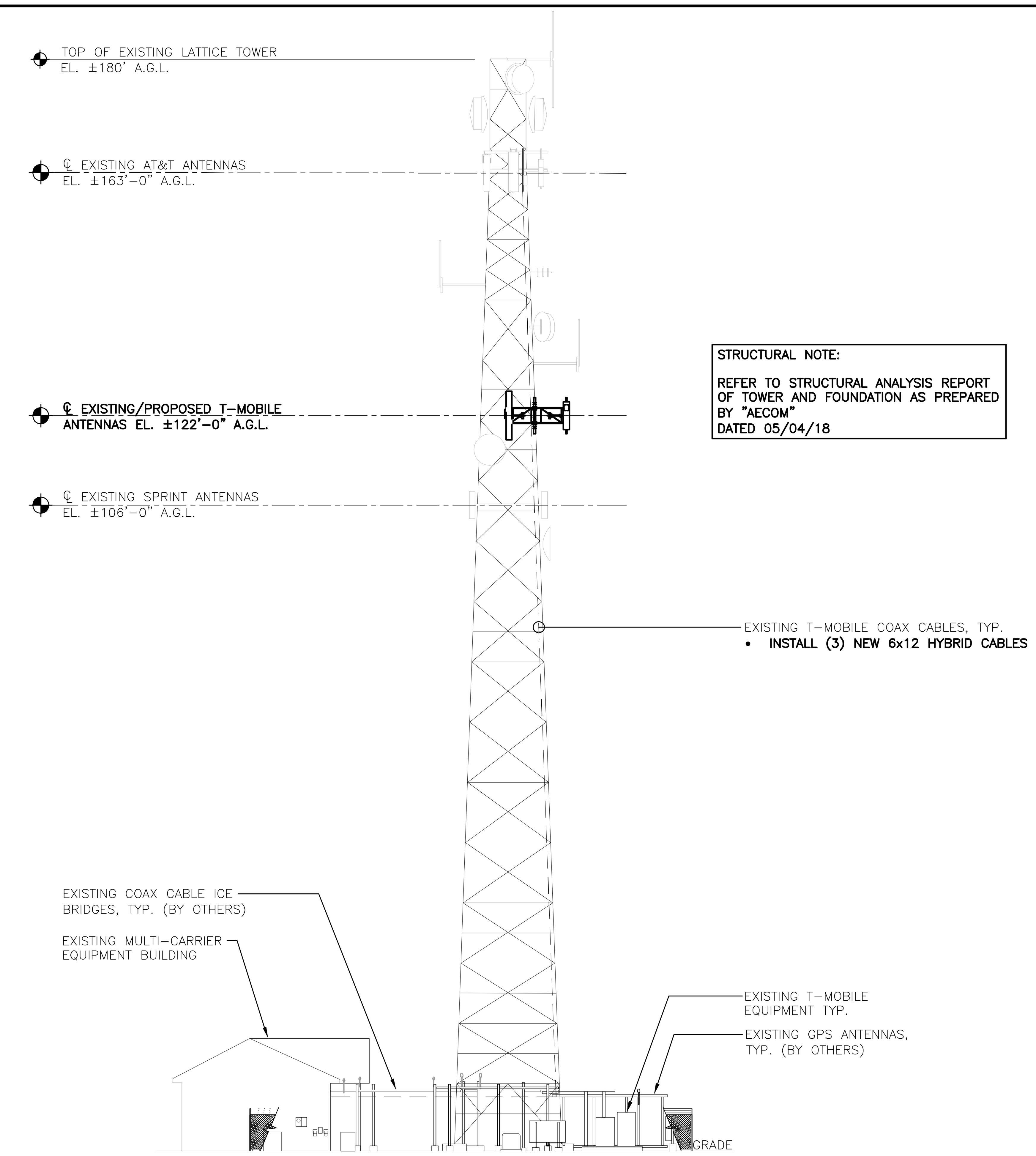
T-MOBILE RF CONFIGURATION:
67D92DBL_1xAIR+1OP (U21 Market)



1 / C-2 **COMPOUND PLAN - PROPOSED**
SCALE: 1" = 20'

TRUE NORTH

GRAPHIC SCALE
20 0 10 20 40 80
(IN FEET)
1 inch = 20 ft.

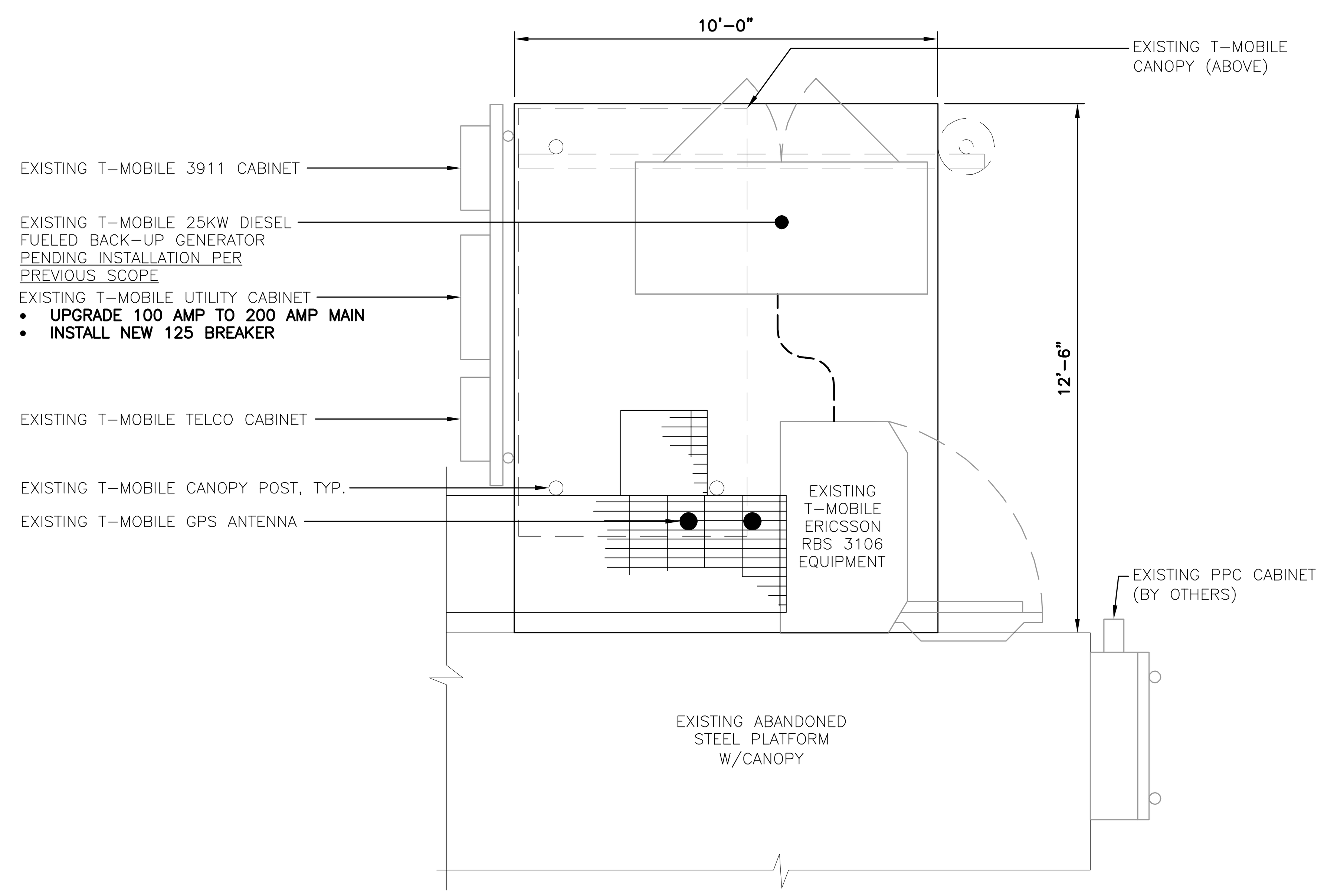


STRUCTURAL NOTE:

REFER TO STRUCTURAL ANALYSIS REPORT OF TOWER AND FOUNDATION AS PREPARED BY "AECOM" DATED 05/04/18

2 / C-2 **SOUTH ELEVATION - PROPOSED**
SCALE: 1" = 10'-0"

GRAPHIC SCALE
10 0 5 10 20 40
(IN FEET)
1 inch = 10 ft.



3 / C-2 **EQUIPMENT PLAN - PROPOSED**
SCALE: 3/8" = 1'

TRUE NORTH

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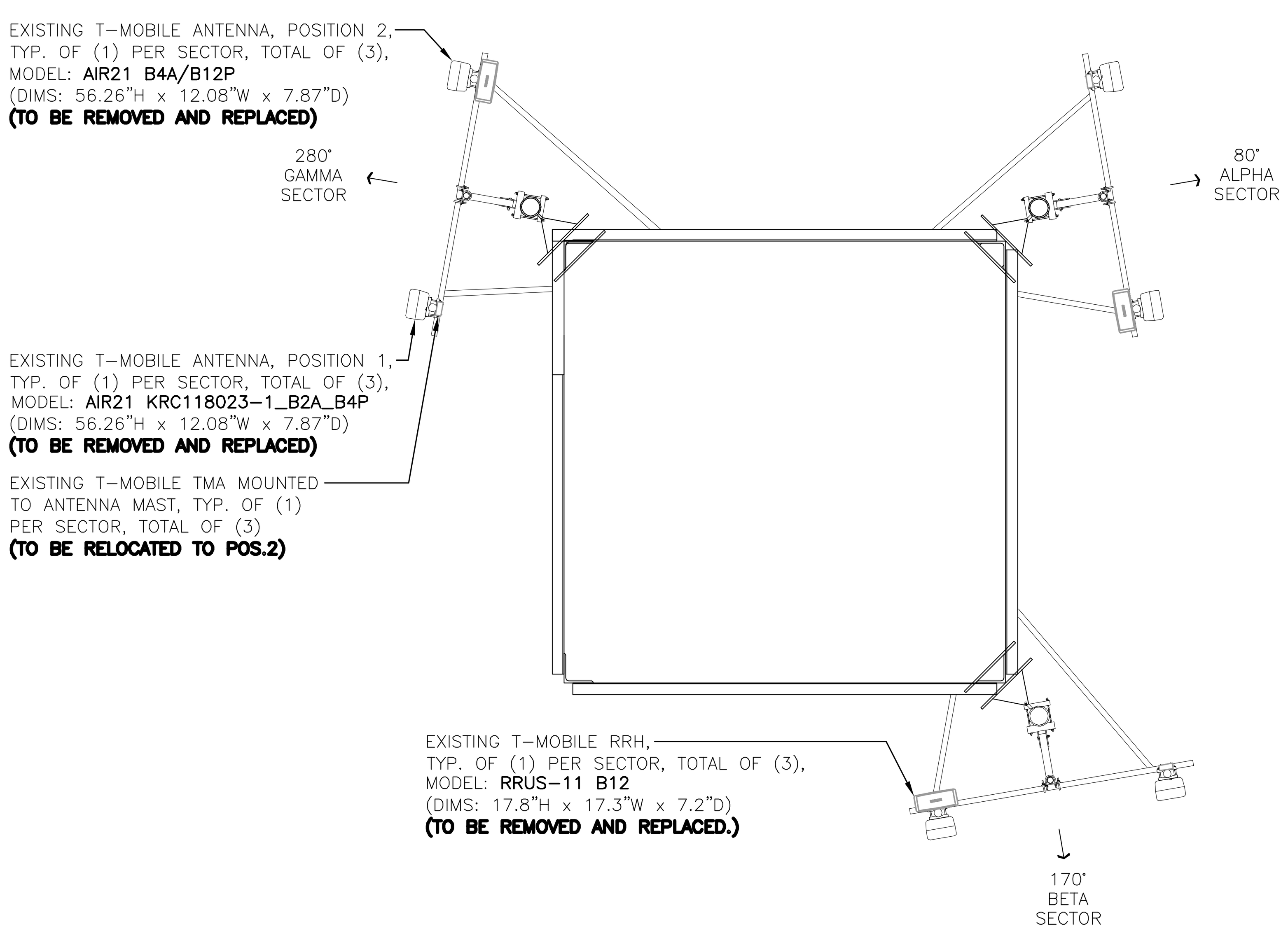
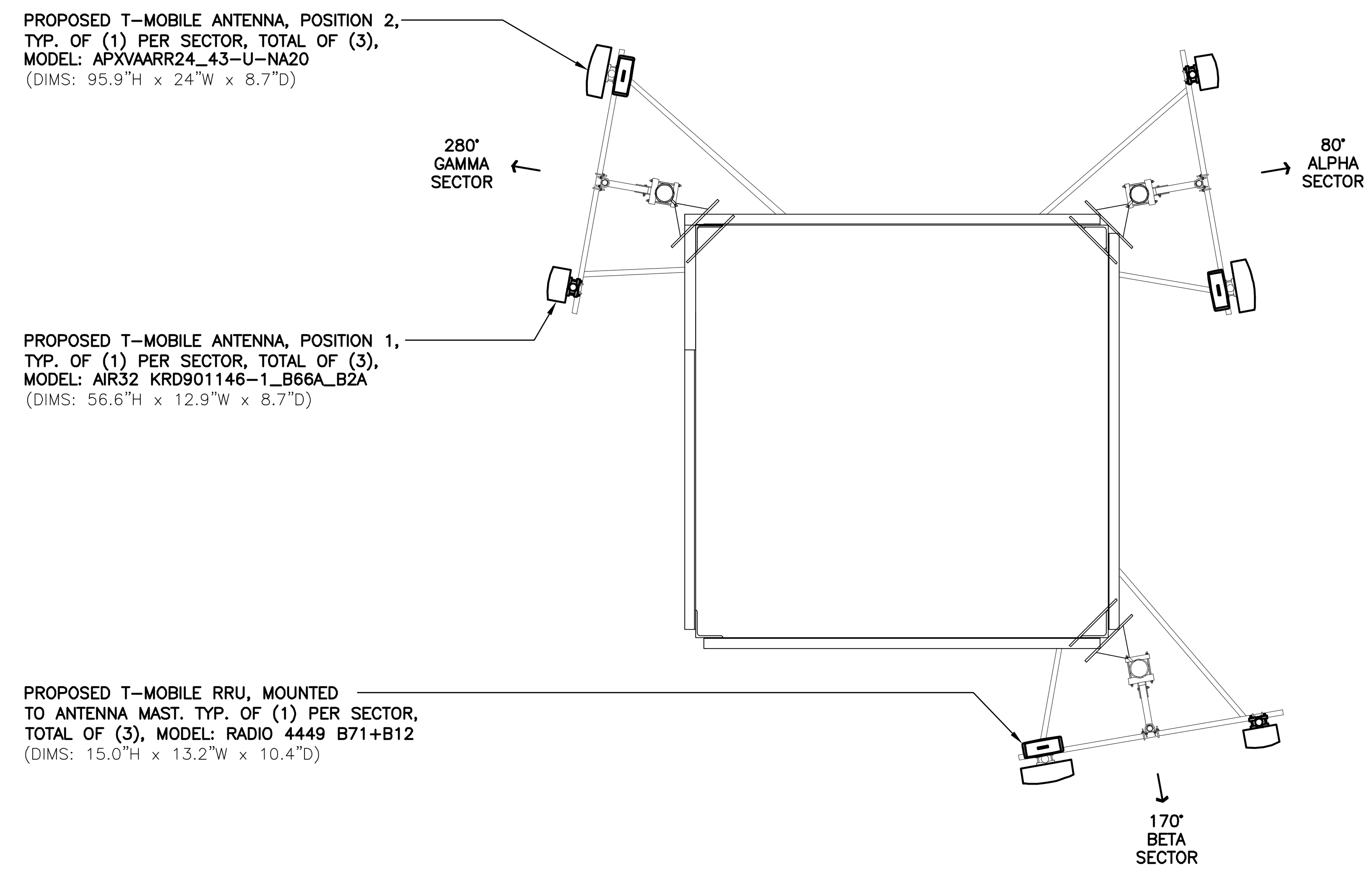
COMPOUND PLAN & TOWER ELEVATION

C-2

Sheet No. 4 of 7

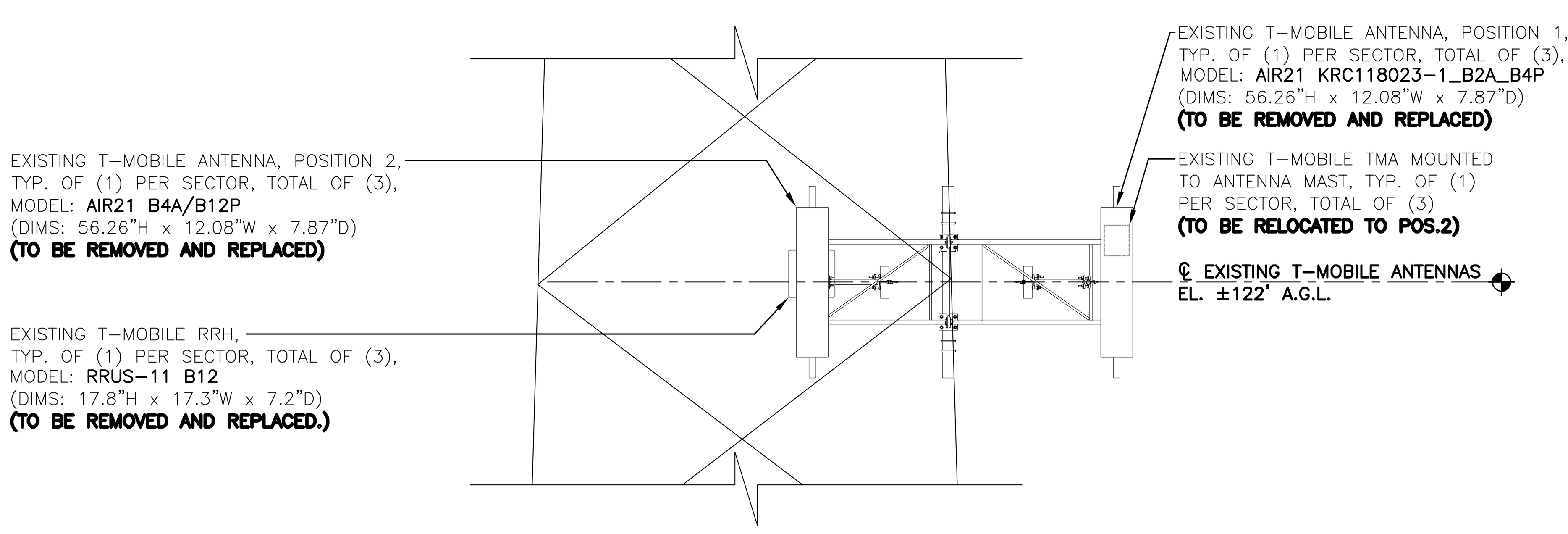


1 / C-3 **EXISTING ANTENNA MOUNTING CONFIGURATION TYP.**
SCALE: NOT TO SCALE — **122'-0" ELEVATION**



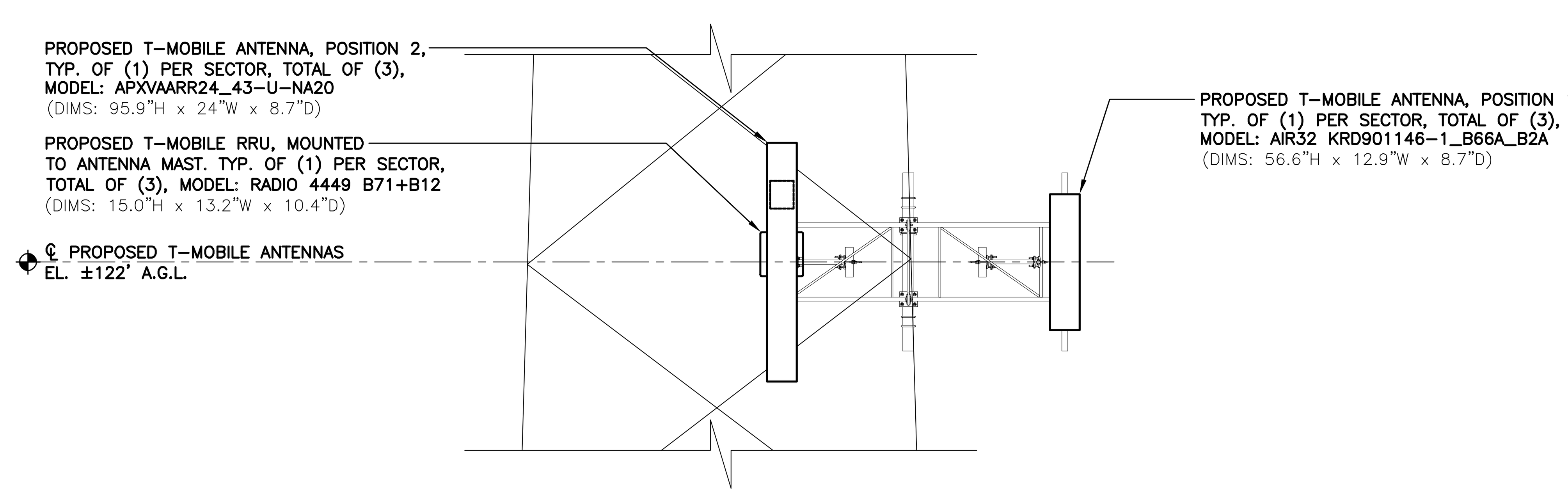
2 / C-3 **PROPOSED ANTENNA MOUNTING CONFIGURATION TYP.**
SCALE: NOT TO SCALE — **122'-0" ELEVATION**

ADDITIONAL ANTENNA MAST NOTE:
REPLACE EXISTING PIPE MAST WITH 2" STD (O.D = 2.375") x 9'-0" LONG PIPE @ RFS APXVAARR24_43-U-NA20



TYPICAL SECTOR

3 / C-3 **ANTENNA ELEVATION - EXISTING**
SCALE: NOT TO SCALE



TYPICAL SECTOR

4 / C-3 **ANTENNA ELEVATION - PROPOSED**
SCALE: NOT TO SCALE

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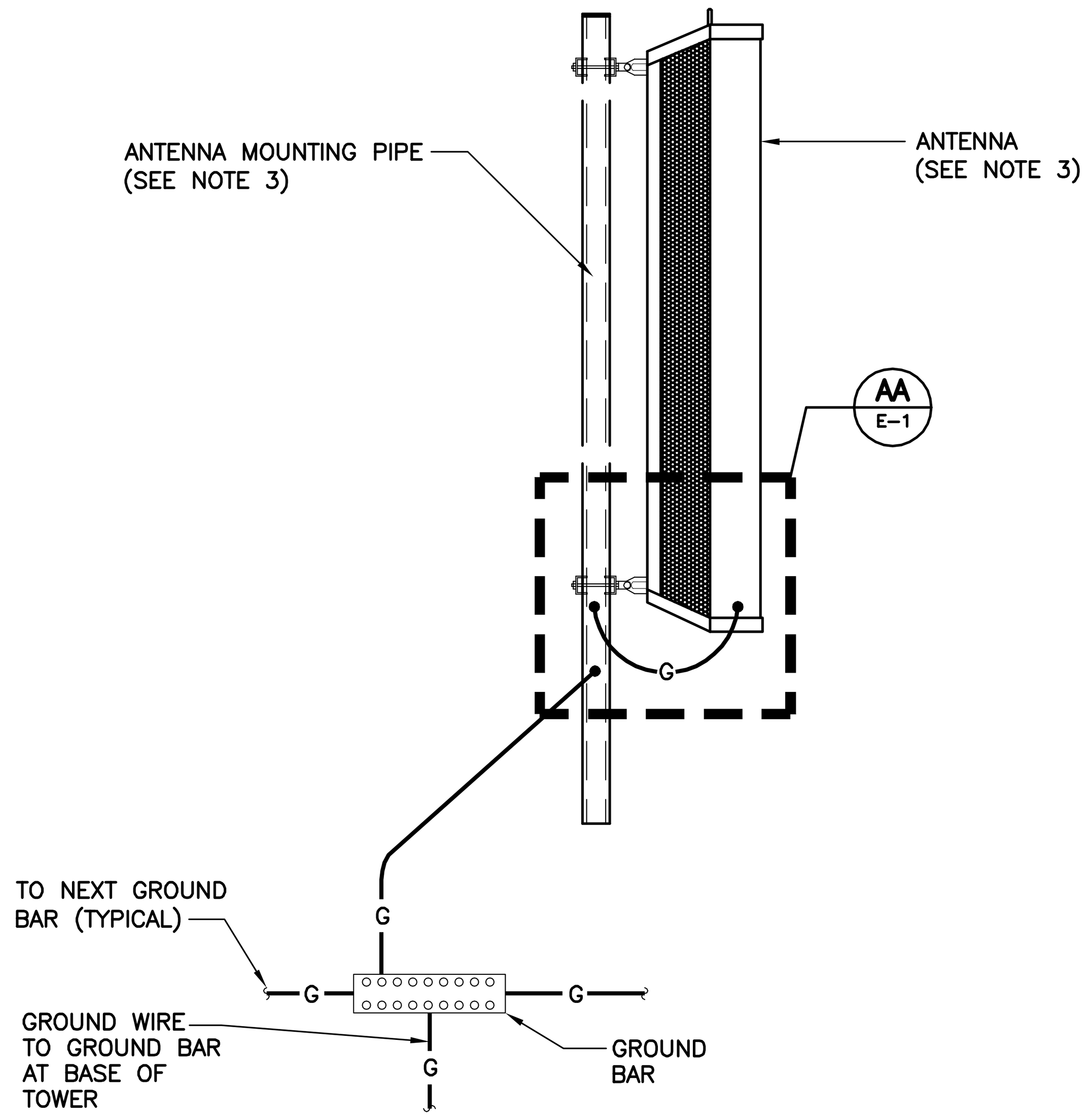
ANTENNA CONFIG. & ELEVATION

C-3

Sheet No. 5 of 7

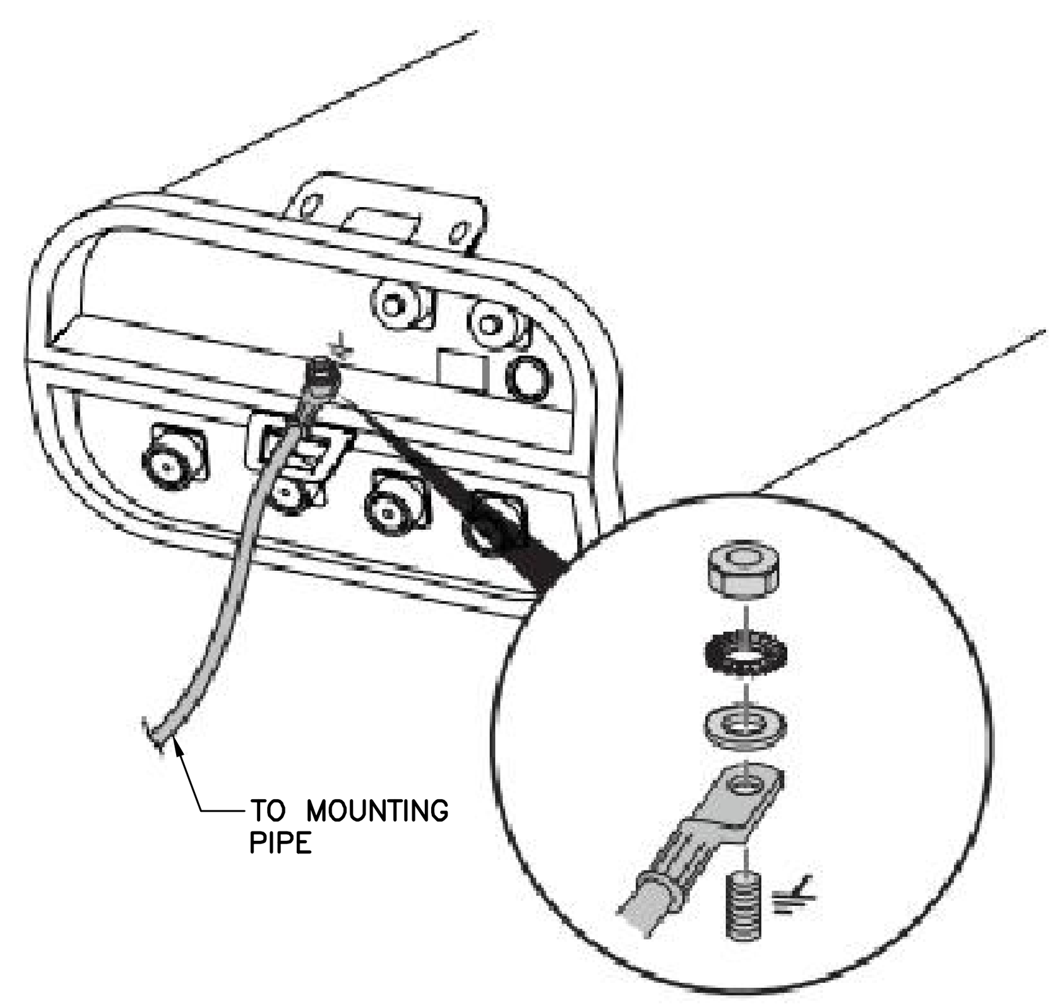


NOTES:

1. BOND COAXIAL CABLE GROUND KITS TO EACH OWNER'S GROUND BAR ALONG ENTIRE COAX RUN FROM ANTENNA TO SHELTER.
2. BOND ALL EQUIPMENT TO GROUND PER NEC AND MANUFACTURERS SPECIFICATIONS.
3. DETAIL IS TYPICAL FOR ALL ANTENNA SECTORS, INCLUDING GPS ANTENNA.

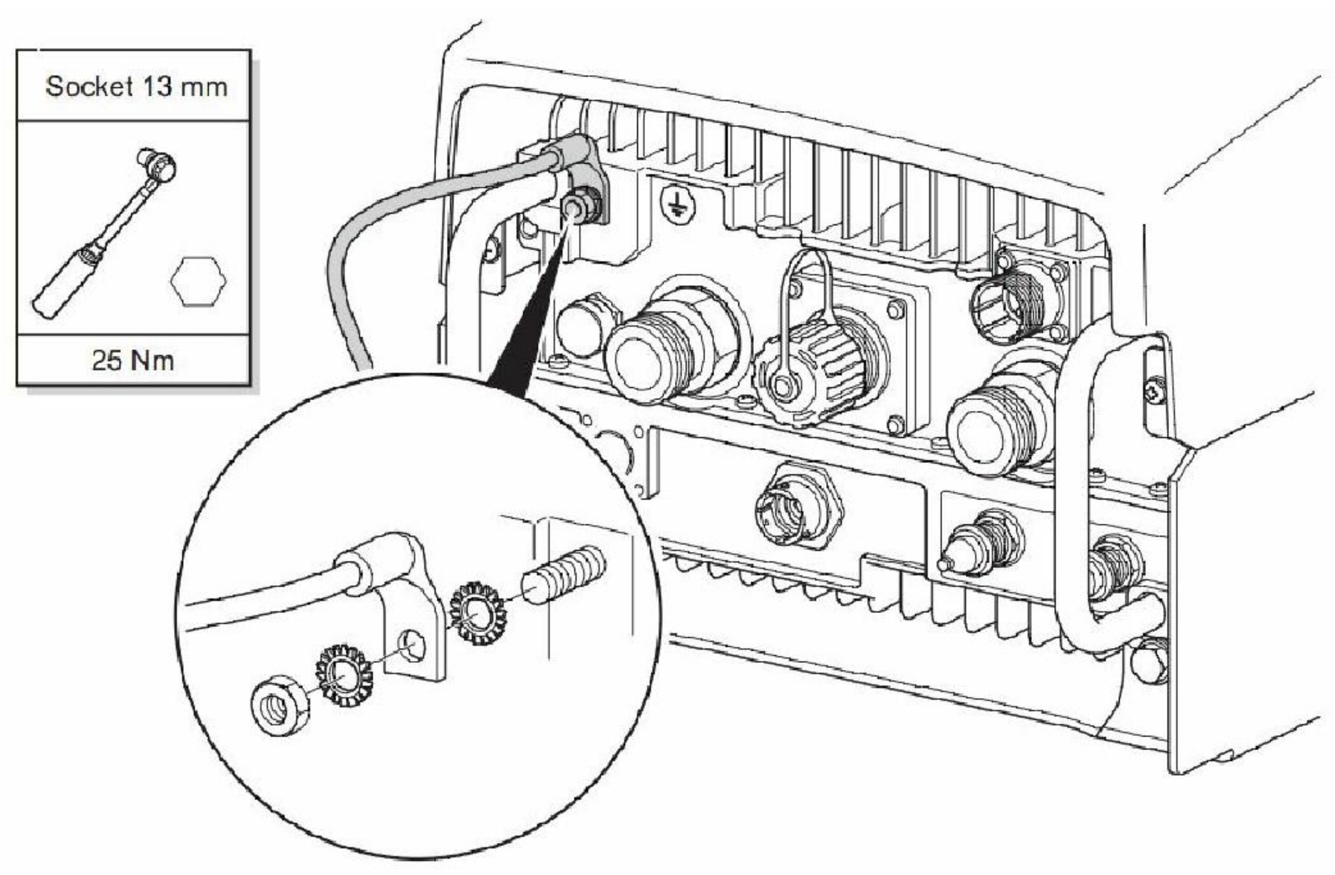
1 (E-1) TYPICAL ANTENNA GROUNDING DETAIL

SCALE: NONE



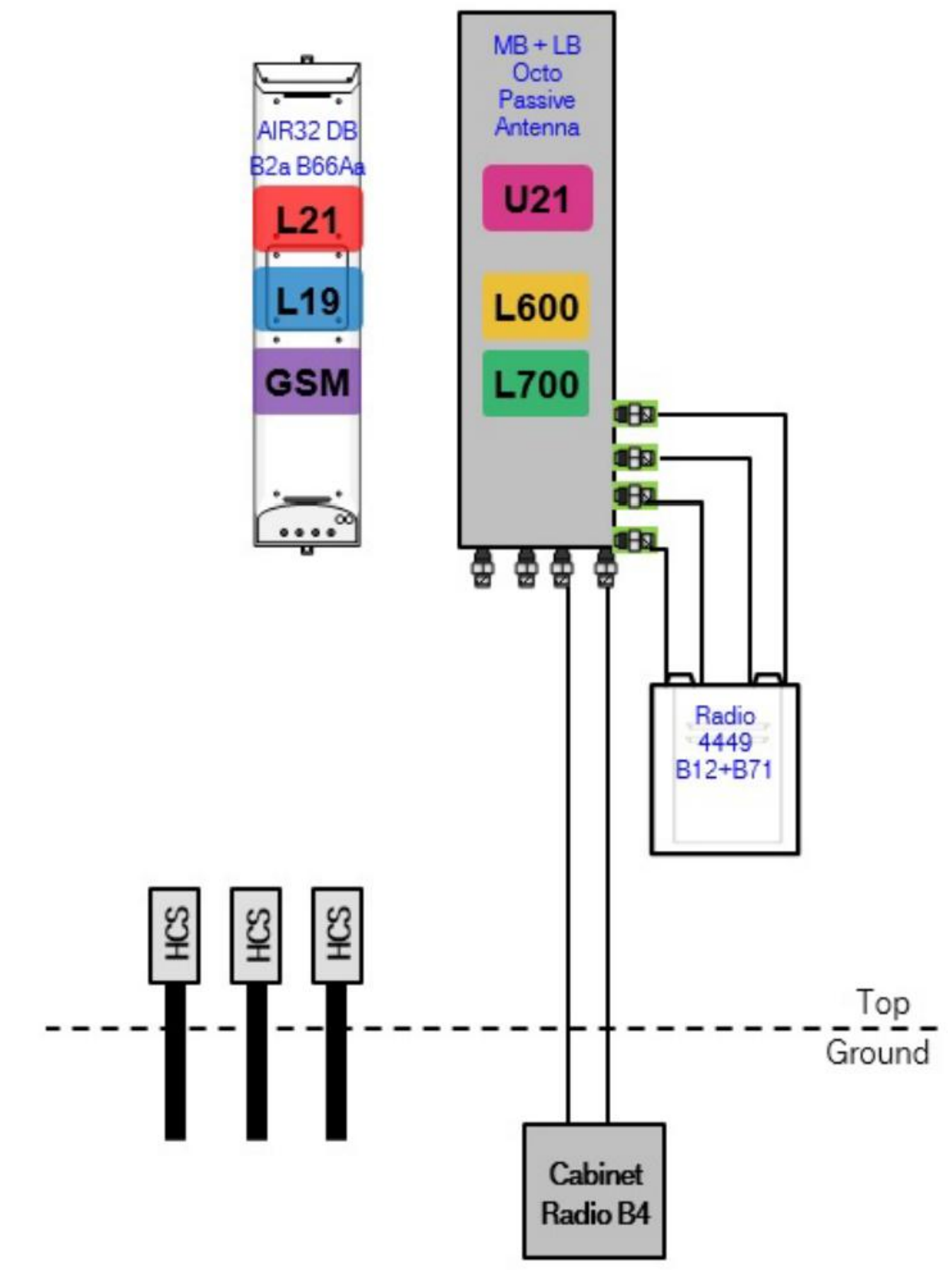
AA (E-1) TYPICAL ANTENNA GROUNDING DETAIL

SCALE: NONE



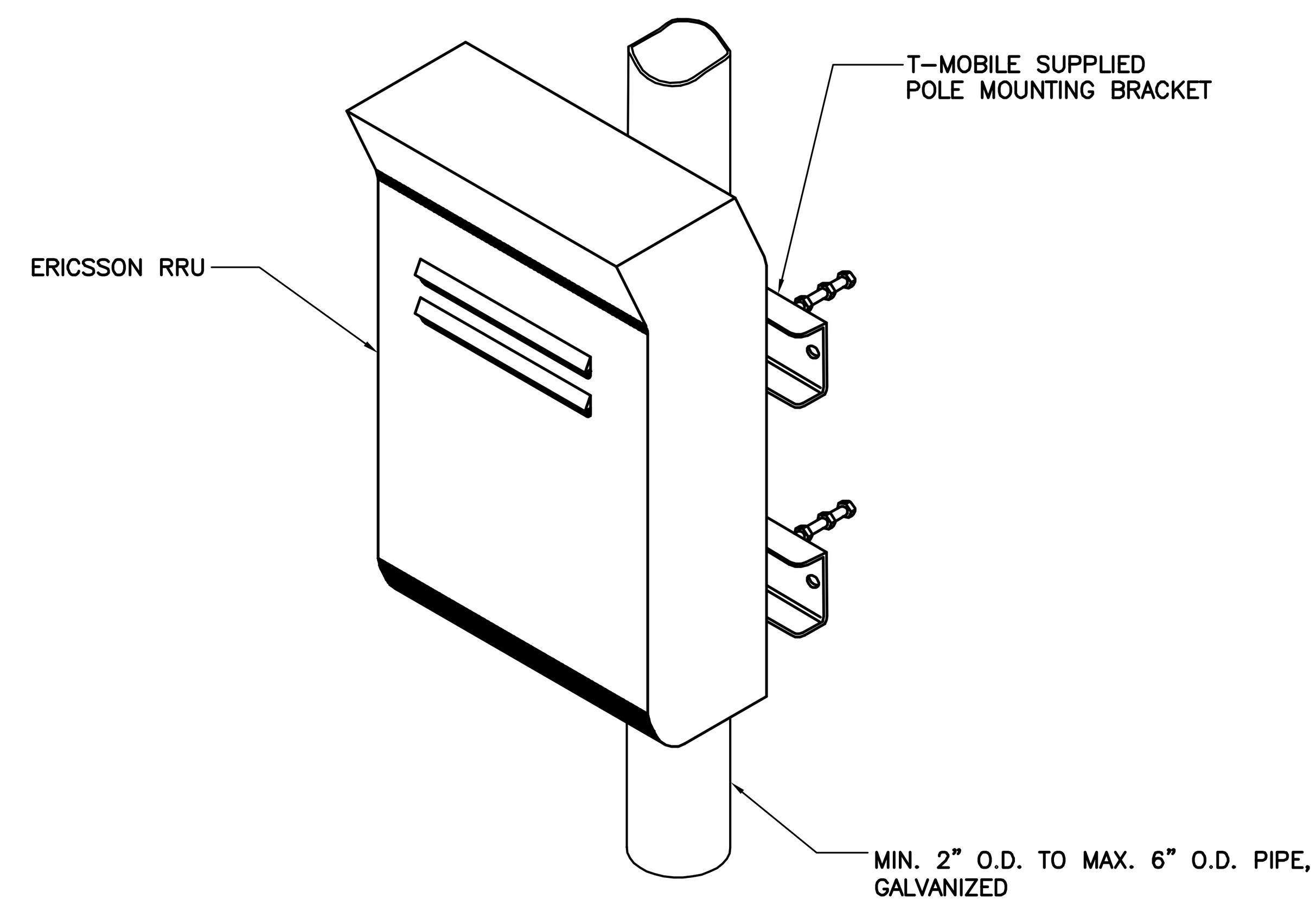
2 (E-1) TYPICAL RRU GROUNDING DETAIL

NOT TO SCALE



3 (E-1) PROPOSED PLUMBING DIAGRAM

SCALE: NONE



ISOMETRIC VIEW

NOTES:

1. T-MOBILE SHALL SUPPLY RRU, AND RRU POLE-MOUNTING BRACKET. CONTRACTOR SHALL SUPPLY POLE/PIPE AND INSTALL ALL MOUNTING HARDWARE INCLUDING ERICSSON RRU POLE-MOUNTING BRACKET. CONTRACTOR SHALL INSTALLS RRU AND MAKES CABLE TERMINATIONS.
2. NO PAINTING OF THE RRU OR SOLAR SHIELD IS ALLOWED.

4 (E-1) TYPICAL RRUS MOUNTING DETAILS

SCALE: NOT TO SCALE

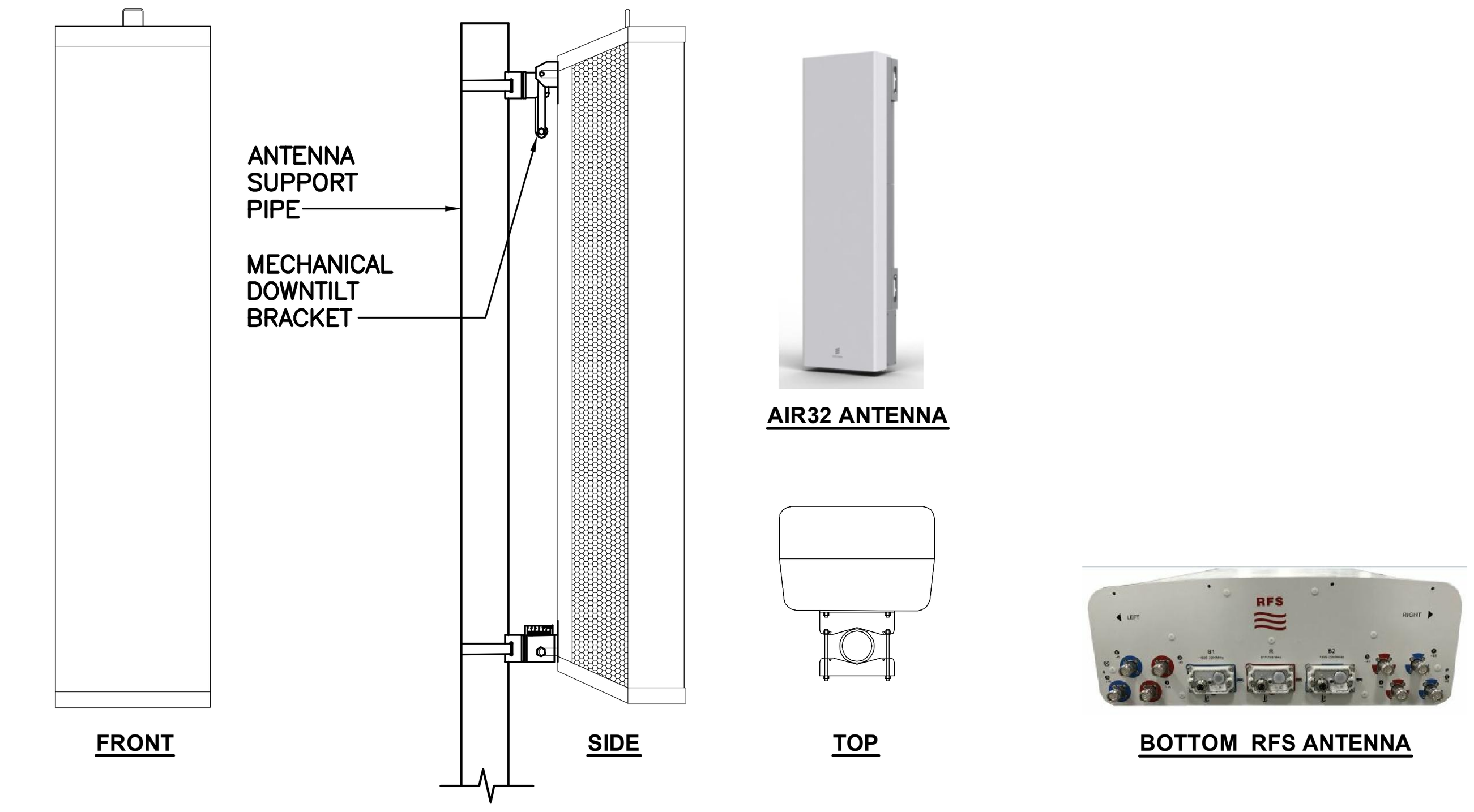
ISOMETRIC VIEW

RRU (REMOTE RADIO UNIT)			
EQUIPMENT	DIMENSIONS	WEIGHT	CLEARANCES
MAKE: ERICSSON MODEL: RADIO 4449 B71B12	14.9"L x 13.2"W x 10.4"D	74 LBS.	ABOVE: 16" MIN. BELOW: 12" MIN. FRONT: 36" MIN.

NOTES:
1. CONTRACTOR TO COORDINATE FINAL EQUIPMENT MODEL SELECTION WITH T-MOBILE CONSTRUCTION MANAGER PRIOR TO ORDERING.

5 (E-1) PROPOSED RRU DETAIL

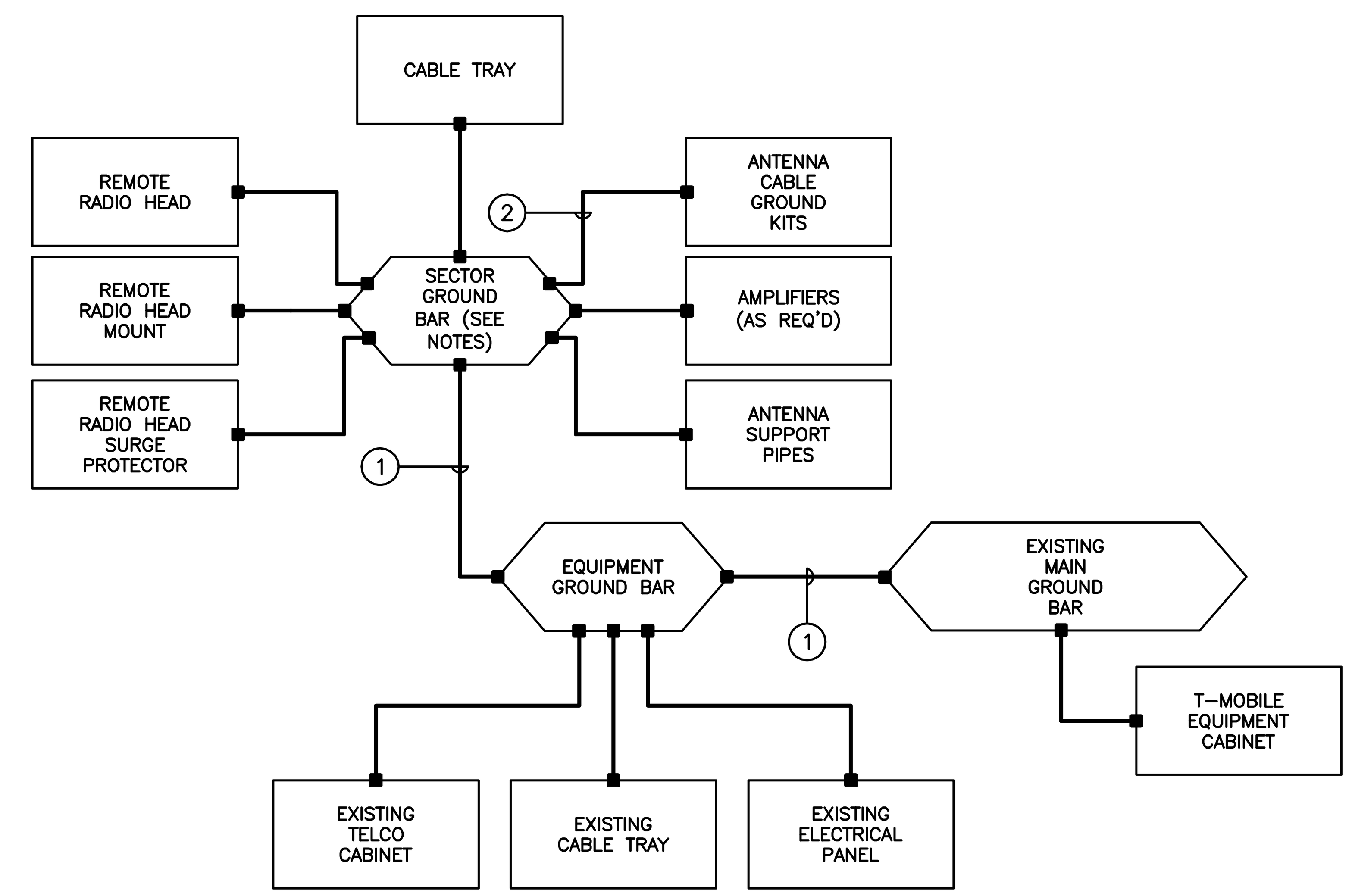
SCALE: NONE



ALPHA/BETA/GAMMA ANTENNA		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: ERICSSON MODEL: AIR32 KRD901146-1	56.6"L x 12.9"W x 8.7"D	132.2 LBS.
MAKE: RFS MODEL: APXVAARR24_43-U-NA20	95.9"L x 24"W x 8.7"D	153 LBS.

6 (E-1) PROPOSED ANTENNA DETAIL

SCALE: NONE



GROUNDING SCHEMATIC NOTES

(1) #2 AWG

(2) #6 AWG

GENERAL NOTES:

1. ALL SURGE SUPPRESSION EQUIPMENT SHALL BE BONDED TO GROUND PER MANUFACTURER'S SPECIFICATIONS
2. UNLESS OTHERWISE NOTED OR REQUIRED BY CODE, GROUND CONDUCTORS SHOWN SHALL BE #2 AWG (SOLID TINNED BCW – EXTERIOR; STRANDED GREEN INSULATED – INTERIOR).
3. ALL SECTOR GROUND BARS SHALL BE BONDED TOGETHER WITH #2 AWG SOLID TINNED BCW.
4. BOND ALL EQUIPMENT CABINETS AND BATTERY CABINETS TO GROUND PER MANUFACTURER'S SPECIFICATIONS.
5. COORDINATE ALL ROOF MOUNTED EQUIPMENT WITH OWNER.
6. ALL ROOF MOUNTED AMPLIFIERS AND ASSOCIATED EQUIPMENT SHALL BE BONDED TO THE SECTOR GROUND BAR PER MANUFACTURER'S SPECIFICATIONS.
7. ALL GROUNDING SHALL BE IN ACCORDANCE WITH NEC AND OWNER'S REQUIREMENTS.

7 (E-1) TYPICAL GROUNDING SCHEMATIC DETAIL

SCALE: NOT TO SCALE

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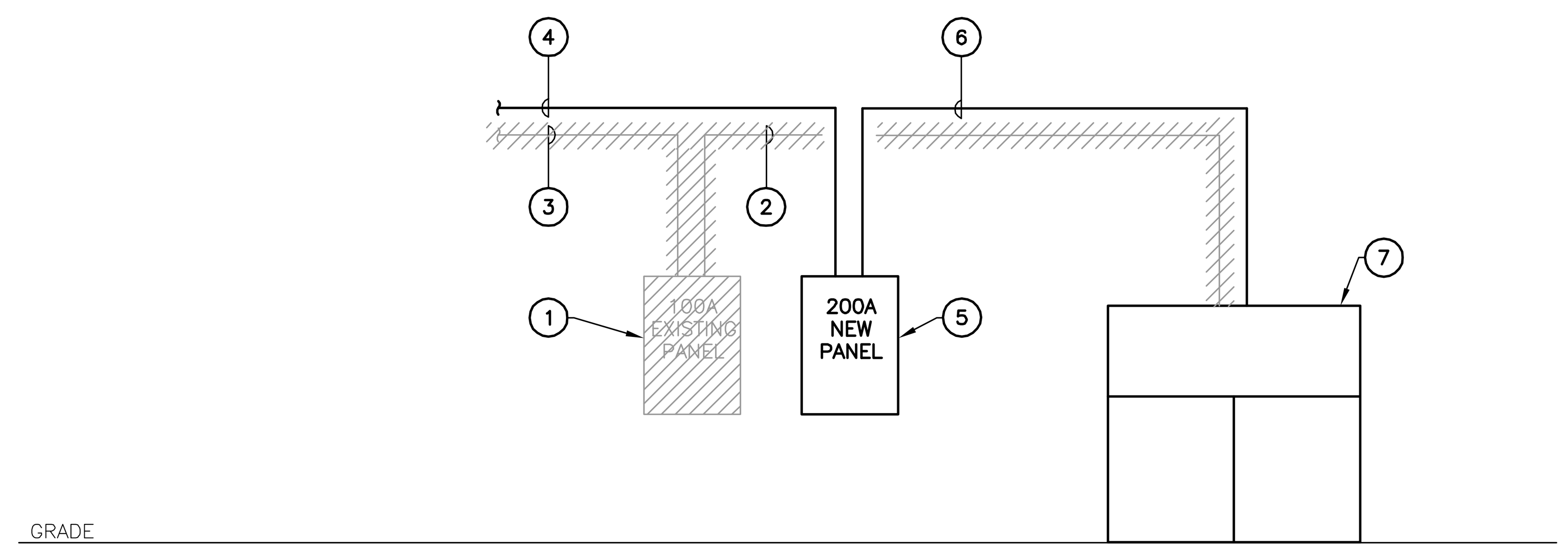
TYPICAL ELECTRICAL DETAILS

E-1

RISER DIAGRAM NOTES

1. EXISTING T–MOBILE 100A DISTRIBUTION PANEL TO BE REMOVED AND REPLACED.
2. CONDUITS AND CONDUCTORS SERVING EXISTING RADIO EQUIPMENT CABINETS TO BE REMOVED.
3. CONDUITS AND CONDUCTORS FEEDING EXISTING 100A PANEL TO BE REMOVED.
4. (3) #3/0 AWG, (1) #6 AWG GROUND, 2 1/2" CONDUIT CONNECTED TO SOURCE PREVIOUSLY FEEDING REMOVED 100A PANEL. MAXIMUM CIRCUIT LENGTH OF 200FT. VERIFY LOCATION IN FIELD. COORDINATE ANY REQUIRED UPGRADES WITH BUILDING OWNER AND LOCAL UTILITY COMPANY.
5. NEW 200A, 240V, SINGLE PHASE, 30 POSITION, NEMA 3R PANEL WITH COPPER BUS, BOLT ON CIRCUIT BREAKERS AND 200A/2P MAIN CIRCUIT BREAKER.
6. (3) #1/0 AWG, (1) #6 AWG GROUND, 2" CONDUIT CONNECTED TO NEW 125A/2P CIRCUIT BREAKER AND ROUTED TO EXISTING T–MOBILE RADIO CABINET.
7. EXISTING T–MOBILE RADIO CABINET TO REMAIN.



1 / E–2 **ELECTRICAL POWER RISER DIAGRAM**
NOT TO SCALE

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TYPICAL ELECTRICAL DETAILS

E–2

Sheet No. 7 of 7

AECOM

Submitted to
Transcend Wireless
35 Griffin Road South
Bloomfield, CT 06002

Submitted by
AECOM
500 Enterprise Drive,
Suite 3B
Rocky Hill, CT 06067
May 4, 2019

DETAILED STRUCTURAL ANALYSIS AND EVALUATION OF AN EXISTING 180' SELF SUPPORTING LATTICE TOWER AND FOUNDATION FOR PROPOSED ANTENNA ARRANGEMENT

T-Mobile Site Name : CT11040D
Site Address: 46 Fenwood Lane
Wilton, Connecticut

60604309
TWM-013

TABLE OF CONTENTS

1. EXECUTIVE SUMMARY

This report summarizes the structural analysis of the 180' self-supporting lattice tower located at 46 Fenwood Lane in Wilton, Connecticut.

The structural analysis was conducted in accordance with the 2018 Connecticut State Building Code which includes the TIA-222-G[1] Standard, 2015 International Building Code, the 2018 Connecticut State Building Code Amendments, the AISC[2] Load Resistance Factor Design (LRFD), the ASCE 7[3] design Code, and the Connecticut State Police Requirements which include the TIA/EIA-222-F[4].

The antenna loading considered in the analysis consists of all the existing and proposed antennas, transmission lines and ancillary items as outlined in the Introduction Section of this Report.

The proposed T-Mobile antenna installation is listed below:

Antenna and Other Appurtenances	Carrier	Antenna Center Elevation
Remove: **(3) Ericsson AIR21 B2A|B4P Panel Antennas** **(3) Ericsson AIR21 B4A/B12P Panel Antennas** **(3) (UMTS) TMA Units** **(3) (LTE) TMA Units** **(3) Ericsson RRUS-11 RRH Units**	**T-Mobile (Existing)**	**@ 122'**
Install: **(3) Ericsson AIR32 B66A/B2A Panel Antennas** **(3) Ericsson APXVAARR24_43-U-NA20 Panel Antennas** **(3) Generic Twin Units (AWS)** **(3) Ericsson Radio 4449 B71+B12 RRH Units** **(3) Ericsson 6x12 HCS Hybrid Cables (analysis applied 4 Gage Cables (AWG))**	**T-Mobile (Proposed)**	**@ 122'**

1. TIA = Telecommunications Industry Association Structural Standard for Antenna Supporting Structures and Antennas (Version G)

2. AISC = American Institute of Steel Construction (14th Edition)

3. ASCE 7 = American Society of Civil Engineers Standard 7 (2010 Edition)

4. TIA/EIA = Telecommunications Industry Association Structural Standard for Antenna Supporting Structures and Antennas (Version F)

1. EXECUTIVE SUMMARY - *continued*

The results of an initial analysis indicate that:

1. The existing steel tower structure IS considered structurally adequate for the proposed antenna loading with the wind classification specified herein.
2. The existing tower anchor bolts ARE considered structurally adequate for the proposed antenna loading with the wind classification specified herein.
3. The existing foundation IS considered structurally adequate for the proposed antenna load classification with the wind classification specified herein.
4. The existing tower's sway (deflection) is 0.5948 degrees, and the existing tower's twist (rotation) is 0.0453 degrees. These figures combined ARE within the Connecticut State Police requirement 0.75 degrees for combined twist (rotation) and sway (deflection) with the load classification specified herein.
5. The controlling structural capacity for all tower and foundation components for the proposed antenna loading is 89.6%

This analysis is based on:

1) The tower structure's theoretical capacity not including any assessment of the condition of the tower.

2) Tower geometry and structural member sizes utilized in the preparation of this report obtained from the original design documents prepared by Bayar and Associates dated July 1990.

3) Previous structural analysis performed by URS Corporation, on behalf of T-Mobile, project number 36931390.00000 / NSS-017, signed and sealed March 3, 2015

4) Previous structural analysis and modification performed by AECOM, on behalf of T-Mobile, project number 60405835, signed and sealed May 5, 2015.

5) Tower Mapping and Inventory by D&K Nationwide Communications, Inc., dated March 17, 2016.

6) Antenna inventory provided by the Connecticut State Police via email on June 20, 2016.

7) Previous structural analysis and evaluation performed by AECOM, on behalf of Pyramid Network Services, LLC, project number 60509756.03 / PNS-603, signed and sealed on August 9, 2016

8) Previous structural analysis and modification performed by AECOM, on behalf of AT&T & Sprint, project (60570722 / EMP-007; 60570721 / ASM-007), signed and sealed on July 5, 2018.

9) Proposed T-Mobile antenna inventory from Radio Frequency Data Sheet (RFDS) dated April 22, 2019, obtained via e-mail dated May 1, 2019.

10) Antenna Mount frame capacity analysis performed by Centek Engineering, on behalf of T-Mobile, project 19027.02, signed and sealed on April 29, 2019.

11) Antenna and mount configuration as specified on the following pages of this report.

1. EXECUTIVE SUMMARY - *continued*

This report is only valid as per the assumptions and data utilized in this report for antenna inventory, mounts and associated cables. The user of this report shall field verify the antenna, cabling and mount configurations used, as well as the physical condition of tower members, connections and foundations. Notify the engineer in writing immediately if any of the information in this report is found to be other than specified.

If you should have any questions, please contact Naish Artaiz at (860) 990-6767.

Sincerely,

AECOM,

Richard A. Sambor, P.E.
Senior Structural Engineer
RAS/mcd

2. INTRODUCTION

The subject tower is located at 46 Fenwood Lane in Wilton, Connecticut. The structure is a 180' four sided self-supporting lattice tower designed by Bayar and Associates.

The structural analysis was conducted in accordance with the following:

- TIA-222-G Standard for Standard for a wind velocity of range of 90 mph to 110 mph (3-second gust) and 50 mph (3-second gust) concurrent with 0.75" ice thickness, considered to increase in thickness with height
- 2015 International Building Code with 2018 Connecticut State Building Code Amendments for a wind speed of 101 mph (3-second gust)
- 2010 AISC Load Resistance Factor Design (LRFD)
- 2010 ASCE 7 Minimum Design Loads for Buildings and Other Structures for the ice thickness referenced in the TIA-222-G Standard
- Connecticut State Police Requirements for a wind velocity of 90 mph (fastest mile) and 90 mph (fastest mile) concurrent with 0.5" ice. Twist (rotation) and sway (deflection) were determined in accordance with Connecticut State Police Requirements for a wind velocity of 90 mph (fastest mile) concurrent with 0.5" ice, analyzed under the TIA/EIA-222-F design Standard.

The inventory together with the proposed T-Mobile antenna arrangement is summarized in the table below:

Antenna Type	***Carrier***	***Mount***	***Mount Elevation***	***Cable***
(1) 10' Lightning Rod	Tower (existing)	Tower mounted	185'	---
(1) 8'x6-5/8" Dia Omni Antenna	(A31) CSP-4 (existing)	*Shared Mount (See CSP-2 Mount)*	185'	(1) 7/8"
(1) 20' 4-Bay Dipole Antenna (1) 20' 2-Bay Dipole Antenna	(A29) FBI-12, FCP-12 (existing)	*Shared Mount (See CSP-1 Mount)*	185'	(2) 7/8"
(1) Sinclair SC479-HF1LFD (D00-E5764) Omni Antenna	(A30) CSP-3 (existing)	*Shared Mount (See CSP-2 Mount)*	183'	(1) 1-5/8" (existing Cable)
(1) Sinclair SC479-HF1LFD (D00-E5764) Omni Antenna	(A28) CSP-6 (existing)	*Shared Mount (See CSP-1 Mount)*	183'	(1) 1-5/8" (existing Cable)
(1) Bird 432-83H-01T TTA Control Box	(A27) CSP-67 (existing)	*Shared Mount (See CSP-1 Mount)*	181'	(1) 1/2"
(1) 6' Dish with Radome	(A25) CSP-36 (existing)	Pipe Mounted to Tower	173'	(1) WEP65
(1) (inverted) Sinclair SC479-HF1LFD (D00I-E5764) Omni Antenna	(A24) CSP-65 (existing)	*Shared Mount (See CSP-2 Mount)*	172'	(1) 1-5/8" (existing Cable)

Antenna Type	*Carrier*	*Mount*	*Mount Elevation*	*Cable*
(1) (inverted) Sinclair SC479-HF1LFD (D00I-E5764) Omni Antenna	(A23) CSP-2 (existing)	15' V-Frame Mount w/ 5 Antenna Pipes @ 180' (Shared with CSP-65, CSP-3 & CSP-4)	172'	(1) 1-5/8" (existing Cable)
(1) 6' Dish with Radome	(A22) CSP-5 (existing)	Pipe Mounted to Tower	170.5'	(1) WEP65
(1) 6' Dish with Radome	(A33) CSP-59 (existing)	Pipe Mounted to Tower	170'	(1) WEP65
(1) BA-1312 Omni Antenna	(A21) CAP-25 (existing)	15' V-Frame Mount w/ 5 Antenna Pipes @ 170'	170'	(1) 7/8"
(1) (inverted) Sinclair SC479-HF1LFD (D00I-E5764) Omni Antenna	(A26) CSP-1 (existing)	15' V-Frame Mount w/ 5 Antenna Pipes @ 180' (Shared with CSP-67, CSP-6 & FBI/FCP-12)	170'	(1) 1-5/8" (existing Cable)
(1) BA1010-2 Omni Antenna	(A20) CSP-10 (existing)	*Shared with Above Mount*	169'	(1) 7/8"
(3) QS66512-2 Panel Antennas (3) 800-10965 Panel Antennas (3) Powerwave 7770 (6) LGP21401 TMAs (3) B14 4478 RRH Units (3) RRUS-32 B66 RRH Units (3) RRUS-32 B2 RRH Units (3) RRUS-32 RRH Units (3) RRUS-11 RRU Units (6) LGP21901 Diplexers (2) DC6-48-Surge Protector	AT&T (existing)	(3) T-Frames	163'	(12) 1-5/8" (1) Fiber Optic Cable (4) DC Cables (1) 2" Flex Conduit with (1) Fiber & (2) DC Cables
(1) Decibel DB408-B Dipole Antenna	(A19) FCP-12 (existing)	(2) 6' Standoff	161'	(1) 7/8"
(1) DB636 12' Omni Antenna	(A15) D&K-30 NEU-57 (existing)	8' Standoff	140'	(1) 7//8"

Antenna Type	*Carrier*	*Mount*	*Mount Elevation*	*Cable*
-----	(A18) D&K-33 (existing)	6’ Standoff	139’	N/A
(1) ASP-816 3’ Yagi Antenna	(A17) D&K-32 WTR-28 (existing)	6’ Standoff	138’	(1) 7/8”
(1) Decibel DB-222-A 12’ Dipole Antenna	(A16) D&K-31 (existing)	4’ Standoff	136.5’	(1) 7/8”
(1) Bird (TX/RX) 101-83B-08-T5 Omni Antenna	(A14) D&K-29 CSP-63 (existing)	*Shared with Below Mount*	134’	(1) 1-5/8”
(1) Bird 432-83H-01T TTA Junction Box	(A13) D&K-28 CSP-66 (existing)	6’ Standoff	133’	(1) 1/2"
(1) (inverted) Bird (TX/RX) 101-83B-08-T5 Omni Antenna	(A12) D&K-27 CSP-64 (existing)	*Shared with Above Mount*	132’	(1) 1-5/8”
(1) Dish Antenna Ice Shield	(A11) D&K-26 (existing)	*Shared with Below Mount*	131’	N/A
(1) 6’ Dish with Radome	(A10) D&K-25 CSP-35 (existing)	Pipe Mounted to Tower	125’	(1) WEP65
(3) Ericsson AIR32 B66A/B2A Panel Antennas **(3) Ericsson APXVAARR24_43-U-NA20 Panel Antennas** **(3) Generic Twin Units (AWS)** **(3) Ericsson Radio 4449 B71+B12 RRH Units**	**T-Mobile (Proposed)**	*Shared with below Mount*	**122’**	**(3) Fiber Optic Cables (6x12 HCS 4 AWG)**

Antenna Type	*Carrier*	*Mount*	*Mount Elevation*	*Cable*
-----	T-Mobile (existing)	(3) SitePro1 EUSF10-U w/ (2) Stiff-Arm Supports (per mount)	122’	(6) 1-1/4” Coaxial Cables (1) Fiber Optic Cable (9x18 HCS 10 AWG)
(1) 7’ Omni Antenna	(A8) D&K-14 (existing)	10’ Standoff Arm	121’	(1) 7/8”
(1) BDC806-09NE 22’ Omni Antenna	(A7) D&K-13 CSP-62 (existing)	6’ Standoff	107’	(1) 1-5/8”
(1) PD-128 12’ Omni Antenna	(A9) D&K-15 (existing)	6’ Standoff	106’	(1) 7/8”
(1) 4’ Grid Dish	(A6) D&K-12 CSP-11 (existing)	Pipe Mounted to Tower	106’	(1) 7/8”
(3) APXVSPP18-C-A20 Panels (3) AAHC Panels (3) NNVV-65B-R4 Panels (3) ALU 800 MHz RRH Units (3) ALU 1900 MHz RRH Units (3) TD-RRH8x20-25W RRH w/ Solar shield Units	Sprint (existing)	(3) 10’ Frame w/ tie-back arms (existing)	105’	(3) RFS Hybriflex Cables (1-1/4” Dia.) (2) MIMO/Nokia Hybrid Cable (1.689” O.D.)
(1) (inverted) 12’ Omni Antenna	(A4) D&K-4 DEA-32 (existing)	10’ Standoff Arm	91’	(1) 7/8”
(1) 22’ 4-Bay Dipole Antenna	(A5) D&K-11 USS-26 (existing)	3’ Standoff	86’	(1) 7/8”
(1) Ice Shield for Dish Mounted Below	CSP-13 (existing)	Pipe Mounted to Tower	76’	N/A

Antenna Type	*Carrier*	*Mount*	*Mount Elevation*	*Cable*
-----	(A3) D&K-3 (existing)	Pipe Mount for Dish Antenna	71’	N/A
(1) GPS	(A2) D&K-2 Sprint (existing)	6’ Standoff	61’	(1) 1/2”
(1) DB-803 3’ Omni Antenna	(A1) D&K-1 CSP-68 (existing)	3’ Standoff	50’	(1) 1/2"

NOTES: Antenna ID numbering of antenna and appurtenances obtained from Tower Mapping and Existing Inventory via tower climb, performed by D&K Nationwide Communications, Inc. on March 17, 2016.

“A#” refers to the antenna number used in the structural analysis program to identify tower appurtenances.

This structural analysis of the communications tower was performed by AECOM for T-Mobile. The purpose of this analysis was to investigate the structural integrity of the existing tower and foundation for existing and proposed antenna loads in compliance with the 2018 Connecticut State Building Code. This analysis was conducted to evaluate stress on the tower and the effect forces to the foundation of the tower resulting from existing and proposed antenna arrangements.

3. ANALYSIS METHODOLOGY AND LOADING CONDITIONS

The structural analysis was done in accordance with, the TIA-222-G–Structural Standard for Antenna Towers and Antenna Supporting Structures and Antennas, the 2015 International Building Code with 2018 Connecticut State Building Code Amendments and the American Institute of Steel Construction (AISC) Manual of Steel Construction – Load Resistance Factor Design (LRFD)

The structural analysis was conducted using TNX Tower version 8.0.5.0 and used the following conditions for this tower review (following the TIA/EIA-222-G Standard):

- Structure Class 3 – (Essential Communications)
  - NOTE: ASCE 7 and CT State Building Code Applied Risk Category 4 for design wind loads (see below)
- Topographic Category 3 – (Tower location on top of hill – rolling wind conditions considered)
  - Crest Height used for analysis: (approximate elevations listed below)
    - Tower Base Elevation = 370 feet
    - High point (2 mile Radius) = 460 feet (Ref. Huckleberry Hills)
    - Low Point (2 mile Radius) = 150 feet (Ref. Winnipauk Millpond)
    - "H" = (Avg. of High/Low) – Base Elevation = 65 feet
- Exposure Class C – (Open Terrain with scattered obstructions)
- Load Conditions:
  - Two load conditions were evaluated as shown which were compared to design stresses according to AISC and TIA-222-G Standard.

Basic Wind Speed:

- TIA-222-G:
  - Fairfield County (Wind Speed Range): V = 90 mph - 110 mph (3-second gust) [Annex of TIA/EIA-222-G 2006]
- IBC 2015 w/ 2018 CT State Building Code Amendment:
  - (2015) IBC Section 1609.1.1 – Determination of Wind Loads – Exception 5 "Designs using TIA-222" applies for determination of Design Wind Load obtained as "V.ult" are to be converted to "V.asd" when applying the TIA-222-G design Standard (under Section 1609.3) for Basic Wind Speed.
  - (2018) CT State Building Code Amendment to the IBC Section 1609.3 wind loads are obtained from Appendix N of the State Building Code.
    - **V.asd = 101 mph** (3-Second Gust) Wind Design Parameter for the Town of Wilton, Connecticut for Risk Category four (IV) for essential communications (Connecticut State Police).

LOAD CONDITION 1 = 101 MPH (3-SECOND GUST) WIND LOAD (WITHOUT ICE) + TOWER DEAD LOAD
Load Condition 2 = 50 mph (3-second gust) Wind Load (with ice) + Ice Load + Tower Dead Load

Ice thickness used for this analysis is **0.75 inch** (assumed to start at the base of the tower) and is considered to increase in thickness with height. The initial ice thickness for design is referenced in the Annex of TIA-222-G and follows the same design criteria as the ASCE 7 Standard.

The below load condition implements the design requirements of the Connecticut State Police for the tower structures deflection limits with the allowable deflection limit of the combination of the tower's sway (deflection) and twist (rotation) under the TIA-222-F design Standard. This design limit required the design combined value of sway (deflection) and twist (rotation) to be under 0.75 degrees following the TIA-222-F design Standard.

3. ANALYSIS METHODOLOGY AND LOADING CONDITIONS (cont.)

Load Condition 3 = 90 mph (fastest mile) Wind Load (with ice) + Ice Load + Tower Dead Load

Seismic event consideration factors/values for design:

- S.s = 0.231 (2018 CT State Building Code – Location Specific Value)
- S.1 = 0.068 (2018 CT State Building Code – Location Specific Value)
- Site Classification = "D" – from Geotechnical Report
- Seismic Design Category = "C" – (2015 International Building Code)
- F.a = 1.6 (Obtained from TIA-222-G Table 2-12 Considering above conditions)
- F.v = 2.4 (Obtained from TIA-222-G Table 2-13 Considering above conditions)

Strength Limit State Load Combinations (TIA-222-G Section 2.3.2):

The structural analysis herein has considered the following load combinations within the analysis:

1. ***1.2 Dead Load Tower structure + 1.0 Dead Load Guy Assemblies + 1.6 Wind load without ice***
2. 1.2 Dead Load Tower structure + 1.0 Dead Load Guy Assemblies + 1.0 Dead weight of ice due to factored ice thickness + 1.0 Concurrent wind load with factored ice thickness + 1.0 Load effects due to temperature
3. 1.2 Dead Load Tower structure + 1.0 Dead Load Guy Assemblies + 1.0 Earthquake Load

NOTE 1: The above **bolded** load combination is considered to create the governing design loads per the results of the analysis.

NOTE 2: The above "Dead Load Guy Assemblies" are not considered as part of the analysis and are considered as a value of zero.

NOTE 3: The "Load effects due to temperature" do not apply for structures that are self-sustaining (from the TIA-222-G Standard)

4. FINDINGS AND EVALUATION

The combined axial and bending stresses on the tower structure were evaluated to compare with the strength design in accordance with AISC (LRFD). The calculated stresses for the tower structure, anchor bolts and foundation were within the required design strength under the proposed configuration and loading (stated herein). Detailed analysis calculations for the proposed load condition are provided in Section 6 of this report.

The tower sway (deflection) is 0.5948 degrees and the tower twist (rotation) is 0.0453 degrees. These figures are within the Connecticut State Police specification of 0.75 degrees for combined deflection (sway) and rotation (twist).

Tower Base Reactions:

Description	Current
Pier Compression (kips)	467
Pier Uplift (kips)	428
Overall Overturning (kip-ft)	11149
Overall Shear (kips)	118
Shear per Leg (kips)	47

Controlling Tower Component Stress vs. Capacity Summary:

Component / (Section No.)	Critical Component Size	Controlling Elevation	Stress (% capacity)	Pass/Fail
Leg (T19)	L8x8x1 1/8”	0’ – 10’	85.5	Pass
Diagonal (T19)	2L2 1/2x2 1/2x5/16	0’ – 10’	89.6	Pass
Horizontal (T19)	2L2 1/2x2 1/2x1/4	0’-10’	55.7	Pass
Secondary Horizontal (T18)	L3 1/2x3 1/2x1/4	10’-20’	37.7	Pass
Top Girt (T16)	2L2-1/2x2-1/2x1/4	30’-40’	21.1	Pass
Redund Horz 1 Bracing (T19)	L2 1/2x2 1/2x3/16	0’-10’	40.4	Pass
Redund Diag 1 Bracing (T19)	L2 1/2x2 1/2x3/16	0’-10’	85.3	Pass
Redund Hip 1 Bracing (T19)	L2 1/2x2 1/2x3/16	0’-10’	0.6	Pass
Redund Sub Horz Bracing (T19)	L3x3x5/16	0’-10’	79.4	Pass
Inner Bracing (T19)	2L2x2 1/2x3/16	0’-10’	2.9	Pass
Tower Connection Bolts	(2) A325X 5/8” Dia. Bolts	90’	68.7	Pass

Foundation Summary:

Component	Required	Computed	% Capacity	Pass/Fail
Anchor Rod Capacity (TIA-222-G – 4.9.9)	Ratio < 1.0	0.692	69.2	Pass
Overturning Moment Factor of Safety TIA-222-G Conditions	Resist OT * (0.75) Reduction Factor (TIA-222-G – Section 9.4.1) 18165 Kip*ft	12274 kip*ft	67.57	Pass
Bearing Pressure (TIA-222-G Conditions)	5.100 ksf max	2.6441 ksf	51.8	Pass

Structure Rating (Maximum from all components) =	89.6 %	Pass

4. FINDINGS AND EVALUATION (cont.)

Maximum Deformations – Proposed Condition

ANSI/TIA-222-G Section 2.8.2 - Limit State Deformations

1. A rotation of 4 degrees about the vertical axis (twist) or any horizontal axis (sway) of the structure
2. A horizontal displacement (in feet) of 3% of the height of the structure.

Load Case Description	Current		Allowable	
	Sway (degree)	Displacement (Feet)	Sway (degree)	Displacement (Feet)
Service Wind Load	0.1322	1.0974	4.0	5.40

Tower Twist & Sway at Top (Connecticut State Police Requirements - TIA-222-F):

Description	Current	Total	Allowable
Tower Twist (degrees)	0.0453	0.6401	0.750
Tower Sway (degrees)	0.5948		

5. CONCLUSIONS

The results of an initial analysis indicate that:

1. The existing steel tower structure IS considered structurally adequate for the proposed antenna loading with the wind classification specified herein.
2. The existing tower anchor bolts ARE considered structurally adequate for the proposed antenna loading with the wind classification specified herein.
3. The existing foundation IS considered structurally adequate for the proposed antenna load classification with the wind classification specified herein.
4. The existing tower's sway (deflection) is 0.5948 degrees, and the existing tower's twist (rotation) is 0.0453 degrees. These figures combined ARE within the Connecticut State Police requirement 0.75 degrees for combined twist (rotation) and sway (deflection) with the load classification specified herein.
5. The controlling structural capacity for all tower and foundation components for the proposed antenna loading is 89.6%

Limitations/Assumptions:

This report is based on the following:

1) Tower inventory as listed in this report.

2) Tower is properly installed and maintained.

3) All members are as specified in the original design documents and are in good condition.

4) All required members are in place.

5) All bolts are in place and are properly tightened.

6) Tower is in plumb condition.

7) All member protective coatings are in good condition.

8) All tower members were properly designed, detailed, fabricated, and installed and have been properly maintained since erection.

9) Foundations are in good condition without defects and were properly constructed to support original design loads as specified in the original design documents.

AECOM is not responsible for any modifications completed prior to or hereafter in which AECOM is not or was not directly involved. Modifications include but are not limited to:

A. Adding antennas
B. Removing/replacing antennas
C. Adding coaxial cables

AECOM hereby states that this document represents the entire report and that it assumes no liability for any factual changes that may occur after the date of this report. All representations, recommendations, and conclusions are based upon information contained and set forth herein. If you are aware of any information which conflicts with that which is contained herein, or you are aware of any defects arising from original design, material, fabrication, or erection deficiencies, you should disregard this report and immediately contact AECOM. AECOM disclaims all liability for any representation, recommendation, or conclusion not expressly stated herein.

Ongoing and Periodic Inspection and Maintenance:

After the Contractor has successfully completed the installation and the work has been accepted, the tower owner will be responsible for the ongoing and periodic inspection and maintenance of the tower.

The owner shall refer to TIA-222-G Section 14.2 for recommendations for maintenance and inspection. The frequency of the inspection and maintenance intervals is to be determined by the owner based upon actual site and environmental conditions. It is recommended that a complete and thorough inspection of the entire tower structural system be performed at least yearly and more frequently as conditions warrant. It is also recommended that the structure be inspected after severe wind and/or ice storms or other extreme loading conditions.

6.) DRAWINGS AND DATA

SEISMIC BASE SHEAR ANALYSIS

AECOM

Seismic (Vs) Base Shear Implementing TIA–222-G, IBC 2015 & Connecticut State Building Code of 2018

Calculation of Seismic Base Shear Implementing TIA-222-G, IBC 2015 & & CT State Building Code 2018.

Location: Wilton, CT -Site Class "D"

$S_{DS} = \frac{2}{3} F_A S_S$, where $S_S = 0.231$ and $F_A = 1.6$ $S_{DS} = \frac{2}{3} F_A S_S = \frac{2}{3} * 1.6 * 0.231 = 0.246$

$S_{D1} = \frac{2}{3} F_V S_1$, where $S_1 = 0.068$ and $F_V = 2.4$ $S_{D1} = \frac{2}{3} F_V S_1 = \frac{2}{3} * 2.4 * 0.068 = 0.109$

TIA-222-G SECTION 2.7 EARTHQUAKE LOADS (PROCEDURES):

1. Importance Factor "I" (tables 2-3 TIA-222-G) = 1.5 (Structure Class 3)

ANSI/TIA-222-G 2.7.7.1 (TOTAL BASE SEISMIC SHEAR (Vs)

W=DL TOWER	=	51.850	Kips
W=Antennas/Mounts	=	14.721	Kips
W=Cables	=	8.2025	Kips
		74.7735	Kips = WT Total = "W"

$$V_s = \frac{S_{DS} * W * I}{R} = \frac{0.246 * 74.7735 kips * 1.5}{3.0} = 9.197\ kips,$$ where R = 3.0 for Lattice Tower

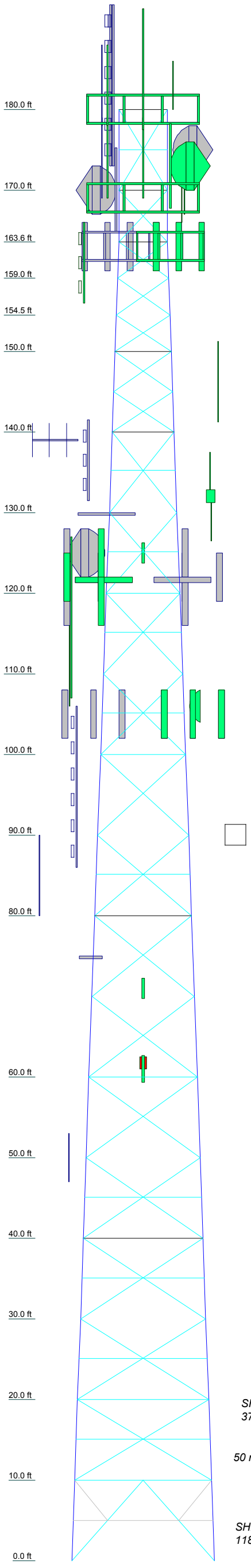
$$V_{S.min} = \frac{0.5 * S_{D1} * W * I}{R} = \frac{0.5 * 0.109 * 73.877 kips * 1.5}{3.0} = 2.0376 \quad kips$$

*By visual inspection, the above "Base Shear" value when considering the following Load Combination is less that the base shear of wind on structure.

$1.2 * DL + 1.0\ E < 1.2\ DL + 1.6\ W$, (118 Kips), therefore seismic effect on structure Does NOT control Design.

