EMPIRE telecom

February 19, 2018

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

Regarding:	Notice of Exempt Modification – Equipment Modification, Mount Replacement, and Tower Reinforcement
Property Address:	23 Wayne Road, Wallingford, CT 06492 (the "Property")
Applicant:	AT&T Mobility ("AT&T", Site # CT2168)

Dear Ms. Bachman:

AT&T currently maintains a wireless telecommunications facility on an existing 80-foot self-support tower at the above-referenced address, latitude N 41.4627419 // longitude W -072.941881 41.73300000°. The property is owned by Stephen Tripp.

AT&T desires to modify its existing (9) panel antenna telecommunications facility by adding three (3) panel antennas and modifying its ancillary tower-installed equipment as follows: add (6) diplexers, swap (3) remote radio units (RRUs), add (6) RRUs, and add (1) DC squid surge suppressor with associated cables. In order to support the proposed equipment, AT&T also proposes to remove the existing mount and replace it with a new mount, designed to accommodate (12) antennas and associated appurtenances.

The newly proposed antenna support mount is accounted for in the Engineer's Report, by Maser Consulting Connecticut dated November 16, 2018, on page 2. Said engineering report also recommends the following reinforcement modifications, installing secondary horizontal members between elevation 20' to 25.1' (two bays) and 0' to 10' (four bays) (See Construction Drawings and Structural Analysis page 4).

Please accept this application as notification pursuant to R.C.S.A. §16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. §16-50j-72 (b)(2). In accordance with R.C.S.A. §16-50j-73, a copy of this letter is being sent to the Honorable William W. Dickinson, Jr., Mayor of the Town of Wallingford; Kacie Hand, as Town Planner with the Town of Wallingford; Stephen Tripp, as property owner.

The planned modifications to AT&T's facility fall squarely within those activities explicitly provided for in R.C.S.A. §16-50j-72 (b)(2). Specifically:

1. The planned modification will not result in an increase in the height of the existing structure. The added antennas, new mount, and accessory equipment will be installed at the existing height of 78 feet on the 80-foot monopole.

2. The proposed modifications will not involve any changes to AT&T's ground-space footprint, and therefore and therefore will not require an extension of the site boundary.

3. The proposed modification will not increase the noise level at the facility by six decibels or more, or to levels that exceed state and local criteria.

4. The operation of the modified facility will not increase radio frequency (RF) emissions at the facility to a level at or above Federal Communications Commission (FCC) safety standard. An RF emissions calculation for AT&T's modified facility is herein provided.

5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.

6. Once the mount is replaced and the tower structure is reinforced by adding secondary horizontal members between elevation 20' to 25.1' (two bays) and 0' to 10' (four bays), the modified structure and its foundation can support AT&T's proposed modifications. Please see enclosed structural analysis completed by Maser Consulting Connecticut dated February 11, 2019.

For the foregoing reasons, AT&T respectfully requests that the proposed installation be allowed within the exempt modifications under R.C.S.A. §16-50j-72 (b)(2).

Sincerely,

Julia Coughlin

Julia Coughlin
Site Acquisition Specialist
Empire Telecom USA, LLC
jcoughlin@empiretelecomm.com

Enclosures: Exhibit 1 – Field Card and GIS Map
Exhibit 2 – Construction Drawings
Exhibit 3 – Structural Analysis
Exhibit 4 – Mount Analysis Recommending Mount Replacement
Exhibit 4 – RF Emissions Analysis Report Evaluation

cc:

The Honorable William W. Dickinson, Jr.
Mayor's Office
45 South Main Street, Room #310
Wallingford, CT 06492

Stephen Tripp
Property Owner
23 Wayne Road
Wallingford, CT 06492

Kacie Hand
Town Planner
45 South Main Street, Room #G-40
Wallingford, CT 06492

EXHIBIT 1


TOWN OF
WALLINGFORD, CT.
PROPERTY MAP
116
N
W
E
S
MERIDEN
CHESHIRE
MIDDLEFIELD
DURHAM
HAMDEN
NORTH HAVEN
NORTH BRANFORD
101
102
103
115
116
117
130
131
132
145
146
147
LEGEND
PARCEL LINE
41
PARCEL ID
50'
*LOT DIMENSIONS
CURRENT TILE FRAME
ROAD
MAIN STREET
ROAD NAME
RIVERS & STREAMS
HYDRO
Parcel Data 02-09-16
GIS Data 02-09-16
0 750 1,500 3,000 4,500 6,000 Feet
102-23
102-14
116-125
116-117
117-9
116-131
CHESHIRE RD
WAYNE RD
DEME RD
MICHAELS WAY
JENNIFER LA
HARVEST LA
LONG VIEW LA
MONTOWESE TRAIL
MONTO WESE TRAIL
ALGONQUIN DR
OAKDALE


88-147
88-144
88-145
88-143
101-50
14
CHESHIRE RD
MONTOWESE TRL
102-25
102-23
102-14
116-125
116-65
116-21
116-116
117-9
MERIDEN
CHESHIRE
MIDDLEFIELD
DURHAM
HAMDEN
NORTH HAVEN
NORTH BRANFORD
87
88
89
101
102
103
115
116
117
130
131
132
LEGEND
PARCEL LINE
41 PARCEL ID
50' *LOT DIMENSIONS
CURRENT TILE FRAME
ROAD
MAIN STREET ROAD NAME
RIVERS & STREAMS
HYDRO
Parcel Data 02-09-16
GIS Data 02-09-16
0 750 1,500 3,000 4,500 6,000 Feet
* Lot dimensions are projected and may not reflect actual measurements.
THIS MAP IS PREPARED FOR THE INVENTORY OF REAL PROPERTY FOUND WITHIN THIS JURISDICTION, AND IS COMPILED FROM RECORDED DEEDS, PLATS AND OTHER RECORDS AND DATA. USERS OF THIS MAP ARE HEREBY NOTIFIED THAT THE AFORMENTIONED PUBLIC PRIMARY INFORMATION SOURCES BE CONSULTED FOR VERIFICATION OF THE INFORMATION CONTAINED ON THIS MAP. THE JURISDICTION AND MAPPING COMPANY ASSUME NO LEGAL RESPONSIBILITY FOR THE INFORMATION CONTAINED ON THIS MAP.
GRID IS BASED ON THE CONNECTICUT STATE PLANE COORDINATE SYSTEM 1983 NORTH AMERICAN DATUM.
COPYRIGHT SpecPrint www.SpecPrint.com 2/10/2016

Property Location: 23 WAYNE RD | **MAP ID:** 116/ / 116/ 1/ | **Bldg Name:** | **State Use:** 1060

Vision ID: 133733 | **Account #** 20010026 | **Bldg #:** 1 of 1 | **Sec #:** 1 of 1 | **Card** 1 of 1 | **Print Date:** 02/24/2017 14:12

CURRENT OWNER	TOPO.	UTILITIES	STRT./ROAD	LOCATION
TRIPP STEPHEN B	2 Above Street	2 Public Water	1 Paved	2 Suburban
23 WAYNE RD	5 Steep			
WALLINGFORD, CT 06492				
Additional Owners:				

SUPPLEMENTAL DATA

Other ID: 077001008001	P/Z MAP #
Census:	ENG MAP #
Old MBLU	Easement
TC MAP #	Town Line?
TC MAP #	IND PARKS
Record Lot	
GIS ID: 116/116/1	ASSOC PID#

CURRENT ASSESSMENT

Description	Code	Appraised Value	Assessed Value
VAC RS LN	5-1	200,000	140,000
VAC OUTBL	5-5	19,500	13,600
	Total	219,500	153,600

6148
WALLINGFORD, CT

VISION

RECORD OF OWNERSHIP	BK-VOL/PAGE	SALE DATE	q/u	v/i	SALE PRICE	V.C.
TRIPP STEPHEN B	857/ 511	03/18/1997	U	I	0	25
STEPHEN B TRIPP	/					

PREVIOUS ASSESSMENTS (HISTORY)

Yr.	Code	Assessed Value	Yr.	Code	Assessed Value	Yr.	Code	Assessed Value
2016	5-1	140,000	2015	5-1	140,000	2014	4-1	140,000
2016	5-5	13,600	2015	5-5	13,600	2014	4-2	36,300
	Total:	153,600		Total:	153,600		Total:	176,300

EXEMPTIONS

Year	Type	Description	Amount
		Total:	

OTHER ASSESSMENTS

Code	Description	Number	Amount	Comm. Int.

This signature acknowledges a visit by a Data Collector or Assessor

ASSESSING NEIGHBORHOOD

NBHD/ SUB	NBHD Name	Street Index Name	Tracing	Batch
0001/A				

NOTES

CELL SITE - ATT/VERIZON/HAMM RADIO
BLDG HOUSES EQUIP FOR CELL TOWER AND
ANTENNAS. BACK-UP GENERATOR
HEAT AND A/C IN 12 X 16
REMOVED CELL TOWER FROM REAL ESTATE
FOR 04GL - DECLARED AS PERSONAL PROPERTY
SEE ALSO 116//116 FOR DWELLING
OWNER USES FOR HAMM RADIO
80 FT SELF SUPPORTING TOWER - CELL AND
MICROWAVE DISHES// ORIG BLT AS RES GAR.
PER OWNER. // (2) O/B = ATT.

APPRAISED VALUE SUMMARY

Appraised Bldg. Value (Card)	0
Appraised XF (B) Value (Bldg)	0
Appraised OB (L) Value (Bldg)	19,500
Appraised Land Value (Bldg)	200,000
Special Land Value	0
Total Appraised Parcel Value	219,500
Valuation Method:	C
Adjustment:	0
Net Total Appraised Parcel Value	219,500

BUILDING PERMIT RECORD

Permit ID	Issue Date	Type	Description	Amount	Insp. Date	% Comp.	Date Comp.	Comments
30373	04/13/2016	CM	Commercial	15,000	09/09/2016	100		3 ANTENNAS/3 RADIO
29456	04/24/2015	CM	Commercial	4,250	07/07/2015	100		3 RADIO HEADS
29456	04/24/2015	CM	Commercial	4,250	07/07/2015	100		3 RADIO HEADS
26696	05/24/2012	CM	Commercial	15,000	10/05/2012	100		3 ANTENNAS
20959	08/31/2006	CM	Commercial	10,000	09/28/2006	100	09/28/2006	INSTALL NEW ANTEN
12553	02/22/2000	NC	New Construct	52,000	12/01/2000	100		GARAGE ADDTN
11242	01/21/2000	NC	New Construct	18,000	12/01/2000	100		FNC,GENERATOR

VISIT/ CHANGE HISTORY

Date	Type	IS	ID	Cd.	Purpose/Result
09/09/2016	02		KC	63	Permit Check - No Measu
12/17/2015			RH	41	Change
07/07/2015	02		TH	63	Permit Check - No Measu
10/05/2012	02		KC	63	Permit Check - No Measu
12/28/2010			DT	41	Change

LAND LINE VALUATION SECTION

B #	Use Code	Use Description	Zone	D	Front	Depth	Units		Unit Price	I. Factor	S.A.	Acre Disc	C. Factor	ST. Idx	Adj.	Notes- Adj	Special Pricing Spec Use	Special Pricing Spec Calc	S Adj Fact	Adj. Unit Price	Land Value
1	1060	Outbuilding MDL-00	R18				1.00	BL	200,000.00	1.0000	0	1.0000	1.00		0.00	CELL SITE			1.00	200,000.00	200,000

Total Card Land Units: 0.00 AC | Parcel Total Land Area: 0 AC | Total Land Value: 200,000

Property Location: 23 WAYNE RD **MAP ID:** 116/ / 116/ 1/ **Bldg Name:** **State Use:** 1060

Vision ID: 133733 **Account #**20010026 **Bldg #:** 1 of 1 **Sec #:** 1 of 1 **Card** 1 of 1 **Print Date:** 02/24/2017 14:12

CONSTRUCTION DETAIL

Element	Cd.	Ch.	Description
Model	00		Vacant

CONSTRUCTION DETAIL (CONTINUED)

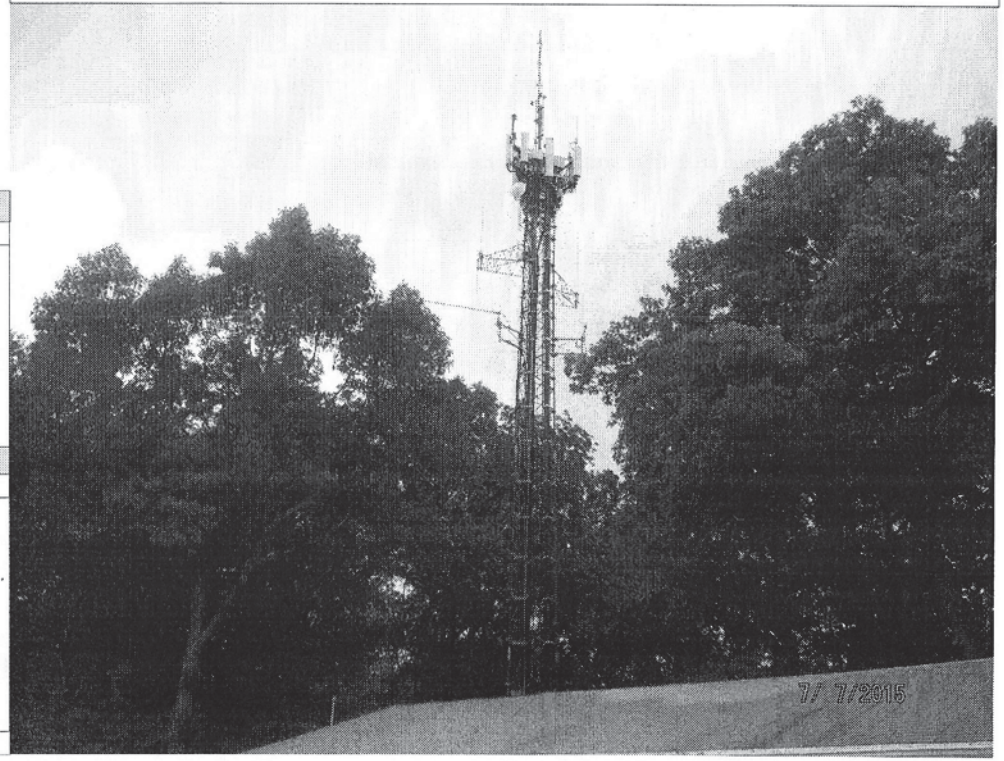
Element	Cd.	Ch.	Description

MIXED USE

Code	Description	Percentage
1060	Outbulding MDL-00	100

COST/MARKET VALUATION

Adj. Base Rate:	0.00
	0
Net Other Adj:	0.00
Replace Cost	0
AYB	
Dep Code	
Remodel Rating	
Year Remodeled	
Dep %	
Functional Obslnc	
External Obslnc	
Cost Trend Factor	
Status	
% Complete	
Overall % Cond	
Apprais Val	
Dep % Ovr	0
Dep Ovr Comment	
Misc Imp Ovr	0
Misc Imp Ovr Comment	
Cost to Cure Ovr	0
Cost to Cure Ovr Comment	



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

Code	Description	Sub	Sub Descript	L/B	Units	Unit Price	Yr	Gde	Dp Rt	Cnd	%Cnd	Apr Value
FGR1	Garage-Avg			L	1,104	30.00	1976	C		A	50	16,600
FGR1	Garage-Avg			L	192	30.00	1976	C		A	50	2,900

BUILDING SUB-AREA SUMMARY SECTION

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

EXHIBIT 2

SITE NAME: MT. TOM WALLINGFORD
FA NUMBER: 10035084
SITE NUMBER: CT2168
6C - MRCTB032233
7C - MRCTB032242
5G NR UPGRADE - MRCTB032262
23 WAYNE ROAD
WALLINGFORD, CT 06492
NEW HAVEN COUNTY

PROJECT NOTES

1. SITE INFORMATION OBTAINED FROM THE FOLLOWING:
   A. PLAN ENTITLED "MT. TOM WALLINGFORD" PREPARED BY CENTEK ENGINEERING OF BRANFORD, CT LAST REVISED 01/06/17.
   B. LIMITED FIELD OBSERVATION BY MASER CONSULTING ON 05/14/2018.
2. THE CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE CODES, ORDINANCES, LAWS AND REGULATIONS OF ALL MUNICIPALITIES, UTILITY COMPANIES OR OTHER PUBLIC/GOVERNING AUTHORITIES.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND INSPECTIONS THAT MAY BE REQUIRED BY ANY FEDERAL, STATE, COUNTY OR MUNICIPAL AUTHORITIES.
4. THE CONTRACTOR SHALL NOTIFY THE CONSTRUCTION MANAGER, IN WRITING, OF ANY CONFLICTS, ERRORS OR OMISSIONS PRIOR TO THE SUBMISSION OF BIDS OR PERFORMANCE OF WORK.
5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING ALL EXISTING SITE IMPROVEMENTS PRIOR TO COMMENCING CONSTRUCTION. THE CONTRACTOR SHALL REPAIR ANY DAMAGE AS A RESULT OF CONSTRUCTION OF THIS FACILITY AT THE CONTRACTOR'S EXPENSE TO THE SATISFACTION OF THE OWNER.
6. THE SCOPE OF WORK FOR THIS PROJECT SHALL INCLUDE PROVIDING ALL MATERIALS, EQUIPMENT AND LABOR REQUIRED TO COMPLETE THIS PROJECT. ALL EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
7. THE CONTRACTOR SHALL VISIT THE PROJECT SITE PRIOR TO SUBMITTING THE BID TO VERIFY THAT THE PROJECT CAN BE CONSTRUCTED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS AND CONSTRUCTION DRAWINGS.
8. THE CONTRACTOR SHALL VERIFY ALL EXISTING DIMENSIONS AND CONDITIONS PRIOR TO COMMENCING ANY WORK. ALL DIMENSIONS OF EXISTING CONSTRUCTION SHOWN ON THESE DRAWINGS MUST BE VERIFIED. THE CONTRACTOR SHALL NOTIFY THE CONSTRUCTION MANAGER OF ANY DISCREPANCIES PRIOR TO ORDERING MATERIAL OR PROCEEDING WITH CONSTRUCTION.
9. SINCE THE CELL SITE MAY BE ACTIVE, ALL SAFETY PRECAUTIONS MUST BE TAKEN WHEN WORKING AROUND HIGH LEVELS OF ELECTROMAGNETIC RADIATION. EQUIPMENT SHOULD BE SHUTDOWN PRIOR TO PERFORMING ANY WORK THAT COULD EXPOSE THE WORKERS TO DANGER. PERSONAL RF EXPOSURE MONITORS ARE REQUIRED TO BE WORN TO ALERT OF ANY POTENTIALLY DANGEROUS EXPOSURE LEVELS.
10. THE PROPOSED FACILITY WILL CAUSE AN INSIGNIFICANT OR "DE-MINIMUS" INCREASE IN STORM WATER RUNOFF, THEREFORE, NO DRAINAGE STRUCTURES ARE PROPOSED.
11. NO NOISE, SMOKE, DUST OR ODOR WILL RESULT FROM THIS FACILITY AS TO CAUSE A NUISANCE.
12. THE FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION (NO HANDICAP ACCESS IS REQUIRED).
13. THE FACILITY DOES NOT REQUIRE POTABLE WATER OR SANITARY SERVICE.
14. CONTRACTOR SHALL VERIFY ANTENNA ELEVATION AND AZIMUTHS WITH RF ENGINEERING PRIOR TO INSTALLATION.
15. THE TOWER, MOUNTS AND ANTENNAS SHALL BE DESIGNED TO MEET EIA/TIA-222-G AS PER IBC REQUIREMENTS.
16. ALL STRUCTURAL ELEMENTS SHALL BE HOT DIPPED GALVANIZED STEEL.
17. CONTRACTOR MUST FIELD LOCATE ALL EXISTING UNDERGROUND UTILITIES PRIOR TO ANY EXCAVATION.
18. CONSTRUCTION SHALL NOT COMMENCE UNTIL COMPLETION OF A PASSING STRUCTURAL ANALYSIS CERTIFIED BY A LICENSED PROFESSIONAL ENGINEER. THE STRUCTURAL ANALYSIS IS TO BE PERFORMED BY OTHERS.
19. CONTRACTOR SHALL CONTACT STATE SPECIFIC ONE CALL SYSTEM THREE WORKING DAYS PRIOR TO ANY EARTH MOVING ACTIVITIES.

VICINITY MAP

CODE COMPLIANCE

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

1. 2016 CONNECTICUT STATE BUILDING CODE, INCORPORATING THE 2012 IBC
2. 2014 NATIONAL ELECTRICAL CODE - NFPA 70
3. 2012 NFPA 101
4. AMERICAN INSTITUTE OF STEEL CONSTRUCTION 360-10
5. AMERICAN CONCRETE INSTITUTE
6. TIA-222-G
7. TIA 607 FOR GROUNDING
8. INSTITUTE FOR ELECTRICAL AND ELECTRONICS ENGINEERS 81 IEEE C2 LATEST EDITION
9. TELCORDIA GR-1275
10. ANSI T1.311
11. PROPOSED USE: UNMANNED TELECOM FACILITY
12. HANDICAP REQUIREMENTS: FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION. HANDICAPPED ACCESS NOT REQUIRED.
13. CONSTRUCTION TYPE: IIB
14. USE GROUP: U

PROJECT INFORMATION

SITE INFORMATION

LATITUDE: 41.4627419° N
LONGITUDE: 72.8418881° W
JURISDICTION: NEW HAVEN COUNTY

APPLICANT/LESSEE

COMPANY: NEW CINGULAR WIRELESS PCS, LLC
ADDRESS: 550 COCHITUATE ROAD
CITY, STATE, ZIP: FRAMINGHAM, MA 01701

STRUCTURE OWNER

COMPANY: TBD
ADDRESS: TBD
CITY, STATE, ZIP: TBD

CLIENT REPRESENTATIVE

COMPANY: EMPIRE TELECOM
ADDRESS: 16 ESQUIRE ROAD
CITY, STATE, ZIP: BILLERICA, MA 01862
CONTACT: DAVID COOPER
E-MAIL: DCOOPER@EMPIRETELECOM.COM

SITE ACQUISITION

COMPANY: EMPIRE TELECOM
ADDRESS: 16 ESQUIRE ROAD
CITY, STATE, ZIP: BILLERICA, MA 01862
CONTACT: DAVID COOPER
E-MAIL: DCOOPER@EMPIRETELECOM.COM

ENGINEER

COMPANY: MASER CONSULTING P.A.
ADDRESS: 331 NEWMAN SPRINGS ROAD, SUITE 203
CITY, STATE, ZIP: RED BANK, NJ 07701-5669
CONTACT: ROBERT ANDREWS
PHONE: (856) 797-0412
E-MAIL: RANDREWS@MASERCONSULTING.COM

PROJECT DESCRIPTION/ SCOPE OF WORK

- INSTALL (9) NEW RRU'S, (3) PER SECTOR
- RELOCATE (9) EXISTING RRU'S, (3) PER SECTOR
- REMOVE (3) EXISTING RRU'S AT GRADE
- INSTALL (3) NEW PANEL ANTENNAS, (1) PER SECTOR
- INSTALL (1) NEW DC-6 DOME (DC ONLY)
- INSTALL (2) NEW 6/C DC CABLES
- INSTALL (6) NEW LOW BAND COMBINERS, (2) PER SECTOR
- REPLACE EXISTING ANTENNA MOUNTS WITH (3) NEW SECTOR FRAMES, (1) PER SECTOR
- SWAP (2) DUS WITH (2) 5216, ADD IDLe AND (1) 6630

PROPOSED PROJECT SCOPE BASED ON RFDS ID# 2346933, VERSION 2.0, LAST UPDATED 06/14/18.

SHEET INDEX

SHEET	DESCRIPTION
T-1	TITLE SHEET
GN-1	GENERAL NOTES
C-1	COMPOUND PLAN
C-2	EQUIPMENT LAYOUT AND ELEVATION VIEW
C-3	ANTENNA LAYOUTS AND ANTENNA SCHEDULE
A-1	DETAILS
A-2	DETAILS
A-3	DETAILS
A-4	RF PLUMBING DIAGRAM
G-1	GROUNDING DETAILS
S-1	STRUCTURAL DETAILS
S-2	STRUCTURAL DETAILS
S-3	STRUCTURAL NOTES
S-4	STRUCTURAL NOTES

MASER CONSULTING
— CONNECTICUT —
Customer Loyalty through Client Satisfaction
www.maserconsulting.com
Engineers ■ Planners ■ Surveyors
Landscape Architects ■ Environmental Scientists

at&t

EMPIRE telecom

811
Know what's below. Call before you dig.
PROTECT YOURSELF
ALL STATES REQUIRE NOTIFICATION OF EXCAVATORS, DESIGNERS, OR ANY PERSON PREPARING TO DISTURB THE EARTH'S SURFACE ANYWHERE IN ANY STATE
FOR STATE SPECIFIC DIRECT PHONE NUMBERS VISIT: WWW.CALL811.COM

SCALE: AS SHOWN
JOB NUMBER: 18963007A

REV	DATE	DESCRIPTION	DRAWN BY	CHECKED BY
.	.	.	.	.
.	.	.	.	.
5	02/22/19	STRUCTURAL REVISIONS	AJC	RA
4	02/11/19	REVISED PER COMMENTS	AJC	RA
4	12/18/18	REVISED PER COMMENTS	AJC	RA
3	11/30/18	NEW MOUNT REVISION	AJC	RA
2	09/25/18	REVISED PER COMMENTS	AJC	RA
1	09/14/18	ISSUED FOR REVIEW	MJB	RA

PETROS TOUKALAS
CONNECTICUT PROFESSIONAL ENGINEER - LICENSE NUMBER: 23567

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF THE RESPONSIBLE LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

SITE NAME:
MT. TOM WALLINGFORD
FA# 10035084
SITE# CT2168
23 WAYNE ROAD
WALLINGFORD, CT 06492
NEW HAVEN COUNTY

RED BANK OFFICE
331 NEWMAN SPRINGS ROAD
SUITE 203
RED BANK, NJ 07701-5669
Phone: 732.383.1950
Fax: 732.383.1984
email: solutions@maserconsulting.com

SHEET TITLE: TITLE SHEET
SHEET NUMBER: T-1

GENERAL NOTES:

1. THE SUBCONTRACTOR SHALL REVIEW AND INSPECT THE EXISTING FACILITY GROUNDING SYSTEM (AS DESIGNED AND INSTALLED) FOR STRICT COMPLIANCE WITH THE NEC (AS ADOPTED BY THE AHJ), THE SITE-SPECIFIC (UL, LPI, OR NFPA) LIGHTING PROTECTION CODE, AND GENERAL COMPLIANCE WITH TELCORDIA AND TIA GROUNDING STANDARDS. THE SUBCONTRACTOR SHALL REPORT ANY VIOLATIONS OR ADVERSE FINDINGS TO THE CONTRACTOR FOR RESOLUTION.
2. ALL GROUND ELECTRODE SYSTEMS (INCLUDING TELECOMMUNICATION, RADIO, LIGHTNING PROTECTION, AND AC POWER GES'S) SHALL BE BONDED TOGETHER, AT OR BELOW GRADE, BY TWO OR MORE COPPER BONDING CONDUCTORS IN ACCORDANCE WITH THE NEC.
3. THE SUBCONTRACTOR SHALL PERFORM IEEE FALL-OF-POTENTIAL RESISTANCE TO EARTH TESTING (PER IEEE 1100 AND 81) FOR GROUND ELECTRODE SYSTEMS. THE SUBCONTRACTOR SHALL FURNISH AND INSTALL SUPPLEMENTAL GROUND ELECTRODES AS NEEDED TO ACHIEVE A TEST RESULT OF 5O HMS OR LESS.
4. THE SUBCONTRACTOR IS RESPONSIBLE FOR PROPERLY SEQUENCING GROUNDING AND UNDERGROUND CONDUIT INSTALLATION AS TO PREVENT ANY LOSS OF CONTINUITY IN THE GROUNDING SYSTEM OR DAMAGE TO THE CONDUIT.
5. METAL CONDUIT AND TRAY SHALL BE GROUNDED AND MADE ELECTRICALLY CONTINUOUS WITH LISTED BONDING FITTINGS OR BY BONDING ACROSS THE DISCONTINUITY WITH #6 AWG COPPER WIRE UL APPROVED GROUNDING TYPE CONDUIT CLAMPS.
6. METAL RACEWAY SHALL NOT BE USED AS THE NEC REQUIRED EQUIPMENT GROUND CONDUCTOR. STRANDED COPPER CONDUCTORS WITH GREEN INSULATION, SIZED IN ACCORDANCE WITH THE NEC, SHALL BE FURNISHED AND INSTALLED WITH THE POWER CIRCUITS TO BTS EQUIPMENT.
7. EACH BTS CABINET FRAME SHALL BE DIRECTLY CONNECTED TO THE EQUIPMENT GROUND RING WITH GREEN INSULATED SUPPLEMENTAL EQUIPMENT GROUND WIRES, 6 AWG STRANDED COPPER OR LARGER FOR INDOOR BTS; 2 AWG STRANDED COPPER FOR OUTDOOR BTS.
8. CONNECTIONS TO THE GROUND BUS SHALL NOT BE DOUBLED UP OR STACKED. BACK TO BACK CONNECTIONS ON OPPOSITE SIDES OF THE GROUND BUS ARE PERMITTED.
9. ALL EXTERIOR GROUND CONDUCTORS BETWEEN EQUIPMENT/GROUND BARS AND THE GROUND RING, SHALL BE #2 AWG SOLID TINNED COPPER UNLESS OTHERWISE INDICATED.
10. ALUMINUM CONDUCTOR OR COPPER CLAD STEEL CONDUCTOR SHALL NOT BE USED FOR GROUNDING CONNECTIONS.
11. USE OF 90° BENDS IN THE PROTECTION GROUNDING CONDUCTORS SHALL BE AVOIDED WHEN 45° BENDS CAN BE ADEQUATELY SUPPORTED. ALL BENDS SHALL BE MADE WITH 12" RADIUS OR LARGER.
12. EXOTHERMIC WELDS SHALL BE USED FOR ALL GROUNDING CONNECTIONS BELOW GRADE.
13. ALL GROUND CONNECTIONS ABOVE GRADE (INTERIOR) SHALL BE FORMED USING HIGH PRESS CRIMPS EXCEPT FOR GROUND BAR CONNECTION FROM MGB TO OUTSIDE EXTERIOR GROUND SHALL ALL BE CADWELD CONNECTIONS.
14. COMPRESSION GROUND CONNECTIONS MAY BE REPLACED BY EXOTHERMIC WELD CONNECTIONS.
15. ICE BRIDGE BONDING CONDUCTORS SHALL BE EXOTHERMICALLY BONDED TO THE TOWER GROUND BAR.
16. APPROVED ANTIOXIDANT COATINGS (I.E. CONDUCTIVE GEL OR PASTE) SHALL BE USED ON ALL COMPRESSION AND BOLTED GROUND CONNECTIONS.
17. ALL EXTERIOR AND INTERIOR GROUND CONNECTIONS SHALL BE COATED WITH A CORROSION RESISTANT MATERIAL.
18. MISCELLANEOUS ELECTRICAL AND NON-ELECTRICAL METAL BOXES, FRAMES AND SUPPORTS SHALL BE BONDED TO THE GROUND RING, IN ACCORDANCE WITH THE NEC.
19. BOND ALL METALLIC OBJECTS WITHIN 6 FT OF MAIN GROUND WIRES WITH 1-#2 AWG TIN-PLATED COPPER GROUND CONDUCTOR.
20. GROUND CONDUCTORS USED IN THE FACILITY GROUND AND LIGHTNING PROTECTION SYSTEMS SHALL NOT BE ROUTED THROUGH METALLIC OBJECTS THAT FORM A RING AROUND THE CONDUCTOR, SUCH AS METALLIC CONDUITS, METAL SUPPORT CLIPS OR SLEEVES THROUGH WALLS OR FLOORS. WHEN IT IS REQUIRED TO BE HOUSED IN CONDUIT TO MEET CODE REQUIREMENTS OR LOCAL CONDITIONS, NON-METALLIC MATERIAL SUCH AS PVC PLASTIC CONDUIT SHALL BE USED. WHERE USE OF METAL CONDUIT IS UNAVOIDABLE (E.G. NON-METALLIC CONDUIT PROHIBITED BY LOCAL CODE) THE GROUND CONDUCTOR SHALL BE BONDED TO EACH END OF THE METAL CONDUIT.
21. ALL NEW STRUCTURES WITH A FOUNDATION AND/OR FOOTING HAVING 20 FT. OR MORE OF 1/4" IN. OR GREATER ELECTRICALLY CONDUCTIVE REINFORCING STEEL MUST HAVE IT BONDED TO THE GROUND RING USING AN EXOTHERMIC WELD CONNECTION USING #2 AWG SOLID BARE TINNED COPPER GROUND WIRE, PER NEC 250.50.
22. FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:

    CONTRACTOR - EMPIRE TELECOM
    SUBCONTRACTOR - GENERAL CONTRACTOR (CONSTRUCTION)
    OWNER - AT&T (NEW CINGULAR WIRELESS PCS, LLC)

23. ALL SITE WORK SHALL BE COMPLETED AS INDICATED ON THE DRAWINGS AND PROJECT SPECIFICATIONS.
24. DRAWINGS PROVIDED HERE ARE NOT TO BE SCALED AND ARE INTENDED TO SHOW OUTLINE ONLY.
25. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES. SUBCONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS, AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK.
26. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.
27. UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES, AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
28. THE SUBCONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
29. IF THE SPECIFIED EQUIPMENT CANNOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE SUBCONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION SPACE FOR APPROVAL BY THE CONTRACTOR.
30. THE SUBCONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT SUBCONTRACTOR'S EXPENSE TO THE SATISFACTION OF OWNER.
31. THE SUBCONTRACTOR SHALL CONTACT UTILITY LOCATING SERVICES PRIOR TO THE START OF CONSTRUCTION.
32. ALL EXISTING ACTIVE SEWER, WATER, GAS, ELECTRIC, AND OTHER UTILITIES WHERE ENCOUNTERED IN THE WORK, SHALL BE PROTECTED AT ALL TIMES, AND WHERE REQUIRED FOR THE PROPER EXECUTION OF THE WORK, SHALL BE RELOCATED AS DIRECTED BY THE RESPONSIBLE ENGINEER. EXTREME CAUTION SHOULD BE USED BY THE SUBCONTRACTOR WHEN EXCAVATING OR DRILLING PIERS AROUND OR NEAR UTILITIES. SUBCONTRACTOR SHALL PROVIDE SAFETY TRAINING FOR THE WORKING CREW. THIS WILL INCLUDE BUT NOT BE LIMITED TO A) FALL PROTECTION B) CONFINED SPACE C) ELECTRICAL SAFETY D) TRENCHING & EXCAVATION.
33. ALL EXISTING INACTIVE SEWER, WATER, GAS, ELECTRIC AND OTHER UTILITIES, WHICH INTERFERE WITH THE EXECUTION OF THE WORK, SHALL BE REMOVED AND/OR CAPPED, PLUGGED OR OTHERWISE DISCONTINUED AT POINTS WHICH WILL NOT INTERFERE WITH THE EXECUTION OF THE WORK, AS DIRECTED BY THE RESPONSIBLE ENGINEER, AND SUBJECT TO THE APPROVAL OF THE OWNER AND/OR LOCAL UTILITIES.
34. THE AREAS OF THE OWNER'S PROPERTY DISTURBED BY THE WORK AND NOT COVERED BY THE TOWER, EQUIPMENT OR DRIVEWAY SHALL BE GRADED TO A UNIFORM SLOPE AND STABILIZED TO PREVENT EROSION.
35. SUBCONTRACTOR SHALL MINIMIZE DISTURBANCE TO EXISTING SITE DURING CONSTRUCTION. EROSION CONTROL MEASURES, IF REQUIRED DURING CONSTRUCTION, SHALL BE IN CONFORMANCE WITH THE LOCAL GUIDELINES FOR EROSION AND SEDIMENT CONTROL.
36. NO FILL OR EMBANKMENT MATERIAL SHALL BE PLACED ON FROZEN GROUND. FROZEN MATERIALS, SNOW OR ICE SHALL NOT BE PLACED IN ANY FILL OR EMBANKMENT.
37. THE SUBGRADE SHALL BE COMPACTED AND BROUGHT TO A SMOOTH UNIFORM GRADE PRIOR TO FINISHED SURFACE APPLICATION.
38. THE SITE SHALL BE GRADED TO CAUSE SURFACE WATER TO FLOW AWAY FROM THE BTS EQUIPMENT AND TOWER AREAS.
39. IF NECESSARY, RUBBISH, STUMPS, DEBRIS, STICKS, STONES AND OTHER REFUSE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF LEGALLY.
40. THE SUBCONTRACTOR SHALL PROVIDE SITE SIGNAGE IN ACCORDANCE WITH THE TECHNICAL SPECIFICATION FOR SITE SIGNAGE.
41. SUBCONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION.
42. PRIOR TO THE SUBMISSION OF BIDS, THE BIDDING SUBCONTRACTOR SHALL VISIT THE CELL SITE TO FAMILIARIZE WITH THE EXISTING CONDITIONS AND TO CONSTRUCTION DRAWINGS. ANY DISCREPANCY FOUND SHALL BE BROUGHT TO THE ATTENTION OF THE CONTRACTOR.
43. SUBCONTRACTOR SHALL DETERMINE ACTUAL ROUTING OF CONDUIT, POWER AND T1 CABLES, GROUNDING CABLES AS SHOWN ON THE POWER, GROUNDING AND TELCO PLAN DRAWING. SUBCONTRACTOR SHALL UTILIZE EXISTING TRAYS AND/OR SHALL ADD NEW TRAYS AS NECESSARY. SUBCONTRACTOR SHALL CONFIRM THE ACTUAL ROUTING WITH THE CONTRACTOR.
44. ALL CONCRETE REPAIR WORK SHALL BE DONE IN ACCORDANCE WITH AMERICAN CONCRETE INSTITUTE (ACI) 301.
45. ANY NEW CONCRETE NEEDED FOR THE CONSTRUCTION SHALL BE AIR-ENTRAINED AND SHALL HAVE 4000 PSI STRENGTH AT 28 DAYS.
46. ALL STRUCTURAL STEEL WORK SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH AISC SPECIFICATIONS. ALL STRUCTURAL STEEL SHALL BE ASTM A36 (Fy = 36 ksi) UNLESS OTHERWISE NOTED. PIPES SHALL BE ASTM A53 TYPE E (Fy = 36 ksi). ALL STEEL EXPOSED TO WEATHER SHALL BE HOT DIPPED GALVANIZED. TOUCHUP ALL SCRATCHES AND OTHER MARKS IN THE FIELD AFTER STEEL IS ERECTED USING A COMPATIBLE ZINC RICH PAINT.
47. CONSTRUCTION SHALL COMPLY WITH SPECIFICATIONS AND "GENERAL CONSTRUCTION SERVICES FOR CONSTRUCTION OF AT&T MOBILITY SITES."
48. SUBCONTRACTOR SHALL VERIFY ALL EXISTING DIMENSIONS AND CONDITIONS PRIOR TO COMMENCING ANY WORK. ALL DIMENSIONS OF EXISTING CONSTRUCTION SHOWN ON THE DRAWINGS MUST BE VERIFIED. SUBCONTRACTOR SHALL NOTIFY THE CONTRACTOR OF ANY DISCREPANCIES PRIOR TO ORDERING MATERIAL OR PROCEEDING WITH CONSTRUCTION.
49. THE EXISTING CELL SITE IS IN FULL COMMERCIAL OPERATION, ANY CONSTRUCTION WORK BY SUBCONTRACTOR SHALL NOT DISRUPT THE EXISTING NORMAL OPERATION. ANY WORK ON EXISTING EQUIPMENT MUST BE COORDINATED WITH CONTRACTOR. ALSO, WORK SHOULD BE SCHEDULED FOR AN APPROPRIATE MAINTENANCE WINDOW USUALLY IN LOW TRAFFIC PERIODS AFTER MIDNIGHT.
50. SINCE THE CELL SITE IS ACTIVE, ALL SAFETY PRECAUTIONS MUST BE TAKEN WHEN WORKING AROUND HIGH LEVELS OF ELECTROMAGNETIC RADIATION. EQUIPMENT SHOULD BE SHUTDOWN PRIOR TO PERFORMING ANY WORK THAT COULD EXPOSE THE WORKERS TO DANGER. PERSONAL RF EXPOSURE MONITORS ARE ADVISED TO BE WORN ALERT OF DANGEROUS EXPOSURE LEVELS.

MASER CONSULTING — CONNECTICUT —
Customer Loyalty through Client Satisfaction
www.maserconsulting.com
Engineers ■ Planners ■ Surveyors
Landscape Architects ■ Environmental Scientists

at&t

EMPIRE telecom

811 PROTECT YOURSELF
ALL STATES REQUIRE NOTIFICATION OF EXCAVATORS, DESIGNERS, OR ANY PERSON PREPARING TO DISTURB THE EARTH'S SURFACE ANYWHERE IN ANY STATE
Know what's below. Call before you dig.
FOR STATE SPECIFIC DIRECT PHONE NUMBERS VISIT: WWW.CALL811.COM

SCALE :	JOB NUMBER :
AS SHOWN	18963007A

REV	DATE	DESCRIPTION	DRAWN BY	CHECKED BY
.	.	.	.	.
.	.	.	.	.
5	02/22/19	STRUCTURAL REVISIONS	AJC	RA
4	02/11/19	REVISED PER COMMENTS	AJC	RA
4	12/18/18	REVISED PER COMMENTS	AJC	RA
3	11/30/18	NEW MOUNT REVISION	AJC	RA
2	09/25/18	REVISED PER COMMENTS	AJC	RA
1	09/14/18	ISSUED FOR REVIEW	MJB	RA

PETROS [illegible]OUKALAS
CONNECTICUT PROFESSIONAL ENGINEER - LICENSE NUMBER: 32577

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF THE RESPONSIBLE LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

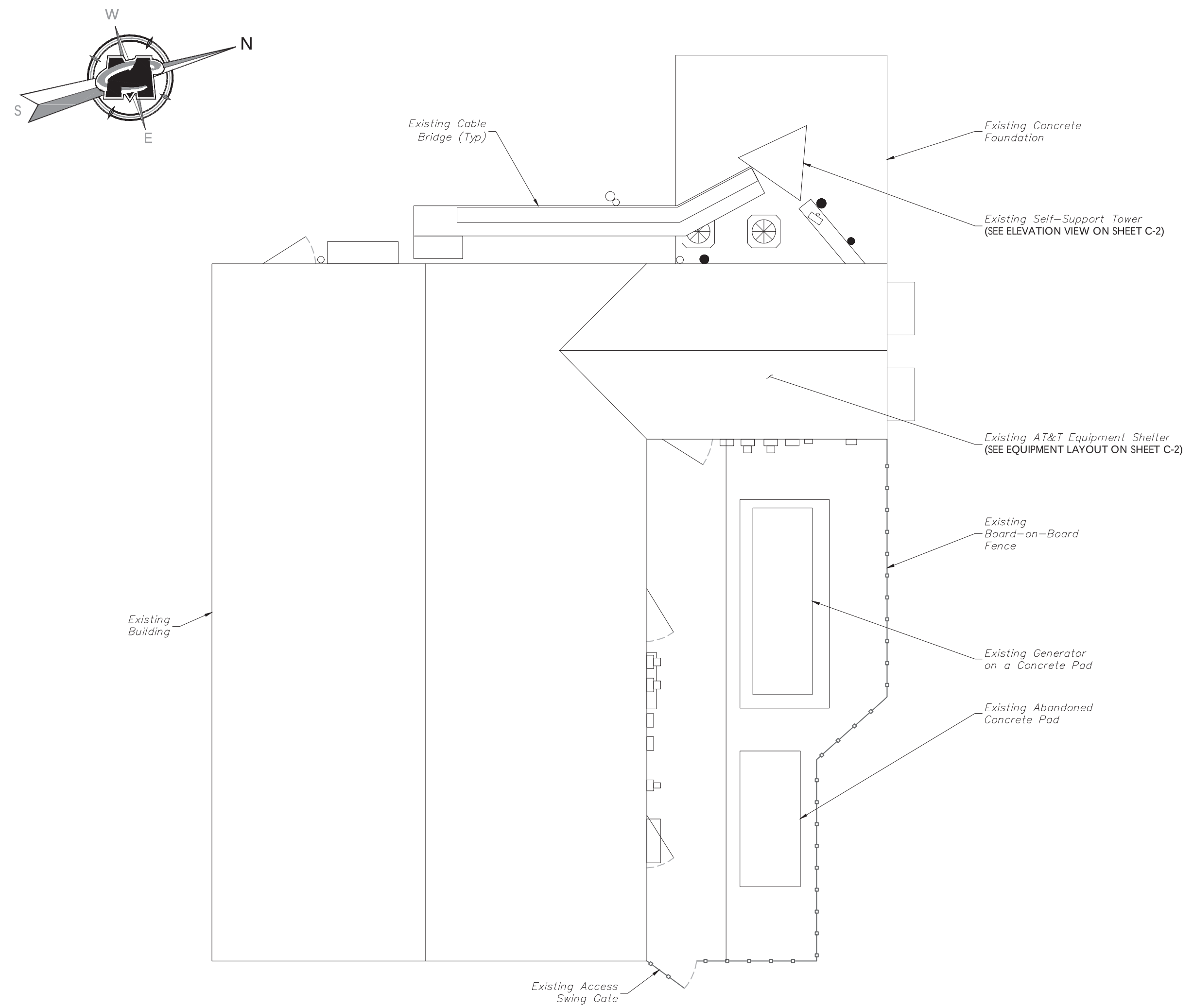
SITE NAME:

MT. TOM WALLINGFORD
FA# 10035084
SITE# CT2168
23 WAYNE ROAD
WALLINGFORD, CT 06492
NEW HAVEN COUNTY

RED BANK OFFICE
331 NEWMAN SPRINGS ROAD
SUITE 203
RED BANK, NJ 07701-5669
Phone: 732.383.1950
Fax: 732.383.1984
email: solutions@maserconsulting.com

SHEET TITLE: GENERAL NOTES

SHEET NUMBER: GN-1



COMPOUND PLAN

SCALE : 1" = 4' FOR 22"X34"
(SCALE : 1" = 8' FOR 11"X17")

MASER CONSULTING — CONNECTICUT —

Customer Loyalty through Client Satisfaction
www.maserconsulting.com
Engineers ■ Planners ■ Surveyors
Landscape Architects ■ Environmental Scientists

at&t

EMPIRE telecom

811 Know what's below. Call before you dig.
PROTECT YOURSELF
ALL STATES REQUIRE NOTIFICATION OF EXCAVATORS, DESIGNERS, OR ANY PERSON PREPARING TO DISTURB THE EARTHS SURFACE ANYWHERE IN ANY STATE
FOR STATE SPECIFIC DIRECT PHONE NUMBERS VISIT: WWW.CALL811.COM

SCALE:	JOB NUMBER:
AS SHOWN	18963007A

REV	DATE	DESCRIPTION	DRAWN BY	CHECKED BY
-	-	-	-	-
5	02/22/19	STRUCTURAL REVISIONS	AJC	RA
4	02/11/19	REVISED PER COMMENTS	AJC	RA
4	12/18/18	REVISED PER COMMENTS	AJC	RA
3	11/30/18	NEW MOUNT REVISION	AJC	RA
2	09/25/18	REVISED PER COMMENTS	AJC	RA
1	09/14/18	ISSUED FOR REVIEW	MB	RA

PETROS TSOUKALAS
CONNECTICUT PROFESSIONAL ENGINEER - LICENSE NUMBER: 25197

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF THE RESPONSIBLE LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

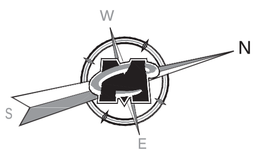
SITE NAME:

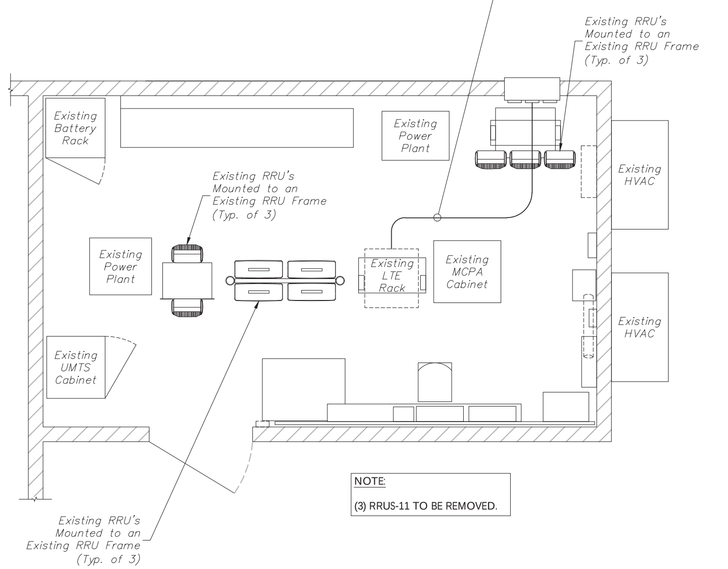
MT. TOM WALLINGFORD
FA# 10035084
SITE# CT2168
23 WAYNE ROAD
WALLINGFORD, CT 06492
NEW HAVEN COUNTY

RED BANK OFFICE
331 NEWMAN SPRINGS ROAD
SUITE 203
RED BANK, NJ 07701-5669
Phone: 732.383.1950
Fax: 732.383.1984
email: solutions@maserconsulting.com

SHEET TITLE: COMPOUND PLAN

SHEET NUMBER: C-1



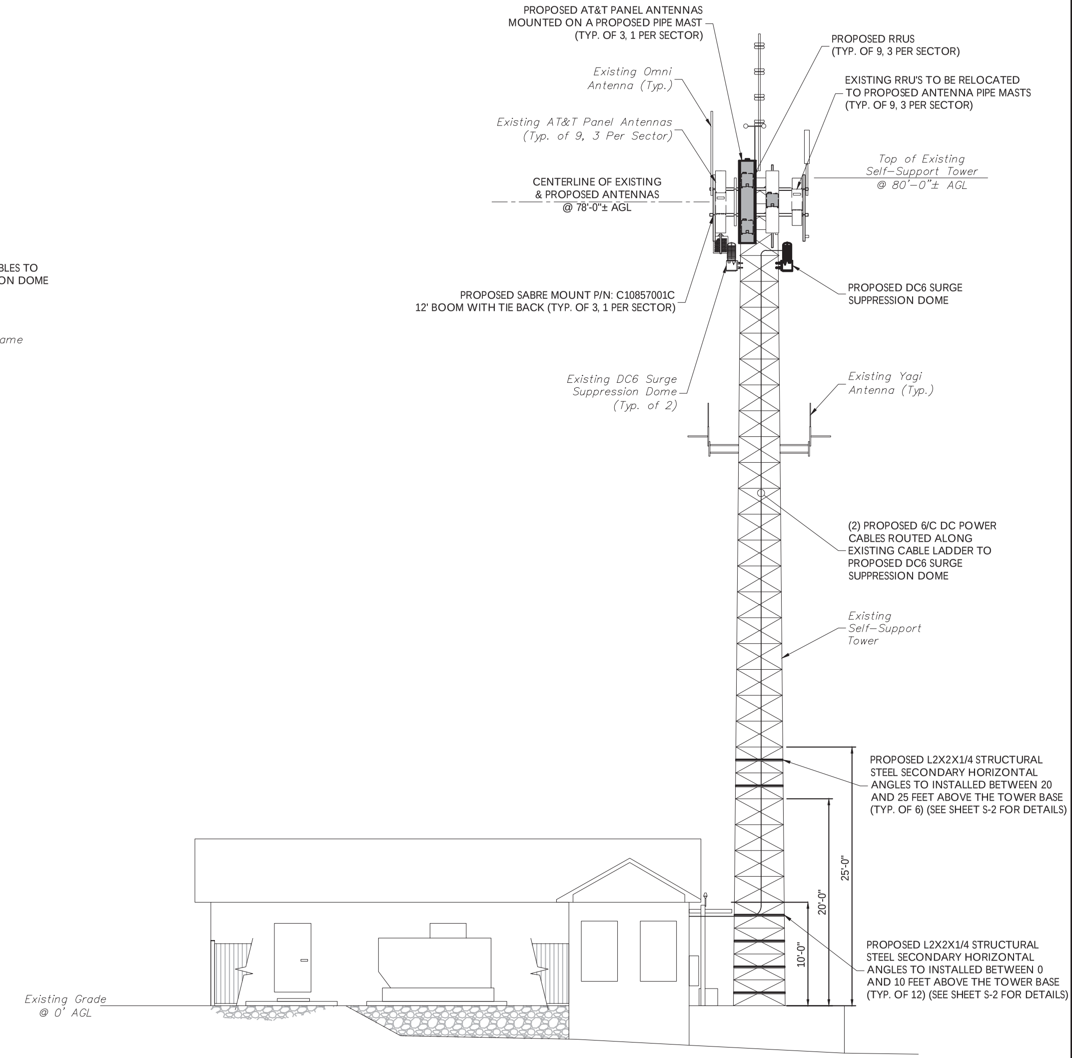


NOTE:

(3) RRUS-11 TO BE REMOVED.

EQUIPMENT LAYOUT

SCALE : 1" = 2' FOR 22"X34"
(SCALE : 1" = 4' FOR 11"X17")



ELEVATION VIEW

SCALE : 1" = 6' FOR 22"X34"
(SCALE : 1" = 12' FOR 11"X17")

STRUCTURAL NOTES:

1. A STRUCTURAL ANALYSIS REPORT PREPARED BY MASER CONSULTING P.A., DATED 11/16/2018 HAS BEEN PREPARED TO CHECK THE STRUCTURAL CAPACITY OF THE TOWER AND ANTENNA MOUNT TO SUPPORT THE PROPOSED ANTENNA AND EQUIPMENT CONFIGURATION AS DEPICTED WITHIN THESE CONSTRUCTION DRAWINGS. BASED ON THE CONCLUSIONS OF THIS REPORT, THE TOWER AND ANTENNA MOUNT HAVE BEEN DETERMINED TO HAVE ADEQUATE CAPACITY.

