



Northeast Site Solutions
Victoria Masse
420 Main Street, Sturbridge MA 01566
860-306-2326
victoria@northeastsitesolutions.com

April 20, 2020

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

RE: Notice of Exempt Modification
142 (aka 240) Baldwin Drive, New Haven CT 06514
Latitude: 41.345440
Longitude: -72.970710
T-Mobile Site#: CT11086B_L700 4x2 (State Police Tower #27)

Dear Ms. Bachman:

T-Mobile currently maintains nine (9) antennas at the 95-foot level of the existing 120-foot monopole tower at 142 (aka 240) Baldwin Drive, New Haven CT. The 179-foot tower and property are both owned by the State of Connecticut. State Police Tower #27. T-Mobile now intends to replace six (6) of its existing antennas with three (3) new 1900/2100 MHz antenna and three (3) new 600/700 MHz antenna. The new antennas would be installed at the 95-foot level of the tower once the planned modifications are completed. SK-1 through SK-5.

Please note this is a refile. We received an approval on January 22, 2019 (EM-T-MOBILE-093-190103) the application expired. The scope of work is the same and the documents have been updated.

Planned Modifications:

Remove: NONE

Remove and Replace:

- (3) LNX6515 Antenna **(Remove)** - (3) APXVAARR24_43U-NA20 Antenna 600/700 MHz **(Replace)**
- (3) AIR21B2P B4A **(Remove)** – AIR32 46 B66A **(Replace)**
- (3)RRUS11 B12 **(Remove)** - (3) RRU 4449 B12/B71 **(Replace)**

Install New:

- (1) Fiber Hybrid Line
- (3) RRU 2217 B2

Existing to Remain:

- (6) 1-5/8" Coax
- (3) TMA
- (2) Fiber Hybrid Line
- (3)AIR32 B66

Ground:

Install New:

- (1) Delta 25KW AC Generator – 220 gallon double walled self-contained tank with fuel sensor.
Requires two (2) 20 minute run cycles monthly.

This facility was approved by the CT Siting Council Petition No.69—on June 25, 1981 CT DOT West Rock Tower. Please note the addresses do not match. We used the information from the previous filing. Please see attached.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies § 16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to Mayor Toni Harp, Elected Official and Tom Talbot, Zoning Director for the Town of New Haven, as well as the property owner and the tower owner.

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

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

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

Sincerely,

Victoria Masse

Mobile: 860-306-2326

Fax: 413-521-0558

Office: 420 Main Street, Unit 2 Sturbridge MA 01566

Email: victoria@northeastsitesolutions.com

Attachments

cc: Mayor Justin Elicker —New Haven elected official

Aicha Woods —City Plan Executive Director

State of CT- State Police - as property and tower owner

Exhibit A



STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION

ARTHUR B. POWERS
COMMISSIONER

May 29, 1981

RECEIVED

JUN 2 1981

POWER FACILITY
EVALUATION COUNCIL

Ms. Gloria Dibble Pond, Chairperson
State of Connecticut
Department of Business Regulation
Power Facility Evaluation Council
State Office Building, Room 24
165 Capitol Avenue
Hartford, Connecticut 06115

Dear Ms. Dibble Pond:

Enclosed is a Petition for Declaratory Ruling that no Certificate of Environmental Compatibility and Public Need is required for our proposal to install a 6' to 8' microwave parabolic antenna on our existing telecommunications tower located on West Rock Mountain in New Haven, and two 6' to 8' microwave dish antennas on the existing telecommunications tower located on Buckley Hill Road in Colchester, which is owned by the Colchester Emergency Communications, Incorporated.

Fifteen copies of the Petition are included along with the \$50 filing fee. Should you have any questions or wish additional information, please contact Mr. Thomas F. Kirker, Regional Transit Manager at 566-4904.

Very truly yours,

Arthur B. Powers
Commissioner

Encls. (16)

cc: Mr. John F. Sweeney, Connecticut Transit

Telephone 566-3477

24 Wolcott Hill Road • P.O. Drawer A • Wethersfield, Connecticut 06109

An Equal Opportunity Employer

STATE OF CONNECTICUT
POWER FACILITY EVALUATION COUNCIL

PETITION FOR DECLARATORY RULING

Ms. Gloria Dibble Pond, Chairperson
Power Facility Evaluation Council
State Office Building, Room 24
165 Capitol Avenue
Hartford, Connecticut 06115

Dear Ms. Dibble Pond:

Pursuant to Section 4-176 of the Connecticut General Statutes and Section 16-50j-39 of the Regulations of Connecticut State Agencies, the State Department of Transportation hereby petitions for a Declaratory Ruling that no Certificate of Environmental Compatibility and Public Need is required pursuant to Section 16-50k(a) of the Connecticut General Statutes for our installation of a 6' to 8' microwave parabolic antenna on our existing telecommunications tower located on West Rock Mountain in New Haven, and two 6' to 8' microwave parabolic antennas on the existing telecommunications tower located on Buckley Hill Road in Colchester, which is owned by the Colchester Emergency Communications, Incorporated. Communications and correspondence should be addressed to Mr. Thomas F. Kirker, Regional Transit Manager, Bureau of Public Transportation, at 24 Wolcott Hill Road, Wethersfield, Connecticut 06109, telephone number 566-4904.

I. New Haven - West Rock Tower Antenna Addition (See Attachment A)

It is submitted that no Certificate of Environmental Compatibility and Public Need is required for this project since; (1) the proposed microwave parabolic antenna will be attached to an existing telecommunications tower owned by the Department of Transportation which has been determined to be structurally capable to support the added antenna by its manufacturer, and (2) that the proposed antenna will not have any substantial adverse environmental effect pursuant to Section 16-50k(d). This antenna will be a necessary component of the microwave link route to our Connecticut Transit bus property in New Haven. The link will provide necessary transit communications, operating data and will also be capable of transmitting emergency alarms for the greater New Haven bus system. No alteration and/or clearing to the existing site will be required.

The antennas proposed will be 6' to 8' in diameter. The exact dimension will be determined when bids for the Connecticut Transit Radio System are received and an award made.

The following telecommunications tower inventory is provided as required.

- a) Ground Elevation: 450' based on U.S.G.S. datum
- b) Tower Height: 120'
- c) Latitude: 41°-20'-43"
- d) Longitude: 72°-58'-17"
- e) U.S.G.S. Quadrangle Map: New Haven Quadrangle N4115
- f) 8½" x 11" Map Copy of Tower Location (See Attachment B)
- g) Tower Use: Telecommunications
- h) Tower Type: Rhon Model SSV Heavy Duty Series with 11N through 6N Sections
- i) Strength of Signal: See Item III

II. Colchester - Buckley Hill Tower Antenna Addition (See Attachment A)

It is submitted that no Certificate of Environmental Compatibility and Public Need is required for this project since; (1) the proposed microwave parabolic antennas will be attached to an existing telecommunications tower owned by the Colchester Emergency Communications, Inc.; address, State Police Barracks, Old Hartford Road, P.O. Box 317, Colchester, Connecticut 06415. This tower has been determined to be structurally capable to support the added antennas, and (2) that the proposed antennas will not have any substantial adverse environmental effect pursuant to Section 16-50k(d), (3) that it is in the mutual benefit of all parties concerned that shared use of existing telecommunications towers, where possible, be explored, and (4) that the Colchester Emergency Communications, Inc., through its Board of Directors, has authorized our mutual shared use of the Buckley Hill Tower.

This antennas will be a necessary component of the microwave link routes to our Connecticut Transit Hartford bus property. The link will provide necessary transit communications, operating data and will also be capable of transmitting emergency alarms for the greater Hartford bus system. No alteration and/or clearing to the existing site will be required. The antennas proposed will be 6' to 8' in diameter. The exact dimension will be determined when bids for the Connecticut Transit Radio system are received and an award made.

The following telecommunications tower inventory is provided as required.

- a) Ground Elevation: 605'
- b) Tower Height: 200'
- c) Latitude: 41°-31'-54'
- d) Longitude: 72°-21'-26'
- e) U.S.G.S. Quadrangle Map: Colchester Quadrangle N4130
- f) 8½" x 11" Map Coy of Tower Location: (See Attachment C)
- g) Tower Use: Telecommunications
- h) Tower Type: Rhon Model SSV Heavy Duty Series with 15N through 7N Sections
- i) Strength of Signal: See Item III
- j) Owner: Colchester Emergency Communications, Inc.
State Police Barracks
Old Hartford Road
P.O. Box 317
Colchester, Connecticut 06415
Norman Gustafson, President
Tele. No. 537-2512 or 537-5353

III. Signal Strength Data: West Rock and Buckley Hill Telecommunications Tower Antenna Additions.

The following microwave antenna data - strength of signal - are requirements of our radio system specifications and must be adhered to by prospective bidders in order to be qualified for award consideration:

The near field values of power density will be less than the U.S. Bureau of Radiological Health (BRH) density limit of one milliwatt per square centimeter. The power density to be expected at a maximum field point is 0.85 milliwatts per square centimeter obtained at a distance of 16.4 feet for a 6 foot parabolic dish antenna. All far field levels are below the U.S.B.R.H. limit for the antennas and transmitters proposed.

One milliwatt per square centimeter is obtained at a distance of 20'-0" from the horn opening.

One milliwatt per square centimeter is obtained at a distance of 4.5" from the feedhorn.

The actual power densities or distances to be expected, whichever the case may be, will be less than the above calculated values due to transmission line losses.

Considering that antennas will be mounted approximately at the top of the towers, it can be stated that the installation of the proposed microwave system will pose no potential radiation hazard. The power density limit intended for use in these matters, as noted above, are far less than the OSHA power density limit of 10 milliwatts per square centimeter.

The proposed signal strength stated above indicates that at each location the power density levels will be below the OSHA power density limit requirements. The installation of these microwave antennas are needed to provide a vital method of radio communications between transit properties in Hartford and New Haven and their fleet of buses, respectively in order to lessen maintenance requirements and retrieve transit data. This communication system is also an essential public need in view of the relationship of the passengers (general public) carried to the systems intent and purpose (public conveyance), especially during emergency purposes. The proposed communications system will also be capable of reacting to other major emergency situations; ie., fixed nuclear facility incidents or crisis relocation through the immediate deployment of buses to emergency evacuation areas.

Analysis has determined that microwave will provide the lowest cost alternate to meet the demands, as described herein, of the Connecticut Transit radio systems proposed for Hartford and New Haven. Its quickness to retrieve information and potential for minimal service problems versus lease lines is a major factor in our selection of system design.

As previously mentioned herein, no clearing or construction is required, and no scenic or historic values will be affected by our proposals. The Department of Transportation therefore submits that no substantial adverse environmental effect will result and that no certificate of environmental compatibility and public need is required in these matters.

IV. Conclusion

For the above reasons the Connecticut Department of Transportation respectfully requests a declaratory ruling to the effect that no certificate of environmental compatibility and public need is required for the use of microwave antennas in the Connecticut Transit Hartford and New Haven radio systems, specifically at; (1) the New Haven, West Park Telecommunications Tower, and (2) the Colchester, Buckley Hill Telecommunications Tower. Such certificate is not necessary because there will be no substantial adverse environmental impact as a result of either antenna installation.

Respectfully submitted,



Thomas F. Kirker
Regional Transit Manager
Bureau of Public Transportation
Connecticut Department of Transportation

cc: Mr. John F. Sweeney, Connecticut Transit

Exhibit B

WINTERGREEN AV

Location WINTERGREEN AV

Mblu 368/ 1166/ 00400/ /

Acct# 368 1166 00400

Owner STATE OF CONNECTICUT

Assessment \$26,040

Appraisal \$37,200

PID 23555

Building Count 1

Current Value

Appraisal			
Valuation Year	Improvements	Land	Total
2015	\$0	\$37,200	\$37,200
Assessment			
Valuation Year	Improvements	Land	Total
2015	\$0	\$26,040	\$26,040

Owner of Record

Owner STATE OF CONNECTICUT
Co-Owner C/O DEPT OF TRANSPORTATION
Address PO BOX 317546
NEWINGTON, CT 06131-7546

Sale Price \$0
Certificate
Book & Page 3357/ 61
Sale Date 10/17/1985

Ownership History

Ownership History				
Owner	Sale Price	Certificate	Book & Page	Sale Date
STATE OF CONNECTICUT	\$0		3357/ 61	10/17/1985

Building Information

Building 1 : Section 1

Year Built:
Living Area: 0
Replacement Cost: \$0
Building Percent
Good:
Replacement Cost
Less Depreciation: \$0

Building Photo

Building Attributes	
Field	Description
Style	Vacant Land
Model	

Grade:	
Stories:	
Occupancy	
Exterior Wall 1	
Exterior Wall 2	
Roof Structure:	
Roof Cover	
Interior Wall 1	
Interior Wall 2	
Interior Flr 1	
Interior Flr 2	
Heat Fuel	
Heat Type:	
AC Type:	
Total Bedrooms:	
Total Bthrms:	
Total Half Baths:	
Total Xtra Fixtrs:	
Total Rooms:	
Bath Style:	
Kitchen Style:	
Interior Condition	
Fin Bsmnt Area	
Fin Bsmnt Qual	
NBHD Code	

 Building Photo

(<http://images.vgsi.com/photos/NewHavenCTPhotos//default.jpg>)

Building Layout

 Building Layout

Building Sub-Areas (sq ft)	Legend
No Data for Building Sub-Areas	

Extra Features

Extra Features	Legend
No Data for Extra Features	

Land

Land Use

Use Code 901V
Description STATE MDL-00
Zone RM1
Neighborhood 2600
Alt Land Appr No
Category

Land Line Valuation

Size (Acres) 0.57
Frontage 0
Depth 0
Assessed Value \$26,040
Appraised Value \$37,200

Outbuildings

Outbuildings	Legend
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No Data for Outbuildings

Valuation History

Appraisal			
Valuation Year	Improvements	Land	Total
2014	\$0	\$37,200	\$37,200
2013	\$0	\$37,200	\$37,200
2012	\$0	\$37,200	\$37,200

Assessment			
Valuation Year	Improvements	Land	Total
2014	\$0	\$26,040	\$26,040
2013	\$0	\$26,040	\$26,040
2012	\$0	\$26,040	\$26,040

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Exhibit C

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ANTENNA UPGRADES BY

T-Mobile

T-MOBILE NORTHEAST LLC

PROJECT: L700 4X2 AAS

SITE NUMBER: CT11086B

SITE NAME: NEW HAVEN/WC X59

SITE ADDRESS: 240 BALDWIN DRIVE

NEW HAVEN, CT 06515

(RF CONFIGURATION 67D92M)

PROJECT SCOPE:

UPGRADE OF EXISTING WIRELESS FACILITY AS FOLLOWS:
REPLACE (6) EXISTING ANTENNAS,
REPLACE (3) REMOTE RADIO UNITS (RRU),
ADD (3) REMOTE RADIO UNITS (RRU),
ADD (1) 6X12 HYBRID CABLES.
ADD A 25KW AC DIESEL GENERATOR ON EXISTING CONCRETE PAD

PROJECT NOTES:

1. THIS IS AN UNMANNED TELECOMMUNICATION FACILITY AND NOT FOR HUMAN HABITATION:
HANDICAPPED ACCESS IS NOT REQUIRED.
POTABLE WATER OR SANITARY SERVICE IS NOT REQUIRED.
NO OUTDOOR STORAGE OR ANY
SOLID WASTE RECEPTACLES REQUIRED.
2. CONTRACTOR SHALL VERIFY ALL PLANS, EXISTING DIMENSIONS, AND CONDITIONS ON THE JOB SITE. CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ARCHITECT/ENGINEER IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK. FAILURE TO NOTIFY THE ARCHITECT/ENGINEER PLACES THE RESPONSIBILITY ON THE CONTRACTOR TO CORRECT THE DISCREPANCIES AT THE CONTRACTOR'S EXPENSE.
3. DEVELOPMENT AND USE OF THE SITE WILL CONFORM TO ALL APPLICABLE CODES, ORDINANCES AND SPECIFICATIONS.
4. REFER TO STRUCTURAL ANALYSIS REPORT ENTITLED "DETAILED STRUCTURAL ANALYSIS AND MODIFICATION OF AN EXISTING 120' SELF SUPPORT LATTICE AND FOUNDATION FOR PROPOSED ANTENNA ARRANGEMENT " SITE ID: CT11086B, REVISION 1, DATED APRIL 10, 2020 PREPARED BY AECOM.

APPLICABLE STATE ADOPTION CODES:

2018 CONNECTICUT STATE BUILDING CODE (CSBC).
ANSI/TIA-222-G-2005 STRUCTURAL STANDARD FOR ANTENNA SUPPORTING STRUCTURES AND ANTENNAS.
2017 NATIONAL ELECTRICAL CODE (NFPA 70) FOR POWER AND GROUNDING REQUIREMENTS.

APPROVALS:

FSA CM	DATE
RF ENGINEER	DATE
FOPS	DATE
T-MOBILE ENGINEERING AND DEVELOPMENT	DATE
	DATE
	DATE

SITE IMAGE:



VICINITY MAP:



PROJECT INFORMATION:

ADDRESS: 240 BALDWIN DRIVE
NEW HAVEN, CT 06515

STRUCTURE TYPE: LATTICE TOWER

COORDINATES: 41.345440 N -72.970710 W

PROJECT TEAM:

APPLICANT: T-MOBILE NORTHEAST, LLC.
35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002
860-692-7100

LANDLORD: CT STATE POICE

PROJECT MANAGER: NORTHEAST SITE SOLUTIONS
420 MAIN STREET, BLDG 4
STURBRIDGE, MA 01566
SHELDON FREINCLE
SHELDON@NORTHEASTSITE
SOLUTIONS.COM
201-776-8521

CONSULTANTS: FORESITE LLC
462 WALNUT ST
NEWTON, MA 02460
SAEED MOSSAVAT
SMOSSAVAT@FORESITELLC.COM
617-212-3123

SHEET INDEX:

T-1: TITLE SHEET
N-1: GENERAL NOTES
A-1: SITE PLAN
A-2: EQUIPMENT LAYOUT PLAN
A-3: TOWER ELEVATION
A-4: ANTENNA PLAN
A-5: ANTENNA DETAILS
A-6: CONCRETE PAD DETAILS
A-7: GENERATOR DETAILS
A-8: GENERATOR DETAILS
E-1: EXISTING CABINET UPGRADE ELECTRICAL DETAILS
E-2: GENERATOR GROUNDING AND ELECTRICAL DETAILS

END: STRUCTURAL MODIFICATION DESIGN (BY OTHERS)

APPLICANT:

T-Mobile

T-MOBILE NORTHEAST LLC

35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002
860-692-7100

PROJECT MANAGER

NSS NORTHEAST
SITE SOLUTIONS
Turnkey Wireless Development
420 MAIN STREET, BLDG 4
STURBRIDGE, MA 01566
203-275-6669

CONSULTANT:

FORESITE LLC

Architects . Engineers . Surveyors

462 WALNUT STREET
NEWTON, MA 02460
617-212-3123



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REV	DESCRIPTION	DATE
A	PRELIMINARY	08/31/18
0	SIGNED AND SEALED	09/04/18
1	GENERATOR ADD	10/16/18
2	ADDED SPRINT ANTENNA ELEV.	02/27/19
3	CORRECTED SOW	04/17/19
4	CHANGED TO AC GENERATOR	05/02/19
5	REVISED PER COMMENTS	06/25/19
6	STRUCTURAL REF. UPDATE	04/21/20

SITE NUMBER: CT11086B
SITE NAME: NEW HAVEN/WC X59
SITE ADDRESS: 240 BALDWIN DRIVE
NEW HAVEN, CT 06515

SHEET TITLE:

T-1: TITLE SHEET

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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 HAS MADE EVERY EFFORT TO SET FORTH IN THE CONSTRUCTION AND CONTRACT 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 CLIENT'S REPRESENTATIVE OF ANY CONFLICTS, ERRORS, OR OMISSIONS PRIOR TO THE SUBMISSION OF CONTRACTOR'S PROPOSAL OR PERFORMANCE OF WORK.
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 CONSTRUCTION DOCUMENTS.
6. 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.
7. THE CONTRACTOR SHALL MAKE NECESSARY PROVISIONS TO PROTECT EXISTING IMPROVEMENTS DURING CONSTRUCTION.
8. THE CONTRACTOR SHALL COMPLY WITH ALL PERTINENT SECTIONS OF THE BASIC STATE BUILDING CODE, LATEST EDITION, AND ALL OSHA REQUIREMENTS AS THEY APPLY TO THIS PROJEC
9. THE CONTRACTOR SHALL NOTIFY THE CLIENT'S REPRESENTATIVE IN WRITING 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 CLIENT'S REPRESENTATIVE.
10. THE WORK SHALL CONFORM TO THE CODES AND STANDARDS OF THE FOLLOWING AGENCIES AS FURTHER CITED HEREIN:

A. ASTM: AMERICAN SOCIETY FOR TESTING AND MATERIALS, AS PUBLISHED IN "COMPILATION OF ASTM STANDARDS BUILDING CODES" OR LATEST EDITION.

B. AWS: AMERICAN WELDING SOCIETY INC. AS PUBLISHED IN "STANDARD D1.1-08, STRUCTURAL WELDING CODE" OR LATEST EDITION.

C. AISC: AMERICAN INSTITUTE FOR STEEL CONSTRUCTION AS PUBLISHED IN "CODE FOR STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES"; "SPECIFICATIONS FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS" (LATEST EDITION).
11. BOLTING:

A. BOLTS SHALL BE CONFORMING TO ASTM A325 HIGH STRENGTH, HOT DIP GALVANIZED WITH ASTM A153 HEAVY HEX TYPE NUTS.

B. BOLTS SHALL BE 3/4"Ø MINIMUM (UNLESS OTHERWISE NOTED)

C. ALL CONNECTIONS SHALL BE 2 BOLTS MINIMUM.
12. FABRICATION:

A. FABRICATION OF STEEL SHALL CONFORM TO THE AISC AND AWS STANDARDS AND CODES (LATEST EDITION).

B. ALL STRUCTURAL STEEL SHALL BE HOT-DIP GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123 (LATEST EDITION), UNLESS OTHERWISE NOTED.
13. ERECTION OF STEEL:

A. PROVIDE ALL ERECTION EQUIPMENT, BRACING, PLANKING, FIELD BOLTS, NUTS, WASHERS, DRIFT PINS, AND SIMILAR MATERIALS WHICH DO NOT FORM A PART OF THE COMPLETED CONSTRUCTION BUT ARE NECESSARY FOR ITS PROPER ERECTION.

B. ERECT AND ANCHOR ALL STRUCTURAL STEEL IN ACCORDANCE WITH AISC REFERENCE STANDARDS. ALL WORK SHALL BE ACCURATELY SET TO ESTABLISHED LINES AND ELEVATIONS AND RIGIDLY FASTENED IN PLACE WITH SUITABLE ATTACHMENTS TO THE CONSTRUCTION OF THE BUILDING.

C. TEMPORARY BRACING, GUYING AND SUPPORT SHALL BE PROVIDED TO KEEP THE STRUCTURE SAFE AND ALIGNED AT ALL TIMES DURING CONSTRUCTION, AND TO PREVENT DANGER TO PERSONS AND PROPERTY. CHECK ALL TEMPORARY LOADS AND STAY WITHIN SAFE CAPACITY OF ALL BUILDING COMPONENTS.

14. ANTENNA INSTALLATION:

A. INSTALL ANTENNAS AS INDICATED ON DRAWINGS AND CLIENT'S REPRESENTATIVE SPECIFICATIONS.

B. INSTALL GALVANIZED STEEL ANTENNA MOUNTS AS INDICATED ON DRAWINGS.

C. INSTALL COAXIAL / FIBER CABLES AND TERMINATIONS BETWEEN ANTENNAS AND EQUIPMENT PER MANUFACTURER'S RECOMMENDATIONS. WEATHERPROOF ALL CONNECTORS BETWEEN THE ANTENNA AND EQUIPMENT PER MANUFACTURER'S REQUIREMENTS.
15. ANTENNA AND COAXIAL / FIBER CABLE GROUNDING:

A. ALL EXTERIOR #6 GREEN GROUND WIRE "DAISY CHAIN" CONNECTIONS ARE TO BE WEATHER SEALED WITH ANDREWS CONNECTOR/SPLICE WEATHERPROOFING KIT TYPE #221213 OR EQUAL.

B. ALL COAXIAL / FIBER CABLE GROUNDING KITS ARE TO BE INSTALLED ON STRAIGHT RUNS OF COAXIAL / FIBER CABLE (NOT WITHIN BENDS).
16. RELATED WORK, FURNISH THE FOLLOWING WORK AS SPECIFIED UNDER CONSTRUCTION DOCUMENTS, BUT COORDINATE WITH OTHER TRADES PRIOR TO BID:

A. FLASHING OF OPENING INTO OUTSIDE WALLS

B. SEALING AND CAULKING ALL OPENINGS

C. PAINTING

D. CUTTING AND PATCHING
17. REQUIREMENTS OF REGULATORY AGENCIES:

A. FURNISH U.L. LISTED EQUIPMENT WHERE SUCH LABEL IS AVAILABLE. INSTALL IN CONFORMANCE WITH U.L. STANDARDS WHERE APPLICABLE.

B. INSTALL ANTENNA, ANTENNA CABLES, GROUNDING SYSTEM IN ACCORDANCE WITH DRAWINGS AND SPECIFICATION IN EFFECT AT PROJECT LOCATION AND RECOMMENDATIONS OF STATE AND LOCAL BUILDING CODES, AND SPECIAL CODES HAVING JURISDICTION OVER SPECIFIC PORTIONS OF WORK. THIS WORK INCLUDES BUT IS NOT LIMITED TO THE FOLLOWING:

C. TIA-EIA - 222 (LATEST EDITION). STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND ANTENNA SUPPORTING STRUCTURES.

D. FAA - FEDERAL AVIATION ADMINISTRATION ADVISORY CIRCULAR AC 70/7460-IH, OBSTRUCTION MARKING AND LIGHTING.

E. FCC - FEDERAL COMMUNICATIONS COMMISSION RULES AND REGULATIONS FORM 715, OBSTRUCTION MARKING AND LIGHTING SPECIFICATION FOR ANTENNA STRUCTURES AND FORM 715A, HIGH INTENSITY OBSTRUCTION LIGHTING SPECIFICATIONS FOR ANTENNA STRUCTURES.

F. AISC - AMERICAN INSTITUTE OF STEEL CONSTRUCTION SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM A325 BOLTS (LATEST EDITION).

G. NEC - NATIONAL ELECTRICAL CODE - ON TOWER LIGHTING KITS.

H. UL - UNDERWRITER'S LABORATORIES APPROVED ELECTRICAL PRODUCTS.

I. IN ALL CASES, PART 77 OF THE FAA RULES AND PARTS 17 AND 22 OF THE FCC RULES ARE APPLICABLE AND IN THE EVENT OF CONFLICT, SUPERSEDE ANY OTHER STANDARDS OR SPECIFICATIONS.

J. 2009 LIFE SAFETY CODE NFPA - 101.

APPLICANT:

**T-MOBILE NORTHEAST LLC**

35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002
860-692-7100

**PROJECT MANAGER**

NSS **NORTHEAST**
SITE SOLUTIONS
Turnkey Wireless Development
420 MAIN STREET, BLDG 4
STURBRIDGE, MA 01566
203-275-6669

CONSULTANT:

**Architects . Engineers . Surveyors**
462 WALNUT STREET
NEWTON, MA 02460
617-212-3123



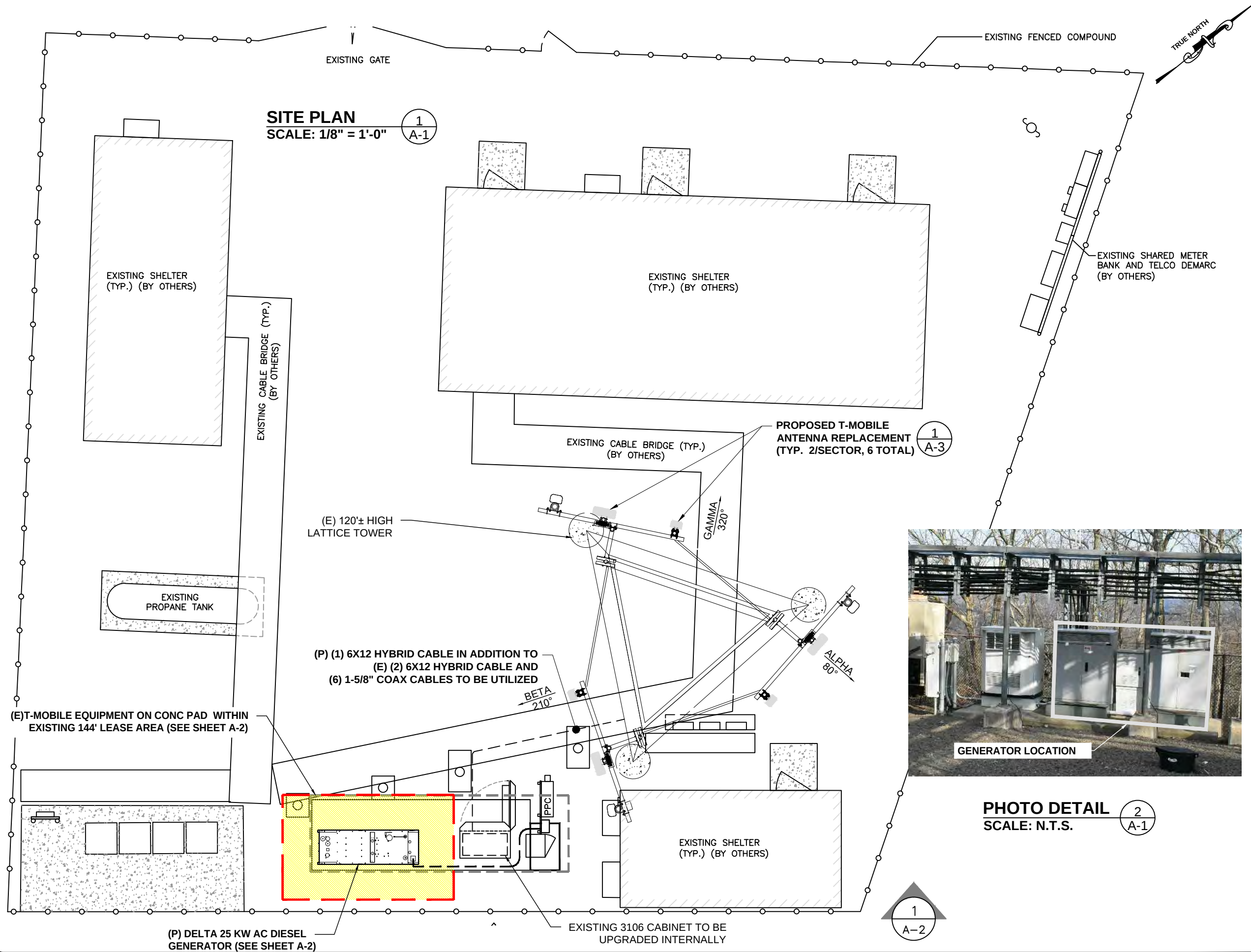
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A	PRELIMINARY	08/31/18
0	SIGNED AND SEALED	09/04/18
1	GENERATOR ADD	10/16/18
2	ADDED SPRINT ANTENNA ELEV.	02/27/19
3	CORRECTED SOW	04/17/19
4	CHANGED TO AC GENERATOR	05/02/19
5	REVISED PER COMMENTS	06/25/19
6	STRUCTURAL REF. UPDATE	04/21/20

SITE NUMBER: CT11086B
SITE NAME: NEW HAVEN/WC X59
SITE ADDRESS: 240 BALDWIN DRIVE
NEW HAVEN, CT 06515

SHEET TITLE:
N-1: NOTES AND DISCLAIMERS

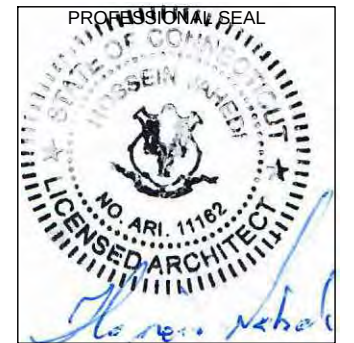
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APPLICANT:
T-Mobile
T-MOBILE NORTHEAST LLC
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PROJECT MANAGER
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SITE SOLUTIONS
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CONSULTANT:
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Architects . Engineers . Surveyors
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NEWTON, MA 02460
617-212-3123



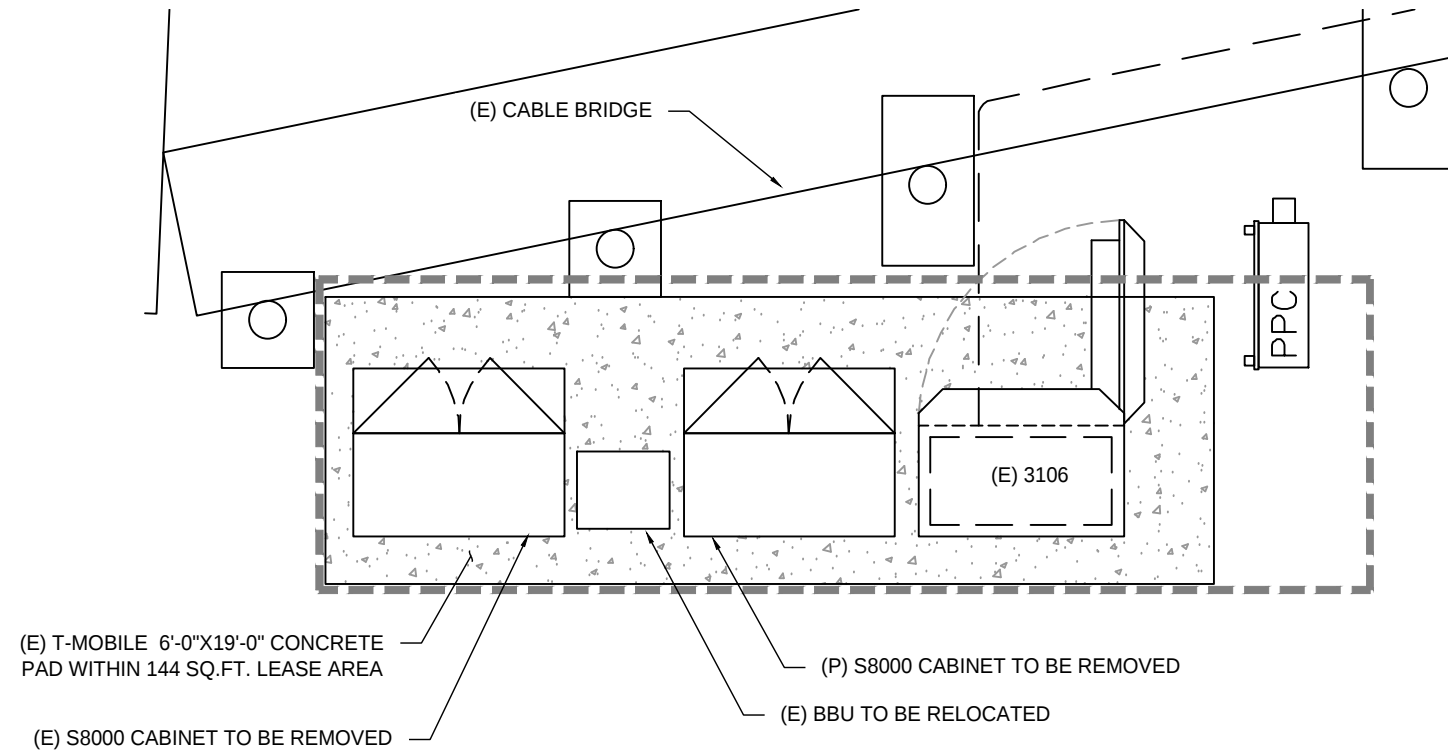
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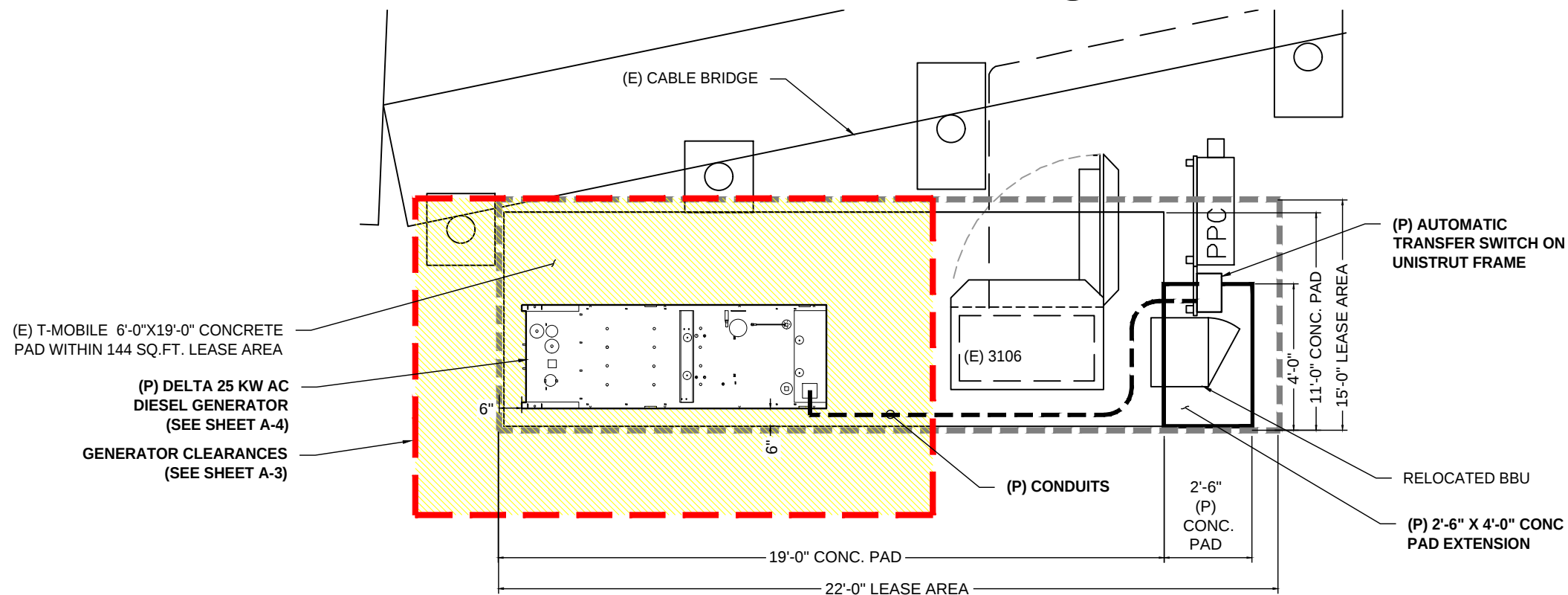
SHEET TITLE:
A-1: SITE PLAN

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EXISTING EQUIPMENT PLAN
SCALE: 1" = 4'

1
A-2



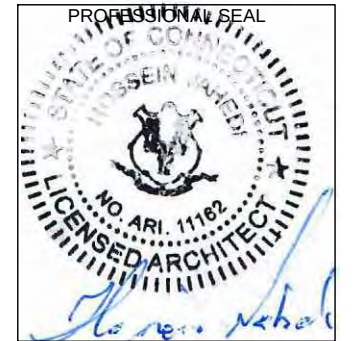
PROPOSED EQUIPMENT PLAN
SCALE: 1" = 4'

2
A-2

APPLICANT:
T-Mobile
T-MOBILE NORTHEAST LLC
35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002
860-692-7100

PROJECT MANAGER
NSS NORTHEAST
SITE SOLUTIONS
Turnkey Wireless Development
420 MAIN STREET, BLDG 4
STURBRIDGE, MA 01566
203-275-6669

CONSULTANT:
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462 WALNUT STREET
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SITE ADDRESS: 240 BALDWIN DRIVE
NEW HAVEN, CT 06515

SHEET TITLE:
A-2: EQUIPMENT LAYOUT PLAN

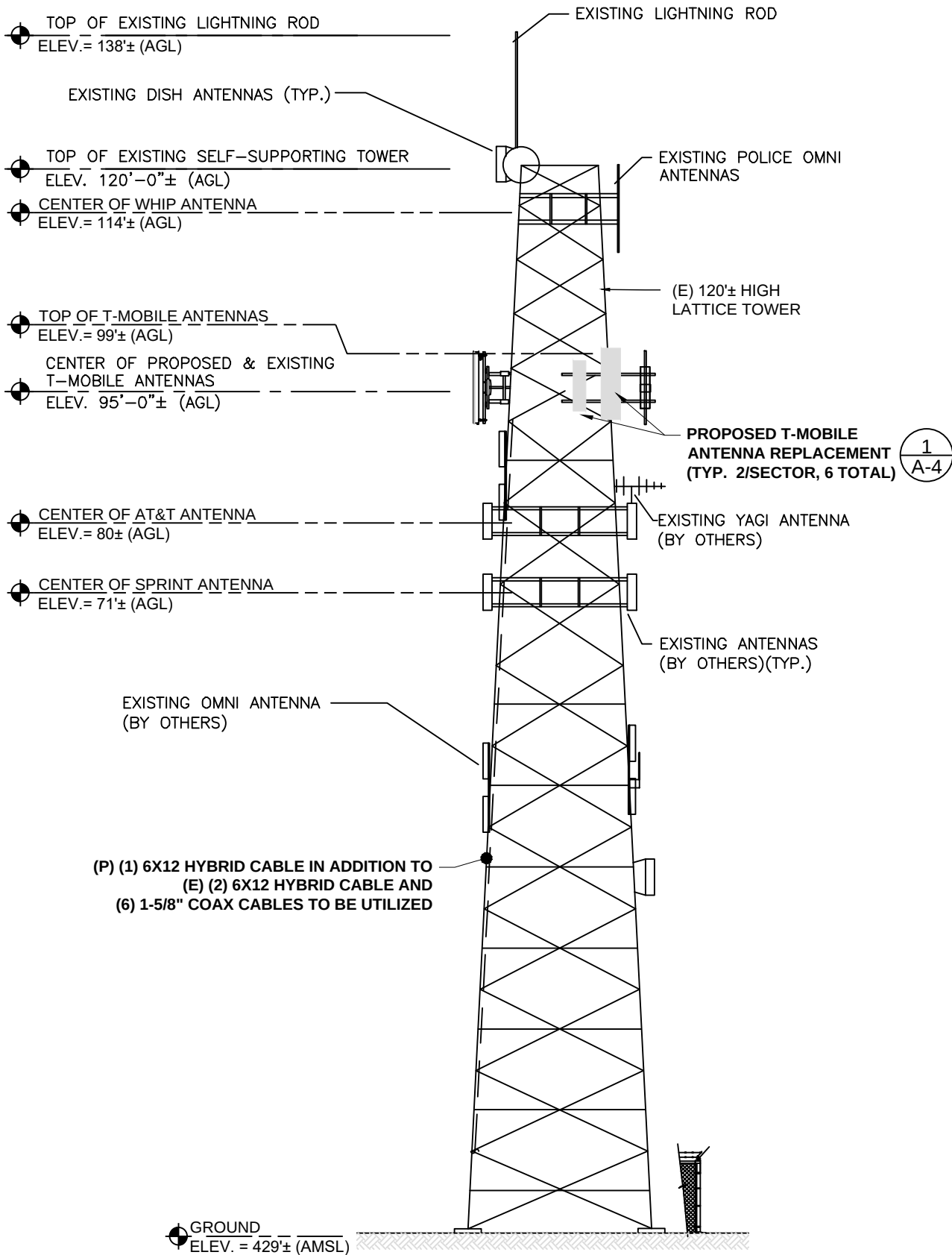
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STRUCTURAL NOTE:

4. REFER TO STRUCTURAL ANALYSIS REPORT ENTITLED "DETAILED STRUCTURAL ANALYSIS AND MODIFICATION OF AN EXISTING 120' SELF SUPPORT LATTICE AND FOUNDATION FOR PROPOSED ANTENNA ARRANGEMENT " SITE ID: CT11086B, REVISION 1, DATED APRIL 10, 2020 PREPARED BY AECOM.