TNX TOWER INPUT/OUTPUT SUMMARY

Section	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14	T15	T16	T17	T18	T19
Legs	L3 1/2x3 1/2x3/8		L5x5x5/16			L5x5x3/8	L6x6x1/2		L6x6x3/4		L8x8x3/4		L8x8x1 w/ 1/2x7 Plates		L8x8x1-1/8 w/ 1/2x7 Plates			L8x8x1 1/8	
Leg Grade	A36																		
Diagonals	L2 1/2x2 1/2x3/16		A			L2 1/2x2x3/16	L3x2 1/2x1/4		L3x3x1/4		L3 1/2x3x1/4		2L2 1/2x2x3/16			2L2 1/2x2x3/8			2L2 1/2x2 1/2x5/16
Diagonal Grade											A36								
Top Girts	L2x2x3/16			N.A.		L2 1/2x2 1/2x3/16			N.A.							2L2x2x3/16		N.A.	
Horizontals					N.A.		L2x2x3/16				L2 1/2x2 1/2x1/4		N.A.			N.A.		2L2x2x3/16	2L2 1/2x2 1/2x1/4
Sec. Horizontals											N.A.								
Red. Horizontals							L2x2x1/4		L2x2x1/4										
Red. Diagonals																			
Red. Sub-Horizs																			
Red. Hips																			
Inner Bracing																			
Face Width (ft) 17.73	6			N.A.				N.A.		N.A.		N.A.		N.A.		N.A.	N.A.	N.A.	
# Panels @ (ft)	1 @ 10	1 @ 6.427	3 @ 4.52433	6.32443	6.64887	2 @ 5	6.9733	7.8903	8.40735	9.1244	9.84145	10.5585	11.2756	11.9926	13.4267	14.1438	14 @ 10	15.5779	16.2949
Weight (K) 51.8	0.7	0.5	0.4	0.4	0.4	1.0	1.5	1.4	2.1	1.9	2.5	2.4	8.0	4.6	5.1	4.8	4.3	5.0	4.9



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Lightning Rod 2"x15' (A32)	185	6' Side-Arm Mount (A12,13,14 / DK-27,28,29)	132
SC479-HF1LDF (D00-E5764) (A28)	183	BA1010 (A12 / DK-27)	132 - 127
ANT150D (A29a)	183	Dish Ice Shield (A11 / DK-26)	130
DB222 (A29b)	183	PD128-1 (A8 / DK-14)	128 - 121
SC479-HF1LDF (D00-E5764) (A30)	183	3" Dia 20' Omni (A7 / DK-13)	127 - 107
ALR8-0 (A31)	183	2'6"x4" Pipe Mount (A10 / DK-25)	125
TMA 432-83H-01T - Future Decom. (A27)	181	6' PAD w/ Radome (A10 / DK-25)	125
SC479-HF1LDF (D00I-E5764) (A23)	180 - 168	EUSF10-U w/ (2) Stiff-Arm Supports (T-Mobile)	122
15' T-Frame Sector Mount (1) (A23,24,30,31)	180	EUSF10-U w/ (2) Stiff-Arm Supports (T-Mobile)	122
SC479-HF1LDF (D00I-E5764) (A24)	180 - 168	EUSF10-U w/ (2) Stiff-Arm Supports (T-Mobile)	122
SC479-HF1LDF (D00I-E5764) (A26)	180 - 168	RFS APXVAARR24_43-U-NA20 Panel Antenna w/ 108" Pipe Mount (T-Mobile - Proposed)	122
15' T-Frame Sector Mount (1) (A26,27,28,29)	180		
10'6"x4" Pipe Mount (A33)	175	RFS APXVAARR24_43-U-NA20 Panel Antenna w/ 108" Pipe Mount (T-Mobile - Proposed)	122
6' PAD w/ Radome (A33)	175		
10'6"x4" Pipe Mount (A25)	173	RFS APXVAARR24_43-U-NA20 Panel Antenna w/ 108" Pipe Mount (T-Mobile - Proposed)	122
6' PAD w/ Radome (A25 /)	173		
DB586-Y (A21)	170	Generic Twin TMA unit (T-Mobile - Proposed)	122
10'6"x4" Pipe Mount (A22)	170	Generic Twin TMA unit (T-Mobile - Proposed)	122
6' PAD w/ Radome (A22 /)	170	Generic Twin TMA unit (T-Mobile - Proposed)	122
BA1010-2 (A20)	169	Ericsson 4449 B71 + B12 Radio Unit (T-Mobile - Proposed)	122
15' T-Frame Sector Mount (1) (A20)	169		
T-Frame (ATI)	163	Ericsson 4449 B71 + B12 Radio Unit (T-Mobile - Proposed)	122
T-Frame (ATI)	163		
T-Frame (ATI)	163	Ericsson 4449 B71 + B12 Radio Unit (T-Mobile - Proposed)	122
7770.00 (ATI)	163		
(2) LGP 21901 Diplexer Unit (ATI)	163	Ericsson AIR32 B66A/B2A Panel Antenna w/ 108" Pipe Mount (T-Mobile - Proposed)	122
Kathrein 800-10965 Panel Antenna (ATI)	163	Ericsson AIR32 B66A/B2A Panel Antenna w/ 108" Pipe Mount (T-Mobile - Proposed)	122
QS66512-3 Quintel Panel (ATI)	163		
RRUS-11 (ATI)	163	Ericsson AIR32 B66A/B2A Panel Antenna w/ 108" Pipe Mount (T-Mobile - Proposed)	122
Raycap DC6-48-60-18-8F DC Power Surge Protection (ATI)	163		
7770.00 (ATI)	163	10' Standoff (A8 / DK-14)	121
(2) LGP 21901 Diplexer Unit (ATI)	163	12' Omni Antenna (A9 - DK-15)	116 - 106
Kathrein 800-10965 Panel Antenna (ATI)	163	6' Side-Arm Mount (A7 / DK-13)	107
QS66512-3 Quintel Panel (ATI)	163	10'6"x4" Pipe Mount (A6 / DK-12 / CSP-11)	106
RRUS-11 (ATI)	163	DB264-A (A5 / DK-11)	106 - 86
7770.00 (ATI)	163	6' Side-Arm Mount (A9 - DK-15)	106
(2) LGP 21901 Diplexer Unit (ATI)	163	4' Grid Dish (A6 / DK 12 / CSP-11)	106
Kathrein 800-10965 Panel Antenna (ATI)	163	ALU 4x45W (1900 MHz) (Sprint)	105
QS66512-3 Quintel Panel (ATI)	163	AAHC Panel Antenna (Sprint)	105
RRUS-11 (ATI)	163	AAHC Panel Antenna (Sprint)	105
4478 Radio Unit (4x40W) (ATI)	163	AAHC Panel Antenna (Sprint)	105
4478 Radio Unit (4x40W) (ATI)	163	NNVV-65B-R4 Panel Antenna (Sprint)	105
4478 Radio Unit (4x40W) (ATI)	163	NNVV-65B-R4 Panel Antenna (Sprint)	105
RRUS-32 B66 (ATI)	163	NNVV-65B-R4 Panel Antenna (Sprint)	105
RRUS-32 B66 (ATI)	163	TD-RRH8x20-25 (Sprint)	105
RRUS-32 B66 (ATI)	163	TD-RRH8x20-25 (Sprint)	105
RRUS-32 B2 (ATI)	163	TD-RRH8x20-25 (Sprint)	105
RRUS-32 B2 (ATI)	163	ALU 800MHz 2x50W (Sprint)	105
RRUS-32 B2 (ATI)	163	APXVSPP18-C-A20 w/ Mount Pipe (Sprint)	105
RRUS-32 (ATI)	163	ALU 800MHz 2x50W (Sprint)	105
RRUS-32 (ATI)	163	ALU 800MHz 2x50W (Sprint)	105
RRUS-32 (ATI)	163	ALU 4x45W (1900 MHz) (Sprint)	105
DC6-48-60-18-8C Squid / Surge Arrestor (ATI)	163	12' Wireless Frame (Sprint)	105
DC6-48-60-18-8C Squid / Surge Arrestor (ATI)	163	12' Wireless Frame (Sprint)	105
(2) LPG21401 TMA (ATI)	163	12' Wireless Frame (Sprint)	105
(2) LPG21401 TMA (ATI)	163	APXVSPP18-C-A20 w/ Mount Pipe (Sprint)	105
(2) LPG21401 TMA (ATI)	163	ALU 4x45W (1900 MHz) (Sprint)	105
DB408-B (A19)	161	APXVSPP18-C-A20 w/ Mount Pipe (Sprint)	105
(2) 6' Side Mount Standoff (A19)	161	10' Standoff (A4 / DK-4)	91
12' Omni Antenna (A15 / DK-30)	152 - 140.5	SC479-HF1LDF (A4 / DK-4)	91 - 79
8' Side Arm Mount (A15 / DK-30)	140.5	4' Side Mount Standoff (A5 / DK-11)	86
6' Side-Arm Mount (A17 / DK-32)	139	Dish Ice Shield (A3 / DK-3)	75
6' Side-Arm Mount (A18 / DK-33)	139	2'6"x4" Pipe Mount (A3 / DK-3)	71
Yagi ASP-816 (A17 / DK-32)	139	3'4"x4" Pipe Mount (A2 / Sprint)	61
BA1010 (A14 / DK-29)	137 - 132	GPS (A2 / Sprint)	61
DB222-A (A16 / DK-31)	136.5	3' Stand-off (A1 / DK-1)	50
4' Side Mount Standoff (A16 / DK-31)	136.5	DB803M-Y (A1 / DK-1)	50
432E-83I-01T TTA Unit (A13 / DK-28)	132		

SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	L2x2x3/16		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A36	36 ksi	58 ksi			

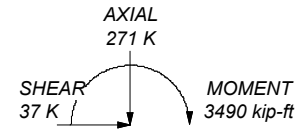
TOWER DESIGN NOTES

1. Tower designed for Exposure C to the TIA-222-G Standard.
2. Tower designed for a 93 mph basic wind in accordance with the TIA-222-G Standard.
3. Tower is also designed for a 50 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 60 mph wind.
5. Tower Structure Class III.
6. Topographic Category 3 with Crest Height of 65.00 ft
7. TOWER RATING: 89.6%

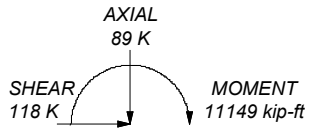
ALL REAC...
ARE FACT...

MAX. CORNER REACTIONS AT BASE:
DOWN: 467 K
SHEAR: 47 K

UPLIFT: -428 K
SHEAR: 45 K



TORQUE 43 kip-ft
50 mph WIND - 0.7500 in ICE

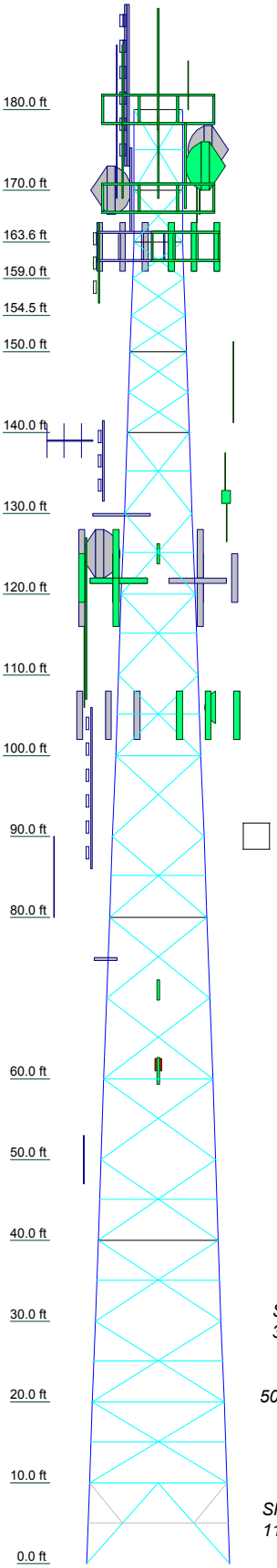


TORQUE 54 kip-ft
REACTIONS - 93 mph WIND

AECOM
500 Enterprise Drive, Suite 3B
Rocky Hill, CT
Phone: 860-529-8882
FAX: 860-529-3991

Job: ***180' Lattice Tower - CSP#31***			
Project: ***Wilton, Connecticut - S. Analysis***			
Client: Transcend Wireless / T-Mobile / TWM-013	Drawn by: MCD	App'd:	
Code: TIA-222-G	Date: 05/04/19	Scale: NTS	
Path: P:\Projects\Telcom\StructuralsByLocation\Connecticut\WiltonCSP#31\19-60604309-TWM-013\TIA-G\TWM-013_G_Wilton_CT.eri		Dwg No. E-1	

Section	T19	T18	T17	T16	T15	T14	T13	T12	T11	T10	T9	T8	T7	T6	T5	T4	T3	T2	T1
Legs		L8x8x1 1/8			B		L8x8x1 w/ 1/2x7 Plates		L8x8x3/4		L6x6x3/4		L6x6x1/2	L5x5x3/8			L5x5x5/16		A
Leg Grade									A36										
Diagonals	D		2L2 1/2x2x3/8				2L2 1/2x2x3/16		L3 1/2x3x1/4		L3x3x1/4		L3x2 1/2x1/4	L2 1/2x2x3/16			C		L2 1/2x2 1/2x3/16
Diagonal Grade									A36										
Top Girts		N.A.		2L2x2x3/16		N.A.		L2 1/2x2 1/2x1/4		N.A.			L2 1/2x2 1/2x3/16		N.A.				L2x2x3/16
Horizontals	F	2L2x2x3/16		N.A.		2L2x2x3/16		N.A.	E	N.A.	E		L2x2x1/4		N.A.				
Sec. Horizontals	N.A.		L3 1/2x3 1/2x1/4						N.A.	L2x2x1/4	L2x2x3/16								L2x2x3/16
Red. Horizontals	G								N.A.										
Red. Diagonals	G								N.A.										
Red. Sub-Horizs	L3x3x5/16								N.A.										
Red. Hips	G								N.A.										
Inner Bracing		2L2x2 1/2x3/16		N.A.		2L2x2x3/16		2L2x2x3/16		N.A.	H	N.A.	L2x2x3/16			N.A.			
Face Width (ft)	17.73	17.0125	16.2949	15.5779	14.8608	14.1438	13.4267	11.9926	11.2756	10.5585	9.84145	9.1244	8.40735	7.6903	6.9736	6.2566	5.5395	4.8225	4.1054
# Panels @ (ft)							14 @ 10							2 @ 5	3 @ 4.52433			1 @ 6.427	1 @ 10
Weight (K)	51.8	4.9	5.0	4.3	4.8	5.1	4.6	8.0	2.4	2.5	1.9	2.1	1.4	1.5	1.0	0.4	0.4	0.5	0.7



SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	L3 1/2x3 1/2x3/8	E	L2 1/2x2 1/2x1/4
B	L8x8x1-1/8 w/ 1/2x7 Plates	F	2L2 1/2x2 1/2x1/4
C	L2x2x3/16	G	L2 1/2x2 1/2x3/16
D	2L2 1/2x2 1/2x5/16	H	L2 1/2x2x3/16

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A36	36 ksi	58 ksi			

TOWER DESIGN NOTES

1. Tower designed for Exposure C to the TIA-222-G Standard.
2. Tower designed for a 93 mph basic wind in accordance with the TIA-222-G Standard.
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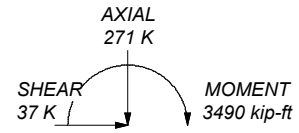
6. Topographic Category 3 with Crest Height of 65.00 ft
7. TOWER RATING: 89.6%

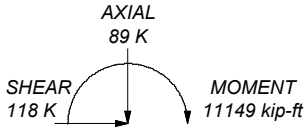
ALL REACTIONS ARE FACTORED

MAX. CORNER REACTIONS AT BASE:
DOWN: 467 K
SHEAR: 47 K

UPLIFT: -428 K
SHEAR: 45 K



TORQUE 43 kip-ft
50 mph WIND - 0.7500 in ICE



TORQUE 54 kip-ft
REACTIONS - 93 mph WIND

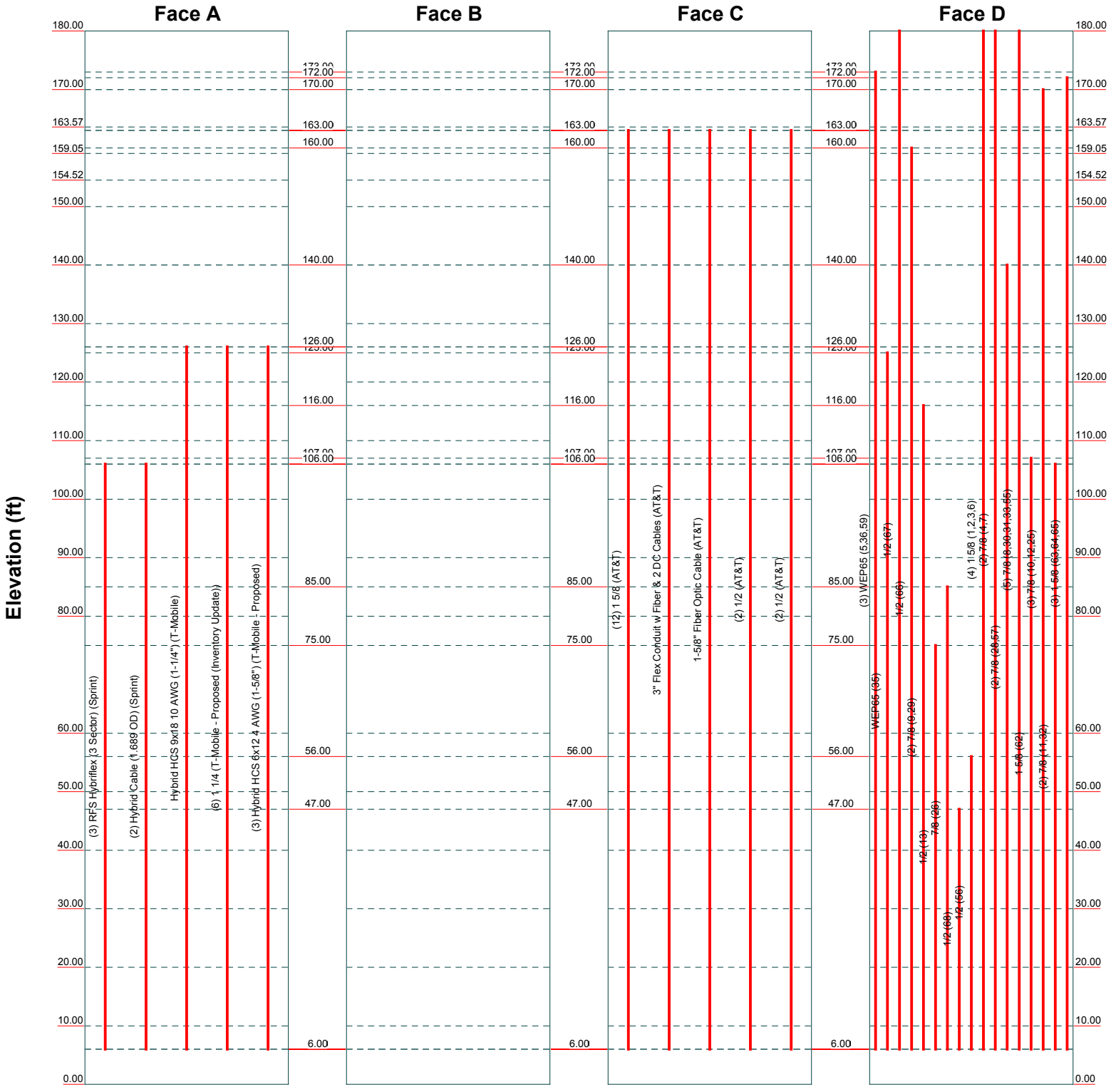
AECOM
500 Enterprise Drive, Suite 3B
Rocky Hill, CT
Phone: 860-529-8882
FAX: 860-529-3991

Job:	***180' Lattice Tower - CSP#31***		
Project:	***Wilton, Connecticut - S. Analysis***		
Client: Transcend Wireless / T-Mobile / TWM-013		Drawn by: MCD	App'd:
Code: TIA-222-G		Date: 05/04/19	Scale: NTS
Path: P:\Projects\Telcom\StructuralsByLocation\Connecticut\WiltonCSP#31\19-60604309-TWM-013\TIA-G\TWM-013_G_Wilton_CT.eri			Dwg No. E-1

TNX TOWER FEEDLINE DISTRIBUTION

Feed Line Distribution Chart
0' - 180'

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



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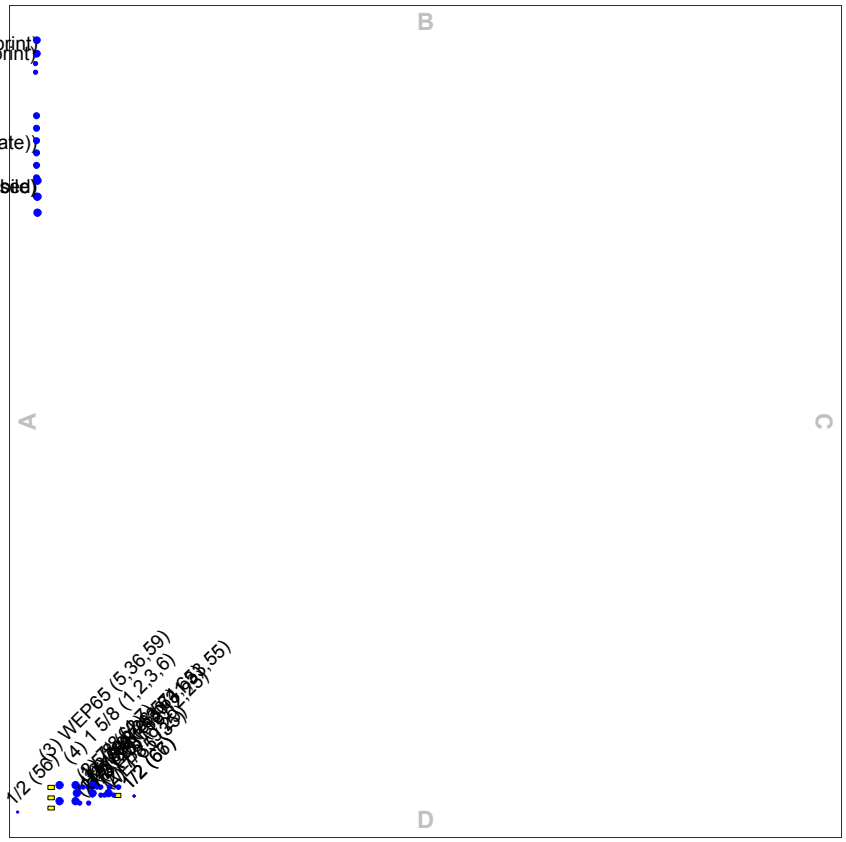
Code: TIA-222-G		Date: 05/04/19	Scale: NTS
Path: P:\Projects\Telcom\StructuralsByLocation\Connecticut\WiltonCSP#31\19-60604309-TWM-013\TIA-G\TWM-013_G_Wilton_CT.eri			Dwg No. E-7

TNX TOWER FEEDLINE PLAN

Feed Line Plan

Round | Flat | App In Face | App Out Face



(8) 1-5/8" Coax Cables
(18) 7/8" Coax Cables
(4) 1/2" Coax Cables
(4) WEP65 Elliptical Cables

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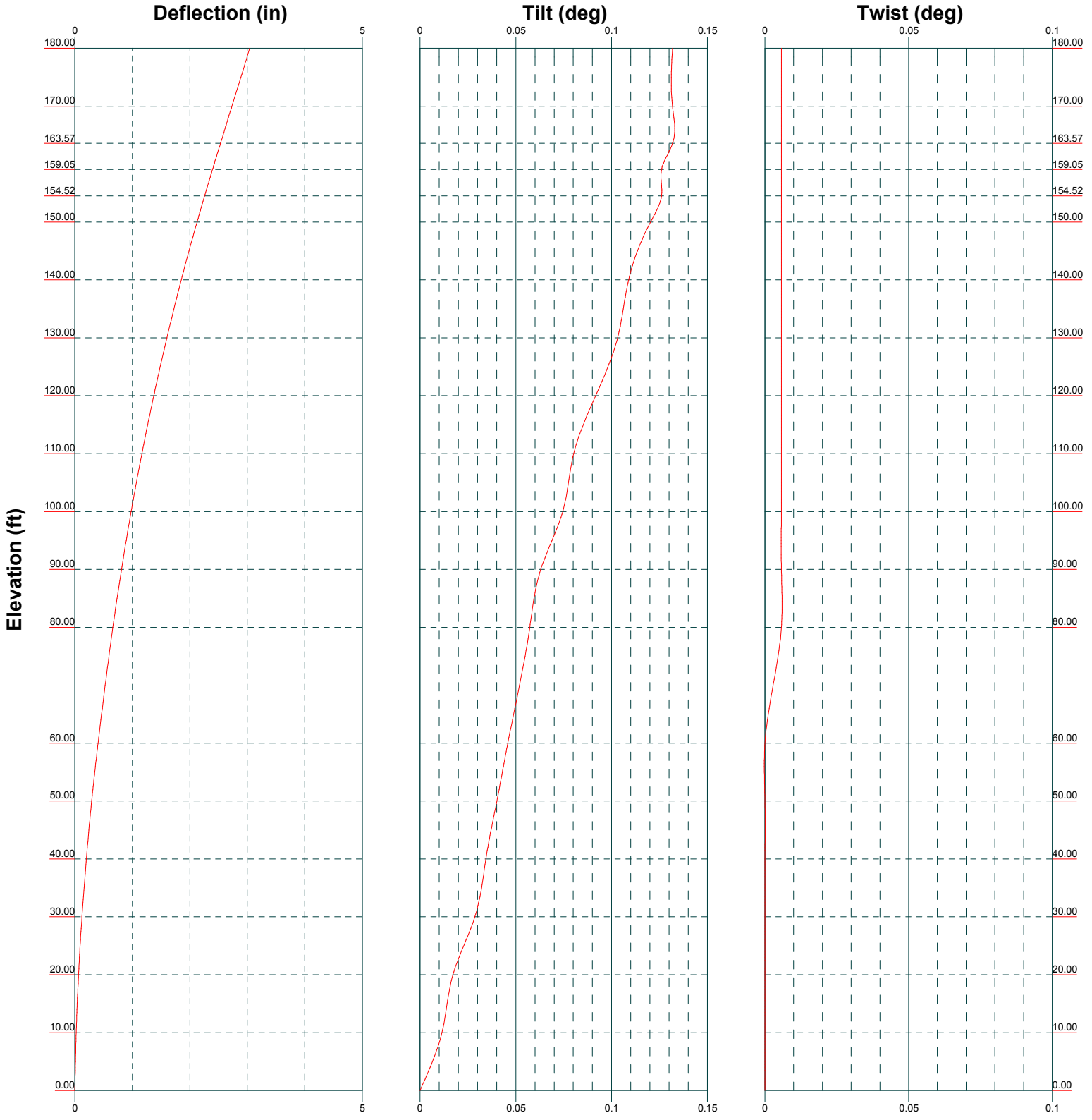
Job:	180' Lattice Tower - CSP#31		
Project:	Wilton, Connecticut - S. Analysis		
Client: Transcend Wireless / T-Mobile / TWM-013		Drawn by: MCD	App'd:
Code: TIA-222-G		Date: 05/04/19	Scale: NTS
Path: P:\Projects\Telcom\StructuralsByLocation\Connecticut\WiltonCSP#31\19-60604309-TWM-013\TIA-G\TWM-013_G_Wilton_CT.eri			Dwg No. E-7

TNX TOWER DEFLECTION, TILT, AND TWIST

TIA-222-G - Service - 60 mph

Maximum Values



AECOM
500 Enterprise Drive, Suite 3B
Rocky Hill, CT
Phone: 860-529-8882
FAX: 860-529-3991

Job: ***180' Lattice Tower - CSP#31***			
Project: ***Wilton, Connecticut - S. Analysis***			
Client: Transcend Wireless / T-Mobile / TWM-013	Drawn by: MCD	App'd:	
Code: TIA-222-G	Date: 05/04/19	Scale: NTS	
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TNX TOWER DETAILED OUTPUT

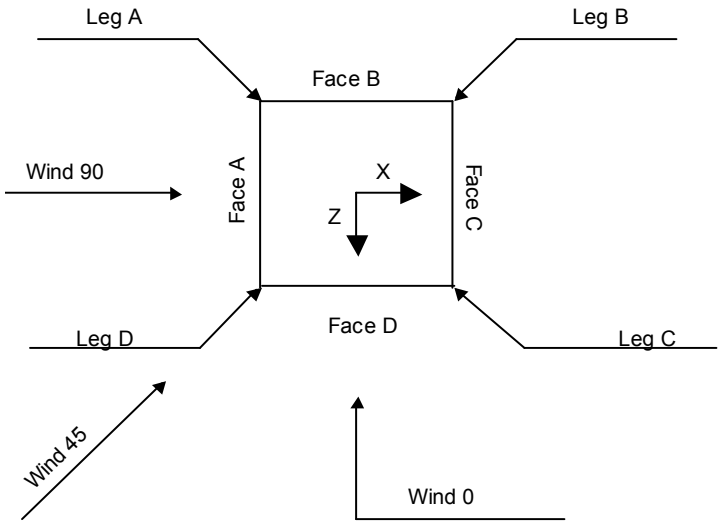
Tower Input Data

The main tower is a 4x free standing tower with an overall height of 180.00 ft above the ground line.
The base of the tower is set at an elevation of 0.00 ft above the ground line.
The face width of the tower is 6.00 ft at the top and 17.73 ft at the base.
This tower is designed using the TIA-222-G standard.
The following design criteria apply:

Basic wind speed of 93 mph.
Structure Class III.
Exposure Category C.
Topographic Category 3.
Crest Height 65.00 ft.
Nominal ice thickness of 0.7500 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 50 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 60 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in tower member design is 1.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

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



Square Tower

Tower Section Geometry

Tower Section	Tower Elevation	Assembly Database	Description	Section Width	Number of Sections	Section Length
	ft			ft		ft
T1	180.00-170.00			6.00	1	10.00
T2	170.00-163.57			6.00	1	6.43
T3	163.57-159.05			6.00	1	4.52
T4	159.05-154.52			6.32	1	4.52
T5	154.52-150.00			6.65	1	4.52
T6	150.00-140.00			6.97	1	10.00
T7	140.00-130.00			7.69	1	10.00
T8	130.00-120.00			8.41	1	10.00
T9	120.00-110.00			9.12	1	10.00
T10	110.00-100.00			9.84	1	10.00
T11	100.00-90.00			10.56	1	10.00
T12	90.00-80.00			11.28	1	10.00
T13	80.00-60.00			11.99	1	20.00
T14	60.00-50.00			13.43	1	10.00
T15	50.00-40.00			14.14	1	10.00
T16	40.00-30.00			14.86	1	10.00
T17	30.00-20.00			15.58	1	10.00
T18	20.00-10.00			16.29	1	10.00
T19	10.00-0.00			17.01	1	10.00

Tower Section Geometry *(cont'd)*

Tower Section	Tower Elevation	Diagonal Spacing	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset	Bottom Girt Offset
	ft	ft				in	in

Tower Section	Tower Elevation ft	Diagonal Spacing ft	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset in	Bottom Girt Offset in
T1	180.00-170.00	10.00	X Brace	No	Yes	0.0000	0.0000
T2	170.00-163.57	6.43	X Brace	No	No	0.0000	0.0000
T3	163.57-159.05	4.52	X Brace	No	No	0.0000	0.0000
T4	159.05-154.52	4.52	X Brace	No	No	0.0000	0.0000
T5	154.52-150.00	4.52	X Brace	No	No	0.0000	0.0000
T6	150.00-140.00	5.00	X Brace	No	No	0.0000	0.0000
T7	140.00-130.00	10.00	X Brace	No	Yes	0.0000	0.0000
T8	130.00-120.00	10.00	X Brace	No	Yes	0.0000	0.0000
T9	120.00-110.00	10.00	X Brace	No	Yes	0.0000	0.0000
T10	110.00-100.00	10.00	X Brace	No	Yes	0.0000	0.0000
T11	100.00-90.00	10.00	X Brace	No	Yes	0.0000	0.0000
T12	90.00-80.00	10.00	X Brace	No	Yes	0.0000	0.0000
T13	80.00-60.00	10.00	X Brace	No	Yes	0.0000	0.0000
T14	60.00-50.00	10.00	X Brace	No	Yes	0.0000	0.0000
T15	50.00-40.00	10.00	X Brace	No	Yes	0.0000	0.0000
T16	40.00-30.00	10.00	X Brace	No	Yes	0.0000	0.0000
T17	30.00-20.00	10.00	X Brace	No	Yes	0.0000	0.0000
T18	20.00-10.00	10.00	X Brace	No	Yes	0.0000	0.0000
T19	10.00-0.00	10.00	K1 Down	No	Yes	0.0000	0.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 180.00-170.00	Single Angle	L3 1/2x3 1/2x3/8	A36 (36 ksi)	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T2 170.00-163.57	Single Angle	L5x5x5/16	A36 (36 ksi)	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T3 163.57-159.05	Single Angle	L5x5x5/16	A36 (36 ksi)	Single Angle	L2x2x3/16	A36 (36 ksi)
T4 159.05-154.52	Single Angle	L5x5x5/16	A36 (36 ksi)	Single Angle	L2 1/2x2x3/16	A36 (36 ksi)
T5 154.52-150.00	Single Angle	L5x5x5/16	A36 (36 ksi)	Single Angle	L2 1/2x2x3/16	A36 (36 ksi)
T6 150.00-140.00	Single Angle	L5x5x3/8	A36 (36 ksi)	Single Angle	L2 1/2x2x3/16	A36 (36 ksi)
T7 140.00-130.00	Single Angle	L6x6x1/2	A36 (36 ksi)	Single Angle	L3x2 1/2x1/4	A36 (36 ksi)
T8 130.00-120.00	Single Angle	L6x6x1/2	A36 (36 ksi)	Single Angle	L3x3x1/4	A36 (36 ksi)
T9 120.00-110.00	Single Angle	L6x6x3/4	A36 (36 ksi)	Single Angle	L3x3x1/4	A36 (36 ksi)
T10 110.00-100.00	Single Angle	L6x6x3/4	A36 (36 ksi)	Single Angle	L3 1/2x3x1/4	A36 (36 ksi)
T11 100.00-90.00	Single Angle	L8x8x3/4	A36 (36 ksi)	Single Angle	L3 1/2x3x1/4	A36 (36 ksi)
T12 90.00-80.00	Single Angle	L8x8x3/4	A36 (36 ksi)	Single Angle	L3 1/2x3x1/4	A36 (36 ksi)
T13 80.00-60.00	Arbitrary Shape	L8x8x1 w/ 1/2x7 Plates	A36 (36 ksi)	Double Angle	2L2 1/2x2x3/16	A36 (36 ksi)
T14 60.00-50.00	Arbitrary Shape	L8x8x1-1/8 w/ 1/2x7 Plates	A36 (36 ksi)	Double Angle	2L2 1/2x2x3/16	A36 (36 ksi)
T15 50.00-40.00	Arbitrary Shape	L8x8x1-1/8 w/ 1/2x7 Plates	A36 (36 ksi)	Double Angle	2L2 1/2x2x3/8	A36 (36 ksi)
T16 40.00-30.00	Single Angle	L8x8x1 1/8	A36 (36 ksi)	Double Angle	2L2 1/2x2x3/8	A36 (36 ksi)

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T17 30.00-20.00	Single Angle	L8x8x1 1/8	A36 (36 ksi)	Double Angle	2L2 1/2x2x3/8	A36 (36 ksi)
T18 20.00-10.00	Single Angle	L8x8x1 1/8	A36 (36 ksi)	Double Angle	2L2 1/2x2x3/8	A36 (36 ksi)
T19 10.00-0.00	Single Angle	L8x8x1 1/8	A36 (36 ksi)	Double Angle	2L2 1/2x2 1/2x5/16	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T1 180.00-170.00	Single Angle	L2x2x3/16	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T2 170.00-163.57	Single Angle	L2x2x3/16	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T3 163.57-159.05	Single Angle	L2x2x3/16	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T6 150.00-140.00	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T7 140.00-130.00	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T13 80.00-60.00	Single Angle	L2 1/2x2 1/2x1/4	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T16 40.00-30.00	Double Angle	2L2x2x3/16	A36 (36 ksi)	Single Angle		A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
T1 180.00-170.00	1	Single Angle	L2x2x3/16	A36 (36 ksi)	Double Angle		A36 (36 ksi)
T9 120.00-110.00	1	Single Angle	L2x2x3/16	A36 (36 ksi)	Single Angle	L2 1/2x2 1/2x1/4	A36 (36 ksi)
T11 100.00-90.00	None	Single Angle		A36 (36 ksi)	Single Angle	L2 1/2x2 1/2x1/4	A36 (36 ksi)
T14 60.00-50.00	None	Single Angle		A36 (36 ksi)	Double Angle	2L2x2x3/16	A36 (36 ksi)
T18 20.00-10.00	None	Single Angle		A36 (36 ksi)	Double Angle	2L2x2x3/16	A36 (36 ksi)
T19 10.00-0.00	None	Single Angle		A36 (36 ksi)	Double Angle	2L2 1/2x2 1/2x1/4	A36 (36 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 180.00-170.00	Single Angle	L2x2x3/16	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T7 140.00-130.00	Equal Angle	L2x2x1/4	A36 (36 ksi)	Single Angle	L2x2x3/16	A36 (36 ksi)
T8 130.00-120.00	Single Angle	L2x2x1/4	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T9 120.00-110.00	Single Angle	L2x2x3/16	A36 (36 ksi)	Single Angle	L2 1/2x2x3/16	A36 (36 ksi)
T10 110.00-100.00	Single Angle	L2x2x1/4	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T11 100.00-90.00	Single Angle		A36 (36 ksi)	Single Angle	L2 1/2x2x3/16	A36 (36 ksi)
T12 90.00-80.00	Single Angle	L2 1/2x2 1/2x1/4	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T13 80.00-60.00	Equal Angle		A36 (36 ksi)	Double Angle	2L2x2x3/16	A36 (36 ksi)
T14 60.00-50.00	Single Angle		A36 (36 ksi)	Double Angle	2L2x2x3/16	A36 (36 ksi)
T15 50.00-40.00	Single Angle	L3 1/2x3 1/2x1/4	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T16 40.00-30.00	Single Angle	L3 1/2x3 1/2x1/4	A36 (36 ksi)	Double Angle	2L2x2x3/16	A36 (36 ksi)
T17 30.00-20.00	Single Angle	L3 1/2x3 1/2x1/4	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T18 20.00-10.00	Single Angle	L3 1/2x3 1/2x1/4	A36 (36 ksi)	Double Angle	2L2x2 1/2x3/16	A36 (36 ksi)
T19 10.00-0.00	Single Angle		A36 (36 ksi)	Double Angle	2L2x2 1/2x3/16	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Redundant Bracing Grade		Redundant Type	Redundant Size	K Factor
T19 10.00-0.00	A36 (36 ksi)	Horizontal (1)	Single Angle	L2 1/2x2 1/2x3/16	1
		Diagonal (1)	Single Angle	L2 1/2x2 1/2x3/16	1
		Sub-Horizontal	Single Angle	L3x3x5/16	1
		Hip (1)	Single Angle	L2 1/2x2 1/2x3/16	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 180.00-170.00	0.00	0.0000	A36 (36 ksi)	1	1	1.02	24.0000	24.0000	36.0000
T2 170.00-163.57	0.00	0.0000	A36 (36 ksi)	1	1	1.02	24.0000	24.0000	36.0000

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
T3 163.57-159.05	0.00	0.0000	A36 (36 ksi)	1	1	1.02	24.0000	24.0000	36.0000
T4 159.05-154.52	0.00	0.0000	A36 (36 ksi)	1	1	1.02	24.0000	24.0000	36.0000
T5 154.52-150.00	0.00	0.0000	A36 (36 ksi)	1	1	1.02	24.0000	24.0000	36.0000
T6 150.00-140.00	0.00	0.0000	A36 (36 ksi)	1	1	1.02	24.0000	24.0000	36.0000
T7 140.00-130.00	0.00	0.0000	A36 (36 ksi)	1	1	1.02	24.0000	24.0000	36.0000
T8 130.00-120.00	0.00	0.0000	A36 (36 ksi)	1	1	1.02	24.0000	24.0000	36.0000
T9 120.00-110.00	0.00	0.0000	A36 (36 ksi)	1	1	1.02	24.0000	24.0000	36.0000
T10 110.00-100.00	0.00	0.0000	A36 (36 ksi)	1	1	1.02	24.0000	24.0000	36.0000
T11 100.00-90.00	0.00	0.0000	A36 (36 ksi)	1	1	1.02	24.0000	24.0000	36.0000
T12 90.00-80.00	0.00	0.0000	A36 (36 ksi)	1	1	1.02	24.0000	24.0000	36.0000
T13 80.00-60.00	0.00	0.0000	A36 (36 ksi)	1	1	1.02	24.0000	24.0000	36.0000
T14 60.00-50.00	0.00	0.0000	A36 (36 ksi)	1	1	1.02	24.0000	24.0000	36.0000
T15 50.00-40.00	0.00	0.0000	A36 (36 ksi)	1	1	1.02	24.0000	24.0000	36.0000
T16 40.00-30.00	0.00	0.0000	A36 (36 ksi)	1	1	1.02	24.0000	24.0000	36.0000
T17 30.00-20.00	0.00	0.0000	A36 (36 ksi)	1	1	1.02	24.0000	24.0000	36.0000
T18 20.00-10.00	0.00	0.0000	A36 (36 ksi)	1	1	1.02	24.0000	24.0000	36.0000
T19 10.00-0.00	0.00	0.0000	A36 (36 ksi)	1	1	1.02	24.0000	24.0000	36.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X 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 180.00-170.00	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T2 170.00-163.57	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T3 163.57-159.05	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T4 159.05-154.52	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T5 154.52-150.00	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T6 150.00-140.00	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X	X Brace Diags Y	K Single Diags X	K Single Diags Y	Girts X	Girts Y	Horiz. X	Horiz. Y	Sec. Horiz. X	Sec. Horiz. Y	Inner Brace X	Inner Brace Y
T7	Yes	No	1	1	1	1	1	1	1	1	1	1	1	1	1
140.00-130.00				1	1	1	1	1	1	1	1	1	1	1	1
T8	Yes	No	1	1	1	1	1	1	1	1	1	1	1	1	1
130.00-120.00				1	1	1	1	1	1	1	1	1	1	1	1
T9	Yes	No	1	1	1	1	1	1	1	1	1	1	1	1	1
120.00-110.00				1	1	1	1	1	1	1	1	1	1	1	1
T10	Yes	No	1	1	1	1	1	1	1	1	1	1	1	1	1
110.00-100.00				1	1	1	1	1	1	1	1	1	1	1	1
T11	Yes	No	1	1	1	1	1	1	1	1	1	1	1	1	1
100.00-90.00				1	1	1	1	1	1	1	1	1	1	1	1
T12	Yes	No	1	1	1	1	1	1	1	1	1	1	1	1	1
90.00-80.00				1	1	1	1	1	1	1	1	1	1	1	1
T13	Yes	No	1	1	1	1	1	1	1	1	1	1	1	1	1
80.00-60.00				1	1	1	1	1	1	1	1	1	1	1	1
T14	Yes	No	1	1	1	1	1	1	1	1	1	1	1	1	1
60.00-50.00				1	1	1	1	1	1	1	1	1	1	1	1
T15	Yes	No	1	1	1	1	1	1	1	1	1	1	1	1	1
50.00-40.00				1	1	1	1	1	1	1	1	1	1	1	1
T16	Yes	No	1	1	1	1	1	1	1	1	1	1	1	1	1
40.00-30.00				1	1	1	1	1	1	1	1	1	1	1	1
T17	Yes	No	1	1	1	1	1	1	1	1	1	1	1	1	1
30.00-20.00				1	1	1	1	1	1	1	1	1	1	1	1
T18	Yes	No	1	1	1	1	1	1	1	1	1	1	1	1	1
20.00-10.00				1	1	1	1	1	1	1	1	1	1	1	1
T19	Yes	No	1	1	1	1	1	1	1	1	1	1	1	1	1
10.00-0.00				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 Net Width Deduct in	Leg U	Diagonal Net Width Deduct in	Diagonal U	Top Girt Net Width Deduct in	Top Girt U	Bottom Girt Net Width Deduct in	Bottom Girt U	Mid Girt Net Width Deduct in	Mid Girt U	Long Horizontal Net Width Deduct in	Long Horizontal U	Short Horizontal Net Width Deduct in	Short Horizontal U
T1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.6250	0.75	0.0000	0.75	0.0000	0.75
180.00-170.00														
T2	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.6250	0.75	0.0000	0.75	0.0000	0.75
170.00-163.57														
T3	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.6250	0.75	0.0000	0.75	0.0000	0.75
163.57-159.05														
T4	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.6250	0.75	0.0000	0.75	0.0000	0.75
159.05-154.52														
T5	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.6250	0.75	0.0000	0.75	0.0000	0.75
154.52-150.00														
T6	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.6250	0.75	0.0000	0.75	0.0000	0.75
150.00-140.00														
T7	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.6250	0.75	0.0000	0.75	0.0000	0.75
140.00-130.00														
T8	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.6250	0.75	0.0000	0.75	0.0000	0.75
130.00-120.00														

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
T9 120.00-110.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.6250	0.75	0.0000	0.75	0.0000	0.75
T10 110.00-100.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.6250	0.75	0.0000	0.75	0.0000	0.75
T11 100.00-90.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.6250	0.75	0.0000	0.75	0.0000	0.75
T12 90.00-80.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.6250	0.75	0.0000	0.75	0.0000	0.75
T13 80.00-60.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.6250	0.75	0.0000	0.75	0.0000	0.75
T14 60.00-50.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.6250	0.75	0.0000	0.75	0.0000	0.75
T15 50.00-40.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.6250	0.75	0.0000	0.75	0.0000	0.75
T16 40.00-30.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.6250	0.75	0.0000	0.75	0.0000	0.75
T17 30.00-20.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.6250	0.75	0.0000	0.75	0.0000	0.75
T18 20.00-10.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.6250	0.75	0.0000	0.75	0.0000	0.75
T19 10.00-0.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.6250	0.75	0.0000	0.75	0.0000	0.75

Tower Section Geometry *(cont'd)*

Tower Elevation	Connection Offsets							
	Diagonal				K-Bracing			
	Vert. Top	Horiz. Top	Vert. Bot.	Horiz. Bot.	Vert. Top	Horiz. Top	Vert. Bot.	Horiz. Bot.
ft	in	in	in	in	in	in	in	in
T1 180.00-170.00	0.0000	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000
T2 170.00-163.57	0.0000	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000
T3 163.57-159.05	0.0000	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000
T4 159.05-154.52	0.0000	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000
T5 154.52-150.00	0.0000	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000
T6 150.00-140.00	0.0000	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000
T7 140.00-130.00	0.0000	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000
T8 130.00-120.00	0.0000	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000
T9 120.00-110.00	0.0000	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000
T10 110.00-100.00	0.0000	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000

Tower Elevation	Connection Offsets							
	Diagonal				K-Bracing			
	Vert. Top	Horiz. Top	Vert. Bot.	Horiz. Bot.	Vert. Top	Horiz. Top	Vert. Bot.	Horiz. Bot.
ft	in	in	in	in	in	in	in	in
T11 100.00-90.00	0.0000	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000
T12 90.00-80.00	0.0000	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000
T13 80.00-60.00	0.0000	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000
T14 60.00-50.00	0.0000	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000
T15 50.00-40.00	0.0000	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000
T16 40.00-30.00	0.0000	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000
T17 30.00-20.00	0.0000	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000
T18 20.00-10.00	0.0000	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000
T19 10.00-0.00	0.0000	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T1 180.00-170.00	Flange	0.7500 A325X	0	0.6250 A325X	2	0.6250 A325X	2	0.6250 A325N	0	0.6250 A325X	2	0.6250 A325X	0	0.6250 A325X	2
T2 170.00-163.57	Flange	0.7500 A325X	0	0.6250 A325X	2	0.6250 A325X	2	0.6250 A325N	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325X	0
T3 163.57-159.05	Flange	0.7500 A325X	0	0.6250 A325X	2	0.6250 A325X	2	0.6250 A325N	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325X	0
T4 159.05-154.52	Flange	0.7500 A325X	0	0.6250 A325X	2	0.6250 A325X	0	0.6250 A325N	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325X	0
T5 154.52-150.00	Flange	0.7500 A325X	0	0.6250 A325X	2	0.6250 A325X	0	0.6250 A325N	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325X	0
T6 150.00-140.00	Flange	0.7500 A325X	0	0.6250 A325X	2	0.6250 A325X	2	0.6250 A325N	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325X	0
T7 140.00-130.00	Flange	0.7500 A325X	0	0.6250 A325X	2	0.6250 A325X	2	0.6250 A325N	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325X	0
T8 130.00-120.00	Flange	0.7500 A325X	0	0.6250 A325X	2	0.6250 A325X	0	0.6250 A325N	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325X	2
T9 120.00-110.00	Flange	0.7500 A325X	0	0.6250 A325X	2	0.6250 A325X	0	0.6250 A325N	0	0.6250 A325X	2	0.6250 A325X	2	0.6250 A325X	2
T10 110.00-100.00	Flange	0.7500 A325X	0	0.6250 A325X	2	0.6250 A325X	0	0.6250 A325N	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325X	2
T11 100.00-90.00	Flange	0.7500 A325X	0	0.6250 A325X	2	0.6250 A325X	0	0.6250 A325N	0	0.6250 A325X	2	0.6250 A325X	2	0.6250 A325X	0
T12 90.00-80.00	Flange	0.7500 A325X	0	0.6250 A325X	2	0.6250 A325X	0	0.6250 A325N	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325X	2
T13 80.00-60.00	Flange	0.7500 A325X	0	0.6250 A325X	2	0.6250 A325X	2	0.6250 A325N	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325X	0

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.
T14 60.00-50.00	Flange	0.7500 A325X	0	0.6250 A325X	2	0.6250 A325X	0	0.6250 A325N	0	0.6250 A325X	2	0.6250 A325X	2	0.6250 A325X	0
T15 50.00-40.00	Flange	0.7500 A325X	0	0.6250 A325X	2	0.6250 A325X	0	0.6250 A325N	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325X	2
T16 40.00-30.00	Flange	0.7500 A325X	0	0.6250 A325X	2	0.6250 A325X	2	0.0000 A325N	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325X	2
T17 30.00-20.00	Flange	0.7500 A325X	0	0.6250 A325X	2	0.6250 A325X	0	0.6250 A325N	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325X	2
T18 20.00-10.00	Flange	0.7500 A325X	0	0.6250 A325X	2	0.6250 A325X	0	0.6250 A325N	0	0.6250 A325X	2	0.6250 A325X	2	0.6250 A325X	2
T19 10.00-0.00	Flange	0.7500 A325X	0	0.6250 A325X	2	0.6250 A325X	0	0.6250 A325N	0	0.6250 A325X	2	0.6250 A325X	2	0.6250 A325X	0

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
WEP65 (5,36,59)	D	No	No	Af (CaAa)	173.00 - 6.00	-12.0000	0.45	3	1	1.5836	1.5836		0.53
WEP65 (35)	D	No	No	Af (CaAa)	125.00 - 6.00	-10.0000	0.37	1	1	1.5836	1.5836		0.53
1/2 (67)	D	No	No	Ar (CaAa)	180.00 - 6.00	-10.0000	0.35	1	1	0.5800	0.5800		0.25
1/2 (66)	D	No	No	Ar (CaAa)	160.00 - 6.00	-10.0000	0.35	1	1	0.5800	0.5800		0.25
7/8 (9,29)	D	No	No	Ar (CaAa)	116.00 - 6.00	-10.0000	0.38	2	2	1.1100	1.1100		0.54
1/2 (13)	D	No	No	Ar (CaAa)	75.00 - 6.00	-10.0000	0.39	1	1	0.5800	0.5800		0.25
7/8 (26)	D	No	No	Ar (CaAa)	85.00 - 6.00	-10.0000	0.39	1	1	1.1100	1.1100		0.54
1/2 (68)	D	No	No	Ar (CaAa)	47.00 - 6.00	-10.0000	0.4	1	1	0.5800	0.5800		0.25
1/2 (56)	D	No	No	Ar (CaAa)	56.00 - 6.00	-6.0000	0.49	1	1	0.5800	0.5800		0.25
1 5/8 (1,2,3,6)	D	No	No	Ar (CaAa)	180.00 - 6.00	-12.0000	0.43	4	2	1.9800	1.9800		1.04
7/8 (4,7)	D	No	No	Ar (CaAa)	180.00 - 6.00	-12.0000	0.41	2	2	1.1100	1.1100		0.54
7/8 (28,57)	D	No	No	Ar (CaAa)	140.00 - 6.00	-12.0000	0.4	2	2	1.1100	1.1100		0.54
7/8 (8,30,31,33,55)	D	No	No	Ar (CaAa)	180.00 - 6.00	-12.0000	0.39	5	5	1.1100	1.1100		0.54
1 5/8 (62)	D	No	No	Ar (CaAa)	107.00 - 6.00	-12.0000	0.4	1	1	1.9800	1.9800		1.04
7/8 (10,12,25)	D	No	No	Ar (CaAa)	170.00 - 6.00	-12.0000	0.38	3	3	1.1100	1.1100		0.54
7/8 (11,32)	D	No	No	Ar (CaAa)	106.00 - 6.00	-8.0000	0.41	2	2	1.1100	1.1100		0.54
1 5/8 (63,64,65)	D	No	No	Ar (CaAa)	172.00 - 6.00	-10.0000	0.4	3	3	1.9800	1.9800		1.04

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
1 5/8 (AT&T)	C	No	No	Ar (CaAa)	163.00 - 6.00	2.0000	-0.35	12	6	1.9800	1.9800		1.04
3" Flex Conduit w Fiber & 2 DC Cables (AT&T)	C	No	No	Ar (CaAa)	163.00 - 6.00	2.0000	-0.28	1	1	3.0000	3.0000		3.00
RFS Hybriflex (3 Sector) (Sprint)	A	No	No	Ar (CaAa)	106.00 - 6.00	-6.0000	0.43	3	3	1.0900	1.0900		0.37
1-5/8" Fiber Optic Cable (AT&T)	C	No	No	Ar (CaAa)	163.00 - 6.00	2.0000	-0.25	1	1	1.9800	1.9800		1.30
1/2 (AT&T)	C	No	No	Ar (CaAa)	163.00 - 6.00	2.0000	-0.27	2	2	0.5800	0.5800		0.25
1/2 (AT&T)	C	No	No	Ar (CaAa)	163.00 - 6.00	2.0000	-0.23	2	2	0.5800	0.5800		0.25
Hybrid Cable (1.689 OD) (Sprint) * T-Mobile Cables	A	No	No	Ar (CaAa)	106.00 - 6.00	-6.0000	0.45	2	2	1.6890	1.6890		2.31
Hybrid HCS 9x18 10 AWG (1-1/4") (T-Mobile)	A	No	No	Ar (CaAa)	126.00 - 6.00	-6.0000	0.27	1	1	1.5400	1.5400		0.90
1 1/4 (T-Mobile - Proposed (Inventory Update))	A	No	No	Ar (CaAa)	126.00 - 6.00	-6.0000	0.33	6	6	1.5500	1.5500		0.66
Hybrid HCS 6x12 4 AWG (1-5/8") (T-Mobile - Proposed)	A	No	No	Ar (CaAa)	126.00 - 6.00	-6.0000	0.27	3	3	1.9900	1.9900		1.90

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	180.00-170.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
		D	0.000	0.000	19.833	0.000	0.09
T2	170.00-163.57	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
		D	0.000	0.000	21.503	0.000	0.09
T3	163.57-159.05	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	12.273	0.000	0.07
		D	0.000	0.000	15.193	0.000	0.07
T4	159.05-154.52	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00

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
		C	0.000	0.000	14.053	0.000	0.08
		D	0.000	0.000	15.400	0.000	0.07
T5	154.52-150.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	14.053	0.000	0.08
		D	0.000	0.000	15.400	0.000	0.07
T6	150.00-140.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	31.060	0.000	0.18
		D	0.000	0.000	34.038	0.000	0.15
T7	140.00-130.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	31.060	0.000	0.18
		D	0.000	0.000	36.258	0.000	0.16
T8	130.00-120.00	A	0.000	0.000	10.086	0.000	0.06
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	31.060	0.000	0.18
		D	0.000	0.000	37.578	0.000	0.16
T9	120.00-110.00	A	0.000	0.000	16.810	0.000	0.11
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	31.060	0.000	0.18
		D	0.000	0.000	40.229	0.000	0.17
T10	110.00-100.00	A	0.000	0.000	20.799	0.000	0.14
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	31.060	0.000	0.18
		D	0.000	0.000	43.835	0.000	0.19
T11	100.00-90.00	A	0.000	0.000	23.458	0.000	0.16
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	31.060	0.000	0.18
		D	0.000	0.000	45.317	0.000	0.20
T12	90.00-80.00	A	0.000	0.000	23.458	0.000	0.16
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	31.060	0.000	0.18
		D	0.000	0.000	45.872	0.000	0.20
T13	80.00-60.00	A	0.000	0.000	46.916	0.000	0.33
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	62.120	0.000	0.36
		D	0.000	0.000	93.724	0.000	0.41
T14	60.00-50.00	A	0.000	0.000	23.458	0.000	0.16
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	31.060	0.000	0.18
		D	0.000	0.000	47.355	0.000	0.21
T15	50.00-40.00	A	0.000	0.000	23.458	0.000	0.16
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	31.060	0.000	0.18
		D	0.000	0.000	47.993	0.000	0.21
T16	40.00-30.00	A	0.000	0.000	23.458	0.000	0.16
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	31.060	0.000	0.18
		D	0.000	0.000	48.167	0.000	0.21
T17	30.00-20.00	A	0.000	0.000	23.458	0.000	0.16
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	31.060	0.000	0.18
		D	0.000	0.000	48.167	0.000	0.21
T18	20.00-10.00	A	0.000	0.000	23.458	0.000	0.16
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	31.060	0.000	0.18
		D	0.000	0.000	48.167	0.000	0.21
T19	10.00-0.00	A	0.000	0.000	9.383	0.000	0.07
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	12.405	0.000	0.07

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
		D	0.000	0.000	19.267	0.000	0.08

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	180.00-170.00	A	2.219	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00
		D		0.000	0.000	63.103	0.000	1.07
T2	170.00-163.57	A	2.210	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00
		D		0.000	0.000	66.524	0.000	1.14
T3	163.57-159.05	A	2.203	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	27.175	0.000	0.59
		D		0.000	0.000	47.239	0.000	0.80
T4	159.05-154.52	A	2.198	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	31.081	0.000	0.68
		D		0.000	0.000	48.961	0.000	0.83
T5	154.52-150.00	A	2.192	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	31.045	0.000	0.68
		D		0.000	0.000	48.901	0.000	0.83
T6	150.00-140.00	A	2.183	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	68.493	0.000	1.49
		D		0.000	0.000	107.869	0.000	1.82
T7	140.00-130.00	A	2.171	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	68.318	0.000	1.48
		D		0.000	0.000	119.337	0.000	1.95
T8	130.00-120.00	A	2.159	0.000	0.000	31.835	0.000	0.54
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	68.145	0.000	1.47
		D		0.000	0.000	122.477	0.000	1.99
T9	120.00-110.00	A	2.147	0.000	0.000	52.958	0.000	0.89
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	67.975	0.000	1.47
		D		0.000	0.000	132.611	0.000	2.12
T10	110.00-100.00	A	2.136	0.000	0.000	69.499	0.000	1.13
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	67.814	0.000	1.46
		D		0.000	0.000	148.268	0.000	2.33
T11	100.00-90.00	A	2.126	0.000	0.000	80.433	0.000	1.28
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	67.666	0.000	1.46
		D		0.000	0.000	154.400	0.000	2.41
T12	90.00-80.00	A	2.117	0.000	0.000	80.298	0.000	1.27
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	67.540	0.000	1.45
		D		0.000	0.000	156.728	0.000	2.44
T13	80.00-60.00	A	2.108	0.000	0.000	160.322	0.000	2.53
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	134.823	0.000	2.89

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
		D		0.000	0.000	325.259	0.000	5.05
T14	60.00-50.00	A	2.106	0.000	0.000	80.138	0.000	1.27
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	67.390	0.000	1.44
		D		0.000	0.000	166.638	0.000	2.58
T15	50.00-40.00	A	2.110	0.000	0.000	80.202	0.000	1.27
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	67.450	0.000	1.45
		D		0.000	0.000	172.105	0.000	2.67
T16	40.00-30.00	A	2.118	0.000	0.000	80.325	0.000	1.27
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	67.565	0.000	1.45
		D		0.000	0.000	173.922	0.000	2.70
T17	30.00-20.00	A	2.127	0.000	0.000	80.450	0.000	1.28
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	67.683	0.000	1.46
		D		0.000	0.000	174.309	0.000	2.72
T18	20.00-10.00	A	2.120	0.000	0.000	80.352	0.000	1.27
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	67.591	0.000	1.45
		D		0.000	0.000	174.006	0.000	2.71
T19	10.00-0.00	A	2.018	0.000	0.000	31.520	0.000	0.49
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	26.453	0.000	0.56
		D		0.000	0.000	67.691	0.000	1.02

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
T1	180.00-170.00	-7.3399	6.0535	-11.2678	9.4985
T2	170.00-163.57	-9.6131	7.9789	-13.4033	11.3316
T3	163.57-159.05	0.6407	1.5899	-2.7548	4.7119
T4	159.05-154.52	1.6634	1.2119	-2.4047	5.3623
T5	154.52-150.00	1.6733	1.3941	-2.5236	5.8070
T6	150.00-140.00	1.6551	1.6433	-2.7031	6.3483
T7	140.00-130.00	1.0505	2.4039	-4.1975	8.2041
T8	130.00-120.00	-2.0945	1.0873	-8.9116	6.1035
T9	120.00-110.00	-4.4715	0.6924	-12.2853	5.5558
T10	110.00-100.00	-6.7222	0.7099	-16.5035	5.5815
T11	100.00-90.00	-7.6483	0.5231	-18.6367	5.1968
T12	90.00-80.00	-8.2149	0.8497	-19.9358	6.0359
T13	80.00-60.00	-11.9178	1.8302	-23.8598	8.2327
T14	60.00-50.00	-12.7384	2.3532	-25.7646	9.6243
T15	50.00-40.00	-12.9480	2.7332	-27.1368	10.8846
T16	40.00-30.00	-10.8417	2.4307	-26.5037	10.9455
T17	30.00-20.00	-11.6991	2.7167	-28.3175	11.8634
T18	20.00-10.00	-11.6129	2.7809	-28.5017	12.0716
T19	10.00-0.00	-5.8801	1.3088	-18.4956	7.7786

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T1	2	WEP65	170.00 - 173.00	0.6000	0.5020
T1	4	1/2	170.00 - 180.00	1.0000	1.0000
T1	11	1 5/8	170.00 - 180.00	0.6000	0.5020
T1	12	7/8	170.00 - 180.00	0.6000	0.5020
T1	14	7/8	170.00 - 180.00	0.6000	0.5020
T1	18	1 5/8	170.00 - 172.00	0.6000	0.5020
T2	2	WEP65	163.57 - 170.00	0.6000	0.4598
T2	4	1/2	163.57 - 170.00	1.0000	1.0000
T2	11	1 5/8	163.57 - 170.00	0.6000	0.4598
T2	12	7/8	163.57 - 170.00	0.6000	0.4598
T2	14	7/8	163.57 - 170.00	0.6000	0.4598
T2	16	7/8	163.57 - 170.00	0.6000	0.4598
T2	18	1 5/8	163.57 - 170.00	0.6000	0.4598
T3	2	WEP65	159.05 - 163.57	0.6000	0.4170
T3	4	1/2	159.05 - 163.57	1.0000	1.0000
T3	5	1/2	159.05 - 160.00	1.0000	1.0000
T3	11	1 5/8	159.05 - 163.57	0.6000	0.4170
T3	12	7/8	159.05 - 163.57	0.6000	0.4170
T3	14	7/8	159.05 - 163.57	0.6000	0.4170
T3	16	7/8	159.05 - 163.57	0.6000	0.4170
T3	18	1 5/8	159.05 - 163.57	0.6000	0.4170
T3	19	1 5/8	159.05 - 163.00	0.6000	0.4170
T3	20	3" Flex Conduit w Fiber & 2 DC Cables	159.05 - 163.00	0.6000	0.4170
T3	23	1-5/8" Fiber Optic Cable	159.05 - 163.00	0.6000	0.4170
T3	24	1/2	159.05 - 163.00	0.6000	0.4170
T3	25	1/2	159.05 - 163.00	0.6000	0.4170
T4	2	WEP65	154.52 - 159.05	0.6000	0.5093
T4	4	1/2	154.52 - 159.05	1.0000	1.0000
T4	5	1/2	154.52 - 159.05	1.0000	1.0000
T4	11	1 5/8	154.52 -	0.6000	0.5093

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T4	12	7/8	154.52 - 159.05	0.6000	0.5093
T4	14	7/8	154.52 - 159.05	0.6000	0.5093
T4	16	7/8	154.52 - 159.05	0.6000	0.5093
T4	18	1 5/8	154.52 - 159.05	0.6000	0.5093
T4	19	1 5/8	154.52 - 159.05	0.6000	0.5093
T4	20	3" Flex Conduit w Fiber & 2 DC Cables	154.52 - 159.05	0.6000	0.5093
T4	23	1-5/8" Fiber Optic Cable	154.52 - 159.05	0.6000	0.5093
T4	24	1/2	154.52 - 159.05	0.6000	0.5093
T4	25	1/2	154.52 - 159.05	0.6000	0.5093
T5	2	WEP65	150.00 - 154.52	0.6000	0.5224
T5	4	1/2	150.00 - 154.52	1.0000	1.0000
T5	5	1/2	150.00 - 154.52	1.0000	1.0000
T5	11	1 5/8	150.00 - 154.52	0.6000	0.5224
T5	12	7/8	150.00 - 154.52	0.6000	0.5224
T5	14	7/8	150.00 - 154.52	0.6000	0.5224
T5	16	7/8	150.00 - 154.52	0.6000	0.5224
T5	18	1 5/8	150.00 - 154.52	0.6000	0.5224
T5	19	1 5/8	150.00 - 154.52	0.6000	0.5224
T5	20	3" Flex Conduit w Fiber & 2 DC Cables	150.00 - 154.52	0.6000	0.5224
T5	23	1-5/8" Fiber Optic Cable	150.00 - 154.52	0.6000	0.5224
T5	24	1/2	150.00 - 154.52	0.6000	0.5224
T5	25	1/2	150.00 - 154.52	0.6000	0.5224
T6	2	WEP65	140.00 - 150.00	0.6000	0.5110
T6	4	1/2	140.00 - 150.00	1.0000	1.0000
T6	5	1/2	140.00 - 150.00	1.0000	1.0000
T6	11	1 5/8	140.00 - 150.00	0.6000	0.5110
T6	12	7/8	140.00 - 150.00	0.6000	0.5110
T6	14	7/8	140.00 - 150.00	0.6000	0.5110
T6	16	7/8	140.00 - 150.00	0.6000	0.5110
T6	18	1 5/8	140.00 - 150.00	0.6000	0.5110
T6	19	1 5/8	140.00 -	0.6000	0.5110

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
			150.00		
T6	20	3" Flex Conduit w Fiber & 2 DC Cables	140.00 - 150.00	0.6000	0.5110
T6	23	1-5/8" Fiber Optic Cable	140.00 - 150.00	0.6000	0.5110
T6	24	1/2	140.00 - 150.00	0.6000	0.5110
T6	25	1/2	140.00 - 150.00	0.6000	0.5110
T7	2	WEP65	130.00 - 140.00	0.6000	0.5314
T7	4	1/2	130.00 - 140.00	1.0000	1.0000
T7	5	1/2	130.00 - 140.00	1.0000	1.0000
T7	11	1 5/8	130.00 - 140.00	0.6000	0.5314
T7	12	7/8	130.00 - 140.00	0.6000	0.5314
T7	13	7/8	130.00 - 140.00	0.6000	0.5314
T7	14	7/8	130.00 - 140.00	0.6000	0.5314
T7	16	7/8	130.00 - 140.00	0.6000	0.5314
T7	18	1 5/8	130.00 - 140.00	0.6000	0.5314
T7	19	1 5/8	130.00 - 140.00	0.6000	0.5314
T7	20	3" Flex Conduit w Fiber & 2 DC Cables	130.00 - 140.00	0.6000	0.5314
T7	23	1-5/8" Fiber Optic Cable	130.00 - 140.00	0.6000	0.5314
T7	24	1/2	130.00 - 140.00	0.6000	0.5314
T7	25	1/2	130.00 - 140.00	0.6000	0.5314
T8	2	WEP65	120.00 - 130.00	0.6000	0.6000
T8	3	WEP65	120.00 - 125.00	0.6000	0.6000
T8	4	1/2	120.00 - 130.00	1.0000	1.0000
T8	5	1/2	120.00 - 130.00	1.0000	1.0000
T8	11	1 5/8	120.00 - 130.00	0.6000	0.6000
T8	12	7/8	120.00 - 130.00	0.6000	0.6000
T8	13	7/8	120.00 - 130.00	0.6000	0.6000
T8	14	7/8	120.00 - 130.00	0.6000	0.6000
T8	16	7/8	120.00 - 130.00	0.6000	0.6000
T8	18	1 5/8	120.00 - 130.00	0.6000	0.6000
T8	19	1 5/8	120.00 - 130.00	0.6000	0.6000
T8	20	3" Flex Conduit w Fiber & 2 DC Cables	120.00 - 130.00	0.6000	0.6000
T8	23	1-5/8" Fiber Optic Cable	120.00 -	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
			130.00		
T8	24	1/2	120.00 - 130.00	0.6000	0.6000
T8	25	1/2	120.00 - 130.00	0.6000	0.6000
T8	28	Hybrid HCS 9x18 10 AWG (1-1/4")	120.00 - 126.00	0.6000	0.6000
T8	30	1 1/4	120.00 - 126.00	0.6000	0.6000
T8	31	Hybrid HCS 6x12 4 AWG (1-5/8")	120.00 - 126.00	0.6000	0.6000
T9	2	WEP65	110.00 - 120.00	0.6000	0.5746
T9	3	WEP65	110.00 - 120.00	0.6000	0.5746
T9	4	1/2	110.00 - 120.00	1.0000	1.0000
T9	5	1/2	110.00 - 120.00	1.0000	1.0000
T9	6	7/8	110.00 - 116.00	0.6000	0.5746
T9	11	1 5/8	110.00 - 120.00	0.6000	0.5746
T9	12	7/8	110.00 - 120.00	0.6000	0.5746
T9	13	7/8	110.00 - 120.00	0.6000	0.5746
T9	14	7/8	110.00 - 120.00	0.6000	0.5746
T9	16	7/8	110.00 - 120.00	0.6000	0.5746
T9	18	1 5/8	110.00 - 120.00	0.6000	0.5746
T9	19	1 5/8	110.00 - 120.00	0.6000	0.5746
T9	20	3" Flex Conduit w Fiber & 2 DC Cables	110.00 - 120.00	0.6000	0.5746
T9	23	1-5/8" Fiber Optic Cable	110.00 - 120.00	0.6000	0.5746
T9	24	1/2	110.00 - 120.00	0.6000	0.5746
T9	25	1/2	110.00 - 120.00	0.6000	0.5746
T9	28	Hybrid HCS 9x18 10 AWG (1-1/4")	110.00 - 120.00	0.6000	0.5746
T9	30	1 1/4	110.00 - 120.00	0.6000	0.5746
T9	31	Hybrid HCS 6x12 4 AWG (1-5/8")	110.00 - 120.00	0.6000	0.5746
T10	2	WEP65	100.00 - 110.00	0.6000	0.6000
T10	3	WEP65	100.00 - 110.00	0.6000	0.6000
T10	4	1/2	100.00 - 110.00	1.0000	1.0000
T10	5	1/2	100.00 - 110.00	1.0000	1.0000
T10	6	7/8	100.00 - 110.00	0.6000	0.6000
T10	11	1 5/8	100.00 - 110.00	0.6000	0.6000
T10	12	7/8	100.00 -	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
			110.00		
T10	13	7/8	100.00 - 110.00	0.6000	0.6000
T10	14	7/8	100.00 - 110.00	0.6000	0.6000
T10	15	1 5/8	100.00 - 107.00	0.6000	0.6000
T10	16	7/8	100.00 - 110.00	0.6000	0.6000
T10	17	7/8	100.00 - 106.00	0.6000	0.6000
T10	18	1 5/8	100.00 - 110.00	0.6000	0.6000
T10	19	1 5/8	100.00 - 110.00	0.6000	0.6000
T10	20	3" Flex Conduit w Fiber & 2 DC Cables	100.00 - 110.00	0.6000	0.6000
T10	21	RFS Hybriflex (3 Sector)	100.00 - 106.00	0.6000	0.6000
T10	23	1-5/8" Fiber Optic Cable	100.00 - 110.00	0.6000	0.6000
T10	24	1/2	100.00 - 110.00	0.6000	0.6000
T10	25	1/2	100.00 - 110.00	0.6000	0.6000
T10	26	Hybrid Cable (1.689 OD)	100.00 - 106.00	0.6000	0.6000
T10	28	Hybrid HCS 9x18 10 AWG (1-1/4")	100.00 - 110.00	0.6000	0.6000
T10	30	1 1/4	100.00 - 110.00	0.6000	0.6000
T10	31	Hybrid HCS 6x12 4 AWG (1-5/8")	100.00 - 110.00	0.6000	0.6000
T11	2	WEP65	90.00 - 100.00	0.6000	0.6000
T11	3	WEP65	90.00 - 100.00	0.6000	0.6000
T11	4	1/2	90.00 - 100.00	1.0000	1.0000
T11	5	1/2	90.00 - 100.00	1.0000	1.0000
T11	6	7/8	90.00 - 100.00	0.6000	0.6000
T11	11	1 5/8	90.00 - 100.00	0.6000	0.6000
T11	12	7/8	90.00 - 100.00	0.6000	0.6000
T11	13	7/8	90.00 - 100.00	0.6000	0.6000
T11	14	7/8	90.00 - 100.00	0.6000	0.6000
T11	15	1 5/8	90.00 - 100.00	0.6000	0.6000
T11	16	7/8	90.00 - 100.00	0.6000	0.6000
T11	17	7/8	90.00 - 100.00	0.6000	0.6000
T11	18	1 5/8	90.00 - 100.00	0.6000	0.6000
T11	19	1 5/8	90.00 - 100.00	0.6000	0.6000
T11	20	3" Flex Conduit w Fiber & 2 DC Cables	90.00 - 100.00	0.6000	0.6000
T11	21	RFS Hybriflex (3 Sector)	90.00 - 100.00	0.6000	0.6000
T11	23	1-5/8" Fiber Optic Cable	90.00 - 100.00	0.6000	0.6000
T11	24	1/2	90.00 - 100.00	0.6000	0.6000
T11	25	1/2	90.00 - 100.00	0.6000	0.6000
T11	26	Hybrid Cable (1.689 OD)	90.00 - 100.00	0.6000	0.6000
T11	28	Hybrid HCS 9x18 10 AWG (1-1/4")	90.00 - 100.00	0.6000	0.6000
T11	30	1 1/4	90.00 - 100.00	0.6000	0.6000
T11	31	Hybrid HCS 6x12 4 AWG (1-5/8")	90.00 - 100.00	0.6000	0.6000
T12	2	WEP65	80.00 - 90.00	0.6000	0.6000
T12	3	WEP65	80.00 - 90.00	0.6000	0.6000
T12	4	1/2	80.00 - 90.00	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T12	5	1/2	80.00 - 90.00	1.0000	1.0000
T12	6	7/8	80.00 - 90.00	0.6000	0.6000
T12	8	7/8	80.00 - 85.00	0.6000	0.6000
T12	11	1 5/8	80.00 - 90.00	0.6000	0.6000
T12	12	7/8	80.00 - 90.00	0.6000	0.6000
T12	13	7/8	80.00 - 90.00	0.6000	0.6000
T12	14	7/8	80.00 - 90.00	0.6000	0.6000
T12	15	1 5/8	80.00 - 90.00	0.6000	0.6000
T12	16	7/8	80.00 - 90.00	0.6000	0.6000
T12	17	7/8	80.00 - 90.00	0.6000	0.6000
T12	18	1 5/8	80.00 - 90.00	0.6000	0.6000
T12	19	1 5/8	80.00 - 90.00	0.6000	0.6000
T12	20	3" Flex Conduit w Fiber & 2 DC Cables	80.00 - 90.00	0.6000	0.6000
T12	21	RFS Hybriflex (3 Sector)	80.00 - 90.00	0.6000	0.6000
T12	23	1-5/8" Fiber Optic Cable	80.00 - 90.00	0.6000	0.6000
T12	24	1/2	80.00 - 90.00	0.6000	0.6000
T12	25	1/2	80.00 - 90.00	0.6000	0.6000
T12	26	Hybrid Cable (1.689 OD)	80.00 - 90.00	0.6000	0.6000
T12	28	Hybrid HCS 9x18 10 AWG (1-1/4")	80.00 - 90.00	0.6000	0.6000
T12	30	1 1/4	80.00 - 90.00	0.6000	0.6000
T12	31	Hybrid HCS 6x12 4 AWG (1-5/8")	80.00 - 90.00	0.6000	0.6000
T13	2	WEP65	60.00 - 80.00	0.6000	0.6000
T13	3	WEP65	60.00 - 80.00	0.6000	0.6000
T13	4	1/2	60.00 - 80.00	1.0000	1.0000
T13	5	1/2	60.00 - 80.00	1.0000	1.0000
T13	6	7/8	60.00 - 80.00	0.6000	0.6000
T13	7	1/2	60.00 - 75.00	0.6000	0.6000
T13	8	7/8	60.00 - 80.00	0.6000	0.6000
T13	11	1 5/8	60.00 - 80.00	0.6000	0.6000
T13	12	7/8	60.00 - 80.00	0.6000	0.6000
T13	13	7/8	60.00 - 80.00	0.6000	0.6000
T13	14	7/8	60.00 - 80.00	0.6000	0.6000
T13	15	1 5/8	60.00 - 80.00	0.6000	0.6000
T13	16	7/8	60.00 - 80.00	0.6000	0.6000
T13	17	7/8	60.00 - 80.00	0.6000	0.6000
T13	18	1 5/8	60.00 - 80.00	0.6000	0.6000
T13	19	1 5/8	60.00 - 80.00	0.6000	0.6000
T13	20	3" Flex Conduit w Fiber & 2 DC Cables	60.00 - 80.00	0.6000	0.6000
T13	21	RFS Hybriflex (3 Sector)	60.00 - 80.00	0.6000	0.6000
T13	23	1-5/8" Fiber Optic Cable	60.00 - 80.00	0.6000	0.6000
T13	24	1/2	60.00 - 80.00	0.6000	0.6000
T13	25	1/2	60.00 - 80.00	0.6000	0.6000
T13	26	Hybrid Cable (1.689 OD)	60.00 - 80.00	0.6000	0.6000
T13	28	Hybrid HCS 9x18 10 AWG (1-1/4")	60.00 - 80.00	0.6000	0.6000
T13	30	1 1/4	60.00 - 80.00	0.6000	0.6000
T13	31	Hybrid HCS 6x12 4 AWG (1-5/8")	60.00 - 80.00	0.6000	0.6000
T14	2	WEP65	50.00 - 60.00	0.6000	0.6000
T14	3	WEP65	50.00 - 60.00	0.6000	0.6000
T14	4	1/2	50.00 - 60.00	1.0000	1.0000
T14	5	1/2	50.00 - 60.00	1.0000	1.0000
T14	6	7/8	50.00 - 60.00	0.6000	0.6000
T14	7	1/2	50.00 - 60.00	0.6000	0.6000
T14	8	7/8	50.00 - 60.00	0.6000	0.6000
T14	10	1/2	50.00 - 56.00	0.6000	0.6000
T14	11	1 5/8	50.00 - 60.00	0.6000	0.6000
T14	12	7/8	50.00 - 60.00	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T14	13	7/8	50.00 - 60.00	0.6000	0.6000
T14	14	7/8	50.00 - 60.00	0.6000	0.6000
T14	15	1 5/8	50.00 - 60.00	0.6000	0.6000
T14	16	7/8	50.00 - 60.00	0.6000	0.6000
T14	17	7/8	50.00 - 60.00	0.6000	0.6000
T14	18	1 5/8	50.00 - 60.00	0.6000	0.6000
T14	19	1 5/8	50.00 - 60.00	0.6000	0.6000
T14	20	3" Flex Conduit w Fiber & 2 DC Cables	50.00 - 60.00	0.6000	0.6000
T14	21	RFS Hybriflex (3 Sector)	50.00 - 60.00	0.6000	0.6000
T14	23	1-5/8" Fiber Optic Cable	50.00 - 60.00	0.6000	0.6000
T14	24	1/2	50.00 - 60.00	0.6000	0.6000
T14	25	1/2	50.00 - 60.00	0.6000	0.6000
T14	26	Hybrid Cable (1.689 OD)	50.00 - 60.00	0.6000	0.6000
T14	28	Hybrid HCS 9x18 10 AWG (1-1/4")	50.00 - 60.00	0.6000	0.6000
T14	30	1 1/4	50.00 - 60.00	0.6000	0.6000
T14	31	Hybrid HCS 6x12 4 AWG (1-5/8")	50.00 - 60.00	0.6000	0.6000
T15	2	WEP65	40.00 - 50.00	0.6000	0.6000
T15	3	WEP65	40.00 - 50.00	0.6000	0.6000
T15	4	1/2	40.00 - 50.00	1.0000	1.0000
T15	5	1/2	40.00 - 50.00	1.0000	1.0000
T15	6	7/8	40.00 - 50.00	0.6000	0.6000
T15	7	1/2	40.00 - 50.00	0.6000	0.6000
T15	8	7/8	40.00 - 50.00	0.6000	0.6000
T15	9	1/2	40.00 - 47.00	0.6000	0.6000
T15	10	1/2	40.00 - 50.00	0.6000	0.6000
T15	11	1 5/8	40.00 - 50.00	0.6000	0.6000
T15	12	7/8	40.00 - 50.00	0.6000	0.6000
T15	13	7/8	40.00 - 50.00	0.6000	0.6000
T15	14	7/8	40.00 - 50.00	0.6000	0.6000
T15	15	1 5/8	40.00 - 50.00	0.6000	0.6000
T15	16	7/8	40.00 - 50.00	0.6000	0.6000
T15	17	7/8	40.00 - 50.00	0.6000	0.6000
T15	18	1 5/8	40.00 - 50.00	0.6000	0.6000
T15	19	1 5/8	40.00 - 50.00	0.6000	0.6000
T15	20	3" Flex Conduit w Fiber & 2 DC Cables	40.00 - 50.00	0.6000	0.6000
T15	21	RFS Hybriflex (3 Sector)	40.00 - 50.00	0.6000	0.6000
T15	23	1-5/8" Fiber Optic Cable	40.00 - 50.00	0.6000	0.6000
T15	24	1/2	40.00 - 50.00	0.6000	0.6000
T15	25	1/2	40.00 - 50.00	0.6000	0.6000
T15	26	Hybrid Cable (1.689 OD)	40.00 - 50.00	0.6000	0.6000
T15	28	Hybrid HCS 9x18 10 AWG (1-1/4")	40.00 - 50.00	0.6000	0.6000
T15	30	1 1/4	40.00 - 50.00	0.6000	0.6000
T15	31	Hybrid HCS 6x12 4 AWG (1-5/8")	40.00 - 50.00	0.6000	0.6000
T16	2	WEP65	30.00 - 40.00	0.6000	0.6000
T16	3	WEP65	30.00 - 40.00	0.6000	0.6000
T16	4	1/2	30.00 - 40.00	1.0000	1.0000
T16	5	1/2	30.00 - 40.00	1.0000	1.0000
T16	6	7/8	30.00 - 40.00	0.6000	0.6000
T16	7	1/2	30.00 - 40.00	0.6000	0.6000
T16	8	7/8	30.00 - 40.00	0.6000	0.6000
T16	9	1/2	30.00 - 40.00	0.6000	0.6000
T16	10	1/2	30.00 - 40.00	0.6000	0.6000
T16	11	1 5/8	30.00 - 40.00	0.6000	0.6000
T16	12	7/8	30.00 - 40.00	0.6000	0.6000
T16	13	7/8	30.00 - 40.00	0.6000	0.6000
T16	14	7/8	30.00 - 40.00	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T16	15	1 5/8	30.00 - 40.00	0.6000	0.6000
T16	16	7/8	30.00 - 40.00	0.6000	0.6000
T16	17	7/8	30.00 - 40.00	0.6000	0.6000
T16	18	1 5/8	30.00 - 40.00	0.6000	0.6000
T16	19	1 5/8	30.00 - 40.00	0.6000	0.6000
T16	20	3" Flex Conduit w Fiber & 2 DC Cables	30.00 - 40.00	0.6000	0.6000
T16	21	RFS Hybriflex (3 Sector)	30.00 - 40.00	0.6000	0.6000
T16	23	1-5/8" Fiber Optic Cable	30.00 - 40.00	0.6000	0.6000
T16	24	1/2	30.00 - 40.00	0.6000	0.6000
T16	25	1/2	30.00 - 40.00	0.6000	0.6000
T16	26	Hybrid Cable (1.689 OD)	30.00 - 40.00	0.6000	0.6000
T16	28	Hybrid HCS 9x18 10 AWG (1-1/4")	30.00 - 40.00	0.6000	0.6000
T16	30	1 1/4	30.00 - 40.00	0.6000	0.6000
T16	31	Hybrid HCS 6x12 4 AWG (1-5/8")	30.00 - 40.00	0.6000	0.6000
T17	2	WEP65	20.00 - 30.00	0.6000	0.6000
T17	3	WEP65	20.00 - 30.00	0.6000	0.6000
T17	4	1/2	20.00 - 30.00	1.0000	1.0000
T17	5	1/2	20.00 - 30.00	1.0000	1.0000
T17	6	7/8	20.00 - 30.00	0.6000	0.6000
T17	7	1/2	20.00 - 30.00	0.6000	0.6000
T17	8	7/8	20.00 - 30.00	0.6000	0.6000
T17	9	1/2	20.00 - 30.00	0.6000	0.6000
T17	10	1/2	20.00 - 30.00	0.6000	0.6000
T17	11	1 5/8	20.00 - 30.00	0.6000	0.6000
T17	12	7/8	20.00 - 30.00	0.6000	0.6000
T17	13	7/8	20.00 - 30.00	0.6000	0.6000
T17	14	7/8	20.00 - 30.00	0.6000	0.6000
T17	15	1 5/8	20.00 - 30.00	0.6000	0.6000
T17	16	7/8	20.00 - 30.00	0.6000	0.6000
T17	17	7/8	20.00 - 30.00	0.6000	0.6000
T17	18	1 5/8	20.00 - 30.00	0.6000	0.6000
T17	19	1 5/8	20.00 - 30.00	0.6000	0.6000
T17	20	3" Flex Conduit w Fiber & 2 DC Cables	20.00 - 30.00	0.6000	0.6000
T17	21	RFS Hybriflex (3 Sector)	20.00 - 30.00	0.6000	0.6000
T17	23	1-5/8" Fiber Optic Cable	20.00 - 30.00	0.6000	0.6000
T17	24	1/2	20.00 - 30.00	0.6000	0.6000
T17	25	1/2	20.00 - 30.00	0.6000	0.6000
T17	26	Hybrid Cable (1.689 OD)	20.00 - 30.00	0.6000	0.6000
T17	28	Hybrid HCS 9x18 10 AWG (1-1/4")	20.00 - 30.00	0.6000	0.6000
T17	30	1 1/4	20.00 - 30.00	0.6000	0.6000
T17	31	Hybrid HCS 6x12 4 AWG (1-5/8")	20.00 - 30.00	0.6000	0.6000
T18	2	WEP65	10.00 - 20.00	0.6000	0.6000
T18	3	WEP65	10.00 - 20.00	0.6000	0.6000
T18	4	1/2	10.00 - 20.00	1.0000	1.0000
T18	5	1/2	10.00 - 20.00	1.0000	1.0000
T18	6	7/8	10.00 - 20.00	0.6000	0.6000
T18	7	1/2	10.00 - 20.00	0.6000	0.6000
T18	8	7/8	10.00 - 20.00	0.6000	0.6000
T18	9	1/2	10.00 - 20.00	0.6000	0.6000
T18	10	1/2	10.00 - 20.00	0.6000	0.6000
T18	11	1 5/8	10.00 - 20.00	0.6000	0.6000
T18	12	7/8	10.00 - 20.00	0.6000	0.6000
T18	13	7/8	10.00 - 20.00	0.6000	0.6000
T18	14	7/8	10.00 - 20.00	0.6000	0.6000
T18	15	1 5/8	10.00 - 20.00	0.6000	0.6000
T18	16	7/8	10.00 - 20.00	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T18	17	7/8	10.00 - 20.00	0.6000	0.6000
T18	18	1 5/8	10.00 - 20.00	0.6000	0.6000
T18	19	1 5/8	10.00 - 20.00	0.6000	0.6000
T18	20	3" Flex Conduit w Fiber & 2 DC Cables	10.00 - 20.00	0.6000	0.6000
T18	21	RFS Hybriflex (3 Sector)	10.00 - 20.00	0.6000	0.6000
T18	23	1-5/8" Fiber Optic Cable	10.00 - 20.00	0.6000	0.6000
T18	24	1/2	10.00 - 20.00	0.6000	0.6000
T18	25	1/2	10.00 - 20.00	0.6000	0.6000
T18	26	Hybrid Cable (1.689 OD)	10.00 - 20.00	0.6000	0.6000
T18	28	Hybrid HCS 9x18 10 AWG (1-1/4")	10.00 - 20.00	0.6000	0.6000
T18	30	1 1/4	10.00 - 20.00	0.6000	0.6000
T18	31	Hybrid HCS 6x12 4 AWG (1-5/8")	10.00 - 20.00	0.6000	0.6000
T19	2	WEP65	6.00 - 10.00	0.6000	0.6000
T19	3	WEP65	6.00 - 10.00	0.6000	0.6000
T19	4	1/2	6.00 - 10.00	1.0000	1.0000
T19	5	1/2	6.00 - 10.00	1.0000	1.0000
T19	6	7/8	6.00 - 10.00	0.6000	0.6000
T19	7	1/2	6.00 - 10.00	0.6000	0.6000
T19	8	7/8	6.00 - 10.00	0.6000	0.6000
T19	9	1/2	6.00 - 10.00	0.6000	0.6000
T19	10	1/2	6.00 - 10.00	0.6000	0.6000
T19	11	1 5/8	6.00 - 10.00	0.6000	0.6000
T19	12	7/8	6.00 - 10.00	0.6000	0.6000
T19	13	7/8	6.00 - 10.00	0.6000	0.6000
T19	14	7/8	6.00 - 10.00	0.6000	0.6000
T19	15	1 5/8	6.00 - 10.00	0.6000	0.6000
T19	16	7/8	6.00 - 10.00	0.6000	0.6000
T19	17	7/8	6.00 - 10.00	0.6000	0.6000
T19	18	1 5/8	6.00 - 10.00	0.6000	0.6000
T19	19	1 5/8	6.00 - 10.00	0.6000	0.6000
T19	20	3" Flex Conduit w Fiber & 2 DC Cables	6.00 - 10.00	1.0000	0.6000
T19	21	RFS Hybriflex (3 Sector)	6.00 - 10.00	0.6000	0.6000
T19	23	1-5/8" Fiber Optic Cable	6.00 - 10.00	0.6000	0.6000
T19	24	1/2	6.00 - 10.00	0.6000	0.6000
T19	25	1/2	6.00 - 10.00	0.6000	0.6000
T19	26	Hybrid Cable (1.689 OD)	6.00 - 10.00	0.6000	0.6000
T19	28	Hybrid HCS 9x18 10 AWG (1-1/4")	6.00 - 10.00	0.6000	0.6000
T19	30	1 1/4	6.00 - 10.00	0.6000	0.6000
T19	31	Hybrid HCS 6x12 4 AWG (1-5/8")	6.00 - 10.00	0.6000	0.6000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert	Azimuth Adjustment	Placement	C_AA_A Front	C_AA_A Side	Weight
			ft ft ft	°	ft	ft^2	ft^2	K