MASER CONSULTING
— CONNECTICUT —
Customer Loyalty through Client Satisfaction
www.maserconsulting.com
Engineers ■ Planners ■ Surveyors
Landscape Architects ■ Environmental Scientists

at&t

EMPIRE telecom

811 Know what's below. Call before you dig.
PROTECT YOURSELF
ALL STATES REQUIRE NOTIFICATION OF EXCAVATORS, DESIGNERS, OR ANY PERSON PREPARING TO DISTURB THE EARTH'S SURFACE ANYWHERE IN ANY STATE
FOR STATE SPECIFIC DIRECT PHONE NUMBERS VISIT: WWW.CALL811.COM

SCALE:	JOB NUMBER:
AS SHOWN	18963007A

REV	DATE	DESCRIPTION	DRAWN BY	CHECKED BY
5	02/22/19	STRUCTURAL REVISIONS	AJC	RA
4	02/11/19	REVISED PER COMMENTS	AJC	RA
4	12/18/18	REVISED PER COMMENTS	AJC	RA
3	11/30/18	NEW MOUNT REVISION	AJC	RA
2	09/25/18	REVISED PER COMMENTS	AJC	RA
1	09/14/18	[illegible]	MJB	RA

PETROS [illegible] TOUKALAS
CONNECTICUT PROFESSIONAL ENGINEER - LICENSE NUMBER: [illegible]

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF THE RESPONSIBLE LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

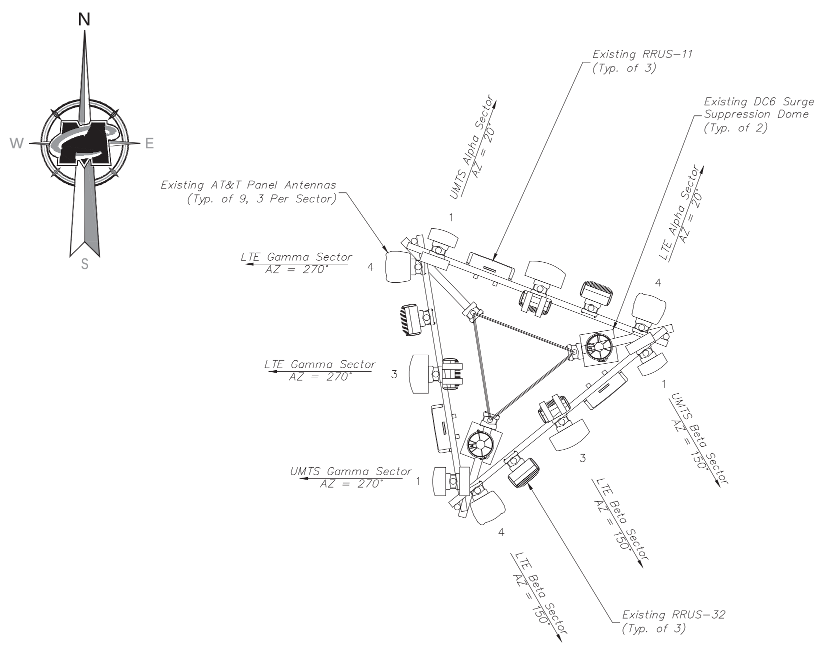
SITE NAME:

MT. TOM WALLINGFORD
FA# 10035084
SITE# CT2168
23 WAYNE ROAD
WALLINGFORD, CT 06492
NEW HAVEN COUNTY

RED BANK OFFICE
331 NEWMAN SPRINGS ROAD
SUITE 203
RED BANK, NJ 07701-5669
Phone: 732.383.1950
Fax: 732.383.1984
email: solutions@maserconsulting.com

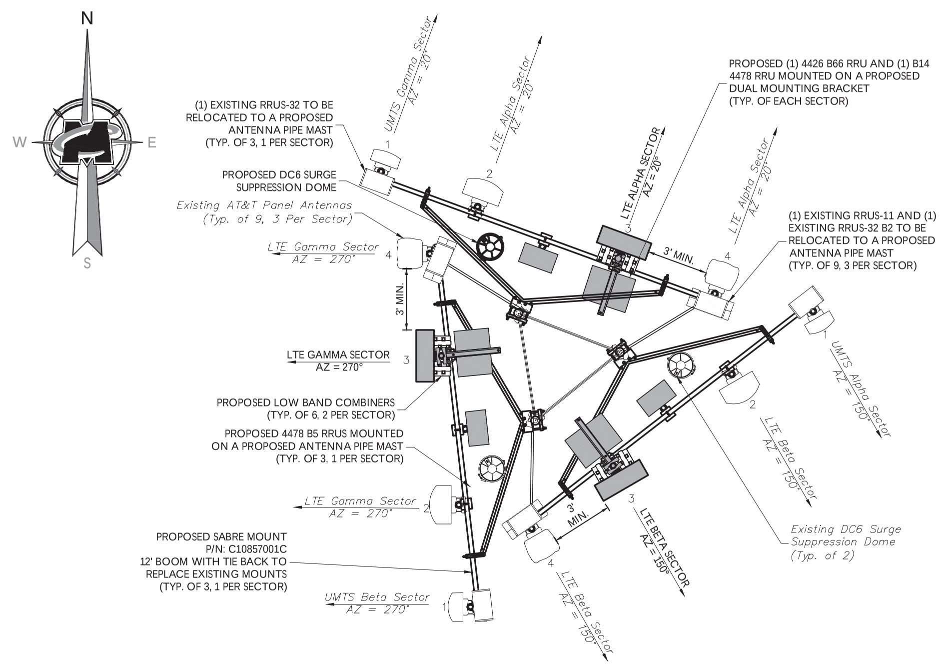
SHEET TITLE:
EQUIPMENT LAYOUT AND ELEVATION VIEW

SHEET NUMBER:
C-2



EXISTING ANTENNA LAYOUT

NOT TO SCALE



PROPOSED ANTENNA LAYOUT

NOT TO SCALE

ANTENNA SCHEDULE

	SECTOR	EXISTING ANTENNA	PROPOSED ANTENNA	TECHNOLOGY	ANTENNA STATUS	HEIGHT (in)	WIDTH (in)	DEPTH (in)	WEIGHT (lbs)	ANTENNA AZIMUTH (DEG.)	ANT. CL. ELEV. (ft.)	REMOTE RADIO/TMA CONFIGURATION	TRANSMISSION CABLE QUANTITY	TYPE	STATUS
Sector 1	1	POWERWAVE 7770	POWERWAVE 7770	UMTS	EXISTING	55.00	11.00	5.00	35.00	150	78	(1) POWERWAVE TT19-08BP111-001 TWIN TMA	1	7/8" COAX	EXISTING
	2	CCI OPA-65R-LCUU-H6	CCI OPA-65R-LCUU-H6	LTE	EXISTING	72.00	14.80	7.40	88.00	20	78	(1) RRUS-E2 B29 (AT GRADE) RRUS-32	1/2	FIBER/DC	EXISTING
	3	- -	**KATHREIN 80010965**	**LTE**	**PROPOSED**	**78.70**	**20.00**	**6.90**	**108.60**	**20**	**78**	**(1) B14 4478 (1) 4478 B5 (1) RRUS-32 B2 (2) DBCT108F1V92-1**	**1/2**	**FIBER/DC**	**PROPOSED**
	4	QUINTEL QS66512-2	QUINTEL QS66512-2	LTE	EXISTING	72.00	12.00	9.60	126.60	20	78	(1) RRUS -11 (1) RRUS-32	-	FIBER/DC	EXISTING
Sector 2	1	POWERWAVE 7770	POWERWAVE 7770	UMTS	EXISTING	55.00	11.00	5.00	35.00	270	78	(1) POWERWAVE TT19-08BP111-001 TWIN TMA	1	7/8" COAX	EXISTING
	2	CCI OPA-65R-LCUU-H6	CCI OPA-65R-LCUU-H6	LTE	EXISTING	72.00	14.80	7.40	69.50	150	78	(1) RRUS-E2 B29 (AT GRADE) RRUS-32	-	-	-
	3	**- -**	**KATHREIN 80010965**	**LTE**	**PROPOSED**	**78.70**	**20.00**	**6.90**	**108.60**	**150**	**78**	**(1) B14 4478 (1) 4478 B5 (1) RRUS-32 B2 (2) DBCT108F1V92-1**	**-**	**-**	**-**
	4	QUINTEL QS66512-2	QUINTEL QS66512-2	LTE	EXISTING	72.00	12.00	9.60	126.60	150	78	(1) RRUS -11 (1) RRUS-32	-	-	-
Sector 3	1	POWERWAVE 7770	POWERWAVE 7770	UMTS	EXISTING	55.00	11.00	5.00	35.00	20	78	(1) POWERWAVE TT19-08BP111-001 TWIN TMA	1	7/8" COAX	EXISTING
	2	CCI OPA-65R-LCUU-H6	CCI OPA-65R-LCUU-H6	LTE	EXISTING	72.00	14.80	7.40	69.50	270	78	(1) RRUS-E2 B29 (AT GRADE) RRUS-32	-	-	-
	3		**KATHREIN 80010965**	**LTE**	**PROPOSED**	**78.70**	**20.00**	**6.90**	**108.60**	**270**	**78**	**(1) B14 4478 (1) 4478 B5 (1) RRUS-32 B2 (2) DBCT108F1V92-1**	**-**	**-**	**-**
	4	QUINTEL QS66512-2	QUINTEL QS66512-2	LTE	EXISTING	72.00	12.00	9.60	126.60	270	78	(1) RRUS -11 (1) RRUS-32	-	-	-

MASER CONSULTING
— CONNECTICUT —
Customer Loyalty through Client Satisfaction
www.maserconsulting.com
Engineers ■ Planners ■ Surveyors
Landscape Architects ■ Environmental Scientists

at&t

EMPIRE telecom

SCALE:	JOB NUMBER:
AS SHOWN	18963007A

REV	DATE	DESCRIPTION	DRAWN BY	CHECKED BY
5	02/22/19	STRUCTURAL REVISIONS	AJC	RA
4	02/11/19	REVISED PER COMMENTS	AJC	RA
4	12/18/18	REVISED PER COMMENTS	AJC	RA
3	11/30/18	NEW MOUNT REVISION	AJC	RA
2	09/25/18	REVISED PER COMMENTS	AJC	RA
1	09/14/18	[illegible]	MJB	RA

PETROS [illegible] TOUKALAS
CONNECTICUT PROFESSIONAL ENGINEER - LICENSE NUMBER: [illegible]

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF THE RESPONSIBLE LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

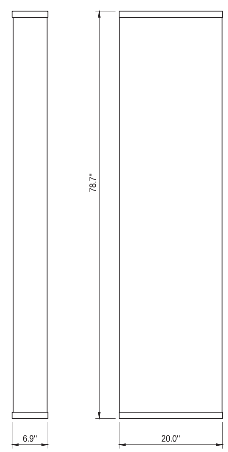
SITE NAME:

MT. TOM WALLINGFORD
FA# 10035084
SITE# CT2168
23 WAYNE ROAD
WALLINGFORD, CT 06492
NEW HAVEN COUNTY

RED BANK OFFICE
331 NEWMAN SPRINGS ROAD
SUITE 203
RED BANK, NJ 07701-5669
Phone: 732.383.1950
Fax: 732.383.1984
email: solutions@maserconsulting.com

SHEET TITLE: ANTENNA LAYOUTS AND ANTENNA SCHEDULE

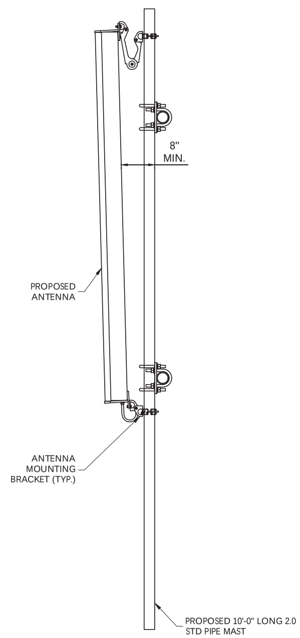
SHEET NUMBER: C-3



WEIGHT = 108.6 LBS

KATHREIN 800-10965

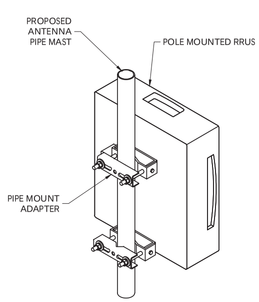
ANTENNA DETAILS



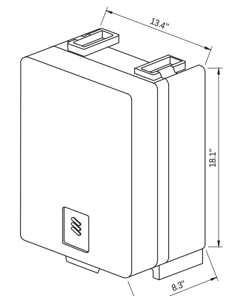
ANTENNA MOUNTING DETAIL
NOT TO SCALE

NOTE:

8" MINIMUM SEPERATION BETWEEN BACK OF PANEL ANTENNA AND EXISTING/PROPOSED EQUIPMENT

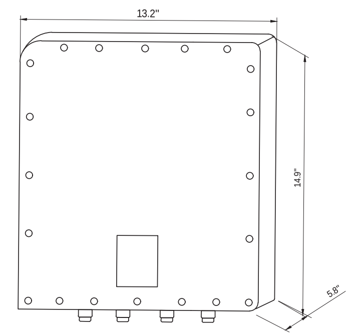


RRUS PIPE MOUNTING DETAIL
NOT TO SCALE



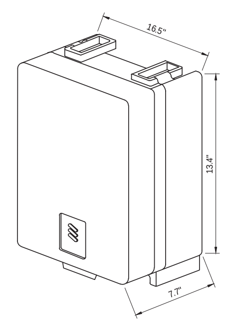
DIMENSIONS (H X W X D): 18.1"H X 13.4"W X 8.3"D (INCLUDES SUNSHIELD)
WEIGHT: 59.4 LBS

RRUS-4478 B14 DETAIL
NOT TO SCALE



RRUS 4426 B66 DIMENSIONS (H X W X D): 14.9" X 13.2" X 5.9"
(INCLUDES SUNSHIELD) WEIGHT: 48 LBS

RRUS 4426 B66 DETAIL
NOT TO SCALE



DIMENSIONS (H X W X D): 16.5"H X 13.4"W X 7.7"D (INCLUDES SUNSHIELD)
WEIGHT: 59.9 LBS

RRU-4478-B5 DETAIL
NOT TO SCALE

MASER CONSULTING — CONNECTICUT —

Customer Loyalty through Client Satisfaction
www.maserconsulting.com
Engineers ■ Planners ■ Surveyors
Landscape Architects ■ Environmental Scientists

at&t

EMPIRE telecom

811 Know what's below. Call before you dig.

PROTECT YOURSELF
ALL STATES REQUIRE NOTIFICATION OF EXCAVATORS, DESIGNERS, OR ANY PERSON PREPARING TO DISTURB THE EARTH'S SURFACE ANYWHERE IN ANY STATE

FOR STATE SPECIFIC DIRECT PHONE NUMBERS VISIT: WWW.CALL811.COM

SCALE:	JOB NUMBER:
AS SHOWN	18963007A

REV	DATE	DESCRIPTION	DRAWN BY	CHECKED BY
-	-	-	-	-
5	02/22/19	STRUCTURAL REVISIONS	AJC	RA
4	02/11/19	REVISED PER COMMENTS	AJC	RA
4	12/18/18	REVISED PER COMMENTS	AJC	RA
3	11/30/18	NEW MOUNT REVISION	AJC	RA
2	09/25/18	REVISED PER COMMENTS	AJC	RA
1	09/14/18	[illegible]	MJB	RA

PETROS D. TSOUKALAS
CONNECTICUT PROFESSIONAL ENGINEER - LICENSE NUMBER: 25374

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF THE RESPONSIBLE LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

SITE NAME:

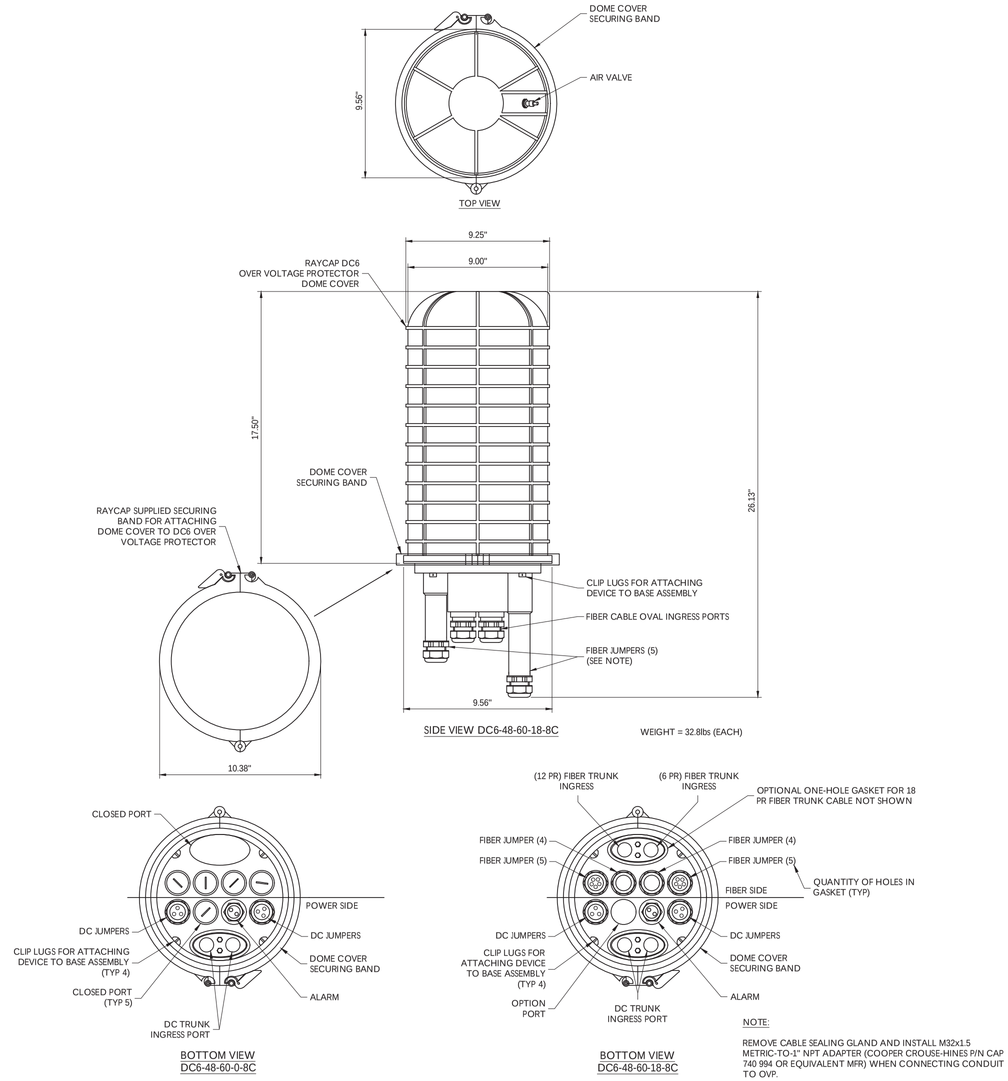
MT. TOM WALLINGFORD
FA# 10035084
SITE# CT2168

23 WAYNE ROAD
WALLINGFORD, CT 06492
NEW HAVEN COUNTY

RED BANK OFFICE
331 NEWMAN SPRINGS ROAD
SUITE 203
RED BANK, NJ 07701-5669
Phone: 732.383.1950
Fax: 732.383.1984
email: solutions@maserconsulting.com

SHEET TITLE: DETAILS

SHEET NUMBER: A-1

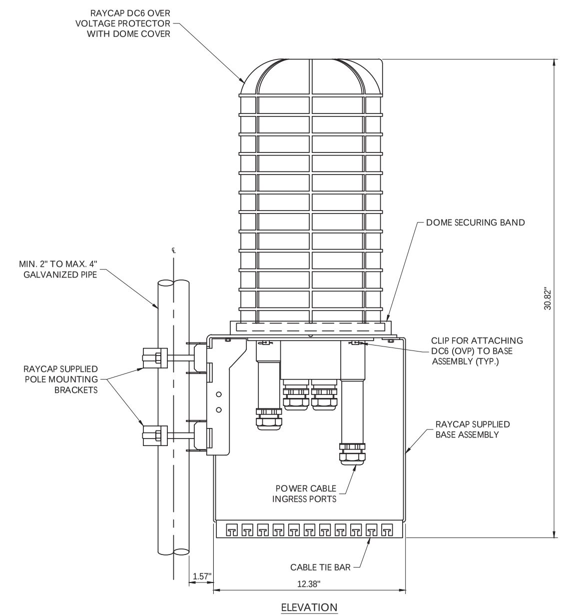


NOTE:

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

DC6 SURGE SUPPRESSION DOME DETAIL

NOT TO SCALE



NOTES:

RAYCAP VIA AT&T SUPPLIES THE DC6 OVER VOLTAGE PROTECTOR AND PIPE MOUNTING BRACKETS. SUBCONTRACTOR SHALL SUPPLY THE PIPE.

RAYCAP DC6-48-60-18-8C & DC6-48-60-0-8C
DC POWER OVER VOLTAGE PROTECTOR (OVP)
POLE MOUNT BASE ASSEMBLY

NOT TO SCALE

MASER CONSULTING CONNECTICUT

Customer Loyalty through Client Satisfaction
www.maserconsulting.com
Engineers ■ Planners ■ Surveyors
Landscape Architects ■ Environmental Scientists

at&t

EMPIRE telecom

811 Know what's below. Call before you dig.

PROTECT YOURSELF
ALL STATES REQUIRE NOTIFICATION OF EXCAVATORS, DESIGNERS, OR ANY PERSON PREPARING TO DISTURB THE EARTH'S SURFACE ANYWHERE IN ANY STATE

FOR STATE SPECIFIC DIRECT PHONE NUMBERS VISIT: WWW.CALL811.COM

SCALE:	JOB NUMBER:
AS SHOWN	18963007A

REV	DATE	DESCRIPTION	DRAWN BY	CHECKED BY
5	02/22/19	STRUCTURAL REVISIONS	AJC	RA
4	02/11/19	REVISED PER COMMENTS	AJC	RA
4	12/18/18	REVISED PER COMMENTS	AJC	RA
3	11/30/18	NEW MOUNT REVISION	AJC	RA
2	09/25/18	REVISED PER COMMENTS	AJC	RA
1	09/14/18	[illegible]	MJB	RA

PETROS TSOUKALAS
CONNECTICUT PROFESSIONAL ENGINEER - LICENSE NUMBER: 25371

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF THE RESPONSIBLE LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

SITE NAME:

MT. TOM WALLINGFORD
FA# 10035084
SITE# CT2168

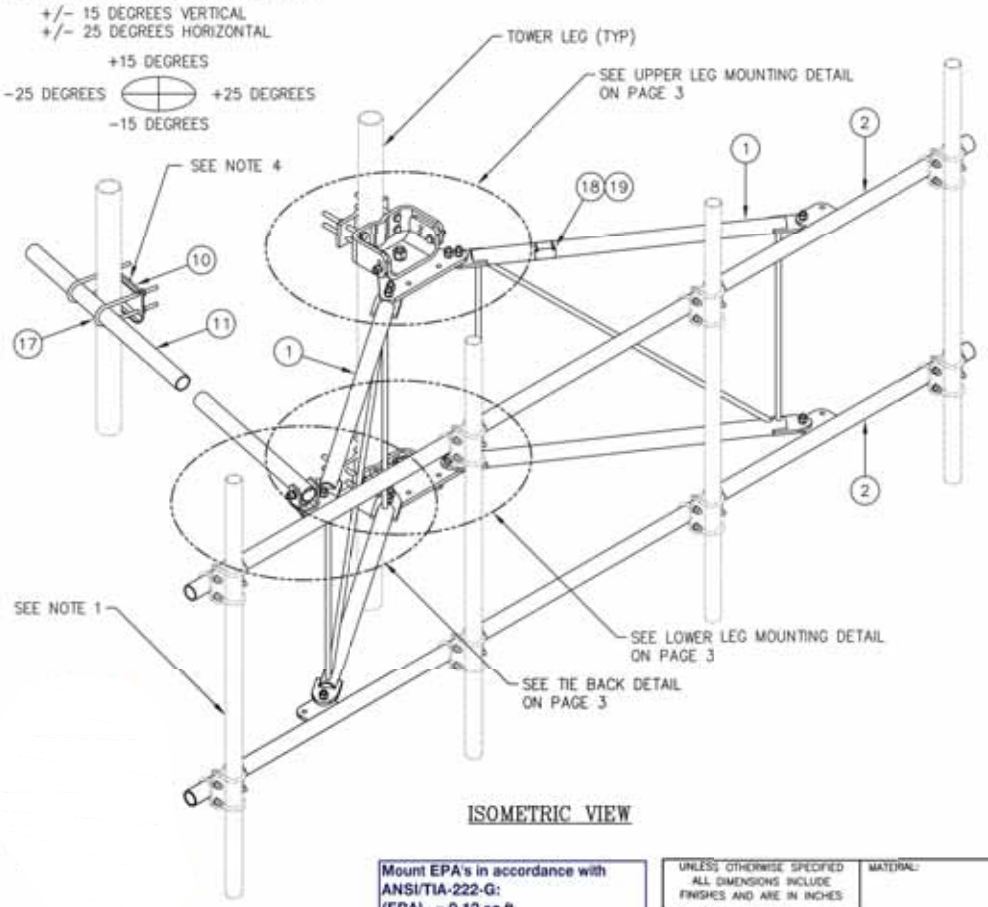
23 WAYNE ROAD
WALLINGFORD, CT 06492
NEW HAVEN COUNTY

RED BANK OFFICE
331 NEWMAN SPRINGS ROAD
SUITE 203
RED BANK, NJ 07701-5669
Phone: 732.383.1950
Fax: 732.383.1984
email: solutions@maserconsulting.com

SHEET TITLE: DETAILS

SHEET NUMBER: A-2

TIEBACK ANGLE RANGE DETAIL



ISOMETRIC VIEW

Mount EPA's in accordance with ANSI/TIA-222-G:
$(EPA)_N$ = 9.12 sq.ft.
$(EPA)_T$ = 5.23 sq.ft.
***Excludes mount pipes**

NOTES:

1. MOUNTING PIPES & CROSSOVER PLATE KITS MUST BE PURCHASED SEPARATELY.
2. QUANTITIES SHOWN IN LISTS OF MATERIAL ARE FOR ONE (1) V-BOOM ONLY.
3. THIS V-BOOM WILL MOUNT TO THE FOLLOWING:1 1/2"ø TO 5 9/16"ø ROUND LEG.
4. TIEBACK MUST BE CONNECTED TO A RIGID MEMBER THAT PROVIDES ADEQUATE SUPPORT WITHIN THE LIMITS NOTED ABOVE IN THE TIEBACK ANGLE RANGE DETAIL UNLESS APPROVED BY THE ENGINEER OF RECORD.

C10857001C 12' HD V-BOOM ASSEMBLY W/TIEBACK

ITEM	QTY.	PART NO.	DESCRIPTION	WEIGHT
1.	2	CW01222	WELDMENT, STANDOFF ARM	126
2.	2	CW01223	WELDMENT, FACE PIPE	147
3.	2	CS03109	PLATE, ROTATING	34
4.	1	CS03110	PLATE, PIVOTING (UPPER)	16
5.	1	CS03111	PLATE, LEG CLAMP (UPPER)	17
6.	1	CS03112	PLATE, PIVOTING (LOWER)	14
7.	1	CS03113	PLATE, LEG CLAMP (LOWER)	17
8.	2	CS03114	PLATE, LEG CLAMP (BACK)	14
9.	1	CS00098	PLATE, TIE BACK SWIVEL	3
10.	1	CS03285	PLATE, TIE BACK CLAMP	4
11.	1	CS03333	PIPE, TIE BACK	38
12.	2	C40026073	BOLT ASSEMBLY, 1 ø X 3 A325	4
13.	8	C40140004	BOLT ASSEMBLY, 5/8 ø X 8 A307	13
14.	1	C40026033	BOLT ASSEMBLY, 5/8 ø X 4 1/2 A325	1
15.	12	C40026025	BOLT ASSEMBLY, 5/8 ø X 2 1/2 A325	6
16.	5	C40026024	BOLT ASSEMBLY, 5/8 ø X 2 1/4 A325	3
17.	2	C40034183	U-BOLT ASSEMBLY, 1/2 ø X 2 9/16 C-C	3
18.	1	Z30992001	MOUNT CLASSIFICATION TAG C10857001C	1
19.	2	C40062103	STAINLESS STEEL SELF-LOCKING CABLE TIE	1
			TOTAL WEIGHT	462

PACKAGING NOTE

CK00386 INCLUDES ITEMS 1, 3, 4, 5, 6, 7, 12 & 15 (8 QTY)
CK00387 INCLUDES ITEMS 2, 8, 9, 10, 11, 13, 14, 15 (4 QTY), 16, 17, 18 & 19

This mount satisfies the Heavy-10 requirements as specified in AT&T RPF No. 20160229.002.P for Antenna Sector Mounts.
It satisfies ANSI/TIA-222-G for the following parameters:
Structure Class II, Exposure Category C, Topographic Category 1
Mount and antenna centerline at 300' AGL
Gust effect factor = 1.0, Wind direction probability factor = 0.95
Four mount pipes symmetrically placed as shown
Bare condition
Basic wind speed = 120 mph
$(EPA)_N$ = $(EPA)_T$ = 15.0 sq.ft. per mount pipe
Factored Weight = 663 lbs per mount pipe
Iced condition
Basic wind speed = 60 mph, Design ice thickness, t_i = 1.0 in
$(EPA)_N$ = $(EPA)_T$ = 24.0 sq.ft. per mount pipe
Factored Weight = 1325 lbs per mount pipe

UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS INCLUDE FINISHES AND ARE IN INCHES
TOLERANCES: FRACTIONS ± 1/16" ANGLES ± 1/2 DEG. DECIMALS ± .010"
MATERIAL:
TOLERANCES DO NOT APPLY TO RAW MATERIAL

REV	DATE	DRW	CHK	DESCRIPTION
2	02/05/18	DL	WDEL	ADDED PACKAGING NOTE
1	01/27/16	DL	EK	REVISED NOTES & ADDED TIEBACK ANGLE RANGE DETAIL

Sabre Industries
Towers and Poles

12' HD V-BOOM ASSEMBLY W/TIEBACK (3' STANDOFF) W/NO ANTENNA MOUNTING PIPES

		SIZE	DRAWING NO.	REV
DATE	12/22/15	B	C10857001C	2
DRAWN BY	WRF			
CHECKED BY	EK	SCALE None		PAGE 1 OF 3

MAER CONSULTING CONNECTICUT
Customer Loyalty through Client Satisfaction
www.maerconsulting.com
Engineers ■ Planers ■ Surveyors
Landscape Architects ■ Environmental Scientists
RED BANK OFFICE
81 NEWMAN SPRINGS ROAD
SUITE 203
RED BANK, NJ 07701-5869
Phone: 732.383.1950
Fax: 732.383.1984
email: solutions@maerconsulting.com

at&t

EMPIRE telecom

811 Know what's below. Call before you dig.
PROTECT YOURSELF
ALL STATES REQUIRE NOTIFICATION OF EXCAVATORS, DESIGNERS, OR ANY PERSON PREPARING TO DISTURB THE EARTHS SURFACE ANYWHERE IN ANY STATE
FOR STATE SPECIFIC DIRECT PHONE NUMBERS VISIT WWW.CALL811.COM

SCALE: AS SHOWN
JOB NUMBER: 18963007A

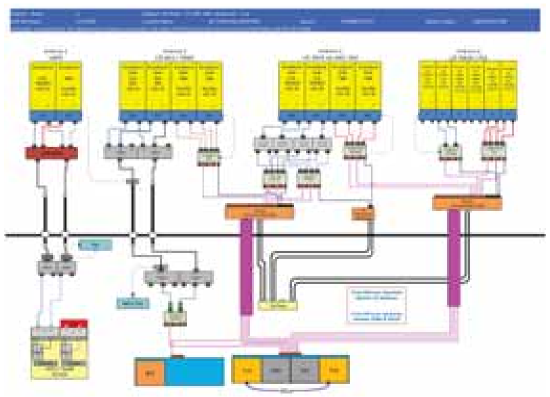
REV	DATE	DESCRIPTION	DRAWN	CHECKED BY
5	02/22/19	STRUCTURAL REVISIONS	AC	RA
4	02/11/19	REVISED PER COMMENTS	AC	RA
4	12/18/18	REVISED PER COMMENTS	AC	RA
3	11/30/18	NEW MOUNT REVISION	AC	RA
2	09/25/18	REVISED PER COMMENTS	AC	RA
1	09/14/18	[illegible]	MB	RA

STATE OF CONNECTICUT
PETROS A. TOUKALAS
CONNECTICUT PROFESSIONAL ENGINEER, LICENSE NUMBER 31,101
PROFESSIONAL ENGINEER

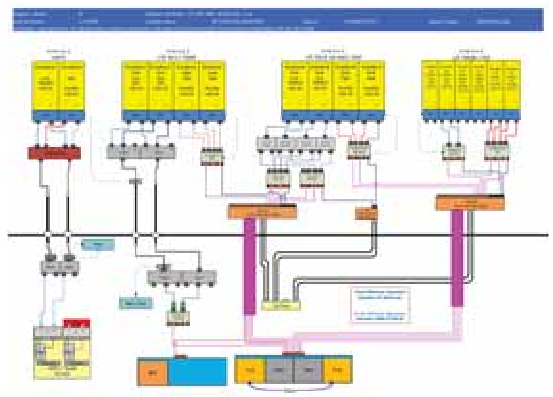
SITE NAME:
MT. TOM WALLINGFORD
FA# 10035084
SITE# CT2168
23 WAYNE ROAD
WALLINGFORD, CT 06492
NEW HAVEN COUNTY

SHEET TITLE: RF PLUMBING DIAGRAM

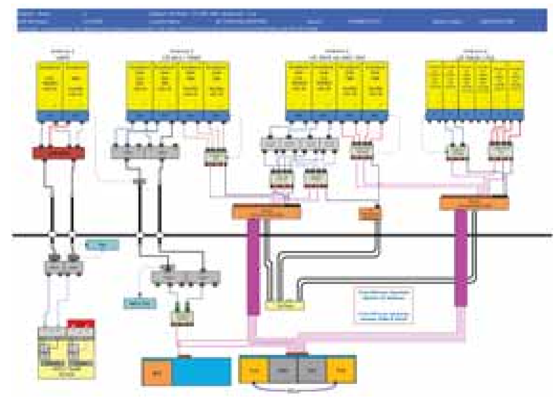
SHEET NUMBER: A-3



ALPHA SECTOR



BETA SECTOR



GAMMA SECTOR

BASED ON: RF ENGINEERING DESIGN ENTITLED "CTU2168_2018-LTE-Next-Carrier_LTE_sp656b_2051A0GWE7_10035084_4563", LAST REVISED 08/28/2018.

RF PLUMBING DIAGRAMS

MASER CONSULTING — CONNECTICUT —
Customer Loyalty through Client Satisfaction
www.maserconsulting.com
Engineers ■ Planners ■ Surveyors
Landscape Architects ■ Environmental Scientists

at&t

EMPIRE telecom

811 Know what's below. Call before you dig.
PROTECT YOURSELF
ALL STATES REQUIRE NOTIFICATION OF EXCAVATORS, DESIGNERS, OR ANY PERSON PREPARING TO DISTURB THE EARTH'S SURFACE ANYWHERE IN ANY STATE
FOR STATE SPECIFIC DIRECT PHONE NUMBERS VISIT: WWW.CALL811.COM

SCALE:	JOB NUMBER:
AS SHOWN	18963007A

REV	DATE	DESCRIPTION	DRAWN BY	CHECKED BY
5	02/22/19	STRUCTURAL REVISIONS	AJC	RA
4	02/11/19	REVISED PER COMMENTS	AJC	RA
4	12/18/18	REVISED PER COMMENTS	AJC	RA
3	11/30/18	NEW MOUNT REVISION	AJC	RA
2	09/25/18	REVISED PER COMMENTS	AJC	RA
1	09/14/18	[illegible]	MJB	RA

PETROS [illegible] TOUKALAS
CONNECTICUT PROFESSIONAL ENGINEER - LICENSE NUMBER: [illegible]

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF THE RESPONSIBLE LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

SITE NAME:

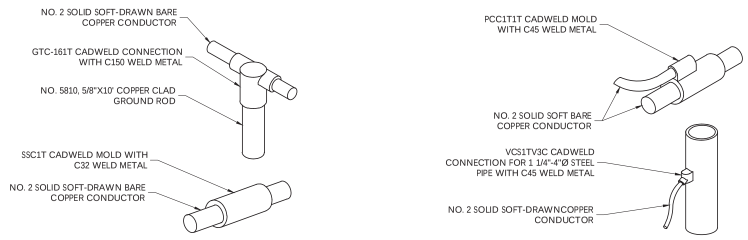
MT. TOM WALLINGFORD
FA# 10035084
SITE# CT2168

23 WAYNE ROAD
WALLINGFORD, CT 06492
NEW HAVEN COUNTY

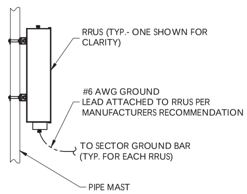
RED BANK OFFICE
331 NEWMAN SPRINGS ROAD
SUITE 203
RED BANK, NJ 07701-5669
Phone: 732.383.1950
Fax: 732.383.1984
email: solutions@maserconsulting.com

SHEET TITLE:
RF PLUMBING DIAGRAM

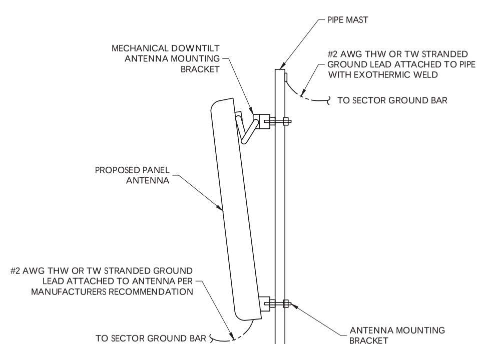
SHEET NUMBER:
A-4



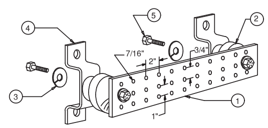
CADWELD DETAILS
NOT TO SCALE



RRU GROUNDING
NOT TO SCALE



ANTENNA GROUNDING
NOT TO SCALE



LEGEND

1- TINNED COPPER GROUND BAR, 1/4"x4"x20", NEWTON INSTRUMENT CO. CAT. NO. B-6142 OR EQUAL. HOLE CENTERS TO MATCH NEMA DOUBLE LUG CONFIGURATION.

2- INSULATORS, NEWTON INSTRUMENT CAT. NO. 3061-4

3- 5/8" LOCKWASHERS, NEWTON INSTRUMENT CO. CAT. NO. 3015-8

4- WALL MOUNTING BRACKET, NEWTON INSTRUMENT CO. CAT NO. A-5056

5- 5/8-11 X 1" HHCS BOLTS, NEWTON INSTRUMENT CO. CAT NO. 3012-1

6- EACH GROUND CONDUCTOR TERMINATING ON ANY GROUND BAR HAVE AN IDENTIFICATION TAG ATTACHED AT EACH END THAT WILL IDENTIFY ITS ORIGIN AND DESTINATION.

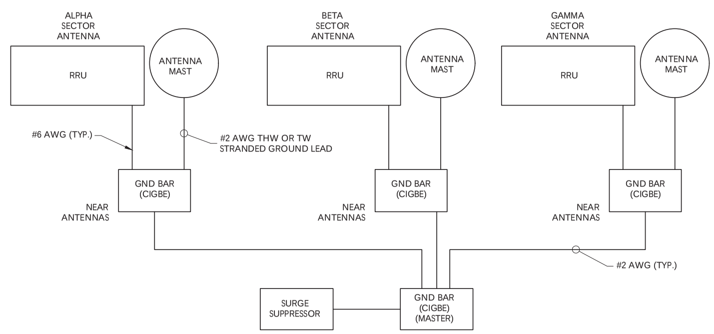
SECTION "P" - SURGE PRODUCERS

CABLE ENTRY PORTS (HATCH PLATES) (#2)
GENERATOR FRAMEWORK (IF AVAILABLE) (#2)
TELCO GROUND BAR
COMMERCIAL POWER COMMON NEUTRAL/GROUND BOND (#2)
+24V POWER SUPPLY RETURN BAR (#2)
-48V POWER SUPPLT RETURN BAR (#2)
RECTIFIER FRAMES.

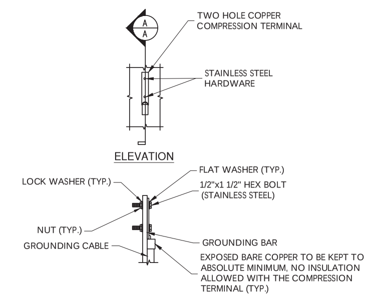
SECTION "A" - SURGE ABSORBERS

INTERIOR GROUND RING (#2)
EXTERNAL EARTH GROUND FIELD (BURIED GROUND RING) (#2)
METALLIC COLD WATER PIPE (IF AVAILABLE) (#2)
BUILDING STEEL (IF AVAILABLE) (#2)

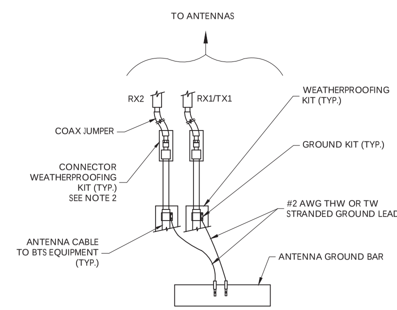
MASTER GROUND BAR
NOT TO SCALE



SCHEMATIC DIAGRAM GROUNDING SYSTEM



TYPICAL GROUND BAR CONNECTION DETAIL
NOT TO SCALE



NOTES:

1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO ANTENNA GROUND BAR.
2. WEATHER PROOFING SHALL BE TWO-PART TAPE KIT, COLD SHRINK SHALL NOT BE USED.

TYPICAL GROUND WIRE TO GROUNDING BAR
NOT TO SCALE

MASER CONSULTING —CONNECTICUT—
Customer Loyalty through Client Satisfaction
www.maserconsulting.com
Engineers ■ Planners ■ Surveyors
Landscape Architects ■ Environmental Scientists

at&t

EMPIRE telecom

811 Know what's below. Call before you dig.
PROTECT YOURSELF
ALL STATES REQUIRE NOTIFICATION OF EXCAVATORS, DESIGNERS, OR ANY PERSON PREPARING TO DISTURB THE EARTH'S SURFACE ANYWHERE IN ANY STATE
FOR STATE SPECIFIC DIRECT PHONE NUMBERS VISIT: WWW.CALL811.COM

SCALE:	JOB NUMBER:
AS SHOWN	18963007A

REV	DATE	DESCRIPTION	DRAWN BY	CHECKED BY
5	02/22/19	STRUCTURAL REVISIONS	AJC	RA
4	02/11/19	REVISED PER COMMENTS	AJC	RA
4	12/18/18	REVISED PER COMMENTS	AJC	RA
3	11/30/18	NEW MOUNT REVISION	AJC	RA
2	09/25/18	REVISED PER COMMENTS	AJC	RA
1	09/14/18	[illegible]	MJB	RA

PETROS TSOUKALAS
CONNECTICUT PROFESSIONAL ENGINEER - LICENSE NUMBER: [illegible]

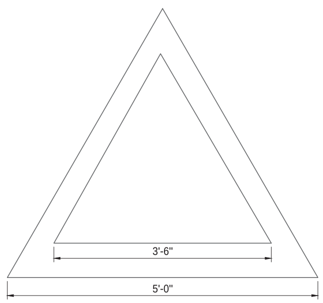
IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF THE RESPONSIBLE LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

SITE NAME:
MT. TOM WALLINGFORD
FA# 10035084
SITE# CT2168
23 WAYNE ROAD
WALLINGFORD, CT 06492
NEW HAVEN COUNTY

RED BANK OFFICE
331 NEWMAN SPRINGS ROAD
SUITE 203
RED BANK, NJ 07701-5669
Phone: 732.383.1950
Fax: 732.383.1984
email: solutions@maserconsulting.com

SHEET TITLE:
GROUNDING DETAILS

SHEET NUMBER:
G-1



TOWER PLAN
NOT TO SCALE

TOWER FOUNDATION REACTIONS	
REACTION TYPE	FORCE
COMPRESSION (MAX KIP PER LEG)	209.9
UPLIFT (MAX KIP PER LEG)	199.6
OVERTURNING MOMENT (KIP-FT)	886
SHEAR (KIP)	15.6

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
20' 8 Bay Di-Pole	90	RRUS 4426 B66 (att)	78
10' Omni	85	RRUS 4426 B66 (att)	78
7' Whip	83	RRUS11 B12 (Partial Shielded by 11.9" Antenna) (att)	78
7770	78	RRUS11 B12 (Partial Shielded by 11.9" Antenna) (att)	78
7770	78	RRUS11 B12 (Partial Shielded by 11.9" Antenna) (att)	78
7770	78	RRUS 32 B2 (att)	78
CCI OPA-65R-LCUU-H6 Panel Antenna with 8ft Pipe (att)	78	RRUS 32 B2 (att)	78
CCI OPA-65R-LCUU-H6 Panel Antenna with 8ft Pipe (att)	78	RRUS 32 B2 (att)	78
CCI OPA-65R-LCUU-H6 Panel Antenna with 8ft Pipe (att)	78	DC6-48-60-18-8C (att)	78
800-10965 (att)	78	DC6-48-60-18-8C (att)	78
800-10965 (att)	78	DC6-48-60-18-8C (att)	78
800-10965 (att)	78	Pirod 12' PCS T-Frame (1) 104569 (att)	78
QS66512-2 (att)	78	Pirod 12' PCS T-Frame (1) 104569 (att)	78
QS66512-2 (att)	78	Pirod 12' PCS T-Frame (1) 104569 (att)	78
QS66512-2 (att)	78	2' dish	73
TMA (att)	78	4' dish	73
TMA (att)	78	1.5" Dia 4' Omni w/Pipe Mount	65
TMA (att)	78	6' Side Arm	65
RRUS 32 (att)	78	6' Side Arm	65
RRUS 32 (att)	78	7' Whip	65
RRUS 32 (att)	78	10' Omni	65
RRU B14 4478 (att)	78	4 ' Side Arm	55
RRU B14 4478 (att)	78	4 ' Side Arm	55
RRU B14 4478 (att)	78	10' Omni	55
RRUS 4478 B5 (att)	78	10' Yagi	55
RRUS 4478 B5 (att)	78		
RRUS 4478 B5 (att)	78		
RRUS 4426 B66 (att)	78		

NOTES:

1. EXISTING TOWER MEMBERS WERE DETERMINED FROM A PREVIOUS STRUCTURAL ANALYSIS REPORT PREPARED BY CENTEK ENGINEERING DATED: 1/05/2017.
2. CONTRACTOR IS TO REMOVE AND REPLACE EXISTING APPURTENANCES, MOUNTS AND TOWER HARDWARE AS NEEDED TO INSTALL THE PROPOSED REINFORCEMENTS.
3. CONTRACTOR SHALL PERFORM A TOWER INSPECTION PRIOR TO PURCHASE AND/OR FABRICATION OF MATERIAL.
4. THE MEANS AND METHODS OF INSTALLATION ARE THE RESPONSIBILITIES OF THE CONTRACTOR.
5. ZRC GALVANIZING COMPOUND OR EQUAL SHALL TREAT ALL WELDED AREAS.
6. CONTRACTOR SHALL NOT REUSE EXISTING BOLTS AND ASSOCIATED HARDWARE.
7. ONCE THE TOWER MODIFICATIONS HAVE BEEN COMPLETED, THE OVERALL TOWER USAGE WILL BE DETERMINED TO BE 96.8% FOR THE EXISTING AND PROPOSED LOADING.

MASER CONSULTING CONNECTICUT

Customer Loyalty through Client Satisfaction
www.maserconsulting.com
Engineers ■ Planners ■ Surveyors
Landscape Architects ■ Environmental Scientists

at&t

EMPIRE telecom

811 PROTECT YOURSELF
ALL STATES REQUIRE NOTIFICATION OF EXCAVATORS, DESIGNERS, OR ANY PERSON PREPARING TO DISTURB THE EARTH'S SURFACE ANYWHERE IN ANY STATE
Know what's below. Call before you dig.
FOR STATE SPECIFIC DIRECT PHONE NUMBERS VISIT: WWW.CALL811.COM

SCALE :	JOB NUMBER :
AS SHOWN	18963007A

REV	DATE	DESCRIPTION	DRAWN BY	CHECKED BY
.	.	.	.	.
.	.	.	.	.
5	02/22/19	STRUCTURAL REVISIONS	AJC	RA
4	02/11/19	REVISED PER COMMENTS	AJC	RA
4	12/18/18	REVISED PER COMMENTS	AJC	RA
3	11/30/18	NEW MOUNT REVISION	AJC	RA
2	09/25/18	REVISED PER COMMENTS	AJC	RA
1	09/14/18	ISSUED FOR REVIEW	MJB	RA

PETROS TSOUKALAS
CONNECTICUT PROFESSIONAL ENGINEER - LICENSE NUMBER: 25377

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF THE RESPONSIBLE LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

SITE NAME:

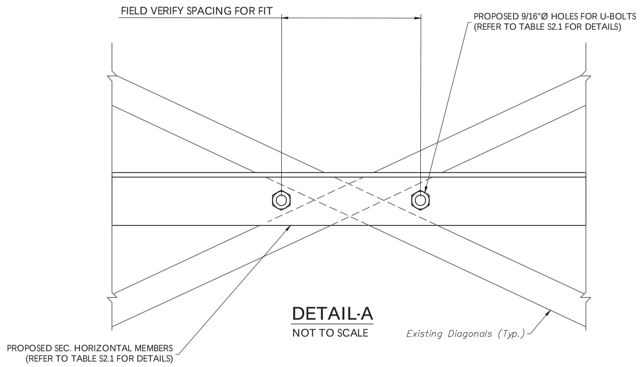
MT. TOM WALLINGFORD
FA# 10035084
SITE# CT2168

23 WAYNE ROAD
WALLINGFORD, CT 06492
NEW HAVEN COUNTY

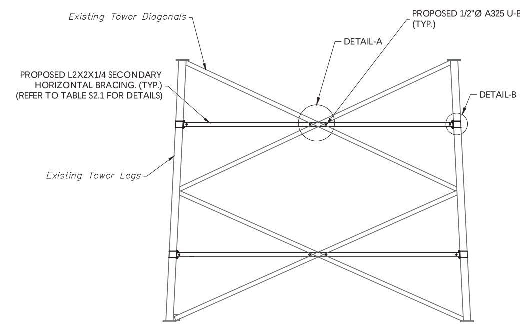
RED BANK OFFICE
331 NEWMAN SPRINGS ROAD
SUITE 203
RED BANK, NJ 07701-5669
Phone: 732.383.1950
Fax: 732.383.1984
email: solutions@maserconsulting.com

SHEET TITLE:
STRUCTURAL DETAILS

SHEET NUMBER:
S-1



DETAIL-A
NOT TO SCALE

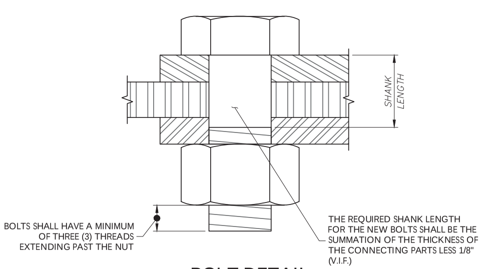


SECONDARY HORIZONTAL ANGLE DETAILS
NOT TO SCALE

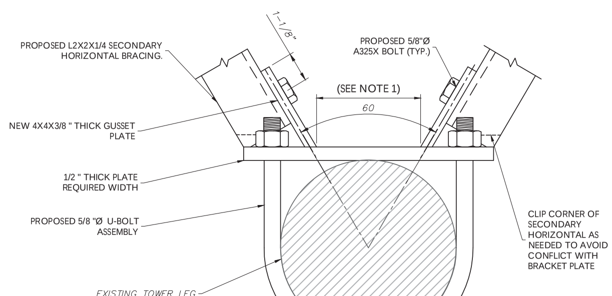
TABLE S2.1 - TOWER BRACING MODIFICATION TABLE

ELEVATION (FT)	MEMBER TYPE	EXISTING MEMBER SIZE	QTY	PROPOSED MEMBER SIZE	QTY	LENGTH	END BOLT	QTY	CENTER BOLT	QTY
1'-3"	SEC. HORIZONTALS	-	-	L2X2X1/4	3	±5'-0"	5/8" Ø A325	16	1/2"Ø A325 U-BOLT	3
3'-9"	SEC. HORIZONTALS	-	-	L2X2X1/4	3	±4'-11"	5/8" Ø A325	16	1/2"Ø A325 U-BOLT	3
6'-3"	SEC. HORIZONTALS	-	-	L2X2X1/4	3	±4'-10"	5/8" Ø A325	16	1/2"Ø A325 U-BOLT	3
8'-9"	SEC. HORIZONTALS	-	-	L2X2X1/4	3	±4'-10"	5/8" Ø A325	16	1/2"Ø A325 U-BOLT	3
21'-3"	SEC. HORIZONTALS	-	-	L2X2X1/4	3	±4'-8"	5/8" Ø A325	16	1/2"Ø A325 U-BOLT	3
23'-9"	SEC. HORIZONTALS	-	-	L2X2X1/4	3	±4'-7"	5/8" Ø A325	16	1/2"Ø A325 U-BOLT	3

LENGTH IS THEORETICAL. CONTRACTOR TO FIELD VERIFY THE LENGTH OF THE EXISTING MEMBERS IN THE FIELD PRIOR TO FABRICATION OF THE PROPOSED BRACING MEMBER

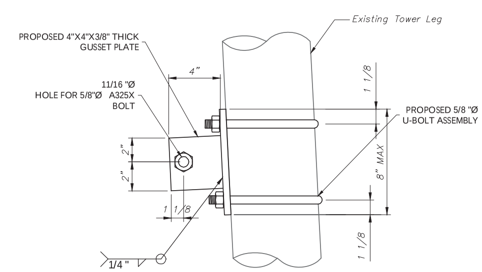


BOLT DETAIL
NOT TO SCALE



DETAIL-B (PLAN VIEW) - W/ EXISTING LEG
NOT TO SCALE

NOTE 1:
CONTRACTOR TO VERIFY THAT GUSSET PLATE ALLOWS FOR SECONDARY HORIZONTAL TO BE INSTALLED ON ONE SIDE OF TOWER FACE AND FLUSH WITH EXISTING DIAGONAL BRACING



DETAIL-B (SIDE VIEW)
NOT TO SCALE

MASER CONSULTING — CONNECTICUT —
Customer Loyalty through Client Satisfaction
www.maserconsulting.com
Engineers ■ Planners ■ Surveyors
Landscape Architects ■ Environmental Scientists

at&t

EMPIRE telecom

811 Know what's below. Call before you dig.
PROTECT YOURSELF
ALL STATES REQUIRE NOTIFICATION OF EXCAVATORS, DESIGNERS, OR ANY PERSON PREPARING TO DISTURB THE EARTH'S SURFACE ANYWHERE IN ANY STATE
FOR STATE SPECIFIC DIRECT PHONE NUMBERS VISIT: WWW.CALL811.COM

SCALE:	JOB NUMBER:
AS SHOWN	18963007A

REV	DATE	DESCRIPTION	DRAWN BY	CHECKED BY
-	-	-	-	-
5	02/22/19	STRUCTURAL REVISIONS	AJC	RA
4	02/11/19	REVISED PER COMMENTS	AJC	RA
4	12/18/18	REVISED PER COMMENTS	AJC	RA
3	11/30/18	NEW MOUNT REVISION	AJC	RA
2	09/25/18	REVISED PER COMMENTS	AJC	RA
1	09/14/18	[illegible]	MJB	RA

PETROS [illegible] TOUKALAS
CONNECTICUT PROFESSIONAL ENGINEER - LICENSE NUMBER: [illegible]

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF THE RESPONSIBLE LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

SITE NAME:
MT. TOM WALLINGFORD
FA# 10035084
SITE# CT2168
23 WAYNE ROAD
WALLINGFORD, CT 06492
NEW HAVEN COUNTY

RED BANK OFFICE
331 NEWMAN SPRINGS ROAD
SUITE 203
RED BANK, NJ 07701-5669
Phone: 732.383.1950
Fax: 732.383.1984
email: solutions@maserconsulting.com

SHEET TITLE:
STRUCTURAL DETAILS

SHEET NUMBER:
S-2

GENERAL NOTES

1. CONTRACTOR IS RESPONSIBLE FOR DISSEMINATION OF REVISIONS TO CONTRACT DOCUMENTS AND REQUIREMENTS TO ALL SUBCONTRACTORS. THE CONTRACTOR SHALL COORDINATE ALL WORK WITH OTHER TRADES AND EQUIPMENT MANUFACTURERS.
2. CONTRACTOR SHALL VERIFY ALL DIMENSIONS, ELEVATIONS AND EXISTING FIELD CONDITIONS BEFORE PROCEEDING WITH CONSTRUCTION. DETERMINE EXACT LOCATIONS OF EXISTING UTILITIES, GROUNDS, DRAIN PIPES AND VENTS BEFORE COMMENCING WORK. CONTRACTOR SHALL NOTIFY ENGINEER IF ACTUAL CONDITIONS DIFFER SIGNIFICANTLY FROM WHAT IS SHOWN ON DRAWINGS.
3. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING A NEAT AND ORDERLY PROJECT SITE, REMOVE AND DISPOSE OF OFF SITE RUBBISH, WASTE MATERIALS, LITTER, AND ALL FOREIGN SUBSTANCES DAILY.
4. INCORRECTLY FABRICATED, DAMAGED, OR OTHERWISE MISFITTING OR NONCONFORMING MATERIALS OR CONDITIONS SHALL BE REPORTED TO THE ENGINEER PRIOR TO REMEDIAL OR CORRECTIVE ACTION. ANY SUCH ACTION SHALL REQUIRE OWNER'S WRITTEN APPROVAL.
5. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING SUCH COVERING, SHIELDING, AND BARRICADES AS REQUIRED TO PROTECT BYSTANDERS AND PASSERSBY, EQUIPMENT, SUPPLIES, ETC. FROM DUST, DEBRIS AND OTHER CAUSE OF DAMAGE RESULTING FROM CONSTRUCTION. ANY DAMAGE DURING CONSTRUCTION SHALL BE RESTORED TO PREVIOUS CONDITIONS.
6. IN AREAS WHERE EXISTING ANTENNA MOUNTS, TRANSMISSION LINES OR OTHER SUPPORTING EQUIPMENT IS TO BE REMOVED, THE EXISTING STRUCTURE SHALL BE REPAIRED AS REQUIRED.
7. ALL SAFETY AND OSHA REGULATIONS SHALL BE FOLLOWED STRICTLY. METHODS OF CONSTRUCTION AND ERECTION OF STRUCTURAL MATERIAL ARE THE CONTRACTOR'S RESPONSIBILITY.
8. CONTRACTOR TO PROVIDE TEMPORARY SUPPORT FOR ALL EXISTING ANTENNAS, TRANSMISSION LINES OR OTHER APPURTENANCES DURING CONSTRUCTION.
9. CONTRACTOR SHALL PROTECT EXISTING APPURTENANCES FROM DAMAGE DURING CONSTRUCTION.
10. NO ANTENNAS, CABLES, OR OTHER APPURTENANCES SHALL BE ADDED TO THE TOWER UNTIL THE MODIFICATION WORK IS COMPLETE.
11. ALL DIMENSIONS SHOWN ARE APPROXIMATE. CONTRACTOR SHALL COORDINATE DIMENSIONS WITH TOWER MANUFACTURER OR FIELD VERIFY DIMENSIONS PRIOR TO FABRICATING MEMBERS.
12. THE CONTRACTOR SHALL LOCATE ALL UTILITIES IN THE AREA OF CONSTRUCTION AND PREVENT DAMAGE TO THEM. SHOULD DAMAGE OCCUR TO ANY UTILITIES, THE CONTRACTOR IS REQUIRED TO REPAIR THE DAMAGE TO THE SATISFACTION OF THE OWNER AT HIS OWN EXPENSE.
13. ALL EXISTING PLANS, DETAILS, DIMENSIONS, AND ELEVATIONS INDICATE EXISTING CONDITIONS AS KNOWN. THE EXISTING INFORMATION SHOWN IS NOT INTENDED TO BE "AS BUILT" AND THE ACTUAL CONSTRUCTION MAY DIFFER FROM THAT SHOWN. THE CONTRACTOR SHALL FIELD VERIFY ALL EXISTING CONDITIONS INCLUDING DIMENSIONS AND ELEVATIONS PRIOR TO STARTING CONSTRUCTION. MINOR VARIATIONS CAN BE EXPECTED AND ANY REQUIRED DEVIATION FROM THE CONTRACT DOCUMENTS SHALL BE APPROVED BY THE ENGINEER PRIOR TO PROCEEDING WITH CONSTRUCTION.
14. MODIFICATION DETAILS REPRESENTS TYPICAL CONDITIONS. CONTRACTOR SHALL NOTIFY ENGINEER OF ANY DEVIATION AS A RESULT OF SITE SPECIFIC CONDITIONS. REINFORCE ALL TOWER FACES IDENTICALLY, UNLESS OTHERWISE NOTED.
15. IN AREAS TO BE MODIFIED, ANY ANTENNA, COAX, OR CONDUIT SHALL BE TEMPORARILY MOVED AND THEN REPLACED AFTER COMPLETION OF WORK. COORDINATE WITH OWNER.
16. CONTRACTOR IS RESPONSIBLE FOR DISPOSAL OF ALL MATERIAL TO BE REMOVED.
17. CONTRACTOR SHALL ENSURE STABILITY OF TOWER DURING ALL WORK.
18. CONTRACTOR IS RESPONSIBLE FOR PROVIDING ADEQUATE TEMPORARY BRACING OF THE STRUCTURE DURING ALL STAGES OF CONSTRUCTION. THE STRUCTURE IS DESIGNED FOR A COMPLETED CONDITION ONLY AND THEREFORE MAY REQUIRE ADDITIONAL SUPPORT BEFORE COMPLETIONS.
19. THIS DESIGN ASSUMES THE TOWER AND FOUNDATIONS HAVE BEEN WELL MAINTAINED, IN GOOD CONDITION, AND ARE WITHOUT DEFECT. BENT MEMBERS, CORRODED MEMBERS, LOOSE BOLTS, CRACKED WELDS AND OTHER MEMBER DEFECTS HAVE NOT BEEN CONSIDERED. THE TOWER IS ASSUMED TO BE PLUMB AND THE SITE IS ASSUMED TO BE LEVEL. THIS DESIGN IS BEING PROVIDED WITHOUT THE BENEFIT OF A COMMON ASSESSMENT BY MASER CONSULTING P.A.. CONTRACTOR SHALL COMMISSION A COMPLETE CONDITION ASSESSMENT PRIOR TO ORDERING ANY REINFORCING MATERIALS. CONTRACTOR SHALL SUPPLY CONDITION ASSESSMENT TO ENGINEER FOR REVIEW. SEE CONTRACTOR NOTES.
20. ALL SUBSTITUTES PROPOSED BY THE CONTRACTOR SHALL BE APPROVED IN WRITING BY THE ENGINEER. CONTRACTOR SHALL PROVIDE DOCUMENTATION TO ENGINEER FOR DETERMINING IF SUBSTITUTE IS SUITABLE FOR USE AND MEETS THE ORIGINAL DESIGN CRITERIA. DIFFERENCES FROM THE ORIGINAL DESIGN, INCLUDING MAINTENANCE, REPAIR AND REPLACEMENT, SHALL BE NOTED. ESTIMATES OF COSTS/CREDITS ASSOCIATED WITH THE SUBSTITUTION (INCLUDING RE-DESIGN COSTS AND COSTS TO SUB-CONTRACTORS) SHALL BE PROVIDED TO THE ENGINEER. CONTRACTOR SHALL PROVIDE ADDITIONAL DOCUMENTATION AND/OR SPECIFICATIONS TO THE ENGINEER AS REQUESTED.
21. PROVIDE STRUCTURAL STEEL SHOP DRAWINGS TO ENGINEER FOR APPROVAL PRIOR TO FABRICATION.
22. INSPECTION OF THE MODIFICATIONS SHALL BE COMPLETED BY A THIRD PARTY. INSPECTION SHALL TAKE PLACE WITHIN 72 HOURS OF THE COMPLETION OF THE TOWER MODIFICATIONS. NO PROPOSED LOADING SHALL BE INSTALLED PRIOR TO INSPECTOR APPROVAL.