ELEVATION NOTE:

AMSL ELEVATIONS ARE TAKEN FROM GOOGLE EARTH AND ARE APPROXIMATE.



ELEVATION
SCALE: 1/16" = 1'-0"

1
A-3

APPLICANT:
T-Mobile
T-MOBILE NORTHEAST LLC

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BLOOMFIELD, CT 06002
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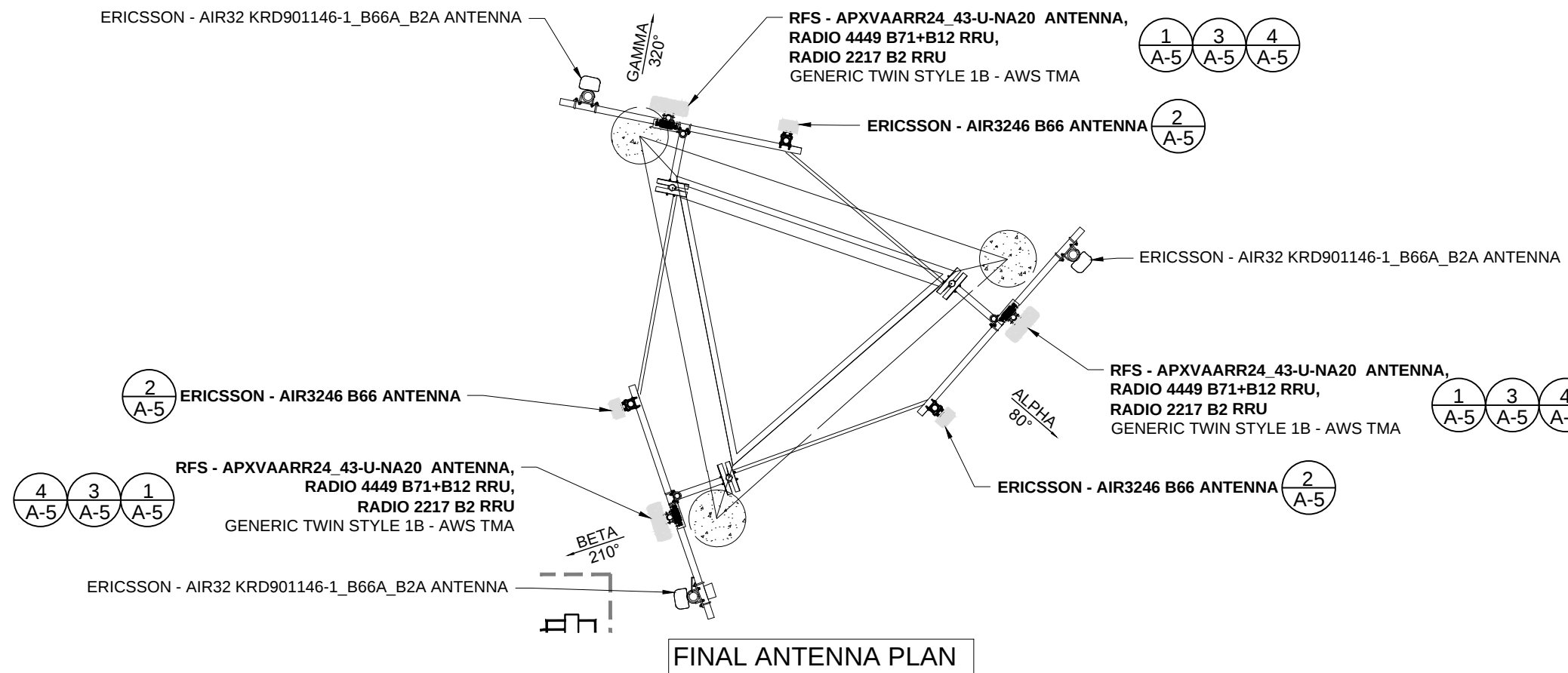
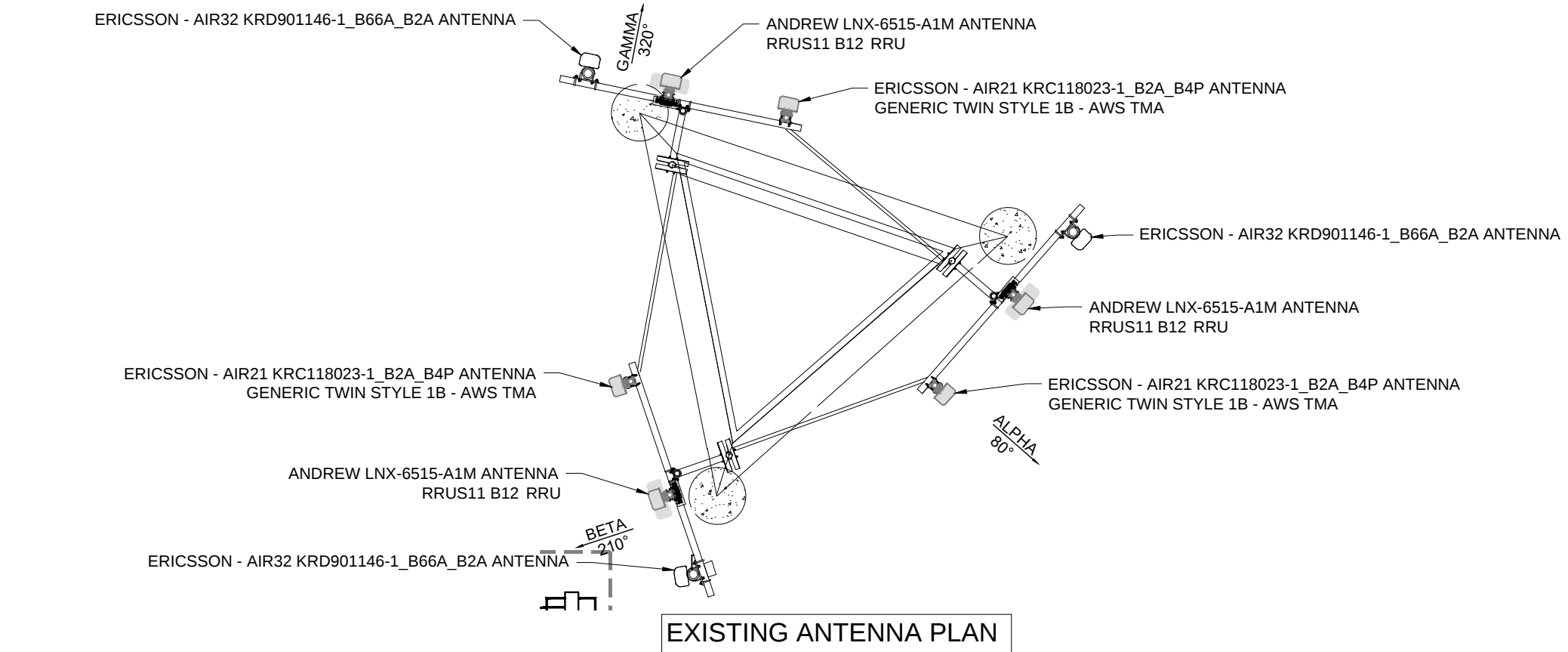
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SHEET TITLE:
A-3: TOWER ELEVATION

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ANTENNA PLAN
SCALE: NTS

1
A-4

APPLICANT:
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860-692-7100

PROJECT MANAGER
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SITE SOLUTIONS
Turnkey Wireless Development
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462 WALNUT STREET
NEWTON, MA 02460
617-212-3123



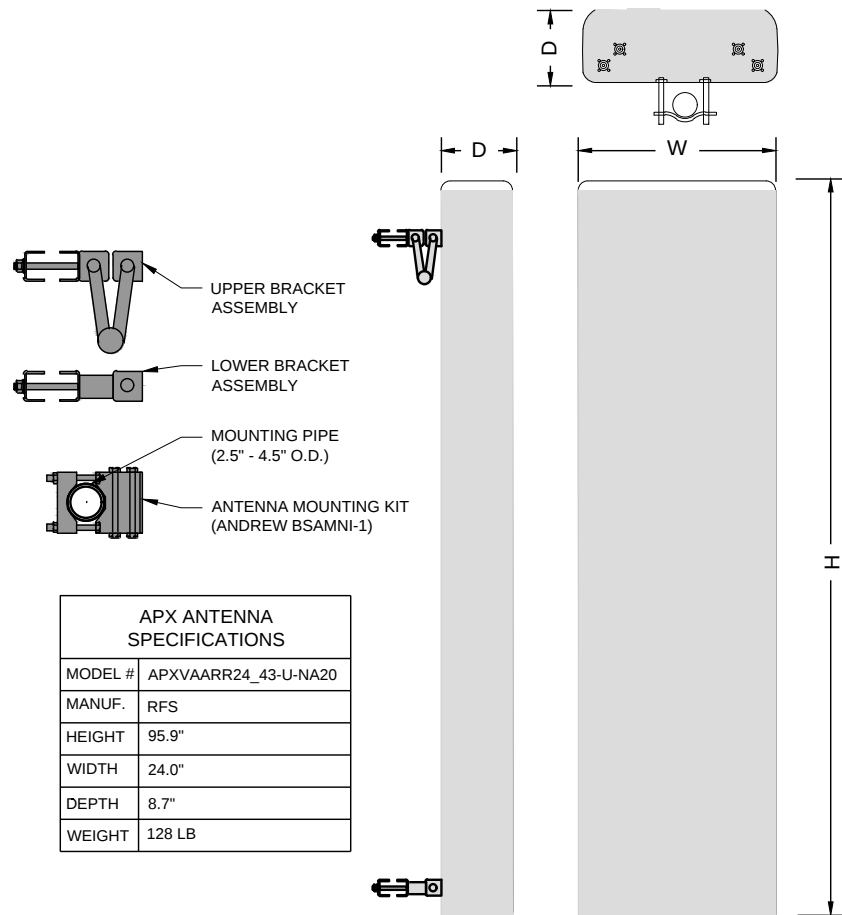
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SHEET TITLE:
A-4: ANTENNA PLAN

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RFS ANTENNA
N.T.S

1
A-5

ANTENNA MOUNTING KIT

EXISTING MOUNTING PIPE
(TYP. 1/SECTOR, 3 TOTAL)

T-MOBILE ANTENNA
(TYP. 1/SECTOR, 3 TOTAL)

REMOTE RADIO UNIT
(TYP. 1/SECTOR, 3 TOTAL)

REMOTE RADIO UNIT
(TYP. 1/SECTOR, 3 TOTAL)

EXISTING T-MOBILE LOW
PROFILE PLATFORM

ANTENNA MOUNTING KIT

STRUCTURAL NOTES:

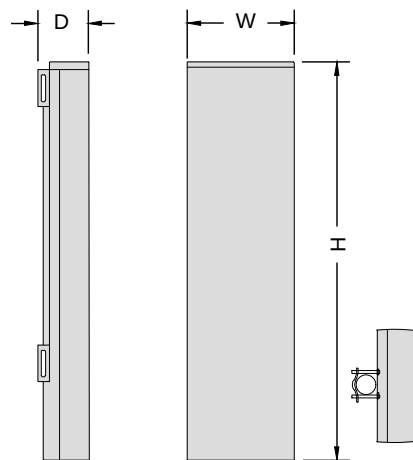
4. REFER TO STRUCTURAL ANALYSIS REPORT ENTITLED "DETAILED STRUCTURAL ANALYSIS AND MODIFICATION OF AN EXISTING 120' SELF SUPPORT LATTICE AND FOUNDATION FOR PROPOSED ANTENNA ARRANGEMENT " SITE ID: CT11086B, REVISION 1, DATED APRIL 10, 2020 PREPARED BY AECOM.

ANTENNA INSTALLATION SPECIAL WORK NOTE:
ANTENNA INSTALLATION WORKING POINT IS THE STRUCTURAL FACE FRAME VERTICAL CENTERLINE OF THE EXISTING ANTENNA SUPPORT ASSEMBLY. UNLESS NOTED OTHERWISE, VERTICALLY CENTERED PROPOSED PIPE MASTS AND ANTENNAS ON THIS WORKING POINT.

ANTENNA MOUNTING DETAIL
N.T.S

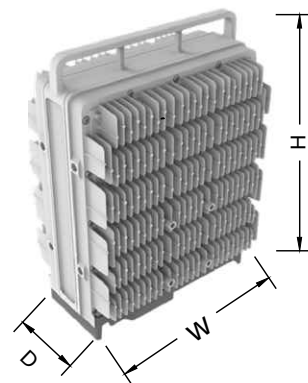
5
A-5

ERICSSON ANTENNA SPECIFICATIONS	
MODEL #	AIR3246 B66
MANUF.	ERICSSON
HEIGHT	58.1"
WIDTH	15.7"
DEPTH	9.4"
WEIGHT	180 LB

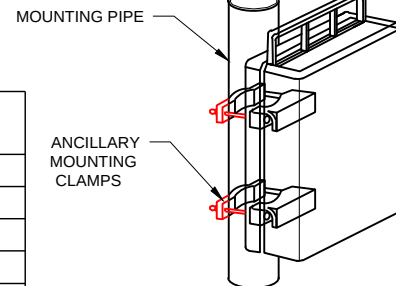


ERICSSON ANTENNA
N.T.S

2
A-5



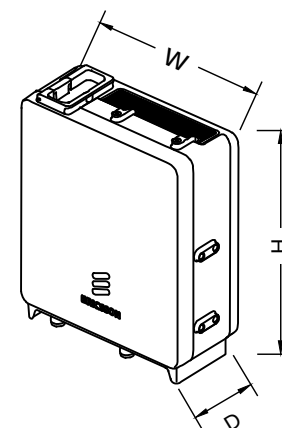
REMOTE RADIO UNIT SPECIFICATIONS	
MODEL #	RADIO 4449 B71+B12
MANUF.	ERICSSON
HEIGHT	14.9"
WIDTH	13.2"
DEPTH	10.4"
WEIGHT	74 LB



REMOTE RADIO UNIT
MOUNTING DETAIL

REMOTE RADIO UNIT
N.T.S

3
A-5



REMOTE RADIO UNIT SPECIFICATIONS	
MODEL #	RADIO 2217 B2
MANUF.	ERICSSON
HEIGHT	9.5"
WIDTH	11.5"
DEPTH	2.5"
WEIGHT	12.8 LB

REMOTE RADIO UNIT
N.T.S

4
A-5

APPLICANT:
T-Mobile
T-MOBILE NORTHEAST LLC
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860-692-7100

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Turnkey Wireless Development
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STURBRIDGE, MA 01566
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CONSULTANT:
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Architects . Engineers . Surveyors
462 WALNUT STREET
NEWTON, MA 02460
617-212-3123

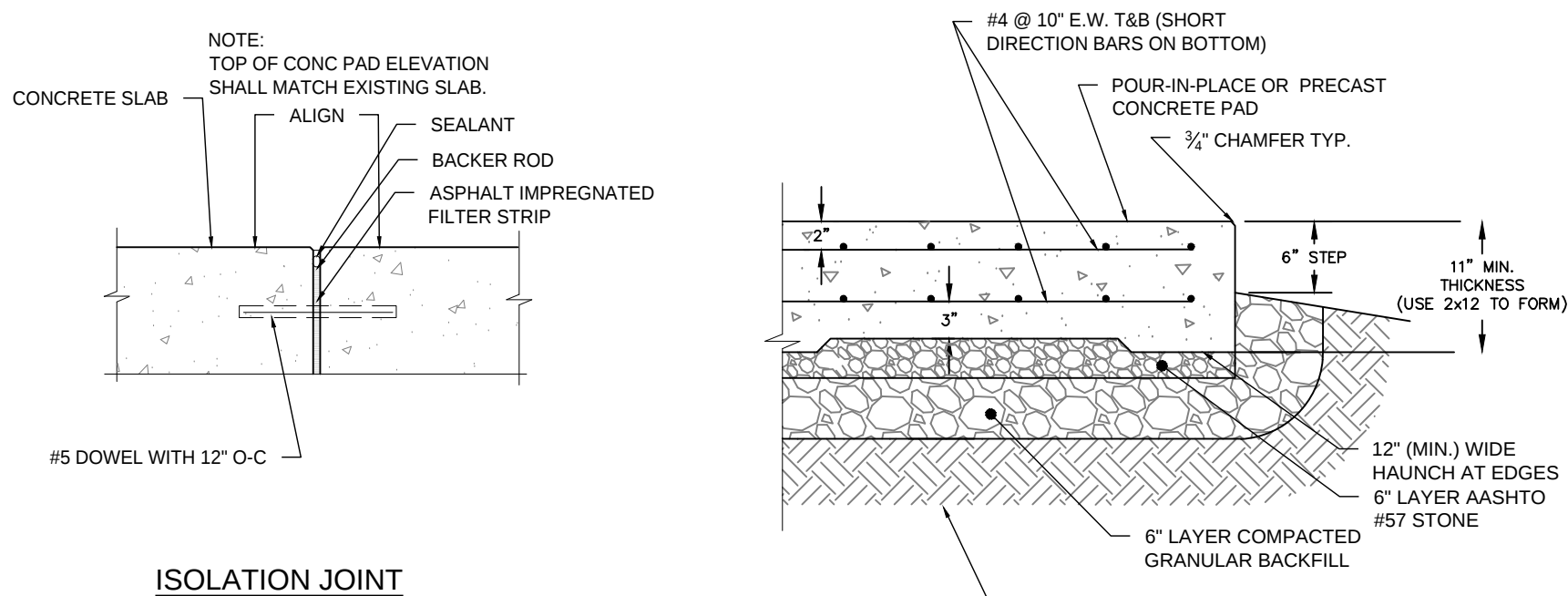
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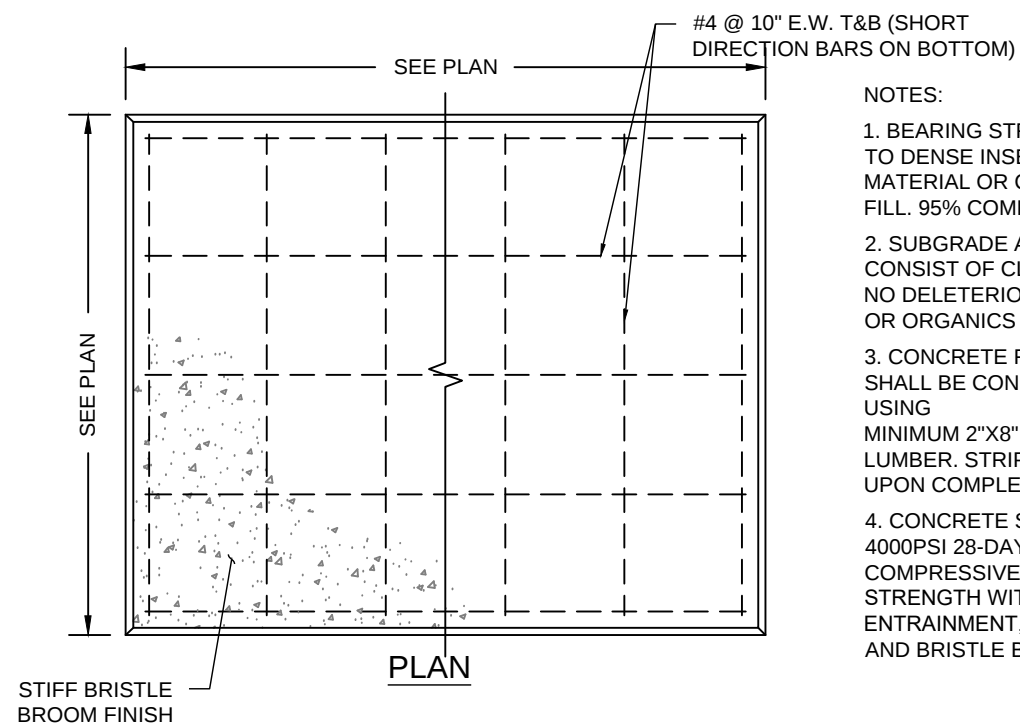
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NEW HAVEN, CT 06515

SHEET TITLE:
A-5: ANTENNA DETAILS

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UNDISTURBED NATURAL SUB-GRADE,
STRUCTURAL FILL OR RE-PURPOSED EXISTING
MATERIAL, PROOF COMPACT PRIOR TO
INSTALLATION OF GRAVEL. DEPENDING ON
RESULTS OF RECORD GEO-TECHNICAL
EXPLORATION.



NOTES:

1. BEARING STRATA MEDIUM TO DENSE INSET GRANULAR MATERIAL OR COMPACTED FILL. 95% COMPACTION.
2. SUBGRADE AND FILL SHALL CONSIST OF CLEAN SOIL. NO DELETERIOUS MATERIALS OR ORGANICS TO BE USED.
3. CONCRETE FORM WORK SHALL BE CONSTRUCTED USING MINIMUM 2"x8" NOMINAL SIZE LUMBER. STRIP AND REMOVE UPON COMPLETION.
4. CONCRETE SHALL HAVE 4000PSI 28-DAY COMPRESSIVE STRENGTH WITH 5(±1)% AIR ENTRAINMENT, 4(±1)"SLUMP AND BRISTLE BROOM FINISH.

CONCRETE PAD DETAILS
SCALE: N.T.S.

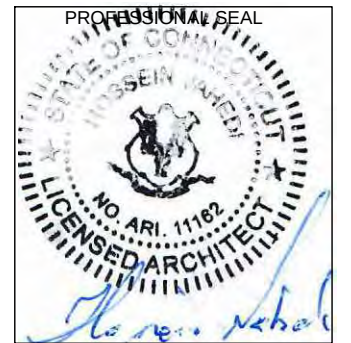
1
A-6

APPLICANT:
T-Mobile
T-MOBILE NORTHEAST LLC

35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002
860-692-7100

PROJECT MANAGER
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SITE SOLUTIONS
Turnkey Wireless Development
420 MAIN STREET, BLDG 4
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203-275-6669

CONSULTANT:
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462 WALNUT STREET
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617-212-3123



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NEW HAVEN, CT 06515

SHEET TITLE:
A-6: CONCRETE PAD DETAILS

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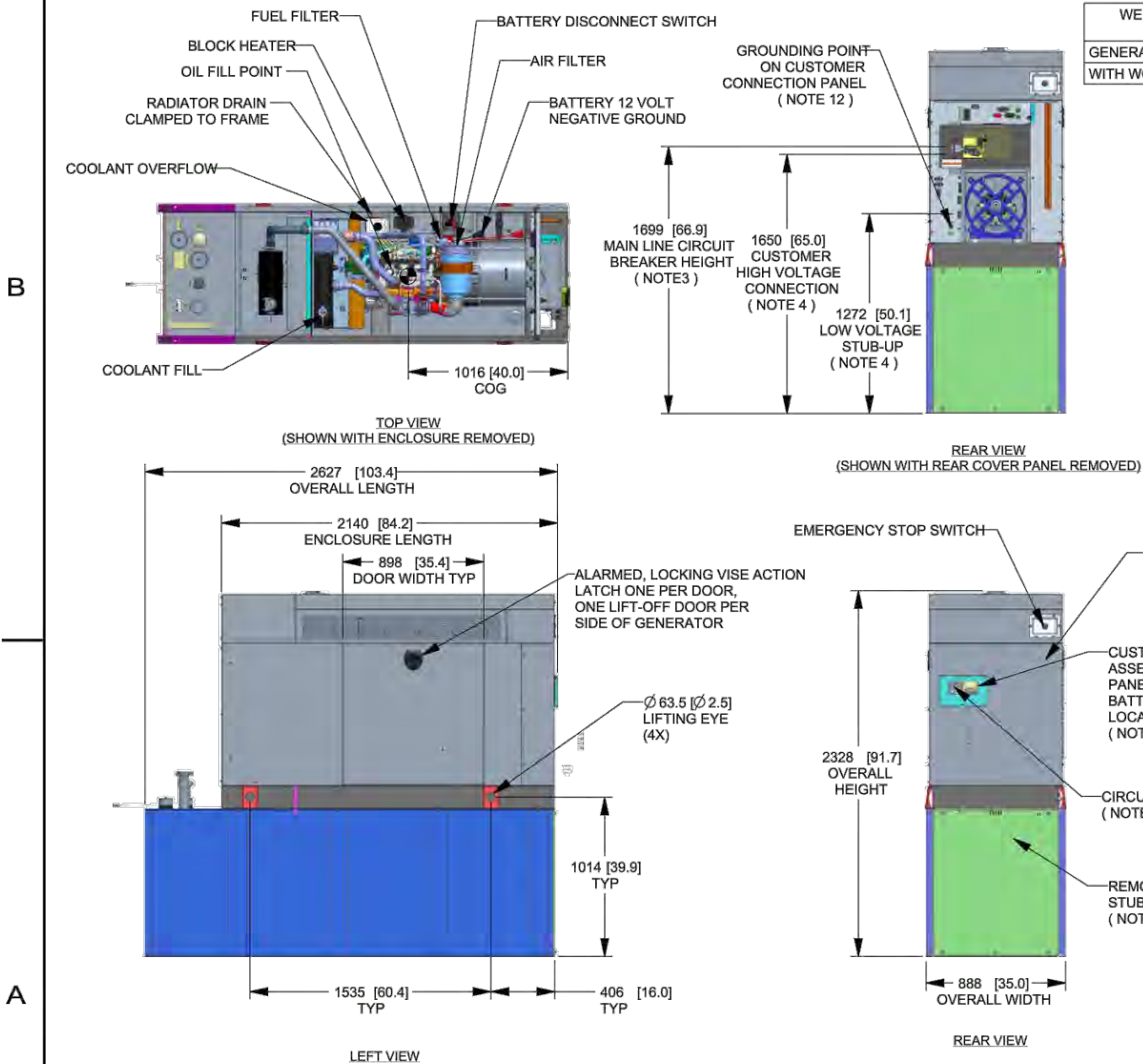
GENERAC 25 KW AC GENERATOR

SH 1/2 REV 2 WINDCHILL VERSION 2.12

WEIGHT DATA WITH EMPTY BASETANK (SEE NOTE 6)	
GENERATOR AS SHOWN	1336 [2946]
WITH WOODEN SHIPPING SKID	1354 [2984]

WEIGHT: KG [LBS]
DIMENSIONS: MM [INCHES]

- NOTES:
1. THIS UNIT MUST BE INSTALLED IN ACCORDANCE WITH CURRENT APPLICABLE NFPA 37 AND NFPA 70 STANDARDS AS WELL AS ANY OTHER FEDERAL, STATE, AND LOCAL CODES.
 2. BATTERY (12 VOLT NEGATIVE GROUND SYSTEM).
 3. CONTROL PANEL / CIRCUIT BREAKER INFORMATION:
 - MAIN LINE CIRCUIT BREAKER 125 AMPS
 - SEE SPECIFICATION SHEET OR OWNERS MANUAL
 - ACCESSIBLE THROUGH CUSTOMER ACCESS ASSEMBLY DOOR ON REAR OF GENERATOR.
 - CONTROL PANEL INCLUDES INTEGRATED BATTERY CHARGER
 4. REMOVE THE REAR STUB-UP AND REAR ENCLOSURE COVER PANEL TO ACCESS THE STUB-UP AREAS AS FOLLOWS:
 - HIGH VOLTAGE CONNECTION INCLUDING AC LOAD LEAD CONDUIT CONNECTION, NEUTRAL CONNECTION, AND BATTERY CHARGER 120 VOLT AC (0.5 AMP MAX) CONNECTION.
 - LOW VOLTAGE CONNECTION INCLUDING TRANSFER SWITCH CONTROL WIRES
 5. ENGINE SERVICE CONNECTIONS
 - OIL DRAIN: 1/2" NPT
 - RADIATOR DRAIN : HOSE CLAMPED TO FRAME
 6. CENTER OF GRAVITY AND WEIGHT MAY CHANGE DUE TO UNIT OPTIONS.
 7. BOTTOM OF GENERATOR SET MUST BE ENCLOSED TO PREVENT PEST INTRUSION AND RECIRCULATION OF DISCHARGE AIR AND/OR IMPROPER COOLING AIR FLOW.
 8. REFERENCE OWNERS MANUAL FOR LIFTING WARNINGS.
 9. MOUNTING BOLTS OR STUDS TO MOUNTING SURFACE SHALL BE 5/8-11 GRADE 5 (USE STANDARD SAE TORQUE SPECS)
 10. MUST ALLOW FREE FLOW OF INTAKE AIR, DISCHARGE AIR AND EXHAUST. SEE SPEC SHEET FOR MINIMUM AIR FLOW AND MAXIMUM RESTRICTION REQUIREMENTS.
 11. GENERATOR MUST BE INSTALLED SUCH THAT FRESH COOLING AIR IS AVAILABLE AND THAT DISCHARGE AIR FROM RADIATOR IS NOT RECIRCULATED. RECOMMENDED MINIMUM PERIMETER(3FT) AND VERTICAL OVER EXHAUST (5FT) CLEARANCE FOR SITE LOCATION.
 12. GENERATOR MUST BE GROUNDED.



DRAWING CREATED FROM PRO/ENGINEER 3D FILE. ECO MODIFICATION TO BE APPLIED TO SOLID MODEL ONLY.

INSTALLATION DRAWING

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ELECTRONICALLY APPROVED INSIDE WINDCHILL

GENERAC				
TITLE				
INSTALLATION D2.2L 25KW Y06 PD				
ISSUE DATE: 5/10/18				
SIZE	CAGE NO	DWG NO	REV	
B	N/A	10000036728	2	
SCALE	0.031	WT-KG	SEE ABOVE	SHEET 1 of 2

GENERATOR SPECIFICATION
SCALE: N.T.S.

APPLICANT:
T-Mobile
T-MOBILE NORTHEAST LLC

35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002
860-692-7100

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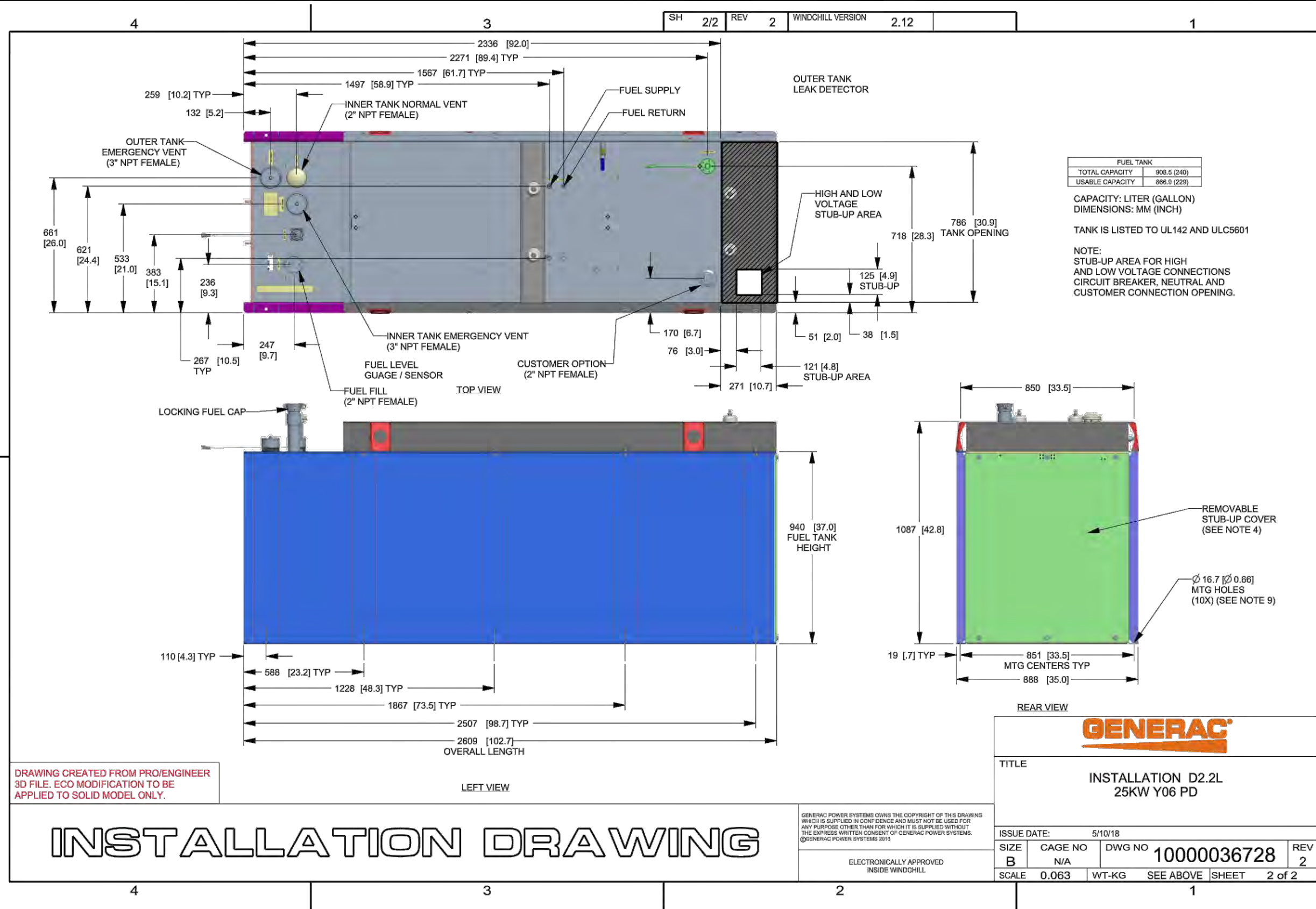


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NEW HAVEN, CT 06515

SHEET TITLE:
A-7: GENERATOR DETAILS



APPLICANT:
T-Mobile
T-MOBILE NORTHEAST LLC

35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002
860-692-7100

PROJECT MANAGER

NSS **NORTHEAST**
SITE SOLUTIONS

Turkey Wireless Development

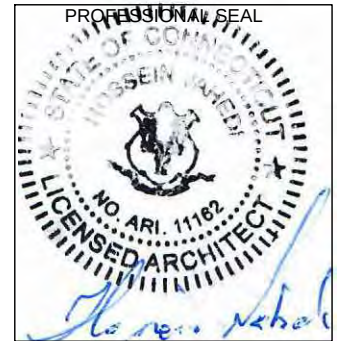
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FORESITE LLC

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REV	DESCRIPTION	DATE
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6	STRUCTURAL REF. UPDATE	04/21/20

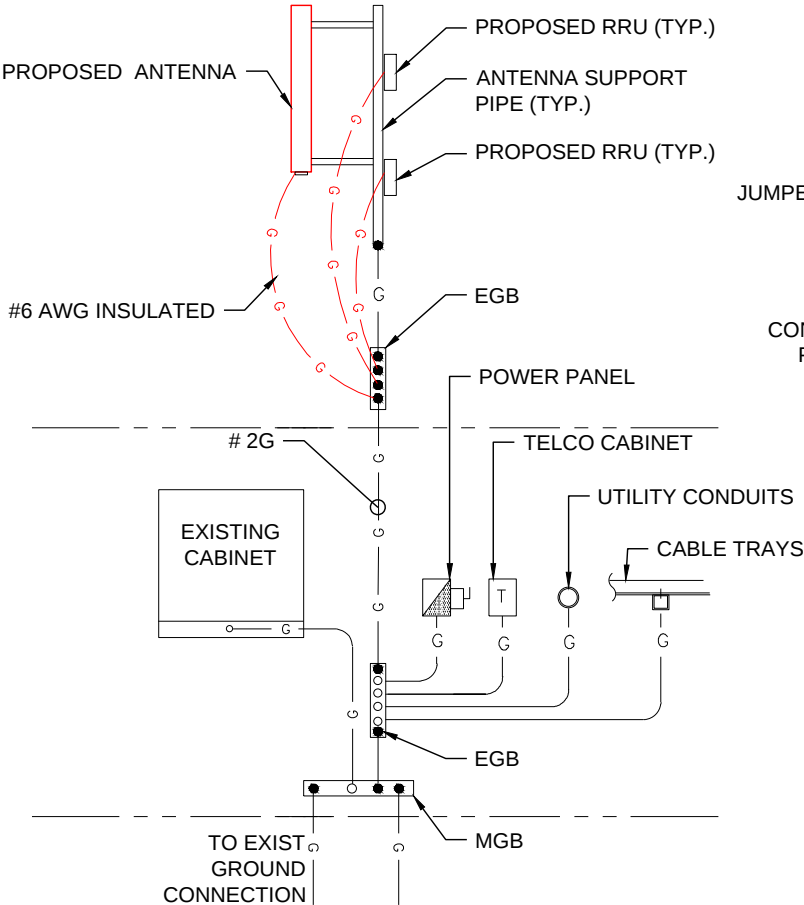
SITE NUMBER: CT11086B
SITE NAME: NEW HAVEN/WC X59
SITE ADDRESS: 240 BALDWIN DRIVE
NEW HAVEN, CT 06515

SHEET TITLE:
A-8: GERATOR DETAILS

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ELECTRICAL & GROUNDING NOTES