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
DB803M-Y	A	From Leg	3.00	0.0000	50.00	No Ice	0.50	0.50	0.00
(A1 / D&K-1)			0.00			1/2" Ice	0.68	0.68	0.01
			0.00			1" Ice	0.87	0.87	0.02
3' Stand-off	A	None		0.0000	50.00	No Ice	1.00	2.00	0.05
(A1 / D&K-1)						1/2" Ice	1.20	2.70	0.07
						1" Ice	1.40	3.40	0.10
GPS	B	From Face	4.00	0.0000	61.00	No Ice	1.00	1.00	0.01
(A2 / Sprint)			0.00			1/2" Ice	1.50	1.50	0.01
			0.00			1" Ice	2.00	2.00	0.02
3'4"x4" Pipe Mount	B	None		0.0000	61.00	No Ice	0.91	0.91	0.04
(A2 / Sprint)						1/2" Ice	1.27	1.27	0.05
						1" Ice	1.49	1.49	0.06
2'6"x4" Pipe Mount	A	None		0.0000	71.00	No Ice	0.66	0.66	0.03
(A3 / D&K-3)						1/2" Ice	0.91	0.91	0.04
						1" Ice	1.09	1.09	0.05
Dish Ice Shield	A	From Leg	0.50	0.0000	75.00	No Ice	4.00	4.00	0.20
(A3 / D&K-3)			0.00			1/2" Ice	5.07	5.07	0.25
			0.00			1" Ice	6.14	6.14	0.30
SC479-HF1LDF	A	From Leg	10.00	0.0000	79.00 - 91.00	No Ice	4.84	4.84	0.03
(A4 / D&K-4)			0.00			1/2" Ice	6.54	6.54	0.07
			0.00			1" Ice	8.04	8.04	0.11
10' Standoff	A	None		0.0000	91.00	No Ice	17.00	17.00	0.55
(A4 / D&K-4)						1/2" Ice	22.00	22.00	0.75
						1" Ice	27.00	27.00	0.95
DB264-A	A	From Leg	4.00	0.0000	106.00 - 86.00	No Ice	3.16	3.16	0.04
(A5 / D&K-11)			0.00			1/2" Ice	5.69	5.69	0.05
			0.00			1" Ice	8.22	8.22	0.06
4' Side Mount Standoff	A	None		0.0000	86.00	No Ice	2.72	2.72	0.05
(A5 / D&K-11)						1/2" Ice	4.91	4.91	0.09
						1" Ice	7.10	7.10	0.13
10'6"x4" Pipe Mount	C	None		0.0000	106.00	No Ice	3.50	3.50	0.11
(A6 / D&K-12 / CSP-11)						1/2" Ice	5.62	5.62	0.15
						1" Ice	6.25	6.25	0.19
3" Dia 20' Omni	D	From Leg	6.00	0.0000	127.00 - 107.00	No Ice	4.00	4.00	0.06
(A7 / D&K-13)			0.00			1/2" Ice	6.00	6.00	0.10
			0.00			1" Ice	8.00	8.00	0.14
6' Side-Arm Mount	D	None		0.0000	107.00	No Ice	10.60	10.60	0.14
(A7 / D&K-13)						1/2" Ice	15.40	15.40	0.21
						1" Ice	20.20	20.20	0.28
PD128-1	C	From Leg	10.00	0.0000	128.00 - 121.00	No Ice	1.00	1.00	0.01
(A8 / D&K-14)			0.00			1/2" Ice	1.80	1.80	0.02
			0.00			1" Ice	2.60	2.60	0.02
10' Standoff	C	None		0.0000	121.00	No Ice	17.00	17.00	0.55
(A8 / D&K-14)						1/2" Ice	22.00	22.00	0.75
						1" Ice	27.00	27.00	0.95
12' Omni Antenna	D	From Leg	6.00	0.0000	116.00 - 106.00	No Ice	5.06	5.06	0.03
(A9 - D&K-15)			0.00			1/2" Ice	6.54	6.54	0.07
			0.00			1" Ice	8.04	8.04	0.11
6' Side-Arm Mount	D	None		0.0000	106.00	No Ice	10.60	10.60	0.14
(A9 - D&K-15)						1/2" Ice	15.40	15.40	0.21
						1" Ice	20.20	20.20	0.28
2'6"x4" Pipe Mount	A	None		0.0000	125.00	No Ice	0.65	0.65	0.03
(A10 / D&K-25)						1/2" Ice	0.91	0.91	0.04
						1" Ice	1.09	1.09	0.05
Dish Ice Shield	A	From Leg	0.50	0.0000	130.00	No Ice	4.00	4.00	0.20
(A11 / D&K-26)			0.00			1/2" Ice	5.07	5.07	0.25
			0.00			1" Ice	6.14	6.14	0.30

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
BA1010	C	From Leg	6.00	0.0000	127.00 - 132.00	No Ice	1.55	1.55	0.01
(A12 / D&K-27)			0.00			1/2" Ice	2.29	2.29	0.01
			0.00			1" Ice	3.03	3.03	0.02
BA1010	C	From Leg	6.00	0.0000	137.00 - 132.00	No Ice	1.55	1.55	0.01
(A14 / D&K-29)			0.00			1/2" Ice	2.29	2.29	0.01
			0.00			1" Ice	3.03	3.03	0.02
432E-83I-01T TTA Unit	C	From Leg	6.00	0.0000	132.00	No Ice	2.85	0.97	0.03
(A13 / D&K-28)			0.00			1/2" Ice	3.06	1.11	0.04
			0.00			1" Ice	3.28	1.26	0.07
6' Side-Arm Mount	C	None		0.0000	132.00	No Ice	10.60	10.60	0.14
(A12,13,14 / D&K-27,28,29)						1/2" Ice	15.40	15.40	0.21
						1" Ice	20.20	20.20	0.28
12' Omni Antenna	C	From Leg	8.00	0.0000	152.00 - 140.50	No Ice	5.06	5.06	0.03
(A15 / D&K-30)			0.00			1/2" Ice	6.54	6.54	0.07
			0.00			1" Ice	8.04	8.04	0.11
8' Side Arm Mount	C	None		0.0000	140.50	No Ice	17.20	17.20	0.33
(A15 / D&K-30)						1/2" Ice	24.50	24.50	0.45
						1" Ice	31.80	31.80	0.57
DB222-A	A	From Leg	4.00	0.0000	136.50	No Ice	1.60	1.60	0.02
(A16 / D&K-31)			0.00			1/2" Ice	2.88	2.88	0.02
			0.00			1" Ice	4.16	4.16	0.03
4' Side Mount Standoff	A	None		0.0000	136.50	No Ice	2.72	2.72	0.05
(A16 / D&K-31)						1/2" Ice	4.91	4.91	0.09
						1" Ice	7.10	7.10	0.13
Yagi ASP-816	A	From Leg	6.00	0.0000	139.00	No Ice	0.92	0.02	0.01
(A17 / D&K-32)			0.00			1/2" Ice	1.21	0.05	0.01
			0.00			1" Ice	1.51	0.08	0.02
6' Side-Arm Mount	A	None		0.0000	139.00	No Ice	10.60	10.60	0.14
(A17 / D&K-32)						1/2" Ice	15.40	15.40	0.21
						1" Ice	20.20	20.20	0.28
6' Side-Arm Mount	D	None		0.0000	139.00	No Ice	10.60	10.60	0.14
(A18 / D&K-33)						1/2" Ice	15.40	15.40	0.21
						1" Ice	20.20	20.20	0.28
*** Following Are D&K NOT Inventoried Appurtenances									
DB408-B	D	From Leg	6.00	0.0000	161.00	No Ice	1.65	1.65	0.02
(A19)			0.00			1/2" Ice	2.61	2.61	0.03
			0.00			1" Ice	3.60	3.60	0.05
(2) 6' Side Mount Standoff	D	None		0.0000	161.00	No Ice	1.40	0.13	0.01
(A19)						1/2" Ice	1.56	0.21	0.02
						1" Ice	1.73	0.30	0.02
BA1010-2	C	From Leg	2.50	0.0000	169.00	No Ice	1.40	1.40	0.02
(A20)			0.00			1/2" Ice	1.77	1.77	0.03
			0.00			1" Ice	2.16	2.16	0.05
15' T-Frame Sector Mount (1)	C	None		0.0000	169.00	No Ice	15.00	15.00	0.50
(A20)						1/2" Ice	20.60	20.60	0.65
						1" Ice	26.20	26.20	0.80
DB586-Y	C	From Leg	3.00	0.0000	170.00	No Ice	1.01	1.01	0.01
(A21)			0.00			1/2" Ice	1.28	1.28	0.02
			0.00			1" Ice	1.56	1.56	0.03
10'6"x4" Pipe Mount	A	From Leg	0.50	0.0000	170.00	No Ice	3.39	3.39	0.11
(A22)			0.00			1/2" Ice	5.62	5.62	0.15
			0.00			1" Ice	6.25	6.25	0.19
SC479-HF1LDF	D	From Leg	2.00	0.0000	168.00 - 180.00	No Ice	5.06	5.06	0.03
(D00I-E5764)			0.00			1/2" Ice	6.54	6.54	0.07
(A23)			0.00			1" Ice	8.04	8.04	0.11

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
15' T-Frame Sector Mount (1)	D	From Face	2.00	0.0000	180.00	No Ice	15.00	15.00	0.50
(A23,24,30,31)			0.00			1/2" Ice	20.60	20.60	0.65
			0.00			1" Ice	26.20	26.20	0.80
SC479-HF1LDF	D	From Face	2.00	0.0000	168.00 - 180.00	No Ice	5.06	5.06	0.03
(D00I-E5764)			0.00			1/2" Ice	6.54	6.54	0.07
(A24)			0.00			1" Ice	8.04	8.04	0.11
10'6"x4" Pipe Mount	C	From Leg	0.50	0.0000	173.00	No Ice	3.38	3.38	0.11
(A25)			0.00			1/2" Ice	5.62	5.62	0.15
			0.00			1" Ice	6.25	6.25	0.19
SC479-HF1LDF	A	From Leg	3.00	0.0000	168.00 - 180.00	No Ice	5.06	5.06	0.03
(D00I-E5764)			0.00			1/2" Ice	6.54	6.54	0.07
(A26)			0.00			1" Ice	8.04	8.04	0.11
15' T-Frame Sector Mount (1)	B	From Face	2.00	0.0000	180.00	No Ice	15.00	15.00	0.50
(A26,27,28,29)			0.00			1/2" Ice	20.60	20.60	0.65
			0.00			1" Ice	26.20	26.20	0.80
TMA 432-83H-01T - Future	A	From Leg	2.00	0.0000	181.00	No Ice	1.63	0.95	0.03
Decom.			0.00			1/2" Ice	1.81	1.09	0.04
(A27)			0.00			1" Ice	1.99	1.24	0.05
SC479-HF1LDF	A	From Leg	3.00	0.0000	183.00	No Ice	5.06	5.06	0.03
(D00-E5764)			0.00			1/2" Ice	6.54	6.54	0.07
(A28)			0.00			1" Ice	8.04	8.04	0.11
ANT150D	A	From Leg	1.00	0.0000	183.00	No Ice	7.00	2.02	0.08
(A29a)			0.00			1/2" Ice	7.47	2.90	0.12
			0.00			1" Ice	7.95	3.79	0.17
DB222	A	From Leg	1.50	0.0000	183.00	No Ice	1.60	1.60	0.02
(A29b)			0.00			1/2" Ice	2.88	2.88	0.02
			0.00			1" Ice	4.16	4.16	0.03
SC479-HF1LDF	D	From Leg	2.00	0.0000	183.00	No Ice	5.06	5.06	0.03
(D00-E5764)			0.00			1/2" Ice	6.54	6.54	0.07
(A30)			0.00			1" Ice	8.04	8.04	0.11
ALR8-0	C	From Leg	1.00	0.0000	183.00	No Ice	3.99	3.99	0.05
(A31)			0.00			1/2" Ice	8.21	8.21	0.11
			0.00			1" Ice	8.94	8.94	0.17
Lightning Rod 2"x15'	C	None		0.0000	185.00	No Ice	3.00	3.00	0.08
(A32)						1/2" Ice	4.53	4.53	0.10
						1" Ice	6.07	6.07	0.14
10'6"x4" Pipe Mount	A	From Leg	0.50	0.0000	175.00	No Ice	3.38	3.38	0.11
(A33)			0.00			1/2" Ice	5.62	5.62	0.15
			0.00			1" Ice	6.25	6.25	0.19
*** Empire EMP-004 Inventory									
T-Frame	A	From Leg	0.50	0.0000	163.00	No Ice	10.20	10.20	0.40
(AT&T)			0.00			1/2" Ice	16.20	16.20	0.60
			0.00			1" Ice	22.20	22.20	0.80
T-Frame	B	From Leg	0.50	0.0000	163.00	No Ice	10.20	10.20	0.40
(AT&T)			0.00			1/2" Ice	16.20	16.20	0.60
			0.00			1" Ice	22.20	22.20	0.80
T-Frame	C	From Leg	0.50	0.0000	163.00	No Ice	10.20	10.20	0.40
(AT&T)			0.00			1/2" Ice	16.20	16.20	0.60
			0.00			1" Ice	22.20	22.20	0.80
7770.00	A	From Leg	2.00	0.0000	163.00	No Ice	5.90	4.01	0.05
(AT&T)			4.00			1/2" Ice	6.34	4.64	0.10
			0.00			1" Ice	6.78	5.28	0.15
(2) LGP 21901 Diplexer Unit	A	From Leg	2.00	0.0000	163.00	No Ice	0.23	0.12	0.01
(AT&T)			4.00			1/2" Ice	0.30	0.17	0.01
			0.00			1" Ice	0.38	0.22	0.01
Kathrein 800-10965 Panel	A	From Leg	2.00	0.0000	163.00	No Ice	15.30	5.83	0.11

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
Antenna			-4.00			1/2" Ice	15.95	6.32	0.19
(AT&T)			0.00			1" Ice	16.60	6.82	0.27
QS66512-3 Quintel Panel	A	From Leg	2.00	0.0000	163.00	No Ice	8.40	8.22	0.13
(AT&T)			0.00			1/2" Ice	8.95	9.19	0.20
			0.00			1" Ice	9.51	10.09	0.28
RRUS-11	A	From Leg	2.00	0.0000	163.00	No Ice	2.99	1.25	0.05
(AT&T)			0.00			1/2" Ice	3.23	1.41	0.07
			0.00			1" Ice	3.47	1.59	0.09
Raycap DC6-48-60-18-8F	A	From Leg	2.00	0.0000	163.00	No Ice	1.27	1.27	0.05
DC Power Surge Protection			0.00			1/2" Ice	1.46	1.46	0.07
(AT&T)			0.00			1" Ice	1.66	1.66	0.08
7770.00	B	From Leg	2.00	0.0000	163.00	No Ice	5.90	4.01	0.05
(AT&T)			4.00			1/2" Ice	6.34	4.64	0.10
			0.00			1" Ice	6.78	5.28	0.15
(2) LGP 21901 Diplexer Unit	B	From Leg	2.00	0.0000	163.00	No Ice	0.23	0.12	0.01
(AT&T)			4.00			1/2" Ice	0.30	0.17	0.01
			0.00			1" Ice	0.38	0.22	0.01
Kathrein 800-10965 Panel	B	From Leg	2.00	0.0000	163.00	No Ice	15.30	5.83	0.11
Antenna			-4.00			1/2" Ice	15.95	6.32	0.19
(AT&T)			0.00			1" Ice	16.60	6.82	0.27
QS66512-3 Quintel Panel	B	From Leg	2.00	0.0000	163.00	No Ice	8.40	8.22	0.13
(AT&T)			0.00			1/2" Ice	8.95	9.19	0.20
			0.00			1" Ice	9.51	10.09	0.28
RRUS-11	B	From Leg	2.00	0.0000	163.00	No Ice	2.99	1.25	0.05
(AT&T)			0.00			1/2" Ice	3.23	1.41	0.07
			0.00			1" Ice	3.47	1.59	0.09
7770.00	C	From Leg	2.00	0.0000	163.00	No Ice	5.90	4.01	0.05
(AT&T)			4.00			1/2" Ice	6.34	4.64	0.10
			0.00			1" Ice	6.78	5.28	0.15
(2) LGP 21901 Diplexer Unit	C	From Leg	2.00	0.0000	163.00	No Ice	0.23	0.12	0.01
(AT&T)			4.00			1/2" Ice	0.30	0.17	0.01
			0.00			1" Ice	0.38	0.22	0.01
Kathrein 800-10965 Panel	C	From Leg	2.00	0.0000	163.00	No Ice	15.30	5.83	0.11
Antenna			-4.00			1/2" Ice	15.95	6.32	0.19
(AT&T)			0.00			1" Ice	16.60	6.82	0.27
QS66512-3 Quintel Panel	C	From Leg	2.00	0.0000	163.00	No Ice	8.40	8.22	0.13
(AT&T)			0.00			1/2" Ice	8.95	9.19	0.20
			0.00			1" Ice	9.51	10.09	0.28
RRUS-11	C	From Leg	2.00	0.0000	163.00	No Ice	2.99	1.25	0.05
(AT&T)			0.00			1/2" Ice	3.23	1.41	0.07
			0.00			1" Ice	3.47	1.59	0.09
4478 Radio Unit (4x40W)	A	From Leg	2.00	0.0000	163.00	No Ice	1.26	1.26	0.06
(AT&T)			0.00			1/2" Ice	1.42	1.42	0.07
			0.00			1" Ice	1.58	1.58	0.09
4478 Radio Unit (4x40W)	B	From Leg	2.00	0.0000	163.00	No Ice	1.26	1.26	0.06
(AT&T)			0.00			1/2" Ice	1.42	1.42	0.07
			0.00			1" Ice	1.58	1.58	0.09
4478 Radio Unit (4x40W)	C	From Leg	2.00	0.0000	163.00	No Ice	1.26	1.26	0.06
(AT&T)			0.00			1/2" Ice	1.42	1.42	0.07
			0.00			1" Ice	1.58	1.58	0.09
RRUS-32 B66	A	From Leg	2.00	0.0000	163.00	No Ice	3.88	2.76	0.08
(AT&T)			0.00			1/2" Ice	4.14	2.98	0.11
			0.00			1" Ice	4.41	3.22	0.15
RRUS-32 B66	B	From Leg	2.00	0.0000	163.00	No Ice	3.88	2.76	0.08
(AT&T)			0.00			1/2" Ice	4.14	2.98	0.11
			0.00			1" Ice	4.41	3.22	0.15
RRUS-32 B66	C	From Leg	2.00	0.0000	163.00	No Ice	3.88	2.76	0.08

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(AT&T)			0.00			1/2" Ice	4.14	2.98	0.11
			0.00			1" Ice	4.41	3.22	0.15
RRUS-32 B2	A	From Leg	2.00	0.0000	163.00	No Ice	3.88	2.76	0.08
(AT&T)			0.00			1/2" Ice	4.14	2.98	0.11
			0.00			1" Ice	4.41	3.22	0.15
RRUS-32 B2	B	From Leg	2.00	0.0000	163.00	No Ice	3.88	2.76	0.08
(AT&T)			0.00			1/2" Ice	4.14	2.98	0.11
			0.00			1" Ice	4.41	3.22	0.15
RRUS-32 B2	C	From Leg	2.00	0.0000	163.00	No Ice	3.88	2.76	0.08
(AT&T)			0.00			1/2" Ice	4.14	2.98	0.11
			0.00			1" Ice	4.41	3.22	0.15
RRUS-32	A	From Leg	2.00	0.0000	163.00	No Ice	3.88	2.76	0.08
(AT&T)			0.00			1/2" Ice	4.14	2.98	0.11
			0.00			1" Ice	4.41	3.22	0.15
RRUS-32	B	From Leg	2.00	0.0000	163.00	No Ice	3.88	2.76	0.08
(AT&T)			0.00			1/2" Ice	4.14	2.98	0.11
			0.00			1" Ice	4.41	3.22	0.15
RRUS-32	C	From Leg	2.00	0.0000	163.00	No Ice	3.88	2.76	0.08
(AT&T)			0.00			1/2" Ice	4.14	2.98	0.11
			0.00			1" Ice	4.41	3.22	0.15
DC6-48-60-18-8C Squid /	B	From Leg	2.00	0.0000	163.00	No Ice	1.79	1.79	0.03
Surge Arrestor			0.00			1/2" Ice	2.02	2.02	0.05
(AT&T)			0.00			1" Ice	2.27	2.27	0.07
DC6-48-60-18-8C Squid /	C	From Leg	2.00	0.0000	163.00	No Ice	1.79	1.79	0.03
Surge Arrestor			0.00			1/2" Ice	2.02	2.02	0.05
(AT&T)			0.00			1" Ice	2.27	2.27	0.07
(2) LPG21401 TMA	A	From Face	2.00	0.0000	163.00	No Ice	0.95	0.37	0.02
(AT&T)			4.00			1/2" Ice	1.09	0.48	0.02
			0.00			1" Ice	1.24	0.60	0.03
(2) LPG21401 TMA	B	From Face	2.00	0.0000	163.00	No Ice	0.95	0.37	0.02
(AT&T)			4.00			1/2" Ice	1.09	0.48	0.02
			0.00			1" Ice	1.24	0.60	0.03
(2) LPG21401 TMA	C	From Face	2.00	0.0000	163.00	No Ice	0.95	0.37	0.02
(AT&T)			4.00			1/2" Ice	1.09	0.48	0.02
			0.00			1" Ice	1.24	0.60	0.03
*** Empire EMP-004 Inventory ** Sprint Equipment ASM-008									
12' Wireless Frame	A	From Leg	1.00	0.0000	105.00	No Ice	11.07	11.07	0.24
(Sprint)			0.00			1/2" Ice	15.53	15.53	0.35
			0.00			1" Ice	19.99	19.99	0.45
12' Wireless Frame	B	From Leg	1.00	0.0000	105.00	No Ice	11.07	11.07	0.24
(Sprint)			0.00			1/2" Ice	15.53	15.53	0.35
			0.00			1" Ice	19.99	19.99	0.45
12' Wireless Frame	C	From Leg	1.00	0.0000	105.00	No Ice	11.07	11.07	0.24
(Sprint)			0.00			1/2" Ice	15.53	15.53	0.35
			0.00			1" Ice	19.99	19.99	0.45
APXVSPP18-C-A20 w/	A	From Leg	1.50	0.0000	105.00	No Ice	8.02	7.23	0.11
Mount Pipe			-5.00			1/2" Ice	8.48	8.19	0.18
(Sprint)			0.00			1" Ice	8.94	9.02	0.26
APXVSPP18-C-A20 w/	B	From Leg	1.50	0.0000	105.00	No Ice	8.02	7.23	0.11
Mount Pipe			-5.00			1/2" Ice	8.48	8.19	0.18
(Sprint)			0.00			1" Ice	8.94	9.02	0.26
APXVSPP18-C-A20 w/	C	From Leg	1.50	0.0000	105.00	No Ice	8.02	7.23	0.11
Mount Pipe			-5.00			1/2" Ice	8.48	8.19	0.18
(Sprint)			0.00			1" Ice	8.94	9.02	0.26

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
ALU 800MHz 2x50W (Sprint)	A	From Leg	1.50 0.00 2.50	0.0000	105.00	No Ice 1/2" Ice 1" Ice	2.40 2.61 2.83	2.25 2.46 2.68	0.06 0.09 0.11
ALU 800MHz 2x50W (Sprint)	B	From Leg	1.50 0.00 2.50	0.0000	105.00	No Ice 1/2" Ice 1" Ice	2.40 2.61 2.83	2.25 2.46 2.68	0.06 0.09 0.11
ALU 800MHz 2x50W (Sprint)	C	From Leg	1.50 0.00 2.50	0.0000	105.00	No Ice 1/2" Ice 1" Ice	2.40 2.61 2.83	2.25 2.46 2.68	0.06 0.09 0.11
ALU 4x45W (1900 MHz) (Sprint)	A	From Leg	1.50 0.00 -2.50	0.0000	105.00	No Ice 1/2" Ice 1" Ice	2.96 3.21 3.46	1.81 2.02 2.25	0.06 0.08 0.10
ALU 4x45W (1900 MHz) (Sprint)	B	From Leg	1.50 0.00 -2.50	0.0000	105.00	No Ice 1/2" Ice 1" Ice	2.96 3.21 3.46	1.81 2.02 2.25	0.06 0.08 0.10
ALU 4x45W (1900 MHz) (Sprint)	C	From Leg	1.50 0.00 -2.50	0.0000	105.00	No Ice 1/2" Ice 1" Ice	2.96 3.21 3.46	1.81 2.02 2.25	0.06 0.08 0.10
AAHC Panel Antenna (Sprint)	A	From Leg	1.50 0.00 0.00	0.0000	105.00	No Ice 1/2" Ice 1" Ice	4.90 5.20 5.51	2.40 2.63 2.87	0.10 0.14 0.17
AAHC Panel Antenna (Sprint)	B	From Leg	1.50 0.00 0.00	0.0000	105.00	No Ice 1/2" Ice 1" Ice	4.90 5.20 5.51	2.40 2.63 2.87	0.10 0.14 0.17
AAHC Panel Antenna (Sprint)	C	From Leg	1.50 0.00 0.00	0.0000	105.00	No Ice 1/2" Ice 1" Ice	4.90 5.20 5.51	2.40 2.63 2.87	0.10 0.14 0.17
NNVV-65B-R4 Panel Antenna (Sprint)	A	From Leg	1.50 5.00 0.00	0.0000	105.00	No Ice 1/2" Ice 1" Ice	13.72 14.32 14.92	5.75 6.21 6.67	0.09 0.16 0.24
NNVV-65B-R4 Panel Antenna (Sprint)	B	From Leg	1.50 5.00 0.00	0.0000	105.00	No Ice 1/2" Ice 1" Ice	13.72 14.32 14.92	5.75 6.21 6.67	0.09 0.16 0.24
NNVV-65B-R4 Panel Antenna (Sprint)	C	From Leg	1.50 5.00 0.00	0.0000	105.00	No Ice 1/2" Ice 1" Ice	13.72 14.32 14.92	5.75 6.21 6.67	0.09 0.16 0.24
TD-RRH8x20-25 (Sprint)	A	From Leg	1.50 0.00 2.50	0.0000	105.00	No Ice 1/2" Ice 1" Ice	4.72 5.01 5.32	1.70 1.92 2.14	0.07 0.10 0.13
TD-RRH8x20-25 (Sprint)	B	From Leg	1.50 0.00 2.50	0.0000	105.00	No Ice 1/2" Ice 1" Ice	4.72 5.01 5.32	1.70 1.92 2.14	0.07 0.10 0.13
TD-RRH8x20-25 (Sprint)	C	From Leg	1.50 0.00 2.50	0.0000	105.00	No Ice 1/2" Ice 1" Ice	4.72 5.01 5.32	1.70 1.92 2.14	0.07 0.10 0.13
** Sprint Equipment ASM-008 ** T-Mobile Proposed Equipment TWM-013									
EUSF10-U w/ (2) Stiff-Arm Supports (T-Mobile)	A	From Leg	0.50 0.00 0.00	0.0000	122.00	No Ice 1/2" Ice 1" Ice	8.91 12.66 16.41	3.67 5.24 6.81	0.41 0.51 0.61
EUSF10-U w/ (2) Stiff-Arm Supports (T-Mobile)	D	From Leg	0.50 0.00 0.00	0.0000	122.00	No Ice 1/2" Ice 1" Ice	8.91 12.66 16.41	3.67 5.24 6.81	0.41 0.51 0.61
EUSF10-U w/ (2) Stiff-Arm Supports	B	From Leg	0.50 0.00	0.0000	122.00	No Ice 1/2" Ice	8.91 12.66	3.67 5.24	0.41 0.51

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(T-Mobile)			0.00			1" Ice	16.41	6.81	0.61
RFS	A	From Leg	4.00	0.0000	122.00	No Ice	20.48	11.03	0.19
APXVAARR24_43-U-NA20			-3.00			1/2" Ice	21.23	12.55	0.32
Panel Antenna w/ 108" Pipe Mount			0.00			1" Ice	21.99	14.10	0.47
(T-Mobile - Proposed)									
RFS	B	From Leg	4.00	0.0000	122.00	No Ice	20.48	11.03	0.19
APXVAARR24_43-U-NA20			-3.00			1/2" Ice	21.23	12.55	0.32
Panel Antenna w/ 108" Pipe Mount			0.00			1" Ice	21.99	14.10	0.47
(T-Mobile - Proposed)									
RFS	D	From Leg	4.00	0.0000	122.00	No Ice	20.48	11.03	0.19
APXVAARR24_43-U-NA20			-3.00			1/2" Ice	21.23	12.55	0.32
Panel Antenna w/ 108" Pipe Mount			0.00			1" Ice	21.99	14.10	0.47
(T-Mobile - Proposed)									
Generic Twin TMA unit	A	From Leg	4.00	0.0000	122.00	No Ice	0.37	0.96	0.03
(T-Mobile - Proposed)			-3.00			1/2" Ice	0.46	1.09	0.03
			3.00			1" Ice	0.55	1.22	0.04
Generic Twin TMA unit	B	From Leg	4.00	0.0000	122.00	No Ice	0.37	0.96	0.03
(T-Mobile - Proposed)			-3.00			1/2" Ice	0.46	1.09	0.03
			3.00			1" Ice	0.55	1.22	0.04
Generic Twin TMA unit	D	From Leg	4.00	0.0000	122.00	No Ice	0.37	0.96	0.03
(T-Mobile - Proposed)			-3.00			1/2" Ice	0.46	1.09	0.03
			3.00			1" Ice	0.55	1.22	0.04
Ericsson 4449 B71 + B12	A	From Leg	4.00	0.0000	122.00	No Ice	1.66	1.16	0.08
Radio Unit			-3.00			1/2" Ice	1.82	1.29	0.10
(T-Mobile - Proposed)			-3.00			1" Ice	1.98	1.44	0.11
Ericsson 4449 B71 + B12	B	From Leg	4.00	0.0000	122.00	No Ice	1.66	1.16	0.08
Radio Unit			-3.00			1/2" Ice	1.82	1.29	0.10
(T-Mobile - Proposed)			-3.00			1" Ice	1.98	1.44	0.11
Ericsson 4449 B71 + B12	D	From Leg	4.00	0.0000	122.00	No Ice	1.66	1.16	0.08
Radio Unit			-3.00			1/2" Ice	1.82	1.29	0.10
(T-Mobile - Proposed)			-3.00			1" Ice	1.98	1.44	0.11
Ericsson AIR32 B66A/B2A	A	From Leg	4.00	0.0000	122.00	No Ice	7.53	6.85	0.17
Panel Antenna w/ 108" Pipe Mount			3.00			1/2" Ice	8.35	8.13	0.23
(T-Mobile - Proposed)			0.00			1" Ice	9.18	9.44	0.31
Ericsson AIR32 B66A/B2A	B	From Leg	4.00	0.0000	122.00	No Ice	7.53	6.85	0.17
Panel Antenna w/ 108" Pipe Mount			3.00			1/2" Ice	8.35	8.13	0.23
(T-Mobile - Proposed)			0.00			1" Ice	9.18	9.44	0.31
Ericsson AIR32 B66A/B2A	D	From Leg	4.00	0.0000	122.00	No Ice	7.53	6.85	0.17
Panel Antenna w/ 108" Pipe Mount			3.00			1/2" Ice	8.35	8.13	0.23
(T-Mobile - Proposed)			0.00			1" Ice	9.18	9.44	0.31
** T-Mobile Proposed Equipment TWM-013									

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight K
4' Grid Dish	C	Grid	From	1.00	Worst		106.00	4.00	No Ice	12.57	0.06
(A6 / D&K 12 /			Leg	0.00					1/2" Ice	13.10	0.11
CSP-11)				0.00					1" Ice	13.62	0.17
6' PAD w/ Radome	A	Paraboloid	From	0.50	Worst		125.00	6.00	No Ice	28.27	0.24
(A10 / D&K-25)		w/Radome	Leg	0.00					1/2" Ice	29.07	0.29
				0.00					1" Ice	29.87	0.34
6' PAD w/ Radome	B	Paraboloid	From	1.00	Worst		175.00	6.00	No Ice	28.27	0.24
(A33)		w/Radome	Leg	0.00					1/2" Ice	29.07	0.29
				0.00					1" Ice	29.87	0.34
6' PAD w/ Radome	A	Paraboloid	From	0.50	Worst		170.00	6.00	No Ice	28.27	0.24
(A22 /)		w/Radome	Leg	0.00					1/2" Ice	29.07	0.29
				0.00					1" Ice	29.87	0.34
6' PAD w/ Radome	C	Paraboloid	From	0.50	Worst		173.00	6.00	No Ice	28.27	0.24
(A25 /)		w/Radome	Leg	0.00					1/2" Ice	29.07	0.29
				0.00					1" Ice	29.87	0.34

222-G Verification Constants

Constant	Value
Wind Importance Factor Without Ice	1.15
Wind Importance Factor With Ice Factor	1
Ice Importance Factor	1.25
K_d	0.85
Z_g	900
α	9.5
K_{zmin}	0.85
K_e	1
K_t	0.53
f	2

222-G Section Verification ArRr By Element

Section Elevation ft	Elem. Num.	Size	C	C w/Ice	Face	e	e w/Ice	A_r ft^2	A_r w/Ice ft^2	A_rR_r ft^2	A_rR_r w/Ice ft^2
T1					A		Sum:	0.000	0.000	0.000	0.000
180.00-170.00					B			0.000	0.000	0.000	0.000
					C			0.000	0.000	0.000	0.000
					D			0.000	0.000	0.000	0.000
T2					A		Sum:	0.000	0.000	0.000	0.000
170.00-163.57					B			0.000	0.000	0.000	0.000
					C			0.000	0.000	0.000	0.000
					D			0.000	0.000	0.000	0.000
T3					A		Sum:	0.000	0.000	0.000	0.000
163.57-159.05					B			0.000	0.000	0.000	0.000
					C			0.000	0.000	0.000	0.000
					D			0.000	0.000	0.000	0.000
T4					A		Sum:	0.000	0.000	0.000	0.000
159.05-154.52					B			0.000	0.000	0.000	0.000
					C			0.000	0.000	0.000	0.000
					D			0.000	0.000	0.000	0.000
T5					A		Sum:	0.000	0.000	0.000	0.000

Section Elevation ft	Elem. Num.	Size	C	C w/Ice	Face	e	e w/Ice	A_r ft^2	A_r w/Ice ft^2	A_rR_r ft^2	A_rR_r w/Ice ft^2
154.52-150.00					B			0.000	0.000	0.000	0.000
					C			0.000	0.000	0.000	0.000
					D			0.000	0.000	0.000	0.000
T6					A		Sum:	0.000	0.000	0.000	0.000
150.00-140.00					B			0.000	0.000	0.000	0.000
					C			0.000	0.000	0.000	0.000
					D			0.000	0.000	0.000	0.000
T7					A		Sum:	0.000	0.000	0.000	0.000
140.00-130.00					B			0.000	0.000	0.000	0.000
					C			0.000	0.000	0.000	0.000
					D			0.000	0.000	0.000	0.000
T8					A		Sum:	0.000	0.000	0.000	0.000
130.00-120.00					B			0.000	0.000	0.000	0.000
					C			0.000	0.000	0.000	0.000
					D			0.000	0.000	0.000	0.000
T9					A		Sum:	0.000	0.000	0.000	0.000
120.00-110.00					B			0.000	0.000	0.000	0.000
					C			0.000	0.000	0.000	0.000
					D			0.000	0.000	0.000	0.000
T10					A		Sum:	0.000	0.000	0.000	0.000
110.00-100.00					B			0.000	0.000	0.000	0.000
					C			0.000	0.000	0.000	0.000
					D			0.000	0.000	0.000	0.000
T11					A		Sum:	0.000	0.000	0.000	0.000
100.00-90.00					B			0.000	0.000	0.000	0.000
					C			0.000	0.000	0.000	0.000
					D			0.000	0.000	0.000	0.000
T12 90.00-80.00					A		Sum:	0.000	0.000	0.000	0.000
					B			0.000	0.000	0.000	0.000
					C			0.000	0.000	0.000	0.000
					D			0.000	0.000	0.000	0.000
T13 80.00-60.00	220	L8x8x1 w/ 1/2x7 Plates	81.252	54.203	D	0.167	0.311	14.185	21.219	6.062	12.785
	220	L8x8x1 w/ 1/2x7 Plates	81.252	54.203	A	0.167	0.311	14.185	21.219	6.062	12.785
	221	L8x8x1 w/ 1/2x7 Plates	81.252	54.203	D	0.167	0.311	14.185	21.219	6.062	12.785
	221	L8x8x1 w/ 1/2x7 Plates	81.252	54.203	C	0.167	0.311	14.185	21.219	6.062	12.785
	222	L8x8x1 w/ 1/2x7 Plates	81.252	54.203	C	0.167	0.311	14.185	21.219	6.062	12.785
	222	L8x8x1 w/ 1/2x7 Plates	81.252	54.203	B	0.167	0.311	14.185	21.219	6.062	12.785
	223	L8x8x1 w/ 1/2x7 Plates	81.252	54.203	B	0.167	0.311	14.185	21.219	6.062	12.785
	223	L8x8x1 w/ 1/2x7 Plates	81.252	54.203	A	0.167	0.311	14.185	21.219	6.062	12.785
					A		Sum:	28.370	42.439	12.125	25.569
					B			28.370	42.439	12.125	25.569
					C			28.370	42.439	12.125	25.569
					D			28.370	42.439	12.125	25.569
T14 60.00-50.00	249	L8x8x1-1/8 w/ 1/2x7 Plates	81.907	54.631	D	0.163	0.318	7.092	10.607	3.018	6.414
	249	L8x8x1-1/8 w/ 1/2x7 Plates	81.907	54.631	A	0.163	0.318	7.092	10.607	3.018	6.414
	250	L8x8x1-1/8 w/ 1/2x7 Plates	81.907	54.631	D	0.163	0.318	7.092	10.607	3.018	6.414
	250	L8x8x1-1/8 w/ 1/2x7 Plates	81.907	54.631	C	0.163	0.318	7.092	10.607	3.018	6.414
	251	L8x8x1-1/8 w/ 1/2x7	81.907	54.631	C	0.163	0.318	7.092	10.607	3.018	6.414

Section Elevation ft	Elem. Num.	Size	C	C w/Ice	Face	e	e w/Ice	A_r ft^2	A_r w/Ice ft^2	A_rR_r ft^2	A_rR_r w/Ice ft^2
		Plates									
	251	L8x8x1-1/8 w/ 1/2x7 Plates	81.907	54.631	B	0.163	0.318	7.092	10.607	3.018	6.414
	252	L8x8x1-1/8 w/ 1/2x7 Plates	81.907	54.631	B	0.163	0.318	7.092	10.607	3.018	6.414
	252	L8x8x1-1/8 w/ 1/2x7 Plates	81.907	54.631	A	0.163	0.318	7.092	10.607	3.018	6.414
					A		Sum:	14.185	21.214	6.035	12.829
					B			14.185	21.214	6.035	12.829
					C			14.185	21.214	6.035	12.829
					D			14.185	21.214	6.035	12.829
T15 50.00-40.00	270	L8x8x1-1/8 w/ 1/2x7 Plates	82.764	55.229	D	0.17	0.322	7.092	10.614	3.042	6.435
	270	L8x8x1-1/8 w/ 1/2x7 Plates	82.764	55.229	A	0.17	0.322	7.092	10.614	3.042	6.435
	271	L8x8x1-1/8 w/ 1/2x7 Plates	82.764	55.229	D	0.17	0.322	7.092	10.614	3.042	6.435
	271	L8x8x1-1/8 w/ 1/2x7 Plates	82.764	55.229	C	0.17	0.322	7.092	10.614	3.042	6.435
	272	L8x8x1-1/8 w/ 1/2x7 Plates	82.764	55.229	C	0.17	0.322	7.092	10.614	3.042	6.435
	272	L8x8x1-1/8 w/ 1/2x7 Plates	82.764	55.229	B	0.17	0.322	7.092	10.614	3.042	6.435
	273	L8x8x1-1/8 w/ 1/2x7 Plates	82.764	55.229	B	0.17	0.322	7.092	10.614	3.042	6.435
	273	L8x8x1-1/8 w/ 1/2x7 Plates	82.764	55.229	A	0.17	0.322	7.092	10.614	3.042	6.435
					A		Sum:	14.185	21.228	6.084	12.869
					B			14.185	21.228	6.084	12.869
					C			14.185	21.228	6.084	12.869
					D			14.185	21.228	6.084	12.869
T16 40.00-30.00					A		Sum:	0.000	0.000	0.000	0.000
					B			0.000	0.000	0.000	0.000
					C			0.000	0.000	0.000	0.000
					D			0.000	0.000	0.000	0.000
T17 30.00-20.00					A		Sum:	0.000	0.000	0.000	0.000
					B			0.000	0.000	0.000	0.000
					C			0.000	0.000	0.000	0.000
					D			0.000	0.000	0.000	0.000
T18 20.00-10.00					A		Sum:	0.000	0.000	0.000	0.000
					B			0.000	0.000	0.000	0.000
					C			0.000	0.000	0.000	0.000
					D			0.000	0.000	0.000	0.000
T19 10.00-0.00					A		Sum:	0.000	0.000	0.000	0.000
					B			0.000	0.000	0.000	0.000
					C			0.000	0.000	0.000	0.000
					D			0.000	0.000	0.000	0.000

222-G Section Verification Tables - No Ice

Section Elevation ft	z_{wind} ft	z_{ice} ft	K_z	K_h	K_{zt}	t_z in	q_z psf	Face	e	A_rR_r ft^2
T1 180.00-170.00	175.00		1.424	218.026	1.005		31	A	0.203	0.000
								B	0.203	0.000
								C	0.203	0.000
								D	0.203	0.000
T2 170.00-163.57	166.79		1.41	169.337	1.006		31	A	0.246	0.000
								B	0.246	0.000
								C	0.246	0.000
								D	0.246	0.000
T3 163.57-159.05	161.31		1.4	143.081	1.007		31	A	0.246	0.000
								B	0.246	0.000
								C	0.246	0.000
								D	0.246	0.000
T4 159.05-154.52	156.79		1.391	124.487	1.009		30	A	0.227	0.000
								B	0.227	0.000
								C	0.227	0.000
								D	0.227	0.000
T5 154.52-150.00	152.26		1.383	108.309	1.01		30	A	0.22	0.000
								B	0.22	0.000
								C	0.22	0.000
								D	0.22	0.000
T6 150.00-140.00	145.00		1.369	86.621	1.012		30	A	0.222	0.000
								B	0.222	0.000
								C	0.222	0.000
								D	0.222	0.000
T7 140.00-130.00	135.00		1.348	63.678	1.017		30	A	0.229	0.000
								B	0.229	0.000
								C	0.229	0.000
								D	0.229	0.000
T8 130.00-120.00	125.00		1.326	46.813	1.023		29	A	0.198	0.000
								B	0.198	0.000
								C	0.198	0.000
								D	0.198	0.000
T9 120.00-110.00	115.00		1.303	34.414	1.031		29	A	0.205	0.000
								B	0.205	0.000
								C	0.205	0.000
								D	0.205	0.000
T10 110.00-100.00	105.00		1.279	25.299	1.042		29	A	0.188	0.000
								B	0.188	0.000
								C	0.188	0.000
								D	0.188	0.000
T11 100.00-90.00	95.00		1.252	18.598	1.058		29	A	0.211	0.000
								B	0.211	0.000
								C	0.211	0.000
								D	0.211	0.000
T12 90.00-80.00	85.00		1.223	13.672	1.079		29	A	0.203	0.000
								B	0.203	0.000
								C	0.203	0.000
								D	0.203	0.000
T13 80.00-60.00	70.00		1.174	8.618	1.127		29	A	0.167	12.125
								B	0.167	12.125
								C	0.167	12.125
								D	0.167	12.125
T14 60.00-50.00	55.00		1.116	5.432	1.205		29	A	0.163	6.035
								B	0.163	6.035
								C	0.163	6.035
								D	0.163	6.035
T15 50.00-40.00	45.00		1.07	3.993	1.283		30	A	0.17	6.084
								B	0.17	6.084
								C	0.17	6.084
								D	0.17	6.084

Section Elevation ft	z_{wind} ft	z_{ice} ft	K_z	K_h	K_{zt}	t_z in	q_z psf	Face	e	A_rR_r ft²
T16 40.00-30.00	35.00		1.015	2.936	1.394		31	A	0.175	0.000
								B	0.175	0.000
								C	0.175	0.000
								D	0.175	0.000
T17 30.00-20.00	25.00		0.945	2.158	1.551		32	A	0.156	0.000
								B	0.156	0.000
								C	0.156	0.000
								D	0.156	0.000
T18 20.00-10.00	15.00		0.85	1.587	1.78		33	A	0.167	0.000
								B	0.167	0.000
								C	0.167	0.000
								D	0.167	0.000
T19 10.00-0.00	5.00		0.85	1.166	2.115		39	A	0.16	0.000
								B	0.16	0.000
								C	0.16	0.000
								D	0.16	0.000

222-G Section Verification Tables - Ice

Section Elevation ft	z_{wind} ft	z_{ice} ft	K_z	K_h	K_{zt}	t_z in	q_z psf	Face	e	A_rR_r ft²
T1 180.00-170.00	175.00	175.00	1.424	218.026	1.005	2.2192	8	A	0.498	13.721
								B	0.498	13.721
								C	0.498	13.721
								D	0.498	13.721
T2 170.00-163.57	166.79	166.79	1.41	169.337	1.006	2.2096	8	A	0.54	9.244
								B	0.54	9.244
								C	0.54	9.244
								D	0.54	9.244
T3 163.57-159.05	161.31	161.31	1.4	143.081	1.007	2.2031	8	A	0.583	7.845
								B	0.583	7.845
								C	0.583	7.845
								D	0.583	7.845
T4 159.05-154.52	156.79	156.79	1.391	124.487	1.009	2.1977	8	A	0.491	5.996
								B	0.491	5.996
								C	0.491	5.996
								D	0.491	5.996
T5 154.52-150.00	152.26	152.26	1.383	108.309	1.01	2.1923	8	A	0.478	6.049
								B	0.478	6.049
								C	0.478	6.049
								D	0.478	6.049
T6 150.00-140.00	145.00	145.00	1.369	86.621	1.012	2.1834	8	A	0.489	14.941
								B	0.489	14.941
								C	0.489	14.941
								D	0.489	14.941
T7 140.00-130.00	135.00	135.00	1.348	63.678	1.017	2.1712	7	A	0.469	14.491
								B	0.469	14.491
								C	0.469	14.491
								D	0.469	14.491
T8 130.00-120.00	125.00	125.00	1.326	46.813	1.023	2.1591	7	A	0.398	12.396
								B	0.398	12.396
								C	0.398	12.396
								D	0.398	12.396
T9 120.00-110.00	115.00	115.00	1.303	34.414	1.031	2.1472	7	A	0.425	14.951
								B	0.425	14.951

Section Elevation ft	z_{wind} ft	z_{ice} ft	K_z	K_h	K_{zt}	t_z in	q_z psf	Face	e	A_rR_r ft²
								C	0.425	14.951
								D	0.425	14.951
T10 110.00-100.00	105.00	105.00	1.279	25.299	1.042	2.1359	7	A	0.371	12.795
								B	0.371	12.795
								C	0.371	12.795
								D	0.371	12.795
T11 100.00-90.00	95.00	95.00	1.252	18.598	1.058	2.1255	7	A	0.384	13.152
								B	0.384	13.152
								C	0.384	13.152
								D	0.384	13.152
T12 90.00-80.00	85.00	85.00	1.223	13.672	1.079	2.1167	7	A	0.371	13.413
								B	0.371	13.413
								C	0.371	13.413
								D	0.371	13.413
T13 80.00-60.00	70.00	70.00	1.174	8.618	1.127	2.1077	7	A	0.311	41.332
								B	0.311	41.332
								C	0.311	41.332
								D	0.311	41.332
T14 60.00-50.00	55.00	55.00	1.116	5.432	1.205	2.1061	7	A	0.318	22.589
								B	0.318	22.589
								C	0.318	22.589
								D	0.318	22.589
T15 50.00-40.00	45.00	45.00	1.07	3.993	1.283	2.1104	7	A	0.322	23.148
								B	0.322	23.148
								C	0.322	23.148
								D	0.322	23.148
T16 40.00-30.00	35.00	35.00	1.015	2.936	1.394	2.1184	8	A	0.358	18.428
								B	0.358	18.428
								C	0.358	18.428
								D	0.358	18.428
T17 30.00-20.00	25.00	25.00	0.945	2.158	1.551	2.1267	8	A	0.306	15.347
								B	0.306	15.347
								C	0.306	15.347
								D	0.306	15.347
T18 20.00-10.00	15.00	15.00	0.85	1.587	1.78	2.1202	8	A	0.346	19.465
								B	0.346	19.465
								C	0.346	19.465
								D	0.346	19.465
T19 10.00-0.00	5.00	5.00	0.85	1.166	2.115	2.0180	10	A	0.325	18.516
								B	0.325	18.516
								C	0.325	18.516
								D	0.325	18.516

222-G Section Verification Tables - Service

Section Elevation ft	z_{wind} ft	z_{ice} ft	K_z	K_h	K_{zt}	t_z in	q_z psf	Face	e	A_rR_r ft²
T1 180.00-170.00	175.00		1.424	218.026	1.005		11	A	0.203	0.000
								B	0.203	0.000
								C	0.203	0.000
								D	0.203	0.000
T2 170.00-163.57	166.79		1.41	169.337	1.006		11	A	0.246	0.000
								B	0.246	0.000
								C	0.246	0.000
								D	0.246	0.000

Section Elevation	z_{wind}	z_{ice}	K_z	K_h	K_{zt}	t_z	q_z	Face	e	A_rR_r
ft	ft	ft				in	psf			ft^2
T3 163.57-159.05	161.31		1.4	143.081	1.007		11	A	0.246	0.000
								B	0.246	0.000
								C	0.246	0.000
								D	0.246	0.000
T4 159.05-154.52	156.79		1.391	124.487	1.009		11	A	0.227	0.000
								B	0.227	0.000
								C	0.227	0.000
								D	0.227	0.000
T5 154.52-150.00	152.26		1.383	108.309	1.01		11	A	0.22	0.000
								B	0.22	0.000
								C	0.22	0.000
								D	0.22	0.000
T6 150.00-140.00	145.00		1.369	86.621	1.012		11	A	0.222	0.000
								B	0.222	0.000
								C	0.222	0.000
								D	0.222	0.000
T7 140.00-130.00	135.00		1.348	63.678	1.017		11	A	0.229	0.000
								B	0.229	0.000
								C	0.229	0.000
								D	0.229	0.000
T8 130.00-120.00	125.00		1.326	46.813	1.023		11	A	0.198	0.000
								B	0.198	0.000
								C	0.198	0.000
								D	0.198	0.000
T9 120.00-110.00	115.00		1.303	34.414	1.031		11	A	0.205	0.000
								B	0.205	0.000
								C	0.205	0.000
								D	0.205	0.000
T10 110.00-100.00	105.00		1.279	25.299	1.042		10	A	0.188	0.000
								B	0.188	0.000
								C	0.188	0.000
								D	0.188	0.000
T11 100.00-90.00	95.00		1.252	18.598	1.058		10	A	0.211	0.000
								B	0.211	0.000
								C	0.211	0.000
								D	0.211	0.000
T12 90.00-80.00	85.00		1.223	13.672	1.079		10	A	0.203	0.000
								B	0.203	0.000
								C	0.203	0.000
								D	0.203	0.000
T13 80.00-60.00	70.00		1.174	8.618	1.127		10	A	0.167	12.125
								B	0.167	12.125
								C	0.167	12.125
								D	0.167	12.125
T14 60.00-50.00	55.00		1.116	5.432	1.205		11	A	0.163	6.035
								B	0.163	6.035
								C	0.163	6.035
								D	0.163	6.035
T15 50.00-40.00	45.00		1.07	3.993	1.283		11	A	0.17	6.084
								B	0.17	6.084
								C	0.17	6.084
								D	0.17	6.084
T16 40.00-30.00	35.00		1.015	2.936	1.394		11	A	0.175	0.000
								B	0.175	0.000
								C	0.175	0.000
								D	0.175	0.000
T17 30.00-20.00	25.00		0.945	2.158	1.551		11	A	0.156	0.000
								B	0.156	0.000
								C	0.156	0.000
								D	0.156	0.000

Section Elevation ft	z_{wind} ft	z_{ice} ft	K_z	K_h	K_{zt}	t_z in	q_z psf	Face	e	A_rR_r ft²
T18 20.00-10.00	15.00		0.85	1.587	1.78		12	A	0.167	0.000
								B	0.167	0.000
								C	0.167	0.000
								D	0.167	0.000
T19 10.00-0.00	5.00		0.85	1.166	2.115		14	A	0.16	0.000
								B	0.16	0.000
								C	0.16	0.000
								D	0.16	0.000

Tower Pressures - No Ice

$G_H = 0.850$

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
T1	175.00	1.424	31	61.674	A	12.491	0.000	5.833	46.70	0.000	0.000
180.00-170.00					B	12.491	0.000		46.70	0.000	0.000
					C	12.491	0.000		46.70	0.000	0.000
					D	12.491	0.000		46.70	19.833	0.000
T2	166.79	1.41	31	40.022	A	9.832	0.000	5.356	54.47	0.000	0.000
170.00-163.57					B	9.832	0.000		54.47	0.000	0.000
					C	9.832	0.000		54.47	0.000	0.000
					D	9.832	0.000		54.47	21.503	0.000
T3	161.31	1.4	31	28.908	A	7.122	0.000	3.775	53.00	0.000	0.000
163.57-159.05					B	7.122	0.000		53.00	0.000	0.000
					C	7.122	0.000		53.00	12.273	0.000
					D	7.122	0.000		53.00	15.193	0.000
T4	156.79	1.391	30	30.376	A	6.903	0.000	3.775	54.69	0.000	0.000
159.05-154.52					B	6.903	0.000		54.69	0.000	0.000
					C	6.903	0.000		54.69	14.053	0.000
					D	6.903	0.000		54.69	15.400	0.000
T5	152.26	1.383	30	31.844	A	7.011	0.000	3.775	53.84	0.000	0.000
154.52-150.00					B	7.011	0.000		53.84	0.000	0.000
					C	7.011	0.000		53.84	14.053	0.000
					D	7.011	0.000		53.84	15.400	0.000
T6	145.00	1.369	30	75.634	A	16.767	0.000	8.344	49.76	0.000	0.000
150.00-140.00					B	16.767	0.000		49.76	0.000	0.000
					C	16.767	0.000		49.76	31.060	0.000
					D	16.767	0.000		49.76	34.038	0.000
T7	135.00	1.348	30	83.296	A	19.051	0.000	10.013	52.56	0.000	0.000
140.00-130.00					B	19.051	0.000		52.56	0.000	0.000
					C	19.051	0.000		52.56	31.060	0.000
					D	19.051	0.000		52.56	36.258	0.000
T8	125.00	1.326	29	90.466	A	17.878	0.000	10.013	56.01	10.086	0.000
130.00-120.00					B	17.878	0.000		56.01	0.000	0.000
					C	17.878	0.000		56.01	31.060	0.000
					D	17.878	0.000		56.01	37.578	0.000
T9	115.00	1.303	29	97.774	A	20.028	0.000	10.013	49.99	16.810	0.000
120.00-110.00					B	20.028	0.000		49.99	0.000	0.000
					C	20.028	0.000		49.99	31.060	0.000
					D	20.028	0.000		49.99	40.229	0.000
T10	105.00	1.279	29	104.945	A	19.757	0.000	10.013	50.68	20.799	0.000
110.00-100.00					B	19.757	0.000		50.68	0.000	0.000
					C	19.757	0.000		50.68	31.060	0.000

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
					D	19.757	0.000		50.68	43.835	0.000
T11	95.00	1.252	29	112.984	A	23.872	0.000	13.350	55.93	23.458	0.000
100.00-90.00					B	23.872	0.000		55.93	0.000	0.000
					C	23.872	0.000		55.93	31.060	0.000
					D	23.872	0.000		55.93	45.317	0.000
T12	85.00	1.223	29	120.155	A	24.365	0.000	13.350	54.79	23.458	0.000
90.00-80.00					B	24.365	0.000		54.79	0.000	0.000
					C	24.365	0.000		54.79	31.060	0.000
					D	24.365	0.000		54.79	45.872	0.000
T13	70.00	1.174	29	263.233	A	15.516	28.370	28.370	64.64	46.916	0.000
80.00-60.00					B	15.516	28.370		64.64	0.000	0.000
					C	15.516	28.370		64.64	62.120	0.000
					D	15.516	28.370		64.64	93.724	0.000
T14	55.00	1.116	29	142.444	A	9.050	14.185	14.185	61.05	23.458	0.000
60.00-50.00					B	9.050	14.185		61.05	0.000	0.000
					C	9.050	14.185		61.05	31.060	0.000
					D	9.050	14.185		61.05	47.355	0.000
T15	45.00	1.07	30	149.614	A	11.192	14.185	14.185	55.90	23.458	0.000
50.00-40.00					B	11.192	14.185		55.90	0.000	0.000
					C	11.192	14.185		55.90	31.060	0.000
					D	11.192	14.185		55.90	47.993	0.000
T16	35.00	1.015	31	156.196	A	27.367	0.000	13.350	48.78	23.458	0.000
40.00-30.00					B	27.367	0.000		48.78	0.000	0.000
					C	27.367	0.000		48.78	31.060	0.000
					D	27.367	0.000		48.78	48.167	0.000
T17	25.00	0.945	32	163.366	A	25.467	0.000	13.350	52.42	23.458	0.000
30.00-20.00					B	25.467	0.000		52.42	0.000	0.000
					C	25.467	0.000		52.42	31.060	0.000
					D	25.467	0.000		52.42	48.167	0.000
T18	15.00	0.85	33	170.539	A	28.533	0.000	13.350	46.79	23.458	0.000
20.00-10.00					B	28.533	0.000		46.79	0.000	0.000
					C	28.533	0.000		46.79	31.060	0.000
					D	28.533	0.000		46.79	48.167	0.000
T19 10.00-0.00	5.00	0.85	39	177.715	A	28.435	0.000	13.350	46.95	9.383	0.000
					B	28.435	0.000		46.95	0.000	0.000
					C	28.435	0.000		46.95	12.405	0.000
					D	28.435	0.000		46.95	19.267	0.000

Tower Pressure - With Ice

$G_H = 0.850$

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
T1	175.00	1.424	8	2.2192	65.373	A	12.491	20.062	13.231	40.64	0.000	0.000
180.00-170.00						B	12.491	20.062		40.64	0.000	0.000
						C	12.491	20.062		40.64	0.000	0.000
						D	12.491	20.062		40.64	63.103	0.000
T2	166.79	1.41	8	2.2096	42.389	A	9.832	13.066	10.090	44.06	0.000	0.000
170.00-163.57						B	9.832	13.066		44.06	0.000	0.000
						C	9.832	13.066		44.06	0.000	0.000
						D	9.832	13.066		44.06	66.524	0.000
T3	161.31	1.4	8	2.2031	30.571	A	7.122	10.701	7.102	39.85	0.000	0.000
163.57-159.05						B	7.122	10.701		39.85	0.000	0.000

Section Elevation	z	K_Z	q_z	t_Z	A_G	Face	A_F	A_R	A_{leg}	Leg %	C_AA_A In Face	C_AA_A Out Face
ft	ft		psf	in	ft^2		ft^2	ft^2	ft^2		ft^2	ft^2
						C	7.122	10.701		39.85	27.175	0.000
						D	7.122	10.701		39.85	47.239	0.000
T4	156.79	1.391	8	2.1977	32.034	A	6.903	8.817	7.094	45.13	0.000	0.000
159.05-154.52						B	6.903	8.817		45.13	0.000	0.000
						C	6.903	8.817		45.13	31.081	0.000
						D	6.903	8.817		45.13	48.961	0.000
T5	152.26	1.383	8	2.1923	33.498	A	7.011	8.986	7.086	44.29	0.000	0.000
154.52-150.00						B	7.011	8.986		44.29	0.000	0.000
						C	7.011	8.986		44.29	31.045	0.000
						D	7.011	8.986		44.29	48.901	0.000
T6	145.00	1.369	8	2.1834	79.275	A	16.767	22.001	15.632	40.32	0.000	0.000
150.00-140.00						B	16.767	22.001		40.32	0.000	0.000
						C	16.767	22.001		40.32	68.493	0.000
						D	16.767	22.001		40.32	107.869	0.000
T7	135.00	1.348	7	2.1712	86.917	A	19.051	21.676	17.260	42.38	0.000	0.000
140.00-130.00						B	19.051	21.676		42.38	0.000	0.000
						C	19.051	21.676		42.38	68.318	0.000
						D	19.051	21.676		42.38	119.337	0.000
T8	125.00	1.326	7	2.1591	94.067	A	17.878	19.516	17.219	46.05	31.835	0.000
130.00-120.00						B	17.878	19.516		46.05	0.000	0.000
						C	17.878	19.516		46.05	68.145	0.000
						D	17.878	19.516		46.05	122.477	0.000
T9	115.00	1.303	7	2.1472	101.355	A	20.028	23.087	17.179	39.85	52.958	0.000
120.00-110.00						B	20.028	23.087		39.85	0.000	0.000
						C	20.028	23.087		39.85	67.975	0.000
						D	20.028	23.087		39.85	132.611	0.000
T10	105.00	1.279	7	2.1359	108.507	A	19.757	20.499	17.142	42.58	69.499	0.000
110.00-100.00						B	19.757	20.499		42.58	0.000	0.000
						C	19.757	20.499		42.58	67.814	0.000
						D	19.757	20.499		42.58	148.268	0.000
T11	95.00	1.252	7	2.1255	116.529	A	23.872	20.891	20.445	45.67	80.433	0.000
100.00-90.00						B	23.872	20.891		45.67	0.000	0.000
						C	23.872	20.891		45.67	67.666	0.000
						D	23.872	20.891		45.67	154.400	0.000
T12 90.00-80.00	85.00	1.223	7	2.1167	123.685	A	24.365	21.492	20.415	44.52	80.298	0.000
						B	24.365	21.492		44.52	0.000	0.000
						C	24.365	21.492		44.52	67.540	0.000
						D	24.365	21.492		44.52	156.728	0.000
T13 80.00-60.00	70.00	1.174	7	2.1077	270.263	A	15.516	68.601	42.439	50.45	160.322	0.000
						B	15.516	68.601		50.45	0.000	0.000
						C	15.516	68.601		50.45	134.823	0.000
						D	15.516	68.601		50.45	325.259	0.000
T14 60.00-50.00	55.00	1.116	7	2.1061	145.956	A	9.050	37.355	21.214	45.72	80.138	0.000
						B	9.050	37.355		45.72	0.000	0.000
						C	9.050	37.355		45.72	67.390	0.000
						D	9.050	37.355		45.72	166.638	0.000
T15 50.00-40.00	45.00	1.07	7	2.1104	153.134	A	11.192	38.184	21.228	42.99	80.202	0.000
						B	11.192	38.184		42.99	0.000	0.000
						C	11.192	38.184		42.99	67.450	0.000
						D	11.192	38.184		42.99	172.105	0.000
T16 40.00-30.00	35.00	1.015	8	2.1184	159.729	A	27.367	29.771	20.421	35.74	80.325	0.000
						B	27.367	29.771		35.74	0.000	0.000
						C	27.367	29.771		35.74	67.565	0.000
						D	27.367	29.771		35.74	173.922	0.000
T17 30.00-20.00	25.00	0.945	8	2.1267	166.913	A	25.467	25.548	20.449	40.08	80.450	0.000
						B	25.467	25.548		40.08	0.000	0.000
						C	25.467	25.548		40.08	67.683	0.000
						D	25.467	25.548		40.08	174.309	0.000
T18 20.00-10.00	15.00	0.85	8	2.1202	174.075	A	28.533	31.675	20.427	33.93	80.352	0.000
						B	28.533	31.675		33.93	0.000	0.000

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
						C	28.533	31.675		33.93	67.591	0.000
						D	28.533	31.675		33.93	174.006	0.000
T19 10.00-0.00	5.00	0.85	10	2.0180	181.080	A	28.435	30.492	20.086	34.09	31.520	0.000
						B	28.435	30.492		34.09	0.000	0.000
						C	28.435	30.492		34.09	26.453	0.000
						D	28.435	30.492		34.09	67.691	0.000

Tower Pressure - Service

$G_H = 0.850$

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
T1	175.00	1.424	11	61.674	A	12.491	0.000	5.833	46.70	0.000	0.000
180.00-170.00					B	12.491	0.000		46.70	0.000	0.000
					C	12.491	0.000		46.70	0.000	0.000
					D	12.491	0.000		46.70	19.833	0.000
T2	166.79	1.41	11	40.022	A	9.832	0.000	5.356	54.47	0.000	0.000
170.00-163.57					B	9.832	0.000		54.47	0.000	0.000
					C	9.832	0.000		54.47	0.000	0.000
					D	9.832	0.000		54.47	21.503	0.000
T3	161.31	1.4	11	28.908	A	7.122	0.000	3.775	53.00	0.000	0.000
163.57-159.05					B	7.122	0.000		53.00	0.000	0.000
					C	7.122	0.000		53.00	12.273	0.000
					D	7.122	0.000		53.00	15.193	0.000
T4	156.79	1.391	11	30.376	A	6.903	0.000	3.775	54.69	0.000	0.000
159.05-154.52					B	6.903	0.000		54.69	0.000	0.000
					C	6.903	0.000		54.69	14.053	0.000
					D	6.903	0.000		54.69	15.400	0.000
T5	152.26	1.383	11	31.844	A	7.011	0.000	3.775	53.84	0.000	0.000
154.52-150.00					B	7.011	0.000		53.84	0.000	0.000
					C	7.011	0.000		53.84	14.053	0.000
					D	7.011	0.000		53.84	15.400	0.000
T6	145.00	1.369	11	75.634	A	16.767	0.000	8.344	49.76	0.000	0.000
150.00-140.00					B	16.767	0.000		49.76	0.000	0.000
					C	16.767	0.000		49.76	31.060	0.000
					D	16.767	0.000		49.76	34.038	0.000
T7	135.00	1.348	11	83.296	A	19.051	0.000	10.013	52.56	0.000	0.000
140.00-130.00					B	19.051	0.000		52.56	0.000	0.000
					C	19.051	0.000		52.56	31.060	0.000
					D	19.051	0.000		52.56	36.258	0.000
T8	125.00	1.326	11	90.466	A	17.878	0.000	10.013	56.01	10.086	0.000
130.00-120.00					B	17.878	0.000		56.01	0.000	0.000
					C	17.878	0.000		56.01	31.060	0.000
					D	17.878	0.000		56.01	37.578	0.000
T9	115.00	1.303	11	97.774	A	20.028	0.000	10.013	49.99	16.810	0.000
120.00-110.00					B	20.028	0.000		49.99	0.000	0.000
					C	20.028	0.000		49.99	31.060	0.000
					D	20.028	0.000		49.99	40.229	0.000
T10	105.00	1.279	10	104.945	A	19.757	0.000	10.013	50.68	20.799	0.000
110.00-100.00					B	19.757	0.000		50.68	0.000	0.000
					C	19.757	0.000		50.68	31.060	0.000
					D	19.757	0.000		50.68	43.835	0.000

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
T11	95.00	1.252	10	112.984	A	23.872	0.000	13.350	55.93	23.458	0.000
100.00-90.00					B	23.872	0.000		55.93	0.000	0.000
					C	23.872	0.000		55.93	31.060	0.000
					D	23.872	0.000		55.93	45.317	0.000
T12	85.00	1.223	10	120.155	A	24.365	0.000	13.350	54.79	23.458	0.000
90.00-80.00					B	24.365	0.000		54.79	0.000	0.000
					C	24.365	0.000		54.79	31.060	0.000
					D	24.365	0.000		54.79	45.872	0.000
T13	70.00	1.174	10	263.233	A	15.516	28.370	28.370	64.64	46.916	0.000
80.00-60.00					B	15.516	28.370		64.64	0.000	0.000
					C	15.516	28.370		64.64	62.120	0.000
					D	15.516	28.370		64.64	93.724	0.000
T14	55.00	1.116	11	142.444	A	9.050	14.185	14.185	61.05	23.458	0.000
60.00-50.00					B	9.050	14.185		61.05	0.000	0.000
					C	9.050	14.185		61.05	31.060	0.000
					D	9.050	14.185		61.05	47.355	0.000
T15	45.00	1.07	11	149.614	A	11.192	14.185	14.185	55.90	23.458	0.000
50.00-40.00					B	11.192	14.185		55.90	0.000	0.000
					C	11.192	14.185		55.90	31.060	0.000
					D	11.192	14.185		55.90	47.993	0.000
T16	35.00	1.015	11	156.196	A	27.367	0.000	13.350	48.78	23.458	0.000
40.00-30.00					B	27.367	0.000		48.78	0.000	0.000
					C	27.367	0.000		48.78	31.060	0.000
					D	27.367	0.000		48.78	48.167	0.000
T17	25.00	0.945	11	163.366	A	25.467	0.000	13.350	52.42	23.458	0.000
30.00-20.00					B	25.467	0.000		52.42	0.000	0.000
					C	25.467	0.000		52.42	31.060	0.000
					D	25.467	0.000		52.42	48.167	0.000
T18	15.00	0.85	12	170.539	A	28.533	0.000	13.350	46.79	23.458	0.000
20.00-10.00					B	28.533	0.000		46.79	0.000	0.000
					C	28.533	0.000		46.79	31.060	0.000
					D	28.533	0.000		46.79	48.167	0.000
T19 10.00-0.00	5.00	0.85	14	177.715	A	28.435	0.000	13.350	46.95	9.383	0.000
					B	28.435	0.000		46.95	0.000	0.000
					C	28.435	0.000		46.95	12.405	0.000
					D	28.435	0.000		46.95	19.267	0.000

Tower Forces - No Ice - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.09	0.75	A	0.203	2.969	31	1	1	12.491	1.30	129.56	D
180.00-170.00			B	0.203	2.969		1	1	12.491			
			C	0.203	2.969		1	1	12.491			
			D	0.203	2.969		1	1	12.491			
T2	0.09	0.54	A	0.246	2.792	31	1	1	9.832	1.06	164.43	D
170.00-163.57			B	0.246	2.792		1	1	9.832			
			C	0.246	2.792		1	1	9.832			
			D	0.246	2.792		1	1	9.832			
T3	0.14	0.39	A	0.246	2.789	31	1	1	7.122	0.95	209.11	D
163.57-159.05			B	0.246	2.789		1	1	7.122			
			C	0.246	2.789		1	1	7.122			
			D	0.246	2.789		1	1	7.122			
T4	0.15	0.36	A	0.227	2.866	30	1	1	6.903	0.97	214.89	D
159.05-154.52			B	0.227	2.866		1	1	6.903			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
			C	0.227	2.866		1	1	6.903			
			D	0.227	2.866		1	1	6.903			
T5	0.15	0.37	A	0.22	2.895	30	1	1	7.011	0.98	216.76	D
154.52-150.00			B	0.22	2.895		1	1	7.011			
			C	0.22	2.895		1	1	7.011			
			D	0.22	2.895		1	1	7.011			
T6	0.33	0.97	A	0.222	2.889	30	1	1	16.767	2.24	224.17	D
150.00-140.00			B	0.222	2.889		1	1	16.767			
			C	0.222	2.889		1	1	16.767			
			D	0.222	2.889		1	1	16.767			
T7	0.34	1.53	A	0.229	2.86	30	1	1	19.051	2.40	240.41	D
140.00-130.00			B	0.229	2.86		1	1	19.051			
			C	0.229	2.86		1	1	19.051			
			D	0.229	2.86		1	1	19.051			
T8	0.40	1.43	A	0.198	2.99	29	1	1	17.878	2.52	252.48	D
130.00-120.00			B	0.198	2.99		1	1	17.878			
			C	0.198	2.99		1	1	17.878			
			D	0.198	2.99		1	1	17.878			
T9	0.45	2.05	A	0.205	2.959	29	1	1	20.028	2.78	278.36	D
120.00-110.00			B	0.205	2.959		1	1	20.028			
			C	0.205	2.959		1	1	20.028			
			D	0.205	2.959		1	1	20.028			
T10	0.51	1.91	A	0.188	3.031	29	1	1	19.757	2.89	288.75	D
110.00-100.00			B	0.188	3.031		1	1	19.757			
			C	0.188	3.031		1	1	19.757			
			D	0.188	3.031		1	1	19.757			
T11	0.54	2.50	A	0.211	2.932	29	1	1	23.872	3.18	317.61	D
100.00-90.00			B	0.211	2.932		1	1	23.872			
			C	0.211	2.932		1	1	23.872			
			D	0.211	2.932		1	1	23.872			
T12	0.54	2.43	A	0.203	2.968	29	1	1	24.365	3.23	322.94	D
90.00-80.00			B	0.203	2.968		1	1	24.365			
			C	0.203	2.968		1	1	24.365			
			D	0.203	2.968		1	1	24.365			
T13	1.09	7.96	A	0.167	3.128	29	1	1	27.641	5.09	254.36	D
80.00-60.00			B	0.167	3.128		1	1	27.641			
			C	0.167	3.128		1	1	27.641			
			D	0.167	3.128		1	1	27.641			
T14	0.55	4.57	A	0.163	3.144	29	1	1	15.085	2.70	269.61	D
60.00-50.00			B	0.163	3.144		1	1	15.085			
			C	0.163	3.144		1	1	15.085			
			D	0.163	3.144		1	1	15.085			
T15	0.55	5.12	A	0.17	3.114	30	1	1	17.276	2.92	292.34	D
50.00-40.00			B	0.17	3.114		1	1	17.276			
			C	0.17	3.114		1	1	17.276			
			D	0.17	3.114		1	1	17.276			
T16	0.55	4.78	A	0.175	3.089	31	1	1	27.367	3.81	381.41	D
40.00-30.00			B	0.175	3.089		1	1	27.367			
			C	0.175	3.089		1	1	27.367			
			D	0.175	3.089		1	1	27.367			
T17	0.55	4.27	A	0.156	3.177	32	1	1	25.467	3.86	385.80	D
30.00-20.00			B	0.156	3.177		1	1	25.467			
			C	0.156	3.177		1	1	25.467			
			D	0.156	3.177		1	1	25.467			
T18	0.55	5.02	A	0.167	3.125	33	1	1	28.533	4.21	420.89	D
20.00-10.00			B	0.167	3.125		1	1	28.533			
			C	0.167	3.125		1	1	28.533			
			D	0.167	3.125		1	1	28.533			
T19	0.22	4.90	A	0.16	3.158	39	1	1	28.435	3.81	380.73	D
10.00-0.00			B	0.16	3.158		1	1	28.435			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
			C	0.16	3.158		1	1	28.435			
			D	0.16	3.158		1	1	28.435			
Sum Weight:	7.77	51.85						OTM	3970.16 kip-ft	50.89		

Tower Forces - No Ice - Wind 45 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.09	0.75	A	0.203	2.969	31	1.152	1.152	14.389	1.44	144.39	D
180.00-170.00			B	0.203	2.969		1.152	1.152	14.389			
			C	0.203	2.969		1.152	1.152	14.389			
			D	0.203	2.969		1.152	1.152	14.389			
T2	0.09	0.54	A	0.246	2.792	31	1.184	1.184	11.643	1.19	184.97	D
170.00-163.57			B	0.246	2.792		1.184	1.184	11.643			
			C	0.246	2.792		1.184	1.184	11.643			
			D	0.246	2.792		1.184	1.184	11.643			
T3	0.14	0.39	A	0.246	2.789	31	1.185	1.185	8.438	1.04	230.16	D
163.57-159.05			B	0.246	2.789		1.185	1.185	8.438			
			C	0.246	2.789		1.185	1.185	8.438			
			D	0.246	2.789		1.185	1.185	8.438			
T4	0.15	0.36	A	0.227	2.866	30	1.17	1.17	8.079	1.06	234.12	D
159.05-154.52			B	0.227	2.866		1.17	1.17	8.079			
			C	0.227	2.866		1.17	1.17	8.079			
			D	0.227	2.866		1.17	1.17	8.079			
T5	0.15	0.37	A	0.22	2.895	30	1.165	1.165	8.169	1.07	235.79	D
154.52-150.00			B	0.22	2.895		1.165	1.165	8.169			
			C	0.22	2.895		1.165	1.165	8.169			
			D	0.22	2.895		1.165	1.165	8.169			
T6	0.33	0.97	A	0.222	2.889	30	1.166	1.166	19.555	2.45	244.70	D
150.00-140.00			B	0.222	2.889		1.166	1.166	19.555			
			C	0.222	2.889		1.166	1.166	19.555			
			D	0.222	2.889		1.166	1.166	19.555			
T7	0.34	1.53	A	0.229	2.86	30	1.172	1.172	22.319	2.64	263.97	D
140.00-130.00			B	0.229	2.86		1.172	1.172	22.319			
			C	0.229	2.86		1.172	1.172	22.319			
			D	0.229	2.86		1.172	1.172	22.319			
T8	0.40	1.43	A	0.198	2.99	29	1.148	1.148	20.527	2.72	272.25	D
130.00-120.00			B	0.198	2.99		1.148	1.148	20.527			
			C	0.198	2.99		1.148	1.148	20.527			
			D	0.198	2.99		1.148	1.148	20.527			
T9	0.45	2.05	A	0.205	2.959	29	1.154	1.154	23.105	3.01	300.87	D
120.00-110.00			B	0.205	2.959		1.154	1.154	23.105			
			C	0.205	2.959		1.154	1.154	23.105			
			D	0.205	2.959		1.154	1.154	23.105			
T10	0.51	1.91	A	0.188	3.031	29	1.141	1.141	22.546	3.09	309.49	D
110.00-100.00			B	0.188	3.031		1.141	1.141	22.546			
			C	0.188	3.031		1.141	1.141	22.546			
			D	0.188	3.031		1.141	1.141	22.546			
T11	0.54	2.50	A	0.211	2.932	29	1.158	1.158	27.655	3.45	344.63	D
100.00-90.00			B	0.211	2.932		1.158	1.158	27.655			
			C	0.211	2.932		1.158	1.158	27.655			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
			D	0.211	2.932		1.158	1.158	27.655			
T12	0.54	2.43	A	0.203	2.968	29	1.152	1.152	28.071	3.50	349.64	D
90.00-80.00			B	0.203	2.968		1.152	1.152	28.071			
			C	0.203	2.968		1.152	1.152	28.071			
			D	0.203	2.968		1.152	1.152	28.071			
T13	1.09	7.96	A	0.167	3.128	29	1.125	1.125	31.097	5.35	267.52	D
80.00-60.00			B	0.167	3.128		1.125	1.125	31.097			
			C	0.167	3.128		1.125	1.125	31.097			
			D	0.167	3.128		1.125	1.125	31.097			
T14	0.55	4.57	A	0.163	3.144	29	1.122	1.122	16.931	2.84	283.96	D
60.00-50.00			B	0.163	3.144		1.122	1.122	16.931			
			C	0.163	3.144		1.122	1.122	16.931			
			D	0.163	3.144		1.122	1.122	16.931			
T15	0.55	5.12	A	0.17	3.114	30	1.127	1.127	19.474	3.10	309.63	D
50.00-40.00			B	0.17	3.114		1.127	1.127	19.474			
			C	0.17	3.114		1.127	1.127	19.474			
			D	0.17	3.114		1.127	1.127	19.474			
T16	0.55	4.78	A	0.175	3.089	31	1.131	1.131	30.964	4.10	410.31	D
40.00-30.00			B	0.175	3.089		1.131	1.131	30.964			
			C	0.175	3.089		1.131	1.131	30.964			
			D	0.175	3.089		1.131	1.131	30.964			
T17	0.55	4.27	A	0.156	3.177	32	1.117	1.117	28.444	4.11	411.33	D
30.00-20.00			B	0.156	3.177		1.117	1.117	28.444			
			C	0.156	3.177		1.117	1.117	28.444			
			D	0.156	3.177		1.117	1.117	28.444			
T18	0.55	5.02	A	0.167	3.125	33	1.125	1.125	32.114	4.52	452.03	D
20.00-10.00			B	0.167	3.125		1.125	1.125	32.114			
			C	0.167	3.125		1.125	1.125	32.114			
			D	0.167	3.125		1.125	1.125	32.114			
T19	0.22	4.90	A	0.16	3.158	39	1.12	1.12	31.847	4.16	416.38	D
10.00-0.00			B	0.16	3.158		1.12	1.12	31.847			
			C	0.16	3.158		1.12	1.12	31.847			
			D	0.16	3.158		1.12	1.12	31.847			
Sum Weight:	7.77	51.85						OTM	4299.59 kip-ft	54.84		

Tower Forces - With Ice - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	1.07	3.61	A	0.498	2.054	8	1	1	26.212	0.58	58.23	D
180.00-170.00			B	0.498	2.054		1	1	26.212			
			C	0.498	2.054		1	1	26.212			
			D	0.498	2.054		1	1	26.212			
T2	1.14	2.56	A	0.54	1.98	8	1	1	19.076	0.46	71.53	D
170.00-163.57			B	0.54	1.98		1	1	19.076			
			C	0.54	1.98		1	1	19.076			
			D	0.54	1.98		1	1	19.076			
T3	1.40	1.96	A	0.583	1.92	8	1	1	14.967	0.40	88.42	D
163.57-159.05			B	0.583	1.92		1	1	14.967			
			C	0.583	1.92		1	1	14.967			
			D	0.583	1.92		1	1	14.967			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
T4	1.51	1.68	A	0.491	2.068	8	1	1	12.898	0.44*	96.47	D
159.05-154.52			B	0.491	2.068		1	1	12.898			
			C	0.491	2.068		1	1	12.898			
			D	0.491	2.068		1	1	12.898			
T5	1.50	1.71	A	0.478	2.095	8	1	1	13.060	0.45*	100.39	D
154.52-150.00			B	0.478	2.095		1	1	13.060			
			C	0.478	2.095		1	1	13.060			
			D	0.478	2.095		1	1	13.060			
T6	3.31	4.33	A	0.489	2.071	8	1	1	31.709	1.03	102.90	D
150.00-140.00			B	0.489	2.071		1	1	31.709			
			C	0.489	2.071		1	1	31.709			
			D	0.489	2.071		1	1	31.709			
T7	3.43	5.56	A	0.469	2.114	7	1	1	33.542	1.11	111.06	D
140.00-130.00			B	0.469	2.114		1	1	33.542			
			C	0.469	2.114		1	1	33.542			
			D	0.469	2.114		1	1	33.542			
T8	4.01	4.77	A	0.398	2.287	7	1	1	30.273	1.24*	123.92	D
130.00-120.00			B	0.398	2.287		1	1	30.273			
			C	0.398	2.287		1	1	30.273			
			D	0.398	2.287		1	1	30.273			
T9	4.48	6.50	A	0.425	2.214	7	1	1	34.979	1.32*	132.26	D
120.00-110.00			B	0.425	2.214		1	1	34.979			
			C	0.425	2.214		1	1	34.979			
			D	0.425	2.214		1	1	34.979			
T10	4.92	5.51	A	0.371	2.362	7	1	1	32.552	1.40*	140.43	D
110.00-100.00			B	0.371	2.362		1	1	32.552			
			C	0.371	2.362		1	1	32.552			
			D	0.371	2.362		1	1	32.552			
T11	5.14	7.10	A	0.384	2.324	7	1	1	37.023	1.50*	149.86	D
100.00-90.00			B	0.384	2.324		1	1	37.023			
			C	0.384	2.324		1	1	37.023			
			D	0.384	2.324		1	1	37.023			
T12	5.16	6.58	A	0.371	2.362	7	1	1	37.778	1.59*	158.50	D
90.00-80.00			B	0.371	2.362		1	1	37.778			
			C	0.371	2.362		1	1	37.778			
			D	0.371	2.362		1	1	37.778			
T13	10.47	16.24	A	0.311	2.551	7	1	1	56.848	3.21	160.56	D
80.00-60.00			B	0.311	2.551		1	1	56.848			
			C	0.311	2.551		1	1	56.848			
			D	0.311	2.551		1	1	56.848			
T14	5.29	9.77	A	0.318	2.529	7	1	1	31.639	1.69	169.29	D
60.00-50.00			B	0.318	2.529		1	1	31.639			
			C	0.318	2.529		1	1	31.639			
			D	0.318	2.529		1	1	31.639			
T15	5.38	9.81	A	0.322	2.513	7	1	1	34.339	1.79	178.99	D
50.00-40.00			B	0.322	2.513		1	1	34.339			
			C	0.322	2.513		1	1	34.339			
			D	0.322	2.513		1	1	34.339			
T16	5.43	11.75	A	0.358	2.401	8	1	1	45.795	2.01	200.68	D
40.00-30.00			B	0.358	2.401		1	1	45.795			
			C	0.358	2.401		1	1	45.795			
			D	0.358	2.401		1	1	45.795			
T17	5.45	9.57	A	0.306	2.57	8	1	1	40.814	2.05	204.96	D
30.00-20.00			B	0.306	2.57		1	1	40.814			
			C	0.306	2.57		1	1	40.814			
			D	0.306	2.57		1	1	40.814			
T18	5.43	12.46	A	0.346	2.438	8	1	1	47.999	2.20	219.67	D
20.00-10.00			B	0.346	2.438		1	1	47.999			
			C	0.346	2.438		1	1	47.999			
			D	0.346	2.438		1	1	47.999			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
T19	2.06	12.26	A	0.325	2.504	10	1	1	46.951	1.62	161.65	D
10.00-0.00			B	0.325	2.504		1	1	46.951			
			C	0.325	2.504		1	1	46.951			
			D	0.325	2.504		1	1	46.951			
Sum Weight:	76.57	133.73			*2.1A_g limit			OTM	1972.35 kip-ft	26.09		

Tower Forces - With Ice - Wind 45 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
T1	1.07	3.61	A	0.498	2.054	8	1.2	1.2	31.454	0.65	65.35	D
180.00-170.00			B	0.498	2.054		1.2	1.2	31.454			
			C	0.498	2.054		1.2	1.2	31.454			
			D	0.498	2.054		1.2	1.2	31.454			
T2	1.14	2.56	A	0.54	1.98	8	1.2	1.2	22.892	0.51	79.24	D
170.00-163.57			B	0.54	1.98		1.2	1.2	22.892			
			C	0.54	1.98		1.2	1.2	22.892			
			D	0.54	1.98		1.2	1.2	22.892			
T3	1.40	1.96	A	0.583	1.92	8	1.2	1.2	17.961	0.42*	92.52	D
163.57-159.05			B	0.583	1.92		1.2	1.2	17.961			
			C	0.583	1.92		1.2	1.2	17.961			
			D	0.583	1.92		1.2	1.2	17.961			
T4	1.51	1.68	A	0.491	2.068	8	1.2	1.2	15.478	0.44*	96.47	D
159.05-154.52			B	0.491	2.068		1.2	1.2	15.478			
			C	0.491	2.068		1.2	1.2	15.478			
			D	0.491	2.068		1.2	1.2	15.478			
T5	1.50	1.71	A	0.478	2.095	8	1.2	1.2	15.672	0.45*	100.39	D
154.52-150.00			B	0.478	2.095		1.2	1.2	15.672			
			C	0.478	2.095		1.2	1.2	15.672			
			D	0.478	2.095		1.2	1.2	15.672			
T6	3.31	4.33	A	0.489	2.071	8	1.2	1.2	38.050	1.07*	106.65	D
150.00-140.00			B	0.489	2.071		1.2	1.2	38.050			
			C	0.489	2.071		1.2	1.2	38.050			
			D	0.489	2.071		1.2	1.2	38.050			
T7	3.43	5.56	A	0.469	2.114	7	1.2	1.2	40.251	1.16*	115.69	D
140.00-130.00			B	0.469	2.114		1.2	1.2	40.251			
			C	0.469	2.114		1.2	1.2	40.251			
			D	0.469	2.114		1.2	1.2	40.251			
T8	4.01	4.77	A	0.398	2.287	7	1.2	1.2	36.328	1.24*	123.92	D
130.00-120.00			B	0.398	2.287		1.2	1.2	36.328			
			C	0.398	2.287		1.2	1.2	36.328			
			D	0.398	2.287		1.2	1.2	36.328			
T9	4.48	6.50	A	0.425	2.214	7	1.2	1.2	41.975	1.32*	132.26	D
120.00-110.00			B	0.425	2.214		1.2	1.2	41.975			
			C	0.425	2.214		1.2	1.2	41.975			
			D	0.425	2.214		1.2	1.2	41.975			
T10	4.92	5.51	A	0.371	2.362	7	1.2	1.2	39.062	1.40*	140.43	D
110.00-100.00			B	0.371	2.362		1.2	1.2	39.062			
			C	0.371	2.362		1.2	1.2	39.062			
			D	0.371	2.362		1.2	1.2	39.062			
T11	5.14	7.10	A	0.384	2.324	7	1.2	1.2	44.428	1.50*	149.86	D