DESIGN LOADS

1. WIND: EIA/TIA-222-G
   WIND SPEED: 125 MPH (ULTIMATE)
   EXPOSURE CATEGORY C
   TOPOGRAPHIC CATEGORY 1
2. DESIGN BASED ON THE SAME TOWER LOADING AND ASSUMPTIONS NOTED IN STRUCTURAL ANALYSIS REPORT BY MASER CONSULTING P.A. DATED NOVEMBER 16, 2018.
3. TOWER MODIFICATIONS WERE DESIGNED IN ACCORDANCE TO TIA-222-G AND 2018 CONNECTICUT STATE BUILDING CODE, INCORPORATING IBC 2015.

STRUCTURAL STEEL

1. DESIGN, FABRICATION, ERECTION AND WORKMANSHIP SHALL CONFORM TO AISC MANUAL OF STEEL CONSTRUCTION, FOURTEENTH EDITION.
2. CONNECTION BOLTS SHALL BE 3/4"Ø ASTM A325N UNLESS OTHERWISE NOTED.
3. FIELD WELDING SHALL BE PERFORMED BY WELDERS THAT ARE CERTIFIED (AWS "STANDARD QUALIFICATION PROCEDURE") TO PERFORM THE TYPE OF WORK REQUIRED. WELDS SHALL CONFORM TO AMERICAN WELDING SOCIETY (AWS) D1.1 "STRUCTURAL WELDING CODE - STEEL". PROVIDE THE MINIMUM SIZE PER PART 8 IN THE AISC "MANUAL OF STEEL CONSTRUCTION", 14TH EDITION, WHEN WELD SIZES ARE NOT SHOWN. USE E70XX ELECTRODES FOR ALL WELDING.
4. RETURN ALL WELDS AT CORNERS TWICE THE NOMINAL SIZE OF THE WELD MINIMUM, UNLESS OTHERWISE NOTED.
5. TO REDUCE WARPING TO A MINIMUM WHEN WELDING TO EXISTING MEMBERS CARRYING LOAD, SHORE OR BRACE EXISTING MEMBER DURING WELDING.
6. ALL COPES, BLOCKS, CUT OUTS, AND OTHER CUTTING OF STRUCTURAL MEMBERS SHALL HAVE ALL RE-ENTRANT CORNERS SHAPED, NOTCHED FREE TO A RADIUS OF AT LEAST 1/2".
7. CONTRACTOR IS RESPONSIBLE FOR ADEQUATE BRACING OF STEEL CONSTRUCTION.
8. ALL NEW STRUCTURAL STEEL SHAPES SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A123.
9. ALL NEW STEEL BOLTS, NUTS, AND HARDWARE SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153.
10. DAMAGED GALVANIZED SURFACES SHALL BE REPAIRED BY COLD GALVANIZING IN ACCORDANCE WITH ASTM A780.
11. ALL STRUCTURAL STEEL SHALL ABIDE BY THE FOLLOWING MATERIAL STRENGTH LIST UNLESS OTHERWISE NOTED:

PLATES	ASTM A572 (GR 36)
ANGLES	ASTM A36 (GR 36) (U.N.O)
SOLID ROUND	ASTM A572 (GR 50)
BOLTS	ASTM A325 (ALL BOLT HOLES STANDARD SIZE U.N.O.)
NUTS	ASTM A194-2H
WASHERS	ASTM F436
HOT-DIPPED GALVANIZING	ASTM A123
WELDS	E70XX
PAINT	NEW STEEL TO BE PAINTED TO MATCH EXISTING TOWER

SITE PREPARATION

1. PLACE CONCRETE AS SOON AS PRACTICAL AFTER EXCAVATION IS MADE TO PRESERVE THE INTEGRITY OF THE FOUNDATION, EXCAVATION AND BEARING CAPACITY. REMOVAL OF ANY WATER ACCUMULATED IN EXCAVATION IS REQUIRED PRIOR TO PLACEMENT OF CONCRETE.
2. ALL EXCAVATIONS SHALL CONFORM TO CURRENT OSHA REQUIREMENTS. CONTRACTOR WILL BE RESPONSIBLE FOR SAFEGUARDING AND PROTECTING, ALL EXCAVATIONS AND EXISTING STRUCTURES DURING CONSTRUCTION BY PROPER SAFEGUARDS WHICH MAY INCLUDE BRACING.
3. EXCAVATIONS SHALL BE FLAT AND LEVEL AND WELL CLEANED OF ALL LOOSE, WET SOIL OR ROCK. EXCAVATIONS SHALL BE FINISHED BY HAND. BACKFILL ANY OVEREXCAVATIONS.

CONTRACTOR NOTES

1. ALL CONTRACTORS AND LOWER TIER CONTRACTORS MUST ACKNOWLEDGE IN WRITING TO TOWER OWNER AND MASER CONSULTING P.A. THAT THEY HAVE OBTAINED, UNDERSTAND, AND WILL FOLLOW TOWER OWNER STANDARDS OF PRACTICE, CONSTRUCTION GUIDELINES, ALL SITE AND TOWER SAFETY PROCEDURES, ALL PRODUCT LIMITATIONS AND INSTALLATION PROCEDURES USED ON SITE, AND PROPOSED MODIFICATIONS DESCRIBED. RECEIPT OF ACKNOWLEDGMENT MUST OCCUR PRIOR TO BEGINNING CONSTRUCTION OR CLIMBING. IT IS THE RESPONSIBILITY OF THE GENERAL CONTRACTOR TO PROVIDE THIS DOCUMENTATION FOR TOWER OWNER AND MASER CONSULTING P.A. ON COMPANY LETTERHEAD AND THE RESPONSIBILITY OF THE GENERAL CONTRACTOR TO OBTAIN THIS DOCUMENTATION FROM LOWER TIER SUBCONTRACTORS (ON SUBCONTRACTOR LETTERHEAD) AND DELIVER IT TO TOWER OWNER AND MASER CONSULTING P.A.
2. IF THE CONTRACTOR DISCOVERS ANY EXISTING CONDITIONS THAT ARE NOT REPRESENTED ON THESE DRAWINGS, OR ANY CONDITIONS THAT WOULD INTERFERE WITH THE INSTALLATION OF THE MODIFICATIONS, MASER CONSULTING P.A. SHALL BE CONTACTED IMMEDIATELY TO EVALUATE THE SIGNIFICANCE OF THE DEVIATION.
3. IT IS ASSUMED THAT ANY STRUCTURAL MODIFICATION WORK SPECIFIED ON THESE PLANS WILL BE ACCOMPLISHED BY KNOWLEDGEABLE WORKMEN WITH TOWER CONSTRUCTION EXPERIENCE. THIS INCLUDES PROVIDING THE NECESSARY CERTIFICATIONS TO THE TOWER OWNER AND ENGINEER.
4. THESE DRAWINGS DO NOT INDICATE THE METHOD OF CONSTRUCTION. THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK AND SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION METHODS, MEANS, TECHNIQUES, SEQUENCES, AND PROCEDURES.
5. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR INITIATING, MAINTAINING, AND SUPERVISING ALL SAFETY PROGRAMS AND PRECAUTIONS IN CONNECTION WITH THIS WORK.
6. THE CONTRACTOR SHALL VISIT THE SITE PRIOR TO BIDDING; ANY PROBLEMS WITH ACCESS, INTERFERENCE, ETC. SHALL BE RESOLVED PRIOR TO MOBILIZATION. THE CONTRACTOR MUST VISIT THE SITE PRIOR TO ORDERING ANY MATERIAL AND MUST RESOLVE ALL ISSUES WITH THE OWNER PREVENTING A CONTINUOUS INSTALLATION. CONTRACTOR SHALL NOTE ALL ANTENNAS, MOUNTS, COAX, LIGHTING, CLIMBING SUPPORTS, STEP BOLTS, PORT HOLES, AND ANY OTHER TOWER APPURTENANCES IN THE REGION OF THE MODIFICATIONS.
7. CONTRACTOR IS RESPONSIBLE FOR TEMPORARILY REMOVING ALL COAX, T-BRACKETS, ANTENNA MOUNTS, AND ANY OTHER TOWER APPURTENANCE THAT MAY INTERFERE WITH THE TOWER MODIFICATIONS. ALL TOWER APPURTENANCES MUST BE REPLACED AND/OR RESTORED TO ITS ORIGINAL LOCATION. ANY CARRIER DOWNTIME MUST BE COORDINATED WITH THE TOWER OWNER IN WRITING.
8. SOME ATTACHMENTS MAY REQUIRE CUSTOM MODIFICATIONS TO PROPERLY FIT THE MODIFIED REGION OF THE STRUCTURE. THESE CUSTOMIZATIONS ARE DESIGNED BY OTHERS AND MUST BE APPROVED BY THE ENGINEER PRIOR TO REMOVING SUCH ATTACHMENTS. ANY CARRIER DOWNTIME MUST BE COORDINATED WITH THE TOWER OWNER IN WRITING.
9. CONTRACTOR SHALL ONLY WORK WITHIN THE LIMITS OF THE TOWER OWNER'S PROPERTY OR LEASE AREA AND APPROVED EASEMENTS. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY WORK IS WITHIN THESE BOUNDARIES. CONTRACTOR SHALL EMPLOY A SURVEYOR AS REQUIRED. ANY WORK OUTSIDE THESE BOUNDARIES SHALL BE APPROVED IN WRITING BY THE LAND OWNER PRIOR TO MOBILIZATION. CONSTRUCTION STAKING AND BOUNDARY MARKING IS THE RESPONSIBILITY OF THE CONTRACTOR.
10. WORK SHALL ONLY BE PERFORMED DURING CALM DRY DAYS (WINDS LESS THAN 10-MPH) CONTRACTOR IS RESPONSIBLE FOR ALL TEMPORARY LOCAL TOWER SHORING, TEMPORARY GLOBAL TOWER SHORING, AND ALL SHORING OF SURROUNDING BUILDINGS, PADS, AND OTHER OUTDOOR SITE OBSTRUCTIONS. ALL SHORING, TEMPORARY BRACING, AND TEMPORARY SUPPORTS ARE THE RESPONSIBILITY OF THE CONTRACTOR.
11. MODIFICATIONS SHOWN SHALL BE INSTALLED ON ALL TOWER LEGS/FACES.

MASER CONSULTING — CONNECTICUT —

Customer Loyalty *through* Client Satisfaction
www.maserconsulting.com
Engineers ■ Planners ■ Surveyors
Landscape Architects ■ Environmental Scientists

at&t

EMPIRE telecom

811 Know what's below. Call before you dig.
PROTECT YOURSELF
ALL STATES REQUIRE NOTIFICATION OF EXCAVATORS, DESIGNERS, OR ANY PERSON PREPARING TO DISTURB THE EARTH'S SURFACE ANYWHERE IN ANY STATE
FOR STATE SPECIFIC DIRECT PHONE NUMBERS VISIT: WWW.CALL811.COM

SCALE: AS SHOWN
JOB NUMBER: 18963007A

REV	DATE	DESCRIPTION	DRAWN BY	CHECKED BY
5	02/22/19	STRUCTURAL REVISIONS	AJC	RA
4	02/11/19	REVISED PER COMMENTS	AJC	RA
4	12/18/18	REVISED PER COMMENTS	AJC	RA
3	11/30/18	NEW MOUNT REVISION	AJC	RA
2	09/25/18	REVISED PER COMMENTS	AJC	RA
1	09/14/18	ISSUED FOR REVIEW	MJB	RA

PETROS E. TSOUKALAS
CONNECTICUT PROFESSIONAL ENGINEER - LICENSE NUMBER: 32577

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF THE RESPONSIBLE LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

SITE NAME:

MT. TOM WALLINGFORD
FA# 10035084
SITE# CT2168

23 WAYNE ROAD
WALLINGFORD, CT 06492
NEW HAVEN COUNTY

RED BANK OFFICE
331 NEWMAN SPRINGS ROAD
SUITE 203
RED BANK, NJ 07701-5669
Phone: 732.383.1950
Fax: 732.383.1984
email: solutions@maserconsulting.com

SHEET TITLE: STRUCTURAL NOTES

SHEET NUMBER: S-3

MODIFICATION INSPECTION CHECKLIST

BEFORE CONSTRUCTION

CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REQUIRED (COMPLETED BY ENGINEER OF RECORD	REPORT ITEM
X	MODIFICATION INSPECTION CHECKLIST DRAWING
X	ENGINEER OF RECORD APPROVED SHOP DRAWINGS
X	FABRICATION INSPECTION
-	FABRICATOR CERTIFIED WELD INSPECTION
X	MATERIAL TEST REPORT
-	FABRICATOR NDE INSPECTION
-	NDE REPORT OF MONOPOLE BASE PLATE (AS REQUIRED)
X	PACKING SLIPS
ADDITIONAL TESTING AND INSPECTIONS:	

DURING CONSTRUCTION

CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REQUIRED (COMPLETED BY ENGINEER OF RECORD	REPORT ITEM
X	CONSTRUCTION INSPECTIONS
X	FOUNDATION INSPECTIONS
-	CONCRETE COMP. STRENGTH AND SLUMP TESTS
X	POST INSTALLED ANCHOR BOLT VERIFICATION
-	BASE PLATE GROUT VERIFICATION
X	CONTRACTOR'S CERTIFIED WELD INSPECTION
-	EARTHWORK: LIFT AND DENSITY
X	ON SITE COLD GALVANIZING VERIFICATION
-	GUY WIRE TENSION REPORT
X	GC AS-BUILT DOCUMENTS
ADDITIONAL TESTING AND INSPECTIONS:	

AFTER CONSTRUCTION

CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REQUIRED (COMPLETED BY ENGINEER OF RECORD	REPORT ITEM
X	MODIFICATION INSPECTOR REDLINE OR RECORD DRAWING(S)
X	POST INSTALLED ANCHOR BOLT PULL-OUT TESTING
X	PHOTOGRAPHS
ADDITIONAL TESTING AND INSPECTIONS:	

NOTE: X DENOTES A DOCUMENT NEEDED FOR THE MODIFICATION INSPECTION REPORT
- DENOTES A DOCUMENT THAT IS NOT REQUIRED FOR THE MODIFICATION INSPECTION REPORT

MODIFICATION INSPECTION NOTES:

GENERAL

1. THE MODIFICATION INSPECTION IS A VISUAL INSPECTION OF TOWER MODIFICATIONS AND A REVIEW OF CONSTRUCTION INSPECTIONS AND OTHER REPORTS TO ENSURE THE INSTALLATION WAS CONSTRUCTED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS, NAMELY THE MODIFICATION DRAWINGS, AS DESIGNED BY THE ENGINEER OF RECORD.
2. THE MODIFICATION INSPECTION IS TO CONFIRM INSTALLATION CONFIGURATION AND WORKMANSHIP ONLY AND IS NOT A REVIEW OF THE MODIFICATION DESIGN ITSELF, NOR DOES THE MODIFICATION INSPECTOR TAKE OWNERSHIP OF THE MODIFICATION DESIGN. OWNERSHIP OF THE STRUCTURAL MODIFICATION DESIGN EFFECTIVENESS AND INTENT RESIDES WITH THE ENGINEER OF RECORD AT ALL TIMES.
3. TO ENSURE THAT THE REQUIREMENTS OF THE MODIFICATION INSPECTION ARE MET, IT IS VITAL THAT THE GENERAL CONTRACTOR (GC) AND THE MODIFICATION INSPECTOR BEGIN COMMUNICATING AND COORDINATING AS SOON AS A PO OR PAYMENT IS RECEIVED. IT IS EXPECTED THAT EACH PARTY WILL BE PROACTIVE IN REACHING OUT TO THE OTHER PARTY. CONTACT LISTED ON THE TITLE SHEET SHALL BE CONTACTED IF SPECIFIC INSPECTOR CONTACT INFORMATION IS NOT KNOWN.

MODIFICATION INSPECTOR

1. THE MODIFICATION INSPECTOR IS REQUIRED TO CONTACT THE GC AS SOON AS RECEIVING A PO OR PAYMENT FOR THE MODIFICATION INSPECTION TO:
   - REVIEW THE REQUIREMENTS OF THE MODIFICATION INSPECTION CHECKLIST
   - WORK WITH THE GC TO DEVELOP A SCHEDULE TO CONDUCT ON-SITE INSPECTIONS, INCLUDING FOUNDATION INSPECTIONS
   - DISCUSS ANY SITE SPECIFIC INSPECTIONS OR CONCERNS
2. THE MODIFICATION INSPECTOR IS RESPONSIBLE FOR COLLECTING ALL GENERAL CONTRACTOR (GC) INSPECTION AND TEST REPORTS, REVIEWING THE DOCUMENTS FOR ADHERENCE TO THE CONTRACT DOCUMENTS, CONDUCTING THE IN-FIELD INSPECTIONS, AND SUBMITTING THE MODIFICATION INSPECTION REPORT.

GENERAL CONTRACTOR

1. THE GC IS REQUIRED TO CONTACT THE MODIFICATION INSPECTOR AS SOON AS RECEIVING A PO OR PAYMENT FOR THE MODIFICATION INSTALLATION OR TURNKEY PROJECT TO:
   - REVIEW THE REQUIREMENTS OF THE MODIFICATION INSPECTION CHECKLIST
   - WORK WITH THE MI INSPECTOR TO DEVELOP A SCHEDULE TO CONDUCT ON-SITE MODIFICATION INSPECTIONS, INCLUDING FOUNDATION INSPECTIONS
   - BETTER UNDERSTAND ALL INSPECTION AND TESTING REQUIREMENTS
2. THE GC SHALL PERFORM AND RECORD THE TEST AND INSPECTION RESULTS IN ACCORDANCE WITH THE REQUIREMENTS OF THE MODIFICATION INSPECTION CHECKLIST.

RECOMMENDATIONS

1. THE FOLLOWING RECOMMENDATIONS AND SUGGESTIONS ARE OFFERED TO ENHANCE THE EFFICIENCY AND EFFECTIVENESS OF DELIVERING A MODIFICATION INSPECTION REPORT:
   - IT IS SUGGESTED THAT THE GC PROVIDE A MINIMUM OF 5 BUSINESS DAYS NOTICE, PREFERABLY 10, TO THE MODIFICATION INSPECTOR AS TO WHEN THE SITE WILL BE READY FOR THE MODIFICATION INSPECTION TO BE CONDUCTED.
   - THE GC AND MODIFICATION INSPECTOR COORDINATE CLOSELY THROUGHOUT THE ENTIRE PROJECT.
   - WHEN POSSIBLE, IT IS PREFERRED TO HAVE THE GC AND MODIFICATION INSPECTOR ON-SITE SIMULTANEOUSLY FOR ANY GUY WIRE TENSIONING OR RE-TENSIONING OPERATIONS.
   - IT MAY BE BENEFICIAL TO INSTALL ALL TOWER MODIFICATIONS PRIOR TO CONDUCTING THE FOUNDATION INSPECTIONS TO ALLOW FOUNDATION AND MODIFICATION INSPECTION(S) TO COMMENCE WITH ONE SITE VISIT.
   - WHEN POSSIBLE, IT IS PREFERRED TO HAVE THE GC AND MODIFICATION INSPECTOR ON-SITE DURING THE MODIFICATION INSPECTION TO HAVE ANY DEFICIENCIES CORRECTED DURING THE INITIAL MODIFICATION INSPECTION. THEREFORE, THE GC MAY CHOOSE TO COORDINATE THE MODIFICATION INSPECTION CAREFULLY TO ENSURE ALL CONSTRUCTION FACILITIES ARE AT THEIR DISPOSAL WHEN THE MI INSPECTOR IS ON SITE.

CANCELLATION OR DELAYS IN SCHEDULED MODIFICATION INSPECTION

1. IF THE GC AND MODIFICATION INSPECTOR AGREE TO A DATE ON WHICH THE MODIFICATION INSPECTION WILL BE CONDUCTED, AND EITHER PARTY CANCELS OR DELAYS, THE TOWER OWNER SHALL NOT BE RESPONSIBLE FOR ANY COSTS, FLEES, LOSS OF DEPOSITS AND/OR OTHER PENALTIES RELATED TO THE CANCELLATION OR DELAY INCURRED BY EITHER PARTY FOR ANY TIME (E.G. TRAVEL AND LODGING, COSTS OF KEEPING EQUIPMENT ON-SITE, ETC.). EXCEPTIONS MAY BE MADE IN THE EVENT THAT THE DELAY/CANCELLATION IS CAUSED BY WEATHER OR OTHER CONDITIONS THAT MAY COMPROMISE THE SAFETY OF THE PARTIES INVOLVED.

CORRECTION OF FAILING MODIFICATION INSPECTION

1. IF THE MODIFICATION INSTALLATION WOULD FAIL THE MODIFICATION INSPECTION ("FAILED MODIFICATION INSPECTION"), THE GC SHALL WORK WITH MODIFICATION INSPECTOR TO COORDINATE A REMEDIATION PLAN IN ONE OF TWO WAYS:
   - CORRECT FAILING ISSUES TO COMPLY WITH THE SPECIFICATIONS CONTAINED IN THE ORIGINAL CONTRACT DOCUMENTS AND COORDINATE A SUPPLEMENT MODIFICATION INSPECTION.
   - OR, WITH TOWER OWNER'S APPROVAL, THE GC MAY WORK WITH THE ENGINEER OF RECORD TO RE-ANALYZE THE MODIFICATION/REINFORCEMENT USING THE AS-BUILT CONDITION.

VERIFICATION INSPECTIONS

1. TOWER OWNER RESERVES THE RIGHT TO CONDUCT A VERIFICATION INSPECTION TO VERIFY THE ACCURACY AND COMPLETENESS OF PREVIOUSLY COMPLETED MODIFICATION INSPECTION(S) ON TOWER MODIFICATION PROJECTS.
2. VERIFICATION INSPECTION MAY BE CONDUCTED BY AN INDEPENDENT FIRM AFTER A MODIFICATION PROJECT IS COMPLETED, AS MARKED BY THE DATE OF AN ACCEPTED "PASSING MODIFICATION INSPECTION" OR "PASS AS NOTED MODIFICATION INSPECTION" REPORT FOR THE ORIGINAL PROJECT.

REQUIRED PHOTOS

1. BETWEEN THE GC AND THE MI INSPECTOR THE FOLLOWING PHOTOGRAPHS ARE TO BE TAKEN AND INCLUDED IN THE MODIFICATION INSPECTION REPORT:
   - PRE-CONSTRUCTION GENERAL SITE CONDITION
   - PHOTOGRAPHS DURING THE REINFORCEMENT MODIFICATION CONSTRUCTION/ERECTION AND INSPECTION
     - RAW MATERIALS
     - PHOTOS OF ALL CRITICAL DETAILS
     - FOUNDATION MODIFICATIONS
     - WELD PREPARATION
     - BOLT INSTALLATION AND TORQUE
     - FINAL INSTALLED CONDITION
     - SURFACE COATING REPAIR
   - POST CONSTRUCTION PHOTOGRAPHS FINAL INFIELD CONDITION
   - ANY OTHER PHOTOS DEEMED RELEVANT TO SHOW COMPLETE DETAILS OF MODIFICATIONS
2. PHOTOS OF ELEVATED MODIFICATIONS TAKEN FROM THE GROUND SHALL BE CONSIDERED INADEQUATE.

MASER CONSULTING CONNECTICUT
Customer Loyalty through Client Satisfaction
www.maserconsulting.com
Engineers ■ Planners ■ Surveyors
Landscape Architects ■ Environmental Scientists

at&t

EMPIRE telecom

811 Know what's below. Call before you dig.
PROTECT YOURSELF
ALL STATES REQUIRE NOTIFICATION OF EXCAVATORS, DESIGNERS, OR ANY PERSON PREPARING TO DISTURB THE EARTH'S SURFACE ANYWHERE IN ANY STATE
FOR STATE SPECIFIC DIRECT PHONE NUMBERS VISIT: WWW.CALL811.COM

SCALE: AS SHOWN | JOB NUMBER: 18963007A

REV	DATE	DESCRIPTION	DRAWN BY	CHECKED BY
5	02/22/19	STRUCTURAL REVISIONS	AJC	RA
4	02/11/19	REVISED PER COMMENTS	AJC	RA
4	12/18/18	REVISED PER COMMENTS	AJC	RA
3	11/30/18	NEW MOUNT REVISION	AJC	RA
2	09/25/18	REVISED PER COMMENTS	AJC	RA
1	09/14/18	ISSUED FOR REVIEW	MJB	RA

PETROS E. TSOUKALAS
CONNECTICUT PROFESSIONAL ENGINEER - LICENSE NUMBER: 32577

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF THE RESPONSIBLE LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

SITE NAME:
MT. TOM WALLINGFORD
FA# 10035084
SITE# CT2168
23 WAYNE ROAD
WALLINGFORD, CT 06492
NEW HAVEN COUNTY

RED BANK OFFICE
331 NEWMAN SPRINGS ROAD
SUITE 203
RED BANK, NJ 07701-5669
Phone: 732.383.1950
Fax: 732.383.1984
email: solutions@maserconsulting.com

SHEET TITLE: TOWER MODIFICATION INSPECTION CHECKLIST

SHEET NUMBER: S-4

EXHIBIT 3

MASER CONSULTING
— CONNECTICUT —

Engineers Planners Surveyors Landscape Architects Environmental Scientists

Self-Support Tower Modifications

FOR

CT2168 – MT. Tom Wallingford

FA #: 10035084
23 Wayne Road
Wallingford, CT 06492
New Haven County

LTE 5G NR Upgrade – MRCTB032262
LTE 6C – MRCTB032233
LTE 7C – MRCTB032242

Tower Utilization (before Modifications): 109.2%
Tower Utilization (after Modifications): 96.8%
Foundation Utilization: 49.2%
Anchor Utilization: 93.7%

November 16, 2018

Prepared For

AT&T
550 Cochituate Road
Framingham, MA 01701

Prepared By

Maser Consulting Connecticut
331 Newman Springs Road, Suite 203
Red Bank, NJ 07701
T: 732.383.1950

STATE OF CONNECTICUT
PETROS ISOUKALAS
32557
PROFESSIONAL ENGINEER

Petros E. Isoukalas, P.E.
Geographic Discipline Leader
Connecticut License No. 32557

www.maserconsulting.com

MC Project No. 18963007A

Objective:

The objective of this report is to determine the capacity of the existing modified self-support tower at the subject facility for the final wireless telecommunications configuration, per the applicable codes and standards.

Introduction:

Maser Consulting Connecticut has performed limited field observations on May 14, 2018 to verify the existing condition of the structure and to locate and quantify the existing wireless appurtenances where possible, from ground level. Maser Consulting Connecticut has reviewed the following documents in completing this report:

• Failing Structural Analysis Report, prepared by Maser Consulting, P.A., dated November 02, 2018.
• Structural Analysis Report, prepared by Centek Engineering, dated January 5, 2017.
• RFDS 2346933 provided by Smartlink, dated June 14, 2018.

The proposed **AT&T** equipment is to be supported on a proposed antenna support mount constructed of structural steel antenna support pipes supported by pipes at a centerline of approximately 78'-0" above ground level. This report is based only upon this information.

Codes, Standards and Loading:

Maser Consulting Connecticut utilized the following codes and standards:

- 2018 Connecticut State Building Code, Incorporating the 2012 IBC
- Structural Standards for Antenna Supporting Structures and Antennas ANSI/TIA-222-G
    - Ultimate Wind Speed – 125 mph (3 Second Gust)
    - Basic Wind Speed – 97 mph (3 Second Gust)
    - Exposure Category – C
    - Structural Class – II
    - Topographic Category – 1
    - Ice Wind – 50 mph
    - Ice Thickness – 0.75"
- Specification for Structural Steel Buildings ANSI/AISC 360-10, American Institute of Steel Construction (AISC)

Maser Consulting Connecticut understands the final **AT&T** loading to be the following:

- (3) 7770 Antennas (Existing)
- (3) OPA-65R-LCUU-H6 Antennas (Existing)
- **(3) 800-10965 Antennas (Proposed)**
- (3) QS66512-2 Antennas (Existing)
- (2) DC6 (Existing)
- **(1) DC6 (Proposed)**
- (3) TMAs (Existing)
- (3) RRUS 32 (Existing)
- **(3) B14 4478 RRUS (Proposed)**
- **(3) 4478 B5 RRUS (Proposed)**
- **(3) 4426 B66 RRUS (Proposed)**
- (3) RRUS 11 (Existing)
- (3) RRUS-32 B2 (Existing)
- **(6) Low Band Combiners (Proposed)**

Analysis Approach & Assumptions:

The analysis approach used in this structural analysis is based on the premise that if the existing modified self-support structure is structurally adequate to support the existing and proposed equipment per the aforementioned codes and standards, or if the increase in the forces in the structure are deemed to be negligible or acceptable, then the proposed equipment can be installed as intended. Tower Numerics, tnx Tower, a tower analysis and design program, designed specifically for the telecommunications industry and for all applicable codes and standards was used for this structural analysis.

General Site Design Assumption:

- All engineering services are performed on the basis that the information used is current and correct.
- It is assumed that the telecommunication equipment supports, antenna supports, and existing structure have been designed by a registered licensed professional engineer for the existing loads acting on the structure, as required by all applicable codes, prior to the proposed modifications listed within this report, if any.
- It is assumed that information provided by the client regarding the structure itself, the antenna models, feed lines, and other relevant information is current and correct.
- It is the responsibility of the client to ensure that the information provided to Maser Consulting Connecticut and used in the performance of our engineering services is correct and complete. In the absence of information to the contrary, we assume that the original design, material production, fabrication, and erection of the existing structure was performed in accordance with accepted industry design standards and in accordance with all applicable codes. Further, it is assumed that the existing structure and appurtenances have been properly maintained in accordance with all applicable codes and manufacturer's specifications and no structural defects and/or deterioration to the structural members has occurred.
- It is assumed all other existing appurtenances, antennas, cables, etc. belonging to others have been installed and supported per code and per specifications so as not to damage any existing structural support members, and that any contributing loads from adjacent equipment has been taken into consideration for their design.
- All services are performed, results obtained, and recommendations made in accordance with generally accepted engineering principles and practices. Maser Consulting Connecticut is not responsible for the conclusion, opinions, and recommendations made by others based on the information we supply.

Site Specific Design Parameters and Assumptions:

The following design parameters have been utilized in this report:

- ***It is assumed that all tower, foundation, soil parameters and appurtenance information in the referenced analysis is accurate and reflective of the current condition of the tower.***
- The existing antenna mounts shall be removed and replaced with larger sector frames.

Tower Modification Descriptions:

The following tower modifications have been utilized in this report:

- Install L2x2x1/4 secondary horizontal members between elevation 20' to 25.1' (two bays) and 0' to 10' (four bays).

Calculations:

The calculations are found in Appendix A of this report.

Conclusion:

The existing modified tower was analyzed for the loading in the applicable codes and standards. The modified tower has been determined to be structurally **ADEQUATE** to support the proposed and existing loading, based upon the aforementioned assumptions. The self-support tower has been determined to be stressed to a maximum of **96.8%** of its structural capacity with the maximum usage occurring at the tower legs between elevations 0'-2.6'. Therefore, the proposed **AT&T** installation **CAN** be installed as intended in all sectors, **once the proposed modifications are properly installed.**

Additionally, Maser Consulting Connecticut has analyzed the existing foundation and anchor bolts based off of the information provided in the referenced analysis. Maser Consulting Connecticut has determined the foundation to be stressed to a maximum of **49.2%** in overturning and the anchor bolts are stressed to a maximum of **93.7%** of their capacity.

Maser Consulting Connecticut reserves the right to amend this report if additional information about the existing members is provided. Any change to the installation will require a revision to this structural analysis.

We appreciate the opportunity to be of service on this project. If you should have any questions or require any additional information, please do not hesitate to call our office.
Sincerely,

Maser Consulting Connecticut

Petros E. Tsoukalas, P.E.
Geographic Discipline Leader

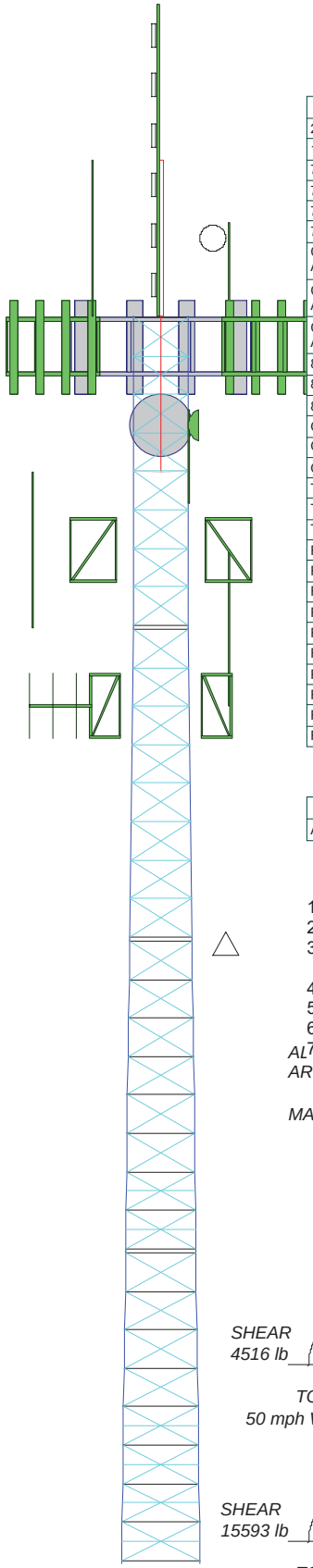
Dejian Xu, P.E.
Project Engineer

R:\Projects\2018\18963000A\18963007A\Structural\Tower Analysis\Rev 1 -MOD\Word\10035084.CT2168.MOD.Rev 1.docx

MASER CONSULTING
— CONNECTICUT—

APPENDIX A

Section		T18	T17	T16	T15	T14	T13	T12	T11	T10	T9	T8	T7	T6	T5	T4	T3	T2	T1	L1
Legs					SR 2 1/2									SR 2 1/4				SR 2	SR 1 1/2	P4x.237
Leg Grade																	A572-50			A53-B-35
Diagonals														SR 7/8					SR 3/4	N.A.
Diagonal Grade																	A572-50			N.A.
Top Girts					SR 7/8				SR 1				SR 7/8			SR 1		SR 7/8	L3 1/2x3 1/2x5/16	N.A.
Bottom Girts		SR 1			N.A.					SR 1			N.A.					SR 7/8	SR 3/4	N.A.
Horizontals									N.A.									SR 7/8	SR 3/4	N.A.
Sec. Horizontals			L2x2x1/4					N.A.		L2x2x1/4								N.A.		
Face Width (ft)	54.9375		4.875	4.8125	4.75	4.6875	4.625	4.5625	4.5	4.4375	4.375	4.3125	4.25	4.1875	4.125	4.0625	4	3.5	0.375	
# Panels @ (ft)																	32 @ 2.46875		N.A.	
Weight (lb)	6301.9	334.0	281.5	279.7	278.0	228.8	227.7	226.5	238.7	289.5	242.8	197.4	196.3	195.2	194.1	193.0	203.4	1354.0	1027.8	113.4



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
20' 8 Bay Di-Pole	90	RRUS 4426 B66 (att)	78
10' Omni	85	RRUS 4426 B66 (att)	78
7' Whip	83	RRUS11 B12 (Partiall Shielded by 11.9" Antenna) (att)	78
7770	78	RRUS11 B12 (Partiall Shielded by 11.9" Antenna) (att)	78
7770	78	RRUS11 B12 (Partiall Shielded by 11.9" Antenna) (att)	78
7770	78	RRUS 32 B2 (att)	78
CCI OPA-65R-LCUU-H6 Panel Antenna with 8ft Pipe (att)	78	RRUS 32 B2 (att)	78
CCI OPA-65R-LCUU-H6 Panel Antenna with 8ft Pipe (att)	78	RRUS 32 B2 (att)	78
CCI OPA-65R-LCUU-H6 Panel Antenna with 8ft Pipe (att)	78	DC6-48-60-18-8C (att)	78
800-10965 (att)	78	DC6-48-60-18-8C (att)	78
800-10965 (att)	78	DC6-48-60-18-8C (att)	78
800-10965 (att)	78	Pirod 12' PCS T-Frame (1) 104569 (att)	78
QS66512-2 (att)	78	Pirod 12' PCS T-Frame (1) 104569 (att)	78
QS66512-2 (att)	78	Pirod 12' PCS T-Frame (1) 104569 (att)	78
QS66512-2 (att)	78	2' dish	73
TMA (att)	78	4' dish	73
TMA (att)	78	1.5" Dia 4' Omni w/Pipe Mount	65
TMA (att)	78	6' Side Arm	65
RRUS 32 (att)	78	6' Side Arm	65
RRUS 32 (att)	78	7' Whip	65
RRUS 32 (att)	78	10' Omni	65
RRU B14 4478 (att)	78	4 ' Side Arm	55
RRU B14 4478 (att)	78	4 ' Side Arm	55
RRU B14 4478 (att)	78	10' Omni	55
RRUS 4478 B5 (att)	78	10' Yagi	55
RRUS 4478 B5 (att)	78		
RRUS 4478 B5 (att)	78		
RRUS 4426 B66 (att)	78		

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

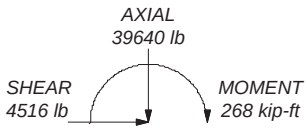
1. Tower designed for Exposure C to the TIA-222-G Standard.
2. Tower designed for a 97 mph basic wind in accordance with the TIA-222-G Standard.
3. Tower is also designed for a 50 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 60 mph wind.
5. Tower Structure Class II.
6. Topographic Category 1 with Crest Height of 0.00 ft
7. TOWER RATING: 96.8%

ALL ARE FACTORED

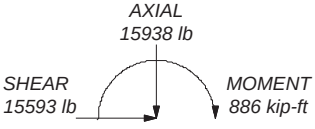
MAX. CORNER REACTIONS AT BASE:

DOWN: 209930 lb
SHEAR: 9131 lb

UPLIFT: -199608 lb
SHEAR: 9201 lb



TORQUE 1 kip-ft
50 mph WIND - 0.7500 in ICE



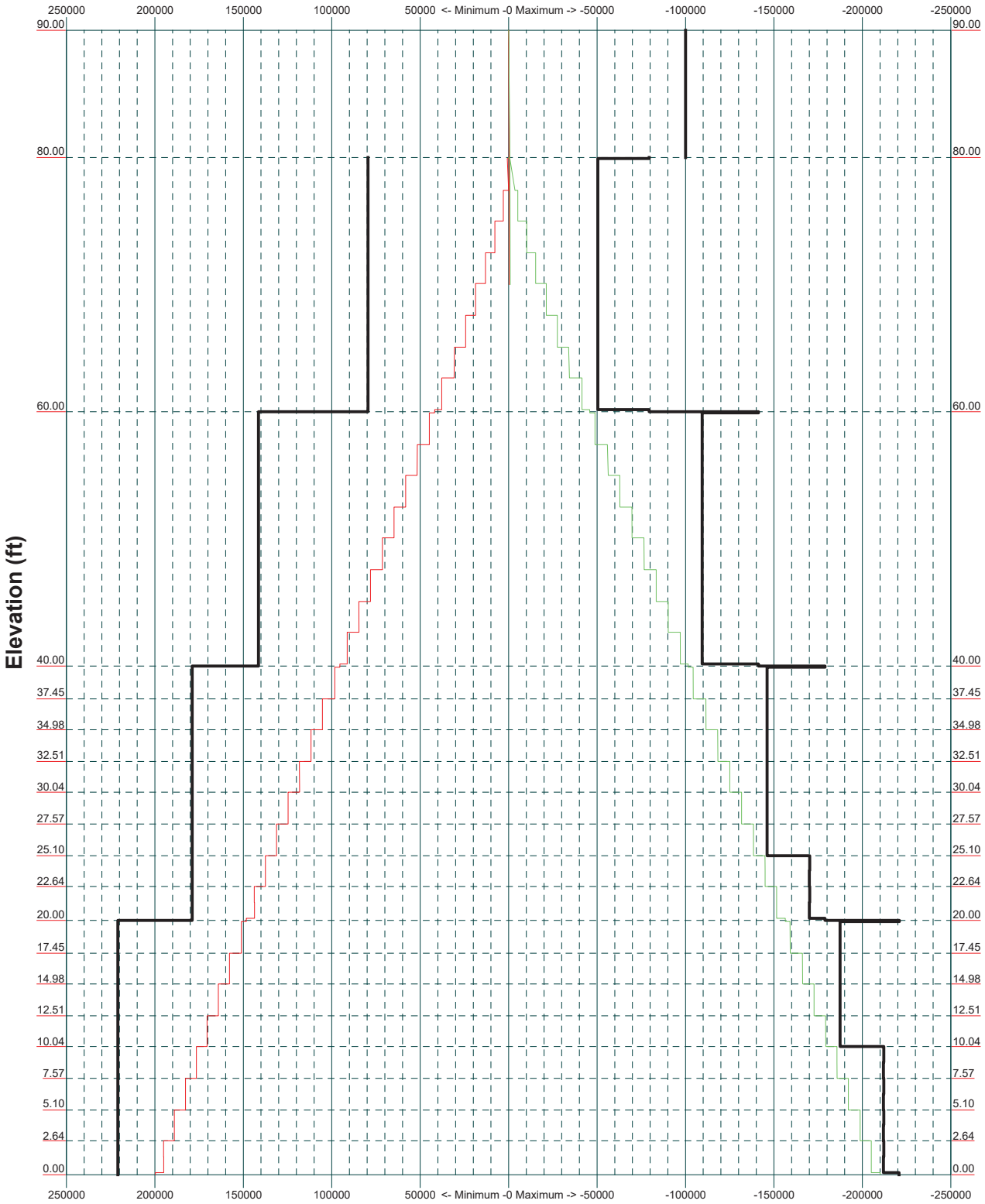
TORQUE 2 kip-ft
REACTIONS - 97 mph WIND

Maser Consulting, P.A.
2000 Midlantic Drive, Suite 100
Mt. Laurel, NJ 08054
Phone: (856) 797-0412
FAX:
Consulting Engineers

Job: 18963007A		
Project: CT2168		
Client: AT&T	Drawn by: dxu	App'd:
Code: TIA-222-G	Date: 11/12/18	Scale: NTS
Path: R:\Projects\2018\18963000A\18963007A\Structural\Tower Analysis\Rev 1 -MOD\tnx Tower\CT2168.eri		Dwg No. E-1

TIA-222-G - 97 mph/50 mph 0.7500 in Ice Exposure C

Leg Capacity ——— **Leg Compression (lb)**



Maser Consulting, P.A.
2000 Midlantic Drive, Suite 100
Mt. Laurel, NJ 08054
Phone: (856) 797-0412
FAX:

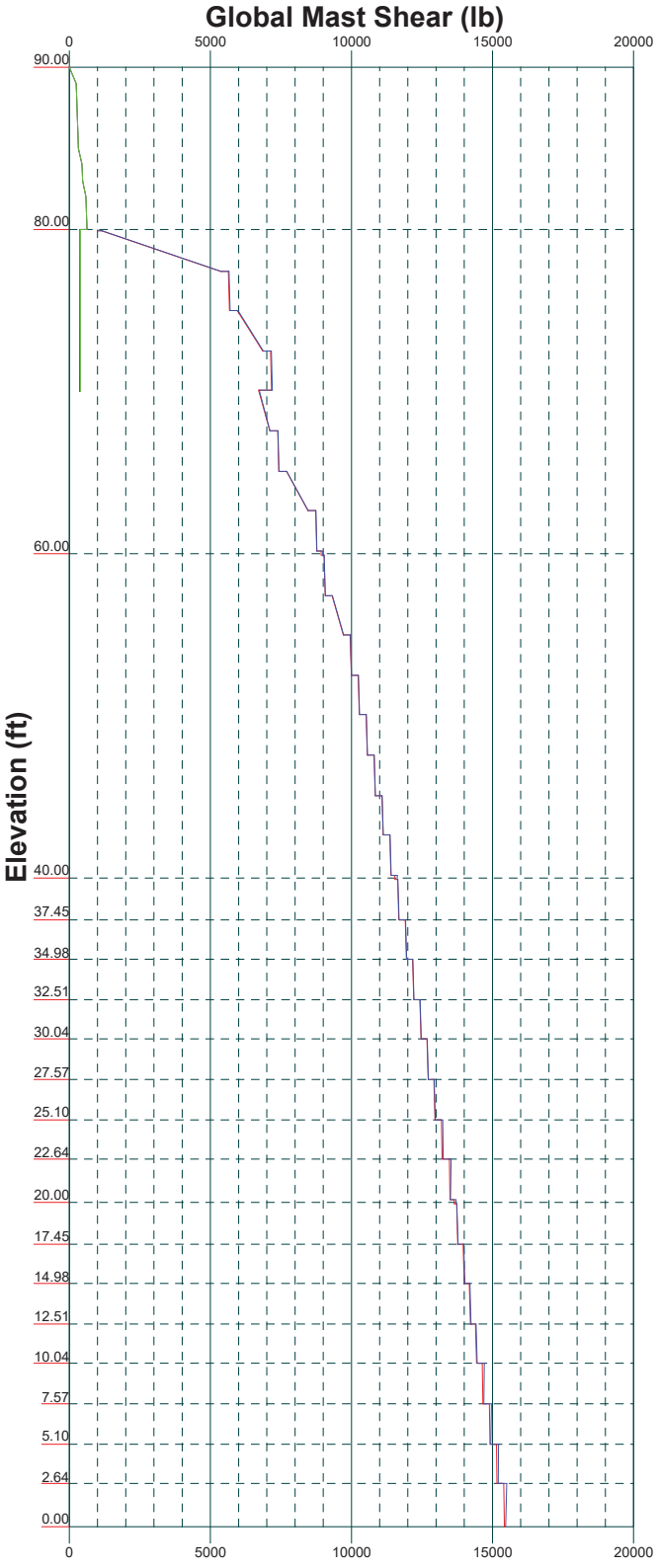
MASER CONSULTING
Consulting Engineers

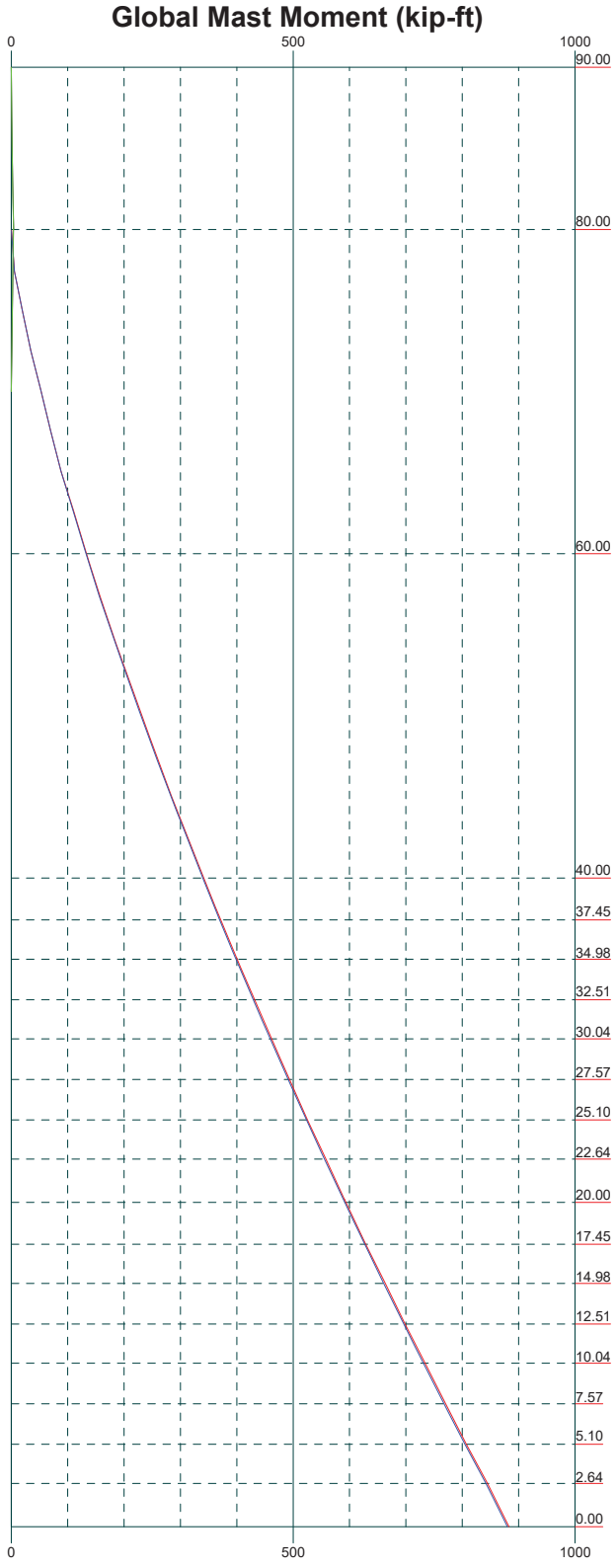
Job: ***18963007A***			
Project: ***CT2168***			
Client: AT&T	Drawn by: dxu	App'd:	
Code: TIA-222-G	Date: 11/12/18	Scale: NTS	
Path: R:\Projects\2018\18963000A\18963007A\Structural\Tower Analysis\Rev 1 -MOD\tnx Tower\CT2168.eri		Dwg No. E-3	