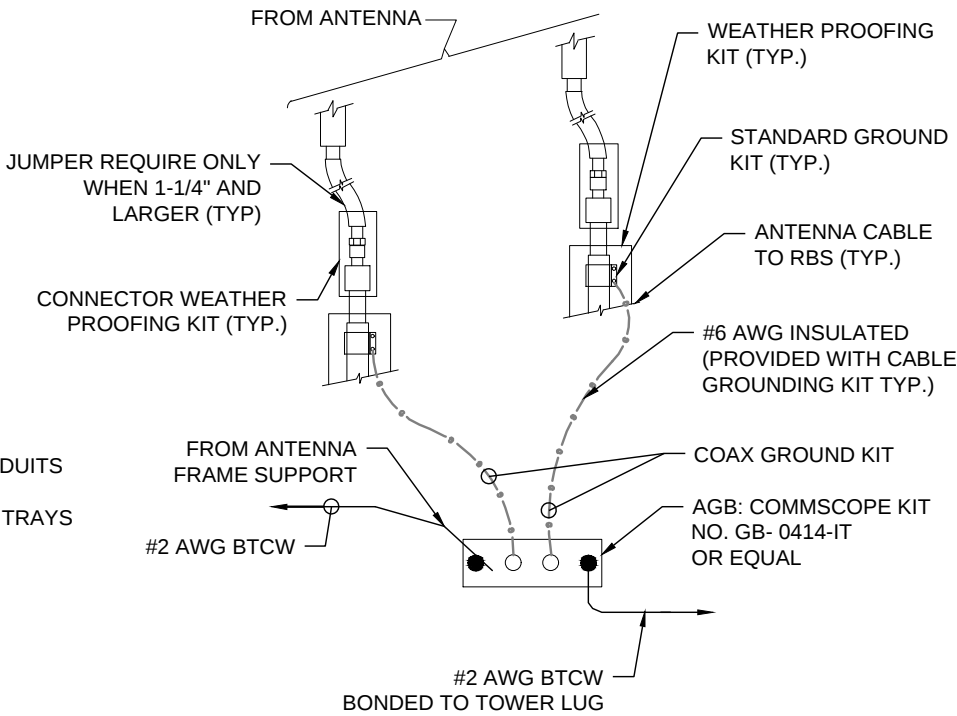
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3. THE ELECTRICAL WORK INCLUDES ALL LABOR AND MATERIAL DESCRIBED BY DRAWINGS AND SPECIFICATION INCLUDING INCIDENTAL WORK TO PROVIDE COMPLETE OPERATING AND APPROVED ELECTRICAL SYSTEM.
4. GENERAL CONTRACTOR SHALL PAY FEES FOR PERMITS, AND RESPONSIBLE FOR OBTAINING SAID PERMITS AND COORDINATION OF INSPECTIONS.
5. ELECTRICAL AND TELCO WIRING OUTSIDE A BUILDING AND EXPOSED TO WEATHER SHALL BE IN WATER TIGHT GALVANIZED RIGID STEEL CONDUITS OR SCHEDULE 80 PVC (AS PERMITTED BY CODE) ND WHERE REQUIRED IN LIQUID TIGHT FLEXIBLE METAL OR NONMETALLIC CONDUITS.
6. RIGID STEEL CONDUITS SHALL BE GROUNDED AT BOTH ENDS.
7. ELECTRICAL WIRING SHALL BE COPPER WITH TYPE XHHW, THWN, OR THIN INSULATION.
8. RUN ELECTRICAL CONDUIT OR CABLING BETWEEN ELECTRICAL ROOM AND PROPOSED CELL SITE ARE PEDESTAL AS INDICATED ON THIS DRAWING. PROVIDE FULL LENGTH PULL ROPE. COORDINATE INSTALLATION WITH UTILITY COMPANY.
9. RUN TELCO CONDUIT OR CABLE BETWEEN TELEPHONE UTILITY DEMARCATION POINT AND PROPOSED CELL SITE TELECOM CABINET AND RBS CABINET AS INDICATED ON DRAWING A -1.
10. PROVIDE FULL LENGTH PULL ROPE INSTALLED TELCO CONDUIT. PROVIDE GREENLEE CONDUIT MEASURING TAPE AT EACH END.
11. ALL EQUIPMENT LOCATED OUTSIDE SHALL HAVE NAME 3R ENCLOSURE.
12. GROUNDING SHALL COMPLY WITH NEC ART. 250.
13. GROUNDING COAX CABLE SHIELDS MINIMUM AT BOTH ENDS USING MANUFACTURES COAX CABLE GROUNDING KITS SUPPLIED BY PROJECT OWNER.
14. USE #6 COPPER STRANDED WIRE WITH GREEN COLOR INSTALLATION FOR ABOVE GRADE GROUNDING (UNLESS OTHERWISE SPECIFIED) AND #2 SOLID TINNED BARE COPPER WIRE FOR BELOW GRADE GROUNDING AS INDICATED ON THE GROUND.
15. ALL GROUND CONNECTION TO BE BURNDY HYGROUND COMPRESSION TYPE CONNECTORS OR CADWELD EXOTHERMIC WELD. DO NOT ALLOW BARE COPPER WIRE TO BE IN CONTACT WITH GALVANIZED STEEL.
16. ROUTE GROUNDING CONDUCTORS ALONG THE SHORTEST AND STRAIGHTEST PATH POSSIBLE, EXCEPT AS OTHERWISE INDICATED. GROUNDING LEADS SHOULD NEVER BE BENT AS RIGHT ANGLE. ALWAYS MAKE AT LEAST 12" RADIUS BENDS. #6 WIRE CAN BE BENT AT 6" RADIUS WHEN NECESSARY BOND ANY METER OBJECTS WITHIN 7 FEET OF PROPOSED EQUIPMENT OR CABINET TO MASTER GROUND BAR.
17. CONNECTIONS TO MGB SHALL BE ARRANGED IN THREE MAIN GROUPS: SURGE PROCEDURES (COAXIAL CABLE GROUND KITS, TELCO AND POWER PANEL GROUND); (GROUNDING ELECTRODE RING OR BUILDING STEEL); NON-SURGING OBJECTS (EGB GROUND IN RBS UNIT).
18. CONNECTIONS TO GROUND BARS SHALL BE MADE WITH TWO HOLE COMPRESSION TYPE COPPER LUGS. APPLY OXIDE INHIBITING COMPOUND TO ALL LOCATIONS.
19. APPLY OXIDE INHIBITING COMPOUND TO ALL COMPRESSION TYPE GROUND CONNECTION.
20. BOND ANTENNA MOUNTING BRACKETS, COAXIAL CABLE GROUND KITS, AND ALNA TO EGB PLACED NEAR THE ANTENNA LOCATION.
21. BOND ANTENNA EGB'S AND MGB TO WATER MAIN.
22. TEST COMPLETED GROUND SYSTEM AND RECORD RESULTS FOR PROJECT CLOSE-OUT DOCUMENTATION.
23. BOND ANY METAL OBJECTS WITHIN 7 FEET OF PROPOSED EQUIPMENT OR CABINET TO MASTER GROUND BAR.
24. VERIFY PROPOSED SERVICE UPGRADE WITH LOCAL UTILITY COMPANY PRIOR TO CONSTRUCTION.



GROUNDING RISER DIAGRAM

SCALE: N.T.S

1
E-1

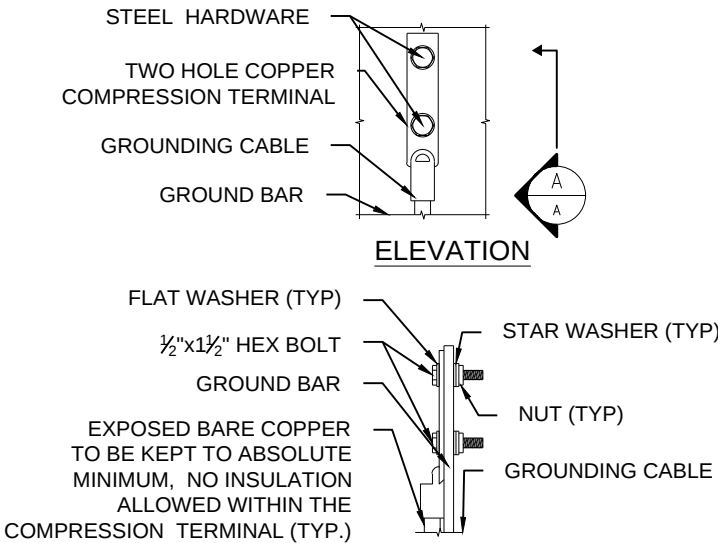


NOTES:
INSTALL CABLE GROUND KIT ABOVE HORIZONTAL BEND
AND ALWAYS DIRECT GROUND WIRE DOWN TO AGB/EGB

TOWER TOP CABLE GROUNDING DETAIL

SCALE: N.T.S

2
E-1



SECTION A-A

NOTES:

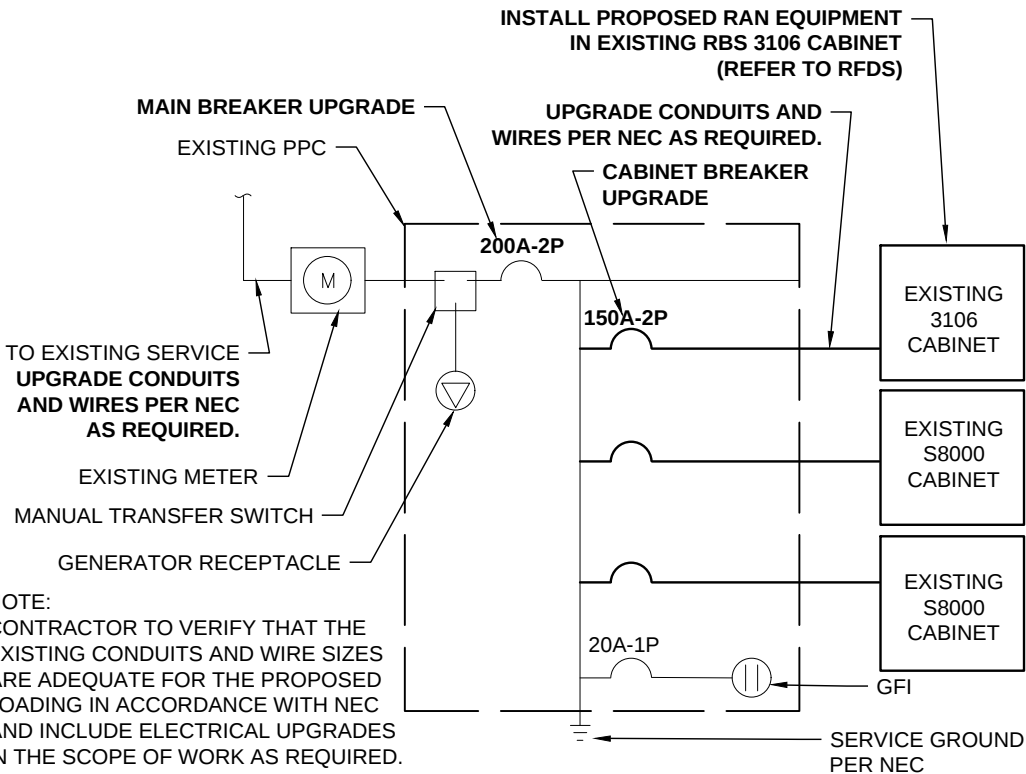
1. "DOUBLING UP" OR "STACKING " OF CONNECTION IS NOT PERMITTED.
2. OXIDE INHIBITING COMPOUND TO BE USED AT ALL LOCATIONS.

TYPICAL GROUND BAR

CONNECTIONS DETAIL

SCALE: N.T.S

3
E-1



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

ONE LINE DIAGRAM

SCALE: N.T.S

4
E-1

APPLICANT:
T-Mobile
T-MOBILE NORTHEAST LLC

35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002
860-692-7100

PROJECT MANAGER
NSS NORTHEAST
SITE SOLUTIONS
Turnkey Wireless Development
420 MAIN STREET, BLDG 4
STURBRIDGE, MA 01566
203-275-6669

CONSULTANT:
FORESITE LLC
Architects . Engineers . Surveyors
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SITE NUMBER: CT11086B
SITE NAME: NEW HAVEN/WC X59
SITE ADDRESS: 240 BALDWIN DRIVE
NEW HAVEN, CT 06515

SHEET TITLE:
E-1: GROUNDING AND
ELECTRICAL DETAILS

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GENERAL ELECTRICAL NOTES

1. ALL ELECTRICAL WORK SHALL CONFORM TO THE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE (NEC) AS WELL AS APPLICABLE STATE AND LOCAL CODES INCLUDING LATEST EDITIONS OF:
NFPA - NATIONAL FIRE PROTECTION ASSOCIATION
UL - UNDERWRITERS LABORATORIES
NEC - 2014 NATIONAL ELECTRICAL CODE NEMA - NATIONAL ELECTRIC MANUFACTURERS ASSOCIATION
OSHA - OCCUPATIONAL SAFETY AND HEALTH ACT
IBC - 2009 INTERNATIONAL BUILDING CODE
2. ALL ELECTRICAL ITEMS SHALL BE U.L. APPROVED OR LISTED AND PRODUCED PER SPECIFICATION REQUIREMENTS.
3. THE ELECTRICAL WORK INCLUDES ALL LABOR AND MATERIAL DESCRIBED BY DRAWINGS AND SPECIFICATION INCLUDING INCIDENTAL WORK TO PROVIDE COMPLETE OPERATING AND APPROVED ELECTRICAL SYSTEM.
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6. RIGID STEEL CONDUITS SHALL BE GROUNDED AT BOTH ENDS.
7. ELECTRICAL WIRING SHALL BE COPPER WITH TYPE XHHW, THWN, OR THIN INSULATION.
8. ALL EQUIPMENT LOCATED OUTSIDE SHALL HAVE NAME 3R ENCLOSURE.
9. GROUNDING SHALL COMPLY WITH NEC ART. 250.
10. GROUNDING COAX CABLE SHIELDS MINIMUM AT BOTH ENDS USING MANUFACTURES COAX CABLE GROUNDING KITS SUPPLIED BY PROJECT OWNER.
11. USE #6 COPPER STRANDED WIRE WITH GREEN COLOR INSTALLATION FOR ABOVE GRADE GROUNDING (UNLESS OTHERWISE SPECIFIED) AND #2 SOLID TINNED BARE COPPER WIRE FOR BELOW GRADE GROUNDING AS INDICATED ON THE GROUND.
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18. BOND ANY METAL OBJECTS WITHIN 7 FEET OF PROPOSED EQUIPMENT OR CABINET TO MASTER GROUND BAR.
19. VERIFY PROPOSED SERVICE UPGRADE WITH LOCAL UTILITY COMPANY PRIOR TO CONSTRUCTION.
20. EXISTING UNDERGROUND UTILITY LOCATIONS ARE UNKNOWN. GENERAL CONTRACTOR SHALL HAND-EXCAVATE TO REQUIRED SUB-GRADE DEPTH, SUFFICIENT TEST HOLES OR AS DIRECTED / REQUIRED BY CONSTRUCTION MANAGER. ALL PROPOSED UNDERGROUND UTILITY TRENCHES SHALL BE HAND-EXCAVATE AS REQUIRED. GENERAL CONTRACTOR IS RESPONSIBLE FOR ANY REQUIRED SPECIAL TEMPORARY PROTECTION OF, PHYSICAL DAMAGE TO, OR REPAIR OF EXISTING UNDERGROUND CONDUIT INCLUDING RESTORATION OF SERVICE.

NOTES:

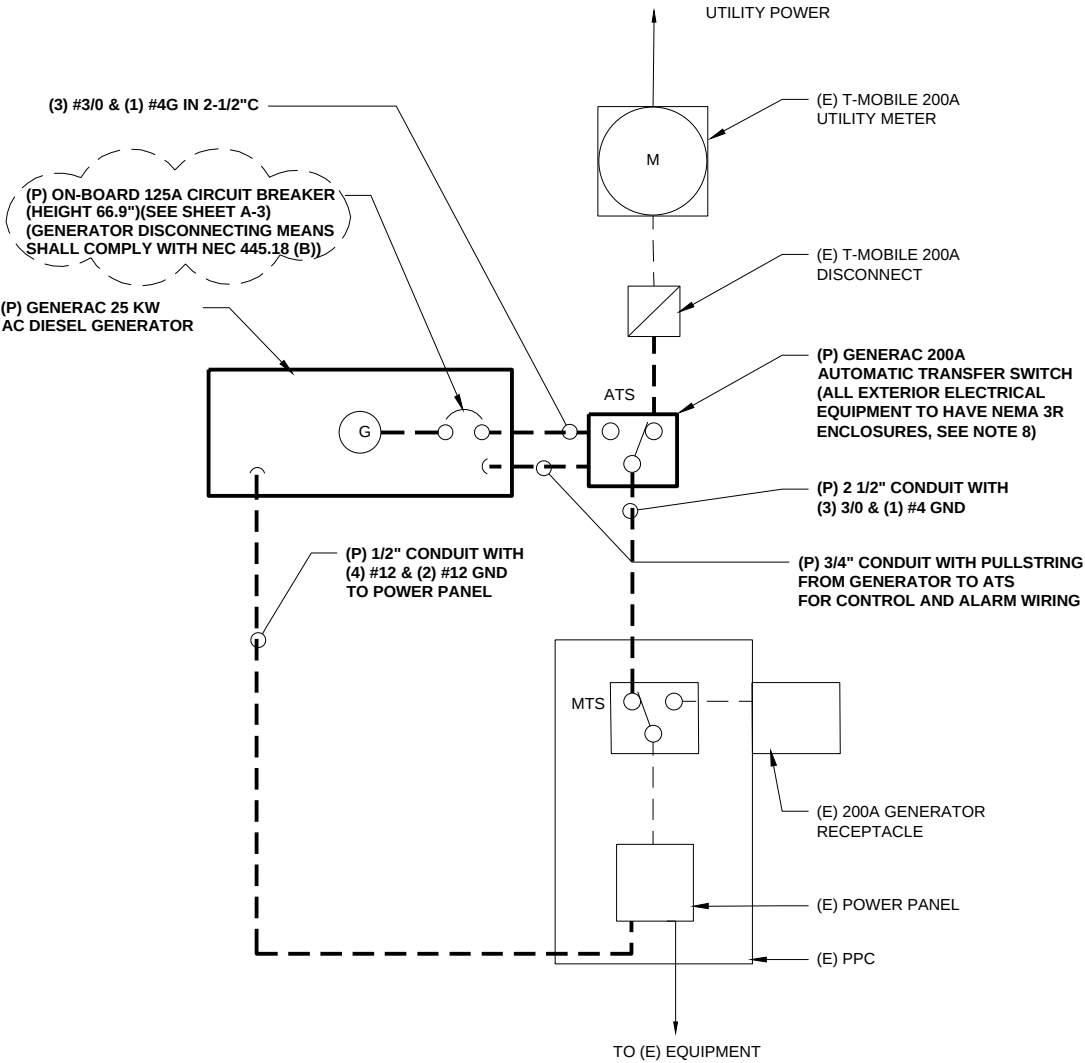
G.C. TO VERIFY THAT THE EXISTING AND PROPOSED CONDUITS AND WIRE SIZES ARE ADEQUATE FOR THE PROPOSED SCOPE IN ACCORDANCE WITH NEC AND INCLUDE ELECTRICAL UPGRADES IN THE SCOPE OF WORK AS REQUIRED.

NOTES:

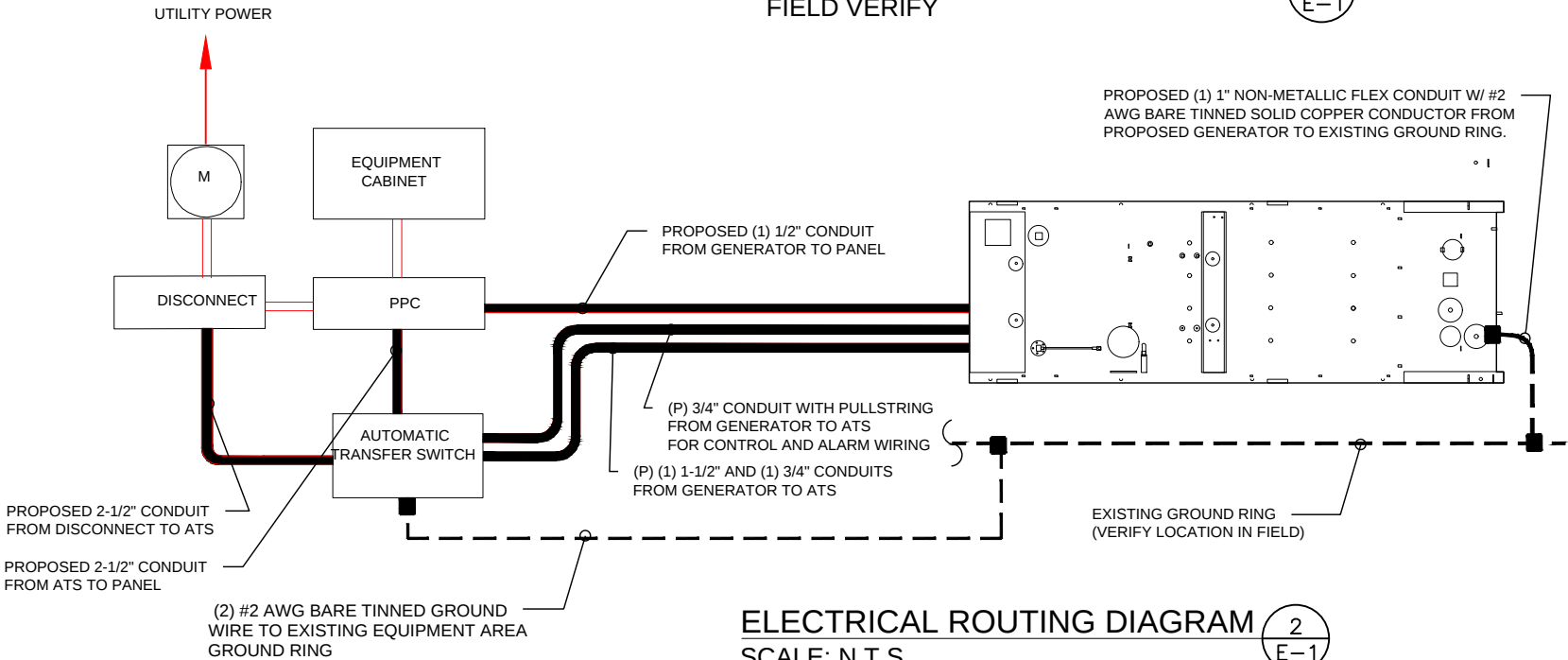
DIAGRAM AS SHOWN, IS A GENERIC ROUTING SCHEMATIC BASED ON AVAILABLE INFORMATION AND MAY NOT REPRESENT ACTUAL FIELD CONDITIONS. CONTRACTOR SHOULD INSTALL THE GENERATOR, EQUIPMENT AND CONNECTIONS BASED ON VERIFIED ELECTRICAL AUDITS AND PER MANUFACTURER'S INSTALLATION GUIDELINES AS WELL AS ALL APPLICABLE LOCAL AND NATIONAL CODES AND REQUIREMENTS.

GROUNDING NOTES:

1. GROUNDING SHALL COMPLY WITH NEC ART. 250 AND MANUFACTURER'S RECOMMENDATIONS. TIE INTO THE EXISTING GROUNDING SYSTEM.
2. CONTRACTOR SHALL INSTALL GROUND RODS ON ALL UNDERGROUND GROUNDING RUNS LONGER THAN 10'. GROUND RODS WILL BE INSTALLED ON 20' CENTERS MAXIMUM.
3. ALL DOWN CONDUCTORS MUST GO DOWN PER NFPA 780.
4. CONTRACTOR SHALL NOTIFY THE CONSTRUCTION MANAGER WHEN THE GROUNDING SYSTEM IS COMPLETE. THE CONSTRUCTION MANAGER SHALL INSPECT THE GROUNDING SYSTEM PRIOR TO BACKFILLING.
5. CONTRACTOR MY USE EXISTING CONDUITS AND CONDUCTORS PROVIDED THEY ARE IN GOOD CONDITION AND ARE SUFFICIENTLY RATED.



TYP. ONE LINE DIAGRAM
FIELD VERIFY



ELECTRICAL ROUTING DIAGRAM
SCALE: N.T.S

APPLICANT:

T-Mobile
T-MOBILE NORTHEAST LLC

35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002
860-692-7100



PROJECT MANAGER

NSS NORTHEAST
SITE SOLUTIONS
Turnkey Wireless Development
420 MAIN STREET, BLDG 4
STURBRIDGE, MA 01566
203-275-6669

CONSULTANT:

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Architects . Engineers . Surveyors

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SITE NUMBER: CT11086B

SITE NAME: NEW HAVEN/WC X59
SITE ADDRESS: 240 BALDWIN DRIVE
NEW HAVEN, CT 06515

SHEET TITLE:

E-2: GENERATOR GROUNDING
AND ELECTRICAL DETAILS

Exhibit D



Submitted to
AT&T / Smartlink
85 Rangeway Road
Building 3, Suite 102
N. Billerica, MA 01862

Submitted by
AECOM
500 Enterprise Drive,
Suite 3B
Rocky Hill, CT 06067
April 10, 2020

Sprint /
Airosmith Development, Inc.
32 Clinton Street
Saratoga Springs, NY 12866

T-Mobile / Northeast Site
Solutions
420 Main Street
Sturbridge, MA 01566

DETAILED STRUCTURAL ANALYSIS AND MODIFICATION OF AN EXISTING 120' SELF SUPPORT LATTICE AND FOUNDATION FOR PROPOSED ANTENNA ARRANGEMENT



at&t

Sprint



.. T .. Mobile ..



smartlink



AT&T Site ID # : CTLO2013
Sprint Site I.D # : CT03XC003
T-Mobile Site I.D. #: CT11086A
Site Name : New Haven – State Police Tower #27
Site Address: 142 Baldwin Drive, New Haven, CT

60579836 / SMK-003
60579840 / ASM-010
60579905 / NSS-044 Revision 1

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- 3. ANALYSIS METHODOLOGY AND LOADING CONDITIONS**
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 - **REINFORCEMENT DRAWINGS SK-1 THROUGH SK-5**
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 - **TNX TOWER INPUT / OUTPUT SUMMARY**
 - **TNX TOWER FEEDLINE DISTRIBUTION CHART**
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 - **ANCHOR BOLT ANALYSIS**
 - **FOUNDATION ANALYSIS**
 - **GEOTECHNICAL STUDY**
 - **ANALYSIS UNDER TIA-222-F DESIGN CRITERIA (DESPP / CSP)**

1. EXECUTIVE SUMMARY

This report summarizes the structural analysis and modification of the existing 120' self-supporting lattice tower structure located at 142 Baldwin Drive, New Haven, Connecticut.

The structural analysis was conducted in accordance with the 2018 Connecticut State Building Code which includes the TIA-222-G¹ Standard, 2015 International Building Code, the 2018 Connecticut State Building Code Amendments, the AISC² Load Resistance Factor Design (LRFD), the ASCE 7³ design Code, and the Connecticut State Police Requirements which include the TIA/EIA-222-F⁴.

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

The proposed T-Mobile, AT&T and Sprint antenna installations are listed below:

Proposed Appurtenances	Carrier	Antenna Center Elevation
<u>Remove:</u>		
(3) Ericsson AIR 21 B2A/B4P Panel Antennas (3) Commscope LNX-6515DS-A1M Panel Antennas (3) Ericsson RRUS-11 RRH Units	T-Mobile (existing)	@ 95'
(2) CCI HPA-65R-BUU-H8 Panel (Alpha & Beta Sectors, 1 Panel each Sector) (1) CCI HPA-65R-BUU-H6 Panel Antenna (Gamma Sector) (3) Ericsson RRUS-11 RRH Units (3) Ericsson RRUS-32 B2 RRH Units (3) Ericsson RRUS-12 RRH Units	AT&T (existing)	@ 80'
(3) RFS APXVSP18-C-A20 Panel Antennas	Sprint (existing)	@ 71'
<u>Install:</u>		
(3) RFS APXVAARR24_43—U-NA20 Panel Antennas (3) Ericsson AIR 3246 B66 Panel Antennas (3) Ericsson 2217 B2 Radio Units (RRH) (3) Ericsson 4449 B71 + B12 Radio Units (RRH) (1) Ericsson 6x12 (6 AWG) Hybrid Cable	T-Mobile (Proposed)	@ 95'
(2) Kathrein 800-10966 Panel Antennas (Alpha & Beta Sectors, 1 panel each sector) (1) Kathrein 800-10965 Panel antenna (Gamma Sector) (3) Ericsson RRUS-E2 B29 RRH Units (3) Ericsson B2/B66A Radio 8843 RRH Units (3) Ericsson B5/B12 Radio 4449 RRH Units (1) DC6-48-60-0-8F Surge Suppressor Units (2) 1/2" Diameter DC Cables	AT&T (Proposed)	@ 80'

Proposed Appurtenances	Carrier	Antenna Center Elevation
<u>Install (Continued):</u> (3) Commscope NNVV-65B-R4 Panel Antennas (3) Nokia Dual Band MIMO AAHC Panel Antennas (3) 800 MHz RRH Units	Sprint (Proposed)	@ 71'

The results of an initial structural analysis indicated that the existing tower and anchor bolts did not have enough capacity for the proposed loading conditions above. The tower structure and anchor bolts require modifications shown on SK-1 through SK-5. **Once the modifications indicated on sheets SK-1 through SK-5 are performed, the modified structure and anchor bolts are considered structurally adequate with the load specification specified above with the existing and proposed antenna loading herein.**

The results of the analysis indicate the modified tower's sway (deflection) is 0.3125 degrees and the modified tower's twist (rotation) is 0.1428 degrees. These figures combined are within the Connecticut State Police requirements of 0.75 degrees for combined twist (rotation) and sway (deflection) when applying the TIA/EIA-222-F design conditions.

This analysis is based on:

- 1) The tower structure's theoretical capacity, not including any assessment of the condition of the tower.
- 2) Tower geometry and structural member sizes utilized in the preparation of this report were obtained from manufacturer's original design documents prepared by Stainless, Inc. report number 358810, noted as revision B, dated March 3, 1995.
- 3) Tower Mapping and Existing Inventory via tower climb, performed by D&K Nationwide Communications, Inc. on March 30, 2016.
- 5) Antenna inventory provided by Connecticut State Police via e-mail on April 7, 2016.
- 6) Previous structural analysis and evaluation performed by AECOM on behalf of AT&T, project number 60565638 / SMK-001, signed and sealed in May 21, 2018.
- 7) Previous structural analysis and evaluation performed by AECOM on behalf of T-Mobile, project number 60577309 / NSS-043, signed and sealed on May 25, 2018.
- 8) Previous structural analysis and evaluation performed by AECOM on behalf of Sprint, project number 60565103 / ASM-005, signed and sealed on June 11, 2018.
- 9) Geotechnical Review of Existing State Police Communications Tower #27, prepared by Welti Geotechnical, P.C. dated August 13, 2018.
- 10) Previous antenna Mount Analysis Report and analysis performed by Infinigy on behalf of AT&T, project number 499-006, signed and sealed on August 5, 2019.
- 11) Construction Drawings of proposed AT&T antennas, signed and sealed on August 5, 2019.
- 12) Antenna and mount configuration as specified within Section 2 and 6 of this report.
- 13) Coax cable orientation as specified in section 6 of this report.

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

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

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

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

1. EXECUTIVE SUMMARY - *continued*

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

If you should have any questions, please contact Mike Egan at (860) 263-5817.

Sincerely,

AECOM,



Richard A. Sambor, P.E.
Senior Structural Engineer



RAS/mcd

cc: DJR, CF/Book - AECOM

2. INTRODUCTION

The subject tower is located at 142 Baldwin Drive, New Haven, Connecticut. The structure is an existing 120' self supporting steel tapered lattice tower, designed and manufactured by Stainless, Inc.

The structural analysis was conducted in accordance with the following:

- TIA-222-G Standard for Standard for a wind velocity of range of 95 mph to 115 mph (3-second gust) and 50 mph (3-second gust) concurrent with 0.75" ice thickness, considered to increase in thickness with height
- 2015 International Building Code with 2018 Connecticut State Building Code Amendments for a wind speed of 105 mph (3-second gust)
- 2010 AISC Load Resistance Factor Design (LRFD)
- 2010 ASCE 7 Minimum Design Loads for Buildings and Other Structures for the ice thickness referenced in the TIA-222-G Standard
- Connecticut State Police Requirements for a wind velocity of 90 mph (fastest mile) and 90 mph (fastest mile) concurrent with 0.5" ice. Twist (rotation) and sway (deflection) were determined in accordance with Connecticut State Police Requirements for a wind velocity of 90 mph (fastest mile) concurrent with 0.5" ice, analyzed under the TIA/EIA-222-F design Standard.

The inventory together with the proposed T-Mobile, AT&T and Sprint antenna arrangement is summarized in the table below:

Antenna Type	Carrier	Mount	Antenna Centerline Elevation	Cable
(1) 4' Lightning Rod	#27 Tower (existing)	18' Pipe Mast on Top of Tower	138'	---
(1) UHF3 Dipole Antenna	#26 CSP-15 (existing)	2' Flange Mount	120'	(1) LDF6-50A
(1) UHF-6 Whip Antenna	CSP-1 (existing)	Share with below mount	120'	(1) LDF5-50A
(1) OGT9-806 Whip Antenna	#25-B CSP-7 (existing)	Share with below Mount	120'	(1) LDF7-50A
(1) SC479-HF1LDF Whip Antenna	#24-C CSP-21 (existing)	Share with below Mount	120'	(1) AVA7-50A
(1) OGT9-806 Whip Antenna	#24-D CSP-8 (existing)	Share with below Mount	120'	(1) LDF7-50A
(1) (Inverted) SC479-HF1LDF Whip Antenna	#25-A CSP-17 (existing)	(2) 5' Sidearm Mounts w/ 8' Pipe	114'	(1) AVA7-50A
(1) Junction Box	#24-A (existing)	(2) 4' Sidearm mounts w/ 8' Pipe	113.5'	(2) 3/8"
(1) (Inverted) Whip Antenna	#24-B (existing)	Share with above Mount	113.5'	(1) 1/2"
(1) (Inverted) Dipole Antenna	#24-E (existing)	Share with above Mount	113.5'	(1) 1-1/4" Cable
(1) (Inverted) SC479-HF1LDF Whip Antenna	#23-A CSP-22 (existing)	Share with above mount	112.75'	(1) AVA7-50A

Antenna Type	Carrier	Mount	Antenna Centerline Elevation	Cable
(1) (Inverted) SC479-HF1LDF Whip Antenna	#23-B CSP-23 (existing)	Share with above mount	112.75'	(1) AVA7-50A
(1) Sinclair Whip Antenna	#22 (existing)	(1) 4'x8' Gate-boom 3' Standoff w/ 2-1/2" Pipe	112'	(3) 1 5/8"
(1) Junction Box	#23-C (existing)	(1) Unistrut mount attached to Waveguide ladder	112'	(1) 1/2"
(1) PA6-65 Dish Antenna	#21 CSP-5 (existing)	2-1/2" Pipe Mounted to leg	110'	(1) WEP65
(1) (Inverted) SC479-HF1LDF Whip Antenna	CSP-9 (existing)	See above mount @ 113'	110'	(1) LDF7-50A
(1) SC479-HF1LDF Whip Antenna	CSP-18 (existing)	See above mount @ 113'	110'	(1) AVA7-50A
(1) (Inverted) SC479-HF1LDF Whip Antenna	CSP-19 (existing)	See above mount @ 113'	110'	(1) AVA7-50A
(1) 432E-83I-01T TTA Unit	CSP-20 (existing)	See above mount @ 113'	110'	(1) LDF4-50A
(1) WPA-70040-4CF-EDIN Panel Antenna	CSP-28 (existing)	Leg Mounted	110'	(1) AVA7-50A
(1) PA6-65 Dish Antenna	#20 CSP-3 (existing)	2-1/2" Pipe Mounted to leg	109'	(1) WEP65
(1) PA6-65 Dish Antenna	#19 CSP-6 (existing)	2-1/2" Pipe Mounted to leg	107'	(1) WEP65
(1) SE419-SWBPALDF Panel Antenna	CSP-29 (existing)	Leg Mounted	105'	(1) AVA7-50A
(1) 432E-83I-01T TTA Unit	CSP-30 (existing)	Face Mounted	105'	(1) LDF4-50A
(1) 422-86A-99116 TTA Unit	CSP-31 (existing)	Face Mounted	105'	(1) LDF3-50A
(1) 422-86A-99116 TTA Unit	CSP-32 (existing)	Face Mounted	105'	(1) LDF3-50A
(1) AP13-850 Panel Antenna	#18A CSP-12 (existing)	2-1/2" Pipe Mounted to Face	101'	(1) LDF7-50A
(1) SE419-SWBPALDF Panel Antenna	#18B CSP-13 (existing)	2-1/2" Pipe Mounted to Face	101'	(1) LDF7-50A
(3) APXVAARR24_43—U-NA20 Panels (3) Ericsson AIR 3246 B66 Panels (3) Ericsson 2217 B2 RRH's (3) Ericsson 4449 B71 + B12 RRH's	T-Mobile (Proposed)	Shared with Below Mount	95'	(1) 1-1/4" F.O. Cable (6x12 6AWG)
(3) AIR32 B66 Panel Antennas (3) TMA Units	T-Mobile (existing)	(3) EUSF10-U T-Arm Mounts attached to Leg	95'	(6) 1-5/8" (2) 1-1/4" Fiber Optic Cables
(1) (Inverted) OGT9-806 Whip Antenna	#16A CSP-10 (existing)	(2) 5' Standoff Mounts w/ 4-1/2" Pipe Mount	92'	(1) LDF7-50A
(1) PD-458 Whip Antenna	#16B CSP-2 (existing)	Share with above mount	92'	(1) LDF5-50A

Antenna Type	Carrier	Mount	Antenna Centerline Elevation	Cable
(1) Dipole Antenna	#15 (existing)	3' Sidearm w/ 2" Pipe Mount	86'	(1) 7/8"
(1) 3' Yagi Antenna	#12 (existing)	Share with above mount	81'	(1) 1/2"
(1) DB-230 Yagi Antenna	#13 CSP-11 (existing)	Share with above mount	81'	(1) LDF5-50A
(2) Kathrein 800-10966 Panel Antennas (1 A; 1 B Sectors) (1) Kathrein 800-10965 Panel antenna (Gamma Sector) (3) RRUS-E2 B29 RRH Units (3) B2/B66a 8843 Radio RRH Units (3) B5/B12 Radio 4449 Radio RRH (1) DC6-48-60-0-8F Surge Suppressor Units	AT&T (Proposed)	(3) SitePro1 VFA12-WLL-30120	80'	(2) DC Cables (analysis applied 1/2" diameter cables)
(2) CCI TPA-65R-LCUUUU-H8 Panel Antennas (Alpha & Beta Sectors, 1 panel each sector) (2) Andrew SBNH-1D6565C Panels (Alpha & Beta Sectors, 1 per sector) (2) Kathrein 800-10966 Panel Antennas (1 A; 1 B Sectors) (1) Kathrein 800-10965 Panel Antenna (Gamma Sector) (1) Quintel QS66512-2 Panel Antenna (Gamma Sector) (3) Ericsson B14 Radio 4478 (3) RRUS-32 RRH Units (3) DC6-48-60-18-8F Surge Suppressor Units (2) DTMABP7819VG12A TMA Units	AT&T (existing)	See above Mounts	80'	(4) 1-5/8" (3) Fiber Optic Cables (analysis applied 1-5/8" diameter cables) (6) DC Cables (analysis applied 1/2" diameter cables)
(1) 22' Dipole Antenna	#14 (existing)	4' Sidearm	77'	(1) 1/2"
(3) NNVV-65B-R4 Panel Antennas (3) Nokia MIMO Panel Antennas (3) TD-RRH8x20-25 RRH Units	Sprint (Proposed)	Shared with below Mount	71'	Shared with below Cables
(3) ALU RRH 800 MHz 2x50W (3) 1900 RRH Units	Sprint (existing)	Pipe Mounts on Existing Frame	71'	(4) 1-1/4" Hybriflex Cables
(1) 6' Dual Yagi Antenna	#9 (existing)	2' Sidearm	65'	(1) 1/2"
(1) GPS Antenna	#8 (existing)	3' Sidearm	63'	(1) 7/8"
(1) DB-264 20' Dipole Antenna	#7 CSP-4 (existing)	2' Sidearm	55'	(1) LDF5-50A

<i>Antenna Type</i>	<i>Carrier</i>	<i>Mount</i>	<i>Antenna Centerline Elevation</i>	<i>Cable</i>
(1) DB-803 Whip Antenna	#6 CSP-16 (existing)	2' Sidearm	53'	(1) LDF4-50A
(1) 10' Dipole Antenna	#4A (existing)	3' Sidearm	48'	(1) 1/2"
(1) 3' Yagi Antenna	#4B (existing)	<i>Shared with above mount</i>	48'	(1) 1/2"
(1) 5' Whip Antenna	#3 (existing)	Leg Mounted	47'	(1) 1/2"
(1) 3' Whip Antenna	#2 (existing)	Leg Mounted	43'	(1) 7/8"
(1) 4' Dish with Shroud Cover	#1A (existing)	4' Sidearm	41'	(2) 1/2"
(1) 1'x1' Panel Antenna	#1B (existing)	<i>Shared with above mount</i>	41'	(1) 3/8"
(1) 6' Whip Antenna	#5 CSP-14 (existing)	1' Sidearm Mount	39'	(1) LDF4-50A

Notes: Refer to TNX Tower feed-line plan within Section 6 of this report for coax locations. Antenna elevations and ID numbering obtained from Tower Mapping and Existing Inventory via tower climb, performed by D&K Nationwide Communications, Inc. on March 30, 2016.

