Transcend Wireless

10 Industrial Ave,
Suite 3
Mahwah NJ 07430

Phone: 201.684.0055
Fax: 201.684.0066

October 14, 2016

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

T-Mobile Northeast LLC – CT11180C
Tower Share Application
130 Vernon Road, Bolton, CT 06043
Latitude- 41.80264800
Longitude- -72.44121300

Dear Ms. Bachman,

This letter and attachments are submitted on behalf of T-Mobile Northeast LLC ("T-Mobile"). T-Mobile plans to install antennas and related equipment at the tower site located at 130 Vernon Road in Bolton, Connecticut. Please note, T-Mobile currently has equipment installed at this same address. This proposed installation involves the installation and collocation at a different tower on the same property.

T-Mobile will install four (4) 700/1900 MHz antennas and four (4) RRHs at the 130' level of the existing 150' guyed tower. One (1) hybrid cable will also be installed. T-Mobile's equipment cabinets will be placed on an existing 4.5' X 7.5' concrete pad within the existing ground facility. Included are plans by Infinigy, dated October 11, 2016, depicting the planned changes and attached as **Exhibit A**. Also included is a structural analysis prepared by AECOM, dated September 20, 2016, confirming that the existing tower is structurally capable of supporting the proposed equipment. This is attached as **Exhibit B**.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies 16-50aa, of T-Mobile's intent to share a telecommunications facility pursuant to R.C.S.A. 16-50j-88. In accordance with R.C.S.A., a copy of this letter is being sent to Robert Morra, First Selectman of the Town of Bolton, as well as the tower and property owner, Mountaintop Enterprises, Inc. Please see the attached letter from Mountaintop Enterprises, Inc. authorizing the proposed shared use of this facility attached as **Exhibit C**.

The planned modifications of the facility fall squarely within those activities explicitly provided for in R.C.S.A. 16-50j-89.

1. The proposed modification will not result in an increase in the height of the existing structure. The top of the guyed tower is 150'; T-Mobile's proposed antennas will be located at a center line height of 130'.

2. The proposed modifications will not result in the increase of the site boundary as depicted on the attached site plan.

3. The proposed modifications will not increase noise levels at the facility by six decibels or more, or to levels that exceed local and state criteria. The incremental effect of the proposed changes will be negligent.

4. The operation of the proposed antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communications Commission safety standard. As indicated in the attached power density calculations, the combined site operations will result in a total power density of 13.52%, as evidenced by **Exhibit D**.

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

A. Technical Feasibility. The existing guyed tower has been deemed structurally capable of supporting T-Mobile's proposed loading. The structural analysis is included as Exhibit B.
B. Legal Feasibility. As referenced above, C.G.S. 16-50aa has been authorized to issue orders approving the shared use of an existing tower such as this guyed tower in Bolton. Under the authority granted to the Council, an order of the Council approving the requested shared use would permit T-Mobile to obtain a building permit for the proposed installation. Further, a Letter of Authorization is included as Exhibit C, authorizing T-Mobile to file this application for shared use.
C. Environmental Feasibility. The proposed shared use of this facility would have a minimal environmental impact. The installation of T-Mobile equipment at the 130' level of the existing 150' tower would have an insignificant visual impact on the area around the tower. T-Mobile's ground equipment would be installed within the existing facility compound. T-Mobile's shared use would therefore not cause any significant alteration in the physical or environmental characteristics of the existing site. Additionally, as evidenced by Exhibit D, the proposed antennas would not increase radio frequency emissions to a level at or above the Federal Communications Commission safety standard.
D. Economic Feasibility. T-Mobile will be entering into an agreement with the owner of this facility to mutually agreeable terms. As previously mentioned, the Letter of Authorization has been provided by the owner to assist T-Mobile with this tower sharing application.
E. Public Safety Concerns. As discussed above, the guyed tower is structurally capable of supporting T-Mobile's proposed loading. T-Mobile is not aware of any public safety concerns relative to the proposed sharing of the existing guyed tower. T-Mobile's intentions of providing new and improved wireless service through the shared use of this facility is expected to enhance the safety and welfare of local residents and individuals traveling through Bolton.

Sincerely,

Kyle Richers

Kyle Richers
Transcend Wireless
10 Industrial Ave., Suite 3
Mahwah, New Jersey
krichers@transcendwireless.com
908-447-4716

cc: Robert Morra- First Selectman, Town of Bolton
Mountaintop Enterprises, Inc

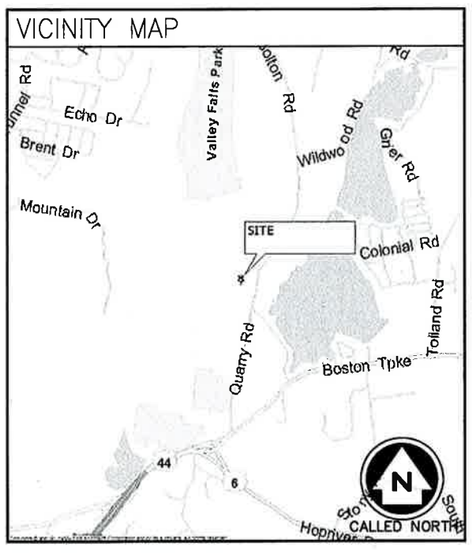
T-MOBILE NORTHEAST LLC

CT11180C
BOLTON CT.._1

130 VERNON ROAD
BOLTON, CT 06043

(701D_WOUTU21 CONFIGURATION)

VICINITY MAP



DO NOT SCALE DRAWINGS

CONTRACTOR SHALL VERIFY PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE ARCHITECT IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.

CALL:

"CALL BEFORE YOU DIG"
WWW.CBYD.COM
CALL 811, OR 1-800-922-4455

CALL THREE WORKING DAYS PRIOR TO DIGGING

SAFETY PRECAUTIONS SHALL BE IMPLEMENTED BY CONTRACTOR(S) AT ALL TRENCHING IN ACCORDANCE WITH CURRENT OSHA STANDARDS.

COLOR CODE FOR UTILITY LOCATIONS

ELECTRIC	– RED	SEWER	– GREEN
GAS/OIL	– YELLOW	SURVEY	– PINK
TEL/CATV	– ORANGE	PROPOSED EXCAVATION	– WHITE
WATER	– BLUE	RECLAIMED WATER	– PURPLE

GENERAL NOTES

1. THE CONTRACTOR SHALL GIVE ALL NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES. RULES, REGULATIONS AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY, MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS, AND LOCAL AND STATE JURISDICTIONAL CODES BEARING ON THE PERFORMANCE OF THE WORK. THE WORK PERFORMED ON THE PROJECT AND THE MATERIALS INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS AND ORDINANCES.
2. THE ARCHITECT/ENGINEER HAVE MADE EVERY EFFORT TO SET FORTH IN THE CONSTRUCTION AND CONSTRUCT DOCUMENTS THE COMPLETE SCOPE OF WORK. THE CONTRACTOR BIDDING THE JOB IS NEVERTHELESS CAUTIONED THAT MINOR OMISSIONS OR ERRORS IN THE DRAWINGS AND OR SPECIFICATIONS SHALL NOT EXCUSE SAID CONTRACTOR FROM COMPLETING THE PROJECT AND IMPROVEMENTS IN ACCORDANCE WITH THE INTENT OF THESE DOCUMENTS.
3. THE CONTRACTOR OR BIDDER SHALL BEAR THE RESPONSIBILITY OF NOTIFYING (IN WRITING) THE T-MOBILE REPRESENTATIVE OF ANY CONFLICTS, ERRORS, OR OMISSIONS PRIOR TO THE SUBMISSION OF THE CONTRACTOR'S PROPOSAL OR PERFORMANCE OF WORK. IN THE EVENT OF DISCREPANCIES, THE CONTRACTOR SHALL PRICE THE MORE COSTLY OR EXPENSIVE WORK, UNLESS DIRECTED IN WRITING OTHERWISE.
4. THE SCOPE OF WORK SHALL INCLUDE FURNISHING OF ALL MATERIALS, EQUIPMENT, LABOR AND ALL OTHER MATERIALS AND LABOR DEEMED NECESSARY TO COMPLETE THE WORK/PROJECT AS DESCRIBED HEREIN.
5. THE CONTRACTOR SHALL VISIT THE JOB SITE PRIOR TO THE SUBMISSION OF BIDS OR PERFORMING WORK TO FAMILIARIZE HIMSELF WITH THE FIELD CONDITIONS AND TO VERIFY THAT THE PROJECT CAN BE CONSTRUCTED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
6. THE CONTRACTOR SHALL OBTAIN AUTHORIZATION TO PROCEED WITH CONSTRUCTION PRIOR TO STARTING WORK ON ANY ITEM NOT CLEARLY DEFINED BY THE CONSTRUCTION DRAWINGS/CONTRACT DOCUMENTS.
7. THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS ACCORDING TO THE MANUFACTURER'S/VENDOR'S SPECIFICATIONS UNLESS NOTED OTHERWISE OR WHERE LOCAL CODES OR ORDINANCES TAKE PRECEDENCE.
8. THE CONTRACTOR SHALL PROVIDE A FULL SET OF CONSTRUCTION DOCUMENTS AT THE SITE UPDATED WITH THE LATEST REVISIONS AND ADDENDUM OR CLARIFICATIONS AVAILABLE FOR THE USE BY ALL PERSONNEL INVOLVED WITH THE PROJECT.
9. THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE PROJECT DESCRIBED HEREIN. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES AND FOR COORDINATING ALL PORTIONS OF THE WORK UNDER CONTRACT.
10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ANY PERMITS AND INSPECTIONS WHICH ARE REQUIRED FOR THE WORK BY THE ARCHITECT/ENGINEER, THE STATE, COUNTY, OR LOCAL GOVERNMENT AUTHORITY.
11. THE CONTRACTOR SHALL MAKE NECESSARY PROVISIONS TO PROTECT EXISTING IMPROVEMENTS, EASEMENTS, PAVING, CURBING, ETC., DURING CONSTRUCTION. UPON COMPLETION OF WORK, THE CONTRACTOR SHALL REPAIR ANY DAMAGE THAT MAY HAVE OCCURRED DUE TO CONSTRUCTION ON OR ABOUT THE PROPERTY.
12. THE CONTRACTOR SHALL KEEP THE GENERAL WORK AREA CLEAN AND HAZARD FREE DURING CONSTRUCTION AND DISPOSE OF ALL DIRT, DEBRIS, RUBBISH AND REMOVE EQUIPMENT NOT SPECIFIED AS REMAINING ON PROPERTY. PREMISES SHALL BE LEFT IN CLEAN CONDITION AND FREE FROM PAINT SPOTS, DUST, OR SMUDGES OF ANY NATURE.
13. THE CONTRACTOR SHALL COMPLY WITH ALL OSHA REQUIREMENTS, AS WELL AS THE LATEST EDITIONS OF ANY PERTINENT STATE SAFETY REGULATIONS.
14. THE CONTRACTOR SHALL NOTIFY THE T-MOBILE REPRESENTATIVE WHERE A CONFLICT OCCURS ON ANY OF THE CONTRACT DOCUMENTS. THE CONTRACTOR IS NOT TO ORDER MATERIAL OR CONSTRUCT ANY PORTION OF THE WORK THAT IS IN CONFLICT UNTIL CONFLICT IS RESOLVED BY THE T-MOBILE REPRESENTATIVE.
15. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS, ELEVATIONS, PROPERTY LINES, ETC., ON THE JOB.
16. THE CONTRACTOR SHALL RETURN ALL DISTURBED AREAS TO THEIR ORIGINAL CONDITION AT THE COMPLETION OF WORK.

PROJECT SUMMARY

SITE NUMBER:	CT11180C	APPLICANT:	T-MOBILE NORTHEAST LLC 103 MONARCH DRIVE LIVERPOOL, NY 13088
SITE NAME:	BOLTON CT.._1		
SITE ADDRESS:	130 VERNON ROAD BOLTON, CT 06043	PROJECT MANAGER:	TRANSCEND WIRELESS 10 INDUSTRIAL AVE, SUITE 3 MAHWAH, NJ 07430
PROPERTY OWNER:	MOUNTAINTOP ENTERPRISES, INC. C/O MILTON HIGHWAY PO BOX 9219 BOLTON, CT 06043	CONTACT:	JAMIE MARCHINI (973) 885-0660
PARCEL:	TBD		
ZONING:	R-1	ARCHITECT/ENGINEER:	INFINIGY ENGINEERING 1033 WATERVLIET SHAKER ROAD ALBANY, NY 12205
JURISDICTION:	TOWN OF BOLTON, CT		
LAT./LONG.:	N 41.802648° / W -72.441213°		
CONSTRUCTION TYPE:	L700 UPGRADE	CONTACT:	ALEX WELLER 518-690-0790

PROJECT DESCRIPTION

- ☐ EXISTING MONOPOLE
- ▨ EXISTING GUYED TOWER
- ☐ EXISTING TRANSMISSION TOWER
- ☐ EXISTING BILLBOARD
- ☐ EXISTING ROOFTOP
- ☐ EXISTING FLAGPOLE
- ☐ EXISTING FORT WORTH
- ☐ EXISTING CABINET(S)
- ☐ EXISTING RBS 6201
- ▨ PROPOSED RBS 3106
- ▨ EXISTING S8000
- ☐ SITE SUPPORT KIT
- ☐ SITE SUPPORT CABINET
- ▨ GPS
- ▨ OUTDOOR
- ☐ INDOOR
- ▨ EXISTING CONCRETE PAD
- ☐ EXISTING STEEL PLATFORM
- ▨ EXISTING PPC
- ☐ PANELBOARD

T-MOBILE NORTHEAST LLC PROPOSES THE MODIFICATION OF AN UNMANNED WIRELESS BROADBAND FACILITY. ADDITION OF PROPOSED LTE PANEL ANTENNAS, RRU'S, FIBER CABLE AND EQUIPMENT CABINET.

SHEET INDEX

SHEET	DESCRIPTION	REVISION
T-1	TITLE SHEET	C
C-1	SITE PLAN	C
C-2	COMPOUND PLAN & ELEVATION	C
C-3	ANTENNA DETAIL & RF SCHEDULE	C
C-4	EQUIPMENT SPECIFICATIONS	C
E-1	GROUNDING AND POWER DIAGRAMS	C
E-2	COAX/FIBER PLUMBING DIAGRAM	C
N-1	GENERAL AND ELECTRICAL NOTES	C

T-MOBILE NORTHEAST LLC
103 MONARCH DRIVE
LIVERPOOL, NY 13088

INFINIGY
1033 Watervliet Shaker Rd
Albany, NY 12205
Office # (518) 690-0790
Fax # (518) 690-0793

SUBMITTALS

DATE	DESCRIPTION	REVISION
2/19/16	FOR REVIEW	A
4/27/16	FOR PERMIT	B
10/11/16	REVISED LOCATION	C

DEPT.	DATE	APP'D	REVISIONS
RFE			
RF MAN.			
ZONING			
OPS			
CONSTR.			
SITE AC.			

PROJECT NO: 428-000
DRAWN BY: JLM
CHECKED BY: ASW

STATE OF CONNECTICUT
JOHN S. STEVENS
No. 24705
LICENSED
PROFESSIONAL ENGINEER
PROFESSIONAL SEAL

NOTE: IF DRAWINGS ARE 22"x34", USE GRAPHICAL SCALE AND/OR 1/2 TIMES OF THE NOTED SCALE.

SITE NUMBER:
CT11180C

SITE NAME:
BOLTON CT.._1

130 VERNON ROAD
BOLTON, CT 06043

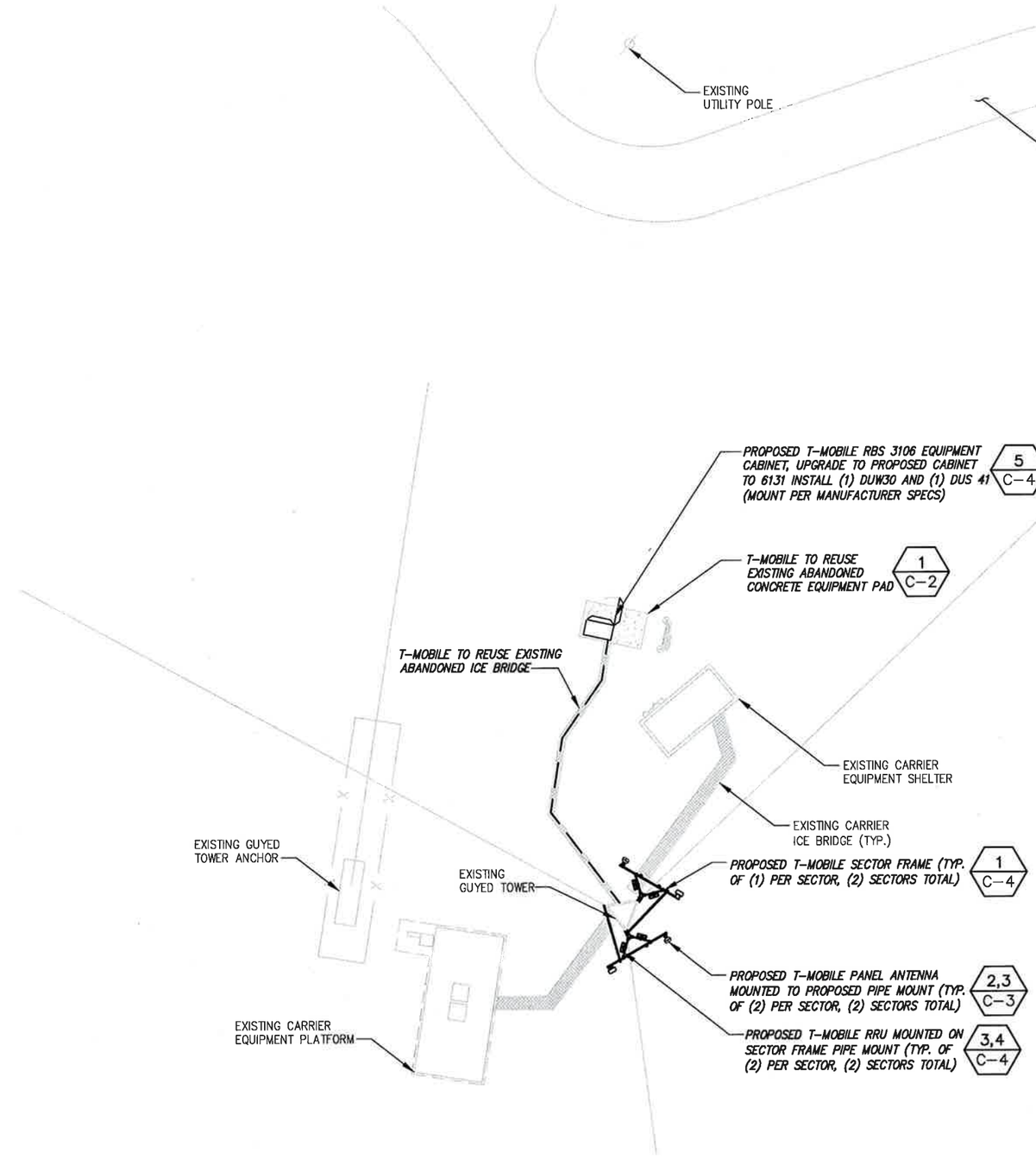
SHEET TITLE

TITLE SHEET

SHEET NUMBER

T-1

SHEET 1 OF 8 SHEETS



GENERAL SITE NOTES:

1. A COMPLETE BOUNDARY SURVEY OF THE HOST PARCEL HAS NOT BEEN PERFORMED BY INFINIGY. BOUNDARY INFORMATION IF SHOWN WAS OBTAINED FROM INFORMATION PROVIDED BY OTHERS. PROPERTY IS SUBJECT TO ALL EASEMENTS AND RESTRICTIONS OF RECORD.
2. BASEMAPPING INFORMATION BASED ON PROVIDED INFORMATION.
3. CONTRACTOR TO FIELD VERIFY DIMENSIONS AS NECESSARY BEFORE CONSTRUCTION.
4. THE PROPOSED DEVELOPMENT DOES NOT INCLUDE SIGNS OF ADVERTISING.
5. THE PROPOSED DEVELOPMENT IS UNMANNED AND THEREFORE DOES NOT REQUIRE A MEANS OF WATER SUPPLY OR SEWAGE DISPOSAL.
6. NO LANDSCAPING WORK IS PROPOSED IN CONJUNCTION WITH THIS DEVELOPMENT OTHER THAN THAT WHICH IS SHOWN.
7. THE PROPOSED DEVELOPMENT DOES NOT INCLUDE OUTDOOR STORAGE OR ANY SOLID WASTE RECEPTACLES.
8. UTILITIES SHOWN ON PLAN ARE TAKEN FROM OWNERS RECORDS AND FIELD LOCATION OF VISIBLE SURFACE FEATURES. THE EXISTENCE, EXTENT AND EXACT HORIZONTAL AND VERTICAL LOCATIONS OF UTILITIES HAS NOT BEEN VERIFIED. ANY CONTRACTOR PERFORMING WORK ON THIS SITE MUST CONTACT MISS UTILITY AT LEAST 48 HOURS PRIOR TO COMMENCING WORK.
9. ALL OBSOLETE OR UNUSED FACILITIES SHALL BE REMOVED WITHIN 12 MONTHS OF CESSATION OF OPERATIONS.

SITE LEGEND

— — —	SITE PROPERTY LINE
———	STREET OR ROAD
— x — x —	CHAIN LINK FENCE
—o—o—	OPAQUE WOODEN FENCE
	TREES/SHRUBS
	TREE LINE
⊠	UTILITY POLE
(E)	EXISTING
(N)	NEW
(P)	PROPOSED
(F)	FUTURE

GRAPHIC SCALE

20' 10' 0 10' 20'

SCALE (11x17): 1" = 20'-0"
SCALE (22x34): 1" = 10'-0"

T-Mobile
T-MOBILE NORTHEAST LLC
103 MONARCH DRIVE
LIVERPOOL, NY 13088

INFINIGY
1033 Watervliet Shaker Rd
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Fax # (518) 690-0793

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RFE			
RF MAN.			
ZONING			
OPS			
CONSTR.			
SITE AC.			

PROJECT NO:	428-000
DRAWN BY:	JLM
CHECKED BY:	ASW

STATE OF CONNECTICUT
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No. 24705
LICENSED PROFESSIONAL ENGINEER
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SITE NUMBER:
CT11180C

SITE NAME:
BOLTON CT_1

130 VERNON ROAD
BOLTON, CT 06043

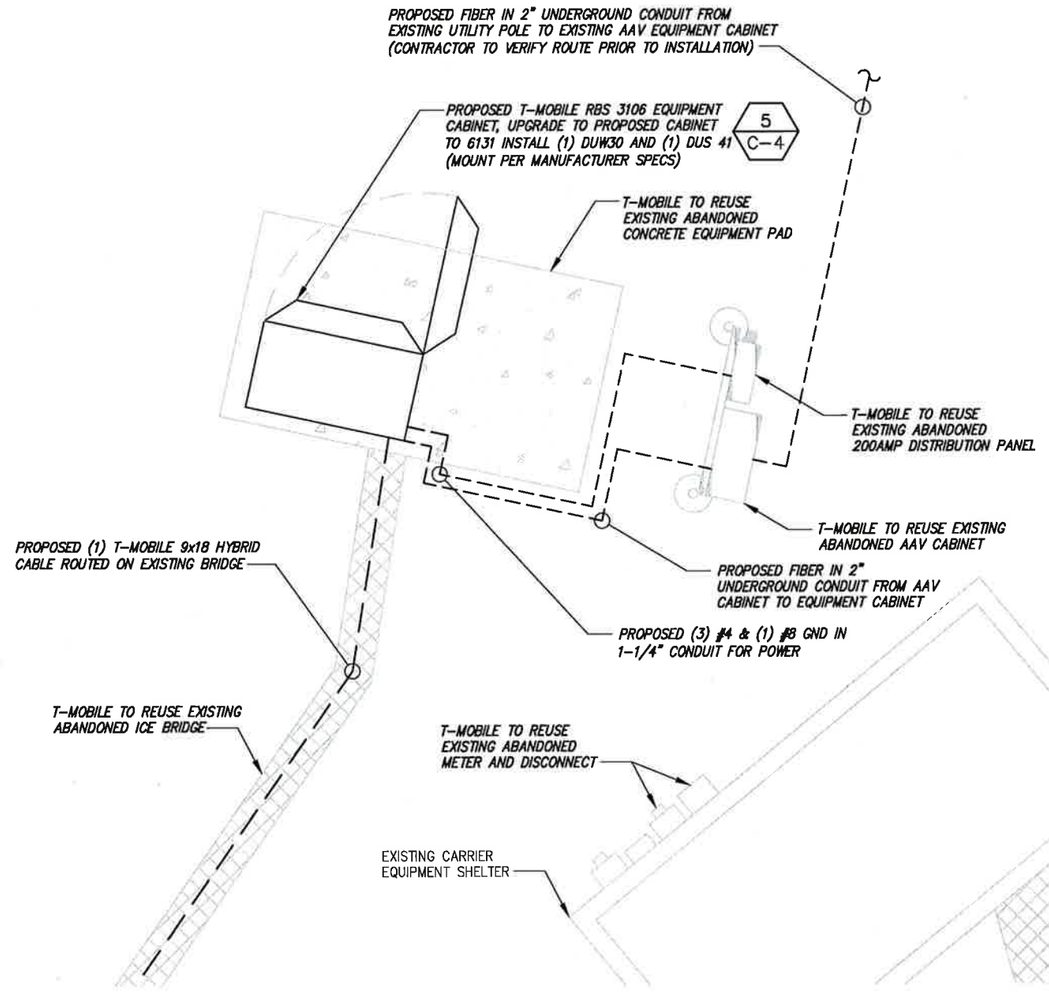
SHEET TITLE

SITE PLAN

SHEET NUMBER

C-1

SHEET 2 OF **8** SHEETS



N
CALLED NORTH

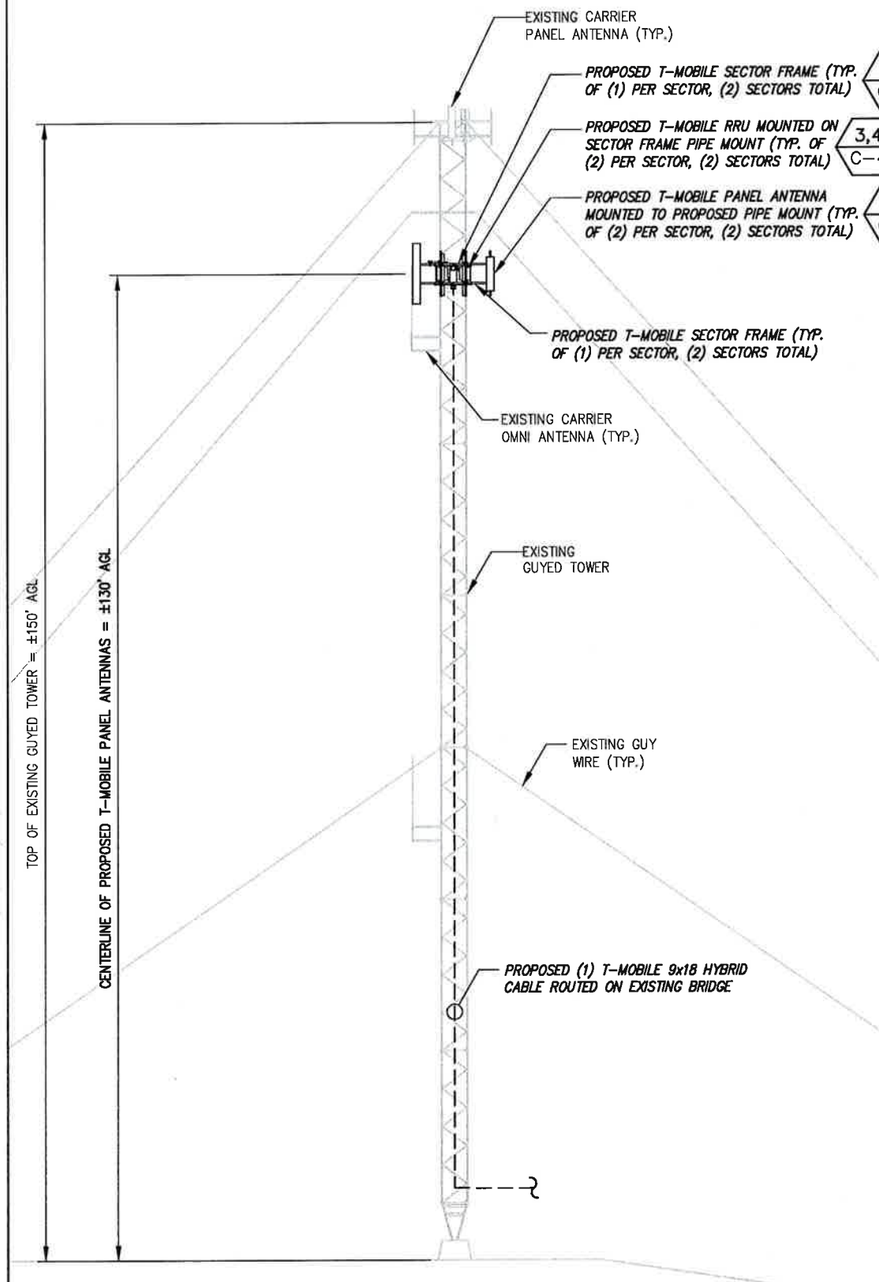
1 / -- EQUIPMENT PLAN
SCALE: AS NOTED

GRAPHIC SCALE

4' 2' 0 2' 4'

SCALE (11x17): 1" = 4'-0"
SCALE (22x34): 1" = 2'-0"

STRUCTURAL ANALYSIS HAS NOT BEEN COMPLETED AT TIME OF ISSUANCE OF THESE DRAWINGS. STRUCTURAL ANALYSIS MUST BE COMPLETED PRIOR TO INSTALLATION.



2 / -- BUILDING ELEVATION
NOT TO SCALE

T-MOBILE NORTHEAST LLC
103 MONARCH DRIVE
LIVERPOOL, NY 13088

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SITE NUMBER:
CT11180C

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BOLTON CT._1

130 VERNON ROAD
BOLTON, CT 06043

SHEET TITLE

COMPOUND PLAN & ELEVATION

SHEET NUMBER

C-2

SHEET 3 OF 8 SHEETS

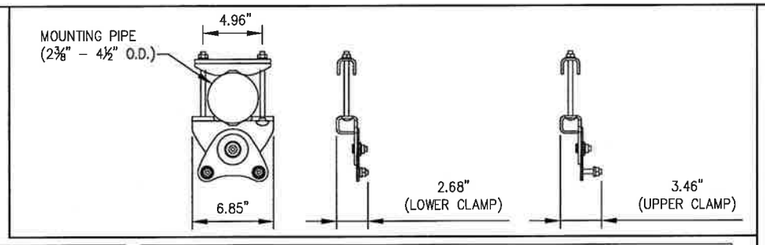
RF SYSTEM SCHEDULE (701D_WoutU21 CONFIGURATION)

SECTOR	TECHNOLOGY	ANTENNA PORT	BAND	ANTENNA MODEL #	VENDOR	QTY (REMOVED)	QTY (NEW)	AZIMUTH	M-TILT	E-TILT	ANTENNA CENTERLINE	TMA MODEL #	VENDOR	RRU MODEL #	VENDOR	CABLE LENGTH	CABLE DIAMETER	CABLE QTY.	CABLE TYPE	CABLE MODEL #	VENDOR	CABLE TAGGING	COLOR CODING	JUMPER TYPE	JUMPER TAGGING	COLOR CODING
A	L2100	P1	B4A	AIR21 B4A/B2P	ERICSSON	0	1	30°	0°	2°	130'-0"	–	–	–	–	TBD	–	–	HYBRID	MASTERLINE EXTREME HYBRID (9/18)	ERICSSON	FIBER 1	0	FIBER	--	–
	U1900	P2	B2P											(PROPOSED) RRUS 11 B2	ERICSSON	(ANTENNA CONNECTED VIA PROPOSED PROPOSED CABLE)								FIBER	--	–
	L700	P3/P4	B12P	SBNH-1D65C	COMMSCOPE	0	1	30°	0°	2°	130'-0"	–	–	(PROPOSED) RRUS 11 B12	ERICSSON	(ANTENNA CONNECTED VIA PROPOSED PROPOSED CABLE)								FIBER	--	–
B	L2100	P1	B4A	AIR21 B4A/B2P	ERICSSON	0	1	150°	0°	2°	130'-0"	–	–	–	–	(ANTENNA CONNECTED VIA PROPOSED PROPOSED CABLE)								FIBER	--	–
	U1900	P2	B2P											(PROPOSED) RRUS 11 B2	ERICSSON	(ANTENNA CONNECTED VIA PROPOSED PROPOSED CABLE)								FIBER	--	–
	L700	P3/P4	B12P	SBNH-1D65C	COMMSCOPE	0	1	150°	0°	2°	130'-0"	–	–	(PROPOSED) RRUS 11 B12	ERICSSON	(ANTENNA CONNECTED VIA PROPOSED PROPOSED CABLE)								FIBER	--	–

KEY

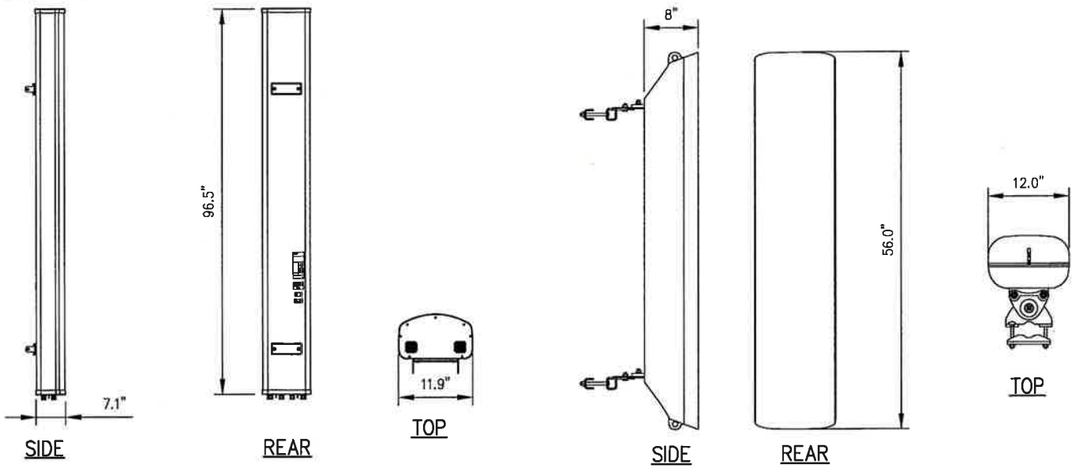
EXISTING	R – RED – GSM
PROPOSED	G – GREEN – UMTS 1900
FIBER CONNECTION	B – BLUE – UMTS AWS
	Y – YELLOW – LTE
	O – ORANGE – FIBER CABLE

1 RF SCHEDULE
NOT TO SCALE

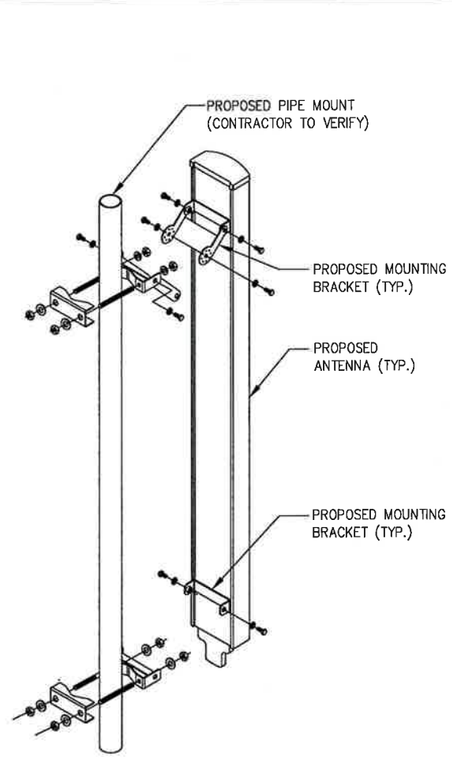


COMMSCOPE MODEL NO.:	SBNH-1D65C
RADOME MATERIAL:	FIBERGLASS, UV RESISTANT
RADOME COLOR:	LIGHT GRAY
DIMENSIONS, HxWxD:	96.5"x11.9"x7.1"
WEIGHT, W/ PRE-MOUNTED BRACKETS:	49.6 LBS (19.8 kg)
CONNECTOR:	7-16 DIN FEMALE

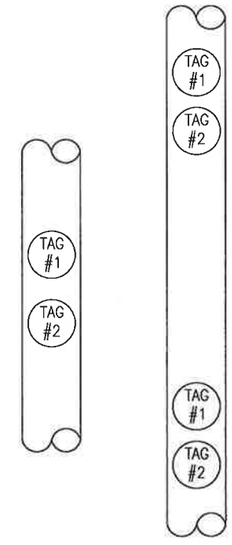
ERICSSON MODEL NO.:	AIR21 B4A/B2P
RADOME MATERIAL:	FIBERGLASS, UV RESISTANT
RADOME COLOR:	LIGHT GRAY
DIMENSIONS, HXWXD:	54"X12"X8"
WEIGHT, W/ PRE-MOUNTED BRACKETS:	90LBS
CONNECTOR:	(2) 7-16 DIN FEMALE



2 ANTENNA DETAIL
NOT TO SCALE



3 MOUNTING DETAIL
NOT TO SCALE



METALLIC TAG NOTES:

1. TWO METALLIC TAGS SHALL BE ATTACHED AT EACH END OF EVERY CABLE LONGER THAN (3) THREE FEET.
2. CABLES LESS THAN (3) THREE FEET WILL HAVE TWO METALLIC TAGS ATTACHED AT THE CENTER OF THE CABLE.
3. TAGS WILL BE FASTENED WITH STAINLESS STEEL ZIP TIES APPROPRIATE FOR CABLE DIAMETER.
4. STANDARDIZED METALLIC TAG KITS WILL BE ASSEMBLED WITH TAGS ALREADY ENGRAVED TO ACCOMODATE ALL CONFIGURATIONS.