TIA-222-G - 97 mph/50 mph 0.7500 in Ice Exposure C

Maximum Values

Vx Vz Mx Mz





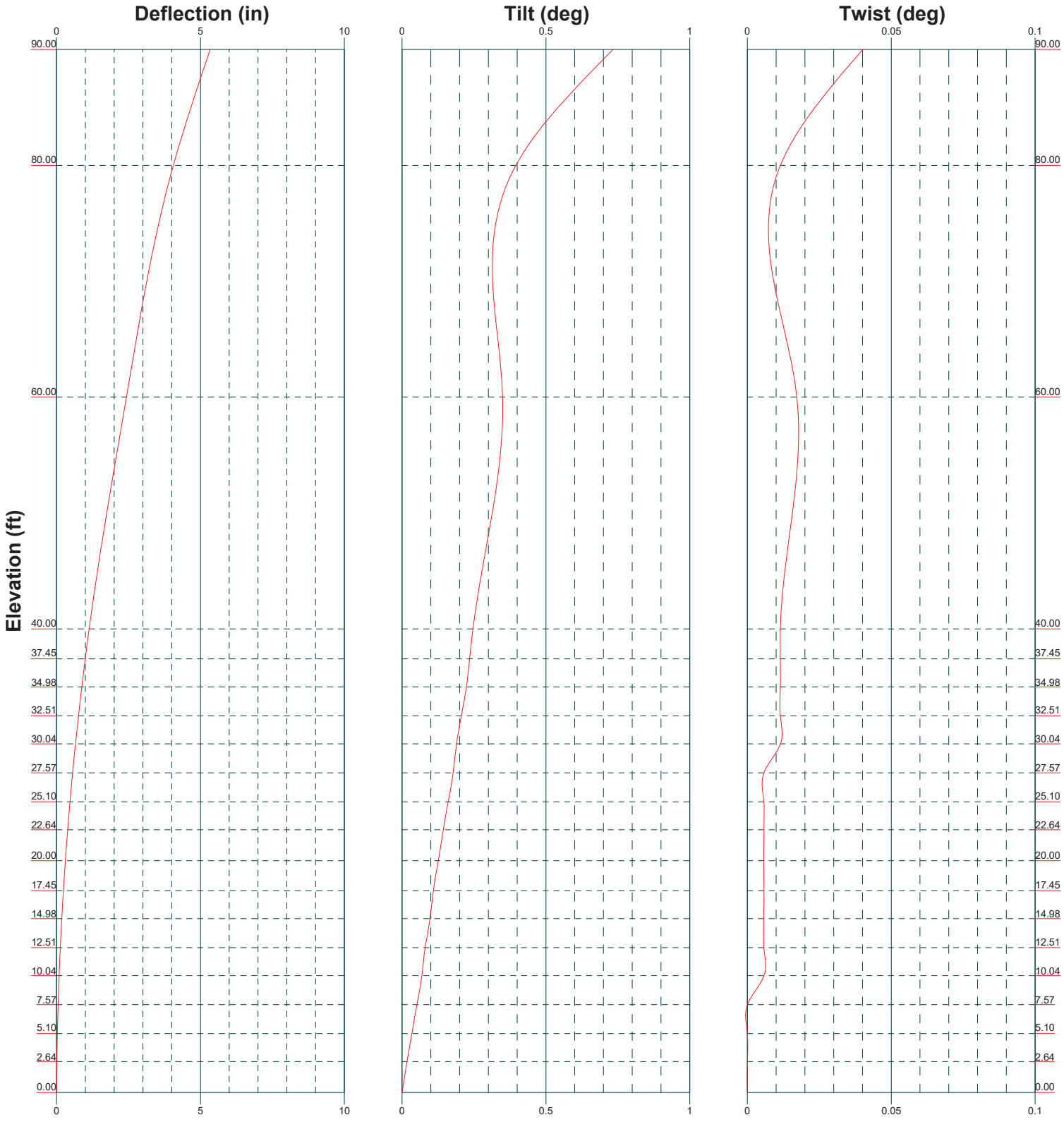
MASER Consulting Engineers

Maser Consulting, P.A.
2000 Midlantic Drive, Suite 100
Mt. Laurel, NJ 08054
Phone: (856) 797-0412
FAX:

Job: ***18963007A***			
Project: ***CT2168***			
Client: AT&T	Drawn by: dxu	App'd:	
Code: TIA-222-G	Date: 11/12/18	Scale: NTS	
Path: R:\Projects\2018\18963000A\18963007A\Structural\Tower Analysis\Rev 1 -MOD\tnx Tower\CT2168.er		Dwg No. E-4	

TIA-222-G - Service - 60 mph

Maximum Values



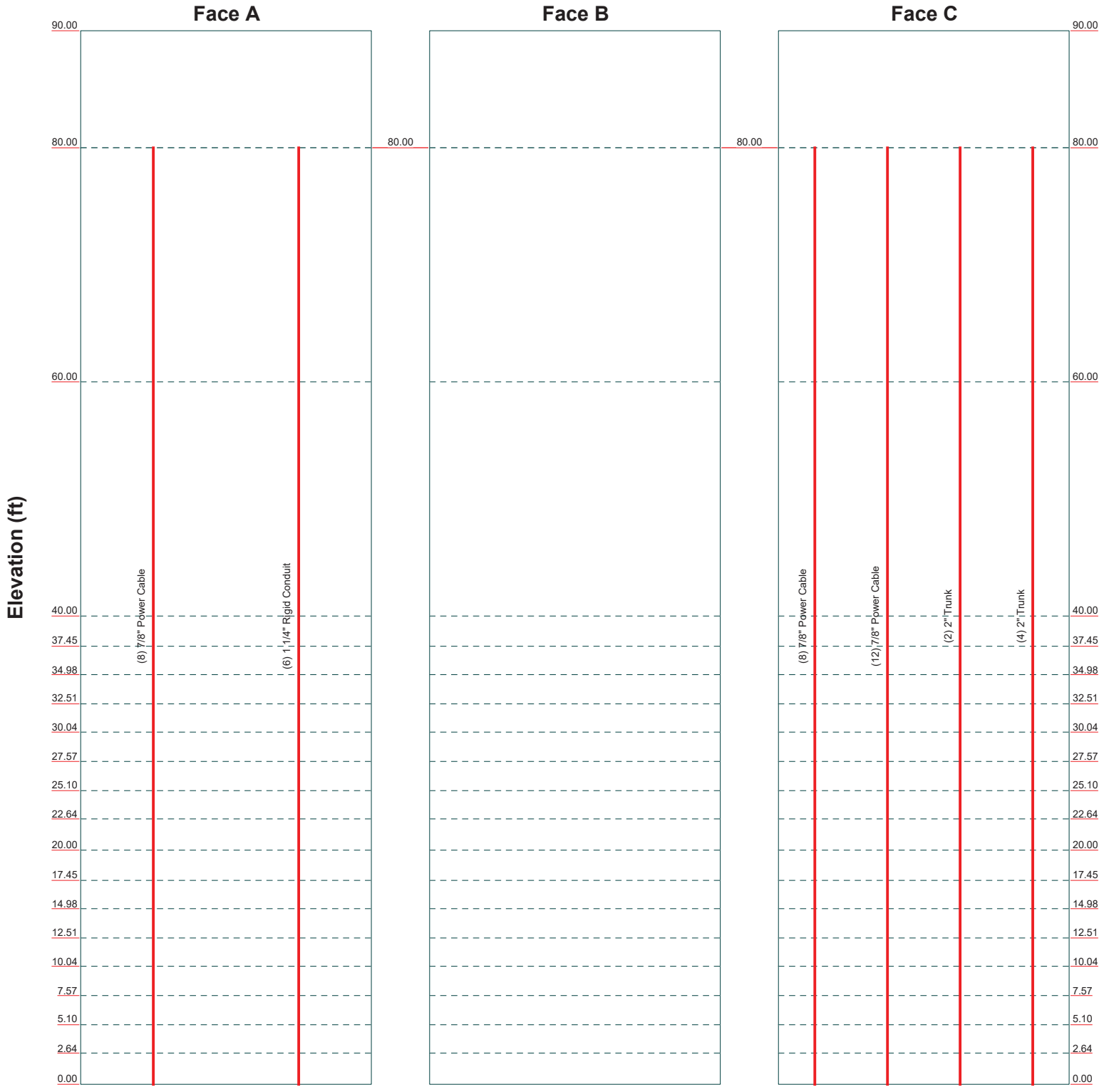
Maser Consulting, P.A.
2000 Midlantic Drive, Suite 100
Mt. Laurel, NJ 08054
Phone: (856) 797-0412
FAX:

MASER CONSULTING
Consulting Engineers

Job: ***18963007A***			
Project: ***CT2168***			
Client: AT&T	Drawn by: dxu	App'd:	
Code: TIA-222-G	Date: 11/12/18	Scale: NTS	
Path: R:\Projects\2018\18963000A\18963007A\Structural\Tower Analysis\Rev 1 -MOD\tnx Tower\CT2168.eri		Dwg No. E-5	

Feed Line Distribution Chart
0' - 90'

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



MASER Consulting Engineers

Maser Consulting, P.A.
2000 Midlantic Drive, Suite 100
Mt. Laurel, NJ 08054
Phone: (856) 797-0412
FAX:

Job: ***18963007A***		
Project: ***CT2168***		
Client: AT&T	Drawn by: dxu	App'd:
Code: TIA-222-G	Date: 11/12/18	Scale: NTS
Path: R:\Projects\2018\18963000A\18963007A\Structural\Tower Analysis\Rev 1 -MOD\tnx Tower\CT2168.eri		Dwg No. E-7

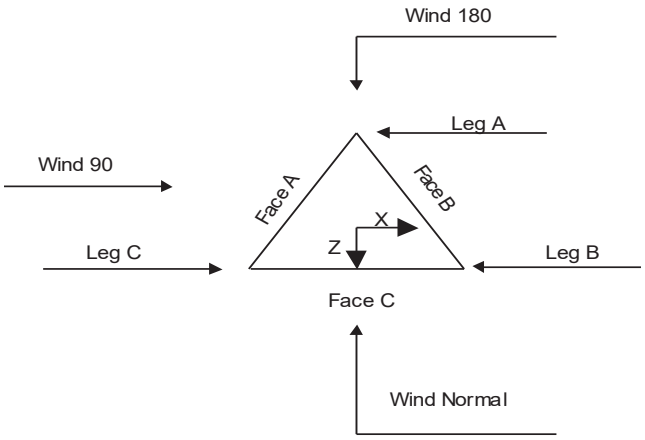
Tower Input Data

The main tower is a 3x free standing tower with an overall height of 90.00 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 3.50 ft at the top and 5.00 ft at the base.
An index plate is provided at the 3x free standing -tower connection.
There is a pole section.
This tower is designed using the TIA-222-G standard.
The following design criteria apply:

ASCE 7-10 Wind Data is used (wind speeds converted to nominal values).
Basic wind speed of 97 mph.
Structure Class II.
Exposure Category C.
Topographic Category 1.
Crest Height 0.00 ft.
Nominal ice thickness of 0.7500 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 50 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 60 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.
Stress ratio used in tower member design is 1.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

Consider Moments - Legs	Distribute Leg Loads As Uniform	Use ASCE 10 X-Brace Ly Rules
Consider Moments - Horizontals	Assume Legs Pinned	Calculate Redundant Bracing Forces
Consider Moments - Diagonals	√ Assume Rigid Index Plate	Ignore Redundant Members in FEA
Use Moment Magnification	√ Use Clear Spans For Wind Area	SR Leg Bolts Resist Compression
√ Use Code Stress Ratios	Use Clear Spans For KL/r	All Leg Panels Have Same Allowable
√ Use Code Safety Factors - Guys	Retension Guys To Initial Tension	Offset Girt At Foundation
Escalate Ice	√ Bypass Mast Stability Checks	√ Consider Feed Line Torque
Always Use Max Kz	Use Azimuth Dish Coefficients	√ Include Angle Block Shear Check
Use Special Wind Profile	√ Project Wind Area of Appurt.	Use TIA-222-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		



Triangular Tower

Pole Section Geometry

Section	Elevation ft	Section Length ft	Pole Size	Pole Grade	Socket Length ft
L1	90.00-80.00	10.00	P4x.237	A53-B-35 (35 ksi)	10.00

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
L1 90.00-80.00				1	1	1.05			

Tower Section Geometry

Tower Section	Tower Elevation ft	Assembly Database	Description	Section Width ft	Number of Sections	Section Length ft
T1	80.00-60.00			3.50	1	20.00
T2	60.00-40.00			3.50	1	20.00
T3	40.00-37.45			4.00	1	2.55
T4	37.45-34.98			4.06	1	2.47
T5	34.98-32.51			4.13	1	2.47

Tower Section	Tower Elevation ft	Assembly Database	Description	Section Width ft	Number of Sections	Section Length ft
T6	32.51-30.04			4.19	1	2.47
T7	30.04-27.57			4.25	1	2.47
T8	27.57-25.10			4.31	1	2.47
T9	25.10-22.64			4.38	1	2.47
T10	22.64-20.00			4.44	1	2.64
T11	20.00-17.45			4.50	1	2.55
T12	17.45-14.98			4.56	1	2.47
T13	14.98-12.51			4.63	1	2.47
T14	12.51-10.04			4.69	1	2.47
T15	10.04-7.57			4.75	1	2.47
T16	7.57-5.10			4.81	1	2.47
T17	5.10-2.64			4.88	1	2.47
T18	2.64-0.00			4.94	1	2.64

Tower Section Geometry *(cont'd)*

Tower Section	Tower Elevation ft	Diagonal Spacing ft	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset in	Bottom Girt Offset in
T1	80.00-60.00	2.47	X Brace	No	Yes	1.0000	2.0000
T2	60.00-40.00	2.47	X Brace	No	Yes	1.0000	2.0000
T3	40.00-37.45	2.47	X Brace	No	Yes	1.0000	0.0000
T4	37.45-34.98	2.47	X Brace	No	Yes	0.0000	0.0000
T5	34.98-32.51	2.47	X Brace	No	Yes	0.0000	0.0000
T6	32.51-30.04	2.47	X Brace	No	Yes	0.0000	0.0000
T7	30.04-27.57	2.47	X Brace	No	Yes	0.0000	0.0000
T8	27.57-25.10	2.47	X Brace	No	Yes	0.0000	0.0000
T9	25.10-22.64	2.47	X Brace	No	Yes	0.0000	0.0000
T10	22.64-20.00	2.47	X Brace	No	Yes	0.0000	2.0000
T11	20.00-17.45	2.47	X Brace	No	Yes	1.0000	0.0000
T12	17.45-14.98	2.47	X Brace	No	Yes	0.0000	0.0000
T13	14.98-12.51	2.47	X Brace	No	Yes	0.0000	0.0000
T14	12.51-10.04	2.47	X Brace	No	Yes	0.0000	0.0000
T15	10.04-7.57	2.47	X Brace	No	Yes	0.0000	0.0000
T16	7.57-5.10	2.47	X Brace	No	Yes	0.0000	0.0000
T17	5.10-2.64	2.47	X Brace	No	Yes	0.0000	0.0000
T18	2.64-0.00	2.47	X Brace	No	Yes	0.0000	2.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 80.00-60.00	Solid Round	1 1/2	A572-50 (50 ksi)	Solid Round	3/4	A572-50 (50 ksi)
T2 60.00-40.00	Solid Round	2	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T3 40.00-37.45	Solid Round	2 1/4	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T4 37.45-34.98	Solid Round	2 1/4	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T5 34.98-32.51	Solid Round	2 1/4	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T6 32.51-30.04	Solid Round	2 1/4	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T7 30.04-27.57	Solid Round	2 1/4	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T8 27.57-25.10	Solid Round	2 1/4	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T9 25.10-22.64	Solid Round	2 1/4	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T10 22.64-20.00	Solid Round	2 1/4	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T11 20.00-17.45	Solid Round	2 1/2	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T12 17.45-14.98	Solid Round	2 1/2	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T13 14.98-12.51	Solid Round	2 1/2	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T14 12.51-10.04	Solid Round	2 1/2	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T15 10.04-7.57	Solid Round	2 1/2	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T16 7.57-5.10	Solid Round	2 1/2	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T17 5.10-2.64	Solid Round	2 1/2	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T18 2.64-0.00	Solid Round	2 1/2	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T1 80.00-60.00	Single Angle	L3 1/2x3 1/2x5/16	A36 (36 ksi)	Solid Round	3/4	A572-50 (50 ksi)
T2 60.00-40.00	Solid Round	7/8	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T3 40.00-37.45	Solid Round	1	A572-50 (50 ksi)	Solid Round		A572-50 (50 ksi)
T4 37.45-34.98	Solid Round	7/8	A572-50 (50 ksi)	Solid Round		A572-50 (50 ksi)
T5 34.98-32.51	Solid Round	7/8	A572-50 (50 ksi)	Solid Round		A572-50 (50 ksi)
T6 32.51-30.04	Solid Round	7/8	A572-50 (50 ksi)	Solid Round		A572-50 (50 ksi)
T7 30.04-27.57	Solid Round	7/8	A572-50 (50 ksi)	Solid Round		A572-50 (50 ksi)
T8 27.57-25.10	Solid Round	7/8	A572-50 (50 ksi)	Solid Round		A572-50 (50 ksi)
T9 25.10-22.64	Solid Round	7/8	A572-50 (50 ksi)	Solid Round		A572-50 (50 ksi)
T10 22.64-20.00	Solid Round	7/8	A572-50 (50 ksi)	Solid Round	1	A572-50 (50 ksi)
T11 20.00-17.45	Solid Round	1	A572-50 (50 ksi)	Solid Round		A572-50 (50 ksi)

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T12 17.45-14.98	Solid Round	7/8	A572-50 (50 ksi)	Solid Round		A572-50 (50 ksi)
T13 14.98-12.51	Solid Round	7/8	A572-50 (50 ksi)	Solid Round		A572-50 (50 ksi)
T14 12.51-10.04	Solid Round	7/8	A572-50 (50 ksi)	Solid Round		A572-50 (50 ksi)
T15 10.04-7.57	Solid Round	7/8	A572-50 (50 ksi)	Solid Round		A572-50 (50 ksi)
T16 7.57-5.10	Solid Round	7/8	A572-50 (50 ksi)	Solid Round		A572-50 (50 ksi)
T17 5.10-2.64	Solid Round	7/8	A572-50 (50 ksi)	Solid Round		A572-50 (50 ksi)
T18 2.64-0.00	Solid Round	7/8	A572-50 (50 ksi)	Solid Round	1	A572-50 (50 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
T1 80.00-60.00	None	Flat Bar		A36 (36 ksi)	Solid Round	3/4	A572-50 (50 ksi)
T2 60.00-40.00	None	Flat Bar		A36 (36 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T3 40.00-37.45	None	Flat Bar		A36 (36 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T4 37.45-34.98	None	Flat Bar		A36 (36 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T5 34.98-32.51	None	Flat Bar		A36 (36 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T6 32.51-30.04	None	Flat Bar		A36 (36 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T7 30.04-27.57	None	Flat Bar		A36 (36 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T8 27.57-25.10	None	Flat Bar		A36 (36 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T9 25.10-22.64	None	Flat Bar		A36 (36 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T10 22.64-20.00	None	Flat Bar		A36 (36 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T11 20.00-17.45	None	Flat Bar		A36 (36 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T12 17.45-14.98	None	Flat Bar		A36 (36 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T13 14.98-12.51	None	Flat Bar		A36 (36 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T14 12.51-10.04	None	Flat Bar		A36 (36 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T15 10.04-7.57	None	Flat Bar		A36 (36 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T16 7.57-5.10	None	Flat Bar		A36 (36 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T17 5.10-2.64	None	Flat Bar		A36 (36 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T18 2.64-0.00	None	Flat Bar		A36	Solid Round	7/8	A572-50

Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
				(36 ksi)			(50 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Secondary Horizontal Type	Secondary Horizontal Size	Secondary Horizontal Grade	Inner Bracing Type	Inner Bracing Size	Inner Bracing Grade
T9 25.10-22.64	Single Angle	L2x2x1/4	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T10 22.64-20.00	Single Angle	L2x2x1/4	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T15 10.04-7.57	Single Angle	L2x2x1/4	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T16 7.57-5.10	Single Angle	L2x2x1/4	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T17 5.10-2.64	Single Angle	L2x2x1/4	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T18 2.64-0.00	Single Angle	L2x2x1/4	A36 (36 ksi)	Single Angle		A36 (36 ksi)

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 80.00-60.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T2 60.00-40.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T3 40.00-37.45	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T4 37.45-34.98	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T5 34.98-32.51	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T6 32.51-30.04	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T7 30.04-27.57	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T8 27.57-25.10	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T9 25.10-22.64	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T10 22.64-20.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T11 20.00-17.45	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T12	0.00	0.0000	A36	1	1	1.05	36.0000	36.0000	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
17.45-14.98			(36 ksi)						
T13	0.00	0.0000	A36	1	1	1.05	36.0000	36.0000	36.0000
14.98-12.51			(36 ksi)						
T14	0.00	0.0000	A36	1	1	1.05	36.0000	36.0000	36.0000
12.51-10.04			(36 ksi)						
T15 10.04-7.57	0.00	0.0000	A36	1	1	1.05	36.0000	36.0000	36.0000
			(36 ksi)						
T16 7.57-5.10	0.00	0.0000	A36	1	1	1.05	36.0000	36.0000	36.0000
			(36 ksi)						
T17 5.10-2.64	0.00	0.0000	A36	1	1	1.05	36.0000	36.0000	36.0000
			(36 ksi)						
T18 2.64-0.00	0.00	0.0000	A36	1	1	1.05	36.0000	36.0000	36.0000
			(36 ksi)						

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	Yes	Yes	1	1	1	1	1	1	1	1
80.00-60.00				1	1	1	1	1	1	1
T2	Yes	Yes	1	1	1	1	1	1	1	1
60.00-40.00				1	1	1	1	1	1	1
T3	Yes	Yes	1	1	1	1	1	1	1	1
40.00-37.45				1	1	1	1	1	1	1
T4	Yes	Yes	1	1	1	1	1	1	1	1
37.45-34.98				1	1	1	1	1	1	1
T5	Yes	Yes	1	1	1	1	1	1	1	1
34.98-32.51				1	1	1	1	1	1	1
T6	Yes	Yes	1	1	1	1	1	1	1	1
32.51-30.04				1	1	1	1	1	1	1
T7	Yes	Yes	1	1	1	1	1	1	1	1
30.04-27.57				1	1	1	1	1	1	1
T8	Yes	Yes	1	1	1	1	1	1	1	1
27.57-25.10				1	1	1	1	1	1	1
T9	Yes	Yes	1	1	1	1	1	1	1	1
25.10-22.64				1	1	1	1	1	1	1
T10	Yes	Yes	1	1	1	1	1	1	1	1
22.64-20.00				1	1	1	1	1	1	1
T11	Yes	Yes	1	1	1	1	1	1	1	1
20.00-17.45				1	1	1	1	1	1	1
T12	Yes	Yes	1	1	1	1	1	1	1	1
17.45-14.98				1	1	1	1	1	1	1
T13	Yes	Yes	1	1	1	1	1	1	1	1
14.98-12.51				1	1	1	1	1	1	1
T14	Yes	Yes	1	1	1	1	1	1	1	1
12.51-10.04				1	1	1	1	1	1	1
T15	Yes	Yes	1	1	1	1	1	1	1	1
10.04-7.57				1	1	1	1	1	1	1
T16 7.57-5.10	Yes	Yes	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T17 5.10-2.64	Yes	Yes	1	1	1	1	1	1	1	1

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	Legs	K Factors[1] 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
				1	1	1	1	1	1	1
T18 2.64-0.00	Yes	Yes	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1

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

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T1 80.00-60.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T2 60.00-40.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T3 40.00-37.45	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T4 37.45-34.98	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T5 34.98-32.51	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T6 32.51-30.04	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T7 30.04-27.57	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T8 27.57-25.10	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T9 25.10-22.64	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T10 22.64-20.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T11 20.00-17.45	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T12 17.45-14.98	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T13 14.98-12.51	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T14 12.51-10.04	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T15 10.04-7.57	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T16 7.57-5.10	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T17 5.10-2.64	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T18 2.64-0.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
7/8" Power Cable	A	No	Ar (CaAa)	80.00 - 0.00	0.0000	-0.35	8	4	0.8750	0.8750		1.00
7/8" Power Cable	C	No	Ar (CaAa)	80.00 - 0.00	0.0000	0.35	8	4	0.8750	0.8750		1.00
7/8" Power Cable	C	No	Ar (CaAa)	80.00 - 0.00	-1.0000	-0.35	12	4	0.8750	0.8750		1.00

Description	Face or Leg	Allow Shield	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 1/4" Rigid Conduit	A	No	Ar (CaAa)	80.00 - 0.00	-4.0000	0.38	6	3	1.2500	1.2500		0.70
2" Trunk	C	No	Ar (CaAa)	80.00 - 0.00	0.0000	-0.28	2	2	2.0000	2.0000		1.00
2" Trunk	C	No	Ar (CaAa)	80.00 - 0.00	0.0000	-0.26	4	4	2.0000	2.0000		1.00

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
L1	90.00-80.00	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
T1	80.00-60.00	A	0.000	0.000	29.000	0.000	244.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	59.000	0.000	520.00
T2	60.00-40.00	A	0.000	0.000	29.000	0.000	244.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	59.000	0.000	520.00
T3	40.00-37.45	A	0.000	0.000	3.701	0.000	31.14
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	7.529	0.000	66.35
T4	37.45-34.98	A	0.000	0.000	3.580	0.000	30.12
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	7.283	0.000	64.19
T5	34.98-32.51	A	0.000	0.000	3.580	0.000	30.12
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	7.283	0.000	64.19
T6	32.51-30.04	A	0.000	0.000	3.580	0.000	30.12
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	7.283	0.000	64.19
T7	30.04-27.57	A	0.000	0.000	3.580	0.000	30.12
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	7.283	0.000	64.19
T8	27.57-25.10	A	0.000	0.000	3.580	0.000	30.12
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	7.283	0.000	64.19
T9	25.10-22.64	A	0.000	0.000	3.580	0.000	30.12
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	7.283	0.000	64.19
T10	22.64-20.00	A	0.000	0.000	3.821	0.000	32.15
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	7.774	0.000	68.52
T11	20.00-17.45	A	0.000	0.000	3.701	0.000	31.14
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	7.529	0.000	66.35
T12	17.45-14.98	A	0.000	0.000	3.580	0.000	30.12
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	7.283	0.000	64.19
T13	14.98-12.51	A	0.000	0.000	3.580	0.000	30.12
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	7.283	0.000	64.19
T14	12.51-10.04	A	0.000	0.000	3.580	0.000	30.12
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	7.283	0.000	64.19
T15	10.04-7.57	A	0.000	0.000	3.580	0.000	30.12
		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 lb
		C	0.000	0.000	7.283	0.000	64.19
T16	7.57-5.10	A	0.000	0.000	3.580	0.000	30.12
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	7.283	0.000	64.19
T17	5.10-2.64	A	0.000	0.000	3.580	0.000	30.12
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	7.283	0.000	64.19
T18	2.64-0.00	A	0.000	0.000	3.821	0.000	32.15
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	7.774	0.000	68.52

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
L1	90.00-80.00	A	1.649	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
T1	80.00-60.00	A	1.617	0.000	0.000	57.051	0.000	1029.30
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	129.326	0.000	2190.03
T2	60.00-40.00	A	1.564	0.000	0.000	56.309	0.000	1006.14
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	127.884	0.000	2139.45
T3	40.00-37.45	A	1.524	0.000	0.000	7.115	0.000	126.23
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	16.183	0.000	268.29
T4	37.45-34.98	A	1.514	0.000	0.000	6.866	0.000	121.57
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	15.621	0.000	258.36
T5	34.98-32.51	A	1.503	0.000	0.000	6.847	0.000	121.01
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	15.585	0.000	257.14
T6	32.51-30.04	A	1.492	0.000	0.000	6.828	0.000	120.42
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	15.547	0.000	255.83
T7	30.04-27.57	A	1.480	0.000	0.000	6.807	0.000	119.78
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	15.507	0.000	254.44
T8	27.57-25.10	A	1.467	0.000	0.000	6.784	0.000	119.09
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	15.463	0.000	252.94
T9	25.10-22.64	A	1.452	0.000	0.000	6.760	0.000	118.35
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	15.415	0.000	251.31
T10	22.64-20.00	A	1.436	0.000	0.000	7.186	0.000	125.44
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	16.398	0.000	266.30
T11	20.00-17.45	A	1.417	0.000	0.000	6.926	0.000	120.49
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	15.816	0.000	255.72
T12	17.45-14.98	A	1.397	0.000	0.000	6.666	0.000	115.52
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	15.232	0.000	245.10
T13	14.98-12.51	A	1.374	0.000	0.000	6.626	0.000	114.35
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	15.157	0.000	242.54

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
T14	12.51-10.04	A	1.347	0.000	0.000	6.580	0.000	112.98
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	15.067	0.000	239.55
T15	10.04-7.57	A	1.314	0.000	0.000	6.524	0.000	111.33
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	14.958	0.000	235.92
T16	7.57-5.10	A	1.272	0.000	0.000	6.452	0.000	109.21
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	14.818	0.000	231.26
T17	5.10-2.64	A	1.211	0.000	0.000	6.347	0.000	106.20
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	14.615	0.000	224.63
T18	2.64-0.00	A	1.087	0.000	0.000	6.551	0.000	107.01
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	15.167	0.000	225.80

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	90.00-80.00	0.0000	0.0000	0.0000	0.0000
T1	80.00-60.00	0.1589	1.2704	0.1940	0.6590
T2	60.00-40.00	0.1709	1.3941	0.2207	0.7502
T3	40.00-37.45	0.1762	1.4669	0.2446	0.8319
T4	37.45-34.98	0.1779	1.4866	0.2459	0.8365
T5	34.98-32.51	0.1793	1.5051	0.2504	0.8519
T6	32.51-30.04	0.1808	1.5236	0.2550	0.8676
T7	30.04-27.57	0.1823	1.5420	0.2597	0.8838
T8	27.57-25.10	0.1837	1.5604	0.2645	0.9004
T9	25.10-22.64	0.1734	1.4780	0.2077	0.7072
T10	22.64-20.00	0.1711	1.4639	0.1737	0.5915
T11	20.00-17.45	0.1861	1.5985	0.2814	0.9582
T12	17.45-14.98	0.1877	1.6181	0.2842	0.9677
T13	14.98-12.51	0.1892	1.6360	0.2904	0.9892
T14	12.51-10.04	0.1906	1.6539	0.2973	1.0127
T15	10.04-7.57	0.1790	1.5587	0.2436	0.8298
T16	7.57-5.10	0.1802	1.5740	0.2535	0.8636
T17	5.10-2.64	0.1813	1.5892	0.2669	0.9093
T18	2.64-0.00	0.1785	1.5695	0.2599	0.8856

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T1	1	7/8" Power Cable	60.00 - 80.00	0.6000	0.3763
T1	2	7/8" Power Cable	60.00 - 80.00	0.6000	0.3763
T1	3	7/8" Power Cable	60.00 - 80.00	0.6000	0.3763
T1	4	1 1/4" Rigid Conduit	60.00 - 80.00	0.6000	0.3763
T1	5	2" Trunk	60.00 - 80.00	0.6000	0.3763
T1	6	2" Trunk	60.00 - 80.00	0.6000	0.3763

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T2	1	7/8" Power Cable	40.00 - 60.00	0.6000	0.3927
T2	2	7/8" Power Cable	40.00 - 60.00	0.6000	0.3927
T2	3	7/8" Power Cable	40.00 - 60.00	0.6000	0.3927
T2	4	1 1/4" Rigid Conduit	40.00 - 60.00	0.6000	0.3927
T2	5	2" Trunk	40.00 - 60.00	0.6000	0.3927
T2	6	2" Trunk	40.00 - 60.00	0.6000	0.3927
T3	1	7/8" Power Cable	37.45 - 40.00	0.6000	0.4316
T3	2	7/8" Power Cable	37.45 - 40.00	0.6000	0.4316
T3	3	7/8" Power Cable	37.45 - 40.00	0.6000	0.4316
T3	4	1 1/4" Rigid Conduit	37.45 - 40.00	0.6000	0.4316
T3	5	2" Trunk	37.45 - 40.00	0.6000	0.4316
T3	6	2" Trunk	37.45 - 40.00	0.6000	0.4316
T4	1	7/8" Power Cable	34.98 - 37.45	0.6000	0.4282
T4	2	7/8" Power Cable	34.98 - 37.45	0.6000	0.4282
T4	3	7/8" Power Cable	34.98 - 37.45	0.6000	0.4282
T4	4	1 1/4" Rigid Conduit	34.98 - 37.45	0.6000	0.4282
T4	5	2" Trunk	34.98 - 37.45	0.6000	0.4282
T4	6	2" Trunk	34.98 - 37.45	0.6000	0.4282
T5	1	7/8" Power Cable	32.51 - 34.98	0.6000	0.4337
T5	2	7/8" Power Cable	32.51 - 34.98	0.6000	0.4337
T5	3	7/8" Power Cable	32.51 - 34.98	0.6000	0.4337
T5	4	1 1/4" Rigid Conduit	32.51 - 34.98	0.6000	0.4337
T5	5	2" Trunk	32.51 - 34.98	0.6000	0.4337
T5	6	2" Trunk	32.51 - 34.98	0.6000	0.4337
T6	1	7/8" Power Cable	30.04 - 32.51	0.6000	0.4392
T6	2	7/8" Power Cable	30.04 - 32.51	0.6000	0.4392
T6	3	7/8" Power Cable	30.04 - 32.51	0.6000	0.4392
T6	4	1 1/4" Rigid Conduit	30.04 - 32.51	0.6000	0.4392
T6	5	2" Trunk	30.04 - 32.51	0.6000	0.4392
T6	6	2" Trunk	30.04 - 32.51	0.6000	0.4392
T7	1	7/8" Power Cable	27.57 - 30.04	0.6000	0.4449
T7	2	7/8" Power Cable	27.57 - 30.04	0.6000	0.4449
T7	3	7/8" Power Cable	27.57 - 30.04	0.6000	0.4449
T7	4	1 1/4" Rigid Conduit	27.57 - 30.04	0.6000	0.4449
T7	5	2" Trunk	27.57 - 30.04	0.6000	0.4449
T7	6	2" Trunk	27.57 - 30.04	0.6000	0.4449
T8	1	7/8" Power Cable	25.10 - 27.57	0.6000	0.4507
T8	2	7/8" Power Cable	25.10 - 27.57	0.6000	0.4507
T8	3	7/8" Power Cable	25.10 - 27.57	0.6000	0.4507
T8	4	1 1/4" Rigid Conduit	25.10 - 27.57	0.6000	0.4507
T8	5	2" Trunk	25.10 - 27.57	0.6000	0.4507
T8	6	2" Trunk	25.10 - 27.57	0.6000	0.4507
T9	1	7/8" Power Cable	22.64 - 25.10	0.6000	0.3123
T9	2	7/8" Power Cable	22.64 - 25.10	0.6000	0.3123
T9	3	7/8" Power Cable	22.64 - 25.10	0.6000	0.3123
T9	4	1 1/4" Rigid Conduit	22.64 - 25.10	0.6000	0.3123
T9	5	2" Trunk	22.64 - 25.10	0.6000	0.3123
T9	6	2" Trunk	22.64 - 25.10	0.6000	0.3123
T10	1	7/8" Power Cable	20.00 - 22.64	0.6000	0.2437
T10	2	7/8" Power Cable	20.00 - 22.64	0.6000	0.2437
T10	3	7/8" Power Cable	20.00 - 22.64	0.6000	0.2437
T10	4	1 1/4" Rigid Conduit	20.00 - 22.64	0.6000	0.2437
T10	5	2" Trunk	20.00 - 22.64	0.6000	0.2437
T10	6	2" Trunk	20.00 - 22.64	0.6000	0.2437
T11	1	7/8" Power Cable	17.45 - 20.00	0.6000	0.4735
T11	2	7/8" Power Cable	17.45 - 20.00	0.6000	0.4735
T11	3	7/8" Power Cable	17.45 - 20.00	0.6000	0.4735
T11	4	1 1/4" Rigid Conduit	17.45 - 20.00	0.6000	0.4735
T11	5	2" Trunk	17.45 - 20.00	0.6000	0.4735
T11	6	2" Trunk	17.45 - 20.00	0.6000	0.4735
T12	1	7/8" Power Cable	14.98 - 17.45	0.6000	0.4727
T12	2	7/8" Power Cable	14.98 - 17.45	0.6000	0.4727

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T12	3	7/8" Power Cable	14.98 - 17.45	0.6000	0.4727
T12	4	1 1/4" Rigid Conduit	14.98 - 17.45	0.6000	0.4727
T12	5	2" Trunk	14.98 - 17.45	0.6000	0.4727
T12	6	2" Trunk	14.98 - 17.45	0.6000	0.4727
T13	1	7/8" Power Cable	12.51 - 14.98	0.6000	0.4804
T13	2	7/8" Power Cable	12.51 - 14.98	0.6000	0.4804
T13	3	7/8" Power Cable	12.51 - 14.98	0.6000	0.4804
T13	4	1 1/4" Rigid Conduit	12.51 - 14.98	0.6000	0.4804
T13	5	2" Trunk	12.51 - 14.98	0.6000	0.4804
T13	6	2" Trunk	12.51 - 14.98	0.6000	0.4804
T14	1	7/8" Power Cable	10.04 - 12.51	0.6000	0.4890
T14	2	7/8" Power Cable	10.04 - 12.51	0.6000	0.4890
T14	3	7/8" Power Cable	10.04 - 12.51	0.6000	0.4890
T14	4	1 1/4" Rigid Conduit	10.04 - 12.51	0.6000	0.4890
T14	5	2" Trunk	10.04 - 12.51	0.6000	0.4890
T14	6	2" Trunk	10.04 - 12.51	0.6000	0.4890
T15	1	7/8" Power Cable	7.57 - 10.04	0.6000	0.3619
T15	2	7/8" Power Cable	7.57 - 10.04	0.6000	0.3619
T15	3	7/8" Power Cable	7.57 - 10.04	0.6000	0.3619
T15	4	1 1/4" Rigid Conduit	7.57 - 10.04	0.6000	0.3619
T15	5	2" Trunk	7.57 - 10.04	0.6000	0.3619
T15	6	2" Trunk	7.57 - 10.04	0.6000	0.3619
T16	1	7/8" Power Cable	5.10 - 7.57	0.6000	0.3762
T16	2	7/8" Power Cable	5.10 - 7.57	0.6000	0.3762
T16	3	7/8" Power Cable	5.10 - 7.57	0.6000	0.3762
T16	4	1 1/4" Rigid Conduit	5.10 - 7.57	0.6000	0.3762
T16	5	2" Trunk	5.10 - 7.57	0.6000	0.3762
T16	6	2" Trunk	5.10 - 7.57	0.6000	0.3762
T17	1	7/8" Power Cable	2.64 - 5.10	0.6000	0.3960
T17	2	7/8" Power Cable	2.64 - 5.10	0.6000	0.3960
T17	3	7/8" Power Cable	2.64 - 5.10	0.6000	0.3960
T17	4	1 1/4" Rigid Conduit	2.64 - 5.10	0.6000	0.3960
T17	5	2" Trunk	2.64 - 5.10	0.6000	0.3960
T17	6	2" Trunk	2.64 - 5.10	0.6000	0.3960
T18	1	7/8" Power Cable	0.00 - 2.64	0.6000	0.3714
T18	2	7/8" Power Cable	0.00 - 2.64	0.6000	0.3714
T18	3	7/8" Power Cable	0.00 - 2.64	0.6000	0.3714
T18	4	1 1/4" Rigid Conduit	0.00 - 2.64	0.6000	0.3714
T18	5	2" Trunk	0.00 - 2.64	0.6000	0.3714
T18	6	2" Trunk	0.00 - 2.64	0.6000	0.3714

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
20' 8 Bay Di-Pole	C	From Leg	0.00 0.00 0.00	0.0000	90.00	No Ice 1/2" Ice 1" Ice	4.00 6.00 8.00	4.00 6.00 8.00	55.00 100.00 145.00
10' Omni	C	From Leg	2.00 5.00	0.0000	85.00	No Ice 1/2" Ice	2.00 3.02	2.00 3.02	30.00 45.50

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
			0.00			1" Ice	4.07	4.07	67.47
7' Whip	B	From Leg	2.00	0.0000	83.00	No Ice	1.74	1.74	37.30
			-5.00			1/2" Ice	2.60	2.60	53.68
			0.00			1" Ice	3.29	3.29	75.57
7770	A	From Leg	2.00	0.0000	78.00	No Ice	5.51	2.93	35.00
			-5.00			1/2" Ice	5.87	3.27	67.63
			0.00			1" Ice	6.23	3.63	105.06
7770	B	From Leg	2.00	0.0000	78.00	No Ice	5.51	2.93	35.00
			-5.00			1/2" Ice	5.87	3.27	67.63
			0.00			1" Ice	6.23	3.63	105.06
7770	C	From Leg	2.00	0.0000	78.00	No Ice	5.51	2.93	35.00
			-5.00			1/2" Ice	5.87	3.27	67.63
			0.00			1" Ice	6.23	3.63	105.06
CCI OPA-65R-LCUU-H6	A	From Leg	2.00	0.0000	78.00	No Ice	9.72	7.15	101.05
Panel Antenna with 8ft Pipe			0.00			1/2" Ice	10.29	8.33	176.87
(at&t)			0.00			1" Ice	10.83	9.23	260.86
CCI OPA-65R-LCUU-H6	B	From Leg	2.00	0.0000	78.00	No Ice	9.72	7.15	101.05
Panel Antenna with 8ft Pipe			0.00			1/2" Ice	10.29	8.33	176.87
(at&t)			0.00			1" Ice	10.83	9.23	260.86
CCI OPA-65R-LCUU-H6	C	From Leg	2.00	0.0000	78.00	No Ice	9.72	7.15	101.05
Panel Antenna with 8ft Pipe			0.00			1/2" Ice	10.29	8.33	176.87
(at&t)			0.00			1" Ice	10.83	9.23	260.86
800-10965	A	From Leg	2.00	0.0000	78.00	No Ice	14.16	7.73	137.80
(at&t)			0.00			1/2" Ice	14.84	9.05	235.43
			0.00			1" Ice	15.50	10.22	342.19
800-10965	B	From Leg	2.00	0.0000	78.00	No Ice	14.16	7.73	137.80
(at&t)			0.00			1/2" Ice	14.84	9.05	235.43
			0.00			1" Ice	15.50	10.22	342.19
800-10965	C	From Leg	2.00	0.0000	78.00	No Ice	14.16	7.73	137.80
(at&t)			0.00			1/2" Ice	14.84	9.05	235.43
			0.00			1" Ice	15.50	10.22	342.19
QS66512-2	A	From Leg	2.00	0.0000	78.00	No Ice	8.13	6.80	111.00
(at&t)			-5.00			1/2" Ice	8.59	7.27	168.20
			0.00			1" Ice	9.05	7.72	231.66
QS66512-2	B	From Leg	2.00	0.0000	78.00	No Ice	8.13	6.80	111.00
(at&t)			-5.00			1/2" Ice	8.59	7.27	168.20
			0.00			1" Ice	9.05	7.72	231.66
QS66512-2	C	From Leg	2.00	0.0000	78.00	No Ice	8.13	6.80	111.00
(at&t)			-5.00			1/2" Ice	8.59	7.27	168.20
			0.00			1" Ice	9.05	7.72	231.66
TMA	A	From Leg	2.00	0.0000	78.00	No Ice	1.00	0.41	20.00
(at&t)			0.00			1/2" Ice	1.13	0.50	27.62
			0.00			1" Ice	1.26	0.59	37.11
TMA	B	From Leg	2.00	0.0000	78.00	No Ice	1.00	0.41	20.00
(at&t)			0.00			1/2" Ice	1.13	0.50	27.62
			0.00			1" Ice	1.26	0.59	37.11
TMA	C	From Leg	2.00	0.0000	78.00	No Ice	1.00	0.41	20.00
(at&t)			0.00			1/2" Ice	1.13	0.50	27.62
			0.00			1" Ice	1.26	0.59	37.11
RRUS 32	A	From Leg	2.00	0.0000	78.00	No Ice	2.72	1.67	52.90
(at&t)			0.00			1/2" Ice	2.94	1.86	73.90
			0.00			1" Ice	3.17	2.05	98.09
RRUS 32	B	From Leg	2.00	0.0000	78.00	No Ice	2.72	1.67	52.90
(at&t)			0.00			1/2" Ice	2.94	1.86	73.90
			0.00			1" Ice	3.17	2.05	98.09
RRUS 32	C	From Leg	2.00	0.0000	78.00	No Ice	2.72	1.67	52.90
(at&t)			0.00			1/2" Ice	2.94	1.86	73.90

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
			0.00			1" Ice	3.17	2.05	98.09
RRU B14 4478	A	From Leg	2.00	0.0000	78.00	No Ice	1.86	0.82	47.40
(at&t)			0.00			1/2" Ice	2.03	0.94	61.55
			0.00			1" Ice	2.20	1.07	78.22
RRU B14 4478	B	From Leg	2.00	0.0000	78.00	No Ice	1.86	0.82	47.40
(at&t)			0.00			1/2" Ice	2.03	0.94	61.55
			0.00			1" Ice	2.20	1.07	78.22
RRU B14 4478	C	From Leg	2.00	0.0000	78.00	No Ice	1.86	0.82	47.40
(at&t)			0.00			1/2" Ice	2.03	0.94	61.55
			0.00			1" Ice	2.20	1.07	78.22
RRUS 4478 B5	A	From Leg	2.00	0.0000	78.00	No Ice	1.84	1.06	59.90
(at&t)			0.00			1/2" Ice	2.01	1.20	75.78
			0.00			1" Ice	2.19	1.34	94.29
RRUS 4478 B5	B	From Leg	2.00	0.0000	78.00	No Ice	1.84	1.06	59.90
(at&t)			0.00			1/2" Ice	2.01	1.20	75.78
			0.00			1" Ice	2.19	1.34	94.29
RRUS 4478 B5	C	From Leg	2.00	0.0000	78.00	No Ice	1.84	1.06	59.90
(at&t)			0.00			1/2" Ice	2.01	1.20	75.78
			0.00			1" Ice	2.19	1.34	94.29
RRUS 4426 B66	A	From Leg	2.00	0.0000	78.00	No Ice	1.65	0.68	46.00
(at&t)			0.00			1/2" Ice	1.81	0.79	58.47
			0.00			1" Ice	1.98	0.92	73.32
RRUS 4426 B66	B	From Leg	2.00	0.0000	78.00	No Ice	1.65	0.68	46.00
(at&t)			0.00			1/2" Ice	1.81	0.79	58.47
			0.00			1" Ice	1.98	0.92	73.32
RRUS 4426 B66	C	From Leg	2.00	0.0000	78.00	No Ice	1.65	0.68	46.00
(at&t)			0.00			1/2" Ice	1.81	0.79	58.47
			0.00			1" Ice	1.98	0.92	73.32
RRUS11 B12 (Partiall	A	From Leg	2.00	0.0000	78.00	No Ice	0.88	1.18	50.70
Shielded by 11.9" Antenna)			0.00			1/2" Ice	1.02	1.33	60.68
(at&t)			0.00			1" Ice	1.16	1.48	72.93
RRUS11 B12 (Partiall	B	From Leg	2.00	0.0000	78.00	No Ice	0.88	1.18	50.70
Shielded by 11.9" Antenna)			0.00			1/2" Ice	1.02	1.33	60.68
(at&t)			0.00			1" Ice	1.16	1.48	72.93
RRUS11 B12 (Partiall	C	From Leg	2.00	0.0000	78.00	No Ice	0.88	1.18	50.70
Shielded by 11.9" Antenna)			0.00			1/2" Ice	1.02	1.33	60.68
(at&t)			0.00			1" Ice	1.16	1.48	72.93
RRUS 32 B2	A	From Leg	2.00	0.0000	78.00	No Ice	2.72	1.67	52.90
(at&t)			0.00			1/2" Ice	2.94	1.86	73.90
			0.00			1" Ice	3.17	2.05	98.09
RRUS 32 B2	B	From Leg	2.00	0.0000	78.00	No Ice	2.72	1.67	52.90
(at&t)			0.00			1/2" Ice	2.94	1.86	73.90
			0.00			1" Ice	3.17	2.05	98.09
RRUS 32 B2	C	From Leg	2.00	0.0000	78.00	No Ice	2.72	1.67	52.90
(at&t)			0.00			1/2" Ice	2.94	1.86	73.90
			0.00			1" Ice	3.17	2.05	98.09
DC6-48-60-18-8C	A	From Face	1.00	0.0000	78.00	No Ice	0.55	0.55	26.20
(at&t)			0.00			1/2" Ice	0.90	0.90	37.21
			0.00			1" Ice	1.04	1.04	50.18
DC6-48-60-18-8C	B	From Leg	1.00	0.0000	78.00	No Ice	0.55	0.55	26.20
(at&t)			0.00			1/2" Ice	0.90	0.90	37.21
			0.00			1" Ice	1.04	1.04	50.18
DC6-48-60-18-8C	C	From Leg	1.00	0.0000	78.00	No Ice	0.55	0.55	26.20
(at&t)			0.00			1/2" Ice	0.90	0.90	37.21
			0.00			1" Ice	1.04	1.04	50.18
Pirod 12' PCS T-Frame (1)	A	From Leg	0.00	0.0000	78.00	No Ice	9.80	9.80	260.00
104569			0.00			1/2" Ice	14.80	14.80	360.00

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
(at&t)			0.00			1" Ice	19.80	19.80	460.00
Pirod 12' PCS T-Frame (1)	B	From Leg	0.00	0.0000	78.00	No Ice	9.80	9.80	260.00
104569			0.00			1/2" Ice	14.80	14.80	360.00
(at&t)			0.00			1" Ice	19.80	19.80	460.00
Pirod 12' PCS T-Frame (1)	C	From Leg	0.00	0.0000	78.00	No Ice	9.80	9.80	260.00
104569			0.00			1/2" Ice	14.80	14.80	360.00
(at&t)			0.00			1" Ice	19.80	19.80	460.00
7' Whip	B	From Leg	0.00	0.0000	65.00	No Ice	1.74	1.74	37.30
			0.00			1/2" Ice	2.60	2.60	53.68
			6.00			1" Ice	3.29	3.29	75.57
10' Omni	C	From Leg	4.00	0.0000	65.00	No Ice	2.00	2.00	30.00
			6.00			1/2" Ice	3.02	3.02	45.50
			0.00			1" Ice	4.07	4.07	67.47
1.5" Dia 4' Omni w/Pipe Mount	C	From Leg	6.00	0.0000	65.00	No Ice	0.94	0.94	22.30
			0.00			1/2" Ice	1.39	1.39	32.81
			-3.00			1" Ice	1.78	1.78	46.94
4 ' Side Arm	C	From Leg	2.00	0.0000	55.00	No Ice	2.60	2.60	72.00
			0.00			1/2" Ice	3.01	3.01	93.13
			0.00			1" Ice	3.42	3.42	114.26
4 ' Side Arm	B	From Leg	2.00	0.0000	55.00	No Ice	2.60	2.60	72.00
			0.00			1/2" Ice	3.01	3.01	93.13
			0.00			1" Ice	3.42	3.42	114.26
10' Omni	B	From Leg	3.00	0.0000	55.00	No Ice	2.00	2.00	30.00
			0.00			1/2" Ice	3.02	3.02	45.50
			5.00			1" Ice	4.07	4.07	67.47
10' Yagi	C	From Leg	3.00	0.0000	55.00	No Ice	4.00	4.00	120.00
			0.00			1/2" Ice	8.70	8.70	220.00
			0.00			1" Ice	13.40	13.40	320.00
6' Side Arm	C	From Leg	3.00	0.0000	65.00	No Ice	8.70	8.70	160.00
			0.00			1/2" Ice	9.40	9.40	215.00
			0.00			1" Ice	10.10	10.10	270.00
6' Side Arm	B	From Leg	3.00	0.0000	65.00	No Ice	8.70	8.70	160.00
			0.00			1/2" Ice	9.40	9.40	215.00
			0.00			1" Ice	10.10	10.10	270.00

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight lb
2' dish	B	Paraboloid w/o Radome	From Leg	0.00	Worst		73.00	2.00	No Ice	3.14	15.00
				0.00					1/2" Ice	3.41	47.50
				0.00					1" Ice	3.68	65.01
4' dish	A	Paraboloid w/o Radome	From Leg	0.00	Worst		73.00	4.00	No Ice	12.57	80.00
				0.00					1/2" Ice	13.10	80.00
				0.00					1" Ice	13.62	80.00

Tower Pressures - No Ice

G_H = 0.850 (base tower), 1.350 (upper structure)