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
100.00-90.00			B	0.384	2.324		1.2	1.2	44.428			
			C	0.384	2.324		1.2	1.2	44.428			
			D	0.384	2.324		1.2	1.2	44.428			
T12	5.16	6.58	A	0.371	2.362	7	1.2	1.2	45.334	1.59*	158.50	D
90.00-80.00			B	0.371	2.362		1.2	1.2	45.334			
			C	0.371	2.362		1.2	1.2	45.334			
			D	0.371	2.362		1.2	1.2	45.334			
T13	10.47	16.24	A	0.311	2.551	7	1.2	1.2	68.218	3.39	169.43	D
80.00-60.00			B	0.311	2.551		1.2	1.2	68.218			
			C	0.311	2.551		1.2	1.2	68.218			
			D	0.311	2.551		1.2	1.2	68.218			
T14	5.29	9.77	A	0.318	2.529	7	1.2	1.2	37.967	1.79	179.23	D
60.00-50.00			B	0.318	2.529		1.2	1.2	37.967			
			C	0.318	2.529		1.2	1.2	37.967			
			D	0.318	2.529		1.2	1.2	37.967			
T15	5.38	9.81	A	0.322	2.513	7	1.2	1.2	41.207	1.90	189.94	D
50.00-40.00			B	0.322	2.513		1.2	1.2	41.207			
			C	0.322	2.513		1.2	1.2	41.207			
			D	0.322	2.513		1.2	1.2	41.207			
T16	5.43	11.75	A	0.358	2.401	8	1.2	1.2	54.954	2.15	215.06	D
40.00-30.00			B	0.358	2.401		1.2	1.2	54.954			
			C	0.358	2.401		1.2	1.2	54.954			
			D	0.358	2.401		1.2	1.2	54.954			
T17	5.45	9.57	A	0.306	2.57	8	1.2	1.2	48.976	2.19	219.19	D
30.00-20.00			B	0.306	2.57		1.2	1.2	48.976			
			C	0.306	2.57		1.2	1.2	48.976			
			D	0.306	2.57		1.2	1.2	48.976			
T18	5.43	12.46	A	0.346	2.438	8	1.2	1.2	57.598	2.36	236.04	D
20.00-10.00			B	0.346	2.438		1.2	1.2	57.598			
			C	0.346	2.438		1.2	1.2	57.598			
			D	0.346	2.438		1.2	1.2	57.598			
T19	2.06	12.26	A	0.325	2.504	10	1.2	1.2	56.341	1.81	181.19	D
10.00-0.00			B	0.325	2.504		1.2	1.2	56.341			
			C	0.325	2.504		1.2	1.2	56.341			
			D	0.325	2.504		1.2	1.2	56.341			
Sum Weight:	76.57	133.73			*2.1A_g limit			OTM	2042.58 kip-ft	27.34		

Tower Forces - Service - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.09	0.75	A	0.203	2.969	11	1	1	12.491	0.47	46.89	D
180.00-170.00			B	0.203	2.969		1	1	12.491			
			C	0.203	2.969		1	1	12.491			
			D	0.203	2.969		1	1	12.491			
T2	0.09	0.54	A	0.246	2.792	11	1	1	9.832	0.38	59.52	D
170.00-163.57			B	0.246	2.792		1	1	9.832			
			C	0.246	2.792		1	1	9.832			
			D	0.246	2.792		1	1	9.832			
T3	0.14	0.39	A	0.246	2.789	11	1	1	7.122	0.34	75.69	D
163.57-159.05			B	0.246	2.789		1	1	7.122			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
			C	0.246	2.789		1	1	7.122			
			D	0.246	2.789		1	1	7.122			
T4	0.15	0.36	A	0.227	2.866	11	1	1	6.903	0.35	77.78	D
159.05-154.52			B	0.227	2.866		1	1	6.903			
			C	0.227	2.866		1	1	6.903			
			D	0.227	2.866		1	1	6.903			
T5	0.15	0.37	A	0.22	2.895	11	1	1	7.011	0.35	78.46	D
154.52-150.00			B	0.22	2.895		1	1	7.011			
			C	0.22	2.895		1	1	7.011			
			D	0.22	2.895		1	1	7.011			
T6	0.33	0.97	A	0.222	2.889	11	1	1	16.767	0.81	81.14	D
150.00-140.00			B	0.222	2.889		1	1	16.767			
			C	0.222	2.889		1	1	16.767			
			D	0.222	2.889		1	1	16.767			
T7	0.34	1.53	A	0.229	2.86	11	1	1	19.051	0.87	87.01	D
140.00-130.00			B	0.229	2.86		1	1	19.051			
			C	0.229	2.86		1	1	19.051			
			D	0.229	2.86		1	1	19.051			
T8	0.40	1.43	A	0.198	2.99	11	1	1	17.878	0.91	91.38	D
130.00-120.00			B	0.198	2.99		1	1	17.878			
			C	0.198	2.99		1	1	17.878			
			D	0.198	2.99		1	1	17.878			
T9	0.45	2.05	A	0.205	2.959	11	1	1	20.028	1.01	100.75	D
120.00-110.00			B	0.205	2.959		1	1	20.028			
			C	0.205	2.959		1	1	20.028			
			D	0.205	2.959		1	1	20.028			
T10	0.51	1.91	A	0.188	3.031	10	1	1	19.757	1.05	104.51	D
110.00-100.00			B	0.188	3.031		1	1	19.757			
			C	0.188	3.031		1	1	19.757			
			D	0.188	3.031		1	1	19.757			
T11	0.54	2.50	A	0.211	2.932	10	1	1	23.872	1.15	114.96	D
100.00-90.00			B	0.211	2.932		1	1	23.872			
			C	0.211	2.932		1	1	23.872			
			D	0.211	2.932		1	1	23.872			
T12	0.54	2.43	A	0.203	2.968	10	1	1	24.365	1.17	116.89	D
90.00-80.00			B	0.203	2.968		1	1	24.365			
			C	0.203	2.968		1	1	24.365			
			D	0.203	2.968		1	1	24.365			
T13	1.09	7.96	A	0.167	3.128	10	1	1	27.641	1.84	92.07	D
80.00-60.00			B	0.167	3.128		1	1	27.641			
			C	0.167	3.128		1	1	27.641			
			D	0.167	3.128		1	1	27.641			
T14	0.55	4.57	A	0.163	3.144	11	1	1	15.085	0.98	97.58	D
60.00-50.00			B	0.163	3.144		1	1	15.085			
			C	0.163	3.144		1	1	15.085			
			D	0.163	3.144		1	1	15.085			
T15	0.55	5.12	A	0.17	3.114	11	1	1	17.276	1.06	105.81	D
50.00-40.00			B	0.17	3.114		1	1	17.276			
			C	0.17	3.114		1	1	17.276			
			D	0.17	3.114		1	1	17.276			
T16	0.55	4.78	A	0.175	3.089	11	1	1	27.367	1.38	138.05	D
40.00-30.00			B	0.175	3.089		1	1	27.367			
			C	0.175	3.089		1	1	27.367			
			D	0.175	3.089		1	1	27.367			
T17	0.55	4.27	A	0.156	3.177	11	1	1	25.467	1.40	139.64	D
30.00-20.00			B	0.156	3.177		1	1	25.467			
			C	0.156	3.177		1	1	25.467			
			D	0.156	3.177		1	1	25.467			
T18	0.55	5.02	A	0.167	3.125	12	1	1	28.533	1.52	152.34	D
20.00-10.00			B	0.167	3.125		1	1	28.533			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
			C	0.167	3.125		1	1	28.533			
			D	0.167	3.125		1	1	28.533			
T19	0.22	4.90	A	0.16	3.158	14	1	1	28.435	1.38	137.80	D
10.00-0.00			B	0.16	3.158		1	1	28.435			
			C	0.16	3.158		1	1	28.435			
			D	0.16	3.158		1	1	28.435			
Sum Weight:	7.77	51.85						OTM	1436.97 kip-ft	18.42		

Tower Forces - Service - Wind 45 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.09	0.75	A	0.203	2.969	11	1.152	1.152	14.389	0.52	52.26	D
180.00-170.00			B	0.203	2.969		1.152	1.152	14.389			
			C	0.203	2.969		1.152	1.152	14.389			
			D	0.203	2.969		1.152	1.152	14.389			
T2	0.09	0.54	A	0.246	2.792	11	1.184	1.184	11.643	0.43	66.95	D
170.00-163.57			B	0.246	2.792		1.184	1.184	11.643			
			C	0.246	2.792		1.184	1.184	11.643			
			D	0.246	2.792		1.184	1.184	11.643			
T3	0.14	0.39	A	0.246	2.789	11	1.185	1.185	8.438	0.38	83.30	D
163.57-159.05			B	0.246	2.789		1.185	1.185	8.438			
			C	0.246	2.789		1.185	1.185	8.438			
			D	0.246	2.789		1.185	1.185	8.438			
T4	0.15	0.36	A	0.227	2.866	11	1.17	1.17	8.079	0.38	84.74	D
159.05-154.52			B	0.227	2.866		1.17	1.17	8.079			
			C	0.227	2.866		1.17	1.17	8.079			
			D	0.227	2.866		1.17	1.17	8.079			
T5	0.15	0.37	A	0.22	2.895	11	1.165	1.165	8.169	0.39	85.34	D
154.52-150.00			B	0.22	2.895		1.165	1.165	8.169			
			C	0.22	2.895		1.165	1.165	8.169			
			D	0.22	2.895		1.165	1.165	8.169			
T6	0.33	0.97	A	0.222	2.889	11	1.166	1.166	19.555	0.89	88.57	D
150.00-140.00			B	0.222	2.889		1.166	1.166	19.555			
			C	0.222	2.889		1.166	1.166	19.555			
			D	0.222	2.889		1.166	1.166	19.555			
T7	0.34	1.53	A	0.229	2.86	11	1.172	1.172	22.319	0.96	95.54	D
140.00-130.00			B	0.229	2.86		1.172	1.172	22.319			
			C	0.229	2.86		1.172	1.172	22.319			
			D	0.229	2.86		1.172	1.172	22.319			
T8	0.40	1.43	A	0.198	2.99	11	1.148	1.148	20.527	0.99	98.54	D
130.00-120.00			B	0.198	2.99		1.148	1.148	20.527			
			C	0.198	2.99		1.148	1.148	20.527			
			D	0.198	2.99		1.148	1.148	20.527			
T9	0.45	2.05	A	0.205	2.959	11	1.154	1.154	23.105	1.09	108.90	D
120.00-110.00			B	0.205	2.959		1.154	1.154	23.105			
			C	0.205	2.959		1.154	1.154	23.105			
			D	0.205	2.959		1.154	1.154	23.105			
T10	0.51	1.91	A	0.188	3.031	10	1.141	1.141	22.546	1.12	112.02	D
110.00-100.00			B	0.188	3.031		1.141	1.141	22.546			
			C	0.188	3.031		1.141	1.141	22.546			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
			D	0.188	3.031		1.141	1.141	22.546			
T11	0.54	2.50	A	0.211	2.932	10	1.158	1.158	27.655	1.25	124.74	D
100.00-90.00			B	0.211	2.932		1.158	1.158	27.655			
			C	0.211	2.932		1.158	1.158	27.655			
			D	0.211	2.932		1.158	1.158	27.655			
T12	0.54	2.43	A	0.203	2.968	10	1.152	1.152	28.071	1.27	126.55	D
90.00-80.00			B	0.203	2.968		1.152	1.152	28.071			
			C	0.203	2.968		1.152	1.152	28.071			
			D	0.203	2.968		1.152	1.152	28.071			
T13	1.09	7.96	A	0.167	3.128	10	1.125	1.125	31.097	1.94	96.83	D
80.00-60.00			B	0.167	3.128		1.125	1.125	31.097			
			C	0.167	3.128		1.125	1.125	31.097			
			D	0.167	3.128		1.125	1.125	31.097			
T14	0.55	4.57	A	0.163	3.144	11	1.122	1.122	16.931	1.03	102.78	D
60.00-50.00			B	0.163	3.144		1.122	1.122	16.931			
			C	0.163	3.144		1.122	1.122	16.931			
			D	0.163	3.144		1.122	1.122	16.931			
T15	0.55	5.12	A	0.17	3.114	11	1.127	1.127	19.474	1.12	112.07	D
50.00-40.00			B	0.17	3.114		1.127	1.127	19.474			
			C	0.17	3.114		1.127	1.127	19.474			
			D	0.17	3.114		1.127	1.127	19.474			
T16	0.55	4.78	A	0.175	3.089	11	1.131	1.131	30.964	1.49	148.51	D
40.00-30.00			B	0.175	3.089		1.131	1.131	30.964			
			C	0.175	3.089		1.131	1.131	30.964			
			D	0.175	3.089		1.131	1.131	30.964			
T17	0.55	4.27	A	0.156	3.177	11	1.117	1.117	28.444	1.49	148.88	D
30.00-20.00			B	0.156	3.177		1.117	1.117	28.444			
			C	0.156	3.177		1.117	1.117	28.444			
			D	0.156	3.177		1.117	1.117	28.444			
T18	0.55	5.02	A	0.167	3.125	12	1.125	1.125	32.114	1.64	163.61	D
20.00-10.00			B	0.167	3.125		1.125	1.125	32.114			
			C	0.167	3.125		1.125	1.125	32.114			
			D	0.167	3.125		1.125	1.125	32.114			
T19	0.22	4.90	A	0.16	3.158	14	1.12	1.12	31.847	1.51	150.70	D
10.00-0.00			B	0.16	3.158		1.12	1.12	31.847			
			C	0.16	3.158		1.12	1.12	31.847			
			D	0.16	3.158		1.12	1.12	31.847			
Sum Weight:	7.77	51.85						OTM	1556.20 kip-ft	19.85		

Force Totals

Load Case	Vertical Forces K	Sum of Forces X K	Sum of Forces Z K	Sum of Overturning Moments, M_x kip-ft	Sum of Overturning Moments, M_z kip-ft	Sum of Torques kip-ft
Leg Weight	30.80					
Bracing Weight	21.04					
Total Member Self-Weight	51.85			-21.65	9.90	
Total Weight	74.34			-21.65	9.90	
Wind 0 deg - No Ice		-0.33	-69.41	-6585.70	61.07	-33.60
Wind 30 deg - No Ice		36.41	-63.36	-5965.99	-3395.00	-32.76
Wind 45 deg - No Ice		51.66	-51.64	-4859.89	-4831.85	-28.94
Wind 60 deg - No Ice		63.39	-36.39	-3424.08	-5938.73	-23.14

Load Case	Vertical Forces K	Sum of Forces X K	Sum of Forces Z K	Sum of Overturning Moments, M_x kip-ft	Sum of Overturning Moments, M_z kip-ft	Sum of Torques kip-ft
Wind 90 deg - No Ice		69.44	0.33	29.52	-6559.10	-7.33
Wind 120 deg - No Ice		63.72	36.97	3469.40	-5989.90	10.45
Wind 135 deg - No Ice		52.13	52.11	4888.96	-4904.21	18.58
Wind 150 deg - No Ice		36.98	63.70	5973.86	-3483.63	25.43
Wind 180 deg - No Ice		0.33	69.41	6542.40	-41.26	33.60
Wind 210 deg - No Ice		-36.41	63.36	5922.70	3414.81	32.76
Wind 225 deg - No Ice		-51.66	51.64	4816.60	4851.66	28.94
Wind 240 deg - No Ice		-63.39	36.39	3380.78	5958.54	23.14
Wind 270 deg - No Ice		-69.44	-0.33	-72.82	6578.91	7.33
Wind 300 deg - No Ice		-63.72	-36.97	-3512.70	6009.71	-10.45
Wind 315 deg - No Ice		-52.13	-52.11	-4932.25	4924.02	-18.58
Wind 330 deg - No Ice		-36.98	-63.70	-6017.16	3503.43	-25.43
Member Ice	81.88					
Total Weight Ice	255.76			-5.23	134.38	
Wind 0 deg - Ice		-0.06	-35.38	-3270.38	144.53	-42.69
Wind 30 deg - Ice		18.27	-31.69	-2888.68	-1525.27	-30.25
Wind 45 deg - Ice		25.87	-25.86	-2356.53	-2217.98	-21.21
Wind 60 deg - Ice		31.70	-18.26	-1664.13	-2750.37	-10.72
Wind 90 deg - Ice		35.39	0.06	4.91	-3132.27	12.19
Wind 120 deg - Ice		31.77	18.37	1671.24	-2760.51	30.96
Wind 135 deg - Ice		25.96	25.95	2360.41	-2232.32	37.73
Wind 150 deg - Ice		18.38	31.76	2888.36	-1542.84	41.93
Wind 180 deg - Ice		0.06	35.38	3259.91	124.24	42.69
Wind 210 deg - Ice		-18.27	31.69	2878.22	1794.04	30.25
Wind 225 deg - Ice		-25.87	25.86	2346.06	2486.74	21.21
Wind 240 deg - Ice		-31.70	18.26	1653.67	3019.14	10.72
Wind 270 deg - Ice		-35.39	-0.06	-15.38	3401.04	-12.19
Wind 300 deg - Ice		-31.77	-18.37	-1681.71	3029.28	-30.96
Wind 315 deg - Ice		-25.96	-25.95	-2370.87	2501.09	-37.73
Wind 330 deg - Ice		-18.38	-31.76	-2898.82	1811.61	-41.93
Total Weight	74.34			-21.65	9.90	
Wind 0 deg - Service		-0.12	-25.12	-2393.87	19.78	-12.16
Wind 30 deg - Service		13.18	-22.93	-2169.57	-1231.12	-11.86
Wind 45 deg - Service		18.70	-18.69	-1769.23	-1751.17	-10.47
Wind 60 deg - Service		22.94	-13.17	-1249.55	-2151.80	-8.38
Wind 90 deg - Service		25.13	0.12	0.45	-2376.34	-2.65
Wind 120 deg - Service		23.06	13.38	1245.49	-2170.32	3.78
Wind 135 deg - Service		18.87	18.86	1759.29	-1777.36	6.72
Wind 150 deg - Service		13.38	23.05	2151.96	-1263.20	9.20
Wind 180 deg - Service		0.12	25.12	2357.74	-17.26	12.16
Wind 210 deg - Service		-13.18	22.93	2133.44	1233.64	11.86
Wind 225 deg - Service		-18.70	18.69	1733.10	1753.69	10.47
Wind 240 deg - Service		-22.94	13.17	1213.42	2154.32	8.38
Wind 270 deg - Service		-25.13	-0.12	-36.58	2378.86	2.65
Wind 300 deg - Service		-23.06	-13.38	-1281.62	2172.84	-3.78
Wind 315 deg - Service		-18.87	-18.86	-1795.42	1779.88	-6.72
Wind 330 deg - Service		-13.38	-23.05	-2188.09	1265.71	-9.20

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice
3	0.9 Dead+1.6 Wind 0 deg - No Ice
4	1.2 Dead+1.6 Wind 30 deg - No Ice

Comb. No.	Description
5	0.9 Dead+1.6 Wind 30 deg - No Ice
6	1.2 Dead+1.6 Wind 45 deg - No Ice
7	0.9 Dead+1.6 Wind 45 deg - No Ice
8	1.2 Dead+1.6 Wind 60 deg - No Ice
9	0.9 Dead+1.6 Wind 60 deg - No Ice
10	1.2 Dead+1.6 Wind 90 deg - No Ice
11	0.9 Dead+1.6 Wind 90 deg - No Ice
12	1.2 Dead+1.6 Wind 120 deg - No Ice
13	0.9 Dead+1.6 Wind 120 deg - No Ice
14	1.2 Dead+1.6 Wind 135 deg - No Ice
15	0.9 Dead+1.6 Wind 135 deg - No Ice
16	1.2 Dead+1.6 Wind 150 deg - No Ice
17	0.9 Dead+1.6 Wind 150 deg - No Ice
18	1.2 Dead+1.6 Wind 180 deg - No Ice
19	0.9 Dead+1.6 Wind 180 deg - No Ice
20	1.2 Dead+1.6 Wind 210 deg - No Ice
21	0.9 Dead+1.6 Wind 210 deg - No Ice
22	1.2 Dead+1.6 Wind 225 deg - No Ice
23	0.9 Dead+1.6 Wind 225 deg - No Ice
24	1.2 Dead+1.6 Wind 240 deg - No Ice
25	0.9 Dead+1.6 Wind 240 deg - No Ice
26	1.2 Dead+1.6 Wind 270 deg - No Ice
27	0.9 Dead+1.6 Wind 270 deg - No Ice
28	1.2 Dead+1.6 Wind 300 deg - No Ice
29	0.9 Dead+1.6 Wind 300 deg - No Ice
30	1.2 Dead+1.6 Wind 315 deg - No Ice
31	0.9 Dead+1.6 Wind 315 deg - No Ice
32	1.2 Dead+1.6 Wind 330 deg - No Ice
33	0.9 Dead+1.6 Wind 330 deg - No Ice
34	1.2 Dead+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 45 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
39	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
40	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
41	1.2 Dead+1.0 Wind 135 deg+1.0 Ice+1.0 Temp
42	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
43	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
44	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
45	1.2 Dead+1.0 Wind 225 deg+1.0 Ice+1.0 Temp
46	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
47	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
48	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
49	1.2 Dead+1.0 Wind 315 deg+1.0 Ice+1.0 Temp
50	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
51	Dead+Wind 0 deg - Service
52	Dead+Wind 30 deg - Service
53	Dead+Wind 45 deg - Service
54	Dead+Wind 60 deg - Service
55	Dead+Wind 90 deg - Service
56	Dead+Wind 120 deg - Service
57	Dead+Wind 135 deg - Service
58	Dead+Wind 150 deg - Service
59	Dead+Wind 180 deg - Service
60	Dead+Wind 210 deg - Service
61	Dead+Wind 225 deg - Service
62	Dead+Wind 240 deg - Service
63	Dead+Wind 270 deg - Service
64	Dead+Wind 300 deg - Service
65	Dead+Wind 315 deg - Service
66	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	180 - 170	Leg	Max Tension	31	1.85	0.19	0.08
			Max. Compression	45	-3.02	-0.09	-0.12
			Max. Mx	8	-1.24	-0.67	0.47
			Max. My	26	-1.88	0.17	-0.67
			Max. Vy	18	-0.68	0.37	-0.13
			Max. Vx	2	-0.68	-0.11	0.37
		Diagonal	Max Tension	3	2.88	-0.01	-0.00
			Max. Compression	26	-3.05	0.00	0.00
			Max. Mx	47	0.21	0.04	0.00
			Max. My	8	-0.72	-0.00	0.00
			Max. Vy	47	-0.03	0.04	0.00
			Max. Vx	8	-0.00	0.00	0.00
		Secondary Horizontal	Max Tension	3	0.79	0.00	0.00
			Max. Compression	18	-0.80	0.04	0.00
			Max. Mx	2	-0.49	0.04	-0.00
			Max. My	25	0.36	-0.02	-0.00
			Max. Vy	35	-0.04	0.03	-0.00
			Max. Vx	21	-0.00	0.02	0.00
		Top Girt	Max Tension	47	0.26	0.00	0.00
			Max. Compression	3	-0.11	0.00	0.00
			Max. Mx	34	0.17	-0.07	0.00
			Max. My	10	0.04	0.00	0.00
			Max. Vy	34	0.05	0.00	0.00
			Max. Vx	10	-0.00	0.00	0.00
T2	170 - 163.573	Leg	Max Tension	15	8.64	-0.57	-0.48
			Max. Compression	30	-10.45	-0.78	-0.84
			Max. Mx	12	7.61	0.92	0.63
			Max. My	32	-10.14	-0.62	-0.94
			Max. Vy	2	0.48	-0.76	0.09
			Max. Vx	4	-0.49	-0.45	0.75
		Diagonal	Max Tension	19	3.57	0.00	0.00
			Max. Compression	2	-3.75	0.00	0.00
			Max. Mx	46	0.18	0.03	0.00
			Max. My	6	-3.03	-0.00	0.00
			Max. Vy	46	-0.03	0.03	0.00
			Max. Vx	35	-0.00	0.00	0.00
		Top Girt	Max Tension	47	0.85	0.00	0.00
			Max. Compression	3	-0.47	0.00	0.00
			Max. Mx	34	0.59	-0.07	0.00
			Max. My	10	0.10	0.00	0.00
			Max. Vy	34	-0.05	0.00	0.00
			Max. Vx	10	-0.00	0.00	0.00
T3	163.573 - 159.049	Leg	Max Tension	31	16.93	-0.25	-0.29
			Max. Compression	30	-20.50	-0.92	-0.72
			Max. Mx	10	9.76	-1.36	-0.06
			Max. My	26	8.57	-0.12	-1.39
			Max. Vy	10	1.41	-0.56	0.21
			Max. Vx	26	1.44	0.22	-0.57
		Diagonal	Max Tension	27	4.89	0.00	0.00
			Max. Compression	26	-5.04	0.00	0.00
			Max. Mx	50	0.82	0.02	-0.00
			Max. My	49	-1.26	0.02	-0.01
			Max. Vy	36	0.03	0.02	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vx	48	0.00	0.00	0.00
		Top Girt	Max Tension	26	0.55	0.00	0.00
			Max. Compression	27	-0.47	0.00	0.00
			Max. Mx	34	0.34	-0.07	0.00
			Max. My	35	0.28	0.00	0.00
			Max. Vy	34	-0.05	0.00	0.00
			Max. Vx	35	0.00	0.00	0.00
T4	159.049 - 154.524	Leg	Max Tension	31	25.51	-0.35	-0.36
			Max. Compression	30	-30.18	-0.52	-0.44
			Max. Mx	16	3.27	1.04	-0.79
			Max. My	28	3.31	-0.80	1.05
			Max. Vy	26	0.37	-0.96	0.31
			Max. Vx	12	0.37	0.81	-1.05
		Diagonal	Max Tension	26	5.52	0.00	0.00
			Max. Compression	26	-5.42	0.00	0.00
			Max. Mx	37	1.49	0.04	-0.00
			Max. My	49	-0.84	0.03	-0.01
			Max. Vy	38	-0.04	0.04	-0.00
			Max. Vx	49	0.00	0.00	0.00
T5	154.524 - 150	Leg	Max Tension	31	33.78	-0.48	-0.60
			Max. Compression	30	-38.49	-0.84	-0.72
			Max. Mx	28	-37.29	-0.92	-0.59
			Max. My	16	-36.95	-0.59	-0.91
			Max. Vy	28	0.41	-0.92	-0.59
			Max. Vx	16	0.41	-0.59	-0.91
		Diagonal	Max Tension	11	5.47	0.00	0.00
			Max. Compression	26	-5.60	0.00	0.00
			Max. Mx	36	0.37	0.05	-0.01
			Max. My	38	1.08	0.04	0.01
			Max. Vy	36	-0.04	0.05	-0.01
			Max. Vx	38	-0.00	0.00	0.00
T6	150 - 140	Leg	Max Tension	31	52.94	-0.57	-0.66
			Max. Compression	30	-58.36	-0.99	-0.86
			Max. Mx	33	-14.02	-1.31	1.03
			Max. My	28	7.58	-1.01	1.31
			Max. Vy	18	-0.60	1.29	-0.09
			Max. Vx	2	-0.60	-0.05	1.28
		Diagonal	Max Tension	26	5.92	0.00	0.00
			Max. Compression	26	-5.97	0.00	0.00
			Max. Mx	36	0.70	0.06	-0.01
			Max. My	10	-5.70	-0.01	0.01
			Max. Vy	36	-0.04	0.06	-0.01
			Max. Vx	50	0.00	0.00	0.00
		Top Girt	Max Tension	2	0.62	0.00	0.00
			Max. Compression	3	-0.55	0.00	0.00
			Max. Mx	34	0.21	-0.12	0.00
			Max. My	35	0.24	0.00	0.00
			Max. Vy	34	0.07	0.00	0.00
			Max. Vx	35	-0.00	0.00	0.00
T7	140 - 130	Leg	Max Tension	31	67.53	-0.87	-0.99
			Max. Compression	30	-73.96	-0.46	-0.33
			Max. Mx	14	-4.64	3.91	-3.75
			Max. My	30	-4.51	-3.77	3.93
			Max. Vy	14	-0.99	3.91	-3.75
			Max. Vx	30	-1.00	-3.77	3.93
		Diagonal	Max Tension	19	9.12	0.03	0.02
			Max. Compression	18	-9.31	0.00	0.00
			Max. Mx	32	4.95	0.09	0.01
			Max. My	16	-8.91	-0.05	0.04
			Max. Vy	38	0.05	0.07	-0.01

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vx	16	0.01	0.00	0.00
		Secondary Horizontal	Max Tension	30	1.11	0.00	0.00
			Max. Compression	30	-1.11	-0.03	-0.01
			Max. Mx	32	-0.51	0.05	0.03
			Max. My	32	-0.51	0.05	0.03
			Max. Vy	48	-0.04	0.04	0.01
			Max. Vx	32	0.01	0.00	0.00
		Top Girt	Max Tension	10	0.46	0.00	0.00
			Max. Compression	10	-0.53	-0.06	0.00
			Max. Mx	35	-0.05	-0.43	0.01
			Max. My	35	-0.05	-0.43	0.02
			Max. Vy	35	-0.15	0.00	0.00
			Max. Vx	35	-0.01	0.00	0.00
		Inner Bracing	Max Tension	14	0.07	0.00	0.00
			Max. Compression	14	-0.07	0.00	0.00
			Max. Mx	34	0.00	-0.12	0.00
			Max. My	47	0.00	0.00	0.00
			Max. Vy	34	0.06	0.00	0.00
			Max. Vx	47	-0.00	0.00	0.00
T8	130 - 120	Leg	Max Tension	31	87.88	-2.00	-2.10
			Max. Compression	30	-97.40	-1.20	-1.20
			Max. Mx	8	17.19	2.48	-1.73
			Max. My	20	17.01	-1.74	2.49
			Max. Vy	8	-1.41	2.48	-1.73
			Max. Vx	20	-1.43	-1.74	2.49
		Diagonal	Max Tension	11	11.04	0.04	-0.01
			Max. Compression	26	-11.27	0.00	0.00
			Max. Mx	32	4.26	0.14	0.03
			Max. My	27	-9.28	-0.05	-0.05
			Max. Vy	50	-0.07	0.14	0.03
			Max. Vx	10	-0.01	-0.04	0.05
		Secondary Horizontal	Max Tension	30	1.46	0.00	0.00
			Max. Compression	7	-1.51	0.02	0.02
			Max. Mx	48	0.19	0.06	0.01
			Max. My	13	-1.37	-0.01	-0.02
			Max. Vy	48	0.05	0.06	0.01
			Max. Vx	32	-0.01	-0.00	-0.02
T9	120 - 110	Leg	Max Tension	31	112.79	-1.80	-1.96
			Max. Compression	30	-123.76	-0.50	-0.50
			Max. Mx	6	-7.10	4.71	-4.48
			Max. My	28	22.62	-4.18	4.73
			Max. Vy	30	-1.14	4.66	-4.48
			Max. Vx	14	-1.14	-4.45	4.64
		Diagonal	Max Tension	10	12.08	0.00	0.00
			Max. Compression	26	-12.14	0.00	0.00
			Max. Mx	28	7.08	0.09	-0.01
			Max. My	26	-12.11	-0.01	-0.05
			Max. Vy	48	0.07	0.09	0.01
			Max. Vx	26	-0.01	0.00	0.00
		Horizontal	Max Tension	27	0.79	0.00	0.00
			Max. Compression	27	-0.94	-0.08	0.00
			Max. Mx	43	-0.27	-0.65	0.02
			Max. My	35	-0.25	-0.65	0.02
			Max. Vy	43	-0.19	0.00	0.00
			Max. Vx	35	-0.01	0.00	0.00
		Secondary Horizontal	Max Tension	30	1.86	0.00	0.00
			Max. Compression	30	-1.86	-0.01	-0.01
			Max. Mx	36	0.03	0.05	0.01

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. My	32	-0.61	0.03	0.02
			Max. Vy	36	-0.05	0.05	0.01
			Max. Vx	32	0.00	0.00	0.00
		Inner Bracing	Max Tension	14	0.08	0.00	0.00
			Max. Compression	14	-0.08	0.00	0.00
			Max. Mx	34	0.00	-0.18	0.00
			Max. My	47	0.00	0.00	0.00
			Max. Vy	34	0.08	0.00	0.00
			Max. Vx	47	-0.00	0.00	0.00
T10	110 - 100	Leg	Max Tension	31	137.85	-2.46	-2.46
			Max. Compression	30	-150.90	-1.83	-1.69
			Max. Mx	24	-139.92	3.04	2.12
			Max. My	4	-140.85	2.12	3.05
			Max. Vy	18	1.13	0.19	1.04
			Max. Vx	32	1.12	1.12	0.72
		Diagonal	Max Tension	11	14.89	0.06	-0.01
			Max. Compression	26	-15.15	0.00	0.00
			Max. Mx	50	1.02	0.18	0.03
			Max. My	11	-11.99	-0.05	0.04
			Max. Vy	50	-0.08	0.18	0.03
			Max. Vx	35	-0.01	0.00	0.00
		Secondary Horizontal	Max Tension	30	2.27	0.00	0.00
			Max. Compression	30	-2.27	0.01	-0.02
			Max. Mx	48	0.25	0.07	0.01
			Max. My	5	-2.10	-0.00	-0.02
			Max. Vy	48	0.06	0.07	0.01
			Max. Vx	49	0.00	0.00	0.00
T11	100 - 90	Leg	Max Tension	31	167.15	-2.05	-2.09
			Max. Compression	30	-182.53	-1.29	-1.36
			Max. Mx	8	35.02	6.52	-5.51
			Max. My	28	34.04	-5.52	6.52
			Max. Vy	8	-1.34	6.52	-5.51
			Max. Vx	20	-1.35	-5.45	6.46
		Diagonal	Max Tension	10	14.41	0.00	0.00
			Max. Compression	26	-14.51	0.00	0.00
			Max. Mx	28	8.24	0.13	0.00
			Max. My	26	-14.47	-0.03	-0.05
			Max. Vy	48	0.08	0.12	0.02
			Max. Vx	26	0.01	0.00	0.00
		Horizontal	Max Tension	2	1.53	0.00	0.00
			Max. Compression	3	-1.63	-0.15	0.01
			Max. Mx	35	-0.15	-0.86	0.03
			Max. My	35	-0.15	-0.86	0.03
			Max. Vy	35	-0.22	0.00	0.00
			Max. Vx	35	-0.01	0.00	0.00
		Inner Bracing	Max Tension	30	0.10	0.00	0.00
			Max. Compression	30	-0.10	0.00	0.00
			Max. Mx	34	0.00	-0.24	0.00
			Max. My	47	0.00	0.00	0.00
			Max. Vy	34	-0.09	0.00	0.00
			Max. Vx	47	0.00	0.00	0.00
T12	90 - 80	Leg	Max Tension	31	195.61	-1.99	-2.12
			Max. Compression	30	-212.57	-1.16	-1.07
			Max. Mx	26	-141.85	3.35	-0.17
			Max. My	10	-144.99	-0.09	3.33
			Max. Vy	24	1.10	-1.99	-1.79
			Max. Vx	4	1.11	-1.84	-1.98
		Diagonal	Max Tension	11	15.97	0.06	-0.00
			Max. Compression	26	-16.30	0.00	0.00
			Max. Mx	50	1.37	0.20	0.03

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	-14.79	-0.04	-0.04
			Max. Vy	50	-0.09	0.20	0.03
			Max. Vx	48	-0.01	0.00	0.00
		Secondary Horizontal	Max Tension	30	3.19	0.00	0.00
			Max. Compression	30	-3.19	0.02	-0.02
			Max. Mx	48	0.27	0.11	0.02
			Max. My	5	-2.98	0.00	-0.02
			Max. Vy	48	0.08	0.11	0.02
			Max. Vx	42	-0.01	0.00	0.00
T13	80 - 60	Leg	Max Tension	31	253.87	1.84	0.15
			Max. Compression	30	-275.05	6.65	-0.09
			Max. Mx	49	-119.82	7.70	-0.84
			Max. My	6	-12.27	-0.72	6.39
			Max. Vy	37	-1.28	7.68	1.03
			Max. Vx	6	-1.18	-0.72	6.39
		Diagonal	Max Tension	19	15.87	0.00	0.00
			Max. Compression	10	-16.35	0.00	0.00
			Max. Mx	48	2.62	-0.19	0.04
			Max. My	35	-2.14	-0.19	-0.04
			Max. Vy	48	-0.10	-0.19	0.04
			Max. Vx	35	-0.01	0.00	0.00
		Top Girt	Max Tension	35	1.53	0.00	0.00
			Max. Compression	27	-0.97	-0.20	0.01
			Max. Mx	35	1.07	-1.18	0.04
			Max. My	35	1.07	-1.18	0.04
			Max. Vy	35	-0.25	0.00	0.00
			Max. Vx	35	-0.01	0.00	0.00
		Inner Bracing	Max Tension	30	0.13	0.00	0.00
			Max. Compression	30	-0.13	0.00	0.00
			Max. Mx	34	0.00	0.39	0.00
			Max. My	47	0.00	0.00	-0.00
			Max. Vy	34	0.13	0.00	0.00
			Max. Vx	47	-0.00	0.00	0.00
T14	60 - 50	Leg	Max Tension	31	279.87	-0.25	-0.13
			Max. Compression	30	-304.33	0.57	0.29
			Max. Mx	41	36.79	-8.21	0.85
			Max. My	7	-11.22	-0.91	8.82
			Max. Vy	41	1.48	-8.21	0.85
			Max. Vx	7	-1.48	-0.91	8.82
		Diagonal	Max Tension	18	15.90	0.00	0.00
			Max. Compression	18	-16.01	0.00	0.00
			Max. Mx	49	2.90	-0.17	-0.03
			Max. My	48	-5.14	-0.15	-0.04
			Max. Vy	49	-0.11	-0.17	-0.03
			Max. Vx	48	-0.01	0.00	0.00
		Horizontal	Max Tension	35	3.91	0.00	0.00
			Max. Compression	27	-1.67	0.32	-0.02
			Max. Mx	35	3.21	1.12	-0.05
			Max. My	35	3.21	1.12	-0.05
			Max. Vy	35	-0.24	0.00	0.00
			Max. Vx	35	-0.01	0.00	0.00
		Inner Bracing	Max Tension	30	0.15	0.00	0.00
			Max. Compression	31	-0.15	0.00	0.00
			Max. Mx	34	0.00	0.49	0.00
			Max. My	49	0.01	0.00	0.00
			Max. Vy	34	-0.15	0.00	0.00
			Max. Vx	49	-0.00	0.00	0.00
T15	50 - 40	Leg	Max Tension	31	306.48	2.00	0.25
			Max. Compression	30	-332.57	2.11	-0.17
			Max. Mx	49	-142.37	-7.99	1.03

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. My	20	65.76	0.55	-4.77
			Max. Vy	30	-2.23	6.36	0.02
			Max. Vx	32	-1.21	0.58	4.77
		Diagonal	Max Tension	19	16.67	-0.09	-0.01
			Max. Compression	18	-17.86	0.00	0.00
			Max. Mx	50	0.63	-0.30	0.03
			Max. My	49	0.86	-0.29	-0.03
			Max. Vy	50	-0.15	-0.30	0.03
			Max. Vx	48	0.01	0.00	0.00
		Secondary Horizontal	Max Tension	30	4.99	0.00	0.00
			Max. Compression	30	-4.99	0.05	0.00
			Max. Mx	40	0.74	0.23	0.05
			Max. My	36	-0.13	0.23	0.06
			Max. Vy	40	0.12	0.23	0.05
			Max. Vx	42	-0.01	0.00	0.00
T16	40 - 30	Leg	Max Tension	31	330.92	-2.71	-2.22
			Max. Compression	30	-361.17	1.60	1.16
			Max. Mx	4	-106.76	7.46	-5.89
			Max. My	16	-103.59	-5.96	7.47
			Max. Vy	4	-1.72	7.46	-5.89
			Max. Vx	16	-1.73	-5.96	7.47
		Diagonal	Max Tension	5	17.19	-0.13	-0.01
			Max. Compression	20	-17.58	0.00	0.00
			Max. Mx	48	1.41	-0.24	-0.03
			Max. My	40	-8.03	-0.19	0.04
			Max. Vy	48	-0.14	-0.24	-0.03
			Max. Vx	40	0.01	0.00	0.00
		Secondary Horizontal	Max Tension	30	5.42	0.00	0.00
			Max. Compression	30	-5.42	0.01	0.00
			Max. Mx	42	-0.39	0.14	0.06
			Max. My	49	-0.73	0.12	0.06
			Max. Vy	42	0.11	0.14	0.06
			Max. Vx	49	-0.01	0.00	0.00
		Top Girt	Max Tension	35	5.20	0.00	0.00
			Max. Compression	27	-1.75	0.43	-0.03
			Max. Mx	35	4.51	1.10	-0.05
			Max. My	35	4.52	1.10	-0.05
			Max. Vy	35	-0.23	0.00	0.00
			Max. Vx	35	-0.01	0.00	0.00
		Inner Bracing	Max Tension	31	0.20	0.00	0.00
			Max. Compression	31	-0.20	0.00	0.00
			Max. Mx	34	0.00	0.60	0.00
			Max. My	49	0.02	0.00	0.00
			Max. Vy	34	-0.16	0.00	0.00
			Max. Vx	49	-0.00	0.00	0.00
T17	30 - 20	Leg	Max Tension	31	359.79	-3.68	-4.08
			Max. Compression	30	-392.23	0.04	0.22
			Max. Mx	18	-267.93	6.21	1.06
			Max. My	2	-265.18	0.94	6.25
			Max. Vy	16	2.03	-3.48	-3.16
			Max. Vx	4	2.03	-3.11	-3.45
		Diagonal	Max Tension	19	18.14	-0.12	-0.00
			Max. Compression	18	-18.76	0.00	0.00
			Max. Mx	49	3.87	-0.35	-0.04
			Max. My	49	3.87	-0.35	-0.04
			Max. Vy	49	-0.16	-0.34	0.03
			Max. Vx	49	0.01	0.00	0.00
		Secondary Horizontal	Max Tension	30	5.89	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Compression	30	-5.89	0.07	-0.01
			Max. Mx	40	0.93	0.27	0.05
			Max. My	50	-0.24	0.26	0.05
			Max. Vy	40	0.13	0.27	0.05
			Max. Vx	50	-0.01	0.00	0.00
T18	20 - 10	Leg	Max Tension	31	384.41	-3.97	-3.37
			Max. Compression	30	-416.76	1.01	0.84
			Max. Mx	32	367.13	-4.46	-3.04
			Max. My	20	359.58	-2.97	-4.45
			Max. Vy	30	-1.58	2.94	2.71
			Max. Vx	22	-1.56	2.66	2.89
		Diagonal	Max Tension	5	19.69	-0.13	0.00
			Max. Compression	8	-22.41	0.00	0.00
			Max. Mx	49	-1.78	-0.30	-0.05
			Max. My	35	-9.51	-0.28	-0.07
			Max. Vy	49	-0.16	-0.30	-0.05
			Max. Vx	35	0.01	0.00	0.00
		Horizontal	Max Tension	50	7.96	0.00	0.00
			Max. Compression	27	-1.72	0.61	-0.04
			Max. Mx	35	6.72	0.96	-0.04
			Max. My	2	-0.21	0.77	-0.05
			Max. Vy	35	-0.21	0.00	0.00
			Max. Vx	35	-0.01	0.00	0.00
		Secondary Horizontal	Max Tension	30	6.26	0.00	0.00
			Max. Compression	30	-6.26	0.04	0.01
			Max. Mx	50	-0.42	0.20	0.09
			Max. My	42	1.34	0.19	0.09
			Max. Vy	50	-0.13	0.20	0.09
			Max. Vx	42	0.02	0.00	0.00
		Inner Bracing	Max Tension	8	0.06	0.00	0.00
			Max. Compression	32	-0.04	0.00	0.00
			Max. Mx	34	0.00	0.75	0.00
			Max. My	49	0.01	0.00	0.00
			Max. Vy	34	-0.18	0.00	0.00
			Max. Vx	49	-0.00	0.00	0.00
T19	10 - 0	Leg	Max Tension	31	391.05	-2.64	-2.78
			Max. Compression	30	-427.78	0.00	-0.00
			Max. Mx	18	-292.68	4.37	0.56
			Max. My	2	-289.76	0.49	4.40
			Max. Vy	32	1.49	-2.97	-2.79
			Max. Vx	20	1.47	-2.67	-2.96
		Diagonal	Max Tension	17	28.67	-0.06	0.04
			Max. Compression	20	-29.75	0.00	0.00
			Max. Mx	48	2.97	-0.09	-0.03
			Max. My	50	-8.71	-0.07	-0.06
			Max. Vy	48	-0.08	-0.09	-0.03
			Max. Vx	50	-0.01	0.00	0.00
		Horizontal	Max Tension	8	21.34	-0.12	-0.02
			Max. Compression	17	-19.05	-0.04	0.02
			Max. Mx	47	6.32	-0.25	-0.02
			Max. My	10	-4.36	-0.15	-0.04
			Max. Vy	47	0.15	-0.25	-0.02
			Max. Vx	10	-0.01	0.00	0.00
		Redund Horz 1 Bracing	Max Tension	30	6.42	0.00	0.00
			Max. Compression	30	-6.42	0.00	0.00
			Max. Mx	40	2.75	-0.04	0.00
			Max. My	42	0.32	0.00	0.00
			Max. Vy	40	-0.04	0.00	0.00
			Max. Vx	42	-0.00	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
		Redund Diag 1 Bracing	Max Tension	3	7.94	0.00	0.00
			Max. Compression	26	-8.42	0.00	0.00
			Max. Mx	50	2.18	-0.06	0.00
			Max. My	42	4.96	0.00	0.00
			Max. Vy	50	-0.04	0.00	0.00
			Max. Vx	42	-0.00	0.00	0.00
		Redund Hip 1 Bracing	Max Tension	19	0.00	0.00	0.00
			Max. Compression	30	-0.04	0.00	0.00
			Max. Mx	34	-0.00	-0.08	0.00
			Max. Vy	34	-0.05	0.00	0.00
		Redund Sub Horz Bracing	Max Tension	3	8.96	0.00	0.00
			Max. Compression	26	-9.79	0.00	0.00
			Max. Mx	34	3.78	-0.22	0.00
			Max. My	34	3.78	0.00	0.01
			Max. Vy	34	0.10	0.00	0.00
			Max. Vx	34	-0.00	0.00	0.00
		Inner Bracing	Max Tension	30	0.18	0.00	0.00
			Max. Compression	30	-0.19	0.00	0.00
			Max. Mx	34	-0.01	0.78	0.00
			Max. My	47	-0.01	0.00	-0.00
			Max. Vy	34	0.18	0.00	0.00
			Max. Vx	47	-0.00	0.00	0.00

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Leg D	Max. Vert	22	458.59	32.45	-33.81
	Max. H_x	24	443.79	33.83	-30.29
	Max. H_z	5	-405.69	-27.30	33.56
	Min. Vert	7	-420.66	-30.93	32.18
	Min. H_x	9	-405.78	-32.34	28.52
	Min. H_z	20	443.71	28.96	-35.14
Leg C	Max. Vert	14	464.46	-33.86	-33.07
	Max. H_x	29	-412.61	33.47	28.14
	Max. H_z	33	-412.53	28.99	32.61
	Min. Vert	31	-427.72	32.38	31.50
	Min. H_x	12	449.43	-34.92	-29.85
	Min. H_z	16	449.36	-30.61	-34.15
Leg B	Max. Vert	6	459.39	-33.82	32.47
	Max. H_x	25	-405.17	33.34	-27.49
	Max. H_z	4	444.51	-30.51	33.64
	Min. Vert	23	-420.06	32.19	-30.89
	Min. H_x	8	444.59	-34.94	29.21
	Min. H_z	21	-405.09	28.74	-32.08
Leg A	Max. Vert	30	466.60	33.12	33.93
	Max. H_x	28	451.57	34.54	30.35
	Max. H_z	32	451.50	29.56	35.31
	Min. Vert	15	-426.11	-31.47	-32.31
	Min. H_x	13	-411.00	-32.93	-28.58
	Min. H_z	17	-410.92	-27.77	-33.74

Tower Mast Reaction Summary

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 Only	74.34	0.00	0.00	-21.66	9.91	0.00
1.2 Dead+1.6 Wind 0 deg - No Ice	89.20	-0.53	-111.06	-10535.48	94.11	-53.78
0.9 Dead+1.6 Wind 0 deg - No Ice	66.90	-0.53	-111.06	-10522.34	91.07	-53.77
1.2 Dead+1.6 Wind 30 deg - No Ice	89.20	58.25	-101.38	-9542.73	-5438.97	-52.51
0.9 Dead+1.6 Wind 30 deg - No Ice	66.90	58.25	-101.38	-9530.23	-5438.53	-52.49
1.2 Dead+1.6 Wind 45 deg - No Ice	89.20	82.66	-82.62	-7771.89	-7739.37	-46.44
0.9 Dead+1.6 Wind 45 deg - No Ice	66.90	82.66	-82.62	-7760.51	-7737.49	-46.41
1.2 Dead+1.6 Wind 60 deg - No Ice	89.20	101.43	-58.23	-5473.19	-9511.53	-37.20
0.9 Dead+1.6 Wind 60 deg - No Ice	66.90	101.43	-58.23	-5463.24	-9508.54	-37.16
1.2 Dead+1.6 Wind 90 deg - No Ice	89.20	111.10	0.53	55.97	-10505.46	-11.89
0.9 Dead+1.6 Wind 90 deg - No Ice	66.90	111.10	0.53	62.44	-10501.83	-11.84
1.2 Dead+1.6 Wind 120 deg - No Ice	89.20	101.95	59.15	5563.14	-9593.71	16.59
0.9 Dead+1.6 Wind 120 deg - No Ice	66.90	101.95	59.15	5566.17	-9590.65	16.63
1.2 Dead+1.6 Wind 135 deg - No Ice	89.20	83.40	83.37	7835.79	-7855.57	29.61
0.9 Dead+1.6 Wind 135 deg - No Ice	66.90	83.40	83.37	7837.39	-7853.61	29.64
1.2 Dead+1.6 Wind 150 deg - No Ice	89.20	59.17	101.91	9572.65	-5581.26	40.62
0.9 Dead+1.6 Wind 150 deg - No Ice	66.90	59.17	101.91	9573.16	-5580.72	40.63
1.2 Dead+1.6 Wind 180 deg - No Ice	89.20	0.53	111.06	10483.33	-70.12	53.77
0.9 Dead+1.6 Wind 180 deg - No Ice	66.90	0.53	111.06	10483.26	-73.04	53.77
1.2 Dead+1.6 Wind 210 deg - No Ice	89.20	-58.25	101.38	9490.46	5463.00	52.53
0.9 Dead+1.6 Wind 210 deg - No Ice	66.90	-58.25	101.38	9491.03	5456.61	52.50
1.2 Dead+1.6 Wind 225 deg - No Ice	89.20	-82.66	82.62	7719.56	7763.35	46.44
0.9 Dead+1.6 Wind 225 deg - No Ice	66.90	-82.66	82.62	7721.25	7755.52	46.40
1.2 Dead+1.6 Wind 240 deg - No Ice	89.20	-101.43	58.23	5420.81	9535.45	37.19
0.9 Dead+1.6 Wind 240 deg - No Ice	66.90	-101.43	58.23	5423.95	9526.50	37.15
1.2 Dead+1.6 Wind 270 deg - No Ice	89.20	-111.10	-0.53	-108.27	10529.26	11.90
0.9 Dead+1.6 Wind 270 deg - No Ice	66.90	-111.10	-0.53	-101.67	10519.67	11.85
1.2 Dead+1.6 Wind 300 deg - No Ice	89.20	-101.95	-59.15	-5615.33	9617.49	-16.57

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+1.6 Wind 300 deg - No Ice	66.90	-101.95	-59.15	-5605.28	9608.48	-16.61
1.2 Dead+1.6 Wind 315 deg - No Ice	89.20	-83.40	-83.37	-7887.92	7879.39	-29.61
0.9 Dead+1.6 Wind 315 deg - No Ice	66.90	-83.40	-83.37	-7876.44	7871.47	-29.64
1.2 Dead+1.6 Wind 330 deg - No Ice	89.20	-59.17	-101.91	-9624.76	5605.16	-40.63
0.9 Dead+1.6 Wind 330 deg - No Ice	66.90	-59.17	-101.91	-9612.19	5598.66	-40.64
1.2 Dead+1.0 Ice+1.0 Temp	270.62	-0.00	-0.00	-9.95	137.22	0.01
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	270.62	-0.06	-35.38	-3295.26	147.49	-42.80
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	270.62	18.27	-31.69	-2910.70	-1532.35	-30.37
1.2 Dead+1.0 Wind 45 deg+1.0 Ice+1.0 Temp	270.62	25.87	-25.86	-2375.34	-2229.23	-21.32
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	270.62	31.70	-18.26	-1678.78	-2764.83	-10.82
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	270.62	35.39	0.06	0.32	-3149.61	12.14
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	270.62	31.77	18.37	1676.65	-2775.07	30.97
1.2 Dead+1.0 Wind 135 deg+1.0 Ice+1.0 Temp	270.62	25.96	25.95	2369.92	-2243.75	37.78
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	270.62	18.38	31.76	2901.07	-1550.10	42.02
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	270.62	0.06	35.38	3275.37	126.99	42.82
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	270.62	-18.27	31.69	2890.79	1806.82	30.40
1.2 Dead+1.0 Wind 225 deg+1.0 Ice+1.0 Temp	270.62	-25.87	25.86	2355.43	2503.68	21.35
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	270.62	-31.70	18.26	1658.87	3039.28	10.85
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	270.62	-35.39	-0.06	-20.20	3424.04	-12.11
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	270.62	-31.77	-18.37	-1696.52	3049.53	-30.95
1.2 Dead+1.0 Wind 315 deg+1.0 Ice+1.0 Temp	270.62	-25.96	-25.95	-2389.83	2518.17	-37.76
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	270.62	-18.38	-31.76	-2920.94	1824.57	-41.99
Dead+Wind 0 deg - Service	74.34	-0.12	-25.12	-2398.08	28.48	-12.16
Dead+Wind 30 deg - Service	74.34	13.18	-22.93	-2173.60	-1222.65	-11.88
Dead+Wind 45 deg - Service	74.34	18.70	-18.69	-1773.18	-1742.79	-10.50
Dead+Wind 60 deg - Service	74.34	22.94	-13.17	-1253.40	-2143.50	-8.41
Dead+Wind 90 deg - Service	74.34	25.13	0.12	-3.15	-2368.29	-2.68
Dead+Wind 120 deg - Service	74.34	23.06	13.38	1242.11	-2162.07	3.75
Dead+Wind 135 deg - Service	74.34	18.87	18.86	1755.99	-1769.06	6.71
Dead+Wind 150 deg - Service	74.34	13.38	23.05	2148.72	-1254.81	9.19
Dead+Wind 180 deg - Service	74.34	0.12	25.12	2354.69	-8.65	12.16
Dead+Wind 210 deg - Service	74.34	-13.18	22.93	2130.14	1242.50	11.88
Dead+Wind 225 deg - Service	74.34	-18.70	18.69	1729.72	1762.64	10.50
Dead+Wind 240 deg - Service	74.34	-22.94	13.17	1209.95	2163.35	8.41
Dead+Wind 270 deg - Service	74.34	-25.13	-0.12	-40.29	2388.12	2.69
Dead+Wind 300 deg - Service	74.34	-23.06	-13.38	-1285.55	2181.91	-3.76
Dead+Wind 315 deg - Service	74.34	-18.87	-18.86	-1799.44	1788.93	-6.70
Dead+Wind 330 deg - Service	74.34	-13.38	-23.05	-2192.18	1274.67	-9.19

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
1	0.00	-74.34	0.00	-0.00	74.34	-0.00	0.000%
2	-0.53	-89.20	-111.06	0.53	89.20	111.06	0.000%
3	-0.53	-66.90	-111.06	0.53	66.90	111.06	0.000%
4	58.25	-89.20	-101.38	-58.25	89.20	101.38	0.000%
5	58.25	-66.90	-101.38	-58.25	66.90	101.38	0.000%
6	82.66	-89.20	-82.62	-82.66	89.20	82.62	0.000%
7	82.66	-66.90	-82.62	-82.66	66.90	82.62	0.000%
8	101.43	-89.20	-58.23	-101.43	89.20	58.23	0.000%
9	101.43	-66.90	-58.23	-101.43	66.90	58.23	0.000%
10	111.10	-89.20	0.53	-111.10	89.20	-0.53	0.000%
11	111.10	-66.90	0.53	-111.10	66.90	-0.53	0.000%
12	101.95	-89.20	59.14	-101.95	89.20	-59.15	0.000%
13	101.95	-66.90	59.14	-101.95	66.90	-59.15	0.000%
14	83.40	-89.20	83.37	-83.40	89.20	-83.37	0.000%
15	83.40	-66.90	83.37	-83.40	66.90	-83.37	0.001%
16	59.17	-89.20	101.91	-59.17	89.20	-101.91	0.000%
17	59.17	-66.90	101.91	-59.17	66.90	-101.91	0.000%
18	0.53	-89.20	111.06	-0.53	89.20	-111.06	0.000%
19	0.53	-66.90	111.06	-0.53	66.90	-111.06	0.000%
20	-58.25	-89.20	101.38	58.25	89.20	-101.38	0.000%
21	-58.25	-66.90	101.38	58.25	66.90	-101.38	0.000%
22	-82.66	-89.20	82.62	82.66	89.20	-82.62	0.000%
23	-82.66	-66.90	82.62	82.66	66.90	-82.62	0.000%
24	-101.43	-89.20	58.23	101.43	89.20	-58.23	0.000%
25	-101.43	-66.90	58.23	101.43	66.90	-58.23	0.000%
26	-111.10	-89.20	-0.53	111.10	89.20	0.53	0.000%
27	-111.10	-66.90	-0.53	111.10	66.90	0.53	0.000%
28	-101.95	-89.20	-59.14	101.95	89.20	59.15	0.000%
29	-101.95	-66.90	-59.14	101.95	66.90	59.15	0.000%
30	-83.40	-89.20	-83.37	83.40	89.20	83.37	0.000%
31	-83.40	-66.90	-83.37	83.40	66.90	83.37	0.001%
32	-59.17	-89.20	-101.91	59.17	89.20	101.91	0.000%
33	-59.17	-66.90	-101.91	59.17	66.90	101.91	0.000%
34	0.00	-270.62	0.00	0.00	270.62	0.00	0.000%
35	-0.06	-270.62	-35.38	0.06	270.62	35.38	0.000%
36	18.27	-270.62	-31.69	-18.27	270.62	31.69	0.000%
37	25.87	-270.62	-25.86	-25.87	270.62	25.86	0.000%
38	31.70	-270.62	-18.26	-31.70	270.62	18.26	0.000%
39	35.39	-270.62	0.06	-35.39	270.62	-0.06	0.000%
40	31.77	-270.62	18.37	-31.77	270.62	-18.37	0.000%
41	25.96	-270.62	25.95	-25.96	270.62	-25.95	0.000%
42	18.38	-270.62	31.76	-18.38	270.62	-31.76	0.000%
43	0.06	-270.62	35.38	-0.06	270.62	-35.38	0.000%
44	-18.27	-270.62	31.69	18.27	270.62	-31.69	0.000%
45	-25.87	-270.62	25.86	25.87	270.62	-25.86	0.000%
46	-31.70	-270.62	18.26	31.70	270.62	-18.26	0.000%
47	-35.39	-270.62	-0.06	35.39	270.62	0.06	0.000%
48	-31.77	-270.62	-18.37	31.77	270.62	18.37	0.000%
49	-25.96	-270.62	-25.95	25.96	270.62	25.95	0.000%
50	-18.38	-270.62	-31.76	18.38	270.62	31.76	0.000%
51	-0.12	-74.34	-25.12	0.12	74.34	25.12	0.000%
52	13.18	-74.34	-22.93	-13.18	74.34	22.93	0.000%
53	18.70	-74.34	-18.69	-18.70	74.34	18.69	0.000%
54	22.94	-74.34	-13.17	-22.94	74.34	13.17	0.000%
55	25.13	-74.34	0.12	-25.13	74.34	-0.12	0.000%
56	23.06	-74.34	13.38	-23.06	74.34	-13.38	0.000%

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
57	18.87	-74.34	18.86	-18.87	74.34	-18.86	0.000%
58	13.38	-74.34	23.05	-13.38	74.34	-23.05	0.000%
59	0.12	-74.34	25.12	-0.12	74.34	-25.12	0.000%
60	-13.18	-74.34	22.93	13.18	74.34	-22.93	0.000%
61	-18.70	-74.34	18.69	18.70	74.34	-18.69	0.000%
62	-22.94	-74.34	13.17	22.94	74.34	-13.17	0.000%
63	-25.13	-74.34	-0.12	25.13	74.34	0.12	0.000%
64	-23.06	-74.34	-13.38	23.06	74.34	13.38	0.000%
65	-18.87	-74.34	-18.86	18.87	74.34	18.86	0.000%
66	-13.38	-74.34	-23.05	13.38	74.34	23.05	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00074385
2	Yes	9	0.00082806	0.00025549
3	Yes	11	0.00086552	0.00019860
4	Yes	7	0.00073675	0.00026058
5	Yes	8	0.00075623	0.00020409
6	Yes	6	0.00061122	0.00024635
7	Yes	6	0.00068405	0.00022003
8	Yes	7	0.00099253	0.00026127
9	Yes	8	0.00084504	0.00016696
10	Yes	10	0.00099731	0.00022594
11	Yes	12	0.00091930	0.00015288
12	Yes	8	0.00074944	0.00019655
13	Yes	8	0.00088574	0.00017347
14	Yes	6	0.00063844	0.00025334
15	Yes	6	0.00071629	0.00022695
16	Yes	7	0.00074039	0.00026156
17	Yes	8	0.00076796	0.00020661
18	Yes	9	0.00080168	0.00024877
19	Yes	11	0.00083849	0.00019328
20	Yes	7	0.00071672	0.00025509
21	Yes	8	0.00073705	0.00019984
22	Yes	6	0.00061244	0.00024537
23	Yes	6	0.00068209	0.00021856
24	Yes	8	0.00073101	0.00019248
25	Yes	8	0.00085942	0.00016910
26	Yes	11	0.00082678	0.00018405
27	Yes	12	0.00093526	0.00015507
28	Yes	8	0.00075758	0.00019815
29	Yes	8	0.00089316	0.00017459
30	Yes	6	0.00064752	0.00025635
31	Yes	6	0.00072585	0.00022950
32	Yes	7	0.00076007	0.00026673
33	Yes	8	0.00078703	0.00021067
34	Yes	7	0.00000001	0.00055796
35	Yes	7	0.00034913	0.00043134
36	Yes	6	0.00078851	0.00099554
37	Yes	6	0.00076543	0.00097727
38	Yes	6	0.00074412	0.00095783
39	Yes	6	0.00073631	0.00094843
40	Yes	6	0.00074993	0.00096129
41	Yes	6	0.00077454	0.00098347

42	Yes	7	0.00033867	0.00042085
43	Yes	7	0.00035688	0.00043630
44	Yes	6	0.00079003	0.00098617
45	Yes	6	0.00075900	0.00095751
46	Yes	6	0.00073335	0.00093136
47	Yes	6	0.00071668	0.00091293
48	Yes	6	0.00072260	0.00092317
49	Yes	6	0.00074387	0.00094614
50	Yes	6	0.00077176	0.00097276
51	Yes	4	0.00000001	0.00040248
52	Yes	4	0.00000001	0.00036934
53	Yes	4	0.00000001	0.00033836
54	Yes	4	0.00000001	0.00031321
55	Yes	4	0.00000001	0.00029772
56	Yes	4	0.00000001	0.00031258
57	Yes	4	0.00000001	0.00033716
58	Yes	4	0.00000001	0.00036822
59	Yes	4	0.00000001	0.00040436
60	Yes	4	0.00000001	0.00036878
61	Yes	4	0.00000001	0.00033705
62	Yes	4	0.00000001	0.00031192
63	Yes	4	0.00000001	0.00029684
64	Yes	4	0.00000001	0.00031197
65	Yes	4	0.00000001	0.00033621
66	Yes	4	0.00000001	0.00036680

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	180 - 170	3.043	66	0.1340	0.0079
T2	170 - 163.573	2.732	66	0.1330	0.0076
T3	163.573 - 159.049	2.533	66	0.1308	0.0073
T4	159.049 - 154.524	2.394	66	0.1288	0.0068
T5	154.524 - 150	2.258	66	0.1253	0.0064
T6	150 - 140	2.126	66	0.1211	0.0061
T7	140 - 130	1.851	66	0.1103	0.0057
T8	130 - 120	1.601	65	0.1014	0.0057
T9	120 - 110	1.373	65	0.0912	0.0056
T10	110 - 100	1.166	65	0.0823	0.0048
T11	100 - 90	0.979	65	0.0727	0.0043
T12	90 - 80	0.811	65	0.0642	0.0039
T13	80 - 60	0.661	65	0.0553	0.0034
T14	60 - 50	0.404	65	0.0452	0.0023
T15	50 - 40	0.292	65	0.0400	0.0018
T16	40 - 30	0.200	65	0.0345	0.0015
T17	30 - 20	0.123	65	0.0261	0.0012
T18	20 - 10	0.064	65	0.0175	0.0009
T19	10 - 0	0.023	57	0.0086	0.0006

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
185.00	Lightning Rod 2"x15'	66	3.043	0.1340	0.0079	631864
183.00	SC479-HF1LDF (D00-E5764)	66	3.043	0.1340	0.0079	631864
181.00	TMA 432-83H-01T - Future Decom.	66	3.043	0.1340	0.0079	631864
180.00	SC479-HF1LDF (D00I-E5764)	66	3.043	0.1340	0.0079	631864
175.00	6' PAD w/ Radome	66	2.887	0.1338	0.0077	631864
174.00	SC479-HF1LDF (D00I-E5764)	66	2.856	0.1337	0.0077	529294
173.00	6' PAD w/ Radome	66	2.825	0.1335	0.0076	467913
170.00	6' PAD w/ Radome	66	2.732	0.1330	0.0076	505110
169.00	BA1010-2	66	2.701	0.1327	0.0075	678591
168.00	SC479-HF1LDF (D00I-E5764)	66	2.670	0.1324	0.0075	Inf
163.00	T-Frame	66	2.516	0.1306	0.0072	295132
161.00	DB408-B	66	2.454	0.1298	0.0070	112192
152.00	12' Omni Antenna	66	2.183	0.1230	0.0062	54144
146.25	12' Omni Antenna	66	2.020	0.1170	0.0059	49718
140.50	12' Omni Antenna	66	1.864	0.1108	0.0057	48521
139.00	Yagi ASP-816	66	1.825	0.1093	0.0057	48800
137.00	BA1010	66	1.774	0.1075	0.0057	49667
136.50	DB222-A	66	1.761	0.1071	0.0057	49947
134.50	BA1010	66	1.711	0.1054	0.0057	51199
132.00	BA1010	66	1.649	0.1032	0.0057	52829
130.00	Dish Ice Shield	65	1.601	0.1014	0.0057	54045
129.50	BA1010	65	1.589	0.1009	0.0057	54321
128.00	PD128-1	65	1.554	0.0994	0.0057	55085
127.00	3" Dia 20' Omni	65	1.530	0.0984	0.0057	55552
125.00	6' PAD w/ Radome	65	1.484	0.0963	0.0057	56439
124.50	PD128-1	65	1.473	0.0958	0.0057	56661
122.00	3" Dia 20' Omni	65	1.417	0.0932	0.0056	57748
121.00	PD128-1	65	1.395	0.0921	0.0056	58147
117.00	3" Dia 20' Omni	65	1.309	0.0884	0.0054	59337
116.00	12' Omni Antenna	65	1.288	0.0875	0.0053	59558
112.00	3" Dia 20' Omni	65	1.206	0.0841	0.0050	60324
111.00	12' Omni Antenna	65	1.186	0.0832	0.0049	60425
107.00	3" Dia 20' Omni	65	1.108	0.0794	0.0046	60084
106.00	4' Grid Dish	65	1.089	0.0784	0.0046	59866
105.00	12' Wireless Frame	65	1.070	0.0774	0.0045	59631
101.00	DB264-A	65	0.996	0.0736	0.0043	59278
96.00	DB264-A	65	0.909	0.0692	0.0041	63260
91.00	SC479-HF1LDF	65	0.827	0.0651	0.0039	69729
86.00	DB264-A	65	0.749	0.0605	0.0037	71699
85.00	SC479-HF1LDF	65	0.734	0.0596	0.0037	71618
79.00	SC479-HF1LDF	65	0.646	0.0546	0.0034	74416
75.00	Dish Ice Shield	65	0.592	0.0521	0.0032	83864
71.00	2'6"x4" Pipe Mount	65	0.539	0.0500	0.0029	97841
61.00	GPS	65	0.415	0.0457	0.0024	146458
50.00	DB803M-Y	65	0.292	0.0400	0.0018	52020

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	180 - 170	13.310	30	0.5823	0.0349
T2	170 - 163.573	11.959	30	0.5783	0.0335
T3	163.573 - 159.049	11.095	30	0.5691	0.0323
T4	159.049 - 154.524	10.486	30	0.5607	0.0302
T5	154.524 - 150	9.892	30	0.5464	0.0285

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T6	150 - 140	9.316	30	0.5281	0.0270
T7	140 - 130	8.117	30	0.4814	0.0253
T8	130 - 120	7.023	30	0.4424	0.0254
T9	120 - 110	6.027	30	0.3979	0.0246
T10	110 - 100	5.120	30	0.3595	0.0213
T11	100 - 90	4.300	30	0.3178	0.0190
T12	90 - 80	3.564	30	0.2811	0.0172
T13	80 - 60	2.905	30	0.2425	0.0151
T14	60 - 50	1.776	30	0.1983	0.0103
T15	50 - 40	1.284	30	0.1756	0.0079
T16	40 - 30	0.881	30	0.1514	0.0065
T17	30 - 20	0.544	30	0.1144	0.0052
T18	20 - 10	0.283	30	0.0766	0.0039
T19	10 - 0	0.103	14	0.0378	0.0025

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
185.00	Lightning Rod 2"x15'	30	13.310	0.5823	0.0349	151622
183.00	SC479-HF1LDF (D00-E5764)	30	13.310	0.5823	0.0349	151622
181.00	TMA 432-83H-01T - Future Decom.	30	13.310	0.5823	0.0349	151622
180.00	SC479-HF1LDF (D00I-E5764)	30	13.310	0.5823	0.0349	151622
175.00	6' PAD w/ Radome	30	12.633	0.5815	0.0341	151622
174.00	SC479-HF1LDF (D00I-E5764)	30	12.498	0.5811	0.0340	127036
173.00	6' PAD w/ Radome	30	12.363	0.5807	0.0338	112453
170.00	6' PAD w/ Radome	30	11.959	0.5783	0.0335	127151
169.00	BA1010-2	30	11.824	0.5772	0.0334	181927
168.00	SC479-HF1LDF (D00I-E5764)	30	11.690	0.5759	0.0332	240613
163.00	T-Frame	30	11.017	0.5682	0.0321	100940
161.00	DB408-B	30	10.748	0.5648	0.0312	29724
152.00	12' Omni Antenna	30	9.568	0.5366	0.0276	12785
146.25	12' Omni Antenna	30	8.854	0.5106	0.0261	11469
140.50	12' Omni Antenna	30	8.174	0.4836	0.0253	11102
139.00	Yagi ASP-816	30	8.002	0.4772	0.0252	11154
137.00	BA1010	30	7.778	0.4693	0.0251	11347
136.50	DB222-A	30	7.722	0.4674	0.0251	11411
134.50	BA1010	30	7.502	0.4599	0.0252	11699
132.00	BA1010	30	7.234	0.4504	0.0253	12078
130.00	Dish Ice Shield	30	7.023	0.4424	0.0254	12371
129.50	BA1010	30	6.971	0.4403	0.0254	12440
128.00	PD128-1	30	6.817	0.4338	0.0254	12636
127.00	3" Dia 20' Omni	30	6.715	0.4293	0.0254	12761
125.00	6' PAD w/ Radome	30	6.514	0.4202	0.0253	13006
124.50	PD128-1	30	6.464	0.4179	0.0253	13068
122.00	3" Dia 20' Omni	30	6.219	0.4065	0.0250	13369
121.00	PD128-1	30	6.123	0.4021	0.0248	13478
117.00	3" Dia 20' Omni	30	5.746	0.3859	0.0238	13767
116.00	12' Omni Antenna	30	5.654	0.3821	0.0234	13812
112.00	3" Dia 20' Omni	30	5.295	0.3672	0.0220	13958
111.00	12' Omni Antenna	30	5.207	0.3634	0.0217	13975
107.00	3" Dia 20' Omni	30	4.865	0.3471	0.0205	13880
106.00	4' Grid Dish	30	4.781	0.3429	0.0203	13828
105.00	12' Wireless Frame	30	4.699	0.3386	0.0200	13772
101.00	DB264-A	30	4.378	0.3218	0.0192	13683
96.00	DB264-A	30	3.996	0.3029	0.0183	14586

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
91.00	SC479-HF1LDF	30	3.634	0.2848	0.0174	16051
86.00	DB264-A	30	3.292	0.2652	0.0164	16469
85.00	SC479-HF1LDF	30	3.225	0.2612	0.0162	16442
79.00	SC479-HF1LDF	30	2.843	0.2393	0.0149	17052
75.00	Dish Ice Shield	30	2.602	0.2282	0.0140	19223
71.00	2'6"x4" Pipe Mount	30	2.371	0.2192	0.0130	22444
61.00	GPS	30	1.828	0.2003	0.0106	33640
50.00	DB803M-Y	30	1.284	0.1756	0.0079	11793

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	180	Diagonal	A325X	0.6250	2	1.44	7.19	0.201 ✔	1	Member Block Shear
		Secondary Horizontal	A325X	0.6250	2	0.40	6.17	0.064 ✔	1	Member Block Shear
		Top Girt	A325X	0.6250	2	0.13	6.17	0.021 ✔	1	Member Block Shear
T2	170	Diagonal	A325X	0.6250	2	1.78	7.19	0.248 ✔	1	Member Block Shear
		Top Girt	A325X	0.6250	2	0.42	6.17	0.069 ✔	1	Member Block Shear
T3	163.573	Diagonal	A325X	0.6250	2	2.44	6.17	0.396 ✔	1	Member Block Shear
		Top Girt	A325X	0.6250	2	0.27	6.17	0.044 ✔	1	Member Block Shear
T4	159.049	Diagonal	A325X	0.6250	2	2.76	7.19	0.384 ✔	1	Member Block Shear
T5	154.524	Diagonal	A325X	0.6250	2	2.73	7.19	0.380 ✔	1	Member Block Shear
T6	150	Diagonal	A325X	0.6250	2	2.96	7.19	0.412 ✔	1	Member Block Shear
		Top Girt	A325X	0.6250	2	0.31	7.19	0.043 ✔	1	Member Block Shear
T7	140	Diagonal	A325X	0.6250	2	4.56	10.26	0.444 ✔	1	Member Block Shear
		Top Girt	A325X	0.6250	2	0.23	7.19	0.032 ✔	1	Member Block Shear
T8	130	Diagonal	A325X	0.6250	2	5.52	10.26	0.538 ✔	1	Member Block Shear
		Secondary Horizontal	A325X	0.6250	2	0.73	8.22	0.089 ✔	1	Member Block Shear
T9	120	Diagonal	A325X	0.6250	2	6.04	10.26	0.589 ✔	1	Member Block Shear
		Horizontal	A325X	0.6250	2	0.39	9.58	0.041 ✔	1	Member Block Shear
		Secondary Horizontal	A325X	0.6250	2	0.93	6.17	0.151 ✔	1	Member Block Shear
T10	110	Diagonal	A325X	0.6250	2	7.44	11.62	0.640 ✔	1	Member Block Shear
		Secondary Horizontal	A325X	0.6250	2	1.13	8.22	0.138 ✔	1	Member Block Shear
T11	100	Diagonal	A325X	0.6250	2	7.20	11.62	0.620 ✔	1	Member Block

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	A325X	0.6250	2	0.77	9.58	0.080 ✔	1	Shear Member Block Shear
T12	90	Diagonal	A325X	0.6250	2	7.98	11.62	0.687 ✔	1	Member Block Shear
		Secondary Horizontal	A325X	0.6250	2	1.60	9.58	0.166 ✔	1	Member Block Shear
T13	80	Diagonal	A325X	0.6250	2	7.94	14.38	0.552 ✔	1	Member Block Shear
		Top Girt	A325X	0.6250	2	0.77	9.58	0.080 ✔	1	Member Block Shear
T14	60	Diagonal	A325X	0.6250	2	7.95	14.38	0.553 ✔	1	Member Block Shear
		Horizontal	A325X	0.6250	2	1.95	12.34	0.158 ✔	1	Member Block Shear
T15	50	Diagonal	A325X	0.6250	2	8.93	30.37	0.294 ✔	1	Bolt Shear
		Secondary Horizontal	A325X	0.6250	2	2.50	11.62	0.215 ✔	1	Member Block Shear
T16	40	Diagonal	A325X	0.6250	2	8.59	28.75	0.299 ✔	1	Member Block Shear
		Secondary Horizontal	A325X	0.6250	2	2.71	11.62	0.233 ✔	1	Member Block Shear
		Top Girt	A325X	0.6250	2	2.60	12.34	0.211 ✔	1	Member Block Shear
T17	30	Diagonal	A325X	0.6250	2	9.07	28.75	0.316 ✔	1	Member Block Shear
		Secondary Horizontal	A325X	0.6250	2	2.94	11.62	0.253 ✔	1	Member Block Shear
T18	20	Diagonal	A325X	0.6250	2	11.20	30.37	0.369 ✔	1	Bolt Shear
		Horizontal	A325X	0.6250	2	3.98	12.34	0.323 ✔	1	Member Block Shear
		Secondary Horizontal	A325X	0.6250	2	3.13	11.62	0.269 ✔	1	Member Block Shear
T19	10	Diagonal	A325X	0.6250	2	14.34	23.96	0.598 ✔	1	Member Block Shear
		Horizontal	A325X	0.6250	2	10.67	19.17	0.557 ✔	1	Member Block Shear

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	180 - 170	L3 1/2x3 1/2x3/8	10.00	5.00	87.3 K=1.00	2.4800	-3.02	53.78	0.056 [1] ✔
T2	170 - 163.573	L5x5x5/16	6.43	6.43	77.6 K=1.00	3.0300	-10.45	69.83	0.150 [1] ✔
T3	163.573 -	L5x5x5/16	4.53	4.53	54.7	3.0300	-20.50	81.46	0.252 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
	159.049				K=1.00				✔
T4	159.049 - 154.524	L5x5x5/16	4.53	4.53	54.7 K=1.00	3.0300	-30.18	81.46	0.370 [1] ✔
T5	154.524 - 150	L5x5x5/16	4.53	4.53	54.7 K=1.00	3.0300	-38.49	81.46	0.473 [1] ✔
T6	150 - 140	L5x5x3/8	10.01	5.01	60.7 K=1.00	3.6100	-58.36	96.35	0.606 [1] ✔
T7	140 - 130	L6x6x1/2	10.01	5.23	53.2 K=1.00	5.7500	-73.96	160.53	0.461 [1] ✔
T8	130 - 120	L6x6x1/2	10.01	5.21	53.0 K=1.00	5.7500	-97.40	160.69	0.606 [1] ✔
T9	120 - 110	L6x6x3/4	10.01	5.20	53.3 K=1.00	8.4400	-123.76	235.48	0.526 [1] ✔
T10	110 - 100	L6x6x3/4	10.01	5.18	53.2 K=1.00	8.4400	-150.90	235.66	0.640 [1] ✔
T11	100 - 90	L8x8x3/4	10.01	10.01	76.0 K=1.00	11.4000	-182.54	272.41	0.670 [1] ✔
T12	90 - 80	L8x8x3/4	10.01	5.16	39.2 K=1.00	11.4000	-212.57	340.66	0.624 [1] ✔
T13	80 - 60	L8x8x1 w/ 1/2x7 Plates	20.03	10.01	48.3 K=1.00	22.0000	-275.05	630.40	0.436 [1] ✔
T14	60 - 50	L8x8x1-1/8 w/ 1/2x7 Plates	10.01	10.01	48.6 K=1.00	23.7340	-304.33	679.24	0.448 [1] ✔
T15	50 - 40	L8x8x1-1/8 w/ 1/2x7 Plates	10.01	5.13	24.9 K=1.00	23.7340	-332.57	744.33	0.447 [1] ✔
T16	40 - 30	L8x8x1 1/8	10.01	5.12	39.4 K=1.00	16.7000	-361.17	498.58	0.724 [1] ✔
T17	30 - 20	L8x8x1 1/8	10.01	5.12	39.4 K=1.00	16.7000	-392.24	498.67	0.787 [1] ✔
T18	20 - 10	L8x8x1 1/8	10.01	5.11	39.3 K=1.00	16.7000	-416.76	498.74	0.836 [1] ✔
T19	10 - 0	L8x8x1 1/8	10.01	5.01	38.5 K=1.00	16.7000	-427.77	500.44	0.855 [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	180 - 170	L2 1/2x2 1/2x3/16	11.41	5.51	130.4 K=0.98	0.9020	-3.05	11.95	0.256 [1] ✔
T2	170 - 163.573	L2 1/2x2 1/2x3/16	8.46	4.03	103.3 K=1.06	0.9020	-3.75	16.66	0.225 [1] ✔
T3	163.573 - 159.049	L2x2x3/16	7.25	3.52	110.5 K=1.03	0.7150	-5.04	12.19	0.414 [1] ✔
T4	159.049 - 154.524	L2 1/2x2x3/16	7.51	3.65	106.9 K=1.04	0.8090	-5.42	14.36	0.377 [1] ✔

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T5	154.524 - 150	L2 1/2x2x3/16	7.77	3.78	109.6 K=1.03	0.8090	-5.60	13.92	0.403 [1] ✔
T6	150 - 140	L2 1/2x2x3/16	8.61	4.21	118.8 K=1.00	0.8090	-5.97	12.47	0.479 [1] ✔
T7	140 - 130	L3x2 1/2x1/4	12.53	6.35	138.5 K=0.96	1.3100	-9.31	15.42	0.604 [1] ✔
T8	130 - 120	L3x3x1/4	12.98	6.56	129.9 K=0.98	1.4400	-11.27	19.20	0.587 [1] ✔
T9	120 - 110	L3x3x1/4	13.45	6.78	133.3 K=0.97	1.4400	-12.14	18.30	0.663 [1] ✔
T10	110 - 100	L3 1/2x3x1/4	13.94	7.02	130.3 K=0.98	1.5600	-15.15	20.69	0.732 [1] ✔
T11	100 - 90	L3 1/2x3x1/4	14.44	7.26	133.8 K=0.97	1.5600	-14.51	19.68	0.737 [1] ✔
T12	90 - 80	L3 1/2x3x1/4	14.97	7.52	137.5 K=0.96	1.5600	-16.30	18.63	0.875 [1] ✔
T13	80 - 60	2L2 1/2x2x3/16	16.07	8.06	122.4 K=1.00	1.6200	-16.35	23.87	0.685 [1] ✔
T14	60 - 50	2L2 1/2x2x3/16	16.63	8.33	126.6 K=1.00	1.6200	-16.01	22.57	0.709 [1] ✔
T15	50 - 40	2L2 1/2x2x3/8	17.21	8.62	131.2 K=0.97	3.0900	-17.86	40.44	0.442 [1] ✔
T16	40 - 30	2L2 1/2x2x3/8	17.80	8.91	134.7 K=0.97	3.0900	-17.58	38.48	0.457 [1] ✔
T17	30 - 20	2L2 1/2x2x3/8	18.40	9.21	138.2 K=0.96	3.0900	-18.76	36.54	0.513 [1] ✔
T18	20 - 10	2L2 1/2x2x3/8	19.00	9.51	141.8 K=0.95	3.0900	-22.41	34.72	0.645 [1] ✔
T19	10 - 0	2L2 1/2x2 1/2x5/16	13.37	12.47	141.2 K=1.00	2.9300	-29.75	33.21	0.896 [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 $\frac{P_u}{\phi P_n}$
T9	120 - 110	L2 1/2x2 1/2x1/4	9.12	4.11	110.3 K=1.10	1.1900	-0.94	20.33	0.046 [1] ✔
T11	100 - 90	L2 1/2x2 1/2x1/4	10.56	4.83	119.0 K=1.01	1.1900	-1.63	18.29	0.089 [1] ✔
T14	60 - 50	2L2x2x3/16	13.43	6.16	119.8 K=1.00	1.4300	-1.67	21.76	0.077 [1] ✔
T18	20 - 10	2L2x2x3/16	16.29	7.62	141.5 K=0.96	1.4300	-1.72	16.14	0.107 [1] ✔
T19	10 - 0	2L2 1/2x2 1/2x1/4	17.01	7.97	123.4 K=0.99	2.3800	-19.05	34.58	0.551 [1] ✔

[1] P_u / ϕP_n controls

Secondary 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	180 - 170	L2x2x3/16	6.00	5.31	111.7 K=1.08	0.7150	-0.80	12.02	0.067 [1] ✔
T7	140 - 130	L2x2x1/4	8.03	7.53	137.5 K=0.93	0.9380	-1.11	11.21	0.099 [1] ✔
T8	130 - 120	L2x2x1/4	8.75	7.86	141.4 K=0.91	0.9380	-1.51	10.60	0.142 [1] ✔
T9	120 - 110	L2x2x3/16	9.47	8.57	148.7 K=0.89	0.7150	-1.86	7.30	0.254 [1] ✔
T10	110 - 100	L2x2x1/4	10.19	9.29	158.8 K=0.87	0.9380	-2.27	8.40	0.270 [1] ✔
T12	90 - 80	L2 1/2x2 1/2x1/4	11.62	10.56	147.5 K=0.90	1.1900	-3.19	12.35	0.258 [1] ✔
T15	50 - 40	L3 1/2x3 1/2x1/4	14.49	13.39	136.9 K=0.93	1.6900	-4.99	20.39	0.245 [1] ✔
T16	40 - 30	L3 1/2x3 1/2x1/4	15.21	14.15	142.0 K=0.91	1.6900	-5.42	18.94	0.286 [1] ✔
T17	30 - 20	L3 1/2x3 1/2x1/4	15.93	14.87	146.9 K=0.90	1.6900	-5.89	17.70	0.333 [1] ✔
T18	20 - 10	L3 1/2x3 1/2x1/4	16.65	15.58	151.7 K=0.88	1.6900	-6.26	16.59	0.377 [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	180 - 170	L2x2x3/16	6.00	5.31	145.7 K=0.90	0.7150	-0.11	7.61	0.014 [1] ✔
T2	170 - 163.573	L2x2x3/16	6.00	5.31	145.7 K=0.90	0.7150	-0.47	7.61	0.062 [1] ✔
T3	163.573 - 159.049	L2x2x3/16	6.00	5.19	143.4 K=0.91	0.7150	-0.47	7.86	0.060 [1] ✔
T6	150 - 140	L2 1/2x2 1/2x3/16	6.97	6.16	138.1 K=0.92	0.9020	-0.55	10.69	0.052 [1] ✔
T7	140 - 130	L2 1/2x2 1/2x3/16	7.69	3.44	101.7 K=1.22	0.9020	-0.53	16.96	0.031 [1] ✔
T13	80 - 60	L2 1/2x2 1/2x1/4	11.99	5.47	130.4 K=0.98	1.1900	-0.97	15.76	0.061 [1] ✔
T16	40 - 30	2L2x2x3/16	14.86	6.88	130.5 K=0.98	1.4300	-1.75	18.89	0.093 [1] ✔

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

[1] P_u / ϕP_n controls

Redundant Horizontal (1) Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T19	10 - 0	L2 1/2x2 1/2x3/16	4.25	3.92	107.5 K=1.13	0.9020	-6.42	15.90	0.404 [1] ✔

[1] P_u / ϕP_n controls

Redundant Diagonal (1) Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T19	10 - 0	L2 1/2x2 1/2x3/16	6.45	5.92	143.6 K=1.00	0.9020	-8.42	9.88	0.853 [1] ✔

[1] P_u / ϕP_n controls

Redundant Hip (1) Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T19	10 - 0	L2 1/2x2 1/2x3/16	6.01	6.01	145.8 K=1.00	0.9020	-0.04	9.58	0.004 [1] ✔