4 METALLIC TAG DETAIL
NOT TO SCALE

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BOLTON CT._1

130 VERNON ROAD
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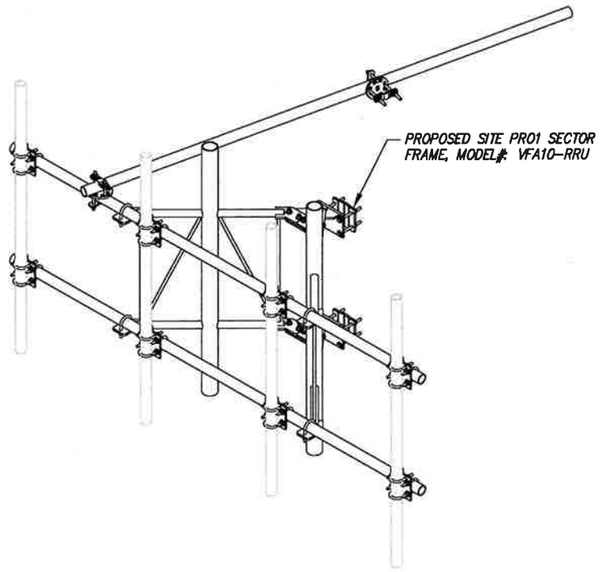
SHEET TITLE

ANTENNA DETAIL & RF SCHEDULE

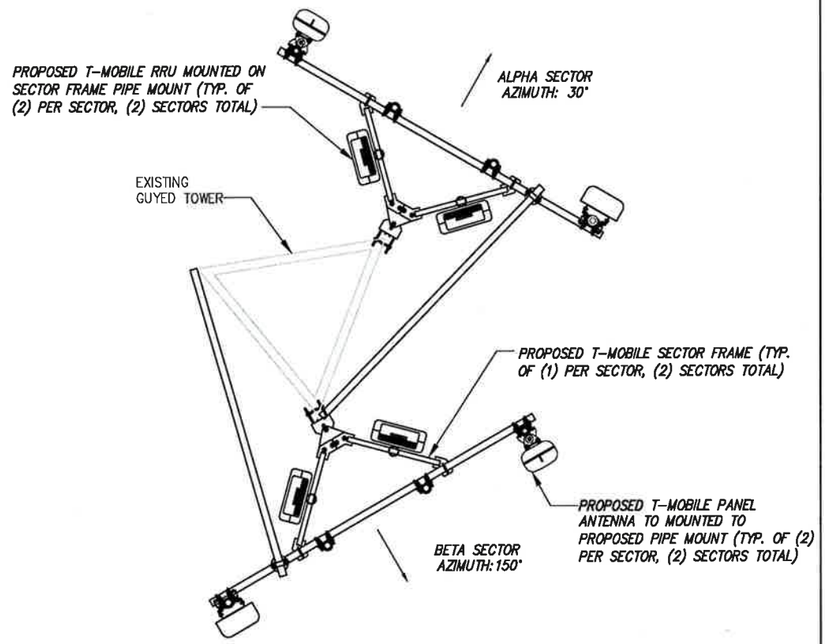
SHEET NUMBER

C-3

SHEET 4 OF **8** SHEETS



1 SECTOR FRAME DETAIL
NOT TO SCALE



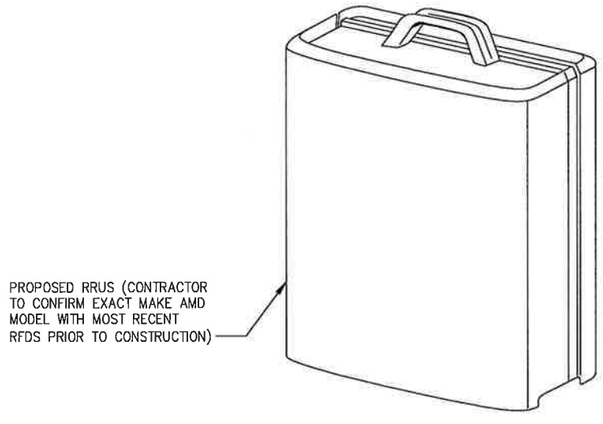
CALLED NORTH

2 PROPOSED ANTENNA ORIENTATION PLAN
NOT TO SCALE

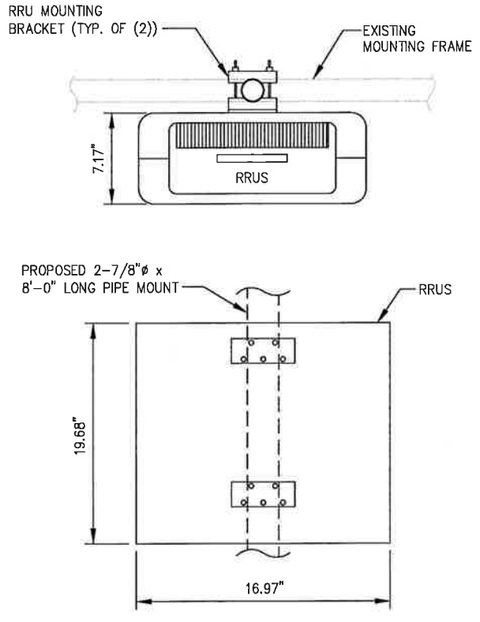
STRUCTURAL NOTES:

1. SPECIFICATIONS / CODES:
   - CONCRETE WORK SHALL BE PERFORMED IN ACCORDANCE WITH LATEST EDITION OF THE ACI CODE.
   - STEEL WORK SHALL BE PERFORMED IN ACCORDANCE WITH AISC STEEL CONSTRUCTION MANUAL, 9tH EDITION.
   - WELDING SHALL BE PERFORMED IN ACCORDANCE WITH AMERICAN WELDING SOCIETY (AWS) D1.1-92 "STRUCTURAL WELDING" CODE-STEEL.
   - REINFORCING STEEL SHALL BE PLACED IN ACCORDANCE WITH THE CONCRETE REINFORCING STEEL INSTITUTE (CRSI), "MANUAL OF STANDARD PRACTICE."
2. MATERIALS:
   - CONCRETE: fc' - 3000psi. (MIN. U.N.O.)
   - REINFORCING STEEL: ASTM A615, GRADE 60.
   - WIRE MESH: ASTM A185.
   - STRUCTURAL STEEL: ASTM A36.
   - ELECTRODES FOR WELDING: E 70xx.
   - GALVANIZING: ASTM A153 (BOLTS) OR ASTM A123 (SHAPES, PLATES).
   - EXPANSION BOLTS: HILTI KWIK BOLT II, STAINLESS STEEL, 3/4"ø x43/4" EMBEDMENT OR AN APPROVED EQUAL.

ERICSSON MODEL #:	RRUS11
COLOR:	GRAY
DIMENSIONS, HxWxD:	19.7"x17"x7.2" (500 x 431 x 182 mm)
WEIGHT:	50.71 LBS (23 kg)



3 RRUS11 DETAIL
NOT TO SCALE

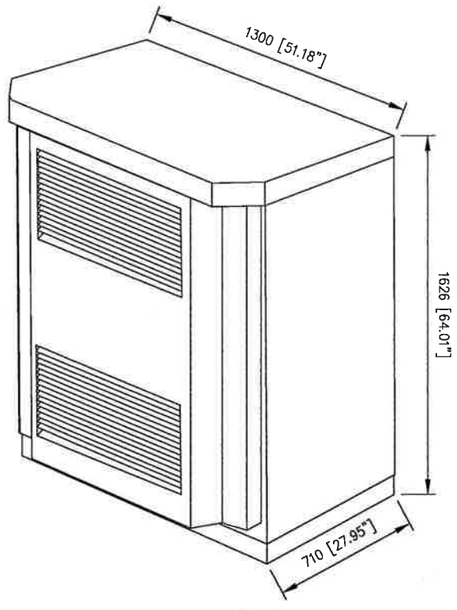


4 RRUS MOUNTING DETAIL
NOT TO SCALE

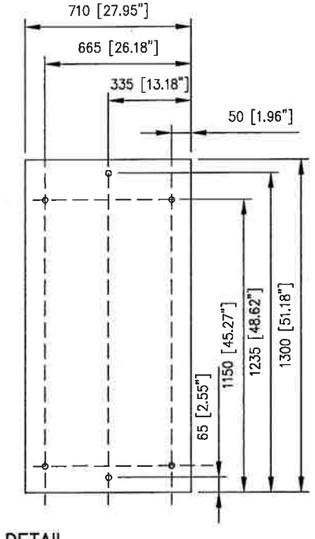
ERICSSON - RBS 3106 W/ 6131 UPGRADE

CABINET COLOR: GRAY, RAL 7035

DIMENSIONS (HxWxD IN): 64.01x51.18x27.95 IN



NOTES:
1. VERIFY BOLT HOLE SPACING WITH EQUIPMENT CUT SHEETS.
2. NEW EQUIPMENT CABINET TO BE MOUNTED TO EXISTING CONCRETE PAD WITH BOLT-DOWN SYSTEM PER MANUFACTURER'S SPECIFICATION. FIELD DRILL HOLES IN EXISTING CONCRETE AS REQUIRED.



5 EQUIPMENT CABINET DETAIL
NOT TO SCALE

T-MOBILE NORTHEAST LLC
103 MONARCH DRIVE
LIVERPOOL, NY 13088

INFINIGY
1033 Watervliet Shaker Rd
Albany, NY 12205
Office # (518) 690-0790
Fax # (518) 690-0793

SUBMITTALS

DATE	DESCRIPTION	REVISION
2/19/16	FOR REVIEW	A
4/27/16	FOR PERMIT	B
10/11/16	REVISED LOCATION	C

DEPT.	DATE	APP'D	REVISIONS
RFE			
RF MAN.			
ZONING			
OPS			
CONSTR.			
SITE AC.			

PROJECT NO:	428-000
DRAWN BY:	JLM
CHECKED BY:	ASW

STATE OF CONNECTICUT
JOHN S. STEVENS
No. 24705
LICENSED PROFESSIONAL ENGINEER
PROFESSIONAL SEAL

NOTE: IF DRAWINGS ARE 22"x34", USE GRAPHICAL SCALE AND/OR 1/2 TIMES OF THE NOTED SCALE.

SITE NUMBER:
CT11180C

SITE NAME:
BOLTON CT_1

130 VERNON ROAD
BOLTON, CT 06043

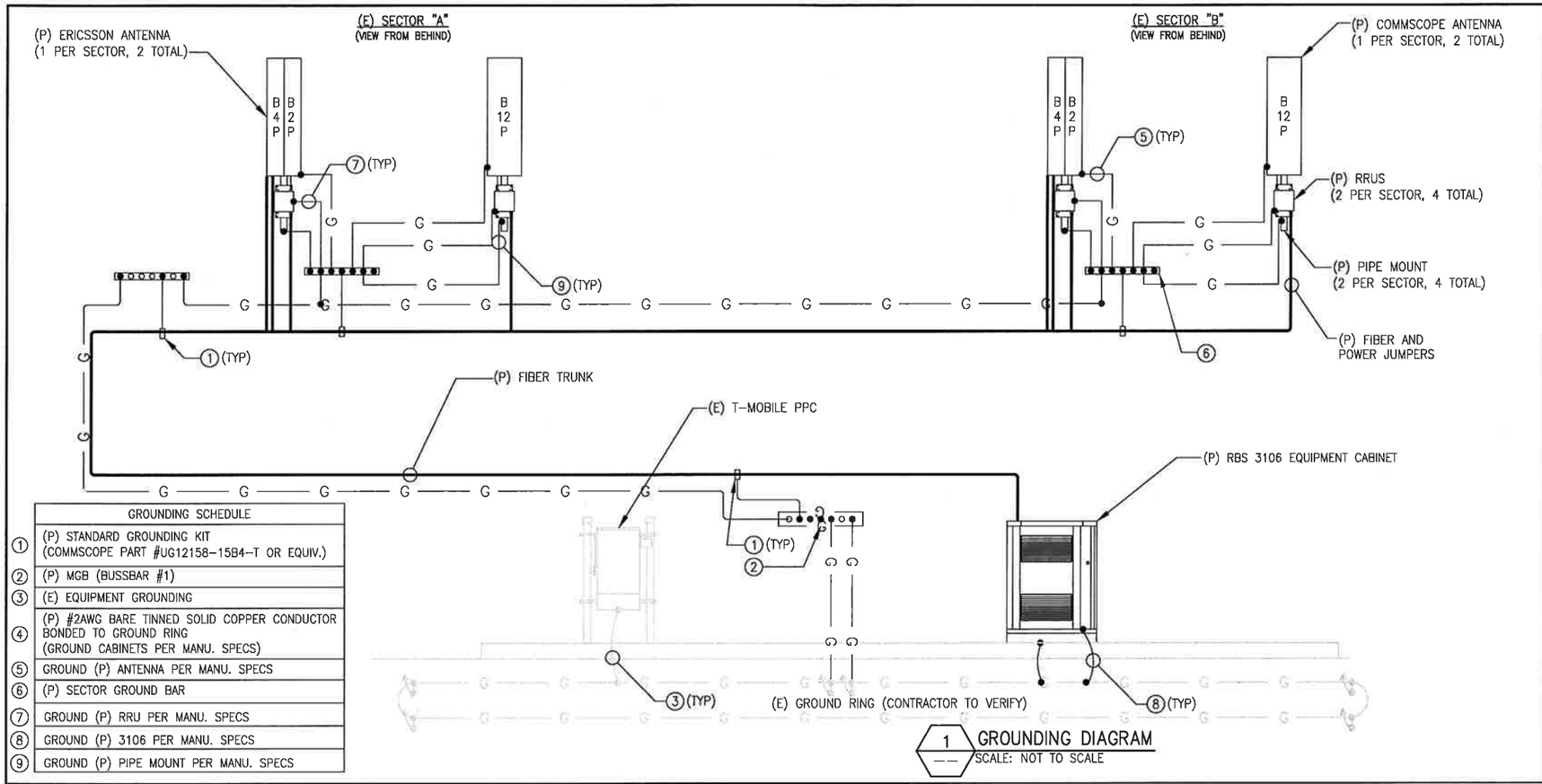
SHEET TITLE

EQUIPMENT SPECIFICATIONS

SHEET NUMBER

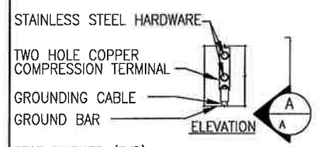
C-4

SHEET 5 OF **8** SHEETS

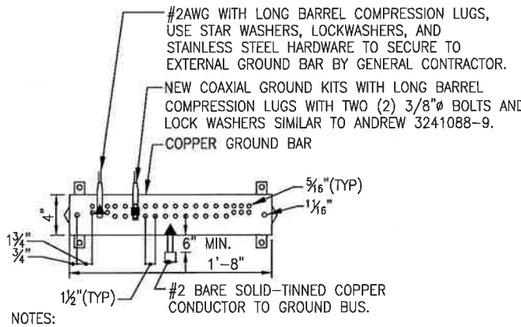


GROUNDING SCHEDULE	
①	(P) STANDARD GROUNDING KIT (COMMSCOPE PART #UG12158-15B4-T OR EQUIV.)
②	(P) MGB (BUSSBAR #1)
③	(E) EQUIPMENT GROUNDING
④	(P) #2AWG BARE TINNED SOLID COPPER CONDUCTOR BONDED TO GROUND RING (GROUND CABINETS PER MANU. SPECS)
⑤	GROUND (P) ANTENNA PER MANU. SPECS
⑥	(P) SECTOR GROUND BAR
⑦	GROUND (P) RRU PER MANU. SPECS
⑧	GROUND (P) 3106 PER MANU. SPECS
⑨	GROUND (P) PIPE MOUNT PER MANU. SPECS

1 GROUNDING DIAGRAM
SCALE: NOT TO SCALE



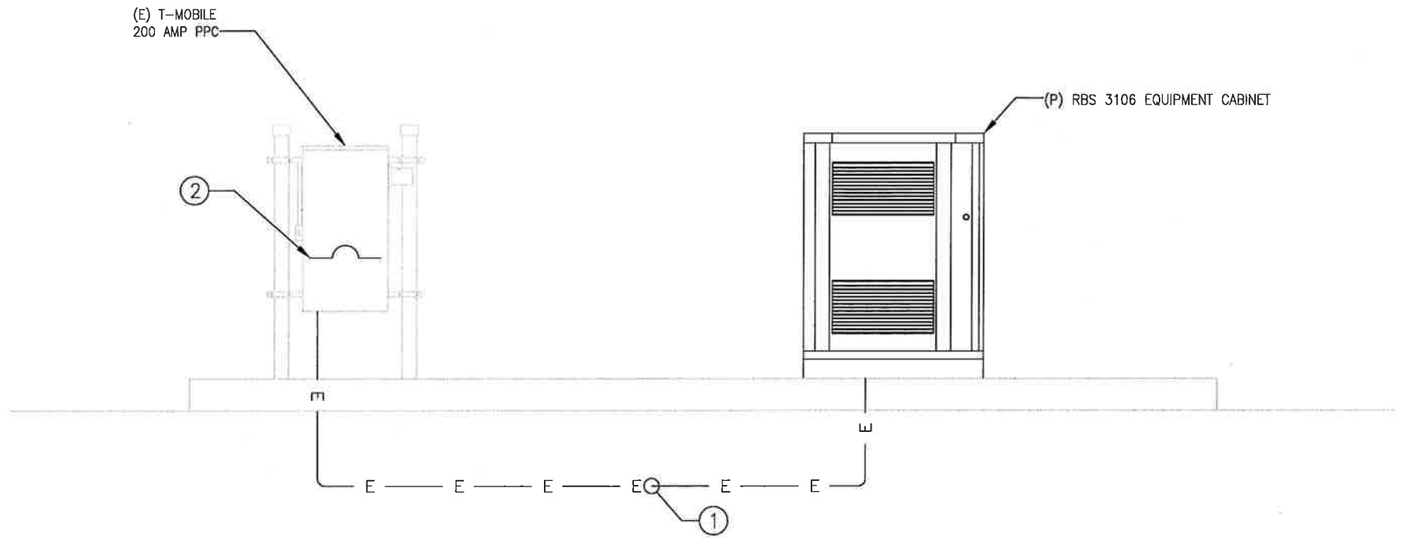
NOTES:
1. OXIDE INHIBITING COMPOUND TO BE USED AT ALL LOCATIONS.



NOTES:
1. ALL HARDWARE STAINLESS STEEL COAT ALL SURFACES WITH KOPR-SHIELD BEFORE MATING.
2. FOR GROUND BOND TO STEEL ONLY: INSERT A TOOTH WASHER BETWEEN LUG AND STEEL, COAT ALL SURFACES WITH KOPR-SHIELD.
3. ALL HOLES ARE COUNTERSUNK 1/16".

2 GROUND BAR CONNECTION DETAILS
SCALE: NOT TO SCALE

CONDUIT SCHEDULE	
①	(P) POWER CONDUIT UPGRADE
②	(P) BREAKER FOR 3106 EQUIPMENT CABINET



3 POWER DIAGRAM
SCALE: NOT TO SCALE

CONTRACTOR NOTE:
CONTRACTOR TO VERIFY THAT THE EXISTING CONDUITS AND WIRE SIZES ARE ADEQUATE FOR THE PROPOSE LOADING IN ACCORDANCE WITH NEC AND INCLUDE ELECTRICAL UPGRADES IN THE SCOPE OF WORK AS REQUIRED.

NOTE:
INFINIGY HAS NOT CONDUCTED AN ELECTRICAL LOAD STUDY FOR THIS SITE. CONTRACTOR IS TO VERIFY EXISTING ELECTRICAL LOADING PRIOR TO CONSTRUCTION TO ENSURE EXISTING INCOMING SERVICE CAPACITY. ALL ELECTRICAL INSTALLATION IS TO COMPLY WITH NEC, ADOPTED VERSION.

T-Mobile
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DEPT.	DATE	APP'D	REVISIONS
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RF MAN.			
ZONING			
OPS			
CONSTR.			
SITE AC.			

PROJECT NO:	428-000
DRAWN BY:	JLM
CHECKED BY:	ASW

PROFESSIONAL SEAL

NOTE: IF DRAWINGS ARE 22"x34", USE GRAPHICAL SCALE AND/OR 1/2 TIMES OF THE NOTED SCALE.

SITE NUMBER:
CT11180C

SITE NAME:
BOLTON CT._1

130 VERNON ROAD
BOLTON, CT 06043

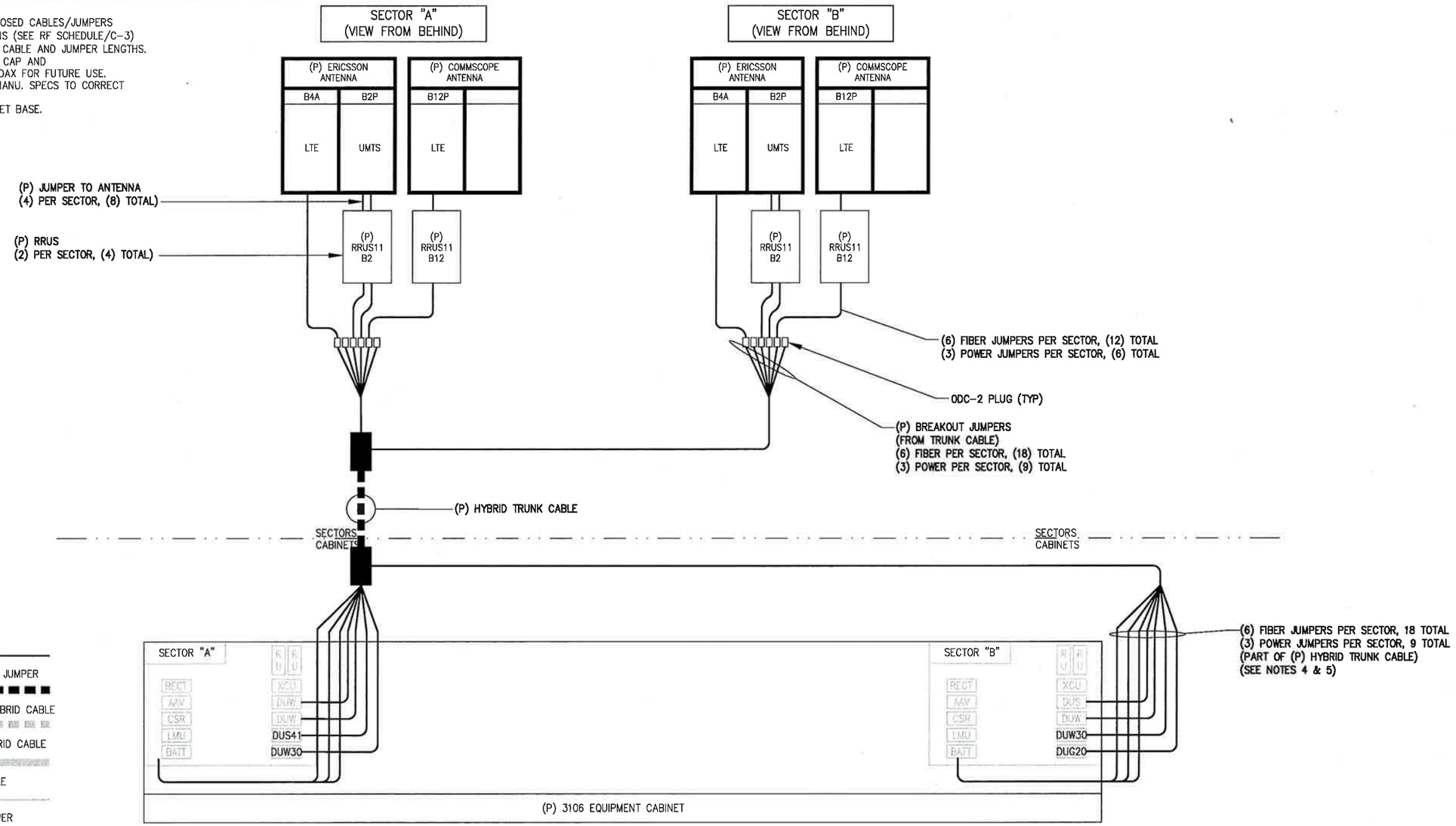
SHEET TITLE
GROUNDING & POWER DIAGRAMS

SHEET NUMBER
E-1

SHEET 6 OF **8** SHEETS

NOTES:

1. TAG ALL EXISTING AND PROPOSED CABLES/JUMPERS PER METRO PCS SPECIFICATIONS (SEE RF SCHEDULE/C-3)
2. SEE RF SCHEDULE/C-3 FOR CABLE AND JUMPER LENGTHS.
3. IF NEW GPS ADDED TO SITE, CAP AND WEATHERPROOF ANY UNUSED COAX FOR FUTURE USE.
4. TRIM POWER JUMPERS PER MANU. SPECS TO CORRECT LENGTH FOR CONNECTION.
5. COIL EXCESS FIBER IN CABINET BASE.



PROPOSED FIBER/POWER JUMPER

PROPOSED FIBER/POWER HYBRID CABLE

EXISTING FIBER/POWER HYBRID CABLE

EXISTING COAX CABLE

EXISTING COAX JUMPER

1 701D_WoutU21 CONFIGURATION COAX/FIBER PLUMBING DIAGRAM
NOT TO SCALE

T-MOBILE NORTHEAST LLC
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LIVERPOOL, NY 13088

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PROJECT NO:	428-000
DRAWN BY:	JLM
CHECKED BY:	ASW

STATE OF CONNECTICUT
JOHN S. STEVENS
No. 24705
LICENSED PROFESSIONAL ENGINEER

PROFESSIONAL SEAL

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SITE NUMBER:
CT11180C

SITE NAME:
BOLTON CT__1

130 VERNON ROAD
BOLTON, CT 06043

SHEET TITLE

COAX/FIBER PLUMBING DIAGRAM

SHEET NUMBER

E-2

SHEET 7 OF **8** SHEETS

ELECTRICAL NOTES:

WORK INCLUDED

1. INCLUDE ALL LABOR, MATERIALS, EQUIPMENT, PLANT SERVICES AND ADMINISTRATIVE TASKS REQUIRED TO COMPLETE AND MAKE OPERABLE THE ELECTRICAL WORK SHOWN ON THE DRAWINGS AND SPECIFIED HEREIN, INCLUDING BUT NOT LIMITED TO THE FOLLOWING:
   - A. PREPARE AND SUBMIT SHOP DRAWINGS, DIAGRAMS AND ILLUSTRATIONS.
   - B. PROCURE ALL NECESSARY PERMITS AND APPROVALS AND PAY ALL REQUIRED FEES AND CHARGES IN CONNECTION WITH THE WORK OF THIS CONTRACT.
   - C. SUBMIT AS-BUILT DRAWINGS, OPERATING AND MAINTENANCE INSTRUCTIONS AND MANUALS.
   - D. EXECUTE ALL CUTTING, DRILLING, ROUGH AND FINISH PATCHING OF EXISTING OR NEWLY INSTALLED CONSTRUCTION REQUIRED FOR THE WORK OF THIS CONTRACT. FOR SLAB PENETRATIONS THROUGH POST TENSION SLABS, X-RAY EXACT AREA OF PENETRATION PRIOR TO PERFORMING WORK. COORDINATE ALL X-RAY WORK WITH BUILDING ENGINEER.
   - E. PROVIDE HANGERS, SUPPORTS, FOUNDATIONS, STRUCTURAL FRAMING SUPPORTS, AND BASES FOR CONDUIT AND EQUIPMENT PROVIDED OR INSTALLED UNDER THE WORK OF HIS CONTRACT. PROVIDE COUNTER FLASHING, SLEEVES AND SEALS FOR FLOOR AND WALL PENETRATIONS.
   - F. MAINTAIN ALL EXISTING ELECTRICAL SERVICES IN THE BUILDING AREAS NOT AFFECTED BY THE ALTERATION DURING THE PROGRESS OF THE WORK INCLUDING PROVIDING ALL TEMPORARY JUMPERS, CONDUITS, CAPS, PROTECTIVE DEVICES, CONNECTIONS AND EQUIPMENT REQUIRED. PROVIDE TEMPORARY LIGHT AND POWER FOR CONSTRUCTION PURPOSES.
2. IT IS THE INTENT OF THESE DRAWINGS AND SPECIFICATIONS TO CALL FOR AN INSTALLATION THAT IS COMPLETE IN EVERY RESPECT. IT IS NOT THE INTENT TO GIVE EVERY DETAIL ON THE DRAWINGS AND IN THE SPECIFICATIONS. IF AN ITEM OF WORK IS INDICATED IN THE DRAWINGS, IT IS CONSIDERED SUFFICIENT FOR INCLUSION IN THE CONTRACT. FURNISH AND INSTALL ALL MATERIAL AND EQUIPMENT USUALLY FURNISHED OR NEEDED TO MAKE A COMPLETE INSTALLATION WHETHER OR NOT SPECIFICALLY MENTIONED IN THE CONTRACT DOCUMENTS.

GENERAL REQUIREMENTS

1. PROVIDE ALL WORK IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE (NEC) AND LOCAL AND STATE ELECTRICAL CODES.
2. THE ELECTRICAL PLANS ARE DIAGRAMMATIC ONLY. REFER TO THE ARCHITECTURAL PLANS FOR THE EXACT DIMENSIONS OF THE BUILDING.
3. LOAD CALCULATIONS ARE BASED ON EXISTING BUILDING INFORMATION/DRAWINGS PROVIDED TO ENGINEERING. CONTRACTOR IS TO VERIFY ALL EXISTING RATINGS AND LOADS PRIOR TO PURCHASING OF SPECIFIED EQUIPMENT FOR COMPLIANCE TO NEC. CONTRACTOR TO NOTIFY ENGINEER OF ANY DISCREPANCIES AND REQUEST FURTHER DIRECTION BY ENGINEER.
4. EXISTING BUILDING EQUIPMENT IS NOTED ON THE DRAWINGS. NEW OR RELOCATED EQUIPMENT IS SHOWN WITH SOLID LINES. FUTURE EQUIPMENT (NOT IN THIS CONTRACT) IS DEPICTED WITH SHADED LINES. REQUEST CLARIFICATION OF DRAWINGS OR OF SPECIFICATIONS PRIOR TO PRICING OR INSTALLATION.
5. GENERAL
   - A. AFTER CAREFULLY STUDYING THE DRAWINGS AND SPECIFICATIONS, AND BEFORE SUBMITTING THE PROPOSAL, MAKE A MANDATORY SITE VISIT TO ASCERTAIN CONDITIONS OF THE SITE, AND THE NATURE AND EXACT QUANTITY OF WORK TO BE PERFORMED. NO EXTRA COMPENSATION WILL BE ALLOWED FOR FAILURE TO NOTIFY THE OWNER, IN WRITING, OF ANY DISCREPANCIES THAT MAY HAVE BEEN NOTED BETWEEN THE EXISTING CONDITIONS AND THE DRAWINGS AND SPECIFICATIONS.
   - B. VERIFY ALL MEASUREMENTS AT THE SITE AND BE RESPONSIBLE FOR CORRECTNESS OF SAME.
6. QUALITY, WORKMANSHIP, MATERIALS AND SAFETY
   - A. PROVIDE NEW MATERIALS AND EQUIPMENT OF A DOMESTIC MANUFACTURER BY THOSE REGULARLY ENGAGED IN THE PRODUCTION AND MANUFACTURE OF SPECIFIED MATERIALS AND EQUIPMENT. WHERE UL, OR OTHER AGENCY, HAS ESTABLISHED STANDARDS FOR MATERIALS, PROVIDE MATERIALS WHICH ARE LISTED AND LABELED ACCORDINGLY. THE COMMERCIALLY STANDARD ITEMS OF EQUIPMENT AND THE SPECIFIC NAMES MENTIONED HEREIN ARE INTENDED FOR THE PROPER FUNCTIONING OF THE WORK.
   - B. WORK SHALL BE PERFORMED BY WORKMEN SKILLED IN THE TRADE REQUIRED FOR THE WORK. INSTALL MATERIALS AND EQUIPMENT TO PRESENT A NEAT APPEARANCE WHEN COMPLETED AND IN ACCORDANCE WITH THE APPROVED RECOMMENDATIONS OF THE MANUFACTURER AND IN ACCORDANCE WITH CONTRACT DOCUMENTS.
   - C. PROVIDE LABOR, MATERIALS, APPARATUS AND APPLIANCES ESSENTIAL TO THE FUNCTIONING OF THE SYSTEMS DESCRIBED OR INDICATED HEREIN, OR WHICH MAY BE REASONABLY IMPLIED AS ESSENTIAL WHENEVER MENTIONED IN THE CONTRACT DOCUMENT OR NOT.
   - D. MAKE WRITTEN REQUESTS FOR SUPPLEMENTARY INSTRUCTIONS TO ARCHITECT/ENGINEER IN CASE OF DOUBT AS TO WORK INTENDED OR IN EVENT OF NEED FOR EXPLANATION THEREOF.
   - E. PERFORMANCE AND MATERIAL REQUIREMENTS SCHEDULED OR SPECIFIED ARE MINIMUM STANDARD ACCEPTABLE. THE RIGHT TO JUDGE THE QUALITY OF EQUIPMENT THAT DEVIATES FROM THE CONTRACT DOCUMENT REMAINS SOLELY WITH ARCHITECT/ENGINEER. CONTRACT DOCUMENT OR NOT.

GUARANTEE

1. GUARANTEE MATERIALS, PARTS AND LABOR FOR WORK FOR ONE YEAR FROM THE DATE OF ISSUANCE OF OCCUPANCY PERMIT. DURING THAT PERIOD, MAKE GOOD FAULTS OR IMPERFECTIONS THAT MAY ARISE DUE TO DEFECTS OR OMISSIONS IN MATERIALS OR WORKMANSHIP WITH NO ADDITIONAL COMPENSATION AND AS DIRECTED BY ARCHITECT.

CLEANING

1. REMOVE ALL CONSTRUCTION DEBRIS RESULTING FROM THE WORK.
2. CLEAN EQUIPMENT AND SYSTEMS FOLLOWING THE COMPLETION OF THE PROJECT TO THE SATISFACTION OF THE ENGINEER.

COORDINATION AND SUPERVISION

1. CAREFULLY LAY OUT ALL WORK IN ADVANCE TO AVOID UNNECESSARY CUTTING, CHANNELING, CHASING OR DRILLING OF FLOORS, WALLS, PARTITIONS, CEILINGS OR OTHER SURFACES. WHERE SUCH WORK IS NECESSARY, HOWEVER, PATCH AND REPAIR THE WORK IN AN APPROVED MANNER BY SKILLED MECHANICS AT NO ADDITIONAL COST TO THE OWNER. RENDER FULL COOPERATION TO OTHER TRADES WHERE WORK WILL BE INSTALLED IN CLOSE PROXIMITY TO WORK OF OTHER TRADES. ASSIST IN WORKING OUT SPACE CONDITIONS. IF WORK IS INSTALLED BEFORE COORDINATION WITH OTHER TRADES, OR CAUSES INTERFERENCE, MAKE CHANGES NECESSARY TO CORRECT CONDITIONS WITHOUT EXTRA CHARGE.

SUBMITTALS

1. AS-BUILT DRAWINGS:
   - A. UPON COMPLETION OF THE WORK, FURNISH TO THE OWNER "AS-BUILT" DRAWINGS.
2. SERVICE MANUALS:
   - A. UPON COMPLETION OF THE WORK, FULLY INSTRUCT T-MOBILE AS TO THE OPERATION AND MAINTENANCE OF ALL MATERIAL, EQUIPMENT AND SYSTEMS.
   - B. PROVIDE 3 COMPLETE BOUND SETS OF INSTRUCTIONS FOR OPERATING AND MAINTAINING ALL SYSTEMS AND EQUIPMENT.

CUTTING AND PATCHING

1. PROVIDE ALL CUTTING, DRILLING, ROUGH AND FINISH PATCHING REQUIRED TO COMPLETE THE WORK.
2. OBTAIN OWNER APPROVAL PRIOR TO CUTTING THROUGH FLOORS OR WALLS FOR PIPING OR CONDUIT.

TESTS, INSPECTION AND APPROVAL

1. BEFORE ENERGIZING ANY ELECTRICAL INSTALLATION, INSPECT EACH UNIT IN DETAIL. TIGHTEN ALL BOLTS AND CONNECTIONS (TORQUE-TIGHTEN WHERE REQUIRED) AND DETERMINE THAT ALL COMPONENTS ARE ALIGNED, AND THE EQUIPMENT IS IN SAFE, OPERATIONAL CONDITION.
2. PROVIDE THE COMPLETE ELECTRICAL SYSTEM FREE OF GROUND FAULTS AND SHORT CIRCUITS SUCH THAT THE SYSTEM WILL OPERATE SATISFACTORILY UNDER FULL LOAD CONDITIONS, WITHOUT EXCESSIVE HEATING AT ANY POINT IN THE SYSTEM.

SPECIAL REQUIREMENTS

1. DO NOT LEAVE ANY WORK INCOMPLETE NOR ANY HAZARDOUS SITUATIONS CREATED WHICH WILL AFFECT THE LIFE OR SAFETY OF THE PUBLIC AND/OR BUILDING OCCUPANTS. DO NOT INTERFERE WITH OR CUTOFF ANY OF THE EXISTING SERVICES WITHOUT THE OWNER'S WRITTEN PERMISSION.
2. WHEN NECESSARY TO TEMPORARILY DISCONNECT ANY EXISTING BUILDING UTILITIES AND SERVICE SYSTEMS, INCLUDING FEEDER OR BRANCH CIRCUITING SUPPLYING EXISTING FACILITIES, CONFER WITH THE OWNER AND ARRANGE THE PERIOD OF INTERRUPTION FOR A TIME MUTUALLY AGREED UPON. SHUTDOWN NOTE: SCHEDULE AND NOTIFY OWNER 48 HOURS PRIOR TO SHUTDOWN. ALL SHUTDOWN WORK TO BE SCHEDULED AT A TIME CONVENIENT TO OWNER.

GROUNDING

1. ROUTE ALL GROUNDING CONDUCTORS AS SHOWN ON CONDUIT/GROUNDING RISER.
2. ROUTE 500 KCMIL CU. THHN CONDUCTOR FROM THE MGB LOCATION TO BUILDING STEEL. VERIFY BUILDING STEEL IS EFFECTIVELY GROUNDED PER NEC TO THE MAIN SERVICE GROUNDING ELECTRODE CONDUCTOR (GEC).
3. MAKE ALL GROUND CONNECTIONS FROM MGB TO ELECTRICAL EQUIPMENT WITH 2 HOLE, CRIMP TYPE, BURNDY COMPRESSION TERMINATIONS, SIZED AS REQUIRED.
4. USE 1 HOLE, CRIMP TYPE, BURNDY COMPRESSIONS TERMINATIONS, SIZED AS REQUIRED, AT EQUIPMENT GROUND CONNECTIONS.
5. HIRE AN INDEPENDENT LAB TO PERFORM THE SPECIFIED OHMS TESTING. PROVIDE 4 SETS OF THE CERTIFIED DOCUMENTS TO THE OWNER FOR VERIFICATION PRIOR TO THE PROJECT COMPLETION.

RACEWAYS

1. ALL WIRING TO BE INSTALLED IN CONDUIT SYSTEMS IN ACCORDANCE WITH THE FOLLOWING:
   - A. EXTERIOR FEEDERS AND CONTROL, WHERE UNDERGROUND, TO BE IN SCH 40 PVC.
   - B. EXTERIOR, ABOVE GROUND POWER CONDUITS TO BE GALVANIZED RIGID STEEL (RGS).
   - C. ALL TELECOMMUNICATION CONDUITS, INTERIOR/EXTERIOR, TO BE EMT.
   - D. INSTALL PULL ROPES IN ALL NEW EMPTY CONDUITS INSTALLED ON THIS PROJECT.
   - E. ALL TELECOM CONDUITS AND PULL BOXES INSTALLED ON THIS PROJECT TO BE LABELED "T-MOBILE". OWNER WILL PROVIDE LABELS FOR CONTRACTOR TO INSTALL.
   - F. INTERIOR FEEDERS TO BE INSTALLED IN E.M.T. WITH STEEL COMPRESSION FITTINGS.
   - G. MINIMUM SIZE CONDUIT TO BE ¾" TRADE SIZE UNLESS OTHERWISE INDICATED ON THE DRAWINGS.
   - H. FINAL CONNECTIONS TO MOTORS AND VIBRATING EQUIPMENT TO BE INSTALLED IN LIQUID-TIGHT FLEXIBLE METAL CONDUIT.
   - I. CONDUIT TO BE RUN CONCEALED IN CEILINGS, FINISHED AREAS OR DRYWALL PARTITIONS, UNLESS OTHERWISE NOTED.
   - J. THE ROUTING OF CONDUITS INDICATED ON THE DRAWINGS IS DIAGRAMMATIC. BEFORE INSTALLING ANY WORK, EXAMINE THE WORKING LAYOUTS AND SHOP DRAWINGS OF THE OTHER TRADES TO DETERMINE THE EXACT LOCATIONS AND CLEARANCES.
   - K. ALL EXTERIOR MOUNTING HARDWARE TO BE GALVANIZED STEEL. COORDINATE WITH BUILDING ENGINEER PRIOR TO ATTACHING TO BUILDING STRUCTURE.

RACEWAYS CONT'D

   - L. PENETRATIONS OF WALLS, FLOORS AND ROOFS, FOR THE PASSAGE OF ELECTRICAL RACEWAYS, TO BE PROPERLY SEALED AFTER INSTALLATION OF RACEWAYS SO AS TO MAINTAIN THE STRUCTURAL OR WATERPROOF INTEGRITY OF THE WALL, FLOOR OR ROOF SYSTEM TO BE PENETRATED. SEAL ALL CONDUIT PENETRATIONS THROUGH FIRE OR SMOKE RATED WALLS, CEILINGS OR SMOKE TIGHT CORRIDOR PARTITIONS TO MAINTAIN PROPER RATING OF WALL OR CEILING.
   - M. PROVIDE ALL CONDUIT ENDS WITH INSULATED METALLIC GROUNDING BUSHINGS.
   - N. CONDUIT TO BE SUPPORTED AT MAXIMUM DISTANCE OF 8'-0", OR AS REQUIRED BY NEC, IN HORIZONTAL AND VERTICAL DIRECTIONS.
   - O. PROVIDE STAINLESS STEEL BLANK COVER PLATES FOR ALL JUNCTION BOXES AND/OR OUTLET BOXES NOT USED IN EXPOSED AREAS. PROVIDE ALL OTHER UNUSED BOXES WITH STANDARD STEEL COVER PLATES.
   - P. WHERE APPLICABLE, PROVIDE ROOFTOP CONDUIT SUPPORT SYSTEM, CONFORMING TO ROOFTOP WARRANTY REQUIREMENTS, PER BUILDING.