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1 90.00-80.00	85.00	1.223	25	3.750	A	0.000	3.750	3.750	100.00	0.000	0.000
					B	0.000	3.750		100.00	0.000	0.000
					C	0.000	3.750		100.00	0.000	0.000
T1 80.00-60.00	70.00	1.174	24	72.500	A	0.984	10.818	5.000	42.37	29.000	0.000
					B	0.984	10.818		42.37	0.000	0.000
					C	0.984	10.818		42.37	59.000	0.000
T2 60.00-40.00	50.00	1.094	22	78.334	A	0.000	14.023	6.667	47.55	29.000	0.000
					B	0.000	14.023		47.55	0.000	0.000
					C	0.000	14.023		47.55	59.000	0.000
T3 40.00-37.45	38.72	1.036	21	10.767	A	0.000	1.932	0.957	49.53	3.701	0.000
					B	0.000	1.932		49.53	0.000	0.000
					C	0.000	1.932		49.53	7.529	0.000
T4 37.45-34.98	36.21	1.022	21	10.569	A	0.000	1.874	0.926	49.42	3.580	0.000
					B	0.000	1.874		49.42	0.000	0.000
					C	0.000	1.874		49.42	7.283	0.000
T5 34.98-32.51	33.74	1.007	21	10.724	A	0.000	1.886	0.926	49.09	3.580	0.000
					B	0.000	1.886		49.09	0.000	0.000
					C	0.000	1.886		49.09	7.283	0.000
T6 32.51-30.04	31.28	0.991	20	10.878	A	0.000	1.899	0.926	48.76	3.580	0.000
					B	0.000	1.899		48.76	0.000	0.000
					C	0.000	1.899		48.76	7.283	0.000
T7 30.04-27.57	28.81	0.974	20	11.032	A	0.000	1.911	0.926	48.44	3.580	0.000
					B	0.000	1.911		48.44	0.000	0.000
					C	0.000	1.911		48.44	7.283	0.000
T8 27.57-25.10	26.34	0.956	20	11.187	A	0.000	1.924	0.926	48.13	3.580	0.000
					B	0.000	1.924		48.13	0.000	0.000
					C	0.000	1.924		48.13	7.283	0.000
T9 25.10-22.64	23.87	0.936	19	11.341	A	0.703	1.936	0.926	35.08	3.580	0.000
					B	0.703	1.936		35.08	0.000	0.000
					C	0.703	1.936		35.08	7.283	0.000
T10 22.64-20.00	21.32	0.914	19	12.271	A	0.713	2.370	0.988	32.05	3.821	0.000
					B	0.713	2.370		32.05	0.000	0.000
					C	0.713	2.370		32.05	7.774	0.000
T11 20.00-17.45	18.72	0.889	18	12.096	A	0.000	2.139	1.063	49.71	3.701	0.000
					B	0.000	2.139		49.71	0.000	0.000
					C	0.000	2.139		49.71	7.529	0.000
T12 17.45-14.98	16.21	0.863	18	11.855	A	0.000	2.072	1.029	49.64	3.580	0.000
					B	0.000	2.072		49.64	0.000	0.000
					C	0.000	2.072		49.64	7.283	0.000
T13 14.98-12.51	13.74	0.85	17	12.009	A	0.000	2.085	1.029	49.34	3.580	0.000
					B	0.000	2.085		49.34	0.000	0.000
					C	0.000	2.085		49.34	7.283	0.000
T14 12.51-10.04	11.28	0.85	17	12.164	A	0.000	2.098	1.029	49.04	3.580	0.000
					B	0.000	2.098		49.04	0.000	0.000
					C	0.000	2.098		49.04	7.283	0.000
T15 10.04-7.57	8.81	0.85	17	12.318	A	0.762	2.110	1.029	35.81	3.580	0.000
					B	0.762	2.110		35.81	0.000	0.000
					C	0.762	2.110		35.81	7.283	0.000
T16 7.57-5.10	6.34	0.85	17	12.472	A	0.773	2.123	1.029	35.53	3.580	0.000
					B	0.773	2.123		35.53	0.000	0.000
					C	0.773	2.123		35.53	7.283	0.000
T17 5.10-2.64	3.87	0.85	17	12.627	A	0.783	2.136	1.029	35.24	3.580	0.000
					B	0.783	2.136		35.24	0.000	0.000
					C	0.783	2.136		35.24	7.283	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
T18 2.64-0.00	1.32	0.85	17	13.644	A	0.793	2.617	1.098	32.21	3.821	0.000
					B	0.793	2.617		32.21	0.000	0.000
					C	0.793	2.617		32.21	7.774	0.000

Tower Pressure - With Ice

G_H = 0.850 (base tower), 1.350 (upper structure)

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1 90.00-80.00	85.00	1.223	7	1.6489	6.498	A	0.000	6.498	6.498	100.00	0.000	0.000
						B	0.000	6.498		100.00	0.000	0.000
						C	0.000	6.498		100.00	0.000	0.000
T1 80.00-60.00	70.00	1.174	6	1.6171	77.890	A	0.984	47.596	15.781	32.48	57.051	0.000
						B	0.984	47.596		32.48	0.000	0.000
						C	0.984	47.596		32.48	129.326	0.000
T2 60.00-40.00	50.00	1.094	6	1.5636	83.546	A	0.000	50.738	17.093	33.69	56.309	0.000
						B	0.000	50.738		33.69	0.000	0.000
						C	0.000	50.738		33.69	127.884	0.000
T3 40.00-37.45	38.72	1.036	6	1.5242	11.415	A	0.000	6.489	2.254	34.74	7.115	0.000
						B	0.000	6.489		34.74	0.000	0.000
						C	0.000	6.489		34.74	16.183	0.000
T4 37.45-34.98	36.21	1.022	6	1.5140	11.192	A	0.000	6.400	2.172	33.94	6.866	0.000
						B	0.000	6.400		33.94	0.000	0.000
						C	0.000	6.400		33.94	15.621	0.000
T5 34.98-32.51	33.74	1.007	5	1.5034	11.342	A	0.000	6.423	2.163	33.68	6.847	0.000
						B	0.000	6.423		33.68	0.000	0.000
						C	0.000	6.423		33.68	15.585	0.000
T6 32.51-30.04	31.28	0.991	5	1.4920	11.492	A	0.000	6.444	2.154	33.42	6.828	0.000
						B	0.000	6.444		33.42	0.000	0.000
						C	0.000	6.444		33.42	15.547	0.000
T7 30.04-27.57	28.81	0.974	5	1.4798	11.641	A	0.000	6.462	2.144	33.17	6.807	0.000
						B	0.000	6.462		33.17	0.000	0.000
						C	0.000	6.462		33.17	15.507	0.000
T8 27.57-25.10	26.34	0.956	5	1.4666	11.790	A	0.000	6.476	2.133	32.93	6.784	0.000
						B	0.000	6.476		32.93	0.000	0.000
						C	0.000	6.476		32.93	15.463	0.000
T9 25.10-22.64	23.87	0.936	5	1.4522	11.938	A	0.703	7.507	2.121	25.83	6.760	0.000
						B	0.703	7.507		25.83	0.000	0.000
						C	0.703	7.507		25.83	15.415	0.000
T10 22.64-20.00	21.32	0.914	5	1.4359	12.902	A	0.713	9.044	2.250	23.06	7.186	0.000
						B	0.713	9.044		23.06	0.000	0.000
						C	0.713	9.044		23.06	16.398	0.000
T11 20.00-17.45	18.72	0.889	5	1.4174	12.699	A	0.000	6.686	2.269	33.94	6.926	0.000
						B	0.000	6.686		33.94	0.000	0.000
						C	0.000	6.686		33.94	15.816	0.000
T12 17.45-14.98	16.21	0.863	5	1.3971	12.430	A	0.000	6.555	2.179	33.24	6.666	0.000
						B	0.000	6.555		33.24	0.000	0.000
						C	0.000	6.555		33.24	15.232	0.000
T13 14.98-12.51	13.74	0.85	5	1.3742	12.575	A	0.000	6.534	2.160	33.06	6.626	0.000
						B	0.000	6.534		33.06	0.000	0.000
						C	0.000	6.534		33.06	15.157	0.000
T14 12.51-10.04	11.28	0.85	5	1.3473	12.718	A	0.000	6.498	2.138	32.89	6.580	0.000
						B	0.000	6.498		32.89	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	0.000	6.498		32.89	15.067	0.000
T15 10.04-7.57	8.81	0.85	5	1.3144	12.859	A	0.762	7.444	2.111	25.72	6.524	0.000
						B	0.762	7.444		25.72	0.000	0.000
						C	0.762	7.444		25.72	14.958	0.000
T16 7.57-5.10	6.34	0.85	5	1.2719	12.996	A	0.773	7.334	2.076	25.60	6.452	0.000
						B	0.773	7.334		25.60	0.000	0.000
						C	0.773	7.334		25.60	14.818	0.000
T17 5.10-2.64	3.87	0.85	5	1.2106	13.125	A	0.783	7.144	2.025	25.55	6.347	0.000
						B	0.783	7.144		25.55	0.000	0.000
						C	0.783	7.144		25.55	14.615	0.000
T18 2.64-0.00	1.32	0.85	5	1.0870	14.121	A	0.793	8.083	2.053	23.13	6.551	0.000
						B	0.793	8.083		23.13	0.000	0.000
						C	0.793	8.083		23.13	15.167	0.000

Tower Pressure - Service

G_H = 0.850 (base tower), 1.350 (upper structure)

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1 90.00-80.00	85.00	1.223	10	3.750	A	0.000	3.750	3.750	100.00	0.000	0.000
					B	0.000	3.750		100.00	0.000	0.000
					C	0.000	3.750		100.00	0.000	0.000
T1 80.00-60.00	70.00	1.174	9	72.500	A	0.984	10.818	5.000	42.37	29.000	0.000
					B	0.984	10.818		42.37	0.000	0.000
					C	0.984	10.818		42.37	59.000	0.000
T2 60.00-40.00	50.00	1.094	9	78.334	A	0.000	14.023	6.667	47.55	29.000	0.000
					B	0.000	14.023		47.55	0.000	0.000
					C	0.000	14.023		47.55	59.000	0.000
T3 40.00-37.45	38.72	1.036	8	10.767	A	0.000	1.932	0.957	49.53	3.701	0.000
					B	0.000	1.932		49.53	0.000	0.000
					C	0.000	1.932		49.53	7.529	0.000
T4 37.45-34.98	36.21	1.022	8	10.569	A	0.000	1.874	0.926	49.42	3.580	0.000
					B	0.000	1.874		49.42	0.000	0.000
					C	0.000	1.874		49.42	7.283	0.000
T5 34.98-32.51	33.74	1.007	8	10.724	A	0.000	1.886	0.926	49.09	3.580	0.000
					B	0.000	1.886		49.09	0.000	0.000
					C	0.000	1.886		49.09	7.283	0.000
T6 32.51-30.04	31.28	0.991	8	10.878	A	0.000	1.899	0.926	48.76	3.580	0.000
					B	0.000	1.899		48.76	0.000	0.000
					C	0.000	1.899		48.76	7.283	0.000
T7 30.04-27.57	28.81	0.974	8	11.032	A	0.000	1.911	0.926	48.44	3.580	0.000
					B	0.000	1.911		48.44	0.000	0.000
					C	0.000	1.911		48.44	7.283	0.000
T8 27.57-25.10	26.34	0.956	7	11.187	A	0.000	1.924	0.926	48.13	3.580	0.000
					B	0.000	1.924		48.13	0.000	0.000
					C	0.000	1.924		48.13	7.283	0.000
T9 25.10-22.64	23.87	0.936	7	11.341	A	0.703	1.936	0.926	35.08	3.580	0.000
					B	0.703	1.936		35.08	0.000	0.000
					C	0.703	1.936		35.08	7.283	0.000
T10 22.64-20.00	21.32	0.914	7	12.271	A	0.713	2.370	0.988	32.05	3.821	0.000
					B	0.713	2.370		32.05	0.000	0.000
					C	0.713	2.370		32.05	7.774	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	18.72	0.889	7	12.096	A	0.000	2.139	1.063	49.71	3.701	0.000
20.00-17.45					B	0.000	2.139		49.71	0.000	0.000
					C	0.000	2.139		49.71	7.529	0.000
T12	16.21	0.863	7	11.855	A	0.000	2.072	1.029	49.64	3.580	0.000
17.45-14.98					B	0.000	2.072		49.64	0.000	0.000
					C	0.000	2.072		49.64	7.283	0.000
T13	13.74	0.85	7	12.009	A	0.000	2.085	1.029	49.34	3.580	0.000
14.98-12.51					B	0.000	2.085		49.34	0.000	0.000
					C	0.000	2.085		49.34	7.283	0.000
T14	11.28	0.85	7	12.164	A	0.000	2.098	1.029	49.04	3.580	0.000
12.51-10.04					B	0.000	2.098		49.04	0.000	0.000
					C	0.000	2.098		49.04	7.283	0.000
T15 10.04-7.57	8.81	0.85	7	12.318	A	0.762	2.110	1.029	35.81	3.580	0.000
					B	0.762	2.110		35.81	0.000	0.000
					C	0.762	2.110		35.81	7.283	0.000
T16 7.57-5.10	6.34	0.85	7	12.472	A	0.773	2.123	1.029	35.53	3.580	0.000
					B	0.773	2.123		35.53	0.000	0.000
					C	0.773	2.123		35.53	7.283	0.000
T17 5.10-2.64	3.87	0.85	7	12.627	A	0.783	2.136	1.029	35.24	3.580	0.000
					B	0.783	2.136		35.24	0.000	0.000
					C	0.783	2.136		35.24	7.283	0.000
T18 2.64-0.00	1.32	0.85	7	13.644	A	0.793	2.617	1.098	32.21	3.821	0.000
					B	0.793	2.617		32.21	0.000	0.000
					C	0.793	2.617		32.21	7.774	0.000

Tower Forces - No Ice - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1	0.00	113.41	A	1	0.956	25	1	1	3.750	121.23	12.12	C
90.00-80.00			B	1	0.956		1	1	3.750			
			C	1	0.956		1	1	3.750			
T1	764.00	1027.75	A	0.163	2.725	24	1	1	7.139	1551.09	77.55	C
80.00-60.00			B	0.163	2.725		1	1	7.139			
			C	0.163	2.725		1	1	7.139			
T2	764.00	1354.01	A	0.179	2.668	22	1	1	8.009	1411.71	70.59	C
60.00-40.00			B	0.179	2.668		1	1	8.009			
			C	0.179	2.668		1	1	8.009			
T3	97.49	203.42	A	0.179	2.666	21	1	1	1.104	174.61	68.42	C
40.00-37.45			B	0.179	2.666		1	1	1.104			
			C	0.179	2.666		1	1	1.104			
T4	94.31	193.04	A	0.177	2.674	21	1	1	1.070	166.78	67.55	C
37.45-34.98			B	0.177	2.674		1	1	1.070			
			C	0.177	2.674		1	1	1.070			
T5	94.31	194.13	A	0.176	2.679	21	1	1	1.076	164.72	66.72	C
34.98-32.51			B	0.176	2.679		1	1	1.076			
			C	0.176	2.679		1	1	1.076			
T6	94.31	195.23	A	0.175	2.683	20	1	1	1.083	162.51	65.83	C
32.51-30.04			B	0.175	2.683		1	1	1.083			
			C	0.175	2.683		1	1	1.083			
T7	94.31	196.33	A	0.173	2.688	20	1	1	1.090	160.12	64.86	C
30.04-27.57			B	0.173	2.688		1	1	1.090			
			C	0.173	2.688		1	1	1.090			
T8	94.31	197.43	A	0.172	2.692	20	1	1	1.097	157.51	63.80	C
27.57-25.10			B	0.172	2.692		1	1	1.097			

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
			C	0.172	2.692		1	1	1.097			
T9	94.31	242.83	A	0.233	2.49	19	1	1	1.828	180.34	73.05	C
25.10-22.64			B	0.233	2.49		1	1	1.828			
			C	0.233	2.49		1	1	1.828			
T10	100.67	289.48	A	0.251	2.434	19	1	1	2.101	192.00	72.85	C
22.64-20.00			B	0.251	2.434		1	1	2.101			
			C	0.251	2.434		1	1	2.101			
T11	97.49	238.72	A	0.177	2.675	18	1	1	1.221	154.86	60.68	C
20.00-17.45			B	0.177	2.675		1	1	1.221			
			C	0.177	2.675		1	1	1.221			
T12	94.31	226.54	A	0.175	2.682	18	1	1	1.182	145.50	58.94	C
17.45-14.98			B	0.175	2.682		1	1	1.182			
			C	0.175	2.682		1	1	1.182			
T13	94.31	227.66	A	0.174	2.687	17	1	1	1.189	143.67	58.19	C
14.98-12.51			B	0.174	2.687		1	1	1.189			
			C	0.174	2.687		1	1	1.189			
T14	94.31	228.77	A	0.172	2.691	17	1	1	1.196	144.02	58.34	C
12.51-10.04			B	0.172	2.691		1	1	1.196			
			C	0.172	2.691		1	1	1.196			
T15	94.31	277.96	A	0.233	2.489	17	1	1	1.988	169.62	68.71	C
10.04-7.57			B	0.233	2.489		1	1	1.988			
			C	0.233	2.489		1	1	1.988			
T16 7.57-5.10	94.31	279.71	A	0.232	2.492	17	1	1	2.006	170.35	69.00	C
			B	0.232	2.492		1	1	2.006			
			C	0.232	2.492		1	1	2.006			
T17 5.10-2.64	94.31	281.46	A	0.231	2.495	17	1	1	2.023	171.09	69.30	C
			B	0.231	2.495		1	1	2.023			
			C	0.231	2.495		1	1	2.023			
T18 2.64-0.00	100.67	334.00	A	0.25	2.438	17	1	1	2.324	186.72	70.85	C
			B	0.25	2.438		1	1	2.324			
			C	0.25	2.438		1	1	2.324			
Sum Weight:	3056.00	6301.87						OTM	242.41 kip-ft	5728.43		

Tower Forces - No Ice - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
L1	0.00	113.41	A	1	0.956	25	1	1	3.750	121.23	12.12	C
90.00-80.00			B	1	0.956		1	1	3.750			
			C	1	0.956		1	1	3.750			
T1	764.00	1027.75	A	0.163	2.725	24	0.8	1	6.942	1540.13	77.01	C
80.00-60.00			B	0.163	2.725		0.8	1	6.942			
			C	0.163	2.725		0.8	1	6.942			
T2	764.00	1354.01	A	0.179	2.668	22	0.8	1	8.009	1411.71	70.59	C
60.00-40.00			B	0.179	2.668		0.8	1	8.009			
			C	0.179	2.668		0.8	1	8.009			
T3	97.49	203.42	A	0.179	2.666	21	0.8	1	1.104	174.61	68.42	C
40.00-37.45			B	0.179	2.666		0.8	1	1.104			
			C	0.179	2.666		0.8	1	1.104			
T4	94.31	193.04	A	0.177	2.674	21	0.8	1	1.070	166.78	67.55	C
37.45-34.98			B	0.177	2.674		0.8	1	1.070			

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
			C	0.177	2.674		0.8	1	1.070			
T5	94.31	194.13	A	0.176	2.679	21	0.8	1	1.076	164.72	66.72	C
34.98-32.51			B	0.176	2.679		0.8	1	1.076			
			C	0.176	2.679		0.8	1	1.076			
T6	94.31	195.23	A	0.175	2.683	20	0.8	1	1.083	162.51	65.83	C
32.51-30.04			B	0.175	2.683		0.8	1	1.083			
			C	0.175	2.683		0.8	1	1.083			
T7	94.31	196.33	A	0.173	2.688	20	0.8	1	1.090	160.12	64.86	C
30.04-27.57			B	0.173	2.688		0.8	1	1.090			
			C	0.173	2.688		0.8	1	1.090			
T8	94.31	197.43	A	0.172	2.692	20	0.8	1	1.097	157.51	63.80	C
27.57-25.10			B	0.172	2.692		0.8	1	1.097			
			C	0.172	2.692		0.8	1	1.097			
T9	94.31	242.83	A	0.233	2.49	19	0.8	1	1.687	174.64	70.74	C
25.10-22.64			B	0.233	2.49		0.8	1	1.687			
			C	0.233	2.49		0.8	1	1.687			
T10	100.67	289.48	A	0.251	2.434	19	0.8	1	1.958	186.48	70.76	C
22.64-20.00			B	0.251	2.434		0.8	1	1.958			
			C	0.251	2.434		0.8	1	1.958			
T11	97.49	238.72	A	0.177	2.675	18	0.8	1	1.221	154.86	60.68	C
20.00-17.45			B	0.177	2.675		0.8	1	1.221			
			C	0.177	2.675		0.8	1	1.221			
T12	94.31	226.54	A	0.175	2.682	18	0.8	1	1.182	145.50	58.94	C
17.45-14.98			B	0.175	2.682		0.8	1	1.182			
			C	0.175	2.682		0.8	1	1.182			
T13	94.31	227.66	A	0.174	2.687	17	0.8	1	1.189	143.67	58.19	C
14.98-12.51			B	0.174	2.687		0.8	1	1.189			
			C	0.174	2.687		0.8	1	1.189			
T14	94.31	228.77	A	0.172	2.691	17	0.8	1	1.196	144.02	58.34	C
12.51-10.04			B	0.172	2.691		0.8	1	1.196			
			C	0.172	2.691		0.8	1	1.196			
T15	94.31	277.96	A	0.233	2.489	17	0.8	1	1.836	164.01	66.43	C
10.04-7.57			B	0.233	2.489		0.8	1	1.836			
			C	0.233	2.489		0.8	1	1.836			
T16 7.57-5.10	94.31	279.71	A	0.232	2.492	17	0.8	1	1.851	164.66	66.70	C
			B	0.232	2.492		0.8	1	1.851			
			C	0.232	2.492		0.8	1	1.851			
T17 5.10-2.64	94.31	281.46	A	0.231	2.495	17	0.8	1	1.867	165.31	66.96	C
			B	0.231	2.495		0.8	1	1.867			
			C	0.231	2.495		0.8	1	1.867			
T18 2.64-0.00	100.67	334.00	A	0.25	2.438	17	0.8	1	2.165	181.00	68.68	C
			B	0.25	2.438		0.8	1	2.165			
			C	0.25	2.438		0.8	1	2.165			
Sum Weight:	3056.00	6301.87						OTM	241.27 kip-ft	5683.43		

Tower Forces - No Ice - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1	0.00	113.41	A	1	0.956	25	1	1	3.750	121.23	12.12	C
90.00-80.00			B	1	0.956		1	1	3.750			

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
			C	1	0.956		1	1	3.750			
T1	764.00	1027.75	A	0.163	2.725	24	0.85	1	6.992	1542.87	77.14	C
80.00-60.00			B	0.163	2.725		0.85	1	6.992			
			C	0.163	2.725		0.85	1	6.992			
T2	764.00	1354.01	A	0.179	2.668	22	0.85	1	8.009	1411.71	70.59	C
60.00-40.00			B	0.179	2.668		0.85	1	8.009			
			C	0.179	2.668		0.85	1	8.009			
T3	97.49	203.42	A	0.179	2.666	21	0.85	1	1.104	174.61	68.42	C
40.00-37.45			B	0.179	2.666		0.85	1	1.104			
			C	0.179	2.666		0.85	1	1.104			
T4	94.31	193.04	A	0.177	2.674	21	0.85	1	1.070	166.78	67.55	C
37.45-34.98			B	0.177	2.674		0.85	1	1.070			
			C	0.177	2.674		0.85	1	1.070			
T5	94.31	194.13	A	0.176	2.679	21	0.85	1	1.076	164.72	66.72	C
34.98-32.51			B	0.176	2.679		0.85	1	1.076			
			C	0.176	2.679		0.85	1	1.076			
T6	94.31	195.23	A	0.175	2.683	20	0.85	1	1.083	162.51	65.83	C
32.51-30.04			B	0.175	2.683		0.85	1	1.083			
			C	0.175	2.683		0.85	1	1.083			
T7	94.31	196.33	A	0.173	2.688	20	0.85	1	1.090	160.12	64.86	C
30.04-27.57			B	0.173	2.688		0.85	1	1.090			
			C	0.173	2.688		0.85	1	1.090			
T8	94.31	197.43	A	0.172	2.692	20	0.85	1	1.097	157.51	63.80	C
27.57-25.10			B	0.172	2.692		0.85	1	1.097			
			C	0.172	2.692		0.85	1	1.097			
T9	94.31	242.83	A	0.233	2.49	19	0.85	1	1.723	176.06	71.32	C
25.10-22.64			B	0.233	2.49		0.85	1	1.723			
			C	0.233	2.49		0.85	1	1.723			
T10	100.67	289.48	A	0.251	2.434	19	0.85	1	1.994	187.86	71.28	C
22.64-20.00			B	0.251	2.434		0.85	1	1.994			
			C	0.251	2.434		0.85	1	1.994			
T11	97.49	238.72	A	0.177	2.675	18	0.85	1	1.221	154.86	60.68	C
20.00-17.45			B	0.177	2.675		0.85	1	1.221			
			C	0.177	2.675		0.85	1	1.221			
T12	94.31	226.54	A	0.175	2.682	18	0.85	1	1.182	145.50	58.94	C
17.45-14.98			B	0.175	2.682		0.85	1	1.182			
			C	0.175	2.682		0.85	1	1.182			
T13	94.31	227.66	A	0.174	2.687	17	0.85	1	1.189	143.67	58.19	C
14.98-12.51			B	0.174	2.687		0.85	1	1.189			
			C	0.174	2.687		0.85	1	1.189			
T14	94.31	228.77	A	0.172	2.691	17	0.85	1	1.196	144.02	58.34	C
12.51-10.04			B	0.172	2.691		0.85	1	1.196			
			C	0.172	2.691		0.85	1	1.196			
T15	94.31	277.96	A	0.233	2.489	17	0.85	1	1.874	165.41	67.00	C
10.04-7.57			B	0.233	2.489		0.85	1	1.874			
			C	0.233	2.489		0.85	1	1.874			
T16 7.57-5.10	94.31	279.71	A	0.232	2.492	17	0.85	1	1.890	166.08	67.27	C
			B	0.232	2.492		0.85	1	1.890			
			C	0.232	2.492		0.85	1	1.890			
T17 5.10-2.64	94.31	281.46	A	0.231	2.495	17	0.85	1	1.906	166.75	67.54	C
			B	0.231	2.495		0.85	1	1.906			
			C	0.231	2.495		0.85	1	1.906			
T18 2.64-0.00	100.67	334.00	A	0.25	2.438	17	0.85	1	2.205	182.43	69.22	C
			B	0.25	2.438		0.85	1	2.205			
			C	0.25	2.438		0.85	1	2.205			
Sum Weight:	3056.00	6301.87						OTM	241.55 kip-ft	5694.68		

Tower Forces - With Ice - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1	0.00	237.27	A	1	1.2	7	1	1	6.498	70.04	7.00	C
90.00-80.00			B	1	1.2		1	1	6.498			
			C	1	1.2		1	1	6.498			
T1	3219.33	3008.71	A	0.624	1.791	6	1	1	37.110	775.76	38.79	C
80.00-60.00			B	0.624	1.791		1	1	37.110			
			C	0.624	1.791		1	1	37.110			
T2	3145.59	3238.01	A	0.607	1.8	6	1	1	37.973	711.45	35.57	C
60.00-40.00			B	0.607	1.8		1	1	37.973			
			C	0.607	1.8		1	1	37.973			
T3	394.52	440.40	A	0.568	1.827	6	1	1	4.699	89.34	35.01	C
40.00-37.45			B	0.568	1.827		1	1	4.699			
			C	0.568	1.827		1	1	4.699			
T4	379.93	425.21	A	0.572	1.824	6	1	1	4.648	85.57	34.66	C
37.45-34.98			B	0.572	1.824		1	1	4.648			
			C	0.572	1.824		1	1	4.648			
T5	378.15	425.95	A	0.566	1.829	5	1	1	4.644	84.83	34.36	C
34.98-32.51			B	0.566	1.829		1	1	4.644			
			C	0.566	1.829		1	1	4.644			
T6	376.25	426.49	A	0.561	1.834	5	1	1	4.637	83.99	34.02	C
32.51-30.04			B	0.561	1.834		1	1	4.637			
			C	0.561	1.834		1	1	4.637			
T7	374.22	426.78	A	0.555	1.839	5	1	1	4.628	83.03	33.63	C
30.04-27.57			B	0.555	1.839		1	1	4.628			
			C	0.555	1.839		1	1	4.628			
T8	372.03	426.80	A	0.549	1.844	5	1	1	4.616	81.93	33.19	C
27.57-25.10			B	0.549	1.844		1	1	4.616			
			C	0.549	1.844		1	1	4.616			
T9	369.66	571.19	A	0.688	1.776	5	1	1	6.727	81.68	33.09	C
25.10-22.64			B	0.688	1.776		1	1	6.727			
			C	0.688	1.776		1	1	6.727			
T10	391.74	676.58	A	0.756	1.79	5	1	1	8.421	88.01	33.39	C
22.64-20.00			B	0.756	1.79		1	1	8.421			
			C	0.756	1.79		1	1	8.421			
T11	376.21	470.12	A	0.526	1.868	5	1	1	4.678	80.23	31.44	C
20.00-17.45			B	0.526	1.868		1	1	4.678			
			C	0.526	1.868		1	1	4.678			
T12	360.61	450.25	A	0.527	1.867	5	1	1	4.589	75.49	30.58	C
17.45-14.98			B	0.527	1.867		1	1	4.589			
			C	0.527	1.867		1	1	4.589			
T13	356.89	447.64	A	0.52	1.876	5	1	1	4.546	74.65	30.24	C
14.98-12.51			B	0.52	1.876		1	1	4.546			
			C	0.52	1.876		1	1	4.546			
T14	352.53	444.00	A	0.511	1.886	5	1	1	4.490	74.90	30.34	C
12.51-10.04			B	0.511	1.886		1	1	4.490			
			C	0.511	1.886		1	1	4.490			
T15	347.25	582.36	A	0.638	1.785	5	1	1	6.483	76.04	30.80	C
10.04-7.57			B	0.638	1.785		1	1	6.483			
			C	0.638	1.785		1	1	6.483			
T16 7.57-5.10	340.47	572.68	A	0.624	1.791	5	1	1	6.340	76.08	30.82	C
			B	0.624	1.791		1	1	6.340			
			C	0.624	1.791		1	1	6.340			
T17 5.10-2.64	330.82	556.81	A	0.604	1.802	5	1	1	6.114	75.93	30.75	C
			B	0.604	1.802		1	1	6.114			
			C	0.604	1.802		1	1	6.114			

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
T18 2.64-0.00	332.81	615.98	A	0.629	1.789	5	1	1	6.954	80.60	30.58	C
			B	0.629	1.789		1	1	6.954			
			C	0.629	1.789		1	1	6.954			
Sum Weight:	12199.02	14443.23						OTM	122.40 kip-ft	2849.54		

Tower Forces - With Ice - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
L1	0.00	237.27	A	1	1.2	7	1	1	6.498	70.04	7.00	C
90.00-80.00			B	1	1.2		1	1	6.498			
			C	1	1.2		1	1	6.498			
T1	3219.33	3008.71	A	0.624	1.791	6	0.8	1	36.913	773.85	38.69	C
80.00-60.00			B	0.624	1.791		0.8	1	36.913			
			C	0.624	1.791		0.8	1	36.913			
T2	3145.59	3238.01	A	0.607	1.8	6	0.8	1	37.973	711.45	35.57	C
60.00-40.00			B	0.607	1.8		0.8	1	37.973			
			C	0.607	1.8		0.8	1	37.973			
T3	394.52	440.40	A	0.568	1.827	6	0.8	1	4.699	89.34	35.01	C
40.00-37.45			B	0.568	1.827		0.8	1	4.699			
			C	0.568	1.827		0.8	1	4.699			
T4	379.93	425.21	A	0.572	1.824	6	0.8	1	4.648	85.57	34.66	C
37.45-34.98			B	0.572	1.824		0.8	1	4.648			
			C	0.572	1.824		0.8	1	4.648			
T5	378.15	425.95	A	0.566	1.829	5	0.8	1	4.644	84.83	34.36	C
34.98-32.51			B	0.566	1.829		0.8	1	4.644			
			C	0.566	1.829		0.8	1	4.644			
T6	376.25	426.49	A	0.561	1.834	5	0.8	1	4.637	83.99	34.02	C
32.51-30.04			B	0.561	1.834		0.8	1	4.637			
			C	0.561	1.834		0.8	1	4.637			
T7	374.22	426.78	A	0.555	1.839	5	0.8	1	4.628	83.03	33.63	C
30.04-27.57			B	0.555	1.839		0.8	1	4.628			
			C	0.555	1.839		0.8	1	4.628			
T8	372.03	426.80	A	0.549	1.844	5	0.8	1	4.616	81.93	33.19	C
27.57-25.10			B	0.549	1.844		0.8	1	4.616			
			C	0.549	1.844		0.8	1	4.616			
T9	369.66	571.19	A	0.688	1.776	5	0.8	1	6.586	80.60	32.65	C
25.10-22.64			B	0.688	1.776		0.8	1	6.586			
			C	0.688	1.776		0.8	1	6.586			
T10	391.74	676.58	A	0.756	1.79	5	0.8	1	8.278	86.93	32.99	C
22.64-20.00			B	0.756	1.79		0.8	1	8.278			
			C	0.756	1.79		0.8	1	8.278			
T11	376.21	470.12	A	0.526	1.868	5	0.8	1	4.678	80.23	31.44	C
20.00-17.45			B	0.526	1.868		0.8	1	4.678			
			C	0.526	1.868		0.8	1	4.678			
T12	360.61	450.25	A	0.527	1.867	5	0.8	1	4.589	75.49	30.58	C
17.45-14.98			B	0.527	1.867		0.8	1	4.589			
			C	0.527	1.867		0.8	1	4.589			
T13	356.89	447.64	A	0.52	1.876	5	0.8	1	4.546	74.65	30.24	C
14.98-12.51			B	0.52	1.876		0.8	1	4.546			
			C	0.52	1.876		0.8	1	4.546			

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T14	352.53	444.00	A	0.511	1.886	5	0.8	1	4.490	74.90	30.34	C
12.51-10.04			B	0.511	1.886		0.8	1	4.490			
			C	0.511	1.886		0.8	1	4.490			
T15	347.25	582.36	A	0.638	1.785	5	0.8	1	6.330	74.97	30.37	C
10.04-7.57			B	0.638	1.785		0.8	1	6.330			
			C	0.638	1.785		0.8	1	6.330			
T16 7.57-5.10	340.47	572.68	A	0.624	1.791	5	0.8	1	6.185	74.99	30.38	C
			B	0.624	1.791		0.8	1	6.185			
			C	0.624	1.791		0.8	1	6.185			
T17 5.10-2.64	330.82	556.81	A	0.604	1.802	5	0.8	1	5.958	74.82	30.31	C
			B	0.604	1.802		0.8	1	5.958			
			C	0.604	1.802		0.8	1	5.958			
T18 2.64-0.00	332.81	615.98	A	0.629	1.789	5	0.8	1	6.796	79.49	30.16	C
			B	0.629	1.789		0.8	1	6.796			
			C	0.629	1.789		0.8	1	6.796			
Sum Weight:	12199.02	14443.23						OTM	122.20 kip-ft	2841.08		

Tower Forces - With Ice - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1	0.00	237.27	A	1	1.2	7	1	1	6.498	70.04	7.00	C
90.00-80.00			B	1	1.2		1	1	6.498			
			C	1	1.2		1	1	6.498			
T1	3219.33	3008.71	A	0.624	1.791	6	0.85	1	36.962	774.33	38.72	C
80.00-60.00			B	0.624	1.791		0.85	1	36.962			
			C	0.624	1.791		0.85	1	36.962			
T2	3145.59	3238.01	A	0.607	1.8	6	0.85	1	37.973	711.45	35.57	C
60.00-40.00			B	0.607	1.8		0.85	1	37.973			
			C	0.607	1.8		0.85	1	37.973			
T3	394.52	440.40	A	0.568	1.827	6	0.85	1	4.699	89.34	35.01	C
40.00-37.45			B	0.568	1.827		0.85	1	4.699			
			C	0.568	1.827		0.85	1	4.699			
T4	379.93	425.21	A	0.572	1.824	6	0.85	1	4.648	85.57	34.66	C
37.45-34.98			B	0.572	1.824		0.85	1	4.648			
			C	0.572	1.824		0.85	1	4.648			
T5	378.15	425.95	A	0.566	1.829	5	0.85	1	4.644	84.83	34.36	C
34.98-32.51			B	0.566	1.829		0.85	1	4.644			
			C	0.566	1.829		0.85	1	4.644			
T6	376.25	426.49	A	0.561	1.834	5	0.85	1	4.637	83.99	34.02	C
32.51-30.04			B	0.561	1.834		0.85	1	4.637			
			C	0.561	1.834		0.85	1	4.637			
T7	374.22	426.78	A	0.555	1.839	5	0.85	1	4.628	83.03	33.63	C
30.04-27.57			B	0.555	1.839		0.85	1	4.628			
			C	0.555	1.839		0.85	1	4.628			
T8	372.03	426.80	A	0.549	1.844	5	0.85	1	4.616	81.93	33.19	C
27.57-25.10			B	0.549	1.844		0.85	1	4.616			
			C	0.549	1.844		0.85	1	4.616			
T9	369.66	571.19	A	0.688	1.776	5	0.85	1	6.621	80.87	32.76	C
25.10-22.64			B	0.688	1.776		0.85	1	6.621			
			C	0.688	1.776		0.85	1	6.621			

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T10	391.74	676.58	A	0.756	1.79	5	0.85	1	8.314	87.20	33.09	C
22.64-20.00			B	0.756	1.79		0.85	1	8.314			
			C	0.756	1.79		0.85	1	8.314			
T11	376.21	470.12	A	0.526	1.868	5	0.85	1	4.678	80.23	31.44	C
20.00-17.45			B	0.526	1.868		0.85	1	4.678			
			C	0.526	1.868		0.85	1	4.678			
T12	360.61	450.25	A	0.527	1.867	5	0.85	1	4.589	75.49	30.58	C
17.45-14.98			B	0.527	1.867		0.85	1	4.589			
			C	0.527	1.867		0.85	1	4.589			
T13	356.89	447.64	A	0.52	1.876	5	0.85	1	4.546	74.65	30.24	C
14.98-12.51			B	0.52	1.876		0.85	1	4.546			
			C	0.52	1.876		0.85	1	4.546			
T14	352.53	444.00	A	0.511	1.886	5	0.85	1	4.490	74.90	30.34	C
12.51-10.04			B	0.511	1.886		0.85	1	4.490			
			C	0.511	1.886		0.85	1	4.490			
T15	347.25	582.36	A	0.638	1.785	5	0.85	1	6.368	75.24	30.48	C
10.04-7.57			B	0.638	1.785		0.85	1	6.368			
			C	0.638	1.785		0.85	1	6.368			
T16 7.57-5.10	340.47	572.68	A	0.624	1.791	5	0.85	1	6.224	75.26	30.49	C
			B	0.624	1.791		0.85	1	6.224			
			C	0.624	1.791		0.85	1	6.224			
T17 5.10-2.64	330.82	556.81	A	0.604	1.802	5	0.85	1	5.997	75.09	30.42	C
			B	0.604	1.802		0.85	1	5.997			
			C	0.604	1.802		0.85	1	5.997			
T18 2.64-0.00	332.81	615.98	A	0.629	1.789	5	0.85	1	6.835	79.77	30.27	C
			B	0.629	1.789		0.85	1	6.835			
			C	0.629	1.789		0.85	1	6.835			
Sum Weight:	12199.02	14443.23						OTM	122.25 kip-ft	2843.20		

Tower Forces - Service - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1	0.00	113.41	A	1	1.2	10	1	1	3.750	58.20	5.82	C
90.00-80.00			B	1	1.2		1	1	3.750			
			C	1	1.2		1	1	3.750			
T1	764.00	1027.75	A	0.163	2.725	9	1	1	7.139	593.47	29.67	C
80.00-60.00			B	0.163	2.725		1	1	7.139			
			C	0.163	2.725		1	1	7.139			
T2	764.00	1354.01	A	0.179	2.668	9	1	1	8.009	540.14	27.01	C
60.00-40.00			B	0.179	2.668		1	1	8.009			
			C	0.179	2.668		1	1	8.009			
T3	97.49	203.42	A	0.179	2.666	8	1	1	1.104	66.81	26.18	C
40.00-37.45			B	0.179	2.666		1	1	1.104			
			C	0.179	2.666		1	1	1.104			
T4	94.31	193.04	A	0.177	2.674	8	1	1	1.070	63.81	25.85	C
37.45-34.98			B	0.177	2.674		1	1	1.070			
			C	0.177	2.674		1	1	1.070			
T5	94.31	194.13	A	0.176	2.679	8	1	1	1.076	63.03	25.53	C
34.98-32.51			B	0.176	2.679		1	1	1.076			
			C	0.176	2.679		1	1	1.076			

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T6	94.31	195.23	A	0.175	2.683	8	1	1	1.083	62.18	25.19	C
32.51-30.04			B	0.175	2.683		1	1	1.083			
			C	0.175	2.683		1	1	1.083			
T7	94.31	196.33	A	0.173	2.688	8	1	1	1.090	61.26	24.82	C
30.04-27.57			B	0.173	2.688		1	1	1.090			
			C	0.173	2.688		1	1	1.090			
T8	94.31	197.43	A	0.172	2.692	7	1	1	1.097	60.27	24.41	C
27.57-25.10			B	0.172	2.692		1	1	1.097			
			C	0.172	2.692		1	1	1.097			
T9	94.31	242.83	A	0.233	2.49	7	1	1	1.828	69.00	27.95	C
25.10-22.64			B	0.233	2.49		1	1	1.828			
			C	0.233	2.49		1	1	1.828			
T10	100.67	289.48	A	0.251	2.434	7	1	1	2.101	73.46	27.87	C
22.64-20.00			B	0.251	2.434		1	1	2.101			
			C	0.251	2.434		1	1	2.101			
T11	97.49	238.72	A	0.177	2.675	7	1	1	1.221	59.25	23.22	C
20.00-17.45			B	0.177	2.675		1	1	1.221			
			C	0.177	2.675		1	1	1.221			
T12	94.31	226.54	A	0.175	2.682	7	1	1	1.182	55.67	22.55	C
17.45-14.98			B	0.175	2.682		1	1	1.182			
			C	0.175	2.682		1	1	1.182			
T13	94.31	227.66	A	0.174	2.687	7	1	1	1.189	54.97	22.27	C
14.98-12.51			B	0.174	2.687		1	1	1.189			
			C	0.174	2.687		1	1	1.189			
T14	94.31	228.77	A	0.172	2.691	7	1	1	1.196	55.10	22.32	C
12.51-10.04			B	0.172	2.691		1	1	1.196			
			C	0.172	2.691		1	1	1.196			
T15	94.31	277.96	A	0.233	2.489	7	1	1	1.988	64.90	26.29	C
10.04-7.57			B	0.233	2.489		1	1	1.988			
			C	0.233	2.489		1	1	1.988			
T16 7.57-5.10	94.31	279.71	A	0.232	2.492	7	1	1	2.006	65.18	26.40	C
			B	0.232	2.492		1	1	2.006			
			C	0.232	2.492		1	1	2.006			
T17 5.10-2.64	94.31	281.46	A	0.231	2.495	7	1	1	2.023	65.46	26.52	C
			B	0.231	2.495		1	1	2.023			
			C	0.231	2.495		1	1	2.023			
T18 2.64-0.00	100.67	334.00	A	0.25	2.438	7	1	1	2.324	71.44	27.11	C
			B	0.25	2.438		1	1	2.324			
			C	0.25	2.438		1	1	2.324			
Sum Weight:	3056.00	6301.87						OTM	93.75 kip-ft	2203.59		

Tower Forces - Service - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1	0.00	113.41	A	1	1.2	10	1	1	3.750	58.20	5.82	C
90.00-80.00			B	1	1.2		1	1	3.750			
			C	1	1.2		1	1	3.750			
T1	764.00	1027.75	A	0.163	2.725	9	0.8	1	6.942	589.27	29.46	C
80.00-60.00			B	0.163	2.725		0.8	1	6.942			
			C	0.163	2.725		0.8	1	6.942			

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T2	764.00	1354.01	A	0.179	2.668	9	0.8	1	8.009	540.14	27.01	C
60.00-40.00			B	0.179	2.668		0.8	1	8.009			
			C	0.179	2.668		0.8	1	8.009			
T3	97.49	203.42	A	0.179	2.666	8	0.8	1	1.104	66.81	26.18	C
40.00-37.45			B	0.179	2.666		0.8	1	1.104			
			C	0.179	2.666		0.8	1	1.104			
T4	94.31	193.04	A	0.177	2.674	8	0.8	1	1.070	63.81	25.85	C
37.45-34.98			B	0.177	2.674		0.8	1	1.070			
			C	0.177	2.674		0.8	1	1.070			
T5	94.31	194.13	A	0.176	2.679	8	0.8	1	1.076	63.03	25.53	C
34.98-32.51			B	0.176	2.679		0.8	1	1.076			
			C	0.176	2.679		0.8	1	1.076			
T6	94.31	195.23	A	0.175	2.683	8	0.8	1	1.083	62.18	25.19	C
32.51-30.04			B	0.175	2.683		0.8	1	1.083			
			C	0.175	2.683		0.8	1	1.083			
T7	94.31	196.33	A	0.173	2.688	8	0.8	1	1.090	61.26	24.82	C
30.04-27.57			B	0.173	2.688		0.8	1	1.090			
			C	0.173	2.688		0.8	1	1.090			
T8	94.31	197.43	A	0.172	2.692	7	0.8	1	1.097	60.27	24.41	C
27.57-25.10			B	0.172	2.692		0.8	1	1.097			
			C	0.172	2.692		0.8	1	1.097			
T9	94.31	242.83	A	0.233	2.49	7	0.8	1	1.687	66.82	27.07	C
25.10-22.64			B	0.233	2.49		0.8	1	1.687			
			C	0.233	2.49		0.8	1	1.687			
T10	100.67	289.48	A	0.251	2.434	7	0.8	1	1.958	71.35	27.07	C
22.64-20.00			B	0.251	2.434		0.8	1	1.958			
			C	0.251	2.434		0.8	1	1.958			
T11	97.49	238.72	A	0.177	2.675	7	0.8	1	1.221	59.25	23.22	C
20.00-17.45			B	0.177	2.675		0.8	1	1.221			
			C	0.177	2.675		0.8	1	1.221			
T12	94.31	226.54	A	0.175	2.682	7	0.8	1	1.182	55.67	22.55	C
17.45-14.98			B	0.175	2.682		0.8	1	1.182			
			C	0.175	2.682		0.8	1	1.182			
T13	94.31	227.66	A	0.174	2.687	7	0.8	1	1.189	54.97	22.27	C
14.98-12.51			B	0.174	2.687		0.8	1	1.189			
			C	0.174	2.687		0.8	1	1.189			
T14	94.31	228.77	A	0.172	2.691	7	0.8	1	1.196	55.10	22.32	C
12.51-10.04			B	0.172	2.691		0.8	1	1.196			
			C	0.172	2.691		0.8	1	1.196			
T15	94.31	277.96	A	0.233	2.489	7	0.8	1	1.836	62.75	25.42	C
10.04-7.57			B	0.233	2.489		0.8	1	1.836			
			C	0.233	2.489		0.8	1	1.836			
T16 7.57-5.10	94.31	279.71	A	0.232	2.492	7	0.8	1	1.851	63.00	25.52	C
			B	0.232	2.492		0.8	1	1.851			
			C	0.232	2.492		0.8	1	1.851			
T17 5.10-2.64	94.31	281.46	A	0.231	2.495	7	0.8	1	1.867	63.25	25.62	C
			B	0.231	2.495		0.8	1	1.867			
			C	0.231	2.495		0.8	1	1.867			
T18 2.64-0.00	100.67	334.00	A	0.25	2.438	7	0.8	1	2.165	69.25	26.28	C
			B	0.25	2.438		0.8	1	2.165			
			C	0.25	2.438		0.8	1	2.165			
Sum Weight:	3056.00	6301.87						OTM	93.32 kip-ft	2186.37		

Tower Forces - Service - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
L1	0.00	113.41	A	1	1.2	10	1	1	3.750	58.20	5.82	C
90.00-80.00			B	1	1.2		1	1	3.750			
			C	1	1.2		1	1	3.750			
T1	764.00	1027.75	A	0.163	2.725	9	0.85	1	6.992	590.32	29.52	C
80.00-60.00			B	0.163	2.725		0.85	1	6.992			
			C	0.163	2.725		0.85	1	6.992			
T2	764.00	1354.01	A	0.179	2.668	9	0.85	1	8.009	540.14	27.01	C
60.00-40.00			B	0.179	2.668		0.85	1	8.009			
			C	0.179	2.668		0.85	1	8.009			
T3	97.49	203.42	A	0.179	2.666	8	0.85	1	1.104	66.81	26.18	C
40.00-37.45			B	0.179	2.666		0.85	1	1.104			
			C	0.179	2.666		0.85	1	1.104			
T4	94.31	193.04	A	0.177	2.674	8	0.85	1	1.070	63.81	25.85	C
37.45-34.98			B	0.177	2.674		0.85	1	1.070			
			C	0.177	2.674		0.85	1	1.070			
T5	94.31	194.13	A	0.176	2.679	8	0.85	1	1.076	63.03	25.53	C
34.98-32.51			B	0.176	2.679		0.85	1	1.076			
			C	0.176	2.679		0.85	1	1.076			
T6	94.31	195.23	A	0.175	2.683	8	0.85	1	1.083	62.18	25.19	C
32.51-30.04			B	0.175	2.683		0.85	1	1.083			
			C	0.175	2.683		0.85	1	1.083			
T7	94.31	196.33	A	0.173	2.688	8	0.85	1	1.090	61.26	24.82	C
30.04-27.57			B	0.173	2.688		0.85	1	1.090			
			C	0.173	2.688		0.85	1	1.090			
T8	94.31	197.43	A	0.172	2.692	7	0.85	1	1.097	60.27	24.41	C
27.57-25.10			B	0.172	2.692		0.85	1	1.097			
			C	0.172	2.692		0.85	1	1.097			
T9	94.31	242.83	A	0.233	2.49	7	0.85	1	1.723	67.36	27.29	C
25.10-22.64			B	0.233	2.49		0.85	1	1.723			
			C	0.233	2.49		0.85	1	1.723			
T10	100.67	289.48	A	0.251	2.434	7	0.85	1	1.994	71.88	27.27	C
22.64-20.00			B	0.251	2.434		0.85	1	1.994			
			C	0.251	2.434		0.85	1	1.994			
T11	97.49	238.72	A	0.177	2.675	7	0.85	1	1.221	59.25	23.22	C
20.00-17.45			B	0.177	2.675		0.85	1	1.221			
			C	0.177	2.675		0.85	1	1.221			
T12	94.31	226.54	A	0.175	2.682	7	0.85	1	1.182	55.67	22.55	C
17.45-14.98			B	0.175	2.682		0.85	1	1.182			
			C	0.175	2.682		0.85	1	1.182			
T13	94.31	227.66	A	0.174	2.687	7	0.85	1	1.189	54.97	22.27	C
14.98-12.51			B	0.174	2.687		0.85	1	1.189			
			C	0.174	2.687		0.85	1	1.189			
T14	94.31	228.77	A	0.172	2.691	7	0.85	1	1.196	55.10	22.32	C
12.51-10.04			B	0.172	2.691		0.85	1	1.196			
			C	0.172	2.691		0.85	1	1.196			
T15	94.31	277.96	A	0.233	2.489	7	0.85	1	1.874	63.29	25.64	C
10.04-7.57			B	0.233	2.489		0.85	1	1.874			
			C	0.233	2.489		0.85	1	1.874			
T16 7.57-5.10	94.31	279.71	A	0.232	2.492	7	0.85	1	1.890	63.54	25.74	C
			B	0.232	2.492		0.85	1	1.890			
			C	0.232	2.492		0.85	1	1.890			
T17 5.10-2.64	94.31	281.46	A	0.231	2.495	7	0.85	1	1.906	63.80	25.84	C
			B	0.231	2.495		0.85	1	1.906			
			C	0.231	2.495		0.85	1	1.906			
T18 2.64-0.00	100.67	334.00	A	0.25	2.438	7	0.85	1	2.205	69.80	26.49	C
			B	0.25	2.438		0.85	1	2.205			
			C	0.25	2.438		0.85	1	2.205			
Sum Weight:	3056.00	6301.87						OTM	93.43 kip-ft	2190.68		

Discrete Appurtenance Pressures - No Ice

G_H = 0.850 (base tower), 1.350 (upper structure)

Description	Aiming Azimuth °	Weight lb	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z psf	C_AA_C Front ft^2	C_AA_C Side ft^2
20' 8 Bay Di-Pole	240.0000	55.00	-0.16	0.09	90.00	1.238	25	4.00	4.00
10' Omni	240.0000	30.00	-4.39	-3.24	85.00	1.223	25	2.00	2.00
7' Whip	120.0000	37.30	4.39	-3.24	83.00	1.217	25	1.74	1.74
7770	0.0000	35.00	-5.00	-4.02	78.00	1.201	25	5.51	2.93
7770	120.0000	35.00	5.98	-2.32	78.00	1.201	25	5.51	2.93
7770	240.0000	35.00	-0.98	6.34	78.00	1.201	25	5.51	2.93
CCI OPA-65R-LCUU-H6 Panel Antenna with 8ft Pipe	0.0000	101.05	0.00	-4.02	78.00	1.201	25	9.72	7.15
CCI OPA-65R-LCUU-H6 Panel Antenna with 8ft Pipe	120.0000	101.05	3.48	2.01	78.00	1.201	25	9.72	7.15
CCI OPA-65R-LCUU-H6 Panel Antenna with 8ft Pipe	240.0000	101.05	-3.48	2.01	78.00	1.201	25	9.72	7.15
800-10965	0.0000	137.80	0.00	-4.02	78.00	1.201	25	14.16	7.73
800-10965	120.0000	137.80	3.48	2.01	78.00	1.201	25	14.16	7.73
800-10965	240.0000	137.80	-3.48	2.01	78.00	1.201	25	14.16	7.73
QS66512-2	0.0000	111.00	-5.00	-4.02	78.00	1.201	25	8.13	6.80
QS66512-2	120.0000	111.00	5.98	-2.32	78.00	1.201	25	8.13	6.80
QS66512-2	240.0000	111.00	-0.98	6.34	78.00	1.201	25	8.13	6.80
TMA	0.0000	20.00	0.00	-4.02	78.00	1.201	25	1.00	0.41
TMA	120.0000	20.00	3.48	2.01	78.00	1.201	25	1.00	0.41
TMA	240.0000	20.00	-3.48	2.01	78.00	1.201	25	1.00	0.41
RRUS 32	0.0000	52.90	0.00	-4.02	78.00	1.201	25	2.72	1.67
RRUS 32	120.0000	52.90	3.48	2.01	78.00	1.201	25	2.72	1.67
RRUS 32	240.0000	52.90	-3.48	2.01	78.00	1.201	25	2.72	1.67
RRU B14 4478	0.0000	47.40	0.00	-4.02	78.00	1.201	25	1.86	0.82
RRU B14 4478	120.0000	47.40	3.48	2.01	78.00	1.201	25	1.86	0.82
RRU B14 4478	240.0000	47.40	-3.48	2.01	78.00	1.201	25	1.86	0.82
RRUS 4478 B5	0.0000	59.90	0.00	-4.02	78.00	1.201	25	1.84	1.06
RRUS 4478 B5	120.0000	59.90	3.48	2.01	78.00	1.201	25	1.84	1.06
RRUS 4478 B5	240.0000	59.90	-3.48	2.01	78.00	1.201	25	1.84	1.06
RRUS 4426 B66	0.0000	46.00	0.00	-4.02	78.00	1.201	25	1.65	0.68
RRUS 4426 B66	120.0000	46.00	3.48	2.01	78.00	1.201	25	1.65	0.68
RRUS 4426 B66	240.0000	46.00	-3.48	2.01	78.00	1.201	25	1.65	0.68
RRUS11 B12 (Partiall Shielded by 11.9" Antenna)	0.0000	50.70	0.00	-4.02	78.00	1.201	25	0.88	1.18
RRUS11 B12 (Partiall Shielded by 11.9" Antenna)	120.0000	50.70	3.48	2.01	78.00	1.201	25	0.88	1.18
RRUS11 B12 (Partiall Shielded by 11.9" Antenna)	240.0000	50.70	-3.48	2.01	78.00	1.201	25	0.88	1.18
RRUS 32 B2	0.0000	52.90	0.00	-4.02	78.00	1.201	25	2.72	1.67
RRUS 32 B2	120.0000	52.90	3.48	2.01	78.00	1.201	25	2.72	1.67
RRUS 32 B2	240.0000	52.90	-3.48	2.01	78.00	1.201	25	2.72	1.67
DC6-48-60-18-8C	300.0000	26.20	-1.74	-1.01	78.00	1.201	25	0.55	0.55
DC6-48-60-18-8C	120.0000	26.20	2.62	1.51	78.00	1.201	25	0.55	0.55