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

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

3. ANALYSIS METHODOLOGY AND LOADING CONDITIONS

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

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

- Structure Class 3 – (Essential Communications)
 - o NOTE: ASCE 7 and CT State Building Code Applied Risk Category 4 for design wind loads (see below)
- Topographic Category 4 – (Tower location on top of ridge – rolling wind conditions considered)
 - o Crest Height used for analysis: (approximate elevations listed below)
 - Tower Base Elevation = 450 feet
 - High point (2 mile Radius) = 550 feet (Ref. NW Regicides Trail)
 - Low Point (2 mile Radius) = 50 feet (Ref. Benchmark @ Southern Connecticut State University)
 - “H” = (Avg of High/Low) – Base Elevation = 150 feet
- Exposure Class C – (Open Terrain with scattered obstructions)
- Load Conditions:
 - o Two load conditions were evaluated as shown which were compared to design stresses according to AISC and TIA-222-G Standard.

Basic Wind Speed:

- TIA-222-G:
 - o New Haven County (Wind Speed Range): V = 95 mph - 115 mph (3-second gust) [Annex of TIA/EIA-222-G 2006]
- IBC 2015 w/ 2018 CT State Building Code Amendment:
 - o (2015) IBC Section 1609.1.1 – Determination of Wind Loads – Exception 5 “Designs using TIA-222” applies for determination of Design Wind Load obtained as “V_{ult}” are to be converted to “V_{asd}” when applying the TIA-222-G design Standard (under Section 1609.3) for Basic Wind Speed.
 - o (2018) CT State Building Code Amendment to the IBC Section 1609.3 wind loads are obtained from Appendix N of the State Building Code.
 - **V_{asd} = 105 mph** (3-Second Gust) Wind Design Parameter for the City of New Haven, Connecticut for Risk Category four (IV) for essential communications (Connecticut State Police).

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

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

3. ANALYSIS METHODOLOGY AND LOADING CONDITIONS (cont.)

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

Seismic event consideration factors/values for design:

- $S_s = 0.186$ (2018 CT State Building Code – Location Specific Value)
- $S_1 = 0.062$ (2018 CT State Building Code – Location Specific Value)
- Site Classification = “C” – from Geotechnical Report description of “Fractured Rock”
- Seismic Design Category = “C” – (2015 International Building Code)
- $F_a = 1.2$ (Obtained from TIA-222-G Table 2-12 Considering above conditions)
- $F_v = 1.7$ (Obtained from TIA-222-G Table 2-13 Considering above conditions)

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

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

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

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

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

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

4. FINDINGS AND EVALUATION

The combined axial and bending stresses on the tower structure were evaluated to compare with the strength design in accordance with AISC (LRFD). The results of an initial analysis indicated that the existing tower did not have enough capacity to support the proposed loading conditions. The tower structure and anchor bolts require modifications shown on SK-1 through SK-5. **Once the modifications indicated on sheets SK-1 through SK-5 are performed, the modified structure and existing foundation are considered structurally adequate with the wind load classification specified with the existing and proposed antenna loading noted herein.**

The modified tower's sway (deflection) is 0.3125 degrees and the modified tower's twist (rotation) is 0.1428 degrees. These figures combined are within the Connecticut State Police required maximum 0.75 degrees for combined twist and sway when applying the TIA/EIA-222-F design conditions.

Controlling Tower Component Stress vs. Capacity Summary:

Component / (Section No.)	Critical Component Size	Controlling Elevation	Stress (% capacity)	Pass/Fail
Leg (T8)	Pipe 5"x0.400" (t) / Compression	25' – 50'	92.4	Pass
Diagonal (T9)	(2)L3-1/2x3-1/2x3/8 / Compression	0' – 25'	91.8	Pass
Horizontal (T9)	L4x4x3/8 / Compression	0' – 25'	96.8	Pass
Top Grit (T9)	L4x4x3/8 / Compression	0' – 25'	99.0	Pass
Redundant Horizontal Bracing (T9)	L2-1/2x2-1/2x1/4 / Compression	0' – 25'	32.5	Pass
Redundant Diagonal Bracing (T9)	L2-1/2x2-1/2x1/4 / Compression	0' – 25'	59.9	Pass
Inner Bracing (T9)	L2-1/2x2-1/2x3/16 / Compression	0' – 25'	13.8	Pass
Tower Connection Bolt	(2) 5/8" Diameter A325X Bolts / Shear Capacity	25'	99.0	Pass

Foundation Summary:

Component	Required	Computed	% Capacity	Pass/Fail
(Modified) Anchor Rod - Capacity (TIA-222-G – 4.9.9)	Ratio < 1.0	0.850	85.0	Pass
Foundation – Spread Foot (6'x6') Uplift Capacity	625.89 Kip (Factored Resistance)	380 Kip	61.0	Pass
Foundation – Rock Anchorage – Bonded Embedment Length	20 Feet (installed)	16.01Ft	76.0	Pass
Foundation – Bearing on Rock Capacity	13.4400 ksf (Factored Resistance)	12.343 ksf	71.6	Pass

Structure Rating (Maximum from all components) =	99.0 %	Pass
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4. FINDINGS AND EVALUATION (cont.)

Maximum Deformations – Proposed Condition

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

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

Load Case Description	Current		Allowable	
	Sway (degree)	Displacement (Feet)	Sway (degree)	Displacement (Feet)
Service Wind Load	0.1334	0.7365	4.0	3.6

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

Description	Current	Total	Allowable
Tower Twist (degrees)	0.1428	0.4553	0.750
Tower Sway (degrees)	0.3125		

5. CONCLUSIONS AND RECOMMENDATIONS

The results of an initial structural analysis indicated that the existing tower and anchor bolts did not have enough capacity for the proposed loading conditions above. The tower structure and anchor bolts require modifications shown on SK-1 through SK-5. **Once the modifications indicated on sheets SK-1 through SK-5 are performed, the modified structure and anchor bolts are considered structurally adequate with the load specification specified above with the existing and proposed antenna loading herein.**

The results of the analysis indicate the modified tower's sway (deflection) is 0.3125 degrees and the modified tower's twist (rotation) is 0.1428 degrees. These figures combined are within the Connecticut State Police requirements of 0.75 degrees for combined twist (rotation) and sway (deflection) when applying the TIA/EIA-222-F design conditions.

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 defect and were properly constructed to support original design loads as specified in the original design documents.

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

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

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

Ongoing and Periodic Inspection and Maintenance:

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

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

6. DRAWINGS AND DATA

REINFORCEMENT DRAWINGS SK-1 THROUGH SK-5

GENERAL CONSTRUCTION NOTES

1. ALL WORK SHALL COMPLY WITH THE CURRENT CONNECTICUT STATE BUILDING AND LIFE SAFETY CODES, SUPPLEMENTS AND AMENDMENTS.
2. CONTRACTOR IS TO REVIEW ALL DRAWINGS AND NOTES IN THE CONTRACT DOCUMENT SET. CONTRACTOR SHALL COORDINATE ALL WORK SHOWN IN THE SET OF DRAWINGS. THE CONTRACTOR SHALL PROVIDE A COMPLETE SET OF DRAWINGS TO ALL SUB-CONTRACTORS AND ALL RELATED PARTIES. THE SUB-CONTRACTORS SHALL EXAMINE ALL THE DRAWINGS AND SPECIFICATIONS FOR THE INFORMATION THAT AFFECTS THEIR WORK.
3. CONTRACTOR SHALL PROVIDE A COMPLETE BUILD-OUT WITH ALL FINISHES, STRUCTURAL, MECHANICAL, AND ELECTRICAL COMPONENTS AND PROVIDE ALL ITEMS AS SHOWN OR INDICATED ON DRAWINGS OR WRITTEN IN SPECIFICATIONS.
4. CONTRACTOR SHALL FURNISH ALL MATERIAL, LABOR AND EQUIPMENT TO COMPLETE THE WORK AND FURNISH A COMPLETED JOB ALL IN ACCORDANCE WITH LOCAL AND STATE GOVERNING AUTHORITIES AND OTHER AUTHORITIES HAVING LAWFUL JURISDICTION OVER THE WORK.
5. CONTRACTOR SHALL SECURE AND PAY FOR ALL PERMITS AND ALL INSPECTIONS REQUIRED AND SHALL ALSO PAY FEES REQUIRED FOR THE GENERAL CONSTRUCTION AND ELECTRICAL SUB-CONTRACTORS SHALL PAY FOR THEIR PERMITS.
6. CONTRACTOR SHALL MAINTAIN A CURRENT SET OF DRAWINGS ON SITE AT ALL TIMES AND ENSURE THE DISTRIBUTION OF NEW DRAWINGS TO SUB-CONTRACTORS AND OTHER RELEVANT PARTIES AS SOON AS THEY ARE MADE AVAILABLE. ALL OLD DRAWINGS SHALL BE MARKED VOID AND REMOVED FROM THE CONTRACT AREA. CONTRACTOR SHALL FURNISH 'AS-BUILT' SET OF DRAWINGS TO OWNER UPON COMPLETION OF PROJECT.
7. INSTALLATION OF THIS WIRELESS COMMUNICATIONS EQUIPMENT SITE REQUIRES WORK IN THE IMMEDIATE VICINITY OF EXISTING OPERATING TELECOMMUNICATION SYSTEMS. THE CONTRACTOR SHALL PROVIDE AND COORDINATE THE METHODS OF PROTECTION WITH THE VARIOUS TELECOMMUNICATION CARRIERS AND THE TOWER OWNER. THERE SHALL BE NO INTERRUPTION OF OPERATION WITHOUT TIMELY COORDINATION WITH AND APPROVAL BY THE VARIOUS COMMUNICATIONS OPERATORS INCLUDING THE CONNECTICUT STATE POLICE.
8. NO MOVEMENT, ALTERATION, OR DISCONNECTION OF CONNECTICUT STATE POLICE ANTENNAS MAY OCCUR WITHOUT THE NOTIFICATION AND APPROVAL OF THE CONNECTICUT STATE POLICE. CONTACT THE NETWORK CONTROL CENTER AT 860-865-8008.
9. TOWER REINFORCING WORK AFFECTING CRITICAL CONNECTICUT STATE POLICE ANTENNAS MAY BE REQUIRED TO BE CONDUCTED AT TIMES AS DETERMINED BY THE REQUIREMENTS OF THE CONNECTICUT STATE POLICE.
10. ALL EQUIPMENT AND PRODUCTS PURCHASED ARE TO BE REVIEWED BY CONTRACTOR AND ALL APPLICABLE SUB-CONTRACTORS FOR ANY CONDITION PER MFR'S RECOMMENDATIONS. CONTRACTOR TO SUPPLY THESE ITEMS AT NO COST TO OWNER OR ARCHITECT.
11. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL ON-SITE SAFETY FROM THE TIME THE JOB IS AWARDED UNTIL ALL WORK IS COMPLETE AND ACCEPTED BY THE OWNER.
12. CONTRACTOR TO REVIEW ALL SHOP DRAWINGS AND SUBMIT COPY TO ARCHITECT FOR REVIEW. DRAWINGS MUST BEAR THE CHECKER'S INITIALS BEFORE SUBMITTAL TO THE ARCHITECT FOR REVIEW.
13. THE CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS, ELEVATIONS, ANGLES, AND EXISTING CONDITIONS AT THE SITE, PRIOR TO FABRICATION AND/OR INSTALLATION OF ANY WORK IN THE CONTRACT AREA. SUBMIT ANY DISCREPANCIES FROM THE DRAWINGS TO THE ARCHITECT.
14. THE CONTRACTOR IS SOLELY RESPONSIBLE TO DETERMINE CONSTRUCTION PROCEDURE AND SEQUENCE, AND TO ENSURE THE SAFETY OF THE EXISTING STRUCTURE AND ITS COMPONENT PARTS DURING CONSTRUCTION. THIS INCLUDES THE ADDITION OF WHATEVER SHORING, BRACING, UNDERPINNING, ETC. THAT MAY BE NECESSARY.
15. CONTRACTOR SHALL COMPLY WITH OWNER ENVIRONMENTAL ENGINEER ON ALL METHODS AND PROVISIONS FOR ALL EXCAVATION ACTIVITIES INCLUDING SOIL/ROCK DISPOSAL. ALL BACKFILL MATERIALS TO BE PROVIDED BY THE CONTRACTOR.
16. CONTRACTOR TO CONTACT "CALL BEFORE YOU DIG" AT 1-800-922-4455 TO VERIFY AND IDENTIFY THE EXACT LOCATIONS OF ALL UNDERGROUND UTILITIES AND OBSTRUCTIONS IDENTIFIED PRIOR TO COMMENCING WORK IN THE CONTRACT AREA.
17. DIMENSIONS OF EXISTING TOWER ARE BASED ON MANUFACTURER'S DRAWINGS PREPARED BY STAINLESS, INC., DATED MARCH 3, 1995, AND ARE NOT GUARANTEED. CONTRACTOR SHALL TAKE FIELD DIMENSIONS AS NECESSARY TO ASSURE PROPER FIT OF ALL FINISHED WORK AND SHALL ASSUME FULL RESPONSIBILITY FOR THEIR ACCURACY. WHEN SHOP DRAWINGS BASED ON FIELD MEASUREMENT ARE SUBMITTED FOR REVIEW, DIMENSIONS ARE PROVIDED FOR THE ENGINEER'S REFERENCE ONLY.
18. TOWER INVENTORY IS BASED ON INFORMATION OBTAINED FROM D&K NATIONWIDE COMMUNICATIONS, INC., MARCH 30, 2016 AND BY CONNECTICUT STATE POLICE DATED APRIL 7, 2016.
19. CONTRACTOR TO VERIFY REQUIRED CLEARANCES INCLUDING BUT NOT LIMITED TO EXISTING BUILDINGS, EQUIPMENT PADS AND SHELTERS PRIOR TO COMMENCING WORK.
20. THE CONTRACTOR IS RESPONSIBLE FOR THE STABILITY OF THE STRUCTURE DURING CONSTRUCTION. NO MEMBER OF THE TOWER SHALL BE LEFT DISCONNECTED FOR THE NEXT WORKING DAY. THE CONTRACTOR SHALL BE AWARE OF WEATHER AND WIND CONDITIONS AND NOT PERFORM MEMBER REPLACEMENT IN A WIND.

STRUCTURAL NOTES

STRUCTURAL STEEL MATERIAL:

STRUCTURAL STEEL LEG:
LEG PIPES 0.400 THICK AND THICKER.....A572-60 (60 KSI)
LEG PIPES 3/8" THICK AND THINNER.....A572-50 (50 KSI)
EXISTING BEAMS, CHANNELS, PLATES, ANGLES.....A36
REPLACEMENT ANGLES.....A529 Gr 50 (50 KSI)
WELDED "T" BEAM.....A992 (50 KSI)

STRUCTURAL STEEL SHALL CONFORM TO ALL THE REQUIREMENTS OF THE ASTM SPECIFICATION, AS REFERENCED IN THE CODE.

UNLESS OTHERWISE NOTED, ALL STEEL WILL BE GALVANIZED IN ACCORDANCE WITH ASTM 123 AFTER FABRICATION. TOUCH UP ALL DAMAGED GALVANIZED STEEL WITH APPROVED COLD ZINC, "GALVANOX", "DRY GALV", "ZINC-IT", OR APPROVED EQUIVALENT, IN ACCORDANCE WITH MANUFACTURERS GUIDELINES. TOUCH-UP DAMAGED NON GALVANIZED STEEL WITH SAME PAINT APPLIED IN SHOP OR FIELD.

SHOP AND ERECTION DRAWINGS SHALL BE SUBMITTED FOR ALL STRUCTURAL STEEL WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS. SUBMIT 2 SETS OF PRINTS FOR THE ENGINEER REVIEW.

MILL BEARING ENDS OF COLUMNS, STIFFENERS, AND OTHER BEARING SURFACES TO TRANSFER LOAD OVER ENTIRE CROSS SECTION.

THE OMISSION OF ANY MATERIAL THAT WAS SHOWN ON THE CONTRACT DRAWINGS SHALL NOT RELIEVE THE CONTRACTOR OF PROVIDING THE SAME.

CONNECTIONS / FIELD ASSEMBLY:

BOLTED CONNECTIONS: UNLESS OTHERWISE NOTED, ALL JOINTS ARE SLIP CRITICAL TYPE, REQUIRING 5/8", 3/4", 7/8", 1" DIA. A325-X & A490-X BOLTS, A563 NUTS AND F436 WASHERS, ALL GALVANIZED. BEVELED WASHERS SHALL BE USED ON BEAM FLANGES HAVING A SLOPE GREATER THAN 1:20.

STRUCTURE IS DESIGNED TO BE LEVEL AND PLUMB, SELF-SUPPORTING AND STABLE AFTER WORK IS COMPLETED.

COMMENCEMENT OF WORK WITHOUT NOTIFYING THE ENGINEER OF ANY DISCREPANCIES WILL BE CONSIDERED ACCEPTANCE OF PRECEDING WORK.

ALL WELDING SHALL BE DONE BY A CERTIFIED WELDER IN ACCORDANCE WITH AWS STANDARDS, USING E70XX ELECTRODES UNLESS OTHERWISE NOTED. WHERE WELD SIZES ARE NOT SHOWN PROVIDE THE MINIMUM SIZES PER "PREQUALIFIED WELDED JOINTS" TABLES IN AISC "MANUAL OF STEEL CONSTRUCTION", 14TH EDITION.

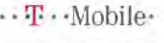
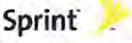
INSPECTIONS:

SPECIAL INSPECTIONS ARE REQUIRED PER THE CODE FOR STRUCTURAL STEEL WORK.

PLEASE CONTACT AECOM @ 860-990-6767 FOR CONSTRUCTION PHASE SERVICES AND/OR SPECIAL INSPECTIONS.

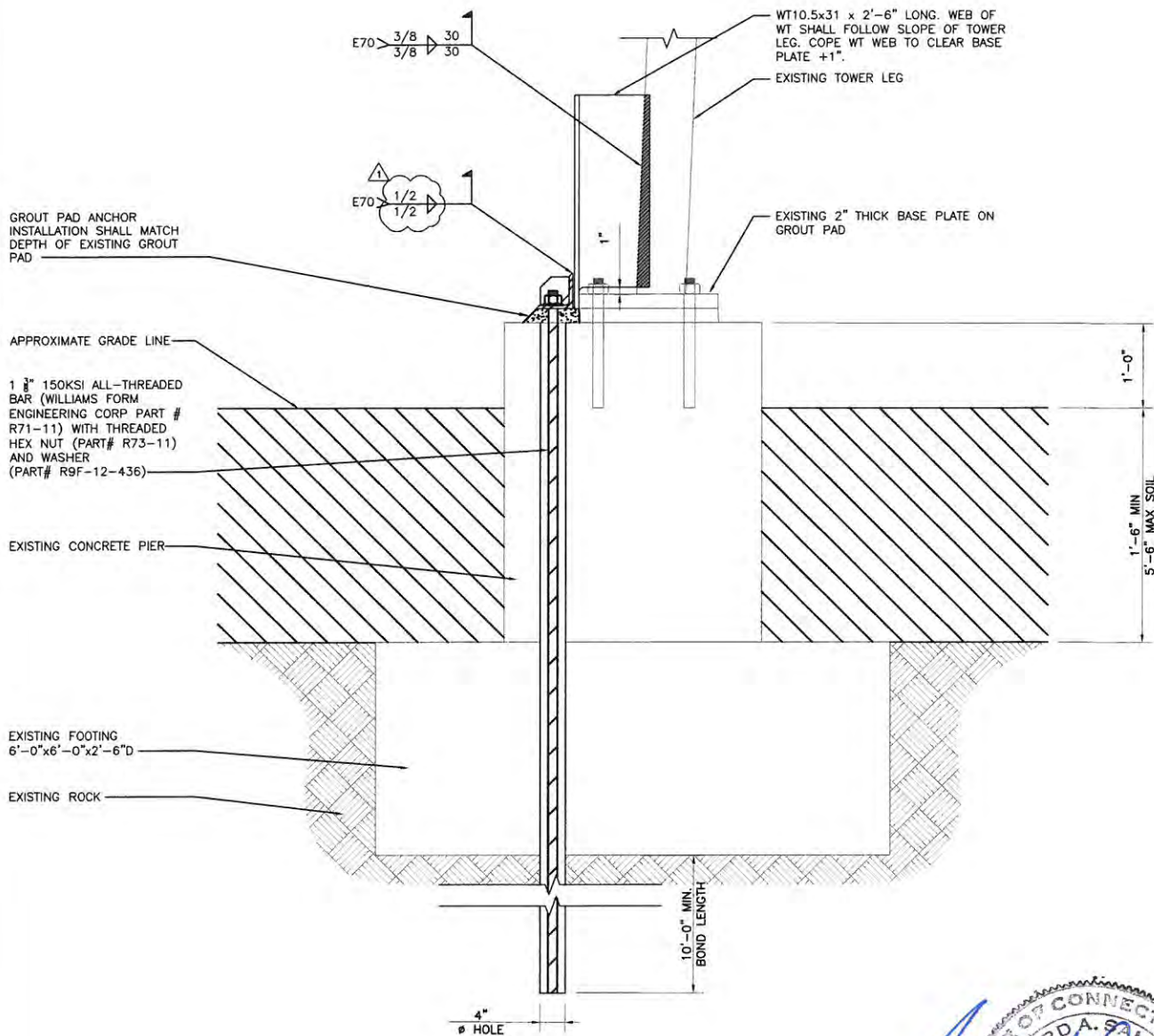
AT&T, SPRINT, AND T-MOBILE WILL SUPPLY THE SERVICES OF THE REQUIRED SPECIAL INSPECTOR AND TESTING AGENTS AS REQUIRED. CONTRACTOR SHALL COORDINATE INSPECTIONS OF FABRICATOR'S AND ERECTOR'S WORK AND MATERIALS TO MEET THE REQUIREMENTS OF THE STATEMENT OF SPECIAL INSPECTIONS FOR THIS PROJECT.

COPIES OF TESTING AND INSPECTION REPORTS MUST BE PROVIDED TO AT&T, SPRINT, T-MOBILE, STATE BUILDING OFFICIAL, ENGINEER OF RECORD AND CONTRACTOR.

PROJECT NO.	 500 ENTERPRISE DRIVE ROCKY HILL, CONNECTICUT (860)-529-8882	  	142 BALDWIN AVENUE NEW HAVEN, CONNECTICUT 06516		Dwg. No.	
Designed by: MCD					CODE UPDATES	
Drawn by: GAT					3RD PARTY UPDATES	
Checked by: KAB					REV. DATE: DESCRIPTION	
Approved by: RAS					Scale: AS NOTED Date: 08/14/18	
				Job No.	File No.	Dwg. 1 of 5

NOTES:

1. ELEVATION OF EXISTING SOIL AND ROCK DETERMINED FROM GEOTECHNICAL REPORT DATED AUGUST 13, 2018.
2. PRODUCTS LISTED BY WILLIAMS FORM ENGINEERING CORP. ARE MINIMUM DESIGN REQUIREMENTS. CONTRACTOR MAY SUBSTITUTE MATERIALS THAT MEET OR EXCEED THESE LISTED PRODUCTS.
3. CONTRACTOR SHALL AVOID EXISTING PIER REINFORCING WHEN DRILLING 4" DIAMETER ROCK ANCHOR HOLE.
4. ROCK ANCHOR BAR IS NOT INTENDED TO BE PRE-STRESSED FOR THIS INSTALLATION. MINIMUM GROUT BOND LENGTH FOR ANCHOR SHALL BE NO LESS THAN 10 FEET INTO ROCK.
5. GROUT SHALL FILL DRILLED HOLE AND MUST SET PRIOR TO FURTHER ANCHORAGE INSTALLATION. GROUT MATERIAL CONSIDERED FOR DESIGN IS US SPEC RA GROUT SUPPLIED BY WILLIAMS FORM ENGINEERING CORP.
6. GROUT PAD EXTENSION SHALL CREATE LEVEL SURFACE AREA FOR ANCHOR TO BE INSTALLED.



1 ANCHOR ELEVATION @ LEGS A, B & C
SK-2 SCALE: 1/2"=1'-0" (EXISTING ROCK ANCHORS NOT SHOWN FOR CLARITY)



PROJECT NO.
Designed by: MCD
Drawn by: GAT
Checked by: KAB
Approved by: RAS

AECOM
500 ENTERPRISE DRIVE
ROCKY HILL, CONNECTICUT
(860)-529-8882

...T...Mobile... Sprint... at&t...
142 BALDWIN AVENUE
SITE ADDRESS: NEW HAVEN, CONNECTICUT 06516

2	4/10/2020	CODE UPDATES
1	3/1/2019	3RD PARTY UPDATES
REV.	DATE:	DESCRIPTION
Scale: AS NOTED		Date: 08/14/18
Job No.	File No.	Dwg. No.

SK-2

Dwg. 2 of 5

WT10.5x31. END OF WT TO BE
COPED PER SLOPE OF TOWER LEG.
COORDINATE WITH SHEET SK-2.

WILLIAMS FORM ENG. CORP.
WASHER - SHOWN FOR CLARITY

1 1/2" Ø HOLE

E70 1/2 1/2

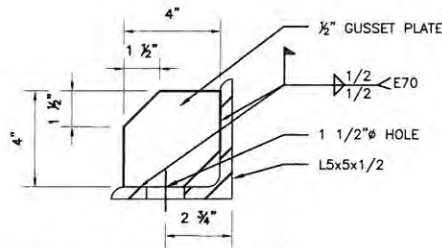
2 3/4"

1" 3 1/2" 3 1/2"

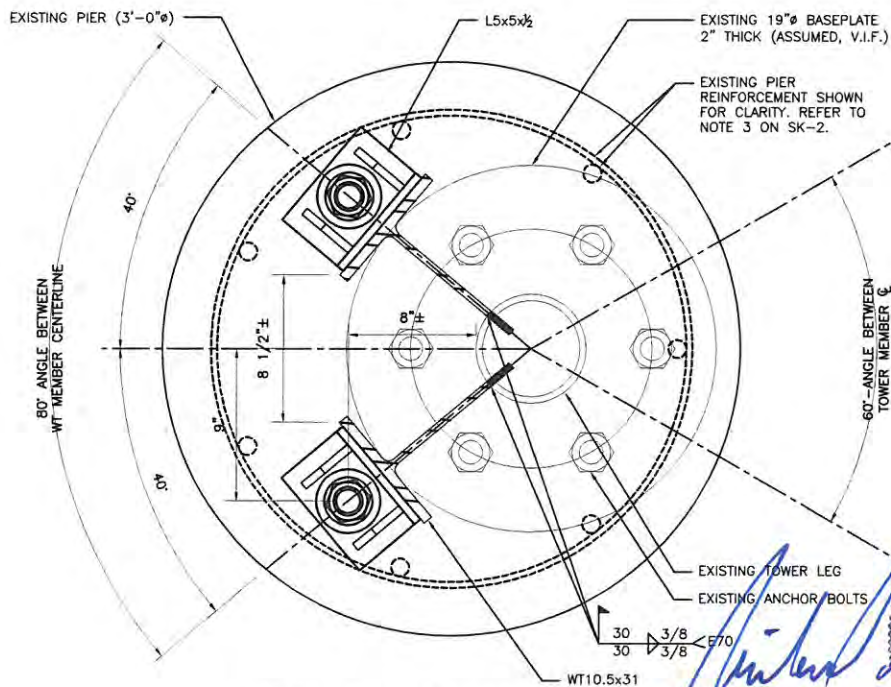
L5x5x1/2

1/2 1/2 < E70

1/2 1/2 < E70



2 ANCHOR DETAIL
SK-3 SCALE: 1-1/2"=1'-0"



1 ANCHOR LAYOUT @ LEGS A, B & C
SK-3 SCALE: 1"=1'-0" (FOOTING NOT SHOWN FOR CLARITY)



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Job No.		File No.

Dwg. No.
SK-3
Dwg. 3 of 5

NOTES:

1. REFER TO STRUCTURAL NOTES ON SK-1 FOR STEEL GRADE REQUIREMENTS FOR REPLACEMENT MEMBERS.
2. CONTRACTOR SHALL FIELD VERIFY EXISTING TOWER INFORMATION AND ANGLE MEMBER ORIENTATION PRIOR TO ORDERING MATERIALS.
3. REINFORCEMENT OF TOWER IS REQUIRED FOR ALL 3 SIDES OF EXISTING TOWER STRUCTURE.
4. CONNECTION BOLTS FOR REPLACEMENT MEMBERS SHALL BE REPLACED IN KIND. EXISTING BOLTS SHALL NOT BE RE-USED FOR CONNECTING REPLACEMENT MEMBERS. THIS ALSO APPLIES TO EXISTING STITCH BOLTS FOR BACK-TO-BACK ANGLES. LOCATIONS OF EXISTING STITCH BOLTS SHALL BE FIELD VERIFIED PRIOR TO ORDERING OF MATERIALS.
5. CONTRACTOR SHALL VERIFY THE APPLICABILITY OF INSTALLING A 7/8" DIA BOLT AT THE INDICATED TOWER LEG FLANGE CONNECTION. CONTRACTOR SHALL OBTAIN PRIOR APPROVAL FROM THE CONNECTICUT STATE POLICE IF THE EXISTING FLANGE BOLT HOLES NEED TO BE INCREASED VIA DRILLING OR OTHER METHODS OF CONSTRUCTION.
5. BACK-TO-BACK ANGLES WITHIN ELEVATION REGION 0'-25' SHALL INCLUDE ADDITIONAL STITCH BOLTS. REFER TO SHEET SK-4A FOR CONNECTION DETAILS.

REPLACE EXISTING DIAGONAL
(2)L2-1/2x2x3/16 (LLBB) WITH
(2)L2-1/2x2-1/2x1/4 @
ELEVATION RANGE 85.4'-100'.

REPLACE EXISTING DIAGONAL
(2)L3x2-1/2x1/4 (LLBB) WITH
(2)L3x3x5/16 @ ELEVATION RANGE
50'-75'.

REPLACE EXISTING (6) 3/4" DIA
A325X BOLTS WITH (6) 7/8" A490X
BOLTS AT LEG FLANGE CONNECTION
(ELEVATION 50') SEE NOTE 5.

REPLACE EXISTING DIAGONAL
(2)L3x2-1/2x1/4 (LLBB) WITH
(2)L3x3x3/8 @ ELEVATION RANGE
25'-50'.

REPLACE EXISTING HORIZONTAL
L4x4x1/4 WITH L4x4x3/8 @
ELEVATION 12.5'.

REPLACE (2) EXISTING HORIZONTAL
ANGLE CONNECTION BOLTS 5/8" DIA
A325X WITH 5/8" DIA A490X BOLTS
AT ELEVATION 12.5'.

REPLACE EXISTING DIAGONAL
(2)L3-1/2x3x5/16 (LLBB) WITH
(2)L3-1/2x3-1/2x3/8 @
ELEVATION RANGE 0'-25'.
REFER TO NOTE 5 FOR CONNECTION
DETAILS.

EL 120'-0"

EL 100'-0"

EL 83'-4"

EL 75'-0"

EL 50'-0"

EL 25'-0"

EL 0'-0"

REPLACE EXISTING HORIZONTAL
(TOP-GIRT) L3x3x1/4 WITH
L3x3x5/16 @ ELEVATION 75'

REPLACE EXISTING HORIZONTAL
L3x3x1/4 WITH L3-1/2x3-1/2x1/4
@ ELEVATION 58.3 & 66.7'

REPLACE EXISTING HORIZONTAL
(TOP-GIRT) L3x3x1/4 WITH
L3-1/2x3-1/2x5/16 @ ELEVATION
50'

REPLACE EXISTING HORIZONTAL
L3x3x1/2 WITH L4x4x5/16 @
ELEVATION 33.3 & 41.7'

REPLACE EXISTING HORIZONTAL
(TOP-GIRT) L4x4x1/4 WITH
L4x4x3/8 @ ELEVATION 25'

INSTALL REDUNDANT HORIZONTAL
AND DIAGONAL L2-1/2x2-1/2x
ANGLES @ ELEVATION RANGE
0'-50'. REFER TO SK-5 FOR
CONNECTION DETAILS.

1

TOWER ELEVATION

SK-4

SCALE: 1" = 30'-0"

NOTES:

REFER TO SK-1 STRUCTURAL NOTES FOR MORE INFORMATION



PROJECT NO.

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Approved by: RAS

AECOM

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at&t

SITE ADDRESS:

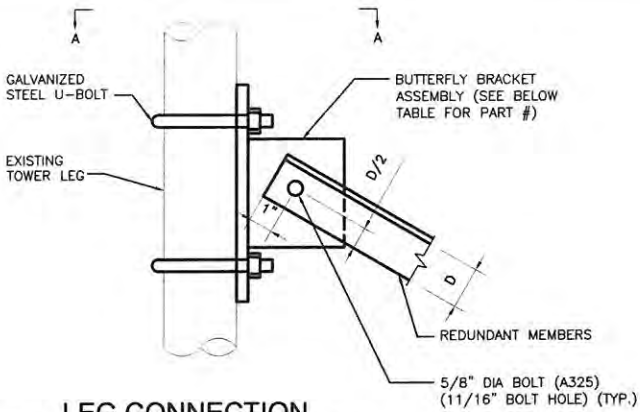
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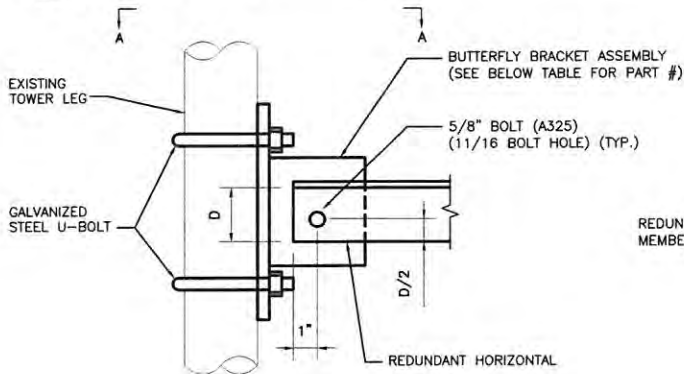
Dwg. No.

SK-4

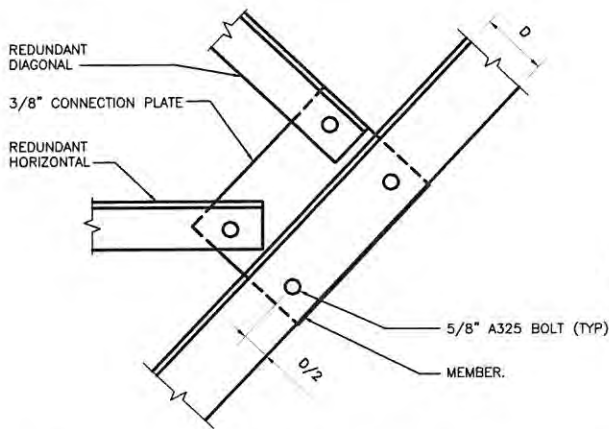
Dwg. 4 of 5



3
SK-5
LEG CONNECTION REDUNDANT DIAGONAL
SCALE: 1-1/2\"=1'-0\"



2
SK-5
LEG CONNECTION REDUNDANT HORIZONTAL
SCALE: 1-1/2\"=1'-0\"

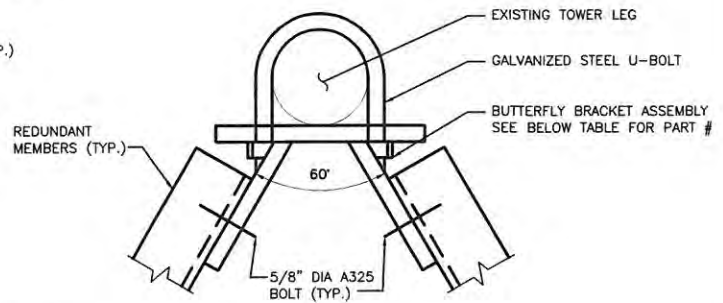


1
SK-5
REDUNDANT MEMBER CONNECTION
SCALE: 1-1/2\"=1'-0\"

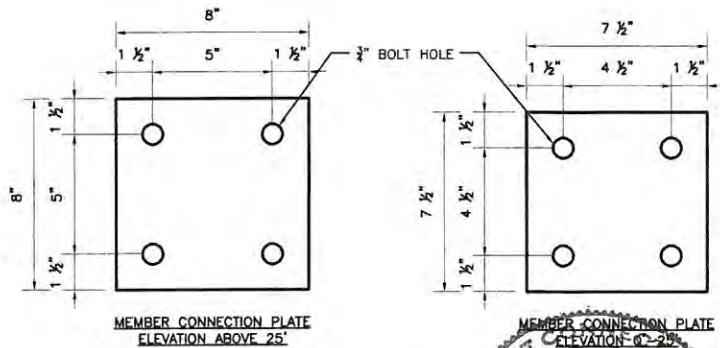
ELEVATION	LEG BUTTERFLY BRACKET #
0'-25'	RSH-0568-86
25'-50'	RSH-0545-68

NOTE: LEG BUTTERFLY BRACKET ASSEMBLY INFORMATION BASED PRIMUS ELECTRONICS CORPORATION. CONTRACTOR SHALL USE PRODUCTS SIMILAR TO OR EXCEEDING IN QUALITY FOR CONSTRUCTION.

- NOTES:**
1. REFER TO SK-1 FOR STRUCTURAL NOTES. COORDINATE SHEET WITH SK-4 FOR SECONDARY HORIZONTAL/DIAGONAL CONNECTION MEMBERS.
 2. CONTRACTOR SHALL FIELD VERIFY DIMENSIONS SHOWN PRIOR TO ORDERING MATERIALS.
 3. DIMENSIONS NOTED AS 'D' (DEPTH) VARY. REFER TO SK-4 FOR MEMBER SIZE REQUIREMENTS.



5
SK-5
SECTION A
SCALE: N.T.S.



4
SK-5
CONNECTION PLATES
SCALE: 1-1/2\"=1'-0\"

- NOTE:**
1. DETAILS 2 & 3 ABOVE ILLUSTRATE CONNECTIONS OF DIAGONAL AND HORIZONTAL MEMBERS TO TOWER LEGS. BUTTERFLY BRACKET ASSEMBLIES USED FOR CONNECTION TO EXISTING LEGS SHALL BE INSTALLED AS CLOSE TO EXISTING ADJOINING MEMBER AS POSSIBLE.