WIRES AND CABLES

1. CONTRACTOR TO COORDINATE WITH EQUIPMENT SUPPLIER AND VENDOR FOR EXACT EQUIPMENT OVER-CURRENT PROTECTION VOLTAGE, WIRE SIZE AND PLUG CONFIGURATION, IF APPLICABLE, PRIOR TO BID.
2. ALL EQUIPMENT/DEVICES TO BE PROVIDED WITH INSULATED GROUND CONDUCTOR.
3. ALL WIRE AND CABLE TO BE 600VOLT, COPPER, WITH THWN/THHN INSULATION, EXCEPT AS NOTED.
4. WIRE FOR POWER AND LIGHTING WILL NOT BE LESS THAN NO. 12AWG. ALL WIRE NO. 8 AND LARGER TO BE STRANDED.
5. CONTROL WIRING IS NOT TO BE LESS THAN NO. 14AWG, FLEXIBLE IN SINGLE CONDUCTORS OR MULTI-CONDUCTOR CABLES. CONTROL WIRING WILL CONSIST OF MULTI-CONDUCTOR CABLES WHEREVER POSSIBLE. CABLES TO BE PROVIDED WITH AN OVERALL FLAME-RETARDANT, EXTRUDED JACKET AND RATED FOR PLENUM USE. ALL CONTROL WIRE TO BE 600VOLT RATED.
6. WIRE PREVIOUSLY PULLED INTO CONDUIT IS CONSIDERED USED AND IS NOT TO BE RE-PULLED.
7. HOME RUNS AND BRANCH CIRCUIT WIRING FOR 20A, 120V CIRCUITS:

LENGTH (FT.)	HOME RUN WIRE SIZE
0 TO 50	NO. 12
51 TO 100	NO. 10
101 TO 150	NO. 8

8. VOLTAGE DROP IS NOT TO EXCEED 3%.
9. MAKE ALL CONNECTIONS WITH UL APPROVED, SOLDERLESS, PRESSURE TYPE INSULATED CONNECTORS: SCOTCHLOK OR AND APPROVED EQUAL.

WIRING DEVICES

1. ALL RECEPTACLES INSTALLED IN THIS PROJECT TO BE GROUNDING TYPE, WITH GROUNDING PIN SLOT CONNECTED TO DEVICE GROUND SCREW FOR GROUND WIRE CONNECTION.

DISCONNECT SWITCHES AND FUSES

1. DISCONNECT SWITCHES TO BE VOLTAGE-RATED TO SUIT THE CHARACTERISTICS OF THE SYSTEM FROM WHICH THEY ARE SUPPLIED.
2. PROVIDE HEAVY-DUTY, METAL-ENCLOSED, EXTERNALLY-OPERATED DISCONNECT SWITCHES, FUSED OR UNFUSED, OF SUCH TYPE AND SIZE AS REQUIRED TO PROPERLY PROTECT OR DISCONNECT THE LOAD FOR WHICH THEY ARE INTENDED.
3. PROVIDE NEMA 1 DISCONNECT SWITCHES FOR INTERIOR INSTALLATION, NEMA 3R FOR EXTERIOR INSTALLATION.
4. DISCONNECT SWITCHES TO BE MANUFACTURED BY:
   - A. GENERAL ELECTRIC COMPANY
   - B. SQUARE-D
5. PROVIDE RK-1 TYPE FUSES, UNLESS NOTED OTHERWISE.

INSTALLATION

1. INSTALL DISCONNECT SWITCHES WHERE INDICATED ON DRAWINGS.
2. INSTALL FUSES IN FUSIBLE DISCONNECT SWITCHES. FUSES MUST MATCH IN TYPE AND RATING.
3. FUSES TO BE MOUNTED SO THAT THE LABELS SHOWING THEIR RATINGS CAN BE READ WITHOUT REQUIRING FUSE REMOVAL.
4. FURNISH AND DEPOSIT SPARE FUSES AT THE JOB SITE AS FOLLOWS:
   - A. THREE SPARES FOR EACH TYPE AND SIZE, IN EXCESS OF 60A, USED FOR INITIAL FUSING.
   - B. TEN PERCENT SPARES FOR EACH TYPE AND SIZE, UP TO AND INCLUDING 60A, USED FOR INITIAL FUSING. IN NO CASE WILL LESS THAN THREE FUSES OF ONE PARTICULAR TYPE AND SIZE BE FURNISHED.

GENERAL NOTES:

INTENT

1. THESE SPECIFICATIONS AND CONSTRUCTION DRAWINGS ACCOMPANYING THEM DESCRIBE THE WORK TO BE DONE AND THE MATERIALS TO BE FURNISHED FOR CONSTRUCTION.
2. THE DRAWINGS AND SPECIFICATIONS ARE INTENDED TO BE FULLY EXPLANATORY AND SUPPLEMENTARY. HOWEVER, SHOULD ANYTHING BE SHOWN, INDICATED, OR SPECIFIED ON ONE AND NOT THE OTHER, IT SHALL BE DONE THE SAME AS IF SHOWN, INDICATED OR SPECIFIED IN BOTH
3. THE INTENTION OF THE DOCUMENTS IS TO INCLUDE ALL LABOR AND MATERIALS REASONABLY NECESSARY FOR THE PROPER EXECUTION AND COMPLETION OF THE WORK AS STIPULATED IN THE CONTRACT.
4. THE PURPOSE OF THE SPECIFICATIONS IS TO INTERPRET THE INTENT OF THE DRAWINGS AND TO DESIGNATE THE METHOD OF THE PROCEDURE, TYPE AND QUALITY OF MATERIALS REQUIRED TO COMPLETE THE WORK.
5. MINOR DEVIATIONS FROM THE DESIGN LAYOUT ARE ANTICIPATED AND SHALL BE CONSIDERED AS PART OF THE WORK. NO CHANGES THAT ALTER THE CHARACTER OF THE WORK WILL BE MADE OR PERMITTED BY THE OWNER WITHOUT ISSUING A CHANGE ORDER.

CONFLICTS

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFICATIONS OF ALL MEASUREMENTS AT THE SITE BEFORE ORDERING ANY MATERIALS OR DOING ANY WORK. NO EXTRA CHARGE OR COMPENSATION SHALL BE ALLOWED DUE TO DIFFERENCE BETWEEN ACTUAL DIMENSIONS AND DIMENSIONS INDICATED ON THE CONSTRUCTION DRAWINGS. ANY SUCH DISCREPANCY IN DIMENSION WHICH MAY BE FOUND SHALL BE SUBMITTED TO THE OWNER FOR CONSIDERATION BEFORE THE CONTRACTOR PROCEEDS WITH THE WORK IN THE AFFECTED AREAS.
2. THE BIDDER, IF AWARDED THE CONTRACT, WILL NOT BE ALLOWED ANY EXTRA COMPENSATION BY REASON OF ANY MATTER OR THING CONCERNING SUCH BIDDER MIGHT HAVE FULLY INFORMED THEMSELVES PRIOR TO THE BIDDING.
3. NO PLEA OF IGNORANCE OF CONDITIONS THAT EXIST, OR OF DIFFICULTIES OR CONDITIONS THAT MAY BE ENCOUNTERED, OR OF ANY OTHER RELEVANT MATTER CONCERNING THE WORK TO BE PERFORMED IN THE EXECUTION OF THE WORK WILL BE ACCEPTED AS AN EXCUSE FOR ANY FAILURE OR OMISSION ON THE PART OF THE CONTRACTOR TO FULFILL EVERY DETAIL OF ALL THE REQUIREMENTS OF THE CONTRACT DOCUMENTS GOVERNING THE WORK.

CONTRACTS AND WARRANTIES

1. CONTRACTOR IS RESPONSIBLE FOR APPLICATION AND PAYMENT OF CONTRACTOR LICENSES AND BONDS.
2. SEE MASTER CONTRACTION SERVICES AGREEMENT FOR ADDITIONAL DETAILS.

STORAGE

1. ALL MATERIALS MUST BE STORED IN A LEVEL AND DRY FASHION AND IN A MANNER THAT DOES NOT NECESSARILY OBSTRUCT THE FLOW OF OTHER WORK. ANY STORAGE METHOD MUST MEET ALL RECOMMENDATIONS OF THE ASSOCIATED MANUFACTURER.

CLEANUP

1. THE CONTRACTORS SHALL, AT ALL TIMES, KEEP THE SITE FREE FROM ACCUMULATION OF WASTE MATERIALS OR RUBBISH CAUSED BY THEIR EMPLOYEES AT WORK AND AT THE COMPLETION OF THE WORK. THEY SHALL REMOVE ALL RUBBISH FROM AND ABOUT THE BUILDING AREA, INCLUDING ALL THEIR TOOLS, SCAFFOLDING AND SURPLUS MATERIALS AND SHALL LEAVE THEIR WORK CLEAN AND READY TO USE.
2. EXTERIOR
   - A. VISUALLY INSPECT EXTERIOR SURFACES AND REMOVE ALL TRACES OF SOIL, WASTE MATERIALS, SMUDGES AND OTHER FOREIGN MATTER.
   - B. REMOVE ALL TRACES OF SPLASHED MATERIALS FROM ADJACENT SURFACES.
   - C. IF NECESSARY, TO ACHIEVE A UNIFORM DEGREE OF CLEANLINESS, HOSE DOWN THE EXTERIOR OF THE STRUCTURE.
3. INTERIOR
   - A. VISUALLY INSPECT INTERIOR SURFACE AND REMOVE ALL TRACES OF SOIL, WASTE MATERIALS, SMUDGES AND OTHER FOREIGN MATTER FROM WALLS, FLOOR, AND CEILING.
   - B. REMOVE ALL TRACES OF SPLASHED MATERIALS FROM ADJACENT SURFACES.
   - C. REMOVE PAINT DROPPINGS, SPOTS, STAINS, AND DIRT FROM FINISHED SURFACES.

CHANGE ORDER PROCEDURE:

1. REFER TO SECTION 17 OF SIGNED MCSA: SEE PROFESSIONAL SERVICE AGREEMENT FOR MCSA.

RELATED DOCUMENTS AND COORDINATION

1. GENERAL CARPENTRY, ELECTRICAL AND ANTENNA DRAWINGS ARE INTERRELATED. IN PERFORMANCE OF THE WORK, THE CONTRACTOR MUST REFER TO ALL DRAWINGS. ALL COORDINATION TO BE THE RESPONSIBILITY OF THE CONTRACTOR.

SHOP DRAWINGS

1. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS AS REQUIRED AND LISTED IN THESE SPECIFICATIONS TO THE OWNER FOR APPROVAL.
2. ALL SHOP DRAWINGS SHALL BE REVIEWED, CHECKED AND CORRECTED BY CONTRACTOR PRIOR TO SUBMITTAL TO THE OWNER.

PRODUCTS AND SUBSTITUTIONS

1. SUBMIT 3 COPIES OF EACH REQUEST FOR SUBSTITUTION. IN EACH REQUEST, IDENTIFY THE PRODUCT OR FABRICATION OR INSTALLATION METHOD TO BE REPLACED BY THE SUBSTITUTION. INCLUDE RELATED SPECIFICATION SECTION AND DRAWING NUMBERS AND COMPLETE DOCUMENTATION SHOWING COMPLIANCE WITH THE REQUIREMENTS FOR SUBSTITUTIONS.
2. SUBMIT ALL NECESSARY PRODUCT DATA AND CUT SHEETS WHICH PROPERLY INDICATE AND DESCRIBE THE ITEMS, PRODUCTS AND MATERIALS BEING INSTALLED. THE CONTRACTOR SHALL, IF DEEMED NECESSARY BY THE OWNER, SUBMIT ACTUAL SAMPLES TO THE OWNER FOR APPROVAL IN LIEU OF CUT SHEETS.

QUALITY ASSURANCE

1. ALL WORK SHALL BE IN ACCORDANCE WITH APPLICABLE LOCAL, STATE AND FEDERAL REGULATIONS. THESE SHALL INCLUDE, BUT NOT BE LIMITED TO THE APPLICABLE CODES SET FORTH BY THE LOCAL GOVERNING BODY. SEE "CODE COMPLIANCE" T-1.

ADMINISTRATION

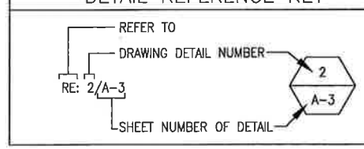
1. BEFORE THE COMMENCEMENT OF ANY WORK, THE CONTRACTOR WILL ASSIGN A PROJECT MANAGER WHO WILL ACT AS A SINGLE POINT OF CONTACT FOR ALL PERSONNEL INVOLVED IN THIS PROJECT. THIS PROJECT MANAGER WILL DEVELOP A MASTER SCHEDULE FOR THE PROJECT WHICH WILL BE SUBMITTED TO THE OWNER PRIOR TO THE COMMENCEMENT OF ANY WORK.
2. SUBMIT A BAR TYPE PROGRESS CHART, NOT MORE THAN 3 DAYS AFTER THE DATE ESTABLISHED FOR COMMENCEMENT OF THE WORK ON THE SCHEDULE, INDICATING A TIME BAR FOR EACH MAJOR CATEGORY OR UNIT OF WORK TO BE PERFORMED AT THE SITE, PROPERLY SEQUENCED AND COORDINATED WITH OTHER ELEMENTS OF WORK AND SHOWING COMPLETION OF THE WORK SUFFICIENTLY IN ADVANCE OF THE DATE ESTABLISHED FOR SUBSTANTIAL COMPLETION OF THE WORK.
3. PRIOR TO COMMENCING CONSTRUCTION, THE OWNER SHALL SCHEDULE AN ON-SITE MEETING WITH ALL MOR PARTIES. THIS WOULD INCLUDE, BUT NOT LIMITED TO, THE OWNER, PROJECT MANAGER, CONTRACTOR, LAND OWNER REPRESENTATIVE, LOCAL TELEPHONE COMPANY, TOWER ERECTION FOREMAN (IF SUBCONTRACTED).
4. CONTRACTOR SHALL BE EQUIPPED WITH SOME MEANS OF CONSTANT COMMUNICATIONS, SUCH AS A MOBILE PHONE OR A BEEPER. THIS EQUIPMENT WILL NOT BE SUPPLIED BY THE OWNER, NOR WILL WIRELESS SERVICE BE ARRANGED.
5. DURING CONSTRUCTION, CONTRACTOR MUST ENSURE THAT EMPLOYEES AND SUBCONTRACTORS WEAR HARD HATS AT ALL TIMES. CONTRACTOR WILL COMPLY WITH ALL WPCS SAFETY REQUIREMENTS IN THEIR AGREEMENT.
6. PROVIDE WRITTEN DAILY UPDATES ON SITE PROGRESS TO THE OWNER.
7. COMPLETE INVENTORY OF CONSTRUCTION MATERIALS AND EQUIPMENT IS REQUIRED PRIOR TO START OF CONSTRUCTION.
8. NOTIFY THE OWNER/PROJECT MANAGER IN WRITING NO LESS THAN 48 HOURS IN ADVANCE OF CONCRETE POURS, TOWER ERECTIONS, AND EQUIPMENT CABINET PLACEMENTS.

INSURANCE AND BONDS

1. CONTRACTOR, AT THEIR OWN EXPENSE, SHALL CARRY AND MAINTAIN, FOR THE DURATION OF THE PROJECT, ALL INSURANCE, AS REQUIRED AND LISTED, AND SHALL NOT COMMENCE WITH THEIR WORK UNTIL THEY HAVE PRESENTED AN ORIGINAL CERTIFICATE OF INSURANCE STATING ALL COVERAGES TO THE OWNER. REFER TO THE MASTER AGREEMENT FOR REQUIRED INSURANCE LIMITS.
2. THE OWNER SHALL BE NAMED AS AN ADDITIONAL INSURED ON ALL POLICIES.
3. CONTRACTOR MUST PROVIDE PROOF OF INSURANCE.

ARCHITECTURAL SYMBOLS

DETAIL REFERENCE KEY



ABBREVIATIONS

ADJ	ADJUSTABLE
AGL	ABOVE GROUND LINE
&	AND
APPROX	APPROXIMATE
@	AT
BTS	BASE TRANSMISSION STATION
CAB	CABINET
CLG	CEILING
CONC	CONCRETE
CONT	CONTINUOUS
DIA OR ø	DIAMETER
DWG	DRAWING
EA	EACH
ELEC	ELECTRICAL
ELEV	ELEVATION
EQ	EQUAL
EQUIP	EQUIPMENT
EGB	EQUIPMENT GROUND BAR
(E)	EXISTING
EXT	EXTERIOR
FF	FINISHED FLOOR
GA	GAUGE
GALV	GALVANIZED
GC	GENERAL CONTRACTOR
GRND	GROUND
LG	LONG
MAX	MAXIMUM
MECH	MECHANICAL
MW	MICROWAVE DISH
MFR	MANUFACTURER
MGB	MASTER GROUND BAR
MIN	MINIMUM
MTL	METAL
(N)	NEW
NIC	NOT IN CONTRACT
NTS	NOT TO SCALE
OC	ON CENTER
OPP	OPPOSITE
(P)	PROPOSED
PCS	PERSONAL COMMUNICATION SYSTEM
PPC	POWER PROTECTION CABINET
SF	SQUARE FOOT
SHT	SHEET
SIM	SIMILAR
SS	STAINLESS STEEL
STL	STEEL
TOC	TOP OF CONCRETE
TOM	TOP OF MASONRY
TYP	TYPICAL
VIF	VERIFY IN FIELD
UON	UNLESS OTHERWISE NOTED
WWF	WELDED WIRE FABRIC
W/	WITH

T-Mobile

T-MOBILE NORTHEAST LLC
103 MONARCH DRIVE
LIVERPOOL, NY 13088

INFINIGY

1033 Watervliet Shaker Rd
Albany, NY 12205
Office # (518) 690-0790
Fax # (518) 690-0793

SUBMITTALS		
DATE	DESCRIPTION	REVISION
2/19/16	FOR REVIEW	A
4/27/16	FOR PERMIT	B
10/11/16	REVISED LOCATION	C

DEPT.	DATE	APP'D	REVISIONS
RFE			
RF MAN.			
ZONING			
OPS			
CONSTR.			
SITE AC.			

PROJECT NO:	428-000
DRAWN BY:	JLM
CHECKED BY:	ASW

STATE OF CONNECTICUT
JOHN S. STEVENS
No. 24705
LICENSED
PROFESSIONAL ENGINEER
PROFESSIONAL SEAL

NOTE: IF DRAWINGS ARE 22"x34", USE GRAPHICAL SCALE AND/OR 1/2 TIMES OF THE NOTED SCALE.

SITE NUMBER:
CT11180C

SITE NAME:
BOLTON CT_1

130 VERNON ROAD
BOLTON, CT 06043

SHEET TITLE

GENERAL AND ELECTRICAL NOTES

SHEET NUMBER

N-1

SHEET 8 OF 8 SHEETS

AECOM

Submitted to
Transcend Wireless
10 Industrial Avenue
Suite 3
Mahwah, New Jersey 07430

Submitted by
AECOM
500 Enterprise Drive,
Suite 3B
Rocky Hill, CT 06067
September 20, 2016

DETAILED STRUCTURAL ANALYSIS AND MODIFICATION OF AN EXISTING 150' GUYED TOWER AND FOUNDATION FOR PROPOSED ANTENNA ARRANGEMENT

T-Mobile

Site ID : CT11180C
Site Address: 130 Vernon Road
(West Coventry Tower)
Bolton, CT

TWM-007

TABLE OF CONTENTS

1. EXECUTIVE SUMMARY

This report summarizes the structural analysis of the existing, previously reinforced, 150' guyed tower structure located at 130 Vernon Road, Bolton, CT. The structural analysis was conducted in accordance with the TIA-222-G[1] Standard for a wind velocity of 105 mph (3-second gust) and 50 mph (3-second gust) concurrent with 1" ice thickness, considered to increase in thickness with height and with the 2012 International Building Code with 2016 Connecticut State Building Code Amendments for a wind speed of 105 mph (3-second gust) and the AISC[2] Load Resistance Factor Design (LRFD) . The design ice thickness for the State Code is to follow the ASCE 7[3] Standard which is referenced in the TIA-222-G Standard. The antenna loading considered ion the analysis consists of all the existing antennas, transmission lines and ancillary items as outlined in the Introduction Section of this report.

The proposed T-Mobile antenna modification is listed below:

Antenna and Mount	Carrier	Antenna Center Elevation
Install: **(2) Ericsson AIR21 B4A/B2P Panel Antennas (Alpha and Beta Sectors)** **(2) Commscope SBNH-1D65C Panel Antennas (Alpha and Beta Sectors)** **(2) Ericsson RRUS11 B2 RRH Units (Alpha and Beta Sectors)** **(2) Ericsson RRHUS11 B12 Units (Alpha and Beta Sectors)** **(2) T-Arm Mounts (Alpha and Beta Sectors)** **(1) Fiber Optic Cable**	**T-Mobile (Proposed)**	**@ 130'**

The results of the analysis indicate that:

1. The existing steel tower structure IS considered structurally adequate for the proposed antenna loading with the wind classification specified above.
2. The existing tower foundation pad IS considered structurally adequate for the proposed antenna loading with the load classification specified above.
3. The existing guy anchor foundation components ARE considered structurally adequate for the proposed antenna loading with the load classification specified above.

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

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

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

1. EXECUTIVE SUMMARY – continued

This analysis is based on:

1) The tower structure's theoretical capacity, not including any assessment of the condition of the tower.
2) Geotechnical Study for Proposed Tower off Quarry Road, Bolton, CT, prepared by DR. Clarence Welti, dated April 23, 2001.
3) PiROD Inc. Bill of Materials and Detail Drawings on behalf of Mountaintop Enterprises, Inc. dated October 29, 2001.
4) Construction Drawings for antenna upgrades, prepared by Ramaker & Associates on behalf of Sprint, dated May 8, 2014.
5) Previous structural analysis and assessment performed by URS Corporation on behalf of Sprint, project number 36928701 / TWS-016, signed and sealed on July 6, 2014.
6) Proposed antenna upgrades for installation to tower provided by Transcend Wireless on behalf of T-Mobile, obtained via e-mail dated 9/16/2016.
7) Antenna and mount configuration as specified on the following page of this report.

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

If you should have any questions, please call.

Sincerely,

AECOM,

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

2. INTRODUCTION

The subject tower is located at 130 Vernon Road, Bolton, CT. The structure is a 150' guyed tower structure designed by PiROD Industries.

The inventory is summarized in Table 1:

Table 1: Antenna and Mount Configuration

Antenna Type	*Carrier*	*Mount*	*Antenna Centerline Elevation*	*Cable*
(3) RFS APXVTM14-ALU-120 Panel Antennas (3) Alcatel-Lucent TD-RRH8x20 RRH Units (3) APXVSPP18-C-A20 Panel Antennas (3) 1900 MHz RRH Units (3) 800 MHz RRH Units	Sprint (Existing)	(3) T-Frame Sector Mounts	148'	(1) 5/8" F.O. Cable (2) Fiber Jumpers (27) Antenna/RRH Jumpers (3) 1 1/4" F.O. Cables
(2) AIR 21 B4A/B2P (Sectors A & B) (2) SBNH-1DC65C (Sectors A & B) (2) RRUS-11 B2 (2) RRUS-11 B12	**T-Mobile (Proposed)**	**(2) T-Arm Mounts (Sectors A & B)**	**130'**	**(1) Fiber Optic Cable**

This structural analysis of the communications tower was performed by AECOM for T-Mobile. The purpose of this analysis was to assess the existing tower for its existing and proposed loads This analysis was conducted to evaluate stress on the tower and the effect of forces to the foundation of the tower resulting from existing and proposed antenna arrangements.

3. ANALYSIS METHODOLOGY AND LOADING CONDITIONS

The structural analysis was done in accordance with , the TIA/EIA-222-G–Structural Standard for Antenna Towers and Antenna Supporting Structures and Antennas, the 2012 International Building Code with 2016 Connecticut State Building Code Amendments and the American Institute of Steel Construction (AISC) Manual of Steel Construction – Load Resistance Factor Design (LRFD)

The structural analysis was conducted using TNX Tower version 7.0.7.0 and used the following conditions for this tower review (following the TIA/EIA-222-G Standard):

- Structure Class 2 – (Substantial Communications)
  - NOTE: ASCE 7 and CT State Building Code Applied Risk Category 3 for design wind loads (see below)
- Topographic Category 1 – (No abrupt changes in general topography)
  - NOTE: Tower base is surrounded by nearby hills that would restrict rolling wind speed build-up effects for this location.
- Exposure Class C – (Open Terrain with scattered obstructions)
- Load Conditions:
  - Two load conditions were evaluated as shown which were compared to design stresses according to AISC and TIA/EIA-222-G Standard.

Basic Wind Speed:

- TIA-222-G:
  - Tolland County: **V = 105 mph** (3-second gust) [Annex of TIA/EIA-222-G 2006]
- IBC 2012 w/ 2016 CT State Building Code Amendment:
  - **V.asd = 105 mph** (3-second gust) for the following conditions:
    - IBC 2012 Section 1609.1 – Exception 5 would apply, therefore wind speed is based off of "V.asd" not "V.ult"
    - Risk Category for wind speed determination = "III"

Load Condition 1 = 105 mph (3-second gust) Wind Load (without ice) + Tower Dead Load
Load Condition 2 = 50 mph (3-second gust) Wind Load (with ice) + Ice Load + Tower Dead Load

Ice thickness used for this analysis is **1 inch** (assumed to start at the base of the tower) and is considered to increase in thickness with height. The initial ice thickness for design is referenced in the Annex of TIA-222-G and follows the same design criteria as the ASCE 7 Standard.

4. FINDINGS AND EVALUATION

Combined axial and bending stresses on the guyed tower structure were evaluated to compare with strength design in accordance with AISC (LRFD). The calculated stresses for portions of the structure were BELOW the required design strength under the proposed configuration and loading. Detailed analysis and calculations for the proposed load condition are provided in Section 6 of this report.

Table 1: Tower Component Stress vs. Capacity Table

Component / Section No.	*Controlling Component / Elevation*	*Stress (% Capacity)*	*Pass/Fail*	*Comments*
Tower Leg (T3)	SR 2 / 100' – 120'	26.5	**Pass**	
Diagonal (T2)	SR 3/4 / 120' – 140'	62.1	**Pass**	
Horizontal (T9)	4"x1/2"(t) A36 Welded Plates / 0' – 5'	2.2	**Pass**	
Top Girt (T2)	SR 3/4" / 120' – 140'	55.9	**Pass**	
Bottom Girt (T8)	SR 3/4" / 120' – 140'	37.0	**Pass**	
Guy @ 138'	EHS 9/16"	58.7	**Pass**	
Guy @ 70'	EHS 11/16"	45.6	**Pass**	
Top Guy Pull-Off (T1)	SR 1 1/4" / 140' – 150'	29.7	**Pass**	
Torque Arm Top (T2)	2L 3"x3"x5/16" / 120' – 140'	43.4	**Pass**	
Torque Arm Bottom (T2)	2L 3"x3"x5/16" / 120' – 140'	35.6	**Pass**	
Connection Bolt	Torque Arm Connecting Bolt (5/8" A325N) / 138'	43.4	**Pass**	
Tower Foundation	Bearing Capacity/Foundation Pad	46.4	**Pass**	
Anchor Uplift Resistance	Concrete Guy Anchor (connected to solid rock)	15.0	**Pass**	
Anchor Slide Resistance	Concrete Guy Anchor (connected to solid rock)	29.3	**Pass**	
Guyed Anchor Connection Rod	1-1/4" Dia. @ 50 ksi (min.) / Tension	66.7	**Pass**	Modeled after PiROD # 102305. Size to be field verified.

5. CONCLUSIONS

The results of the analysis indicate that:

1. The existing steel tower structure IS considered structurally adequate for the proposed antenna loading with the wind classification specified herein.
2. The existing tower foundation pad IS considered structurally adequate for the proposed antenna loading with the load classification specified herein.
3. The existing guy anchor foundation components ARE considered structurally adequate for the proposed antenna loading with the load classification specified herein.

Limitations/Assumptions:

This report is based on the following:

1. Tower inventory as listed in this report.
2. Tower is properly installed and maintained.
3. All members are as specified in the original design documents and are in good condition.
4. All required members are in place.
5. All bolts are in place and are properly tightened.
6. Tower is in plumb condition.
7. All member protective coatings are in good condition.
8. All tower members were properly designed, detailed, fabricated, and installed and have been properly maintained since erection.
9. Foundations are in good condition without defects and were properly constructed to support original design loads a specified in the original design documents.

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

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

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

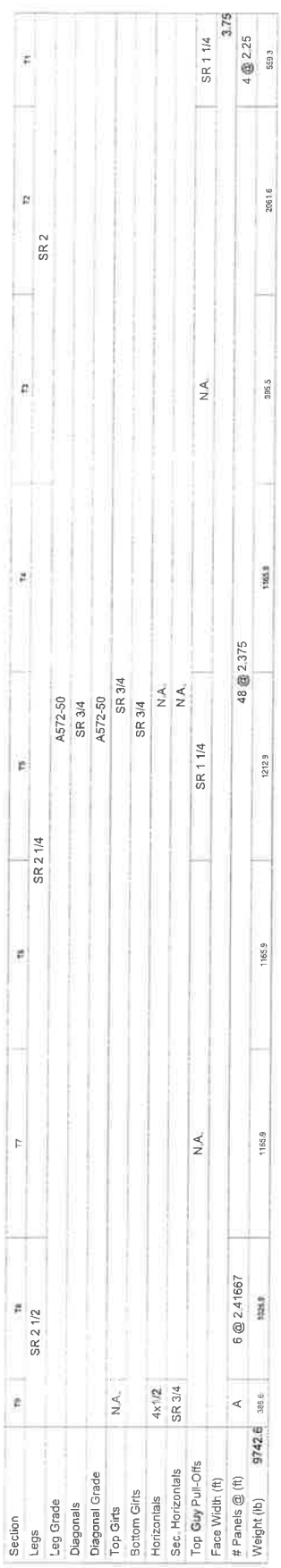
Ongoing and Periodic Inspection and Maintenance:

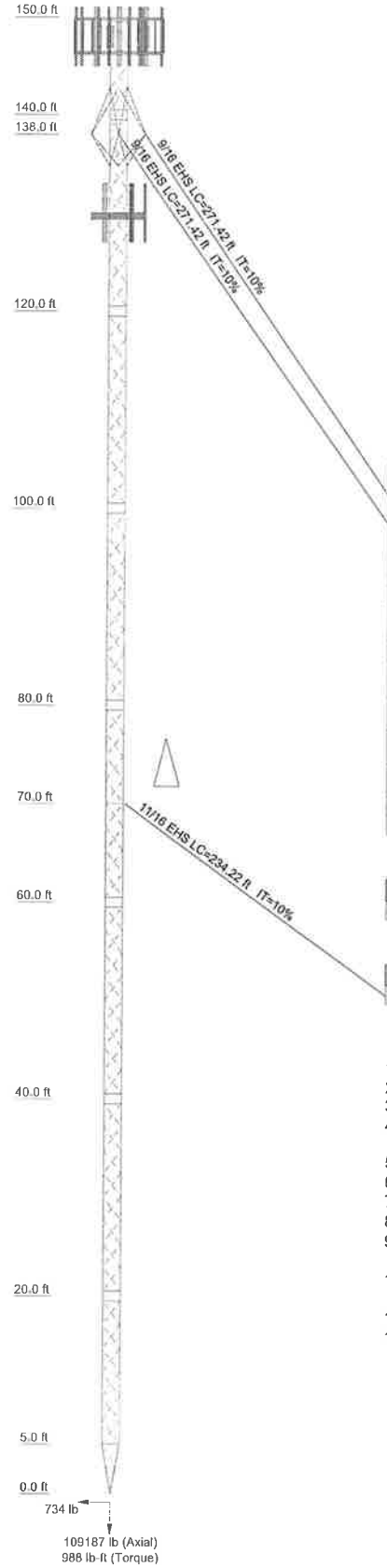
After the Contractor has successfully completed the installation and the work has been accepted, the owner will be responsible for the ongoing and periodic inspection and maintenance of the tower.

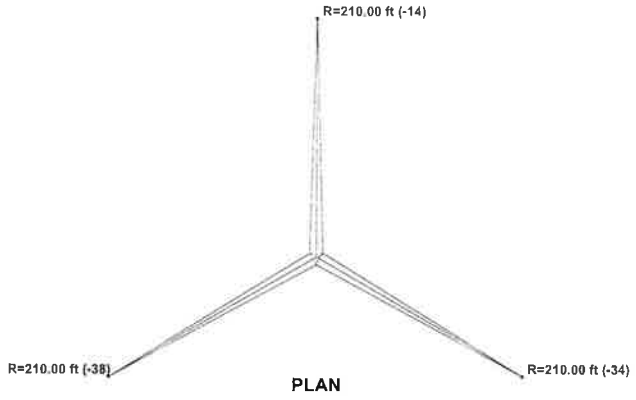
The owner shall refer to TIA/EIA-222-G Section 14.2 for recommendations for maintenance and inspection. The frequency of the inspection and maintenance intervals is to be determined by the owner based upon actual site and environmental conditions. It is recommended that a complete and thorough inspection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

6. DRAWINGS AND DATA

TNX TOWER INPUT/OUTPUT SUMMARY







PLAN

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
APXVSPP18-C-A20 w/ Mounting Pipe (Sprint)	148	APXVTM14-ALU-120 (Sprint)	148
APXVSPP18-C-A20 w/ Mounting Pipe (Sprint)	148	8' Long Jumper Cables (27) (Sprint)	148
APXVSPP18-C-A20 w/ Mounting Pipe (Sprint)	148	TD-RRH8x20 (Sprint)	148
Andrew 800MHz RRH (Sprint)	148	TD-RRH8x20 (Sprint)	148
Andrew 800MHz RRH (Sprint)	148	TD-RRH8x20 (Sprint)	148
Andrew 800MHz RRH (Sprint)	148	SBNH-1D65C Panel Antenna (T-Mobile)	130
Panasonic RRH 1900MHZ (Sprint)	148	Pirod 12' T-Frame Sector Mount (1) (T-Mobile)	130
Panasonic RRH 1900MHZ (Sprint)	148	Pirod 12' T-Frame Sector Mount (1) (T-Mobile)	130
Panasonic RRH 1900MHZ (Sprint)	148	RRUS-11 (T-Mobile)	130
Pirod 12' T-Frame Sector Mount (1) (Sprint)	148	RRUS-11 (T-Mobile)	130
Pirod 12' T-Frame Sector Mount (1) (Sprint)	148	RRUS-11 (T-Mobile)	130
Pirod 12' T-Frame Sector Mount (1) (Sprint)	148	RRUS-11 (T-Mobile)	130
APXVTM14-ALU-120 (Sprint)	148	AIR21 B4A/B2P (T-Mobile)	130
APXVTM14-ALU-120 (Sprint)	148	SBNH-1D65C Panel Antenna (T-Mobile)	130
		AIR21 B4A/B2P (T-Mobile)	130

SYMBOL LIST

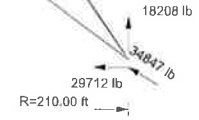
MARK	SIZE	MARK	SIZE
A	2 @ 2.25		

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in Tolland County, Connecticut.
2. Tower designed for Exposure C to the TIA-222-G Standard.
3. Tower designed for a 105 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. Weld together tower sections have flange connections.
9. Connections use galvanized A325 bolts, nuts and locking devices. Installation per TIA/EIA-222 and AISC Specifications.
10. Tower members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards.
11. Welds are fabricated with ER-70S-6 electrodes.
12. TOWER RATING: 62.1%



ALL REACTIONS ARE FACTORED

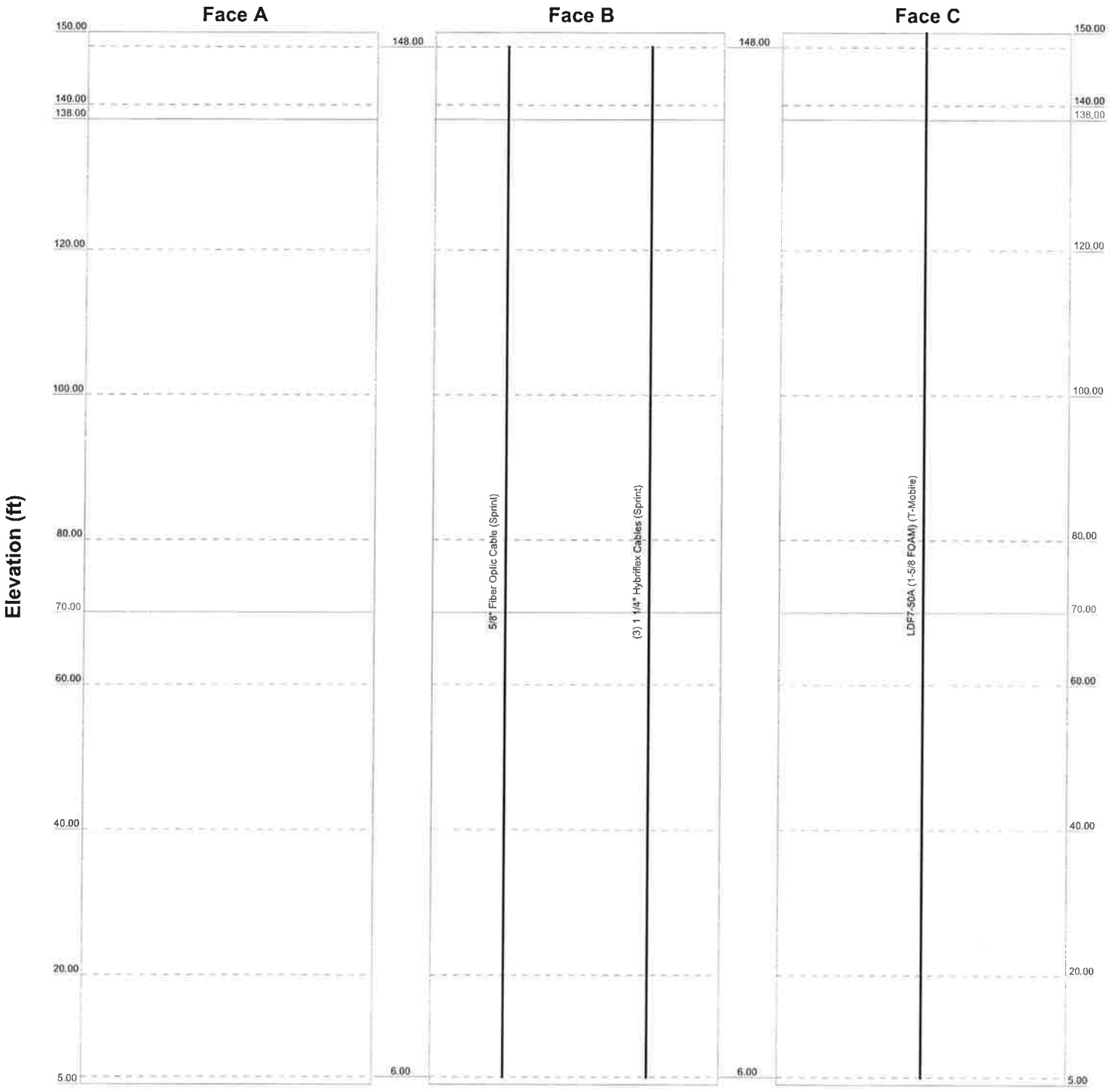
AECOM
500 Enterprise Drive, Suite 3B
Rocky Hill, CT
Phone: 860-529-8882
FAX: 860-529-3991

Job:	S.A. - West Coventry Tower (Bolton, CT		
Project:	TWM-007 / T-Mobile		
Client:	Transcend Wireless	Drawn by: MCD	App'd:
Code:	TIA-222-G	Date: 09/20/16	Scale: NTS
Path:			Dwg No. E-1

TNX TOWER FEEDLINE DISTRIBUTION CHART

Feed Line Distribution Chart
5' - 150'

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



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Project:	TWM-007 / T-Mobile		
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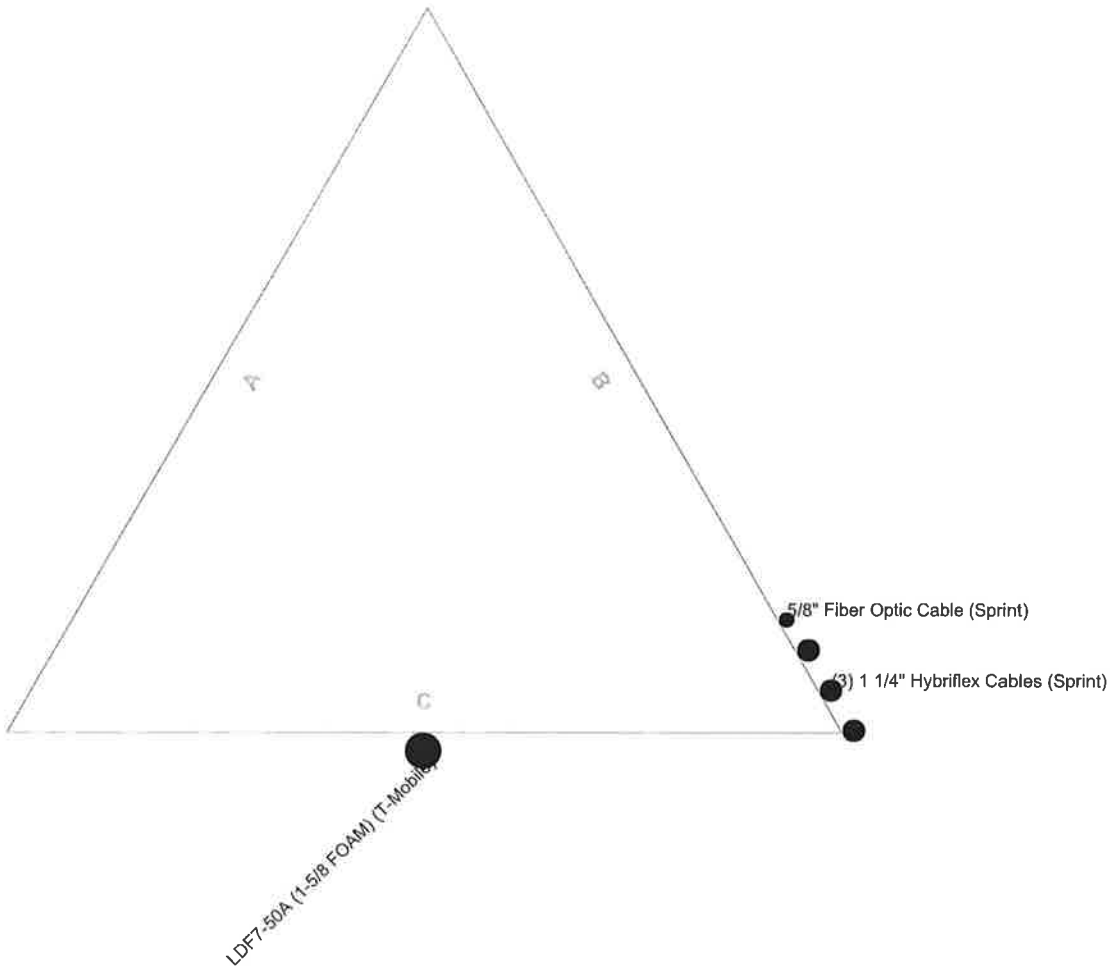
Code:	TIA-222-G	Date: 09/20/16	Scale: NTS
Path:			Dwg No. E-7