[1] P_u / ϕP_n controls

Redundant Sub-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 $\frac{P_u}{\phi P_n}$
T19	10 - 0	L3x3x5/16	8.86	8.86	180.6 K=1.00	1.7800	-9.79	12.33	0.794 [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 $\frac{P_u}{\phi P_n}$
T7	140 - 130	L2x2x3/16	5.44	5.44	165.6 K=1.00	0.7150	-0.07	5.89	0.012 [1] ✔
T9	120 - 110	L2 1/2x2x3/16	6.45	6.45	181.3 K=1.00	0.8090	-0.08	5.56	0.015 [1] ✔
T11	100 - 90	L2 1/2x2x3/16	7.47	7.47	209.8 K=1.00	0.8090	-0.10	4.15	0.023 [1] ✔
T13	80 - 60	2L2x2x3/16	8.48	8.48	164.9 K=1.00	1.4300	-0.13	11.88	0.011 [1] ✔
T14	60 - 50	2L2x2x3/16	9.49	9.49	184.6 K=1.00	1.4300	-0.15	9.47	0.016 [1] ✔
T16	40 - 30	2L2x2x3/16	10.51	10.51	204.4 K=1.00	1.4300	-0.20	7.73	0.026 [1] ✔
T18	20 - 10	2L2x2 1/2x3/16	11.52	11.52	230.4 K=1.00	1.6200	-0.04	6.89	0.006 [1] ✔
T19	10 - 0	2L2x2 1/2x3/16	12.03	12.03	240.6 K=1.00	1.6200	-0.19	6.32	0.029 [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	180 - 170	L3 1/2x3 1/2x3/8	10.00	5.00	56.1	2.4800	1.83	80.35	0.023 [1] ✔
T2	170 - 163.573	L5x5x5/16	6.43	6.43	49.1	3.0300	8.64	98.17	0.088 [1] ✔
T3	163.573 - 159.049	L5x5x5/16	4.53	4.53	34.6	3.0300	16.93	98.17	0.172 [1] ✔
T4	159.049 - 154.524	L5x5x5/16	4.53	4.53	34.6	3.0300	25.51	98.17	0.260 [1] ✔
T5	154.524 - 150	L5x5x5/16	4.53	4.53	34.6	3.0300	33.78	98.17	0.344 [1] ✔
T6	150 - 140	L5x5x3/8	10.01	5.01	38.5	3.6100	52.94	116.96	0.453 [1] ✔
T7	140 - 130	L6x6x1/2	10.01	5.23	33.7	5.7500	67.53	186.30	0.362 [1] ✔
T8	130 - 120	L6x6x1/2	10.01	5.21	33.6	5.7500	87.88	186.30	0.472 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T9	120 - 110	L6x6x3/4	10.01	5.20	34.1	8.4400	112.79	273.46	0.412 [1]
T10	110 - 100	L6x6x3/4	10.01	5.18	34.0	8.4400	137.85	273.46	0.504 [1]
T11	100 - 90	L8x8x3/4	10.01	10.01	48.6	11.4000	167.15	369.36	0.453 [1]
T12	90 - 80	L8x8x3/4	10.01	5.16	25.1	11.4000	195.60	369.36	0.530 [1]
T13	80 - 60	L8x8x1 w/ 1/2x7 Plates	20.03	10.01	48.3	22.0000	253.87	712.80	0.356 [1]
T14	60 - 50	L8x8x1-1/8 w/ 1/2x7 Plates	10.01	10.01	48.6	23.7340	279.87	768.98	0.364 [1]
T15	50 - 40	L8x8x1-1/8 w/ 1/2x7 Plates	10.01	5.13	24.9	23.7340	306.48	768.98	0.399 [1]
T16	40 - 30	L8x8x1 1/8	10.01	5.12	25.4	16.7000	330.92	541.08	0.612 [1]
T17	30 - 20	L8x8x1 1/8	10.01	5.12	25.4	16.7000	359.79	541.08	0.665 [1]
T18	20 - 10	L8x8x1 1/8	10.01	5.11	25.4	16.7000	384.41	541.08	0.710 [1]
T19	10 - 0	L8x8x1 1/8	10.01	5.01	24.8	16.7000	391.05	541.08	0.723 [1]

[1] $P_u / \phi P_n$ 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	180 - 170	L2 1/2x2 1/2x3/16	11.41	5.51	88.0	0.5710	2.88	24.84	0.116 [1]
T2	170 - 163.573	L2 1/2x2 1/2x3/16	8.46	4.03	65.2	0.5710	3.57	24.84	0.144 [1]
T3	163.573 - 159.049	L2x2x3/16	7.25	3.52	72.4	0.4308	4.89	18.74	0.261 [1]
T4	159.049 - 154.524	L2 1/2x2x3/16	7.51	3.65	77.0	0.5013	5.52	21.81	0.253 [1]
T5	154.524 - 150	L2 1/2x2x3/16	7.77	3.78	79.6	0.5013	5.47	21.81	0.251 [1]
T6	150 - 140	L2 1/2x2x3/16	8.61	4.21	88.2	0.5013	5.92	21.81	0.272 [1]
T7	140 - 130	L3x2 1/2x1/4	12.53	6.35	104.5	0.8419	9.12	36.62	0.249 [1]
T8	130 - 120	L3x3x1/4	12.98	6.56	87.2	0.9394	11.04	40.86	0.270 [1]
T9	120 - 110	L3x3x1/4	13.45	6.78	90.0	0.9394	12.08	40.86	0.296 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T10	110 - 100	L3 1/2x3x1/4	13.94	7.02	94.8	1.0294	14.89	44.78	0.332 [1]
T11	100 - 90	L3 1/2x3x1/4	14.44	7.26	98.1	1.0294	14.41	44.78	0.322 [1]
T12	90 - 80	L3 1/2x3x1/4	14.97	7.52	101.4	1.0294	15.97	44.78	0.357 [1]
T13	80 - 60	2L2 1/2x2x3/16	16.07	8.06	125.4	1.0041	15.87	43.68	0.363 [1]
T14	60 - 50	2L2 1/2x2x3/16	16.63	8.33	129.6	1.0041	15.90	43.68	0.364 [1]
T15	50 - 40	2L2 1/2x2x3/8	17.21	8.62	137.8	1.8956	16.67	82.46	0.202 [1]
T16	40 - 30	2L2 1/2x2x3/8	17.80	8.91	142.3	1.8956	17.19	82.46	0.208 [1]
T17	30 - 20	2L2 1/2x2x3/8	18.40	9.21	147.0	1.8956	18.14	82.46	0.220 [1]
T18	20 - 10	2L2 1/2x2x3/8	19.00	9.51	151.6	1.8956	19.69	82.46	0.239 [1]
T19	10 - 0	2L2 1/2x2 1/2x5/16	13.37	12.47	145.7	1.8459	28.67	80.30	0.357 [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 $\frac{P_u}{\phi P_n}$
T9	120 - 110	L2 1/2x2 1/2x1/4	9.12	4.11	67.3	0.7519	0.79	32.71	0.024 [1]
T11	100 - 90	L2 1/2x2 1/2x1/4	10.56	4.83	78.5	0.7519	1.53	32.71	0.047 [1]
T14	60 - 50	2L2x2x3/16	13.43	6.16	123.7	0.8616	3.91	37.48	0.104 [1]
T18	20 - 10	2L2x2x3/16	16.29	7.62	152.0	0.8616	7.96	37.48	0.212 [1]
T19	10 - 0	2L2 1/2x2 1/2x1/4	17.01	7.97	127.5	1.5037	21.34	65.41	0.326 [1]

[1] P_u / ϕP_n controls

Secondary 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	180 - 170	L2x2x3/16	6.00	5.31	111.0	0.4308	0.79	18.74	0.042 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T7	140 - 130	L2x2x1/4	8.03	7.53	148.4	0.9380	1.11	30.39	0.037 [1]
T8	130 - 120	L2x2x1/4	8.75	7.86	162.6	0.5629	1.46	24.49	0.060 [1]
T9	120 - 110	L2x2x3/16	9.47	8.57	174.4	0.4308	1.86	18.74	0.099 [1]
T10	110 - 100	L2x2x1/4	10.19	9.29	190.9	0.5629	2.27	24.49	0.093 [1]
T12	90 - 80	L2 1/2x2 1/2x1/4	11.62	10.56	171.0	0.7519	3.19	32.71	0.098 [1]
T15	50 - 40	L3 1/2x3 1/2x1/4	14.49	13.39	151.8	1.1269	4.99	49.02	0.102 [1]
T16	40 - 30	L3 1/2x3 1/2x1/4	15.21	14.15	160.1	1.1269	5.42	49.02	0.111 [1]
T17	30 - 20	L3 1/2x3 1/2x1/4	15.93	14.87	168.0	1.1269	5.89	49.02	0.120 [1]
T18	20 - 10	L3 1/2x3 1/2x1/4	16.65	15.58	175.9	1.1269	6.26	49.02	0.128 [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	180 - 170	L2x2x3/16	6.00	5.31	111.0	0.4308	0.26	18.74	0.014 [1]
T2	170 - 163.573	L2x2x3/16	6.00	5.31	111.0	0.4308	0.85	18.74	0.045 [1]
T3	163.573 - 159.049	L2x2x3/16	6.00	5.19	108.6	0.4308	0.55	18.74	0.029 [1]
T6	150 - 140	L2 1/2x2 1/2x3/16	6.97	6.16	101.1	0.5710	0.62	24.84	0.025 [1]
T7	140 - 130	L2 1/2x2 1/2x3/16	7.69	3.44	56.1	0.5710	0.46	24.84	0.019 [1]
T13	80 - 60	L2 1/2x2 1/2x1/4	11.99	5.47	88.4	0.7519	1.53	32.71	0.047 [1]
T16	40 - 30	2L2x2x3/16	14.86	6.88	137.6	0.8616	5.20	37.48	0.139 [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 $\frac{P_u}{\phi P_n}$
T19	10 - 0	L2 1/2x2 1/2x3/16	4.25	3.92	60.5	0.9020	6.42	29.22	0.220 [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 $\frac{P_u}{\phi P_n}$
T19	10 - 0	L2 1/2x2 1/2x3/16	6.45	5.92	91.4	0.9020	7.94	29.22	0.272 [1] ✔

[1] P_u / ϕP_n controls

Redundant Hip (1) Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T19	10 - 0	L2 1/2x2 1/2x3/16	6.01	6.01	92.8	0.9020	0.00	29.22	0.000 [1] ✔

[1] P_u / ϕP_n controls

Redundant Sub-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 $\frac{P_u}{\phi P_n}$
T19	10 - 0	L3x3x5/16	8.86	8.86	115.4	1.7800	8.96	57.67	0.155 [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 $\frac{P_u}{\phi P_n}$
T7	140 - 130	L2x2x3/16	5.44	5.44	105.8	0.7150	0.07	23.17	0.003 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T9	120 - 110	L2 1/2x2x3/16	6.45	6.45	129.1	0.8090	0.08	26.21	0.003 [1]
T11	100 - 90	L2 1/2x2x3/16	7.47	7.47	149.4	0.8090	0.10	26.21	0.004 [1]
T13	80 - 60	2L2x2x3/16	8.48	8.48	164.9	1.4300	0.13	46.33	0.003 [1]
T14	60 - 50	2L2x2x3/16	9.49	9.49	184.6	1.4300	0.15	46.33	0.003 [1]
T16	40 - 30	2L2x2x3/16	10.51	10.51	204.4	1.4300	0.20	46.33	0.004 [1]
T18	20 - 10	2L2x2 1/2x3/16	11.52	11.52	230.4	1.6200	0.06	52.49	0.001 [1]
T19	10 - 0	2L2x2 1/2x3/16	12.03	12.03	240.6	1.6200	0.18	52.49	0.004 [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	180 - 170	Leg	L3 1/2x3 1/2x3/8	1	-3.02	53.78	5.6	Pass
		Leg	L3 1/2x3 1/2x3/8	2	-2.79	53.78	5.2	Pass
		Leg	L3 1/2x3 1/2x3/8	3	-2.61	53.78	4.9	Pass
		Leg	L3 1/2x3 1/2x3/8	4	-2.73	53.78	5.1	Pass
T2	170 - 163.573	Leg	L5x5x5/16	21	-9.85	69.83	14.1	Pass
		Leg	L5x5x5/16	22	-10.15	69.83	14.5	Pass
		Leg	L5x5x5/16	23	-9.90	69.83	14.2	Pass
		Leg	L5x5x5/16	24	-10.45	69.83	15.0	Pass
T3	163.573 - 159.049	Leg	L5x5x5/16	37	-18.69	81.46	22.9	Pass
		Leg	L5x5x5/16	38	-20.09	81.46	24.7	Pass
		Leg	L5x5x5/16	39	-20.45	81.46	25.1	Pass
		Leg	L5x5x5/16	40	-20.50	81.46	25.2	Pass
T4	159.049 - 154.524	Leg	L5x5x5/16	53	-27.94	81.46	34.3	Pass
		Leg	L5x5x5/16	54	-29.80	81.46	36.6	Pass
		Leg	L5x5x5/16	55	-29.71	81.46	36.5	Pass
		Leg	L5x5x5/16	56	-30.18	81.46	37.0	Pass
T5	154.524 - 150	Leg	L5x5x5/16	65	-35.96	81.46	44.1	Pass
		Leg	L5x5x5/16	66	-38.17	81.46	46.9	Pass
		Leg	L5x5x5/16	67	-37.64	81.46	46.2	Pass
		Leg	L5x5x5/16	68	-38.49	81.46	47.3	Pass
T6	150 - 140	Leg	L5x5x3/8	77	-55.20	96.35	57.3	Pass
		Leg	L5x5x3/8	78	-58.18	96.35	60.4	Pass
		Leg	L5x5x3/8	79	-56.83	96.35	59.0	Pass
		Leg	L5x5x3/8	80	-58.36	96.35	60.6	Pass
T7	140 - 130	Leg	L6x6x1/2	101	-70.45	160.53	43.9	Pass
		Leg	L6x6x1/2	102	-73.86	160.53	46.0	Pass
		Leg	L6x6x1/2	103	-71.96	160.53	44.8	Pass
		Leg	L6x6x1/2	104	-73.96	160.53	46.1	Pass
T8	130 - 120	Leg	L6x6x1/2	126	-92.42	160.69	57.5	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
		Leg	L6x6x1/2	127	-95.39	160.69	59.4	Pass
		Leg	L6x6x1/2	128	-93.72	160.69	58.3	Pass
		Leg	L6x6x1/2	129	-97.40	160.69	60.6	Pass
T9	120 - 110	Leg	L6x6x3/4	142	-118.71	235.48	50.4	Pass
		Leg	L6x6x3/4	143	-121.82	235.48	51.7	Pass
		Leg	L6x6x3/4	144	-119.79	235.48	50.9	Pass
		Leg	L6x6x3/4	145	-123.76	235.48	52.6	Pass
T10	110 - 100	Leg	L6x6x3/4	167	-145.34	235.66	61.7	Pass
		Leg	L6x6x3/4	168	-149.04	235.66	63.2	Pass
		Leg	L6x6x3/4	169	-147.31	235.66	62.5	Pass
		Leg	L6x6x3/4	170	-150.90	235.66	64.0	Pass
T11	100 - 90	Leg	L8x8x3/4	183	-176.62	272.41	64.8	Pass
		Leg	L8x8x3/4	184	-180.66	272.41	66.3	Pass
		Leg	L8x8x3/4	185	-178.42	272.41	65.5	Pass
		Leg	L8x8x3/4	186	-182.54	272.41	67.0	Pass
T12	90 - 80	Leg	L8x8x3/4	204	-206.28	340.66	60.6	Pass
		Leg	L8x8x3/4	205	-210.61	340.66	61.8	Pass
		Leg	L8x8x3/4	206	-207.95	340.66	61.0	Pass
		Leg	L8x8x3/4	207	-212.57	340.66	62.4	Pass
T13	80 - 60	Leg	L8x8x1 w/ 1/2x7 Plates	220	-268.08	630.40	42.5	Pass
		Leg	L8x8x1 w/ 1/2x7 Plates	221	-272.84	630.40	43.3	Pass
		Leg	L8x8x1 w/ 1/2x7 Plates	222	-269.50	630.40	42.8	Pass
		Leg	L8x8x1 w/ 1/2x7 Plates	223	-275.05	630.40	43.6	Pass
T14	60 - 50	Leg	L8x8x1-1/8 w/ 1/2x7 Plates	249	-297.17	679.24	43.8	Pass
		Leg	L8x8x1-1/8 w/ 1/2x7 Plates	250	-302.13	679.24	44.5	Pass
		Leg	L8x8x1-1/8 w/ 1/2x7 Plates	251	-298.46	679.24	43.9	Pass
		Leg	L8x8x1-1/8 w/ 1/2x7 Plates	252	-304.33	679.24	44.8	Pass
T15	50 - 40	Leg	L8x8x1-1/8 w/ 1/2x7 Plates	270	-325.22	744.33	43.7	Pass
		Leg	L8x8x1-1/8 w/ 1/2x7 Plates	271	-330.37	744.33	44.4	Pass
		Leg	L8x8x1-1/8 w/ 1/2x7 Plates	272	-326.40	744.33	43.9	Pass
		Leg	L8x8x1-1/8 w/ 1/2x7 Plates	273	-332.57	744.33	44.7	Pass
T16	40 - 30	Leg	L8x8x1 1/8	286	-353.66	498.58	70.9	Pass
		Leg	L8x8x1 1/8	287	-358.96	498.58	72.0	Pass
		Leg	L8x8x1 1/8	288	-354.73	498.58	71.1	Pass
		Leg	L8x8x1 1/8	289	-361.17	498.58	72.4	Pass
T17	30 - 20	Leg	L8x8x1 1/8	311	-384.53	498.67	77.1	Pass
		Leg	L8x8x1 1/8	312	-390.01	498.67	78.2	Pass
		Leg	L8x8x1 1/8	313	-385.50	498.67	77.3	Pass
		Leg	L8x8x1 1/8	314	-392.24	498.67	78.7	Pass
T18	20 - 10	Leg	L8x8x1 1/8	327	-408.99	498.74	82.0	Pass
		Leg	L8x8x1 1/8	328	-414.55	498.74	83.1	Pass
		Leg	L8x8x1 1/8	329	-409.86	498.74	82.2	Pass
		Leg	L8x8x1 1/8	330	-416.76	498.74	83.6	Pass
T19	10 - 0	Leg	L8x8x1 1/8	352	-420.05	500.44	83.9	Pass
		Leg	L8x8x1 1/8	353	-425.60	500.44	85.0	Pass
		Leg	L8x8x1 1/8	354	-420.86	500.44	84.1	Pass
		Leg	L8x8x1 1/8	355	-427.77	500.44	85.5	Pass
T1	180 - 170	Diagonal	L2 1/2x2 1/2x3/16	9	-2.85	11.95	23.8	Pass
		Diagonal	L2 1/2x2 1/2x3/16	10	-2.88	11.95	24.1	Pass
		Diagonal	L2 1/2x2 1/2x3/16	11	-3.05	11.95	25.5	Pass
		Diagonal	L2 1/2x2 1/2x3/16	12	-3.01	11.95	25.2	Pass
		Diagonal	L2 1/2x2 1/2x3/16	13	-3.02	11.95	25.3	Pass
		Diagonal	L2 1/2x2 1/2x3/16	14	-3.05	11.95	25.6	Pass
		Diagonal	L2 1/2x2 1/2x3/16	15	-2.88	11.95	24.1	Pass
		Diagonal	L2 1/2x2 1/2x3/16	16	-2.85	11.95	23.9	Pass
T2	170 - 163.573	Diagonal	L2 1/2x2 1/2x3/16	29	-3.50	16.66	21.0 23.3 (b)	Pass
		Diagonal	L2 1/2x2 1/2x3/16	30	-3.65	16.66	21.9 24.3 (b)	Pass
		Diagonal	L2 1/2x2 1/2x3/16	31	-3.59	16.66	21.5 23.7 (b)	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
		Diagonal	L2 1/2x2 1/2x3/16	32	-3.45	16.66	20.7 22.9 (b)	Pass
		Diagonal	L2 1/2x2 1/2x3/16	33	-3.73	16.66	22.4 24.5 (b)	Pass
		Diagonal	L2 1/2x2 1/2x3/16	34	-3.70	16.66	22.2 24.4 (b)	Pass
		Diagonal	L2 1/2x2 1/2x3/16	35	-3.75	16.66	22.5 24.8 (b)	Pass
		Diagonal	L2 1/2x2 1/2x3/16	36	-3.75	16.66	22.5 24.8 (b)	Pass
T3	163.573 - 159.049	Diagonal	L2x2x3/16	45	-4.25	12.19	34.9	Pass
		Diagonal	L2x2x3/16	46	-4.25	12.19	34.8	Pass
		Diagonal	L2x2x3/16	47	-4.78	12.19	39.2	Pass
		Diagonal	L2x2x3/16	48	-4.71	12.19	38.7	Pass
		Diagonal	L2x2x3/16	49	-5.00	12.19	41.0	Pass
		Diagonal	L2x2x3/16	50	-5.04	12.19	41.4	Pass
		Diagonal	L2x2x3/16	51	-4.49	12.19	36.8	Pass
		Diagonal	L2x2x3/16	52	-4.52	12.19	37.1	Pass
T4	159.049 - 154.524	Diagonal	L2 1/2x2x3/16	57	-4.66	14.36	32.5 32.5 (b)	Pass
		Diagonal	L2 1/2x2x3/16	58	-4.63	14.36	32.2 32.6 (b)	Pass
		Diagonal	L2 1/2x2x3/16	59	-5.17	14.36	36.0 36.2 (b)	Pass
		Diagonal	L2 1/2x2x3/16	60	-5.15	14.36	35.9 36.6 (b)	Pass
		Diagonal	L2 1/2x2x3/16	61	-5.41	14.36	37.7 38.4 (b)	Pass
		Diagonal	L2 1/2x2x3/16	62	-5.42	14.36	37.7 38.1 (b)	Pass
		Diagonal	L2 1/2x2x3/16	63	-4.85	14.36	33.7 34.3 (b)	Pass
		Diagonal	L2 1/2x2x3/16	64	-4.89	14.36	34.1	Pass
T5	154.524 - 150	Diagonal	L2 1/2x2x3/16	69	-4.87	13.92	35.0	Pass
		Diagonal	L2 1/2x2x3/16	70	-4.86	13.92	34.9	Pass
		Diagonal	L2 1/2x2x3/16	71	-5.39	13.92	38.7	Pass
		Diagonal	L2 1/2x2x3/16	72	-5.34	13.92	38.3	Pass
		Diagonal	L2 1/2x2x3/16	73	-5.56	13.92	39.9	Pass
		Diagonal	L2 1/2x2x3/16	74	-5.60	13.92	40.3	Pass
		Diagonal	L2 1/2x2x3/16	75	-5.05	13.92	36.3	Pass
		Diagonal	L2 1/2x2x3/16	76	-5.07	13.92	36.4	Pass
T6	150 - 140	Diagonal	L2 1/2x2x3/16	85	-5.49	12.47	44.0	Pass
		Diagonal	L2 1/2x2x3/16	86	-5.47	12.47	43.9	Pass
		Diagonal	L2 1/2x2x3/16	87	-5.94	12.47	47.6	Pass
		Diagonal	L2 1/2x2x3/16	88	-5.90	12.47	47.3	Pass
		Diagonal	L2 1/2x2x3/16	89	-5.94	12.47	47.6	Pass
		Diagonal	L2 1/2x2x3/16	90	-5.97	12.47	47.9	Pass
		Diagonal	L2 1/2x2x3/16	91	-5.49	12.47	44.0	Pass
		Diagonal	L2 1/2x2x3/16	92	-5.51	12.47	44.2	Pass
		Diagonal	L2 1/2x2x3/16	93	-5.15	12.95	39.8	Pass
		Diagonal	L2 1/2x2x3/16	94	-5.12	12.95	39.5	Pass
		Diagonal	L2 1/2x2x3/16	95	-5.63	12.95	43.5	Pass
		Diagonal	L2 1/2x2x3/16	96	-5.59	12.95	43.2	Pass
		Diagonal	L2 1/2x2x3/16	97	-5.74	12.95	44.3	Pass
		Diagonal	L2 1/2x2x3/16	98	-5.77	12.95	44.5	Pass
		Diagonal	L2 1/2x2x3/16	99	-5.23	12.95	40.4	Pass
		Diagonal	L2 1/2x2x3/16	100	-5.27	12.95	40.7	Pass
T7	140 - 130	Diagonal	L3x2 1/2x1/4	114	-8.72	15.42	56.5	Pass
		Diagonal	L3x2 1/2x1/4	115	-8.71	15.42	56.5	Pass
		Diagonal	L3x2 1/2x1/4	116	-9.31	15.42	60.4	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
		Diagonal	L3x2 1/2x1/4	117	-9.23	15.42	59.9	Pass
		Diagonal	L3x2 1/2x1/4	118	-9.18	15.42	59.6	Pass
		Diagonal	L3x2 1/2x1/4	119	-9.25	15.42	60.0	Pass
		Diagonal	L3x2 1/2x1/4	120	-8.62	15.42	55.9	Pass
		Diagonal	L3x2 1/2x1/4	121	-8.64	15.42	56.1	Pass
T8	130 - 120	Diagonal	L3x3x1/4	130	-10.37	19.20	54.0	Pass
		Diagonal	L3x3x1/4	131	-10.41	19.20	54.2	Pass
		Diagonal	L3x3x1/4	132	-10.82	19.20	56.4	Pass
		Diagonal	L3x3x1/4	133	-10.72	19.20	55.9	Pass
		Diagonal	L3x3x1/4	134	-11.22	19.20	58.4	Pass
		Diagonal	L3x3x1/4	135	-11.27	19.20	58.7	Pass
		Diagonal	L3x3x1/4	136	-10.82	19.20	56.4	Pass
		Diagonal	L3x3x1/4	137	-10.84	19.20	56.5	Pass
T9	120 - 110	Diagonal	L3x3x1/4	155	-11.16	18.30	61.0	Pass
		Diagonal	L3x3x1/4	156	-11.23	18.30	61.4	Pass
		Diagonal	L3x3x1/4	157	-11.38	18.30	62.2	Pass
		Diagonal	L3x3x1/4	158	-11.25	18.30	61.5	Pass
		Diagonal	L3x3x1/4	159	-12.12	18.30	66.2	Pass
		Diagonal	L3x3x1/4	160	-12.14	18.30	66.3	Pass
		Diagonal	L3x3x1/4	161	-11.99	18.30	65.5	Pass
		Diagonal	L3x3x1/4	162	-12.02	18.30	65.7	Pass
T10	110 - 100	Diagonal	L3 1/2x3x1/4	171	-14.11	20.69	68.2	Pass
		Diagonal	L3 1/2x3x1/4	172	-14.13	20.69	68.3	Pass
		Diagonal	L3 1/2x3x1/4	173	-14.54	20.69	70.3	Pass
		Diagonal	L3 1/2x3x1/4	174	-14.42	20.69	69.7	Pass
		Diagonal	L3 1/2x3x1/4	175	-15.12	20.69	73.1	Pass
		Diagonal	L3 1/2x3x1/4	176	-15.15	20.69	73.2	Pass
		Diagonal	L3 1/2x3x1/4	177	-14.71	20.69	71.1	Pass
		Diagonal	L3 1/2x3x1/4	178	-14.77	20.69	71.4	Pass
T11	100 - 90	Diagonal	L3 1/2x3x1/4	196	-13.50	19.68	68.6	Pass
		Diagonal	L3 1/2x3x1/4	197	-13.52	19.68	68.7	Pass
		Diagonal	L3 1/2x3x1/4	198	-13.91	19.68	70.7	Pass
		Diagonal	L3 1/2x3x1/4	199	-13.80	19.68	70.1	Pass
		Diagonal	L3 1/2x3x1/4	200	-14.48	19.68	73.6	Pass
		Diagonal	L3 1/2x3x1/4	201	-14.51	19.68	73.7	Pass
		Diagonal	L3 1/2x3x1/4	202	-14.14	19.68	71.9	Pass
		Diagonal	L3 1/2x3x1/4	203	-14.21	19.68	72.2	Pass
T12	90 - 80	Diagonal	L3 1/2x3x1/4	208	-15.31	18.63	82.2	Pass
		Diagonal	L3 1/2x3x1/4	209	-15.33	18.63	82.3	Pass
		Diagonal	L3 1/2x3x1/4	210	-15.50	18.63	83.2	Pass
		Diagonal	L3 1/2x3x1/4	211	-15.40	18.63	82.7	Pass
		Diagonal	L3 1/2x3x1/4	212	-16.28	18.63	87.4	Pass
		Diagonal	L3 1/2x3x1/4	213	-16.30	18.63	87.5	Pass
		Diagonal	L3 1/2x3x1/4	214	-16.05	18.63	86.2	Pass
		Diagonal	L3 1/2x3x1/4	215	-16.11	18.63	86.5	Pass
T13	80 - 60	Diagonal	2L2 1/2x2x3/16	233	-15.45	23.87	64.8	Pass
		Diagonal	2L2 1/2x2x3/16	234	-15.47	23.87	64.8	Pass
		Diagonal	2L2 1/2x2x3/16	235	-15.31	23.87	64.2	Pass
		Diagonal	2L2 1/2x2x3/16	236	-15.23	23.87	63.8	Pass
		Diagonal	2L2 1/2x2x3/16	237	-16.35	23.87	68.5	Pass
		Diagonal	2L2 1/2x2x3/16	238	-16.33	23.87	68.4	Pass
		Diagonal	2L2 1/2x2x3/16	239	-16.23	23.87	68.0	Pass
		Diagonal	2L2 1/2x2x3/16	240	-16.30	23.87	68.3	Pass
		Diagonal	2L2 1/2x2x3/16	241	-14.48	25.15	57.6	Pass
		Diagonal	2L2 1/2x2x3/16	242	-14.51	25.15	57.7	Pass
		Diagonal	2L2 1/2x2x3/16	243	-14.63	25.15	58.2	Pass
		Diagonal	2L2 1/2x2x3/16	244	-14.53	25.15	57.8	Pass
		Diagonal	2L2 1/2x2x3/16	245	-15.45	25.15	61.4	Pass
		Diagonal	2L2 1/2x2x3/16	246	-15.45	25.15	61.4	Pass
		Diagonal	2L2 1/2x2x3/16	247	-15.37	25.15	61.1	Pass
		Diagonal	2L2 1/2x2x3/16	248	-15.44	25.15	61.4	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
T14	60 - 50	Diagonal	2L2 1/2x2x3/16	262	-15.03	22.57	66.6	Pass
		Diagonal	2L2 1/2x2x3/16	263	-15.07	22.57	66.8	Pass
		Diagonal	2L2 1/2x2x3/16	264	-14.94	22.57	66.2	Pass
		Diagonal	2L2 1/2x2x3/16	265	-14.85	22.57	65.8	Pass
		Diagonal	2L2 1/2x2x3/16	266	-15.84	22.57	70.2	Pass
		Diagonal	2L2 1/2x2x3/16	267	-15.84	22.57	70.2	Pass
		Diagonal	2L2 1/2x2x3/16	268	-15.96	22.57	70.7	Pass
		Diagonal	2L2 1/2x2x3/16	269	-16.01	22.57	70.9	Pass
T15	50 - 40	Diagonal	2L2 1/2x2x3/8	274	-16.98	40.44	42.0	Pass
		Diagonal	2L2 1/2x2x3/8	275	-17.02	40.44	42.1	Pass
		Diagonal	2L2 1/2x2x3/8	276	-16.61	40.44	41.1	Pass
		Diagonal	2L2 1/2x2x3/8	277	-16.52	40.44	40.9	Pass
		Diagonal	2L2 1/2x2x3/8	278	-17.71	40.44	43.8	Pass
		Diagonal	2L2 1/2x2x3/8	279	-17.71	40.44	43.8	Pass
		Diagonal	2L2 1/2x2x3/8	280	-17.81	40.44	44.1	Pass
		Diagonal	2L2 1/2x2x3/8	281	-17.86	40.44	44.2	Pass
T16	40 - 30	Diagonal	2L2 1/2x2x3/8	299	-16.57	38.48	43.1	Pass
		Diagonal	2L2 1/2x2x3/8	300	-17.07	38.48	44.4	Pass
		Diagonal	2L2 1/2x2x3/8	301	-16.48	38.48	42.8	Pass
		Diagonal	2L2 1/2x2x3/8	302	-16.08	38.48	41.8	Pass
		Diagonal	2L2 1/2x2x3/8	303	-17.50	38.48	45.5	Pass
		Diagonal	2L2 1/2x2x3/8	304	-17.26	38.48	44.9	Pass
		Diagonal	2L2 1/2x2x3/8	305	-17.53	38.48	45.6	Pass
		Diagonal	2L2 1/2x2x3/8	306	-17.58	38.48	45.7	Pass
T17	30 - 20	Diagonal	2L2 1/2x2x3/8	315	-17.80	36.54	48.7	Pass
		Diagonal	2L2 1/2x2x3/8	316	-17.83	36.54	48.8	Pass
		Diagonal	2L2 1/2x2x3/8	317	-17.24	36.54	47.2	Pass
		Diagonal	2L2 1/2x2x3/8	318	-17.17	36.54	47.0	Pass
		Diagonal	2L2 1/2x2x3/8	319	-18.35	36.54	50.2	Pass
		Diagonal	2L2 1/2x2x3/8	320	-18.34	36.54	50.2	Pass
		Diagonal	2L2 1/2x2x3/8	321	-18.70	36.54	51.2	Pass
		Diagonal	2L2 1/2x2x3/8	322	-18.76	36.54	51.3	Pass
T18	20 - 10	Diagonal	2L2 1/2x2x3/8	340	-21.10	34.72	60.8	Pass
		Diagonal	2L2 1/2x2x3/8	341	-22.11	34.72	63.7	Pass
		Diagonal	2L2 1/2x2x3/8	342	-20.97	34.72	60.4	Pass
		Diagonal	2L2 1/2x2x3/8	343	-20.54	34.72	59.2	Pass
		Diagonal	2L2 1/2x2x3/8	344	-22.41	34.72	64.5	Pass
		Diagonal	2L2 1/2x2x3/8	345	-21.66	34.72	62.4	Pass
		Diagonal	2L2 1/2x2x3/8	346	-22.16	34.72	63.8	Pass
		Diagonal	2L2 1/2x2x3/8	347	-22.31	34.72	64.3	Pass
T19	10 - 0	Diagonal	2L2 1/2x2 1/2x5/16	357	-27.77	33.21	83.6	Pass
		Diagonal	2L2 1/2x2 1/2x5/16	360	-29.13	33.21	87.7	Pass
		Diagonal	2L2 1/2x2 1/2x5/16	365	-27.97	33.21	84.2	Pass
		Diagonal	2L2 1/2x2 1/2x5/16	368	-27.44	33.21	82.6	Pass
		Diagonal	2L2 1/2x2 1/2x5/16	374	-29.42	33.21	88.6	Pass
		Diagonal	2L2 1/2x2 1/2x5/16	377	-28.45	33.21	85.7	Pass
		Diagonal	2L2 1/2x2 1/2x5/16	383	-29.61	33.21	89.2	Pass
		Diagonal	2L2 1/2x2 1/2x5/16	386	-29.75	33.21	89.6	Pass
T9	120 - 110	Horizontal	L2 1/2x2 1/2x1/4	146	-0.94	20.33	4.6	Pass
		Horizontal	L2 1/2x2 1/2x1/4	147	-0.94	20.33	4.6	Pass
		Horizontal	L2 1/2x2 1/2x1/4	148	-0.94	20.33	4.6	Pass
		Horizontal	L2 1/2x2 1/2x1/4	149	-0.94	20.33	4.6	Pass
T11	100 - 90	Horizontal	L2 1/2x2 1/2x1/4	187	-1.63	18.29	8.9	Pass
		Horizontal	L2 1/2x2 1/2x1/4	188	-1.62	18.29	8.9	Pass
		Horizontal	L2 1/2x2 1/2x1/4	189	-1.61	18.29	8.8	Pass
		Horizontal	L2 1/2x2 1/2x1/4	190	-1.63	18.29	8.9	Pass
T14	60 - 50	Horizontal	2L2x2x3/16	253	3.89	37.48	10.4 15.8 (b)	Pass
		Horizontal	2L2x2x3/16	254	-1.67	21.76	7.7 11.3 (b)	Pass
		Horizontal	2L2x2x3/16	255	3.91	37.48	10.4	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
							15.8 (b)	
		Horizontal	2L2x2x3/16	256	-1.67	21.76	7.7	Pass
							11.4 (b)	
T18	20 - 10	Horizontal	2L2x2x3/16	331	7.95	37.48	21.2	Pass
							32.2 (b)	
		Horizontal	2L2x2x3/16	332	6.11	37.48	16.3	Pass
							24.8 (b)	
		Horizontal	2L2x2x3/16	333	7.96	37.48	21.2	Pass
							32.3 (b)	
		Horizontal	2L2x2x3/16	334	6.17	37.48	16.5	Pass
							25.0 (b)	
T19	10 - 0	Horizontal	2L2 1/2x2 1/2x1/4	356	-18.40	34.58	53.2	Pass
							55.1 (b)	
		Horizontal	2L2 1/2x2 1/2x1/4	364	-17.89	34.58	51.7	Pass
							52.5 (b)	
		Horizontal	2L2 1/2x2 1/2x1/4	373	-18.51	34.58	53.5	Pass
							55.7 (b)	
		Horizontal	2L2 1/2x2 1/2x1/4	382	-19.05	34.58	55.1	Pass
							55.6 (b)	
T1	180 - 170	Secondary Horizontal	L2x2x3/16	17	-0.63	12.02	5.2	Pass
		Secondary Horizontal	L2x2x3/16	18	-0.80	12.02	6.7	Pass
		Secondary Horizontal	L2x2x3/16	19	-0.68	12.02	5.7	Pass
		Secondary Horizontal	L2x2x3/16	20	-0.49	12.02	4.1	Pass
T7	140 - 130	Secondary Horizontal	L2x2x1/4	122	-1.11	11.21	9.9	Pass
		Secondary Horizontal	L2x2x1/4	123	-1.11	11.21	9.9	Pass
		Secondary Horizontal	L2x2x1/4	124	-1.11	11.21	9.9	Pass
		Secondary Horizontal	L2x2x1/4	125	-1.11	11.21	9.9	Pass
T8	130 - 120	Secondary Horizontal	L2x2x1/4	138	-1.43	10.60	13.5	Pass
		Secondary Horizontal	L2x2x1/4	139	-1.43	10.60	13.5	Pass
		Secondary Horizontal	L2x2x1/4	140	-1.49	10.60	14.1	Pass
		Secondary Horizontal	L2x2x1/4	141	-1.51	10.60	14.2	Pass
T9	120 - 110	Secondary Horizontal	L2x2x3/16	163	-1.83	7.30	25.0	Pass
		Secondary Horizontal	L2x2x3/16	164	-1.83	7.30	25.0	Pass
		Secondary Horizontal	L2x2x3/16	165	-1.86	7.30	25.4	Pass
		Secondary Horizontal	L2x2x3/16	166	-1.86	7.30	25.4	Pass
T10	110 - 100	Secondary Horizontal	L2x2x1/4	179	-2.24	8.40	26.6	Pass
		Secondary Horizontal	L2x2x1/4	180	-2.24	8.40	26.6	Pass
		Secondary Horizontal	L2x2x1/4	181	-2.27	8.40	27.0	Pass
		Secondary Horizontal	L2x2x1/4	182	-2.27	8.40	27.0	Pass
T12	90 - 80	Secondary Horizontal	L2 1/2x2 1/2x1/4	216	-3.16	12.35	25.6	Pass
		Secondary Horizontal	L2 1/2x2 1/2x1/4	217	-3.16	12.35	25.6	Pass
		Secondary Horizontal	L2 1/2x2 1/2x1/4	218	-3.19	12.35	25.8	Pass
		Secondary Horizontal	L2 1/2x2 1/2x1/4	219	-3.19	12.35	25.8	Pass
T15	50 - 40	Secondary Horizontal	L3 1/2x3 1/2x1/4	282	-4.96	20.39	24.3	Pass
		Secondary Horizontal	L3 1/2x3 1/2x1/4	283	-4.96	20.39	24.3	Pass
		Secondary Horizontal	L3 1/2x3 1/2x1/4	284	-4.99	20.39	24.5	Pass
		Secondary Horizontal	L3 1/2x3 1/2x1/4	285	-4.99	20.39	24.5	Pass
T16	40 - 30	Secondary Horizontal	L3 1/2x3 1/2x1/4	307	-5.39	18.94	28.5	Pass
		Secondary Horizontal	L3 1/2x3 1/2x1/4	308	-5.39	18.94	28.5	Pass
		Secondary Horizontal	L3 1/2x3 1/2x1/4	309	-5.42	18.94	28.6	Pass
		Secondary Horizontal	L3 1/2x3 1/2x1/4	310	-5.42	18.94	28.6	Pass
T17	30 - 20	Secondary Horizontal	L3 1/2x3 1/2x1/4	323	-5.85	17.70	33.1	Pass
		Secondary Horizontal	L3 1/2x3 1/2x1/4	324	-5.85	17.70	33.1	Pass
		Secondary Horizontal	L3 1/2x3 1/2x1/4	325	-5.89	17.70	33.3	Pass
		Secondary Horizontal	L3 1/2x3 1/2x1/4	326	-5.89	17.70	33.3	Pass
T18	20 - 10	Secondary Horizontal	L3 1/2x3 1/2x1/4	348	-6.22	16.59	37.5	Pass
		Secondary Horizontal	L3 1/2x3 1/2x1/4	349	-6.22	16.59	37.5	Pass
		Secondary Horizontal	L3 1/2x3 1/2x1/4	350	-6.26	16.59	37.7	Pass
		Secondary Horizontal	L3 1/2x3 1/2x1/4	351	-6.26	16.59	37.7	Pass
T1	180 - 170	Top Girt	L2x2x3/16	5	-0.11	7.61	1.4	Pass
							1.8 (b)	

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
		Top Girt	L2x2x3/16	6	-0.11	7.61	1.4 1.5 (b)	Pass
		Top Girt	L2x2x3/16	7	-0.10	7.61	1.3 1.8 (b)	Pass
		Top Girt	L2x2x3/16	8	0.26	18.74	1.4 2.1 (b)	Pass
T2	170 - 163.573	Top Girt	L2x2x3/16	25	-0.47	7.61	6.2 6.3 (b)	Pass
		Top Girt	L2x2x3/16	26	-0.46	7.61	6.1	Pass
		Top Girt	L2x2x3/16	27	-0.45	7.61	5.9 6.2 (b)	Pass
		Top Girt	L2x2x3/16	28	-0.46	7.61	6.0 6.9 (b)	Pass
T3	163.573 - 159.049	Top Girt	L2x2x3/16	41	-0.47	7.86	5.9	Pass
		Top Girt	L2x2x3/16	42	-0.47	7.86	6.0	Pass
		Top Girt	L2x2x3/16	43	-0.47	7.86	5.9	Pass
		Top Girt	L2x2x3/16	44	-0.46	7.86	5.9	Pass
T6	150 - 140	Top Girt	L2 1/2x2 1/2x3/16	81	-0.55	10.69	5.2	Pass
		Top Girt	L2 1/2x2 1/2x3/16	82	-0.54	10.69	5.0	Pass
		Top Girt	L2 1/2x2 1/2x3/16	83	-0.53	10.69	5.0	Pass
		Top Girt	L2 1/2x2 1/2x3/16	84	-0.55	10.69	5.1	Pass
T7	140 - 130	Top Girt	L2 1/2x2 1/2x3/16	105	-0.52	16.96	3.1 3.1 (b)	Pass
		Top Girt	L2 1/2x2 1/2x3/16	106	-0.50	16.96	3.0 3.2 (b)	Pass
		Top Girt	L2 1/2x2 1/2x3/16	107	-0.51	16.96	3.0 3.1 (b)	Pass
		Top Girt	L2 1/2x2 1/2x3/16	108	-0.53	16.96	3.1	Pass
T13	80 - 60	Top Girt	L2 1/2x2 1/2x1/4	224	-0.93	15.76	5.9 7.9 (b)	Pass
		Top Girt	L2 1/2x2 1/2x1/4	225	-0.97	15.76	6.1	Pass
		Top Girt	L2 1/2x2 1/2x1/4	226	-0.92	15.76	5.9 8.0 (b)	Pass
		Top Girt	L2 1/2x2 1/2x1/4	227	-0.97	15.76	6.1	Pass
T16	40 - 30	Top Girt	2L2x2x3/16	290	5.20	37.48	13.9 21.1 (b)	Pass
		Top Girt	2L2x2x3/16	291	3.66	37.48	9.8 14.8 (b)	Pass
		Top Girt	2L2x2x3/16	292	5.20	37.48	13.9 21.1 (b)	Pass
		Top Girt	2L2x2x3/16	293	3.69	37.48	9.9 15.0 (b)	Pass
T19	10 - 0	Redund Horz 1 Bracing	L2 1/2x2 1/2x3/16	358	-6.30	15.90	39.6	Pass
		Redund Horz 1 Bracing	L2 1/2x2 1/2x3/16	361	-6.39	15.90	40.2	Pass
		Redund Horz 1 Bracing	L2 1/2x2 1/2x3/16	366	-6.39	15.90	40.2	Pass
		Redund Horz 1 Bracing	L2 1/2x2 1/2x3/16	369	-6.32	15.90	39.7	Pass
		Redund Horz 1 Bracing	L2 1/2x2 1/2x3/16	375	-6.32	15.90	39.7	Pass
		Redund Horz 1 Bracing	L2 1/2x2 1/2x3/16	378	-6.42	15.90	40.4	Pass
		Redund Horz 1 Bracing	L2 1/2x2 1/2x3/16	384	-6.42	15.90	40.4	Pass
		Redund Horz 1 Bracing	L2 1/2x2 1/2x3/16	387	-6.30	15.90	39.6	Pass
T19	10 - 0	Redund Diag 1 Bracing	L2 1/2x2 1/2x3/16	359	-8.36	9.88	84.7	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
		Redund Diag 1 Bracing	L2 1/2x2 1/2x3/16	362	-8.30	9.88	84.1	Pass
		Redund Diag 1 Bracing	L2 1/2x2 1/2x3/16	367	-8.38	9.88	84.8	Pass
		Redund Diag 1 Bracing	L2 1/2x2 1/2x3/16	370	-8.40	9.88	85.0	Pass
		Redund Diag 1 Bracing	L2 1/2x2 1/2x3/16	376	-8.33	9.88	84.4	Pass
		Redund Diag 1 Bracing	L2 1/2x2 1/2x3/16	379	-8.42	9.88	85.2	Pass
		Redund Diag 1 Bracing	L2 1/2x2 1/2x3/16	385	-8.42	9.88	85.3	Pass
		Redund Diag 1 Bracing	L2 1/2x2 1/2x3/16	388	-8.38	9.88	84.8	Pass
T19	10 - 0	Redund Hip 1 Bracing	L2 1/2x2 1/2x3/16	372	-0.04	9.58	0.6	Pass
		Redund Hip 1 Bracing	L2 1/2x2 1/2x3/16	381	-0.04	9.58	0.6	Pass
		Redund Hip 1 Bracing	L2 1/2x2 1/2x3/16	390	-0.04	9.58	0.6	Pass
		Redund Hip 1 Bracing	L2 1/2x2 1/2x3/16	391	-0.04	9.58	0.6	Pass
T19	10 - 0	Redund Sub Horz Bracing	L3x3x5/16	363	-9.67	12.33	78.4	Pass
		Redund Sub Horz Bracing	L3x3x5/16	371	-9.78	12.33	79.4	Pass
		Redund Sub Horz Bracing	L3x3x5/16	380	-9.72	12.33	78.9	Pass
		Redund Sub Horz Bracing	L3x3x5/16	389	-9.79	12.33	79.4	Pass
T7	140 - 130	Inner Bracing	L2x2x3/16	109	-0.07	5.89	1.2	Pass
		Inner Bracing	L2x2x3/16	110	-0.07	5.89	1.2	Pass
		Inner Bracing	L2x2x3/16	111	-0.07	5.89	1.2	Pass
		Inner Bracing	L2x2x3/16	112	-0.07	5.89	1.2	Pass
		Inner Bracing	L2x2x3/16	113	-0.01	2.94	0.9	Pass
T9	120 - 110	Inner Bracing	L2 1/2x2x3/16	150	-0.08	5.56	1.4	Pass
		Inner Bracing	L2 1/2x2x3/16	151	-0.08	5.56	1.5	Pass
		Inner Bracing	L2 1/2x2x3/16	152	-0.08	5.56	1.4	Pass
		Inner Bracing	L2 1/2x2x3/16	153	-0.08	5.56	1.5	Pass
		Inner Bracing	L2 1/2x2x3/16	154	-0.00	2.78	1.1	Pass
T11	100 - 90	Inner Bracing	L2 1/2x2x3/16	191	-0.09	4.15	2.2	Pass
		Inner Bracing	L2 1/2x2x3/16	192	-0.10	4.15	2.3	Pass
		Inner Bracing	L2 1/2x2x3/16	193	-0.09	4.15	2.2	Pass
		Inner Bracing	L2 1/2x2x3/16	194	-0.10	4.15	2.3	Pass
		Inner Bracing	L2 1/2x2x3/16	195	-0.00	2.08	1.2	Pass
T13	80 - 60	Inner Bracing	2L2x2x3/16	228	-0.12	11.88	1.0	Pass
		Inner Bracing	2L2x2x3/16	229	-0.13	11.88	1.1	Pass
		Inner Bracing	2L2x2x3/16	230	-0.12	11.88	1.0	Pass
		Inner Bracing	2L2x2x3/16	231	-0.13	11.88	1.1	Pass
		Inner Bracing	2L2x2x3/16	232	-0.01	5.94	0.9	Pass
T14	60 - 50	Inner Bracing	2L2x2x3/16	257	-0.14	9.47	1.5	Pass
		Inner Bracing	2L2x2x3/16	258	-0.15	9.47	1.6	Pass
		Inner Bracing	2L2x2x3/16	259	-0.14	9.47	1.5	Pass
		Inner Bracing	2L2x2x3/16	260	-0.15	9.47	1.6	Pass
		Inner Bracing	2L2x2x3/16	261	0.00	46.33	1.0	Pass
T16	40 - 30	Inner Bracing	2L2x2x3/16	294	-0.19	7.73	2.5	Pass
		Inner Bracing	2L2x2x3/16	295	-0.20	7.73	2.6	Pass
		Inner Bracing	2L2x2x3/16	296	-0.19	7.73	2.5	Pass
		Inner Bracing	2L2x2x3/16	297	-0.20	7.73	2.6	Pass
		Inner Bracing	2L2x2x3/16	298	-0.02	3.87	1.1	Pass
T18	20 - 10	Inner Bracing	2L2x2 1/2x3/16	335	-0.04	6.89	0.7	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
		Inner Bracing	2L2x2 1/2x3/16	336	-0.04	6.89	0.7	Pass
		Inner Bracing	2L2x2 1/2x3/16	337	-0.04	6.89	0.7	Pass
		Inner Bracing	2L2x2 1/2x3/16	338	-0.04	6.89	0.7	Pass
		Inner Bracing	2L2x2 1/2x3/16	339	0.01	52.49	1.0	Pass
T19	10 - 0	Inner Bracing	2L2x2 1/2x3/16	392	-0.18	6.32	2.8	Pass
		Inner Bracing	2L2x2 1/2x3/16	393	-0.18	6.32	2.9	Pass
		Inner Bracing	2L2x2 1/2x3/16	394	-0.18	6.32	2.8	Pass
		Inner Bracing	2L2x2 1/2x3/16	395	-0.19	6.32	2.9	Pass
		Inner Bracing	2L2x2 1/2x3/16	396	-0.01	3.16	1.0	Pass
							Summary	
						Leg (T19)	85.5	Pass
						Diagonal (T19)	89.6	Pass
						Horizontal (T19)	55.7	Pass
						Secondary Horizontal (T18)	37.7	Pass
						Top Girt (T16)	21.1	Pass
						Redund Horz 1 Bracing (T19)	40.4	Pass
						Redund Diag 1 Bracing (T19)	85.3	Pass
						Redund Hip 1 Bracing (T19)	0.6	Pass
						Redund Sub Horz Bracing (T19)	79.4	Pass
						Inner Bracing (T19)	2.9	Pass
						Bolt Checks	68.7	Pass
						RATING =	**89.6**	**Pass**

ANCHOR BOLT EVALUATION

ANCHOR BOLT ANALYSIS

Input Data

Tower Reactions:

Uplift:	Uplift := 428·kips	*user input*
Shear:	Shear := 47·kips	*user input*
Compression:	Compression := 467·kips	*user input*

Anchor Bolt Data:

Use ASTM A36	Use ASTM A36 per page 4.1 of structural analysis dated November 23, 1993		
Number of Anchor Bolts = N	N := 4	*user input*	
Bolt Ultimate Strength:	$F_u := 58 \cdot ksi$	*user input*	
Bolt Yield Strength:	Fy := 36·ksi	*user input*	
Bolt Modulus:	E := 29000·ksi	*user input*	
Thickness of Anchor Bolts	D := 2.5in	*user input*	
Threads per Inch:	n := 4	*user input*	
Coefficient of Friction:	$\mu := 0.55$	*user input*	(for baseplate with grout ASCE 10-15)
Length from top of pier to bottom of leveling nut:	$L_{ar} := 2.5in$	*user input*	(assumed single level nut to plate pt.)
Bolt Modulus:	E := 29000·ksi	*user input*	

Anchor Bolt Section Properties:

Gross Area of Bolt:

$$A_g := \frac{\pi}{4}\cdot D^2 \qquad A_g = 4.91\cdot in^2$$

Net Area of Bolt:

$$A_n := \frac{\pi}{4}\cdot\left(D - \frac{0.9743\cdot in}{n}\right)^2 \qquad A_n = 4\cdot in^2$$

Net Diameter:

$$D_n := D - \frac{0.9743 in}{n} \qquad D_n = 2.26\cdot in$$

Radius of Gyration of Bolt:

$$r := \frac{D_n}{4} \qquad r = 0.56\cdot in$$

Plastic Section Modulus of Bolt:

$$Z_x := \frac{D_n^3}{6} \qquad Z_x = 1.91\cdot in^3$$

Forces:

Tension Force:

$$T_u := \frac{Uplift}{N}$$

$T_u = 107\cdot kip$

$T_{ub} := T_u$

Shear Force:

$$V_u := \frac{Shear}{N}$$

$V_u = 11.75\cdot kip$ $\quad V_{ub} := V_u$

Resistance Factor for Flexure (ANSI/TIA-222-G 4.7):

$\phi_f := 0.9$

Resistance Factor for Anchor Bolt (ANSI/TIA-222-G 4.5.4.2):

$\phi_b := 0.80$

Resistance Factor for Tension (ANSI/TIA-222-G 4.9.6.1):

$\phi_t := 0.75$

Resistance Factor for Shear (ANSI/TIA-222-G 4.9.6.3):

$\phi_v := 0.75$

ANSI/TIA-222-G 4.7.1 Flexural Members:

Nominal Flexure Strength, Mn:

$M_n := Fy \cdot Z_x$

$M_n = 5.74 \cdot ft \cdot kip$

$\phi_f \cdot M_n = 5.17 \cdot ft \cdot kip$

Applied Moment due to Shear (worst case lever arm), Mu:

$M_u := L_{ar} \cdot V_u$

$M_u = 2.45 \cdot ft \cdot kip$

Flexure Check:

$FlexureCheck := if(M_u \le \phi_f \cdot M_n, "OK", "NO GOOD")$

FlexureCheck = "OK"

$$\frac{M_u}{\phi_f \cdot M_n} = 47.35 \cdot \%$$

ANSI/TIA-222-G 4.9.6.1 Tensile Strength:

Design Tensile Strength, Rnt:

$R_{nt} := F_u \cdot A_n$

$R_{nt} = 231.93 \cdot ft \cdot kip$

$\phi_t \cdot R_{nt} = 173.95 \cdot ft \cdot kip$

Tension Check:

$TensionCheck := if(T_u \le \phi_t \cdot R_{nt}, "OK", "NO GOOD")$

TensionCheck = "OK"

$$\frac{T_u}{\phi_t \cdot R_{nt}} = 61.51 \cdot \%$$

ANSI/TIA-222-G 4.9.6.3 Design Shear Strength:

Design Shear Strength, Rnv:

$R_{nv} := 0.45 \cdot F_u \cdot A_g$

$R_{nv} = 128.12 \cdot ft \cdot kip$

$\phi_v \cdot R_{nv} = 96.09 \cdot ft \cdot kip$

Shear Check:

$ShearCheck := if(V_u \le \phi_v \cdot R_{nv}, "OK", "NO GOOD")$

ShearCheck = "OK"

$$\frac{V_u}{\phi_v \cdot R_{nv}} = 12.23 \cdot \%$$

ANSI/TIA-222-G 4.9.6.4 Combined Shear and Tension:

$$\left[\frac{V_{ub}}{(\phi_v \cdot R_{nv})}\right]^2 + \left[\frac{T_{ub}}{(\phi_t \cdot R_{nt})}\right]^2 \le 1$$

$$\left[\frac{V_{ub}}{(\phi_v \cdot R_{nv})}\right]^2 + \left[\frac{T_{ub}}{(\phi_t \cdot R_{nt})}\right]^2 = 0.39$$

Combined Shear and Tension Check:

$$\text{ShearAndTensionCheck} := \text{if}\left[\left[\frac{V_{ub}}{(\phi_v \cdot R_{nv})}\right]^2 + \left[\frac{T_{ub}}{(\phi_t \cdot R_{nt})}\right]^2 \le 1, \text{"OK"}, \text{"NO GOOD"}\right]$$

ShearAndTensionCheck = "OK"

ANSI/TIA-222-G 4.9.9 Anchor Rods (Capacity):

$$\frac{\left[T_u + \left(\frac{V_u}{\eta}\right)\right]}{\phi_b \cdot P_n} \le 1$$

$\eta := 0.55$ *user input from ANSI/TIA-222-G 4.9.9*

$$\frac{\left[T_u + \left(\frac{V_u}{\eta}\right)\right]}{\phi_b \cdot F_u \cdot A_n} = 0.692$$

Capacity Check:

$$\text{CapacityCheck} := \text{if}\left[\frac{\left[T_u + \left(\frac{V_u}{\eta}\right)\right]}{\phi_b \cdot F_u \cdot A_n} \le 1, \text{"OK"}, \text{"NO GOOD"}\right]$$

CapacityCheck = "OK"

FOUNDATION ANALYSIS

AECOM

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	Analysis Report	Checked by		Date	

FOOTING WITH FOUR CONCRETE PIERS

INPUT DATA

TOWER FORCES:

Moment Caused by Tower	$M_t := 11149\,kip\cdot ft$
Shear at Base of Tower	$S_t := 118\,kip$
Max Compressive Force	$C_t := 467\,kip$
Max Uplift	$U_t := 428\,kip$
Max Pier Shear	$S_p := 47\,kip$
Height of Tower	$H_t := 180\,ft$
Width of Tower at Base	$W_t := 17.729\,ft$
Weight of Tower	$WT_t := 1\,kip$

NOTE: Weight of Tower is incorporated into the other loads listed above and is therefore set equal to one for programming.

FOOTING DIMENSIONS:

Width of Footing: $W_f := 37\,ft + 0ft$

NOTE: 2ft extension from original 35'-0" foundation based on MODification from AECOM project NSS-017R1 (dated 05/05/2015).

Overall Depth of Footing	$D_f := 9.5ft$
Length of Pier	$L_p := 6.5\,ft - 0ft$
Extension of Pier Above Grade	$L_{pag} := 1.0\,ft$
Square Dimension of Pier	$d_p := 4.0\,ft$
Thickness of Footing	$T_f := 3.0\,ft + 0ft$
Reinforement Cover:	$Cvr := 3in$
Ftg. Edge To Pier CL:	$X_t := 8.635ft$

MATERIAL PROPERTIES:

Compressive Strength of Concrete	$f'c := 3000\,psi$	Unit Weight of Soil	$\gamma_s := 100\,pcf$
Yield Strength of Steel Reinforcement	$fy := 60000\,psi$	Unit Weight of Concrete	$\gamma_c := 150\,pcf$
Internal Friction Angle of Soil	$\phi_s := 30\,deg$	Depth to Neglect	$n := 1.5\,ft$
Allowable Bearing Capacity	$q_s := 3400\,psf$	Cohesion of Clay Type Soil	$c := 0\,ksf$
Ultimate Bearing Capacity	$R_s := 2\cdot q_s$	Note: Use 0 for Sandy Soil	

Coefficient of Lateral Soil Pressure: $K_p := \frac{1 + \sin(\phi_s)}{1 - \sin(\phi_s)}$ $K_p = 3$

What is Position of Center of Tower with respect to Center of Pad? 1=Offset, 2=Not Offset: $Pos_{tower} := 2$

PIER REINFORCEMENT:

Bar Size	$BSpier := 9$	Bar Diameter	$d_{bpier} := 1.128\,in$
Number of Bars	$NBpier := 24$	Bar Area	$A_{bpier} := 1.00\,in^2$

PAD REINFORCEMENT:

Bar Size	$BS_{pad} := 9$	Bar Diameter	$d_{bpad} := 1.128\,in$
Number of Bars	$NB_{pad} := 42$	Bar Area	$A_{bpad} := 1.00\,in^2$

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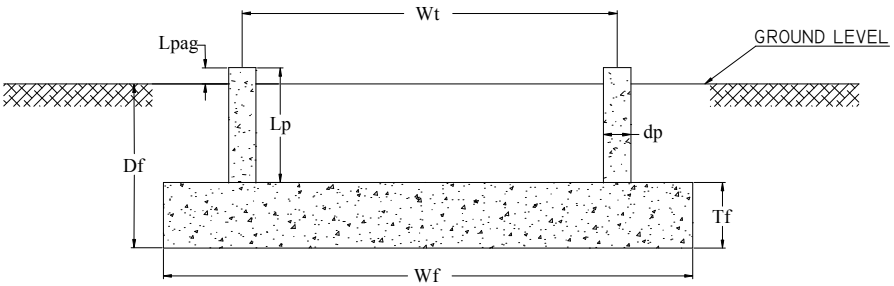
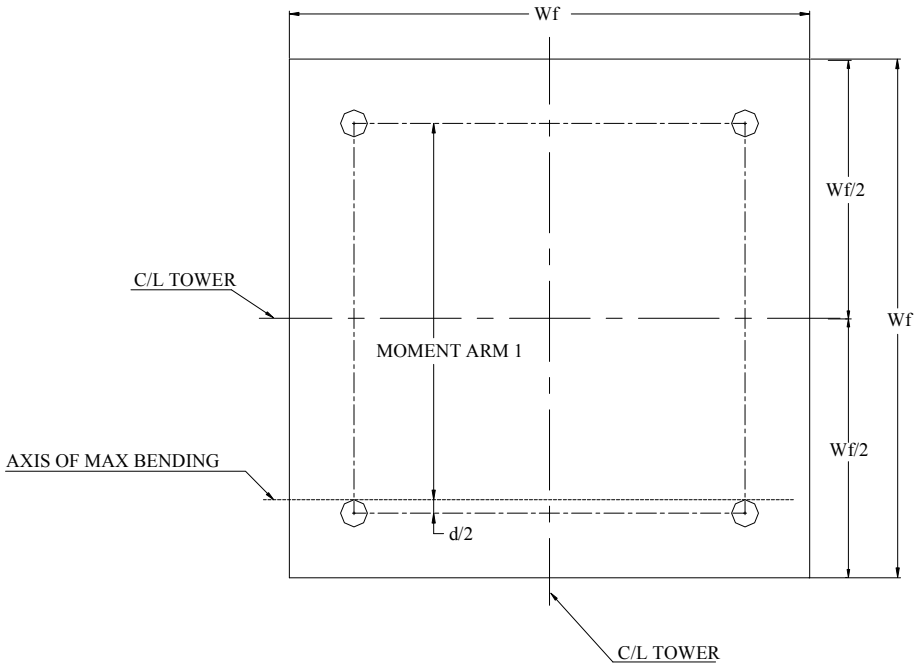
Typical Footing Plan and Elevation:



ELEVATION



PLAN

AECOM

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STABILITY OF FOOTING

NOTE: Reduction factor is implemented as 0.75 for pull-out/uplift of foundation. Reduction factor shall be applied to Overturning Moment in this case

Passive Pressure:

Pressure at Neglect: $P_{pn} := K_p \cdot \gamma_s \cdot n + c \cdot 2 \cdot \sqrt{K_p}$ $P_{pn} = 0.45 \cdot ksf$

Pressure at Footing Top: $P_{pt} := K_p \cdot \gamma_s \cdot (D_f - T_f) + c \cdot 2 \cdot \sqrt{K_p}$ $P_{pt} = 1.95 \cdot ksf$

Pressure at Top: $P_{top} := \text{if}\left[n < (D_f - T_f), P_{pt}, P_{pn}\right]$ $P_{top} = 1.95 \cdot ksf$

Pressure at Bottom: $P_{bot} := K_p \cdot \gamma_s \cdot D_f + c \cdot 2 \cdot \sqrt{K_p}$ $P_{bot} = 2.85 \cdot ksf$

Average Pressure: $P_{ave} := \frac{P_{top} + P_{bot}}{2}$ $P_{ave} = 2.4 \cdot ksf$

Soil Shear:

Effective Soil Depth: $T_{pp} := \text{if}\left[n < (D_f - T_f), T_f, (D_f - n)\right]$ $T_{pp} = 3 \cdot ft$

Area of Resistance: $A_{pp} := W_f \cdot T_{pp}$ $A_{pp} = 111 \cdot ft^2$

Shear Resistance: $S_u := P_{ave} \cdot A_{pp}$ $S_u = 266.4 \cdot kip$

Stabilizing Dead Load:

Weight of Concrete Pad: $WT_c := \left(W_f^2 \cdot T_f\right) \cdot \gamma_c$ $WT_c = 616.05 \cdot kip$

Weight of Soil: above Footing:

$$Depth := \begin{cases} D_f - n - T_f & \text{if } n < (D_f - T_f) \\ 0 & \text{otherwise} \end{cases}$$

$Depth = 5 \cdot ft$

$WT_{s1} := W_f^2 \cdot Depth \cdot \gamma_s$ $WT_{s1} = 684.5 \cdot kip$

Weight of Soil Wedge at Back Face: $WT_{s2} := \left[\frac{(D_f - n)^2 \cdot \tan(\phi_s)}{2} \cdot W_f\right] \cdot \gamma_s$ $WT_{s2} = 68.3583 \cdot kip$

Distance to center of Tower Leg from Edge of Footing: $X_{t1} := \frac{W_f}{2} - \frac{W_t}{2}$ $X_{t2} := \frac{W_f}{2} - \frac{W_t}{2}$ $X_t := \text{if}\left(Pos_{tower} = 1, X_{t1}, X_{t2}\right)$

Additional Offset of Footing: $X_{off1} := \frac{W_f}{2} - \left(\frac{W_t \cdot \cos(30 \cdot deg)}{3} + X_t\right)$ $X_{off1} = 3.7466 \cdot ft$ $X_{off2} := X_{off1}$

$X_{off} := \text{if}\left(Pos_{tower} = 1, X_{off1}, X_{off2}\right)$ $X_{off} = 3.7466 \cdot ft$

Stability Analysis:

Resisting Moment:

$$M_r := \left(WT_c \cdot 0.9 + WT_{s1} \cdot 0.9\right) \cdot \frac{W_f}{2} + WT_t \cdot \left(\frac{W_f}{2} - X_{off}\right) \ldots + 0.9\left(S_u \cdot \frac{T_{pp}}{3}\right) + 0.9 \cdot WT_{s2} \cdot \left(W_f + \frac{T_{pp} \cdot \tan(\phi_s)}{3}\right)$$

$M_r = 24220.5214 \cdot kip \cdot ft$

$\phi_{OT} := 0.75$ ***ANSI/TIA-222-G REDUCTION FACTOR***

(Factored) Overturning Moment: $M_{ot} := M_t + S_t \cdot (L_p + T_f) + WT_t \cdot X_{off}$ $M_{ot} = 12273.7466 \cdot kip \cdot ft$

$StabilityCheck := \text{if}\left(M_r \cdot \phi_{OT} > M_{ot}, \text{"Okay"}, \text{"No Good"}\right)$

Overturn Ratio (%): $Ratio_{Stability} := \frac{M_{ot}}{M_r \cdot \phi_{OT}}$ $Ratio_{Stability} = 67.57 \cdot \%$

$StabilityCheck = \text{"Okay"}$

BEARING PRESSURES

Loading Eccentricity:

Total Axial Load: $LOAD_{tot} := \left(WT_c + WT_{s1} + WT_t\right) \cdot 1.2$ $\quad LOAD_{tot} = 1561.86 \cdot kip$

Total Moment: $M_{ot} := M_t + S_t \cdot \left(L_p + T_f\right) + WT_t$ $\quad M_{ot} = 12271 \cdot kip \cdot ft$

Eccentricity: $e := \dfrac{M_{ot}}{LOAD_{tot}}$ $\quad e = 7.8567 \cdot ft$

Dist. From Ftg. CL to Kern Edge: $X_k := \dfrac{W_f}{6}$ $\quad X_k = 6.1667 \cdot ft$

Calculate Soil Pressures:

Maximum Contact Pressure:

$$P_{max} := \begin{cases} \dfrac{LOAD_{tot}}{W_f^{\,2}} \cdot \left(1 + \dfrac{6 \cdot e}{W_f}\right) & \text{if } e \le X_k \\ \dfrac{2 \cdot LOAD_{tot}}{3 \cdot W_f \cdot \left(\dfrac{W_f}{2} - e\right)} & \text{otherwise} \end{cases}$$

$P_{max} = 2.6441 \cdot ksf$

Minimum Contact Pressure:

$$P_{min} := \begin{cases} \dfrac{LOAD_{tot}}{W_f^{\,2}} \cdot \left(1 - \dfrac{6 \cdot e}{W_f}\right) & \text{if } e \le X_k \\ 0ksf & \text{otherwise} \end{cases}$$

$P_{min} = 0 \cdot ksf$

Length of Applied Pressure:

$$X_p := \begin{cases} W_f & \text{if } e \le X_k \\ 3 \cdot \left(\dfrac{W_f}{2} - e\right) & \text{otherwise} \end{cases}$$

$X_p = 31.93 \cdot ft$

Pressure Slope:

$$m_p := \frac{P_{max} - P_{min}}{X_p}$$

$m_p = 0.0828 \cdot ksf$

Revised Maximum: $q_{max} := P_{max}$ $\quad q_{max} = 2.6441 \cdot ksf$

$PressureCheck := \text{if}\left(q_{max} < 0.75 \cdot R_s, \text{"Okay"}, \text{"No Good"}\right)$ $\quad PressureCheck = \text{"Okay"}$

$\dfrac{q_{max}}{0.75 \cdot R_s} = 0.5184$

Concrete Bearing Capacity (ACI 10.14):

(ACI 9.3.2.2) $\phi_c := 0.65$

$P_b := \phi_c \cdot 0.85 \cdot f'c \cdot \frac{d_p^2 \cdot \pi}{4}$ $P_b = 2999.3413 \cdot kip$

$BearingCheck := if(P_b > C_t, "Okay", "No Good")$ $BearingCheck = "Okay"$

SHEAR STRENGTH OF CONCRETE

Beam (One-Way) Shear Action (ACI 11.2.1.1):

"d" Distance: $d := T_f - Cvr - .5 \cdot in$ $d = 32.5 \cdot in$

Factored Pressure at "d" Distance: $P_d := \left[P_{max} - \left(X_t - \frac{d_p}{2} - d \right) \cdot m_p \right]$ $P_d = 2.2361 \cdot ksf$

Factored Pressure at Edge: $P_{edge} := P_{max}$ $P_{edge} = 2.6441 \cdot ksf$

Average Pressure: $P_{ave} := \frac{P_d + P_{edge}}{2}$ $P_{ave} = 2.4401 \cdot ksf$

Capacity Reduction Factor: (ACI 9.3.2.3) $\phi_c := 0.75$

Applied Shear Force: $V_{req} := \frac{P_{ave} \cdot (X_t - 0.5 \cdot d_p - d) \cdot W_f}{\phi_c}$ $V_{req} = 593.1127 \cdot kip$

Available Shear: (ACI 11.3.1.1) $V_{Avail} := 2 \cdot \sqrt{f'c \cdot psi} \cdot W_f \cdot d$ $V_{Avail} = 1580.7273 \cdot kip$

Check Capacity: $BeamShearCheck := if(V_{req} < V_{Avail}, "Okay", "No Good")$

$BeamShearCheck = "Okay"$

Punching (Two-Way) Shear Action (ACI 11.11.1.2):

Critical Perimeter: $b_o := 4(d_p + d)$ → $b_o = 26.8333 \cdot ft$

Capacity Reduction Factor: (ACI 9.3.2.3) $\phi_c := .85$ $C_t = 467 \cdot kip$

Factored Maximum Punching Shear Force $FL := \frac{C_t}{\phi_c}$ → $FL = 549.4118 \cdot kip$

Available Shear: $V_{Avail} := 4 \cdot \sqrt{f'c \cdot psi} \cdot b_o \cdot d$ → $V_{Avail} = 2292.7666 \cdot kip$

Check Capacity: $PunchingShearCheck := if(V_{req} < V_{Avail}, "Okay", "No Good")$

$PunchingShearCheck = "Okay"$

BENDING

Maximim Bending Moment:

Distance From Edge of FTG To Face of Pier: $X_b := \frac{W_f}{2} - e - \frac{d_p}{2}$ → $X_b = 8.6433 \cdot ft$

Moment Due To Overturning:

Factored Pressure at "d" Distance: $P_{face} := 1 \cdot (P_{max} - X_b \cdot m_p)$ → $P_{face} = 1.9283 \cdot ksf$

Factored Pressure at Edge: $P_{edge} := 1 \cdot P_{max}$ → $P_{edge} = 2.6441 \cdot ksf$

Moment Due To Rectangular Loading: $M_1 := (P_{face} \cdot X_b \cdot W_f) \cdot \left(\frac{1}{2} \cdot X_b\right)$ → $M_1 = 2665.1067 \cdot kip \cdot ft$

Moment Due to Triangular Loading: $M_2 := \left[\frac{1}{2} \cdot X_b \cdot (P_{edge} - P_{face})\right] \cdot \left(\frac{2}{3} \cdot X_b\right)$ → $M_2 = 17.8236 \cdot kip \cdot ft$

Sum Moments: $M_{ot} := M_1 + M_2$ → $M_{ot} = 2682.9303 \cdot kip \cdot ft$

Moment Due To Uplift:

Pier Forces:

$$M_{nT} := 1 \cdot \left[U_t \cdot \left(W_f - 2 \cdot X_b - \frac{d}{2} - d \right) + S_t \cdot \left(D_f + L_{pag} \right) \right] \qquad M_{nT} = 7937.5493 \cdot kip \cdot ft$$

Concrete Resistance:

$$M_{nS} := \left[\frac{1}{2} \cdot \left(W_f - X_b - d_p \right)^2 \cdot \left(T_f \cdot W_f \right) \cdot \gamma_s \right] \cdot 0.9 \qquad M_{nS} = 2963.2677 \cdot kip \cdot ft$$

Soil Resistance:

$$M_{nC} := \left[\frac{1}{2} \cdot \left(W_f - X_b - d_p \right)^2 \cdot \left(T_f \cdot W_f \right) \cdot \gamma_c \right] \cdot 0.9 \qquad M_{nC} = 4444.9016 \cdot kip \cdot ft$$

Sum Moments

$$M_{uplift} := M_{nT} - M_{nS} - M_{nC} \qquad M_{uplift} = 529.38 \cdot kips \cdot ft$$

Select Controlling Moment:

$$M_u := \begin{cases} M_{ot} & \text{if } M_{ot} \geq M_{uplift} \\ M_{uplift} & \text{otherwise} \end{cases} \qquad M_u = 2682.9303 \cdot kips \cdot ft$$

Strength Reduction Factor: (ACI 9.3.2.2)

$$\phi_m := .90$$

Design Moment:

$$M_n := \frac{M_u}{\phi_m} \qquad M_n = 2981.0337 \cdot kips \cdot ft$$

Size Reinforcing Steel:

Effective Width:

$$b_{eff} := W_f \qquad b_{eff} = 444 \cdot in$$

Stress Block:

$$a := d \cdot \left(1 - \sqrt{1 - 2.3529 \cdot \frac{M_n}{f'c \cdot b_{eff} \cdot d^2}} \right) \qquad a = 0.9871 \cdot in$$

Steel Req'd For Bending:

$$A_s := \frac{M_n}{fy \cdot \left(d - \frac{a}{2} \right)} \qquad A_s = 18.6277 \cdot in^2$$

Reinforcement Ratio:

$$\rho := \frac{A_s}{b_{eff} \cdot d} \qquad \rho = 0.0013$$

Steel Req'd For Temperature and Shrinkage: (ACI 7.12.2.1b)

$$\rho_{sh} := \text{if}(fy \geq 60000 \cdot psi, 0.0018, 0.0020) \qquad \rho_{sh} = 0.0018$$

$$As := \text{if}\left(\rho \geq \rho_{sh}, A_s, \rho_{sh} \cdot b_{eff} \cdot d \right) \qquad As = 25.974 \cdot in^2$$

$$As_{prov} := A_{bpad} \cdot NB_{pad} \qquad As_{prov} = 42 \cdot in^2$$

Check Provided Steel:

$$PadReinforcement := \text{if}\left(As_{prov} > As, \text{"Okay"}, \text{"No Good"} \right)$$

$$PadReinforcement = \text{"Okay"}$$

DEVELOPMENT LENGTH OF PAD REINFORCEMENT

TENSION (ACI 12.2.3)

Bar Spacing:

$$B_{sPad} := \frac{W_f - 2\cdot Cvr - NB_{pad}\cdot d_{bpad}}{NB_{pad} - 1}$$

$B_{sPad} = 9.5274\cdot in$

Development Length Factors:

Reinforcement Location Factor	$\alpha := 1.0$
Coating Factor	$\beta := 1.0$
Concrete strength Factor	$\lambda := 1.0$
Reinforcement Size Factor	$\gamma := 1.0$

Spacing or Cover Dimension:

$$c := if\left(Cvr < \frac{B_{sPad}}{2}, Cvr, \frac{B_{sPad}}{2}\right)$$

$c = 3\cdot in$

Transverse Reinforcement Index: As allowed by ACI 12.2.4

$k_{tr} := 0$

$$L_{dbt} := \frac{3}{40}\cdot\frac{fy}{\sqrt{f'c\cdot psi}}\cdot\frac{\alpha\cdot\beta\cdot\gamma\cdot\lambda}{\frac{c+k_{tr}}{d_{bpad}}}\cdot d_{bpad}$$

$L_{dbt} = 34.8457\cdot in$

$L_{dbmin} := 12\cdot in$

Minimum Development Length: (ACI 12.2.1)

$L_{dbtCheck} := if\left(L_{dbt} \geq L_{dbmin}, "Use\ L.dbt", "Use\ L.dbmin"\right)$ $L_{dbtCheck} = "Use\ L.dbt"$

Available Length in Pad:

$$L_{Pad} := \frac{W_f}{2} - \frac{W_t}{2} - Cvr$$

$L_{Pad} = 112.626\cdot in$

$LpadTension := if\left(L_{Pad} > L_{dbt}, "Okay", "No\ Good"\right)$ $LpadTension = "Okay"$

REINFORCEMENT IN PIER

Pier Area:

(ACI 10.8.4 and 10.9.1)

$$A_p := \frac{\pi\cdot d_p^{\,2}}{4}$$

$A_p = 1809.5574\cdot in^2$

$A_{smin} := 0.01\cdot 0.5\cdot A_p$

$A_{smin} = 9.0478\cdot in^2$

$A_{sprov} := NBpier\cdot A_{bpier}$

$A_{sprov} = 24\cdot in^2$

$SteelAreaCheck := if\left(A_{sprov} > A_{smin}, "Okay", "No\ Good"\right)$ $SteelAreaCheck = "Okay"$

NOTE: Anchor Bolts are not accounted for in reinforcement calculation and will provide additional reinforcement to satisfy minimum requirement of steel.