Description	Aiming Azimuth °	Weight lb	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z psf	C_AA_C Front ft^2	C_AA_C Side ft^2
DC6-48-60-18-8C	240.0000	26.20	-2.62	1.51	78.00	1.201	25	0.55	0.55
Pirod 12' PCS T-Frame (1) 104569	0.0000	260.00	0.00	-2.02	78.00	1.201	25	9.80	9.80
Pirod 12' PCS T-Frame (1) 104569	120.0000	260.00	1.75	1.01	78.00	1.201	25	9.80	9.80
Pirod 12' PCS T-Frame (1) 104569	240.0000	260.00	-1.75	1.01	78.00	1.201	25	9.80	9.80
7' Whip	120.0000	37.30	1.75	1.01	71.00	1.178	24	1.74	1.74
10' Omni	240.0000	30.00	-8.21	-2.19	65.00	1.156	24	2.00	2.00
1.5" Dia 4' Omni w/Pipe Mount	240.0000	22.30	-6.95	4.01	62.00	1.144	23	0.94	0.94
4 ' Side Arm	240.0000	72.00	-3.54	2.05	55.00	1.116	23	2.60	2.60
4 ' Side Arm	120.0000	72.00	3.54	2.05	55.00	1.116	23	2.60	2.60
10' Omni	120.0000	30.00	4.41	2.55	60.00	1.137	23	2.00	2.00
10' Yagi	240.0000	120.00	-4.41	2.55	55.00	1.116	23	4.00	4.00
6' Side Arm	240.0000	160.00	-4.35	2.51	65.00	1.156	24	8.70	8.70
6' Side Arm	120.0000	160.00	4.35	2.51	65.00	1.156	24	8.70	8.70
	Sum Weight:	3828.45							

Discrete Appurtenance Pressures - With Ice

G_H = 0.850 (base tower), 1.350 (upper structure)

Description	Aiming Azimuth °	Weight lb	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z psf	C_AA_C Front ft^2	C_AA_C Side ft^2	t_z in
20' 8 Bay Di-Pole	240.0000	204.25	-0.16	0.09	90.00	1.238	7	10.63	10.63	1.6583
10' Omni	240.0000	108.95	-4.39	-3.24	85.00	1.223	7	5.13	5.13	1.6489
7' Whip	120.0000	115.52	4.39	-3.24	83.00	1.217	7	4.06	4.06	1.6449
7770	0.0000	162.21	-5.00	-4.02	78.00	1.201	7	6.71	4.09	1.6347
7770	120.0000	162.21	5.98	-2.32	78.00	1.201	7	6.71	4.09	1.6347
7770	240.0000	162.21	-0.98	6.34	78.00	1.201	7	6.71	4.09	1.6347
CCI OPA-65R-LCUU-H6 Panel Antenna with 8ft Pipe	0.0000	385.34	0.00	-4.02	78.00	1.201	7	11.52	10.39	1.6347
CCI OPA-65R-LCUU-H6 Panel Antenna with 8ft Pipe	120.0000	385.34	3.48	2.01	78.00	1.201	7	11.52	10.39	1.6347
CCI OPA-65R-LCUU-H6 Panel Antenna with 8ft Pipe	240.0000	385.34	-3.48	2.01	78.00	1.201	7	11.52	10.39	1.6347
800-10965	0.0000	497.61	0.00	-4.02	78.00	1.201	7	16.31	11.50	1.6347
800-10965	120.0000	497.61	3.48	2.01	78.00	1.201	7	16.31	11.50	1.6347
800-10965	240.0000	497.61	-3.48	2.01	78.00	1.201	7	16.31	11.50	1.6347
QS66512-2	0.0000	324.64	-5.00	-4.02	78.00	1.201	7	9.66	8.31	1.6347
QS66512-2	120.0000	324.64	5.98	-2.32	78.00	1.201	7	9.66	8.31	1.6347
QS66512-2	240.0000	324.64	-0.98	6.34	78.00	1.201	7	9.66	8.31	1.6347
TMA	0.0000	53.24	0.00	-4.02	78.00	1.201	7	1.44	0.73	1.6347
TMA	120.0000	53.24	3.48	2.01	78.00	1.201	7	1.44	0.73	1.6347
TMA	240.0000	53.24	-3.48	2.01	78.00	1.201	7	1.44	0.73	1.6347
RRUS 32	0.0000	135.36	0.00	-4.02	78.00	1.201	7	3.48	2.31	1.6347
RRUS 32	120.0000	135.36	3.48	2.01	78.00	1.201	7	3.48	2.31	1.6347
RRUS 32	240.0000	135.36	-3.48	2.01	78.00	1.201	7	3.48	2.31	1.6347
RRU B14 4478	0.0000	104.68	0.00	-4.02	78.00	1.201	7	2.44	1.26	1.6347
RRU B14 4478	120.0000	104.68	3.48	2.01	78.00	1.201	7	2.44	1.26	1.6347
RRU B14 4478	240.0000	104.68	-3.48	2.01	78.00	1.201	7	2.44	1.26	1.6347

Description	Aiming Azimuth °	Weight lb	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z psf	C_AA_C Front ft^2	C_AA_C Side ft^2	t_z in
RRUS 4478 B5	0.0000	123.29	0.00	-4.02	78.00	1.201	7	2.43	1.54	1.6347
RRUS 4478 B5	120.0000	123.29	3.48	2.01	78.00	1.201	7	2.43	1.54	1.6347
RRUS 4478 B5	240.0000	123.29	-3.48	2.01	78.00	1.201	7	2.43	1.54	1.6347
RRUS 4426 B66	0.0000	97.17	0.00	-4.02	78.00	1.201	7	2.21	1.09	1.6347
RRUS 4426 B66	120.0000	97.17	3.48	2.01	78.00	1.201	7	2.21	1.09	1.6347
RRUS 4426 B66	240.0000	97.17	-3.48	2.01	78.00	1.201	7	2.21	1.09	1.6347
RRUS11 B12 (Partiall Shielded by 11.9" Antenna)	0.0000	93.30	0.00	-4.02	78.00	1.201	7	1.36	1.70	1.6347
RRUS11 B12 (Partiall Shielded by 11.9" Antenna)	120.0000	93.30	3.48	2.01	78.00	1.201	7	1.36	1.70	1.6347
RRUS11 B12 (Partiall Shielded by 11.9" Antenna)	240.0000	93.30	-3.48	2.01	78.00	1.201	7	1.36	1.70	1.6347
RRUS 32 B2	0.0000	135.36	0.00	-4.02	78.00	1.201	7	3.48	2.31	1.6347
RRUS 32 B2	120.0000	135.36	3.48	2.01	78.00	1.201	7	3.48	2.31	1.6347
RRUS 32 B2	240.0000	135.36	-3.48	2.01	78.00	1.201	7	3.48	2.31	1.6347
DC6-48-60-18-8C	300.0000	70.76	-1.74	-1.01	78.00	1.201	7	1.24	1.24	1.6347
DC6-48-60-18-8C	120.0000	70.76	2.62	1.51	78.00	1.201	7	1.24	1.24	1.6347
DC6-48-60-18-8C	240.0000	70.76	-2.62	1.51	78.00	1.201	7	1.24	1.24	1.6347
Pirod 12' PCS T-Frame (1) 104569	0.0000	586.95	0.00	-2.02	78.00	1.201	7	26.15	26.15	1.6347
Pirod 12' PCS T-Frame (1) 104569	120.0000	586.95	1.75	1.01	78.00	1.201	7	26.15	26.15	1.6347
Pirod 12' PCS T-Frame (1) 104569	240.0000	586.95	-1.75	1.01	78.00	1.201	7	26.15	26.15	1.6347
7' Whip	120.0000	113.06	1.75	1.01	71.00	1.178	6	4.01	4.01	1.6052
10' Omni	240.0000	106.16	-8.21	-2.19	65.00	1.156	6	5.06	5.06	1.6052
1.5" Dia 4' Omni w/Pipe Mount	240.0000	71.62	-6.95	4.01	62.00	1.144	6	2.29	2.29	1.6052
4 ' Side Arm	240.0000	149.98	-3.54	2.05	55.00	1.116	6	3.89	3.89	1.5786
4 ' Side Arm	120.0000	149.98	3.54	2.05	55.00	1.116	6	3.89	3.89	1.5786
10' Omni	120.0000	104.46	4.41	2.55	60.00	1.137	6	5.01	5.01	1.5786
10' Yagi	240.0000	435.72	-4.41	2.55	55.00	1.116	6	18.84	18.84	1.5786
6' Side Arm	240.0000	213.11	-4.35	2.51	65.00	1.156	6	4.12	4.12	1.6052
6' Side Arm	120.0000	213.11	4.35	2.51	65.00	1.156	6	4.12	4.12	1.6052
	Sum Weight:	10295.65								

Discrete Appurtenance Pressures - Service

G_H = 0.850 (base tower), 1.350 (upper structure)

Description	Aiming Azimuth °	Weight lb	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z psf	C_AA_C Front ft^2	C_AA_C Side ft^2
20' 8 Bay Di-Pole	240.0000	55.00	-0.16	0.09	90.00	1.238	10	4.00	4.00
10' Omni	240.0000	30.00	-4.39	-3.24	85.00	1.223	10	2.00	2.00
7' Whip	120.0000	37.30	4.39	-3.24	83.00	1.217	10	1.74	1.74
7770	0.0000	35.00	-5.00	-4.02	78.00	1.201	9	5.51	2.93
7770	120.0000	35.00	5.98	-2.32	78.00	1.201	9	5.51	2.93
7770	240.0000	35.00	-0.98	6.34	78.00	1.201	9	5.51	2.93
CCI OPA-65R-LCUU-H6 Panel Antenna with 8ft Pipe	0.0000	101.05	0.00	-4.02	78.00	1.201	9	9.72	7.15
CCI OPA-65R-LCUU-H6 Panel Antenna with 8ft	120.0000	101.05	3.48	2.01	78.00	1.201	9	9.72	7.15

Description	Aiming Azimuth °	Weight lb	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z psf	C_AA_C Front ft^2	C_AA_C Side ft^2
Pipe									
CCI OPA-65R-LCUU-H6 Panel Antenna with 8ft Pipe	240.0000	101.05	-3.48	2.01	78.00	1.201	9	9.72	7.15
800-10965	0.0000	137.80	0.00	-4.02	78.00	1.201	9	14.16	7.73
800-10965	120.0000	137.80	3.48	2.01	78.00	1.201	9	14.16	7.73
800-10965	240.0000	137.80	-3.48	2.01	78.00	1.201	9	14.16	7.73
QS66512-2	0.0000	111.00	-5.00	-4.02	78.00	1.201	9	8.13	6.80
QS66512-2	120.0000	111.00	5.98	-2.32	78.00	1.201	9	8.13	6.80
QS66512-2	240.0000	111.00	-0.98	6.34	78.00	1.201	9	8.13	6.80
TMA	0.0000	20.00	0.00	-4.02	78.00	1.201	9	1.00	0.41
TMA	120.0000	20.00	3.48	2.01	78.00	1.201	9	1.00	0.41
TMA	240.0000	20.00	-3.48	2.01	78.00	1.201	9	1.00	0.41
RRUS 32	0.0000	52.90	0.00	-4.02	78.00	1.201	9	2.72	1.67
RRUS 32	120.0000	52.90	3.48	2.01	78.00	1.201	9	2.72	1.67
RRUS 32	240.0000	52.90	-3.48	2.01	78.00	1.201	9	2.72	1.67
RRU B14 4478	0.0000	47.40	0.00	-4.02	78.00	1.201	9	1.86	0.82
RRU B14 4478	120.0000	47.40	3.48	2.01	78.00	1.201	9	1.86	0.82
RRU B14 4478	240.0000	47.40	-3.48	2.01	78.00	1.201	9	1.86	0.82
RRUS 4478 B5	0.0000	59.90	0.00	-4.02	78.00	1.201	9	1.84	1.06
RRUS 4478 B5	120.0000	59.90	3.48	2.01	78.00	1.201	9	1.84	1.06
RRUS 4478 B5	240.0000	59.90	-3.48	2.01	78.00	1.201	9	1.84	1.06
RRUS 4426 B66	0.0000	46.00	0.00	-4.02	78.00	1.201	9	1.65	0.68
RRUS 4426 B66	120.0000	46.00	3.48	2.01	78.00	1.201	9	1.65	0.68
RRUS 4426 B66	240.0000	46.00	-3.48	2.01	78.00	1.201	9	1.65	0.68
RRUS11 B12 (Partiall Shielded by 11.9" Antenna)	0.0000	50.70	0.00	-4.02	78.00	1.201	9	0.88	1.18
RRUS11 B12 (Partiall Shielded by 11.9" Antenna)	120.0000	50.70	3.48	2.01	78.00	1.201	9	0.88	1.18
RRUS11 B12 (Partiall Shielded by 11.9" Antenna)	240.0000	50.70	-3.48	2.01	78.00	1.201	9	0.88	1.18
RRUS 32 B2	0.0000	52.90	0.00	-4.02	78.00	1.201	9	2.72	1.67
RRUS 32 B2	120.0000	52.90	3.48	2.01	78.00	1.201	9	2.72	1.67
RRUS 32 B2	240.0000	52.90	-3.48	2.01	78.00	1.201	9	2.72	1.67
DC6-48-60-18-8C	300.0000	26.20	-1.74	-1.01	78.00	1.201	9	0.55	0.55
DC6-48-60-18-8C	120.0000	26.20	2.62	1.51	78.00	1.201	9	0.55	0.55
DC6-48-60-18-8C	240.0000	26.20	-2.62	1.51	78.00	1.201	9	0.55	0.55
Pirod 12' PCS T-Frame (1) 104569	0.0000	260.00	0.00	-2.02	78.00	1.201	9	9.80	9.80
Pirod 12' PCS T-Frame (1) 104569	120.0000	260.00	1.75	1.01	78.00	1.201	9	9.80	9.80
Pirod 12' PCS T-Frame (1) 104569	240.0000	260.00	-1.75	1.01	78.00	1.201	9	9.80	9.80
7' Whip	120.0000	37.30	1.75	1.01	71.00	1.178	9	1.74	1.74
10' Omni	240.0000	30.00	-8.21	-2.19	65.00	1.156	9	2.00	2.00
1.5" Dia 4' Omni w/Pipe Mount	240.0000	22.30	-6.95	4.01	62.00	1.144	9	0.94	0.94
4 ' Side Arm	240.0000	72.00	-3.54	2.05	55.00	1.116	9	2.60	2.60
4 ' Side Arm	120.0000	72.00	3.54	2.05	55.00	1.116	9	2.60	2.60
10' Omni	120.0000	30.00	4.41	2.55	60.00	1.137	9	2.00	2.00
10' Yagi	240.0000	120.00	-4.41	2.55	55.00	1.116	9	4.00	4.00
6' Side Arm	240.0000	160.00	-4.35	2.51	65.00	1.156	9	8.70	8.70
6' Side Arm	120.0000	160.00	4.35	2.51	65.00	1.156	9	8.70	8.70
	Sum Weight:	3828.45							

Dish Pressures - No Ice

Elevation ft	Dish Description	Aiming Azimuth °	Weight lb	$Offset_x$ ft	$Offset_z$ ft	K_z	A_A ft^2	q_z psf
73.00	2' dish	120.0000	15.00	1.75	1.01	1.184	3.14	24
73.00	4' dish	0.0000	80.00	0.00	-2.02	1.184	12.57	24
		Sum Weight:	95.00					

Dish Pressures - With Ice

Elevation ft	Dish Description	Aiming Azimuth °	Weight lb	$Offset_x$ ft	$Offset_z$ ft	K_z	A_A ft^2	q_z psf	t_z in
73.00	2' dish	120.0000	86.85	1.75	1.01	1.184	4.01	6	1.6239
73.00	4' dish	0.0000	80.00	0.00	-2.02	1.184	14.28	6	1.6239
		Sum Weight:	166.85						

Dish Pressures - Service

Elevation ft	Dish Description	Aiming Azimuth °	Weight lb	$Offset_x$ ft	$Offset_z$ ft	K_z	A_A ft^2	q_z psf
73.00	2' dish	120.0000	15.00	1.75	1.01	1.184	3.14	9
73.00	4' dish	0.0000	80.00	0.00	-2.02	1.184	12.57	9
		Sum Weight:	95.00					

Force Totals

Load Case	Vertical Forces lb	Sum of Forces X lb	Sum of Forces Z lb	Sum of Overturning Moments, M_x kip-ft	Sum of Overturning Moments, M_z kip-ft	Sum of Torques kip-ft
Leg Weight	3070.68					
Bracing Weight	3231.19					
Total Member Self-Weight	6301.87			3.59	0.92	
Total Weight	13281.32			3.59	0.92	
Wind 0 deg - No Ice		0.00	-9745.69	-541.43	0.92	-0.38
Wind 30 deg - No Ice		4855.97	-8410.79	-467.68	-271.16	0.14
Wind 60 deg - No Ice		8401.05	-4850.35	-268.35	-470.10	0.62
Wind 90 deg - No Ice		9711.94	0.00	3.59	-543.25	0.93
Wind 120 deg - No Ice		8440.01	4872.84	276.10	-471.08	1.00
Wind 150 deg - No Ice		4855.97	8410.79	474.85	-271.16	0.79
Wind 180 deg - No Ice		0.00	9700.69	547.47	0.92	0.38
Wind 210 deg - No Ice		-4855.97	8410.79	474.85	273.00	-0.14
Wind 240 deg - No Ice		-8440.01	4872.84	276.10	472.92	-0.62
Wind 270 deg - No Ice		-9711.94	0.00	3.59	545.09	-0.93
Wind 300 deg - No Ice		-8401.05	-4850.35	-268.35	471.94	-0.99
Wind 330 deg - No Ice		-4855.97	-8410.79	-467.68	273.00	-0.79
Member Ice	8141.36					

Load Case	Vertical Forces lb	Sum of Forces X lb	Sum of Forces Z lb	Sum of Overturning Moments, M_x kip-ft	Sum of Overturning Moments, M_z kip-ft	Sum of Torques kip-ft
Total Weight Ice	37104.76			10.76	1.28	
Wind 0 deg - Ice		0.00	-4515.54	-237.51	1.28	-0.53
Wind 30 deg - Ice		2254.60	-3905.08	-204.12	-122.78	-0.35
Wind 60 deg - Ice		3903.25	-2253.54	-113.27	-213.55	-0.07
Wind 90 deg - Ice		4509.20	0.00	10.76	-246.84	0.23
Wind 120 deg - Ice		3910.58	2257.77	134.90	-213.73	0.46
Wind 150 deg - Ice		2254.60	3905.08	225.64	-122.78	0.57
Wind 180 deg - Ice		0.00	4507.09	258.83	1.28	0.53
Wind 210 deg - Ice		-2254.60	3905.08	225.64	125.35	0.35
Wind 240 deg - Ice		-3910.58	2257.77	134.90	216.30	0.07
Wind 270 deg - Ice		-4509.20	0.00	10.76	249.41	-0.23
Wind 300 deg - Ice		-3903.25	-2253.54	-113.27	216.12	-0.46
Wind 330 deg - Ice		-2254.60	-3905.08	-204.12	125.35	-0.57
Total Weight	13281.32			3.59	0.92	
Wind 0 deg - Service		0.00	-3740.64	-208.30	0.73	-0.14
Wind 30 deg - Service		1863.87	-3228.31	-179.95	-103.88	0.05
Wind 60 deg - Service		3224.58	-1861.71	-103.32	-180.36	0.24
Wind 90 deg - Service		3727.73	0.00	1.24	-208.48	0.36
Wind 120 deg - Service		3239.49	1870.32	106.00	-180.73	0.38
Wind 150 deg - Service		1863.87	3228.31	182.42	-103.88	0.30
Wind 180 deg - Service		0.00	3723.43	210.34	0.73	0.14
Wind 210 deg - Service		-1863.87	3228.31	182.42	105.33	-0.05
Wind 240 deg - Service		-3239.49	1870.32	106.00	182.19	-0.24
Wind 270 deg - Service		-3727.73	0.00	1.24	209.94	-0.36
Wind 300 deg - Service		-3224.58	-1861.71	-103.32	181.82	-0.38
Wind 330 deg - Service		-1863.87	-3228.31	-179.95	105.33	-0.30

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice
3	0.9 Dead+1.6 Wind 0 deg - No Ice
4	1.2 Dead+1.6 Wind 30 deg - No Ice
5	0.9 Dead+1.6 Wind 30 deg - No Ice
6	1.2 Dead+1.6 Wind 60 deg - No Ice
7	0.9 Dead+1.6 Wind 60 deg - No Ice
8	1.2 Dead+1.6 Wind 90 deg - No Ice
9	0.9 Dead+1.6 Wind 90 deg - No Ice
10	1.2 Dead+1.6 Wind 120 deg - No Ice
11	0.9 Dead+1.6 Wind 120 deg - No Ice
12	1.2 Dead+1.6 Wind 150 deg - No Ice
13	0.9 Dead+1.6 Wind 150 deg - No Ice
14	1.2 Dead+1.6 Wind 180 deg - No Ice
15	0.9 Dead+1.6 Wind 180 deg - No Ice
16	1.2 Dead+1.6 Wind 210 deg - No Ice
17	0.9 Dead+1.6 Wind 210 deg - No Ice
18	1.2 Dead+1.6 Wind 240 deg - No Ice
19	0.9 Dead+1.6 Wind 240 deg - No Ice
20	1.2 Dead+1.6 Wind 270 deg - No Ice
21	0.9 Dead+1.6 Wind 270 deg - No Ice
22	1.2 Dead+1.6 Wind 300 deg - No Ice
23	0.9 Dead+1.6 Wind 300 deg - No Ice
24	1.2 Dead+1.6 Wind 330 deg - No Ice
25	0.9 Dead+1.6 Wind 330 deg - No Ice

Comb. No.	Description
26	1.2 Dead+1.0 Ice+1.0 Temp
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service
41	Dead+Wind 60 deg - Service
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	90 - 80	Pole	Max Tension	39	0.00	0.00	0.00
			Max. Compression	26	-713.13	0.00	0.76
			Max. Mx	8	-259.24	-4.08	0.23
			Max. My	2	-258.96	-0.03	4.31
			Max. Vy	8	625.28	-4.08	0.23
			Max. Vx	2	-625.40	-0.03	4.31
			Max. Torque	20			-0.64
T1	80 - 60	Leg	Max Tension	15	41819.45	0.01	-0.43
			Max. Compression	18	-45817.78	0.39	-0.23
			Max. Mx	20	-1807.84	-0.40	0.00
			Max. My	2	-45046.12	-0.01	0.45
			Max. Vy	38	-4641.26	0.39	-0.20
			Max. Vx	26	-5347.48	0.00	-0.00
		Diagonal	Max Tension	17	3701.42	0.00	0.00
			Max. Compression	16	-3873.26	0.00	0.00
			Max. Mx	35	607.40	-0.00	0.00
			Max. My	10	-3326.00	0.00	-0.00
			Max. Vy	35	7.67	-0.00	0.00
			Max. Vx	10	-0.60	0.00	-0.00
		Horizontal	Max Tension	14	1299.66	0.00	0.00
			Max. Compression	16	-1161.12	0.00	0.00
			Max. Mx	26	398.97	0.01	0.00
			Max. My	22	-321.41	0.00	-0.00
			Max. Vy	26	11.50	0.00	0.00
			Max. Vx	22	0.00	0.00	0.00
		Top Girt	Max Tension	27	3403.54	0.00	0.00
			Max. Compression	4	-3804.16	0.00	0.00
			Max. Mx	26	3119.61	-0.03	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. My	12	-3397.05	0.00	0.00
			Max. Vy	26	38.39	0.00	0.00
			Max. Vx	12	-0.00	0.00	0.00
		Bottom Girt	Max Tension	14	1305.89	0.00	0.00
			Max. Compression	19	-1181.75	0.00	0.00
			Max. Mx	26	191.52	0.01	0.00
			Max. My	22	-530.42	0.00	-0.00
			Max. Vy	26	11.50	0.00	0.00
			Max. Vx	22	0.00	0.00	0.00
		Pole Socket	Max Tension	1	0.00	0.00	0.00
			Max. Compression	27	-851.23	0.00	0.00
			Max. Mx	8	-293.50	-3.72	0.23
			Max. My	2	-294.06	-0.03	3.92
			Max. Vy	8	-373.48	-3.72	0.23
			Max. Vx	2	394.38	-0.03	3.92
		Pole Socket Support	Max Tension	18	2536.91	0.23	-0.01
			Max. Compression	13	-1274.68	0.00	0.00
			Max. Mx	29	775.81	0.55	-0.12
			Max. My	18	-898.81	0.30	3.66
			Max. Vy	29	273.39	0.55	-0.12
			Max. Vx	18	1810.22	0.30	3.66
T2	60 - 40	Leg	Max Tension	15	95443.01	0.33	0.01
			Max. Compression	18	-101492.86	0.39	0.01
			Max. Mx	18	-48757.18	0.74	-0.01
			Max. My	12	-2485.25	0.00	-0.40
			Max. Vy	2	-4517.32	0.39	0.01
			Max. Vx	24	-2082.10	0.00	0.20
		Diagonal	Max Tension	23	4101.74	0.00	0.00
			Max. Compression	10	-4320.79	0.00	0.00
			Max. Mx	18	2521.26	-0.01	0.00
			Max. My	16	-3759.59	0.00	0.00
			Max. Vy	35	9.69	-0.01	-0.00
			Max. Vx	16	-0.37	0.00	0.00
		Horizontal	Max Tension	14	2060.11	0.00	0.00
			Max. Compression	19	-1790.52	0.00	0.00
			Max. Mx	26	392.01	0.01	0.00
			Max. My	22	-609.39	0.00	-0.00
			Max. Vy	26	14.24	0.00	0.00
			Max. Vx	22	-0.00	0.00	0.00
		Top Girt	Max Tension	33	168.95	0.00	0.00
			Max. Compression	13	-16.60	0.00	0.00
			Max. Mx	26	163.39	0.01	0.00
			Max. My	10	20.01	0.00	0.00
			Max. Vy	26	-12.67	0.00	0.00
			Max. Vx	10	0.00	0.00	0.00
		Bottom Girt	Max Tension	14	1560.99	0.00	0.00
			Max. Compression	19	-1423.89	0.00	0.00
			Max. Mx	26	199.05	0.01	0.00
			Max. My	22	-665.46	0.00	-0.00
			Max. Vy	26	14.46	0.00	0.00
			Max. Vx	22	0.00	0.00	0.00
T3	40 - 37.4479	Leg	Max Tension	15	98337.50	-0.72	-0.01
			Max. Compression	18	-104382.93	-0.08	-0.00
			Max. Mx	2	-100038.36	0.77	0.02
			Max. My	24	-3806.01	0.00	0.37
			Max. Vy	2	-4531.32	0.77	0.02
			Max. Vx	24	-2082.33	0.00	0.37
		Diagonal	Max Tension	23	4199.47	0.00	0.00
			Max. Compression	10	-4416.43	0.00	0.00
			Max. Mx	14	3851.14	-0.01	0.00
			Max. My	20	-4272.42	0.00	-0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vy	35	9.38	-0.01	-0.00
			Max. Vx	20	0.44	0.00	-0.00
		Top Girt	Max Tension	14	727.73	0.00	0.00
			Max. Compression	19	-593.37	0.00	0.00
			Max. Mx	26	204.58	0.02	0.00
			Max. My	22	-312.96	0.00	-0.00
			Max. Vy	26	16.14	0.00	0.00
			Max. Vx	22	0.00	0.00	0.00
T4	37.4479 - 34.9792	Leg	Max Tension	15	105272.14	0.07	0.00
			Max. Compression	18	-111586.22	0.15	0.00
			Max. Mx	18	-111586.22	0.15	0.00
			Max. My	12	-4005.85	0.00	-0.11
			Max. Vy	2	-100.73	0.15	0.00
			Max. Vx	24	-31.33	0.00	0.11
		Diagonal	Max Tension	22	3755.98	0.00	0.00
			Max. Compression	8	-3937.33	0.00	0.00
			Max. Mx	35	668.13	-0.01	-0.00
			Max. My	22	-3000.11	0.00	-0.00
			Max. Vy	35	9.53	-0.01	-0.00
			Max. Vx	22	-0.19	0.00	0.00
		Top Girt	Max Tension	14	1915.53	0.00	0.00
			Max. Compression	19	-1684.34	0.00	0.00
			Max. Mx	26	311.46	0.01	0.00
			Max. My	22	-823.45	0.00	-0.00
			Max. Vy	26	-14.21	0.00	0.00
			Max. Vx	22	0.00	0.00	0.00
T5	34.9792 - 32.5104	Leg	Max Tension	15	111728.53	-0.15	-0.00
			Max. Compression	18	-118266.61	0.10	0.00
			Max. Mx	18	-118210.43	0.15	0.00
			Max. My	12	-4069.26	0.00	-0.11
			Max. Vy	2	28.09	0.15	0.00
			Max. Vx	24	9.22	0.00	0.11
		Diagonal	Max Tension	23	3897.52	0.00	0.00
			Max. Compression	10	-4082.85	0.00	0.00
			Max. Mx	35	675.01	-0.01	-0.00
			Max. My	22	-3054.87	0.00	-0.00
			Max. Vy	35	9.60	-0.01	-0.00
			Max. Vx	22	-0.22	0.00	0.00
		Top Girt	Max Tension	14	1747.90	0.00	0.00
			Max. Compression	19	-1542.88	0.00	0.00
			Max. Mx	26	291.57	0.01	0.00
			Max. My	22	-752.24	0.00	-0.00
			Max. Vy	26	14.33	0.00	0.00
			Max. Vx	22	0.00	0.00	0.00
T6	32.5104 - 30.0417	Leg	Max Tension	15	118257.89	-0.10	0.00
			Max. Compression	18	-125022.46	0.11	0.00
			Max. Mx	14	118108.95	-0.11	-0.00
			Max. My	16	-3705.82	-0.00	0.11
			Max. Vy	6	11.00	-0.11	-0.00
			Max. Vx	4	9.99	-0.00	-0.11
		Diagonal	Max Tension	23	3917.46	0.00	0.00
			Max. Compression	10	-4107.70	0.00	0.00
			Max. Mx	35	674.84	-0.01	-0.00
			Max. My	22	-3057.96	0.00	-0.00
			Max. Vy	35	9.67	-0.01	-0.00
			Max. Vx	22	-0.21	0.00	0.00
		Top Girt	Max Tension	14	1842.72	0.00	0.00
			Max. Compression	19	-1625.91	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Mx	26	296.61	0.02	0.00
			Max. My	22	-798.92	0.00	-0.00
			Max. Vy	26	14.43	0.00	0.00
			Max. Vx	22	0.00	0.00	0.00
T7	30.0417 - 27.5729	Leg	Max Tension	15	124748.87	-0.11	-0.00
			Max. Compression	18	-131739.61	0.15	0.00
			Max. Mx	18	-131739.61	0.15	0.00
			Max. My	16	-3835.99	0.00	0.12
			Max. Vy	18	-24.61	0.15	0.00
			Max. Vx	16	-9.57	0.00	0.12
		Diagonal	Max Tension	23	3939.71	0.00	0.00
			Max. Compression	10	-4133.79	0.00	0.00
			Max. Mx	14	3617.06	-0.01	0.00
			Max. My	22	-3072.43	0.00	-0.00
			Max. Vy	35	9.74	-0.01	-0.00
			Max. Vx	22	-0.22	0.00	0.00
		Top Girt	Max Tension	14	1880.52	0.00	0.00
			Max. Compression	19	-1662.79	0.00	0.00
			Max. Mx	26	295.63	0.02	0.00
			Max. My	22	-819.35	0.00	-0.00
			Max. Vy	26	14.52	0.00	0.00
			Max. Vx	22	0.00	0.00	0.00
T8	27.5729 - 25.1042	Leg	Max Tension	15	131216.93	-0.15	-0.00
			Max. Compression	18	-138442.29	-0.02	-0.00
			Max. Mx	18	-138386.09	0.15	0.00
			Max. My	16	-3963.50	-0.00	0.13
			Max. Vy	18	76.18	0.15	0.00
			Max. Vx	16	-14.51	-0.00	0.13
		Diagonal	Max Tension	23	4031.18	0.00	0.00
			Max. Compression	10	-4225.48	0.00	0.00
			Max. Mx	18	2605.33	-0.01	-0.00
			Max. My	22	-3103.44	0.00	-0.00
			Max. Vy	35	9.80	-0.01	-0.00
			Max. Vx	10	-0.19	0.00	0.00
		Top Girt	Max Tension	14	1989.83	0.00	0.00
			Max. Compression	19	-1757.95	0.00	0.00
			Max. Mx	26	307.12	0.02	0.00
			Max. My	22	-871.98	0.00	-0.00
			Max. Vy	26	-14.61	0.00	0.00
			Max. Vx	22	0.00	0.00	0.00
T9	25.1042 - 22.6354	Leg	Max Tension	15	137498.14	0.01	-0.00
			Max. Compression	18	-144998.09	-0.29	-0.00
			Max. Mx	18	-144969.78	0.47	-0.00
			Max. My	12	-4622.99	-0.01	-0.18
			Max. Vy	18	613.68	0.47	-0.00
			Max. Vx	12	83.18	-0.01	-0.18
		Diagonal	Max Tension	23	4302.69	-0.01	-0.00
			Max. Compression	10	-4485.73	0.00	0.00
			Max. Mx	10	2756.76	-0.01	-0.00
			Max. My	24	-3324.39	0.00	-0.00
			Max. Vy	35	9.90	-0.01	-0.00
			Max. Vx	24	-0.55	0.00	-0.00
		Secondary Horizontal	Max Tension	16	521.22	0.00	-0.00
			Max. Compression	15	-629.05	0.00	0.00
			Max. Mx	28	-78.68	0.01	0.00
			Max. My	12	-557.52	0.00	0.00
			Max. Vy	28	-15.93	0.01	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vx	24	-1.44	0.00	0.00
		Top Girt	Max Tension	14	1877.02	0.00	0.00
			Max. Compression	19	-1670.40	0.00	0.00
			Max. Mx	26	275.03	0.02	0.00
			Max. My	22	-815.80	0.00	-0.00
			Max. Vy	26	-14.67	0.00	0.00
			Max. Vx	22	0.00	0.00	0.00
T10	22.6354 - 20	Leg	Max Tension	15	148347.25	0.62	0.01
			Max. Compression	18	-156383.65	0.21	0.00
			Max. Mx	2	-149920.04	-0.67	-0.01
			Max. My	12	-4879.13	-0.00	-0.18
			Max. Vy	2	-5298.50	0.21	0.00
			Max. Vx	24	-2038.55	-0.00	0.18
		Diagonal	Max Tension	23	4926.43	-0.00	-0.00
			Max. Compression	10	-5155.92	0.00	0.00
			Max. Mx	10	2524.47	-0.01	-0.00
			Max. My	8	271.71	-0.01	0.00
			Max. Vy	35	9.97	-0.01	-0.00
			Max. Vx	8	-0.53	-0.01	0.00
		Secondary Horizontal	Max Tension	10	926.74	0.00	-0.00
			Max. Compression	23	-1027.65	0.00	0.00
			Max. Mx	32	-22.06	0.01	0.00
			Max. My	18	-284.20	-0.00	0.00
			Max. Vy	32	16.83	0.01	0.00
			Max. Vx	18	-1.36	0.00	0.00
		Top Girt	Max Tension	14	1996.89	0.00	0.00
			Max. Compression	19	-1756.56	0.00	0.00
			Max. Mx	26	309.82	0.02	0.00
			Max. My	22	-844.22	0.00	-0.00
			Max. Vy	26	-14.71	0.00	0.00
			Max. Vx	22	0.00	0.00	0.00
		Bottom Girt	Max Tension	14	1408.31	0.00	0.00
			Max. Compression	19	-1280.47	0.00	0.00
			Max. Mx	26	171.47	0.02	0.00
			Max. My	22	-619.84	0.00	-0.00
			Max. Vy	26	-17.18	0.00	0.00
			Max. Vx	22	0.00	0.00	0.00
T11	20 - 17.4479	Leg	Max Tension	15	151143.90	-0.62	-0.01
			Max. Compression	18	-159200.28	0.03	-0.00
			Max. Mx	2	-154789.31	0.65	0.01
			Max. My	24	-4882.40	-0.00	0.35
			Max. Vy	2	-5227.98	0.65	0.01
			Max. Vx	24	-2038.83	-0.00	0.35
		Diagonal	Max Tension	23	4344.94	0.00	0.00
			Max. Compression	10	-4545.52	0.00	0.00
			Max. Mx	35	732.38	-0.01	-0.00
			Max. My	10	-4522.12	0.00	0.00
			Max. Vy	35	9.72	-0.01	-0.00
			Max. Vx	10	-0.42	0.00	0.00
		Top Girt	Max Tension	14	975.85	0.00	0.00
			Max. Compression	19	-844.52	0.00	0.00
			Max. Mx	26	183.47	0.02	0.00
			Max. My	22	-427.85	0.00	-0.00
			Max. Vy	26	-17.00	0.00	0.00
			Max. Vx	22	0.00	0.00	0.00
T12	17.4479 - 14.9792	Leg	Max Tension	15	157845.13	-0.04	0.00
			Max. Compression	18	-166164.91	0.19	0.00
			Max. Mx	18	-166164.91	0.19	0.00
			Max. My	12	-5085.73	0.00	-0.16

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vy	2	-70.25	0.19	0.00
			Max. Vx	10	12.43	-0.09	-0.14
		Diagonal	Max Tension	9	4018.29	0.00	0.00
			Max. Compression	8	-4223.14	0.00	0.00
			Max. Mx	35	752.42	-0.01	-0.00
			Max. My	10	-4136.31	0.00	0.00
			Max. Vy	35	9.77	-0.01	-0.00
			Max. Vx	10	-0.18	0.00	0.00
		Top Girt	Max Tension	14	1897.39	0.00	0.00
			Max. Compression	19	-1669.96	0.00	0.00
			Max. Mx	26	223.61	0.02	0.00
			Max. My	22	-843.20	0.00	-0.00
			Max. Vy	26	14.73	0.00	0.00
			Max. Vx	22	0.00	0.00	0.00
T13	14.9792 - 12.5104	Leg	Max Tension	15	164146.56	-0.19	-0.00
			Max. Compression	18	-172716.61	0.21	-0.00
			Max. Mx	18	-172716.61	0.21	-0.00
			Max. My	16	-4720.26	0.00	0.17
			Max. Vy	18	-12.99	0.21	-0.00
			Max. Vx	16	-10.98	0.00	0.17
		Diagonal	Max Tension	9	4072.42	0.00	0.00
			Max. Compression	8	-4280.10	0.00	0.00
			Max. Mx	35	751.60	-0.01	-0.00
			Max. My	10	-4212.44	0.00	0.00
			Max. Vy	35	9.74	-0.01	-0.00
			Max. Vx	10	-0.23	0.00	0.00
		Top Girt	Max Tension	14	1722.92	0.00	0.00
			Max. Compression	19	-1528.93	0.00	0.00
			Max. Mx	26	204.04	0.02	0.00
			Max. Vy	26	-14.69	0.00	0.00
			Max. Vx	22	0.00	0.00	0.00
T14	12.5104 - 10.0417	Leg	Max Tension	15	170478.74	-0.20	-0.00
			Max. Compression	18	-179307.49	-0.01	-0.00
			Max. Mx	18	-179241.38	0.21	-0.00
			Max. My	16	-4861.05	-0.00	0.20
			Max. Vy	18	93.60	0.21	-0.00
			Max. Vx	16	-17.14	-0.00	0.20
		Diagonal	Max Tension	9	4140.75	0.00	0.00
			Max. Compression	8	-4341.98	0.00	0.00
			Max. Mx	35	760.51	-0.01	-0.00
			Max. My	10	-4283.40	0.00	0.00
			Max. Vy	35	9.70	-0.01	-0.00
			Max. Vx	10	-0.20	0.00	0.00
		Top Girt	Max Tension	14	1831.74	0.00	0.00
			Max. Compression	19	-1617.99	0.00	0.00
			Max. Mx	26	215.01	0.02	0.00
			Max. Vy	26	-14.62	0.00	0.00
			Max. Vx	12	0.00	0.00	0.00
T15	10.0417 - 7.57292	Leg	Max Tension	15	176538.96	-0.01	-0.00
			Max. Compression	18	-185657.56	-0.32	-0.00
			Max. Mx	18	-185624.28	0.63	-0.00
			Max. My	16	-5001.96	-0.01	0.23
			Max. Vy	18	767.73	0.63	-0.00
			Max. Vx	16	-87.31	-0.01	0.23
		Diagonal	Max Tension	23	4473.12	-0.00	-0.00
			Max. Compression	8	-4682.32	0.00	0.00
			Max. Mx	10	2877.57	-0.01	-0.00
			Max. My	8	688.11	-0.01	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vy	35	9.66	-0.01	-0.00
			Max. Vx	8	-0.43	-0.01	0.00
		Secondary Horizontal	Max Tension	16	657.32	0.00	-0.00
			Max. Compression	15	-777.90	0.00	0.00
			Max. Mx	31	-12.72	0.01	0.00
			Max. My	12	-687.31	0.00	0.00
			Max. Vy	31	16.05	0.01	0.00
			Max. Vx	24	-1.12	0.00	0.00
		Top Girt	Max Tension	14	1712.57	0.00	0.00
			Max. Compression	19	-1521.37	0.00	0.00
			Max. Mx	26	198.50	0.02	0.00
			Max. Vy	26	-14.47	0.00	0.00
			Max. Vx	12	0.00	0.00	0.00
T16	7.57292 - 5.10417	Leg	Max Tension	15	182734.76	0.27	-0.00
			Max. Compression	18	-192142.01	-0.33	-0.00
			Max. Mx	18	-192120.55	0.69	-0.00
			Max. My	16	-5092.05	-0.01	0.23
			Max. Vy	18	-825.83	0.69	-0.00
			Max. Vx	16	83.48	-0.01	0.23
		Diagonal	Max Tension	23	4574.85	-0.00	-0.00
			Max. Compression	10	-4765.12	0.00	0.00
			Max. Mx	10	2730.85	-0.01	-0.00
			Max. My	8	540.64	-0.01	0.00
			Max. Vy	35	9.48	-0.01	-0.00
			Max. Vx	8	-0.42	-0.01	0.00
		Secondary Horizontal	Max Tension	16	846.50	0.00	-0.00
			Max. Compression	15	-960.87	0.00	0.00
			Max. Mx	30	-119.40	0.01	0.00
			Max. My	12	-853.46	0.00	0.00
			Max. Vy	30	15.38	0.01	0.00
			Max. Vx	24	-1.10	0.00	0.00
		Top Girt	Max Tension	14	1557.80	0.00	0.00
			Max. Compression	19	-1376.64	0.00	0.00
			Max. Mx	26	155.12	0.02	0.00
			Max. Vy	26	-14.23	0.00	0.00
			Max. Vx	12	0.00	0.00	0.00
T17	5.10417 - 2.63542	Leg	Max Tension	15	189015.87	0.28	-0.00
			Max. Compression	18	-198715.65	-0.36	0.00
			Max. Mx	18	-198694.32	0.71	-0.00
			Max. My	12	-5794.92	-0.02	-0.29
			Max. Vy	18	871.28	0.71	-0.00
			Max. Vx	12	153.26	-0.02	-0.29
		Diagonal	Max Tension	9	4555.08	-0.00	0.00
			Max. Compression	8	-4763.03	0.00	0.00
			Max. Mx	10	2799.41	-0.01	-0.00
			Max. My	24	-3428.34	0.00	-0.00
			Max. Vy	35	9.31	-0.01	-0.00
			Max. Vx	24	-0.41	0.00	-0.00
		Secondary Horizontal	Max Tension	16	928.33	0.00	-0.00
			Max. Compression	15	-1011.17	0.00	0.00
			Max. Mx	32	-288.36	0.01	0.00
			Max. My	12	-933.21	0.00	0.00
			Max. Vy	32	16.85	0.01	0.00
			Max. Vx	12	1.09	0.00	0.00
		Top Girt	Max Tension	14	1530.45	0.00	0.00
			Max. Compression	19	-1360.24	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Mx	26	321.69	0.02	0.00
			Max. Vy	26	-13.80	0.00	0.00
			Max. Vx	12	0.00	0.00	0.00
T18	2.63542 - 0	Leg	Max Tension	15	199727.66	1.02	0.01
			Max. Compression	18	-210023.99	0.00	-0.00
			Max. Mx	29	44424.39	1.65	-0.00
			Max. My	12	-5852.96	-0.02	-0.29
			Max. Vy	29	9913.79	0.00	-0.00
			Max. Vx	25	-1394.45	-0.00	-0.00
		Diagonal	Max Tension	23	5443.55	-0.00	-0.00
			Max. Compression	10	-5704.92	0.00	0.00
			Max. Mx	10	2629.00	-0.01	-0.00
			Max. My	8	260.35	-0.01	0.00
			Max. Vy	35	8.18	-0.00	0.00
			Max. Vx	8	-0.40	-0.01	0.00
		Secondary Horizontal	Max Tension	10	1359.94	0.01	-0.00
			Max. Compression	23	-1434.42	0.00	0.00
			Max. Mx	35	-877.48	-0.02	0.00
			Max. My	10	-433.04	-0.00	0.00
			Max. Vy	35	17.23	0.00	0.00
			Max. Vx	18	-0.97	0.00	0.00
		Top Girt	Max Tension	14	1868.18	0.00	0.00
			Max. Compression	19	-1633.45	0.00	0.00
			Max. Mx	26	-426.76	0.02	0.00
			Max. Vy	26	-12.80	0.00	0.00
			Max. Vx	12	0.00	0.00	0.00
		Bottom Girt	Max Tension	37	4725.71	0.00	0.00
			Max. Compression	19	-457.68	0.00	0.00
			Max. Mx	26	4598.00	0.02	0.00
			Max. Vy	26	-15.34	0.00	0.00

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Leg C	Max. Vert	18	209930.41	7967.31	-4460.60
	Max. H_x	18	209930.41	7967.31	-4460.60
	Max. H_z	28	-36338.31	-8784.34	5339.25
	Min. Vert	7	-198309.82	-8017.77	4489.12
	Min. H_x	29	-44250.74	-9200.62	5339.14
	Min. H_z	18	209930.41	7967.31	-4460.60
Leg B	Max. Vert	10	209481.63	-7998.97	-4398.32
	Max. H_x	37	-44879.72	9236.16	5289.72
	Max. H_z	37	-44879.72	9236.16	5289.72
	Min. Vert	23	-198645.84	8057.44	4426.94
	Min. H_x	10	209481.63	-7998.97	-4398.32
	Min. H_z	10	209481.63	-7998.97	-4398.32
Leg A	Max. Vert	2	208192.25	-69.59	9115.66
	Max. H_x	21	3228.42	1052.61	110.89
	Max. H_z	2	208192.25	-69.59	9115.66
	Min. Vert	15	-199608.00	74.02	-9200.58
	Min. H_x	9	3228.05	-1056.09	110.91
	Min. H_z	33	-48633.04	60.66	-10679.12

Tower Mast Reaction Summary

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	lb	lb	lb	kip-ft	kip-ft	kip-ft
Dead Only	13281.32	-0.00	0.00	3.62	0.93	0.00
1.2 Dead+1.6 Wind 0 deg - No Ice	15937.59	0.00	-15593.10	-878.49	1.13	-0.62
0.9 Dead+1.6 Wind 0 deg - No Ice	11953.19	0.00	-15593.10	-876.88	0.84	-0.62
1.2 Dead+1.6 Wind 30 deg - No Ice	15937.59	7769.55	-13457.26	-759.02	-439.63	0.24
0.9 Dead+1.6 Wind 30 deg - No Ice	11953.19	7769.55	-13457.26	-757.77	-438.55	0.24
1.2 Dead+1.6 Wind 60 deg - No Ice	15937.59	13441.68	-7760.56	-436.14	-761.88	1.04
0.9 Dead+1.6 Wind 60 deg - No Ice	11953.19	13441.68	-7760.56	-435.88	-759.81	1.03
1.2 Dead+1.6 Wind 90 deg - No Ice	15937.59	15539.11	0.00	4.38	-880.37	1.57
0.9 Dead+1.6 Wind 90 deg - No Ice	11953.19	15539.11	0.00	3.28	-877.93	1.55
1.2 Dead+1.6 Wind 120 deg - No Ice	15937.59	13504.02	7796.55	445.81	-763.45	1.68
0.9 Dead+1.6 Wind 120 deg - No Ice	11953.19	13504.02	7796.55	443.35	-761.38	1.66
1.2 Dead+1.6 Wind 150 deg - No Ice	15937.59	7769.55	13457.26	767.77	-439.61	1.33
0.9 Dead+1.6 Wind 150 deg - No Ice	11953.19	7769.55	13457.26	764.31	-438.54	1.31
1.2 Dead+1.6 Wind 180 deg - No Ice	15937.59	0.00	15521.11	885.40	1.12	0.63
0.9 Dead+1.6 Wind 180 deg - No Ice	11953.19	0.00	15521.11	881.58	0.84	0.62
1.2 Dead+1.6 Wind 210 deg - No Ice	15937.59	-7769.55	13457.26	767.76	441.86	-0.25
0.9 Dead+1.6 Wind 210 deg - No Ice	11953.19	-7769.55	13457.26	764.31	440.22	-0.24
1.2 Dead+1.6 Wind 240 deg - No Ice	15937.59	-13504.02	7796.55	445.81	765.70	-1.05
0.9 Dead+1.6 Wind 240 deg - No Ice	11953.19	-13504.02	7796.55	443.34	763.06	-1.04
1.2 Dead+1.6 Wind 270 deg - No Ice	15937.59	-15539.11	0.00	4.38	882.62	-1.57
0.9 Dead+1.6 Wind 270 deg - No Ice	11953.19	-15539.11	0.00	3.27	879.61	-1.55
1.2 Dead+1.6 Wind 300 deg - No Ice	15937.59	-13441.68	-7760.56	-436.14	764.13	-1.67
0.9 Dead+1.6 Wind 300 deg - No Ice	11953.19	-13441.68	-7760.56	-435.88	761.49	-1.65
1.2 Dead+1.6 Wind 330 deg - No Ice	15937.59	-7769.55	-13457.26	-759.02	441.89	-1.33
0.9 Dead+1.6 Wind 330 deg - No Ice	11953.19	-7769.55	-13457.26	-757.77	440.24	-1.31
1.2 Dead+1.0 Ice+1.0 Temp	39640.16	0.00	-0.00	11.72	1.57	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	39640.16	0.00	-4515.54	-244.53	1.58	-0.55
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	39640.16	2254.60	-3905.08	-210.06	-126.48	-0.33
1.2 Dead+1.0 Wind 60 deg+1.0	39640.16	3903.25	-2253.54	-116.28	-220.18	-0.03

Load Combination	Vertical lb	$Shear_x$ lb	$Shear_z$ lb	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Ice+1.0 Temp						
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	39640.16	4509.20	-0.00	11.75	-254.54	0.28
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	39640.16	3910.58	2257.77	139.88	-220.37	0.52
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	39640.16	2254.60	3905.08	233.54	-126.49	0.61
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	39640.16	0.00	4507.09	267.80	1.57	0.55
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	39640.16	-2254.60	3905.08	233.54	129.62	0.33
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	39640.16	-3910.58	2257.77	139.88	223.50	0.03
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	39640.16	-4509.20	-0.00	11.74	257.68	-0.28
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	39640.16	-3903.25	-2253.54	-116.28	223.33	-0.52
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	39640.16	-2254.60	-3905.08	-210.06	129.63	-0.61
Dead+Wind 0 deg - Service	13281.32	-0.00	-3740.64	-208.10	0.93	-0.15
Dead+Wind 30 deg - Service	13281.32	1863.87	-3228.31	-179.45	-104.77	0.06
Dead+Wind 60 deg - Service	13281.32	3224.58	-1861.71	-102.01	-182.05	0.25
Dead+Wind 90 deg - Service	13281.32	3727.73	-0.00	3.63	-210.47	0.37
Dead+Wind 120 deg - Service	13281.32	3239.49	1870.32	109.50	-182.43	0.40
Dead+Wind 150 deg - Service	13281.32	1863.87	3228.31	186.72	-104.77	0.31
Dead+Wind 180 deg - Service	13281.32	-0.00	3723.43	214.93	0.93	0.15
Dead+Wind 210 deg - Service	13281.32	-1863.87	3228.31	186.72	106.64	-0.06
Dead+Wind 240 deg - Service	13281.32	-3239.49	1870.32	109.50	184.30	-0.25
Dead+Wind 270 deg - Service	13281.32	-3727.73	-0.00	3.63	212.34	-0.37
Dead+Wind 300 deg - Service	13281.32	-3224.58	-1861.71	-102.01	183.92	-0.40
Dead+Wind 330 deg - Service	13281.32	-1863.87	-3228.31	-179.45	106.64	-0.31

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX lb	PY lb	PZ lb	PX lb	PY lb	PZ lb	% Error
1	0.00	-13281.32	-0.00	0.00	13281.32	-0.00	0.000%
2	-0.00	-15937.59	-15593.10	-0.00	15937.59	15593.10	0.000%
3	-0.00	-11953.19	-15593.10	-0.00	11953.19	15593.10	0.000%
4	7769.55	-15937.59	-13457.26	-7769.55	15937.59	13457.26	0.000%
5	7769.55	-11953.19	-13457.26	-7769.55	11953.19	13457.26	0.000%
6	13441.68	-15937.59	-7760.56	-13441.68	15937.59	7760.56	0.000%
7	13441.68	-11953.19	-7760.56	-13441.68	11953.19	7760.56	0.000%
8	15539.11	-15937.59	0.00	-15539.11	15937.59	-0.00	0.000%
9	15539.11	-11953.19	0.00	-15539.11	11953.19	-0.00	0.000%
10	13504.02	-15937.59	7796.55	-13504.02	15937.59	-7796.55	0.000%
11	13504.02	-11953.19	7796.55	-13504.02	11953.19	-7796.55	0.000%
12	7769.55	-15937.59	13457.26	-7769.55	15937.59	-13457.26	0.000%
13	7769.55	-11953.19	13457.26	-7769.55	11953.19	-13457.26	0.000%
14	0.00	-15937.59	15521.11	-0.00	15937.59	-15521.11	0.000%
15	0.00	-11953.19	15521.11	-0.00	11953.19	-15521.11	0.000%
16	-7769.55	-15937.59	13457.26	7769.55	15937.59	-13457.26	0.000%
17	-7769.55	-11953.19	13457.26	7769.55	11953.19	-13457.26	0.000%
18	-13504.02	-15937.59	7796.55	13504.02	15937.59	-7796.55	0.000%
19	-13504.02	-11953.19	7796.55	13504.02	11953.19	-7796.55	0.000%
20	-15539.11	-15937.59	-0.00	15539.11	15937.59	-0.00	0.000%
21	-15539.11	-11953.19	-0.00	15539.11	11953.19	-0.00	0.000%