TNX TOWER FEEDLINE PLAN

Feed Line Plan

_____ Round _____ Flat _____ App In Face _____ App Out Face



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Project:	TWM-007 / T-Mobile		
Client:	Transcend Wireless	Drawn by: MCD	App'd:
Code:	TIA-222-G	Date: 09/20/16	Scale: NTS
Path:			Dwg No. E-7

TNX TOWER ANCHOR REACTIONS

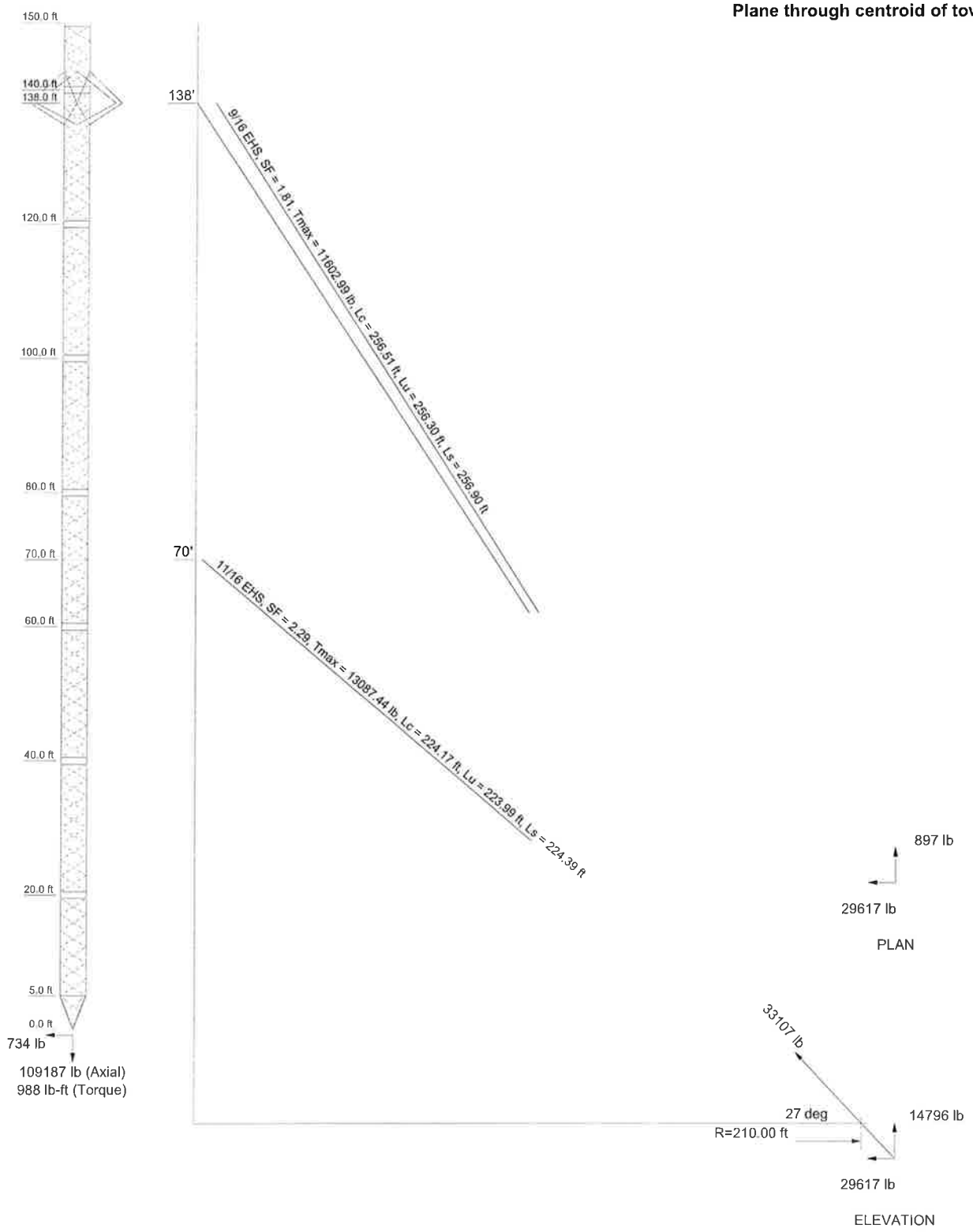
Guy Tensions and Tower Reactions

TIA-222-G - 105 mph/50 mph 1.0000 in Ice Exposure C

Maximum Values

Anchor 'A'@210 ft Azimuth 0 deg Elev -14 ft

Plane through centroid of tower



AECOM 500 Enterprise Drive, Suite 3B Rocky Hill, CT Phone: 860-529-8882 FAX: 860-529-3991	Job: ***S.A. - West Coventry Tower (Bolton, CT*** Project: ***TWM-007 / T-Mobile*** Client: Transcend Wireless — Drawn by: MCD — App'd: Code: TIA-222-G — Date: 09/20/16 — Scale: NTS Path: — Dwg No. E-6

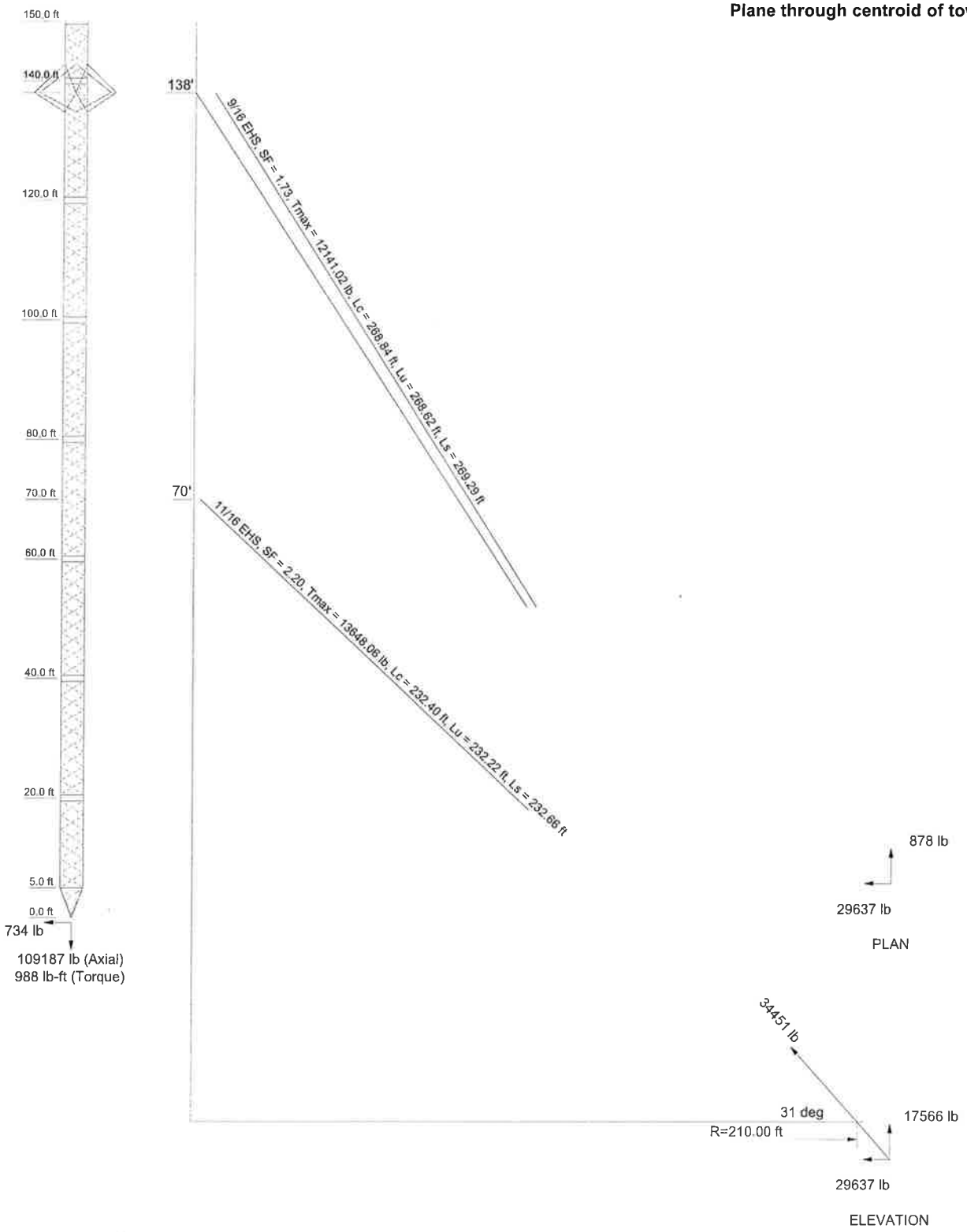
Guy Tensions and Tower Reactions

TIA-222-G - 105 mph/50 mph 1.0000 in Ice Exposure C

Maximum Values

Anchor 'B'@210 ft Azimuth 120 deg Elev -34 ft

Plane through centroid of tower



AECOM
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Rocky Hill, CT
Phone: 860-529-8882
FAX: 860-529-3991

Job:	***S.A. - West Coventry Tower (Bolton, CT***		
Project:	***TWM-007 / T-Mobile***		
Client:	Transcend Wireless	Drawn by: MCD	App'd:
Code:	TIA-222-G	Date: 09/20/16	Scale: NTS
Path:			Dwg No. E-6

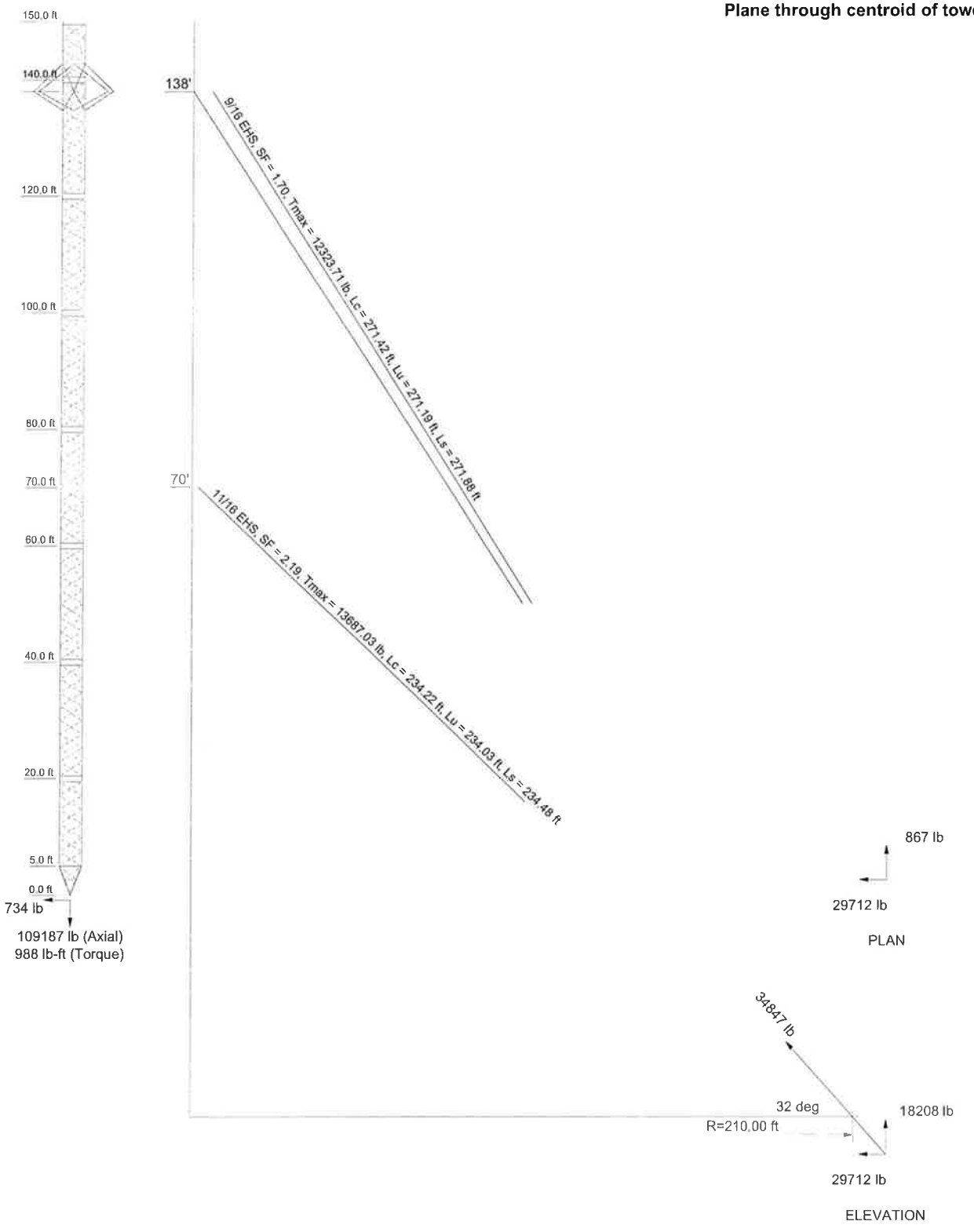
Guy Tensions and Tower Reactions

TIA-222-G - 105 mph/50 mph 1.0000 in Ice Exposure C

Maximum Values

Anchor 'C'@210 ft Azimuth 240 deg Elev -38 ft

Plane through centroid of tower



AECOM	Job: S.A. - West Coventry Tower (Bolton, CT			
500 Enterprise Drive, Suite 3B	Project: TWM-007 / T-Mobile			
Rocky Hill, CT	Client: Transcend Wireless	Drawn by: MCD	App'd:	
Phone: 860-529-8882	Code: TIA-222-G	Date: 09/20/16	Scale: NTS	
FAX: 860-529-3991	Path:		Dwg No. E-6	

TNX TOWER DETAILED OUTPUT

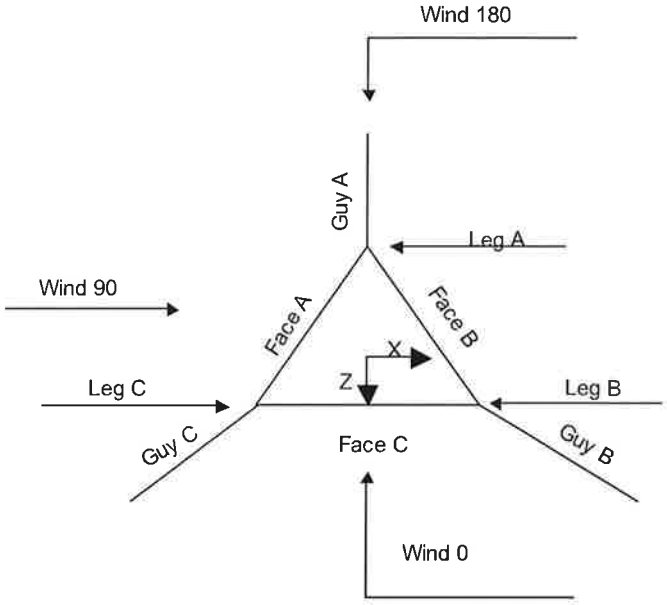
Tower Input Data

The main tower is a 3x guyed tower with an overall height of 150.00 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 3.75 ft at the top and tapered at the base.
This tower is designed using the TIA-222-G standard.
The following design criteria apply:

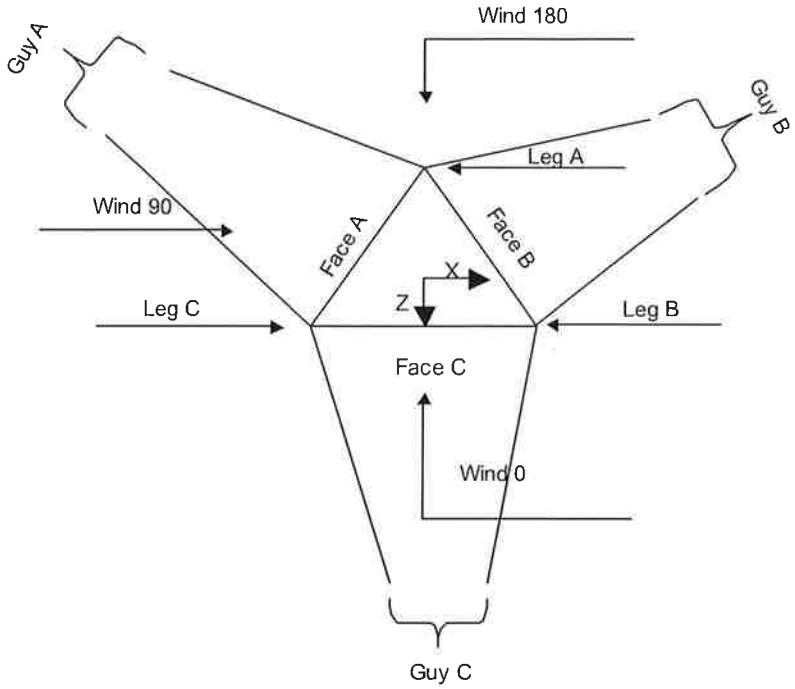
Tower is located in Tolland County, Connecticut.
Basic wind speed of 105 mph.
Structure Class II.
Exposure Category C.
Topographic Category 1.
Crest Height 0.00 ft.
Nominal ice thickness of 1.0000 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 50 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 60 mph.
Weld together tower sections have flange connections..
Connections use galvanized A325 bolts, nuts and locking devices. Installation per TIA/EIA-222 and AISC Specifications..
Tower members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards..
Welds are fabricated with ER-70S-6 electrodes..
Pressures are calculated at each section.
Safety factor used in guy 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		



Corner & Starmount Guyed Tower



Face Guyed

Tower Section Geometry

Tower Section	*Tower Elevation*	*Assembly Database*	*Description*	*Section Width*	*Number of Sections*	*Section Length*
	ft			*ft*		*ft*
T1	150.00-140.00			3.75	1	10.00
T2	140.00-120.00			3.75	1	20.00
T3	120.00-100.00			3.75	1	20.00
T4	100.00-80.00			3.75	1	20.00
T5	80.00-60.00			3.75	1	20.00
T6	60.00-40.00			3.75	1	20.00
T7	40.00-20.00			3.75	1	20.00
T8	20.00-5.00			3.75	1	15.00
T9	5.00-0.00			3.75	1	5.00

Tower Section Geometry *(cont'd)*

Tower Section	Tower Elevation ft	Diagonal Spacing ft	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset in	Bottom Girt Offset in
T1	150.00-140.00	2.25	X Brace	No	Steps	6.0000	6.0000
T2	140.00-120.00	2.38	X Brace	No	Steps	6.0000	6.0000
T3	120.00-100.00	2.38	X Brace	No	Steps	6.0000	6.0000
T4	100.00-80.00	2.38	X Brace	No	Steps	6.0000	6.0000
T5	80.00-60.00	2.38	X Brace	No	Steps	6.0000	6.0000
T6	60.00-40.00	2.38	X Brace	No	Steps	6.0000	6.0000
T7	40.00-20.00	2.38	X Brace	No	Steps	6.0000	6.0000
T8	20.00-5.00	2.42	X Brace	No	Steps	6.0000	0.0000
T9	5.00-0.00	2.25	X Brace	No	Yes	0.0000	6.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 150.00-140.00	Solid Round	2	A572-50 (50 ksi)	Solid Round	3/4	A572-50 (50 ksi)
T2 140.00-120.00	Solid Round	2	A572-50 (50 ksi)	Solid Round	3/4	A572-50 (50 ksi)
T3 120.00-100.00	Solid Round	2	A572-50 (50 ksi)	Solid Round	3/4	A572-50 (50 ksi)
T4 100.00-80.00	Solid Round	2 1/4	A572-50 (50 ksi)	Solid Round	3/4	A572-50 (50 ksi)
T5 80.00-60.00	Solid Round	2 1/4	A572-50 (50 ksi)	Solid Round	3/4	A572-50 (50 ksi)
T6 60.00-40.00	Solid Round	2 1/4	A572-50 (50 ksi)	Solid Round	3/4	A572-50 (50 ksi)
T7 40.00-20.00	Solid Round	2 1/4	A572-50 (50 ksi)	Solid Round	3/4	A572-50 (50 ksi)
T8 20.00-5.00	Solid Round	2 1/2	A572-50 (50 ksi)	Solid Round	3/4	A572-50 (50 ksi)
T9 5.00-0.00	Solid Round	2 1/2	A572-50 (50 ksi)	Solid Round	3/4	A572-50 (50 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T1 150.00-140.00	Solid Round	3/4	A572-50 (50 ksi)	Solid Round	3/4	A572-50 (50 ksi)
T2 140.00-120.00	Solid Round	3/4	A572-50 (50 ksi)	Solid Round	3/4	A572-50 (50 ksi)
T3 120.00-100.00	Solid Round	3/4	A572-50 (50 ksi)	Solid Round	3/4	A572-50 (50 ksi)
T4 100.00-80.00	Solid Round	3/4	A572-50 (50 ksi)	Solid Round	3/4	A572-50 (50 ksi)
T5 80.00-60.00	Solid Round	3/4	A572-50 (50 ksi)	Solid Round	3/4	A572-50 (50 ksi)
T6 60.00-40.00	Solid Round	3/4	A572-50 (50 ksi)	Solid Round	3/4	A572-50 (50 ksi)
T7 40.00-20.00	Solid Round	3/4	A572-50	Solid Round	3/4	A572-50

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T8 20.00-5.00	Solid Round	3/4	(50 ksi) A572-50 (50 ksi)	Solid Round	3/4	(50 ksi) A572-50 (50 ksi)
T9 5.00-0.00	Solid Round		A572-50 (50 ksi)	Solid Round	3/4	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
T9 5.00-0.00	None	Flat Bar		A36 (36 ksi)	Flat Bar	4x1/2	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Secondary Horizontal Type	Secondary Horizontal Size	Secondary Horizontal Grade	Inner Bracing Type	Inner Bracing Size	Inner Bracing Grade
T9 5.00-0.00	Solid Round	3/4	A572-50 (50 ksi)	Solid Round		A572-50 (50 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 150.00-140.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T2 140.00-120.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T3 120.00-100.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T4 100.00-80.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T5 80.00-60.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T6 60.00-40.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T7 40.00-20.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T8 20.00-5.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000

Tower Elevation ft	Gusset Area (per face) ft²	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
T9 5.00-0.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X	X Brace Diags Y	Single Diags X	Single Diags Y	Girts X	Girts Y	Horiz. X	Horiz. Y	Sec. Horiz. X	Sec. Horiz. Y	Inner Brace X	Inner Brace Y
T1	No	No	1	1	1	1	1	1	1	1	1	1	1	1	1
150.00-140.00				1	1	1	1	1	1	1	1	1	1	1	1
T2	No	No	1	1	1	1	1	1	1	1	1	1	1	1	1
140.00-120.00				1	1	1	1	1	1	1	1	1	1	1	1
T3	No	No	1	1	1	1	1	1	1	1	1	1	1	1	1
120.00-100.00				1	1	1	1	1	1	1	1	1	1	1	1
T4	No	No	1	1	1	1	1	1	1	1	1	1	1	1	1
100.00-80.00				1	1	1	1	1	1	1	1	1	1	1	1
T5	No	No	1	1	1	1	1	1	1	1	1	1	1	1	1
80.00-60.00				1	1	1	1	1	1	1	1	1	1	1	1
T6	No	No	1	1	1	1	1	1	1	1	1	1	1	1	1
60.00-40.00				1	1	1	1	1	1	1	1	1	1	1	1
T7	No	No	1	1	1	1	1	1	1	1	1	1	1	1	1
40.00-20.00				1	1	1	1	1	1	1	1	1	1	1	1
T8 20.00-5.00	No	No	1	1	1	1	1	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1	1	1	1	1	1
T9 5.00-0.00	No	No	1	1	1	1	1	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1	1	1	1	1	1

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

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Net Width Deduct in	Leg U	Diagonal Net Width Deduct in	Diagonal U	Top Girt Net Width Deduct in	Top Girt U	Bottom Girt Net Width Deduct in	Bottom Girt U	Mid Girt Net Width Deduct in	Mid Girt U	Long Horizontal Net Width Deduct in	Long Horizontal U	Short Horizontal Net Width Deduct in	Short Horizontal U
T1	0.0000	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
150.00-140.00														
T2	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
140.00-120.00														
T3	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
120.00-100.00														
T4	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
100.00-80.00														
T5 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
T6 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

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
T7 40.00-20.00	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
T8 20.00-5.00	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
T9 5.00-0.00	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

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T1 150.00-140.00	Sleeve DS	0.7500 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T2 140.00-120.00	Sleeve DS	0.6250 A325N	5	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T3 120.00-100.00	Sleeve DS	0.6250 A325N	5	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T4 100.00-80.00	Sleeve DS	0.7500 A325N	5	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T5 80.00-60.00	Sleeve DS	0.7500 A325N	5	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T6 60.00-40.00	Sleeve DS	0.7500 A325N	5	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T7 40.00-20.00	Sleeve DS	0.7500 A325N	5	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T8 20.00-5.00	Sleeve DS	0.7500 A325N	5	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T9 5.00-0.00	Sleeve DS	0.7500 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0

Guy Data

Guy Elevation ft	Guy Grade		Guy Size	Initial Tension lb	%	Guy Modulus ksi	Guy Weight plf	L_u ft	Anchor Radius ft	Anchor Azimuth Adj. °	Anchor Elevation ft	End Fitting Efficiency %
138	EHS	A	9/16	3500.00	10%	21000	0.671	256.30	210.00	0.0000	-14.00	100%
		B	9/16	3500.00	10%	21000	0.671	268.63	210.00	0.0000	-34.00	100%
		C	9/16	3500.00	10%	21000	0.671	271.20	210.00	0.0000	-38.00	100%
70	EHS	A	11/16	5000.00	10%	21000	0.813	223.99	210.00	0.0000	-14.00	100%
		B	11/16	5000.00	10%	21000	0.813	232.22	210.00	0.0000	-34.00	100%
		C	11/16	5000.00	10%	21000	0.813	234.03	210.00	0.0000	-38.00	100%

Guy Data *(cont'd)*

Guy Elevation ft	Mount Type	Torque-Arm Spread ft	Torque-Arm Leg Angle °	Torque-Arm Style	Torque-Arm Grade	Torque-Arm Type	Torque-Arm Size
138	Torque Arm	12.00	30.0000	Wing	A36 (36 ksi)	Double Angle	2L3x3x5/16
70	Corner						

Guy Data *(cont'd)*

Guy Elevation ft	Diagonal Grade	Diagonal Type	Upper Diagonal Size	Lower Diagonal Size	Is Strap.	Pull-Off Grade	Pull-Off Type	Pull-Off Size
138.00	A572-50 (50 ksi)	Solid Round			No	A572-50 (50 ksi)	Solid Round	1 1/4
70.00	A572-50 (50 ksi)	Solid Round			No	A572-50 (50 ksi)	Solid Round	1 1/4

Guy Data *(cont'd)*

Guy Elevation ft	Cable Weight A lb	Cable Weight B lb	Cable Weight C lb	Cable Weight D lb	Tower Intercept A ft	Tower Intercept B ft	Tower Intercept C ft	Tower Intercept D ft
138	171.98	180.25	181.98		6.21 4.3 sec/pulse	6.81 4.5 sec/pulse	6.94 4.5 sec/pulse	
70	182.10	188.79	190.27		4.06 3.5 sec/pulse	4.35 3.6 sec/pulse	4.42 3.6 sec/pulse	

Guy Data *(cont'd)*

Guy Elevation ft	Calc K Single Angles	Calc K Solid Rounds	Torque Arm K_x	Torque Arm K_y	Pull Off K_x	Pull Off K_y	Diagonal K_x	Diagonal K_y
138	No	No	1	1	1	1	1	1
70	No	No			1	1	1	1

Guy Data *(cont'd)*

Guy Elevation ft	Torque-Arm Bolt Size in	Torque-Arm Number	Torque-Arm Net Width Deduct in	Torque-Arm U	Pull Off Bolt Size in	Pull Off Number	Pull Off Net Width Deduct in	Pull Off U	Diagonal Bolt Size in	Diagonal Number	Diagonal Net Width Deduct in	Diagonal U
138	0.6250 A325N	1	0.0000	1	0.6250 A325N	0	0.0000	0.75	0.6250 A325N	0	0.0000	0.75

Guy Elevation ft	Torque-Arm				Pull Off				Diagonal			
	Bolt Size in	Number	Net Width Deduct in	U	Bolt Size in	Number	Net Width Deduct in	U	Bolt Size in	Number	Net Width Deduct in	U
70	0.6250 A325N	0	0.0000	0.75	0.6250 A325N	0	0.0000	0.75	0.6250 A325N	0	0.0000	0.75

Guy Pressures

Guy Elevation ft	Guy Location	z ft	q_z psf	q_z Ice psf	Ice Thickness in
138	A	62.00	27	6	2.1302
	B	52.00	26	6	2.0930
	C	50.00	26	6	2.0849
70	A	28.00	23	5	1.9674
	B	18.00	21	5	1.8824
	C	16.00	21	5	1.8603

Guy-Mast Forces (Excluding Wind) - No Ice

Guy Elevation ft	Guy Location	Chord Angle °	Guy Tension Top Bottom lb	F_x lb	F_y lb	F_z lb	M_x lb-ft	M_y lb-ft	M_z lb-ft
138	A	36.3397	3601.90 3500.00	-83.04	2190.05	-2858.41	-7586.54	17438.12	-13140.28
	A	36.3397	3601.90 3500.00	83.04	2190.05	-2858.41	-7586.54	-17438.12	13140.28
	B	39.7751	3615.31 3500.00	2405.99	2366.08	1297.44	16392.71	16669.17	0.00
	B	39.7751	3615.31 3500.00	2326.61	2366.08	1434.93	-8196.36	-16669.17	-14196.50
	C	40.4241	3617.99 3500.00	-2305.38	2398.64	1421.83	-8309.13	16517.09	14391.84
	C	40.4241	3617.99 3500.00	-2384.04	2398.64	1285.60	16618.26	-16517.09	0.00
			Sum:	**43.18**	13909.54	**-277.02**	**1332.40**	0.00	**195.33**
70	A	22.0069	5068.23 5000.00	0.00	1977.34	-4666.60	-4281.06	0.00	0.00
	B	26.5833	5084.48 5000.00	3904.45	2350.68	2254.23	2544.68	0.00	-4407.52
	C	27.4583	5087.73 5000.00	-3875.39	2420.77	2237.46	2620.56	-0.00	4538.94
			Sum:	**29.05**	6748.78	**-174.91**	**884.18**	0.00	**131.42**

Guy-Mast Forces (Excluding Wind) - Ice

Guy Elevation	Guy Location	Chord Angle	Guy Tension Top Bottom lb	F_x	F_y	F_z	M_x	M_y	M_z
ft		°		lb	lb	lb	lb-ft	lb-ft	lb-ft
138	A	36.3397	10042.46 8877.61	-220.22	6583.15	-7580.55	-22804.70	46246.14	-39498.89
	A	36.3397	10042.46 8877.61	220.22	6583.15	-7580.55	-22804.70	-46246.14	39498.89
	B	39.7751	9969.77 8688.88	6279.50	6964.01	3386.25	48248.08	43505.64	0.00
	B	39.7751	9969.77 8688.88	6072.33	6964.01	3745.08	-24124.04	-43505.64	-41784.06
	C	40.4241	9951.71 8649.36	-5995.88	7029.31	3697.93	-24350.26	42957.90	42175.89
	C	40.4241	9951.71 8649.36	-6200.44	7029.31	3343.62	48700.52	-42957.90	0.00
			Sum:	**155.51**	41152.95	**-988.22**	**2864.91**	-0.00	**391.83**
70	A	22.0069	11464.48 10861.08	0.00	4985.45	-10323.73	-10793.83	0.00	0.00
	B	26.5833	11190.16 10492.02	8375.82	5628.55	4835.78	6093.08	0.00	-10553.53
	C	27.4583	11114.63 10402.49	-8247.76	5730.13	4761.84	6203.05	-0.00	10744.00
			Sum:	**128.07**	16344.14	**-726.10**	**1502.31**	0.00	**190.47**

Guy-Mast Forces (Excluding Wind) - Service

Guy Elevation	Guy Location	Chord Angle	Guy Tension Top Bottom lb	F_x	F_y	F_z	M_x	M_y	M_z
ft		°		lb	lb	lb	lb-ft	lb-ft	lb-ft
138	A	36.3397	3601.90 3500.00	-83.04	2190.05	-2858.41	-7586.54	17438.12	-13140.28
	A	36.3397	3601.90 3500.00	83.04	2190.05	-2858.41	-7586.54	-17438.12	13140.28
	B	39.7751	3615.31 3500.00	2405.99	2366.08	1297.44	16392.71	16669.17	0.00
	B	39.7751	3615.31 3500.00	2326.61	2366.08	1434.93	-8196.36	-16669.17	-14196.50
	C	40.4241	3617.99 3500.00	-2305.38	2398.64	1421.83	-8309.13	16517.09	14391.84
	C	40.4241	3617.99 3500.00	-2384.04	2398.64	1285.60	16618.26	-16517.09	0.00
			Sum:	**43.18**	13909.54	**-277.02**	**1332.40**	0.00	**195.33**
70	A	22.0069	5068.23 5000.00	0.00	1977.34	-4666.60	-4281.06	0.00	0.00
	B	26.5833	5084.48 5000.00	3904.45	2350.68	2254.23	2544.68	0.00	-4407.52
	C	27.4583	5087.73 5000.00	-3875.39	2420.77	2237.46	2620.56	-0.00	4538.94
			Sum:	**29.05**	6748.78	**-174.91**	**884.18**	0.00	**131.42**

Guy-Tensioning Information

				Temperature At Time Of Tensioning													
				0 F		20 F		40 F		60 F		80 F		100 F		120 F	
Guy Elevation		H	V	Initial Tension	Intercept	Initial Tension	Intercept	Initial Tension	Intercept	Initial Tension	Intercept	Initial Tension	Intercept	Initial Tension	Intercept	Initial Tension	Intercept
ft		ft	ft	lb	ft	lb	ft	lb	ft	lb	ft	lb	ft	lb	ft	lb	ft
138	A	206.62	152.00	4437	4.91	4118	5.29	3805	5.72	3500	6.21	3205	6.78	2922	7.42	2654	8.16
	B	206.62	172.00	4351	5.49	4062	5.88	3778	6.32	3500	6.81	3231	7.37	2971	8.00	2724	8.72
	C	206.62	176.00	4335	5.62	4051	6.01	3772	6.45	3500	6.94	3235	7.50	2981	8.13	2737	8.84
70	A	207.83	84.00	6871	2.96	6235	3.26	5610	3.62	5000	4.06	4412	4.59	3855	5.25	3341	6.05
	B	207.83	104.00	6738	3.23	6148	3.54	5567	3.91	5000	4.35	4452	4.88	3929	5.53	3443	6.30
	C	207.83	108.00	6710	3.30	6130	3.61	5558	3.98	5000	4.42	4460	4.95	3945	5.59	3465	6.36

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
5/8" Fiber Optic Cable (Sprint)	B	Yes	Ar (CaAa)	148.00 - 6.00	0.0000	0.35	1	1	0.8400	0.8400		0.24
1 1/4" Hybriflex Cables (Sprint)	B	Yes	Ar (CaAa)	148.00 - 6.00	0.0000	0.45	3	3	1.2500	1.2500		0.42
LDF7-50A (1-5/8 FOAM) (T-Mobile)	C	Yes	Ar (CaAa)	150.00 - 6.00	0.0000	0	1	1	1.9800	1.9800		0.99

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
T1	150.00-140.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	3.672	0.000	12.12
		C	0.000	0.000	1.980	0.000	9.92
T2	140.00-120.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	9.180	0.000	30.30
		C	0.000	0.000	3.960	0.000	19.84
T3	120.00-100.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	9.180	0.000	30.30
		C	0.000	0.000	3.960	0.000	19.84
T4	100.00-80.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	9.180	0.000	30.30
		C	0.000	0.000	3.960	0.000	19.84
T5	80.00-60.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	9.180	0.000	30.30
		C	0.000	0.000	3.960	0.000	19.84
T6	60.00-40.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	9.180	0.000	30.30
		C	0.000	0.000	3.960	0.000	19.84
T7	40.00-20.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	9.180	0.000	30.30
		C	0.000	0.000	3.960	0.000	19.84
T8	20.00-5.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	6.426	0.000	21.21

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	2.772	0.000	13.89
T9	5.00-0.00	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

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
T1	150.00-140.00	A	2.319	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	16.761	0.000	248.58
		C		0.000	0.000	6.618	0.000	131.73
T2	140.00-120.00	A	2.294	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	41.631	0.000	612.53
		C		0.000	0.000	13.136	0.000	259.39
T3	120.00-100.00	A	2.256	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	41.221	0.000	599.18
		C		0.000	0.000	12.984	0.000	253.33
T4	100.00-80.00	A	2.211	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	40.739	0.000	583.62
		C		0.000	0.000	12.804	0.000	246.27
T5	80.00-60.00	A	2.156	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	40.149	0.000	564.84
		C		0.000	0.000	12.585	0.000	237.76
T6	60.00-40.00	A	2.085	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	39.382	0.000	540.86
		C		0.000	0.000	12.299	0.000	226.91
T7	40.00-20.00	A	1.981	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	38.267	0.000	506.85
		C		0.000	0.000	11.884	0.000	211.58
T8	20.00-5.00	A	1.815	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	25.542	0.000	318.26
		C		0.000	0.000	7.854	0.000	131.70
T9	5.00-0.00	A	1.545	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

Feed Line Shielding

Section	Elevation ft	Face	A_R ft^2	A_R Ice ft^2	A_F ft^2	A_F Ice ft^2
T1	150.00-140.00	A	0.000	0.000	0.000	0.000
		B	0.249	6.086	0.000	0.000
		C	0.134	3.076	0.000	0.000
T2	140.00-120.00	A	0.000	0.000	0.000	0.000
		B	0.501	12.625	0.000	0.000
		C	0.216	5.098	0.000	0.000
T3	120.00-100.00	A	0.000	0.000	0.000	0.000
		B	0.501	12.329	0.000	0.000
		C	0.216	4.967	0.000	0.000
T4	100.00-80.00	A	0.000	0.000	0.000	0.000
		B	0.501	11.984	0.000	0.000

Section	Elevation	Face	A_R	A_R Ice	A_F	A_F Ice
	ft		ft^2	ft^2	ft^2	ft^2
		C	0.216	4.815	0.000	0.000
T5	80.00-60.00	A	0.000	0.000	0.000	0.000
		B	0.540	12.175	0.000	0.000
		C	0.233	4.875	0.000	0.000
T6	60.00-40.00	A	0.000	0.000	0.000	0.000
		B	0.501	11.038	0.000	0.000
		C	0.216	4.399	0.000	0.000
T7	40.00-20.00	A	0.000	0.000	0.000	0.000
		B	0.501	10.287	0.000	0.000
		C	0.216	4.071	0.000	0.000
T8	20.00-5.00	A	0.000	0.000	0.000	0.000
		B	0.363	6.630	0.000	0.000
		C	0.157	2.592	0.000	0.000
T9	5.00-0.00	A	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000