Bar Spacing In Pier:

$$B_{sPier} := \frac{d_p \cdot \pi}{NBpier} - d_{bpier} \qquad B_{sPier} = 5.1552 \cdot in$$

Diameter of Reinforcement Cage:

$$Diam_{cage} := d_p - 2 \cdot Cvr \qquad Diam_{cage} = 42 \cdot in$$

Maximum Moment in Pier:

$$M_p := (S_p \cdot L_p) \cdot 1 \qquad M_p = 3666 \cdot kips \cdot in$$

Pier Check evaluated from outside program and results are listed below;

(defined variables)

$$(f'_c \;\; f_y \;\; cl \;\; Spiral) = (3 \;\; 60 \;\; 4 \;\; 0)$$

The required input is column diameter in inches, number of reinforcing bars, bar size number, factored axial load in kips and moment in kip inches:

$$(D \;\; N \;\; n \;\; P_u \;\; M_{xu}) := (48 \;\; 24 \;\; 9 \;\; 560.4 \;\; 11045)$$

Clears any previous output:

$$(\phi P_n \;\; \phi M_{xn} \;\; f_{sp} \;\; \rho) := (0 \;\; 0 \;\; 0 \;\; 0)$$

$$(\phi P_n \;\; \phi M_{xn} \;\; f_{sp} \;\; \rho) := \phi P'_n(D, N, n, P_u, M_{xu})^T$$

The Output is given as useable axial load in kips, moment capacity in kip inches, splicing stress in ksi, and reinforcement ratio:

$$(\phi P_n \;\; \phi M_{xn} \;\; f_{sp} \;\; \rho) = (1368.1926 \;\; 26965.895 \;\; -60 \;\; 0.0133)$$

Column size and reinforcement may be changed to match capacity to the applied load.

$$AxialLoadCheck := if(\phi P_n \geq P_u, "Okay", "No Good") \qquad AxialLoadCheck = "Okay"$$

$$BendingCheck := if(\phi M_{xn} \geq M_{xu}, "Okay", "No Good") \qquad BendingCheck = "Okay"$$

DEVELOPMENT LENGTH OF PIER REINFORCEMENT

TENSION (ACI 12.2.3)

Spacing and Cover: $Cvr = 3\cdot in$ $B_{sPier} = 5.1552\cdot in$

Factors for development:

Reinforcement Location Factor	$\alpha := 1.0$
Coating Factor	$\beta := 1.0$
Concrete strength Factor	$\lambda := 1.0$
Reinforcement Size Factor	$\gamma := 1.0$

Spacing or Cover Dimension: $c := if\left(Cvr < \frac{B_{sPier}}{2}, Cvr, \frac{B_{sPier}}{2}\right)$ $c = 2.5776\cdot in$

Transverse Reinforcement: As allowed by ACI 12.2.4 $k_{tr} := 0$

$$L_{dbt} := \frac{3}{40}\cdot\frac{fy}{\sqrt{f'c\cdot psi}}\cdot\frac{\alpha\cdot\beta\cdot\gamma\cdot\lambda}{\frac{c+k_{tr}}{d_{bpier}}}\cdot d_{bpier} \qquad L_{dbt} = 40.5561\cdot in$$

Minimum Development Length: (ACI 12.2.1) $L_{dbmin} := 12\cdot in$

$L_{dbtCheck} := if\left(L_{dbt} \geq L_{dbmin}, "Use\ L.dbt", "Use\ L.dbmin"\right)$ $L_{dbtCheck} = "Use\ L.dbt"$

COMPRESSION: (ACI 12.3.2)

$$L_{dbc1} := \frac{.02\cdot d_{bpier}\cdot fy}{\sqrt{f'c\cdot psi}} \qquad L_{dbc1} = 24.7132\cdot in$$

$L_{dbmin} := 0.0003\cdot\frac{in^2}{lb}\cdot\left(d_{bpier}\cdot fy\right)$ $L_{dbmin} = 20.304\cdot in$

$L_{dbc} := if\left(L_{dbc1} \geq L_{dbmin}, L_{dbc1}, L_{dbmin}\right)$ $L_{dbc} = 24.7132\cdot in$

Available Length in Pier: $L_{pier} := L_p - 3\cdot in$ $L_{pier} = 75\cdot in$

Available Length in Pad: $L_{pad} := T_f - 3\cdot in$ $L_{pad} = 33\cdot in$

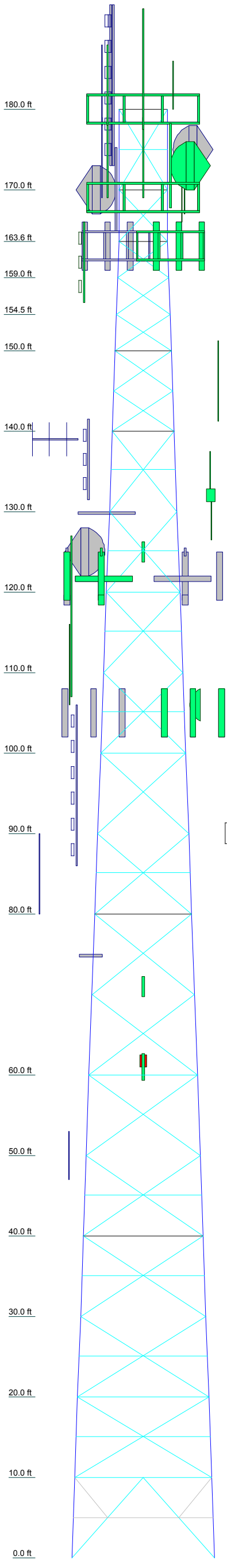
Available Length: $L_{total} := L_{pad} + L_{pier}$ $L_{total} = 108\cdot in$

$L_{tension} := if\left(L_{total} > L_{dbt}, "Okay", "No\ Good"\right)$ $L_{tension} = "Okay"$

$L_{compression} := if\left(L_{total} > L_{dbc}, "Okay", "No\ Good"\right)$ $L_{compression} = "Okay"$

ANALYSIS UNDER TIA-222-F DEISGN CRITERIA (DESPP / CSP)

Section	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14	T15	T16	T17	T18	T19
Legs	L3 1/2x3 1/2x3/8	L5x5x5/16				L5x5x3/8	L6x6x1/2		L6x6x3/4		L8x8x3/4		L8x8x1 w/ 1/2x7 Plates		L8x8x1-1/8 w/ 1/2x7 Plates			L8x8x1 1/8	
Leg Grade	A36																		
Diagonals	L2 1/2x2 1/2x3/16		A		L2 1/2x2x3/16		L3x2 1/2x1/4		L3x3x1/4		L3 1/2x3x1/4		2L2 1/2x2x3/16				2L2 1/2x2x3/8		2L2 1/2x2 1/2x5/16
Diagonal Grade											A36								
Top Girts	L2x2x3/16			N.A.			L2 1/2x2 1/2x3/16		N.A.		N.A.		N.A.		N.A.		2L2x2x3/16		
Horizontals					N.A.												N.A.		2L2 1/2x2 1/2x1/4
Sec. Horizontals	L2x2x3/16			N.A.			L2x2x1/4				N.A.		N.A.		N.A.				N.A.
Red. Horizontals																	L3 1/2x3 1/2x1/4		
Red. Diagonals											N.A.								L2 1/2x2 1/2x3/16
Red. Sub-Horizs																			L3x3x5/16
Red. Hips											N.A.								L2 1/2x2 1/2x3/16
Inner Bracing	N.A.						L2x2x3/16	N.A.	L2 1/2x2x3/16	N.A.	L2 1/2x2x3/16	N.A.	2L2x2x3/16	N.A.	N.A.	N.A.	N.A.	2L2x2x3/16	2L2x2 1/2x3/16
Face Width (ft) 17.73	6						6.9733	8.40735	9.1244	9.84145	10.5585	11.2756	11.9926	13.4267	14.1438	14.8608	15.5779	16.2949	17.0125
# Panels @ (ft)	1 @ 10		1 @ 6.427		3 @ 4.52433	6.64887	2 @ 5						14 @ 10						
Weight (K) 51.8	0.7	0.5	0.4	0.4	0.4	1.0	1.5	1.4	2.1	1.9	2.5	2.4	8.0	4.6	5.1	4.8	4.3	5.0	4.9



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Lightning Rod 2"x15' (A32)	185	BA1010 (A12 / DK-27)	132 - 127
SC479-HF1LDF (D00-E5764) (A28)	183	Dish Ice Shield (A11 / DK-26)	130
ANT150D (A29a)	183	PD128-1 (A8 / DK-14)	128 - 121
DB222 (A29b)	183	3" Dia 20' Omni (A7 / DK-13)	127 - 107
SC479-HF1LDF (D00-E5764) (A30)	183	2'6"x4" Pipe Mount (A10 / DK-25)	125
ALR8-0 (A31)	183	6' PAD w/ Radome (A10 / DK-25)	125
TMA 432-83H-01T - Future Decom. (A27)	181	EUSF10-U w/ (2) Stiff-Arm Supports (T-Mobile)	122
SC479-HF1LDF (D00I-E5764) (A23)	180 - 168	EUSF10-U w/ (2) Stiff-Arm Supports (T-Mobile)	122
15' T-Frame Sector Mount (1) (A23,24,30,31)	180	EUSF10-U w/ (2) Stiff-Arm Supports (T-Mobile)	122
SC479-HF1LDF (D00I-E5764) (A24)	180 - 168	RFS APXVAARR24_43-U-NA20 Panel Antenna w/ 108" Pipe Mount (T-Mobile - Proposed)	122
SC479-HF1LDF (D00I-E5764) (A26)	180 - 168		
15' T-Frame Sector Mount (1) (A26,27,28,29)	180	RFS APXVAARR24_43-U-NA20 Panel Antenna w/ 108" Pipe Mount (T-Mobile - Proposed)	122
10'6"x4" Pipe Mount (A33)	175		
6' PAD w/ Radome (A33)	175	RFS APXVAARR24_43-U-NA20 Panel Antenna w/ 108" Pipe Mount (T-Mobile - Proposed)	122
10'6"x4" Pipe Mount (A25)	173		
6' PAD w/ Radome (A25 /)	173	Generic Twin TMA unit (T-Mobile - Proposed)	122
DB586-Y (A21)	170	Generic Twin TMA unit (T-Mobile - Proposed)	122
10'6"x4" Pipe Mount (A22)	170	Generic Twin TMA unit (T-Mobile - Proposed)	122
6' PAD w/ Radome (A22 /)	170	Ericsson 4449 B71 + B12 Radio Unit (T-Mobile - Proposed)	122
BA1010-2 (A20)	169	Ericsson 4449 B71 + B12 Radio Unit (T-Mobile - Proposed)	122
15' T-Frame Sector Mount (1) (A20)	169		
T-Frame (ATI)	163	Ericsson 4449 B71 + B12 Radio Unit (T-Mobile - Proposed)	122
T-Frame (ATI)	163		
T-Frame (ATI)	163	Ericsson AIR32 B66A/B2A Panel Antenna w/ 108" Pipe Mount (T-Mobile - Proposed)	122
7770.00 (ATI)	163	Ericsson AIR32 B66A/B2A Panel Antenna w/ 108" Pipe Mount (T-Mobile - Proposed)	122
(2) LGP 21901 Diplexer Unit (ATI)	163		
Kathrein 800-10965 Panel Antenna (ATI)	163	Ericsson AIR32 B66A/B2A Panel Antenna w/ 108" Pipe Mount (T-Mobile - Proposed)	122
QS66512-3 Quintel Panel (ATI)	163		
RRUS-11 (ATI)	163	10' Standoff (A8 / DK-14)	121
Raycap DC6-48-60-18-8F DC Power Surge Protection (ATI)	163	12' Omni Antenna (A9 - DK-15)	116 - 106
7770.00 (ATI)	163	6' Side-Arm Mount (A7 / DK-13)	107
(2) LGP 21901 Diplexer Unit (ATI)	163	10'6"x4" Pipe Mount (A6 / DK-12 / CSP-11)	106
Kathrein 800-10965 Panel Antenna (ATI)	163	DB264-A (A5 / DK-11)	106 - 86
QS66512-3 Quintel Panel (ATI)	163	6' Side-Arm Mount (A9 - DK-15)	106
RRUS-11 (ATI)	163	4' Grid Dish (A6 / DK 12 / CSP-11)	106
7770.00 (ATI)	163	ALU 4x45W (1900 MHz) (Sprint / DK 5-10)	105
(2) LGP 21901 Diplexer Unit (ATI)	163	AAHC Panel Antenna (Sprint)	105
Kathrein 800-10965 Panel Antenna (ATI)	163	AAHC Panel Antenna (Sprint)	105
QS66512-3 Quintel Panel (ATI)	163	AAHC Panel Antenna (Sprint)	105
RRUS-11 (ATI)	163	NNVV-65B-R4 Panel Antenna (Sprint)	105
4478 Radio Unit (4x40W) (ATI)	163	NNVV-65B-R4 Panel Antenna (Sprint)	105
4478 Radio Unit (4x40W) (ATI)	163	NNVV-65B-R4 Panel Antenna (Sprint)	105
4478 Radio Unit (4x40W) (ATI)	163	TD-RRH8x20-25 (Sprint)	105
RRUS-32 B66 (ATI)	163	TD-RRH8x20-25 (Sprint)	105
RRUS-32 B66 (ATI)	163	TD-RRH8x20-25 (Sprint)	105
RRUS-32 B66 (ATI)	163	ALU 800MHz 2x50W (Sprint / DK 5-10)	105
RRUS-32 B2 (ATI)	163	APXVSPP18-C-A20 w/ Mount Pipe (Sprint / DK 5-10)	105
RRUS-32 B2 (ATI)	163		
RRUS-32 B2 (ATI)	163	ALU 800MHz 2x50W (Sprint / DK 5-10)	105
RRUS-32 (ATI)	163	ALU 800MHz 2x50W (Sprint / DK 5-10)	105
RRUS-32 (ATI)	163	ALU 4x45W (1900 MHz) (Sprint / DK 5-10)	105
RRUS-32 (ATI)	163	12' Wireless Frame (Sprint / DK 5-10)	105
DC6-48-60-18-8C Squid / Surge Arrestor (ATI)	163	12' Wireless Frame (Sprint / DK 5-10)	105
DC6-48-60-18-8C Squid / Surge Arrestor (ATI)	163	12' Wireless Frame (Sprint / DK 5-10)	105
(2) LPG21401 TMA (ATI)	163	APXVSPP18-C-A20 w/ Mount Pipe (Sprint / DK 5-10)	105
(2) LPG21401 TMA (ATI)	163	ALU 4x45W (1900 MHz) (Sprint / DK 5-10)	105
(2) LPG21401 TMA (ATI)	163	APXVSPP18-C-A20 w/ Mount Pipe (Sprint / DK 5-10)	105
DB408-B (A19)	161		
(2) 6' Side Mount Standoff (A19)	161	10' Standoff (A4 / DK-4)	91
12' Omni Antenna (A15 / DK-30)	152 - 140.5	SC479-HF1LDF (A4 / DK-4)	91 - 79
8' Side Arm Mount (A15 / DK-30)	140.5	4' Side Mount Standoff (A5 / DK-11)	86
6' Side-Arm Mount (A17 / DK-32)	139	Dish Ice Shield (A3 / DK-3)	75
6' Side-Arm Mount (A18 / DK-33)	139	2'6"x4" Pipe Mount (A3 / DK-3)	71
Yagi ASP-816 (A17 / DK-32)	139	3'4"x4" Pipe Mount (A2 / Sprint)	61
BA1010 (A14 / DK-29)	137 - 132	GPS (A2 / Sprint)	61
DB222-A (A16 / DK-31)	136.5	3' Stand-off (A1 / DK-1)	50
4' Side Mount Standoff (A16 / DK-31)	136.5	DB803M-Y (A1 / DK-1)	50
432E-83I-01T TTA Unit (A13 / DK-28)	132		
6' Side-Arm Mount (A12,13,14 / DK-27,28,29)	132		

SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	L2x2x3/16		

MATERIAL STRENGTH

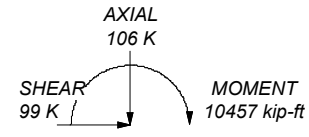
GRADE	Fy	Fu	GRADE	Fy	Fu
A36	36 ksi	58 ksi			

TOWER DESIGN NOTES

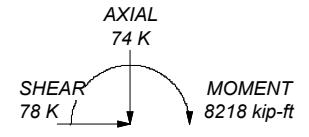
1. Tower designed for a 90 mph basic wind in accordance with the TIA/EIA-222-F Standard.
2. Tower is also designed for a 90 mph basic wind with 0.50 in ice.
3. Deflections are based upon a 90 mph wind.
4. TOWER RATING: 96.8%

MAX. CORNER REACTIONS AT BASE:
DOWN: 443 K
SHEAR: 39 K

UPLIFT: -391 K
SHEAR: 42 K



TORQUE 99 kip-ft
90 mph WIND - 0.5000 in ICE

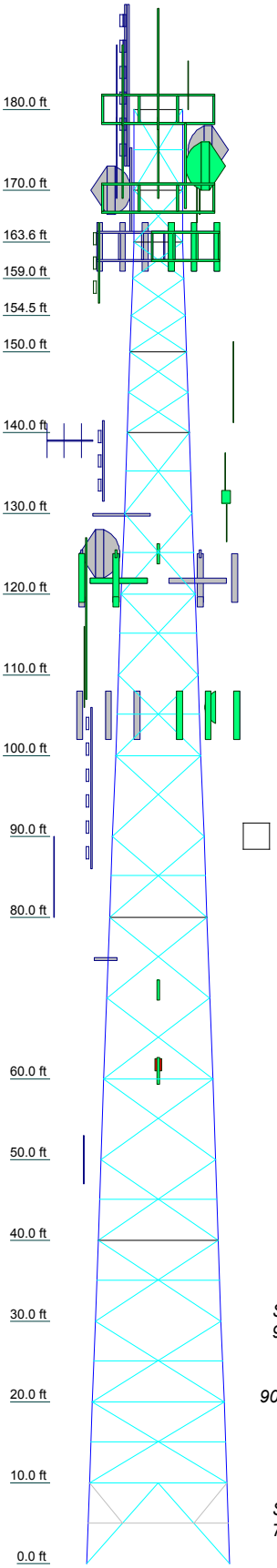


TORQUE 57 kip-ft
REACTIONS - 90 mph WIND

AECOM
500 Enterprise Drive, Suite 3B
Rocky Hill, CT
Phone: 860-529-8882
FAX: 860-529-3991

Job: ***180' Lattice Tower - CSP***			
Project: ***Wilton, Connecticut - DESPP/CSP Load Conditions***			
Client: Transcend Wireless / T-Mobile / TWM-013		Drawn by: MCD	App'd:
Code: TIA/EIA-222-F		Date: 05/04/19	Scale: NTS
Path: P:\Projects\Telcom\StructuralsByLocation\Connecticut\WiltonCSP#31\19-60604309-TWM-013\TIA-F\DESPP_CSP_Wilton_CT.eri			Dwg No. E-1

Section	T19	T18	T17	T16	T15	T14	T13	T12	T11	T10	T9	T8	T7	T6	T5	T4	T3	T2	T1
Legs		L8x8x1 1/8				B	L8x8x1 w/ 1/2x7 Plates		L8x8x3/4	L6x6x3/4		L6x6x1/2		L5x5x3/8			L5x5x5/16		A
Leg Grade									A36										
Diagonals	D		2L2 1/2x2x3/8				2L2 1/2x2x3/16		L3 1/2x3x1/4		L3x3x1/4		L3x2 1/2x1/4	L2 1/2x2x3/16		C		L2 1/2x2 1/2x3/16	
Diagonal Grade									A36										
Top Girts		N.A.		2L2x2x3/16		N.A.	L2 1/2x2 1/2x1/4			N.A.			L2 1/2x2 1/2x3/16		N.A.			L2x2x3/16	
Horizontals	F	2L2x2x3/16		N.A.		2L2x2x3/16	N.A.		E	N.A.	E		L2x2x1/4	N.A.					
Sec. Horizontals	N.A.		L3 1/2x3 1/2x1/4				N.A.		N.A.	L2x2x1/4	L2x2x3/16	L2x2x1/4						L2x2x3/16	
Red. Horizontals	G								N.A.										
Red. Diagonals	G								N.A.										
Red. Sub-Horizs	L3x3x5/16								N.A.										
Red. Hips	G								N.A.										
Inner Bracing		2L2x2 1/2x3/16		N.A.		2L2x2x3/16	N.A.		2L2x2x3/16	N.A.	H	N.A.	L2x2x3/16			N.A.			
Face Width (ft)	17.73	16.2949	15.5779	14.8608	N.A.	13.4267	11.9926	N.A.	11.2756	9.84145	9.1244	8.40735	7.6903	6.9736	6.4888	6.32443			6
# Panels @ (ft)		17.0125				14.1438	14 @ 10		10.5585					2 @ 5	3 @ 4.52433		1 @ 6.427	1 @ 10	
Weight (K)	51.8																		



SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	L3 1/2x3 1/2x3/8	E	L2 1/2x2 1/2x1/4
B	L8x8x1-1/8 w/ 1/2x7 Plates	F	2L2 1/2x2 1/2x1/4
C	L2x2x3/16	G	L2 1/2x2 1/2x3/16
D	2L2 1/2x2 1/2x5/16	H	L2 1/2x2x3/16

MATERIAL STRENGTH

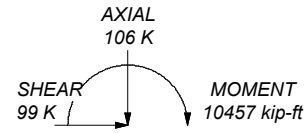
GRADE	Fy	Fu	GRADE	Fy	Fu
A36	36 ksi	58 ksi			

TOWER DESIGN NOTES

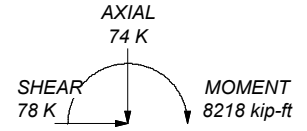
1. Tower designed for a 90 mph basic wind in accordance with the TIA/EIA-222-F Standard.
2. Tower is also designed for a 90 mph basic wind with 0.50 in ice.
3. Deflections are based upon a 90 mph wind.
4. TOWER RATING: 96.8%

MAX. CORNER REACTIONS AT BASE:
DOWN: 443 K
SHEAR: 39 K

UPLIFT: -391 K
SHEAR: 42 K



TORQUE 99 kip-ft
90 mph WIND - 0.5000 in ICE



TORQUE 57 kip-ft
REACTIONS - 90 mph WIND

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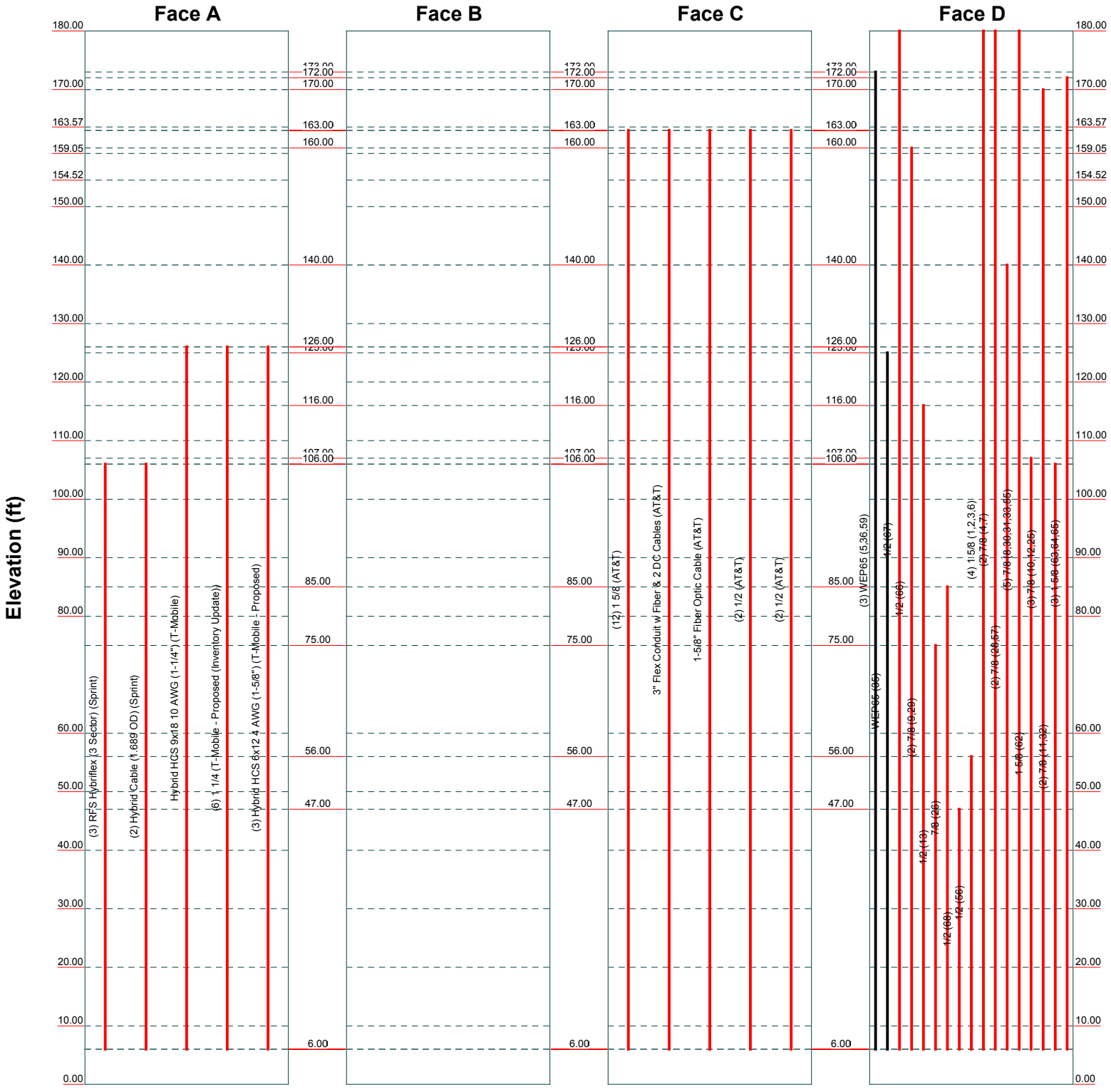
Project: ***Wilton, Connecticut - DESPP/CSP Load Conditions***			
Client: Transcend Wireless / T-Mobile / TWM-013	Drawn by: MCD	App'd:	
Code: TIA/EIA-222-F	Date: 05/04/19	Scale: NTS	
Path: P:\Projects\Telcom\StructuralsByLocation\Connecticut\WiltonCSP#31\19-60604309-TWM-013\TIA-F\DESPP_CSP_Wilton_CT.eri		Dwg No. E-1	

Feed Line Distribution Chart
0' - 180'

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



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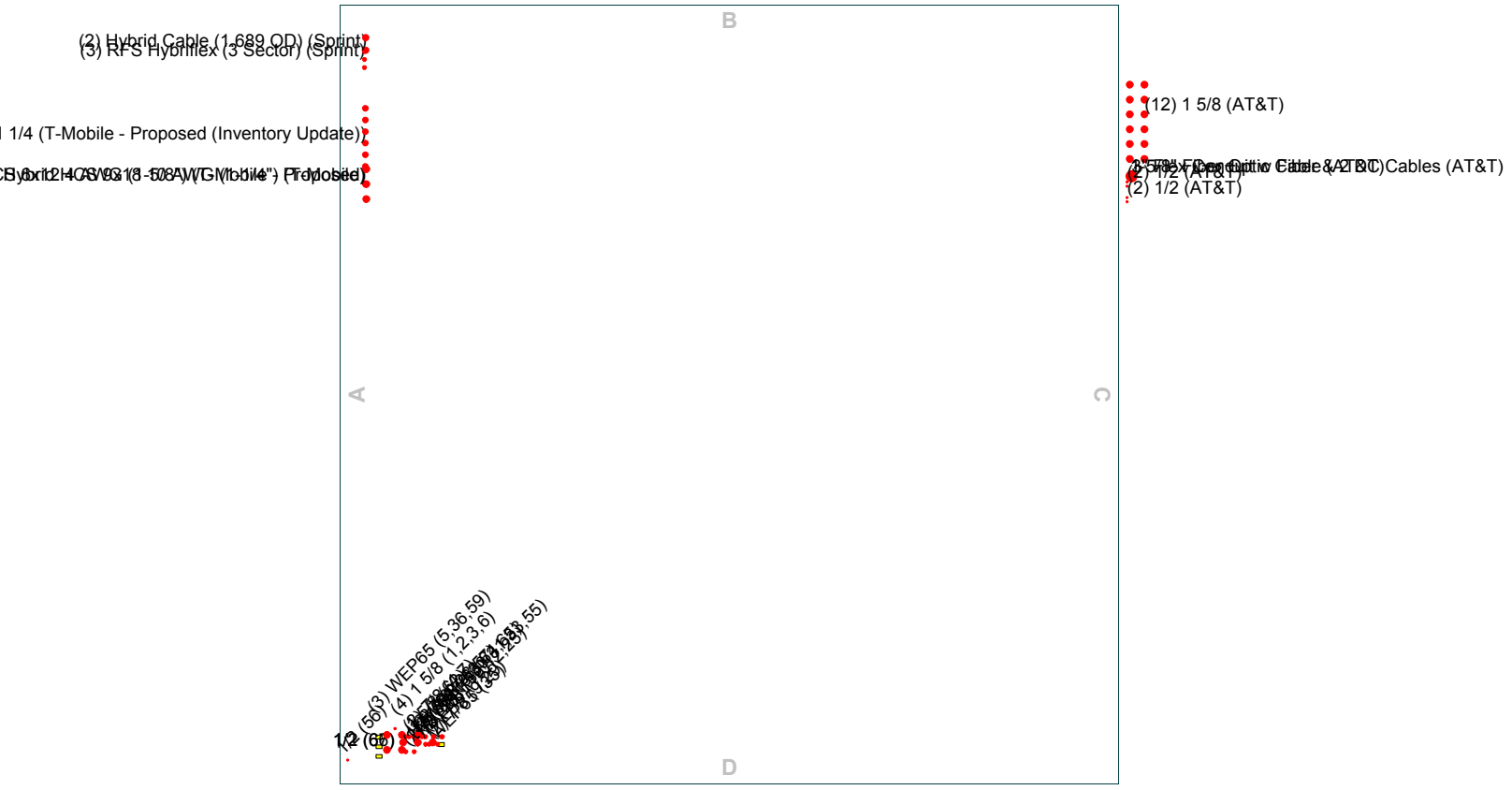
Path: P:\Projects\Telcom\StructuralsByLocation\Connecticut\WiltonCSP#31\19-60604309-TWM-013\TIA-F\DESPP_CSP_Wilton_CT.eri			Dwg No. E-7

Feed Line Plan

Round Flat App In Face App Out Face



(8) 1-5/8" Coax Cables
(18) 7/8" Coax Cables
(4) 1/2" Coax Cables
(4) WEP65 Elliptical Cables

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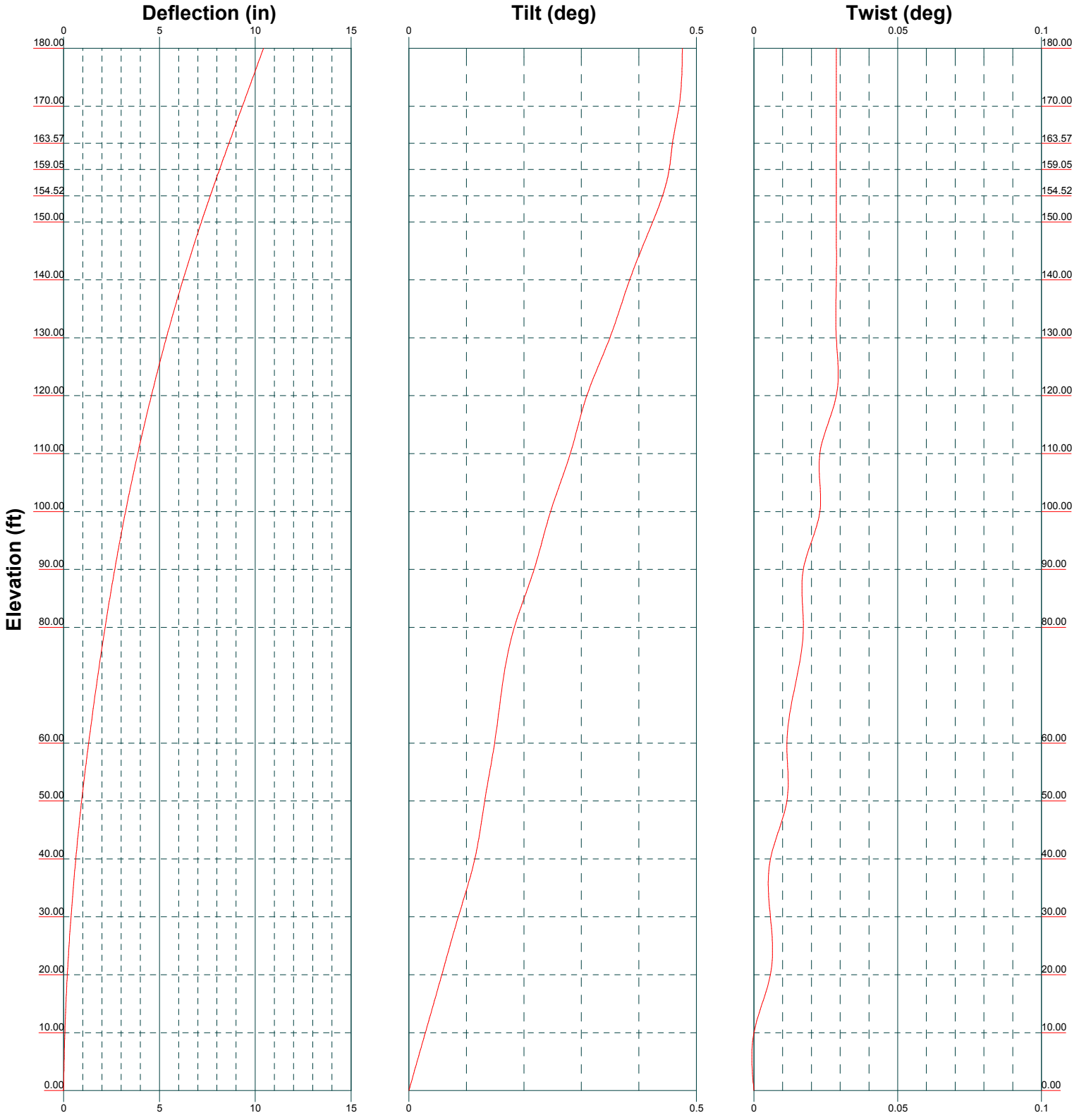
TIA/EIA-222-F - Service - 90 mph

Maximum Values



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Client: Transcend Wireless / T-Mobile / TWM-013	Drawn by: MCD	App'd:	
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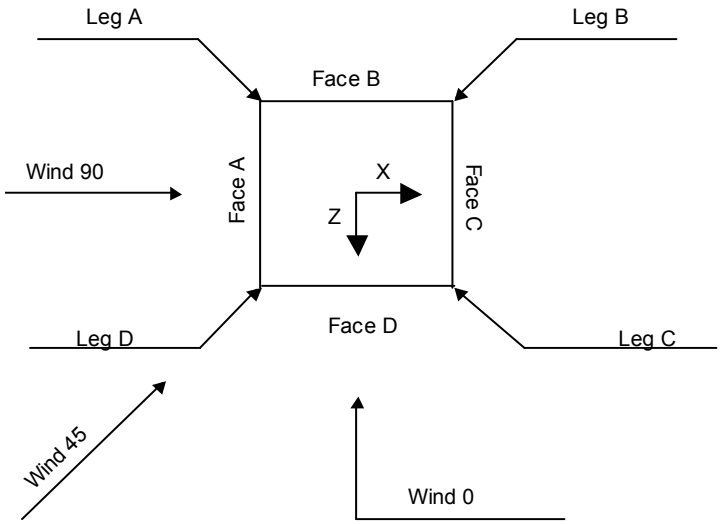
Tower Input Data

The main tower is a 4x free standing tower with an overall height of 180.00 ft above the ground line.
The base of the tower is set at an elevation of 0.00 ft above the ground line.
The face width of the tower is 6.00 ft at the top and 17.73 ft at the base.
This tower is designed using the TIA/EIA-222-F standard.
The following design criteria apply:

Basic wind speed of 90 mph.
Nominal ice thickness of 0.5000 in.
Ice density of 56 pcf.
A wind speed of 90 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 90 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in tower member design is 1.333.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

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



Square Tower

Tower Section Geometry

Tower Section	Tower Elevation	Assembly Database	Description	Section Width	Number of Sections	Section Length
	ft			ft		ft
T1	180.00-170.00			6.00	1	10.00
T2	170.00-163.57			6.00	1	6.43
T3	163.57-159.05			6.00	1	4.52
T4	159.05-154.52			6.32	1	4.52
T5	154.52-150.00			6.65	1	4.52
T6	150.00-140.00			6.97	1	10.00
T7	140.00-130.00			7.69	1	10.00
T8	130.00-120.00			8.41	1	10.00
T9	120.00-110.00			9.12	1	10.00
T10	110.00-100.00			9.84	1	10.00
T11	100.00-90.00			10.56	1	10.00
T12	90.00-80.00			11.28	1	10.00
T13	80.00-60.00			11.99	1	20.00
T14	60.00-50.00			13.43	1	10.00
T15	50.00-40.00			14.14	1	10.00
T16	40.00-30.00			14.86	1	10.00
T17	30.00-20.00			15.58	1	10.00
T18	20.00-10.00			16.29	1	10.00
T19	10.00-0.00			17.01	1	10.00

Tower Section Geometry *(cont'd)*

Tower Section	Tower Elevation	Diagonal Spacing	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset	Bottom Girt Offset
	ft	ft				in	in

Tower Section	Tower Elevation ft	Diagonal Spacing ft	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset in	Bottom Girt Offset in
T1	180.00-170.00	10.00	X Brace	No	Yes	0.0000	0.0000
T2	170.00-163.57	6.43	X Brace	No	No	0.0000	0.0000
T3	163.57-159.05	4.52	X Brace	No	No	0.0000	0.0000
T4	159.05-154.52	4.52	X Brace	No	No	0.0000	0.0000
T5	154.52-150.00	4.52	X Brace	No	No	0.0000	0.0000
T6	150.00-140.00	5.00	X Brace	No	No	0.0000	0.0000
T7	140.00-130.00	10.00	X Brace	No	Yes	0.0000	0.0000
T8	130.00-120.00	10.00	X Brace	No	Yes	0.0000	0.0000
T9	120.00-110.00	10.00	X Brace	No	Yes	0.0000	0.0000
T10	110.00-100.00	10.00	X Brace	No	Yes	0.0000	0.0000
T11	100.00-90.00	10.00	X Brace	No	Yes	0.0000	0.0000
T12	90.00-80.00	10.00	X Brace	No	Yes	0.0000	0.0000
T13	80.00-60.00	10.00	X Brace	No	Yes	0.0000	0.0000
T14	60.00-50.00	10.00	X Brace	No	Yes	0.0000	0.0000
T15	50.00-40.00	10.00	X Brace	No	Yes	0.0000	0.0000
T16	40.00-30.00	10.00	X Brace	No	Yes	0.0000	0.0000
T17	30.00-20.00	10.00	X Brace	No	Yes	0.0000	0.0000
T18	20.00-10.00	10.00	X Brace	No	Yes	0.0000	0.0000
T19	10.00-0.00	10.00	K1 Down	No	Yes	0.0000	0.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 180.00-170.00	Single Angle	L3 1/2x3 1/2x3/8	A36 (36 ksi)	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T2 170.00-163.57	Single Angle	L5x5x5/16	A36 (36 ksi)	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T3 163.57-159.05	Single Angle	L5x5x5/16	A36 (36 ksi)	Single Angle	L2x2x3/16	A36 (36 ksi)
T4 159.05-154.52	Single Angle	L5x5x5/16	A36 (36 ksi)	Single Angle	L2 1/2x2x3/16	A36 (36 ksi)
T5 154.52-150.00	Single Angle	L5x5x5/16	A36 (36 ksi)	Single Angle	L2 1/2x2x3/16	A36 (36 ksi)
T6 150.00-140.00	Single Angle	L5x5x3/8	A36 (36 ksi)	Single Angle	L2 1/2x2x3/16	A36 (36 ksi)
T7 140.00-130.00	Single Angle	L6x6x1/2	A36 (36 ksi)	Single Angle	L3x2 1/2x1/4	A36 (36 ksi)
T8 130.00-120.00	Single Angle	L6x6x1/2	A36 (36 ksi)	Single Angle	L3x3x1/4	A36 (36 ksi)
T9 120.00-110.00	Single Angle	L6x6x3/4	A36 (36 ksi)	Single Angle	L3x3x1/4	A36 (36 ksi)
T10 110.00-100.00	Single Angle	L6x6x3/4	A36 (36 ksi)	Single Angle	L3 1/2x3x1/4	A36 (36 ksi)
T11 100.00-90.00	Single Angle	L8x8x3/4	A36 (36 ksi)	Single Angle	L3 1/2x3x1/4	A36 (36 ksi)
T12 90.00-80.00	Single Angle	L8x8x3/4	A36 (36 ksi)	Single Angle	L3 1/2x3x1/4	A36 (36 ksi)
T13 80.00-60.00	Arbitrary Shape	L8x8x1 w/ 1/2x7 Plates	A36 (36 ksi)	Double Angle	2L2 1/2x2x3/16	A36 (36 ksi)
T14 60.00-50.00	Arbitrary Shape	L8x8x1-1/8 w/ 1/2x7 Plates	A36 (36 ksi)	Double Angle	2L2 1/2x2x3/16	A36 (36 ksi)
T15 50.00-40.00	Arbitrary Shape	L8x8x1-1/8 w/ 1/2x7 Plates	A36 (36 ksi)	Double Angle	2L2 1/2x2x3/8	A36 (36 ksi)
T16 40.00-30.00	Single Angle	L8x8x1 1/8	A36 (36 ksi)	Double Angle	2L2 1/2x2x3/8	A36 (36 ksi)

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T17 30.00-20.00	Single Angle	L8x8x1 1/8	A36 (36 ksi)	Double Angle	2L2 1/2x2x3/8	A36 (36 ksi)
T18 20.00-10.00	Single Angle	L8x8x1 1/8	A36 (36 ksi)	Double Angle	2L2 1/2x2x3/8	A36 (36 ksi)
T19 10.00-0.00	Single Angle	L8x8x1 1/8	A36 (36 ksi)	Double Angle	2L2 1/2x2 1/2x5/16	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T1 180.00-170.00	Single Angle	L2x2x3/16	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T2 170.00-163.57	Single Angle	L2x2x3/16	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T3 163.57-159.05	Single Angle	L2x2x3/16	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T6 150.00-140.00	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T7 140.00-130.00	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T13 80.00-60.00	Single Angle	L2 1/2x2 1/2x1/4	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T16 40.00-30.00	Double Angle	2L2x2x3/16	A36 (36 ksi)	Single Angle		A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
T1 180.00-170.00	1	Single Angle	L2x2x3/16	A36 (36 ksi)	Double Angle		A36 (36 ksi)
T9 120.00-110.00	1	Single Angle	L2x2x3/16	A36 (36 ksi)	Single Angle	L2 1/2x2 1/2x1/4	A36 (36 ksi)
T11 100.00-90.00	None	Single Angle		A36 (36 ksi)	Single Angle	L2 1/2x2 1/2x1/4	A36 (36 ksi)
T14 60.00-50.00	None	Single Angle		A36 (36 ksi)	Double Angle	2L2x2x3/16	A36 (36 ksi)
T18 20.00-10.00	None	Single Angle		A36 (36 ksi)	Double Angle	2L2x2x3/16	A36 (36 ksi)
T19 10.00-0.00	None	Single Angle		A36 (36 ksi)	Double Angle	2L2 1/2x2 1/2x1/4	A36 (36 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 180.00-170.00	Single Angle	L2x2x3/16	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T7 140.00-130.00	Equal Angle	L2x2x1/4	A36 (36 ksi)	Single Angle	L2x2x3/16	A36 (36 ksi)
T8 130.00-120.00	Single Angle	L2x2x1/4	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T9 120.00-110.00	Single Angle	L2x2x3/16	A36 (36 ksi)	Single Angle	L2 1/2x2x3/16	A36 (36 ksi)
T10 110.00-100.00	Single Angle	L2x2x1/4	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T11 100.00-90.00	Single Angle		A36 (36 ksi)	Single Angle	L2 1/2x2x3/16	A36 (36 ksi)
T12 90.00-80.00	Single Angle	L2 1/2x2 1/2x1/4	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T13 80.00-60.00	Equal Angle		A36 (36 ksi)	Double Angle	2L2x2x3/16	A36 (36 ksi)
T14 60.00-50.00	Single Angle		A36 (36 ksi)	Double Angle	2L2x2x3/16	A36 (36 ksi)
T15 50.00-40.00	Single Angle	L3 1/2x3 1/2x1/4	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T16 40.00-30.00	Single Angle	L3 1/2x3 1/2x1/4	A36 (36 ksi)	Double Angle	2L2x2x3/16	A36 (36 ksi)
T17 30.00-20.00	Single Angle	L3 1/2x3 1/2x1/4	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T18 20.00-10.00	Single Angle	L3 1/2x3 1/2x1/4	A36 (36 ksi)	Double Angle	2L2x2 1/2x3/16	A36 (36 ksi)
T19 10.00-0.00	Single Angle		A36 (36 ksi)	Double Angle	2L2x2 1/2x3/16	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Redundant Bracing Grade		Redundant Type	Redundant Size	K Factor
T19 10.00-0.00	A36 (36 ksi)	Horizontal (1)	Single Angle	L2 1/2x2 1/2x3/16	1
		Diagonal (1)	Single Angle	L2 1/2x2 1/2x3/16	1
		Sub-Horizontal	Single Angle	L3x3x5/16	1
		Hip (1)	Single Angle	L2 1/2x2 1/2x3/16	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 180.00-170.00	0.00	0.0000	A36 (36 ksi)	1	1	1.02	24.0000	24.0000	36.0000
T2 170.00-163.57	0.00	0.0000	A36 (36 ksi)	1	1	1.02	24.0000	24.0000	36.0000

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
T3 163.57-159.05	0.00	0.0000	A36 (36 ksi)	1	1	1.02	24.0000	24.0000	36.0000
T4 159.05-154.52	0.00	0.0000	A36 (36 ksi)	1	1	1.02	24.0000	24.0000	36.0000
T5 154.52-150.00	0.00	0.0000	A36 (36 ksi)	1	1	1.02	24.0000	24.0000	36.0000
T6 150.00-140.00	0.00	0.0000	A36 (36 ksi)	1	1	1.02	24.0000	24.0000	36.0000
T7 140.00-130.00	0.00	0.0000	A36 (36 ksi)	1	1	1.02	24.0000	24.0000	36.0000
T8 130.00-120.00	0.00	0.0000	A36 (36 ksi)	1	1	1.02	24.0000	24.0000	36.0000
T9 120.00-110.00	0.00	0.0000	A36 (36 ksi)	1	1	1.02	24.0000	24.0000	36.0000
T10 110.00-100.00	0.00	0.0000	A36 (36 ksi)	1	1	1.02	24.0000	24.0000	36.0000
T11 100.00-90.00	0.00	0.0000	A36 (36 ksi)	1	1	1.02	24.0000	24.0000	36.0000
T12 90.00-80.00	0.00	0.0000	A36 (36 ksi)	1	1	1.02	24.0000	24.0000	36.0000
T13 80.00-60.00	0.00	0.0000	A36 (36 ksi)	1	1	1.02	24.0000	24.0000	36.0000
T14 60.00-50.00	0.00	0.0000	A36 (36 ksi)	1	1	1.02	24.0000	24.0000	36.0000
T15 50.00-40.00	0.00	0.0000	A36 (36 ksi)	1	1	1.02	24.0000	24.0000	36.0000
T16 40.00-30.00	0.00	0.0000	A36 (36 ksi)	1	1	1.02	24.0000	24.0000	36.0000
T17 30.00-20.00	0.00	0.0000	A36 (36 ksi)	1	1	1.02	24.0000	24.0000	36.0000
T18 20.00-10.00	0.00	0.0000	A36 (36 ksi)	1	1	1.02	24.0000	24.0000	36.0000
T19 10.00-0.00	0.00	0.0000	A36 (36 ksi)	1	1	1.02	24.0000	24.0000	36.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X 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 180.00-170.00	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T2 170.00-163.57	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T3 163.57-159.05	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T4 159.05-154.52	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T5 154.52-150.00	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T6 150.00-140.00	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X	X Brace Diags Y	K Brace Diags X	K Brace Diags Y	Single Diags X	Single Diags Y	Girts X	Girts Y	Horiz. X	Horiz. Y	Sec. Horiz. X	Sec. Horiz. Y	Inner Brace X	Inner Brace Y
T7	Yes	No	1	1		1		1		1		1		1		1	
140.00-130.00				1		1		1		1		1		1		1	
T8	Yes	No	1	1		1		1		1		1		1		1	
130.00-120.00				1		1		1		1		1		1		1	
T9	Yes	No	1	1		1		1		1		1		1		1	
120.00-110.00				1		1		1		1		1		1		1	
T10	Yes	No	1	1		1		1		1		1		1		1	
110.00-100.00				1		1		1		1		1		1		1	
T11	Yes	No	1	1		1		1		1		1		1		1	
100.00-90.00				1		1		1		1		1		1		1	
T12	Yes	No	1	1		1		1		1		1		1		1	
90.00-80.00				1		1		1		1		1		1		1	
T13	Yes	No	1	1		1		1		1		1		1		1	
80.00-60.00				1		1		1		1		1		1		1	
T14	Yes	No	1	1		1		1		1		1		1		1	
60.00-50.00				1		1		1		1		1		1		1	
T15	Yes	No	1	1		1		1		1		1		1		1	
50.00-40.00				1		1		1		1		1		1		1	
T16	Yes	No	1	1		1		1		1		1		1		1	
40.00-30.00				1		1		1		1		1		1		1	
T17	Yes	No	1	1		1		1		1		1		1		1	
30.00-20.00				1		1		1		1		1		1		1	
T18	Yes	No	1	1		1		1		1		1		1		1	
20.00-10.00				1		1		1		1		1		1		1	
T19	Yes	No	1	1		1		1		1		1		1		1	
10.00-0.00				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 Net Width Deduct in	Leg U	Diagonal Net Width Deduct in	Diagonal U	Top Girt Net Width Deduct in	Top Girt U	Bottom Girt Net Width Deduct in	Bottom Girt U	Mid Girt Net Width Deduct in	Mid Girt U	Long Horizontal Net Width Deduct in	Long Horizontal U	Short Horizontal Net Width Deduct in	Short Horizontal U
T1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.6250	0.75	0.0000	0.75	0.0000	0.75
180.00-170.00														
T2	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.6250	0.75	0.0000	0.75	0.0000	0.75
170.00-163.57														
T3	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.6250	0.75	0.0000	0.75	0.0000	0.75
163.57-159.05														
T4	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.6250	0.75	0.0000	0.75	0.0000	0.75
159.05-154.52														
T5	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.6250	0.75	0.0000	0.75	0.0000	0.75
154.52-150.00														
T6	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.6250	0.75	0.0000	0.75	0.0000	0.75
150.00-140.00														
T7	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.6250	0.75	0.0000	0.75	0.0000	0.75
140.00-130.00														
T8	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.6250	0.75	0.0000	0.75	0.0000	0.75
130.00-120.00														

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
T9 120.00-110.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.6250	0.75	0.0000	0.75	0.0000	0.75
T10 110.00-100.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.6250	0.75	0.0000	0.75	0.0000	0.75
T11 100.00-90.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.6250	0.75	0.0000	0.75	0.0000	0.75
T12 90.00-80.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.6250	0.75	0.0000	0.75	0.0000	0.75
T13 80.00-60.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.6250	0.75	0.0000	0.75	0.0000	0.75
T14 60.00-50.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.6250	0.75	0.0000	0.75	0.0000	0.75
T15 50.00-40.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.6250	0.75	0.0000	0.75	0.0000	0.75
T16 40.00-30.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.6250	0.75	0.0000	0.75	0.0000	0.75
T17 30.00-20.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.6250	0.75	0.0000	0.75	0.0000	0.75
T18 20.00-10.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.6250	0.75	0.0000	0.75	0.0000	0.75
T19 10.00-0.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.6250	0.75	0.0000	0.75	0.0000	0.75

Tower Section Geometry *(cont'd)*

Tower Elevation	Connection Offsets							
	Diagonal				K-Bracing			
	Vert. Top	Horiz. Top	Vert. Bot.	Horiz. Bot.	Vert. Top	Horiz. Top	Vert. Bot.	Horiz. Bot.
ft	in	in	in	in	in	in	in	in
T1 180.00-170.00	0.0000	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000
T2 170.00-163.57	0.0000	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000
T3 163.57-159.05	0.0000	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000
T4 159.05-154.52	0.0000	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000
T5 154.52-150.00	0.0000	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000
T6 150.00-140.00	0.0000	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000
T7 140.00-130.00	0.0000	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000
T8 130.00-120.00	0.0000	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000
T9 120.00-110.00	0.0000	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000
T10 110.00-100.00	0.0000	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000

Tower Elevation	Connection Offsets							
	Diagonal				K-Bracing			
	Vert. Top	Horiz. Top	Vert. Bot.	Horiz. Bot.	Vert. Top	Horiz. Top	Vert. Bot.	Horiz. Bot.
ft	in	in	in	in	in	in	in	in
T11 100.00-90.00	0.0000	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000
T12 90.00-80.00	0.0000	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000
T13 80.00-60.00	0.0000	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000
T14 60.00-50.00	0.0000	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000
T15 50.00-40.00	0.0000	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000
T16 40.00-30.00	0.0000	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000
T17 30.00-20.00	0.0000	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000
T18 20.00-10.00	0.0000	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000
T19 10.00-0.00	0.0000	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T1 180.00-170.00	Flange	0.7500 A325X	0	0.6250 A325X	2	0.6250 A325X	2	0.6250 A325N	0	0.6250 A325X	2	0.6250 A325X	0	0.6250 A325X	2
T2 170.00-163.57	Flange	0.7500 A325X	0	0.6250 A325X	2	0.6250 A325X	2	0.6250 A325N	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325X	0
T3 163.57-159.05	Flange	0.7500 A325X	0	0.6250 A325X	2	0.6250 A325X	2	0.6250 A325N	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325X	0
T4 159.05-154.52	Flange	0.7500 A325X	0	0.6250 A325X	2	0.6250 A325X	0	0.6250 A325N	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325X	0
T5 154.52-150.00	Flange	0.7500 A325X	0	0.6250 A325X	2	0.6250 A325X	0	0.6250 A325N	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325X	0
T6 150.00-140.00	Flange	0.7500 A325X	0	0.6250 A325X	2	0.6250 A325X	2	0.6250 A325N	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325X	0
T7 140.00-130.00	Flange	0.7500 A325X	0	0.6250 A325X	2	0.6250 A325X	2	0.6250 A325N	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325X	0
T8 130.00-120.00	Flange	0.7500 A325X	0	0.6250 A325X	2	0.6250 A325X	0	0.6250 A325N	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325X	2
T9 120.00-110.00	Flange	0.7500 A325X	0	0.6250 A325X	2	0.6250 A325X	0	0.6250 A325N	0	0.6250 A325X	2	0.6250 A325X	2	0.6250 A325X	2
T10 110.00-100.00	Flange	0.7500 A325X	0	0.6250 A325X	2	0.6250 A325X	0	0.6250 A325N	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325X	2
T11 100.00-90.00	Flange	0.7500 A325X	0	0.6250 A325X	2	0.6250 A325X	0	0.6250 A325N	0	0.6250 A325X	2	0.6250 A325X	2	0.6250 A325X	0
T12 90.00-80.00	Flange	0.7500 A325X	0	0.6250 A325X	2	0.6250 A325X	0	0.6250 A325N	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325X	2
T13 80.00-60.00	Flange	0.7500 A325X	0	0.6250 A325X	2	0.6250 A325X	2	0.6250 A325N	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325X	0

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.
T14 60.00-50.00	Flange	0.7500 A325X	0	0.6250 A325X	2	0.6250 A325X	0	0.6250 A325N	0	0.6250 A325X	2	0.6250 A325X	2	0.6250 A325X	0
T15 50.00-40.00	Flange	0.7500 A325X	0	0.6250 A325X	2	0.6250 A325X	0	0.6250 A325N	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325X	2
T16 40.00-30.00	Flange	0.7500 A325X	0	0.6250 A325X	2	0.6250 A325X	2	0.0000 A325N	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325X	2
T17 30.00-20.00	Flange	0.7500 A325X	0	0.6250 A325X	2	0.6250 A325X	0	0.6250 A325N	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325X	2
T18 20.00-10.00	Flange	0.7500 A325X	0	0.6250 A325X	2	0.6250 A325X	0	0.6250 A325N	0	0.6250 A325X	2	0.6250 A325X	2	0.6250 A325X	2
T19 10.00-0.00	Flange	0.7500 A325X	0	0.6250 A325X	2	0.6250 A325X	0	0.6250 A325N	0	0.6250 A325X	2	0.6250 A325X	2	0.6250 A325X	0

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
WEP65 (5,36,59)	D	Yes	No	Af (CfAe)	173.00 - 6.00	-12.0000	0.45	3	1	1.5836	1.5836	5.1284	0.53
WEP65 (35)	D	Yes	No	Af (CfAe)	125.00 - 6.00	-10.0000	0.37	1	1	1.5836	1.5836	5.1284	0.53
1/2 (67)	D	No	No	Ar (Leg)	180.00 - 6.00	0.0000	0.1	1	1	0.5800	0.5800		0.25
1/2 (66)	D	No	No	Ar (Leg)	160.00 - 6.00	0.0000	0.1	1	1	0.5800	0.5800		0.25
7/8 (9,29)	D	Yes	No	Ar (CfAe)	116.00 - 6.00	-10.0000	0.38	2	2	1.1100	1.1100		0.54
1/2 (13)	D	Yes	No	Ar (CfAe)	75.00 - 6.00	-10.0000	0.39	1	1	0.5800	0.5800		0.25
7/8 (26)	D	Yes	No	Ar (CfAe)	85.00 - 6.00	-10.0000	0.39	1	1	1.1100	1.1100		0.54
1/2 (68)	D	Yes	No	Ar (CfAe)	47.00 - 6.00	-10.0000	0.4	1	1	0.5800	0.5800		0.25
1/2 (56)	D	Yes	No	Ar (CfAe)	56.00 - 6.00	-6.0000	0.49	1	1	0.5800	0.5800		0.25
1 5/8 (1,2,3,6)	D	Yes	No	Ar (CfAe)	180.00 - 6.00	-12.0000	0.43	4	2	1.9800	1.9800		1.04
7/8 (4,7)	D	Yes	No	Ar (CfAe)	180.00 - 6.00	-12.0000	0.41	2	2	1.1100	1.1100		0.54
7/8 (28,57)	D	Yes	No	Ar (CfAe)	140.00 - 6.00	-12.0000	0.4	2	2	1.1100	1.1100		0.54
7/8 (8,30,31,33,55)	D	Yes	No	Ar (CfAe)	180.00 - 6.00	-12.0000	0.39	5	5	1.1100	1.1100		0.54
1 5/8 (62)	D	Yes	No	Ar (CfAe)	107.00 - 6.00	-12.0000	0.4	1	1	1.9800	1.9800		1.04
7/8 (10,12,25)	D	Yes	No	Ar (CfAe)	170.00 - 6.00	-12.0000	0.38	3	3	1.1100	1.1100		0.54
7/8 (11,32)	D	Yes	No	Ar (CfAe)	106.00 - 6.00	-8.0000	0.41	2	2	1.1100	1.1100		0.54
1 5/8 (63,64,65)	D	Yes	No	Ar (CfAe)	172.00 - 6.00	-10.0000	0.4	3	3	1.9800	1.9800		1.04

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
1 5/8 (AT&T)	C	Yes	No	Ar (CfAe)	163.00 - 6.00	2.0000	-0.35	12	6	1.9800	1.9800		1.04
3" Flex Conduit w Fiber & 2 DC Cables (AT&T)	C	Yes	No	Ar (CfAe)	163.00 - 6.00	2.0000	-0.28	1	1	3.0000	3.0000		3.00
RFS Hybriflex (3 Sector) (Sprint)	A	Yes	No	Ar (CfAe)	106.00 - 6.00	-6.0000	0.43	3	3	1.0900	1.0900		0.37
1-5/8" Fiber Optic Cable (AT&T)	C	Yes	No	Ar (CfAe)	163.00 - 6.00	2.0000	-0.28	1	1	1.9800	1.9800		1.30
1/2 (AT&T)	C	Yes	No	Ar (CfAe)	163.00 - 6.00	2.0000	-0.27	2	2	0.5800	0.5800		0.25
1/2 (AT&T)	C	Yes	No	Ar (CfAe)	163.00 - 6.00	2.0000	-0.25	2	2	0.5800	0.5800		0.25
Hybrid Cable (1.689 OD) (Sprint) * T-Mobile Cables	A	Yes	No	Ar (CfAe)	106.00 - 6.00	-6.0000	0.45	2	2	1.6890	1.6890		2.31
Hybrid HCS 9x18 10 AWG (1-1/4") (T-Mobile)	A	Yes	No	Ar (CfAe)	126.00 - 6.00	-6.0000	0.27	1	1	1.5400	1.5400		0.90
1 1/4 (T-Mobile - Proposed (Inventory Update))	A	Yes	No	Ar (CfAe)	126.00 - 6.00	-6.0000	0.33	6	6	1.5500	1.5500		0.66
Hybrid HCS 6x12 4 AWG (1-5/8") (T-Mobile - Proposed)	A	Yes	No	Ar (CfAe)	126.00 - 6.00	-6.0000	0.27	3	3	1.9900	1.9900		1.90

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	180.00-170.00	A	0.483	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
		D	11.248	0.396	0.000	0.000	0.09
T2	170.00-163.57	A	0.311	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
		D	11.558	0.848	0.000	0.000	0.09
T3	163.57-159.05	A	0.265	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	6.316	0.000	0.000	0.000	0.07
		D	8.182	0.597	0.000	0.000	0.07
T4	159.05-154.52	A	0.437	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00

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
		C	7.231	0.000	0.000	0.000	0.08
		D	8.355	0.597	0.000	0.000	0.07
T5	154.52-150.00	A	0.437	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	7.231	0.000	0.000	0.000	0.08
		D	8.355	0.597	0.000	0.000	0.07
T6	150.00-140.00	A	0.967	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	15.983	0.000	0.000	0.000	0.18
		D	18.467	1.320	0.000	0.000	0.15
T7	140.00-130.00	A	0.967	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	15.983	0.000	0.000	0.000	0.18
		D	20.317	1.320	0.000	0.000	0.16
T8	130.00-120.00	A	9.372	0.000	0.000	0.000	0.06
		B	0.000	0.000	0.000	0.000	0.00
		C	15.983	0.000	0.000	0.000	0.18
		D	20.317	1.979	0.000	0.000	0.16
T9	120.00-110.00	A	14.975	0.000	0.000	0.000	0.11
		B	0.000	0.000	0.000	0.000	0.00
		C	15.983	0.000	0.000	0.000	0.18
		D	21.427	2.639	0.000	0.000	0.17
T10	110.00-100.00	A	18.299	0.000	0.000	0.000	0.14
		B	0.000	0.000	0.000	0.000	0.00
		C	15.983	0.000	0.000	0.000	0.18
		D	24.432	2.639	0.000	0.000	0.19
T11	100.00-90.00	A	20.515	0.000	0.000	0.000	0.16
		B	0.000	0.000	0.000	0.000	0.00
		C	15.983	0.000	0.000	0.000	0.18
		D	25.667	2.639	0.000	0.000	0.20
T12	90.00-80.00	A	20.515	0.000	0.000	0.000	0.16
		B	0.000	0.000	0.000	0.000	0.00
		C	15.983	0.000	0.000	0.000	0.18
		D	26.129	2.639	0.000	0.000	0.20
T13	80.00-60.00	A	41.030	0.000	0.000	0.000	0.33
		B	0.000	0.000	0.000	0.000	0.00
		C	31.967	0.000	0.000	0.000	0.36
		D	53.908	5.279	0.000	0.000	0.41
T14	60.00-50.00	A	20.515	0.000	0.000	0.000	0.16
		B	0.000	0.000	0.000	0.000	0.00
		C	15.983	0.000	0.000	0.000	0.18
		D	27.365	2.639	0.000	0.000	0.21
T15	50.00-40.00	A	20.515	0.000	0.000	0.000	0.16
		B	0.000	0.000	0.000	0.000	0.00
		C	15.983	0.000	0.000	0.000	0.18
		D	27.897	2.639	0.000	0.000	0.21
T16	40.00-30.00	A	20.515	0.000	0.000	0.000	0.16
		B	0.000	0.000	0.000	0.000	0.00
		C	15.983	0.000	0.000	0.000	0.18
		D	28.042	2.639	0.000	0.000	0.21
T17	30.00-20.00	A	20.515	0.000	0.000	0.000	0.16
		B	0.000	0.000	0.000	0.000	0.00
		C	15.983	0.000	0.000	0.000	0.18
		D	28.042	2.639	0.000	0.000	0.21
T18	20.00-10.00	A	20.515	0.000	0.000	0.000	0.16
		B	0.000	0.000	0.000	0.000	0.00
		C	15.983	0.000	0.000	0.000	0.18
		D	28.042	2.639	0.000	0.000	0.21
T19	10.00-0.00	A	8.206	0.000	0.000	0.000	0.07
		B	0.000	0.000	0.000	0.000	0.00
		C	6.393	0.000	0.000	0.000	0.07

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
		D	11.217	1.056	0.000	0.000	0.08

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	180.00-170.00	A	0.500	1.317	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00
		D		20.082	0.563	0.000	0.000	0.25
T2	170.00-163.57	A	0.500	0.846	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00
		D		20.127	1.205	0.000	0.000	0.26
T3	163.57-159.05	A	0.500	0.721	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		9.226	0.764	0.000	0.000	0.17
		D		14.294	0.848	0.000	0.000	0.18
T4	159.05-154.52	A	0.500	1.191	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		10.564	0.875	0.000	0.000	0.19
		D		14.764	0.848	0.000	0.000	0.18
T5	154.52-150.00	A	0.500	1.191	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		10.564	0.875	0.000	0.000	0.19
		D		14.764	0.848	0.000	0.000	0.18
T6	150.00-140.00	A	0.500	2.633	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		23.350	1.933	0.000	0.000	0.42
		D		32.633	1.875	0.000	0.000	0.41
T7	140.00-130.00	A	0.500	2.633	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		23.350	1.933	0.000	0.000	0.42
		D		36.150	1.875	0.000	0.000	0.44
T8	130.00-120.00	A	0.500	16.038	0.000	0.000	0.000	0.14
		B		0.000	0.000	0.000	0.000	0.00
		C		23.350	1.933	0.000	0.000	0.42
		D		36.150	2.813	0.000	0.000	0.45
T9	120.00-110.00	A	0.500	24.975	0.000	0.000	0.000	0.24
		B		0.000	0.000	0.000	0.000	0.00
		C		23.350	1.933	0.000	0.000	0.42
		D		38.260	3.750	0.000	0.000	0.47
T10	110.00-100.00	A	0.500	30.799	0.000	0.000	0.000	0.31
		B		0.000	0.000	0.000	0.000	0.00
		C		23.350	1.933	0.000	0.000	0.42
		D		43.515	3.750	0.000	0.000	0.52
T11	100.00-90.00	A	0.500	34.682	0.000	0.000	0.000	0.35
		B		0.000	0.000	0.000	0.000	0.00
		C		23.350	1.933	0.000	0.000	0.42
		D		45.667	3.750	0.000	0.000	0.54
T12	90.00-80.00	A	0.500	34.682	0.000	0.000	0.000	0.35
		B		0.000	0.000	0.000	0.000	0.00
		C		23.350	1.933	0.000	0.000	0.42
		D		46.546	3.750	0.000	0.000	0.55
T13	80.00-60.00	A	0.500	69.363	0.000	0.000	0.000	0.70
		B		0.000	0.000	0.000	0.000	0.00
		C		46.700	3.867	0.000	0.000	0.84

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
		D		96.825	7.501	0.000	0.000	1.13
T14	60.00-50.00	A	0.500	34.682	0.000	0.000	0.000	0.35
		B		0.000	0.000	0.000	0.000	0.00
		C		23.350	1.933	0.000	0.000	0.42
		D		49.532	3.750	0.000	0.000	0.57
T15	50.00-40.00	A	0.500	34.682	0.000	0.000	0.000	0.35
		B		0.000	0.000	0.000	0.000	0.00
		C		23.350	1.933	0.000	0.000	0.42
		D		50.980	3.750	0.000	0.000	0.58
T16	40.00-30.00	A	0.500	34.682	0.000	0.000	0.000	0.35
		B		0.000	0.000	0.000	0.000	0.00
		C		23.350	1.933	0.000	0.000	0.42
		D		51.375	3.750	0.000	0.000	0.58
T17	30.00-20.00	A	0.500	34.682	0.000	0.000	0.000	0.35
		B		0.000	0.000	0.000	0.000	0.00
		C		23.350	1.933	0.000	0.000	0.42
		D		51.375	3.750	0.000	0.000	0.58
T18	20.00-10.00	A	0.500	34.682	0.000	0.000	0.000	0.35
		B		0.000	0.000	0.000	0.000	0.00
		C		23.350	1.933	0.000	0.000	0.42
		D		51.375	3.750	0.000	0.000	0.58
T19	10.00-0.00	A	0.500	13.873	0.000	0.000	0.000	0.14
		B		0.000	0.000	0.000	0.000	0.00
		C		9.340	0.773	0.000	0.000	0.17
		D		20.550	1.500	0.000	0.000	0.23

Feed Line Shielding

Section	Elevation ft	Face	A_R ft^2	A_R Ice ft^2	A_F ft^2	A_F Ice ft^2
T1	180.00-170.00	A	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000
		D	0.000	0.952	1.276	2.219
T2	170.00-163.57	A	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000
		D	0.000	1.053	1.463	2.499
T3	163.57-159.05	A	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	0.000	0.641	0.810	1.281
		D	0.000	0.933	1.092	1.865
T4	159.05-154.52	A	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	0.000	0.514	0.812	1.284
		D	0.000	0.653	0.956	1.633
T5	154.52-150.00	A	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	0.000	0.506	0.799	1.265
		D	0.000	0.643	0.941	1.608
T6	150.00-140.00	A	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	0.000	1.231	1.945	3.077
		D	0.000	1.565	2.291	3.914
T7	140.00-130.00	A	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000

Section	Elevation	Face	A_R	A_R Ice	A_F	A_F Ice
	ft		ft^2	ft^2	ft^2	ft^2
		C	0.000	1.093	1.873	2.963
		D	0.000	1.542	2.422	4.180
T8	130.00-120.00	A	0.000	0.450	0.777	1.240
		B	0.000	0.000	0.000	0.000
		C	0.000	0.850	1.478	2.338
		D	0.000	1.235	1.973	3.398
T9	120.00-110.00	A	0.000	0.913	1.543	2.461
		B	0.000	0.000	0.000	0.000
		C	0.000	1.034	1.760	2.785
		D	0.000	1.632	2.544	4.398
T10	110.00-100.00	A	0.000	0.892	1.704	2.770
		B	0.000	0.000	0.000	0.000
		C	0.000	0.801	1.572	2.486
		D	0.000	1.431	2.567	4.443
T11	100.00-90.00	A	0.000	0.991	1.953	3.202
		B	0.000	0.000	0.000	0.000
		C	0.000	0.782	1.597	2.526
		D	0.000	1.464	2.732	4.730
T12	90.00-80.00	A	0.000	0.971	1.911	3.132
		B	0.000	0.000	0.000	0.000
		C	0.000	0.766	1.562	2.471
		D	0.000	1.461	2.717	4.713
T13	80.00-60.00	A	0.000	1.627	2.481	4.067
		B	0.000	0.000	0.000	0.000
		C	0.000	1.283	2.028	3.208
		D	0.000	2.542	3.633	6.356
T14	60.00-50.00	A	0.000	0.927	1.332	2.184
		B	0.000	0.000	0.000	0.000
		C	0.000	0.731	1.089	1.723
		D	0.000	1.481	1.979	3.489
T15	50.00-40.00	A	0.000	0.916	1.559	2.557
		B	0.000	0.000	0.000	0.000
		C	0.000	0.723	1.275	2.017
		D	0.000	1.505	2.359	4.200
T16	40.00-30.00	A	0.000	1.173	1.870	3.067
		B	0.000	0.000	0.000	0.000
		C	0.000	0.926	1.529	2.419
		D	0.000	1.942	2.843	5.076
T17	30.00-20.00	A	0.000	0.898	1.532	2.511
		B	0.000	0.000	0.000	0.000
		C	0.000	0.708	1.252	1.981
		D	0.000	1.486	2.328	4.156
T18	20.00-10.00	A	0.000	1.157	1.846	3.026
		B	0.000	0.000	0.000	0.000
		C	0.000	0.913	1.509	2.388
		D	0.000	1.915	2.806	5.009
T19	10.00-0.00	A	0.000	0.544	0.829	1.359
		B	0.000	0.000	0.000	0.000
		C	0.000	0.429	0.678	1.072
		D	0.000	0.900	1.260	2.250

Feed Line Center of Pressure

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
T1	180.00-170.00	-6.8722	5.7038	-9.3485	7.8120

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
T2	170.00-163.57	-9.1052	7.6489	-10.3067	8.6923
T3	163.57-159.05	-0.1172	2.5894	-2.1679	4.0671
T4	159.05-154.52	0.9553	2.3555	-1.5216	4.3236
T5	154.52-150.00	0.9322	2.5924	-1.6530	4.7664
T6	150.00-140.00	0.8590	2.8678	-1.8407	5.2793
T7	140.00-130.00	-0.1651	3.9782	-3.1766	6.7828
T8	130.00-120.00	-5.6918	1.4151	-10.0368	4.0810
T9	120.00-110.00	-9.7395	0.3807	-14.8811	2.9045
T10	110.00-100.00	-13.9541	0.2843	-20.3534	2.8246
T11	100.00-90.00	-15.4025	-0.1059	-22.4797	2.2382
T12	90.00-80.00	-16.2638	0.3622	-24.0433	3.0001
T13	80.00-60.00	-21.5493	1.3887	-29.9308	4.9432
T14	60.00-50.00	-22.5650	2.0537	-31.8021	6.1584
T15	50.00-40.00	-22.6338	2.6119	-32.5638	7.2081
T16	40.00-30.00	-19.9167	2.5236	-30.4961	7.1220
T17	30.00-20.00	-21.4431	2.8300	-33.1096	7.8530
T18	20.00-10.00	-20.8903	2.8788	-32.3356	7.8568
T19	10.00-0.00	-9.6502	1.3666	-15.8340	3.9089

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral / Vert	Azimuth Adjustment	Placement		C_AA_A Front	C_AA_A Side	Weight
			ft / ft / ft	°	ft		ft^2	ft^2	K
DB803M-Y	A	From Leg	3.00	0.0000	50.00	No Ice	0.50	0.50	0.00
(A1 / D&K-1)			0.00			1/2" Ice	0.68	0.68	0.01
			0.00						
3' Stand-off	A	None		0.0000	50.00	No Ice	1.00	2.00	0.05
(A1 / D&K-1)						1/2" Ice	1.20	2.70	0.07
GPS	B	From Face	4.00	0.0000	61.00	No Ice	1.00	1.00	0.01
(A2 / Sprint)			0.00			1/2" Ice	1.50	1.50	0.01
			0.00						
3'4"x4" Pipe Mount	B	None		0.0000	61.00	No Ice	1.05	1.05	0.04
(A2 / Sprint)						1/2" Ice	1.27	1.27	0.05
2'6"x4" Pipe Mount	A	None		0.0000	71.00	No Ice	0.75	0.75	0.03
(A3 / D&K-3)						1/2" Ice	0.95	0.95	0.04
Dish Ice Shield	A	From Leg	0.50	0.0000	75.00	No Ice	4.00	4.00	0.20
(A3 / D&K-3)			0.00			1/2" Ice	5.07	5.07	0.25
			0.00						
SC479-HF1LDF	A	From Leg	10.00	0.0000	79.00 - 91.00	No Ice	5.06	5.06	0.03
(A4 / D&K-4)			0.00			1/2" Ice	6.54	6.54	0.07
			0.00						
10' Standoff	A	None		0.0000	91.00	No Ice	17.00	17.00	0.55
(A4 / D&K-4)						1/2" Ice	22.00	22.00	0.75
DB264-A	A	From Leg	4.00	0.0000	106.00 - 86.00	No Ice	3.16	3.16	0.04
(A5 / D&K-11)			0.00			1/2" Ice	5.69	5.69	0.05
			0.00						
4' Side Mount Standoff	A	None		0.0000	86.00	No Ice	2.72	2.72	0.05
(A5 / D&K-11)						1/2" Ice	4.91	4.91	0.09
10'6"x4" Pipe Mount	C	None		0.0000	106.00	No Ice	4.72	4.72	0.11
(A6 / D&K-12 / CSP-11)						1/2" Ice	5.62	5.62	0.15
3" Dia 20' Omni	D	From Leg	6.00	0.0000	127.00 - 107.00	No Ice	4.00	4.00	0.06

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(A7 / D&K-13)			0.00 0.00			1/2" Ice	6.00	6.00	0.10
6' Side-Arm Mount	D	None		0.0000	107.00	No Ice	10.60	10.60	0.14
(A7 / D&K-13)						1/2" Ice	15.40	15.40	0.21
PD128-1	C	From Leg	10.00	0.0000	128.00 - 121.00	No Ice	1.00	1.00	0.01
(A8 / D&K-14)			0.00 0.00			1/2" Ice	1.80	1.80	0.02
10' Standoff	C	None		0.0000	121.00	No Ice	17.00	17.00	0.55
(A8 / D&K-14)						1/2" Ice	22.00	22.00	0.75
12' Omni Antenna	D	From Leg	6.00	0.0000	116.00 - 106.00	No Ice	5.06	5.06	0.03
(A9 - D&K-15)			0.00 0.00			1/2" Ice	6.54	6.54	0.07
6' Side-Arm Mount	D	None		0.0000	106.00	No Ice	10.60	10.60	0.14
(A9 - D&K-15)						1/2" Ice	15.40	15.40	0.21
2'6"x4" Pipe Mount	A	None		0.0000	125.00	No Ice	0.75	0.75	0.03
(A10 / D&K-25)						1/2" Ice	0.95	0.95	0.04
Dish Ice Shield	A	From Leg	0.50	0.0000	130.00	No Ice	4.00	4.00	0.20
(A11 / D&K-26)			0.00 0.00			1/2" Ice	5.07	5.07	0.25
BA1010	C	From Leg	6.00	0.0000	127.00 - 132.00	No Ice	1.55	1.55	0.01
(A12 / D&K-27)			0.00 0.00			1/2" Ice	2.29	2.29	0.01
BA1010	C	From Leg	6.00	0.0000	137.00 - 132.00	No Ice	1.55	1.55	0.01
(A14 / D&K-29)			0.00 0.00			1/2" Ice	2.29	2.29	0.01
432E-83I-01T TTA Unit	C	From Leg	6.00	0.0000	132.00	No Ice	3.33	1.11	0.03
(A13 / D&K-28)			0.00 0.00			1/2" Ice	3.57	1.27	0.04
6' Side-Arm Mount	C	None		0.0000	132.00	No Ice	10.60	10.60	0.14
(A12,13,14 / D&K-27,28,29)						1/2" Ice	15.40	15.40	0.21
12' Omni Antenna	C	From Leg	8.00	0.0000	152.00 - 140.50	No Ice	5.06	5.06	0.03
(A15 / D&K-30)			0.00 0.00			1/2" Ice	6.54	6.54	0.07
8' Side Arm Mount	C	None		0.0000	140.50	No Ice	17.20	17.20	0.33
(A15 / D&K-30)						1/2" Ice	24.50	24.50	0.45
DB222-A	A	From Leg	4.00	0.0000	136.50	No Ice	1.60	1.60	0.02
(A16 / D&K-31)			0.00 0.00			1/2" Ice	2.88	2.88	0.02
4' Side Mount Standoff	A	None		0.0000	136.50	No Ice	2.72	2.72	0.05
(A16 / D&K-31)						1/2" Ice	4.91	4.91	0.09
Yagi ASP-816	A	From Leg	6.00	0.0000	139.00	No Ice	0.92	0.02	0.01
(A17 / D&K-32)			0.00 0.00			1/2" Ice	1.21	0.05	0.01
6' Side-Arm Mount	A	None		0.0000	139.00	No Ice	10.60	10.60	0.14
(A17 / D&K-32)						1/2" Ice	15.40	15.40	0.21
6' Side-Arm Mount	D	None		0.0000	139.00	No Ice	10.60	10.60	0.14
(A18 / D&K-33)						1/2" Ice	15.40	15.40	0.21
*** Following Are D&K NOT Inventoried Appurtenances									
DB408-B	D	From Leg	6.00	0.0000	161.00	No Ice	1.65	1.65	0.02
(A19)			0.00 0.00			1/2" Ice	2.61	2.61	0.03
(2) 6' Side Mount Standoff	D	None		0.0000	161.00	No Ice	1.40	0.13	0.01
(A19)						1/2" Ice	1.56	0.21	0.02
BA1010-2	C	From Leg	2.50	0.0000	169.00	No Ice	1.40	1.40	0.02
(A20)			0.00			1/2" Ice	1.77	1.77	0.03

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00						
15' T-Frame Sector Mount (1)	C	None		0.0000	169.00	No Ice	15.00	15.00	0.50
(A20)						1/2" Ice	20.60	20.60	0.65
DB586-Y	C	From Leg	3.00	0.0000	170.00	No Ice	1.01	1.01	0.01
(A21)			0.00			1/2" Ice	1.28	1.28	0.02
			0.00						
10'6"x4" Pipe Mount	A	From Leg	0.50	0.0000	170.00	No Ice	4.72	4.72	0.11
(A22)			0.00			1/2" Ice	5.62	5.62	0.15
			0.00						
SC479-HF1LDF	D	From Leg	2.00	0.0000	168.00 - 180.00	No Ice	5.06	5.06	0.03
(D00I-E5764)			0.00			1/2" Ice	6.54	6.54	0.07
(A23)			0.00						
15' T-Frame Sector Mount (1)	D	From Face	2.00	0.0000	180.00	No Ice	15.00	15.00	0.50
(A23,24,30,31)			0.00			1/2" Ice	20.60	20.60	0.65
			0.00						
SC479-HF1LDF	D	From Face	2.00	0.0000	168.00 - 180.00	No Ice	5.06	5.06	0.03
(D00I-E5764)			0.00			1/2" Ice	6.54	6.54	0.07
(A24)			0.00						
10'6"x4" Pipe Mount	C	From Leg	0.50	0.0000	173.00	No Ice	4.72	4.72	0.11
(A25)			0.00			1/2" Ice	5.62	5.62	0.15
			0.00						
SC479-HF1LDF	A	From Leg	3.00	0.0000	168.00 - 180.00	No Ice	5.06	5.06	0.03
(D00I-E5764)			0.00			1/2" Ice	6.54	6.54	0.07
(A26)			0.00						
15' T-Frame Sector Mount (1)	B	From Face	2.00	0.0000	180.00	No Ice	15.00	15.00	0.50
(A26,27,28,29)			0.00			1/2" Ice	20.60	20.60	0.65
			0.00						
TMA 432-83H-01T - Future	A	From Leg	2.00	0.0000	181.00	No Ice	1.63	0.95	0.03
Decom.			0.00			1/2" Ice	1.81	1.09	0.04
(A27)			0.00						
SC479-HF1LDF	A	From Leg	3.00	0.0000	183.00	No Ice	5.06	5.06	0.03
(D00-E5764)			0.00			1/2" Ice	6.54	6.54	0.07
(A28)			0.00						
ANT150D	A	From Leg	1.00	0.0000	183.00	No Ice	7.00	2.02	0.08
(A29a)			0.00			1/2" Ice	7.47	2.90	0.12
			0.00						
DB222	A	From Leg	1.50	0.0000	183.00	No Ice	1.60	1.60	0.02
(A29b)			0.00			1/2" Ice	2.88	2.88	0.02
			0.00						
SC479-HF1LDF	D	From Leg	2.00	0.0000	183.00	No Ice	5.06	5.06	0.03
(D00-E5764)			0.00			1/2" Ice	6.54	6.54	0.07
(A30)			0.00						
ALR8-0	C	From Leg	1.00	0.0000	183.00	No Ice	7.49	7.49	0.05
(A31)			0.00			1/2" Ice	8.21	8.21	0.11
			0.00						
Lightning Rod 2"x15'	C	None		0.0000	185.00	No Ice	3.00	3.00	0.08
(A32)						1/2" Ice	4.53	4.53	0.10
10'6"x4" Pipe Mount	A	From Leg	0.50	0.0000	175.00	No Ice	4.72	4.72	0.11
(A33)			0.00			1/2" Ice	5.62	5.62	0.15
			0.00						
*** AT&T EMP-004 Inventory									
T-Frame	A	From Leg	0.50	0.0000	163.00	No Ice	10.20	10.20	0.40
(AT&T)			0.00			1/2" Ice	16.20	16.20	0.60
			0.00						
T-Frame	B	From Leg	0.50	0.0000	163.00	No Ice	10.20	10.20	0.40
(AT&T)			0.00			1/2" Ice	16.20	16.20	0.60

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00						
T-Frame	C	From Leg	0.50	0.0000	163.00	No Ice	10.20	10.20	0.40
(AT&T)			0.00			1/2" Ice	16.20	16.20	0.60
			0.00						
7770.00	A	From Leg	2.00	0.0000	163.00	No Ice	5.90	4.01	0.05
(AT&T)			4.00			1/2" Ice	6.34	4.64	0.10
			0.00						
(2) LGP 21901 Diplexer Unit	A	From Leg	2.00	0.0000	163.00	No Ice	0.23	0.12	0.01
(AT&T)			4.00			1/2" Ice	0.30	0.17	0.01
			0.00						
Kathrein 800-10965 Panel	A	From Leg	2.00	0.0000	163.00	No Ice	15.30	5.83	0.11
Antenna			-4.00			1/2" Ice	15.95	6.32	0.19
(AT&T)			0.00						
QS66512-3 Quintel Panel	A	From Leg	2.00	0.0000	163.00	No Ice	8.40	8.22	0.13
(AT&T)			0.00			1/2" Ice	8.95	9.19	0.20
			0.00						
RRUS-11	A	From Leg	2.00	0.0000	163.00	No Ice	2.99	1.25	0.05
(AT&T)			0.00			1/2" Ice	3.23	1.41	0.07
			0.00						
Raycap DC6-48-60-18-8F	A	From Leg	2.00	0.0000	163.00	No Ice	1.27	1.27	0.05
DC Power Surge Protection			0.00			1/2" Ice	1.46	1.46	0.07
(AT&T)			0.00						
7770.00	B	From Leg	2.00	0.0000	163.00	No Ice	5.90	4.01	0.05
(AT&T)			4.00			1/2" Ice	6.34	4.64	0.10
			0.00						
(2) LGP 21901 Diplexer Unit	B	From Leg	2.00	0.0000	163.00	No Ice	0.23	0.12	0.01
(AT&T)			4.00			1/2" Ice	0.30	0.17	0.01
			0.00						
Kathrein 800-10965 Panel	B	From Leg	2.00	0.0000	163.00	No Ice	15.30	5.83	0.11
Antenna			-4.00			1/2" Ice	15.95	6.32	0.19
(AT&T)			0.00						
QS66512-3 Quintel Panel	B	From Leg	2.00	0.0000	163.00	No Ice	8.40	8.22	0.13
(AT&T)			0.00			1/2" Ice	8.95	9.19	0.20
			0.00						
RRUS-11	B	From Leg	2.00	0.0000	163.00	No Ice	2.99	1.25	0.05
(AT&T)			0.00			1/2" Ice	3.23	1.41	0.07
			0.00						
7770.00	C	From Leg	2.00	0.0000	163.00	No Ice	5.90	4.01	0.05
(AT&T)			4.00			1/2" Ice	6.34	4.64	0.10
			0.00						
(2) LGP 21901 Diplexer Unit	C	From Leg	2.00	0.0000	163.00	No Ice	0.23	0.12	0.01
(AT&T)			4.00			1/2" Ice	0.30	0.17	0.01
			0.00						
Kathrein 800-10965 Panel	C	From Leg	2.00	0.0000	163.00	No Ice	15.30	5.83	0.11
Antenna			-4.00			1/2" Ice	15.95	6.32	0.19
(AT&T)			0.00						
QS66512-3 Quintel Panel	C	From Leg	2.00	0.0000	163.00	No Ice	8.40	8.22	0.13
(AT&T)			0.00			1/2" Ice	8.95	9.19	0.20
			0.00						
RRUS-11	C	From Leg	2.00	0.0000	163.00	No Ice	2.99	1.25	0.05
(AT&T)			0.00			1/2" Ice	3.23	1.41	0.07
			0.00						
4478 Radio Unit (4x40W)	A	From Leg	2.00	0.0000	163.00	No Ice	1.26	1.26	0.06
(AT&T)			0.00			1/2" Ice	1.42	1.42	0.07
			0.00						
4478 Radio Unit (4x40W)	B	From Leg	2.00	0.0000	163.00	No Ice	1.26	1.26	0.06
(AT&T)			0.00			1/2" Ice	1.42	1.42	0.07

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00						
4478 Radio Unit (4x40W)	C	From Leg	2.00	0.0000	163.00	No Ice	1.26	1.26	0.06
(AT&T)			0.00			1/2" Ice	1.42	1.42	0.07
			0.00						
RRUS-32 B66	A	From Leg	2.00	0.0000	163.00	No Ice	3.88	2.76	0.08
(AT&T)			0.00			1/2" Ice	4.14	2.98	0.11
			0.00						
RRUS-32 B66	B	From Leg	2.00	0.0000	163.00	No Ice	3.88	2.76	0.08
(AT&T)			0.00			1/2" Ice	4.14	2.98	0.11
			0.00						
RRUS-32 B66	C	From Leg	2.00	0.0000	163.00	No Ice	3.88	2.76	0.08
(AT&T)			0.00			1/2" Ice	4.14	2.98	0.11
			0.00						
RRUS-32 B2	A	From Leg	2.00	0.0000	163.00	No Ice	3.88	2.76	0.08
(AT&T)			0.00			1/2" Ice	4.14	2.98	0.11
			0.00						
RRUS-32 B2	B	From Leg	2.00	0.0000	163.00	No Ice	3.88	2.76	0.08
(AT&T)			0.00			1/2" Ice	4.14	2.98	0.11
			0.00						
RRUS-32 B2	C	From Leg	2.00	0.0000	163.00	No Ice	3.88	2.76	0.08
(AT&T)			0.00			1/2" Ice	4.14	2.98	0.11
			0.00						
RRUS-32	A	From Leg	2.00	0.0000	163.00	No Ice	3.88	2.76	0.08
(AT&T)			0.00			1/2" Ice	4.14	2.98	0.11
			0.00						
RRUS-32	B	From Leg	2.00	0.0000	163.00	No Ice	3.88	2.76	0.08
(AT&T)			0.00			1/2" Ice	4.14	2.98	0.11
			0.00						
RRUS-32	C	From Leg	2.00	0.0000	163.00	No Ice	3.88	2.76	0.08
(AT&T)			0.00			1/2" Ice	4.14	2.98	0.11
			0.00						
DC6-48-60-18-8C Squid /	B	From Leg	2.00	0.0000	163.00	No Ice	1.79	1.79	0.03
Surge Arrestor			0.00			1/2" Ice	2.02	2.02	0.05
(AT&T)			0.00						
DC6-48-60-18-8C Squid /	C	From Leg	2.00	0.0000	163.00	No Ice	1.79	1.79	0.03
Surge Arrestor			0.00			1/2" Ice	2.02	2.02	0.05
(AT&T)			0.00						
(2) LPG21401 TMA	A	From Face	2.00	0.0000	163.00	No Ice	0.95	0.37	0.02
(AT&T)			4.00			1/2" Ice	1.09	0.48	0.02
			0.00						
(2) LPG21401 TMA	B	From Face	2.00	0.0000	163.00	No Ice	0.95	0.37	0.02
(AT&T)			4.00			1/2" Ice	1.09	0.48	0.02
			0.00						
(2) LPG21401 TMA	C	From Face	2.00	0.0000	163.00	No Ice	0.95	0.37	0.02
(AT&T)			4.00			1/2" Ice	1.09	0.48	0.02
			0.00						
*** AT&T EMP-004 Inventory ** Sprint Equipment ASM-008									
12' Wireless Frame	A	From Leg	1.00	0.0000	105.00	No Ice	11.07	11.07	0.24
(Sprint / D&K 5-10)			0.00			1/2" Ice	15.53	15.53	0.35
			0.00						
12' Wireless Frame	B	From Leg	1.00	0.0000	105.00	No Ice	11.07	11.07	0.24
(Sprint / D&K 5-10)			0.00			1/2" Ice	15.53	15.53	0.35
			0.00						
12' Wireless Frame	C	From Leg	1.00	0.0000	105.00	No Ice	11.07	11.07	0.24

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(Sprint / D&K 5-10)			0.00 0.00			1/2" Ice	15.53	15.53	0.35
APXVSPP18-C-A20 w/ Mount Pipe	A	From Leg	1.50 -5.00	0.0000	105.00	No Ice 1/2" Ice	8.26 8.81	7.23 8.19	0.11 0.18
(Sprint / D&K 5-10)			0.00						
APXVSPP18-C-A20 w/ Mount Pipe	B	From Leg	1.50 -5.00	0.0000	105.00	No Ice 1/2" Ice	8.26 8.81	7.23 8.19	0.11 0.18
(Sprint / D&K 5-10)			0.00						
APXVSPP18-C-A20 w/ Mount Pipe	C	From Leg	1.50 -5.00	0.0000	105.00	No Ice 1/2" Ice	8.26 8.81	7.23 8.19	0.11 0.18
(Sprint / D&K 5-10)			0.00						
ALU 800MHz 2x50W (Sprint / D&K 5-10)	A	From Leg	1.50 0.00 2.50	0.0000	105.00	No Ice 1/2" Ice	2.40 2.61	2.25 2.46	0.06 0.09
ALU 800MHz 2x50W (Sprint / D&K 5-10)	B	From Leg	1.50 0.00 2.50	0.0000	105.00	No Ice 1/2" Ice	2.40 2.61	2.25 2.46	0.06 0.09
ALU 800MHz 2x50W (Sprint / D&K 5-10)	C	From Leg	1.50 0.00 2.50	0.0000	105.00	No Ice 1/2" Ice	2.40 2.61	2.25 2.46	0.06 0.09
ALU 4x45W (1900 MHz) (Sprint / D&K 5-10)	A	From Leg	1.50 0.00 -2.50	0.0000	105.00	No Ice 1/2" Ice	2.96 3.21	1.81 2.02	0.06 0.08
ALU 4x45W (1900 MHz) (Sprint / D&K 5-10)	B	From Leg	1.50 0.00 -2.50	0.0000	105.00	No Ice 1/2" Ice	2.96 3.21	1.81 2.02	0.06 0.08
ALU 4x45W (1900 MHz) (Sprint / D&K 5-10)	C	From Leg	1.50 0.00 -2.50	0.0000	105.00	No Ice 1/2" Ice	2.96 3.21	1.81 2.02	0.06 0.08
AAHC Panel Antenna (Sprint)	A	From Leg	1.50 0.00 0.00	0.0000	105.00	No Ice 1/2" Ice	4.90 5.20	2.40 2.63	0.10 0.14
AAHC Panel Antenna (Sprint)	B	From Leg	1.50 0.00 0.00	0.0000	105.00	No Ice 1/2" Ice	4.90 5.20	2.40 2.63	0.10 0.14
AAHC Panel Antenna (Sprint)	C	From Leg	1.50 0.00 0.00	0.0000	105.00	No Ice 1/2" Ice	4.90 5.20	2.40 2.63	0.10 0.14
NNVV-65B-R4 Panel Antenna (Sprint)	A	From Leg	1.50 5.00 0.00	0.0000	105.00	No Ice 1/2" Ice	13.72 14.32	5.75 6.21	0.09 0.16
NNVV-65B-R4 Panel Antenna (Sprint)	B	From Leg	1.50 5.00 0.00	0.0000	105.00	No Ice 1/2" Ice	13.72 14.32	5.75 6.21	0.09 0.16
NNVV-65B-R4 Panel Antenna (Sprint)	C	From Leg	1.50 5.00 0.00	0.0000	105.00	No Ice 1/2" Ice	13.72 14.32	5.75 6.21	0.09 0.16
TD-RRH8x20-25 (Sprint)	A	From Leg	1.50 0.00 2.50	0.0000	105.00	No Ice 1/2" Ice	4.72 5.01	1.70 1.92	0.07 0.10
TD-RRH8x20-25 (Sprint)	B	From Leg	1.50 0.00 2.50	0.0000	105.00	No Ice 1/2" Ice	4.72 5.01	1.70 1.92	0.07 0.10
TD-RRH8x20-25 (Sprint)	C	From Leg	1.50 0.00 2.50	0.0000	105.00	No Ice 1/2" Ice	4.72 5.01	1.70 1.92	0.07 0.10