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SK-5

SEISMIC BASE SHEAR ANALYSIS



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

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

Location: New Haven, CT -Site Class "C"

$$S_{DS} = \frac{2}{3} F_A S_S, \text{ where } S_S = 0.186 \quad \text{and } F_A = 1.2 \quad S_{DS} = \frac{2}{3} F_A S_S = \frac{2}{3} * 1.2 * 0.186 = 0.1488$$

$$S_{D1} = \frac{2}{3} F_V S_1, \text{ where } S_1 = 0.062 \quad \text{and } F_V = 1.7 \quad S_{D1} = \frac{2}{3} F_V S_1 = \frac{2}{3} * 1.7 * 0.062 = 0.0703$$

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

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

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

$$\begin{aligned} W &= \text{DL TOWER} &= & 41.290 \text{ Kips} \\ W &= \text{Antennas/Mounts} &= & 11.358 \text{ Kips} \\ W &= \text{Cables} &= & 4.464 \text{ Kips} \\ &&& \underline{57.112 \text{ Kips}} &= \text{WT Total} = "W" \end{aligned}$$

$$V_s = \frac{S_{DS} * W * I}{R} = \frac{0.149 * 57.112 \text{ kips} * 1.5}{3.0} = 4.254844 \text{ kips}, \quad \text{where } R = 3.0 \text{ for Lattice Tower}$$

$$V_{s.min} = \frac{0.5 * S_{D1} * W * I}{R} = \frac{0.5 * 0.0703 * 35.9120 \text{ kips} * 1.5}{3.0} = 1.0037 \text{ kips}$$

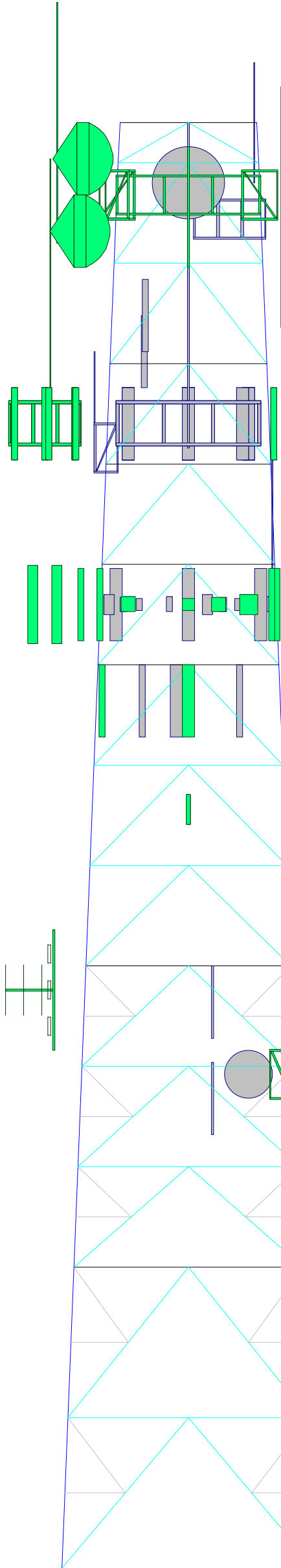
*By visual inspection, the above "Base Shear" value when considering the following Load Combination is less than the base shear of wind on structure.

$1.2 * DL + 1.0 E < 1.2 DL + 1.6 W$, (119 Kips), therefore seismic effect on structure
Does NOT control Design.

TNX TOWER INPUT/OUTPUT SUMMARY

Section	T9	T8	T7	T6	T5	T4	T3	T2	T1
Legs	P6.875x.400	P.5x.400	P5x.375			P.5x.250			
Leg Grade	A572-60			A500-50					
Diagonals	2L13 1/2x3 1/2x3/8x3/8	2L3x3x3/8x3/8	2L3x3x5/16x3/8	2L2 1/2x2x3/8x3/8	2L2 1/2x2 1/2x1/4x3/8		2L2 1/2x2x3/16x3/8		
Diagonal Grade		A529-50		A36	A529-50		A36		
Top Girts	L4x4x3/8	L3 1/2x3 1/2x5/16	L3x3x5/16	L3x3x1/4	N.A.		N.A.	A	
Horizontals	L4x4x3/8	L4x4x5/16	L3 1/2x3 1/2x1/4		N.A.		L2 1/2x2 1/2x3/16	N.A.	
Red. Horizontals					N.A.				
Red. Diagonals					N.A.				
Inner Bracing									
Face Width (ft)	21.0188	19.0179	17.017	15.0162	13.6822	13.0153	12.3483	11.6814	11.4146
# Panels @ (ft)	2 @ 12.5			11 @ 8.33333					B
Weight (K)	26.1	7.7		7.2				0.8	0.5

120.0 ft
116.7 ft
108.3 ft
100.0 ft
91.7 ft
83.3 ft
75.0 ft
50.0 ft
25.0 ft
0.0 ft



DESIGNED APPURTENANCE LOADING			
TYPE	ELEVATION	TYPE	ELEVATION
Lightning Rod 5/8x4' (#27)	138	20' 4-Bay Dipole (#15)	86
16"x2.5" Pipe Mount (#27 Mount)	138	3' Yagi (#13 - CSP-11)	82
16"x3" Omni (inverted) (#23-A - CSP-22)	120 - 106	3' Yagi (#12)	81
16"x3" Omni (inverted) (#23-B - CSP-23)	120 - 106	VFA12-HD-S Antenna Mount Frame ((#11) ATT)	80
SC479-HF1LDF (inverted) (#24-B)	120 - 106	VFA12-HD-S Antenna Mount Frame ((#11) ATT)	80
SC479-HF1LDF (#24-C - CSP#21)	120	VFA12-HD-S Antenna Mount Frame ((#11) ATT)	80
OGT9-840 (#24-D - CSP#8)	120	TPA-65R-LCUUUU-H8 Panel w/ RET ((#11) ATT)	80
OGT9-840 (#25-B - CSP#7)	120	800-10966 Kathrien Panel w/ Pipe Mt. ((#11) ATT)	80
10"x2" Dipole Antenna (#26 - CSP-15)	120	800-10966 Kathrien Panel w/ Pipe Mt. ((#11) ATT)	80
TMA 432-83H-01T (CSP-24)	120	SBNH-1D6565C ((#11) ATT)	80
SC479-HF1LDF (inverted) (CSP - 9 (P))	120 - 106	RRUS E2 B29 RRH Unit ((#11) ATT)	80
TMA 432-83H-01T (CSP-24)	120	B2/B66a Radio 8843 RRH Unit ((#11) ATT)	80
6" DISH (SOLID) (#19 - CSP-3)	117	Radio 4478 B14 RRH ((#11) ATT)	80
6" DISH (SOLID) (#21 - CSP-5)	115	Ericsson RRUS-32 RRH Unit ((#11) ATT)	80
Rohn 6" Side-Arm(1) (#24 Antennas Mount)	114	Radio 4449 B5/B12 RRH ((#11) ATT)	80
Rohn 6" Side-Arm(1) (#24 Antennas Mount)	114	DTMABP7819VG12A TMA ((#11) ATT)	80
Junction Box (#24-A)	114	DC6-48-60-18-8F (Squid) Suppressor ((#11) ATT)	80
10"x2" Dipole Antenna (inverted) (#24-E)	114 - 104	TPA-65R-LCUUUU-H8 Panel w/ RET ((#11) ATT)	80
Rohn 6" Side-Arm(1) (#25 Antennas Mount)	114	800-10966 Kathrien Panel w/ Pipe Mt. ((#11) ATT)	80
SC479-HF1LDF (inverted) (#25-A - CSP-17)	114 - 100	800-10966 Kathrien Panel w/ Pipe Mt. ((#11) ATT)	80
Pirod 4' Side Mount Standoff (1) (#22, 23-A, 23-B Mount)	113	SBNH-1D6565C ((#11) ATT)	80
16"x3" Omni (#22)	113	RRUS E2 B29 RRH Unit ((#11) ATT)	80
Junction Box (#23-C)	112	B2/B66a Radio 8843 RRH Unit ((#11) ATT)	80
Radio 4478 B14 RRH ((#11) ATT)	112	Radio 4478 B14 RRH ((#11) ATT)	80
6" DISH (SOLID) (#20 - CSP-6)	111	Ericsson RRUS-32 RRH Unit ((#11) ATT)	80
6"8"x4" Pipe Mount (#21 - Dish Mount)	110	Radio 4449 B5/B12 RRH ((#11) ATT)	80
SC479-HF1LDF (CSP-18 (New Install))	110	DTMABP7819VG12A TMA ((#11) ATT)	80
SC479-HF1LDF (inverted) (CSP-19 (New Install))	110 - 96	DC6-48-60-18-8F (Squid) Suppressor ((#11) ATT)	80
TMA 432-83H-01T (CSP-20)	110	Quintel QS66512-2 Panel ((#11) ATT)	80
WPA-70040-4CF-EDIN Panel (CSP-28)	110	800-10965 Kathrein Panel Antenna ((#11) ATT)	80
6"8"x4" Pipe Mount (#19 - Dish Mount)	107	800-10965 Kathrein Panel Antenna ((#11) ATT)	80
6"8"x4" Pipe Mount (#20 - Dish Mount)	107	RRUS E2 B29 RRH Unit ((#11) ATT)	80
SE419-SWBPALDF Panel Antenna (CSP-29)	105	B2/B66a Radio 8843 RRH Unit ((#11) ATT)	80
TMA 432-83H-01T (CSP-30)	105	Radio 4478 B14 RRH ((#11) ATT)	80
AP13-850/065D w/Mount Pipe (#18-B - CSP-12(E))	104	Ericsson RRUS-32 RRH Unit ((#11) ATT)	80
TMA 432-83H-01T (CSP-32)	103	Radio 4449 B5/B12 RRH ((#11) ATT)	80
SE419-SWBPALDF Panel Antenna (#18-A - CSP 13(P))	101	DC6-48-60-18-8F (Squid) Suppressor ((#11) ATT)	80
PD458-406 (# 16-B - CSP-2)	100 - 92	20' 4-Bay Dipole (#14)	77
3'4"x4" Pipe Mount (horizontal) ((Top Mount) #15)	96	3'4"x4" Pipe Mount (horizontal) ((Bottom mount) #15)	76
SC479-HF1LDF (inverted) (# 16-A - CSP-10)	95 - 81	Face Mount (Sprint)	72
EUSF10-U ((#17) T-Mobile)	95	Face Mount (Sprint)	72
EUSF10-U ((#17) T-Mobile)	95	Face Mount (Sprint)	72
EUSF10-U ((#17) T-Mobile)	95	ALU 4x45W (1900 MHz) (Sprint)	72
TMA2093F00V1-1 Twin TMA ((#17) T-Mobile)	95	ALU 4x45W (1900 MHz) (Sprint)	72
TMA2093F00V1-1 Twin TMA ((#17) T-Mobile)	95	ALU 4x45W (1900 MHz) (Sprint)	72
TMA2093F00V1-1 Twin TMA ((#17) T-Mobile)	95	ALU TD-RRH-8x20-25 (Sprint)	72
AIR32 B66Aa/B2a Antenna Panel ((#17) T-Mobile)	95	ALU TD-RRH-8x20-25 (Sprint)	72
AIR32 B66Aa/B2a Antenna Panel ((#17) T-Mobile)	95	ALU TD-RRH-8x20-25 (Sprint)	72
AIR32 B66Aa/B2a Antenna Panel ((#17) T-Mobile)	95	ALU 800MHz 2x50W (Sprint)	72
AIR32 B66Aa/B2a Antenna Panel ((#17) T-Mobile)	95	ALU 800MHz 2x50W (Sprint)	72
APXVAARR24_43-U-NA20 Panel (RFS) (T-Mobile - Proposed)	95	ALU 800MHz 2x50W (Sprint)	72
APXVAARR24_43-U-NA20 Panel (RFS) (T-Mobile - Proposed)	95	NNVV-65B-R4 Panel Antenna (Sprint)	72
APXVAARR24_43-U-NA20 Panel (RFS) (T-Mobile - Proposed)	95	NNVV-65B-R4 Panel Antenna (Sprint)	72
APXVAARR24_43-U-NA20 Panel (RFS) (T-Mobile - Proposed)	95	NNVV-65B-R4 Panel Antenna (Sprint)	72
APXVAARR24_43-U-NA20 Panel (RFS) (T-Mobile - Proposed)	95	AAHC Panel Antenna (Sprint)	72
AIR 3246 B66 Panel Antenna (T-Mobile - Proposed)	95	AAHC Panel Antenna (Sprint)	72
AIR 3246 B66 Panel Antenna (T-Mobile - Proposed)	95	AAHC Panel Antenna (Sprint)	72
AIR 3246 B66 Panel Antenna (T-Mobile - Proposed)	95	4'6"x3" Pipe Mount (horizontal) ((Bottom mount) #14)	67
AIR 3246 B66 Panel Antenna (T-Mobile - Proposed)	95	6' Yagi w/ Mount (#9)	65
2217 B2 Radio Unit (T-Mobile - Proposed)	95	2'6"x4" Pipe Mount (For #8)	63
2217 B2 Radio Unit (T-Mobile - Proposed)	95	GPS (#8)	63
2217 B2 Radio Unit (T-Mobile - Proposed)	95	20' 4-Bay Dipole w/ 2' Sidearm Mount (#7 - CSP-4)	55
4449 B71 + B12 Radio Unit (T-Mobile - Proposed)	95	1.0" Dia 4" Omni w/Pipe Mount (#6 - CSP#16)	53
4449 B71 + B12 Radio Unit (T-Mobile - Proposed)	95	Pirod 4' Side Mount Standoff (1) (#4-AB)	48
4449 B71 + B12 Radio Unit (T-Mobile - Proposed)	95	10'x6" Dipole Antenna (#4-A)	48
(2) (Horizontal) 8'x2 1/2" Pipe Mount (Invert #16-A) (# 16-AB)	92	3' Yagi (#4-B)	48
(2) (Horizontal) 8'x2 1/2" Pipe Mount (Upright # 16-B) (# 16-AB)	92	5'x1.5in dia Whip Antenna /w mount (#3)	47
4'6"x3" Pipe Mount (horizontal) ((Top Mount) #14)	87	3' Whip (3in diameter) /w mount (#2)	43
		4 FT DISH (#1-A)	41
		Pirod 6' Side Mount Standoff (1) (#1-A Dish Mount)	41
		1'x1" Panel Antenna (#1-B (mount Share #1-A))	40
		6'x1" Whip Antenna w/ Mount (#5 - CSP#14)	39

SYMBOL LIST			
MARK	SIZE	MARK	SIZE
A	L2 1/2x2 1/2x3/16	B	1 @ 3.33333

MATERIAL STRENGTH					
GRADE	Fy	Fu	GRADE	Fy	Fu
A500-50	50 ksi	62 ksi	A529-50	50 ksi	65 ksi
A36	36 ksi	58 ksi	A572-60	60 ksi	75 ksi

TOWER DESIGN NOTES

1. Tower designed for Exposure C to the TIA-222-G Standard.
2. Tower designed for a 97 mph basic wind in accordance with the TIA-222-G Standard.
3. Tower is also designed for a 50 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 60 mph wind.
5. Tower Structure Class III.
6. Topographic Category 4 with Crest Height of 150.00 ft
7. Antenna/Mount/Cable's marked (# ##) refer to site tower climb identification numbers. Tower climb by D and K Nationwide Communications, Inc. (March 30, 2016).
8. Antenna/Mount/Cable's marked (CSP-#) refer to Connecticut State Police inventory obtained via e-mail dated April 8, 2016.
9. TIA-222-G Section 2.6.9.2.2 manually implemented within the TNX Data (Revised Analysis 4/9/2020).
10. TOWER RATING: 99%

REACTIONS - 97 mph WIND

SHEAR 44 K

MOMENT 2841 kip-ft

TORQUE 96 kip-ft

50 mph WIND - 0.7500 in ICE

AXIAL 52 K

SHEAR 119 K

MOMENT 7460 kip-ft

TORQUE 161 kip-ft

AECOM 500 Enterprise Drive, Suite 3B Rocky Hill, CT Phone: 860-263-5800 FAX: 860-812-2094	Job: 120' Self-Supporting Lattice Tower		
	Project: Connecticut State Police Tower - West Rock - MODification	Drawn by: MCD	App'd:
	Client: SMK-003 / ASM-010 / NSS-044 / (AT&T) / (Sprint) / (T-Mobile)	Date: 04/09/20	Scale: NTS
	Code: TIA-222-G		Dwg No. E-1

SYMBOL LIST

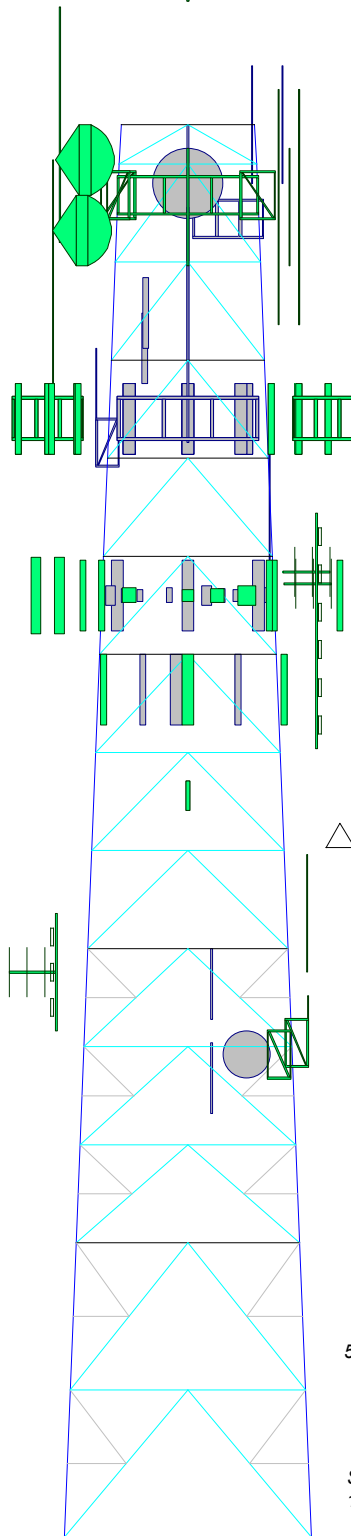
MARK	SIZE	MARK	SIZE
A	2L2 1/2x2x3/8x3/8	C	1 @ 3.33333
B	L2 1/2x2 1/2x3/16		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A500-50	50 ksi	62 ksi	A529-50	50 ksi	65 ksi
A36	36 ksi	58 ksi	A572-60	60 ksi	75 ksi

TOWER DESIGN NOTES

1. Tower designed for Exposure C to the TIA-222-G Standard.
2. Tower designed for a 97 mph basic wind in accordance with the TIA-222-G Standard.
3. Tower is also designed for a 50 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 60 mph wind.
5. Tower Structure Class III.
6. Topographic Category 4 with Crest Height of 150.00 ft
7. Antenna/Mount/Cable's marked (# ##) refer to site tower climb identification numbers. Tower climb by D and K Nationwide Communications, Inc. (March 30, 2016).
8. Antenna/Mount/Cable's marked (CSP-#) refer to Connecticut State Police inventory obtained via e-mail dated April 8, 2016.
9. TIA-222-G Section 2.6.9.2.2 manually implemented within the TNX Data (Revised Analysis 4/9/2020).
10. TOWER RATING: 99%



ALL REACTIONS
ARE FACTORED

MAX. CORNER REACTIONS AT BASE:

DOWN: 427 K
SHEAR: 65 K

UPLIFT: -380 K
SHEAR: 59 K

AXIAL
214 K
SHEAR
44 K
MOMENT
2841 kip-ft
TORQUE 96 kip-ft
50 mph WIND - 0.7500 in ICE

AXIAL
52 K
SHEAR
119 K
MOMENT
7460 kip-ft
TORQUE 161 kip-ft
REACTIONS - 97 mph WIND

AECOM

500 Enterprise Drive, Suite 3B
Rocky Hill, CT
Phone: 860-263-5800
FAX: 860-812-2094

Job: **120' Self-Supporting Lattice Tower**

Project: **Connecticut State Police Tower - West Rock - MODification**

Client: **SMK-003 / ASM-010 / NSS-044 / (AT&T) / (Sprint) / (T-Mobile)**

Code: **TIA-222-G**

Path:

Drawn by: **MCD** App'd:

Date: **04/09/20**

Scale: **NTS**

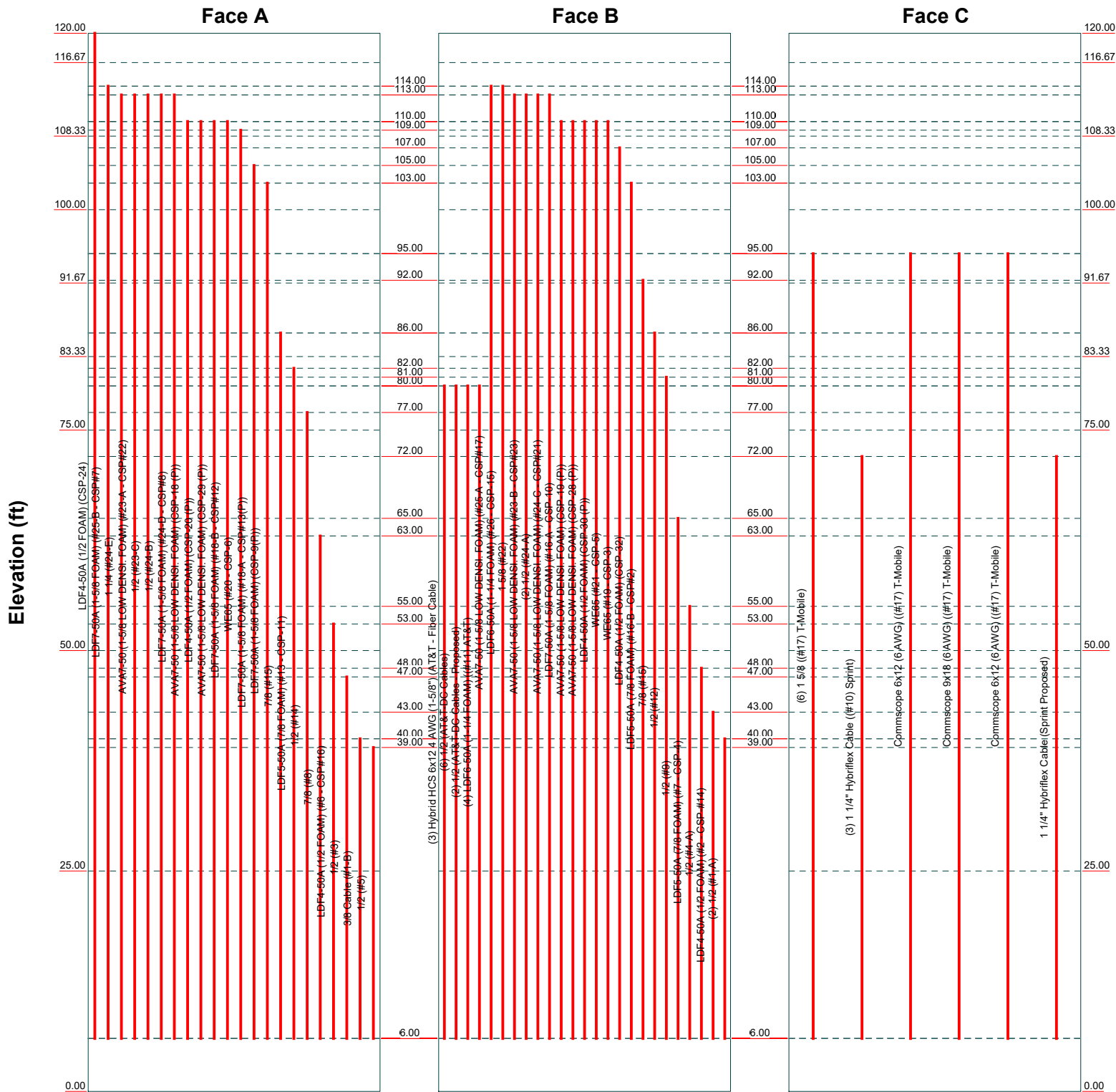
Dwg No. **E-1**

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TNX TOWER FEEDLINE DISTRIBUTION CHART

Feed Line Distribution Chart
0' - 120'

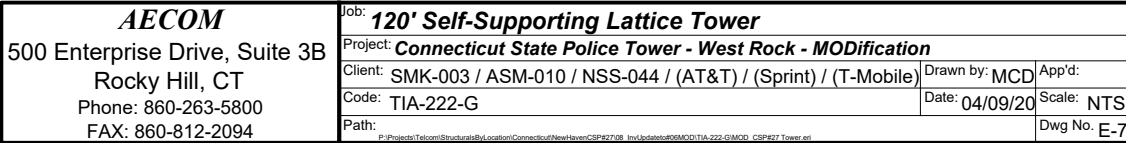
Round Flat App In Face App Out Face Truss Leg



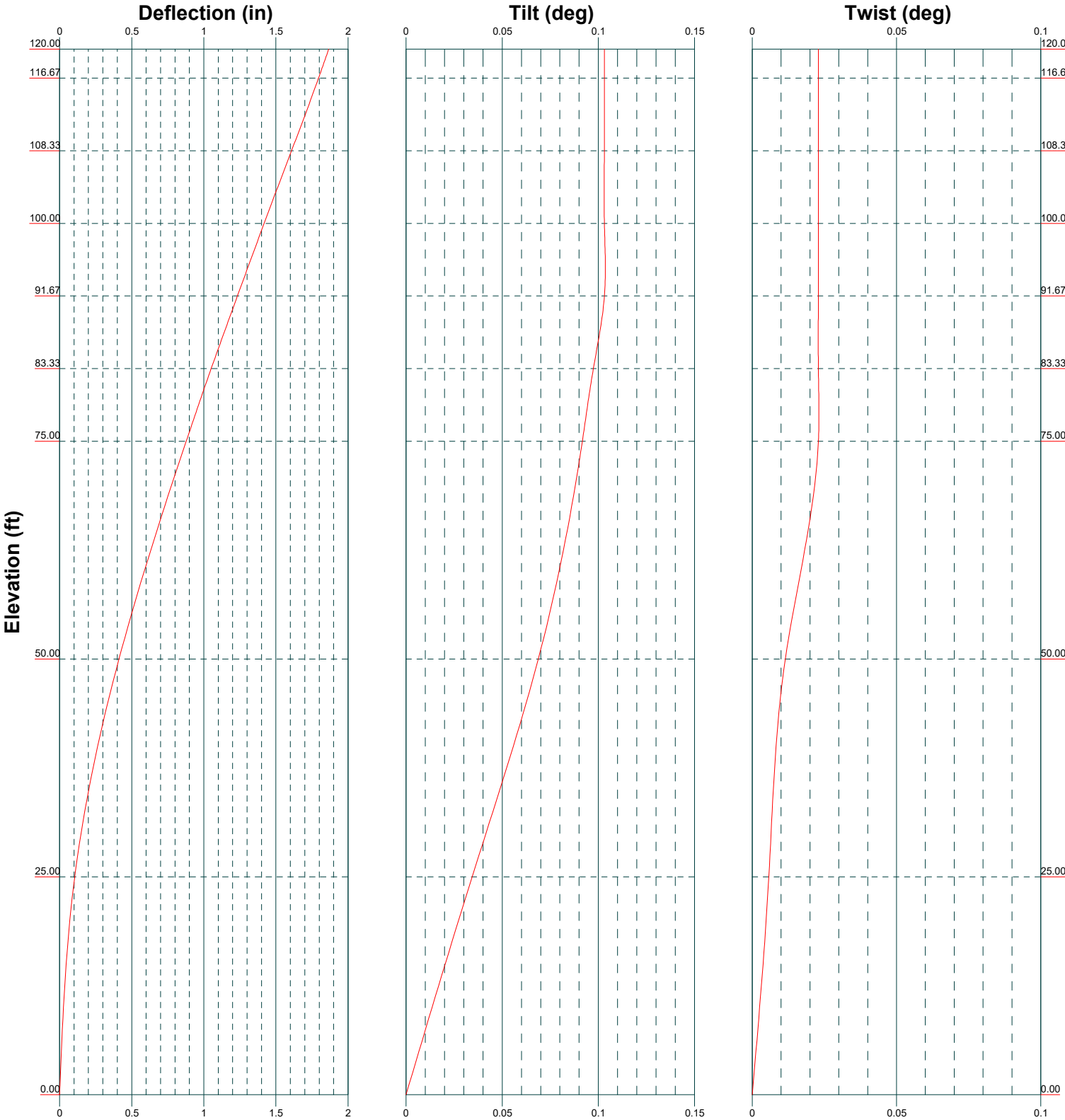
AECOM 500 Enterprise Drive, Suite 3B Rocky Hill, CT Phone: 860-263-5800 FAX: 860-812-2094	Job: 120' Self-Supporting Lattice Tower			
	Project: Connecticut State Police Tower - West Rock - MODification			
	Client: SMK-003 / ASM-010 / NSS-044 / (AT&T) / (Sprint) / (T-Mobile)	Drawn by: MCD	App'd:	
	Code: TIA-222-G	Date: 04/09/20	Scale: NTS	
	Path:	Dwg No. E-7		

TNX TOWER FEEDLINE PLAN

Round Flat App In Face App Out Face



TNX DEFLECTION, TILT AND TWIST



AECOM 500 Enterprise Drive, Suite 3B Rocky Hill, CT Phone: 860-263-5800 FAX: 860-812-2094	Job: 120' Self-Supporting Lattice Tower		
	Project: Connecticut State Police Tower - West Rock - MODification		
	Client: SMK-003 / ASM-010 / NSS-044 / (AT&T) / (Sprint) / (T-Mobile)	Drawn by: MCD	App'd:
	Code: TIA-222-G	Date: 04/09/20	Scale: NTS
	Path:	Dwg No. E-5	

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TNX TOWER DETAILED OUTPUT

tnxTower AECOM 500 Enterprise Drive, Suite 3B Rocky Hill, CT Phone: 860-263-5800 FAX: 860-812-2094	Job	120' Self-Supporting Lattice Tower	Page	1 of 66
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	Client	SMK-003 / ASM-010 / NSS-044 / (AT&T) / (Sprint) / (T-Mobile)	Designed by	MCD

Tower Input Data

The main tower is a 3x free standing tower with an overall height of 120.00 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 11.41 ft at the top and 21.02 ft at the base.

This tower is designed using the TIA-222-G standard.

The following design criteria apply:

Basic wind speed of 97 mph.

Structure Class III.

Exposure Category C.

Topographic Category 4.

Crest Height 150.00 ft.

Nominal ice thickness of 0.7500 in.

Ice thickness is considered to increase with height.

Ice density of 56 pcf.

A wind speed of 50 mph is used in combination with ice.

Temperature drop of 50 °F.

Deflections calculated using a wind speed of 60 mph.

Antenna/Mount/Cable's marked (# ##) refer to site tower climb identification numbers. Tower climb by D and K Nationwide Communications, Inc. (March 30, 2016)..

Antenna/Mount/Cable's marked (CSP-#) refer to Connecticut State Police inventory obtained via e-mail dated April 8, 2016..

Pressures are calculated at each section.

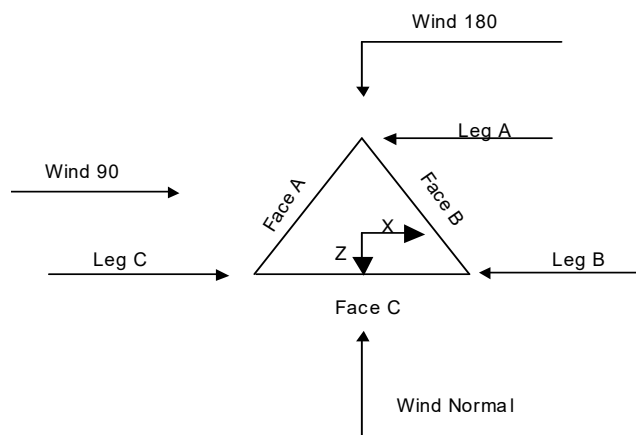
Stress ratio used in tower member design is 1.

Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

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

tnxTower AECOM 500 Enterprise Drive, Suite 3B Rocky Hill, CT Phone: 860-263-5800 FAX: 860-812-2094	Job 120' Self-Supporting Lattice Tower	Page 2 of 66
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	Client SMK-003 / ASM-010 / NSS-044 / (AT&T) / (Sprint) / (T-Mobile)	Designed by MCD



Triangular Tower

Tower Section Geometry

Tower Section	Tower Elevation	Assembly Database	Description	Section Width	Number of Sections	Section Length
	<i>ft</i>			<i>ft</i>		<i>ft</i>
T1	120.00-116.67			11.41	1	3.33
T2	116.67-108.33			11.68	1	8.33
T3	108.33-100.00			12.35	1	8.33
T4	100.00-91.67			13.02	1	8.33
T5	91.67-83.33			13.68	1	8.33
T6	83.33-75.00			14.35	1	8.33
T7	75.00-50.00			15.02	1	25.00
T8	50.00-25.00			17.02	1	25.00
T9	25.00-0.00			19.02	1	25.00

Tower Section Geometry (cont'd)

Tower Section	Tower Elevation	Diagonal Spacing	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset	Bottom Girt Offset
	<i>ft</i>	<i>ft</i>				<i>in</i>	<i>in</i>
T1	120.00-116.67	3.33	K Brace Down	No	Yes	0.0000	0.0000
T2	116.67-108.33	8.33	K Brace Down	No	Yes	0.0000	0.0000
T3	108.33-100.00	8.33	K Brace Down	No	Yes	0.0000	0.0000
T4	100.00-91.67	8.33	K Brace Down	No	Yes	0.0000	0.0000
T5	91.67-83.33	8.33	K Brace Down	No	Yes	0.0000	0.0000
T6	83.33-75.00	8.33	K Brace Down	No	Yes	0.0000	0.0000

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<i>Tower Section</i>	<i>Tower Elevation</i>	<i>Diagonal Spacing</i>	<i>Bracing Type</i>	<i>Has K Brace End Panels</i>	<i>Has Horizontals</i>	<i>Top Girt Offset</i>	<i>Bottom Girt Offset</i>
	<i>ft</i>	<i>ft</i>				<i>in</i>	<i>in</i>
T7	75.00-50.00	8.33	K Brace Down	No	Yes	0.0000	0.0000
T8	50.00-25.00	8.33	K1 Down	No	Yes	0.0000	0.0000
T9	25.00-0.00	12.50	K1 Down	No	Yes	0.0000	0.0000

Tower Section Geometry (cont'd)

<i>Tower Elevation</i>	<i>Leg Type</i>	<i>Leg Size</i>	<i>Leg Grade</i>	<i>Diagonal Type</i>	<i>Diagonal Size</i>	<i>Diagonal Grade</i>
<i>ft</i>						
T1 120.00-116.67	Pipe	P.5x.250	A500-50 (50 ksi)	Double Angle	2L2 1/2x2x3/16x3/8	A36 (36 ksi)
T2 116.67-108.33	Pipe	P.5x.250	A500-50 (50 ksi)	Double Angle	2L2 1/2x2x3/16x3/8	A36 (36 ksi)
T3 108.33-100.00	Pipe	P.5x.250	A500-50 (50 ksi)	Double Angle	2L2 1/2x2x3/16x3/8	A36 (36 ksi)
T4 100.00-91.67	Pipe	P.5x.250	A500-50 (50 ksi)	Double Angle	2L2 1/2x2 1/2x1/4x3/8	A529-50 (50 ksi)
T5 91.67-83.33	Pipe	P.5x.250	A500-50 (50 ksi)	Double Equal Angle	2L2 1/2x2 1/2x1/4x3/8	A529-50 (50 ksi)
T6 83.33-75.00	Pipe	P.5x.250	A500-50 (50 ksi)	Double Angle	2L2 1/2x2x3/8x3/8	A36 (36 ksi)
T7 75.00-50.00	Pipe	P5x.375	A500-50 (50 ksi)	Double Equal Angle	2L3x3x5/16x3/8	A529-50 (50 ksi)
T8 50.00-25.00	Pipe	P.5x.400	A572-60 (60 ksi)	Double Equal Angle	2L3x3x3/8x3/8	A529-50 (50 ksi)
T9 25.00-0.00	Pipe	P6.875x.400	A572-60 (60 ksi)	Double Equal Angle	2L3 1/2x3 1/2x3/8x3/8	A529-50 (50 ksi)

Tower Section Geometry (cont'd)

<i>Tower Elevation</i>	<i>Top Girt Type</i>	<i>Top Girt Size</i>	<i>Top Girt Grade</i>	<i>Bottom Girt Type</i>	<i>Bottom Girt Size</i>	<i>Bottom Girt Grade</i>
<i>ft</i>						
T1 120.00-116.67	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)	Solid Round		A36 (36 ksi)
T4 100.00-91.67	Single Angle	L3x3x1/4	A36 (36 ksi)	Solid Round		A36 (36 ksi)
T5 91.67-83.33	Single Angle	L3x3x1/4	A36 (36 ksi)	Solid Round		A36 (36 ksi)
T6 83.33-75.00	Single Angle	L3x3x1/4	A36 (36 ksi)	Solid Round		A36 (36 ksi)
T7 75.00-50.00	Single Angle	L3x3x5/16	A529-50 (50 ksi)	Solid Round		A36 (36 ksi)
T8 50.00-25.00	Equal Angle	L3 1/2x3 1/2x5/16	A529-50 (50 ksi)	Solid Round		A36 (36 ksi)
T9 25.00-0.00	Equal Angle	L4x4x3/8	A529-50 (50 ksi)	Solid Round		A36 (36 ksi)

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Tower Section Geometry (cont'd)

<i>Tower Elevation</i> <i>ft</i>	<i>No. of Mid Girts</i>	<i>Mid Girt Type</i>	<i>Mid Girt Size</i>	<i>Mid Girt Grade</i>	<i>Horizontal Type</i>	<i>Horizontal Size</i>	<i>Horizontal Grade</i>
T1 120.00-116.67	None	Flat Bar		A36 (36 ksi)	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T2 116.67-108.33	None	Flat Bar		A36 (36 ksi)	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T3 108.33-100.00	None	Flat Bar		A36 (36 ksi)	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T4 100.00-91.67	None	Flat Bar		A36 (36 ksi)	Single Angle	L3x3x1/4	A36 (36 ksi)
T5 91.67-83.33	None	Flat Bar		A36 (36 ksi)	Single Angle	L3x3x1/4	A36 (36 ksi)
T6 83.33-75.00	None	Flat Bar		A36 (36 ksi)	Single Angle	L3x3x1/4	A36 (36 ksi)
T7 75.00-50.00	None	Flat Bar		A36 (36 ksi)	Equal Angle	L3 1/2x3 1/2x1/4	A529-50 (50 ksi)
T8 50.00-25.00	None	Flat Bar		A36 (36 ksi)	Equal Angle	L4x4x5/16	A529-50 (50 ksi)
T9 25.00-0.00	None	Flat Bar		A36 (36 ksi)	Equal Angle	L4x4x3/8	A529-50 (50 ksi)

Tower Section Geometry (cont'd)

<i>Tower Elevation</i> <i>ft</i>	<i>Secondary Horizontal Type</i>	<i>Secondary Horizontal Size</i>	<i>Secondary Horizontal Grade</i>	<i>Inner Bracing Type</i>	<i>Inner Bracing Size</i>	<i>Inner Bracing Grade</i>
T4 100.00-91.67	Solid Round		A572-50 (50 ksi)	Single Angle	L2 1/2x2x3/16	A36 (36 ksi)
T5 91.67-83.33	Solid Round		A572-50 (50 ksi)	Single Angle	L2 1/2x2x3/16	A36 (36 ksi)
T6 83.33-75.00	Solid Round		A572-50 (50 ksi)	Single Angle	L2 1/2x2x3/16	A36 (36 ksi)
T7 75.00-50.00	Solid Round		A572-50 (50 ksi)	Single Angle	L2 1/2x2x3/16	A36 (36 ksi)
T8 50.00-25.00	Solid Round		A572-50 (50 ksi)	Single Angle	L2 1/2x2x3/16	A36 (36 ksi)
T9 25.00-0.00	Solid Round		A572-50 (50 ksi)	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)

Tower Section Geometry (cont'd)

<i>Tower Elevation</i> <i>ft</i>	<i>Redundant Bracing Grade</i>	<i>Redundant Type</i>	<i>Redundant Size</i>	<i>K Factor</i>
T8 50.00-25.00	A529-50 (50 ksi)	Horizontal (1) Diagonal (1)	Equal Angle Equal Angle	1 1
T9 25.00-0.00	A529-50 (50 ksi)	Horizontal (1) Diagonal (1)	Equal Angle Equal Angle	1 1

tnxTower AECOM 500 Enterprise Drive, Suite 3B Rocky Hill, CT Phone: 860-263-5800 FAX: 860-812-2094	Job	Page
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Tower Section Geometry (cont'd)

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
ft	ft ²	in							
T1 120.00-116.67	0.00	0.0000	A36 (36 ksi)	1	1	1.05	26.9200	36.0000	36.0000
T2 116.67-108.33	0.00	0.0000	A36 (36 ksi)	1	1	1.05	41.4800	36.0000	36.0000
T3 108.33-100.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	42.3200	36.0000	36.0000
T4 100.00-91.67	0.00	0.0000	A36 (36 ksi)	1	1	1.05	43.1200	36.0000	36.0000
T5 91.67-83.33	0.00	0.0000	A36 (36 ksi)	1	1	1.05	44.0000	36.0000	36.0000
T6 83.33-75.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	44.8800	36.0000	36.0000
T7 75.00-50.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	47.6400	36.0000	36.0000
T8 50.00-25.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	50.6000	36.0000	36.0000
T9 25.00-0.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	32.6600	36.0000	36.0000