Feed Line Center of Pressure

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
T1	150.00-140.00	1.7948	1.4689	0.3880	0.4430
T2	140.00-120.00	2.1693	1.6231	0.6212	0.5737
T3	120.00-100.00	2.1693	1.6231	0.6371	0.5838
T4	100.00-80.00	2.1099	1.5786	0.6525	0.5925
T5	80.00-60.00	2.0754	1.5528	0.6306	0.5734
T6	60.00-40.00	2.1099	1.5786	0.7067	0.6264
T7	40.00-20.00	2.1099	1.5786	0.7527	0.6551
T8	20.00-5.00	1.9775	1.4796	0.7691	0.6543
T9	5.00-0.00	0.0000	0.0000	0.0000	0.0000

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T1	4	5/8" Fiber Optic Cable	140.00 - 148.00	1.0000	1.0000
T1	6	1 1/4" Hybriflex Cables	140.00 - 148.00	1.0000	1.0000
T1	7	LDF7-50A (1-5/8 FOAM)	140.00 - 150.00	1.0000	1.0000
T2	4	5/8" Fiber Optic Cable	120.00 - 140.00	1.0000	1.0000
T2	6	1 1/4" Hybriflex Cables	120.00 - 140.00	1.0000	1.0000
T2	7	LDF7-50A (1-5/8 FOAM)	120.00 - 140.00	1.0000	1.0000
T3	4	5/8" Fiber Optic Cable	100.00 - 120.00	1.0000	1.0000
T3	6	1 1/4" Hybriflex Cables	100.00 -	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T3	7	LDF7-50A (1-5/8 FOAM)	120.00 100.00 - 120.00	1.0000	1.0000
T4	4	5/8" Fiber Optic Cable	80.00 - 100.00	1.0000	1.0000
T4	6	1 1/4" Hybriflex Cables	80.00 - 100.00	1.0000	1.0000
T4	7	LDF7-50A (1-5/8 FOAM)	80.00 - 100.00	1.0000	1.0000
T5	4	5/8" Fiber Optic Cable	60.00 - 80.00	1.0000	1.0000
T5	6	1 1/4" Hybriflex Cables	60.00 - 80.00	1.0000	1.0000
T5	7	LDF7-50A (1-5/8 FOAM)	60.00 - 80.00	1.0000	1.0000
T6	4	5/8" Fiber Optic Cable	40.00 - 60.00	1.0000	1.0000
T6	6	1 1/4" Hybriflex Cables	40.00 - 60.00	1.0000	1.0000
T6	7	LDF7-50A (1-5/8 FOAM)	40.00 - 60.00	1.0000	1.0000
T7	4	5/8" Fiber Optic Cable	20.00 - 40.00	1.0000	1.0000
T7	6	1 1/4" Hybriflex Cables	20.00 - 40.00	1.0000	1.0000
T7	7	LDF7-50A (1-5/8 FOAM)	20.00 - 40.00	1.0000	1.0000
T8	4	5/8" Fiber Optic Cable	6.00 - 20.00	1.0000	1.0000
T8	6	1 1/4" Hybriflex Cables	6.00 - 20.00	1.0000	1.0000
T8	7	LDF7-50A (1-5/8 FOAM)	6.00 - 20.00	1.0000	1.0000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
APXVSPP18-C-A20 w/ Mounting Pipe (Sprint)	A	From Leg	4.00 0.00 0.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice	5.93 6.39 6.85	4.61 4.99 5.43	26.20 66.22 111.47
APXVSPP18-C-A20 w/ Mounting Pipe (Sprint)	B	From Leg	4.00 0.00 0.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice	5.93 6.39 6.85	4.61 4.99 5.43	26.20 66.22 111.47
APXVSPP18-C-A20 w/ Mounting Pipe (Sprint)	C	From Leg	4.00 -6.00 0.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice	5.93 6.39 6.85	4.61 4.99 5.43	26.20 66.22 111.47
Andrew 800MHz RRH (Sprint)	A	From Leg	4.00 -2.00 0.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice	2.36 2.57 2.79	1.97 2.17 2.37	57.00 77.36 100.68
Andrew 800MHz RRH (Sprint)	B	From Leg	4.00 -2.00 0.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice	2.36 2.57 2.79	1.97 2.17 2.37	57.00 77.36 100.68
Andrew 800MHz RRH (Sprint)	C	From Leg	4.00 -2.00 0.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice	2.36 2.57 2.79	1.97 2.17 2.37	57.00 77.36 100.68
Panasonic RRH 1900MHZ (Sprint)	A	From Leg	4.00 -2.00 0.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice	2.49 2.71 2.93	3.06 3.30 3.54	90.00 116.87 147.08
Panasonic RRH 1900MHZ (Sprint)	A	From Leg	4.00 -2.00 0.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice	2.49 2.71 2.93	3.06 3.30 3.54	90.00 116.87 147.08
Panasonic RRH 1900MHZ (Sprint)	A	From Leg	4.00 -2.00 0.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice	2.49 2.71 2.93	3.06 3.30 3.54	90.00 116.87 147.08

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
Pirod 12' T-Frame Sector Mount (1) (Sprint)	A	From Leg	0.00 0.00 0.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice	13.60 18.40 23.20	13.60 18.40 23.20	465.00 600.00 735.00
Pirod 12' T-Frame Sector Mount (1) (Sprint)	B	From Leg	0.00 0.00 0.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice	13.60 18.40 23.20	13.60 18.40 23.20	465.00 600.00 735.00
Pirod 12' T-Frame Sector Mount (1) (Sprint)	C	From Leg	0.00 0.00 0.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice	13.60 18.40 23.20	13.60 18.40 23.20	465.00 600.00 735.00
APXVTM14-ALU-120 (Sprint)	A	From Leg	4.00 6.00 0.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice	3.61 3.97 4.33	7.76 8.46 9.17	81.20 131.40 187.95
APXVTM14-ALU-120 (Sprint)	B	From Leg	4.00 6.00 0.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice	3.61 3.97 4.33	7.76 8.46 9.17	81.20 131.40 187.95
APXVTM14-ALU-120 (Sprint)	C	From Leg	4.00 6.00 0.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice	3.61 3.97 4.33	7.76 8.46 9.17	81.20 131.40 187.95
8' Long Jumper Cables (27) (Sprint)	C	None		0.0000	148.00	No Ice 1/2" Ice 1" Ice	0.01 0.03 0.05	0.01 0.03 0.05	30.00 30.23 30.84
AIR21 B4A/B2P (T-Mobile)	A	From Leg	3.00 -3.00 0.00	0.0000	130.00	No Ice 1/2" Ice 1" Ice	6.05 6.42 6.80	5.56 6.19 6.85	110.02 166.56 230.27
SBNH-1D65C Panel Antenna (T-Mobile)	A	From Leg	3.00 3.00 0.00	0.0000	130.00	No Ice 1/2" Ice 1" Ice	11.46 12.08 12.70	8.89 9.80 10.71	67.85 147.06 235.43
AIR21 B4A/B2P (T-Mobile)	B	From Leg	3.00 -3.00 0.00	0.0000	130.00	No Ice 1/2" Ice 1" Ice	6.05 6.42 6.80	5.56 6.19 6.85	110.02 166.56 230.27
SBNH-1D65C Panel Antenna (T-Mobile)	B	From Leg	3.00 3.00 0.00	0.0000	130.00	No Ice 1/2" Ice 1" Ice	11.46 12.08 12.70	8.89 9.80 10.71	67.85 147.06 235.43
Pirod 12' T-Frame Sector Mount (1) (T-Mobile)	A	None		0.0000	130.00	No Ice 1/2" Ice 1" Ice	13.60 18.40 23.20	13.60 18.40 23.20	465.00 600.00 735.00
Pirod 12' T-Frame Sector Mount (1) (T-Mobile)	A	None		0.0000	130.00	No Ice 1/2" Ice 1" Ice	13.60 18.40 23.20	13.60 18.40 23.20	465.00 600.00 735.00
RRUS-11 (T-Mobile)	A	From Leg	3.00 -3.00 0.00	0.0000	130.00	No Ice 1/2" Ice 1" Ice	2.57 2.76 2.97	1.07 1.21 1.36	50.00 69.57 92.08
RRUS-11 (T-Mobile)	A	From Leg	3.00 3.00 0.00	0.0000	130.00	No Ice 1/2" Ice 1" Ice	2.57 2.76 2.97	1.07 1.21 1.36	50.00 69.57 92.08
RRUS-11 (T-Mobile)	B	From Leg	3.00 -3.00 0.00	0.0000	130.00	No Ice 1/2" Ice 1" Ice	2.57 2.76 2.97	1.07 1.21 1.36	50.00 69.57 92.08
RRUS-11 (T-Mobile)	B	From Leg	3.00 3.00 0.00	0.0000	130.00	No Ice 1/2" Ice 1" Ice	2.57 2.76 2.97	1.07 1.21 1.36	50.00 69.57 92.08
TD-RRH8x20 (Sprint)	A	From Leg	4.00 -2.00 0.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice	4.05 4.30 4.56	1.53 1.71 1.90	66.13 93.27 123.93
TD-RRH8x20 (Sprint)	B	From Leg	4.00 -2.00 0.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice	4.05 4.30 4.56	1.53 1.71 1.90	66.13 93.27 123.93

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
TD-RRH8x20 (Sprint)	C	From Leg	4.00	0.0000	148.00	No Ice	4.05	1.53	66.13
			-2.00			1/2" Ice	4.30	1.71	93.27
			0.00			1" Ice	4.56	1.90	123.93

222-G Verification Constants

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

222-G Section Verification ArRr By Element

Section Elevation ft	Elem. Num.	Size	C	C w/Ice	Face	e	e w/Ice	A_r ft^2	A_r w/Ice ft^2	A_rR_r ft^2	A_rR_r w/Ice ft^2
T1 150.00-140.00	1	2	20.473	32.357	C	0.156	0.65	1.667	5.532	0.947	4.295
	1	2	20.473	32.357	A	0.159	0.722	1.667	5.532	0.948	4.573
	2	2	20.473	32.357	C	0.156	0.65	1.667	5.532	0.947	4.295
	2	2	20.473	32.357	B	0.153	0.58	1.667	5.532	0.946	4.046
	3	2	20.473	32.357	B	0.153	0.58	1.667	5.532	0.946	4.046
	3	2	20.473	32.357	A	0.159	0.722	1.667	5.532	0.948	4.573
	4	3/4	7.677	26.264	C	0.156	0.65	0.224	1.609	0.127	1.249
	5	3/4	7.677	26.264	B	0.153	0.58	0.224	1.609	0.127	1.177
	6	3/4	7.677	26.264	A	0.159	0.722	0.224	1.609	0.127	1.330
	7	3/4	7.677	26.264	C	0.156	0.65	0.224	1.609	0.127	1.249
	8	3/4	7.677	26.264	B	0.153	0.58	0.224	1.609	0.127	1.177
	9	3/4	7.677	26.264	A	0.159	0.722	0.224	1.609	0.127	1.330
	10	3/4	7.677	26.264	C	0.156	0.65	0.261	1.876	0.148	1.457
	11	3/4	7.677	26.264	C	0.156	0.65	0.261	1.876	0.148	1.457
	12	3/4	7.677	26.264	B	0.153	0.58	0.261	1.876	0.148	1.372
	13	3/4	7.677	26.264	B	0.153	0.58	0.261	1.876	0.148	1.372
	14	3/4	7.677	26.264	A	0.159	0.722	0.261	1.876	0.148	1.551
	15	3/4	7.677	26.264	A	0.159	0.722	0.261	1.876	0.148	1.551
	16	3/4	7.677	26.264	C	0.156	0.65	0.261	1.876	0.148	1.457
	17	3/4	7.677	26.264	C	0.156	0.65	0.261	1.876	0.148	1.457
	18	3/4	7.677	26.264	B	0.153	0.58	0.261	1.876	0.148	1.372
	19	3/4	7.677	26.264	B	0.153	0.58	0.261	1.876	0.148	1.372
	20	3/4	7.677	26.264	A	0.159	0.722	0.261	1.876	0.148	1.551

Section Elevation ft	Elem. Num.	Size	C	C w/Ice	Face	e	e w/Ice	A_r ft²	A_e w/Ice ft²	$A_r R_r$ ft²	$A_r R_r$ w/Ice ft²
	21	3/4	7.677	26.264	A	0.159	0.722	0.261	1.876	0.148	1.551
	22	3/4	7.677	26.264	C	0.156	0.65	0.261	1.876	0.148	1.457
	23	3/4	7.677	26.264	C	0.156	0.65	0.261	1.876	0.148	1.457
	24	3/4	7.677	26.264	B	0.153	0.58	0.261	1.876	0.148	1.372
	25	3/4	7.677	26.264	B	0.153	0.58	0.261	1.876	0.148	1.372
	26	3/4	7.677	26.264	A	0.159	0.722	0.261	1.876	0.148	1.551
	27	3/4	7.677	26.264	A	0.159	0.722	0.261	1.876	0.148	1.551
	28	3/4	7.677	26.264	C	0.156	0.65	0.261	1.876	0.148	1.457
	29	3/4	7.677	26.264	C	0.156	0.65	0.261	1.876	0.148	1.457
	30	3/4	7.677	26.264	B	0.153	0.58	0.261	1.876	0.148	1.372
	31	3/4	7.677	26.264	B	0.153	0.58	0.261	1.876	0.148	1.372
	32	3/4	7.677	26.264	A	0.159	0.722	0.261	1.876	0.148	1.551
	33	3/4	7.677	26.264	A	0.159	0.722	0.261	1.876	0.148	1.551
	452	1 1/4	12.795	28.702	C	0.156	0.65	0.373	1.758	0.212	1.365
	453	1 1/4	12.795	28.702	B	0.153	0.58	0.373	1.758	0.212	1.286
	454	1 1/4	12.795	28.702	A	0.159	0.722	0.373	1.758	0.212	1.453
					A		Sum:	6.244	31.051	3.550	25.666
					B			6.244	31.051	3.546	22.709
					C			6.244	31.051	3.548	24.111
T2	34	2	20.239	31.745	C	0.142	0.584	3.333	10.980	1.889	8.058
140.00-120.00											
	34	2	20.239	31.745	A	0.145	0.644	3.333	10.980	1.890	8.478
	35	2	20.239	31.745	C	0.142	0.584	3.333	10.980	1.889	8.058
	35	2	20.239	31.745	B	0.139	0.497	3.333	10.980	1.888	7.502
	36	2	20.239	31.745	B	0.139	0.497	3.333	10.980	1.888	7.502
	36	2	20.239	31.745	A	0.145	0.644	3.333	10.980	1.890	8.478
	37	3/4	7.59	25.721	C	0.142	0.584	0.224	1.594	0.127	1.170
	38	3/4	7.59	25.721	B	0.139	0.497	0.224	1.594	0.127	1.089
	39	3/4	7.59	25.721	A	0.145	0.644	0.224	1.594	0.127	1.231
	40	3/4	7.59	25.721	C	0.142	0.584	0.224	1.594	0.127	1.170
	41	3/4	7.59	25.721	B	0.139	0.497	0.224	1.594	0.127	1.089
	42	3/4	7.59	25.721	A	0.145	0.644	0.224	1.594	0.127	1.231
	43	3/4	7.59	25.721	C	0.142	0.584	0.265	1.887	0.150	1.385
	44	3/4	7.59	25.721	C	0.142	0.584	0.265	1.887	0.150	1.385
	45	3/4	7.59	25.721	B	0.139	0.497	0.265	1.887	0.150	1.289
	46	3/4	7.59	25.721	B	0.139	0.497	0.265	1.887	0.150	1.289
	47	3/4	7.59	25.721	A	0.145	0.644	0.265	1.887	0.150	1.457
	48	3/4	7.59	25.721	A	0.145	0.644	0.265	1.887	0.150	1.457
	49	3/4	7.59	25.721	C	0.142	0.584	0.265	1.887	0.150	1.385
	50	3/4	7.59	25.721	C	0.142	0.584	0.265	1.887	0.150	1.385
	51	3/4	7.59	25.721	B	0.139	0.497	0.265	1.887	0.150	1.289
	52	3/4	7.59	25.721	B	0.139	0.497	0.265	1.887	0.150	1.289
	53	3/4	7.59	25.721	A	0.145	0.644	0.265	1.887	0.150	1.457
	54	3/4	7.59	25.721	A	0.145	0.644	0.265	1.887	0.150	1.457
	55	3/4	7.59	25.721	C	0.142	0.584	0.265	1.887	0.150	1.385
	56	3/4	7.59	25.721	C	0.142	0.584	0.265	1.887	0.150	1.385
	57	3/4	7.59	25.721	B	0.139	0.497	0.265	1.887	0.150	1.289
	58	3/4	7.59	25.721	B	0.139	0.497	0.265	1.887	0.150	1.289
	59	3/4	7.59	25.721	A	0.145	0.644	0.265	1.887	0.150	1.457
	60	3/4	7.59	25.721	A	0.145	0.644	0.265	1.887	0.150	1.457
	61	3/4	7.59	25.721	C	0.142	0.584	0.265	1.887	0.150	1.385
	62	3/4	7.59	25.721	C	0.142	0.584	0.265	1.887	0.150	1.385
	63	3/4	7.59	25.721	B	0.139	0.497	0.265	1.887	0.150	1.289
	64	3/4	7.59	25.721	B	0.139	0.497	0.265	1.887	0.150	1.289
	65	3/4	7.59	25.721	A	0.145	0.644	0.265	1.887	0.150	1.457
	66	3/4	7.59	25.721	A	0.145	0.644	0.265	1.887	0.150	1.457
	67	3/4	7.59	25.721	C	0.142	0.584	0.265	1.887	0.150	1.385
	68	3/4	7.59	25.721	C	0.142	0.584	0.265	1.887	0.150	1.385
	69	3/4	7.59	25.721	B	0.139	0.497	0.265	1.887	0.150	1.289
	70	3/4	7.59	25.721	B	0.139	0.497	0.265	1.887	0.150	1.289

Section Elevation ft	Elem. Num.	Size	C	C w/Ice	Face	e	e w/Ice	A_r ft^2	A_e w/Ice ft^2	A_rR_r ft^2	A_rR_r w/Ice ft^2
	71	3/4	7.59	25.721	A	0.145	0.644	0.265	1.887	0.150	1.457
	72	3/4	7.59	25.721	A	0.145	0.644	0.265	1.887	0.150	1.457
	73	3/4	7.59	25.721	C	0.142	0.584	0.265	1.887	0.150	1.385
	74	3/4	7.59	25.721	C	0.142	0.584	0.265	1.887	0.150	1.385
	75	3/4	7.59	25.721	B	0.139	0.497	0.265	1.887	0.150	1.289
	76	3/4	7.59	25.721	B	0.139	0.497	0.265	1.887	0.150	1.289
	77	3/4	7.59	25.721	A	0.145	0.644	0.265	1.887	0.150	1.457
	78	3/4	7.59	25.721	A	0.145	0.644	0.265	1.887	0.150	1.457
	79	3/4	7.59	25.721	C	0.142	0.584	0.265	1.887	0.150	1.385
	80	3/4	7.59	25.721	C	0.142	0.584	0.265	1.887	0.150	1.385
	81	3/4	7.59	25.721	B	0.139	0.497	0.265	1.887	0.150	1.289
	82	3/4	7.59	25.721	B	0.139	0.497	0.265	1.887	0.150	1.289
	83	3/4	7.59	25.721	A	0.145	0.644	0.265	1.887	0.150	1.457
	84	3/4	7.59	25.721	A	0.145	0.644	0.265	1.887	0.150	1.457
	85	3/4	7.59	25.721	C	0.142	0.584	0.265	1.887	0.150	1.385
	86	3/4	7.59	25.721	C	0.142	0.584	0.265	1.887	0.150	1.385
	87	3/4	7.59	25.721	B	0.139	0.497	0.265	1.887	0.150	1.289
	88	3/4	7.59	25.721	B	0.139	0.497	0.265	1.887	0.150	1.289
	89	3/4	7.59	25.721	A	0.145	0.644	0.265	1.887	0.150	1.457
	90	3/4	7.59	25.721	A	0.145	0.644	0.265	1.887	0.150	1.457
					A		Sum:	11.356	55.334	6.439	42.725
					B			11.356	55.334	6.433	37.807
					C			11.356	55.334	6.437	40.611
T3	91	2	19.886	30.832	C	0.142	0.578	3.333	10.853	1.889	7.924
120.00-100.00											
	91	2	19.886	30.832	A	0.145	0.636	3.333	10.853	1.890	8.325
	92	2	19.886	30.832	C	0.142	0.578	3.333	10.853	1.889	7.924
	92	2	19.886	30.832	B	0.139	0.492	3.333	10.853	1.888	7.390
	93	2	19.886	30.832	B	0.139	0.492	3.333	10.853	1.888	7.390
	93	2	19.886	30.832	A	0.145	0.636	3.333	10.853	1.890	8.325
	94	3/4	7.457	24.913	C	0.142	0.578	0.224	1.571	0.127	1.147
	95	3/4	7.457	24.913	B	0.139	0.492	0.224	1.571	0.127	1.070
	96	3/4	7.457	24.913	A	0.145	0.636	0.224	1.571	0.127	1.205
	97	3/4	7.457	24.913	C	0.142	0.578	0.224	1.571	0.127	1.147
	98	3/4	7.457	24.913	B	0.139	0.492	0.224	1.571	0.127	1.070
	99	3/4	7.457	24.913	A	0.145	0.636	0.224	1.571	0.127	1.205
	100	3/4	7.457	24.913	C	0.142	0.578	0.265	1.860	0.150	1.358
	101	3/4	7.457	24.913	C	0.142	0.578	0.265	1.860	0.150	1.358
	102	3/4	7.457	24.913	B	0.139	0.492	0.265	1.860	0.150	1.266
	103	3/4	7.457	24.913	B	0.139	0.492	0.265	1.860	0.150	1.266
	104	3/4	7.457	24.913	A	0.145	0.636	0.265	1.860	0.150	1.427
	105	3/4	7.457	24.913	A	0.145	0.636	0.265	1.860	0.150	1.427
	106	3/4	7.457	24.913	C	0.142	0.578	0.265	1.860	0.150	1.358
	107	3/4	7.457	24.913	C	0.142	0.578	0.265	1.860	0.150	1.358
	108	3/4	7.457	24.913	B	0.139	0.492	0.265	1.860	0.150	1.266
	109	3/4	7.457	24.913	B	0.139	0.492	0.265	1.860	0.150	1.266
	110	3/4	7.457	24.913	A	0.145	0.636	0.265	1.860	0.150	1.427
	111	3/4	7.457	24.913	A	0.145	0.636	0.265	1.860	0.150	1.427
	112	3/4	7.457	24.913	C	0.142	0.578	0.265	1.860	0.150	1.358
	113	3/4	7.457	24.913	C	0.142	0.578	0.265	1.860	0.150	1.358
	114	3/4	7.457	24.913	B	0.139	0.492	0.265	1.860	0.150	1.266
	115	3/4	7.457	24.913	B	0.139	0.492	0.265	1.860	0.150	1.266
	116	3/4	7.457	24.913	A	0.145	0.636	0.265	1.860	0.150	1.427
	117	3/4	7.457	24.913	A	0.145	0.636	0.265	1.860	0.150	1.427
	118	3/4	7.457	24.913	C	0.142	0.578	0.265	1.860	0.150	1.358
	119	3/4	7.457	24.913	C	0.142	0.578	0.265	1.860	0.150	1.358
	120	3/4	7.457	24.913	B	0.139	0.492	0.265	1.860	0.150	1.266
	121	3/4	7.457	24.913	B	0.139	0.492	0.265	1.860	0.150	1.266
	122	3/4	7.457	24.913	A	0.145	0.636	0.265	1.860	0.150	1.427
	123	3/4	7.457	24.913	A	0.145	0.636	0.265	1.860	0.150	1.427

Section Elevation ft	Elem. Num.	Size	C	C w/Ice	Face	e	e w/Ice	A_r ft^2	A_r w/Ice ft^2	A_rR_r ft^2	A_rR_r w/Ice ft^2
	124	3/4	7.457	24.913	C	0.142	0.578	0.265	1.860	0.150	1.358
	125	3/4	7.457	24.913	C	0.142	0.578	0.265	1.860	0.150	1.358
	126	3/4	7.457	24.913	B	0.139	0.492	0.265	1.860	0.150	1.266
	127	3/4	7.457	24.913	B	0.139	0.492	0.265	1.860	0.150	1.266
	128	3/4	7.457	24.913	A	0.145	0.636	0.265	1.860	0.150	1.427
	129	3/4	7.457	24.913	A	0.145	0.636	0.265	1.860	0.150	1.427
	130	3/4	7.457	24.913	C	0.142	0.578	0.265	1.860	0.150	1.358
	131	3/4	7.457	24.913	C	0.142	0.578	0.265	1.860	0.150	1.358
	132	3/4	7.457	24.913	B	0.139	0.492	0.265	1.860	0.150	1.266
	133	3/4	7.457	24.913	B	0.139	0.492	0.265	1.860	0.150	1.266
	134	3/4	7.457	24.913	A	0.145	0.636	0.265	1.860	0.150	1.427
	135	3/4	7.457	24.913	A	0.145	0.636	0.265	1.860	0.150	1.427
	136	3/4	7.457	24.913	C	0.142	0.578	0.265	1.860	0.150	1.358
	137	3/4	7.457	24.913	C	0.142	0.578	0.265	1.860	0.150	1.358
	138	3/4	7.457	24.913	B	0.139	0.492	0.265	1.860	0.150	1.266
	139	3/4	7.457	24.913	B	0.139	0.492	0.265	1.860	0.150	1.266
	140	3/4	7.457	24.913	A	0.145	0.636	0.265	1.860	0.150	1.427
	141	3/4	7.457	24.913	A	0.145	0.636	0.265	1.860	0.150	1.427
	142	3/4	7.457	24.913	C	0.142	0.578	0.265	1.860	0.150	1.358
	143	3/4	7.457	24.913	C	0.142	0.578	0.265	1.860	0.150	1.358
	144	3/4	7.457	24.913	B	0.139	0.492	0.265	1.860	0.150	1.266
	145	3/4	7.457	24.913	B	0.139	0.492	0.265	1.860	0.150	1.266
	146	3/4	7.457	24.913	A	0.145	0.636	0.265	1.860	0.150	1.427
	147	3/4	7.457	24.913	A	0.145	0.636	0.265	1.860	0.150	1.427
					A		Sum:	11.356	54.606	6.439	41.889
					B			11.356	54.606	6.433	37.183
					C			11.356	54.606	6.437	39.871
T4 100.00-80.00	148	2 1/4	21.904	30.931	C	0.152	0.576	3.750	11.120	2.129	8.102
	148	2 1/4	21.904	30.931	A	0.154	0.632	3.750	11.120	2.130	8.498
	149	2 1/4	21.904	30.931	C	0.152	0.576	3.750	11.120	2.129	8.102
	149	2 1/4	21.904	30.931	B	0.148	0.492	3.750	11.120	2.128	7.572
	150	2 1/4	21.904	30.931	B	0.148	0.492	3.750	11.120	2.128	7.572
	150	2 1/4	21.904	30.931	A	0.154	0.632	3.750	11.120	2.130	8.498
	151	3/4	7.301	23.977	C	0.152	0.576	0.223	1.535	0.126	1.119
	152	3/4	7.301	23.977	B	0.148	0.492	0.223	1.535	0.126	1.046
	153	3/4	7.301	23.977	A	0.154	0.632	0.223	1.535	0.126	1.173
	154	3/4	7.301	23.977	C	0.152	0.576	0.223	1.535	0.126	1.119
	155	3/4	7.301	23.977	B	0.148	0.492	0.223	1.535	0.126	1.046
	156	3/4	7.301	23.977	A	0.154	0.632	0.223	1.535	0.126	1.173
	157	3/4	7.301	23.977	C	0.152	0.576	0.264	1.818	0.150	1.324
	158	3/4	7.301	23.977	C	0.152	0.576	0.264	1.818	0.150	1.324
	159	3/4	7.301	23.977	B	0.148	0.492	0.264	1.818	0.150	1.238
	160	3/4	7.301	23.977	B	0.148	0.492	0.264	1.818	0.150	1.238
	161	3/4	7.301	23.977	A	0.154	0.632	0.264	1.818	0.150	1.389
	162	3/4	7.301	23.977	A	0.154	0.632	0.264	1.818	0.150	1.389
	163	3/4	7.301	23.977	C	0.152	0.576	0.264	1.818	0.150	1.324
	164	3/4	7.301	23.977	C	0.152	0.576	0.264	1.818	0.150	1.324
	165	3/4	7.301	23.977	B	0.148	0.492	0.264	1.818	0.150	1.238
	166	3/4	7.301	23.977	B	0.148	0.492	0.264	1.818	0.150	1.238
	167	3/4	7.301	23.977	A	0.154	0.632	0.264	1.818	0.150	1.389
	168	3/4	7.301	23.977	A	0.154	0.632	0.264	1.818	0.150	1.389
	169	3/4	7.301	23.977	C	0.152	0.576	0.264	1.818	0.150	1.324
	170	3/4	7.301	23.977	C	0.152	0.576	0.264	1.818	0.150	1.324
	171	3/4	7.301	23.977	B	0.148	0.492	0.264	1.818	0.150	1.238
	172	3/4	7.301	23.977	B	0.148	0.492	0.264	1.818	0.150	1.238
	173	3/4	7.301	23.977	A	0.154	0.632	0.264	1.818	0.150	1.389
	174	3/4	7.301	23.977	A	0.154	0.632	0.264	1.818	0.150	1.389
	175	3/4	7.301	23.977	C	0.152	0.576	0.264	1.818	0.150	1.324
	176	3/4	7.301	23.977	C	0.152	0.576	0.264	1.818	0.150	1.324
	177	3/4	7.301	23.977	B	0.148	0.492	0.264	1.818	0.150	1.238

Section Elevation ft	Elem. Num.	Size	C	C w/Ice	Face	e	e w/Ice	A_r ft^2	A_r w/Ice ft^2	A_rR_a ft^2	A_rR_a w/Ice ft^2
	178	3/4	7.301	23.977	B	0.148	0.492	0.264	1.818	0.150	1.238
	179	3/4	7.301	23.977	A	0.154	0.632	0.264	1.818	0.150	1.389
	180	3/4	7.301	23.977	A	0.154	0.632	0.264	1.818	0.150	1.389
	181	3/4	7.301	23.977	C	0.152	0.576	0.264	1.818	0.150	1.324
	182	3/4	7.301	23.977	C	0.152	0.576	0.264	1.818	0.150	1.324
	183	3/4	7.301	23.977	B	0.148	0.492	0.264	1.818	0.150	1.238
	184	3/4	7.301	23.977	B	0.148	0.492	0.264	1.818	0.150	1.238
	185	3/4	7.301	23.977	A	0.154	0.632	0.264	1.818	0.150	1.389
	186	3/4	7.301	23.977	A	0.154	0.632	0.264	1.818	0.150	1.389
	187	3/4	7.301	23.977	C	0.152	0.576	0.264	1.818	0.150	1.324
	188	3/4	7.301	23.977	C	0.152	0.576	0.264	1.818	0.150	1.324
	189	3/4	7.301	23.977	B	0.148	0.492	0.264	1.818	0.150	1.238
	190	3/4	7.301	23.977	B	0.148	0.492	0.264	1.818	0.150	1.238
	191	3/4	7.301	23.977	A	0.154	0.632	0.264	1.818	0.150	1.389
	192	3/4	7.301	23.977	A	0.154	0.632	0.264	1.818	0.150	1.389
	193	3/4	7.301	23.977	C	0.152	0.576	0.264	1.818	0.150	1.324
	194	3/4	7.301	23.977	C	0.152	0.576	0.264	1.818	0.150	1.324
	195	3/4	7.301	23.977	B	0.148	0.492	0.264	1.818	0.150	1.238
	196	3/4	7.301	23.977	B	0.148	0.492	0.264	1.818	0.150	1.238
	197	3/4	7.301	23.977	A	0.154	0.632	0.264	1.818	0.150	1.389
	198	3/4	7.301	23.977	A	0.154	0.632	0.264	1.818	0.150	1.389
	199	3/4	7.301	23.977	C	0.152	0.576	0.264	1.818	0.150	1.324
	200	3/4	7.301	23.977	C	0.152	0.576	0.264	1.818	0.150	1.324
	201	3/4	7.301	23.977	B	0.148	0.492	0.264	1.818	0.150	1.238
	202	3/4	7.301	23.977	B	0.148	0.492	0.264	1.818	0.150	1.238
	203	3/4	7.301	23.977	A	0.154	0.632	0.264	1.818	0.150	1.389
	204	3/4	7.301	23.977	A	0.154	0.632	0.264	1.818	0.150	1.389
					A		Sum:	12.162	54.392	6.908	41.564
					B			12.162	54.392	6.900	37.038
					C			12.162	54.392	6.905	39.631
T5 80.00-60.00	205	2 1/4	21.332	29.628	C	0.156	0.583	3.750	10.937	2.131	8.020
	205	2 1/4	21.332	29.628	A	0.159	0.64	3.750	10.937	2.132	8.419
	206	2 1/4	21.332	29.628	C	0.156	0.583	3.750	10.937	2.131	8.020
	206	2 1/4	21.332	29.628	B	0.152	0.498	3.750	10.937	2.129	7.482
	207	2 1/4	21.332	29.628	B	0.152	0.498	3.750	10.937	2.129	7.482
	207	2 1/4	21.332	29.628	A	0.159	0.64	3.750	10.937	2.132	8.419
	208	3/4	7.111	22.855	C	0.156	0.583	0.223	1.503	0.127	1.102
	209	3/4	7.111	22.855	B	0.152	0.498	0.223	1.503	0.126	1.028
	210	3/4	7.111	22.855	A	0.159	0.64	0.223	1.503	0.127	1.157
	211	3/4	7.111	22.855	C	0.156	0.583	0.223	1.503	0.127	1.102
	212	3/4	7.111	22.855	B	0.152	0.498	0.223	1.503	0.126	1.028
	213	3/4	7.111	22.855	A	0.159	0.64	0.223	1.503	0.127	1.157
	214	3/4	7.111	22.855	C	0.156	0.583	0.264	1.779	0.150	1.304
	215	3/4	7.111	22.855	C	0.156	0.583	0.264	1.779	0.150	1.304
	216	3/4	7.111	22.855	B	0.152	0.498	0.264	1.779	0.150	1.217
	217	3/4	7.111	22.855	B	0.152	0.498	0.264	1.779	0.150	1.217
	218	3/4	7.111	22.855	A	0.159	0.64	0.264	1.779	0.150	1.369
	219	3/4	7.111	22.855	A	0.159	0.64	0.264	1.779	0.150	1.369
	220	3/4	7.111	22.855	C	0.156	0.583	0.264	1.779	0.150	1.304
	221	3/4	7.111	22.855	C	0.156	0.583	0.264	1.779	0.150	1.304
	222	3/4	7.111	22.855	B	0.152	0.498	0.264	1.779	0.150	1.217
	223	3/4	7.111	22.855	B	0.152	0.498	0.264	1.779	0.150	1.217
	224	3/4	7.111	22.855	A	0.159	0.64	0.264	1.779	0.150	1.369
	225	3/4	7.111	22.855	A	0.159	0.64	0.264	1.779	0.150	1.369
	226	3/4	7.111	22.855	C	0.156	0.583	0.264	1.779	0.150	1.304
	227	3/4	7.111	22.855	C	0.156	0.583	0.264	1.779	0.150	1.304
	228	3/4	7.111	22.855	B	0.152	0.498	0.264	1.779	0.150	1.217
	229	3/4	7.111	22.855	B	0.152	0.498	0.264	1.779	0.150	1.217
	230	3/4	7.111	22.855	A	0.159	0.64	0.264	1.779	0.150	1.369
	231	3/4	7.111	22.855	A	0.159	0.64	0.264	1.779	0.150	1.369

Section Elevation ft	Elem. Num.	Size	C	C w/Ice	Face	e	e w/Ice	A_r ft^2	A_e w/Ice ft^2	A_rR_e ft^2	A_rR_e w/Ice ft^2
	232	3/4	7.111	22.855	C	0.156	0.583	0.264	1.779	0.150	1.304
	233	3/4	7.111	22.855	C	0.156	0.583	0.264	1.779	0.150	1.304
	234	3/4	7.111	22.855	B	0.152	0.498	0.264	1.779	0.150	1.217
	235	3/4	7.111	22.855	B	0.152	0.498	0.264	1.779	0.150	1.217
	236	3/4	7.111	22.855	A	0.159	0.64	0.264	1.779	0.150	1.369
	237	3/4	7.111	22.855	A	0.159	0.64	0.264	1.779	0.150	1.369
	238	3/4	7.111	22.855	C	0.156	0.583	0.264	1.779	0.150	1.304
	239	3/4	7.111	22.855	C	0.156	0.583	0.264	1.779	0.150	1.304
	240	3/4	7.111	22.855	B	0.152	0.498	0.264	1.779	0.150	1.217
	241	3/4	7.111	22.855	B	0.152	0.498	0.264	1.779	0.150	1.217
	242	3/4	7.111	22.855	A	0.159	0.64	0.264	1.779	0.150	1.369
	243	3/4	7.111	22.855	A	0.159	0.64	0.264	1.779	0.150	1.369
	244	3/4	7.111	22.855	C	0.156	0.583	0.264	1.779	0.150	1.304
	245	3/4	7.111	22.855	C	0.156	0.583	0.264	1.779	0.150	1.304
	246	3/4	7.111	22.855	B	0.152	0.498	0.264	1.779	0.150	1.217
	247	3/4	7.111	22.855	B	0.152	0.498	0.264	1.779	0.150	1.217
	248	3/4	7.111	22.855	A	0.159	0.64	0.264	1.779	0.150	1.369
	249	3/4	7.111	22.855	A	0.159	0.64	0.264	1.779	0.150	1.369
	250	3/4	7.111	22.855	C	0.156	0.583	0.264	1.779	0.150	1.304
	251	3/4	7.111	22.855	C	0.156	0.583	0.264	1.779	0.150	1.304
	252	3/4	7.111	22.855	B	0.152	0.498	0.264	1.779	0.150	1.217
	253	3/4	7.111	22.855	B	0.152	0.498	0.264	1.779	0.150	1.217
	254	3/4	7.111	22.855	A	0.159	0.64	0.264	1.779	0.150	1.369
	255	3/4	7.111	22.855	A	0.159	0.64	0.264	1.779	0.150	1.369
	256	3/4	7.111	22.855	C	0.156	0.583	0.264	1.779	0.150	1.304
	257	3/4	7.111	22.855	C	0.156	0.583	0.264	1.779	0.150	1.304
	258	3/4	7.111	22.855	B	0.152	0.498	0.264	1.779	0.150	1.217
	259	3/4	7.111	22.855	B	0.152	0.498	0.264	1.779	0.150	1.217
	260	3/4	7.111	22.855	A	0.159	0.64	0.264	1.779	0.150	1.369
	261	3/4	7.111	22.855	A	0.159	0.64	0.264	1.779	0.150	1.369
	470	1 1/4	11.851	25.113	C	0.156	0.583	0.371	1.651	0.211	1.211
	471	1 1/4	11.851	25.113	B	0.152	0.498	0.371	1.651	0.211	1.130
	472	1 1/4	11.851	25.113	A	0.159	0.64	0.371	1.651	0.211	1.271
					A		Sum:	12.533	54.995	7.126	42.330
					B			12.533	54.995	7.116	37.620
					C			12.533	54.995	7.121	40.326
T6 60.00-40.00	262	2 1/4	20.59	27.975	C	0.152	0.555	3.750	10.700	2.129	7.664
	262	2 1/4	20.59	27.975	A	0.154	0.607	3.750	10.700	2.130	8.002
	263	2 1/4	20.59	27.975	C	0.152	0.555	3.750	10.700	2.129	7.664
	263	2 1/4	20.59	27.975	B	0.148	0.478	3.750	10.700	2.128	7.203
	264	2 1/4	20.59	27.975	B	0.148	0.478	3.750	10.700	2.128	7.203
	264	2 1/4	20.59	27.975	A	0.154	0.607	3.750	10.700	2.130	8.002
	265	3/4	6.863	21.438	C	0.152	0.555	0.223	1.461	0.126	1.046
	266	3/4	6.863	21.438	B	0.148	0.478	0.223	1.461	0.126	0.983
	267	3/4	6.863	21.438	A	0.154	0.607	0.223	1.461	0.126	1.092
	268	3/4	6.863	21.438	C	0.152	0.555	0.223	1.461	0.126	1.046
	269	3/4	6.863	21.438	B	0.148	0.478	0.223	1.461	0.126	0.983
	270	3/4	6.863	21.438	A	0.154	0.607	0.223	1.461	0.126	1.092
	271	3/4	6.863	21.438	C	0.152	0.555	0.264	1.729	0.150	1.238
	272	3/4	6.863	21.438	C	0.152	0.555	0.264	1.729	0.150	1.238
	273	3/4	6.863	21.438	B	0.148	0.478	0.264	1.729	0.150	1.164
	274	3/4	6.863	21.438	B	0.148	0.478	0.264	1.729	0.150	1.164
	275	3/4	6.863	21.438	A	0.154	0.607	0.264	1.729	0.150	1.293
	276	3/4	6.863	21.438	A	0.154	0.607	0.264	1.729	0.150	1.293
	277	3/4	6.863	21.438	C	0.152	0.555	0.264	1.729	0.150	1.238
	278	3/4	6.863	21.438	C	0.152	0.555	0.264	1.729	0.150	1.238
	279	3/4	6.863	21.438	B	0.148	0.478	0.264	1.729	0.150	1.164
	280	3/4	6.863	21.438	B	0.148	0.478	0.264	1.729	0.150	1.164
	281	3/4	6.863	21.438	A	0.154	0.607	0.264	1.729	0.150	1.293
	282	3/4	6.863	21.438	A	0.154	0.607	0.264	1.729	0.150	1.293