** Sprint Equipment

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
ASM-008 ** T-Mobile Proposed Equipment TWM-013									
EUSF10-U w/ (2) Stiff-Arm Supports (T-Mobile)	A	From Leg	0.50 0.00 0.00	0.0000	122.00	No Ice 1/2" Ice	8.91 12.66	3.67 5.24	0.41 0.51
EUSF10-U w/ (2) Stiff-Arm Supports (T-Mobile)	D	From Leg	0.50 0.00 0.00	0.0000	122.00	No Ice 1/2" Ice	8.91 12.66	3.67 5.24	0.41 0.51
EUSF10-U w/ (2) Stiff-Arm Supports (T-Mobile)	B	From Leg	0.50 0.00 0.00	0.0000	122.00	No Ice 1/2" Ice	8.91 12.66	3.67 5.24	0.41 0.51
RFS APXVAARR24_43-U-NA20 Panel Antenna w/ 108" Pipe Mount (T-Mobile - Proposed)	A	From Leg	4.00 -3.00 0.00	0.0000	122.00	No Ice 1/2" Ice	22.62 23.50	11.03 12.55	0.19 0.32
RFS APXVAARR24_43-U-NA20 Panel Antenna w/ 108" Pipe Mount (T-Mobile - Proposed)	B	From Leg	4.00 -3.00 0.00	0.0000	122.00	No Ice 1/2" Ice	22.62 23.50	11.03 12.55	0.19 0.32
RFS APXVAARR24_43-U-NA20 Panel Antenna w/ 108" Pipe Mount (T-Mobile - Proposed)	D	From Leg	4.00 -3.00 0.00	0.0000	122.00	No Ice 1/2" Ice	22.62 23.50	11.03 12.55	0.19 0.32
Generic Twin TMA unit (T-Mobile - Proposed)	A	From Leg	4.00 -3.00 3.00	0.0000	122.00	No Ice 1/2" Ice	0.42 0.53	1.12 1.27	0.03 0.03
Generic Twin TMA unit (T-Mobile - Proposed)	B	From Leg	4.00 -3.00 3.00	0.0000	122.00	No Ice 1/2" Ice	0.42 0.53	1.12 1.27	0.03 0.03
Generic Twin TMA unit (T-Mobile - Proposed)	D	From Leg	4.00 -3.00 3.00	0.0000	122.00	No Ice 1/2" Ice	0.42 0.53	1.12 1.27	0.03 0.03
Ericsson 4449 B71 + B12 Radio Unit (T-Mobile - Proposed)	A	From Leg	4.00 -3.00 -3.00	0.0000	122.00	No Ice 1/2" Ice	1.93 2.12	1.35 1.51	0.08 0.10
Ericsson 4449 B71 + B12 Radio Unit (T-Mobile - Proposed)	B	From Leg	4.00 -3.00 -3.00	0.0000	122.00	No Ice 1/2" Ice	1.93 2.12	1.35 1.51	0.08 0.10
Ericsson 4449 B71 + B12 Radio Unit (T-Mobile - Proposed)	D	From Leg	4.00 -3.00 -3.00	0.0000	122.00	No Ice 1/2" Ice	1.93 2.12	1.35 1.51	0.08 0.10
Ericsson AIR32 B66A/B2A Panel Antenna w/ 108" Pipe Mount (T-Mobile - Proposed)	A	From Leg	4.00 3.00 0.00	0.0000	122.00	No Ice 1/2" Ice	8.12 9.01	6.92 8.28	0.17 0.23
Ericsson AIR32 B66A/B2A Panel Antenna w/ 108" Pipe Mount (T-Mobile - Proposed)	B	From Leg	4.00 3.00 0.00	0.0000	122.00	No Ice 1/2" Ice	8.12 9.01	6.92 8.28	0.17 0.23
Ericsson AIR32 B66A/B2A Panel Antenna w/ 108" Pipe Mount (T-Mobile - Proposed)	D	From Leg	4.00 3.00 0.00	0.0000	122.00	No Ice 1/2" Ice	8.12 9.01	6.92 8.28	0.17 0.23

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft	C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
** T-Mobile Proposed Equipment TWM-013								

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight K
4' Grid Dish (A6 / D&K 12 / CSP-11)	C	Grid	From Leg	1.00 0.00 0.00	Worst		106.00	4.00	No Ice 1/2" Ice	12.57 13.10	0.06 0.11
6' PAD w/ Radome (A10 / D&K-25)	A	Paraboloid w/Radome	From Leg	0.50 0.00 0.00	Worst		125.00	6.00	No Ice 1/2" Ice	28.27 29.07	0.24 0.29
6' PAD w/ Radome (A33)	B	Paraboloid w/Radome	From Leg	1.00 0.00 0.00	Worst		175.00	6.00	No Ice 1/2" Ice	28.27 29.07	0.24 0.29
6' PAD w/ Radome (A22 /)	A	Paraboloid w/Radome	From Leg	0.50 0.00 0.00	Worst		170.00	6.00	No Ice 1/2" Ice	28.27 29.07	0.24 0.29
6' PAD w/ Radome (A25 /)	C	Paraboloid w/Radome	From Leg	0.50 0.00 0.00	Worst		173.00	6.00	No Ice 1/2" Ice	28.27 29.07	0.24 0.29

Tower Pressures - No Ice

$G_H = 1.121$

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft^2	Face	A_F ft^2	A_R ft^2	A_{leg} ft^2	Leg %	C_AA_A In Face ft^2	C_AA_A Out Face ft^2
T1	175.00	1.611	33	61.674	A	12.491	0.483	5.833	44.96	0.000	0.000
180.00-170.00					B	12.491	0.000		46.70	0.000	0.000
					C	12.491	0.000		46.70	0.000	0.000
					D	11.611	11.248		25.52	0.000	0.000
T2	166.79	1.589	33	40.022	A	9.832	0.311	5.356	52.81	0.000	0.000
170.00-163.57					B	9.832	0.000		54.47	0.000	0.000
					C	9.832	0.000		54.47	0.000	0.000
					D	9.217	11.558		25.78	0.000	0.000
T3	161.31	1.574	33	28.908	A	7.122	0.265	3.775	51.11	0.000	0.000
163.57-159.05					B	7.122	0.000		53.00	0.000	0.000
					C	6.312	6.316		29.90	0.000	0.000
					D	6.627	8.182		25.49	0.000	0.000
T4	156.79	1.561	32	30.376	A	6.903	0.437	3.775	51.43	0.000	0.000

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
159.05-154.52					B	6.903	0.000		54.69	0.000	0.000
					C	6.091	7.231		28.34	0.000	0.000
					D	6.544	8.355		25.34	0.000	0.000
T5	152.26	1.548	32	31.844	A	7.011	0.437	3.775	50.68	0.000	0.000
154.52-150.00					B	7.011	0.000		53.84	0.000	0.000
					C	6.212	7.231		28.08	0.000	0.000
					D	6.667	8.355		25.13	0.000	0.000
T6	145.00	1.526	32	75.634	A	16.767	0.967	8.344	47.05	0.000	0.000
150.00-140.00					B	16.767	0.000		49.76	0.000	0.000
					C	14.822	15.983		27.09	0.000	0.000
					D	15.796	18.467		24.35	0.000	0.000
T7	135.00	1.496	31	83.296	A	19.051	0.967	10.013	50.02	0.000	0.000
140.00-130.00					B	19.051	0.000		52.56	0.000	0.000
					C	17.178	15.983		30.19	0.000	0.000
					D	17.948	20.317		26.17	0.000	0.000
T8	125.00	1.463	30	90.466	A	17.100	9.372	10.013	37.82	0.000	0.000
130.00-120.00					B	17.878	0.000		56.01	0.000	0.000
					C	16.399	15.983		30.92	0.000	0.000
					D	17.884	20.317		26.21	0.000	0.000
T9	115.00	1.429	30	97.774	A	18.485	14.975	10.013	29.92	0.000	0.000
120.00-110.00					B	20.028	0.000		49.99	0.000	0.000
					C	18.268	15.983		29.23	0.000	0.000
					D	20.123	21.427		24.10	0.000	0.000
T10	105.00	1.392	29	104.945	A	18.053	18.299	10.013	27.54	0.000	0.000
110.00-100.00					B	19.757	0.000		50.68	0.000	0.000
					C	18.185	15.983		29.30	0.000	0.000
					D	19.829	24.432		22.62	0.000	0.000
T11	95.00	1.353	28	112.984	A	21.919	20.515	13.350	31.46	0.000	0.000
100.00-90.00					B	23.872	0.000		55.93	0.000	0.000
					C	22.275	15.983		34.90	0.000	0.000
					D	23.779	25.667		27.00	0.000	0.000
T12	85.00	1.31	27	120.155	A	22.455	20.515	13.350	31.07	0.000	0.000
90.00-80.00					B	24.365	0.000		54.79	0.000	0.000
					C	22.803	15.983		34.42	0.000	0.000
					D	24.287	26.129		26.48	0.000	0.000
T13	70.00	1.24	26	263.233	A	13.036	69.400	28.370	34.41	0.000	0.000
80.00-60.00					B	15.516	28.370		64.64	0.000	0.000
					C	13.488	60.336		38.43	0.000	0.000
					D	17.162	82.278		28.53	0.000	0.000
T14	55.00	1.157	24	142.444	A	7.718	34.700	14.185	33.44	0.000	0.000
60.00-50.00					B	9.050	14.185		61.05	0.000	0.000
					C	7.961	30.168		37.20	0.000	0.000
					D	9.711	41.550		27.67	0.000	0.000
T15	45.00	1.093	23	149.614	A	9.632	34.700	14.185	32.00	0.000	0.000
50.00-40.00					B	11.192	14.185		55.90	0.000	0.000
					C	9.917	30.168		35.39	0.000	0.000
					D	11.472	42.082		26.49	0.000	0.000
T16	35.00	1.017	21	156.196	A	25.497	20.515	13.350	29.02	0.000	0.000
40.00-30.00					B	27.367	0.000		48.78	0.000	0.000
					C	25.838	15.983		31.92	0.000	0.000
					D	27.163	28.042		24.18	0.000	0.000
T17	25.00	1	21	163.366	A	23.935	20.515	13.350	30.03	0.000	0.000
30.00-20.00					B	25.467	0.000		52.42	0.000	0.000
					C	24.214	15.983		33.21	0.000	0.000
					D	25.778	28.042		24.81	0.000	0.000
T18	15.00	1	21	170.539	A	26.687	20.515	13.350	28.28	0.000	0.000
20.00-10.00					B	28.533	0.000		46.79	0.000	0.000
					C	27.024	15.983		31.04	0.000	0.000
					D	28.367	28.042		23.67	0.000	0.000
T19 10.00-0.00	5.00	1	21	177.715	A	27.606	8.206	13.350	37.28	0.000	0.000

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
					B	28.435	0.000		46.95	0.000	0.000
					C	27.757	6.393		39.09	0.000	0.000
					D	28.230	11.217		33.84	0.000	0.000

Tower Pressure - With Ice

$G_H = 1.121$

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
T1	175.00	1.611	33	0.5000	62.507	A	12.491	5.837	7.500	40.92	0.000	0.000
180.00-170.00						B	12.491	4.520		44.09	0.000	0.000
						C	12.491	4.520		44.09	0.000	0.000
						D	10.835	23.650		21.75	0.000	0.000
T2	166.79	1.589	33	0.5000	40.557	A	9.832	3.803	6.427	47.14	0.000	0.000
170.00-163.57						B	9.832	2.957		50.26	0.000	0.000
						C	9.832	2.957		50.26	0.000	0.000
						D	8.538	22.031		21.02	0.000	0.000
T3	161.31	1.574	33	0.5000	29.285	A	7.122	3.150	4.530	44.10	0.000	0.000
163.57-159.05						B	7.122	2.429		47.43	0.000	0.000
						C	6.605	11.014		25.71	0.000	0.000
						D	6.105	15.790		20.69	0.000	0.000
T4	156.79	1.561	32	0.5000	30.753	A	6.903	3.197	4.530	44.85	0.000	0.000
159.05-154.52						B	6.903	2.006		50.85	0.000	0.000
						C	6.493	12.057		24.42	0.000	0.000
						D	6.118	16.117		20.37	0.000	0.000
T5	152.26	1.548	32	0.5000	32.221	A	7.011	3.241	4.530	44.19	0.000	0.000
154.52-150.00						B	7.011	2.050		50.00	0.000	0.000
						C	6.621	12.108		24.19	0.000	0.000
						D	6.252	16.171		20.20	0.000	0.000
T6	145.00	1.526	32	0.5000	76.467	A	16.767	7.671	10.013	40.97	0.000	0.000
150.00-140.00						B	16.767	5.038		45.92	0.000	0.000
						C	15.623	27.157		23.41	0.000	0.000
						D	14.729	36.106		19.70	0.000	0.000
T7	135.00	1.496	31	0.5000	84.129	A	19.051	7.625	11.682	43.79	0.000	0.000
140.00-130.00						B	19.051	4.992		48.59	0.000	0.000
						C	18.021	27.249		25.80	0.000	0.000
						D	16.746	39.600		20.73	0.000	0.000
T8	125.00	1.463	30	0.5000	91.300	A	16.638	20.107	11.682	31.79	0.000	0.000
130.00-120.00						B	17.878	4.520		52.16	0.000	0.000
						C	17.473	27.020		26.26	0.000	0.000
						D	17.292	39.435		20.59	0.000	0.000
T9	115.00	1.429	30	0.5000	98.608	A	17.567	29.438	11.682	24.85	0.000	0.000
120.00-110.00						B	20.028	5.376		45.98	0.000	0.000
						C	19.177	27.693		24.92	0.000	0.000
						D	19.380	42.004		19.03	0.000	0.000
T10	105.00	1.392	29	0.5000	105.778	A	16.987	34.706	11.682	22.60	0.000	0.000
110.00-100.00						B	19.757	4.799		47.57	0.000	0.000
						C	19.204	27.348		25.09	0.000	0.000
						D	19.064	46.883		17.71	0.000	0.000
T11	95.00	1.353	28	0.5000	113.818	A	20.670	38.605	15.019	25.34	0.000	0.000
100.00-90.00						B	23.872	4.914		52.17	0.000	0.000
						C	23.279	27.482		29.59	0.000	0.000
						D	22.892	49.117		20.86	0.000	0.000

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
T12 90.00-80.00	85.00	1.31	27	0.5000	120.989	A	21.233	38.787	15.019	25.02	0.000	0.000
						B	24.365	5.077		51.01	0.000	0.000
						C	23.828	27.661		29.17	0.000	0.000
						D	23.403	50.161		20.42	0.000	0.000
T13 80.00-60.00	70.00	1.24	26	0.5000	264.901	A	11.449	105.650	31.707	27.08	0.000	0.000
						B	15.516	37.914		59.34	0.000	0.000
						C	16.174	83.330		31.87	0.000	0.000
						D	16.661	132.197		21.30	0.000	0.000
T14 60.00-50.00	55.00	1.157	24	0.5000	143.277	A	6.866	53.440	15.854	26.29	0.000	0.000
						B	9.050	19.686		55.17	0.000	0.000
						C	9.260	42.304		30.75	0.000	0.000
						D	9.311	67.736		20.58	0.000	0.000
T15 50.00-40.00	45.00	1.093	23	0.5000	150.448	A	8.635	53.637	15.854	25.46	0.000	0.000
						B	11.192	19.871		51.04	0.000	0.000
						C	11.108	42.498		29.57	0.000	0.000
						D	10.742	69.346		19.80	0.000	0.000
T16 40.00-30.00	35.00	1.017	21	0.5000	157.030	A	24.301	40.535	15.019	23.17	0.000	0.000
						B	27.367	7.027		43.67	0.000	0.000
						C	26.881	29.451		26.66	0.000	0.000
						D	26.042	56.460		18.20	0.000	0.000
T17 30.00-20.00	25.00	1	21	0.5000	164.200	A	22.956	39.791	15.019	23.94	0.000	0.000
						B	25.467	6.007		47.72	0.000	0.000
						C	25.419	28.648		27.78	0.000	0.000
						D	25.061	55.896		18.55	0.000	0.000
T18 20.00-10.00	15.00	1	21	0.5000	171.373	A	25.507	40.994	15.019	22.59	0.000	0.000
						B	28.533	7.470		41.72	0.000	0.000
						C	28.079	29.907		25.90	0.000	0.000
						D	27.274	56.929		17.84	0.000	0.000
T19 10.00-0.00	5.00	1	21	0.5000	178.549	A	27.076	20.884	15.019	31.32	0.000	0.000
						B	28.435	7.555		41.73	0.000	0.000
						C	28.136	16.466		33.67	0.000	0.000
						D	27.685	27.205		27.36	0.000	0.000

Tower Pressure - Service

$G_H = 1.121$

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
T1	175.00	1.611	33	61.674	A	12.491	0.483	5.833	44.96	0.000	0.000
180.00-170.00					B	12.491	0.000		46.70	0.000	0.000
					C	12.491	0.000		46.70	0.000	0.000
					D	11.611	11.248		25.52	0.000	0.000
T2	166.79	1.589	33	40.022	A	9.832	0.311	5.356	52.81	0.000	0.000
170.00-163.57					B	9.832	0.000		54.47	0.000	0.000
					C	9.832	0.000		54.47	0.000	0.000
					D	9.217	11.558		25.78	0.000	0.000
T3	161.31	1.574	33	28.908	A	7.122	0.265	3.775	51.11	0.000	0.000
163.57-159.05					B	7.122	0.000		53.00	0.000	0.000
					C	6.312	6.316		29.90	0.000	0.000
					D	6.627	8.182		25.49	0.000	0.000
T4	156.79	1.561	32	30.376	A	6.903	0.437	3.775	51.43	0.000	0.000
159.05-154.52					B	6.903	0.000		54.69	0.000	0.000

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
					C	6.091	7.231		28.34	0.000	0.000
					D	6.544	8.355		25.34	0.000	0.000
T5	152.26	1.548	32	31.844	A	7.011	0.437	3.775	50.68	0.000	0.000
154.52-150.00					B	7.011	0.000		53.84	0.000	0.000
					C	6.212	7.231		28.08	0.000	0.000
					D	6.667	8.355		25.13	0.000	0.000
T6	145.00	1.526	32	75.634	A	16.767	0.967	8.344	47.05	0.000	0.000
150.00-140.00					B	16.767	0.000		49.76	0.000	0.000
					C	14.822	15.983		27.09	0.000	0.000
					D	15.796	18.467		24.35	0.000	0.000
T7	135.00	1.496	31	83.296	A	19.051	0.967	10.013	50.02	0.000	0.000
140.00-130.00					B	19.051	0.000		52.56	0.000	0.000
					C	17.178	15.983		30.19	0.000	0.000
					D	17.948	20.317		26.17	0.000	0.000
T8	125.00	1.463	30	90.466	A	17.100	9.372	10.013	37.82	0.000	0.000
130.00-120.00					B	17.878	0.000		56.01	0.000	0.000
					C	16.399	15.983		30.92	0.000	0.000
					D	17.884	20.317		26.21	0.000	0.000
T9	115.00	1.429	30	97.774	A	18.485	14.975	10.013	29.92	0.000	0.000
120.00-110.00					B	20.028	0.000		49.99	0.000	0.000
					C	18.268	15.983		29.23	0.000	0.000
					D	20.123	21.427		24.10	0.000	0.000
T10	105.00	1.392	29	104.945	A	18.053	18.299	10.013	27.54	0.000	0.000
110.00-100.00					B	19.757	0.000		50.68	0.000	0.000
					C	18.185	15.983		29.30	0.000	0.000
					D	19.829	24.432		22.62	0.000	0.000
T11	95.00	1.353	28	112.984	A	21.919	20.515	13.350	31.46	0.000	0.000
100.00-90.00					B	23.872	0.000		55.93	0.000	0.000
					C	22.275	15.983		34.90	0.000	0.000
					D	23.779	25.667		27.00	0.000	0.000
T12	85.00	1.31	27	120.155	A	22.455	20.515	13.350	31.07	0.000	0.000
90.00-80.00					B	24.365	0.000		54.79	0.000	0.000
					C	22.803	15.983		34.42	0.000	0.000
					D	24.287	26.129		26.48	0.000	0.000
T13	70.00	1.24	26	263.233	A	13.036	69.400	28.370	34.41	0.000	0.000
80.00-60.00					B	15.516	28.370		64.64	0.000	0.000
					C	13.488	60.336		38.43	0.000	0.000
					D	17.162	82.278		28.53	0.000	0.000
T14	55.00	1.157	24	142.444	A	7.718	34.700	14.185	33.44	0.000	0.000
60.00-50.00					B	9.050	14.185		61.05	0.000	0.000
					C	7.961	30.168		37.20	0.000	0.000
					D	9.711	41.550		27.67	0.000	0.000
T15	45.00	1.093	23	149.614	A	9.632	34.700	14.185	32.00	0.000	0.000
50.00-40.00					B	11.192	14.185		55.90	0.000	0.000
					C	9.917	30.168		35.39	0.000	0.000
					D	11.472	42.082		26.49	0.000	0.000
T16	35.00	1.017	21	156.196	A	25.497	20.515	13.350	29.02	0.000	0.000
40.00-30.00					B	27.367	0.000		48.78	0.000	0.000
					C	25.838	15.983		31.92	0.000	0.000
					D	27.163	28.042		24.18	0.000	0.000
T17	25.00	1	21	163.366	A	23.935	20.515	13.350	30.03	0.000	0.000
30.00-20.00					B	25.467	0.000		52.42	0.000	0.000
					C	24.214	15.983		33.21	0.000	0.000
					D	25.778	28.042		24.81	0.000	0.000
T18	15.00	1	21	170.539	A	26.687	20.515	13.350	28.28	0.000	0.000
20.00-10.00					B	28.533	0.000		46.79	0.000	0.000
					C	27.024	15.983		31.04	0.000	0.000
					D	28.367	28.042		23.67	0.000	0.000
T19 10.00-0.00	5.00	1	21	177.715	A	27.606	8.206	13.350	37.28	0.000	0.000
					B	28.435	0.000		46.95	0.000	0.000

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
					C	27.757	6.393		39.09	0.000	0.000
					D	28.230	11.217		33.84	0.000	0.000

Tower Forces - No Ice - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.09	0.75	A	0.21	2.936	0.593	1	1	12.778	1.66	166.38	D
180.00-170.00			B	0.203	2.969	0.591	1	1	12.491			
			C	0.203	2.969	0.591	1	1	12.491			
			D	0.371	2.363	0.64	1	1	18.811			
T2	0.09	0.54	A	0.253	2.762	0.603	1	1	10.019	1.29	201.38	D
170.00-163.57			B	0.246	2.792	0.601	1	1	9.832			
			C	0.246	2.792	0.601	1	1	9.832			
			D	0.519	2.015	0.707	1	1	17.394			
T3	0.14	0.39	A	0.256	2.754	0.603	1	1	7.282	0.92	202.99	D
163.57-159.05			B	0.246	2.789	0.601	1	1	7.122			
			C	0.437	2.186	0.667	1	1	10.527			
			D	0.512	2.027	0.704	1	1	12.387			
T4	0.15	0.36	A	0.242	2.808	0.6	1	1	7.165	0.93	204.52	D
159.05-154.52			B	0.227	2.866	0.596	1	1	6.903			
			C	0.439	2.182	0.668	1	1	10.922			
			D	0.49	2.068	0.693	1	1	12.331			
T5	0.15	0.37	A	0.234	2.839	0.598	1	1	7.273	0.94	207.37	D
154.52-150.00			B	0.22	2.895	0.595	1	1	7.011			
			C	0.422	2.222	0.661	1	1	10.991			
			D	0.472	2.107	0.683	1	1	12.378			
T6	0.33	0.97	A	0.234	2.837	0.598	1	1	17.345	2.15	215.33	D
150.00-140.00			B	0.222	2.889	0.595	1	1	16.767			
			C	0.407	2.261	0.655	1	1	25.284			
			D	0.453	2.148	0.675	1	1	28.255			
T7	0.34	1.53	A	0.24	2.813	0.599	1	1	19.630	2.35	235.23	D
140.00-130.00			B	0.229	2.86	0.597	1	1	19.051			
			C	0.398	2.285	0.651	1	1	27.580			
			D	0.459	2.134	0.678	1	1	31.715			
T8	0.40	1.43	A	0.293	2.616	0.614	1	1	22.851	2.37	236.58	D
130.00-120.00			B	0.198	2.99	0.59	1	1	17.878			
			C	0.358	2.401	0.635	1	1	26.554			
			D	0.422	2.222	0.661	1	1	31.312			
T9	0.45	2.05	A	0.342	2.449	0.63	1	1	27.915	2.52	252.35	D
120.00-110.00			B	0.205	2.959	0.591	1	1	20.028			
			C	0.35	2.424	0.633	1	1	28.378			
			D	0.425	2.215	0.662	1	1	34.310			
T10	0.51	1.91	A	0.346	2.436	0.631	1	1	29.603	2.59	258.72	D
110.00-100.00			B	0.188	3.031	0.588	1	1	19.757			
			C	0.326	2.503	0.624	1	1	28.160			
			D	0.422	2.223	0.661	1	1	35.972			
T11	0.54	2.50	A	0.376	2.348	0.642	1	1	35.088	2.81	280.96	D
100.00-90.00			B	0.211	2.932	0.593	1	1	23.872			
			C	0.339	2.461	0.628	1	1	32.320			
			D	0.438	2.184	0.668	1	1	40.917			
T12	0.54	2.43	A	0.358	2.402	0.635	1	1	35.486	2.82	281.87	D
90.00-80.00			B	0.203	2.968	0.591	1	1	24.365			
			C	0.323	2.512	0.623	1	1	32.763			
			D	0.42	2.229	0.66	1	1	41.527			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T13	1.09	7.96	A	0.313	2.545	0.62	1	1	56.065	4.73	236.35	D
80.00-60.00			B	0.167	3.128	0.584	1	1	32.089			
			C	0.28	2.66	0.61	1	1	50.300			
			D	0.378	2.342	0.643	1	1	70.049			
T14	0.55	4.57	A	0.298	2.598	0.615	1	1	29.066	2.33	232.76	D
60.00-50.00			B	0.163	3.144	0.584	1	1	17.328			
			C	0.268	2.707	0.607	1	1	26.259			
			D	0.36	2.395	0.636	1	1	36.138			
T15	0.55	5.12	A	0.296	2.603	0.615	1	1	30.965	2.33	232.94	D
50.00-40.00			B	0.17	3.114	0.585	1	1	19.485			
			C	0.268	2.706	0.607	1	1	28.217			
			D	0.358	2.401	0.635	1	1	38.208			
T16	0.55	4.78	A	0.295	2.609	0.614	1	1	38.098	2.56	256.43	D
40.00-30.00			B	0.175	3.089	0.586	1	1	27.367			
			C	0.268	2.707	0.607	1	1	35.533			
			D	0.353	2.414	0.634	1	1	44.934			
T17	0.55	4.27	A	0.272	2.691	0.608	1	1	36.403	2.51	250.71	D
30.00-20.00			B	0.156	3.177	0.582	1	1	25.467			
			C	0.246	2.79	0.601	1	1	33.818			
			D	0.329	2.49	0.625	1	1	43.314			
T18	0.55	5.02	A	0.277	2.673	0.609	1	1	39.182	2.65	265.31	D
20.00-10.00			B	0.167	3.125	0.584	1	1	28.533			
			C	0.252	2.767	0.602	1	1	36.653			
			D	0.331	2.486	0.626	1	1	45.915			
T19	0.22	4.90	A	0.202	2.974	0.591	1	1	32.453	2.34	234.26	D
10.00-0.00			B	0.16	3.158	0.583	1	1	28.435			
			C	0.192	3.014	0.589	1	1	31.522			
			D	0.222	2.887	0.595	1	1	34.906			
Sum Weight:	7.77	51.85						OTM	3704.65 kip-ft	42.80		

Tower Forces - No Ice - Wind 45 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.09	0.75	A	0.21	2.936	0.593	1.158	1.158	14.794	2.00	199.66	D
180.00-170.00			B	0.203	2.969	0.591	1.152	1.152	14.389			
			C	0.203	2.969	0.591	1.152	1.152	14.389			
			D	0.371	2.363	0.64	1.2	1.2	22.573			
T2	0.09	0.54	A	0.253	2.762	0.603	1.19	1.19	11.923	1.55	241.66	D
170.00-163.57			B	0.246	2.792	0.601	1.184	1.184	11.643			
			C	0.246	2.792	0.601	1.184	1.184	11.643			
			D	0.519	2.015	0.707	1.2	1.2	20.872			
T3	0.14	0.39	A	0.256	2.754	0.603	1.192	1.192	8.677	1.10	243.59	D
163.57-159.05			B	0.246	2.789	0.601	1.185	1.185	8.438			
			C	0.437	2.186	0.667	1.2	1.2	12.632			
			D	0.512	2.027	0.704	1.2	1.2	14.864			
T4	0.15	0.36	A	0.242	2.808	0.6	1.181	1.181	8.463	1.11	245.43	D
159.05-154.52			B	0.227	2.866	0.596	1.17	1.17	8.079			
			C	0.439	2.182	0.668	1.2	1.2	13.106			
			D	0.49	2.068	0.693	1.2	1.2	14.797			
T5	0.15	0.37	A	0.234	2.839	0.598	1.175	1.175	8.549	1.13	248.84	D
154.52-150.00			B	0.22	2.895	0.595	1.165	1.165	8.169			
			C	0.422	2.222	0.661	1.2	1.2	13.189			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
			D	0.472	2.107	0.683	1.2	1.2	14.853			
T6	0.33	0.97	A	0.234	2.837	0.598	1.176	1.176	20.395	2.58	258.39	D
150.00-140.00			B	0.222	2.889	0.595	1.166	1.166	19.555			
			C	0.407	2.261	0.655	1.2	1.2	30.341			
			D	0.453	2.148	0.675	1.2	1.2	33.906			
T7	0.34	1.53	A	0.24	2.813	0.599	1.18	1.18	23.169	2.82	282.28	D
140.00-130.00			B	0.229	2.86	0.597	1.172	1.172	22.319			
			C	0.398	2.285	0.651	1.2	1.2	33.096			
			D	0.459	2.134	0.678	1.2	1.2	38.058			
T8	0.40	1.43	A	0.293	2.616	0.614	1.2	1.2	27.422	2.84	283.89	D
130.00-120.00			B	0.198	2.99	0.59	1.148	1.148	20.527			
			C	0.358	2.401	0.635	1.2	1.2	31.865			
			D	0.422	2.222	0.661	1.2	1.2	37.575			
T9	0.45	2.05	A	0.342	2.449	0.63	1.2	1.2	33.498	3.03	302.82	D
120.00-110.00			B	0.205	2.959	0.591	1.154	1.154	23.105			
			C	0.35	2.424	0.633	1.2	1.2	34.054			
			D	0.425	2.215	0.662	1.2	1.2	41.172			
T10	0.51	1.91	A	0.346	2.436	0.631	1.2	1.2	35.523	3.10	310.47	D
110.00-100.00			B	0.188	3.031	0.588	1.141	1.141	22.546			
			C	0.326	2.503	0.624	1.2	1.2	33.792			
			D	0.422	2.223	0.661	1.2	1.2	43.166			
T11	0.54	2.50	A	0.376	2.348	0.642	1.2	1.2	42.106	3.37	337.15	D
100.00-90.00			B	0.211	2.932	0.593	1.158	1.158	27.655			
			C	0.339	2.461	0.628	1.2	1.2	38.784			
			D	0.438	2.184	0.668	1.2	1.2	49.100			
T12	0.54	2.43	A	0.358	2.402	0.635	1.2	1.2	42.584	3.38	338.25	D
90.00-80.00			B	0.203	2.968	0.591	1.152	1.152	28.071			
			C	0.323	2.512	0.623	1.2	1.2	39.316			
			D	0.42	2.229	0.66	1.2	1.2	49.833			
T13	1.09	7.96	A	0.313	2.545	0.62	1.2	1.2	67.277	5.67	283.62	D
80.00-60.00			B	0.167	3.128	0.584	1.125	1.125	36.101			
			C	0.28	2.66	0.61	1.2	1.2	60.360			
			D	0.378	2.342	0.643	1.2	1.2	84.059			
T14	0.55	4.57	A	0.298	2.598	0.615	1.2	1.2	34.879	2.79	279.31	D
60.00-50.00			B	0.163	3.144	0.584	1.122	1.122	19.447			
			C	0.268	2.707	0.607	1.2	1.2	31.511			
			D	0.36	2.395	0.636	1.2	1.2	43.366			
T15	0.55	5.12	A	0.296	2.603	0.615	1.2	1.2	37.158	2.80	279.53	D
50.00-40.00			B	0.17	3.114	0.585	1.127	1.127	21.964			
			C	0.268	2.706	0.607	1.2	1.2	33.860			
			D	0.358	2.401	0.635	1.2	1.2	45.850			
T16	0.55	4.78	A	0.295	2.609	0.614	1.2	1.2	45.718	3.08	307.71	D
40.00-30.00			B	0.175	3.089	0.586	1.131	1.131	30.964			
			C	0.268	2.707	0.607	1.2	1.2	42.639			
			D	0.353	2.414	0.634	1.2	1.2	53.920			
T17	0.55	4.27	A	0.272	2.691	0.608	1.2	1.2	43.684	3.01	300.86	D
30.00-20.00			B	0.156	3.177	0.582	1.117	1.117	28.444			
			C	0.246	2.79	0.601	1.185	1.185	40.059			
			D	0.329	2.49	0.625	1.2	1.2	51.976			
T18	0.55	5.02	A	0.277	2.673	0.609	1.2	1.2	47.019	3.18	318.37	D
20.00-10.00			B	0.167	3.125	0.584	1.125	1.125	32.114			
			C	0.252	2.767	0.602	1.189	1.189	43.585			
			D	0.331	2.486	0.626	1.2	1.2	55.098			
T19	0.22	4.90	A	0.202	2.974	0.591	1.151	1.151	37.358	2.73	273.26	D
10.00-0.00			B	0.16	3.158	0.583	1.12	1.12	31.847			
			C	0.192	3.014	0.589	1.144	1.144	36.065			
			D	0.222	2.887	0.595	1.166	1.166	40.717			
Sum Weight:	7.77	51.85						OTM	4445.18 kip-ft	51.28		

Tower Forces - With Ice - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
T1	0.25	1.18	A	0.293	2.614	0.614	1	1	16.074	2.06	205.61	D
180.00-170.00			B	0.272	2.691	0.608	1	1	15.239			
			C	0.272	2.691	0.608	1	1	15.239			
			D	0.552	1.962	0.725	1	1	27.986			
T2	0.26	0.86	A	0.336	2.469	0.628	1	1	12.219	1.85	288.18	D
170.00-163.57			B	0.315	2.537	0.621	1	1	11.667			
			C	0.315	2.537	0.621	1	1	11.667			
			D	0.754	1.825	0.86	1	1	27.478			
T3	0.35	0.63	A	0.351	2.423	0.633	1	1	9.115	1.31	289.23	D
163.57-159.05			B	0.326	2.501	0.624	1	1	8.638			
			C	0.602	1.898	0.755	1	1	14.917			
			D	0.748	1.825	0.855	1	1	19.607			
T4	0.37	0.56	A	0.328	2.494	0.625	1	1	8.901	1.30	286.87	D
159.05-154.52			B	0.29	2.627	0.613	1	1	8.132			
			C	0.603	1.897	0.756	1	1	15.602			
			D	0.723	1.825	0.837	1	1	19.601			
T5	0.37	0.57	A	0.318	2.528	0.622	1	1	9.026	1.28	283.41	D
154.52-150.00			B	0.281	2.657	0.61	1	1	8.262			
			C	0.581	1.922	0.742	1	1	15.609			
			D	0.696	1.831	0.817	1	1	19.462			
T6	0.83	1.49	A	0.32	2.523	0.622	1	1	21.539	2.84	284.47	D
150.00-140.00			B	0.285	2.643	0.611	1	1	19.848			
			C	0.559	1.951	0.73	1	1	35.438			
			D	0.665	1.846	0.795	1	1	43.447			
T7	0.86	2.18	A	0.317	2.531	0.621	1	1	23.788	3.10	309.87	D
140.00-130.00			B	0.286	2.641	0.612	1	1	22.104			
			C	0.538	1.983	0.718	1	1	37.577			
			D	0.67	1.843	0.799	1	1	48.377			
T8	1.01	1.98	A	0.402	2.273	0.653	1	1	29.760	3.04	303.61	D
130.00-120.00			B	0.245	2.793	0.601	1	1	20.592			
			C	0.487	2.075	0.691	1	1	36.146			
			D	0.621	1.878	0.767	1	1	47.534			
T9	1.13	2.78	A	0.477	2.096	0.686	1	1	37.758	3.22	321.78	D
120.00-110.00			B	0.258	2.745	0.604	1	1	23.274			
			C	0.475	2.099	0.685	1	1	38.152			
			D	0.623	1.877	0.768	1	1	51.624			
T10	1.25	2.52	A	0.489	2.072	0.692	1	1	40.997	3.34	334.37	D
110.00-100.00			B	0.232	2.846	0.597	1	1	22.624			
			C	0.44	2.178	0.669	1	1	37.494			
			D	0.623	1.876	0.768	1	1	55.080			
T11	1.32	3.28	A	0.521	2.012	0.708	1	1	48.014	3.58	357.82	D
100.00-90.00			B	0.253	2.764	0.603	1	1	26.833			
			C	0.446	2.164	0.671	1	1	41.732			
			D	0.633	1.868	0.774	1	1	60.915			
T12	1.32	3.15	A	0.496	2.058	0.696	1	1	48.210	3.54	354.01	D
90.00-80.00			B	0.243	2.801	0.6	1	1	27.413			
			C	0.426	2.214	0.662	1	1	42.149			
			D	0.608	1.891	0.759	1	1	61.453			
T13	2.68	9.49	A	0.442	2.174	0.67	1	1	82.199	6.36	317.92	D
80.00-60.00			B	0.202	2.973	0.591	1	1	37.914			
			C	0.376	2.348	0.642	1	1	69.669			
			D	0.562	1.948	0.731	1	1	113.303			
T14	1.35	5.52	A	0.421	2.225	0.66	1	1	42.156	3.09	309.00	D

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
60.00-50.00			B	0.201	2.978	0.591	1	1	20.674			
			C	0.36	2.395	0.636	1	1	36.168			
			D	0.538	1.984	0.717	1	1	57.911			
T15	1.36	5.97	A	0.414	2.243	0.657	1	1	43.894	3.05	305.12	D
50.00-40.00			B	0.206	2.952	0.592	1	1	22.950			
			C	0.356	2.406	0.635	1	1	38.084			
			D	0.532	1.993	0.715	1	1	60.291			
T16	1.36	5.99	A	0.413	2.246	0.657	1	1	50.930	3.13	313.49	D
40.00-30.00			B	0.219	2.9	0.594	1	1	31.544			
			C	0.359	2.398	0.636	1	1	45.601			
			D	0.525	2.004	0.711	1	1	66.172			
T17	1.36	5.18	A	0.382	2.33	0.644	1	1	48.600	3.06	306.22	D
30.00-20.00			B	0.192	3.016	0.589	1	1	29.003			
			C	0.329	2.491	0.625	1	1	43.333			
			D	0.493	2.063	0.694	1	1	63.851			
T18	1.36	6.32	A	0.388	2.313	0.647	1	1	52.022	3.21	320.56	D
20.00-10.00			B	0.21	2.937	0.593	1	1	32.959			
			C	0.338	2.462	0.628	1	1	46.872			
			D	0.491	2.067	0.693	1	1	66.733			
T19	0.54	6.31	A	0.269	2.704	0.607	1	1	39.748	2.65	265.23	D
10.00-0.00			B	0.202	2.973	0.591	1	1	32.898			
			C	0.25	2.776	0.602	1	1	38.046			
			D	0.307	2.564	0.618	1	1	44.503			
Sum Weight:	19.32	65.96						OTM	4850.81 kip-ft	55.01		

Tower Forces - With Ice - Wind 45 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.25	1.18	A	0.293	2.614	0.614	1.2	1.2	19.289	2.47	246.73	D
180.00-170.00			B	0.272	2.691	0.608	1.2	1.2	18.286			
			C	0.272	2.691	0.608	1.2	1.2	18.286			
			D	0.552	1.962	0.725	1.2	1.2	33.583			
T2	0.26	0.86	A	0.336	2.469	0.628	1.2	1.2	14.662	2.22	345.82	D
170.00-163.57			B	0.315	2.537	0.621	1.2	1.2	14.001			
			C	0.315	2.537	0.621	1.2	1.2	14.001			
			D	0.754	1.825	0.86	1.2	1.2	32.974			
T3	0.35	0.63	A	0.351	2.423	0.633	1.2	1.2	10.938	1.57	347.08	D
163.57-159.05			B	0.326	2.501	0.624	1.2	1.2	10.366			
			C	0.602	1.898	0.755	1.2	1.2	17.900			
			D	0.748	1.825	0.855	1.2	1.2	23.528			
T4	0.37	0.56	A	0.328	2.494	0.625	1.2	1.2	10.681	1.56	344.25	D
159.05-154.52			B	0.29	2.627	0.613	1.2	1.2	9.758			
			C	0.603	1.897	0.756	1.2	1.2	18.723			
			D	0.723	1.825	0.837	1.2	1.2	23.521			
T5	0.37	0.57	A	0.318	2.528	0.622	1.2	1.2	10.831	1.54	340.10	D
154.52-150.00			B	0.281	2.657	0.61	1.2	1.2	9.915			
			C	0.581	1.922	0.742	1.2	1.2	18.731			
			D	0.696	1.831	0.817	1.2	1.2	23.355			
T6	0.83	1.49	A	0.32	2.523	0.622	1.2	1.2	25.847	3.41	341.36	D
150.00-140.00			B	0.285	2.643	0.611	1.2	1.2	23.817			
			C	0.559	1.951	0.73	1.2	1.2	42.525			
			D	0.665	1.846	0.795	1.2	1.2	52.137			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
T7	0.86	2.18	A	0.317	2.531	0.621	1.2	1.2	28.546	3.72	371.85	D
140.00-130.00			B	0.286	2.641	0.612	1.2	1.2	26.525			
			C	0.538	1.983	0.718	1.2	1.2	45.092			
			D	0.67	1.843	0.799	1.2	1.2	58.052			
T8	1.01	1.98	A	0.402	2.273	0.653	1.2	1.2	35.712	3.64	364.33	D
130.00-120.00			B	0.245	2.793	0.601	1.184	1.184	24.381			
			C	0.487	2.075	0.691	1.2	1.2	43.376			
			D	0.621	1.878	0.767	1.2	1.2	57.040			
T9	1.13	2.78	A	0.477	2.096	0.686	1.2	1.2	45.310	3.86	386.14	D
120.00-110.00			B	0.258	2.745	0.604	1.193	1.193	27.771			
			C	0.475	2.099	0.685	1.2	1.2	45.783			
			D	0.623	1.877	0.768	1.2	1.2	61.948			
T10	1.25	2.52	A	0.489	2.072	0.692	1.2	1.2	49.196	4.01	401.24	D
110.00-100.00			B	0.232	2.846	0.597	1.174	1.174	26.563			
			C	0.44	2.178	0.669	1.2	1.2	44.993			
			D	0.623	1.876	0.768	1.2	1.2	66.097			
T11	1.32	3.28	A	0.521	2.012	0.708	1.2	1.2	57.617	4.29	429.38	D
100.00-90.00			B	0.253	2.764	0.603	1.19	1.19	31.923			
			C	0.446	2.164	0.671	1.2	1.2	50.078			
			D	0.633	1.868	0.774	1.2	1.2	73.098			
T12	1.32	3.15	A	0.496	2.058	0.696	1.2	1.2	57.852	4.25	424.81	D
90.00-80.00			B	0.243	2.801	0.6	1.183	1.183	32.416			
			C	0.426	2.214	0.662	1.2	1.2	50.579			
			D	0.608	1.891	0.759	1.2	1.2	73.743			
T13	2.68	9.49	A	0.442	2.174	0.67	1.2	1.2	98.639	7.63	381.50	D
80.00-60.00			B	0.202	2.973	0.591	1.151	1.151	43.649			
			C	0.376	2.348	0.642	1.2	1.2	83.603			
			D	0.562	1.948	0.731	1.2	1.2	135.964			
T14	1.35	5.52	A	0.421	2.225	0.66	1.2	1.2	50.587	3.71	370.80	D
60.00-50.00			B	0.201	2.978	0.591	1.15	1.15	23.784			
			C	0.36	2.395	0.636	1.2	1.2	43.402			
			D	0.538	1.984	0.717	1.2	1.2	69.493			
T15	1.36	5.97	A	0.414	2.243	0.657	1.2	1.2	52.673	3.66	366.14	D
50.00-40.00			B	0.206	2.952	0.592	1.155	1.155	26.504			
			C	0.356	2.406	0.635	1.2	1.2	45.700			
			D	0.532	1.993	0.715	1.2	1.2	72.349			
T16	1.36	5.99	A	0.413	2.246	0.657	1.2	1.2	61.116	3.76	376.19	D
40.00-30.00			B	0.219	2.9	0.594	1.164	1.164	36.726			
			C	0.359	2.398	0.636	1.2	1.2	54.722			
			D	0.525	2.004	0.711	1.2	1.2	79.406			
T17	1.36	5.18	A	0.382	2.33	0.644	1.2	1.2	58.320	3.67	367.47	D
30.00-20.00			B	0.192	3.016	0.589	1.144	1.144	33.172			
			C	0.329	2.491	0.625	1.2	1.2	51.999			
			D	0.493	2.063	0.694	1.2	1.2	76.621			
T18	1.36	6.32	A	0.388	2.313	0.647	1.2	1.2	62.426	3.85	384.67	D
20.00-10.00			B	0.21	2.937	0.593	1.158	1.158	38.152			
			C	0.338	2.462	0.628	1.2	1.2	56.247			
			D	0.491	2.067	0.693	1.2	1.2	80.080			
T19	0.54	6.31	A	0.269	2.704	0.607	1.2	1.2	47.698	3.18	318.28	D
10.00-0.00			B	0.202	2.973	0.591	1.151	1.151	37.871			
			C	0.25	2.776	0.602	1.187	1.187	45.173			
			D	0.307	2.564	0.618	1.2	1.2	53.404			
Sum Weight:	19.32	65.96						OTM	5820.97 kip-ft	66.01		

Tower Forces - Service - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
T1	0.09	0.75	A	0.21	2.936	0.593	1	1	12.778	1.66	166.38	D
180.00-170.00			B	0.203	2.969	0.591	1	1	12.491			
			C	0.203	2.969	0.591	1	1	12.491			
			D	0.371	2.363	0.64	1	1	18.811			
T2	0.09	0.54	A	0.253	2.762	0.603	1	1	10.019	1.29	201.38	D
170.00-163.57			B	0.246	2.792	0.601	1	1	9.832			
			C	0.246	2.792	0.601	1	1	9.832			
			D	0.519	2.015	0.707	1	1	17.394			
T3	0.14	0.39	A	0.256	2.754	0.603	1	1	7.282	0.92	202.99	D
163.57-159.05			B	0.246	2.789	0.601	1	1	7.122			
			C	0.437	2.186	0.667	1	1	10.527			
			D	0.512	2.027	0.704	1	1	12.387			
T4	0.15	0.36	A	0.242	2.808	0.6	1	1	7.165	0.93	204.52	D
159.05-154.52			B	0.227	2.866	0.596	1	1	6.903			
			C	0.439	2.182	0.668	1	1	10.922			
			D	0.49	2.068	0.693	1	1	12.331			
T5	0.15	0.37	A	0.234	2.839	0.598	1	1	7.273	0.94	207.37	D
154.52-150.00			B	0.22	2.895	0.595	1	1	7.011			
			C	0.422	2.222	0.661	1	1	10.991			
			D	0.472	2.107	0.683	1	1	12.378			
T6	0.33	0.97	A	0.234	2.837	0.598	1	1	17.345	2.15	215.33	D
150.00-140.00			B	0.222	2.889	0.595	1	1	16.767			
			C	0.407	2.261	0.655	1	1	25.284			
			D	0.453	2.148	0.675	1	1	28.255			
T7	0.34	1.53	A	0.24	2.813	0.599	1	1	19.630	2.35	235.23	D
140.00-130.00			B	0.229	2.86	0.597	1	1	19.051			
			C	0.398	2.285	0.651	1	1	27.580			
			D	0.459	2.134	0.678	1	1	31.715			
T8	0.40	1.43	A	0.293	2.616	0.614	1	1	22.851	2.37	236.58	D
130.00-120.00			B	0.198	2.99	0.59	1	1	17.878			
			C	0.358	2.401	0.635	1	1	26.554			
			D	0.422	2.222	0.661	1	1	31.312			
T9	0.45	2.05	A	0.342	2.449	0.63	1	1	27.915	2.52	252.35	D
120.00-110.00			B	0.205	2.959	0.591	1	1	20.028			
			C	0.35	2.424	0.633	1	1	28.378			
			D	0.425	2.215	0.662	1	1	34.310			
T10	0.51	1.91	A	0.346	2.436	0.631	1	1	29.603	2.59	258.72	D
110.00-100.00			B	0.188	3.031	0.588	1	1	19.757			
			C	0.326	2.503	0.624	1	1	28.160			
			D	0.422	2.223	0.661	1	1	35.972			
T11	0.54	2.50	A	0.376	2.348	0.642	1	1	35.088	2.81	280.96	D
100.00-90.00			B	0.211	2.932	0.593	1	1	23.872			
			C	0.339	2.461	0.628	1	1	32.320			
			D	0.438	2.184	0.668	1	1	40.917			
T12	0.54	2.43	A	0.358	2.402	0.635	1	1	35.486	2.82	281.87	D
90.00-80.00			B	0.203	2.968	0.591	1	1	24.365			
			C	0.323	2.512	0.623	1	1	32.763			
			D	0.42	2.229	0.66	1	1	41.527			
T13	1.09	7.96	A	0.313	2.545	0.62	1	1	56.065	4.73	236.35	D
80.00-60.00			B	0.167	3.128	0.584	1	1	32.089			
			C	0.28	2.66	0.61	1	1	50.300			
			D	0.378	2.342	0.643	1	1	70.049			
T14	0.55	4.57	A	0.298	2.598	0.615	1	1	29.066	2.33	232.76	D
60.00-50.00			B	0.163	3.144	0.584	1	1	17.328			
			C	0.268	2.707	0.607	1	1	26.259			
			D	0.36	2.395	0.636	1	1	36.138			
T15	0.55	5.12	A	0.296	2.603	0.615	1	1	30.965	2.33	232.94	D
50.00-40.00			B	0.17	3.114	0.585	1	1	19.485			
			C	0.268	2.706	0.607	1	1	28.217			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
			D	0.358	2.401	0.635	1	1	38.208			
T16	0.55	4.78	A	0.295	2.609	0.614	1	1	38.098	2.56	256.43	D
40.00-30.00			B	0.175	3.089	0.586	1	1	27.367			
			C	0.268	2.707	0.607	1	1	35.533			
			D	0.353	2.414	0.634	1	1	44.934			
T17	0.55	4.27	A	0.272	2.691	0.608	1	1	36.403	2.51	250.71	D
30.00-20.00			B	0.156	3.177	0.582	1	1	25.467			
			C	0.246	2.79	0.601	1	1	33.818			
			D	0.329	2.49	0.625	1	1	43.314			
T18	0.55	5.02	A	0.277	2.673	0.609	1	1	39.182	2.65	265.31	D
20.00-10.00			B	0.167	3.125	0.584	1	1	28.533			
			C	0.252	2.767	0.602	1	1	36.653			
			D	0.331	2.486	0.626	1	1	45.915			
T19	0.22	4.90	A	0.202	2.974	0.591	1	1	32.453	2.34	234.26	D
10.00-0.00			B	0.16	3.158	0.583	1	1	28.435			
			C	0.192	3.014	0.589	1	1	31.522			
			D	0.222	2.887	0.595	1	1	34.906			
Sum Weight:	7.77	51.85						OTM	3704.65 kip-ft	42.80		

Tower Forces - Service - Wind 45 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.09	0.75	A	0.21	2.936	0.593	1.158	1.158	14.794	2.00	199.66	D
180.00-170.00			B	0.203	2.969	0.591	1.152	1.152	14.389			
			C	0.203	2.969	0.591	1.152	1.152	14.389			
			D	0.371	2.363	0.64	1.2	1.2	22.573			
T2	0.09	0.54	A	0.253	2.762	0.603	1.19	1.19	11.923	1.55	241.66	D
170.00-163.57			B	0.246	2.792	0.601	1.184	1.184	11.643			
			C	0.246	2.792	0.601	1.184	1.184	11.643			
			D	0.519	2.015	0.707	1.2	1.2	20.872			
T3	0.14	0.39	A	0.256	2.754	0.603	1.192	1.192	8.677	1.10	243.59	D
163.57-159.05			B	0.246	2.789	0.601	1.185	1.185	8.438			
			C	0.437	2.186	0.667	1.2	1.2	12.632			
			D	0.512	2.027	0.704	1.2	1.2	14.864			
T4	0.15	0.36	A	0.242	2.808	0.6	1.181	1.181	8.463	1.11	245.43	D
159.05-154.52			B	0.227	2.866	0.596	1.17	1.17	8.079			
			C	0.439	2.182	0.668	1.2	1.2	13.106			
			D	0.49	2.068	0.693	1.2	1.2	14.797			
T5	0.15	0.37	A	0.234	2.839	0.598	1.175	1.175	8.549	1.13	248.84	D
154.52-150.00			B	0.22	2.895	0.595	1.165	1.165	8.169			
			C	0.422	2.222	0.661	1.2	1.2	13.189			
			D	0.472	2.107	0.683	1.2	1.2	14.853			
T6	0.33	0.97	A	0.234	2.837	0.598	1.176	1.176	20.395	2.58	258.39	D
150.00-140.00			B	0.222	2.889	0.595	1.166	1.166	19.555			
			C	0.407	2.261	0.655	1.2	1.2	30.341			
			D	0.453	2.148	0.675	1.2	1.2	33.906			
T7	0.34	1.53	A	0.24	2.813	0.599	1.18	1.18	23.169	2.82	282.28	D
140.00-130.00			B	0.229	2.86	0.597	1.172	1.172	22.319			
			C	0.398	2.285	0.651	1.2	1.2	33.096			
			D	0.459	2.134	0.678	1.2	1.2	38.058			
T8	0.40	1.43	A	0.293	2.616	0.614	1.2	1.2	27.422	2.84	283.89	D
130.00-120.00			B	0.198	2.99	0.59	1.148	1.148	20.527			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
			C	0.358	2.401	0.635	1.2	1.2	31.865			
			D	0.422	2.222	0.661	1.2	1.2	37.575			
T9	0.45	2.05	A	0.342	2.449	0.63	1.2	1.2	33.498	3.03	302.82	D
120.00-110.00			B	0.205	2.959	0.591	1.154	1.154	23.105			
			C	0.35	2.424	0.633	1.2	1.2	34.054			
			D	0.425	2.215	0.662	1.2	1.2	41.172			
T10	0.51	1.91	A	0.346	2.436	0.631	1.2	1.2	35.523	3.10	310.47	D
110.00-100.00			B	0.188	3.031	0.588	1.141	1.141	22.546			
			C	0.326	2.503	0.624	1.2	1.2	33.792			
			D	0.422	2.223	0.661	1.2	1.2	43.166			
T11	0.54	2.50	A	0.376	2.348	0.642	1.2	1.2	42.106	3.37	337.15	D
100.00-90.00			B	0.211	2.932	0.593	1.158	1.158	27.655			
			C	0.339	2.461	0.628	1.2	1.2	38.784			
			D	0.438	2.184	0.668	1.2	1.2	49.100			
T12	0.54	2.43	A	0.358	2.402	0.635	1.2	1.2	42.584	3.38	338.25	D
90.00-80.00			B	0.203	2.968	0.591	1.152	1.152	28.071			
			C	0.323	2.512	0.623	1.2	1.2	39.316			
			D	0.42	2.229	0.66	1.2	1.2	49.833			
T13	1.09	7.96	A	0.313	2.545	0.62	1.2	1.2	67.277	5.67	283.62	D
80.00-60.00			B	0.167	3.128	0.584	1.125	1.125	36.101			
			C	0.28	2.66	0.61	1.2	1.2	60.360			
			D	0.378	2.342	0.643	1.2	1.2	84.059			
T14	0.55	4.57	A	0.298	2.598	0.615	1.2	1.2	34.879	2.79	279.31	D
60.00-50.00			B	0.163	3.144	0.584	1.122	1.122	19.447			
			C	0.268	2.707	0.607	1.2	1.2	31.511			
			D	0.36	2.395	0.636	1.2	1.2	43.366			
T15	0.55	5.12	A	0.296	2.603	0.615	1.2	1.2	37.158	2.80	279.53	D
50.00-40.00			B	0.17	3.114	0.585	1.127	1.127	21.964			
			C	0.268	2.706	0.607	1.2	1.2	33.860			
			D	0.358	2.401	0.635	1.2	1.2	45.850			
T16	0.55	4.78	A	0.295	2.609	0.614	1.2	1.2	45.718	3.08	307.71	D
40.00-30.00			B	0.175	3.089	0.586	1.131	1.131	30.964			
			C	0.268	2.707	0.607	1.2	1.2	42.639			
			D	0.353	2.414	0.634	1.2	1.2	53.920			
T17	0.55	4.27	A	0.272	2.691	0.608	1.2	1.2	43.684	3.01	300.86	D
30.00-20.00			B	0.156	3.177	0.582	1.117	1.117	28.444			
			C	0.246	2.79	0.601	1.185	1.185	40.059			
			D	0.329	2.49	0.625	1.2	1.2	51.976			
T18	0.55	5.02	A	0.277	2.673	0.609	1.2	1.2	47.019	3.18	318.37	D
20.00-10.00			B	0.167	3.125	0.584	1.125	1.125	32.114			
			C	0.252	2.767	0.602	1.189	1.189	43.585			
			D	0.331	2.486	0.626	1.2	1.2	55.098			
T19	0.22	4.90	A	0.202	2.974	0.591	1.151	1.151	37.358	2.73	273.26	D
10.00-0.00			B	0.16	3.158	0.583	1.12	1.12	31.847			
			C	0.192	3.014	0.589	1.144	1.144	36.065			
			D	0.222	2.887	0.595	1.166	1.166	40.717			
Sum Weight:	7.77	51.85						OTM	4445.18 kip-ft	51.28		

Force Totals

Load Case	Vertical Forces K	Sum of Forces X K	Sum of Forces Z K	Sum of Overturning Moments, M_x kip-ft	Sum of Overturning Moments, M_z kip-ft	Sum of Torques kip-ft
Leg Weight	30.80					

Load Case	Vertical Forces K	Sum of Forces X K	Sum of Forces Z K	Sum of Overturning Moments, M_x kip-ft	Sum of Overturning Moments, M_z kip-ft	Sum of Torques kip-ft
Bracing Weight	21.04					
Total Member Self-Weight	51.85			-21.73	9.98	
Total Weight	74.34			-21.73	9.98	
Wind 0 deg - No Ice		-0.43	-68.78	-7397.09	77.50	-49.12
Wind 30 deg - No Ice		38.28	-66.70	-7016.55	-3993.00	-56.77
Wind 45 deg - No Ice		54.36	-54.33	-5712.80	-5686.03	-49.95
Wind 60 deg - No Ice		66.74	-38.26	-4021.21	-6990.90	-39.72
Wind 90 deg - No Ice		68.82	0.43	45.78	-7372.38	-13.51
Wind 120 deg - No Ice		67.16	39.00	4094.69	-7058.41	18.89
Wind 135 deg - No Ice		54.96	54.93	5764.81	-5781.52	32.94
Wind 150 deg - No Ice		39.02	67.12	7040.60	-4109.94	44.75
Wind 180 deg - No Ice		0.43	68.78	7353.63	-57.54	49.12
Wind 210 deg - No Ice		-38.28	66.70	6973.08	4012.95	56.77
Wind 225 deg - No Ice		-54.36	54.33	5669.33	5705.99	49.95
Wind 240 deg - No Ice		-66.74	38.26	3977.74	7010.85	39.72
Wind 270 deg - No Ice		-68.82	-0.43	-89.25	7392.34	13.51
Wind 300 deg - No Ice		-67.16	-39.00	-4138.16	7078.37	-18.89
Wind 315 deg - No Ice		-54.96	-54.93	-5808.28	5801.48	-32.94
Wind 330 deg - No Ice		-39.02	-67.12	-7084.07	4129.90	-44.75
Member Ice	14.12					
Total Weight Ice	106.20			-24.98	25.91	
Wind 0 deg - Ice		-0.40	-87.15	-9389.37	89.88	-92.29
Wind 30 deg - Ice		48.75	-84.81	-8942.98	-5089.64	-92.24
Wind 45 deg - Ice		69.16	-69.12	-7287.38	-7241.68	-73.15
Wind 60 deg - Ice		84.85	-48.73	-5136.86	-8898.44	-49.09
Wind 90 deg - Ice		87.20	0.40	38.99	-9345.82	2.39
Wind 120 deg - Ice		85.25	49.42	5197.70	-8962.41	61.59
Wind 135 deg - Ice		69.72	69.69	7327.89	-7332.14	83.36
Wind 150 deg - Ice		49.45	85.21	8956.99	-5200.44	99.46
Wind 180 deg - Ice		0.40	87.15	9339.41	-38.06	92.29
Wind 210 deg - Ice		-48.75	84.81	8893.02	5141.45	92.24
Wind 225 deg - Ice		-69.16	69.12	7237.42	7293.49	73.15
Wind 240 deg - Ice		-84.85	48.73	5086.90	8950.26	49.09
Wind 270 deg - Ice		-87.20	-0.40	-88.95	9397.63	-2.39
Wind 300 deg - Ice		-85.25	-49.42	-5247.65	9014.23	-61.59
Wind 315 deg - Ice		-69.72	-69.69	-7377.84	7383.96	-83.36
Wind 330 deg - Ice		-49.45	-85.21	-9006.95	5252.25	-99.46
Total Weight	74.34			-21.73	9.98	
Wind 0 deg - Service		-0.43	-68.78	-7393.42	68.78	-49.12
Wind 30 deg - Service		38.28	-66.70	-7012.88	-4001.72	-56.77
Wind 45 deg - Service		54.36	-54.33	-5709.13	-5694.75	-49.95
Wind 60 deg - Service		66.74	-38.26	-4017.54	-6999.62	-39.72
Wind 90 deg - Service		68.82	0.43	49.45	-7381.10	-13.51
Wind 120 deg - Service		67.16	39.00	4098.36	-7067.13	18.89
Wind 135 deg - Service		54.96	54.93	5768.48	-5790.24	32.94
Wind 150 deg - Service		39.02	67.12	7044.27	-4118.66	44.75
Wind 180 deg - Service		0.43	68.78	7357.30	-66.26	49.12
Wind 210 deg - Service		-38.28	66.70	6976.75	4004.24	56.77
Wind 225 deg - Service		-54.36	54.33	5673.00	5697.27	49.95
Wind 240 deg - Service		-66.74	38.26	3981.41	7002.13	39.72
Wind 270 deg - Service		-68.82	-0.43	-85.58	7383.62	13.51
Wind 300 deg - Service		-67.16	-39.00	-4134.48	7069.65	-18.89
Wind 315 deg - Service		-54.96	-54.93	-5804.61	5792.76	-32.94
Wind 330 deg - Service		-39.02	-67.12	-7080.40	4121.18	-44.75

Load Combinations

Comb. No.	Description
1	Dead Only
2	Dead+Wind 0 deg - No Ice
3	Dead+Wind 30 deg - No Ice
4	Dead+Wind 45 deg - No Ice
5	Dead+Wind 60 deg - No Ice
6	Dead+Wind 90 deg - No Ice
7	Dead+Wind 120 deg - No Ice
8	Dead+Wind 135 deg - No Ice
9	Dead+Wind 150 deg - No Ice
10	Dead+Wind 180 deg - No Ice
11	Dead+Wind 210 deg - No Ice
12	Dead+Wind 225 deg - No Ice
13	Dead+Wind 240 deg - No Ice
14	Dead+Wind 270 deg - No Ice
15	Dead+Wind 300 deg - No Ice
16	Dead+Wind 315 deg - No Ice
17	Dead+Wind 330 deg - No Ice
18	Dead+Ice+Temp
19	Dead+Wind 0 deg+Ice+Temp
20	Dead+Wind 30 deg+Ice+Temp
21	Dead+Wind 45 deg+Ice+Temp
22	Dead+Wind 60 deg+Ice+Temp
23	Dead+Wind 90 deg+Ice+Temp
24	Dead+Wind 120 deg+Ice+Temp
25	Dead+Wind 135 deg+Ice+Temp
26	Dead+Wind 150 deg+Ice+Temp
27	Dead+Wind 180 deg+Ice+Temp
28	Dead+Wind 210 deg+Ice+Temp
29	Dead+Wind 225 deg+Ice+Temp
30	Dead+Wind 240 deg+Ice+Temp
31	Dead+Wind 270 deg+Ice+Temp
32	Dead+Wind 300 deg+Ice+Temp
33	Dead+Wind 315 deg+Ice+Temp
34	Dead+Wind 330 deg+Ice+Temp
35	Dead+Wind 0 deg - Service
36	Dead+Wind 30 deg - Service
37	Dead+Wind 45 deg - Service
38	Dead+Wind 60 deg - Service
39	Dead+Wind 90 deg - Service
40	Dead+Wind 120 deg - Service
41	Dead+Wind 135 deg - Service
42	Dead+Wind 150 deg - Service
43	Dead+Wind 180 deg - Service
44	Dead+Wind 210 deg - Service
45	Dead+Wind 225 deg - Service
46	Dead+Wind 240 deg - Service
47	Dead+Wind 270 deg - Service
48	Dead+Wind 300 deg - Service
49	Dead+Wind 315 deg - Service
50	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
T1	180 - 170	Leg	Max Tension	33	2.34	0.20	0.07
			Max. Compression	25	-3.17	-0.42	-0.33

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Mx	31	1.11	0.69	-0.19
			Max. My	23	1.01	-0.20	0.69
			Max. Vy	27	-0.82	0.42	-0.17
			Max. Vx	19	-0.82	-0.15	0.41
		Diagonal	Max Tension	23	2.95	-0.01	0.00
			Max. Compression	31	-3.40	0.00	0.00
			Max. Mx	19	-3.29	0.03	-0.00
			Max. My	28	-1.04	-0.00	-0.00
			Max. Vy	19	-0.01	0.03	0.00
			Max. Vx	27	0.00	0.00	0.00
		Secondary Horizontal	Max Tension	19	0.73	0.00	0.00
			Max. Compression	27	-0.75	0.04	0.00
			Max. Mx	19	-0.51	0.04	-0.00
			Max. My	28	0.62	-0.03	-0.00
			Max. Vy	19	-0.02	0.04	-0.00
			Max. Vx	12	-0.00	0.03	0.00
		Top Girt	Max Tension	31	0.28	0.00	0.00
			Max. Compression	2	-0.10	0.00	0.00
			Max. Mx	18	0.10	-0.02	0.00
			Max. My	28	0.00	0.00	0.00
			Max. Vy	18	0.01	0.00	0.00
			Max. Vx	28	-0.00	0.00	0.00
T2	170 - 163.573	Leg	Max Tension	25	9.73	-0.63	-0.59
			Max. Compression	33	-11.65	-0.80	-0.92
			Max. Mx	24	-10.92	-1.00	-0.66
			Max. My	34	-11.29	-0.64	-1.03
			Max. Vy	19	0.46	-0.88	0.10
			Max. Vx	20	-0.46	-0.53	0.86
		Diagonal	Max Tension	26	3.81	0.00	0.00
			Max. Compression	34	-4.46	0.00	0.00
			Max. Mx	33	3.32	0.02	0.00
			Max. My	34	-2.91	0.01	0.00
			Max. Vy	33	0.01	0.02	0.00
			Max. Vx	34	-0.00	0.00	0.00
		Top Girt	Max Tension	31	0.99	0.00	0.00
			Max. Compression	2	-0.42	0.00	0.00
			Max. Mx	18	0.32	-0.02	0.00
			Max. My	28	-0.04	0.00	0.00
			Max. Vy	18	0.01	0.00	0.00
			Max. Vx	28	-0.00	0.00	0.00
T3	163.573 - 159.049	Leg	Max Tension	33	18.46	-0.29	-0.30
			Max. Compression	21	-23.07	-0.82	-0.88
			Max. Mx	31	-16.52	1.42	-0.02
			Max. My	31	9.27	-0.12	-1.45
			Max. Vy	23	1.47	-0.58	0.22
			Max. Vx	31	1.51	0.23	-0.59
		Diagonal	Max Tension	31	5.02	0.00	0.00
			Max. Compression	31	-5.38	0.00	0.00
			Max. Mx	34	2.66	0.01	-0.00
			Max. My	23	-5.31	0.00	0.00
			Max. Vy	34	0.01	0.01	-0.00
			Max. Vx	23	-0.00	0.00	0.00
		Top Girt	Max Tension	31	0.78	0.00	0.00
			Max. Compression	14	-0.41	0.00	0.00
			Max. Mx	18	0.23	-0.02	0.00
			Max. My	28	-0.08	0.00	0.00
			Max. Vy	18	0.01	0.00	0.00
			Max. Vx	28	0.00	0.00	0.00
T4	159.049 -	Leg	Max Tension	33	26.81	-0.39	-0.37

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
	154.524						
			Max. Compression	33	-33.65	-0.49	-0.46
			Max. Mx	26	3.17	1.09	-0.78
			Max. My	32	3.21	-0.80	1.10
			Max. Vy	26	0.36	-1.02	0.81
			Max. Vx	24	-0.35	-0.75	1.05
		Diagonal	Max Tension	31	5.78	0.00	0.00
			Max. Compression	31	-5.47	0.00	0.00
			Max. Mx	34	2.46	0.03	-0.00
			Max. My	23	-5.41	-0.00	0.01
			Max. Vy	34	0.02	0.03	-0.00
			Max. Vx	23	-0.00	0.00	0.00
T5	154.524 - 150	Leg	Max Tension	33	35.65	-0.55	-0.63
			Max. Compression	33	-42.20	-0.85	-0.80
			Max. Mx	32	-40.89	-0.93	-0.66
			Max. My	26	-40.54	-0.66	-0.93
			Max. Vy	32	0.39	-0.93	-0.66
			Max. Vx	26	0.39	-0.66	-0.93
		Diagonal	Max Tension	31	5.42	0.00	0.00
			Max. Compression	31	-5.78	0.00	0.00
			Max. Mx	34	2.42	0.04	0.00
			Max. My	23	-5.12	-0.00	0.00
			Max. Vy	34	-0.02	0.04	0.00
			Max. Vx	23	-0.00	-0.00	0.00
T6	150 - 140	Leg	Max Tension	33	55.05	-0.60	-0.64
			Max. Compression	33	-63.01	-0.97	-0.94
			Max. Mx	26	7.59	1.34	-1.01
			Max. My	32	7.67	-1.00	1.34
			Max. Vy	31	-0.59	1.20	-0.00
			Max. Vx	27	0.60	-0.01	-1.25
		Diagonal	Max Tension	31	5.76	0.00	0.00
			Max. Compression	31	-5.84	0.00	0.00
			Max. Mx	34	3.01	0.05	0.00
			Max. My	23	-5.64	-0.01	0.01
			Max. Vy	34	-0.02	0.05	0.00
			Max. Vx	23	-0.00	0.00	0.00
		Top Girt	Max Tension	19	0.76	0.00	0.00
			Max. Compression	19	-0.49	0.00	0.00
			Max. Mx	18	0.14	-0.03	0.00
			Max. My	28	-0.18	0.00	0.00
			Max. Vy	18	0.02	0.00	0.00
			Max. Vx	28	-0.00	0.00	0.00
T7	140 - 130	Leg	Max Tension	33	69.67	-0.93	-0.99
			Max. Compression	25	-79.03	-0.31	-0.27
			Max. Mx	33	-4.30	4.01	-3.77
			Max. My	33	-5.63	-3.73	4.01
			Max. Vy	33	-1.02	4.01	-3.77
			Max. Vx	25	-1.02	-3.75	4.00
		Diagonal	Max Tension	27	8.75	0.03	0.02
			Max. Compression	27	-9.05	0.00	0.00
			Max. Mx	32	5.41	0.10	-0.02
			Max. My	26	-8.83	-0.05	0.04
			Max. Vy	32	0.03	0.10	-0.02
			Max. Vx	26	0.01	0.00	0.00
		Secondary Horizontal	Max Tension	25	1.19	0.00	0.00
			Max. Compression	25	-1.19	-0.03	-0.01
			Max. Mx	34	-0.47	0.05	0.03
			Max. My	34	-0.47	0.05	0.03
			Max. Vy	34	0.02	0.05	0.03
			Max. Vx	34	0.01	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
		Top Girt	Max Tension	24	0.54	0.00	0.00
			Max. Compression	23	-0.54	-0.09	0.00
			Max. Mx	19	-0.51	-0.12	0.00
			Max. My	19	-0.52	-0.12	0.01
			Max. Vy	19	-0.04	0.00	0.00
			Max. Vx	19	-0.00	0.00	0.00
		Inner Bracing	Max Tension	29	0.08	0.00	0.00
			Max. Compression	29	-0.08	0.00	0.00
			Max. Mx	18	0.00	-0.03	0.00
			Max. My	31	-0.00	0.00	0.00
			Max. Vy	18	0.02	0.00	0.00
			Max. Vx	31	-0.00	0.00	0.00
T8	130 - 120	Leg	Max Tension	25	89.99	-2.05	-2.05
			Max. Compression	33	-103.19	-1.04	-1.21
			Max. Mx	34	-97.35	2.60	2.00
			Max. My	24	-97.48	2.00	2.61
			Max. Vy	22	-1.42	2.47	-1.69
			Max. Vx	28	-1.46	-1.74	2.53
		Diagonal	Max Tension	26	10.58	0.06	0.01
			Max. Compression	28	-10.85	0.00	0.00
			Max. Mx	34	3.93	0.16	0.04
			Max. My	34	-8.05	-0.08	0.05
			Max. Vy	34	-0.04	0.16	0.04
			Max. Vx	34	-0.01	-0.08	0.05
		Secondary Horizontal	Max Tension	33	1.55	0.00	0.00
			Max. Compression	33	-1.55	0.01	-0.03
			Max. Mx	32	-0.06	0.05	0.00
			Max. My	26	1.47	-0.00	-0.03
			Max. Vy	32	0.02	0.05	0.00
			Max. Vx	26	-0.01	-0.00	-0.03
T9	120 - 110	Leg	Max Tension	33	114.10	-1.84	-1.87
			Max. Compression	33	-129.49	-0.22	-0.45
			Max. Mx	33	-7.52	4.88	-4.53
			Max. My	25	-7.36	-4.51	4.86
			Max. Vy	33	-1.19	4.88	-4.53
			Max. Vx	25	-1.19	-4.51	4.86
		Diagonal	Max Tension	27	11.48	0.00	0.00
			Max. Compression	27	-11.66	0.00	0.00
			Max. Mx	32	6.52	0.10	-0.01
			Max. My	19	-11.58	-0.01	0.05
			Max. Vy	32	0.03	0.10	-0.01
			Max. Vx	19	0.01	0.00	0.00
		Horizontal	Max Tension	26	0.83	0.00	0.00
			Max. Compression	27	-0.94	-0.20	0.01
			Max. Mx	19	-0.94	-0.20	0.01
			Max. My	19	-0.94	-0.20	0.01
			Max. Vy	19	-0.06	0.00	0.00
			Max. Vx	19	-0.00	0.00	0.00
		Secondary Horizontal	Max Tension	33	1.94	0.00	0.00
			Max. Compression	33	-1.94	-0.01	-0.01
			Max. Mx	20	-0.52	0.03	0.02
			Max. My	34	-0.49	0.03	0.02
			Max. Vy	20	-0.02	0.03	0.02
			Max. Vx	34	0.00	0.00	0.00
		Inner Bracing	Max Tension	25	0.09	0.00	0.00
			Max. Compression	25	-0.09	0.00	0.00
			Max. Mx	18	0.00	-0.05	0.00
			Max. My	31	-0.00	0.00	0.00
			Max. Vy	18	0.02	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vx	31	-0.00	0.00	0.00
T10	110 - 100	Leg	Max Tension	33	138.13	-2.39	-2.29
			Max. Compression	33	-156.42	-1.64	-1.70
			Max. Mx	30	-145.70	3.17	2.19
			Max. My	20	-146.49	2.17	3.21
			Max. Vy	25	1.18	-1.24	-1.08
			Max. Vx	32	1.19	-0.93	-1.36
		Diagonal	Max Tension	27	13.89	0.08	0.01
			Max. Compression	27	-14.24	0.00	0.00
			Max. Mx	34	4.57	0.20	0.03
			Max. My	19	-10.81	-0.03	0.04
			Max. Vy	34	-0.05	0.20	0.03
			Max. Vx	19	-0.01	-0.03	0.04
		Secondary Horizontal	Max Tension	33	2.35	0.00	0.00
			Max. Compression	33	-2.35	0.01	-0.02
			Max. Mx	34	-0.69	0.04	0.00
			Max. My	20	-2.23	0.01	-0.02
			Max. Vy	34	-0.02	0.04	0.00
			Max. Vx	26	-0.00	0.01	-0.02
T11	100 - 90	Leg	Max Tension	33	165.47	-2.15	-2.00
			Max. Compression	33	-187.25	-0.82	-1.23
			Max. Mx	34	33.93	6.56	-5.49
			Max. My	28	32.88	-5.38	6.49
			Max. Vy	34	-1.31	6.56	-5.49
			Max. Vx	28	-1.31	-5.38	6.49
		Diagonal	Max Tension	27	13.24	0.00	0.00
			Max. Compression	27	-13.43	0.00	0.00
			Max. Mx	32	7.37	0.14	0.00
			Max. My	19	-13.31	-0.02	0.05
			Max. Vy	32	0.04	0.14	0.00
			Max. Vx	19	-0.01	0.00	0.00
		Horizontal	Max Tension	19	1.55	0.00	0.00
			Max. Compression	19	-1.52	-0.29	0.01
			Max. Mx	19	-1.52	-0.29	0.01
			Max. My	20	-1.36	-0.28	0.01
			Max. Vy	19	-0.07	0.00	0.00
			Max. Vx	20	-0.00	0.00	0.00
		Inner Bracing	Max Tension	33	0.10	0.00	0.00
			Max. Compression	33	-0.10	0.00	0.00
			Max. Mx	18	0.00	-0.07	0.00
			Max. My	31	-0.00	0.00	0.00
			Max. Vy	18	0.03	0.00	0.00
			Max. Vx	31	-0.00	0.00	0.00
T12	90 - 80	Leg	Max Tension	33	192.05	-1.89	-1.98
			Max. Compression	33	-216.10	-1.01	-1.16
			Max. Mx	19	-145.17	3.37	-0.04
			Max. My	19	-142.28	-0.07	3.34
			Max. Vy	26	1.13	-2.06	-1.98
			Max. Vx	20	1.15	-1.96	-2.05
		Diagonal	Max Tension	27	14.56	0.08	0.01
			Max. Compression	27	-14.97	0.00	0.00
			Max. Mx	34	5.96	0.18	0.03
			Max. My	34	-11.85	-0.06	0.03
			Max. Vy	34	-0.05	0.18	0.03
			Max. Vx	34	-0.01	-0.06	0.03
		Secondary Horizontal	Max Tension	33	3.24	0.00	0.00
			Max. Compression	33	-3.24	0.03	-0.02
			Max. Mx	21	-0.20	0.07	-0.00
			Max. My	26	3.10	0.02	-0.02

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vy	21	-0.03	0.07	-0.00
			Max. Vx	26	-0.00	0.02	-0.02
T13	80 - 60	Leg	Max Tension	33	245.47	0.94	0.22
			Max. Compression	33	-274.69	7.00	0.05
			Max. Mx	33	-274.69	7.00	0.05
			Max. My	25	-13.34	-1.20	-6.27
			Max. Vy	25	-1.13	6.98	-0.51
			Max. Vx	26	1.16	-0.52	-6.19
		Diagonal	Max Tension	27	14.34	0.00	0.00
			Max. Compression	27	-15.00	0.00	0.00
			Max. Mx	34	6.11	-0.09	-0.01
			Max. My	19	-14.07	-0.03	-0.03
			Max. Vy	34	0.04	-0.09	-0.01
			Max. Vx	19	0.01	0.00	0.00
		Top Girt	Max Tension	34	1.13	0.00	0.00
			Max. Compression	32	-0.83	-0.34	0.01
			Max. Mx	19	-0.69	-0.48	0.02
			Max. My	19	-0.69	-0.48	0.02
			Max. Vy	19	-0.10	0.00	0.00
			Max. Vx	19	-0.00	0.00	0.00
		Inner Bracing	Max Tension	33	0.13	0.00	0.00
			Max. Compression	33	-0.13	0.00	0.00
			Max. Mx	18	0.00	0.14	0.00
			Max. My	31	0.00	0.00	-0.00
			Max. Vy	18	0.05	0.00	0.00
			Max. Vx	31	-0.00	0.00	0.00
T14	60 - 50	Leg	Max Tension	33	268.57	0.79	-0.40
			Max. Compression	33	-301.96	-0.61	0.74
			Max. Mx	25	265.02	-4.01	-0.07
			Max. My	25	-16.57	-2.23	-8.55
			Max. Vy	25	0.61	-4.01	-0.07
			Max. Vx	25	1.45	-2.23	-8.55
		Diagonal	Max Tension	26	14.42	0.00	0.00
			Max. Compression	28	-14.78	0.00	0.00
			Max. Mx	32	7.55	-0.08	-0.01
			Max. My	28	-14.74	-0.03	0.03
			Max. Vy	33	-0.04	-0.08	-0.01
			Max. Vx	19	0.00	0.00	0.00
		Horizontal	Max Tension	19	2.47	0.00	0.00
			Max. Compression	14	-1.14	0.33	-0.02
			Max. Mx	19	-0.55	0.65	-0.04
			Max. My	27	-0.54	0.65	-0.04
			Max. Vy	19	0.12	0.00	0.00
			Max. Vx	27	0.01	0.00	0.00
		Inner Bracing	Max Tension	33	0.15	0.00	0.00
			Max. Compression	33	-0.14	0.00	0.00
			Max. Mx	18	0.00	0.17	0.00
			Max. My	31	0.00	0.00	-0.00
			Max. Vy	18	-0.05	0.00	0.00
			Max. Vx	33	-0.00	0.00	0.00
T15	50 - 40	Leg	Max Tension	33	292.70	0.49	0.47
			Max. Compression	33	-327.83	1.84	-0.10
			Max. Mx	33	-327.32	6.64	0.00
			Max. My	34	60.91	0.85	4.88
			Max. Vy	33	-2.40	6.63	0.00
			Max. Vx	34	-1.23	0.85	4.88
		Diagonal	Max Tension	26	14.74	-0.14	-0.01
			Max. Compression	28	-16.53	0.00	0.00
			Max. Mx	25	10.09	-0.17	-0.02
			Max. My	34	4.45	-0.17	-0.03
			Max. Vy	25	0.07	-0.17	-0.02

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vx	34	0.00	0.00	0.00
		Secondary Horizontal	Max Tension	33	4.92	0.00	0.00
			Max. Compression	33	-4.92	0.07	0.00
			Max. Mx	24	0.83	0.10	0.02
			Max. My	32	-2.04	0.07	0.04
			Max. Vy	24	0.05	0.10	0.02
			Max. Vx	34	-0.01	0.00	0.00
T16	40 - 30	Leg	Max Tension	33	313.74	-3.31	-2.29
			Max. Compression	33	-353.69	2.23	1.37
			Max. Mx	20	-107.39	7.39	-5.29
			Max. My	26	-104.56	-5.38	7.44
			Max. Vy	20	-1.69	7.39	-5.29
			Max. Vx	26	-1.70	-5.38	7.44
		Diagonal	Max Tension	26	15.63	-0.15	0.00
			Max. Compression	28	-16.72	0.00	0.00
			Max. Mx	32	8.90	-0.16	0.00
			Max. My	34	-16.64	-0.05	-0.04
			Max. Vy	32	-0.07	-0.16	0.00
			Max. Vx	34	-0.01	0.00	0.00
		Secondary Horizontal	Max Tension	33	5.31	0.00	0.00
			Max. Compression	33	-5.31	0.02	0.00
			Max. Mx	25	-1.75	0.08	0.05
			Max. My	26	-1.43	0.07	0.05
			Max. Vy	25	0.04	0.08	0.05
			Max. Vx	33	-0.01	0.00	0.00
		Top Girt	Max Tension	26	3.06	0.00	0.00
			Max. Compression	15	-1.12	0.41	-0.02
			Max. Mx	19	0.02	0.73	-0.04
			Max. My	19	0.02	0.73	-0.04
			Max. Vy	19	0.13	0.00	0.00
			Max. Vx	19	0.01	0.00	0.00
		Inner Bracing	Max Tension	33	0.19	0.00	0.00
			Max. Compression	33	-0.18	0.00	0.00
			Max. Mx	18	0.00	0.21	0.00
			Max. My	31	0.00	0.00	-0.00
			Max. Vy	18	-0.06	0.00	0.00
			Max. Vx	33	-0.00	0.00	0.00
T17	30 - 20	Leg	Max Tension	33	337.59	-2.84	-3.33
			Max. Compression	33	-381.76	0.51	0.56
			Max. Mx	26	-366.12	6.23	3.76
			Max. My	20	-363.05	3.66	6.25
			Max. Vy	26	2.05	-3.55	-3.26
			Max. Vx	20	2.04	-3.23	-3.53
		Diagonal	Max Tension	26	15.38	-0.18	-0.01
			Max. Compression	34	-15.64	0.00	0.00
			Max. Mx	25	11.75	-0.21	-0.03
			Max. My	34	5.76	-0.20	-0.03
			Max. Vy	25	0.07	-0.21	-0.03
			Max. Vx	34	0.01	0.00	0.00
		Secondary Horizontal	Max Tension	33	5.73	0.00	0.00
			Max. Compression	33	-5.73	0.09	-0.01
			Max. Mx	25	1.98	0.11	0.02
			Max. My	34	-2.57	0.09	0.04
			Max. Vy	25	0.05	0.11	0.02
			Max. Vx	34	-0.01	0.00	0.00
T18	20 - 10	Leg	Max Tension	33	359.20	-4.14	-3.09
			Max. Compression	33	-400.59	1.02	0.67
			Max. Mx	34	346.30	-4.41	-2.63

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. My	28	340.06	-2.59	-4.38
			Max. Vy	34	-1.52	2.73	2.72
			Max. Vx	28	-1.50	2.68	2.70
		Diagonal	Max Tension	26	15.51	-0.17	-0.01
			Max. Compression	34	-21.14	0.00	0.00
			Max. Mx	33	5.62	-0.18	0.03
			Max. My	26	-17.46	-0.09	0.04
			Max. Vy	33	-0.07	-0.18	-0.01
			Max. Vx	26	0.01	0.00	0.00
		Horizontal	Max Tension	27	6.02	0.00	0.00
			Max. Compression	14	-0.98	0.54	-0.03
			Max. Mx	19	1.02	0.79	-0.05
			Max. My	19	1.02	0.79	-0.05
			Max. Vy	19	-0.13	0.00	0.00
			Max. Vx	19	-0.01	0.00	0.00
		Secondary Horizontal	Max Tension	33	6.01	0.00	0.00
			Max. Compression	33	-6.01	0.07	0.02
			Max. Mx	28	-0.15	0.09	0.03
			Max. My	34	-2.66	0.07	0.04
			Max. Vy	28	0.05	0.09	0.03
			Max. Vx	34	-0.01	0.00	0.00
		Inner Bracing	Max Tension	32	0.07	0.00	0.00
			Max. Compression	34	-0.05	0.00	0.00
			Max. Mx	18	0.00	0.29	0.00
			Max. My	33	0.05	0.00	0.00
			Max. Vy	18	-0.07	0.00	0.00
			Max. Vx	33	-0.00	0.00	0.00
T19	10 - 0	Leg	Max Tension	33	356.07	-2.46	-2.59
			Max. Compression	33	-416.05	0.00	-0.00
			Max. Mx	20	-396.39	-4.25	-3.15
			Max. My	26	-399.68	-3.17	-4.28
			Max. Vy	34	1.56	-3.92	-3.60
			Max. Vx	28	1.53	-3.56	-3.84
		Diagonal	Max Tension	26	27.96	-0.05	0.01
			Max. Compression	34	-22.26	0.00	0.00
			Max. Mx	4	15.23	-0.07	0.04
			Max. My	34	-22.19	0.02	-0.12
			Max. Vy	33	0.04	-0.07	0.01
			Max. Vx	34	-0.02	0.00	0.00
		Horizontal	Max Tension	34	17.42	-0.11	-0.02
			Max. Compression	26	-17.22	-0.06	0.02
			Max. Mx	31	7.48	-0.14	-0.03
			Max. My	27	-4.75	-0.04	0.03
			Max. Vy	31	-0.07	-0.14	-0.03
			Max. Vx	27	-0.01	-0.04	0.03
		Redund Horz 1 Bracing	Max Tension	33	6.24	0.00	0.00
			Max. Compression	33	-6.24	0.00	0.00
			Max. Mx	28	5.96	-0.01	0.00
			Max. My	34	-1.39	0.00	0.00
			Max. Vy	28	0.01	0.00	0.00
			Max. Vx	34	0.00	0.00	0.00
		Redund Diag 1 Bracing	Max Tension	26	10.62	0.00	0.00
			Max. Compression	17	-6.05	0.00	0.00
			Max. Mx	34	4.59	-0.02	0.00
			Max. My	26	10.62	0.00	0.00
			Max. Vy	34	0.01	0.00	0.00
			Max. Vx	26	-0.00	0.00	0.00
		Redund Hip 1	Max Tension	19	0.02	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
		Bracing					
			Max. Compression	8	-0.03	0.00	0.00
			Max. Mx	18	0.01	-0.02	0.00
			Max. Vy	18	0.02	0.00	0.00
		Redund Sub Horz Bracing	Max Tension	19	12.94	0.00	0.00
			Max. Compression	14	-7.08	0.00	0.00
			Max. Mx	18	4.38	-0.09	0.00
			Max. My	18	4.38	0.00	0.00
			Max. Vy	18	0.04	0.00	0.00
			Max. Vx	18	0.00	0.00	0.00
		Inner Bracing	Max Tension	33	0.16	0.00	0.00
			Max. Compression	33	-0.19	0.00	0.00
			Max. Mx	18	-0.00	0.32	0.00
			Max. My	31	0.00	0.00	-0.00
			Max. Vy	18	-0.07	0.00	0.00
			Max. Vx	31	0.00	0.00	0.00