Tower Section Geometry (cont'd)

Tower Elevation	Calc K Single Angles	Calc K Solid Rounds	Legs	K Factors ¹						
				X Brace Diags	K Brace Diags	Single Diags	Girts	Horiz.	Sec. Horiz.	Inner Brace
				X Y	X Y	X Y	X Y	X Y	X Y	X Y
T1 120.00-116.67	Yes	Yes	1	1	1	1	1	1	1	1
T2 116.67-108.33	Yes	Yes	1	1	1	1	1	1	1	1
T3 108.33-100.00	Yes	Yes	1	1	1	1	1	1	1	1
T4 100.00-91.67	Yes	Yes	1	1	1	1	1	1	1	1
T5 91.67-83.33	Yes	Yes	1	1	1	1	1	1	1	1
T6 83.33-75.00	Yes	Yes	1	1	1	1	1	1	1	1
T7 75.00-50.00	Yes	Yes	1	1	1	1	1	1	1	1
T8 50.00-25.00	Yes	Yes	1	1	1	1	1	1	1	1
T9 25.00-0.00	Yes	Yes	1	1	1	1	1	1	1	1

¹Note: 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.

tnxTower AECOM 500 Enterprise Drive, Suite 3B Rocky Hill, CT Phone: 860-263-5800 FAX: 860-812-2094	Job	Page
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Tower Section Geometry (cont'd)

Tower Elevation ft	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T1 120.00-116.67	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T2 116.67-108.33	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T3 108.33-100.00	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
T4 100.00-91.67	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T5 91.67-83.33	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 83.33-75.00	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
T7 75.00-50.00	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 50.00-25.00	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 25.00-0.00	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 120.00-116.67	Flange	0.0000	0	0.7500	1	0.6250	2	0.0000	0	0.6250	0	0.6250	2	0.6250	0
T2 116.67-108.33	Flange	0.0000	0	0.7500	1	0.6250	0	0.6250	0	0.6250	0	0.6250	2	0.6250	0
T3 108.33-100.00	Flange	0.0000	0	0.7500	1	0.6250	0	0.6250	0	0.6250	0	0.6250	2	0.6250	0
T4 100.00-91.67	Flange	0.7500	6	0.7500	1	0.6250	2	0.0000	0	0.6250	0	0.6250	2	0.6250	0
T5 91.67-83.33	Flange	0.7500	0	0.7500	1	0.6250	2	0.0000	0	0.6250	0	0.6250	2	0.6250	0
T6 83.33-75.00	Flange	0.7500	0	0.7500	1	0.6250	2	0.6250	0	0.6250	0	0.6250	2	0.6250	0
T7 75.00-50.00	Flange	0.7500	6	0.7500	1	0.6250	2	0.6250	0	0.6250	0	0.6250	2	0.6250	0
T8 50.00-25.00	Flange	0.7500	6	0.7500	1	0.6250	2	0.6250	0	0.6250	0	0.6250	2	0.6250	0
T9 25.00-0.00	Flange	1.0000	8	1.0000	1	0.6250	2	0.6250	0	0.6250	0	0.6250	2	0.6250	0

Feed Line/Linear Appurtenances - Entered As Round Or Flat

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	Client	SMK-003 / ASM-010 / NSS-044 / (AT&T) / (Sprint) / (T-Mobile)	Designed by	MCD

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
1 5/8 (#17) T-Mobile)	C	No	No	Ar (CaAa)	95.00 - 6.00	-2.0000	-0.42	6	6	1.9800	1.9800		1.04
1 1/4" Hybriflex Cable (#10) Sprint)	C	No	No	Ar (CaAa)	72.00 - 6.00	-2.0000	-0.3	3	3	1.6250	1.6250		1.60
Commscope 6x12 (6 AWG) (#17) T-Mobile)	C	No	No	Ar (CaAa)	95.00 - 6.00	-2.0000	-0.37	1	1	1.4300	1.4300		1.63
Commscope 9x18 (6 AWG) (#17) T-Mobile)	C	No	No	Ar (CaAa)	95.00 - 6.00	-2.0000	-0.36	1	1	1.5900	1.5900		2.59
Commscope 6x12 (6 AWG) (#17) T-Mobile)	C	No	No	Ar (CaAa)	95.00 - 6.00	-2.0000	-0.35	1	1	1.4300	1.4300		1.63
1 1/4" Hybriflex Cable (Sprint Proposed) * AT&T Update 04 2020	C	No	No	Ar (CaAa)	72.00 - 6.00	-2.0000	-0.285	1	1	1.6250	1.6250		1.60
Hybrid HCS 6x12 4 AWG (1-5/8") (AT&T - Fiber Cable)	B	No	No	Ar (CaAa)	80.00 - 6.00	-4.5000	0.36	3	3	1.9900	1.9900		1.90
1/2 (AT&T-DC Cables)	B	No	No	Ar (CaAa)	80.00 - 6.00	-4.5000	0.4	6	3	0.5800	0.5800		0.25
1/2 (AT&T-DC Cables - Proposed)	B	No	No	Ar (CaAa)	80.00 - 6.00	-4.5000	0.33	2	2	0.5800	0.5800		0.25
LDF6-50A (1-1/4 FOAM) (#11) AT&T) *CSP	B	No	No	Ar (CaAa)	80.00 - 6.00	-4.5000	0.43	4	4	1.5500	1.5500		0.66
LDF4-50A (1/2 FOAM) (CSP-24)	A	No	No	Ar (CaAa)	120.00 - 6.00	-2.0000	0.47	1	1	0.6300	0.6300		0.15
AVA7-50 (1-5/8 LOW DENSI. FOAM) (#25-A - CSP#17)	B	No	No	Ar (CaAa)	114.00 - 6.00	-2.0000	-0.47	1	1	1.9800	1.9800		0.72
LDF7-50A (1-5/8 FOAM) (#25-B - CSP#7)	A	No	No	Ar (CaAa)	114.00 - 6.00	-2.0000	0.455	1	1	1.9800	1.9800		0.82
LDF6-50A	B	No	No	Ar (CaAa)	114.00 -	-2.0000	-0.455	1	1	1.5500	1.5500		0.66

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Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
FOAM)													
(CSP-29 (P))													
LDF4-50A	B	No	No	Ar (CaAa)	110.00 -	-2.0000	-0.335	1	1	0.6300	0.6300		0.15
(1/2 FOAM)					6.00								
(CSP-30 (P))													
LDF7-50A	A	No	No	Ar (CaAa)	110.00 -	-2.0000	0.32	1	1	1.9800	1.9800		0.82
(1-5/8 FOAM)					6.00								
(#18-B -													
CSP#12)													
WE65	B	No	No	Af (CaAa)	110.00 -	-2.0000	-0.32	1	1	1.5836	1.5836		0.53
(#21 - CSP-5)					6.00								
WE65	A	No	No	Af (CaAa)	109.00 -	-2.0000	0.305	1	1	1.5836	1.5836		0.53
(#20 - CSP-6)					6.00								
WE65	B	No	No	Af (CaAa)	107.00 -	-2.0000	-0.305	1	1	1.5836	1.5836		0.53
(#19 - CSP-3)					6.00								
LDF7-50A	A	No	No	Ar (CaAa)	105.00 -	-2.0000	0.29	1	1	1.9800	1.9800		0.82
(1-5/8 FOAM)					6.00								
(#18-A -													
CSP#13(P))													
LDF4-50A	B	No	No	Ar (CaAa)	103.00 -	-2.0000	-0.29	1	1	0.6300	0.6300		0.15
(1/2 FOAM)					6.00								
(CSP-32)													
LDF7-50A	A	No	No	Ar (CaAa)	103.00 -	-2.0000	0.275	1	1	1.9800	1.9800		0.82
(1-5/8 FOAM)					6.00								
(CSP-9(P))													
LDF5-50A	B	No	No	Ar (CaAa)	92.00 - 6.00	-2.0000	-0.275	1	1	1.0900	1.0900		0.33
(7/8 FOAM)													
(#16-B -													
CSP#2)													
7/8	A	No	No	Ar (CaAa)	86.00 - 6.00	-2.0000	0.26	1	1	1.1100	1.1100		0.54
(#15)													
7/8	B	No	No	Ar (CaAa)	86.00 - 6.00	-2.0000	-0.26	1	1	1.1100	1.1100		0.54
(#15)													
LDF5-50A	A	No	No	Ar (CaAa)	82.00 - 6.00	-2.0000	0.245	1	1	1.0900	1.0900		0.33
(7/8 FOAM)													
(#13 -													
CSP-11)													
1/2	B	No	No	Ar (CaAa)	81.00 - 6.00	-2.0000	-0.245	1	1	0.5800	0.5800		0.25
(#12)													
1/2	A	No	No	Ar (CaAa)	77.00 - 6.00	-2.0000	0.23	1	1	0.5800	0.5800		0.25
(#14)													
1/2	B	No	No	Ar (CaAa)	65.00 - 6.00	-2.0000	-0.23	1	1	0.5800	0.5800		0.25
(#9)													
7/8	A	No	No	Ar (CaAa)	63.00 - 6.00	-2.0000	0.215	1	1	1.1100	1.1100		0.54
(#8)													
LDF5-50A	B	No	No	Ar (CaAa)	55.00 - 6.00	-2.0000	-0.215	1	1	1.0900	1.0900		0.33
(7/8 FOAM)													
(#7 - CSP-4)													
LDF4-50A	A	No	No	Ar (CaAa)	53.00 - 6.00	-2.0000	0.2	1	1	0.6300	0.6300		0.15
(1/2 FOAM)													
(#6 - CSP#16)													
1/2	B	No	No	Ar (CaAa)	48.00 - 6.00	-2.0000	-0.2	1	1	0.5800	0.5800		0.25
(#4-A)													
1/2	A	No	No	Ar (CaAa)	47.00 - 6.00	-2.0000	0.185	1	1	0.5800	0.5800		0.25
(#3)													
LDF4-50A	B	No	No	Ar (CaAa)	43.00 - 6.00	-2.0000	-0.185	1	1	0.6300	0.6300		0.15
(1/2 FOAM)													
(#2 -													
CSP-#14)													
3/8 Cable	A	No	No	Ar (CaAa)	40.00 - 6.00	-2.0000	0.17	1	1	0.3750	0.3750		0.20

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	Client	SMK-003 / ASM-010 / NSS-044 / (AT&T) / (Sprint) / (T-Mobile)	Designed by	MCD

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
(#1-B) 1/2	B	No	No	Ar (CaAa)	40.00 - 6.00	-2.0000	-0.17	2	2	0.5800	0.5800		0.25
(#1-A) 1/2 (#5)	A	No	No	Ar (CaAa)	39.00 - 6.00	-2.0000	0.155	1	1	0.5800	0.5800		0.25

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A _R ft ²	A _F ft ²	C _A A _A In Face ft ²	C _A A _A Out Face ft ²	Weight K
T1	120.00-116.67	A	0.000	0.000	0.210	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
T2	116.67-108.33	A	0.000	0.000	6.031	0.000	0.02
		B	0.000	0.000	6.849	0.000	0.03
		C	0.000	0.000	0.000	0.000	0.00
T3	108.33-100.00	A	0.000	0.000	16.992	0.000	0.06
		B	0.000	0.000	18.569	0.000	0.06
		C	0.000	0.000	0.000	0.000	0.00
T4	100.00-91.67	A	0.000	0.000	18.708	0.000	0.07
		B	0.000	0.000	19.293	0.000	0.07
		C	0.000	0.000	5.443	0.000	0.04
T5	91.67-83.33	A	0.000	0.000	19.004	0.000	0.07
		B	0.000	0.000	20.461	0.000	0.07
		C	0.000	0.000	13.608	0.000	0.10
T6	83.33-75.00	A	0.000	0.000	20.512	0.000	0.08
		B	0.000	0.000	29.843	0.000	0.13
		C	0.000	0.000	13.608	0.000	0.10
T7	75.00-50.00	A	0.000	0.000	64.705	0.000	0.24
		B	0.000	0.000	108.161	0.000	0.49
		C	0.000	0.000	55.125	0.000	0.44
T8	50.00-25.00	A	0.000	0.000	70.074	0.000	0.26
		B	0.000	0.000	115.129	0.000	0.52
		C	0.000	0.000	57.075	0.000	0.46
T9	25.00-0.00	A	0.000	0.000	54.158	0.000	0.20
		B	0.000	0.000	88.803	0.000	0.40
		C	0.000	0.000	43.377	0.000	0.35

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 _A A _A In Face ft ²	C _A A _A Out Face ft ²	Weight K
T1	120.00-116.67	A	2.449	0.000	0.000	1.843	0.000	0.03
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00
T2	116.67-108.33	A	2.455	0.000	0.000	27.966	0.000	0.53
		B		0.000	0.000	27.871	0.000	0.51
		C		0.000	0.000	0.000	0.000	0.00
T3	108.33-100.00	A	2.465	0.000	0.000	70.227	0.000	1.36
		B		0.000	0.000	72.619	0.000	1.36
		C		0.000	0.000	0.000	0.000	0.00

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Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft ²	A_F ft ²	$C_A A_A$ In Face ft ²	$C_A A_A$ Out Face ft ²	Weight K
T4	100.00-91.67	A	2.474	0.000	0.000	76.439	0.000	1.49
		B		0.000	0.000	77.014	0.000	1.44
		C		0.000	0.000	17.937	0.000	0.36
T5	91.67-83.33	A	2.484	0.000	0.000	78.287	0.000	1.53
		B		0.000	0.000	83.706	0.000	1.57
		C		0.000	0.000	44.915	0.000	0.91
T6	83.33-75.00	A	2.494	0.000	0.000	87.342	0.000	1.71
		B		0.000	0.000	123.695	0.000	2.23
		C		0.000	0.000	44.988	0.000	0.91
T7	75.00-50.00	A	2.511	0.000	0.000	286.171	0.000	5.59
		B		0.000	0.000	454.378	0.000	8.11
		C		0.000	0.000	190.491	0.000	3.80
T8	50.00-25.00	A	2.516	0.000	0.000	334.794	0.000	6.45
		B		0.000	0.000	512.489	0.000	9.05
		C		0.000	0.000	198.204	0.000	3.95
T9	25.00-0.00	A	2.401	0.000	0.000	254.875	0.000	4.71
		B		0.000	0.000	388.847	0.000	6.58
		C		0.000	0.000	147.477	0.000	2.85

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
T1	120.00-116.67	-0.0006	-0.6522	-0.0023	-2.4359
T2	116.67-108.33	-0.0105	-17.4027	-0.0445	-29.2967
T3	108.33-100.00	-0.1223	-32.5350	-0.1575	-44.6980
T4	100.00-91.67	3.5638	-28.9973	4.1549	-40.6612
T5	91.67-83.33	8.7620	-24.3249	10.0038	-34.9716
T6	83.33-75.00	13.5334	-21.2902	15.7612	-30.6935
T7	75.00-50.00	17.6016	-16.8096	21.1237	-26.0623
T8	50.00-25.00	16.7573	-17.4321	20.7578	-29.6143
T9	25.00-0.00	16.1571	-17.1485	20.9653	-30.4848

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T1	13	LDF4-50A (1/2 FOAM)	116.67 - 120.00	0.6000	0.5082
T2	13	LDF4-50A (1/2 FOAM)	108.33 - 116.67	0.6000	0.6000
T2	14	AVA7-50 (1-5/8 LOW DENS. FOAM)	108.33 - 114.00	0.6000	0.6000
T2	15	LDF7-50A (1-5/8 FOAM)	108.33 - 114.00	0.6000	0.6000
T2	16	LDF6-50A (1-1/4 FOAM)	108.33 - 114.00	0.6000	0.6000
T2	17		108.33 - 113.00	0.6000	0.6000
T2	18		108.33 -	0.6000	0.6000

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	Client	SMK-003 / ASM-010 / NSS-044 / (AT&T) / (Sprint) / (T-Mobile)	Designed by	MCD

<i>Tower Section</i>	<i>Feed Line Record No.</i>	<i>Description</i>	<i>Feed Line Segment Elev.</i>	<i>K_a No Ice</i>	<i>K_a Ice</i>
T2	19	AVA7-50 (1-5/8 LOW DENS. FOAM)	113.00 108.33 - 113.00	0.6000	0.6000
T2	20	AVA7-50 (1-5/8 LOW DENS. FOAM)	108.33 - 113.00	0.6000	0.6000
T2	21	1/2	108.33 - 113.00	0.6000	0.6000
T2	22	1/2	108.33 - 113.00	0.6000	0.6000
T2	23	1/2	108.33 - 113.00	0.6000	0.6000
T2	24	AVA7-50 (1-5/8 LOW DENS. FOAM)	108.33 - 113.00	0.6000	0.6000
T2	25	LDF7-50A (1-5/8 FOAM)	108.33 - 113.00	0.6000	0.6000
T2	26	LDF7-50A (1-5/8 FOAM)	108.33 - 110.00	0.6000	0.6000
T2	27	AVA7-50 (1-5/8 LOW DENS. FOAM)	108.33 - 110.00	0.6000	0.6000
T2	28	AVA7-50 (1-5/8 LOW DENS. FOAM)	108.33 - 110.00	0.6000	0.6000
T2	29	LDF4-50A (1/2 FOAM)	108.33 - 110.00	0.6000	0.6000
T2	30	AVA7-50 (1-5/8 LOW DENS. FOAM)	108.33 - 110.00	0.6000	0.6000
T2	31	AVA7-50 (1-5/8 LOW DENS. FOAM)	108.33 - 110.00	0.6000	0.6000
T2	32	LDF4-50A (1/2 FOAM)	108.33 - 110.00	0.6000	0.6000
T2	33	LDF7-50A (1-5/8 FOAM)	108.33 - 110.00	0.6000	0.6000
T2	34	WE65	108.33 - 110.00	0.6000	0.6000
T2	35	WE65	108.33 - 109.00	0.6000	0.6000
T3	13	LDF4-50A (1/2 FOAM)	100.00 - 108.33	0.6000	0.6000
T3	14	AVA7-50 (1-5/8 LOW DENS. FOAM)	100.00 - 108.33	0.6000	0.6000
T3	15	LDF7-50A (1-5/8 FOAM)	100.00 - 108.33	0.6000	0.6000
T3	16	LDF6-50A (1-1/4 FOAM)	100.00 - 108.33	0.6000	0.6000
T3	17	1 1/4	100.00 - 108.33	0.6000	0.6000
T3	18	1 5/8	100.00 - 108.33	0.6000	0.6000
T3	19	AVA7-50 (1-5/8 LOW DENS. FOAM)	100.00 - 108.33	0.6000	0.6000
T3	20	AVA7-50 (1-5/8 LOW DENS. FOAM)	100.00 - 108.33	0.6000	0.6000
T3	21	1/2	100.00 - 108.33	0.6000	0.6000
T3	22	1/2	100.00 - 108.33	0.6000	0.6000
T3	23	1/2	100.00 - 108.33	0.6000	0.6000
T3	24	AVA7-50 (1-5/8 LOW DENS. FOAM)	100.00 - 108.33	0.6000	0.6000
T3	25	LDF7-50A (1-5/8 FOAM)	100.00 - 108.33	0.6000	0.6000
T3	26	LDF7-50A (1-5/8 FOAM)	100.00 -	0.6000	0.6000

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<i>Tower Section</i>	<i>Feed Line Record No.</i>	<i>Description</i>	<i>Feed Line Segment Elev.</i>	<i>K_a No Ice</i>	<i>K_a Ice</i>
T3	27	AVA7-50 (1-5/8 LOW Densi. FOAM)	108.33 100.00 - 108.33	0.6000	0.6000
T3	28	AVA7-50 (1-5/8 LOW Densi. FOAM)	100.00 - 108.33	0.6000	0.6000
T3	29	LDF4-50A (1/2 FOAM)	100.00 - 108.33	0.6000	0.6000
T3	30	AVA7-50 (1-5/8 LOW Densi. FOAM)	100.00 - 108.33	0.6000	0.6000
T3	31	AVA7-50 (1-5/8 LOW Densi. FOAM)	100.00 - 108.33	0.6000	0.6000
T3	32	LDF4-50A (1/2 FOAM)	100.00 - 108.33	0.6000	0.6000
T3	33	LDF7-50A (1-5/8 FOAM)	100.00 - 108.33	0.6000	0.6000
T3	34	WE65	100.00 - 108.33	0.6000	0.6000
T3	35	WE65	100.00 - 108.33	0.6000	0.6000
T3	36	WE65	100.00 - 107.00	0.6000	0.6000
T3	37	LDF7-50A (1-5/8 FOAM)	100.00 - 105.00	0.6000	0.6000
T3	38	LDF4-50A (1/2 FOAM)	100.00 - 103.00	0.6000	0.6000
T3	39	LDF7-50A (1-5/8 FOAM)	100.00 - 103.00	0.6000	0.6000
T4	1	1 5/8	91.67 - 95.00	0.6000	0.6000
T4	3	Commscope 6x12 (6 AWG)	91.67 - 95.00	0.6000	0.6000
T4	4	Commscope 9x18 (6 AWG)	91.67 - 95.00	0.6000	0.6000
T4	5	Commscope 6x12 (6 AWG)	91.67 - 95.00	0.6000	0.6000
T4	13	LDF4-50A (1/2 FOAM)	91.67 - 100.00	0.6000	0.6000
T4	14	AVA7-50 (1-5/8 LOW Densi. FOAM)	91.67 - 100.00	0.6000	0.6000
T4	15	LDF7-50A (1-5/8 FOAM)	91.67 - 100.00	0.6000	0.6000
T4	16	LDF6-50A (1-1/4 FOAM)	91.67 - 100.00	0.6000	0.6000
T4	17	1 1/4	91.67 - 100.00	0.6000	0.6000
T4	18	1 5/8	91.67 - 100.00	0.6000	0.6000
T4	19	AVA7-50 (1-5/8 LOW Densi. FOAM)	91.67 - 100.00	0.6000	0.6000
T4	20	AVA7-50 (1-5/8 LOW Densi. FOAM)	91.67 - 100.00	0.6000	0.6000
T4	21	1/2	91.67 - 100.00	0.6000	0.6000
T4	22	1/2	91.67 - 100.00	0.6000	0.6000
T4	23	1/2	91.67 - 100.00	0.6000	0.6000
T4	24	AVA7-50 (1-5/8 LOW Densi. FOAM)	91.67 - 100.00	0.6000	0.6000
T4	25	LDF7-50A (1-5/8 FOAM)	91.67 - 100.00	0.6000	0.6000
T4	26	LDF7-50A (1-5/8 FOAM)	91.67 - 100.00	0.6000	0.6000
T4	27	AVA7-50 (1-5/8 LOW Densi. FOAM)	91.67 - 100.00	0.6000	0.6000
T4	28	AVA7-50 (1-5/8 LOW Densi. FOAM)	91.67 - 100.00	0.6000	0.6000
T4	29	LDF4-50A (1/2 FOAM)	91.67 - 100.00	0.6000	0.6000
T4	30	AVA7-50 (1-5/8 LOW Densi. FOAM)	91.67 - 100.00	0.6000	0.6000
T4	31	AVA7-50 (1-5/8 LOW Densi. FOAM)	91.67 - 100.00	0.6000	0.6000
T4	32	LDF4-50A (1/2 FOAM)	91.67 - 100.00	0.6000	0.6000
T4	33	LDF7-50A (1-5/8 FOAM)	91.67 - 100.00	0.6000	0.6000
T4	34	WE65	91.67 - 100.00	0.6000	0.6000
T4	35	WE65	91.67 - 100.00	0.6000	0.6000

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	Project Connecticut State Police Tower - West Rock - MODification	Date 16:04:07 04/09/20
	Client SMK-003 / ASM-010 / NSS-044 / (AT&T) / (Sprint) / (T-Mobile)	Designed by MCD

<i>Tower Section</i>	<i>Feed Line Record No.</i>	<i>Description</i>	<i>Feed Line Segment Elev.</i>	<i>K_a No Ice</i>	<i>K_a Ice</i>
T4	36	WE65	91.67 - 100.00	0.6000	0.6000
T4	37	LDF7-50A (1-5/8 FOAM)	91.67 - 100.00	0.6000	0.6000
T4	38	LDF4-50A (1/2 FOAM)	91.67 - 100.00	0.6000	0.6000
T4	39	LDF7-50A (1-5/8 FOAM)	91.67 - 100.00	0.6000	0.6000
T4	40	LDF5-50A (7/8 FOAM)	91.67 - 92.00	0.6000	0.6000
T5	1	1 5/8	83.33 - 91.67	0.6000	0.6000
T5	3	Commscope 6x12 (6 AWG)	83.33 - 91.67	0.6000	0.6000
T5	4	Commscope 9x18 (6 AWG)	83.33 - 91.67	0.6000	0.6000
T5	5	Commscope 6x12 (6 AWG)	83.33 - 91.67	0.6000	0.6000
T5	13	LDF4-50A (1/2 FOAM)	83.33 - 91.67	0.6000	0.6000
T5	14	AVA7-50 (1-5/8 LOW DENS. FOAM)	83.33 - 91.67	0.6000	0.6000
T5	15	LDF7-50A (1-5/8 FOAM)	83.33 - 91.67	0.6000	0.6000
T5	16	LDF6-50A (1-1/4 FOAM)	83.33 - 91.67	0.6000	0.6000
T5	17	1 1/4	83.33 - 91.67	0.6000	0.6000
T5	18	1 5/8	83.33 - 91.67	0.6000	0.6000
T5	19	AVA7-50 (1-5/8 LOW DENS. FOAM)	83.33 - 91.67	0.6000	0.6000
T5	20	AVA7-50 (1-5/8 LOW DENS. FOAM)	83.33 - 91.67	0.6000	0.6000
T5	21	1/2	83.33 - 91.67	0.6000	0.6000
T5	22	1/2	83.33 - 91.67	0.6000	0.6000
T5	23	1/2	83.33 - 91.67	0.6000	0.6000
T5	24	AVA7-50 (1-5/8 LOW DENS. FOAM)	83.33 - 91.67	0.6000	0.6000
T5	25	LDF7-50A (1-5/8 FOAM)	83.33 - 91.67	0.6000	0.6000
T5	26	LDF7-50A (1-5/8 FOAM)	83.33 - 91.67	0.6000	0.6000
T5	27	AVA7-50 (1-5/8 LOW DENS. FOAM)	83.33 - 91.67	0.6000	0.6000
T5	28	AVA7-50 (1-5/8 LOW DENS. FOAM)	83.33 - 91.67	0.6000	0.6000
T5	29	LDF4-50A (1/2 FOAM)	83.33 - 91.67	0.6000	0.6000
T5	30	AVA7-50 (1-5/8 LOW DENS. FOAM)	83.33 - 91.67	0.6000	0.6000
T5	31	AVA7-50 (1-5/8 LOW DENS. FOAM)	83.33 - 91.67	0.6000	0.6000
T5	32	LDF4-50A (1/2 FOAM)	83.33 - 91.67	0.6000	0.6000
T5	33	LDF7-50A (1-5/8 FOAM)	83.33 - 91.67	0.6000	0.6000
T5	34	WE65	83.33 - 91.67	0.6000	0.6000
T5	35	WE65	83.33 - 91.67	0.6000	0.6000
T5	36	WE65	83.33 - 91.67	0.6000	0.6000
T5	37	LDF7-50A (1-5/8 FOAM)	83.33 - 91.67	0.6000	0.6000
T5	38	LDF4-50A (1/2 FOAM)	83.33 - 91.67	0.6000	0.6000
T5	39	LDF7-50A (1-5/8 FOAM)	83.33 - 91.67	0.6000	0.6000
T5	40	LDF5-50A (7/8 FOAM)	83.33 - 91.67	0.6000	0.6000
T5	41	7/8	83.33 - 86.00	0.6000	0.6000
T5	42	7/8	83.33 - 86.00	0.6000	0.6000
T6	1	1 5/8	75.00 - 83.33	0.6000	0.6000
T6	3	Commscope 6x12 (6 AWG)	75.00 - 83.33	0.6000	0.6000
T6	4	Commscope 9x18 (6 AWG)	75.00 - 83.33	0.6000	0.6000
T6	5	Commscope 6x12 (6 AWG)	75.00 - 83.33	0.6000	0.6000
T6	8	Hybrid HCS 6x12 4 AWG (1-5/8")	75.00 - 80.00	0.6000	0.6000
T6	9	1/2	75.00 - 80.00	0.6000	0.6000
T6	10	1/2	75.00 - 80.00	0.6000	0.6000
T6	11	LDF6-50A (1-1/4 FOAM)	75.00 - 80.00	0.6000	0.6000
T6	13	LDF4-50A (1/2 FOAM)	75.00 - 83.33	0.6000	0.6000
T6	14	AVA7-50 (1-5/8 LOW DENS. FOAM)	75.00 - 83.33	0.6000	0.6000
T6	15	LDF7-50A (1-5/8 FOAM)	75.00 - 83.33	0.6000	0.6000
T6	16	LDF6-50A (1-1/4 FOAM)	75.00 - 83.33	0.6000	0.6000
T6	17	1 1/4	75.00 - 83.33	0.6000	0.6000

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	Client SMK-003 / ASM-010 / NSS-044 / (AT&T) / (Sprint) / (T-Mobile)	Designed by MCD

<i>Tower Section</i>	<i>Feed Line Record No.</i>	<i>Description</i>	<i>Feed Line Segment Elev.</i>	<i>K_a No Ice</i>	<i>K_a Ice</i>
T6	18	1 5/8	75.00 - 83.33	0.6000	0.6000
T6	19	AVA7-50 (1-5/8 LOW DENS. FOAM)	75.00 - 83.33	0.6000	0.6000
T6	20	AVA7-50 (1-5/8 LOW DENS. FOAM)	75.00 - 83.33	0.6000	0.6000
T6	21	1/2	75.00 - 83.33	0.6000	0.6000
T6	22	1/2	75.00 - 83.33	0.6000	0.6000
T6	23	1/2	75.00 - 83.33	0.6000	0.6000
T6	24	AVA7-50 (1-5/8 LOW DENS. FOAM)	75.00 - 83.33	0.6000	0.6000
T6	25	LDF7-50A (1-5/8 FOAM)	75.00 - 83.33	0.6000	0.6000
T6	26	LDF7-50A (1-5/8 FOAM)	75.00 - 83.33	0.6000	0.6000
T6	27	AVA7-50 (1-5/8 LOW DENS. FOAM)	75.00 - 83.33	0.6000	0.6000
T6	28	AVA7-50 (1-5/8 LOW DENS. FOAM)	75.00 - 83.33	0.6000	0.6000
T6	29	LDF4-50A (1/2 FOAM)	75.00 - 83.33	0.6000	0.6000
T6	30	AVA7-50 (1-5/8 LOW DENS. FOAM)	75.00 - 83.33	0.6000	0.6000
T6	31	AVA7-50 (1-5/8 LOW DENS. FOAM)	75.00 - 83.33	0.6000	0.6000
T6	32	LDF4-50A (1/2 FOAM)	75.00 - 83.33	0.6000	0.6000
T6	33	LDF7-50A (1-5/8 FOAM)	75.00 - 83.33	0.6000	0.6000
T6	34	WE65	75.00 - 83.33	0.6000	0.6000
T6	35	WE65	75.00 - 83.33	0.6000	0.6000
T6	36	WE65	75.00 - 83.33	0.6000	0.6000
T6	37	LDF7-50A (1-5/8 FOAM)	75.00 - 83.33	0.6000	0.6000
T6	38	LDF4-50A (1/2 FOAM)	75.00 - 83.33	0.6000	0.6000
T6	39	LDF7-50A (1-5/8 FOAM)	75.00 - 83.33	0.6000	0.6000
T6	40	LDF5-50A (7/8 FOAM)	75.00 - 83.33	0.6000	0.6000
T6	41	7/8	75.00 - 83.33	0.6000	0.6000
T6	42	7/8	75.00 - 83.33	0.6000	0.6000
T6	43	LDF5-50A (7/8 FOAM)	75.00 - 82.00	0.6000	0.6000
T6	44	1/2	75.00 - 81.00	0.6000	0.6000
T6	45	1/2	75.00 - 77.00	0.6000	0.6000
T7	1	1 5/8	50.00 - 75.00	0.6000	0.6000
T7	2	1 1/4" Hybriflex Cable	50.00 - 72.00	0.6000	0.6000
T7	3	Commscope 6x12 (6 AWG)	50.00 - 75.00	0.6000	0.6000
T7	4	Commscope 9x18 (6 AWG)	50.00 - 75.00	0.6000	0.6000
T7	5	Commscope 6x12 (6 AWG)	50.00 - 75.00	0.6000	0.6000
T7	6	1 1/4" Hybriflex Cable	50.00 - 72.00	0.6000	0.6000
T7	8	Hybrid HCS 6x12 4 AWG (1-5/8")	50.00 - 75.00	0.6000	0.6000
T7	9	1/2	50.00 - 75.00	0.6000	0.6000
T7	10	1/2	50.00 - 75.00	0.6000	0.6000
T7	11	LDF6-50A (1-1/4 FOAM)	50.00 - 75.00	0.6000	0.6000
T7	13	LDF4-50A (1/2 FOAM)	50.00 - 75.00	0.6000	0.6000
T7	14	AVA7-50 (1-5/8 LOW DENS. FOAM)	50.00 - 75.00	0.6000	0.6000
T7	15	LDF7-50A (1-5/8 FOAM)	50.00 - 75.00	0.6000	0.6000
T7	16	LDF6-50A (1-1/4 FOAM)	50.00 - 75.00	0.6000	0.6000
T7	17	1 1/4	50.00 - 75.00	0.6000	0.6000
T7	18	1 5/8	50.00 - 75.00	0.6000	0.6000
T7	19	AVA7-50 (1-5/8 LOW DENS. FOAM)	50.00 - 75.00	0.6000	0.6000
T7	20	AVA7-50 (1-5/8 LOW DENS. FOAM)	50.00 - 75.00	0.6000	0.6000
T7	21	1/2	50.00 - 75.00	0.6000	0.6000
T7	22	1/2	50.00 - 75.00	0.6000	0.6000
T7	23	1/2	50.00 - 75.00	0.6000	0.6000
T7	24	AVA7-50 (1-5/8 LOW DENS. FOAM)	50.00 - 75.00	0.6000	0.6000

<i>tnxTower</i> AECOM 500 Enterprise Drive, Suite 3B Rocky Hill, CT Phone: 860-263-5800 FAX: 860-812-2094	Job	120' Self-Supporting Lattice Tower	Page 16 of 66
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	Client	SMK-003 / ASM-010 / NSS-044 / (AT&T) / (Sprint) / (T-Mobile)	Designed by MCD

<i>Tower Section</i>	<i>Feed Line Record No.</i>	<i>Description</i>	<i>Feed Line Segment Elev.</i>	<i>K_a No Ice</i>	<i>K_a Ice</i>
T7	25	LDF7-50A (1-5/8 FOAM)	50.00 - 75.00	0.6000	0.6000
T7	26	LDF7-50A (1-5/8 FOAM)	50.00 - 75.00	0.6000	0.6000
T7	27	AVA7-50 (1-5/8 LOW DENS. FOAM)	50.00 - 75.00	0.6000	0.6000
T7	28	AVA7-50 (1-5/8 LOW DENS. FOAM)	50.00 - 75.00	0.6000	0.6000
T7	29	LDF4-50A (1/2 FOAM)	50.00 - 75.00	0.6000	0.6000
T7	30	AVA7-50 (1-5/8 LOW DENS. FOAM)	50.00 - 75.00	0.6000	0.6000
T7	31	AVA7-50 (1-5/8 LOW DENS. FOAM)	50.00 - 75.00	0.6000	0.6000
T7	32	LDF4-50A (1/2 FOAM)	50.00 - 75.00	0.6000	0.6000
T7	33	LDF7-50A (1-5/8 FOAM)	50.00 - 75.00	0.6000	0.6000
T7	34	WE65	50.00 - 75.00	0.6000	0.6000
T7	35	WE65	50.00 - 75.00	0.6000	0.6000
T7	36	WE65	50.00 - 75.00	0.6000	0.6000
T7	37	LDF7-50A (1-5/8 FOAM)	50.00 - 75.00	0.6000	0.6000
T7	38	LDF4-50A (1/2 FOAM)	50.00 - 75.00	0.6000	0.6000
T7	39	LDF7-50A (1-5/8 FOAM)	50.00 - 75.00	0.6000	0.6000
T7	40	LDF5-50A (7/8 FOAM)	50.00 - 75.00	0.6000	0.6000
T7	41	7/8	50.00 - 75.00	0.6000	0.6000
T7	42	7/8	50.00 - 75.00	0.6000	0.6000
T7	43	LDF5-50A (7/8 FOAM)	50.00 - 75.00	0.6000	0.6000
T7	44	1/2	50.00 - 75.00	0.6000	0.6000
T7	45	1/2	50.00 - 75.00	0.6000	0.6000
T7	46	1/2	50.00 - 65.00	0.6000	0.6000
T7	47	7/8	50.00 - 63.00	0.6000	0.6000
T7	48	LDF5-50A (7/8 FOAM)	50.00 - 55.00	0.6000	0.6000
T7	49	LDF4-50A (1/2 FOAM)	50.00 - 53.00	0.6000	0.6000
T8	1	1 5/8	25.00 - 50.00	0.6000	0.6000
T8	2	1 1/4" Hybriflex Cable	25.00 - 50.00	0.6000	0.6000
T8	3	Commscope 6x12 (6 AWG)	25.00 - 50.00	0.6000	0.6000
T8	4	Commscope 9x18 (6 AWG)	25.00 - 50.00	0.6000	0.6000
T8	5	Commscope 6x12 (6 AWG)	25.00 - 50.00	0.6000	0.6000
T8	6	1 1/4" Hybriflex Cable	25.00 - 50.00	0.6000	0.6000
T8	8	Hybrid HCS 6x12 4 AWG (1-5/8")	25.00 - 50.00	0.6000	0.6000
T8	9	1/2	25.00 - 50.00	0.6000	0.6000
T8	10	1/2	25.00 - 50.00	0.6000	0.6000
T8	11	LDF6-50A (1-1/4 FOAM)	25.00 - 50.00	0.6000	0.6000
T8	13	LDF4-50A (1/2 FOAM)	25.00 - 50.00	0.6000	0.6000
T8	14	AVA7-50 (1-5/8 LOW DENS. FOAM)	25.00 - 50.00	0.6000	0.6000
T8	15	LDF7-50A (1-5/8 FOAM)	25.00 - 50.00	0.6000	0.6000
T8	16	LDF6-50A (1-1/4 FOAM)	25.00 - 50.00	0.6000	0.6000
T8	17	1 1/4	25.00 - 50.00	0.6000	0.6000
T8	18	1 5/8	25.00 - 50.00	0.6000	0.6000
T8	19	AVA7-50 (1-5/8 LOW DENS. FOAM)	25.00 - 50.00	0.6000	0.6000
T8	20	AVA7-50 (1-5/8 LOW DENS. FOAM)	25.00 - 50.00	0.6000	0.6000
T8	21	1/2	25.00 - 50.00	0.6000	0.6000
T8	22	1/2	25.00 - 50.00	0.6000	0.6000
T8	23	1/2	25.00 - 50.00	0.6000	0.6000
T8	24	AVA7-50 (1-5/8 LOW DENS. FOAM)	25.00 - 50.00	0.6000	0.6000
T8	25	LDF7-50A (1-5/8 FOAM)	25.00 - 50.00	0.6000	0.6000
T8	26	LDF7-50A (1-5/8 FOAM)	25.00 - 50.00	0.6000	0.6000
T8	27	AVA7-50 (1-5/8 LOW DENS. FOAM)	25.00 - 50.00	0.6000	0.6000
T8	28	AVA7-50 (1-5/8 LOW DENS. FOAM)	25.00 - 50.00	0.6000	0.6000

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	Client	SMK-003 / ASM-010 / NSS-044 / (AT&T) / (Sprint) / (T-Mobile)	Designed by MCD