Section Elevation ft	Elem. Num.	Size	C	C w/Ice	Face	e	e w/Ice	A_r ft^2	A_r w/Ice ft^2	A_rR_r ft^2	A_rR_r w/Ice ft^2
	283	3/4	6.863	21.438	C	0.152	0.555	0.264	1.729	0.150	1.238
	284	3/4	6.863	21.438	C	0.152	0.555	0.264	1.729	0.150	1.238
	285	3/4	6.863	21.438	B	0.148	0.478	0.264	1.729	0.150	1.164
	286	3/4	6.863	21.438	B	0.148	0.478	0.264	1.729	0.150	1.164
	287	3/4	6.863	21.438	A	0.154	0.607	0.264	1.729	0.150	1.293
	288	3/4	6.863	21.438	A	0.154	0.607	0.264	1.729	0.150	1.293
	289	3/4	6.863	21.438	C	0.152	0.555	0.264	1.729	0.150	1.238
	290	3/4	6.863	21.438	C	0.152	0.555	0.264	1.729	0.150	1.238
	291	3/4	6.863	21.438	B	0.148	0.478	0.264	1.729	0.150	1.164
	292	3/4	6.863	21.438	B	0.148	0.478	0.264	1.729	0.150	1.164
	293	3/4	6.863	21.438	A	0.154	0.607	0.264	1.729	0.150	1.293
	294	3/4	6.863	21.438	A	0.154	0.607	0.264	1.729	0.150	1.293
	295	3/4	6.863	21.438	C	0.152	0.555	0.264	1.729	0.150	1.238
	296	3/4	6.863	21.438	C	0.152	0.555	0.264	1.729	0.150	1.238
	297	3/4	6.863	21.438	B	0.148	0.478	0.264	1.729	0.150	1.164
	298	3/4	6.863	21.438	B	0.148	0.478	0.264	1.729	0.150	1.164
	299	3/4	6.863	21.438	A	0.154	0.607	0.264	1.729	0.150	1.293
	300	3/4	6.863	21.438	A	0.154	0.607	0.264	1.729	0.150	1.293
	301	3/4	6.863	21.438	C	0.152	0.555	0.264	1.729	0.150	1.238
	302	3/4	6.863	21.438	C	0.152	0.555	0.264	1.729	0.150	1.238
	303	3/4	6.863	21.438	B	0.148	0.478	0.264	1.729	0.150	1.164
	304	3/4	6.863	21.438	B	0.148	0.478	0.264	1.729	0.150	1.164
	305	3/4	6.863	21.438	A	0.154	0.607	0.264	1.729	0.150	1.293
	306	3/4	6.863	21.438	A	0.154	0.607	0.264	1.729	0.150	1.293
	307	3/4	6.863	21.438	C	0.152	0.555	0.264	1.729	0.150	1.238
	308	3/4	6.863	21.438	C	0.152	0.555	0.264	1.729	0.150	1.238
	309	3/4	6.863	21.438	B	0.148	0.478	0.264	1.729	0.150	1.164
	310	3/4	6.863	21.438	B	0.148	0.478	0.264	1.729	0.150	1.164
	311	3/4	6.863	21.438	A	0.154	0.607	0.264	1.729	0.150	1.293
	312	3/4	6.863	21.438	A	0.154	0.607	0.264	1.729	0.150	1.293
	313	3/4	6.863	21.438	C	0.152	0.555	0.264	1.729	0.150	1.238
	314	3/4	6.863	21.438	C	0.152	0.555	0.264	1.729	0.150	1.238
	315	3/4	6.863	21.438	B	0.148	0.478	0.264	1.729	0.150	1.164
	316	3/4	6.863	21.438	B	0.148	0.478	0.264	1.729	0.150	1.164
	317	3/4	6.863	21.438	A	0.154	0.607	0.264	1.729	0.150	1.293
	318	3/4	6.863	21.438	A	0.154	0.607	0.264	1.729	0.150	1.293
					A		Sum:	12.162	51.981	6.908	38.878
					B			12.162	51.981	6.900	34.996
					C			12.162	51.981	6.905	37.234
T7 40.00-20.00	319	2 1/4	19.512	25.653	C	0.152	0.538	3.750	10.353	2.129	7.312
	319	2 1/4	19.512	25.653	A	0.154	0.586	3.750	10.353	2.130	7.608
	320	2 1/4	19.512	25.653	C	0.152	0.538	3.750	10.353	2.129	7.312
	320	2 1/4	19.512	25.653	B	0.148	0.465	3.750	10.353	2.128	6.904
	321	2 1/4	19.512	25.653	B	0.148	0.465	3.750	10.353	2.128	6.904
	321	2 1/4	19.512	25.653	A	0.154	0.586	3.750	10.353	2.130	7.608
	322	3/4	6.504	19.459	C	0.152	0.538	0.223	1.399	0.126	0.988
	323	3/4	6.504	19.459	B	0.148	0.465	0.223	1.399	0.126	0.933
	324	3/4	6.504	19.459	A	0.154	0.586	0.223	1.399	0.126	1.028
	325	3/4	6.504	19.459	C	0.152	0.538	0.223	1.399	0.126	0.988
	326	3/4	6.504	19.459	B	0.148	0.465	0.223	1.399	0.126	0.933
	327	3/4	6.504	19.459	A	0.154	0.586	0.223	1.399	0.126	1.028
	328	3/4	6.504	19.459	C	0.152	0.538	0.264	1.656	0.150	1.169
	329	3/4	6.504	19.459	C	0.152	0.538	0.264	1.656	0.150	1.169
	330	3/4	6.504	19.459	B	0.148	0.465	0.264	1.656	0.150	1.104
	331	3/4	6.504	19.459	B	0.148	0.465	0.264	1.656	0.150	1.104
	332	3/4	6.504	19.459	A	0.154	0.586	0.264	1.656	0.150	1.217
	333	3/4	6.504	19.459	A	0.154	0.586	0.264	1.656	0.150	1.217
	334	3/4	6.504	19.459	C	0.152	0.538	0.264	1.656	0.150	1.169
	335	3/4	6.504	19.459	C	0.152	0.538	0.264	1.656	0.150	1.169
	336	3/4	6.504	19.459	B	0.148	0.465	0.264	1.656	0.150	1.104

Section Elevation ft	Elem Num	Size	C	C w/Ice	Face	e	e w/Ice	A_r ft^2	A_r w/Ice ft^2	A_rR_r ft^2	A_rR_r w/Ice ft^2
	337	3/4	6.504	19.459	B	0.148	0.465	0.264	1.656	0.150	1.104
	338	3/4	6.504	19.459	A	0.154	0.586	0.264	1.656	0.150	1.217
	339	3/4	6.504	19.459	A	0.154	0.586	0.264	1.656	0.150	1.217
	340	3/4	6.504	19.459	C	0.152	0.538	0.264	1.656	0.150	1.169
	341	3/4	6.504	19.459	C	0.152	0.538	0.264	1.656	0.150	1.169
	342	3/4	6.504	19.459	B	0.148	0.465	0.264	1.656	0.150	1.104
	343	3/4	6.504	19.459	B	0.148	0.465	0.264	1.656	0.150	1.104
	344	3/4	6.504	19.459	A	0.154	0.586	0.264	1.656	0.150	1.217
	345	3/4	6.504	19.459	A	0.154	0.586	0.264	1.656	0.150	1.217
	346	3/4	6.504	19.459	C	0.152	0.538	0.264	1.656	0.150	1.169
	347	3/4	6.504	19.459	C	0.152	0.538	0.264	1.656	0.150	1.169
	348	3/4	6.504	19.459	B	0.148	0.465	0.264	1.656	0.150	1.104
	349	3/4	6.504	19.459	B	0.148	0.465	0.264	1.656	0.150	1.104
	350	3/4	6.504	19.459	A	0.154	0.586	0.264	1.656	0.150	1.217
	351	3/4	6.504	19.459	A	0.154	0.586	0.264	1.656	0.150	1.217
	352	3/4	6.504	19.459	C	0.152	0.538	0.264	1.656	0.150	1.169
	353	3/4	6.504	19.459	C	0.152	0.538	0.264	1.656	0.150	1.169
	354	3/4	6.504	19.459	B	0.148	0.465	0.264	1.656	0.150	1.104
	355	3/4	6.504	19.459	B	0.148	0.465	0.264	1.656	0.150	1.104
	356	3/4	6.504	19.459	A	0.154	0.586	0.264	1.656	0.150	1.217
	357	3/4	6.504	19.459	A	0.154	0.586	0.264	1.656	0.150	1.217
	358	3/4	6.504	19.459	C	0.152	0.538	0.264	1.656	0.150	1.169
	359	3/4	6.504	19.459	C	0.152	0.538	0.264	1.656	0.150	1.169
	360	3/4	6.504	19.459	B	0.148	0.465	0.264	1.656	0.150	1.104
	361	3/4	6.504	19.459	B	0.148	0.465	0.264	1.656	0.150	1.104
	362	3/4	6.504	19.459	A	0.154	0.586	0.264	1.656	0.150	1.217
	363	3/4	6.504	19.459	A	0.154	0.586	0.264	1.656	0.150	1.217
	364	3/4	6.504	19.459	C	0.152	0.538	0.264	1.656	0.150	1.169
	365	3/4	6.504	19.459	C	0.152	0.538	0.264	1.656	0.150	1.169
	366	3/4	6.504	19.459	B	0.148	0.465	0.264	1.656	0.150	1.104
	367	3/4	6.504	19.459	B	0.148	0.465	0.264	1.656	0.150	1.104
	368	3/4	6.504	19.459	A	0.154	0.586	0.264	1.656	0.150	1.217
	369	3/4	6.504	19.459	A	0.154	0.586	0.264	1.656	0.150	1.217
	370	3/4	6.504	19.459	C	0.152	0.538	0.264	1.656	0.150	1.169
	371	3/4	6.504	19.459	C	0.152	0.538	0.264	1.656	0.150	1.169
	372	3/4	6.504	19.459	B	0.148	0.465	0.264	1.656	0.150	1.104
	373	3/4	6.504	19.459	B	0.148	0.465	0.264	1.656	0.150	1.104
	374	3/4	6.504	19.459	A	0.154	0.586	0.264	1.656	0.150	1.217
	375	3/4	6.504	19.459	A	0.154	0.586	0.264	1.656	0.150	1.217
					A		Sum:	12.162	49.998	6.908	36.741
					B			12.162	49.998	6.900	33.341
					C			12.162	49.998	6.905	35.312
T8 20.00-5.00	376	2 1/2	20.168	23.548	C	0.163	0.528	3.125	7.662	1.778	5.369
	376	2 1/2	20.168	23.548	A	0.166	0.569	3.125	7.662	1.779	5.552
	377	2 1/2	20.168	23.548	C	0.163	0.528	3.125	7.662	1.778	5.369
	377	2 1/2	20.168	23.548	B	0.16	0.465	3.125	7.662	1.777	5.110
	378	2 1/2	20.168	23.548	B	0.16	0.465	3.125	7.662	1.777	5.110
	378	2 1/2	20.168	23.548	A	0.166	0.569	3.125	7.662	1.779	5.552
	379	3/4	6.05	16.825	C	0.163	0.528	0.221	1.293	0.126	0.906
	380	3/4	6.05	16.825	B	0.16	0.465	0.221	1.293	0.126	0.862
	381	3/4	6.05	16.825	A	0.166	0.569	0.221	1.293	0.126	0.937
	382	3/4	6.05	16.825	C	0.163	0.528	0.221	1.293	0.126	0.906
	383	3/4	6.05	16.825	B	0.16	0.465	0.221	1.293	0.126	0.862
	384	3/4	6.05	16.825	A	0.166	0.569	0.221	1.293	0.126	0.937
	385	3/4	6.05	16.825	C	0.163	0.528	0.263	1.538	0.150	1.078
	386	3/4	6.05	16.825	C	0.163	0.528	0.263	1.538	0.150	1.078
	387	3/4	6.05	16.825	B	0.16	0.465	0.263	1.538	0.150	1.026
	388	3/4	6.05	16.825	B	0.16	0.465	0.263	1.538	0.150	1.026
	389	3/4	6.05	16.825	A	0.166	0.569	0.263	1.538	0.150	1.114
	390	3/4	6.05	16.825	A	0.166	0.569	0.263	1.538	0.150	1.114

Section Elevation ft	Elem. Num.	Size	C	C w/Ice	Face	e	e w/Ice	A_r ft^2	A_r w/Ice ft^2	A_rR_r ft^2	A_rR_r w/Ice ft^2
	391	3/4	6.05	16.825	C	0.163	0.528	0.263	1.538	0.150	1.078
	392	3/4	6.05	16.825	C	0.163	0.528	0.263	1.538	0.150	1.078
	393	3/4	6.05	16.825	B	0.16	0.465	0.263	1.538	0.150	1.026
	394	3/4	6.05	16.825	B	0.16	0.465	0.263	1.538	0.150	1.026
	395	3/4	6.05	16.825	A	0.166	0.569	0.263	1.538	0.150	1.114
	396	3/4	6.05	16.825	A	0.166	0.569	0.263	1.538	0.150	1.114
	397	3/4	6.05	16.825	C	0.163	0.528	0.263	1.538	0.150	1.078
	398	3/4	6.05	16.825	C	0.163	0.528	0.263	1.538	0.150	1.078
	399	3/4	6.05	16.825	B	0.16	0.465	0.263	1.538	0.150	1.026
	400	3/4	6.05	16.825	B	0.16	0.465	0.263	1.538	0.150	1.026
	401	3/4	6.05	16.825	A	0.166	0.569	0.263	1.538	0.150	1.114
	402	3/4	6.05	16.825	A	0.166	0.569	0.263	1.538	0.150	1.114
	403	3/4	6.05	16.825	C	0.163	0.528	0.263	1.538	0.150	1.078
	404	3/4	6.05	16.825	C	0.163	0.528	0.263	1.538	0.150	1.078
	405	3/4	6.05	16.825	B	0.16	0.465	0.263	1.538	0.150	1.026
	406	3/4	6.05	16.825	B	0.16	0.465	0.263	1.538	0.150	1.026
	407	3/4	6.05	16.825	A	0.166	0.569	0.263	1.538	0.150	1.114
	408	3/4	6.05	16.825	A	0.166	0.569	0.263	1.538	0.150	1.114
	409	3/4	6.05	16.825	C	0.163	0.528	0.263	1.538	0.150	1.078
	410	3/4	6.05	16.825	C	0.163	0.528	0.263	1.538	0.150	1.078
	411	3/4	6.05	16.825	B	0.16	0.465	0.263	1.538	0.150	1.026
	412	3/4	6.05	16.825	B	0.16	0.465	0.263	1.538	0.150	1.026
	413	3/4	6.05	16.825	A	0.166	0.569	0.263	1.538	0.150	1.114
	414	3/4	6.05	16.825	A	0.166	0.569	0.263	1.538	0.150	1.114
	415	3/4	6.05	16.825	C	0.163	0.528	0.263	1.538	0.150	1.078
	416	3/4	6.05	16.825	C	0.163	0.528	0.263	1.538	0.150	1.078
	417	3/4	6.05	16.825	B	0.16	0.465	0.263	1.538	0.150	1.026
	418	3/4	6.05	16.825	B	0.16	0.465	0.263	1.538	0.150	1.026
	419	3/4	6.05	16.825	A	0.166	0.569	0.263	1.538	0.150	1.114
	420	3/4	6.05	16.825	A	0.166	0.569	0.263	1.538	0.150	1.114
					A		Sum:	9.853	36.365	5.610	26.348
					B			9.853	36.365	5.602	24.249
					C			9.853	36.365	5.606	25.482
T9 5.00-0.00	421	2 1/2	20.168	21.475	C	0.361	0.907	1.135	2.538	0.704	2.465
	421	2 1/2	20.168	21.475	A	0.361	0.907	1.135	2.538	0.704	2.465
	422	2 1/2	20.168	21.475	C	0.361	0.907	1.135	2.538	0.704	2.465
	422	2 1/2	20.168	21.475	B	0.361	0.907	1.135	2.538	0.704	2.465
	423	2 1/2	20.168	21.475	B	0.361	0.907	1.135	2.538	0.704	2.465
	423	2 1/2	20.168	21.475	A	0.361	0.907	1.135	2.538	0.704	2.465
	424	3/4	6.05	14.752	C	0.361	0.907	0.010	0.053	0.006	0.052
	425	3/4	6.05	14.752	B	0.361	0.907	0.010	0.053	0.006	0.052
	426	3/4	6.05	14.752	A	0.361	0.907	0.010	0.053	0.006	0.052
	427	3/4	6.05	14.752	C	0.361	0.907	0.137	0.701	0.085	0.681
	428	3/4	6.05	14.752	C	0.361	0.907	0.137	0.701	0.085	0.681
	429	3/4	6.05	14.752	B	0.361	0.907	0.137	0.701	0.085	0.681
	430	3/4	6.05	14.752	B	0.361	0.907	0.137	0.701	0.085	0.681
	431	3/4	6.05	14.752	A	0.361	0.907	0.137	0.701	0.085	0.681
	432	3/4	6.05	14.752	A	0.361	0.907	0.137	0.701	0.085	0.681
	436	3/4	6.05	14.752	C	0.361	0.907	0.027	0.136	0.017	0.132
	437	3/4	6.05	14.752	B	0.361	0.907	0.027	0.136	0.017	0.132
	438	3/4	6.05	14.752	A	0.361	0.907	0.027	0.136	0.017	0.132
	439	3/4	6.05	14.752	C	0.361	0.907	0.215	1.103	0.134	1.071
	440	3/4	6.05	14.752	C	0.361	0.907	0.215	1.103	0.134	1.071
	441	3/4	6.05	14.752	B	0.361	0.907	0.215	1.103	0.134	1.071
	442	3/4	6.05	14.752	B	0.361	0.907	0.215	1.103	0.134	1.071
	443	3/4	6.05	14.752	A	0.361	0.907	0.215	1.103	0.134	1.071
	444	3/4	6.05	14.752	A	0.361	0.907	0.215	1.103	0.134	1.071
	445	3/4	6.05	14.752	C	0.361	0.907	0.153	0.785	0.095	0.762
	446	3/4	6.05	14.752	B	0.361	0.907	0.153	0.785	0.095	0.762
	447	3/4	6.05	14.752	A	0.361	0.907	0.153	0.785	0.095	0.762

Section Elevation ft	Elem. Num.	Size	C	C w/Ice	Face	e	e w/Ice	A_r ft^2	A_r w/Ice ft^2	A_rR_r ft^2	A_rR_r w/Ice ft^2
					A		Sum:	3.165	9.659	1.963	9.380
					B			3.165	9.659	1.963	9.380
					C			3.165	9.659	1.963	9.380

222-G Section Verification Tables - No Ice

Section Elevation ft	z_{wind} ft	z_{ice} ft	K_z	K_h	K_{zt}	t_z in	q_z psf	Face	e	A_rR_r ft^2
T1 150.00-140.00	145.00		1.369	1	1		33	A	0.159	3.550
								B	0.153	3.546
								C	0.156	3.548
T2 140.00-120.00	130.00		1.337	1	1		32	A	0.145	6.439
								B	0.139	6.433
								C	0.142	6.437
T3 120.00-100.00	110.00		1.291	1	1		31	A	0.145	6.439
								B	0.139	6.433
								C	0.142	6.437
T4 100.00-80.00	90.00		1.238	1	1		30	A	0.154	6.908
								B	0.148	6.900
								C	0.152	6.905
T5 80.00-60.00	70.00		1.174	1	1		28	A	0.159	7.126
								B	0.152	7.116
								C	0.156	7.121
T6 60.00-40.00	50.00		1.094	1	1		26	A	0.154	6.908
								B	0.148	6.900
								C	0.152	6.905
T7 40.00-20.00	30.00		0.982	1	1		24	A	0.154	6.908
								B	0.148	6.900
								C	0.152	6.905
T8 20.00-5.00	12.50		0.85	1	1		20	A	0.166	5.610
								B	0.16	5.602
								C	0.163	5.606
T9 5.00-0.00	2.50		0.85	1	1		20	A	0.361	1.963
								B	0.361	1.963
								C	0.361	1.963

222-G Section Verification Tables - Ice

Section Elevation ft	z_{wind} ft	z_{ice} ft	K_z	K_h	K_{zt}	t_z in	q_z psf	Face	e	A_rR_r ft^2
T1 150.00-140.00	145.00	145.00	1.369	1	1	2.3191	7	A	0.722	25.666
								B	0.58	22.709
								C	0.65	24.111
T2 140.00-120.00	130.00	130.00	1.337	1	1	2.2939	7	A	0.644	42.725
								B	0.497	37.807
								C	0.584	40.611

Section Elevation ft	z_{wind} ft	z_{ice} ft	K_z	K_h	K_{zt}	t_z in	q_z psf	Face	e	A_rR_r ft²
T3 120.00-100.00	110.00	110.00	1.291	1	1	2.2559	7	A	0.636	41.889
								B	0.492	37.183
								C	0.578	39.871
T4 100.00-80.00	90.00	90.00	1.238	1	1	2.2111	7	A	0.632	41.564
								B	0.492	37.038
								C	0.576	39.631
T5 80.00-60.00	70.00	70.00	1.174	1	1	2.1562	6	A	0.64	42.330
								B	0.498	37.620
								C	0.583	40.326
T6 60.00-40.00	50.00	50.00	1.094	1	1	2.0849	6	A	0.607	38.878
								B	0.478	34.996
								C	0.555	37.234
T7 40.00-20.00	30.00	30.00	0.982	1	1	1.9810	5	A	0.586	36.741
								B	0.465	33.341
								C	0.538	35.312
T8 20.00-5.00	12.50	12.50	0.85	1	1	1.8150	5	A	0.569	26.348
								B	0.465	24.249
								C	0.528	25.482
T9 5.00-0.00	2.50	2.50	0.85	1	1	1.5452	5	A	0.907	9.844
								B	0.907	9.844
								C	0.907	9.844

222-G Section Verification Tables - Service

Section Elevation ft	z_{wind} ft	z_{ice} ft	K_z	K_h	K_{zt}	t_z in	q_z psf	Face	e	A_rR_r ft²
T1 150.00-140.00	145.00		1.369	1	1		11	A	0.159	3.550
								B	0.153	3.546
								C	0.156	3.548
T2 140.00-120.00	130.00		1.337	1	1		10	A	0.145	6.439
								B	0.139	6.433
								C	0.142	6.437
T3 120.00-100.00	110.00		1.291	1	1		10	A	0.145	6.439
								B	0.139	6.433
								C	0.142	6.437
T4 100.00-80.00	90.00		1.238	1	1		10	A	0.154	6.908
								B	0.148	6.900
								C	0.152	6.905
T5 80.00-60.00	70.00		1.174	1	1		9	A	0.159	7.126
								B	0.152	7.116
								C	0.156	7.121
T6 60.00-40.00	50.00		1.094	1	1		9	A	0.154	6.908
								B	0.148	6.900
								C	0.152	6.905
T7 40.00-20.00	30.00		0.982	1	1		8	A	0.154	6.908
								B	0.148	6.900
								C	0.152	6.905
T8 20.00-5.00	12.50		0.85	1	1		7	A	0.166	5.610
								B	0.16	5.602
								C	0.163	5.606
T9 5.00-0.00	2.50		0.85	1	1		7	A	0.361	1.963
								B	0.361	1.963
								C	0.361	1.963

Tower Pressures - No Ice

$G_H = 0.850$

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
T1	145.00	1.369	33	39.167	A	0.000	6.244	3.333	53.39	0.000	0.000
150.00-140.00					B	0.000	5.995		55.60	3.672	0.000
					C	0.000	6.110		54.56	1.980	0.000
T2	130.00	1.337	32	78.333	A	0.000	11.356	6.667	58.71	0.000	0.000
140.00-120.00					B	0.000	10.856		61.41	9.180	0.000
					C	0.000	11.140		59.84	3.960	0.000
T3	110.00	1.291	31	78.333	A	0.000	11.356	6.667	58.71	0.000	0.000
120.00-100.00					B	0.000	10.856		61.41	9.180	0.000
					C	0.000	11.140		59.84	3.960	0.000
T4	90.00	1.238	30	78.750	A	0.000	12.162	7.500	61.67	0.000	0.000
100.00-80.00					B	0.000	11.662		64.31	9.180	0.000
					C	0.000	11.946		62.78	3.960	0.000
T5 80.00-60.00	70.00	1.174	28	78.750	A	0.000	12.533	7.500	59.84	0.000	0.000
					B	0.000	11.993		62.54	9.180	0.000
					C	0.000	12.300		60.97	3.960	0.000
T6 60.00-40.00	50.00	1.094	26	78.750	A	0.000	12.162	7.500	61.67	0.000	0.000
					B	0.000	11.662		64.31	9.180	0.000
					C	0.000	11.946		62.78	3.960	0.000
T7 40.00-20.00	30.00	0.982	24	78.750	A	0.000	12.162	7.500	61.67	0.000	0.000
					B	0.000	11.662		64.31	9.180	0.000
					C	0.000	11.946		62.78	3.960	0.000
T8 20.00-5.00	12.50	0.85	20	59.375	A	0.000	9.853	6.250	63.43	0.000	0.000
					B	0.000	9.490		65.86	6.426	0.000
					C	0.000	9.696		64.46	2.772	0.000
T9 5.00-0.00	2.50	0.85	20	10.488	A	0.618	3.165	2.270	60.01	0.000	0.000
					B	0.618	3.165		60.01	0.000	0.000
					C	0.618	3.165		60.01	0.000	0.000

Tower Pressure - With Ice

$G_H = 0.850$

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
T1	145.00	1.369	7	2.3191	43.032	A	0.000	31.051	11.064	35.63	0.000	0.000
150.00-140.00						B	0.000	24.965		44.32	16.761	0.000
						C	0.000	27.974		39.55	6.618	0.000
T2	130.00	1.337	7	2.2939	85.980	A	0.000	55.334	21.959	39.68	0.000	0.000
140.00-120.00						B	0.000	42.710		51.42	41.631	0.000
						C	0.000	50.237		43.71	13.136	0.000
T3	110.00	1.291	7	2.2559	85.853	A	0.000	54.606	21.706	39.75	0.000	0.000
120.00-100.00						B	0.000	42.277		51.34	41.221	0.000
						C	0.000	49.639		43.73	12.984	0.000
T4 100.00-80.00	90.00	1.238	7	2.2111	86.120	A	0.000	54.392	22.240	40.89	0.000	0.000
						B	0.000	42.408		52.44	40.739	0.000
						C	0.000	49.577		44.86	12.804	0.000
T5 80.00-60.00	70.00	1.174	6	2.1562	85.937	A	0.000	54.995	21.875	39.78	0.000	0.000
						B	0.000	42.820		51.08	40.149	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	50.120		43.64	12.585	0.000
T6 60.00-40.00	50.00	1.094	6	2.0849	85.700	A	0.000	51.981	21.399	41.17	0.000	0.000
						B	0.000	40.943		52.26	39.382	0.000
						C	0.000	47.582		44.97	12.299	0.000
T7 40.00-20.00	30.00	0.982	5	1.9810	85.353	A	0.000	49.998	20.707	41.42	0.000	0.000
						B	0.000	39.711		52.14	38.267	0.000
						C	0.000	45.927		45.09	11.884	0.000
T8 20.00-5.00	12.50	0.85	5	1.8150	63.912	A	0.000	36.365	15.325	42.14	0.000	0.000
						B	0.000	29.734		51.54	25.542	0.000
						C	0.000	33.773		45.38	7.854	0.000
T9 5.00-0.00	2.50	0.85	5	1.5452	11.863	A	0.618	10.137	5.077	47.20	0.000	0.000
						B	0.618	10.137		47.20	0.000	0.000
						C	0.618	10.137		47.20	0.000	0.000

Tower Pressure - Service

$G_H = 0.850$

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
T1	145.00	1.369	11	39.167	A	0.000	6.244	3.333	53.39	0.000	0.000
150.00-140.00					B	0.000	5.995		55.60	3.672	0.000
					C	0.000	6.110		54.56	1.980	0.000
T2	130.00	1.337	10	78.333	A	0.000	11.356	6.667	58.71	0.000	0.000
140.00-120.00					B	0.000	10.856		61.41	9.180	0.000
					C	0.000	11.140		59.84	3.960	0.000
T3	110.00	1.291	10	78.333	A	0.000	11.356	6.667	58.71	0.000	0.000
120.00-100.00					B	0.000	10.856		61.41	9.180	0.000
					C	0.000	11.140		59.84	3.960	0.000
T4	90.00	1.238	10	78.750	A	0.000	12.162	7.500	61.67	0.000	0.000
100.00-80.00					B	0.000	11.662		64.31	9.180	0.000
					C	0.000	11.946		62.78	3.960	0.000
T5 80.00-60.00	70.00	1.174	9	78.750	A	0.000	12.533	7.500	59.84	0.000	0.000
					B	0.000	11.993		62.54	9.180	0.000
					C	0.000	12.300		60.97	3.960	0.000
T6 60.00-40.00	50.00	1.094	9	78.750	A	0.000	12.162	7.500	61.67	0.000	0.000
					B	0.000	11.662		64.31	9.180	0.000
					C	0.000	11.946		62.78	3.960	0.000
T7 40.00-20.00	30.00	0.982	8	78.750	A	0.000	12.162	7.500	61.67	0.000	0.000
					B	0.000	11.662		64.31	9.180	0.000
					C	0.000	11.946		62.78	3.960	0.000
T8 20.00-5.00	12.50	0.85	7	59.375	A	0.000	9.853	6.250	63.43	0.000	0.000
					B	0.000	9.490		65.86	6.426	0.000
					C	0.000	9.696		64.46	2.772	0.000
T9 5.00-0.00	2.50	0.85	7	10.488	A	0.618	3.165	2.270	60.01	0.000	0.000
					B	0.618	3.165		60.01	0.000	0.000
					C	0.618	3.165		60.01	0.000	0.000

Tower Forces - No Ice - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	22.04	559.29	A	0.159	2.737	33	1	1	3.550	430.87	43.09	B
150.00-140.00			B	0.153	2.76		1	1	3.546			
			C	0.156	2.75		1	1	3.548			
T2	50.14	995.54	A	0.145	2.79	32	1	1	6.439	852.10	42.60	B
140.00-120.00		TA	B	0.139	2.814		1	1	6.433			
		1066.05	C	0.142	2.8		1	1	6.437			
T3	50.14	995.54	A	0.145	2.79	31	1	1	6.439	822.65	41.13	B
120.00-100.00			B	0.139	2.814		1	1	6.433			
			C	0.142	2.8		1	1	6.437			
T4	50.14	1165.91	A	0.154	2.755	30	1	1	6.908	815.64	40.78	B
100.00-80.00			B	0.148	2.779		1	1	6.900			
			C	0.152	2.765		1	1	6.905			
T5	50.14	1212.89	A	0.159	2.738	28	1	1	7.126	785.33	39.27	B
80.00-60.00			B	0.152	2.763		1	1	7.116			
			C	0.156	2.749		1	1	7.121			
T6	50.14	1165.91	A	0.154	2.755	26	1	1	6.908	720.70	36.04	B
60.00-40.00			B	0.148	2.779		1	1	6.900			
			C	0.152	2.765		1	1	6.905			
T7	50.14	1165.91	A	0.154	2.755	24	1	1	6.908	647.22	32.36	B
40.00-20.00			B	0.148	2.779		1	1	6.900			
			C	0.152	2.765		1	1	6.905			
T8 20.00-5.00	35.10	1026.92	A	0.166	2.714	20	1	1	5.610	425.08	28.34	B
			B	0.16	2.736		1	1	5.602			
			C	0.163	2.723		1	1	5.606			
T9 5.00-0.00	0.00	388.63	A	0.361	2.147	20	1	1	2.581	96.05	19.21	C
			B	0.361	2.147		1	1	2.581			
			C	0.361	2.147		1	1	2.581			
Sum Weight:	357.96	9742.58								5595.64		

Tower Forces - No Ice - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	22.04	559.29	A	0.159	2.737	33	0.8	1	3.550	430.87	43.09	B
150.00-140.00			B	0.153	2.76		0.8	1	3.546			
			C	0.156	2.75		0.8	1	3.548			
T2	50.14	995.54	A	0.145	2.79	32	0.8	1	6.439	852.10	42.60	B
140.00-120.00		TA	B	0.139	2.814		0.8	1	6.433			
		1066.05	C	0.142	2.8		0.8	1	6.437			
T3	50.14	995.54	A	0.145	2.79	31	0.8	1	6.439	822.65	41.13	B
120.00-100.00			B	0.139	2.814		0.8	1	6.433			
			C	0.142	2.8		0.8	1	6.437			
T4	50.14	1165.91	A	0.154	2.755	30	0.8	1	6.908	815.64	40.78	B
100.00-80.00			B	0.148	2.779		0.8	1	6.900			
			C	0.152	2.765		0.8	1	6.905			
T5	50.14	1212.89	A	0.159	2.738	28	0.8	1	7.126	785.33	39.27	B
80.00-60.00			B	0.152	2.763		0.8	1	7.116			
			C	0.156	2.749		0.8	1	7.121			
T6	50.14	1165.91	A	0.154	2.755	26	0.8	1	6.908	720.70	36.04	B
60.00-40.00			B	0.148	2.779		0.8	1	6.900			
			C	0.152	2.765		0.8	1	6.905			
T7	50.14	1165.91	A	0.154	2.755	24	0.8	1	6.908	647.22	32.36	B

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
40.00-20.00			B	0.148	2.779		0.8	1	6.900			
			C	0.152	2.765		0.8	1	6.905			
T8 20.00-5.00	35.10	1026.92	A	0.166	2.714	20	0.8	1	5.610	425.08	28.34	B
			B	0.16	2.736		0.8	1	5.602			
			C	0.163	2.723		0.8	1	5.606			
T9 5.00-0.00	0.00	388.63	A	0.361	2.147	20	0.8	1	2.457	91.45	18.29	C
			B	0.361	2.147		0.8	1	2.457			
			C	0.361	2.147		0.8	1	2.457			
Sum Weight:	357.96	9742.58								5591.04		

Tower Forces - No Ice - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	22.04	559.29	A	0.159	2.737	33	0.85	1	3.550	430.87	43.09	B
150.00-140.00			B	0.153	2.76		0.85	1	3.546			
			C	0.156	2.75		0.85	1	3.548			
T2	50.14	995.54	A	0.145	2.79	32	0.85	1	6.439	852.10	42.60	B
140.00-120.00		TA	B	0.139	2.814		0.85	1	6.433			
		1066.05	C	0.142	2.8		0.85	1	6.437			
T3	50.14	995.54	A	0.145	2.79	31	0.85	1	6.439	822.65	41.13	B
120.00-100.00			B	0.139	2.814		0.85	1	6.433			
			C	0.142	2.8		0.85	1	6.437			
T4	50.14	1165.91	A	0.154	2.755	30	0.85	1	6.908	815.64	40.78	B
100.00-80.00			B	0.148	2.779		0.85	1	6.900			
			C	0.152	2.765		0.85	1	6.905			
T5	50.14	1212.89	A	0.159	2.738	28	0.85	1	7.126	785.33	39.27	B
80.00-60.00			B	0.152	2.763		0.85	1	7.116			
			C	0.156	2.749		0.85	1	7.121			
T6	50.14	1165.91	A	0.154	2.755	26	0.85	1	6.908	720.70	36.04	B
60.00-40.00			B	0.148	2.779		0.85	1	6.900			
			C	0.152	2.765		0.85	1	6.905			
T7	50.14	1165.91	A	0.154	2.755	24	0.85	1	6.908	647.22	32.36	B
40.00-20.00			B	0.148	2.779		0.85	1	6.900			
			C	0.152	2.765		0.85	1	6.905			
T8 20.00-5.00	35.10	1026.92	A	0.166	2.714	20	0.85	1	5.610	425.08	28.34	B
			B	0.16	2.736		0.85	1	5.602			
			C	0.163	2.723		0.85	1	5.606			
T9 5.00-0.00	0.00	388.63	A	0.361	2.147	20	0.85	1	2.488	92.60	18.52	C
			B	0.361	2.147		0.85	1	2.488			
			C	0.361	2.147		0.85	1	2.488			
Sum Weight:	357.96	9742.58								5592.19		

Tower Forces - With Ice - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	380.30	2148.48	A	0.722	1.779	7	1	1	25.666	436.88	43.69	A
150.00-140.00			B	0.58	1.818		1	1	22.709			
			C	0.65	1.781		1	1	24.111			
T2	871.92	3727.05	A	0.644	1.783	7	1	1	42.725	809.95	40.50	A
140.00-120.00		TA	B	0.497	1.904		1	1	37.807			
		3117.31	C	0.584	1.815		1	1	40.611			
T3	852.51	3650.84	A	0.636	1.786	7	1	1	41.889	770.36	38.52	A
120.00-100.00			B	0.492	1.91		1	1	37.183			
			C	0.578	1.819		1	1	39.871			
T4	829.89	3773.20	A	0.632	1.788	7	1	1	41.564	731.81	36.59	A
100.00-80.00			B	0.492	1.91		1	1	37.038			
			C	0.576	1.821		1	1	39.631			
T5	802.60	3813.68	A	0.64	1.785	6	1	1	42.330	696.41	34.82	A
80.00-60.00			B	0.498	1.902		1	1	37.620			
			C	0.583	1.815		1	1	40.326			
T6	767.77	3529.34	A	0.607	1.8	6	1	1	38.878	615.33	30.77	A
60.00-40.00			B	0.478	1.931		1	1	34.996			
			C	0.555	1.839		1	1	37.234			
T7	718.43	3337.37	A	0.586	1.814	5	1	1	36.741	530.41	26.52	A
40.00-20.00			B	0.465	1.949		1	1	33.341			
			C	0.538	1.855		1	1	35.312			
T8 20.00-5.00	449.95	2498.90	A	0.569	1.827	5	1	1	26.348	320.41	21.36	A
			B	0.465	1.949		1	1	24.249			
			C	0.528	1.866		1	1	25.482			
T9 5.00-0.00	0.00	790.40	A	0.907	1.934	5	1	1	10.462	79.50	15.90	C
			B	0.907	1.934		1	1	10.462			
			C	0.907	1.934		1	1	10.462			
Sum Weight:	5673.38	30386.56								4991.07		

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 ft²	F lb	w plf	Ctrl. Face
T1	380.30	2148.48	A	0.722	1.779	7	0.8	1	25.666	436.88	43.69	A
150.00-140.00			B	0.58	1.818		0.8	1	22.709			
			C	0.65	1.781		0.8	1	24.111			
T2	871.92	3727.05	A	0.644	1.783	7	0.8	1	42.725	809.95	40.50	A
140.00-120.00		TA	B	0.497	1.904		0.8	1	37.807			
		3117.31	C	0.584	1.815		0.8	1	40.611			
T3	852.51	3650.84	A	0.636	1.786	7	0.8	1	41.889	770.36	38.52	A
120.00-100.00			B	0.492	1.91		0.8	1	37.183			
			C	0.578	1.819		0.8	1	39.871			
T4	829.89	3773.20	A	0.632	1.788	7	0.8	1	41.564	731.81	36.59	A
100.00-80.00			B	0.492	1.91		0.8	1	37.038			
			C	0.576	1.821		0.8	1	39.631			
T5	802.60	3813.68	A	0.64	1.785	6	0.8	1	42.330	696.41	34.82	A
80.00-60.00			B	0.498	1.902		0.8	1	37.620			
			C	0.583	1.815		0.8	1	40.326			
T6	767.77	3529.34	A	0.607	1.8	6	0.8	1	38.878	615.33	30.77	A
60.00-40.00			B	0.478	1.931		0.8	1	34.996			
			C	0.555	1.839		0.8	1	37.234			
T7	718.43	3337.37	A	0.586	1.814	5	0.8	1	36.741	530.41	26.52	A