Load Comb.	Sum of Applied Forces PX lb	PY lb	PZ lb	Sum of Reactions PX lb	PY lb	PZ lb	% Error
22	-13441.68	-15937.59	-7760.56	13441.68	15937.59	7760.56	0.000%
23	-13441.68	-11953.19	-7760.56	13441.68	11953.19	7760.56	0.000%
24	-7769.55	-15937.59	-13457.26	7769.55	15937.59	13457.26	0.000%
25	-7769.55	-11953.19	-13457.26	7769.55	11953.19	13457.26	0.000%
26	0.00	-39640.16	-0.00	-0.00	39640.16	0.00	0.000%
27	0.00	-39640.16	-4515.54	-0.00	39640.16	4515.54	0.000%
28	2254.60	-39640.16	-3905.08	-2254.60	39640.16	3905.08	0.000%
29	3903.25	-39640.16	-2253.54	-3903.25	39640.16	2253.54	0.000%
30	4509.20	-39640.16	0.00	-4509.20	39640.16	0.00	0.000%
31	3910.58	-39640.16	2257.77	-3910.58	39640.16	-2257.77	0.000%
32	2254.60	-39640.16	3905.08	-2254.60	39640.16	-3905.08	0.000%
33	-0.00	-39640.16	4507.09	-0.00	39640.16	-4507.09	0.000%
34	-2254.60	-39640.16	3905.08	2254.60	39640.16	-3905.08	0.000%
35	-3910.58	-39640.16	2257.77	3910.58	39640.16	-2257.77	0.000%
36	-4509.20	-39640.16	-0.00	4509.20	39640.16	0.00	0.000%
37	-3903.25	-39640.16	-2253.54	3903.25	39640.16	2253.54	0.000%
38	-2254.60	-39640.16	-3905.08	2254.60	39640.16	3905.08	0.000%
39	0.00	-13281.32	-3740.64	0.00	13281.32	3740.64	0.000%
40	1863.87	-13281.32	-3228.31	-1863.87	13281.32	3228.31	0.000%
41	3224.58	-13281.32	-1861.71	-3224.58	13281.32	1861.71	0.000%
42	3727.73	-13281.32	0.00	-3727.73	13281.32	0.00	0.000%
43	3239.49	-13281.32	1870.32	-3239.49	13281.32	-1870.32	0.000%
44	1863.87	-13281.32	3228.31	-1863.87	13281.32	-3228.31	0.000%
45	-0.00	-13281.32	3723.43	0.00	13281.32	-3723.43	0.000%
46	-1863.87	-13281.32	3228.31	1863.87	13281.32	-3228.31	0.000%
47	-3239.49	-13281.32	1870.32	3239.49	13281.32	-1870.32	0.000%
48	-3727.73	-13281.32	-0.00	3727.73	13281.32	0.00	0.000%
49	-3224.58	-13281.32	-1861.71	3224.58	13281.32	1861.71	0.000%
50	-1863.87	-13281.32	-3228.31	1863.87	13281.32	3228.31	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	6	0.00000001	0.00002329
3	Yes	6	0.00000001	0.00002343
4	Yes	6	0.00000001	0.00005656
5	Yes	6	0.00000001	0.00005852
6	Yes	6	0.00000001	0.00006136
7	Yes	6	0.00000001	0.00006356
8	Yes	5	0.00000001	0.00093659
9	Yes	5	0.00000001	0.00096204
10	Yes	6	0.00000001	0.00004690
11	Yes	6	0.00000001	0.00005099
12	Yes	6	0.00000001	0.00004274
13	Yes	6	0.00000001	0.00004710
14	Yes	5	0.00000001	0.00079587
15	Yes	5	0.00000001	0.00085495
16	Yes	6	0.00000001	0.00005008
17	Yes	6	0.00000001	0.00005503
18	Yes	6	0.00000001	0.00005111
19	Yes	6	0.00000001	0.00005546
20	Yes	5	0.00000001	0.00091508
21	Yes	5	0.00000001	0.00094555
22	Yes	6	0.00000001	0.00006585

23	Yes	6	0.00000001	0.00006829
24	Yes	6	0.00000001	0.00006478
25	Yes	6	0.00000001	0.00006721
26	Yes	4	0.00000001	0.00005656
27	Yes	5	0.00000001	0.00004127
28	Yes	5	0.00000001	0.00007013
29	Yes	5	0.00000001	0.00007021
30	Yes	4	0.00000001	0.00092118
31	Yes	5	0.00000001	0.00006146
32	Yes	5	0.00000001	0.00005545
33	Yes	4	0.00000001	0.00028624
34	Yes	5	0.00000001	0.00006073
35	Yes	5	0.00000001	0.00006244
36	Yes	5	0.00000001	0.00003278
37	Yes	5	0.00000001	0.00007251
38	Yes	5	0.00000001	0.00007778
39	Yes	4	0.00000001	0.00083153
40	Yes	5	0.00000001	0.00000001
41	Yes	5	0.00000001	0.00000001
42	Yes	4	0.00000001	0.00068166
43	Yes	5	0.00000001	0.00000001
44	Yes	5	0.00000001	0.00000001
45	Yes	4	0.00000001	0.00049178
46	Yes	5	0.00000001	0.00000001
47	Yes	5	0.00000001	0.00000001
48	Yes	4	0.00000001	0.00065582
49	Yes	5	0.00000001	0.00000001
50	Yes	5	0.00000001	0.00000001

Maximum Tower Deflections - Service Wind

Section No.	*Elevation*	*Horz. Deflection*	*Gov. Load Comb.*	*Tilt*	*Twist*
	ft	*in*		°	°
L1	90 - 80	5.337	48	0.7338	0.0374
T1	80 - 60	4.057	46	0.3973	0.0121
T2	60 - 40	2.427	46	0.3477	0.0176
T3	40 - 37.4479	1.130	46	0.2481	0.0124
T4	37.4479 - 34.9792	0.997	46	0.2347	0.0115
T5	34.9792 - 32.5104	0.876	46	0.2210	0.0107
T6	32.5104 - 30.0417	0.762	46	0.2068	0.0100
T7	30.0417 - 27.5729	0.655	46	0.1919	0.0092
T8	27.5729 - 25.1042	0.556	46	0.1765	0.0085
T9	25.1042 - 22.6354	0.466	46	0.1605	0.0077
T10	22.6354 - 20	0.383	46	0.1440	0.0070
T11	20 - 17.4479	0.305	46	0.1258	0.0061
T12	17.4479 - 14.9792	0.237	46	0.1111	0.0053
T13	14.9792 - 12.5104	0.179	46	0.0965	0.0045
T14	12.5104 - 10.0417	0.129	46	0.0814	0.0038
T15	10.0417 - 7.57292	0.087	46	0.0660	0.0030
T16	7.57292 - 5.10417	0.053	46	0.0503	0.0023
T17	5.10417 - 2.63542	0.027	46	0.0342	0.0016
T18	2.63542 - 0	0.010	47	0.0178	0.0009

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
90.00	20' 8 Bay Di-Pole	48	5.337	0.7338	0.0374	3511
85.00	10' Omni	46	4.657	0.5334	0.0194	3511
83.00	7' Whip	46	4.407	0.4646	0.0145	2538
78.00	7770	46	3.844	0.3702	0.0124	2049
73.00	2' dish	45	3.380	0.3373	0.0142	2938
65.00	7' Whip	46	2.771	0.3413	0.0169	12770
55.00	4 ' Side Arm	46	2.083	0.3369	0.0172	42959

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	90 - 80	21.934	18	2.8023	0.1680
T1	80 - 60	16.635	16	1.6255	0.0519
T2	60 - 40	9.968	16	1.4229	0.0743
T3	40 - 37.4479	4.652	16	1.0186	0.0524
T4	37.4479 - 34.9792	4.104	16	0.9639	0.0486
T5	34.9792 - 32.5104	3.607	16	0.9080	0.0454
T6	32.5104 - 30.0417	3.138	16	0.8496	0.0422
T7	30.0417 - 27.5729	2.699	16	0.7888	0.0390
T8	27.5729 - 25.1042	2.293	18	0.7255	0.0358
T9	25.1042 - 22.6354	1.920	18	0.6600	0.0326
T10	22.6354 - 20	1.581	18	0.5923	0.0295
T11	20 - 17.4479	1.256	18	0.5177	0.0257
T12	17.4479 - 14.9792	0.977	18	0.4573	0.0222
T13	14.9792 - 12.5104	0.740	18	0.3970	0.0191
T14	12.5104 - 10.0417	0.535	18	0.3352	0.0160
T15	10.0417 - 7.57292	0.361	18	0.2719	0.0129
T16	7.57292 - 5.10417	0.221	18	0.2072	0.0098
T17	5.10417 - 2.63542	0.114	18	0.1410	0.0067
T18	2.63542 - 0	0.041	18	0.0735	0.0037

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
90.00	20' 8 Bay Di-Pole	18	21.934	2.8023	0.1680	1069
85.00	10' Omni	18	19.152	2.1253	0.0859	1069
83.00	7' Whip	18	18.097	1.8908	0.0607	772
78.00	7770	16	15.753	1.5066	0.0544	620
73.00	2' dish	16	13.840	1.3615	0.0625	874
65.00	7' Whip	16	11.362	1.3880	0.0727	3222
55.00	4 ' Side Arm	16	8.563	1.3825	0.0733	8082

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
L1	90 - 80 (1)	P4x.237	10.00	0.00	0.0	3.1741	-258.96	99982.50	0.003
T1	80 - 60 (374)	P4x.237	10.00	0.00	79.5 K=1.00	3.1741	-362.07	72352.60	0.005

Pole Bending Design Data

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L1	90 - 80 (1)	P4x.237	4.31	11.32	0.380	0.00	11.32	0.000
T1	80 - 60 (374)	P4x.237	3.92	11.32	0.347	0.00	11.32	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V_u lb	ϕV_n lb	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	90 - 80 (1)	P4x.237	625.40	49991.30	0.013	0.10	16.88	0.006
T1	80 - 60 (374)	P4x.237	394.39	49991.30	0.008	0.00	16.88	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	90 - 80 (1)	0.003	0.380	0.000	0.013	0.006	0.383 ✔	1.000	4.8.2 ✔
T1	80 - 60 (374)	0.005	0.347	0.000	0.008	0.000	0.352 ✔	1.000	4.8.2 ✔

Leg Design Data (Compression)

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

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	80 - 60	1 1/2	20.00	2.47	79.0 K=1.00	1.7672	-41519.30	50385.50	0.824 [1]
T2	60 - 40	2	20.00	2.47	59.3 K=1.00	3.1416	-97077.90	109361.00	0.888 [1]
T3	40 - 37.4479	2 1/4	2.55	2.47	52.7 K=1.00	3.9761	-104383.00	146073.00	0.715 [1]
T4	37.4479 - 34.9792	2 1/4	2.47	2.47	52.7 K=1.00	3.9761	-111586.00	146073.00	0.764 [1]
T5	34.9792 - 32.5104	2 1/4	2.47	2.47	52.7 K=1.00	3.9761	-118267.00	146073.00	0.810 [1]
T6	32.5104 - 30.0417	2 1/4	2.47	2.47	52.7 K=1.00	3.9761	-125022.00	146073.00	0.856 [1]
T7	30.0417 - 27.5729	2 1/4	2.47	2.47	52.7 K=1.00	3.9761	-131740.00	146073.00	0.902 [1]
T8	27.5729 - 25.1042	2 1/4	2.47	2.47	52.7 K=1.00	3.9761	-138442.00	146073.00	0.948 [1]
T9	25.1042 - 22.6354	2 1/4	2.47	1.24	26.5 K=1.00	3.9761	-144998.00	169953.00	0.853 [1]
T10	22.6354 - 20	2 1/4	2.64	1.24	26.5 K=1.00	3.9761	-151516.00	169963.00	0.891 [1]
T11	20 - 17.4479	2 1/2	2.55	2.47	47.4 K=1.00	4.9087	-159200.00	187423.00	0.849 [1]
T12	17.4479 - 14.9792	2 1/2	2.47	2.47	47.4 K=1.00	4.9087	-166165.00	187423.00	0.887 [1]
T13	14.9792 - 12.5104	2 1/2	2.47	2.47	47.4 K=1.00	4.9087	-172717.00	187423.00	0.922 [1]
T14	12.5104 - 10.0417	2 1/2	2.47	2.47	47.4 K=1.00	4.9087	-179307.00	187423.00	0.957 [1]
T15	10.0417 - 7.57292	2 1/2	2.47	1.24	23.9 K=1.00	4.9087	-185658.00	211889.00	0.876 [1]
T16	7.57292 - 5.10417	2 1/2	2.47	1.24	23.9 K=1.00	4.9087	-192142.00	211891.00	0.907 [1]
T17	5.10417 - 2.63542	2 1/2	2.47	1.24	23.9 K=1.00	4.9087	-198716.00	211892.00	0.938 [1]
T18	2.63542 - 0	2 1/2	2.64	1.24	23.8 K=1.00	4.9087	-205034.00	211901.00	0.968 [1]

[1] $P_u / \phi P_n$ controls

Leg Bending Design Data (Compression)

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
T1	80 - 60	1 1/2	0.00	2.11	0.000	0.00	2.11	0.000
T2	60 - 40	2	0.00	5.00	0.000	0.00	5.00	0.000
T3	40 - 37.4479	2 1/4	0.00	7.12	0.000	0.00	7.12	0.000
T4	37.4479 - 34.9792	2 1/4	0.00	7.12	0.000	0.00	7.12	0.000
T5	34.9792 - 32.5104	2 1/4	0.00	7.12	0.000	0.00	7.12	0.000
T6	32.5104 - 30.0417	2 1/4	0.00	7.12	0.000	0.00	7.12	0.000
T7	30.0417 - 27.5729	2 1/4	0.00	7.12	0.000	0.00	7.12	0.000
T8	27.5729 -	2 1/4	0.00	7.12	0.000	0.00	7.12	0.000

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
T9	25.1042 25.1042 - 22.6354	2 1/4	0.00	7.12	0.000	0.00	7.12	0.000
T10	22.6354 - 20	2 1/4	0.00	7.12	0.000	0.00	7.12	0.000
T11	20 - 17.4479	2 1/2	0.00	9.77	0.000	0.00	9.77	0.000
T12	17.4479 - 14.9792	2 1/2	0.00	9.77	0.000	0.00	9.77	0.000
T13	14.9792 - 12.5104	2 1/2	0.00	9.77	0.000	0.00	9.77	0.000
T14	12.5104 - 10.0417	2 1/2	0.00	9.77	0.000	0.00	9.77	0.000
T15	10.0417 - 7.57292	2 1/2	0.00	9.77	0.000	0.00	9.77	0.000
T16	7.57292 - 5.10417	2 1/2	0.00	9.77	0.000	0.00	9.77	0.000
T17	5.10417 - 2.63542	2 1/2	0.00	9.77	0.000	0.00	9.77	0.000
T18	2.63542 - 0	2 1/2	0.00	9.77	0.000	0.00	9.77	0.000

Leg Interaction Design Data (Compression)

Section No.	Elevation ft	Size	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T1	80 - 60	1 1/2	0.824	0.000	0.000	0.824 [1] ✔	1.000	4.8.1 ✔
T2	60 - 40	2	0.888	0.000	0.000	0.888 [1] ✔	1.000	4.8.1 ✔
T3	40 - 37.4479	2 1/4	0.715	0.000	0.000	0.715 [1] ✔	1.000	4.8.1 ✔
T4	37.4479 - 34.9792	2 1/4	0.764	0.000	0.000	0.764 [1] ✔	1.000	4.8.1 ✔
T5	34.9792 - 32.5104	2 1/4	0.810	0.000	0.000	0.810 [1] ✔	1.000	4.8.1 ✔
T6	32.5104 - 30.0417	2 1/4	0.856	0.000	0.000	0.856 [1] ✔	1.000	4.8.1 ✔
T7	30.0417 - 27.5729	2 1/4	0.902	0.000	0.000	0.902 [1] ✔	1.000	4.8.1 ✔
T8	27.5729 - 25.1042	2 1/4	0.948	0.000	0.000	0.948 [1] ✔	1.000	4.8.1 ✔
T9	25.1042 - 22.6354	2 1/4	0.853	0.000	0.000	0.853 [1] ✔	1.000	4.8.1 ✔
T10	22.6354 - 20	2 1/4	0.891	0.000	0.000	0.891 [1] ✔	1.000	4.8.1 ✔
T11	20 - 17.4479	2 1/2	0.849	0.000	0.000	0.849 [1] ✔	1.000	4.8.1 ✔
T12	17.4479 - 14.9792	2 1/2	0.887	0.000	0.000	0.887 [1] ✔	1.000	4.8.1 ✔
T13	14.9792 - 12.5104	2 1/2	0.922	0.000	0.000	0.922 [1] ✔	1.000	4.8.1 ✔
T14	12.5104 - 10.0417	2 1/2	0.957	0.000	0.000	0.957 [1] ✔	1.000	4.8.1 ✔

Section No.	Elevation ft	Size	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T15	10.0417 - 7.57292	2 1/2	0.876	0.000	0.000	0.876 [1] ✔	1.000	4.8.1 ✔
T16	7.57292 - 5.10417	2 1/2	0.907	0.000	0.000	0.907 [1] ✔	1.000	4.8.1 ✔
T17	5.10417 - 2.63542	2 1/2	0.938	0.000	0.000	0.938 [1] ✔	1.000	4.8.1 ✔
T18	2.63542 - 0	2 1/2	0.968	0.000	0.000	0.968 [1] ✔	1.000	4.8.1 ✔

[1] P_u / ϕP_n controls

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	80 - 60	3/4	4.28	2.14	123.4 K=0.90	0.4418	-3873.26	6559.28	0.591 [1] ✔
T2	60 - 40	7/8	4.67	2.35	116.2 K=0.90	0.6013	-4320.79	10061.10	0.429 [1] ✔
T3	40 - 37.4479	7/8	4.73	2.38	117.6 K=0.90	0.6013	-4416.43	9824.43	0.450 [1] ✔
T4	37.4479 - 34.9792	7/8	4.78	2.41	118.9 K=0.90	0.6013	-3937.33	9607.05	0.410 [1] ✔
T5	34.9792 - 32.5104	7/8	4.83	2.44	120.2 K=0.90	0.6013	-4082.85	9397.22	0.434 [1] ✔
T6	32.5104 - 30.0417	7/8	4.89	2.46	121.6 K=0.90	0.6013	-4107.70	9193.38	0.447 [1] ✔
T7	30.0417 - 27.5729	7/8	4.94	2.49	122.9 K=0.90	0.6013	-4133.79	8995.35	0.460 [1] ✔
T8	27.5729 - 25.1042	7/8	5.00	2.52	124.2 K=0.90	0.6013	-4225.48	8802.93	0.480 [1] ✔
T9	25.1042 - 22.6354	7/8	5.05	2.54	125.6 K=0.90	0.6013	-4485.73	8615.97	0.521 [1] ✔
T10	22.6354 - 20	7/8	5.10	2.57	126.8 K=0.90	0.6013	-5155.92	8447.37	0.610 [1] ✔
T11	20 - 17.4479	7/8	5.16	2.60	128.3 K=0.90	0.6013	-4545.52	8258.54	0.550 [1] ✔
T12	17.4479 - 14.9792	7/8	5.22	2.63	129.6 K=0.90	0.6013	-4223.14	8086.03	0.522 [1] ✔
T13	14.9792 - 12.5104	7/8	5.27	2.65	131.0 K=0.90	0.6013	-4280.10	7919.16	0.540 [1] ✔
T14	12.5104 - 10.0417	7/8	5.33	2.68	132.3 K=0.90	0.6013	-4341.98	7756.93	0.560 [1] ✔
T15	10.0417 - 7.57292	7/8	5.38	2.71	133.7 K=0.90	0.6013	-4682.32	7599.17	0.616 [1] ✔
T16	7.57292 - 5.10417	7/8	5.44	2.74	135.1 K=0.90	0.6013	-4765.12	7445.76	0.640 [1] ✔
T17	5.10417 - 2.63542	7/8	5.49	2.76	136.4 K=0.90	0.6013	-4763.03	7296.54	0.653 [1] ✔

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T18	2.63542 - 0	7/8	5.55	2.79	137.7 K=0.90	0.6013	-5704.92	7161.59	0.797 [1]

[1] P_u / ϕP_n controls

Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	80 - 60	3/4	3.50	3.50	156.8 K=0.70	0.4418	-1161.12	4059.38	0.286 [1]
T2	60 - 40	7/8	3.93	3.93	151.1 K=0.70	0.6013	-1790.52	5952.36	0.301 [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 lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T9	25.1042 - 22.6354	L2x2x1/4	4.41	4.41	103.4 K=1.19	0.9380	-629.05	17308.60	0.036 [1]
T10	22.6354 - 20	L2x2x1/4	4.47	4.47	104.0 K=1.18	0.9380	-1027.65	17196.20	0.060 [1]
T15	10.0417 - 7.57292	L2x2x1/4	4.78	4.78	107.1 K=1.14	0.9380	-777.90	16614.20	0.047 [1]
T16	7.57292 - 5.10417	L2x2x1/4	4.84	4.84	107.7 K=1.13	0.9380	-960.87	16498.90	0.058 [1]
T17	5.10417 - 2.63542	L2x2x1/4	4.91	4.91	108.3 K=1.12	0.9380	-1011.17	16383.70	0.062 [1]
T18	2.63542 - 0	L2x2x1/4	4.97	4.97	108.9 K=1.11	0.9380	-1434.42	16272.30	0.088 [1]

[1] P_u / ϕP_n controls

Top Girt Design Data (Compression)

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

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	80 - 60	L3 1/2x3 1/2x5/16	3.50	3.50	90.4 K=1.49	2.0900	-3804.16	44025.70	0.086 [1] ✔
T2	60 - 40	7/8	3.50	3.50	134.5 K=0.70	0.6013	-16.60	7511.56	0.002 [1] ✔
T3	40 - 37.4479	1	4.00	4.00	134.5 K=0.70	0.7854	-593.37	9812.69	0.060 [1] ✔
T4	37.4479 - 34.9792	7/8	4.06	4.06	156.0 K=0.70	0.6013	-1684.34	5582.09	0.302 [1] ✔
T5	34.9792 - 32.5104	7/8	4.13	4.13	158.4 K=0.70	0.6013	-1542.88	5414.21	0.285 [1] ✔
T6	32.5104 - 30.0417	7/8	4.19	4.19	160.8 K=0.70	0.6013	-1625.91	5253.80	0.309 [1] ✔
T7	30.0417 - 27.5729	7/8	4.25	4.25	163.2 K=0.70	0.6013	-1662.79	5100.42	0.326 [1] ✔
T8	27.5729 - 25.1042	7/8	4.31	4.31	165.6 K=0.70	0.6013	-1757.95	4953.65	0.355 [1] ✔
T9	25.1042 - 22.6354	7/8	4.38	4.38	168.0 K=0.70	0.6013	-1670.40	4813.13	0.347 [1] ✔
T10	22.6354 - 20	7/8	4.44	4.44	170.4 K=0.70	0.6013	-1756.56	4678.50	0.375 [1] ✔
T11	20 - 17.4479	1	4.50	4.50	151.3 K=0.70	0.7854	-844.52	7754.12	0.109 [1] ✔
T12	17.4479 - 14.9792	7/8	4.56	4.56	175.2 K=0.70	0.6013	-1669.96	4425.66	0.377 [1] ✔
T13	14.9792 - 12.5104	7/8	4.63	4.63	177.6 K=0.70	0.6013	-1528.93	4306.85	0.355 [1] ✔
T14	12.5104 - 10.0417	7/8	4.69	4.69	180.0 K=0.70	0.6013	-1617.99	4192.77	0.386 [1] ✔
T15	10.0417 - 7.57292	7/8	4.75	4.75	182.4 K=0.70	0.6013	-1521.37	4083.16	0.373 [1] ✔
T16	7.57292 - 5.10417	7/8	4.81	4.81	184.8 K=0.70	0.6013	-1376.64	3977.79	0.346 [1] ✔
T17	5.10417 - 2.63542	7/8	4.88	4.88	187.2 K=0.70	0.6013	-1360.24	3876.45	0.351 [1] ✔
T18	2.63542 - 0	7/8	4.94	4.94	189.6 K=0.70	0.6013	-1633.45	3778.93	0.432 [1] ✔

[1] P_u / ϕP_n controls

Bottom Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	80 - 60	3/4	3.50	3.50	156.8 K=0.70	0.4418	-1181.75	4059.38	0.291 [1] ✔
T2	60 - 40	7/8	4.00	4.00	153.4 K=0.70	0.6013	-1423.89	5769.90	0.247 [1] ✔
T10	22.6354 - 20	1	4.50	4.50	151.1 K=0.70	0.7854	-1280.47	7774.80	0.165 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T18	2.63542 - 0	1	5.00	5.00	167.9 K=0.70	0.7854	-457.68	6296.48	0.073 [1]

[1] P_u / ϕP_n controls

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	80 - 60	1 1/2	20.00	0.17	5.3	1.7672	41819.50	79521.60	0.526 [1]
T2	60 - 40	2	20.00	0.17	4.0	3.1416	95443.00	141372.00	0.675 [1]
T3	40 - 37.4479	2 1/4	2.55	2.47	52.7	3.9761	98337.50	178924.00	0.550 [1]
T4	37.4479 - 34.9792	2 1/4	2.47	2.47	52.7	3.9761	105272.00	178924.00	0.588 [1]
T5	34.9792 - 32.5104	2 1/4	2.47	2.47	52.7	3.9761	111729.00	178924.00	0.624 [1]
T6	32.5104 - 30.0417	2 1/4	2.47	2.47	52.7	3.9761	118258.00	178924.00	0.661 [1]
T7	30.0417 - 27.5729	2 1/4	2.47	2.47	52.7	3.9761	124749.00	178924.00	0.697 [1]
T8	27.5729 - 25.1042	2 1/4	2.47	2.47	52.7	3.9761	131217.00	178924.00	0.733 [1]
T9	25.1042 - 22.6354	2 1/4	2.47	1.23	26.1	3.9761	137498.00	178924.00	0.768 [1]
T10	22.6354 - 20	2 1/4	2.64	0.17	3.6	3.9761	148347.00	178924.00	0.829 [1]
T11	20 - 17.4479	2 1/2	2.55	2.47	47.4	4.9087	151144.00	220893.00	0.684 [1]
T12	17.4479 - 14.9792	2 1/2	2.47	2.47	47.4	4.9087	157845.00	220893.00	0.715 [1]
T13	14.9792 - 12.5104	2 1/2	2.47	2.47	47.4	4.9087	164147.00	220893.00	0.743 [1]
T14	12.5104 - 10.0417	2 1/2	2.47	2.47	47.4	4.9087	170479.00	220893.00	0.772 [1]
T15	10.0417 - 7.57292	2 1/2	2.47	1.23	23.5	4.9087	176539.00	220893.00	0.799 [1]
T16	7.57292 - 5.10417	2 1/2	2.47	1.23	23.5	4.9087	182735.00	220893.00	0.827 [1]
T17	5.10417 - 2.63542	2 1/2	2.47	1.23	23.6	4.9087	189016.00	220893.00	0.856 [1]
T18	2.63542 - 0	2 1/2	2.64	0.17	3.2	4.9087	199728.00	220893.00	0.904 [1]

[1] P_u / ϕP_n controls

Leg Bending Design Data (Tension)

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
T1	80 - 60	1 1/2	0.00	2.11	0.000	0.00	2.11	0.000
T2	60 - 40	2	0.00	5.00	0.000	0.00	5.00	0.000
T3	40 - 37.4479	2 1/4	0.00	7.12	0.000	0.00	7.12	0.000
T4	37.4479 - 34.9792	2 1/4	0.00	7.12	0.000	0.00	7.12	0.000
T5	34.9792 - 32.5104	2 1/4	0.00	7.12	0.000	0.00	7.12	0.000
T6	32.5104 - 30.0417	2 1/4	0.00	7.12	0.000	0.00	7.12	0.000
T7	30.0417 - 27.5729	2 1/4	0.00	7.12	0.000	0.00	7.12	0.000
T8	27.5729 - 25.1042	2 1/4	0.00	7.12	0.000	0.00	7.12	0.000
T9	25.1042 - 22.6354	2 1/4	0.00	7.12	0.000	0.00	7.12	0.000
T10	22.6354 - 20	2 1/4	0.00	7.12	0.000	0.00	7.12	0.000
T11	20 - 17.4479	2 1/2	0.00	9.77	0.000	0.00	9.77	0.000
T12	17.4479 - 14.9792	2 1/2	0.00	9.77	0.000	0.00	9.77	0.000
T13	14.9792 - 12.5104	2 1/2	0.00	9.77	0.000	0.00	9.77	0.000
T14	12.5104 - 10.0417	2 1/2	0.00	9.77	0.000	0.00	9.77	0.000
T15	10.0417 - 7.57292	2 1/2	0.00	9.77	0.000	0.00	9.77	0.000
T16	7.57292 - 5.10417	2 1/2	0.00	9.77	0.000	0.00	9.77	0.000
T17	5.10417 - 2.63542	2 1/2	0.00	9.77	0.000	0.00	9.77	0.000
T18	2.63542 - 0	2 1/2	0.00	9.77	0.000	0.00	9.77	0.000

Leg Interaction Design Data (Tension)

Section No.	Elevation ft	Size	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T1	80 - 60	1 1/2	0.526	0.000	0.000	0.526 [1] ✔	1.000	4.8.1 ✔
T2	60 - 40	2	0.675	0.000	0.000	0.675 [1] ✔	1.000	4.8.1 ✔
T3	40 - 37.4479	2 1/4	0.550	0.000	0.000	0.550 [1] ✔	1.000	4.8.1 ✔
T4	37.4479 - 34.9792	2 1/4	0.588	0.000	0.000	0.588 [1] ✔	1.000	4.8.1 ✔
T5	34.9792 - 32.5104	2 1/4	0.624	0.000	0.000	0.624 [1] ✔	1.000	4.8.1 ✔
T6	32.5104 - 30.0417	2 1/4	0.661	0.000	0.000	0.661 [1] ✔	1.000	4.8.1 ✔
T7	30.0417 - 27.5729	2 1/4	0.697	0.000	0.000	0.697 [1] ✔	1.000	4.8.1 ✔
T8	27.5729 - 25.1042	2 1/4	0.733	0.000	0.000	0.733 [1] ✔	1.000	4.8.1 ✔
T9	25.1042 - 22.6354	2 1/4	0.768	0.000	0.000	0.768 [1] ✔	1.000	4.8.1 ✔

Section No.	Elevation ft	Size	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T10	22.6354 - 20	2 1/4	0.829	0.000	0.000	0.829 [1] ✔	1.000	4.8.1 ✔
T11	20 - 17.4479	2 1/2	0.684	0.000	0.000	0.684 [1] ✔	1.000	4.8.1 ✔
T12	17.4479 - 14.9792	2 1/2	0.715	0.000	0.000	0.715 [1] ✔	1.000	4.8.1 ✔
T13	14.9792 - 12.5104	2 1/2	0.743	0.000	0.000	0.743 [1] ✔	1.000	4.8.1 ✔
T14	12.5104 - 10.0417	2 1/2	0.772	0.000	0.000	0.772 [1] ✔	1.000	4.8.1 ✔
T15	10.0417 - 7.57292	2 1/2	0.799	0.000	0.000	0.799 [1] ✔	1.000	4.8.1 ✔
T16	7.57292 - 5.10417	2 1/2	0.827	0.000	0.000	0.827 [1] ✔	1.000	4.8.1 ✔
T17	5.10417 - 2.63542	2 1/2	0.856	0.000	0.000	0.856 [1] ✔	1.000	4.8.1 ✔
T18	2.63542 - 0	2 1/2	0.904	0.000	0.000	0.904 [1] ✔	1.000	4.8.1 ✔

[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 lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	80 - 60	3/4	4.28	2.14	137.1	0.4418	3701.42	19880.40	0.186 [1] ✔
T2	60 - 40	7/8	4.67	2.35	129.1	0.6013	4101.74	27059.40	0.152 [1] ✔
T3	40 - 37.4479	7/8	4.73	2.38	130.7	0.6013	4199.47	27059.40	0.155 [1] ✔
T4	37.4479 - 34.9792	7/8	4.78	2.41	132.1	0.6013	3755.98	27059.40	0.139 [1] ✔
T5	34.9792 - 32.5104	7/8	4.83	2.44	133.6	0.6013	3897.52	27059.40	0.144 [1] ✔
T6	32.5104 - 30.0417	7/8	4.89	2.46	135.1	0.6013	3917.46	27059.40	0.145 [1] ✔
T7	30.0417 - 27.5729	7/8	4.94	2.49	136.5	0.6013	3939.71	27059.40	0.146 [1] ✔
T8	27.5729 - 25.1042	7/8	5.00	2.52	138.0	0.6013	4031.18	27059.40	0.149 [1] ✔
T9	25.1042 - 22.6354	7/8	5.05	2.54	139.5	0.6013	4302.69	27059.40	0.159 [1] ✔
T10	22.6354 - 20	7/8	5.10	2.57	140.9	0.6013	4926.43	27059.40	0.182 [1] ✔
T11	20 - 17.4479	7/8	5.16	2.60	142.5	0.6013	4344.94	27059.40	0.161 [1] ✔
T12	17.4479 - 14.9792	7/8	5.22	2.63	144.0	0.6013	4018.29	27059.40	0.148 [1] ✔

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T13	14.9792 - 12.5104	7/8	5.27	2.65	145.5	0.6013	4072.42	27059.40	0.150 [1]
T14	12.5104 - 10.0417	7/8	5.33	2.68	147.0	0.6013	4140.75	27059.40	0.153 [1]
T15	10.0417 - 7.57292	7/8	5.38	2.71	148.6	0.6013	4473.13	27059.40	0.165 [1]
T16	7.57292 - 5.10417	7/8	5.44	2.74	150.1	0.6013	4574.85	27059.40	0.169 [1]
T17	5.10417 - 2.63542	7/8	5.49	2.76	151.6	0.6013	4555.08	27059.40	0.168 [1]
T18	2.63542 - 0	7/8	5.55	2.79	153.0	0.6013	5443.55	27059.40	0.201 [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 lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	80 - 60	3/4	3.50	3.50	224.0	0.4418	1299.66	19880.40	0.065 [1]
T2	60 - 40	7/8	3.93	3.93	215.8	0.6013	2060.11	27059.40	0.076 [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 lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T9	25.1042 - 22.6354	L2x2x1/4	4.41	4.41	86.8	0.9380	521.22	30391.20	0.017 [1]
T10	22.6354 - 20	L2x2x1/4	4.47	4.47	88.0	0.9380	926.74	30391.20	0.030 [1]
T15	10.0417 - 7.57292	L2x2x1/4	4.78	4.78	94.2	0.9380	657.32	30391.20	0.022 [1]
T16	7.57292 - 5.10417	L2x2x1/4	4.84	4.84	95.4	0.9380	846.50	30391.20	0.028 [1]
T17	5.10417 - 2.63542	L2x2x1/4	4.91	4.91	96.7	0.9380	928.33	30391.20	0.031 [1]
T18	2.63542 - 0	L2x2x1/4	4.97	4.97	97.9	0.9380	1359.94	30391.20	0.045 [1]

[1] P_u / ϕP_n controls

Top Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	80 - 60	L3 1/2x3 1/2x5/16	3.50	3.50	38.9	2.0900	3403.54	67716.00	0.050 [1] ✔
T2	60 - 40	7/8	3.50	3.50	192.1	0.6013	168.95	27059.40	0.006 [1] ✔
T3	40 - 37.4479	1	4.00	4.00	192.1	0.7854	727.73	35342.90	0.021 [1] ✔
T4	37.4479 - 34.9792	7/8	4.06	4.06	222.9	0.6013	1915.53	27059.40	0.071 [1] ✔
T5	34.9792 - 32.5104	7/8	4.13	4.13	226.3	0.6013	1747.90	27059.40	0.065 [1] ✔
T6	32.5104 - 30.0417	7/8	4.19	4.19	229.7	0.6013	1842.72	27059.40	0.068 [1] ✔
T7	30.0417 - 27.5729	7/8	4.25	4.25	233.1	0.6013	1880.52	27059.40	0.069 [1] ✔
T8	27.5729 - 25.1042	7/8	4.31	4.31	236.6	0.6013	1989.83	27059.40	0.074 [1] ✔
T9	25.1042 - 22.6354	7/8	4.38	4.38	240.0	0.6013	1877.02	27059.40	0.069 [1] ✔
T10	22.6354 - 20	7/8	4.44	4.44	243.4	0.6013	1996.89	27059.40	0.074 [1] ✔
T11	20 - 17.4479	1	4.50	4.50	216.1	0.7854	975.85	35342.90	0.028 [1] ✔
T12	17.4479 - 14.9792	7/8	4.56	4.56	250.3	0.6013	1897.39	27059.40	0.070 [1] ✔
T13	14.9792 - 12.5104	7/8	4.63	4.63	253.7	0.6013	1722.92	27059.40	0.064 [1] ✔
T14	12.5104 - 10.0417	7/8	4.69	4.69	257.1	0.6013	1831.74	27059.40	0.068 [1] ✔
T15	10.0417 - 7.57292	7/8	4.75	4.75	260.6	0.6013	1712.57	27059.40	0.063 [1] ✔
T16	7.57292 - 5.10417	7/8	4.81	4.81	264.0	0.6013	1557.80	27059.40	0.058 [1] ✔
T17	5.10417 - 2.63542	7/8	4.88	4.88	267.4	0.6013	1530.45	27059.40	0.057 [1] ✔
T18	2.63542 - 0	7/8	4.94	4.94	270.9	0.6013	1868.18	27059.40	0.069 [1] ✔

[1] P_u / ϕP_n controls

Bottom Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	80 - 60	3/4	3.50	3.50	224.0	0.4418	1305.89	19880.40	0.066 [1]
T2	60 - 40	7/8	4.00	4.00	219.2	0.6013	1560.99	27059.40	0.058 [1]
T10	22.6354 - 20	1	4.50	4.50	215.8	0.7854	1408.31	35342.90	0.040 [1]
T18	2.63542 - 0	1	5.00	5.00	239.8	0.7854	4725.71	35342.90	0.134 [1]

[1] $P_u / \phi P_n$ controls

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
L1	90 - 80	Pole	P4x.237	1	-258.96	99982.50	38.3	Pass
T1	80 - 60	Leg	1 1/2	2	-41519.30	50385.50	82.4	Pass
T2	60 - 40	Leg	2	80	-97077.90	109361.00	88.8	Pass
T3	40 - 37.4479	Leg	2 1/4	158	-104383.00	146073.00	71.5	Pass
T4	37.4479 - 34.9792	Leg	2 1/4	170	-111586.00	146073.00	76.4	Pass
T5	34.9792 - 32.5104	Leg	2 1/4	182	-118267.00	146073.00	81.0	Pass
T6	32.5104 - 30.0417	Leg	2 1/4	194	-125022.00	146073.00	85.6	Pass
T7	30.0417 - 27.5729	Leg	2 1/4	206	-131740.00	146073.00	90.2	Pass
T8	27.5729 - 25.1042	Leg	2 1/4	218	-138442.00	146073.00	94.8	Pass
T9	25.1042 - 22.6354	Leg	2 1/4	230	-144998.00	169953.00	85.3	Pass
T10	22.6354 - 20	Leg	2 1/4	245	-151516.00	169963.00	89.1	Pass
T11	20 - 17.4479	Leg	2 1/2	263	-159200.00	187423.00	84.9	Pass
T12	17.4479 - 14.9792	Leg	2 1/2	275	-166165.00	187423.00	88.7	Pass
T13	14.9792 - 12.5104	Leg	2 1/2	287	-172717.00	187423.00	92.2	Pass
T14	12.5104 - 10.0417	Leg	2 1/2	299	-179307.00	187423.00	95.7	Pass
T15	10.0417 - 7.57292	Leg	2 1/2	311	-185658.00	211889.00	87.6	Pass
T16	7.57292 - 5.10417	Leg	2 1/2	326	-192142.00	211891.00	90.7	Pass
T17	5.10417 - 2.63542	Leg	2 1/2	341	-198716.00	211892.00	93.8	Pass
T18	2.63542 - 0	Leg	2 1/2	356	-205034.00	211901.00	96.8	Pass
T1	80 - 60	Diagonal	3/4	16	-3873.26	6559.28	59.1	Pass
T2	60 - 40	Diagonal	7/8	90	-4320.79	10061.10	42.9	Pass
T3	40 - 37.4479	Diagonal	7/8	165	-4416.43	9824.43	45.0	Pass
T4	37.4479 - 34.9792	Diagonal	7/8	177	-3937.33	9607.05	41.0	Pass
T5	34.9792 - 32.5104	Diagonal	7/8	189	-4082.85	9397.22	43.4	Pass
T6	32.5104 - 30.0417	Diagonal	7/8	201	-4107.70	9193.38	44.7	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
T7	30.0417 - 27.5729	Diagonal	7/8	213	-4133.79	8995.35	46.0	Pass
T8	27.5729 - 25.1042	Diagonal	7/8	225	-4225.48	8802.93	48.0	Pass
T9	25.1042 - 22.6354	Diagonal	7/8	237	-4485.73	8615.97	52.1	Pass
T10	22.6354 - 20	Diagonal	7/8	255	-5155.92	8447.37	61.0	Pass
T11	20 - 17.4479	Diagonal	7/8	270	-4545.52	8258.54	55.0	Pass
T12	17.4479 - 14.9792	Diagonal	7/8	282	-4223.14	8086.03	52.2	Pass
T13	14.9792 - 12.5104	Diagonal	7/8	294	-4280.10	7919.16	54.0	Pass
T14	12.5104 - 10.0417	Diagonal	7/8	306	-4341.98	7756.93	56.0	Pass
T15	10.0417 - 7.57292	Diagonal	7/8	318	-4682.32	7599.17	61.6	Pass
T16	7.57292 - 5.10417	Diagonal	7/8	333	-4765.12	7445.76	64.0	Pass
T17	5.10417 - 2.63542	Diagonal	7/8	348	-4763.03	7296.54	65.3	Pass
T18	2.63542 - 0	Diagonal	7/8	366	-5704.92	7161.59	79.7	Pass
T1	80 - 60	Horizontal	3/4	46	-1161.12	4059.38	28.6	Pass
T2	60 - 40	Horizontal	7/8	96	-1790.52	5952.36	30.1	Pass
T9	25.1042 - 22.6354	Secondary Horizontal	L2x2x1/4	243	-629.05	17308.60	3.6	Pass
T10	22.6354 - 20	Secondary Horizontal	L2x2x1/4	260	-1027.65	17196.20	6.0	Pass
T15	10.0417 - 7.57292	Secondary Horizontal	L2x2x1/4	324	-777.90	16614.20	4.7	Pass
T16	7.57292 - 5.10417	Secondary Horizontal	L2x2x1/4	339	-960.87	16498.90	5.8	Pass
T17	5.10417 - 2.63542	Secondary Horizontal	L2x2x1/4	354	-1011.17	16383.70	6.2	Pass
T18	2.63542 - 0	Secondary Horizontal	L2x2x1/4	371	-1434.42	16272.30	8.8	Pass
T1	80 - 60	Top Girt	L3 1/2x3 1/2x5/16	7	-3804.16	44025.70	8.6	Pass
T2	60 - 40	Top Girt	7/8	83	168.95	27059.40	0.6	Pass
T3	40 - 37.4479	Top Girt	1	162	-593.37	9812.69	6.0	Pass
T4	37.4479 - 34.9792	Top Girt	7/8	174	-1684.34	5582.09	30.2	Pass
T5	34.9792 - 32.5104	Top Girt	7/8	186	-1542.88	5414.21	28.5	Pass
T6	32.5104 - 30.0417	Top Girt	7/8	198	-1625.91	5253.80	30.9	Pass
T7	30.0417 - 27.5729	Top Girt	7/8	210	-1662.79	5100.42	32.6	Pass
T8	27.5729 - 25.1042	Top Girt	7/8	222	-1757.95	4953.65	35.5	Pass
T9	25.1042 - 22.6354	Top Girt	7/8	234	-1670.40	4813.13	34.7	Pass
T10	22.6354 - 20	Top Girt	7/8	249	-1756.56	4678.50	37.5	Pass
T11	20 - 17.4479	Top Girt	1	267	-844.52	7754.12	10.9	Pass
T12	17.4479 - 14.9792	Top Girt	7/8	279	-1669.96	4425.66	37.7	Pass
T13	14.9792 - 12.5104	Top Girt	7/8	291	-1528.93	4306.85	35.5	Pass
T14	12.5104 - 10.0417	Top Girt	7/8	303	-1617.99	4192.77	38.6	Pass
T15	10.0417 - 7.57292	Top Girt	7/8	315	-1521.37	4083.16	37.3	Pass
T16	7.57292 - 5.10417	Top Girt	7/8	330	-1376.64	3977.79	34.6	Pass
T17	5.10417 -	Top Girt	7/8	345	-1360.24	3876.45	35.1	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
	2.63542							
T18	2.63542 - 0	Top Girt	7/8	360	-1633.45	3778.93	43.2	Pass
T1	80 - 60	Bottom Girt	3/4	9	-1181.75	4059.38	29.1	Pass
T2	60 - 40	Bottom Girt	7/8	87	-1423.89	5769.90	24.7	Pass
T10	22.6354 - 20	Bottom Girt	1	252	-1280.47	7774.80	16.5	Pass
T18	2.63542 - 0	Bottom Girt	1	363	4725.71	35342.90	13.4	Pass
T1	80 - 60	Pole Socket	P4x.237	374	-362.07	72352.60	35.2	Pass
							Summary	
						Pole (L1)	38.3	Pass
						Leg (T18)	96.8	Pass
						Diagonal (T18)	79.7	Pass
						Horizontal (T2)	30.1	Pass
						Secondary Horizontal (T18)	8.8	Pass
						Top Girt (T18)	43.2	Pass
						Bottom Girt (T1)	29.1	Pass
						Pole Socket (T1)	35.2	Pass
						RATING =	**96.8**	**Pass**

Site Information:

Location: **Wallingford, CT**

Tower Leg Reactions (Factored from TNX):

Overall Reactions:

Download: $P_{overall} := 15.9kip$

Shear: $V_{overall} := 15.6kip$

Moment: $M_{overall} := 886kip \cdot ft$

Corner Reactions:

Compression: $P_c := 209.9kip$

Tension: $P_t := 199.6kip$

Shear: $V_F := 9.2kip$

Soil Parameters:

Ultimate Net Bearing Capacity:	$q_{net} := 10000psf$	(per old SA)
Internal Friction Angle:	$\phi := 30deg$	(per old SA)
Unit Weight of Soil:	$\gamma_{soil} := 100pcf$	(per old SA)
Depth to be neglected:	$L_{gnl} := 2.25ft$	(per old SA)

Material Parameters:

Unit Weight of Concrete:	$\gamma_{conc} := 150pcf$
Concrete Compressive Strength:	$f_c := 3ksi$
Steel Yield Strength:	$f_y := 60ksi$

Strength Reduction Factor:

$\phi_{s\_bearing} := 0.75$	as per 9.4.1 from TIA-222-G code for bearing
$\phi_{s\_friction} := 0.75$	as per 9.4.1 from TIA-222-G code for skin friction resistance
$\phi_{s\_lateral} := 0.75$	as per 9.4.1 from TIA-222-G code for lateral resistance
$\phi_{s\_uplift} := 0.75$	as per 9.4.1 TIA-222-G code for lateral resistance

Foundation Parameters:

Tower Face Width:	$Width_{tower} := 5ft$	
Tower Height:	$Height_{tower} := 90ft$	
Tower Eccentricity from the centriod of mat foundation:	$e_{tower} := 0in$	(Assumed)
Length of Mat:	$L_{mat} := 14ft$	
Width of Mat:	$W_{mat} := 14ft$	
Depth of Mat:	$D_{mat} := 4.5ft$	
Thickness of Mat:	$T_{mat} := 8.25ft$	
Pedestal Diameter:	$D_{ped} := 0ft$	
No. of Pedestals:	$N_{ped} := 0$	
Extension Above Grade:	$E_g := T_{mat} - D_{mat} = 3.8\,ft$	

Reinforcement Parameters:

Typical concrete cover	$cc := 3in$
Vertical rebar size	$d_{bar} := 1$
Tiebar size	$d_{tie} := 1$

Mat Foundation Resist Moment Calculation: (0.9D + 1.6W + 1.6H)

Passive Pressure: $K_p := \tan\left(45\cdot\text{deg} + \frac{\phi}{2}\right)^2$ $K_p = 3$

$P_{pave} := \frac{(L_{gnl})\cdot K_p\cdot\gamma_{soil} + (D_{mat} - L_{gnl})\cdot K_p\cdot\gamma_{soil}}{2}$ $P_{pave} = 0.7\cdot\text{ksf}$

1) Resistance Moment - Concrete Weight:

$Wt_{conc} := L_{mat}\cdot W_{mat}\cdot T_{mat}\cdot\gamma_{conc} + \frac{\pi\cdot D_{ped}^2}{4}\cdot(D_{mat} - D_{mat})\cdot N_{ped}\cdot\gamma_{conc} = 242.5\cdot\text{kip}$

$Arm_{conc} := \frac{L_{mat}}{2} = 7\,\text{ft}$

$ROTM_c := Wt_{conc}\cdot Arm_{conc} = 1697.8\cdot\text{kip}\cdot\text{ft}$

2) Resistance Moment - Soil Weight:

$Wt_{soil} := \left(L_{mat}\cdot W_{mat} - \frac{\pi\cdot D_{ped}^2}{4}\cdot N_{ped}\right)\cdot(D_{mat} - D_{mat})\cdot\gamma_{soil} = 0\cdot\text{kip}$

$Arm_{soil} := \frac{L_{mat}}{2} = 7\,\text{ft}$

$ROTM_s := Wt_{soil}\cdot Arm_{soil} = 0\cdot\text{kip}\cdot\text{ft}$

3) Resistance Moment - Soil Wedge:

$Wt_{soilwedge} := \frac{1}{2}\cdot\tan(\phi)\cdot D_{mat}^2\cdot W_{mat}\cdot\gamma_{soil} = 8.2\cdot\text{kip}$

$Arm_{soilw} := \frac{L_{mat}}{2} + \frac{D_{mat}\cdot\tan(\phi)}{3} = 7.9\,\text{ft}$

$ROTM_{sw} := Wt_{soilwedge}\cdot Arm_{soilw} = 64.4\cdot\text{kip}\cdot\text{ft}$

4) Resistance Moment - Soil Passive Pressure:

$F_{pave} := P_{pave} \cdot (D_{mat} - L_{gnl}) \cdot W_{mat} = 21.3 \cdot kip$

$Arm_{pave} := \frac{D_{mat} - L_{gnl}}{3} + L_{gnl} = 3\ ft$ (estimated)

$ROTM_{pave} := F_{pave} \cdot Arm_{pave} = 63.8 \cdot kip \cdot ft$

5) Resistance Moment - Tower Vertical load

$F_{tower} := P_{overall} = 15.9 \cdot kip$

$Arm_{vert} := \frac{L_{mat}}{2} - e_{tower} = 7\ ft$

$ROTM_{vert} := F_{tower} \cdot Arm_{vert} = 111.3 \cdot kip \cdot ft$

Total Resistance Moment:

$Mr_{total} := 0.9ROTM_c + 0.9ROTM_s + 0.9ROTM_{sw} + 1.6ROTM_{pave} + ROTM_{vert} = 1799.4 \cdot kip \cdot ft$

Mat Foundation Overturning Moment Calculation:

$OTM := M_{overall} = 886\ kip \cdot ft$

Mat Foundation Overturning Moment Check:

Overturning Check:

$$Check := \begin{cases} \text{"OK"} & \text{if } Mr_{total} \geq OTM \\ \text{"NOT GOOD"} & \text{otherwise} \end{cases} = \text{"OK"}$$

$Check = \text{"OK"}$

Usage:

$Usage := \frac{OTM}{Mr_{total}}$ $Usage = 49.2 \cdot \%$

Mat Foundation Bearing Check: (0.9D + 1.6W + 1.6H)

Vertical Force:

$F_1 := 0.9Wt_{conc} + 0.9 \cdot Wt_{soil} + 0.9 \cdot Wt_{soilwedge} + F_{tower} = 241.6 \cdot kip$

$e := \frac{L_{mat}}{2} - \frac{OTM}{F_1} = 3.3\,ft$ $\qquad$ $L_{loc} := \frac{L_{mat}}{6} = 2.3\,ft$

$P_{max1} := if\left[e \le L_{loc}, \frac{F_1}{L_{mat} \cdot W_{mat}} \cdot \left[1 + \left(6 \cdot \frac{e}{L_{mat}}\right)\right], 4 \cdot \frac{F_1}{3 \cdot W_{mat} \cdot (L_{mat} - 2 \cdot e)}\right] = 3136.2 \cdot psf$

$F_2 := 0.9Wt_{conc} \cdot \frac{\gamma_{soil}}{\gamma_{conc}}$

$P_2 := \frac{F_2}{L_{mat} \cdot W_{mat}} = 742.5 \cdot psf$

$P_{net} := P_{max1} - P_2 = 2393.7 \cdot psf$

$P_{min1} := if\left[e \le L_{loc}, \frac{F_1}{L_{mat} \cdot W_{mat}} \cdot \left[1 - \left(6 \cdot \frac{e}{L_{mat}}\right)\right], 0\right] = 0 \cdot psf$

Bearing Check:

$Check := \begin{cases} \text{"OK"} & \text{if } \phi_{s\_bearing} \cdot q_{net} \ge P_{net} \\ \text{"NOT GOOD"} & \text{otherwise} \end{cases} = \text{"OK"}$

Check = "OK"

Usage:

$Usage := \frac{P_{net}}{\phi_{s\_bearing} \cdot q_{net}}$ $\qquad$ Usage = 31.9·%

Tower Anchor Bolts Check:

Axial Load on Tower Leg: $P_{up} := P_t = 199.6\,kip$

Axial Load on Tower Leg: $P_{down} := P_c = 209.9\,kip$

Shear Load on Tower Leg under Max. Tension: $V_{sh} := V_F = 9.2\,kip$

$\eta := 0.55$ (TIA 222-G Section 4.9.9, Type c)

$\phi := 0.8$ (TIA 222-G Section 4.9.9)

Anchor Bolts Size: $d_{bolt} := 1.75in$ (Per old SA)

Anchor Bolts Number per leg: $n_{bolt} := 2$

Anchor Bolts Grade: $F_{nt} := 80ksi$ (Assume to be A36 per old SA)

Design Tensile Strength for anchor bolts: $R_{nt} := F_{nt} \cdot 0.75 \cdot \frac{\pi}{4} \cdot \left(d_{bolt}\right)^2 = 144.3 \cdot kip$ (TIA 222-G Section 4.9.6.1)

Anchor Rods Check: (TIA 222-G Section 4.9.9)

$$Test := \begin{cases} \text{"GOOD"} & \text{if } \dfrac{\left(\dfrac{P_{up}}{n_{bolt}} + \dfrac{V_{sh}}{\eta \cdot n_{bolt}}\right)}{\phi \cdot R_{nt}} \le 1 \\ \text{"No Good"} & \text{otherwise} \end{cases}$$

Test = "GOOD"

$$Usage := \frac{\left(\dfrac{P_{up}}{n_{bolt}} + \dfrac{V_{sh}}{\eta \cdot n_{bolt}}\right)}{\phi \cdot R_{nt}} = 93.7 \cdot \%$$

EXHIBIT 4

MASER CONSULTING
— CONNECTICUT —

Engineers Planners Surveyors Landscape Architects Environmental Scientists

Antenna Mount Analysis

FOR

CT2168 – MT. Tom Wallingford

FA #: 10035084
23 Wayne Road
Wallingford, CT 06492
New Haven County

LTE 5G NR Upgrade – MRCTB032262
LTE 6C – MRCTB032233
LTE 7C – MRCTB032242

Mount Utilization: 220%

November 30, 2018

Prepared For

AT&T
550 Cochituate Road
Framingham, MA 01701

Prepared By

Maser Consulting Connecticut
331 Newman Springs Road, Suite 203
Red Bank, NJ 07701
T: 732.383.1950

STATE OF CONNECTICUT
PETROS TSOUKALAS
25577
REGISTERED PROFESSIONAL ENGINEER

Petros T. Tsoukalas, P.E.
Geographic Discipline Leader
Connecticut License No. 25577

MC Project No. 18963007A

Objective:

The objective of this report is to determine the capacity of the existing antenna support mount at the subject facility for the final wireless telecommunications configuration, per the applicable codes and standards.