<i>Tower Section</i>	<i>Feed Line Record No.</i>	<i>Description</i>	<i>Feed Line Segment Elev.</i>	<i>K_a No Ice</i>	<i>K_a Ice</i>
T8	29	LDF4-50A (1/2 FOAM)	25.00 - 50.00	0.6000	0.6000
T8	30	AVA7-50 (1-5/8 LOW DENS. FOAM)	25.00 - 50.00	0.6000	0.6000
T8	31	AVA7-50 (1-5/8 LOW DENS. FOAM)	25.00 - 50.00	0.6000	0.6000
T8	32	LDF4-50A (1/2 FOAM)	25.00 - 50.00	0.6000	0.6000
T8	33	LDF7-50A (1-5/8 FOAM)	25.00 - 50.00	0.6000	0.6000
T8	34	WE65	25.00 - 50.00	0.6000	0.6000
T8	35	WE65	25.00 - 50.00	0.6000	0.6000
T8	36	WE65	25.00 - 50.00	0.6000	0.6000
T8	37	LDF7-50A (1-5/8 FOAM)	25.00 - 50.00	0.6000	0.6000
T8	38	LDF4-50A (1/2 FOAM)	25.00 - 50.00	0.6000	0.6000
T8	39	LDF7-50A (1-5/8 FOAM)	25.00 - 50.00	0.6000	0.6000
T8	40	LDF5-50A (7/8 FOAM)	25.00 - 50.00	0.6000	0.6000
T8	41	7/8	25.00 - 50.00	0.6000	0.6000
T8	42	7/8	25.00 - 50.00	0.6000	0.6000
T8	43	LDF5-50A (7/8 FOAM)	25.00 - 50.00	0.6000	0.6000
T8	44	1/2	25.00 - 50.00	0.6000	0.6000
T8	45	1/2	25.00 - 50.00	0.6000	0.6000
T8	46	1/2	25.00 - 50.00	0.6000	0.6000
T8	47	7/8	25.00 - 50.00	0.6000	0.6000
T8	48	LDF5-50A (7/8 FOAM)	25.00 - 50.00	0.6000	0.6000
T8	49	LDF4-50A (1/2 FOAM)	25.00 - 50.00	0.6000	0.6000
T8	50	1/2	25.00 - 48.00	0.6000	0.6000
T8	51	1/2	25.00 - 47.00	0.6000	0.6000
T8	52	LDF4-50A (1/2 FOAM)	25.00 - 43.00	0.6000	0.6000
T8	53	3/8 Cable	25.00 - 40.00	0.6000	0.6000
T8	54	1/2	25.00 - 40.00	0.6000	0.6000
T8	55	1/2	25.00 - 39.00	0.6000	0.6000
T9	1	1 5/8	6.00 - 25.00	0.6000	0.6000
T9	2	1 1/4" Hybriflex Cable	6.00 - 25.00	0.6000	0.6000
T9	3	Commscope 6x12 (6 AWG)	6.00 - 25.00	0.6000	0.6000
T9	4	Commscope 9x18 (6 AWG)	6.00 - 25.00	0.6000	0.6000
T9	5	Commscope 6x12 (6 AWG)	6.00 - 25.00	0.6000	0.6000
T9	6	1 1/4" Hybriflex Cable	6.00 - 25.00	0.6000	0.6000
T9	8	Hybrid HCS 6x12 4 AWG (1-5/8")	6.00 - 25.00	0.6000	0.6000
T9	9	1/2	6.00 - 25.00	0.6000	0.6000
T9	10	1/2	6.00 - 25.00	0.6000	0.6000
T9	11	LDF6-50A (1-1/4 FOAM)	6.00 - 25.00	0.6000	0.6000
T9	13	LDF4-50A (1/2 FOAM)	6.00 - 25.00	0.6000	0.6000
T9	14	AVA7-50 (1-5/8 LOW DENS. FOAM)	6.00 - 25.00	0.6000	0.6000
T9	15	LDF7-50A (1-5/8 FOAM)	6.00 - 25.00	0.6000	0.6000
T9	16	LDF6-50A (1-1/4 FOAM)	6.00 - 25.00	0.6000	0.6000
T9	17	1 1/4	6.00 - 25.00	0.6000	0.6000
T9	18	1 5/8	6.00 - 25.00	0.6000	0.6000
T9	19	AVA7-50 (1-5/8 LOW DENS. FOAM)	6.00 - 25.00	0.6000	0.6000
T9	20	AVA7-50 (1-5/8 LOW DENS. FOAM)	6.00 - 25.00	0.6000	0.6000
T9	21	1/2	6.00 - 25.00	0.6000	0.6000
T9	22	1/2	6.00 - 25.00	0.6000	0.6000
T9	23	1/2	6.00 - 25.00	0.6000	0.6000
T9	24	AVA7-50 (1-5/8 LOW DENS. FOAM)	6.00 - 25.00	0.6000	0.6000
T9	25	LDF7-50A (1-5/8 FOAM)	6.00 - 25.00	0.6000	0.6000
T9	26	LDF7-50A (1-5/8 FOAM)	6.00 - 25.00	0.6000	0.6000
T9	27	AVA7-50 (1-5/8 LOW DENS. FOAM)	6.00 - 25.00	0.6000	0.6000
T9	28	AVA7-50 (1-5/8 LOW DENS. FOAM)	6.00 - 25.00	0.6000	0.6000

tnxTower AECOM 500 Enterprise Drive, Suite 3B Rocky Hill, CT Phone: 860-263-5800 FAX: 860-812-2094	Job	120' Self-Supporting Lattice Tower	Page	18 of 66
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Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
T9	29	LDF4-50A (1/2 FOAM)	6.00 - 25.00	0.6000	0.6000
T9	30	AVA7-50 (1-5/8 LOW DENS. FOAM)	6.00 - 25.00	0.6000	0.6000
T9	31	AVA7-50 (1-5/8 LOW DENS. FOAM)	6.00 - 25.00	0.6000	0.6000
T9	32	LDF4-50A (1/2 FOAM)	6.00 - 25.00	0.6000	0.6000
T9	33	LDF7-50A (1-5/8 FOAM)	6.00 - 25.00	0.6000	0.6000
T9	34	WE65	6.00 - 25.00	0.6000	0.6000
T9	35	WE65	6.00 - 25.00	0.6000	0.6000
T9	36	WE65	6.00 - 25.00	0.6000	0.6000
T9	37	LDF7-50A (1-5/8 FOAM)	6.00 - 25.00	0.6000	0.6000
T9	38	LDF4-50A (1/2 FOAM)	6.00 - 25.00	0.6000	0.6000
T9	39	LDF7-50A (1-5/8 FOAM)	6.00 - 25.00	0.6000	0.6000
T9	40	LDF5-50A (7/8 FOAM)	6.00 - 25.00	0.6000	0.6000
T9	41	7/8	6.00 - 25.00	0.6000	0.6000
T9	42	7/8	6.00 - 25.00	0.6000	0.6000
T9	43	LDF5-50A (7/8 FOAM)	6.00 - 25.00	0.6000	0.6000
T9	44	1/2	6.00 - 25.00	0.6000	0.6000
T9	45	1/2	6.00 - 25.00	0.6000	0.6000
T9	46	1/2	6.00 - 25.00	0.6000	0.6000
T9	47	7/8	6.00 - 25.00	0.6000	0.6000
T9	48	LDF5-50A (7/8 FOAM)	6.00 - 25.00	0.6000	0.6000
T9	49	LDF4-50A (1/2 FOAM)	6.00 - 25.00	0.6000	0.6000
T9	50	1/2	6.00 - 25.00	0.6000	0.6000
T9	51	1/2	6.00 - 25.00	0.6000	0.6000
T9	52	LDF4-50A (1/2 FOAM)	6.00 - 25.00	0.6000	0.6000
T9	53	3/8 Cable	6.00 - 25.00	0.6000	0.6000
T9	54	1/2	6.00 - 25.00	0.6000	0.6000
T9	55	1/2	6.00 - 25.00	0.6000	0.6000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C _A A _A Front ft ²	C _A A _A Side ft ²	Weight K
Pirol 6' Side Mount Standoff (1)	B	From Leg	1.00	0.0000	41.00	No Ice	4.97	4.97	0.07
(#1-A Dish Mount)			4.00			1/2" Ice	6.12	6.12	0.13
1'x1' Panel Antenna	B	From Leg	0.00			1" Ice	7.27	7.27	0.19
(#1-B (mount Share #1-A))			1.00	0.0000	40.00	No Ice	1.20	0.13	0.01
			4.00			1/2" Ice	1.34	0.21	0.02
			0.00			1" Ice	1.48	0.29	0.02
3' Whip (3in diameter) /w mount	B	From Leg	0.50	0.0000	43.00	No Ice	1.18	1.18	0.02
(#2)			0.00			1/2" Ice	1.64	1.64	0.03
			0.00			1" Ice	2.04	2.04	0.05
5'x1.5in dia Whip Antenna /w mount	A	From Leg	0.50	0.0000	47.00	No Ice	1.81	1.81	0.03
(#3)			0.00			1/2" Ice	2.64	2.64	0.05
			0.00			1" Ice	3.30	3.30	0.07
10'x6" Dipole Antenna	C	From Leg	3.00	0.0000	48.00	No Ice	9.17	1.67	0.05
(#4-A)			0.00			1/2" Ice	9.89	2.79	0.08
			0.00			1" Ice	10.62	3.93	0.12
3' Yagi	C	From Leg	3.00	0.0000	48.00	No Ice	2.08	2.08	0.03

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Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K
(#4-B)			0.00			1/2" Ice	3.79	3.79	0.05
			0.00			1" Ice	5.52	5.52	0.09
Pirot 4' Side Mount Standoff (1)	C	None		0.0000	48.00	No Ice	2.72	2.72	0.05
(#4-A&B)						1/2" Ice	4.91	4.91	0.09
6'x1" Whip Antenna w/ Mount	A	From Leg	1.00	0.0000	39.00	1" Ice	7.10	7.10	0.13
(#5 - CSP#14)			0.00			No Ice	2.02	2.02	0.05
1.0" Dia 4' Omni w/Pipe Mount	B	From Leg	0.00			1/2" Ice	3.14	3.14	0.07
(#6 - CSP#16)			0.00			1" Ice	4.13	4.13	0.10
20' 4-Bay Dipole w/ 2' Sidearm Mount	A	From Leg	2.00	0.0000	53.00	No Ice	0.94	0.94	0.02
(#7 - CSP-4)			0.00			1/2" Ice	1.39	1.39	0.03
GPS	B	From Leg	0.00			1" Ice	1.80	1.80	0.05
(#8)			0.00			No Ice	4.00	4.00	0.06
			0.00			1/2" Ice	6.00	6.00	0.10
2'6"x4" Pipe Mount (For #8)	B	None	0.00			1" Ice	8.00	8.00	0.14
			0.00			No Ice	1.00	1.00	0.01
			0.00			1/2" Ice	1.50	1.50	0.01
			0.00			1" Ice	2.00	2.00	0.02
6' Yagi w/ Mount (#9)	B	From Leg	2.00	0.0000	63.00	No Ice	0.58	0.58	0.03
			0.00			1/2" Ice	0.91	0.91	0.04
			0.00			1" Ice	1.09	1.09	0.05
3' Yagi (#12)	B	From Leg	1.00	40.0000	81.00	No Ice	7.59	0.71	0.05
			0.00			1/2" Ice	8.18	0.98	0.09
			0.00			1" Ice	8.79	1.26	0.14
3' Yagi (#13 - CSP-11)	B	From Leg	1.00	-40.0000	82.00	No Ice	2.08	2.08	0.03
			0.00			1/2" Ice	3.79	3.79	0.05
			0.00			1" Ice	5.52	5.52	0.09
20' 4-Bay Dipole (#14)	B	From Leg	4.00	0.0000	77.00	No Ice	4.00	4.00	0.06
			0.00			1/2" Ice	6.00	6.00	0.10
			0.00			1" Ice	8.00	8.00	0.14
4'6"x3" Pipe Mount (horizontal)	B	None		0.0000	67.00	No Ice	1.30	1.30	0.03
((Bottom mount) #14)						1/2" Ice	1.57	1.57	0.08
4'6"x3" Pipe Mount (horizontal)	B	None		0.0000	87.00	1" Ice	1.86	1.86	0.14
((Top Mount) #14)						No Ice	1.30	1.30	0.03
20' 4-Bay Dipole (#15)	A	From Leg	4.00	0.0000	86.00	1/2" Ice	1.57	1.57	0.08
			0.00			1" Ice	1.86	1.86	0.14
			0.00			No Ice	4.00	4.00	0.06
			0.00			1/2" Ice	6.00	6.00	0.10
			0.00			1" Ice	8.00	8.00	0.14
3'4"x4" Pipe Mount (horizontal)	A	None		0.0000	76.00	No Ice	1.05	1.05	0.04
((Bottom mount) #15)						1/2" Ice	1.27	1.27	0.09
3'4"x4" Pipe Mount (horizontal)	A	None		0.0000	96.00	1" Ice	1.52	1.52	0.13
((Top Mount) #15)						No Ice	1.05	1.05	0.04
SC479-HF1LDF (inverted) (# 16-A - CSP-10)	B	From Face	4.00	0.0000	81.00 - 95.00	1/2" Ice	1.27	1.27	0.09
			0.00			1" Ice	1.52	1.52	0.13
			0.00			No Ice	1.74	1.74	0.04
			0.00			1/2" Ice	2.60	2.60	0.05
			0.00			1" Ice	3.31	3.31	0.08
PD458-406 (# 16-B - CSP-2)	A	From Face	4.00	0.0000	100.00 - 92.00	No Ice	4.59	4.59	0.02
			0.00			1/2" Ice	6.89	6.89	0.04
			0.00			1" Ice	9.19	9.19	0.05
(2) (Horizontal) 8'x2 1/2" Pipe Mount (Upright # 16-B)	A	None		0.0000	92.00	No Ice	2.30	2.30	0.04
(# 16-A&B)						1/2" Ice	3.13	3.13	0.15
						1" Ice	3.62	3.62	0.27
(2) (Horizontal) 8'x2 1/2"	A	None		0.0000	92.00	No Ice	2.30	2.30	0.04

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Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K
Pipe Mount (Invert #16-A) (# 16-A&B)						1/2" Ice	3.13	3.13	0.15
						1" Ice	3.62	3.62	0.27
SE419-SWBPALDF Panel Antenna	A	From Face	0.50 0.00	0.0000	101.00	No Ice	11.64	7.88	0.05
(#18-A - CSP 13(P))			0.00			1/2" Ice	12.29	8.51	0.11
AP13-850/065D w/Mount	A	From Face	0.50 0.00	0.0000	104.00	1" Ice	12.95	9.14	0.19
Pipe			0.00			No Ice	5.31	3.92	0.04
(#18-B - CSP-12(E))			0.00			1/2" Ice	5.93	4.96	0.08
6'8"x4" Pipe Mount	C	None		0.0000	107.00	1" Ice	6.44	5.72	0.14
(#19 - Dish Mount)						No Ice	1.68	1.68	0.07
						1/2" Ice	3.01	3.01	0.09
						1" Ice	3.42	3.42	0.12
6'8"x4" Pipe Mount	C	None		0.0000	107.00	No Ice	1.68	1.68	0.07
(#20 - Dish Mount)						1/2" Ice	3.01	3.01	0.09
						1" Ice	3.42	3.42	0.12
6'8"x4" Pipe Mount	A	None		0.0000	110.00	No Ice	1.69	1.69	0.07
(#21 - Dish Mount)						1/2" Ice	3.01	3.01	0.09
						1" Ice	3.42	3.42	0.12
Pirol 4' Side Mount Standoff (1)	B	None		0.0000	113.00	No Ice	2.72	2.72	0.05
(#22, 23-A, 23-B Mount)						1/2" Ice	4.91	4.91	0.09
16'x3" Omni	B	From Leg	4.00 0.00	0.0000	113.00	1" Ice	7.10	7.10	0.13
(#22)			0.00			No Ice	5.06	5.06	0.03
						1/2" Ice	6.54	6.54	0.07
16'x3" Omni (inverted)	B	From Leg	4.00 0.00	0.0000	106.00 - 120.00	1" Ice	8.04	8.04	0.11
(#23-A - CSP-22)			0.00			No Ice	5.06	5.06	0.03
						1/2" Ice	6.54	6.54	0.07
						1" Ice	8.04	8.04	0.11
16'x3" Omni (inverted)	B	From Leg	2.00 0.00	0.0000	106.00 - 120.00	No Ice	5.06	5.06	0.03
(#23-B - CSP-23)			0.00			1/2" Ice	6.54	6.54	0.07
						1" Ice	8.04	8.04	0.11
Junction Box	B	From Face	0.50 0.00	0.0000	112.00	No Ice	3.15	1.05	0.02
(#23-C)			0.00			1/2" Ice	3.39	1.21	0.04
						1" Ice	3.63	1.37	0.06
Rohn 6' Side-Arm(1)	B	From Leg	0.00 0.00	20.0000	114.00	No Ice	10.60	10.60	0.14
(#24 Antennas Mount)			0.00			1/2" Ice	15.40	15.40	0.21
						1" Ice	20.20	20.20	0.28
Rohn 6' Side-Arm(1)	C	From Leg	0.00 0.00	-20.0000	114.00	No Ice	10.60	10.60	0.14
(#24 Antennas Mount)			0.00			1/2" Ice	15.40	15.40	0.21
						1" Ice	20.20	20.20	0.28
Junction Box	C	From Face	3.00 0.00	0.0000	114.00	No Ice	3.15	1.05	0.02
(#24-A)			0.00			1/2" Ice	3.39	1.21	0.04
						1" Ice	3.63	1.37	0.06
SC479-HF1LDF (inverted)	C	From Face	6.00 0.00	0.0000	106.00 - 120.00	No Ice	5.06	5.06	0.03
(#24-B)			0.00			1/2" Ice	6.54	6.54	0.07
						1" Ice	8.04	8.04	0.11
SC479-HF1LDF	B	From Face	6.00 0.00	0.0000	120.00	No Ice	3.82	3.82	0.03
(#24-C - CSP#21)			0.00			1/2" Ice	6.54	6.54	0.07
						1" Ice	8.04	8.04	0.11
OGT9-840	B	From Face	3.00 0.00	0.0000	120.00	No Ice	2.27	2.27	0.02
(#24-D - CSP#8)			0.00			1/2" Ice	3.44	3.44	0.04
						1" Ice	4.61	4.61	0.06
10'x2" Dipole Antenna	C	From Face	3.00 0.00	0.0000	104.00 - 114.00	No Ice	9.17	1.67	0.05
(inverted)			0.00			1/2" Ice	9.89	2.79	0.08
(#24-E)						1" Ice	10.62	3.93	0.12
Rohn 6' Side-Arm(1)	C	From Leg	0.00 0.00	60.0000	114.00	No Ice	10.60	10.60	0.14
(#25 Antennas Mount)			0.00			1/2" Ice	15.40	15.40	0.21
						1" Ice	20.20	20.20	0.28
SC479-HF1LDF (inverted)	C	From Leg	6.00	60.0000	100.00 - 114.00	No Ice	5.06	5.06	0.03

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Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K
(#25-A - CSP-17)			0.00			1/2" Ice	6.54	6.54	0.07
			0.00			1" Ice	8.04	8.04	0.11
OGT9-840	C	From Leg	6.00	60.0000	120.00	No Ice	2.27	2.27	0.02
(#25-B - CSP#7)			0.00			1/2" Ice	3.44	3.44	0.04
			0.00			1" Ice	4.61	4.61	0.06
10'x2" Dipole Antenna	A	From Leg	0.50	0.0000	120.00	No Ice	9.17	1.67	0.05
(#26 - CSP-15)			0.00			1/2" Ice	9.89	2.79	0.08
			0.00			1" Ice	10.62	3.93	0.12
Lightning Rod 5/8x4'	C	None		0.0000	138.00	No Ice	0.25	0.25	0.03
(#27)						1/2" Ice	0.66	0.66	0.03
						1" Ice	0.97	0.97	0.04
16'x2.5" Pipe Mount	C	None		0.0000	138.00	No Ice	4.00	4.00	0.09
(#27 Mount)						1/2" Ice	4.80	4.80	0.09
						1" Ice	5.60	5.60	0.10
TMA 432-83H-01T	C	None		0.0000	103.00	No Ice	1.40	0.82	0.03
(CSP-32)						1/2" Ice	1.55	0.94	0.04
						1" Ice	1.70	1.06	0.05
TMA 432-83H-01T	B	None		0.0000	120.00	No Ice	1.40	0.82	0.03
(CSP-24)						1/2" Ice	1.55	0.94	0.04
						1" Ice	1.70	1.06	0.05
SC479-HF1LDF (inverted)	B	From Leg	3.00	0.0000	106.00 - 120.00	No Ice	5.06	5.06	0.03
(CSP - 9 (P))			0.00			1/2" Ice	6.54	6.54	0.07
			0.00			1" Ice	8.04	8.04	0.11
SC479-HF1LDF	A	From Leg	3.00	0.0000	110.00	No Ice	3.79	3.79	0.03
(CSP-18 (New Install))			0.00			1/2" Ice	6.54	6.54	0.07
			0.00			1" Ice	8.04	8.04	0.11
SC479-HF1LDF (inverted)	A	From Leg	3.00	0.0000	96.00 - 110.00	No Ice	5.06	5.06	0.03
(CSP-19 (New Install))			0.00			1/2" Ice	6.54	6.54	0.07
			0.00			1" Ice	8.04	8.04	0.11
TMA 432-83H-01T	A	None		0.0000	110.00	No Ice	1.40	0.82	0.03
(CSP-20)						1/2" Ice	1.55	0.94	0.04
						1" Ice	1.70	1.06	0.05
SE419-SWBPALDF Panel	A	From Leg	0.50	0.0000	105.00	No Ice	11.64	7.88	0.05
Antenna			0.00			1/2" Ice	12.29	8.51	0.11
(CSP-29)			0.00			1" Ice	12.95	9.14	0.19
TMA 432-83H-01T	A	None		0.0000	105.00	No Ice	1.40	0.82	0.03
(CSP-30)						1/2" Ice	1.55	0.94	0.04
						1" Ice	1.70	1.06	0.05
WPA-70040-4CF-EDIN	A	None		0.0000	110.00	No Ice	9.46	3.53	0.02
Panel						1/2" Ice	9.86	3.84	0.08
(CSP-28)						1" Ice	10.27	4.15	0.14
TMA 432-83H-01T	A	None		0.0000	120.00	No Ice	1.40	0.82	0.03
(CSP-24)						1/2" Ice	1.55	0.94	0.04
						1" Ice	1.70	1.06	0.05
** Remove AIROSMITH									
ASM-005									
* T-Mobile Existing									
Inventory									
EUSF10-U	A	From Leg	0.50	0.0000	95.00	No Ice	8.91	3.67	0.41
((#17) T-Mobile)			0.00			1/2" Ice	12.66	5.24	0.51
			0.00			1" Ice	16.41	6.81	0.61
EUSF10-U	C	From Leg	0.50	0.0000	95.00	No Ice	8.91	3.67	0.41
((#17) T-Mobile)			0.00			1/2" Ice	12.66	5.24	0.51
			0.00			1" Ice	16.41	6.81	0.61
EUSF10-U	B	From Leg	0.50	0.0000	95.00	No Ice	8.91	3.67	0.41
((#17) T-Mobile)			0.00			1/2" Ice	12.66	5.24	0.51
			0.00			1" Ice	16.41	6.81	0.61

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	Project Connecticut State Police Tower - West Rock - MODification	Date 16:04:07 04/09/20
	Client SMK-003 / ASM-010 / NSS-044 / (AT&T) / (Sprint) / (T-Mobile)	Designed by MCD

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K
TMA2093F00V1-1 Twin TMA	A	From Leg	3.00 4.50	0.0000	95.00	No Ice 1/2" Ice	0.37 0.46	0.96 1.09	0.03 0.03
((#17) T-Mobile)			0.00			1" Ice	0.55	1.22	0.04
TMA2093F00V1-1 Twin TMA	B	From Leg	3.00 4.50	0.0000	95.00	No Ice 1/2" Ice	0.37 0.46	0.96 1.09	0.03 0.03
((#17) T-Mobile)			0.00			1" Ice	0.55	1.22	0.04
TMA2093F00V1-1 Twin TMA	C	From Leg	3.00 4.50	0.0000	95.00	No Ice 1/2" Ice	0.37 0.46	0.96 1.09	0.03 0.03
((#17) T-Mobile)			0.00			1" Ice	0.55	1.22	0.04
AIR32 B66Aa/B2a Antenna Panel	A	From Leg	3.00 0.00	0.0000	95.00	No Ice 1/2" Ice	5.72 6.22	5.16 5.96	0.15 0.21
((#17) T-Mobile)			0.00			1" Ice	6.68	6.64	0.27
AIR32 B66Aa/B2a Antenna Panel	B	From Leg	3.00 0.00	0.0000	95.00	No Ice 1/2" Ice	5.72 6.22	5.16 5.96	0.15 0.21
((#17) T-Mobile)			0.00			1" Ice	6.68	6.64	0.27
AIR32 B66Aa/B2a Antenna Panel	C	From Leg	3.00 0.00	0.0000	95.00	No Ice 1/2" Ice	5.72 6.22	5.16 5.96	0.15 0.21
((#17) T-Mobile)			0.00			1" Ice	6.68	6.64	0.27
* T-Mobile Existing Inventory									
* T-Mobile Proposed Inventory									
APXVAARR24_43-U-NA20 Panel (RFS)	A	From Leg	3.00 4.50	0.0000	95.00	No Ice 1/2" Ice	20.24 20.89	10.79 12.21	0.21 0.34
(T-Mobile - Proposed)			0.00			1" Ice	21.55	13.49	0.48
APXVAARR24_43-U-NA20 Panel (RFS)	B	From Leg	3.00 4.50	0.0000	95.00	No Ice 1/2" Ice	20.24 20.89	10.79 12.21	0.21 0.34
(T-Mobile - Proposed)			0.00			1" Ice	21.55	13.49	0.48
APXVAARR24_43-U-NA20 Panel (RFS)	C	From Leg	3.00 4.50	0.0000	95.00	No Ice 1/2" Ice	20.24 20.89	10.79 12.21	0.21 0.34
(T-Mobile - Proposed)			0.00			1" Ice	21.55	13.49	0.48
AIR 3246 B66 Panel Antenna (T-Mobile - Proposed)	A	From Leg	3.00 4.50	0.0000	95.00	No Ice 1/2" Ice	7.99 8.39	6.34 7.01	0.21 0.28
			0.00			1" Ice	8.81	7.70	0.36
AIR 3246 B66 Panel Antenna (T-Mobile - Proposed)	B	From Leg	3.00 4.50	0.0000	95.00	No Ice 1/2" Ice	7.99 8.39	6.34 7.01	0.21 0.28
			0.00			1" Ice	8.81	7.70	0.36
AIR 3246 B66 Panel Antenna (T-Mobile - Proposed)	C	From Leg	3.00 4.50	0.0000	95.00	No Ice 1/2" Ice	7.99 8.39	6.34 7.01	0.21 0.28
			0.00			1" Ice	8.81	7.70	0.36
2217 B2 Radio Unit (T-Mobile - Proposed)	A	From Leg	3.00 -4.50	0.0000	95.00	No Ice 1/2" Ice	2.27 2.45	2.27 2.45	0.05 0.07
			0.00			1" Ice	2.65	2.65	0.10
2217 B2 Radio Unit (T-Mobile - Proposed)	B	From Leg	3.00 -4.50	0.0000	95.00	No Ice 1/2" Ice	2.27 2.45	2.27 2.45	0.05 0.07
			0.00			1" Ice	2.65	2.65	0.10
2217 B2 Radio Unit (T-Mobile - Proposed)	C	From Leg	3.00 -4.50	0.0000	95.00	No Ice 1/2" Ice	2.27 2.45	2.27 2.45	0.05 0.07
			0.00			1" Ice	2.65	2.65	0.10
4449 B71 + B12 Radio Unit (T-Mobile - Proposed)	A	From Leg	3.00 -4.50	0.0000	95.00	No Ice 1/2" Ice	1.66 1.82	1.16 1.29	0.08 0.10
			0.00			1" Ice	1.98	1.44	0.11
4449 B71 + B12 Radio Unit (T-Mobile - Proposed)	B	From Leg	3.00 -4.50	0.0000	95.00	No Ice 1/2" Ice	1.66 1.82	1.16 1.29	0.08 0.10
			0.00			1" Ice	1.98	1.44	0.11
4449 B71 + B12 Radio Unit (T-Mobile - Proposed)	C	From Leg	3.00 -4.50	0.0000	95.00	No Ice 1/2" Ice	1.66 1.82	1.16 1.29	0.08 0.10

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	Project Connecticut State Police Tower - West Rock - MODification Client SMK-003 / ASM-010 / NSS-044 / (AT&T) / (Sprint) / (T-Mobile)	Date 16:04:07 04/09/20 Designed by MCD

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K
			0.00			1" Ice	1.98	1.44	0.11
* T-Mobile Proposed Inventory									
* Sprint Inventory Exist/Proposed									
Face Mount (Sprint)	A	From Face	0.00	0.0000	72.00	No Ice	9.73	9.73	0.31
			0.00			1/2" Ice	13.12	13.12	0.42
			0.00			1" Ice	16.51	16.51	0.54
Face Mount (Sprint)	B	From Face	0.00	0.0000	72.00	No Ice	9.73	9.73	0.31
			0.00			1/2" Ice	13.12	13.12	0.42
			0.00			1" Ice	16.51	16.51	0.54
Face Mount (Sprint)	C	From Face	0.00	0.0000	72.00	No Ice	9.73	9.73	0.31
			0.00			1/2" Ice	13.12	13.12	0.42
			0.00			1" Ice	16.51	16.51	0.54
ALU 4x45W (1900 MHz) (Sprint)	A	From Face	0.00	0.0000	72.00	No Ice	2.54	1.61	0.06
			0.00			1/2" Ice	2.75	1.79	0.08
			0.50			1" Ice	2.97	1.98	0.10
ALU 4x45W (1900 MHz) (Sprint)	B	From Face	0.00	0.0000	72.00	No Ice	2.54	1.61	0.06
			0.00			1/2" Ice	2.75	1.79	0.08
			0.00			1" Ice	2.97	1.98	0.10
ALU 4x45W (1900 MHz) (Sprint)	C	From Face	0.00	0.0000	72.00	No Ice	2.54	1.61	0.06
			0.00			1/2" Ice	2.75	1.79	0.08
			0.00			1" Ice	2.97	1.98	0.10
ALU TD-RRH-8x20-25 (Sprint)	A	From Face	0.00	0.0000	72.00	No Ice	4.03	1.53	0.08
			0.00			1/2" Ice	4.28	1.70	0.10
			0.00			1" Ice	4.54	1.89	0.13
ALU TD-RRH-8x20-25 (Sprint)	B	From Face	0.00	0.0000	72.00	No Ice	4.03	1.53	0.08
			0.00			1/2" Ice	4.28	1.70	0.10
			0.00			1" Ice	4.54	1.89	0.13
ALU TD-RRH-8x20-25 (Sprint)	C	From Face	0.00	0.0000	72.00	No Ice	4.03	1.53	0.08
			0.00			1/2" Ice	4.28	1.70	0.10
			0.00			1" Ice	4.54	1.89	0.13
ALU 800MHz 2x50W (Sprint)	A	From Face	0.00	0.0000	72.00	No Ice	2.06	1.93	0.06
			0.00			1/2" Ice	2.24	2.11	0.09
			0.00			1" Ice	2.43	2.29	0.11
ALU 800MHz 2x50W (Sprint)	B	From Face	0.00	0.0000	72.00	No Ice	2.06	1.93	0.06
			0.00			1/2" Ice	2.24	2.11	0.09
			0.00			1" Ice	2.43	2.29	0.11
ALU 800MHz 2x50W (Sprint)	C	From Face	0.00	0.0000	72.00	No Ice	2.06	1.93	0.06
			0.00			1/2" Ice	2.24	2.11	0.09
			0.00			1" Ice	2.43	2.29	0.11
NNVV-65B-R4 Panel Antenna (Sprint)	A	From Leg	0.00	0.0000	72.00	No Ice	12.27	5.75	0.09
			-1.00			1/2" Ice	12.77	6.21	0.16
			0.00			1" Ice	13.27	6.67	0.24
NNVV-65B-R4 Panel Antenna (Sprint)	B	From Leg	0.00	0.0000	72.00	No Ice	12.27	5.75	0.09
			-1.00			1/2" Ice	12.77	6.21	0.16
			0.00			1" Ice	13.27	6.67	0.24
NNVV-65B-R4 Panel Antenna (Sprint)	C	From Leg	0.00	0.0000	72.00	No Ice	12.27	5.75	0.09
			-1.00			1/2" Ice	12.77	6.21	0.16
			0.00			1" Ice	13.27	6.67	0.24
AAHC Panel Antenna (Sprint)	A	From Face	0.00	0.0000	72.00	No Ice	4.20	2.07	0.10
			0.00			1/2" Ice	4.46	2.26	0.14
			0.00			1" Ice	4.72	2.46	0.17
AAHC Panel Antenna (Sprint)	B	From Face	0.50	0.0000	72.00	No Ice	4.20	2.07	0.10
			0.00			1/2" Ice	4.46	2.26	0.14
			0.00			1" Ice	4.72	2.46	0.17
AAHC Panel Antenna	C	From Face	0.50	0.0000	72.00	No Ice	4.20	2.07	0.10

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	Project Connecticut State Police Tower - West Rock - MODification	Date 16:04:07 04/09/20
	Client SMK-003 / ASM-010 / NSS-044 / (AT&T) / (Sprint) / (T-Mobile)	Designed by MCD

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K
(Sprint)			0.00		1/2" Ice	4.46	2.26	0.14
			0.00		1" Ice	4.72	2.46	0.17
* Sprint Inventory Exist/Proposed								
* AT&T Inventory Update 4_2020								
VFA12-HD-S Antenna Mount Frame ((#11) ATT)	A	From Leg	0.00	0.0000	80.00	No Ice	12.50	7.00
			0.00			1/2" Ice	18.50	11.30
			0.00			1" Ice	24.60	15.30
VFA12-HD-S Antenna Mount Frame ((#11) ATT)	B	From Leg	0.00	0.0000	80.00	No Ice	12.50	7.00
			0.00			1/2" Ice	18.50	11.30
			0.00			1" Ice	24.60	15.30
VFA12-HD-S Antenna Mount Frame ((#11) ATT)	C	From Leg	0.00	0.0000	80.00	No Ice	12.50	7.00
			0.00			1/2" Ice	18.50	11.30
			0.00			1" Ice	24.60	15.30
TPA-65R-LCUUUU-H8 Panel w/ RET ((#11) ATT)	A	From Leg	3.00	0.0000	80.00	No Ice	12.86	10.38
			-6.00			1/2" Ice	13.46	11.79
			0.00			1" Ice	14.08	13.05
800-10966 Kathrien Panel w/ Pipe Mt. ((#11) ATT)	A	From Leg	3.00	0.0000	80.00	No Ice	17.36	9.40
			-2.00			1/2" Ice	17.99	10.82
			0.00			1" Ice	18.63	12.09
800-10966 Kathrien Panel w/ Pipe Mt. ((#11) ATT)	A	From Leg	3.00	0.0000	80.00	No Ice	17.36	9.40
			2.00			1/2" Ice	17.99	10.82
			0.00			1" Ice	18.63	12.09
SBNH-1D6565C ((#11) ATT)	A	From Leg	3.00	0.0000	80.00	No Ice	11.48	9.64
			6.00			1/2" Ice	12.11	11.07
			0.00			1" Ice	12.75	12.39
RRUS E2 B29 RRH Unit ((#11) ATT)	A	From Face	0.50	0.0000	80.00	No Ice	3.15	1.29
			-5.00			1/2" Ice	3.36	1.44
			0.00			1" Ice	3.59	1.60
B2/B66a Radio 8843 RRH Unit ((#11) ATT)	A	From Face	0.50	0.0000	80.00	No Ice	1.74	1.36
			-2.50			1/2" Ice	1.91	1.51
			0.00			1" Ice	2.08	1.66
Radio 4478 B14 RRH ((#11) ATT)	A	From Face	0.50	0.0000	80.00	No Ice	1.08	1.08
			0.00			1/2" Ice	1.21	1.21
			0.00			1" Ice	1.35	1.35
Ericsson RRUS-32 RRH Unit ((#11) ATT)	A	From Face	0.50	0.0000	80.00	No Ice	3.31	2.42
			2.50			1/2" Ice	3.56	2.64
			0.00			1" Ice	3.81	2.86
Radio 4449 B5/B12 RRH ((#11) ATT)	A	From Face	0.50	0.0000	80.00	No Ice	1.66	1.16
			5.00			1/2" Ice	1.82	1.29
			0.00			1" Ice	1.98	1.44
DTMABP7819VG12A TMA ((#11) ATT)	A	From Face	0.50	0.0000	80.00	No Ice	1.36	0.51
			0.00			1/2" Ice	1.51	0.61
			0.00			1" Ice	1.66	0.72
DC6-48-60-18-8F (Squid) Suppressor ((#11) ATT)	A	From Leg	0.50	0.0000	80.00	No Ice	0.79	0.79
			0.00			1/2" Ice	1.27	1.27
			0.00			1" Ice	1.45	1.45
TPA-65R-LCUUUU-H8 Panel w/ RET ((#11) ATT)	B	From Leg	3.00	0.0000	80.00	No Ice	12.86	10.38
			-6.00			1/2" Ice	13.46	11.79
			0.00			1" Ice	14.08	13.05
800-10966 Kathrien Panel w/ Pipe Mt. ((#11) ATT)	B	From Leg	3.00	0.0000	80.00	No Ice	17.36	9.40
			-2.00			1/2" Ice	17.99	10.82
			0.00			1" Ice	18.63	12.09
800-10966 Kathrien Panel w/ Pipe Mt. ((#11) ATT)	B	From Leg	3.00	0.0000	80.00	No Ice	17.36	9.40
			2.00			1/2" Ice	17.99	10.82
			0.00			1" Ice	18.63	12.09

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	Project Connecticut State Police Tower - West Rock - MODification	Date 16:04:07 04/09/20
	Client SMK-003 / ASM-010 / NSS-044 / (AT&T) / (Sprint) / (T-Mobile)	Designed by MCD

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K
SBNH-1D6565C ((#11) ATT)	B	From Leg	3.00 6.00 0.00	0.0000	80.00	No Ice 1/2" Ice 1" Ice	11.48 12.11 12.75	9.64 11.07 12.39	0.08 0.17 0.27
RRUS E2 B29 RRH Unit ((#11) ATT)	B	From Face	0.50 -5.00 0.00	0.0000	80.00	No Ice 1/2" Ice 1" Ice	3.15 3.36 3.59	1.29 1.44 1.60	0.06 0.08 0.11
B2/B66a Radio 8843 RRH Unit ((#11) ATT)	B	From Face	0.50 -2.50 0.00	0.0000	80.00	No Ice 1/2" Ice 1" Ice	1.74 1.91 2.08	1.36 1.51 1.66	0.07 0.09 0.11
Radio 4478 B14 RRH ((#11) ATT)	B	From Face	0.50 0.00 0.00	0.0000	80.00	No Ice 1/2" Ice 1" Ice	1.08 1.21 1.35	1.08 1.21 1.35	0.06 0.07 0.09
Ericsson RRUS-32 RRH Unit ((#11) ATT)	B	From Face	0.50 2.50 0.00	0.0000	80.00	No Ice 1/2" Ice 1" Ice	3.31 3.56 3.81	2.42 2.64 2.86	0.08 0.10 0.14
Radio 4449 B5/B12 RRH ((#11) ATT)	B	From Face	0.50 5.00 0.00	0.0000	80.00	No Ice 1/2" Ice 1" Ice	1.66 1.82 1.98	1.16 1.29 1.44	0.08 0.10 0.11
DTMABP7819VG12A TMA ((#11) ATT)	B	From Face	0.50 0.00 0.00	0.0000	80.00	No Ice 1/2" Ice 1" Ice	1.36 1.51 1.66	0.51 0.61 0.72	0.02 0.03 0.04
DC6-48-60-18-8F (Squid) Suppressor ((#11) ATT)	B	From Leg	0.50 0.00 0.00	0.0000	80.00	No Ice 1/2" Ice 1" Ice	0.79 1.27 1.45	0.79 1.27 1.45	0.02 0.04 0.05
Quintel QS66512-2 Panel ((#11) ATT)	C	From Leg	3.00 -2.00 0.00	0.0000	80.00	No Ice 1/2" Ice 1" Ice	8.13 8.59 9.05	6.80 7.27 7.72	0.13 0.18 0.25
800-10965 Kathrein Panel Antenna ((#11) ATT)	C	From Leg	3.00 2.00 0.00	0.0000	80.00	No Ice 1/2" Ice 1" Ice	13.93 14.51 15.08	7.61 8.91 9.84	0.15 0.25 0.36
800-10965 Kathrein Panel Antenna ((#11) ATT)	C	From Leg	3.00 6.00 0.00	0.0000	80.00	No Ice 1/2" Ice 1" Ice	13.93 14.51 15.08	7.61 8.91 9.84	0.15 0.25 0.36
RRUS E2 B29 RRH Unit ((#11) ATT)	C	From Face	0.50 -5.00 0.00	0.0000	80.00	No Ice 1/2" Ice 1" Ice	3.15 3.36 3.59	1.29 1.44 1.60	0.06 0.08 0.11
B2/B66a Radio 8843 RRH Unit ((#11) ATT)	C	From Face	0.50 -2.50 0.00	0.0000	80.00	No Ice 1/2" Ice 1" Ice	1.74 1.91 2.08	1.36 1.51 1.66	0.07 0.09 0.11
Radio 4478 B14 RRH ((#11) ATT)	C	From Face	0.50 0.00 0.00	0.0000	80.00	No Ice 1/2" Ice 1" Ice	1.08 1.21 1.35	1.08 1.21 1.35	0.06 0.07 0.09
Ericsson RRUS-32 RRH Unit ((#11) ATT)	C	From Face	0.50 2.50 0.00	0.0000	80.00	No Ice 1/2" Ice 1" Ice	3.31 3.56 3.81	2.42 2.64 2.86	0.08 0.10 0.14
Radio 4449 B5/B12 RRH ((#11) ATT)	C	From Face	0.50 5.00 0.00	0.0000	80.00	No Ice 1/2" Ice 1" Ice	1.66 1.82 1.98	1.16 1.29 1.44	0.08 0.10 0.11
DC6-48-60-18-8F (Squid) Suppressor ((#11) ATT)	C	From Leg	0.50 0.00 0.00	0.0000	80.00	No Ice 1/2" Ice 1" Ice	0.79 1.27 1.45	0.79 1.27 1.45	0.02 0.04 0.05