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
40.00-20.00			B	0.465	1.949		0.8	1	33.341			
			C	0.538	1.855		0.8	1	35.312			
T8 20.00-5.00	449.95	2498.90	A	0.569	1.827	5	0.8	1	26.348	320.41	21.36	A
			B	0.465	1.949		0.8	1	24.249			
			C	0.528	1.866		0.8	1	25.482			
T9 5.00-0.00	0.00	790.40	A	0.907	1.934	5	0.8	1	10.338	78.57	15.71	C
			B	0.907	1.934		0.8	1	10.338			
			C	0.907	1.934		0.8	1	10.338			
Sum Weight:	5673.38	30386.56								4990.13		

Tower Forces - With Ice - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	380.30	2148.48	A	0.722	1.779	7	0.85	1	25.666	436.88	43.69	A
150.00-140.00			B	0.58	1.818		0.85	1	22.709			
			C	0.65	1.781		0.85	1	24.111			
T2	871.92	3727.05	A	0.644	1.783	7	0.85	1	42.725	809.95	40.50	A
140.00-120.00		TA	B	0.497	1.904		0.85	1	37.807			
		3117.31	C	0.584	1.815		0.85	1	40.611			
T3	852.51	3650.84	A	0.636	1.786	7	0.85	1	41.889	770.36	38.52	A
120.00-100.00			B	0.492	1.91		0.85	1	37.183			
			C	0.578	1.819		0.85	1	39.871			
T4	829.89	3773.20	A	0.632	1.788	7	0.85	1	41.564	731.81	36.59	A
100.00-80.00			B	0.492	1.91		0.85	1	37.038			
			C	0.576	1.821		0.85	1	39.631			
T5	802.60	3813.68	A	0.64	1.785	6	0.85	1	42.330	696.41	34.82	A
80.00-60.00			B	0.498	1.902		0.85	1	37.620			
			C	0.583	1.815		0.85	1	40.326			
T6	767.77	3529.34	A	0.607	1.8	6	0.85	1	38.878	615.33	30.77	A
60.00-40.00			B	0.478	1.931		0.85	1	34.996			
			C	0.555	1.839		0.85	1	37.234			
T7	718.43	3337.37	A	0.586	1.814	5	0.85	1	36.741	530.41	26.52	A
40.00-20.00			B	0.465	1.949		0.85	1	33.341			
			C	0.538	1.855		0.85	1	35.312			
T8 20.00-5.00	449.95	2498.90	A	0.569	1.827	5	0.85	1	26.348	320.41	21.36	A
			B	0.465	1.949		0.85	1	24.249			
			C	0.528	1.866		0.85	1	25.482			
T9 5.00-0.00	0.00	790.40	A	0.907	1.934	5	0.85	1	10.369	78.80	15.76	C
			B	0.907	1.934		0.85	1	10.369			
			C	0.907	1.934		0.85	1	10.369			
Sum Weight:	5673.38	30386.56								4990.37		

Tower Forces - Service - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	22.04	559.29	A	0.159	2.737	11	1	1	3.550	140.69	14.07	B
150.00-140.00			B	0.153	2.76		1	1	3.546			
			C	0.156	2.75		1	1	3.548			
T2	50.14	995.54	A	0.145	2.79	10	1	1	6.439	278.24	13.91	B
140.00-120.00		TA	B	0.139	2.814		1	1	6.433			
		1066.05	C	0.142	2.8		1	1	6.437			
T3	50.14	995.54	A	0.145	2.79	10	1	1	6.439	268.62	13.43	B
120.00-100.00			B	0.139	2.814		1	1	6.433			
			C	0.142	2.8		1	1	6.437			
T4	50.14	1165.91	A	0.154	2.755	10	1	1	6.908	266.33	13.32	B
100.00-80.00			B	0.148	2.779		1	1	6.900			
			C	0.152	2.765		1	1	6.905			
T5	50.14	1212.89	A	0.159	2.738	9	1	1	7.126	256.44	12.82	B
80.00-60.00			B	0.152	2.763		1	1	7.116			
			C	0.156	2.749		1	1	7.121			
T6	50.14	1165.91	A	0.154	2.755	9	1	1	6.908	235.33	11.77	B
60.00-40.00			B	0.148	2.779		1	1	6.900			
			C	0.152	2.765		1	1	6.905			
T7	50.14	1165.91	A	0.154	2.755	8	1	1	6.908	211.34	10.57	B
40.00-20.00			B	0.148	2.779		1	1	6.900			
			C	0.152	2.765		1	1	6.905			
T8 20.00-5.00	35.10	1026.92	A	0.166	2.714	7	1	1	5.610	138.80	9.25	B
			B	0.16	2.736		1	1	5.602			
			C	0.163	2.723		1	1	5.606			
T9 5.00-0.00	0.00	388.63	A	0.361	2.147	7	1	1	2.581	31.36	6.27	C
			B	0.361	2.147		1	1	2.581			
			C	0.361	2.147		1	1	2.581			
Sum Weight:	357.96	9742.58								1827.15		

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
T1	22.04	559.29	A	0.159	2.737	11	0.8	1	3.550	140.69	14.07	B
150.00-140.00			B	0.153	2.76		0.8	1	3.546			
			C	0.156	2.75		0.8	1	3.548			
T2	50.14	995.54	A	0.145	2.79	10	0.8	1	6.439	278.24	13.91	B
140.00-120.00		TA	B	0.139	2.814		0.8	1	6.433			
		1066.05	C	0.142	2.8		0.8	1	6.437			
T3	50.14	995.54	A	0.145	2.79	10	0.8	1	6.439	268.62	13.43	B
120.00-100.00			B	0.139	2.814		0.8	1	6.433			
			C	0.142	2.8		0.8	1	6.437			
T4	50.14	1165.91	A	0.154	2.755	10	0.8	1	6.908	266.33	13.32	B
100.00-80.00			B	0.148	2.779		0.8	1	6.900			
			C	0.152	2.765		0.8	1	6.905			
T5	50.14	1212.89	A	0.159	2.738	9	0.8	1	7.126	256.44	12.82	B
80.00-60.00			B	0.152	2.763		0.8	1	7.116			
			C	0.156	2.749		0.8	1	7.121			
T6	50.14	1165.91	A	0.154	2.755	9	0.8	1	6.908	235.33	11.77	B
60.00-40.00			B	0.148	2.779		0.8	1	6.900			
			C	0.152	2.765		0.8	1	6.905			
T7	50.14	1165.91	A	0.154	2.755	8	0.8	1	6.908	211.34	10.57	B

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
40.00-20.00			B	0.148	2.779		0.8	1	6.900			
			C	0.152	2.765		0.8	1	6.905			
T8 20.00-5.00	35.10	1026.92	A	0.166	2.714	7	0.8	1	5.610	138.80	9.25	B
			B	0.16	2.736		0.8	1	5.602			
			C	0.163	2.723		0.8	1	5.606			
T9 5.00-0.00	0.00	388.63	A	0.361	2.147	7	0.8	1	2.457	29.86	5.97	C
			B	0.361	2.147		0.8	1	2.457			
			C	0.361	2.147		0.8	1	2.457			
Sum Weight:	357.96	9742.58								1825.65		

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 ft²	F lb	w plf	Ctrl. Face
T1	22.04	559.29	A	0.159	2.737	11	0.85	1	3.550	140.69	14.07	B
150.00-140.00			B	0.153	2.76		0.85	1	3.546			
			C	0.156	2.75		0.85	1	3.548			
T2	50.14	995.54	A	0.145	2.79	10	0.85	1	6.439	278.24	13.91	B
140.00-120.00		TA	B	0.139	2.814		0.85	1	6.433			
		1066.05	C	0.142	2.8		0.85	1	6.437			
T3	50.14	995.54	A	0.145	2.79	10	0.85	1	6.439	268.62	13.43	B
120.00-100.00			B	0.139	2.814		0.85	1	6.433			
			C	0.142	2.8		0.85	1	6.437			
T4	50.14	1165.91	A	0.154	2.755	10	0.85	1	6.908	266.33	13.32	B
100.00-80.00			B	0.148	2.779		0.85	1	6.900			
			C	0.152	2.765		0.85	1	6.905			
T5	50.14	1212.89	A	0.159	2.738	9	0.85	1	7.126	256.44	12.82	B
80.00-60.00			B	0.152	2.763		0.85	1	7.116			
			C	0.156	2.749		0.85	1	7.121			
T6	50.14	1165.91	A	0.154	2.755	9	0.85	1	6.908	235.33	11.77	B
60.00-40.00			B	0.148	2.779		0.85	1	6.900			
			C	0.152	2.765		0.85	1	6.905			
T7	50.14	1165.91	A	0.154	2.755	8	0.85	1	6.908	211.34	10.57	B
40.00-20.00			B	0.148	2.779		0.85	1	6.900			
			C	0.152	2.765		0.85	1	6.905			
T8 20.00-5.00	35.10	1026.92	A	0.166	2.714	7	0.85	1	5.610	138.80	9.25	B
			B	0.16	2.736		0.85	1	5.602			
			C	0.163	2.723		0.85	1	5.606			
T9 5.00-0.00	0.00	388.63	A	0.361	2.147	7	0.85	1	2.488	30.24	6.05	C
			B	0.361	2.147		0.85	1	2.488			
			C	0.361	2.147		0.85	1	2.488			
Sum Weight:	357.96	9742.58								1826.02		

Force Totals (Does not include forces on guys)

Load Case	Vertical Forces lb	Sum of Forces X lb	Sum of Forces Z lb	Sum of Torques lb-ft
Leg Weight	5875.36			
Bracing Weight	3867.22			
Total Member Self-Weight	9742.58			
Guy Weight	1629.57			
Total Weight	15602.44			
Wind 0 deg - No Ice		-71.46	-11040.91	3279.84
Wind 30 deg - No Ice		5434.49	-9513.90	2442.49
Wind 60 deg - No Ice		9492.38	-5456.27	954.60
Wind 90 deg - No Ice		11003.26	71.46	-791.33
Wind 120 deg - No Ice		9558.73	5577.10	-2325.51
Wind 150 deg - No Ice		5570.28	9606.17	-3237.24
Wind 180 deg - No Ice		71.46	11025.82	-3278.01
Wind 210 deg - No Ice		-5434.49	9513.90	-2442.49
Wind 240 deg - No Ice		-9508.08	5465.33	-957.32
Wind 270 deg - No Ice		-11003.26	-71.46	791.33
Wind 300 deg - No Ice		-9575.55	-5586.81	2324.87
Wind 330 deg - No Ice		-5570.28	-9606.17	3237.24
Member Ice	20643.99			
Guy Ice	15055.03			
Total Weight Ice	64758.14			
Wind 0 deg - Ice		-10.35	-7225.08	1040.01
Wind 30 deg - Ice		3646.70	-6325.99	759.47
Wind 60 deg - Ice		6251.75	-3603.11	265.42
Wind 90 deg - Ice		7225.11	10.35	-293.97
Wind 120 deg - Ice		6337.58	3664.61	-773.25
Wind 150 deg - Ice		3593.91	6213.85	-1046.56
Wind 180 deg - Ice		10.35	7310.36	-1044.34
Wind 210 deg - Ice		-3646.70	6325.99	-759.47
Wind 240 deg - Ice		-6204.75	3575.97	-261.80
Wind 270 deg - Ice		-7225.11	-10.35	293.97
Wind 300 deg - Ice		-6214.28	-3593.43	775.45
Wind 330 deg - Ice		-3593.91	-6213.85	1046.56
Total Weight	15602.44			
Wind 0 deg - Service		-23.33	-3605.20	1070.97
Wind 30 deg - Service		1774.53	-3106.58	797.55
Wind 60 deg - Service		3099.55	-1781.64	311.71
Wind 90 deg - Service		3592.90	23.33	-258.39
Wind 120 deg - Service		3121.22	1821.09	-759.35
Wind 150 deg - Service		1818.87	3136.71	-1057.06
Wind 180 deg - Service		23.33	3600.27	-1070.37
Wind 210 deg - Service		-1774.53	3106.58	-797.55
Wind 240 deg - Service		-3104.68	1784.60	-312.59
Wind 270 deg - Service		-3592.90	-23.33	258.39
Wind 300 deg - Service		-3126.71	-1824.26	759.14
Wind 330 deg - Service		-1818.87	-3136.71	1057.06

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice+1.0 Guy
3	1.2 Dead+1.6 Wind 30 deg - No Ice+1.0 Guy
4	1.2 Dead+1.6 Wind 60 deg - No Ice+1.0 Guy

Comb. No.	Description
5	1.2 Dead+1.6 Wind 90 deg - No Ice+1.0 Guy
6	1.2 Dead+1.6 Wind 120 deg - No Ice+1.0 Guy
7	1.2 Dead+1.6 Wind 150 deg - No Ice+1.0 Guy
8	1.2 Dead+1.6 Wind 180 deg - No Ice+1.0 Guy
9	1.2 Dead+1.6 Wind 210 deg - No Ice+1.0 Guy
10	1.2 Dead+1.6 Wind 240 deg - No Ice+1.0 Guy
11	1.2 Dead+1.6 Wind 270 deg - No Ice+1.0 Guy
12	1.2 Dead+1.6 Wind 300 deg - No Ice+1.0 Guy
13	1.2 Dead+1.6 Wind 330 deg - No Ice+1.0 Guy
14	1.2 Dead+1.0 Ice+1.0 Temp+Guy
15	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp+1.0 Guy
16	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp+1.0 Guy
17	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp+1.0 Guy
18	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp+1.0 Guy
19	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp+1.0 Guy
20	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp+1.0 Guy
21	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp+1.0 Guy
22	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp+1.0 Guy
23	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp+1.0 Guy
24	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp+1.0 Guy
25	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp+1.0 Guy
26	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp+1.0 Guy
27	Dead+Wind 0 deg - Service+Guy
28	Dead+Wind 30 deg - Service+Guy
29	Dead+Wind 60 deg - Service+Guy
30	Dead+Wind 90 deg - Service+Guy
31	Dead+Wind 120 deg - Service+Guy
32	Dead+Wind 150 deg - Service+Guy
33	Dead+Wind 180 deg - Service+Guy
34	Dead+Wind 210 deg - Service+Guy
35	Dead+Wind 240 deg - Service+Guy
36	Dead+Wind 270 deg - Service+Guy
37	Dead+Wind 300 deg - Service+Guy
38	Dead+Wind 330 deg - Service+Guy

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
T1	150 - 140	Leg	Max Tension	12	5608.20	-35.90	-29.92
			Max. Compression	2	-17536.59	13.03	773.21
			Max. Mx	6	-15473.51	-644.35	-356.82
			Max. My	2	-16007.82	12.98	773.22
			Max. Vy	5	1238.73	-297.96	-5.30
			Max. Vx	2	1441.67	12.98	773.22
		Diagonal	Max Tension	6	2130.30	0.00	0.00
			Max. Compression	6	-2189.40	0.00	0.00
			Max. Mx	16	-512.78	-6.16	-0.05
			Max. My	12	-2034.11	-0.92	0.71
			Max. Vy	16	12.66	-6.16	-0.05
			Max. Vx	12	-0.33	-0.80	0.71
		Top Girt	Max Tension	4	93.00	0.00	0.00
			Max. Compression	10	-135.88	0.00	0.00
			Max. Mx	20	-77.01	18.46	0.00
			Max. My	3	-26.22	0.00	-0.00
			Max. Vy	20	19.69	0.00	0.00
			Max. Vx	3	0.00	0.00	0.00
		Bottom Girt	Max Tension	2	645.70	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Max. Compression	4	-348.49	0.00	0.00
			Max. Mx	19	37.49	18.46	0.00
			Max. My	3	42.96	0.00	-0.00
			Max. Vy	19	19.69	0.00	0.00
			Max. Vx	3	0.00	0.00	0.00
		Top Guy Pull-Off	Max Tension	8	5791.70	0.00	0.00
			Max. Compression	2	-4353.58	0.00	0.00
			Max. Mx	20	217.44	26.58	0.00
			Max. My	3	885.40	0.00	-0.00
			Max. Vy	20	-28.36	0.00	0.00
			Max. Vx	3	0.00	0.00	0.00
T2	140 - 120	Leg	Max Tension	12	1861.45	8.14	7.23
			Max. Compression	25	-28241.90	-34.38	-19.77
			Max. Mx	5	-8613.11	-564.01	60.73
			Max. My	2	-16019.54	-9.18	-665.74
			Max. Vy	12	1389.46	158.28	-13.58
			Max. Vx	8	-1562.60	88.91	-124.80
		Diagonal	Max Tension	8	2941.26	0.00	0.00
			Max. Compression	9	-3365.95	0.00	0.00
			Max. Mx	15	-1345.67	-8.90	-0.67
			Max. My	2	-1263.46	6.12	-102.98
			Max. Vy	15	13.70	-8.90	-0.67
			Max. Vx	2	46.42	6.12	-102.98
		Top Girt	Max Tension	12	1099.41	0.00	0.00
			Max. Compression	2	-1060.03	0.00	0.00
			Max. Mx	19	138.50	18.17	0.00
			Max. My	3	-82.02	0.00	-0.00
			Max. Vy	19	-19.38	0.00	0.00
			Max. Vx	3	0.00	0.00	0.00
		Bottom Girt	Max Tension	19	214.34	0.00	0.00
			Max. Compression	17	-9.01	0.00	0.00
			Max. Mx	23	53.70	18.17	0.00
			Max. My	3	73.95	0.00	-0.00
			Max. Vy	23	-19.38	0.00	0.00
			Max. Vx	3	0.00	0.00	0.00
		Guy A	Bottom Tension	21	10647.31		
			Top Tension	8	11602.99		
			Top Cable Vert	21	7591.96		
			Top Cable Norm	21	8774.47		
			Top Cable Tan	21	6.43		
			Bot Cable Vert	8	-6165.44		
			Bot Cable Norm	8	8680.58		
			Bot Cable Tan	8	4.44		
		Guy B	Bottom Tension	25	10921.17		
			Top Tension	12	12141.02		
			Top Cable Vert	25	8444.89		
			Top Cable Norm	25	8722.86		
			Top Cable Tan	25	8.89		
			Bot Cable Vert	12	-6834.70		
			Bot Cable Norm	12	8518.15		
			Bot Cable Tan	12	5.13		
		Guy C	Bottom Tension	17	11022.95		
			Top Tension	17	12323.71		
			Top Cable Vert	17	8660.32		
			Top Cable Norm	17	8767.71		
			Top Cable Tan	17	3.59		
			Bot Cable Vert	17	-6441.85		
			Bot Cable Norm	17	8944.71		
			Bot Cable Tan	17	8.64		
		Torque Arm Top	Max Tension	21	10781.86	0.00	0.00
			Max. Compression	6	-1133.76	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Max. Mx	17	10396.53	224.98	0.00
			Max. My	2	7806.06	0.00	0.44
			Max. Vy	17	-115.94	0.00	0.00
			Max. Vx	2	-0.23	0.00	0.00
		Torque Arm Bottom	Max Tension	13	5197.83	0.00	0.00
			Max. Compression	13	-8842.58	0.00	0.00
			Max. Mx	17	-3263.02	201.32	0.00
			Max. My	2	4253.65	0.00	-0.18
			Max. Vy	17	115.93	0.00	0.00
			Max. Vx	2	0.11	0.00	0.00
T3	120 - 100	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	25	-29594.61	54.36	33.13
			Max. Mx	11	-11115.81	-219.57	-44.81
			Max. My	2	-10375.63	-11.12	-230.44
			Max. Vy	5	525.28	-61.15	-24.56
			Max. Vx	2	-599.77	2.64	68.46
		Diagonal	Max Tension	13	721.58	0.00	0.00
			Max. Compression	13	-850.64	0.00	0.00
			Max. Mx	24	-274.12	-6.67	0.05
			Max. My	12	-697.50	-1.61	0.26
			Max. Vy	24	12.46	-6.67	0.05
			Max. Vx	12	-0.12	-1.61	0.26
		Top Girt	Max Tension	17	149.96	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	23	92.27	17.73	0.00
			Max. My	3	12.66	0.00	-0.00
			Max. Vy	23	-18.92	0.00	0.00
			Max. Vx	3	0.00	0.00	0.00
		Bottom Girt	Max Tension	12	277.86	0.00	0.00
			Max. Compression	6	-210.36	0.00	0.00
			Max. Mx	24	197.46	17.73	0.00
			Max. My	3	92.68	0.00	-0.00
			Max. Vy	24	-18.92	0.00	0.00
			Max. Vx	3	0.00	0.00	0.00
T4	100 - 80	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	25	-29246.15	82.36	49.07
			Max. Mx	11	-418.22	-501.12	-72.57
			Max. My	2	-24332.93	-31.97	-527.21
			Max. Vy	5	1019.84	-28.41	-15.82
			Max. Vx	2	-1122.82	0.14	33.15
		Diagonal	Max Tension	13	1431.45	0.00	0.00
			Max. Compression	13	-1558.11	0.00	0.00
			Max. Mx	23	-144.28	-6.20	0.04
			Max. My	13	-1548.56	-1.15	0.32
			Max. Vy	15	11.99	-6.20	-0.05
			Max. Vx	13	-0.15	-1.15	0.32
		Top Girt	Max Tension	6	339.24	0.00	0.00
			Max. Compression	12	-210.71	0.00	0.00
			Max. Mx	24	-13.09	17.23	0.00
			Max. My	3	25.31	0.00	-0.00
			Max. Vy	24	-18.38	0.00	0.00
			Max. Vx	3	0.00	0.00	0.00
		Bottom Girt	Max Tension	12	525.71	0.00	0.00
			Max. Compression	6	-451.59	0.00	0.00
			Max. Mx	14	146.07	17.23	0.00
			Max. My	3	111.12	0.00	-0.00
			Max. Vy	14	-18.38	0.00	0.00
			Max. Vx	3	0.00	0.00	0.00
T5	80 - 60	Leg	Max Tension	12	7496.91	-46.89	-28.56
			Max. Compression	6	-34682.82	15.17	8.68
			Max. Mx	5	-24045.60	-538.71	-134.58

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Max. My	2	-24348.28	32.71	594.74
			Max. Vy	5	1022.76	-538.71	-134.58
			Max. Vx	2	-1125.18	32.71	594.74
		Diagonal	Max Tension	13	1485.77	0.00	0.00
			Max. Compression	13	-1652.25	0.00	0.00
			Max. Mx	16	-39.08	-6.20	-0.04
			Max. My	13	-1643.26	-0.72	0.51
			Max. Vy	22	11.66	-6.20	0.02
			Max. Vx	13	-0.23	-0.72	0.51
		Top Girt	Max Tension	6	483.94	0.00	0.00
			Max. Compression	12	-331.40	0.00	0.00
			Max. Mx	14	134.45	16.63	0.00
			Max. My	3	36.96	0.00	-0.00
			Max. Vy	14	17.74	0.00	0.00
			Max. Vx	3	0.00	0.00	0.00
		Bottom Girt	Max Tension	6	424.36	0.00	0.00
			Max. Compression	8	-231.14	0.00	0.00
			Max. Mx	14	183.29	16.63	0.00
			Max. My	3	67.85	0.00	-0.00
			Max. Vy	14	17.74	0.00	0.00
			Max. Vx	3	0.00	0.00	0.00
		Guy A	Bottom Tension	21	12484.51		
			Top Tension	21	13087.44		
			Top Cable Vert	21	5619.72		
			Top Cable Norm	21	11819.47		
			Top Cable Tan	21	0.37		
			Bot Cable Vert	21	-3947.92		
			Bot Cable Norm	21	11843.86		
			Bot Cable Tan	21	0.37		
		Guy B	Bottom Tension	25	12950.49		
			Top Tension	25	13648.06		
			Top Cable Vert	25	6760.72		
			Top Cable Norm	25	11855.90		
			Top Cable Tan	25	2.19		
			Bot Cable Vert	25	-5124.00		
			Bot Cable Norm	25	11893.69		
			Bot Cable Tan	25	2.19		
		Guy C	Bottom Tension	17	12975.48		
			Top Tension	17	13687.03		
			Top Cable Vert	17	6949.29		
			Top Cable Norm	17	11791.62		
			Top Cable Tan	17	1.80		
			Bot Cable Vert	17	-5326.36		
			Bot Cable Norm	17	11831.86		
			Bot Cable Tan	17	1.80		
		Top Guy Pull-Off	Max Tension	23	6099.41	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	14	5300.88	24.58	0.00
			Max. My	3	2879.28	0.00	-0.00
			Max. Vy	14	-26.22	0.00	0.00
			Max. Vx	3	0.00	0.00	0.00
T6	60 - 40	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	25	-37306.05	-47.88	-27.69
			Max. Mx	5	-5316.74	444.24	-11.49
			Max. My	8	-4261.44	-26.81	433.31
			Max. Vy	5	-894.11	-32.25	-18.12
			Max. Vx	2	921.53	0.21	37.39
		Diagonal	Max Tension	5	1131.34	0.00	0.00
			Max. Compression	5	-1298.70	0.00	0.00
			Max. Mx	26	-105.29	-6.07	-0.05
			Max. My	3	-1281.91	-1.28	0.23

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Max. Vy	15	11.19	-6.06	-0.05
			Max. Vx	3	-0.11	-1.28	0.23
		Top Girt	Max Tension	12	451.70	0.00	0.00
			Max. Compression	6	-359.27	0.00	0.00
			Max. Mx	14	165.37	15.86	0.00
			Max. My	3	111.65	0.00	-0.00
			Max. Vy	14	-16.92	0.00	0.00
			Max. Vx	3	0.00	0.00	0.00
		Bottom Girt	Max Tension	6	273.25	0.00	0.00
			Max. Compression	12	-90.56	0.00	0.00
			Max. Mx	14	173.53	15.86	0.00
			Max. My	3	64.56	0.00	-0.00
			Max. Vy	14	-16.92	0.00	0.00
			Max. Vx	3	0.00	0.00	0.00
T7	40 - 20	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	25	-38566.90	71.22	42.77
			Max. Mx	5	-14120.17	238.38	2.45
			Max. My	2	-13672.18	22.38	-233.96
			Max. Vy	5	-461.40	-22.30	-12.13
			Max. Vx	2	467.24	0.19	24.31
		Diagonal	Max Tension	3	612.75	0.00	0.00
			Max. Compression	3	-780.42	0.00	0.00
			Max. Mx	26	-249.37	-5.84	-0.08
			Max. My	3	-772.02	-1.07	0.22
			Max. Vy	15	10.52	-5.83	-0.06
			Max. Vx	3	-0.10	-1.07	0.22
		Top Girt	Max Tension	12	233.51	0.00	0.00
			Max. Compression	6	-137.10	0.00	0.00
			Max. Mx	14	169.58	14.79	0.00
			Max. My	3	101.42	0.00	-0.00
			Max. Vy	14	-15.78	0.00	0.00
			Max. Vx	3	0.00	0.00	0.00
		Bottom Girt	Max Tension	25	241.03	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	14	183.62	14.79	0.00
			Max. My	3	67.21	0.00	-0.00
			Max. Vy	14	-15.78	0.00	0.00
			Max. Vx	3	0.00	0.00	0.00
T8	20 - 5	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	25	-38314.25	33.03	35.34
			Max. Mx	15	-38098.96	604.89	316.68
			Max. My	20	-37612.27	7.08	-673.60
			Max. Vy	15	-411.49	-389.30	-214.65
			Max. Vx	20	461.93	7.08	-673.60
		Diagonal	Max Tension	15	1384.23	0.00	0.00
			Max. Compression	15	-880.69	0.00	0.00
			Max. Mx	15	-539.21	-5.53	-0.08
			Max. My	3	54.77	-0.40	0.22
			Max. Vy	15	9.50	-5.53	-0.08
			Max. Vx	3	-0.10	-0.40	0.22
		Top Girt	Max Tension	15	264.71	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	14	179.80	13.17	0.00
			Max. My	3	100.01	0.00	-0.00
			Max. Vy	14	-14.05	0.00	0.00
			Max. Vx	3	0.00	0.00	0.00
		Bottom Girt	Max Tension	15	7356.33	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	14	7082.62	13.17	0.00
			Max. My	3	3114.35	0.00	-0.00
			Max. Vy	14	-14.05	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Max. Vx	3	0.00	0.00	0.00
T9	5 - 0	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-41250.11	18.75	-4.19
			Max. Mx	26	-40583.01	684.24	-6.82
			Max. My	3	-16642.35	-176.89	690.22
			Max. Vy	15	1202.05	-425.11	123.94
			Max. Vx	3	-853.56	-176.89	690.22
		Diagonal	Max Tension	3	608.39	-0.20	1.02
			Max. Compression	16	-3029.03	0.00	0.00
			Max. Mx	16	422.39	-5.76	-1.72
			Max. My	9	-2109.68	-1.14	-5.79
			Max. Vy	3	10.60	0.00	0.00
			Max. Vx	9	-14.46	0.00	0.00
		Horizontal	Max Tension	1	0.00	0.00	0.00
			Max. Compression	15	-412.86	0.00	0.00
			Max. Mx	21	-404.68	9.71	0.00
			Max. My	16	-411.34	0.00	2.10
			Max. Vy	21	18.84	0.00	0.00
			Max. Vx	16	-4.08	0.00	0.00
		Secondary Horizontal	Max Tension	16	925.44	0.00	0.00
			Max. Compression	26	-760.95	0.00	0.00
			Max. Mx	15	832.44	-2.73	3.27
			Max. My	22	876.69	-2.58	3.47
			Max. Vy	9	7.51	0.00	0.00
			Max. Vx	9	5.58	0.00	0.00
		Bottom Girt	Max Tension	15	1015.10	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	14	983.12	0.11	0.00
			Max. My	3	428.06	0.00	-0.00
			Max. Vy	14	-1.15	0.00	0.00
			Max. Vx	3	0.00	0.00	0.00

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Mast	Max. Vert	15	109186.84	64.16	578.80
	Max. H_x	24	107841.56	598.84	-49.26
	Max. H_z	15	109186.84	64.16	578.80
	Max. M_x	1	0.00	1.87	11.17
	Max. M_z	1	0.00	1.87	11.17
	Max. Torsion	9	953.15	186.12	-595.42
	Min. Vert	1	34627.12	1.87	11.17
	Min. H_x	4	46983.82	-580.60	378.33
	Min. H_z	8	45735.20	19.30	-733.98
	Min. M_x	1	0.00	1.87	11.17
	Min. M_z	1	0.00	1.87	11.17
	Min. Torsion	3	-987.84	-392.93	419.02
Guy C @ 210 ft Elev -38 ft Azimuth 240 deg	Max. Vert	10	-1072.02	-1270.66	734.06
	Max. H_x	10	-1072.02	-1270.66	734.06
	Max. H_z	17	-18208.18	-25728.35	14861.27
	Min. Vert	4	-18578.55	-22918.21	13228.36
	Min. H_x	17	-18208.18	-25728.35	14861.27

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
	Min. H_z	10	-1072.02	-1270.66	734.06
Guy B @ 210 ft Elev -34 ft Azimuth 120 deg	Max. Vert	6	-963.53	1194.89	689.62
	Max. H_x	25	-17566.26	25661.22	14826.56
	Max. H_z	25	-17566.26	25661.22	14826.56
	Min. Vert	12	-18251.92	23103.10	13350.60
	Min. H_x	6	-963.53	1194.89	689.62
	Min. H_z	6	-963.53	1194.89	689.62
Guy A @ 210 ft Elev -14 ft Azimuth 0 deg	Max. Vert	2	-605.65	0.37	-1196.63
	Max. H_x	24	-11752.08	894.17	-24076.42
	Max. H_z	2	-605.65	0.37	-1196.63
	Min. Vert	8	-15910.89	-13.85	-26861.03
	Min. H_x	18	-11763.96	-897.13	-24092.88
	Min. H_z	21	-14796.18	-3.57	-29617.07

Tower Mast Reaction Summary

Load Combination	Vertical lb	$Shear_x$ lb	$Shear_z$ lb	Overturning Moment, M_x lb-ft	Overturning Moment, M_z lb-ft	Torque lb-ft
Dead Only	34627.12	-1.87	-11.17	0.00	0.00	-0.07
1.2 Dead+1.6 Wind 0 deg - No Ice+1.0 Guy	46546.21	2.73	-537.31	0.00	0.00	892.41
1.2 Dead+1.6 Wind 30 deg - No Ice+1.0 Guy	47002.80	392.93	-419.02	0.00	0.00	987.84
1.2 Dead+1.6 Wind 60 deg - No Ice+1.0 Guy	46983.82	580.60	-378.33	0.00	0.00	574.06
1.2 Dead+1.6 Wind 90 deg - No Ice+1.0 Guy	46559.56	528.72	-168.97	0.00	0.00	10.67
1.2 Dead+1.6 Wind 120 deg - No Ice+1.0 Guy	45501.58	410.67	248.56	0.00	0.00	-298.78
1.2 Dead+1.6 Wind 150 deg - No Ice+1.0 Guy	45710.81	147.74	580.19	0.00	0.00	-529.13
1.2 Dead+1.6 Wind 180 deg - No Ice+1.0 Guy	45735.20	-19.30	733.98	0.00	0.00	-863.48
1.2 Dead+1.6 Wind 210 deg - No Ice+1.0 Guy	45421.06	-186.12	595.42	0.00	0.00	-953.15
1.2 Dead+1.6 Wind 240 deg - No Ice+1.0 Guy	45050.64	-437.41	266.00	0.00	0.00	-560.56
1.2 Dead+1.6 Wind 270 deg - No Ice+1.0 Guy	46226.51	-553.26	-146.10	0.00	0.00	-11.54
1.2 Dead+1.6 Wind 300 deg - No Ice+1.0 Guy	46858.45	-589.06	-358.61	0.00	0.00	336.05
1.2 Dead+1.6 Wind 330 deg - No Ice+1.0 Guy	46980.05	-390.35	-409.19	0.00	0.00	571.27
1.2 Dead+1.0 Ice+1.0 Temp+Guy	106956.02	-66.14	-13.64	0.00	0.00	2.65
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp+1.0 Guy	109186.84	-64.16	-578.80	0.00	0.00	179.07
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp+1.0 Guy	108533.41	147.49	-502.12	0.00	0.00	264.17
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp+1.0 Guy	107820.78	348.52	-258.09	0.00	0.00	103.23
1.2 Dead+1.0 Wind 90 deg+1.0	108041.53	464.85	42.96	0.00	0.00	-82.48

Load Combination	Vertical lb	$Shear_x$ lb	$Shear_z$ lb	Overturning Moment, M_x lb-ft	Overturning Moment, M_z lb-ft	Torque lb-ft
Ice+1.0 Temp+1.0 Guy						
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp+1.0 Guy	108286.09	430.63	274.08	0.00	0.00	-73.27
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp+1.0 Guy	107471.99	251.28	419.73	0.00	0.00	-41.63
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp+1.0 Guy	106841.40	-69.65	470.22	0.00	0.00	-172.72
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp+1.0 Guy	107373.98	-390.70	422.81	0.00	0.00	-256.19
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp+1.0 Guy	108098.99	-569.18	280.00	0.00	0.00	-94.61
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp+1.0 Guy	107841.56	-598.84	49.26	0.00	0.00	89.15
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp+1.0 Guy	107650.07	-479.09	-252.84	0.00	0.00	78.41
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp+1.0 Guy	108432.34	-276.30	-499.14	0.00	0.00	46.87
Dead+Wind 0 deg - Service+Guy	35045.46	-0.53	-214.18	0.00	0.00	155.80
Dead+Wind 30 deg - Service+Guy	34965.35	88.18	-184.39	0.00	0.00	171.65
Dead+Wind 60 deg - Service+Guy	34889.90	158.28	-104.87	0.00	0.00	109.63
Dead+Wind 90 deg - Service+Guy	34890.92	191.19	-2.99	0.00	0.00	17.65
Dead+Wind 120 deg - Service+Guy	34903.45	172.29	92.21	0.00	0.00	-46.37
Dead+Wind 150 deg - Service+Guy	34809.25	100.51	156.96	0.00	0.00	-97.00
Dead+Wind 180 deg - Service+Guy	34751.89	-3.79	180.13	0.00	0.00	-153.90
Dead+Wind 210 deg - Service+Guy	34800.21	-107.71	158.63	0.00	0.00	-169.61
Dead+Wind 240 deg - Service+Guy	34883.99	-178.41	95.05	0.00	0.00	-108.37
Dead+Wind 270 deg - Service+Guy	34871.87	-195.78	0.20	0.00	0.00	-17.70
Dead+Wind 300 deg - Service+Guy	34873.60	-161.23	-102.25	0.00	0.00	45.78
Dead+Wind 330 deg - Service+Guy	34955.41	-89.75	-182.90	0.00	0.00	97.69

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	-15602.41	0.00	0.43	15602.41	-1.34	0.009%
2	-105.94	-18688.88	-20307.23	106.05	18688.67	20296.28	0.040%
3	10045.87	-18443.27	-17520.35	-10048.31	18443.09	17508.40	0.045%
4	17554.79	-18192.19	-10052.57	-17564.42	18192.28	10048.54	0.038%
5	20339.35	-18403.07	110.10	-20327.36	18402.84	-100.11	0.057%
6	17667.95	-18613.42	10240.23	-17662.34	18613.31	-10237.43	0.023%
7	10230.65	-18356.78	17620.19	-10216.96	18356.59	-17616.61	0.052%
8	105.94	-18105.08	20299.87	-102.36	18105.16	-20305.37	0.024%
9	-10045.87	-18350.69	17520.35	10034.46	18350.55	-17517.46	0.043%
10	-17561.16	-18601.77	10056.25	17552.50	18601.60	-10051.83	0.035%
11	-20339.35	-18390.89	-110.10	20329.42	18390.72	118.77	0.048%

Load Comb.	Sum of Applied Forces PX lb	PY lb	PZ lb	Sum of Reactions PX lb	PY lb	PZ lb	% Error
12	-17661.57	-18180.55	-10236.55	17673.64	18180.63	10228.44	0.053%
13	-10230.65	-18437.18	-17620.19	10233.30	18437.00	17608.01	0.045%
14	-0.00	-67552.33	-0.00	0.28	67552.33	-3.07	0.005%
15	0.80	-67863.52	-10255.32	-0.83	67863.43	10247.65	0.011%
16	5154.90	-67592.08	-8874.85	-5157.04	67591.98	8863.83	0.016%
17	8989.34	-67318.11	-5124.33	-8990.53	67318.06	5116.04	0.012%
18	10389.90	-67556.77	4.12	-10383.33	67556.72	-0.92	0.011%
19	8989.43	-67795.52	5123.45	-8982.41	67795.45	-5119.65	0.012%
20	5154.51	-67517.02	8865.94	-5149.12	67516.99	-8863.90	0.008%
21	-0.80	-67241.15	10254.38	3.77	67241.11	-10249.31	0.009%
22	-5154.90	-67512.58	8874.85	5150.99	67512.56	-8873.19	0.006%
23	-8990.16	-67786.56	5124.80	8984.40	67786.50	-5121.79	0.009%
24	-10389.90	-67547.90	-4.12	10379.38	67547.81	6.54	0.016%
25	-8988.61	-67309.15	-5122.98	8990.30	67309.09	5113.21	0.015%
26	-5154.51	-67587.65	-8865.94	5156.61	67587.54	8854.52	0.017%
27	-21.62	-15661.98	-4144.33	21.61	15661.97	4141.66	0.016%
28	2050.18	-15611.85	-3575.58	-2052.62	15611.85	3571.34	0.030%
29	3582.61	-15560.61	-2051.55	-3588.59	15560.62	2048.54	0.042%
30	4150.89	-15603.65	22.47	-4149.22	15603.65	-17.15	0.035%
31	3605.70	-15646.58	2089.84	-3602.26	15646.57	-2087.60	0.025%
32	2087.89	-15594.20	3595.96	-2084.62	15594.20	-3596.09	0.020%
33	21.62	-15542.84	4142.83	-20.54	15542.84	-4147.01	0.027%
34	-2050.18	-15592.96	3575.58	2047.39	15592.96	-3575.85	0.017%
35	-3583.91	-15644.20	2052.30	3580.87	15644.19	-2050.35	0.022%
36	-4150.89	-15601.17	-22.47	4149.85	15601.17	27.10	0.029%
37	-3604.40	-15558.24	-2089.09	3607.97	15558.24	2087.01	0.026%
38	-2087.89	-15610.61	-3595.96	2090.33	15610.61	3591.59	0.031%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	6	0.00000001	0.00021110
2	Yes	17	0.00057742	0.00080862
3	Yes	16	0.00060638	0.00051933
4	Yes	12	0.00044397	0.00052553
5	Yes	15	0.00072768	0.00068526
6	Yes	17	0.00035756	0.00076043
7	Yes	15	0.00074335	0.00065157
8	Yes	12	0.00033456	0.00048348
9	Yes	15	0.00061373	0.00052379
10	Yes	16	0.00055968	0.00096962
11	Yes	15	0.00062453	0.00058071
12	Yes	12	0.00065790	0.00061397
13	Yes	16	0.00064060	0.00060175
14	Yes	12	0.00063852	0.00008723
15	Yes	14	0.00058091	0.00023411
16	Yes	13	0.00082488	0.00032110
17	Yes	12	0.00058863	0.00021954
18	Yes	12	0.00057675	0.00019943
19	Yes	13	0.00079550	0.00023228
20	Yes	13	0.00066690	0.00016902
21	Yes	11	0.00059350	0.00015215
22	Yes	13	0.00052892	0.00013092
23	Yes	13	0.00073242	0.00019695
24	Yes	11	0.00088361	0.00029410