Introduction:

Maser Consulting Connecticut has performed limited field observations on May 14, 2018 to verify the existing condition of the structure and to locate and quantify the existing wireless appurtenances where possible, from ground level. Maser Consulting Connecticut has reviewed the following documents in completing this report:

- Mount Mapping provided by Tower Engineering Professionals (TEP # 146598.192991), dated November 2, 2018
- RFDS 2346933 version 2.00 provided by Empire, dated June 14, 2018.

The proposed **AT&T** equipment is to be supported on an existing antenna support mount constructed of structural steel antenna support pipes supported by steel angles at a centerline of approximately 78'-0" above ground level. This report is based only upon this information.

Codes, Standards and Loading:

Maser Consulting Connecticut utilized the following codes and standards:

- 2018 Connecticut State Building Code, Incorporating the 2015 International Building Code
- Structural Standards for Antenna Supporting Structures and Antennas ANSI/TIA-222-G
    - Ultimate Wind Speed – 125 mph (3 Second Gust)
    - Basic Wind Speed – 97 mph (3 Second Gust)
    - Exposure Category – B
    - Structural Class – II
    - Topographic Category – 3
    - Crest Height – 350 ft
    - Ice Wind – 50 mph
    - Ice Thickness – 0.75"
    - Maintenance Wind Speed – 30 mph
        - Maintenance Live Load – 250 lbs. (Man live load applied individually at midpoint & cantilevered ends of horizontal members)
        - Maintenance Live Load – 500 lbs. (Man live load applied individually at mount pipe locations)
- Specification for Structural Steel Buildings ANSI/AISC 360-10, American Institute of Steel Construction (AISC)

Loading used in this analysis is found in Appendix A of this report.

Analysis Approach & Assumptions:

The analysis approach used in this structural analysis is based on the premise that if the existing antenna support mount is structurally adequate to support the proposed equipment per the aforementioned codes and standards, or if the increase in the forces in the structure is deemed to be negligible or acceptable, then the proposed equipment can be installed as intended.

The existing angle mount has been modeled in RISA-3D, a comprehensive structural analysis program. The program performs design checks of structures under user specified loads. The user specified loads have been calculated separately based on the requirements of the above referenced codes. The program performs an analysis based on the steel code to determine the adequacy of the members, and produces the reactions at the connection points of the mounts to the existing structure. Additional calculations were then prepared to analyze the mount connection points with the proposed loading conditions.

General Site Design Assumption:

- All engineering services are performed on the basis that the information used is current and correct.
- It is assumed that the telecommunication equipment supports, antenna supports, and existing structure have been designed by a registered licensed professional engineer for the existing loads acting on the structure, as required by all applicable codes, prior to the proposed modifications listed within this report, if any.
- It is assumed that information provided by the client regarding the structure itself, the antenna models, feed lines, and other relevant information is current and correct.
- It is the responsibility of the client to ensure that the information provided to Maser Consulting Connecticut and used in the performance of our engineering services is correct and complete. In the absence of information to the contrary, we assume that the original design, material production, fabrication, and erection of the existing structure was performed in accordance with accepted industry design standards and in accordance with all applicable codes. Further, it is assumed that the existing structure and appurtenances have been properly maintained in accordance with all applicable codes and manufacturer's specifications and no structural defects and/or deterioration to the structural members has occurred.
- It is assumed all other existing appurtenances, antennas, cables, etc. belonging to others have been installed and supported per code and per specifications so as not to damage any existing structural support members, and that any contributing loads from adjacent equipment has been taken into consideration for their design.
- All services are performed, results obtained, and recommendations made in accordance with generally accepted engineering principles and practices. Maser Consulting Connecticut is not responsible for the conclusion, opinions, and recommendations made by others based on the information we supply.

Site Specific Design Parameters:

The following design parameters have been utilized in this report:

- *Structural Steel Angles are constructed of A36 Steel*
- *Structural Steel Pipes are constructed of A53 Grade B Steel*
- *The proposed 80010965 antenna shall be mounted in position 3 in all sectors on a proposed 10' long 2.0 STD pipe mast*
- *The existing RRUS-11 and RRUS-32 shall be relocated to proposed Unistrut frame behind the antennas*
- *The proposed RRUS 4426 B66, RRUS 4478 B5 and RRUS 4478 B14 shall be mounted on a proposed Unistrut frame behind the antennas*
- *The proposed DC6 surge suppressor shall be installed on existing tower leg*

Calculations:

The calculations are found in Appendix A of this report.

Conclusion:

Maser Consulting Connecticut has determined the existing antenna support mount has **INADEQUATE** structural capacity to support the proposed loading. The existing antenna support mount has been determined to be stressed to a maximum of **220%** of its structural capacity with the maximum usage occurring at the L3x3x1/4 Standoff arm. The connection has been determined to be stressed to a maximum of **284.9%** of its structural capacity. We have investigated multiple simple reinforcement modifications and found that the mount requires more extensive reinforcement which is outside the scope of this analysis. Therefore, the proposed **AT&T** installation **CANNOT** be installed as intended. Maser Consulting recommends replacing the existing mount for a larger face mount to accommodate proposed antenna spacing clearances.

The conclusions reached by Maser Consulting Connecticut in this evaluation are only applicable for the structural members supporting the **AT&T** telecommunications installation described herein. Further, no structural qualifications are made or implied by this document for the existing structure. The mount was checked up to, and including, the bolts that fasten it to the mount attachment. However, no structural qualifications are made or implied by this document for the mount attachment.

Maser Consulting Connecticut reserves the right to amend this report if additional information about the existing members is provided. The conclusions reached by Maser Consulting Connecticut in this report are only valid for the appurtenances listed in this report. Any change to the installation will require a revision to this structural analysis.

We appreciate the opportunity to be of service on this project. If you should have any questions or require any additional information, please do not hesitate to call our office.
Sincerely,

Maser Consulting Connecticut

Petros E. Tsoukalas, P.E.
Geographic Discipline Leader

Pedro Sabillon
Project Engineer

R:\AllOffices\MtLaurel\Projects\2018\18963000A\18963007A\Structural\Mount Analysis\Rev 0\Word\Antenna Mount Analysis - Maser Consulting Connecticut.docx

APPENDIX A

Client:	ATT	Computed By:	PS
Site Name:	Mt. Tom Wallingford	Date:	11/30/2018
Project No.	18963007A	Verified By:	SMS
Title:	Antenna Mount Analysis	Page:	1

Version 4.0

LOADING SUMMARY

Quantity	Manufacturer	Antenna/ Appurtenance	Status	Sector	
3	POWERWAVE	7770	Existing	Alpha, Beta, & Gamma	
3	CCI	OPA-65R-LCUU-H6	Existing	Alpha, Beta, & Gamma	
3	**KATHREIN**	**80010965**	**Proposed**	**Alpha, Beta, & Gamma**	
3	QUINTEL	QS66512-2	Existing	Alpha, Beta, & Gamma	
3	POWERWAVE	TT19-08BP111-001	Existing	Alpha, Beta, & Gamma	
3	ERICSSON	RRUS 11	Existing	Alpha, Beta, & Gamma	
3	ERICSSON	RRUS 32	Existing	Alpha, Beta, & Gamma	
3	**ERICSSON**	**RRUS 4478 B5**	**Proposed**	**Alpha, Beta, & Gamma**	
3	**ERICSSON**	**RRUS 4426 B66**	**Proposed**	**Alpha, Beta, & Gamma**	
3	**ERICSSON**	**RRUS 4478 B14**	**Proposed**	**Alpha, Beta, & Gamma**	
6	**KAELUS**	**DBCT108F1V92-1**	**Proposed**	**Alpha, Beta, & Gamma**	
1	**RAYCAP**	**DC6-48-60-18-8C**	**Proposed**	**Gamma**	(On Tower)
2	RAYCAP	DC6-48-60-18-8F	Existing	Alpha & Beta	(On Tower)

Client:	ATT	Computed By:	PS
Site Name:	Mt. Tom Wallingford	Date:	11/30/2018
Project No.	18963007A	Verified By:	SMS
Title:	Antenna Mount Analysis	Page:	2

I. DESIGN INPUTS

Calculations for gravity and lateral loading on equipment and support mounts are determined as per the ANSI/TIA-222-G Code, Addendum 2

Wind Load Inputs Parameters

				Reference	Equation
Antenna Centerline	z	78	ft		
Ultimate Wind Speed	V_U	125	mph		
Nominal Wind Speed (3 sec. Gust):	V	97	mph	Ref. 1, Eqn. 16-33	
Nominal Wind Speed with Ice (3 sec. gust):	V_i	50.0	mph	(Figure a5-2a, p. 233)	
Maintenance Wind Speed:	V_m	30.0	mph		
Service Wind Speed:	V_s	60.0	mph	(Figure a5-2a, p. 233)	
Design Ice Thickness:	t_i	0.75	in	(Figure A1-2a, p. 233)	
Exposure Category:		C		Ref. 3, Section 2.6.5.1	
Structure Class:		II		Ref. 3, Table 2-1	
Gust Effect Factor:	G_h	0.85		Ref. 3, Section 2.6.7	
Wind Directionality Factor:	K_d	0.85		Ref. 3, Table 2-2	
Topographic Category:		3		Ref. 3, Section 2.6.6.2	
Height of Crest Above Surrounding Terrain	H	350			

Wind Load Coefficients

Importance Factors:

			Reference
Non-Iced:	I	1	Ref. 3, Table 2-3
Iced:	I_{ice}	1	(Table 2-3, P. 39)

Exposure Category Coefficients:

				Reference	Equation
3-s Gust-Speed Power Law Exponent:	α	9.5		Ref. 3, Table 2-4	
Nominal Height of the Atmospheric Boundary Layer:	Z_g	900	ft	Ref. 3, Table 2-4	
Min. Value for k_z:	Kz_{min}	0.85		Ref. 3, Table 2-4	
Terrain Constant:	K_e	1.00		Ref. 3, Table 2-4	
Velocity Pressure Exposure Coefficient:	K_z	1.201		Ref. 3, Section 2.6.5.2	$=2.01\cdot(z/z_g)^{2/\alpha}$

Topographic Category Coefficients:

				Reference	Equation
Topographic Constant:	K_t	0.53		Ref. 3, Table 2-5	
Height Attenuation Factor:	f	2		Ref. 3, Table 2-5	
Height Reduction Factor:	K_h	1.56161		Ref. 3, Section 2.6.6.4	$=e^{(f\cdot z/H)}$
Topographic Factor:	K_{zt}	1.79		Ref.3, Section 2.6.6.4	$=[1+(K_e\cdot K_t/K_h)]^2$

Ice Accumulation:

				Reference	Equation
Ice Velocity Pressure Exposure Coefficient:	K_{iz}	1.09			$=(z/33)^{0.10}$
Factored Ice Thickness:	t_{iz}	2.01	in	(Section 2.6.8, p. 16)	$=2.0\cdot t_i\cdot I\cdot K_{iz}\cdot K_{zt}$
Ice Density:	ρ_i	56.00	pcf		

Design Wind Pressures:

				Reference	Equation
Velocity Pressure:	q_z	43.96	psf	Ref. 3, Section 2.6.9.6	$=0.00256\cdot K_z\cdot K_{zt}\cdot K_d\cdot V^2\cdot I$
Velocity Pressure (With Ice):	q_{zi}	11.72	psf	(Section 2.6.9.6, P. 25)	$=.00256\cdot K_z\cdot K_{zt}\cdot K_d\cdot V_i^2\cdot I$
Velocity Pressure (Maintenance):	q_{zm}	4.22	psf	(Section 2.6.9.6, P. 25)	$=.00256\cdot K_z\cdot K_{zt}\cdot K_d\cdot V_m^2\cdot I$
Velocity Pressure (Service):	q_{zs}	16.88	psf	(Section 2.6.9.6, P. 25)	$=.00256\cdot K_z\cdot K_{zt}\cdot K_d\cdot V_i^2\cdot I$

Client:	ATT	Computed By:	PS
Site Name:	Mt. Tom Wallingford	Date:	11/30/2018
Project No.	18963007A	Verified By:	SMS
Title:	Antenna Mount Analysis	Page:	3

II. CALCULATIONS

- ***Wind Load on Appurtenances***

Dimensions and Force Coefficients

Antenna/ Appurtenance	Non-Iced Condition								Iced Condition							
	Mounting Pipe			Equipment			Force Coefficient		Mounting Pipe			Equipment			Force Coefficient	
	Length (in)	Diameter (in)	Force Coefficient C_a	Height (in)	Width (in)	Depth (in)	$C_{a\ Front}$	$C_{a\ Side}$	Length (in)	Diameter (in)	Force Coefficient C_a	Height (in)	Width (in)	Depth (in)	$C_{a\ Front}$	$C_{a\ Side}$
7770	72.0	2.375	1.200	55.00	11.00	5.00	1.31	1.53	76.0	6.4	0.909	59.01	15.01	9.01	1.26	1.38
OPA-65R-LCUU-H6	72.0	2.375	1.200	72.30	14.40	7.30	1.31	1.50	76.0	6.4	0.909	76.31	18.41	11.31	1.27	1.39
80010965	120.0	2.375	1.200	78.70	20.00	6.90	1.26	1.55	124.0	6.4	1.076	82.71	24.01	10.91	1.24	1.42
QS66512-2	72.0	2.375	1.200	72.00	12.00	9.60	1.36	1.42	76.0	6.4	0.909	76.01	16.01	13.61	1.30	1.34
TT19-08BP111-001	0.0	0.000	0.000	9.90	6.70	5.40	1.20	1.20	0.0	0.0	0.000	13.91	10.71	9.41	1.20	1.20
RRUS 11	0.0	0.000	0.000	19.70	17.00	7.20	1.20	1.21	0.0	0.0	0.000	23.71	21.01	11.21	1.20	1.20
RRUS 32	0.0	0.000	0.000	27.20	12.00	7.00	1.20	1.26	0.0	0.0	0.000	31.21	16.01	11.01	1.20	1.21
RRUS 4478 B5	0.0	0.000	0.000	16.50	13.40	7.70	1.20	1.20	0.0	0.0	0.000	20.51	17.41	11.71	1.20	1.20
RRUS 4426 B66	0.0	0.000	0.000	14.96	13.20	5.90	1.20	1.20	0.0	0.0	0.000	18.97	17.21	9.91	1.20	1.20
RRUS 4478 B14	0.0	0.000	0.000	18.10	13.40	8.30	1.20	1.20	0.0	0.0	0.000	22.11	17.41	12.31	1.20	1.20

Antenna/ Appurtenance	# of Brackets	Non-Iced Condition			Iced Condition			Maintenance Condition	
		Wind Force (lbs.)		Gravity (lbs.)	Wind Force (lbs.)		Gravity (lbs.)	Wind Force (lbs.)	
		F_N	F_T		F_N	F_T		F_N	F_T
7770	2	109.2	81.3	**17.5**	43.2	40.6	**84.9**	10.5	7.8
OPA-65R-LCUU-H6	2	177.2	129.1	**34.8**	61.9	56.7	**141.4**	17.0	12.4
80010965	2	273.3	153.3	**54.3**	96.3	73.8	**195.6**	26.2	14.7
QS66512-2	2	151.9	153.7	**63.3**	54.7	63.1	**134.8**	14.6	14.8
TT19-08BP111-001	1	20.7	16.6	**21.0**	12.4	10.9	**30.1**	2.0	1.6
RRUS 11	2	52.1	22.3	**27.9**	20.7	11.0	**49.6**	5.0	2.1
RRUS 32	2	50.8	31.2	**26.5**	20.7	14.4	**50.7**	4.9	3.0
RRUS 4478 B5	2	34.4	19.8	**30.0**	14.8	10.0	**36.6**	3.3	1.9
RRUS 4426 B66	2	30.7	13.8	**24.3**	13.6	7.8	**31.9**	3.0	1.3
RRUS 4478 B14	2	37.8	23.4	**29.7**	16.0	11.3	**40.1**	3.6	2.2
DBCT108F1V92-1	1	22.6	23.8	**28.7**	13.2	13.6	**35.6**	2.2	2.3

** ALL CALCULATED LOADS ARE PER MOUNTING BRACKET. TO GET THE TOTAL EQUIPMENT LOAD, MULTIPLY THE INDIVIDUAL LOADS BY THE NUMBER OF BRACKETS*

- ***Wind Load on Framing Members***

Member Category	Member Shape	Length (in)	Member Surface	Non-Iced Condition			Iced Condition						Maintenance Condition
				Exposed Wind Height (in)	Force Coefficient C_a	Wind Load (plf)	Exposed Wind Height (in)	Depth (in)	Length (in)	Force Coefficient C_a	Wind Load (plf)	Ice Weight (plf)	Wind Load (plf)
Equal Angle	L3x3	102	Square	3.00	2.00	18.68	7.01	7.01	106.01	1.67	9.72	15.31	1.79
Equal Angle	L3x3	32	Square	3.00	1.52	14.22	7.01	7.01	36.01	1.32	7.67	15.31	1.36
Pipe	Pipe 2.0	72	Round	2.38	1.20	8.87	6.39	6.39	76.01	0.91	4.82	10.74	0.85

BASIC EQUATIONS

ANSI/TIA-222-G Reference

Importance Factor:

$$I := \begin{cases} 1.0 & \text{if Class} = \text{"II"} \\ 1.15 & \text{if Class} = \text{"III"} \end{cases}$$

Table 2-3, Pg. 39

Force Coefficient:
(Square)

$$C_{f\_square}(h, w) := \begin{cases} 1.2 & \text{if } \frac{h}{w} \le 2.5 \\ \left[1.2 + \frac{0.2}{4.5} \cdot \left(\frac{h}{w} - 2.5\right)\right] & \text{if } \frac{h}{w} > 2.5 \wedge \frac{h}{w} \le 7 \\ \left[1.4 + \frac{0.6}{18} \cdot \left(\frac{h}{w} - 7\right)\right] & \text{if } \frac{h}{w} > 7 \wedge \frac{h}{w} \le 25 \\ 2.0 & \text{otherwise} \end{cases}$$

Table 2-8, P. 42

Force Coefficient:
(Round)

$$C_{f\_round}(h, w) := \begin{cases} 0.7 & \text{if } \frac{h}{w} \le 2.5 \\ \left[0.7 + \frac{0.1}{4.5} \cdot \left(\frac{h}{w} - 2.5\right)\right] & \text{if } \frac{h}{w} > 2.5 \wedge \frac{h}{w} \le 7 \\ \left[0.8 + \frac{0.4}{18} \cdot \left(\frac{h}{w} - 7\right)\right] & \text{if } \frac{h}{w} > 7 \wedge \frac{h}{w} \le 25 \\ 1.2 & \text{otherwise} \end{cases}$$

Table 2-8, P. 42

Terrain Exposure Constants:

Table 2-4, P. 40

$$\alpha := \begin{cases} 7.0 & \text{if Exp} = \text{"B"} \\ 9.5 & \text{if Exp} = \text{"C"} \\ 11.5 & \text{if Exp} = \text{"D"} \end{cases} \quad Z_g := \begin{cases} 1200\text{ft} & \text{if Exp} = \text{"B"} \\ 900\text{ft} & \text{if Exp} = \text{"C"} \\ 700\text{ft} & \text{if Exp} = \text{"D"} \end{cases} \quad K_{zmin} := \begin{cases} 0.70 & \text{if Exp} = \text{"B"} \\ 0.85 & \text{if Exp} = \text{"C"} \\ 1.03 & \text{if Exp} = \text{"D"} \end{cases}$$

Client:	ATT	Computed By:	PS
Site Name:	Mt. Tom Wallingford	Date:	11/30/2018
Project No.	18963007A	Verified By:	SMS
Title:	Antenna Mount Analysis	Page:	5

BASIC EQUATIONS

ANSI/TIA-222-G Reference

Velocity Pressure Coefficient:

$$Kz(z) := \left| \begin{array}{l} K_z \leftarrow \max\left[2.01 \cdot \left(\frac{z}{Z_g} \right)^{\frac{2}{\alpha}}, K_{zmin} \right] \\ K_z \leftarrow \min\left(K_z, 2.01 \right) \end{array} \right.$$

$K_z := Kz(z)$ — Section 2.6.5, P. 13

$$Kzt(z) := K_{zt} \leftarrow \left| \begin{array}{ll} 1.0 \text{ if } Topo = "1" & \text{Section 2.6.6.4, p. 14} \\ \text{otherwise} & \\ \quad K_e \leftarrow \left| \begin{array}{ll} 0.90 \text{ if } Exp = "B" & \text{Table 2-4 p. 40} \\ 1.00 \text{ if } Exp = "C" & \\ 1.10 \text{ if } Exp = "D" & \end{array} \right. & \\ \quad K_t \leftarrow \left| \begin{array}{ll} 0.43 \text{ if } Topo = "2" & \text{Table 2-5 p. 40} \\ 0.53 \text{ if } Topo = "3" & \\ 0.72 \text{ if } Topo = "4" & \end{array} \right. & \\ \quad f \leftarrow \left| \begin{array}{ll} 1.25 \text{ if } Topo = "2" & \text{Table 2-5 p. 40} \\ 2.00 \text{ if } Topo = "3" & \\ 1.50 \text{ if } Topo = "4" & \end{array} \right. & \\ \quad K_h \leftarrow e^{\left(\frac{f \cdot z}{CH} \right)} & \text{Section 2.6.6.4, P. 14} \\ \quad \left(1 + \frac{K_e \cdot K_t}{K_h} \right)^2 & \text{Section 2.6.6.4, P. 14} \end{array} \right.$$

$K_{zt} := Kzt(z)$

Velocity Pressure: — Section 2.6.9.6, P. 25

$$q_z := 0.00256 \cdot K_z \cdot K_{zt} \cdot K_d \cdot V^2 \cdot I \cdot psf$$

Client:	ATT	Computed By:	PS
Site Name:	Mt. Tom Wallingford	Date:	11/30/2018
Project No.	18963007A	Verified By:	SMS
Title:	Antenna Mount Analysis	Page:	6

LOAD EQUATIONS

WIND LOAD

Area (Normal): $AN_{area} = H_{ant} \cdot Want$

Area (Side): $AT_{area} = H_{ant} \cdot Dant$

Force Coefficient (Normal): $C_{fn} = C_{fsquare}(H_{ant}, Want)$

Force Coefficient (Side): $C_{fs} = C_{fsquare}(H_{ant}, Dant)$

Pipe Area (Normal): $AN_p = \max[(L_p - H_{ant}) * Dp, 0]$

Pipe Area (Side): $AT_p = L_p \cdot Dp$

Force Coefficient (Normal): $C_{fp} = C_{fround}(Lp, Dp)$

Normal Effective Projected Area: $E_{pan} = (C_{fn} \cdot ANarea) + (Cfp \cdot ANp)$

Side Effective Projected Area: $E_{pat} = (C_{fs} \cdot ATarea) + (Cfp \cdot ATp)$

Effective Projected Area: $EPA = max(E_{pan}, Epat)$

Wind Force: $F_{ant} = q_z \cdot Gh \cdot EPA$

ICE DEAD LOAD

Largest Out-to-Out Dimension: $D_{ant} = \sqrt{{D_{ant}}^2 + {W_{ant}}^2}$

Cross Sectional Area of Ice: $A_{ice\_ant} = \pi \cdot tiz \cdot (Dant + tiz)$

Total Ice Dead Load: $DL_{ice\_ant} = \boldsymbol{\rho_i} \cdot (Aice_{\_ant} \cdot Hant)$

ICE WIND LOAD

Dimensions: $H_{i_{ant}} = H_{ant} + 2tiz$

$W_{i_{ant}} = W_{ant} + 2tiz$

$D_{i_{ant}} = D_{ant} + 2tiz$

Area (Normal): $AIN_{area} = H_{i\_ant} \cdot W_{i\_ant}$

Area (Side): $AIT_{area} = H_{i\_ant} \cdot D_{i\_ant}$

Force Coefficient (Normal): $Ci_{fn} = C_{fsquare}(H_{i\_ant}, W_{i\_ant})$

Force Coefficient (Side): $Ci_{fs} = C_{fsquare}(H_{i\_ant}, D_{i\_ant})$

Pipe Area (Normal): $AN_p = \max[(L_{ip} - H_{i\_ant}) * D_{ip}, 0]$

Pipe Area (Side): $AT_p = L_{ip} \cdot Dip$

Force Coefficient (Normal): $C_{fp} = C_{fround}(L_{ip}, D_{ip})$

Normal Effective Projected Area: $E_{pain} = (Ci_{fn} \cdot ANarea) + (Cfp \cdot ANp)$

Side Effective Projected Area: $E_{pait} = (Ci_{fs} \cdot ATarea) + (Cfp \cdot ATp)$

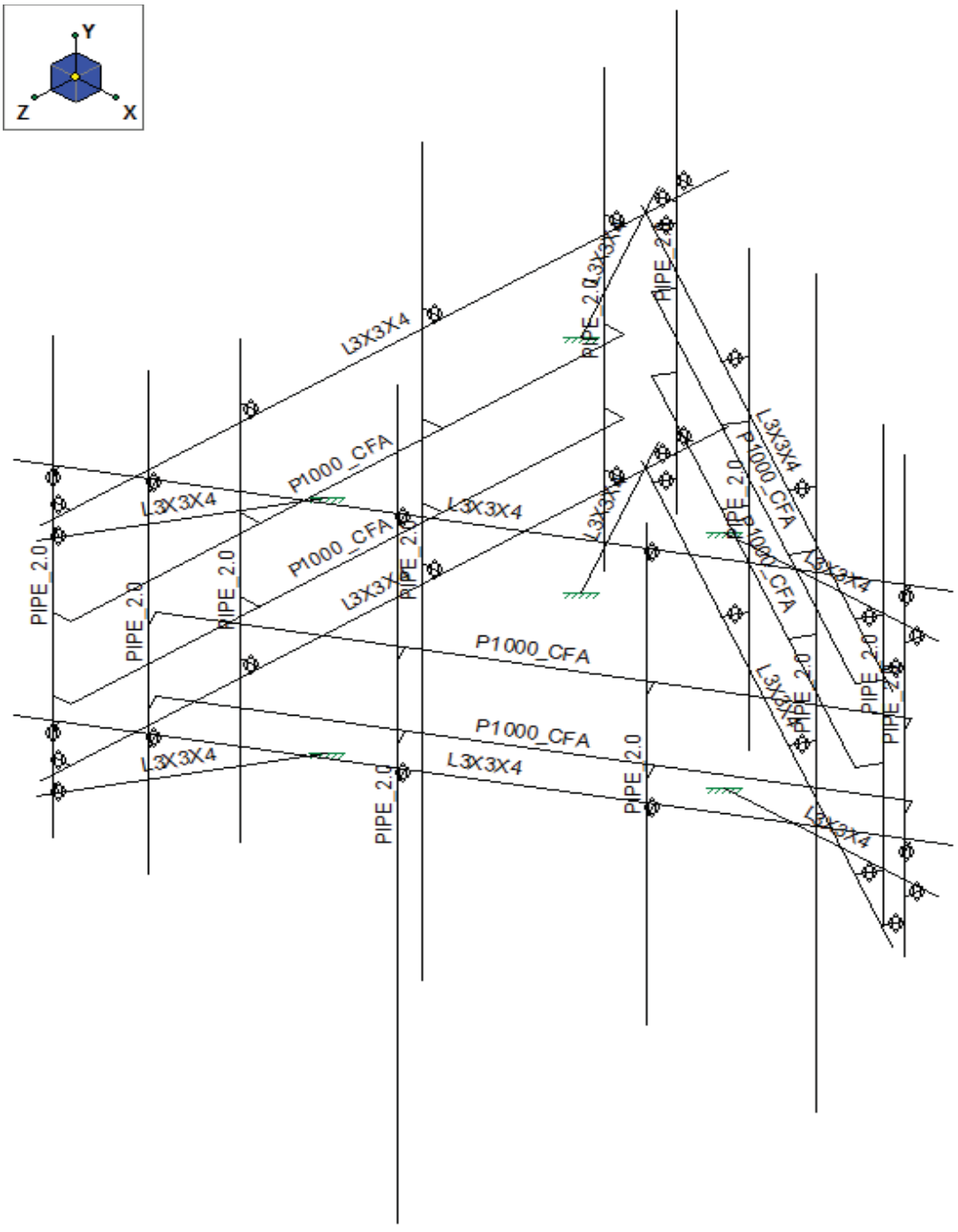
Effective Projected Area: $EPA_i = max(E_{pain}, Epait)$

Wind Force: $F_{i\_ant} = q_z \cdot Gh \cdot EPAi$

III. ATTACHMENTS

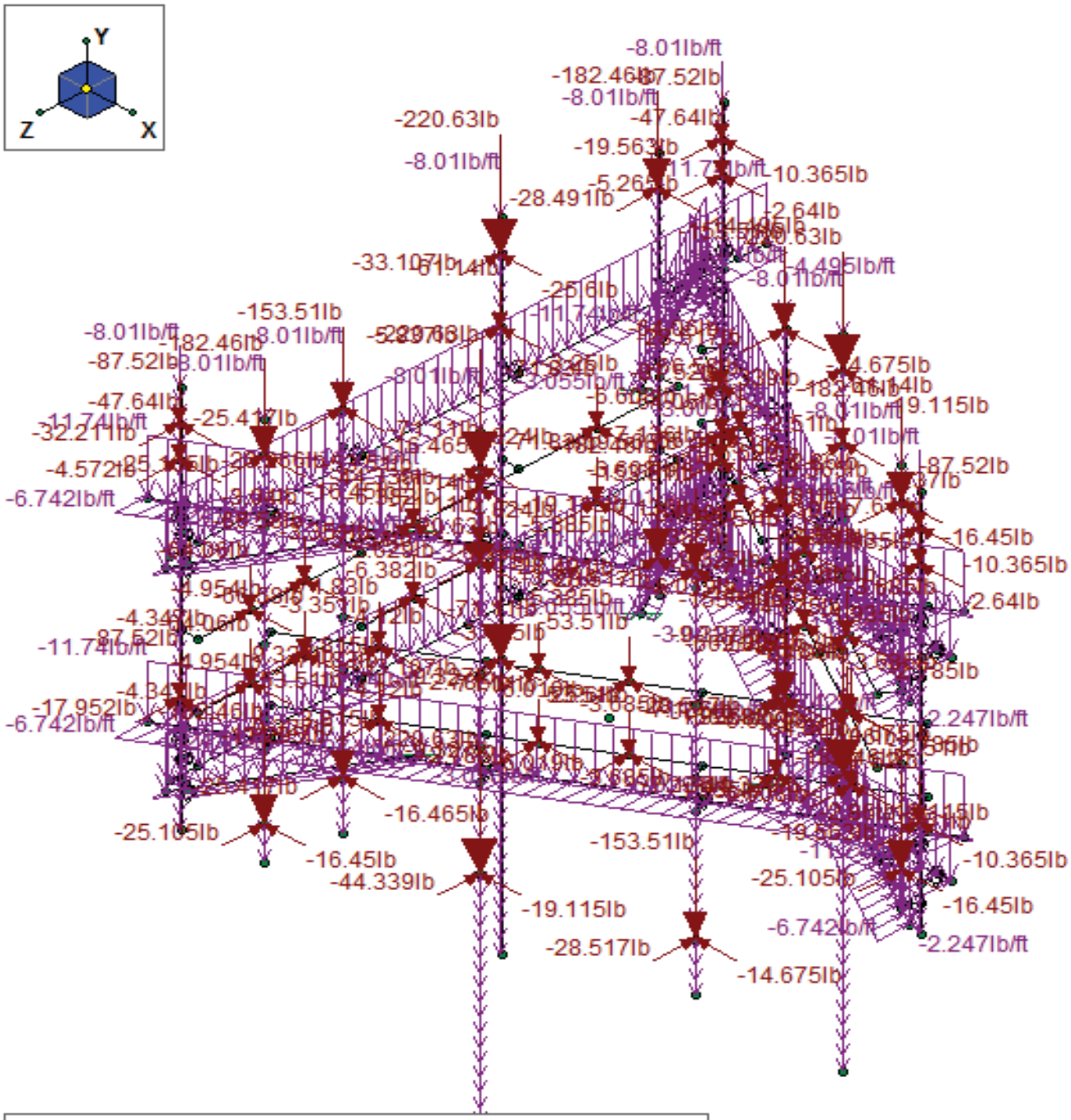
Client:	ATT	Computed By:	PS
Site Name:	Mt. Tom Wallingford	Date:	11/30/2018
Project No.	18963007A	Verified By:	SMS
Title:	Antenna Mount Analysis	Page:	8

RISA MODEL



Client:	ATT	Computed By:	PS
Site Name:	Mt. Tom Wallingford	Date:	11/30/2018
Project No.	18963007A	Verified By:	SMS
Title:	Antenna Mount Analysis	Page:	9

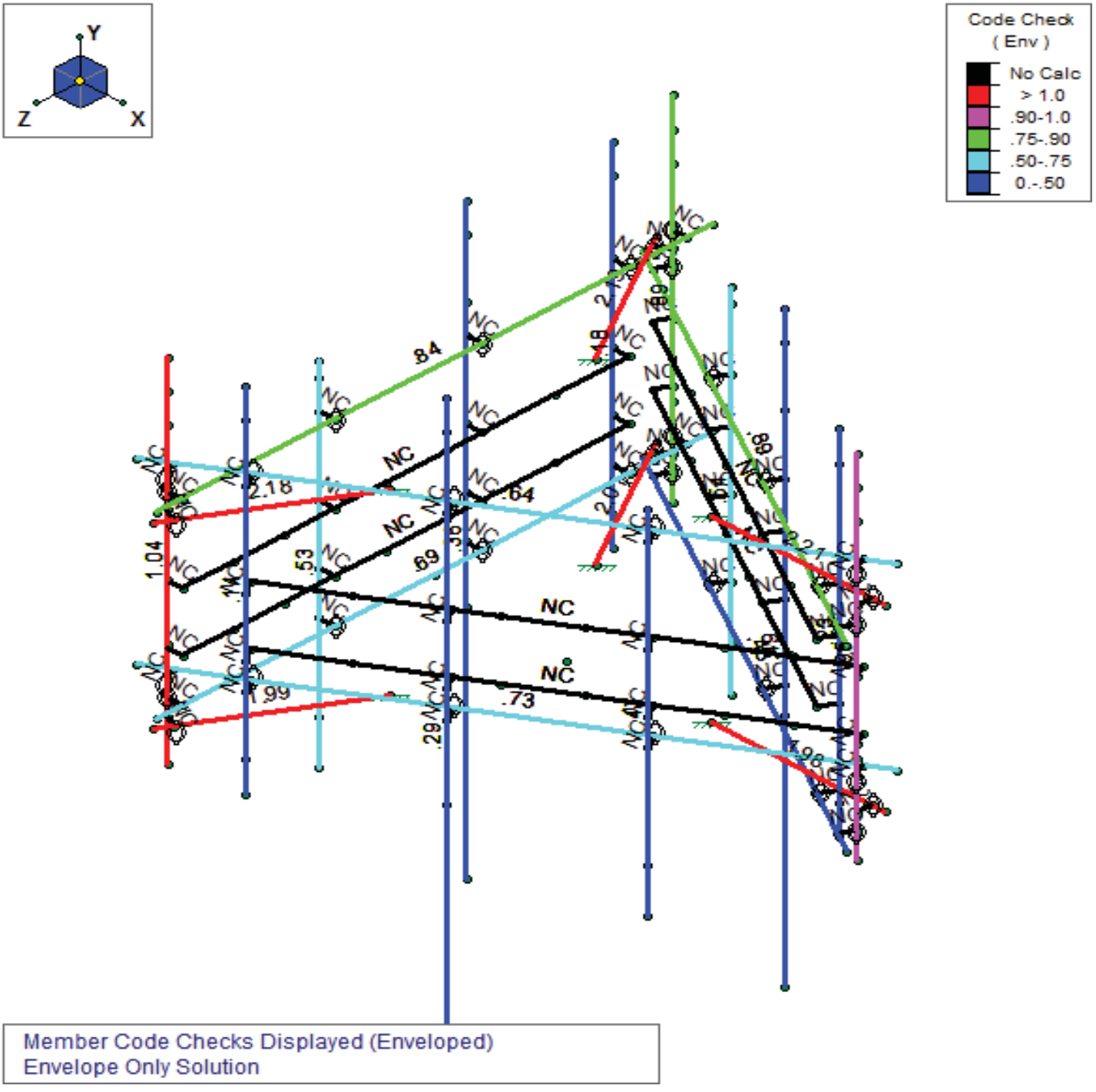
RISA WORST CASE LOADING



Loads: LC 24, 1.2D+1.0ICE+1.0W9ICE
Envelope Only Solution

Client:	ATT	Computed By:	PS
Site Name:	Mt. Tom Wallingford	Date:	11/30/2018
Project No.	18963007A	Verified By:	SMS
Title:	Antenna Mount Analysis	Page:	10

RISA CODE CHECK



Mount to Tower Connection Check:

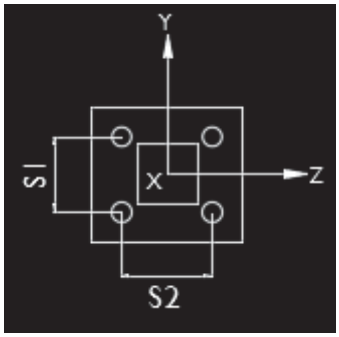
Applied Tension:	$Rx := 3653.2 \cdot lbf$	From Risa 3D LRFD Loading
Applied Shear:	$Ry := 1790.1 lbf$	From Risa 3D LRFD Loading
Applied Shear:	$Rz := 2719.6 \cdot lbf$	From Risa 3D LRFD Loading
Applied Torque:	$Mx := 827 \cdot lbf \cdot ft$	From Risa 3D LRFD Loading
Applied Moment:	$My := 2564.5 lbf \cdot ft$	From Risa 3D LRFD Loading
Applied Moment:	$Mz := 4447.3 \cdot lbf \cdot ft$	From Risa 3D LRFD Loading
Number of Bolts:	$n := 4$	Per Mapping
Bolts Vertical Spacing:	$S_1 := 3in$	Per Mapping
Bolts Horizontal Spacing:	$S_2 := 3.5in$	Per Mapping

Applied Tension at Bolt:

$$P_{a.t} := \frac{Rx}{n} + \frac{2My}{n \cdot S_2} + \frac{2Mz}{n \cdot S_1} = 14204.2\ lbf$$

Applied Shear at Bolt:

$$P_{a.v} := \frac{\sqrt{Ry^2 + Rz^2}}{n} + \frac{2Mx}{\sqrt{S_1^{\,2} + S_2^{\,2}}} = 5119.6\ lbf$$



Bolt Type Used:	**A325N**	
Nominal Tensile Stress, Fnt:	$F_{n.t} := 90ksi$	AISC, Table J3-2, P. 16.1-120
Nominal Shear Stress, Fnv:	$F_{n.v} := 54ksi$	AISC, Table J3-2, P. 16.1-120
Nominal Bolt Diameter:	$d_b := \frac{1}{2}in$	Per Mapping
Gross Area of the Bolt:	$A_{b.g} := 0.196in^2$	AISC, Table 7-18, P. 7-83
Net Area of the Bolt:	$A_{b.n} := 0.142in^2$	AISC, Table 7-18, P. 7-83
Strength Reduction Factor, ϕ:	$\phi := 0.75$	

Applied Tensile Stress:

$$F_{a.t} := \frac{P_{a.t}}{A_{b.g}} = 72.5 \cdot ksi$$

Applied Shear Stress:

$$F_{a.v} := \frac{P_{a.v}}{A_{b.g}} = 26.1 \cdot ksi$$

Combined Tension And Shear Check

Nominal Tensile Reduced Fntr

$$F_{n.t.r} := 1.3 \cdot F_{n.t} - \frac{F_{n.t}}{\phi \cdot F_{n.v}} \cdot \frac{P_{a.v}}{A_{b.g}} = 59 \cdot ksi$$

AISC Eq. J3-3a, P. 16.1-125

$$F_{n.t.r} := \begin{cases} F_{n.t.r} & \text{if } F_{n.t.r} \le F_{n.t} \\ F_{n.t} & \text{otherwise} \end{cases} = 59 \cdot ksi$$

Nominal Shear Reduced Fntv

$$F_{n.v.r} := 1.3 \cdot F_{n.v} - \frac{F_{n.v}}{\phi \cdot F_{n.t}} \cdot \frac{P_{a.t}}{A_{b.g}} = 12.2 \cdot ksi$$

AISC Eq. J3-3a, P. 16.1-125

$$F_{n.v.r} := \begin{cases} F_{n.v.r} & \text{if } F_{n.v.r} \le F_{n.v} \\ F_{n.v} & \text{otherwise} \end{cases} = 12.2 \cdot ksi$$

Available Tensile Stress:

$$F_{n.t} := \begin{cases} F_{n.t} & \text{if } \frac{F_{a.t}}{F_{n.t}} \le 30\% \\ F_{n.t.r} & \text{otherwise} \end{cases} = 58.955 \cdot ksi$$

Bolt Nominal Tensile Strength

$$R_{n.t} := F_{n.t} \cdot A_{b.g} = 11.6 \cdot kip$$

Tension Check

$$Check := \begin{cases} \text{"OK"} & \text{if } \phi \cdot R_{n.t} \ge P_{a.t} \\ \text{"NOT GOOD"} & \text{otherwise} \end{cases}$$

Check = "NOT GOOD"

Tension Ratio

$$Ratio_t := \frac{P_{a.t}}{\phi \cdot R_{n.t}} \qquad Ratio_t = 163.9 \cdot \%$$

Available Shear Stress:

$$F_{n.v} := \begin{cases} F_{n.v} & \text{if } \frac{F_{a.v}}{F_{n.v}} \le 30\% \\ F_{n.v.r} & \text{otherwise} \end{cases} = 12.224 \cdot ksi$$

Bolt Nominal Shear Strength

$$R_{n.v} := F_{n.v} \cdot A_{b.g} = 2.4 \cdot kip$$

Shear Check

$$Check := \begin{cases} \text{"OK"} & \text{if } \phi \cdot R_{n.v} \ge P_{a.v} \\ \text{"NOT GOOD"} & \text{otherwise} \end{cases}$$

Check = "NOT GOOD"

Shear Ratio

$$Ratio_v := \frac{P_{a.v}}{\phi \cdot R_{n.v}} = 284.9 \cdot \%$$

EXHIBIT 5

Radio Frequency Emissions Analysis Report

AT&T Existing Facility

Site ID: CT2168

FA#: 10035084

Mt Tom Wallingford
23 Wayne Street
Wallingford, CT 06492

December 20, 2018

Centerline Communications Project Number: 950006-161

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**24.73 %**

December 20, 2018

AT&T Mobility – New England
Attn: John Benedetto, RF Manager
550 Cochituate Road
Suite 550 – 13&14
Framingham, MA 06040

Emissions Analysis for Site: **CT2168 – Mt Tom Wallingford**

Centerline Communications, LLC ("Centerline") was directed to analyze the proposed AT&T facility located at **23 Wayne Street, Wallingford, CT**, for the purpose of determining whether the emissions from the Proposed AT&T 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 (μW/cm2). 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.

Population 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 700 and 850 MHz Bands are approximately 467 $\mu W/cm^2$ and 567 $\mu W/cm^2$ respectively. The general population exposure limit for the 1900 MHz (PCS), 2100 MHz (AWS) and 2300 MHz (WCS) 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 performed for the proposed AT&T Wireless antenna facility located at **23 Wayne Street, Wallingford, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since AT&T 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 manufactures supplied specifications, minus 10 dB, 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.

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. All power values expressed and analyzed are maximum power levels expected to be used on all radios.

All emissions values for additional carriers were taken from the Connecticut Siting Council (CSC) active MPE database. Values in this database are provided by the individual carriers themselves

For each sector the following channel counts, frequency bands and power levels were utilized as shown in *Table 1*:

Technology	Frequency Band	Channel Count	Transmit Power per Channel (W)
UMTS	850 MHz	2	30
LTE	700 MHz	4	40
LTE	2300 MHz (WCS)	4	30
LTE	700 MHz (Band 14)	4	40
LTE	850 MHz	2	40
LTE	2100 MHz (AWS)	4	30
5G	850 MHz	2	25
LTE	1900 MHz (PCS)	4	40

Table 1: Channel Data Table

The following antennas listed in *Table 2* were used in the modeling for transmission in the 700 MHz, 850 MHz, 1900 MHz (PCS), 2100 MHz (AWS) and 2300 MHz (WCS) frequency bands. This is based on feedback from the carrier with regards to anticipated antenna selection. Maximum gain values for all antennas are listed in the Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, 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.

Sector	Antenna Number	Antenna Make / Model	Antenna Centerline (ft)
A	1	Powerwave 7770	78
A	2	CCI OPA-65R-LCUU-H6	78
A	3	Kathrein 800-10965	78
A	4	Quintel QS66512-2	78
B	1	Powerwave 7770	78
B	2	CCI OPA-65R-LCUU-H6	78
B	3	Kathrein 800-10965	78
B	4	Quintel QS66512-2	78
C	1	Powerwave 7770	78
C	2	CCI OPA-65R-LCUU-H6	78
C	3	Kathrein 800-10965	78
C	4	Quintel QS66512-2	78

Table 2: Antenna Data

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

RESULTS

Per the calculations completed for the proposed AT&T configurations *Table 3* shows resulting emissions power levels and percentages of the FCC's allowable general population limit.

Antenna ID	Antenna Make / Model	Frequency Bands	Antenna Gain (dBd)	Channel Count	Total TX Power (W)	ERP (W)	MPE %
Antenna A1	Powerwave 7770	850 MHz	11.4	2	60	828.23	1.01
Antenna A2	CCI OPA-65R-LCUU-H6	700 MHz / 2300 MHz (WCS)	11.65 / 15.45	5	170	4,326.51	3.93
Antenna A3	Kathrein 800-10965	700 MHz (Band 14) / 850 MHz / 2100 MHz (AWS)	12.65 / 13.45 / 15.95	12	410	10,544.86	11.17
Antenna A4	Quintel QS66512-2	700 MHz / 1900 MHz (PCS)	10.85 / 13.85	6	240	4,855.52	4.14
						Sector A Composite MPE%	**20.24**
Antenna B1	Powerwave 7770	850 MHz	11.4	2	60	828.23	1.01
Antenna B2	CCI OPA-65R-LCUU-H6	700 MHz / 2300 MHz (WCS)	11.65 / 15.45	5	170	4,326.51	3.93
Antenna B3	Kathrein 800-10965	700 MHz (Band 14) / 850 MHz / 2100 MHz (AWS)	12.65 / 13.45 / 15.95	12	410	10,544.86	11.17
Antenna B4	Quintel QS66512-2	700 MHz / 1900 MHz (PCS)	10.85 / 13.85	6	240	4,855.52	4.14
						Sector B Composite MPE%	**20.24**
Antenna C1	Powerwave 7770	850 MHz	11.4	2	60	828.23	1.01
Antenna C2	CCI OPA-65R-LCUU-H6	700 MHz / 2300 MHz (WCS)	11.65 / 15.45	5	170	4,326.51	3.93
Antenna C3	Kathrein 800-10965	700 MHz (Band 14) / 850 MHz / 2100 MHz (AWS)	12.65 / 13.45 / 15.95	12	410	10,544.86	11.17
Antenna C4	Quintel QS66512-2	700 MHz / 1900 MHz (PCS)	10.85 / 13.85	6	240	4,855.52	4.14
						Sector C Composite MPE%	**20.24**

Table 3: AT&T Emissions Levels

The Following table (*table 4*) shows all additional carriers on site and their MPE% as recorded in the CSC active MPE database for this facility along with the newly calculated maximum AT&T MPE contributions per this report. FCC OET 65 specifies that for carriers utilizing directional antennas that the highest recorded sector value be used for composite site MPE values due to their greatly reduced emissions contributions in the directions of the adjacent sectors. For this site, all three sectors have the same configuration yielding the same results on all three sectors. *Table 5* below shows a summary for each AT&T Sector as well as the composite MPE value for the site.

Site Composite MPE%	
Carrier	**MPE%**
AT&T – Max Per Sector Value	**20.24 %**
PageNet	2.87 %
Land Mobile Radio	1.07 %
Amateur Radio	0.55 %
Site Total MPE %:	**24.73 %**

Table 4: All Carrier MPE Contributions

AT&T Sector A Total:	20.24 %
AT&T Sector B Total:	20.24 %
AT&T Sector C Total:	20.24 %
Site Total:	24.73 %

Table 5: Site MPE Summary

FCC OET 65 specifies that for carriers utilizing directional antennas that the highest recorded sector value be used for composite site MPE values due to their greatly reduced emissions contributions in the directions of the adjacent sectors. *Table 6* below details a breakdown by frequency band and technology for the MPE power values for the maximum calculated AT&T sector(s). For this site, all three sectors have the same configuration yielding the same results on all three sectors.

AT&T _ Frequency Band / Technology Max Power Values (Per Sector)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu W/cm^2$)	Frequency (MHz)	Allowable MPE ($\mu W/cm^2$)	Calculated % MPE
AT&T 850 MHz UMTS – Antenna 1	2	414.12	78	5.74	850 MHz	567	1.01%
AT&T 700 MHz LTE – Antenna 2	2	584.87	78	8.11	700 MHz	467	1.74%
AT&T 2300 MHz (WCS) LTE – Antenna 2	3	1,052.26	78	21.89	2300 MHz (WCS)	1000	2.19%
AT&T 700 MHz (Band 14) LTE – Antenna 3	4	736.31	78	20.42	700 MHz	467	4.37%
AT&T 850 MHz LTE – Antenna 3	2	885.24	78	12.28	850 MHz	567	2.17%
AT&T 2100 MHz (AWS) LTE – Antenna 3	4	1,180.65	78	32.75	2100 MHz (AWS)	1000	3.28%
AT&T 850 MHz 5G – Antenna 3	2	553.27	78	7.67	850 MHz	567	1.35%
AT&T 700 MHz LTE – Antenna 4	2	486.47	78	6.75	700 MHz	467	1.44%
AT&T 1900 MHz (PCS) LTE – Antenna 4	4	970.64	78	26.93	1900 MHz (PCS)	1000	2.69%
						Total:	**20.24%**

Table 6: AT&T Maximum Sector MPE Power Values

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 AT&T 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:

AT&T Sector	Power Density Value (%)
Sector A:	20.24 %
Sector B:	20.24 %
Sector C:	20.24 %
AT&T Maximum Total (per sector):	20.24 %
Site Total:	24.73 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **24.73 %** 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.

Scott Heffernan
RF Engineering Director
Centerline Communications, LLC
95 Ryan Drive, Suite 1
Raynham, MA 02767

First-Class Package International Service® is temporarily unavailable on Click-N-Ship®. Please select a different Service Type or visit a Post Office™ location to complete your shipment.

Create Label | Preferences | Shipping History | Address Book

Account # 161958927

Label Details

Label Number:
9405503699300415473863

SCAN® Form: 9475703699300303810544

Terms
Acceptance Cutoff: 02/12/2019 4:30 PM
Acceptance Time: 02/19/2019 1:33 PM
Scheduled Date: 02/14/2019 11:59 PM
Delivery Status: Delivered, Left with Individual
Label Actions 2019-02-21 11:15:00.0

USPS Tracking®
Ship Again

Need help

File an insurance claim
Request A Service Refund

Return Address:
KRISTEN WHITE
EMPIRE TELECOM
16 ESQUIRE RD
N BILLERICA, MA 01862-2527
ne_sa_deliverable@empiretelecomm.com

Delivery Address:
HON. WILLIAM W DICKINSON JR.
45 S MAIN ST
RM 310
WALLINGFORD, CT 06492-4201

Package:
Ship Date: 02/12/19
Value: $50.00
Weight: 3 lbs 0 oz
From: 01862
Label Type: Batch

Service:
Priority Mail® 2-Day
Flat Rate Envelope
USPS Tracking®

Feedback

Transaction Number: 456557536
Transaction Type: Label
Payment Method: AMEX-1004
Payment Status: Account Charged

Postage Cost	$7.35
USPS Tracking®	Free
Label Total:	**$7.35**
Order Total:	**$22.05**

Timestamp	Message
02-12-2019 08:47:45	LABEL REPRINTED
02-12-2019 08:47:25	LABEL PRINTED
02-12-2019 08:47:25	Indicia Failed for label, please check XML logs.
02-12-2019 08:47:00	Getting Payment
02-12-2019 08:46:42	Setting Payment

Back to Shipping History

First-Class Package International Service® is temporarily unavailable on Click-N-Ship®. Please select a different Service Type or visit a Post Office™ location to complete your shipment.

Create Label | Preferences | Shipping History | Address Book

Account # 161958927

Label Details

Label Number:
9405503699300415473856

SCAN® Form: 947570369930030381054 4

Terms
Acceptance Cutoff: 02/12/2019 4:30 PM
Acceptance Time: 02/19/2019 1:33 PM
Scheduled Date: 02/14/2019 11:59 PM
Delivery Status: Delivered, Left with Individual
Label Actions 2019-02-21 11:15:00.0

USPS Tracking®
Ship Again

Need help

File an insurance claim
Request A Service Refund

Return Address:
KRISTEN WHITE
EMPIRE TELECOM
16 ESQUIRE RD
N BILLERICA, MA 01862-2527
ne_sa_deliverable@empiretelecomm.com

Delivery Address:
KACIE HAND
45 S MAIN ST
ROOM G - 40
WALLINGFORD, CT 06492-4201

Package:
Ship Date: 02/12/19
Value: $50.00
Weight: 3 lbs 0 oz
From: 01862
Label Type: Batch

Service:
Priority Mail® 2-Day
Flat Rate Envelope
USPS Tracking®

Feedback

Transaction Number: 456557536
Transaction Type: Label
Payment Method: AMEX-1004
Payment Status: Account Charged

Postage Cost	$7.35
USPS Tracking®	Free
Label Total:	**$7.35**
Order Total:	**$22.05**

Timestamp	Message
02-12-2019 08:47:44	LABEL REPRINTED
02-12-2019 08:47:24	LABEL PRINTED
02-12-2019 08:47:00	Getting Payment
02-12-2019 08:46:42	Setting Payment

Back to Shipping History

First-Class Package International Service® is temporarily unavailable on Click-N-Ship®. Please select a different Service Type or visit a Post Office™ location to complete your shipment.

Create Label | Preferences | Shipping History | Address Book

Account # 161958927

Label Details

Label Number:
9405503699300417599226

SCAN® Form: 947570369930030409244 4

Terms
Acceptance Cutoff: 02/13/2019 4:30 PM
Acceptance Time: 02/19/2019 1:33 PM
Scheduled Date: 02/16/2019 11:59 PM
Delivery Status: Delivered, In/At Mailbox
Label Actions 2019-02-21 10:30:00.0

USPS Tracking®
Ship Again

Need help

File an insurance claim
Request A Service Refund

Return Address:
KRISTEN WHITE
EMPIRE TELECOM
16 ESQUIRE RD
N BILLERICA, MA 01862-2527
ne_sa_deliverable@empiretelecomm.com

Delivery Address:
STEPHEN TRIPP
23 WAYNE RD
WALLINGFORD, CT 06492-3032

Package:
Ship Date: 02/13/19
Value: $50.00
Weight: 3 lbs 0 oz
From: 01862

Service:
Priority Mail® 2-Day
Flat Rate Envelope
USPS Tracking®

Feedback

Transaction Number: 456733084
Transaction Type: Label
Payment Method: AMEX-1004
Payment Status: Account Charged

Postage Cost	$7.35
USPS Tracking®	Free
Label Total:	**$7.35**
Order Total:	**$7.35**

Timestamp	Message
02-13-2019 16:59:30	LABEL REPRINTED
02-13-2019 16:59:14	LABEL PRINTED
02-13-2019 16:59:07	Getting Payment
02-13-2019 16:57:52	Setting Payment

Back to Shipping History