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Leg D	Max. Vert	29	436.74	26.03	-28.17
	Max. H_x	30	422.85	27.03	-25.28
	Max. H_z	20	-370.17	-25.57	31.40
	Min. Vert	21	-384.24	-28.48	30.46
	Min. H_x	22	-370.24	-29.49	27.47
	Min. H_z	28	422.76	23.22	-29.08
Leg C	Max. Vert	25	440.39	-28.49	-26.18
	Max. H_x	32	-376.66	31.35	26.26
	Max. H_z	34	-376.58	28.56	29.02
	Min. Vert	33	-390.84	30.99	28.59
	Min. H_x	24	426.32	-28.83	-23.92
	Min. H_z	26	426.23	-26.17	-26.60
Leg B	Max. Vert	21	436.69	-28.15	26.04
	Max. H_x	30	-370.28	30.82	-26.15
	Max. H_z	20	422.71	-25.88	26.43
	Min. Vert	29	-384.29	30.49	-28.45
	Min. H_x	22	422.80	-28.48	23.82
	Min. H_z	28	-370.22	28.11	-28.85
Leg A	Max. Vert	33	443.27	26.25	28.58
	Max. H_x	32	429.19	27.20	25.72
	Max. H_z	34	429.12	23.46	29.45
	Min. Vert	25	-387.95	-28.54	-30.89
	Min. H_x	24	-373.78	-29.51	-27.92
	Min. H_z	26	-373.71	-25.66	-31.78

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

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	74.34	0.00	0.00	-21.74	9.98	0.00
Dead+Wind 0 deg - No Ice	74.34	-0.42	-68.78	-7405.43	77.74	-49.13
Dead+Wind 30 deg - No Ice	74.34	38.28	-66.70	-7023.88	-3996.97	-56.84
Dead+Wind 45 deg - No Ice	74.34	54.36	-54.33	-5718.76	-5691.81	-50.04
Dead+Wind 60 deg - No Ice	74.34	66.74	-38.26	-4025.42	-6998.07	-39.84
Dead+Wind 90 deg - No Ice	74.34	68.82	0.43	45.85	-7380.66	-13.62
Dead+Wind 120 deg - No Ice	74.34	67.16	39.00	4098.99	-7065.80	18.80
Dead+Wind 135 deg - No Ice	74.34	54.96	54.93	5770.84	-5787.59	32.87
Dead+Wind 150 deg - No Ice	74.34	39.02	67.12	7047.95	-4114.26	44.70
Dead+Wind 180 deg - No Ice	74.34	0.43	68.78	7361.82	-57.64	49.13
Dead+Wind 210 deg - No Ice	74.34	-38.28	66.70	6980.17	4017.13	56.85
Dead+Wind 225 deg - No Ice	74.34	-54.36	54.33	5675.04	5711.92	50.05
Dead+Wind 240 deg - No Ice	74.34	-66.74	38.26	3981.66	7018.15	39.83
Dead+Wind 270 deg - No Ice	74.34	-68.82	-0.43	-89.54	7400.64	13.62
Dead+Wind 300 deg - No Ice	74.34	-67.16	-39.00	-4142.59	7085.78	-18.79
Dead+Wind 315 deg - No Ice	74.34	-54.96	-54.93	-5814.42	5807.60	-32.87
Dead+Wind 330 deg - No Ice	74.34	-39.02	-67.12	-7091.49	4134.33	-44.70
Dead+Ice+Temp	106.20	-0.00	0.00	-25.06	25.95	0.00
Dead+Wind 0 deg+Ice+Temp	106.20	-0.40	-87.15	-9407.48	90.32	-92.32
Dead+Wind 30 deg+Ice+Temp	106.20	48.76	-84.81	-8959.21	-5098.54	-92.35
Dead+Wind 45 deg+Ice+Temp	106.20	69.16	-69.13	-7300.62	-7254.54	-73.30
Dead+Wind 60 deg+Ice+Temp	106.20	84.85	-48.73	-5146.19	-8914.37	-49.26
Dead+Wind 90 deg+Ice+Temp	106.20	87.20	0.40	39.09	-9363.78	2.23
Dead+Wind 120 deg+Ice+Temp	106.20	85.25	49.42	5207.20	-8978.56	61.46
Dead+Wind 135 deg+Ice+Temp	106.20	69.72	69.69	7341.22	-7345.31	83.26
Dead+Wind 150 deg+Ice+Temp	106.20	49.45	85.21	8973.22	-5209.72	99.39
Dead+Wind 180 deg+Ice+Temp	106.20	0.40	87.15	9357.29	-38.07	92.32
Dead+Wind 210 deg+Ice+Temp	106.20	-48.76	84.81	8908.81	5150.81	92.36
Dead+Wind 225 deg+Ice+Temp	106.20	-69.16	69.13	7250.18	7306.68	73.31
Dead+Wind 240 deg+Ice+Temp	106.20	-84.85	48.73	5095.78	8966.40	49.26
Dead+Wind 270 deg+Ice+Temp	106.20	-87.20	-0.40	-89.32	9415.68	-2.22
Dead+Wind 300 deg+Ice+Temp	106.20	-85.25	-49.42	-5257.19	9030.58	-61.44
Dead+Wind 315 deg+Ice+Temp	106.20	-69.72	-69.69	-7391.17	7397.45	-83.25
Dead+Wind 330 deg+Ice+Temp	106.20	-49.45	-85.21	-9023.20	5261.99	-99.39
Dead+Wind 0 deg - Service	74.34	-0.42	-68.78	-7405.43	77.74	-49.13
Dead+Wind 30 deg - Service	74.34	38.28	-66.70	-7023.88	-3996.97	-56.84
Dead+Wind 45 deg - Service	74.34	54.36	-54.33	-5718.76	-5691.81	-50.04
Dead+Wind 60 deg - Service	74.34	66.74	-38.26	-4025.42	-6998.07	-39.84
Dead+Wind 90 deg - Service	74.34	68.82	0.43	45.85	-7380.66	-13.62
Dead+Wind 120 deg - Service	74.34	67.16	39.00	4098.99	-7065.80	18.80
Dead+Wind 135 deg - Service	74.34	54.96	54.93	5770.84	-5787.59	32.87
Dead+Wind 150 deg - Service	74.34	39.02	67.12	7047.95	-4114.26	44.70
Dead+Wind 180 deg - Service	74.34	0.43	68.78	7361.82	-57.64	49.13
Dead+Wind 210 deg - Service	74.34	-38.28	66.70	6980.17	4017.13	56.85
Dead+Wind 225 deg - Service	74.34	-54.36	54.33	5675.04	5711.92	50.05
Dead+Wind 240 deg - Service	74.34	-66.74	38.26	3981.66	7018.15	39.83
Dead+Wind 270 deg - Service	74.34	-68.82	-0.43	-89.54	7400.64	13.62
Dead+Wind 300 deg - Service	74.34	-67.16	-39.00	-4142.59	7085.78	-18.79
Dead+Wind 315 deg - Service	74.34	-54.96	-54.93	-5814.42	5807.60	-32.87
Dead+Wind 330 deg - Service	74.34	-39.02	-67.12	-7091.49	4134.33	-44.70

Solution Summary

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
1	0.00	-74.34	0.00	-0.00	74.34	-0.00	0.000%
2	-0.43	-74.34	-68.78	0.42	74.34	68.78	0.001%

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
3	38.28	-74.34	-66.70	-38.28	74.34	66.70	0.000%
4	54.36	-74.34	-54.33	-54.36	74.34	54.33	0.001%
5	66.74	-74.34	-38.26	-66.74	74.34	38.26	0.000%
6	68.82	-74.34	0.43	-68.82	74.34	-0.43	0.000%
7	67.16	-74.34	39.00	-67.16	74.34	-39.00	0.000%
8	54.96	-74.34	54.93	-54.96	74.34	-54.93	0.000%
9	39.02	-74.34	67.12	-39.02	74.34	-67.12	0.000%
10	0.43	-74.34	68.78	-0.43	74.34	-68.78	0.000%
11	-38.28	-74.34	66.70	38.28	74.34	-66.70	0.000%
12	-54.36	-74.34	54.33	54.36	74.34	-54.33	0.001%
13	-66.74	-74.34	38.26	66.74	74.34	-38.26	0.000%
14	-68.82	-74.34	-0.43	68.82	74.34	0.43	0.000%
15	-67.16	-74.34	-39.00	67.16	74.34	39.00	0.000%
16	-54.96	-74.34	-54.93	54.96	74.34	54.93	0.000%
17	-39.02	-74.34	-67.12	39.02	74.34	67.12	0.000%
18	0.00	-106.20	0.00	0.00	106.20	-0.00	0.000%
19	-0.40	-106.20	-87.15	0.40	106.20	87.15	0.000%
20	48.75	-106.20	-84.81	-48.76	106.20	84.81	0.000%
21	69.16	-106.20	-69.12	-69.16	106.20	69.13	0.001%
22	84.85	-106.20	-48.73	-84.85	106.20	48.73	0.000%
23	87.20	-106.20	0.40	-87.20	106.20	-0.40	0.000%
24	85.25	-106.20	49.42	-85.25	106.20	-49.42	0.000%
25	69.72	-106.20	69.69	-69.72	106.20	-69.69	0.001%
26	49.45	-106.20	85.21	-49.45	106.20	-85.21	0.000%
27	0.40	-106.20	87.15	-0.40	106.20	-87.15	0.000%
28	-48.75	-106.20	84.81	48.76	106.20	-84.81	0.000%
29	-69.16	-106.20	69.12	69.16	106.20	-69.13	0.001%
30	-84.85	-106.20	48.73	84.85	106.20	-48.73	0.000%
31	-87.20	-106.20	-0.40	87.20	106.20	0.40	0.000%
32	-85.25	-106.20	-49.42	85.25	106.20	49.42	0.000%
33	-69.72	-106.20	-69.69	69.72	106.20	69.69	0.001%
34	-49.45	-106.20	-85.21	49.45	106.20	85.21	0.000%
35	-0.43	-74.34	-68.78	0.42	74.34	68.78	0.001%
36	38.28	-74.34	-66.70	-38.28	74.34	66.70	0.000%
37	54.36	-74.34	-54.33	-54.36	74.34	54.33	0.001%
38	66.74	-74.34	-38.26	-66.74	74.34	38.26	0.000%
39	68.82	-74.34	0.43	-68.82	74.34	-0.43	0.000%
40	67.16	-74.34	39.00	-67.16	74.34	-39.00	0.000%
41	54.96	-74.34	54.93	-54.96	74.34	-54.93	0.000%
42	39.02	-74.34	67.12	-39.02	74.34	-67.12	0.000%
43	0.43	-74.34	68.78	-0.43	74.34	-68.78	0.000%
44	-38.28	-74.34	66.70	38.28	74.34	-66.70	0.000%
45	-54.36	-74.34	54.33	54.36	74.34	-54.33	0.001%
46	-66.74	-74.34	38.26	66.74	74.34	-38.26	0.000%
47	-68.82	-74.34	-0.43	68.82	74.34	0.43	0.000%
48	-67.16	-74.34	-39.00	67.16	74.34	39.00	0.000%
49	-54.96	-74.34	-54.93	54.96	74.34	54.93	0.000%
50	-39.02	-74.34	-67.12	39.02	74.34	67.12	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00074384
2	Yes	6	0.00060180	0.00023559
3	Yes	5	0.00076695	0.00032069

4	Yes	4	0.00099900	0.00049184
5	Yes	5	0.00076966	0.00025899
6	Yes	6	0.00062998	0.00018352
7	Yes	5	0.00079021	0.00026350
8	Yes	5	0.00050451	0.00023713
9	Yes	5	0.00076802	0.00032089
10	Yes	6	0.00058989	0.00023233
11	Yes	5	0.00075369	0.00031718
12	Yes	4	0.00099794	0.00049017
13	Yes	5	0.00078110	0.00026081
14	Yes	6	0.00063779	0.00018504
15	Yes	5	0.00079513	0.00026465
16	Yes	5	0.00051142	0.00023935
17	Yes	5	0.00078105	0.00032411
18	Yes	5	0.00000001	0.00052591
19	Yes	8	0.00075344	0.00029710
20	Yes	6	0.00098683	0.00041980
21	Yes	6	0.00087990	0.00037127
22	Yes	9	0.00081531	0.00024707
23	Yes	11	0.00082217	0.00023243
24	Yes	9	0.00084641	0.00025469
25	Yes	6	0.00090864	0.00037906
26	Yes	6	0.00098769	0.00042045
27	Yes	7	0.00098590	0.00038196
28	Yes	6	0.00096978	0.00041471
29	Yes	6	0.00089744	0.00037477
30	Yes	9	0.00084873	0.00025499
31	Yes	11	0.00085670	0.00024032
32	Yes	9	0.00087185	0.00026057
33	Yes	6	0.00092572	0.00038382
34	Yes	7	0.00073022	0.00030123
35	Yes	6	0.00060180	0.00023559
36	Yes	5	0.00076695	0.00032069
37	Yes	4	0.00099900	0.00049184
38	Yes	5	0.00076966	0.00025899
39	Yes	6	0.00062998	0.00018352
40	Yes	5	0.00079021	0.00026350
41	Yes	5	0.00050451	0.00023713
42	Yes	5	0.00076802	0.00032089
43	Yes	6	0.00058989	0.00023233
44	Yes	5	0.00075369	0.00031718
45	Yes	4	0.00099794	0.00049017
46	Yes	5	0.00078110	0.00026081
47	Yes	6	0.00063779	0.00018504
48	Yes	5	0.00079513	0.00026465
49	Yes	5	0.00051142	0.00023935
50	Yes	5	0.00078105	0.00032411

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	180 - 170	10.427	49	0.4729	0.0310
T2	170 - 163.573	9.328	49	0.4691	0.0306
T3	163.573 - 159.049	8.625	49	0.4607	0.0298
T4	159.049 - 154.524	8.132	49	0.4528	0.0282
T5	154.524 - 150	7.651	49	0.4398	0.0268
T6	150 - 140	7.188	49	0.4235	0.0261
T7	140 - 130	6.229	49	0.3826	0.0258

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T8	130 - 120	5.362	49	0.3493	0.0266
T9	120 - 110	4.579	49	0.3119	0.0264
T10	110 - 100	3.870	49	0.2802	0.0236
T11	100 - 90	3.233	49	0.2462	0.0215
T12	90 - 80	2.667	49	0.2165	0.0195
T13	80 - 60	2.163	49	0.1857	0.0171
T14	60 - 50	1.308	49	0.1508	0.0116
T15	50 - 40	0.939	49	0.1331	0.0088
T16	40 - 30	0.636	49	0.1145	0.0073
T17	30 - 20	0.385	49	0.0862	0.0057
T18	20 - 10	0.194	49	0.0576	0.0042
T19	10 - 0	0.065	41	0.0284	0.0026

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
185.00	Lightning Rod 2"x15'	49	10.427	0.4729	0.0310	160712
183.00	SC479-HF1LDF (D00-E5764)	49	10.427	0.4729	0.0310	160712
181.00	TMA 432-83H-01T - Future Decom.	49	10.427	0.4729	0.0310	160712
180.00	SC479-HF1LDF (D00I-E5764)	49	10.427	0.4729	0.0310	160712
175.00	6' PAD w/ Radome	49	9.876	0.4721	0.0308	160712
174.00	SC479-HF1LDF (D00I-E5764)	49	9.766	0.4718	0.0308	134573
173.00	6' PAD w/ Radome	49	9.657	0.4713	0.0307	118701
170.00	6' PAD w/ Radome	49	9.328	0.4691	0.0306	125556
169.00	BA1010-2	49	9.218	0.4681	0.0306	166133
168.00	SC479-HF1LDF (D00I-E5764)	49	9.109	0.4669	0.0305	301992
163.00	T-Frame	49	8.563	0.4598	0.0296	87150
161.00	DB408-B	49	8.344	0.4567	0.0289	30724
152.00	12' Omni Antenna	49	7.391	0.4311	0.0264	14049
146.25	12' Omni Antenna	49	6.817	0.4081	0.0258	12877
140.50	12' Omni Antenna	49	6.274	0.3845	0.0258	12740
139.00	Yagi ASP-816	49	6.138	0.3790	0.0259	12855
137.00	BA1010	49	5.959	0.3722	0.0260	13138
136.50	DB222-A	49	5.915	0.3706	0.0260	13226
134.50	BA1010	49	5.741	0.3641	0.0261	13616
132.00	BA1010	49	5.528	0.3561	0.0264	14129
130.00	Dish Ice Shield	49	5.362	0.3493	0.0266	14524
129.50	BA1010	49	5.321	0.3475	0.0266	14616
128.00	PD128-1	49	5.199	0.3421	0.0267	14877
127.00	3" Dia 20' Omni	49	5.119	0.3383	0.0268	15041
125.00	6' PAD w/ Radome	49	4.961	0.3306	0.0268	15360
124.50	PD128-1	49	4.922	0.3287	0.0268	15441
122.00	3" Dia 20' Omni	49	4.729	0.3192	0.0266	15838
121.00	PD128-1	49	4.654	0.3155	0.0265	15983
117.00	3" Dia 20' Omni	49	4.358	0.3020	0.0257	16403
116.00	12' Omni Antenna	49	4.287	0.2988	0.0254	16477
112.00	3" Dia 20' Omni	49	4.006	0.2865	0.0242	16736
111.00	12' Omni Antenna	49	3.938	0.2834	0.0239	16777
107.00	3" Dia 20' Omni	49	3.672	0.2700	0.0228	16748
106.00	4' Grid Dish	49	3.607	0.2666	0.0226	16705
105.00	12' Wireless Frame	49	3.543	0.2631	0.0224	16658
101.00	DB264-A	49	3.294	0.2494	0.0217	16615
96.00	DB264-A	49	2.999	0.2341	0.0207	17681
91.00	SC479-HF1LDF	49	2.721	0.2195	0.0197	19393
86.00	DB264-A	49	2.459	0.2038	0.0186	20164

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
85.00	SC479-HF1LDF	49	2.408	0.2006	0.0183	20216
79.00	SC479-HF1LDF	49	2.116	0.1831	0.0168	21347
75.00	Dish Ice Shield	49	1.933	0.1743	0.0158	24027
71.00	2'6"x4" Pipe Mount	49	1.758	0.1672	0.0147	27910
61.00	GPS	49	1.348	0.1524	0.0119	41413
50.00	DB803M-Y	49	0.939	0.1331	0.0088	15743

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	180 - 170	13.189	33	0.5948	0.0453
T2	170 - 163.573	11.807	33	0.5899	0.0433
T3	163.573 - 159.049	10.925	33	0.5795	0.0414
T4	159.049 - 154.524	10.305	33	0.5699	0.0405
T5	154.524 - 150	9.701	33	0.5540	0.0399
T6	150 - 140	9.117	33	0.5339	0.0394
T7	140 - 130	7.907	33	0.4835	0.0395
T8	130 - 120	6.811	33	0.4420	0.0401
T9	120 - 110	5.819	33	0.3952	0.0394
T10	110 - 100	4.921	33	0.3552	0.0357
T11	100 - 90	4.113	33	0.3124	0.0329
T12	90 - 80	3.395	33	0.2750	0.0302
T13	80 - 60	2.754	33	0.2361	0.0267
T14	60 - 50	1.666	33	0.1918	0.0186
T15	50 - 40	1.195	33	0.1695	0.0145
T16	40 - 30	0.810	33	0.1458	0.0122
T17	30 - 20	0.490	33	0.1098	0.0098
T18	20 - 10	0.246	33	0.0733	0.0072
T19	10 - 0	0.082	25	0.0362	0.0046

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
185.00	Lightning Rod 2"x15'	33	13.189	0.5948	0.0453	117813
183.00	SC479-HF1LDF (D00-E5764)	33	13.189	0.5948	0.0453	117813
181.00	TMA 432-83H-01T - Future Decom.	33	13.189	0.5948	0.0453	117813
180.00	SC479-HF1LDF (D00I-E5764)	33	13.189	0.5948	0.0453	117813
175.00	6' PAD w/ Radome	33	12.497	0.5937	0.0444	117813
174.00	SC479-HF1LDF (D00I-E5764)	33	12.359	0.5932	0.0442	98638
173.00	6' PAD w/ Radome	33	12.221	0.5926	0.0440	86936
170.00	6' PAD w/ Radome	33	11.807	0.5899	0.0433	90654
169.00	BA1010-2	33	11.670	0.5886	0.0430	117707
168.00	SC479-HF1LDF (D00I-E5764)	33	11.533	0.5872	0.0427	205500
163.00	T-Frame	33	10.846	0.5784	0.0413	75827
161.00	DB408-B	33	10.571	0.5746	0.0408	25424
152.00	12' Omni Antenna	33	9.373	0.5432	0.0396	11497
146.25	12' Omni Antenna	33	8.650	0.5149	0.0393	10492
140.50	12' Omni Antenna	33	7.965	0.4858	0.0395	10411

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
139.00	Yagi ASP-816	33	7.793	0.4790	0.0396	10492
137.00	BA1010	33	7.567	0.4705	0.0397	10686
136.50	DB222-A	33	7.511	0.4685	0.0397	10746
134.50	BA1010	33	7.291	0.4605	0.0399	11008
132.00	BA1010	33	7.022	0.4505	0.0400	11350
130.00	Dish Ice Shield	33	6.811	0.4420	0.0401	11613
129.50	BA1010	33	6.759	0.4398	0.0401	11675
128.00	PD128-1	33	6.605	0.4330	0.0402	11850
127.00	3" Dia 20' Omni	33	6.503	0.4283	0.0402	11961
125.00	6' PAD w/ Radome	33	6.303	0.4186	0.0401	12179
124.50	PD128-1	33	6.253	0.4162	0.0401	12234
122.00	3" Dia 20' Omni	33	6.009	0.4043	0.0398	12508
121.00	PD128-1	33	5.914	0.3997	0.0397	12614
117.00	3" Dia 20' Omni	33	5.540	0.3827	0.0385	12985
116.00	12' Omni Antenna	33	5.449	0.3787	0.0381	13068
112.00	3" Dia 20' Omni	33	5.093	0.3632	0.0365	13375
111.00	12' Omni Antenna	33	5.007	0.3593	0.0361	13425
107.00	3" Dia 20' Omni	33	4.669	0.3425	0.0347	13383
106.00	4' Grid Dish	33	4.587	0.3381	0.0344	13330
105.00	12' Wireless Frame	33	4.506	0.3337	0.0342	13272
101.00	DB264-A	33	4.190	0.3165	0.0332	13166
96.00	DB264-A	33	3.816	0.2972	0.0319	13999
91.00	SC479-HF1LDF	33	3.463	0.2788	0.0305	15384
86.00	DB264-A	33	3.129	0.2589	0.0289	15993
85.00	SC479-HF1LDF	33	3.065	0.2549	0.0285	16030
79.00	SC479-HF1LDF	33	2.694	0.2328	0.0263	16913
75.00	Dish Ice Shield	33	2.461	0.2216	0.0248	19050
71.00	2'6"x4" Pipe Mount	33	2.239	0.2127	0.0232	22156
61.00	GPS	33	1.716	0.1938	0.0190	32980
50.00	DB803M-Y	33	1.195	0.1695	0.0145	12350

(REFERENCE) STRUCTURAL ANALYSIS REPORT – ANTENNA MOUNT ANALYSIS OF EXISTING T-MOBILE MOUNT (SITEPRO1 # EUSF10-U) WITH PROPOSED RFDS

CENTEK engineering

Centered on Solutions℠

Structural Analysis Report

Antenna Mount Analysis

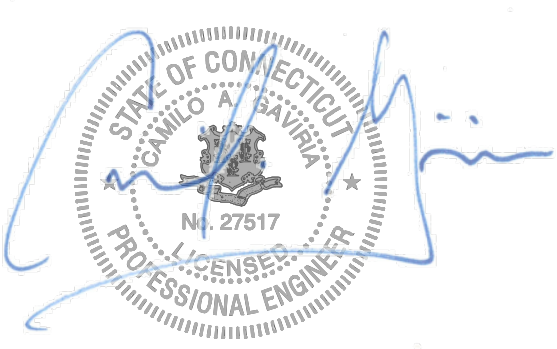
T-Mobile Site #: CT11040D

46 Fenwood Lane
Wilton, CT

Centek Project No. 19027.02

Date: April 29, 2019

Max Stress Ratio = 76.2%



Prepared for:

T-Mobile USA
35 Griffin Road
Bloomfield, CT 06002

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CENTEK engineering

Centered on Solutions℠

April 29, 2019

Mr. Dan Reid
Transcend Wireless
10 Industrial Ave
Mahwah, NJ 07430

Re: Structural Letter ~ Antenna Mount
T-Mobile – Site Ref: CT11040D
46 Fenwood Lane
Wilton, CT 06897

Centek Project No. 19027.02

Dear Mr. Reid,

Centek Engineering, Inc. has reviewed the T-Mobile antenna installation at the above referenced site. The purpose of the review is to determine the structural adequacy of the existing mount, consisting three (3) T frame sector mounts with stiff arms to support the proposed/existing equipment configuration. The review considered the effects of wind load, dead load and ice load in accordance with the 2015 International Building Code as modified by the 2018 Connecticut State Building Code (CTBC) including ASCE 7-10 and ANSI/TIA-222-G *Structural Standards for Steel Antenna Towers and Supporting Structures*.

The loads considered in this analysis consist of the following:

- **T-Mobile:**
  T-Arms: Three (3) RFS APXVAARR24_43-U-NA20 panel antennas, three (3) Ericsson KRD901146-1_B66A_B2A panel antennas, three (3) KRY112 TMAs and three (3) Ericsson 4449 B71_B12 remote radio units mounted on three (3) T-Arms with a RAD center elevation of 122-ft +/- AGL.

The antenna mount was analyzed per the requirements of the 2015 International Building Code as modified by the 2018 Connecticut State Building Code considering a nominal design wind speed of 93 mph for Wilton as required in Appendix N of the 2018 Connecticut State Building Code.

A structural analysis of tower and foundation needs to be completed prior to any work.

Based on our review of the installation, it is our opinion that the **subject antenna mount has sufficient capacity** to support the aforementioned antenna configuration. If there are any questions regarding this matter, please feel free to call.

Respectfully Submitted by:

Camilo A. Gaviria, PE
Structural Engineer

STATE OF CONNECTICUT
CAMILO A. GAVIRIA
No. 27517
LICENSED
PROFESSIONAL ENGINEER

Prepared by:

Fernando J. Palacios
Engineer

Section 2 - Calculations

CENTEK engineering
Centered on Solutions℠ www.centekeng.com
63-2 North Branford Road P: (203) 488-0580
Branford, CT 06405 F: (203) 488-8587

Subject: Loads on Equipment

Location: Wilton, CT

Rev. 0: 04/23/19

Prepared by: F.J.P Checked by: C.A.G.
Job No. 19027.02

Development of Design Heights, Exposure Coefficients, and Velocity Pressures Per TIA-222-G

Wind Speeds

Basic Wind Speed	$V := 93$	mph	(User Input - 2018 CSBC Appendix N)
Basic Wind Speed with Ice	$V_i := 50$	mph	(User Input per Annex B of TIA-222-G)

Input

Structure Type =	Structure_Type := Lattice		(User Input)
Structure Category =	SC := II		(User Input)
Exposure Category =	Exp := C		(User Input)
Structure Height =	$h := 180$	ft	(User Input)
Height to Center of Antennas =	$z := 122$	ft	(User Input)
Radial Ice Thickness =	$t_i := 0.75$	in	(User Input per Annex B of TIA-222-G)
Radial Ice Density =	$Id := 56.00$	pcf	(User Input)
Topograpic Factor =	$K_{zt} := 1.0$		(User Input)
	$K_a := 1.0$		(User Input)
Gust Response Factor =	$G_H = 1.12$		(User Input)

Output

Wind Direction Probability Factor =

$$K_d := \begin{cases} 0.95 & \text{if Structure\_Type} = \text{Pole} \\ 0.85 & \text{if Structure\_Type} = \text{Lattice} \end{cases} = 0.85$$

(Per Table 2-2 of TIA-222-G)

(Per Table 2-3 of TIA-222-G)

Importance Factors =

$$I_{Wind} := \begin{cases} 0.87 & \text{if } SC = 1 \\ 1.00 & \text{if } SC = 2 \\ 1.15 & \text{if } SC = 3 \end{cases} = 1$$

$$I_{Wind\_w\_Ice} := \begin{cases} 0 & \text{if } SC = 1 \\ 1.00 & \text{if } SC = 2 \\ 1.00 & \text{if } SC = 3 \end{cases} = 1$$

$$I_{ice} := \begin{cases} 0 & \text{if } SC = 1 \\ 1.00 & \text{if } SC = 2 \\ 1.25 & \text{if } SC = 3 \end{cases} = 1$$

$$K_{iz} := \left(\frac{z}{33}\right)^{0.1} = 1.14$$

Velocity Pressure Coefficient Antennas =

$$t_{iz} := 2.0 \cdot t_i \cdot I_{ice} \cdot K_{iz} \cdot K_{zt}^{0.35} = 1.71$$

$$Kz := 2.01 \cdot \left(\left(\frac{z}{zg}\right)\right)^{\frac{2}{\alpha}} = 1.32$$

Velocity Pressure w/o Ice Antennas = $qz := 0.00256 \cdot K_d \cdot Kz \cdot V^2 \cdot I_{Wind} = 24.838$

Velocity Pressure with Ice Antennas = $qz_{ice} := 0.00256 \cdot K_d \cdot Kz \cdot V_i^2 \cdot I_{Wind} = 7.179$

Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	RFS APXVAARR24_43		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 95.9$	in	(User Input)
Antenna Width =	$W_{ant} := 19.7$	in	(User Input)
Antenna Thickness =	$T_{ant} := 8.7$	in	(User Input)
Antenna Weight =	$WT_{ant} := 133.4$	lbs	(User Input)
Number of Antennas =	$N_{ant} := 1$		(User Input)
Antenna Aspect Ratio =	$Ar_{ant} := \frac{L_{ant}}{W_{ant}} = 4.9$		
Antenna Force Coefficient =	$Ca_{ant} = 1.31$		

Wind Load (without ice)

Surface Area for One Antenna =	$SA_{antF} := \frac{L_{ant} \cdot W_{ant}}{144} = 13.1$	sf
Total Antenna Wind Force Front =	$F_{ant} := qz \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antF} = 476$	lbs
Surface Area for One Antenna =	$SA_{antS} := \frac{L_{ant} \cdot T_{ant}}{144} = 5.8$	sf
Total Antenna Wind Force Side =	$F_{ant} := qz \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antS} = 210$	lbs

Wind Load (with ice)

Surface Area for One Antenna w/ Ice =	$SA_{ICEantF} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (W_{ant} + 2 \cdot t_{iz})}{144} = 15.9$	sf
Total Antenna Wind Force w/ Ice Front =	$Fi_{ant} := qz_{ice} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantF} = 167$	lbs
Surface Area for One Antenna w/ Ice =	$SA_{ICEantS} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz})}{144} = 8.4$	sf
Total Antenna Wind Force w/ Ice Side =	$Fi_{ant} := qz_{ice} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantS} = 88$	lbs

Gravity Load (without ice)

Weight of All Antennas =	$WT_{ant} \cdot N_{ant} = 133$	lbs

Gravity Loads (ice only)

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 2 \cdot 10^4$	cu in
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 2 \cdot t_{iz}) \cdot (W_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz}) - V_{ant} = 1 \cdot 10^4$	cu in
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 369$	lbs
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 369$	lbs

Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	Ericsson KRD901146-1_B66A_B2A		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 56.65$	in	(User Input)
Antenna Width =	$W_{ant} := 12.87$	in	(User Input)
Antenna Thickness =	$T_{ant} := 8.66$	in	(User Input)
Antenna Weight =	$WT_{ant} := 132.2$	lbs	(User Input)
Number of Antennas =	$N_{ant} := 1$		(User Input)
Antenna Aspect Ratio =	$Ar_{ant} := \frac{L_{ant}}{W_{ant}} = 4.4$		
Antenna Force Coefficient =	$Ca_{ant} = 1.28$		

Wind Load (without ice)

Surface Area for One Antenna =	$SA_{antF} := \frac{L_{ant} \cdot W_{ant}}{144} = 5.1$	sf
Total Antenna Wind Force Front =	$F_{ant} := qz \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antF} = 181$	lbs
Surface Area for One Antenna =	$SA_{antS} := \frac{L_{ant} \cdot T_{ant}}{144} = 3.4$	sf
Total Antenna Wind Force Side =	$F_{ant} := qz \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antS} = 122$	lbs

Wind Load (with ice)

Surface Area for One Antenna w/ Ice =	$SA_{ICEantF} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (W_{ant} + 2 \cdot t_{iz})}{144} = 6.8$	sf
Total Antenna Wind Force w/ Ice Front =	$Fi_{ant} := qz_{ice} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantF} = 70$	lbs
Surface Area for One Antenna w/ Ice =	$SA_{ICEantS} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz})}{144} = 5$	sf
Total Antenna Wind Force w/ Ice Side =	$Fi_{ant} := qz_{ice} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantS} = 52$	lbs

Gravity Load (without ice)

Weight of All Antennas =	$WT_{ant} \cdot N_{ant} = 132$	lbs

Gravity Loads (ice only)

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 6314$	cu in
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 2 \cdot t_{iz}) \cdot (W_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz}) - V_{ant} = 5505$	cu in
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 178$	lbs
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 178$	lbs

Development of Wind & Ice Load on RRUS's

RRUS Data:

RRUS Model =	Ericsson 4449 B71B12		
RRUS Shape =	Flat		(User Input)
RRUS Height =	$L_{RRUS} := 14.9$	in	(User Input)
RRUS Width =	$W_{RRUS} := 13.2$	in	(User Input)
RRUS Thickness =	$T_{RRUS} := 10.4$	in	(User Input)
RRUS Weight =	$WT_{RRUS} := 74$	lbs	(User Input)
Number of RRUS's =	$N_{RRUS} := 1$		
RRUS Aspect Ratio =	$Ar_{RRUS} := \frac{L_{RRUS}}{W_{RRUS}} = 1.1$		
RRUS Force Coefficient =	$Ca_{RRUS} = 1.2$		

Wind Load (without ice)

Surface Area for One RRUS =	$SA_{RRUSF} := \frac{L_{RRUS} \cdot W_{RRUS}}{144} = 1.4$	sf
Total RRUS Wind Force =	$F_{RRUS} := qz \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{RRUSF} = 46$	lbs
Surface Area for One RRUS =	$SA_{RRUSS} := \frac{L_{RRUS} \cdot T_{RRUS}}{144} = 1.1$	sf
Total RRUS Wind Force =	$F_{RRUS} := qz \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{RRUSS} = 36$	lbs

Wind Load (with ice)

Surface Area for One RRUS w/ Ice =	$SA_{ICERRUSF} := \frac{(L_{RRUS} + 2 \cdot t_{iz}) \cdot (W_{RRUS} + 2 \cdot t_{iz})}{144} = 2.1$	sf
Total RRUS Wind Force w/ Ice =	$Fi_{RRUS} := qz_{ice} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{ICERRUSF} = 20$	lbs
Surface Area for One RRUS w/ Ice =	$SA_{ICERRUSS} := \frac{(L_{RRUS} + 2 \cdot t_{iz}) \cdot (T_{RRUS} + 2 \cdot t_{iz})}{144} = 1.8$	sf
Total RRUS Wind Force w/ Ice =	$Fi_{RRUS} := qz_{ice} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{ICERRUSS} = 17$	lbs

Gravity Load (without ice)

Weight of All RRUSs =	$WT_{RRUS} \cdot N_{RRUS} = 74$	lbs

Gravity Loads (ice only)

Volume of Each RRUS =	$V_{RRUS} := L_{RRUS} \cdot W_{RRUS} \cdot T_{RRUS} = 2045$	cu in
Volume of Ice on Each RRUS =	$V_{ice} := (L_{RRUS} + 2 \cdot t_{iz}) \cdot (W_{RRUS} + 2 \cdot t_{iz}) \cdot (T_{RRUS} + 2 \cdot t_{iz}) - V_{RRUS} = 2162$	cu in
Weight of Ice on Each RRUS =	$W_{ICERRUS} := \frac{V_{ice}}{1728} \cdot Id = 70$	lbs
Weight of Ice on All RRUSs =	$W_{ICERRUS} \cdot N_{RRUS} = 70$	lbs

Development of Wind & Ice Load on TMA's

TMA Data:

TMA Model =	Ericsson KRY112 TMA		
TMA Shape =	Flat	in	(User Input)
TMA Height =	$L_{TMA} := 6.9$	in	(User Input)
TMA Width =	$W_{TMA} := 6.1$	in	(User Input)
TMA Thickness =	$T_{TMA} := 2.8$	lbs	(User Input)
TMA Weight =	$WT_{TMA} := 11$		(User Input)
Number of TMA's =	$N_{TMA} := 1$		(User Input)
TMA Aspect Ratio =	$Ar_{TMA} := \frac{L_{TMA}}{W_{TMA}} = 1.1$		
TMA Force Coefficient =	$Ca_{TMA} = 1.2$		

Wind Load (without ice)

Surface Area for One TMA =	$SA_{TMAF} := \frac{L_{TMA} \cdot W_{TMA}}{144} = 0.3$	sf
Total TMA Wind Force =	$F_{TMA} := qz \cdot G_H \cdot Ca_{TMA} \cdot K_a \cdot SA_{TMAF} = 10$	lbs
Surface Area for One TMA =	$SA_{TMAS} := \frac{L_{TMA} \cdot T_{TMA}}{144} = 0.1$	sf
Total TMA Wind Force =	$F_{TMA} := qz \cdot G_H \cdot Ca_{TMA} \cdot K_a \cdot SA_{TMAS} = 4$	lbs

Wind Load (with ice)

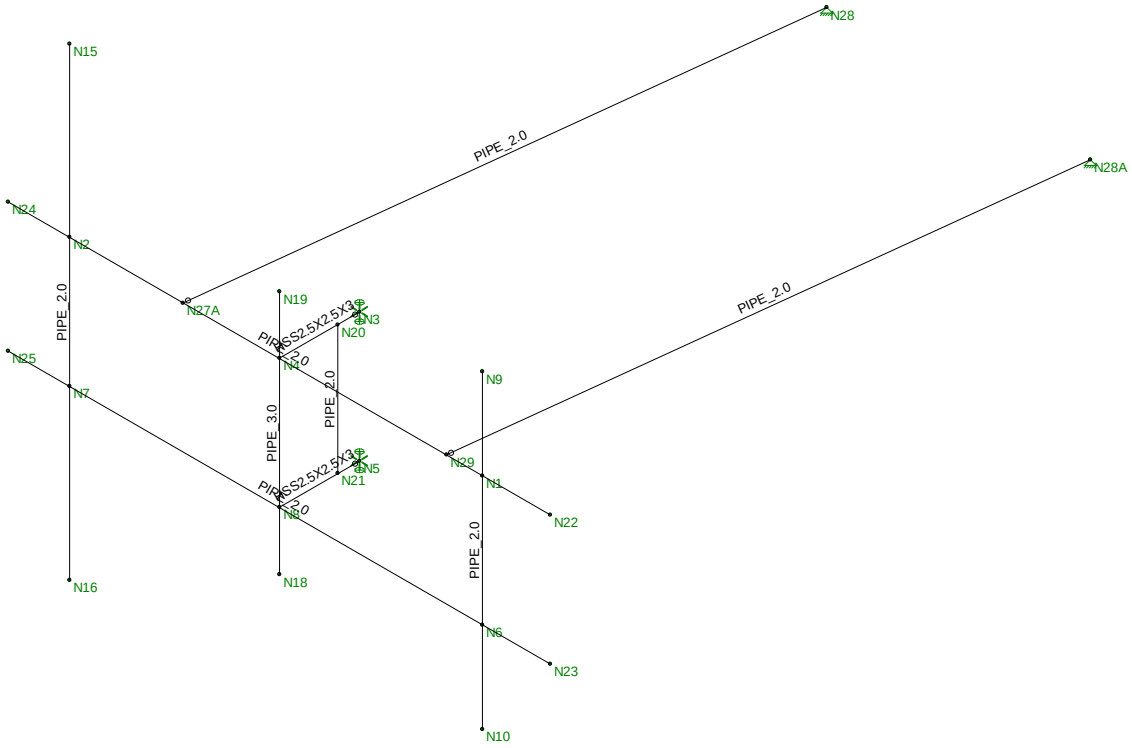
Surface Area for One TMA w/ Ice =	$SA_{ICETMAF} := \frac{(L_{TMA} + 2 \cdot t_{iz}) \cdot (W_{TMA} + 2 \cdot t_{iz})}{144} = 0.7$	sf
Total TMA Wind Force w/ Ice =	$Fi_{TMA} := qz_{ice} \cdot G_H \cdot Ca_{TMA} \cdot K_a \cdot SA_{ICETMAF} = 7$	lbs
Surface Area for One TMA w/ Ice =	$SA_{ICETMAS} := \frac{(L_{TMA} + 2 \cdot t_{iz}) \cdot (T_{TMA} + 2 \cdot t_{iz})}{144} = 0.4$	sf
Total TMA Wind Force w/ Ice =	$Fi_{TMA} := qz_{ice} \cdot G_H \cdot Ca_{TMA} \cdot K_a \cdot SA_{ICETMAS} = 4$	lbs

Gravity Load (without ice)

Weight of All TMAs =	$WT_{TMA} \cdot N_{TMA} = 11$	lbs

Gravity Loads (ice only)

Volume of Each TMA =	$V_{TMA} := L_{TMA} \cdot W_{TMA} \cdot T_{TMA} = 118$	cu in
Volume of Ice on Each TMA =	$V_{ice} := (L_{TMA} + 2 \cdot t_{iz}) \cdot (W_{TMA} + 2 \cdot t_{iz}) \cdot (T_{TMA} + 2 \cdot t_{iz}) - V_{TMA} = 493$	cu in
Weight of Ice on Each TMA =	$W_{ICETMA} := \frac{V_{ice}}{1728} \cdot Id = 16$	lbs
Weight of Ice on All TMAs =	$W_{ICETMA} \cdot N_{TMA} = 16$	lbs



Loads: BLC 8,
Envelope Only Solution

Centek		
THC	CT11040D_AMA	Apr 29, 2019 at 2:36 PM
19027.02	Member Framing	CT11040D_AMA.R3D

(Global) Model Settings

Display Sections for Member Calcs	5
Max Internal Sections for Member Calcs	97
Include Shear Deformation?	Yes
Increase Nailing Capacity for Wind?	Yes
Include Warping?	Yes
Trans Load Btwn Intersecting Wood Wall?	Yes
Area Load Mesh (in^2)	144
Merge Tolerance (in)	.12
P-Delta Analysis Tolerance	0.50%
Include P-Delta for Walls?	Yes
Automatically Iterate Stiffness for Walls?	Yes
Max Iterations for Wall Stiffness	3
Gravity Acceleration (ft/sec^2)	32.2
Wall Mesh Size (in)	12
Eigensolution Convergence Tol. (1.E-)	4
Vertical Axis	Y
Global Member Orientation Plane	XZ
Static Solver	Sparse Accelerated
Dynamic Solver	Accelerated Solver

Hot Rolled Steel Code	AISC 14th(360-10): LRFD
Adjust Stiffness?	Yes(Iterative)
RISAConnection Code	AISC 14th(360-10): ASD
Cold Formed Steel Code	AISI S100-10: ASD
Wood Code	AWC NDS-12: ASD
Wood Temperature	< 100F
Concrete Code	ACI 318-11
Masonry Code	ACI 530-11: ASD
Aluminum Code	AA ADM1-10: ASD - Building
Stainless Steel Code	AISC 14th(360-10): ASD
Adjust Stiffness?	Yes(Iterative)

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

(Global) Model Settings, Continued

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

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (\1E5 F)	Density[k/ft^3]	Yield[ksi]	Ry	Fu[ksi]	Rt
1	A36 Gr.36	29000	11154	.3	.65	.49	36	1.5	58	1.2
2	A572 Gr.50	29000	11154	.3	.65	.49	50	1.1	58	1.2
3	A992	29000	11154	.3	.65	.49	50	1.1	58	1.2
4	A500 Gr.42	29000	11154	.3	.65	.49	42	1.3	58	1.1
5	A500 Gr.46	29000	11154	.3	.65	.49	46	1.2	58	1.1
6	A53 Grade B	29000	11154	.3	.65	.49	35	1.5	58	1.2

Hot Rolled Steel Design Parameters

	Label	Shape	Length[ft]	Lbyy[ft]	Lbzz[ft]	Lcomp top[..	Lcomp bot[..	L-torq...	Kyy	Kzz	Cb	Functi...
1	M1	(P) Antenn...	9			Lbyy						Lateral
2	M2	(E) Antenn...	6			Lbyy						Lateral
3	M3	(E) Outrigg...	1.552	Segment	Segment	Segment	Segment	Segm...				Lateral
4	M4	(E) Horz	10.5	Segment	Segment	Segment	Segment	Segm...				Lateral
5	M5	(E) Outrigg...	1.552	Segment	Segment	Segment	Segment	Segm...				Lateral
6	M6	(E) Horz	10.5	Segment	Segment	Segment	Segment	Segm...				Lateral
7	M7	(E)Vert	4.75	Segment	Segment	Lbyy						Lateral
8	M8	(E) Outrigg...	2.5									Lateral
9	M9	(E) Stiff Arm	12.501			Lbyy						Lateral
10	M10	(E) Stiff Arm	12.501			Lbyy						Lateral

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Desig...	A [in2]	Iyy [i...	Izz [i...	J [in4]
1	(E)Vert	PIPE_3.0	Colu...	Pipe	A53 Grade B	Typical	2.07	2.85	2.85	5.69
2	(E) Outrigger	HSS2.5X2.5X3	Beam	Tube	A500 Gr.46	Typical	1.54	1.35	1.35	2.25
3	(E) Horz	PIPE_2.0	Beam	Pipe	A53 Grade B	Typical	1.02	.627	.627	1.25
4	(E) Stiff Arm	PIPE_2.0	Beam	Pipe	A53 Grade B	Typical	1.02	.627	.627	1.25
5	(E) Antenna Mast	PIPE_2.0	Colu...	Pipe	A53 Grade B	Typical	1.02	.627	.627	1.25
6	(E) Outrigger Brace	PIPE_2.0	Colu...	Pipe	A53 Grade B	Typical	1.02	.627	.627	1.25
7	(P) Antenna Mast	PIPE_2.0	Colu...	Pipe	A53 Grade B	Typical	1.02	.627	.627	1.25

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rules
1	M1	N16	N15			(P) Antenna Mast	Column	Pipe	A53 Grad...	Typical
2	M2	N10	N9			(E) Antenna Mast	Column	Pipe	A53 Grad...	Typical
3	M3	N5	N8			(E) Outrigger	Beam	Tube	A500 Gr.46	Typical
4	M4	N23	N25			(E) Horz	Beam	Pipe	A53 Grad...	Typical
5	M5	N3	N4			(E) Outrigger	Beam	Tube	A500 Gr.46	Typical
6	M6	N22	N24			(E) Horz	Beam	Pipe	A53 Grad...	Typical
7	M7	N19	N18			(E)Vert	Column	Pipe	A53 Grad...	Typical
8	M8	N20	N21			(E) Outrigger Brace	Column	Pipe	A53 Grad...	Typical
9	M9	N27A	N28			(E) Stiff Arm	Beam	Pipe	A53 Grad...	Typical
10	M10	N29	N28A			(E) Stiff Arm	Beam	Pipe	A53 Grad...	Typical

Joint Coordinates and Temperatures

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Diaphragm
1	N1	-1.562502	0	0.	0	
2	N2	-9.562502	0	0.	0	
3	N3	-5.500002	0	-1.552083	0	
4	N4	-5.500002	0	0.	0	
5	N5	-5.500002	-2.5	-1.552083	0	
6	N6	-1.562502	-2.5	0.	0	
7	N7	-9.562502	-2.5	0.	0	
8	N8	-5.500002	-2.5	0.	0	
9	N9	-1.562502	1.75	0.	0	
10	N10	-1.562502	-4.25	0.	0	
11	N15	-9.562502	3.25	0.	0	
12	N16	-9.562502	-5.75	0.	0	
13	N18	-5.500002	-3.625	0.	0	
14	N19	-5.500002	1.125	0.	0	
15	N20	-5.500002	0	-1.135416	0	
16	N21	-5.500002	-2.5	-1.135416	0	
17	N22	-0.250002	0	0.	0	
18	N23	-0.250002	-2.5	0.	0	
19	N24	-10.750002	0	0.	0	
20	N25	-10.750002	-2.5	0.	0	
21	N28	-7.331734	-1.25	-12.438101	0	
22	N27A	-7.364586	0	0.	0	
23	N28A	-2.227568	-1.25	-12.438101	0	
24	N29	-2.260419	0	0.	0	

Joint Boundary Conditions

	Joint Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot.[k-ft/rad]	Y Rot.[k-ft/rad]	Z Rot.[k-ft/rad]
1	N3	Reaction	Reaction	Reaction		Reaction	
2	N5	Reaction	Reaction	Reaction		Reaction	
3	N20						
4	N21						
5	N28	Reaction	Reaction	Reaction			
6	N28A	Reaction	Reaction	Reaction			

Member Point Loads (BLC 2 : Equipment Weight)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	Y	-.067	.5
2	M1	Y	-.067	8.5
3	M2	Y	-.066	.625
4	M2	Y	-.066	5.375
5	M1	Y	-.074	4.333
6	M1	Y	-.011	5.833

Member Point Loads (BLC 3 : Ice Weight)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	Y	-.184	.5
2	M1	Y	-.184	8.5
3	M2	Y	-.089	.625
4	M2	Y	-.089	5.375
5	M1	Y	-.07	4.333
6	M1	Y	-.016	5.833

Member Point Loads (BLC 4 : Wind w/ Ice X)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	X	-.044	.5
2	M1	X	-.044	8.5
3	M2	X	-.026	.625
4	M2	X	-.026	5.375
5	M1	X	-.017	4.333
6	M1	X	-.004	5.833

Member Point Loads (BLC 5 : Wind X)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	X	-.105	.5
2	M1	X	-.105	8.5
3	M2	X	-.061	.625
4	M2	X	-.061	5.375
5	M1	X	-.036	4.333
6	M1	X	-.004	5.833

Member Point Loads (BLC 6 : Wind w/ Ice Z)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	Z	-.084	.5
2	M1	Z	-.084	8.5

Member Point Loads (BLC 6 : Wind w/ Ice Z) (Continued)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
3	M2	Z	-.035	.625
4	M2	Z	-.035	5.375
5	M1	Z	-.02	4.333
6	M1	Z	-.007	5.833

Member Point Loads (BLC 7 : Wind Z)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	Z	-.238	.5
2	M1	Z	-.238	8.5
3	M2	Z	-.09	.625
4	M2	Z	-.09	5.375
5	M1	Z	-.046	4.333
6	M1	Z	-.01	5.833

Joint Loads and Enforced Displacements

Joint Label	L,D,M	Direction	Magnitude[(k,k-ft), (i...
No Data to Print ...			

Member Distributed Loads (BLC 4 : Wind w/ Ice X)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/ft,F,ksf]	Start Location[ft,%]	End Location[ft,%]
1	M8	X	-.002	-.002	0	0
2	M5	X	-.002	-.002	0	0
3	M3	X	-.002	-.002	0	0
4	M7	X	-.002	-.002	0	0
5	M9	X	-.002	-.002	0	0
6	M10	X	-.002	-.002	0	0

Member Distributed Loads (BLC 5 : Wind X)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/ft,F,ksf]	Start Location[ft,%]	End Location[ft,%]
1	M8	X	-.005	-.005	0	0
2	M3	X	-.005	-.005	0	0
3	M5	X	-.005	-.005	0	0
4	M7	X	-.005	-.005	0	0
5	M9	X	-.005	-.005	0	0
6	M10	X	-.005	-.005	0	0

Member Distributed Loads (BLC 6 : Wind w/ Ice Z)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/ft,F,ksf]	Start Location[ft,%]	End Location[ft,%]
1	M4	Z	-.002	-.002	0	0
2	M6	Z	-.002	-.002	0	0
3	M8	Z	-.002	-.002	0	0
4	M7	Z	-.002	-.002	0	0

Member Distributed Loads (BLC 7 : Wind Z)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/ft,F,ksf]	Start Location[ft,%]	End Location[ft,%]
1	M4	Z	-.005	-.005	0	0
2	M6	Z	-.005	-.005	0	0

Member Distributed Loads (BLC 7 : Wind Z) (Continued)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/ft,F,ksf]	Start Location[ft,%]	End Location[ft,%]
3	M8	Z	-.005	-.005	0	0
4	M7	Z	-.005	-.005	0	0

Basic Load Cases

	BLC Description	Category	X Gr...	Y Gr...	Z Gr...	Joint	Point	Distri...	Area(...	Surface(Plate/Wall)
1	Self Weight	None		-1						
2	Equipment Weight	None					6			
3	Ice Weight	None					6			
4	Wind w/ Ice X	None					6	6		
5	Wind X	None					6	6		
6	Wind w/ Ice Z	None					6	4		
7	Wind Z	None					6	4		

Load Combinations

	Description	Solve	P...	SR...	BLC	F...	BLC	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
1	1.2D + 1.6W (X-direction)	Yes	Y		1	1...	2	1.2	5	1.6																
2	0.9D + 1.6W (X-direction)	Yes	Y		1	.9	2	.9	5	1.6																
3	1.2D + 1.0Di + 1.0Wi (X...	Yes	Y		1	1...	2	1.2	3	1	4	1														
4	1.2D + 1.6W (X-direction)	Yes	Y		1	1...	2	1.2	7	1.6																
5	0.9D + 1.6W (X-direction)	Yes	Y		1	.9	2	.9	7	1.6																
6	1.2D + 1.0Di + 1.0Wi (X...	Yes	Y		1	1...	2	1.2	3	1	6	1														

Envelope Joint Reactions

	Joint		X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N3	max	.738	3	.657	3	-.54	2	0	6	0	6	0	6
2		min	.049	5	.09	5	-1.694	4	0	1	0	1	0	1
3	N5	max	.252	2	.654	3	.97	4	0	6	0	6	0	6
4		min	-.622	6	.219	5	.299	2	0	1	0	1	0	1
5	N28	max	.051	2	.205	4	1.789	4	0	6	0	6	0	6
6		min	-.005	4	.041	3	.149	3	0	1	0	1	0	1
7	N28A	max	.052	2	.057	4	.307	4	0	6	0	6	0	6
8		min	0	4	.005	2	-.142	2	0	1	0	1	0	1
9	Totals:	max	.889	2	1.377	6	1.372	5						
10		min	0	4	.558	2	0	3						

Envelope Joint Displacements

	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [...	LC	Y Rotation [...	LC	Z Rotation [...	LC
1	N1	max	-.018	5	-.047	3	.003	1	1.928e-03	6	2.576e-03	5	1.7e-03	3
2		min	-.094	1	-.131	4	-.011	5	-1.683e-03	2	3.531e-04	3	-1.542e-03	5
3	N2	max	-.019	5	-.044	5	.069	3	2.312e-03	1	1.698e-03	3	6.838e-03	3
4		min	-.095	1	-.525	3	-.479	5	-1.968e-04	6	-2.294e-02	5	9.128e-05	5
5	N3	max	0	6	0	6	0	6	0	6	0	6	1.84e-03	3
6		min	0	1	0	1	0	1	0	1	0	1	-5.409e-04	5
7	N4	max	-.018	5	-.011	5	0	4	6.01e-04	3	-1.567e-04	6	3.169e-03	3
8		min	-.094	1	-.032	3	0	2	1.436e-04	5	-3.098e-03	2	-1.01e-03	5
9	N5	max	0	6	0	6	0	6	0	6	0	6	1.935e-03	3

Envelope Joint Displacements (Continued)

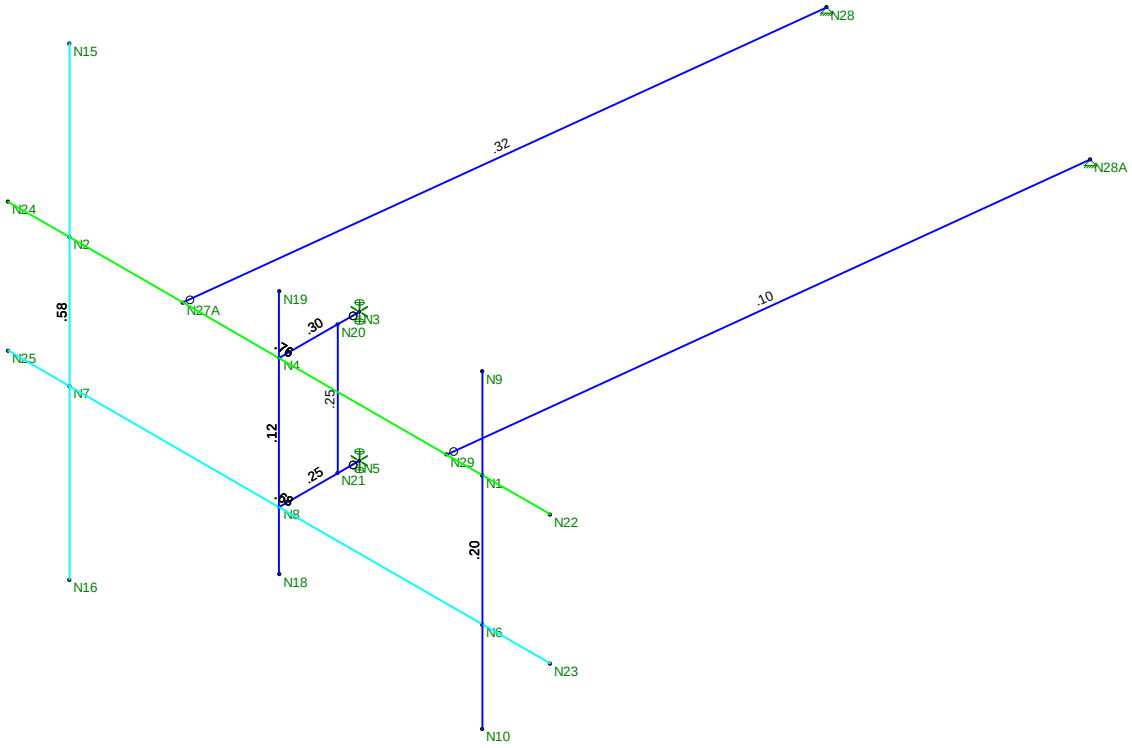
	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [...	LC	Y Rotation [...	LC	Z Rotation [...	LC
10		min	0	1	0	1	0	1	0	1	0	1	-4.256e-04	5
11	N6	max	.055	6	-.046	3	.058	2	4.604e-03	4	4.124e-03	4	1.272e-03	3
12		min	-.086	2	-.131	4	-.107	4	-1.681e-03	2	1.091e-04	2	-1.56e-03	4
13	N7	max	.057	6	-.044	5	.063	3	2.018e-02	4	1.38e-03	3	5.866e-03	6
14		min	-.085	2	-.525	3	-.819	5	2.566e-04	3	-2.339e-02	5	-1.365e-03	2
15	N8	max	.056	6	-.011	5	0	2	7.904e-04	4	1.632e-03	6	3.303e-03	3
16		min	-.085	2	-.032	3	0	4	2.275e-04	2	-3.539e-03	2	-8.342e-04	5
17	N9	max	.014	5	-.047	3	.036	6	1.711e-03	6	2.576e-03	5	1.865e-03	3
18		min	-.111	1	-.131	4	-.034	2	-1.684e-03	2	3.531e-04	3	-1.543e-03	5
19	N10	max	.081	6	-.047	3	.093	2	5.508e-03	4	4.124e-03	4	1.252e-03	6
20		min	-.12	2	-.131	4	-.219	4	-1.68e-03	2	1.091e-04	2	-1.777e-03	1
21	N15	max	-.022	5	-.044	5	.109	1	2.319e-03	1	1.698e-03	3	1.065e-02	1
22		min	-.442	1	-.525	3	-.863	5	-1.382e-02	5	-2.294e-02	5	9.147e-05	5
23	N16	max	.285	6	-.044	5	.053	3	3.436e-02	4	1.38e-03	3	5.824e-03	6
24		min	-.315	2	-.525	3	-2.005	5	2.547e-04	3	-2.339e-02	5	-7.643e-03	2
25	N18	max	.096	6	-.011	5	-.003	2	7.947e-04	4	1.632e-03	6	3.302e-03	3
26		min	-.078	2	-.032	3	-.011	4	2.275e-04	2	-3.539e-03	2	-8.342e-04	5
27	N19	max	-.005	5	-.011	5	.008	3	6.01e-04	3	-1.567e-04	6	3.17e-03	3
28		min	-.098	1	-.032	3	.003	5	1.393e-04	5	-3.098e-03	2	-1.01e-03	5
29	N20	max	-.006	5	-.003	5	0	4	1.772e-03	3	-1.167e-03	5	1.84e-03	3
30		min	-.03	1	-.01	3	0	2	5.986e-04	5	-5.72e-03	1	-5.409e-04	5
31	N21	max	.018	6	-.003	5	0	2	1.772e-03	3	3.337e-03	6	1.935e-03	3
32		min	-.025	2	-.01	3	0	4	4.905e-04	5	-4.954e-03	2	-4.256e-04	5
33	N22	max	-.018	5	-.02	3	-.003	3	1.928e-03	6	2.604e-03	5	1.684e-03	3
34		min	-.094	1	-.155	4	-.052	5	-1.683e-03	2	3.531e-04	3	-1.554e-03	5
35	N23	max	.055	6	-.027	3	.056	2	4.604e-03	4	4.155e-03	4	1.257e-03	3
36		min	-.086	2	-.156	4	-.172	4	-1.681e-03	2	1.091e-04	2	-1.576e-03	4
37	N24	max	-.019	5	-.045	5	.094	3	2.312e-03	1	1.698e-03	3	6.849e-03	3
38		min	-.095	1	-.622	3	-.806	5	-1.968e-04	6	-2.296e-02	5	9.991e-05	5
39	N25	max	.057	6	-.038	5	.082	3	2.018e-02	4	1.38e-03	3	5.877e-03	6
40		min	-.085	2	-.603	3	-1.152	5	2.566e-04	3	-2.341e-02	5	-1.357e-03	2
41	N28	max	0	6	0	6	0	6	4.858e-03	3	1.021e-03	6	1.26e-02	3
42		min	0	1	0	1	0	1	2.574e-03	5	-7.036e-03	2	3.804e-04	5
43	N27A	max	-.018	5	-.012	5	.022	3	1.225e-03	1	1.836e-03	3	1.238e-02	3
44		min	-.095	1	-.232	3	-.01	5	2.255e-04	6	-7.306e-03	5	1.1e-03	5
45	N28A	max	0	6	0	6	0	6	4.105e-03	4	-2.395e-04	6	-1.321e-04	2
46		min	0	1	0	1	0	1	2.977e-03	2	-7.411e-03	1	-2.302e-03	4
47	N29	max	-.018	5	-.051	3	.009	4	1.69e-03	6	1.627e-03	5	-3.669e-04	3
48		min	-.094	1	-.113	4	.005	6	-1.345e-03	2	3.102e-04	3	-2.506e-03	4

Envelope AISC 14th(360-10): LRFD Steel Code Checks

	Me...	Shape	Code C...	Loc...	LC	Shear C...	Loc[ft]	Dir	LC	phi*Pn...	phi*P...	phi*Mn...	phi*...	Cb	Eqn
1	M6	PIPE 2.0	.762	7.1...	4	.134	5.25		4	30.818	32.13	1.872	1.872	1.229	H1-1b
2	M4	PIPE 2.0	.679	5.25	4	.310	5.25		4	26.362	32.13	1.872	1.872	2.271	H3-6
3	M1	PIPE 2.0	.581	5.7...	4	.068	4.406		6	12.144	32.13	1.872	1.872	4.532	H1-1b
4	M9	PIPE 2.0	.324	6.25	4	.006	12.501		1	6.295	32.13	1.872	1.872	1.136	H1-1a
5	M5	HSS2.5X2.5...	.296	1.5...	3	.090	.42	y	3	62.854	63.756	4.554	4.554	1.991	H1-1b
6	M3	HSS2.5X2.5...	.251	1.5...	6	.092	.42	y	3	62.854	63.756	4.554	4.554	2.022	H1-1b
7	M8	PIPE 2.0	.248	2.5	3	.168	0		3	29.81	32.13	1.872	1.872	2.258	H1-1b
8	M2	PIPE 2.0	.201	1.75	3	.052	1.75		4	20.867	32.13	1.872	1.872	4.088	H1-1b

Envelope AISC 14th(360-10): LRFD Steel Code Checks (Continued)

	Me...	Shape	Code C...	Loc...	LC	Shear C...	Loc[ft]	Dir	LC	phi*Pn...	phi*P...	phi*Mn...	phi*...	Cb	Eqn
9	M7	PIPE_3.0	.120	3.6...	6	.102	3.612		5	63.06	65.205	5.749	5.749	1.521	H1-1b
10	M10	PIPE_2.0	.099	6.25	1	.006	12.501		1	6.295	32.13	1.872	1.872	1.136	H1-1b



Member Code Checks Displayed (Enveloped)
Envelope Only Solution

Centek		
THC	CT11040D_AMA	Apr 29, 2019 at 2:35 PM
19027.02	Member Unity Check	CT11040D_AMA.R3D

RAN Template:	A&L Template:	Power System Template:
67D92DBL Outdoor	67D92DBL_1xAIR+1OP (U21 Market)	Custom

CT11040D_L600_4.1

Section 1 - Site Information

Site ID: CT11040D
Status: Final
Version: 4.1
Project Type: L600
Approved: 4/17/2019 12:7:17 PM
Approved By: GSM1900\AMurill9
Last Modified: 4/17/2019 12:7:17 PM
Last Modified By: GSM1900\AMurill9

Site Name: Wilton /state police
Site Class: Monopole
Site Type: Structure Non Building
Plan Year: 2019
Market: CONNECTICUT
Vendor: Ericsson
Landlord: <undefined>

Latitude: 41.1726687900
Longitude: -73.4339652000
Address: 46 Fenwood Lane
City, State: Wilton, CT
Region: NORTHEAST

RAN Template: 67D92DBL Outdoor			**AL Template:** 67D92DBL_1xAIR+1OP (U21 Market)	
Sector Count: 3	**Antenna Count:** 6	**Coax Line Count:** 6	**TMA Count:** 3	**RRU Count:** 3

Section 2 - Existing Template Images

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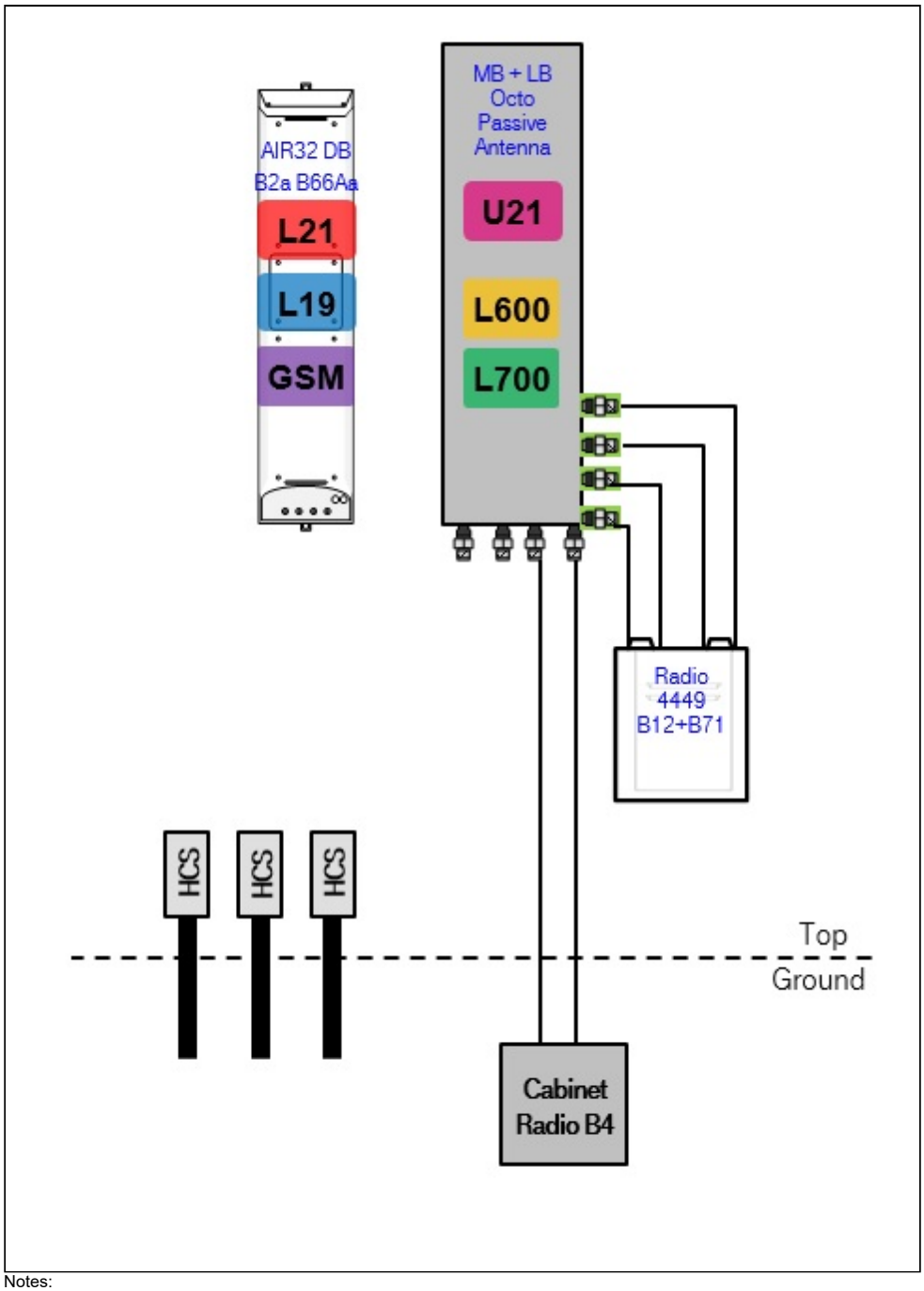
Section 3 - Proposed Template Images

67D92DBL_1xAIR+1OP (U21 Market).jpg



Notes:

Section 4 - Siteplan Images

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RAN Template:	A&L Template:	Power System Template:
67D92DBL Outdoor	67D92DBL_1xAIR+1OP (U21 Market)	Custom

CT11040D_L600_4.1

Section 5 - RAN Equipment

Existing RAN Equipment

Template: 792Cc Outdoor

Enclosure	1	2
Enclosure Type	RBS 6131	S8000 Outdoor
Baseband	DUW30 (U1900 (DECOMMISSIONED)); DUW30 (U2100); DUG20 (G1900); DUS41 (L2100, L1900, L700)	
Hybrid Cable System	Ericsson 9x18 HCS *Select Length*	
Multiplexer	XMU (L700)	
Radio	RU22 (x6) (U2100)	

Proposed RAN Equipment

Template: 67D92DBL Outdoor

Enclosure	1
Enclosure Type	RBS 6131
Baseband	DUW30 (U2100); DUG20 (G1900); BB 6630 (N600 (DARK)); BB 6630 (L2100, L1900, L700, L600)
Hybrid Cable System	Ericsson 9x18 HCS *Select Length*; Ericsson 6x12 HCS *Select Length & AWG* (x3)
Radio	RU22 (x6) (U2100)

RAN Scope of Work:

Swap (1) DUS41 and (1) XMU with (1) BB 6630 and Add (1) BB 6630 for future 5G (N600 Dark)
Add (3) 6x12 HCS.
Remove existing (6) antennas. Add (3) AIR32 DB antenna. Add (3) LB/MB Octa antenna. Connect existing (6) coax and (3) Twin AWS TMAs for U2100 onto MB ports.
Swap (3) RRUS11 B12s with (3) Radio 4449 B71+B12s.

RAN Template:	A&L Template:	Power System Template:
67D92DBL Outdoor	67D92DBL_1xAIR+1OP (U21 Market)	Custom

CT11040D_L600_4.1

Section 6 - A&L Equipment

Existing Template: 792Cc_2xAIR
Proposed Template: 67D92DBL_1xAIR+1OP (U21 Market)

Sector 1 (Existing) view from behind				
Coverage Type	A - Outdoor Macro			
Antenna	1		2	
Antenna Model	Ericsson - AIR21 KRC118023-1_B2A_B4P (Quad)		Ericsson - AIR21 B4A/B12P 4ft (Quad)	
Azimuth	80		80	
M. Tilt	0		0	
Height	122		122	
Ports	**P1**	**P2**	**P3**	**P4**
Active Tech.	L1900, G1900	U2100	L2100	L700
Dark Tech.				
Restricted Tech.				
Decomm. Tech.	U1900			
E. Tilt				
Cables		1-1/4" Coax - 180 ft. **(x2)**		
TMAs		Generic Twin Style 1B - AWS (AtAntenna)		
Diplexers / Combiners				
Radio				RRUS11 B12 (At Antenna)
Sector Equipment				

Unconnected Equipment:

Scope of Work:

RAN Template:	A&L Template:	Power System Template:
67D92DBL Outdoor	67D92DBL_1xAIR+1OP (U21 Market)	Custom

CT11040D_L600_4.1

Sector 1 (Proposed) view from behind								
Coverage Type	A - Outdoor Macro							
Antenna	1				2			
Antenna Model	Ericsson - AIR32 KRD901146-1_B66A_B2A (Octo)				RFS - APXVAARR24_43-U-NA20 (Octo)			
Azimuth	80				80			
M. Tilt	0				0			
Height	122				122			
Ports	P1	P2	P3	P4	P5	P6	P7	P8
Active Tech.	L2100	L2100	L1900 G1900	L1900 G1900	L700 L600	L700 L600	U2100	
Dark Tech.								
Restricted Tech.								
Decomm. Tech.								
E. Tilt	2	2	2	2	2	2	2	
Cables					Coax Jumper **(x2)**	Coax Jumper **(x2)**	1-1/4" Coax - 180 ft. **(x2)**	
TMAs							Generic Twin Style 1B - AWS (AtAntenna)	
Diplexers / Combiners								
Radio					Radio 4449 B71+B12 (At Antenna)	SHARED Radio 4449 B71+B12 (At Antenna)		
Sector Equipment								

Unconnected Equipment:

Scope of Work:

Remove existing (2) antennas. Add (1) AIR32 DB antenna. Add (1) LB/MB Octa antenna. Connect existing (2) coax and (1) Twin AWS TMA for U2100 onto MB ports.
Swap (1) RRUS11 B12 with (1) Radio 4449 B71+B12.

*A dashed border indicates shared equipment. Any connected equipment is denoted with the SHARED keyword.

RAN Template:	A&L Template:	Power System Template:
67D92DBL Outdoor	67D92DBL_1xAIR+1OP (U21 Market)	Custom

CT11040D_L600_4.1

Sector 2 (Existing) view from behind				
Coverage Type	A - Outdoor Macro			
Antenna	1		2	
Antenna Model	Ericsson - AIR21 KRC118023-1_B2A_B4P (Quad)		Ericsson - AIR21 B4A/B12P 4ft (Quad)	
Azimuth	170		170	
M. Tilt	0		0	
Height	122		122	
Ports	P1	P2	P3	P4
Active Tech.	L1900 G1900	U2100	L2100	L700
Dark Tech.				
Restricted Tech.				
Decomm. Tech.	U1900			
E. Tilt				
Cables		1-1/4" Coax - 180 ft. **(x2)**		
TMAs		Generic Twin Style 1B - AWS (AtAntenna)		
Diplexers / Combiners				
Radio				RRUS11 B12 (At Antenna)
Sector Equipment				

Unconnected Equipment:

Scope of Work:

RAN Template:	A&L Template:	Power System Template:
67D92DBL Outdoor	67D92DBL_1xAIR+1OP (U21 Market)	Custom

CT11040D_L600_4.1

Sector 2 (Proposed) view from behind								
Coverage Type	A - Outdoor Macro							
Antenna	1				2			
Antenna Model	Ericsson - AIR32 KRD901146-1_B66A_B2A (Octo)				RFS - APXVAARR24_43-U-NA20 (Octo)			
Azimuth	170				170			
M. Tilt	0				0			
Height	122				122			
Ports	P1	P2	P3	P4	P5	P6	P7	P8
Active Tech.	L2100	L2100	L1900 G1900	L1900 G1900	L700 L600	L700 L600	U2100	
Dark Tech.								
Restricted Tech.								
Decomm. Tech.								
E. Tilt	2	2	2	2	2	2	2	
Cables					Coax Jumper **(x2)**	Coax Jumper **(x2)**	1-1/4" Coax - 180 ft. **(x2)**	
TMAs							Generic Twin Style 1B - AWS (AtAntenna)	
Diplexers / Combiners								
Radio					Radio 4449 B71+B12 (At Antenna)	SHARED Radio 4449 B71+B12 (At Antenna)		
Sector Equipment								

Unconnected Equipment:

Scope of Work:

Remove existing (2) antennas. Add (1) AIR32 DB antenna. Add (1) LB/MB Octa antenna. Connect existing (2) coax and (1) Twin AWS TMA for U2100 onto MB ports.
Swap (1) RRUS11 B12 with (1) Radio 4449 B71+B12.

*A dashed border indicates shared equipment. Any connected equipment is denoted with the SHARED keyword.

RAN Template:	A&L Template:	Power System Template:
67D92DBL Outdoor	67D92DBL_1xAIR+1OP (U21 Market)	Custom

CT11040D_L600_4.1

Sector 3 (Existing) view from behind				
Coverage Type	A - Outdoor Macro			
Antenna	1		2	
Antenna Model	Ericsson - AIR21 KRC118023-1_B2A_B4P (Quad)		Ericsson - AIR21 B4A/B12P 4ft (Quad)	
Azimuth	280		280	
M. Tilt	0		0	
Height	122		122	
Ports	P1	P2	P3	P4
Active Tech.	L1900 G1900	U2100	L2100	L700
Dark Tech.				
Restricted Tech.				
Decomm. Tech.	U1900			
E. Tilt				
Cables		1-1/4" Coax - 180 ft. **(x2)**		
TMAs		Generic Twin Style 1B - AWS (AtAntenna)		
Diplexers / Combiners				
Radio				RRUS11 B12 (At Antenna)
Sector Equipment				

Unconnected Equipment:

Scope of Work:

RAN Template:	A&L Template:	Power System Template:
67D92DBL Outdoor	67D92DBL_1xAIR+1OP (U21 Market)	Custom

CT11040D_L600_4.1

Sector 3 (Proposed) view from behind								
Coverage Type	A - Outdoor Macro							
Antenna	1				2			
Antenna Model	Ericsson - AIR32 KRD901146-1_B66A_B2A (Octo)				RFS - APXVAARR24_43-U-NA20 (Octo)			
Azimuth	280				280			
M. Tilt	0				0			
Height	122				122			
Ports	P1	P2	P3	P4	P5	P6	P7	P8
Active Tech.	L2100	L2100	L1900 G1900	L1900 G1900	L700 L600	L700 L600	U2100	
Dark Tech.								
Restricted Tech.								
Decomm. Tech.								
E. Tilt	2	2	2	2	2	2	2	
Cables					Coax Jumper **(x2)**	Coax Jumper **(x2)**	1-1/4" Coax - 180 ft. **(x2)**	
TMAs							Generic Twin Style 1B - AWS (AtAntenna)	
Diplexers / Combiners								
Radio					Radio 4449 B71+B12 (At Antenna)	SHARED Radio 4449 B71+B12 (At Antenna)		
Sector Equipment								

Unconnected Equipment:

Scope of Work:

Remove existing (2) antennas. Add (1) AIR32 DB antenna. Add (1) LB/MB Octa antenna. Connect existing (2) coax and (1) Twin AWS TMA for U2100 onto MB ports.
Swap (1) RRUS11 B12 with (1) Radio 4449 B71+B12.

*A dashed border indicates shared equipment. Any connected equipment is denoted with the SHARED keyword.

RAN Template:	A&L Template:	Power System Template:
67D92DBL Outdoor	67D92DBL_1xAIR+1OP (U21 Market)	Custom

CT11040D_L600_4.1

Section 7 - Power Systems Equipment

Existing Power Systems Equipment

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Proposed Power Systems Equipment

EBI Consulting

environmental | engineering | due diligence

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

T-Mobile Existing Facility

Site ID: CT11040D

Wilton /state police
46 Fenwood Lane
Wilton, Connecticut 06897

May 24, 2019

EBI Project Number: 6219001814

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**21.41%**

May 24, 2019

T-Mobile
Attn: Jason Overbey, RF Manager
35 Griffin Road South
Bloomfield, Connecticut 06002

Emissions Analysis for Site: CT11040D - Wilton /state police

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **46 Fenwood Lane** in **Wilton, Connecticut** for the purpose of determining whether the emissions from the Proposed T-Mobile Antenna Installation located on this property are within specified federal limits.

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

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

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

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

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

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed T-Mobile Wireless antenna facility located at 46 Fenwood Lane in Wilton, Connecticut using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since T-Mobile is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was focused at the base of the tower. For this report, the sample point is the top of a 6-foot person standing at the base of the tower.

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

1) 2 LTE channels (600 MHz Band) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

2) 2 LTE channels (700 MHz Band) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

3) 4 GSM channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

4) 2 LTE channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.

5) 2 UMTS channels (AWS Band - 2100 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

6) 2 LTE channels (AWS Band – 2100 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.

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

8) For the following calculations, the sample point was the top of a 6-foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was used in this direction. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

9) The antennas used in this modeling are the Ericsson AIR 32 for the 1900 MHz / 1900 MHz / 2100 MHz channel(s), the RFS APXVAARR24_43-U-NA20 for the 2100 MHz / 600 MHz / 700 MHz channel(s) in Sector A, the Ericsson AIR 32 for the 1900 MHz / 1900 MHz / 2100 MHz channel(s), the RFS APXVAARR24_43-U-NA20 for the 2100 MHz / 600 MHz / 700 MHz channel(s) in Sector B, the Ericsson AIR 32 for the 1900 MHz / 1900 MHz / 2100 MHz channel(s), the RFS APXVAARR24_43-U-NA20 for the 2100 MHz / 600 MHz / 700 MHz channel(s) in Sector C. This is based on feedback from the carrier with regard to anticipated antenna selection. All Antenna gain values and associated transmit power levels are shown in the Site Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

10) The antenna mounting height centerline of the proposed antennas is 122 feet above ground level (AGL).

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

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

T-Mobile Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	**1**	Antenna #:	**1**	Antenna #:	**1**
Make / Model:	Ericsson AIR 32	Make / Model:	Ericsson AIR 32	Make / Model:	Ericsson AIR 32
Frequency Bands:	1900 MHz / 1900 MHz / 2100 MHz	Frequency Bands:	1900 MHz / 1900 MHz / 2100 MHz	Frequency Bands:	1900 MHz / 1900 MHz / 2100 MHz
Gain:	15.35 dBd / 15.35 dBd / 15.85 dBd	Gain:	15.35 dBd / 15.35 dBd / 15.85 dBd	Gain:	15.35 dBd / 15.35 dBd / 15.85 dBd
Height (AGL):	122 feet	Height (AGL):	122 feet	Height (AGL):	122 feet
Channel Count:	8	Channel Count:	8	Channel Count:	8
Total TX Power (W):	360 Watts	Total TX Power (W):	360 Watts	Total TX Power (W):	360 Watts
ERP (W):	12,841.53	ERP (W):	12,841.53	ERP (W):	12,841.53
Antenna A1 MPE %:	**3.10%**	Antenna B1 MPE %:	**3.10%**	Antenna C1 MPE %:	**3.10%**
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
Make / Model:	RFS APXVAARR24_43-U-NA20	Make / Model:	RFS APXVAARR24_43-U-NA20	Make / Model:	RFS APXVAARR24_43-U-NA20
Frequency Bands:	2100 MHz / 600 MHz / 700 MHz	Frequency Bands:	2100 MHz / 600 MHz / 700 MHz	Frequency Bands:	2100 MHz / 600 MHz / 700 MHz
Gain:	16.35 dBd / 12.95 dBd / 13.35 dBd	Gain:	16.35 dBd / 12.95 dBd / 13.35 dBd	Gain:	16.35 dBd / 12.95 dBd / 13.35 dBd
Height (AGL):	122 feet	Height (AGL):	122 feet	Height (AGL):	122 feet
Channel Count:	6	Channel Count:	6	Channel Count:	6
Total TX Power (W):	180 Watts	Total TX Power (W):	180 Watts	Total TX Power (W):	180 Watts
ERP (W):	5,070.20	ERP (W):	5,070.20	ERP (W):	5,070.20
Antenna A2 MPE %:	**2.01%**	Antenna B2 MPE %:	**2.01%**	Antenna C2 MPE %:	**2.01%**

Site Composite MPE %	
Carrier	**MPE %**
T-Mobile (Max at Sector A):	5.11%
AT&T	3.51%
CL&P	0.21%
Sprint	5.12%
Town/State	7.46%
Site Total MPE % :	21.41%

T-Mobile Sector A Total:	5.11%
T-Mobile Sector B Total:	5.11%
T-Mobile Sector C Total:	5.11%
Site Total:	21.41%

T-Mobile Maximum MPE Power Values (Sector A)

T-Mobile Frequency Band / Technology (Sector A)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density (μW/cm²)	Frequency (MHz)	Allowable MPE (μW/cm²)	Calculated % MPE
T-Mobile 1900 MHz GSM	4	1028.30	122.0	9.94	1900 MHz GSM	1000	0.99%
T-Mobile 1900 MHz LTE	2	2056.61	122.0	9.94	1900 MHz LTE	1000	0.99%
T-Mobile 2100 MHz LTE	2	2307.55	122.0	11.15	2100 MHz LTE	1000	1.11%
T-Mobile 2100 MHz UMTS	2	1294.56	122.0	6.25	2100 MHz UMTS	1000	0.63%
T-Mobile 600 MHz LTE	2	591.73	122.0	2.86	600 MHz LTE	400	0.71%
T-Mobile 700 MHz LTE	2	648.82	122.0	3.13	700 MHz LTE	467	0.67%
						Total:	**5.11%**

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

Summary

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

The anticipated maximum composite contributions from the T-Mobile facility as well as the site composite emissions value with regards to compliance with FCC's allowable limits for general population exposure to RF Emissions are shown here:

T-Mobile Sector	Power Density Value (%)
Sector A:	5.11%
Sector B:	5.11%
Sector C:	5.11%
T-Mobile Maximum MPE % (Sector A):	5.11%
Site Total:	21.41%
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **21.41%** of the allowable FCC established general population limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

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

STATE OF CONNECTICUT

DEPARTMENT OF EMERGENCY SERVICES AND PUBLIC PROTECTION

May 15, 2019

Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

Re: **Letter of Authorization** – Co-location on Connecticut State Police tower
Property address: 46 Fenwood Lane, Wilton, CT
Latitude: 41.1726687900 Longitude: -73.4339652000

To Whom It May Concern:

T-Mobile Northeast LLC (T-Mobile) has an Agreement with the Connecticut Department of Emergency Services and Public Protection (DESPP) to co-locate its communications equipment on the DESPP tower located at 46 Fenwood Lane, Wilton, CT.

T-Mobile shall be required by the terms of the agreement to seek and obtain all necessary permits and approvals. As a duly authorized representative of the DESPP, permission is hereby granted to T-Mobile and agents thereof, for the purpose of consummating any applications necessary to gain the required approvals from the State of Connecticut.

Any fees or charges associated with all applications or permits and any conditions placed on the applicant shall be the sole responsibility of T-Mobile.

Yours truly,

Brian Benito
Planning Specialist
State Of Connecticut
Department of Emergency Services and Public Protection
CTS Unit
860-685-8297
brian.benito@ct.gov