25	Yes	12	0.00074734	0.00025534
26	Yes	13	0.00089009	0.00033235
27	Yes	10	0.00000001	0.00025709
28	Yes	9	0.00080315	0.00036166
29	Yes	7	0.00090963	0.00025131
30	Yes	8	0.00087352	0.00030653
31	Yes	9	0.00000001	0.00030838
32	Yes	9	0.00000001	0.00023149
33	Yes	7	0.00000001	0.00018483
34	Yes	9	0.00000001	0.00020234
35	Yes	9	0.00000001	0.00027173
36	Yes	8	0.00077732	0.00026239
37	Yes	8	0.00000001	0.00021258
38	Yes	9	0.00084474	0.00036488

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	150 - 140	1.311	29	0.0441	0.0287
T2	140 - 120	1.225	29	0.0411	0.0285
T3	120 - 100	1.065	29	0.0432	0.0369
T4	100 - 80	0.867	29	0.0494	0.0388
T5	80 - 60	0.651	29	0.0477	0.0403
T6	60 - 40	0.473	29	0.0375	0.0398
T7	40 - 20	0.329	29	0.0361	0.0367
T8	20 - 5	0.173	29	0.0396	0.0317
T9	5 - 0	0.044	29	0.0413	0.0269

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
148.00	APXVSPP18-C-A20 w/ Mounting Pipe	29	1.294	0.0434	0.0285	163988
138.00	Guy	29	1.208	0.0409	0.0290	110607
130.00	AIR21 B4A/B2P	29	1.146	0.0410	0.0323	421538
70.00	Guy	29	0.556	0.0425	0.0404	98148

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	150 - 140	8.851	2	0.3439	0.2034
T2	140 - 120	8.162	2	0.3304	0.2025
T3	120 - 100	6.852	2	0.3370	0.2378
T4	100 - 80	5.376	2	0.3535	0.2420
T5	80 - 60	3.888	4	0.3245	0.2452

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T6	60 - 40	2.766	4	0.2443	0.2357
T7	40 - 20	1.876	4	0.2158	0.2142
T8	20 - 5	0.969	4	0.2254	0.1832
T9	5 - 0	0.245	4	0.2321	0.1551

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
148.00	APXVSPP18-C-A20 w/ Mounting Pipe	2	8.711	0.3403	0.2024	37209
138.00	Guy	2	8.029	0.3291	0.2044	24964
130.00	AIR21 B4A/B2P	2	7.511	0.3291	0.2187	60241
70.00	Guy	4	3.289	0.2843	0.2421	12196

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt lb	Allowable Load lb	Ratio Load / Allowable	Allowable Ratio	Criteria
T2	140	Leg	A325N	0.6250	5	372.29	24850.50	0.015 ✔	1	Bolt DS
		Torque Arm Top@138	A325N	0.6250	1	10781.90	24850.50	0.434 ✔	1	Bolt Shear
		Torque Arm Bottom@138	A325N	0.6250	1	8842.58	24850.50	0.356 ✔	1	Bolt Shear
T3	120	Leg	A325N	0.6250	5	0.00	24850.50	0.000 ✔	1	Bolt DS
T4	100	Leg	A325N	0.7500	5	0.00	35784.70	0.000 ✔	1	Bolt DS
T5	80	Leg	A325N	0.7500	5	0.00	35784.70	0.000 ✔	1	Bolt DS
T6	60	Leg	A325N	0.7500	5	0.00	35784.70	0.000 ✔	1	Bolt DS
T7	40	Leg	A325N	0.7500	5	0.00	35784.70	0.000 ✔	1	Bolt DS
T8	20	Leg	A325N	0.7500	5	0.00	35784.70	0.000 ✔	1	Bolt DS

Guy Design Data

Section No.	Elevation ft	Size	Initial Tension lb	Breaking Load lb	Actual T_u lb	Allowable ϕT_n lb	Required S.F.	Actual S.F.
T2	138.00 (A) (463)	9/16 EHS	3500.00	35000.04	11603.00	21000.00	1.000	1.810 ✔
	138.00 (A) (464)	9/16 EHS	3500.00	35000.04	11552.80	21000.00	1.000	1.818 ✔

Section No.	Elevation ft	Size	Initial Tension lb	Breaking Load lb	Actual T_u lb	Allowable ϕT_n lb	Required S.F.	Actual S.F.
	138.00 (B) (457)	9/16 EHS	3500.00	35000.04	12094.30	21000.00	1.000	1.736 ✔
	138.00 (B) (458)	9/16 EHS	3500.00	35000.04	12141.00	21000.00	1.000	1.730 ✔
	138.00 (C) (448)	9/16 EHS	3500.00	35000.04	12320.90	21000.00	1.000	1.704 ✔
	138.00 (C) (449)	9/16 EHS	3500.00	35000.04	12323.70	21000.00	1.000	1.704 ✔
T5	70.00 (A) (474)	11/16 EHS	5000.00	49999.91	13087.40	30000.00	1.000	2.292 ✔
	70.00 (B) (473)	11/16 EHS	5000.00	49999.91	13648.10	30000.00	1.000	2.198 ✔
	70.00 (C) (469)	11/16 EHS	5000.00	49999.91	13687.00	30000.00	1.000	2.192 ✔

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	150 - 140	2	10.00	2.25	54.0 K=1.00	3.1416	-17536.60	114226.00	0.154 [1] ✔
T2	140 - 120	2	20.00	2.38	57.0 K=1.00	3.1416	-28241.90	111479.00	0.253 [1] ✔
T3	120 - 100	2	20.00	2.38	57.0 K=1.00	3.1416	-29594.60	111479.00	0.265 [1] ✔
T4	100 - 80	2 1/4	20.00	2.38	50.7 K=1.00	3.9761	-29246.10	148303.00	0.197 [1] ✔
T5	80 - 60	2 1/4	20.00	2.38	50.7 K=1.00	3.9761	-34682.80	148303.00	0.234 [1] ✔
T6	60 - 40	2 1/4	20.00	2.38	50.7 K=1.00	3.9761	-37306.10	148303.00	0.252 [1] ✔
T7	40 - 20	2 1/4	20.00	2.38	50.7 K=1.00	3.9761	-38566.90	148303.00	0.260 [1] ✔
T8	20 - 5	2 1/2	15.00	2.42	46.4 K=1.00	4.9087	-38314.30	188719.00	0.203 [1] ✔
T9	5 - 0	2 1/2	5.45	2.07	39.8 K=1.00	4.9087	-41250.10	196697.00	0.210 [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	150 - 140	3/4	4.37	2.09	133.7 K=1.00	0.4418	-2189.40	5581.35	0.392 [1] ✔
T2	140 - 120	3/4	4.44	2.12	135.7 K=1.00	0.4418	-3365.95	5417.58	0.621 [1] ✔
T3	120 - 100	3/4	4.44	2.12	135.7 K=1.00	0.4418	-850.64	5417.58	0.157 [1] ✔
T4	100 - 80	3/4	4.44	2.11	134.9 K=1.00	0.4418	-1558.11	5481.13	0.284 [1] ✔
T5	80 - 60	3/4	4.44	2.11	134.9 K=1.00	0.4418	-1652.25	5481.13	0.301 [1] ✔
T6	60 - 40	3/4	4.44	2.11	134.9 K=1.00	0.4418	-1298.70	5481.13	0.237 [1] ✔
T7	40 - 20	3/4	4.44	2.11	134.9 K=1.00	0.4418	-780.42	5481.13	0.142 [1] ✔
T8	20 - 5	3/4	4.46	2.11	134.8 K=1.00	0.4418	-880.69	5490.17	0.160 [1] ✔
T9	5 - 0	3/4	2.60	2.00	127.8 K=1.00	0.4418	-3029.03	6107.75	0.496 [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 $\frac{P_u}{\phi P_n}$
T9	5 - 0	4x1/2	2.06	1.85	154.2 K=1.00	2.0000	-412.86	19013.80	0.022 [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	5 - 0	3/4	2.66	2.45	157.0 K=1.00	0.4418	-760.95	4049.60	0.188 [1] ✔

[1] P_u / ϕP_n controls

Top Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	150 - 140	3/4	3.75	3.58	229.3 K=1.00	0.4418	-135.88	1897.66	0.072 [1] ✔
		KL/R > 200 (C) - 5							
T2	140 - 120	3/4	3.75	3.58	229.3 K=1.00	0.4418	-1060.03	1897.66	0.559 [1] ✔
		KL/R > 200 (C) - 37							
T4	100 - 80	3/4	3.75	3.56	228.0 K=1.00	0.4418	-210.71	1919.92	0.110 [1] ✔
		KL/R > 200 (C) - 153							
T5	80 - 60	3/4	3.75	3.56	228.0 K=1.00	0.4418	-331.40	1919.92	0.173 [1] ✔
		KL/R > 200 (C) - 210							
T6	60 - 40	3/4	3.75	3.56	228.0 K=1.00	0.4418	-359.27	1919.92	0.187 [1] ✔
		KL/R > 200 (C) - 267							
T7	40 - 20	3/4	3.75	3.56	228.0 K=1.00	0.4418	-137.10	1919.92	0.071 [1] ✔
		KL/R > 200 (C) - 324							

[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	150 - 140	3/4	3.75	3.58	229.3 K=1.00	0.4418	-348.49	1897.66	0.184 [1] ✔
		KL/R > 200 (C) - 8							
T2	140 - 120	3/4	3.75	3.58	229.3 K=1.00	0.4418	-9.01	1897.66	0.005 [1] ✔
		KL/R > 200 (C) - 41							
T3	120 - 100	3/4	3.75	3.58	229.3 K=1.00	0.4418	-210.36	1897.66	0.111 [1] ✔
		KL/R > 200 (C) - 99							
T4	100 - 80	3/4	3.75	3.56	228.0 K=1.00	0.4418	-451.59	1919.92	0.235 [1] ✔
		KL/R > 200 (C) - 156							
T5	80 - 60	3/4	3.75	3.56	228.0 K=1.00	0.4418	-231.14	1919.92	0.120 [1] ✔
		KL/R > 200 (C) - 211							
T6	60 - 40	3/4	3.75	3.56	228.0 K=1.00	0.4418	-90.56	1919.92	0.047 [1] ✔
		KL/R > 200 (C) - 270							

[1] P_u / ϕP_n controls

Top Guy Pull-Off 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	150 - 140	1 1/4	3.75	3.58	137.6 K=1.00	1.2272	-4353.58	14642.40	0.297 [1] ✔

[1] $P_u / \phi P_n$ controls

Torque-Arm Top Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T2	140 - 120 (450)	2L3x3x5/16	7.76	7.66	99.7 K=1.00	3.5500	-854.49	68190.30	0.013 [1] ✔
T2	140 - 120 (451)	2L3x3x5/16	7.76	7.66	99.7 K=1.00	3.5500	-1097.75	68190.30	0.016 [1] ✔
T2	140 - 120 (459)	2L3x3x5/16	7.76	7.66	99.7 K=1.00	3.5500	-266.55	68190.30	0.004 [1] ✔
T2	140 - 120 (460)	2L3x3x5/16	7.76	7.66	99.7 K=1.00	3.5500	-503.20	68190.30	0.007 [1] ✔
T2	140 - 120 (465)	2L3x3x5/16	7.76	7.66	99.7 K=1.00	3.5500	-618.51	68190.30	0.009 [1] ✔
T2	140 - 120 (466)	2L3x3x5/16	7.76	7.66	99.7 K=1.00	3.5500	-1133.76	68190.30	0.017 [1] ✔

[1] $P_u / \phi P_n$ controls

Torque-Arm Bottom Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T2	140 - 120 (455)	2L3x3x5/16	6.95	6.85	89.2 K=1.00	3.5500	-8217.55	75673.60	0.109 [1] ✔
T2	140 - 120 (456)	2L3x3x5/16	6.95	6.85	89.2 K=1.00	3.5500	-7554.18	75673.60	0.100 [1] ✔
T2	140 - 120 (461)	2L3x3x5/16	6.95	6.85	89.2 K=1.00	3.5500	-8434.05	75673.60	0.111 [1] ✔
T2	140 - 120 (462)	2L3x3x5/16	6.95	6.85	89.2 K=1.00	3.5500	-8529.59	75673.60	0.113 [1] ✔
T2	140 - 120 (467)	2L3x3x5/16	6.95	6.85	89.2 K=1.00	3.5500	-8842.58	75673.60	0.117 [1] ✔
T2	140 - 120 (468)	2L3x3x5/16	6.95	6.85	89.2 K=1.00	3.5500	-8302.25	75673.60	0.110 [1] ✔

[1] $P_u / \phi P_n$ 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	150 - 140	2	10.00	2.25	54.0	3.1416	5608.20	141372.00	0.040 [1] ✔
T2	140 - 120	2	20.00	2.38	57.0	1.7942	1861.45	87466.00	0.021 [1] ✔
T5	80 - 60	2 1/4	20.00	2.38	50.7	3.9761	7496.92	178924.00	0.042 [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	150 - 140	3/4	4.37	2.09	133.7	0.4418	2130.30	19880.40	0.107 [1] ✔
T2	140 - 120	3/4	4.44	2.12	135.7	0.4418	2941.26	19880.40	0.148 [1] ✔
T3	120 - 100	3/4	4.44	2.12	135.7	0.4418	721.58	19880.40	0.036 [1] ✔
T4	100 - 80	3/4	4.44	2.11	134.9	0.4418	1431.45	19880.40	0.072 [1] ✔
T5	80 - 60	3/4	4.44	2.11	134.9	0.4418	1485.77	19880.40	0.075 [1] ✔
T6	60 - 40	3/4	4.44	2.11	134.9	0.4418	1131.34	19880.40	0.057 [1] ✔
T7	40 - 20	3/4	4.44	2.11	134.9	0.4418	612.75	19880.40	0.031 [1] ✔
T8	20 - 5	3/4	4.46	2.11	134.8	0.4418	1384.23	19880.40	0.070 [1] ✔
T9	5 - 0	3/4	3.71	2.19	139.9	0.4418	608.39	19880.40	0.031 [1] ✔

[1] $P_u / \phi P_n$ 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	5 - 0	3/4	2.66	2.45	157.0	0.4418	925.44	19880.40	0.047 [1] ✔

[1] $P_u / \phi P_n$ 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	150 - 140	3/4	3.75	3.58	229.3	0.4418	93.00	19880.40	0.005 [1] ✔
T2	140 - 120	3/4	3.75	3.58	229.3	0.4418	1099.41	19880.40	0.055 [1] ✔
T3	120 - 100	3/4	3.75	3.58	229.3	0.4418	149.96	19880.40	0.008 [1] ✔
T4	100 - 80	3/4	3.75	3.56	228.0	0.4418	339.24	19880.40	0.017 [1] ✔
T5	80 - 60	3/4	3.75	3.56	228.0	0.4418	483.94	19880.40	0.024 [1] ✔
T6	60 - 40	3/4	3.75	3.56	228.0	0.4418	451.70	19880.40	0.023 [1] ✔
T7	40 - 20	3/4	3.75	3.56	228.0	0.4418	233.51	19880.40	0.012 [1] ✔
T8	20 - 5	3/4	3.75	3.54	226.7	0.4418	264.71	19880.40	0.013 [1] ✔

[1] $P_u / \phi P_n$ 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	150 - 140	3/4	3.75	3.58	229.3	0.4418	645.70	19880.40	0.032 [1] ✔
T2	140 - 120	3/4	3.75	3.58	229.3	0.4418	214.34	19880.40	0.011 [1] ✔
T3	120 - 100	3/4	3.75	3.58	229.3	0.4418	277.86	19880.40	0.014 [1] ✔
T4	100 - 80	3/4	3.75	3.56	228.0	0.4418	525.71	19880.40	0.026 [1] ✔
T5	80 - 60	3/4	3.75	3.56	228.0	0.4418	424.36	19880.40	0.021 [1] ✔
T6	60 - 40	3/4	3.75	3.56	228.0	0.4418	273.25	19880.40	0.014 [1] ✔
T7	40 - 20	3/4	3.75	3.56	228.0	0.4418	241.03	19880.40	0.012 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T8	20 - 5	3/4	3.75	3.54	226.7	0.4418	7356.33	19880.40	0.370 [1]
T9	5 - 0	3/4	0.38	0.17	10.7	0.4418	1015.10	19880.40	0.051 [1]

[1] P_u / ϕP_n controls

Top Guy Pull-Off 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	150 - 140	1 1/4	3.75	3.58	137.6	1.2272	5791.70	55223.30	0.105 [1]
T5	80 - 60	1 1/4	3.75	3.56	136.8	1.2272	6099.41	55223.30	0.110 [1]

[1] P_u / ϕP_n controls

Torque-Arm Top Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T2	140 - 120 (450)	2L3x3x5/16	7.76	7.66	99.7	3.5500	10781.90	115020.00	0.094 [1]
T2	140 - 120 (451)	2L3x3x5/16	7.76	7.66	99.7	3.5500	9995.62	115020.00	0.087 [1]
T2	140 - 120 (459)	2L3x3x5/16	7.76	7.66	99.7	3.5500	10575.50	115020.00	0.092 [1]
T2	140 - 120 (460)	2L3x3x5/16	7.76	7.66	99.7	3.5500	10683.10	115020.00	0.093 [1]
T2	140 - 120 (465)	2L3x3x5/16	7.76	7.66	99.7	3.5500	10641.90	115020.00	0.093 [1]
T2	140 - 120 (466)	2L3x3x5/16	7.76	7.66	99.7	3.5500	9965.64	115020.00	0.087 [1]

[1] P_u / ϕP_n controls

Torque-Arm Bottom Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T2	140 - 120 (455)	2L3x3x5/16	6.95	6.85	89.2	3.5500	4495.44	115020.00	0.039 [1] ✔
T2	140 - 120 (456)	2L3x3x5/16	6.95	6.85	89.2	3.5500	4613.07	115020.00	0.040 [1] ✔
T2	140 - 120 (461)	2L3x3x5/16	6.95	6.85	89.2	3.5500	4744.46	115020.00	0.041 [1] ✔
T2	140 - 120 (462)	2L3x3x5/16	6.95	6.85	89.2	3.5500	4731.26	115020.00	0.041 [1] ✔
T2	140 - 120 (467)	2L3x3x5/16	6.95	6.85	89.2	3.5500	5157.93	115020.00	0.045 [1] ✔
T2	140 - 120 (468)	2L3x3x5/16	6.95	6.85	89.2	3.5500	5197.83	115020.00	0.045 [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
T1	150 - 140	Leg	2	3	-17536.60	114226.00	15.4	Pass
T2	140 - 120	Leg	2	35	-28241.90	111479.00	25.3	Pass
T3	120 - 100	Leg	2	92	-29594.60	111479.00	26.5	Pass
T4	100 - 80	Leg	2 1/4	149	-29246.10	148303.00	19.7	Pass
T5	80 - 60	Leg	2 1/4	206	-34682.80	148303.00	23.4	Pass
T6	60 - 40	Leg	2 1/4	263	-37306.10	148303.00	25.2	Pass
T7	40 - 20	Leg	2 1/4	320	-38566.90	148303.00	26.0	Pass
T8	20 - 5	Leg	2 1/2	377	-38314.30	188719.00	20.3	Pass
T9	5 - 0	Leg	2 1/2	422	-41250.10	196697.00	21.0	Pass
T1	150 - 140	Diagonal	3/4	24	-2189.40	5581.35	39.2	Pass
T2	140 - 120	Diagonal	3/4	76	-3365.95	5417.58	62.1	Pass
T3	120 - 100	Diagonal	3/4	103	-850.64	5417.58	15.7	Pass
T4	100 - 80	Diagonal	3/4	160	-1558.11	5481.13	28.4	Pass
T5	80 - 60	Diagonal	3/4	259	-1652.25	5481.13	30.1	Pass
T6	60 - 40	Diagonal	3/4	313	-1298.70	5481.13	23.7	Pass
T7	40 - 20	Diagonal	3/4	375	-780.42	5481.13	14.2	Pass
T8	20 - 5	Diagonal	3/4	394	-880.69	5490.17	16.0	Pass
T9	5 - 0	Diagonal	3/4	428	-3029.03	6107.75	49.6	Pass
T9	5 - 0	Horizontal	4x1/2	434	-412.86	19013.80	2.2	Pass
T9	5 - 0	Secondary Horizontal	3/4	445	-760.95	4049.60	18.8	Pass
T1	150 - 140	Top Girt	3/4	5	-135.88	1897.66	7.2	Pass
T2	140 - 120	Top Girt	3/4	37	-1060.03	1897.66	55.9	Pass
T3	120 - 100	Top Girt	3/4	95	149.96	19880.40	0.8	Pass
T4	100 - 80	Top Girt	3/4	153	-210.71	1919.92	11.0	Pass
T5	80 - 60	Top Girt	3/4	210	-331.40	1919.92	17.3	Pass
T6	60 - 40	Top Girt	3/4	267	-359.27	1919.92	18.7	Pass
T7	40 - 20	Top Girt	3/4	324	-137.10	1919.92	7.1	Pass
T8	20 - 5	Top Girt	3/4	379	264.71	19880.40	1.3	Pass
T1	150 - 140	Bottom Girt	3/4	8	-348.49	1897.66	18.4	Pass
T2	140 - 120	Bottom Girt	3/4	42	214.34	19880.40	1.1	Pass
T3	120 - 100	Bottom Girt	3/4	99	-210.36	1897.66	11.1	Pass
T4	100 - 80	Bottom Girt	3/4	156	-451.59	1919.92	23.5	Pass
T5	80 - 60	Bottom Girt	3/4	211	-231.14	1919.92	12.0	Pass
T6	60 - 40	Bottom Girt	3/4	270	-90.56	1919.92	4.7	Pass
T7	40 - 20	Bottom Girt	3/4	327	241.03	19880.40	1.2	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
T8	20 - 5	Bottom Girt	3/4	382	7356.33	19880.40	37.0	Pass
T9	5 - 0	Bottom Girt	3/4	424	1015.10	19880.40	5.1	Pass
T2	140 - 120	Guy A@138	9/16	463	11603.00	21000.00	55.3	Pass
T5	80 - 60	Guy A@70	11/16	474	13087.40	30000.00	43.6	Pass
T2	140 - 120	Guy B@138	9/16	458	12141.00	21000.00	57.8	Pass
T5	80 - 60	Guy B@70	11/16	473	13648.10	30000.00	45.5	Pass
T2	140 - 120	Guy C@138	9/16	449	12323.70	21000.00	58.7	Pass
T5	80 - 60	Guy C@70	11/16	469	13687.00	30000.00	45.6	Pass
T1	150 - 140	Top Guy Pull-Off@138	1 1/4	452	-4353.58	14642.40	29.7	Pass
T5	80 - 60	Top Guy Pull-Off@70	1 1/4	471	6099.41	55223.30	11.0	Pass
T2	140 - 120	Torque Arm Top@138	2L3x3x5/16	450	10781.90	115020.00	9.4 43.4 (b)	Pass
T2	140 - 120	Torque Arm Bottom@138	2L3x3x5/16	467	-8842.58	75673.60	11.7 35.6 (b)	Pass
						Summary		
						Leg (T3)	26.5	Pass
						Diagonal (T2)	62.1	Pass
						Horizontal (T9)	2.2	Pass
						Secondary Horizontal (T9)	18.8	Pass
						Top Girt (T2)	55.9	Pass
						Bottom Girt (T8)	37.0	Pass
						Guy A (T2)	55.3	Pass
						Guy B (T2)	57.8	Pass
						Guy C (T2)	58.7	Pass
						Top Guy Pull-Off (T1)	29.7	Pass
						Torque Arm Top (T2)	43.4	Pass
						Torque Arm Bottom (T2)	35.6	Pass
						Bolt Checks	43.4	Pass
						RATING =	**62.1**	**Pass**

FOUNDATION ANALYSIS

AECOM

Job Bolton, CT (Wycoverntry) tower Assessment | Project No. TWM-007 | Page ____ of ____

Description Foundation Analysis w/ TIA-G Standard. | Computed by MCD | Date 9/19/2016

Checked by ____ | Date ____

Reference

Check - Foundation Bearing

- Foundation width of Base = 7'-0"
- Foundation thickness of Base = 1'-3"
- Foundation column = 32'6" - 1'-3" = 2'-3" ht x 2'-6" Dia pier
- (DL) Concrete foundation = (7' x 7' x 1.25') x 150PCF + ($\frac{\pi}{4}$(2.5)^2 x 2.25') x 150PCF
  = 9187.5 + 1656.7 lbf
  = 10,844 lbf
- TNX (Compression Load from tower) = 109,187 lbf

total compressive force = 109,187 + 10,844 = 120,031 lbf

Location of footing pad NOT identified in construction plans nor Geotechnical report of nearby 280' Guyed tower structure ∴ Assume the following

Bottom of foundation bears on Soil

Bearing (Presumptive Load Bearing) values for Soil → 4000PSF (ASD)
of Building Code (2016)

- Consider Geotechnical F.O.S. from ASD to LRFD = 2.0 ∴ → 8000PSF (LRFD)
  (TIA Section 9.4)

TIA-222-G Reduction factor = 0.60

Ultimate Bearing pressure = 0.60 x 8000PSF = 4800 psf
(capacity)

Bearing Load = $\frac{109,187 \text{ lbf}}{7' \times 7'}$ = 2228 psf < 4800PSF ∴ OK

Capacity % → $\frac{2228}{4800} \times 100\% = 46.4\%$

(Amd) **Table 1806.2 PRESUMPTIVE LOAD-BEARING VALUES**

CLASS OF MATERIALS	VERTICAL FOUNDATION PRESSURE (pfs)	LATERAL BEARING PRESSURE (psf/ft below natural grade)	LATERAL SLIDING RESISTANCE	
			Coefficient of friction[a]	Cohesion (psf)[b]
1. Crystalline bedrock	100,000	1,200	0.6	----
2. Sedimentary and foliated rock	20,000	400	0.35	----
3. Cemented sand, gravel, silt, clay (hard pan)	8,000	300	0.35	----
4. Sandy gravel and/or gravel (GW and GP)	6,000	200	0.35	----
5. Sand, silty sand, clayey sand, silty gravel and clayey gravel (SW, SP, SM, SC, GM, and GC)	4,000	150	0.25	----
6. Clay, sandy clay, silty clay, clayey silt, silt and sandy silt (CL, ML, MH, and CH)	1,500	100	----	130

For SI: 1 pound per square foot = 0.0479 kPa, 1 pound per square foot per foot = 0.157 kPa/m

a. Coefficient to be multiplied by the dead load.

b. Cohesion value to be multiplied by the contact area, as limited by Section 1806.3.2

(Add) **1807.2.1.1 Guards.** Retaining walls with a difference in finished grade from the top of the wall to the bottom of the wall that is greater than 4 feet (1219 mm) shall be provided with guards complying with Sections 1013.3, 1013.4 and 1607.8 when there is a walking surface, parking lot or driveway on the high side located closer than 2 feet (610 mm) to the retaining wall. For the purpose of this section, grass, planting beds or landscaped areas shall not be considered a walking surface.

(Add) **1808.3.2 Surcharge.** No fill or other surcharge loads shall be placed adjacent to any building or structure unless such building or structure is capable of withstanding the additional loads caused by the fill or the surcharge. Existing footings or foundations that will be affected by any excavation shall be underpinned or otherwise protected against settlement and shall be protected against detrimental lateral or vertical movement or both.

> **Exception:** Minor grading for landscaping purposes shall be permitted where done with walk-behind equipment, where the grade is not increased more than 1 foot (305 mm) from original design grade or where approved by the building official.

(Amd) **1809.4 Depth of footings.** The minimum depth of footings below the undisturbed ground surface shall be in accordance with Section 1809.5. The minimum width of footings shall be 12 inches (305 mm).

(Amd) **1809.5 Frost protection.** Except where otherwise protected from frost, foundations and other permanent supports of buildings and structures shall be protected from frost by one or more of the following methods:

1. Extending a minimum of 42 inches below finished grade;
2. Constructing in accordance with ASCE 32; or

ANCHOR DETAILS

AECOM

Job Bolton, Cr Tower Assessment (150') Project No. TWM-007 Page ____ of ____

Description Foundation Analysis w/ TIA-G Standard. Computed by MCD Date 9/19/2016 Sheet ____ of ____

Checked by ____ Date ____

Reference

Check Guyed Anchor to Rock:

- Existing foundation anchored to Rock, therefore check anchor connected to Rock capacity.

$P_U = L_{bond} * \pi * D_{hole} * T_W * \phi_{factor}$ (TIA)

T_W = 30PSI (Grout to rock - working Bond Stress) Reference Structure "Soft Shale"

L_b = 29'

D_{hole} = 3in

$P_u = (29' \times 12in/ft)(\pi)(3in)(30psi)(0.6) = 59,037$ lbs/anchor

#anchors = 2 → (2)(59,037) = 118,073 lbs resistance

Anchor (maximum) uplift force (TNX) = 18,208 lbs

Uplift capacity = $\frac{18,208}{118,073} = 15\%$ OK

Shear resistance bearing to soil:

* No soil parameters given ∴ Assume 3000psf ultimate Bearing pressure.

Determine shear resistance

- Anchor "Lock-off" strength = 108 kip

- Apply TIA-222-G Reduction factor: 0.75 (Lateral Resistance)

$\mu = 0.8$

$V_{resist} = \frac{108}{.8} \times 0.75 = 101.25$ kip > 29.7 kip OK

29.3%

Note: Locked off anchor will assist in shear resistance

AECOM

Page ____ of ____

Job ____ Project No. ____ Sheet ____ of ____

Description ____ Computed by ____ Date ____

____ Checked by ____ Date ____

Reference

• Check Tension Anchor rod Steel

1 3/8" Dia Rod → 1.16 in² (Net tension Area) × Fy = 127 KSI = 148,132 lbf

Fy = 127

148,132 lbf × 2 = 296,264 lbf × 0.90 = 266,638 lbf (OK) visual inspection

Check Anchor shaft

* Assumed Grade Anchor similar to Piroad Pt # 102305 where

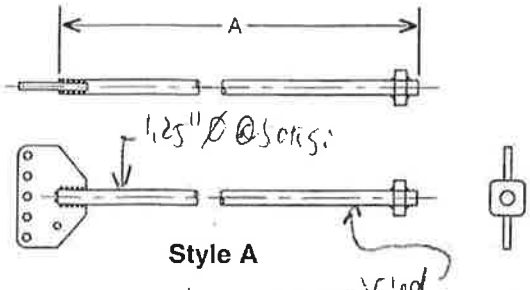
Ø = 1.25 in Ø Steel is min (50 ksi) Fy = 50 Fu = 65 (See Attached Documentation Piroad catalog 2001)

AISC Method Tensile Strength check [D2-1]

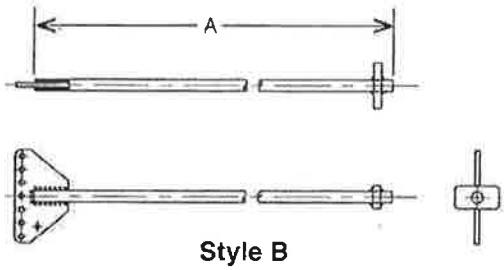
$P_n = F_y A_g = (50 ksi)\left(\frac{\pi}{4} \times 1.25\right)^2 \times 0.9$ LRFD = 55,223 lbf > 34,847 lbf ∴ OK

$\frac{34,847}{55,223} = 63.1\%$

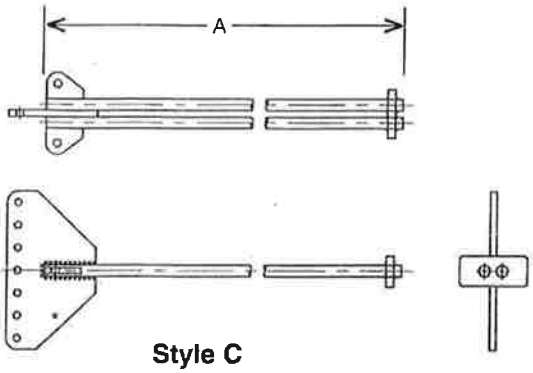
Rod-Type Guy Anchors



Style A



Style B



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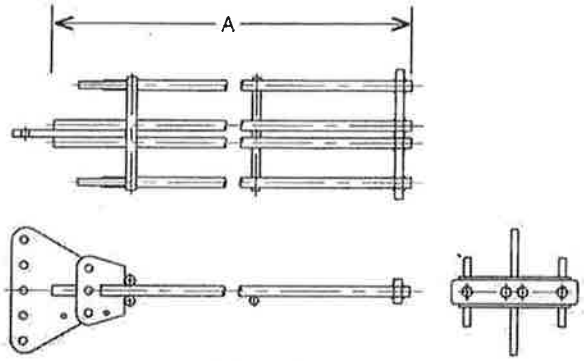

Style D

Style	Length Dim. A	Anchor Holes	Allowable Tension(KIPS)*	Turnbuckle Size	Weight	Part Number	Price
A	10'	5	36.82	5/8" & 3/4"	56#	102305	99.00
B	10'	7	53.01	5/8" & 3/4"	79#	125964	150.00
B	12.5'	7		5/8" & 3/4"	94#	125965	179.00
B	15'	7		5/8" & 3/4"	110#	125966	208.00
C	10'	7	106.03	7/8" & 1"	175#	105000	331.00
C	12.5'	7		7/8" & 1"	206#	125967	391.00
C	15'	7		7/8" & 1"	235#	105001	445.00
C	17'	7		7/8" & 1"	259#	105999	490.00
C	20'	7		7/8" & 1"	301#	125968	570.00
D	10'	11	Large Head 73.64 Small Head 36.82	7/8" & 1"	235#	125969	445.00
D	12.5'	11		7/8" & 1"	279#	125970	528.00
D	15'	11		7/8" & 1"	319#	125971	604.00
D	17.5'	11		7/8" & 1"	362#	112371	686.00
D	20'	11		7/8" & 1"	481#	116466	911.00

*** The Allowable Tension is based upon the following:**

Allowable Tension Stress; Fa=0.6 x Fy.
Allowable Tension Stress is computed using the gross cross sectional area.
No 1/3rd increase in allowable stresses is considered.
The Allowable Tension Stress is computed without consideration of the effects of a combined tension and shear loading.

About AECOM

AECOM (NYSE: ACM) is a global provider of professional technical and management support services to a broad range of markets, including transportation, facilities, environmental, energy, water and government. With approximately 45,000 employees around the world, AECOM is a leader in all of the key markets that it serves. AECOM provides a blend of global reach, local knowledge, innovation, and collaborative technical excellence in delivering solutions that enhance and sustain the world's built, natural, and social environments. A Fortune 500 company, AECOM serves clients in more than 100 countries and has annual revenue in excess of $6 billion.

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MTS
MOUNTAINTOP SERVICES
Real Estate
Contractor Services Development & Sales

LETTER OF AUTHORIZATION for CT Siting Council Application

LEESOR: Mountaintop Enterprises, Inc
LEESEE: T-Mobile Northeast LLC
SITE: 150' Guyed Tower at 130 Vernon Road, Bolton CT 06043

I, Milton Hathaway, President of Mountaintop Services, Inc., who manages Mountaintop Enterprises, Inc. and its tower facility located at the address identified above (the "Lessor"), do hereby authorize T-Mobile Northeast LLC, its successors and assigns, and/or its agent, (collectively, the "Leesee") to act as Mountaintop Enterprise's non-exclusive agent for the sole purpose of filing a tower sharing application and consummating any permit application(s) as may be required by the CT Siting Council's applicable permitting authorities for Licensee's telecommunications' installation between 120' & 130', strictly for their Second Amendment to their existing Lease currently in negotiation with the Lessor.

We understand that this application may be denied, modified, or approved with conditions which we require notice thereof. The above authorization is limited to the acceptance by Leesee only of conditions related to Leesee's installation and any such conditions of approval or modification will be Licensee's sole responsibility.

Signature:

Milton Hathaway

Milton Hathaway
Mountaintop Services, Inc.

10-19-16

Date

10 Quarry Road Suites C Bolton, CT 06043
Office: 860-647-7772 Fax: 860-647-8519
mts@mountaintopservices.com

EBI Consulting
environmental | engineering | due diligence

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

T-Mobile Existing Facility

Site ID: CT11180C

Bolton Ct.._1
130 Vernon Road
Bolton, CT 06043

September 30, 2016

EBI Project Number: 6216004445

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general public allowable limit:	13.52 %

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

EBI Consulting
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September 30, 2016

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

Emissions Analysis for Site: **CT11180C – Bolton Ct._1**

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **130 Vernon Road, Bolton, CT**, for the purpose of determining whether the emissions from the Proposed T-Mobile Antenna Installation located on this property are within specified federal limits.

All information used in this report was analyzed as a percentage of current Maximum Permissible Exposure (% MPE) as listed in the FCC OET Bulletin 65 Edition 97-01and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter (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 public may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Therefore, members of the general public would always be considered under this category when exposure is not employment related, for example, in the case of a telecommunications tower that exposes persons in a nearby residential area.

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

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

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed T-Mobile Wireless antenna facility located at **130 Vernon Road, Bolton, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since T-Mobile is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna 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.

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

1) 2 UMTS channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

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

3) 1 LTE channel (700 MHz Band) was considered for each sector of the proposed installation. This channel has a transmit power of 30 Watts.

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

5) For the following calculations the sample point was the top of a 6-foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufactures supplied specifications minus 10 dB was used in this direction. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

6) The antennas used in this modeling are the **Ericsson AIR21 B4A/B2P** 1900 MHz (PCS) and 2100 MHz (AWS) channels and the **Commscope SBNH-1D65C** for 700 MHz and 2100 MHz (AWS) channels. This is based on feedback from the carrier with regards to anticipated antenna selection. The **Ericsson AIR21 B4A/B2P** has a maximum gain of **15.9 dBd** at its main lobe at 1900 MHz and 2100 MHz. The **Commscope SBNH-1D65C** has a maximum gain of **15.1 dBd** at its main lobe at 1900 MHz and a maximum gain of **13.6 dBd** at its main lobe at 700 MHz. 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.

7) The antenna mounting height centerline of the proposed antennas is **130 feet** above ground level (AGL).

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

9) All calculations were done with respect to uncontrolled / general public threshold limits.

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T-Mobile Site Inventory and Power Data

Sector:	A	Sector:	B
Antenna #:	**1**	Antenna #:	**1**
Make / Model:	Ericsson AIR21 B4A/B2P	Make / Model:	Ericsson AIR21 B4A/B2P
Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	130	Height (AGL):	130
Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)
Channel Count	4	Channel Count	4
Total TX Power(W):	180	Total TX Power(W):	180
ERP (W):	7,002.81	ERP (W):	7,002.81
Antenna A1 MPE%	1.64	Antenna B1 MPE%	1.64
Antenna #:	**2**	Antenna #:	**2**
Make / Model:	Commscope SBNH-1D65C	Make / Model:	Commscope SBNH-1D65C
Gain:	13.6 dBd	Gain:	13.6 dBd
Height (AGL):	130	Height (AGL):	130
Frequency Bands	700 MHz	Frequency Bands	700 MHz
Channel Count	1	Channel Count	1
Total TX Power(W):	30	Total TX Power(W):	30
ERP (W):	687.26	ERP (W):	687.26
Antenna A2 MPE%	0.34	Antenna B2 MPE%	0.34

Site Composite MPE%	
Carrier	**MPE%**
T-Mobile (Per Sector Max)	**1.98 %**
AT&T	1.31 %
Verizon Wireless	2.71 %
Sprint	0.74 %
Nextel	0.32 %
Bolton Radio Station	0.00 %
Commsite Internat'l	0.04 %
Metrocall	0.12 %
Pagemart	2.30 %
AirTouch	0.63
Conn. Radio	0.23
Eversource	3.14
Site Total MPE %:	**13.52 %**

T-Mobile Sector A Total:	1.98 %
T-Mobile Sector B Total:	1.98 %
T-Mobile Sector C Total:	1.98 %
Site Total:	13.52 %

T-Mobile _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**
T-Mobile AWS - 2100 MHz LTE	2	2,334.27	130	10.92	AWS - 2100 MHz	1000	1.09%
T-Mobile PCS - 1950 MHz UMTS	2	1,167.14	130	5.46	PCS - 1950 MHz	1000	0.55%
T-Mobile 700 MHz LTE	1	687.26	130	1.61	700 MHz	467	0.34%
						Total:	**1.98%**

Summary

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

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

T-Mobile Sector	Power Density Value (%)
Sector A:	1.98 %
Sector B:	1.98 %
T-Mobile Per Sector Maximum:	1.98 %
Site Total:	13.52 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **13.52%** of the allowable FCC established general public 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.