* AT&T Inventory Update
4_2020

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	Client	SMK-003 / ASM-010 / NSS-044 / (AT&T) / (Sprint) / (T-Mobile)	Designed by	MCD

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft	Aperture Area ft ²	Weight K
4 FT DISH (#1-A)	A	Paraboloid w/Shroud (HP)	From Leg	1.50 5.00 0.00	Worst		41.00	4.00	No Ice 12.57 1/2" Ice 13.10 1" Ice 13.62	0.14 0.28 0.42
6' DISH (SOLID) (#19 - CSP-3)	C	Paraboloid w/Radome	From Leg	0.50 0.00 0.00	Worst		117.00	6.00	No Ice 28.27 1/2" Ice 29.05 1" Ice 29.83	0.09 0.24 0.39
6' DISH (SOLID) (#21 - CSP-5)	A	Paraboloid w/Radome	From Leg	0.50 0.00 0.00	Worst		115.00	6.00	No Ice 28.27 1/2" Ice 29.05 1" Ice 29.83	0.09 0.24 0.39
6' DISH (SOLID) (#20 - CSP-6)	C	Paraboloid w/Radome	From Leg	0.50 0.00 0.00	Worst		111.00	6.00	No Ice 28.27 1/2" Ice 29.05 1" Ice 29.83	0.09 0.24 0.39

222-G Verification Constants

Constant	Value
Wind Importance Factor Without Ice	1.15
Wind Importance Factor With Ice Factor	1
Ice Importance Factor	1.25
K _d	0.85
Z _R	900
α	9.5
K _{zmin}	0.85
K _c	1
K _t	0.72
f	1.5

222-G Section Verification ArRr By Element

Section Elevation ft	Elem. Num.	Size	C	C w/Ice	F a c e	e	e w/Ice	A _r ft ²	A _r w/Ice ft ²	A _r R _r ft ²	A _r R _r w/Ice ft ²
T1 120.00-116.67	1	P.5x.250	60.575	57.643	C	0.195	0.492	1.390	2.753	0.635	1.873
	1	P.5x.250	60.575	57.643	A	0.195	0.492	1.390	2.753	0.635	1.873
	2	P.5x.250	60.575	57.643	C	0.195	0.492	1.390	2.753	0.635	1.873
	2	P.5x.250	60.575	57.643	B	0.195	0.492	1.390	2.753	0.635	1.873
	3	P.5x.250	60.575	57.643	B	0.195	0.492	1.390	2.753	0.635	1.873
	3	P.5x.250	60.575	57.643	A	0.195	0.492	1.390	2.753	0.635	1.873
					A		Sum:	2.781	5.505	1.270	3.747
					B			2.781	5.505	1.270	3.747
T2 116.67-108.33					C			2.781	5.505	1.270	3.747
	13	P.5x.250	60.908	58.031	C	0.13	0.309	3.476	6.890	1.474	4.147
	13	P.5x.250	60.908	58.031	A	0.13	0.309	3.476	6.890	1.474	4.147
	14	P.5x.250	60.908	58.031	C	0.13	0.309	3.476	6.890	1.474	4.147

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	120' Self-Supporting Lattice Tower	27 of 66
	Project Connecticut State Police Tower - West Rock - MODification Client SMK-003 / ASM-010 / NSS-044 / (AT&T) / (Sprint) / (T-Mobile)	Date 16:04:07 04/09/20 Designed by MCD

Section Elevation ft	Elem. Num.	Size	C	C w/Ice	F a c e	e	e w/Ice	A _r ft ²	A _r w/Ice ft ²	A _r R _r ft ²	A _r R _r w/Ice ft ²
T3 108.33-100.00	14	P.5x.250	60.908	58.031	B	0.13	0.309	3.476	6.890	1.474	4.147
	15	P.5x.250	60.908	58.031	B	0.13	0.309	3.476	6.890	1.474	4.147
	15	P.5x.250	60.908	58.031	A	0.13	0.309	3.476	6.890	1.474	4.147
					A		Sum:	6.952	13.780	2.948	8.294
					B			6.952	13.780	2.948	8.294
					C			6.952	13.780	2.948	8.294
	25	P.5x.250	61.411	58.619	C	0.126	0.301	3.476	6.903	1.458	4.136
	25	P.5x.250	61.411	58.619	A	0.126	0.301	3.476	6.903	1.458	4.136
	26	P.5x.250	61.411	58.619	C	0.126	0.301	3.476	6.903	1.458	4.136
	26	P.5x.250	61.411	58.619	B	0.126	0.301	3.476	6.903	1.458	4.136
T4 100.00-91.67	27	P.5x.250	61.411	58.619	B	0.126	0.301	3.476	6.903	1.458	4.136
	27	P.5x.250	61.411	58.619	A	0.126	0.301	3.476	6.903	1.458	4.136
					A		Sum:	6.952	13.805	2.916	8.272
					B			6.952	13.805	2.916	8.272
					C			6.952	13.805	2.916	8.272
	37	P.5x.250	61.946	59.244	C	0.126	0.298	3.476	6.916	1.450	4.137
	37	P.5x.250	61.946	59.244	A	0.126	0.298	3.476	6.916	1.450	4.137
	38	P.5x.250	61.946	59.244	C	0.126	0.298	3.476	6.916	1.450	4.137
	38	P.5x.250	61.946	59.244	B	0.126	0.298	3.476	6.916	1.450	4.137
	39	P.5x.250	61.946	59.244	B	0.126	0.298	3.476	6.916	1.450	4.137
T5 91.67-83.33	39	P.5x.250	61.946	59.244	A	0.126	0.298	3.476	6.916	1.450	4.137
					A		Sum:	6.952	13.832	2.900	8.274
					B			6.952	13.832	2.900	8.274
					C			6.952	13.832	2.900	8.274
	52	P.5x.250	62.51	59.9	C	0.122	0.291	3.476	6.930	1.434	4.130
	52	P.5x.250	62.51	59.9	A	0.122	0.291	3.476	6.930	1.434	4.130
	53	P.5x.250	62.51	59.9	C	0.122	0.291	3.476	6.930	1.434	4.130
	53	P.5x.250	62.51	59.9	B	0.122	0.291	3.476	6.930	1.434	4.130
	54	P.5x.250	62.51	59.9	B	0.122	0.291	3.476	6.930	1.434	4.130
	54	P.5x.250	62.51	59.9	A	0.122	0.291	3.476	6.930	1.434	4.130
T6 83.33-75.00					A		Sum:	6.952	13.859	2.869	8.261
					B			6.952	13.859	2.869	8.261
					C			6.952	13.859	2.869	8.261
	67	P.5x.250	63.095	60.58	C	0.119	0.284	3.476	6.943	1.419	4.126
	67	P.5x.250	63.095	60.58	A	0.119	0.284	3.476	6.943	1.419	4.126
	68	P.5x.250	63.095	60.58	C	0.119	0.284	3.476	6.943	1.419	4.126
	68	P.5x.250	63.095	60.58	B	0.119	0.284	3.476	6.943	1.419	4.126
	69	P.5x.250	63.095	60.58	B	0.119	0.284	3.476	6.943	1.419	4.126
	69	P.5x.250	63.095	60.58	A	0.119	0.284	3.476	6.943	1.419	4.126
					A		Sum:	6.952	13.886	2.838	8.251
T7 75.00-50.00					B			6.952	13.886	2.838	8.251
					C			6.952	13.886	2.838	8.251
	82	P5x.375	71.529	65.42	C	0.129	0.288	11.602	22.075	4.735	13.138
	82	P5x.375	71.529	65.42	A	0.129	0.288	11.602	22.075	4.735	13.138
	83	P5x.375	71.529	65.42	C	0.129	0.288	11.602	22.075	4.735	13.138
	83	P5x.375	71.529	65.42	B	0.129	0.288	11.602	22.075	4.735	13.138
	84	P5x.375	71.529	65.42	B	0.129	0.288	11.602	22.075	4.735	13.138
	84	P5x.375	71.529	65.42	A	0.129	0.288	11.602	22.075	4.735	13.138
					A		Sum:	23.204	44.151	9.469	26.277
					B			23.204	44.151	9.469	26.277
T8 50.00-25.00					C			23.204	44.151	9.469	26.277
	121	P.5x.400	65.738	63.404	C	0.147	0.352	10.428	20.924	4.352	12.906
	121	P.5x.400	65.738	63.404	A	0.147	0.352	10.428	20.924	4.352	12.906
	122	P.5x.400	65.738	63.404	C	0.147	0.352	10.428	20.924	4.352	12.906
	122	P.5x.400	65.738	63.404	B	0.147	0.352	10.428	20.924	4.352	12.906
	123	P.5x.400	65.738	63.404	B	0.147	0.352	10.428	20.924	4.352	12.906
	123	P.5x.400	65.738	63.404	A	0.147	0.352	10.428	20.924	4.352	12.906
					A		Sum:	20.856	41.848	8.705	25.813
					B			20.856	41.848	8.705	25.813

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Section Elevation <i>ft</i>	Elem. Num.	Size	C	C w/Ice	F a c e	e	e w/Ice	A _r <i>ft</i> ²	A _r w/Ice <i>ft</i> ²	A _r R _r <i>ft</i> ²	A _r R _r w/Ice <i>ft</i> ²
T9 25.00-0.00	196	P6.875x.400	89.856	73.358	C	0.135	0.284	20.856	41.848	8.705	25.813
	196	P6.875x.400	89.856	73.358	A	0.135	0.284	14.338	24.353	5.899	14.471
	197	P6.875x.400	89.856	73.358	C	0.135	0.284	14.338	24.353	5.899	14.471
	197	P6.875x.400	89.856	73.358	B	0.135	0.284	14.338	24.353	5.899	14.471
	198	P6.875x.400	89.856	73.358	B	0.135	0.284	14.338	24.353	5.899	14.471
	198	P6.875x.400	89.856	73.358	A	0.135	0.284	14.338	24.353	5.899	14.471
					A		Sum:	28.676	48.705	11.797	28.941
					B			28.676	48.705	11.797	28.941
					C			28.676	48.705	11.797	28.941

222-G Section Verification Tables - No Ice

Section Elevation <i>ft</i>	z _{wind} <i>ft</i>	z _{ice} <i>ft</i>	K _z	K _h	K _{zt}	t _z <i>in</i>	q _z <i>psf</i>	F a c e	e	A _r R _r <i>ft</i> ²
T1 120.00-116.67	118.33		1.311	3.265	1.49		46	A	0.195	1.270
								B	0.195	1.270
								C	0.195	1.270
T2 116.67-108.33	112.50		1.297	3.08	1.522		46	A	0.13	2.948
								B	0.13	2.948
								C	0.13	2.948
T3 108.33-100.00	104.17		1.277	2.834	1.573		47	A	0.126	2.916
								B	0.126	2.916
								C	0.126	2.916
T4 100.00-91.67	95.83		1.254	2.607	1.629		48	A	0.126	2.900
								B	0.126	2.900
								C	0.126	2.900
T5 91.67-83.33	87.50		1.231	2.399	1.69		49	A	0.122	2.869
								B	0.122	2.869
								C	0.122	2.869
T6 83.33-75.00	79.17		1.205	2.207	1.759		50	A	0.119	2.838
								B	0.119	2.838
								C	0.119	2.838
T7 75.00-50.00	62.50		1.146	1.868	1.919		52	A	0.129	9.469
								B	0.129	9.469
								C	0.129	9.469
T8 50.00-25.00	37.50		1.029	1.455	2.235		54	A	0.147	8.705
								B	0.147	8.705
								C	0.147	8.705
T9 25.00-0.00	12.50		0.85	1.133	2.675		54	A	0.135	11.797
								B	0.135	11.797
								C	0.135	11.797

222-G Section Verification Tables - Ice

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Section Elevation	z_{wind}	z_{ice}	K_z	K_h	K_{zt}	t_z	q_z	F a c e	e	$A_e R_r$
ft	ft	ft				in	psf			ft ²
T1 120.00-116.67	118.33	118.33	1.311	3.265	1.49	2.4493	11	A B C	0.492 0.492 0.492	10.406 10.406 10.406
T2 116.67-108.33	112.50	112.50	1.297	3.08	1.522	2.4554	11	A B C	0.309 0.309 0.309	16.007 16.007 16.007
T3 108.33-100.00	104.17	104.17	1.277	2.834	1.573	2.4646	11	A B C	0.301 0.301 0.301	16.247 16.247 16.247
T4 100.00-91.67	95.83	95.83	1.254	2.607	1.629	2.4742	11	A B C	0.298 0.298 0.298	16.539 16.539 16.539
T5 91.67-83.33	87.50	87.50	1.231	2.399	1.69	2.4840	11	A B C	0.291 0.291 0.291	16.805 16.805 16.805
T6 83.33-75.00	79.17	79.17	1.205	2.207	1.759	2.4937	12	A B C	0.284 0.284 0.284	17.080 17.080 17.080
T7 75.00-50.00	62.50	62.50	1.146	1.868	1.919	2.5109	12	A B C	0.288 0.288 0.288	54.616 54.616 54.616
T8 50.00-25.00	37.50	37.50	1.029	1.455	2.235	2.5163	13	A B C	0.352 0.352 0.352	73.321 73.321 73.321
T9 25.00-0.00	12.50	12.50	0.85	1.133	2.675	2.4009	12	A B C	0.284 0.284 0.284	64.315 64.315 64.315

222-G Section Verification Tables - Service

Section Elevation	z_{wind}	z_{ice}	K_z	K_h	K_{zt}	t_z	q_z	F a c e	e	$A_e R_r$
ft	ft	ft				in	psf			ft ²
T1 120.00-116.67	118.33		1.311	3.265	1.49		15	A B C	0.195 0.195 0.195	1.270 1.270 1.270
T2 116.67-108.33	112.50		1.297	3.08	1.522		15	A B C	0.13 0.13 0.13	2.948 2.948 2.948
T3 108.33-100.00	104.17		1.277	2.834	1.573		16	A B C	0.126 0.126 0.126	2.916 2.916 2.916
T4 100.00-91.67	95.83		1.254	2.607	1.629		16	A B C	0.126 0.126 0.126	2.900 2.900 2.900
T5 91.67-83.33	87.50		1.231	2.399	1.69		16	A B C	0.122 0.122 0.122	2.869 2.869 2.869
T6 83.33-75.00	79.17		1.205	2.207	1.759		17	A B C	0.119 0.119 0.119	2.838 2.838 2.838
T7 75.00-50.00	62.50		1.146	1.868	1.919		17	A B C	0.129 0.129 0.129	9.469 9.469 9.469
T8 50.00-25.00	37.50		1.029	1.455	2.235		18	A B	0.147 0.147	8.705 8.705

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Section Elevation	z_{wind}	z_{ice}	K_z	K_h	K_{zt}	t_z	q_z	F_{ac}	e	A_{Rr}
ft	ft	ft				in	psf			ft ²
T9 25.00-0.00	12.50		0.85	1.133	2.675		18	C A B C	0.147 0.135 0.135 0.135	8.705 11.797 11.797 11.797

Tower Pressures - No Ice

$$G_H = 0.850$$

Section Elevation	z	K_Z	q_z	A_G	F_{ac}	A_F	A_R	A_{leg}	Leg %	C_{AA} In Face	C_{AA} Out Face
ft	ft		psf	ft ²	ft ²	ft ²	ft ²	ft ²		ft ²	ft ²
T1 120.00-116.67	118.33	1.311	46	39.883	A B C	4.994 4.994 4.994	2.781 2.781 2.781	2.781	35.77 35.77 35.77	0.210 0.000 0.000	0.000 0.000 0.000
T2 116.67-108.33	112.50	1.297	46	103.599	A B C	6.523 6.523 6.523	6.952 6.952 6.952	6.952	51.59 51.59 51.59	6.031 6.849 0.000	0.000 0.000 0.000
T3 108.33-100.00	104.17	1.277	47	109.157	A B C	6.751 6.751 6.751	6.952 6.952 6.952	6.952	50.73 50.73 50.73	16.992 18.569 0.000	0.000 0.000 0.000
T4 100.00-91.67	95.83	1.254	48	114.715	A B C	7.506 7.506 7.506	6.952 6.952 6.952	6.952	48.08 48.08 48.08	18.708 19.293 5.443	0.000 0.000 0.000
T5 91.67-83.33	87.50	1.231	49	120.273	A B C	7.766 7.766 7.766	6.952 6.952 6.952	6.952	47.23 47.23 47.23	19.004 20.461 13.608	0.000 0.000 0.000
T6 83.33-75.00	79.17	1.205	50	125.831	A B C	8.028 8.028 8.028	6.952 6.952 6.952	6.952	46.41 46.41 46.41	20.512 29.843 13.608	0.000 0.000 0.000
T7 75.00-50.00	62.50	1.146	52	412.014	A B C	29.741 29.741 29.741	23.204 23.204 23.204	23.204	43.83 43.83 43.83	64.705 108.161 55.125	0.000 0.000 0.000
T8 50.00-25.00	37.50	1.029	54	460.861	A B C	47.069 47.069 47.069	20.856 20.856 20.856	20.856	30.70 30.70 30.70	70.074 115.129 57.075	0.000 0.000 0.000
T9 25.00-0.00	12.50	0.85	54	514.792	A B C	40.991 40.991 40.991	28.676 28.676 28.676	28.676	41.16 41.16 41.16	54.158 88.803 43.377	0.000 0.000 0.000

Tower Pressure - With Ice

$$G_H = 0.850$$

Section Elevation	z	K_Z	q_z	t_z	A_G	F_{ac}	A_F	A_R	A_{leg}	Leg %	C_{AA} In Face	C_{AA} Out Face
ft	ft		psf	in	ft ²	ft ²	ft ²	ft ²	ft ²		ft ²	ft ²
T1 120.00-116.67	118.33	1.311	11	2.4493	41.245	A B C	4.994 4.994 4.994	15.290 15.290 15.290	5.505	27.14 27.14 27.14	1.843 0.000 0.000	0.000 0.000 0.000
T2	112.50	1.297	11	2.4554	107.012	A	6.523	26.593	13.780	41.61	27.966	0.000

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Section Elevation	z	K _Z	q _z	t _z	A _G	F a c e	A _F	A _R	A _{leg}	Leg %	C _A A _A In Face ft ²	C _A A _A Out Face ft ²
ft	ft		psf	in	ft ²		ft ²	ft ²	ft ²			
116.67-108.33						B	6.523	26.593		41.61	27.871	0.000
						C	6.523	26.593		41.61	0.000	0.000
T3	104.17	1.277	11	2.4646	112.583	A	6.751	27.116	13.805	40.76	70.227	0.000
108.33-100.00						B	6.751	27.116		40.76	72.619	0.000
						C	6.751	27.116		40.76	0.000	0.000
T4 100.00-91.67	95.83	1.254	11	2.4742	118.154	A	7.506	27.650	13.832	39.34	76.439	0.000
						B	7.506	27.650		39.34	77.014	0.000
						C	7.506	27.650		39.34	17.937	0.000
T5 91.67-83.33	87.50	1.231	11	2.4840	123.725	A	7.766	28.193	13.859	38.54	78.287	0.000
						B	7.766	28.193		38.54	83.706	0.000
						C	7.766	28.193		38.54	44.915	0.000
T6 83.33-75.00	79.17	1.205	12	2.4937	129.297	A	8.028	28.743	13.886	37.76	87.342	0.000
						B	8.028	28.743		37.76	123.695	0.000
						C	8.028	28.743		37.76	44.988	0.000
T7 75.00-50.00	62.50	1.146	12	2.5109	422.484	A	29.741	91.767	44.151	36.34	286.171	0.000
						B	29.741	91.767		36.34	454.378	0.000
						C	29.741	91.767		36.34	190.491	0.000
T8 50.00-25.00	37.50	1.029	13	2.5163	471.355	A	47.069	118.868	41.848	25.22	334.794	0.000
						B	47.069	118.868		25.22	512.489	0.000
						C	47.069	118.868		25.22	198.204	0.000
T9 25.00-0.00	12.50	0.85	12	2.4009	524.804	A	40.991	108.237	48.705	32.64	254.875	0.000
						B	40.991	108.237		32.64	388.847	0.000
						C	40.991	108.237		32.64	147.477	0.000

Tower Pressure - Service

$$G_H = 0.850$$

Section Elevation	z	K _Z	q _z	A _G	F a c e	A _F	A _R	A _{leg}	Leg %	C _A A _A In Face ft ²	C _A A _A Out Face ft ²
ft	ft		psf	ft ²		ft ²	ft ²	ft ²			
T1	118.33	1.311	15	39.883	A	4.994	2.781		35.77	0.210	0.000
120.00-116.67					B	4.994	2.781		35.77	0.000	0.000
					C	4.994	2.781		35.77	0.000	0.000
T2	112.50	1.297	15	103.599	A	6.523	6.952	6.952	51.59	6.031	0.000
116.67-108.33					B	6.523	6.952		51.59	6.849	0.000
					C	6.523	6.952		51.59	0.000	0.000
T3	104.17	1.277	16	109.157	A	6.751	6.952	6.952	50.73	16.992	0.000
108.33-100.00					B	6.751	6.952		50.73	18.569	0.000
					C	6.751	6.952		50.73	0.000	0.000
T4	95.83	1.254	16	114.715	A	7.506	6.952	6.952	48.08	18.708	0.000
100.00-91.67					B	7.506	6.952		48.08	19.293	0.000
					C	7.506	6.952		48.08	5.443	0.000
T5 91.67-83.33	87.50	1.231	16	120.273	A	7.766	6.952	6.952	47.23	19.004	0.000
					B	7.766	6.952		47.23	20.461	0.000
					C	7.766	6.952		47.23	13.608	0.000
T6 83.33-75.00	79.17	1.205	17	125.831	A	8.028	6.952	6.952	46.41	20.512	0.000
					B	8.028	6.952		46.41	29.843	0.000
					C	8.028	6.952		46.41	13.608	0.000
T7 75.00-50.00	62.50	1.146	17	412.014	A	29.741	23.204	23.204	43.83	64.705	0.000
					B	29.741	23.204		43.83	108.161	0.000
					C	29.741	23.204		43.83	55.125	0.000
T8 50.00-25.00	37.50	1.029	18	460.861	A	47.069	20.856	20.856	30.70	70.074	0.000
					B	47.069	20.856		30.70	115.129	0.000

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Section Elevation	z	K _Z	q _z	A _G	F _{a c e}	A _F	A _R	A _{leg}	Leg %	C _{AA} In Face	C _{AA} Out Face
ft	ft		psf	ft ²		ft ²	ft ²	ft ²		ft ²	ft ²
T9 25.00-0.00	12.50	0.85	18	514.792	C	47.069	20.856		30.70	57.075	0.000
					A	40.991	28.676	28.676	41.16	54.158	0.000
					B	40.991	28.676		41.16	88.803	0.000
					C	40.991	28.676		41.16	43.377	0.000

Tower Forces - No Ice - Wind Normal To Face

Section Elevation	Add Weight	Self Weight	F _{a c e}	e	C _F	q _z	D _F	D _R	A _E	F	w	Ctrl. Face
ft	K	K				psf			ft ²	K	plf	
T1 120.00-116.67	0.00	0.48	A	0.195	2.613	46	1	1	6.264	0.64	193.44	C
			B	0.195	2.613		1	1	6.264			
			C	0.195	2.613		1	1	6.264			
T2 116.67-108.33	0.05	0.81	A	0.13	2.846	46	1	1	9.471	1.37	164.49	C
			B	0.13	2.846		1	1	9.471			
			C	0.13	2.846		1	1	9.471			
T3 108.33-100.00	0.13	0.82	A	0.126	2.864	47	1	1	9.668	1.97	236.35	C
			B	0.126	2.864		1	1	9.668			
			C	0.126	2.864		1	1	9.668			
T4 100.00-91.67	0.18	1.14	A	0.126	2.862	48	1	1	10.406	2.28	273.96	C
			B	0.126	2.862		1	1	10.406			
			C	0.126	2.862		1	1	10.406			
T5 91.67-83.33	0.24	1.17	A	0.122	2.876	49	1	1	10.635	2.60	311.85	C
			B	0.122	2.876		1	1	10.635			
			C	0.122	2.876		1	1	10.635			
T6 83.33-75.00	0.30	1.36	A	0.119	2.889	50	1	1	10.866	2.96	355.07	C
			B	0.119	2.889		1	1	10.866			
			C	0.119	2.889		1	1	10.866			
T7 75.00-50.00	1.18	5.38	A	0.129	2.852	52	1	1	39.210	10.95	437.93	C
			B	0.129	2.852		1	1	39.210			
			C	0.129	2.852		1	1	39.210			
T8 50.00-25.00	1.24	7.25	A	0.147	2.781	54	1	1	55.773	13.83	553.37	C
			B	0.147	2.781		1	1	55.773			
			C	0.147	2.781		1	1	55.773			
T9 25.00-0.00	0.95	7.66	A	0.135	2.826	54	1	1	52.788	11.87	474.98	C
			B	0.135	2.826		1	1	52.788			
			C	0.135	2.826		1	1	52.788			
Sum Weight:	4.27	26.06						OTM	2467.58 kip-ft	48.48		

Tower Forces - No Ice - Wind 45 To Face

Section Elevation	Add Weight	Self Weight	F _{a c e}	e	C _F	q _z	D _F	D _R	A _E	F	w	Ctrl. Face
ft	K	K				psf			ft ²	K	plf	
T1 120.00-116.67	0.00	0.48	A	0.195	2.613	46	0.825	1	5.390	0.56	166.66	C
			B	0.195	2.613		0.825	1	5.390			
			C	0.195	2.613		0.825	1	5.390			
T2	0.05	0.81	A	0.13	2.846	46	0.825	1	8.329	1.24	149.08	C

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	Client SMK-003 / ASM-010 / NSS-044 / (AT&T) / (Sprint) / (T-Mobile)	Designed by MCD

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	q _z psf	D _F	D _R	A _E ft ²	F K	w plf	Ctrl. Face
ft	K	K										
116.67-108.33			B	0.13	2.846		0.825	1	8.329			
			C	0.13	2.846		0.825	1	8.329			
T3	0.13	0.82	A	0.126	2.864	47	0.825	1	8.486	1.83	220.04	C
108.33-100.00			B	0.126	2.864		0.825	1	8.486			
			C	0.126	2.864		0.825	1	8.486			
T4	0.18	1.14	A	0.126	2.862	48	0.825	1	9.092	2.13	255.52	C
100.00-91.67			B	0.126	2.862		0.825	1	9.092			
			C	0.126	2.862		0.825	1	9.092			
T5	0.24	1.17	A	0.122	2.876	49	0.825	1	9.275	2.44	292.33	C
91.67-83.33			B	0.122	2.876		0.825	1	9.275			
			C	0.122	2.876		0.825	1	9.275			
T6	0.30	1.36	A	0.119	2.889	50	0.825	1	9.461	2.79	334.42	C
83.33-75.00			B	0.119	2.889		0.825	1	9.461			
			C	0.119	2.889		0.825	1	9.461			
T7	1.18	5.38	A	0.129	2.852	52	0.825	1	34.006	10.29	411.78	C
75.00-50.00			B	0.129	2.852		0.825	1	34.006			
			C	0.129	2.852		0.825	1	34.006			
T8	1.24	7.25	A	0.147	2.781	54	0.825	1	47.536	12.78	511.18	C
50.00-25.00			B	0.147	2.781		0.825	1	47.536			
			C	0.147	2.781		0.825	1	47.536			
T9 25.00-0.00	0.95	7.66	A	0.135	2.826	54	0.825	1	45.615	10.95	438.08	C
			B	0.135	2.826		0.825	1	45.615			
			C	0.135	2.826		0.825	1	45.615			
Sum Weight:	4.27	26.06						OTM	2293.89 kip-ft	45.01		

Tower Forces - No Ice - Wind 60 To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	q _z psf	D _F	D _R	A _E ft ²	F K	w plf	Ctrl. Face
ft	K	K										
T1	0.00	0.48	A	0.195	2.613	46	0.8	1	5.265	0.54	162.83	C
120.00-116.67			B	0.195	2.613		0.8	1	5.265			
			C	0.195	2.613		0.8	1	5.265			
T2	0.05	0.81	A	0.13	2.846	46	0.8	1	8.166	1.22	146.88	C
116.67-108.33			B	0.13	2.846		0.8	1	8.166			
			C	0.13	2.846		0.8	1	8.166			
T3	0.13	0.82	A	0.126	2.864	47	0.8	1	8.317	1.81	217.71	C
108.33-100.00			B	0.126	2.864		0.8	1	8.317			
			C	0.126	2.864		0.8	1	8.317			
T4	0.18	1.14	A	0.126	2.862	48	0.8	1	8.904	2.11	252.88	C
100.00-91.67			B	0.126	2.862		0.8	1	8.904			
			C	0.126	2.862		0.8	1	8.904			
T5	0.24	1.17	A	0.122	2.876	49	0.8	1	9.081	2.41	289.54	C
91.67-83.33			B	0.122	2.876		0.8	1	9.081			
			C	0.122	2.876		0.8	1	9.081			
T6	0.30	1.36	A	0.119	2.889	50	0.8	1	9.260	2.76	331.47	C
83.33-75.00			B	0.119	2.889		0.8	1	9.260			
			C	0.119	2.889		0.8	1	9.260			
T7	1.18	5.38	A	0.129	2.852	52	0.8	1	33.262	10.20	408.05	C
75.00-50.00			B	0.129	2.852		0.8	1	33.262			
			C	0.129	2.852		0.8	1	33.262			
T8	1.24	7.25	A	0.147	2.781	54	0.8	1	46.360	12.63	505.15	C

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	Project Connecticut State Police Tower - West Rock - MODification Client SMK-003 / ASM-010 / NSS-044 / (AT&T) / (Sprint) / (T-Mobile)	Date 16:04:07 04/09/20 Designed by MCD

Section Elevation <i>ft</i>	Add Weight <i>K</i>	Self Weight <i>K</i>	<i>F a c e</i>	<i>e</i>	<i>C_F</i>	<i>q_z</i> <i>psf</i>	<i>D_F</i>	<i>D_R</i>	<i>A_E</i> <i>ft²</i>	<i>F</i> <i>K</i>	<i>w</i> <i>plf</i>	<i>Ctrl. Face</i>
50.00-25.00			B	0.147	2.781		0.8	1	46.360			
			C	0.147	2.781		0.8	1	46.360			
T9 25.00-0.00	0.95	7.66	A	0.135	2.826	54	0.8	1	44.590	10.82	432.81	C
			B	0.135	2.826		0.8	1	44.590			
			C	0.135	2.826		0.8	1	44.590			
Sum Weight:	4.27	26.06						OTM	2269.08 kip-ft	44.51		

Tower Forces - No Ice - Wind 90 To Face

Section Elevation <i>ft</i>	Add Weight <i>K</i>	Self Weight <i>K</i>	<i>F a c e</i>	<i>e</i>	<i>C_F</i>	<i>q_z</i> <i>psf</i>	<i>D_F</i>	<i>D_R</i>	<i>A_E</i> <i>ft²</i>	<i>F</i> <i>K</i>	<i>w</i> <i>plf</i>	<i>Ctrl. Face</i>
T1	0.00	0.48	A	0.195	2.613	46	0.85	1	5.515	0.57	170.48	C
120.00-116.67			B	0.195	2.613		0.85	1	5.515			
			C	0.195	2.613		0.85	1	5.515			
T2	0.05	0.81	A	0.13	2.846	46	0.85	1	8.492	1.26	151.28	C
116.67-108.33			B	0.13	2.846		0.85	1	8.492			
			C	0.13	2.846		0.85	1	8.492			
T3	0.13	0.82	A	0.126	2.864	47	0.85	1	8.655	1.85	222.37	C
108.33-100.00			B	0.126	2.864		0.85	1	8.655			
			C	0.126	2.864		0.85	1	8.655			
T4	0.18	1.14	A	0.126	2.862	48	0.85	1	9.280	2.15	258.15	C
100.00-91.67			B	0.126	2.862		0.85	1	9.280			
			C	0.126	2.862		0.85	1	9.280			
T5	0.24	1.17	A	0.122	2.876	49	0.85	1	9.470	2.46	295.12	C
91.67-83.33			B	0.122	2.876		0.85	1	9.470			
			C	0.122	2.876		0.85	1	9.470			
T6	0.30	1.36	A	0.119	2.889	50	0.85	1	9.661	2.81	337.37	C
83.33-75.00			B	0.119	2.889		0.85	1	9.661			
			C	0.119	2.889		0.85	1	9.661			
T7	1.18	5.38	A	0.129	2.852	52	0.85	1	34.749	10.39	415.52	C
75.00-50.00			B	0.129	2.852		0.85	1	34.749			
			C	0.129	2.852		0.85	1	34.749			
T8	1.24	7.25	A	0.147	2.781	54	0.85	1	48.713	12.93	517.21	C
50.00-25.00			B	0.147	2.781		0.85	1	48.713			
			C	0.147	2.781		0.85	1	48.713			
T9 25.00-0.00	0.95	7.66	A	0.135	2.826	54	0.85	1	46.640	11.08	443.35	C
			B	0.135	2.826		0.85	1	46.640			
			C	0.135	2.826		0.85	1	46.640			
Sum Weight:	4.27	26.06						OTM	2318.70 kip-ft	45.51		

Tower Forces - With Ice - Wind Normal To Face

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	Client SMK-003 / ASM-010 / NSS-044 / (AT&T) / (Sprint) / (T-Mobile)	Designed by MCD

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	q _z psf	D _F	D _R	A _E ft ²	F K	w plf	Ctrl. Face
ft	K	K										
T1 120.00-116.67	0.03	2.26	A	0.492	1.911	11	1	1	15.399	0.27	82.27	C
			B	0.492	1.911		1	1	15.399			
			C	0.492	1.911		1	1	15.399			
T2 116.67-108.33	1.05	3.46	A	0.309	2.271	11	1	1	22.530	0.77	92.78	C
			B	0.309	2.271		1	1	22.530			
			C	0.309	2.271		1	1	22.530			
T3 108.33-100.00	2.72	3.55	A	0.301	2.294	11	1	1	22.998	1.29	154.24	C
			B	0.301	2.294		1	1	22.998			
			C	0.301	2.294		1	1	22.998			
T4 100.00-91.67	3.30	4.37	A	0.298	2.303	11	1	1	24.045	1.49	179.31	C
			B	0.298	2.303		1	1	24.045			
			C	0.298	2.303		1	1	24.045			
T5 91.67-83.33	4.02	4.50	A	0.291	2.321	11	1	1	24.571	1.74	209.11	C
			B	0.291	2.321		1	1	24.571			
			C	0.291	2.321		1	1	24.571			
T6 83.33-75.00	4.86	4.80	A	0.284	2.338	12	1	1	25.107	2.08	249.68	C
			B	0.284	2.338		1	1	25.107			
			C	0.284	2.338		1	1	25.107			
T7 75.00-50.00	17.49	17.33	A	0.288	2.329	12	1	1	84.357	7.68	307.31	C
			B	0.288	2.329		1	1	84.357			
			C	0.288	2.329		1	1	84.357			
T8 50.00-25.00	19.45	23.85	A	0.352	2.167	13	1	1	120.390	9.45	377.91	C
			B	0.352	2.167		1	1	120.390			
			C	0.352	2.167		1	1	120.390			
T9 25.00-0.00	14.14	21.70	A	0.284	2.338	12	1	1	105.306	7.58	303.15	C
			B	0.284	2.338		1	1	105.306			
			C	0.284	2.338		1	1	105.306			
Sum Weight:	67.05	85.82						OTM	1642.92 kip-ft	32.36		

Tower Forces - With Ice - Wind 45 To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	q _z psf	D _F	D _R	A _E ft ²	F K	w plf	Ctrl. Face
ft	K	K										
T1 120.00-116.67	0.03	2.26	A	0.492	1.911	11	0.825	1	14.526	0.26	77.75	C
			B	0.492	1.911		0.825	1	14.526			
			C	0.492	1.911		0.825	1	14.526			
T2 116.67-108.33	1.05	3.46	A	0.309	2.271	11	0.825	1	21.389	0.75	89.94	C
			B	0.309	2.271		0.825	1	21.389			
			C	0.309	2.271		0.825	1	21.389			
T3 108.33-100.00	2.72	3.55	A	0.301	2.294	11	0.825	1	21.817	1.26	151.22	C
			B	0.301	2.294		0.825	1	21.817			
			C	0.301	2.294		0.825	1	21.817			
T4 100.00-91.67	3.30	4.37	A	0.298	2.303	11	0.825	1	22.731	1.47	175.88	C
			B	0.298	2.303		0.825	1	22.731			
			C	0.298	2.303		0.825	1	22.731			
T5 91.67-83.33	4.02	4.50	A	0.291	2.321	11	0.825	1	23.212	1.71	205.47	C
			B	0.291	2.321		0.825	1	23.212			
			C	0.291	2.321		0.825	1	23.212			
T6 83.33-75.00	4.86	4.80	A	0.284	2.338	12	0.825	1	23.702	2.05	245.81	C
			B	0.284	2.338		0.825	1	23.702			
			C	0.284	2.338		0.825	1	23.702			

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	Client SMK-003 / ASM-010 / NSS-044 / (AT&T) / (Sprint) / (T-Mobile)	Designed by MCD

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	q _z psf	D _F	D _R	A _E ft ²	F K	w plf	Ctrl. Face
ft	K	K										
T7 75.00-50.00	17.49	17.33	A	0.288	2.329	12	0.825	1	79.152	7.56	302.37	C
			B	0.288	2.329		0.825	1	79.152			
			C	0.288	2.329		0.825	1	79.152			
T8 50.00-25.00	19.45	23.85	A	0.352	2.167	13	0.825	1	112.153	9.26	370.31	C
			B	0.352	2.167		0.825	1	112.153			
			C	0.352	2.167		0.825	1	112.153			
T9 25.00-0.00	14.14	21.70	A	0.284	2.338	12	0.825	1	98.133	7.40	296.10	C
			B	0.284	2.338		0.825	1	98.133			
			C	0.284	2.338		0.825	1	98.133			
Sum Weight:	67.05	85.82						OTM	1610.87 kip-ft	31.71		

Tower Forces - With Ice - Wind 60 To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	q _z psf	D _F	D _R	A _E ft ²	F K	w plf	Ctrl. Face
ft	K	K										
T1 120.00-116.67	0.03	2.26	A	0.492	1.911	11	0.8	1	14.401	0.26	77.10	C
			B	0.492	1.911		0.8	1	14.401			
			C	0.492	1.911		0.8	1	14.401			
T2 116.67-108.33	1.05	3.46	A	0.309	2.271	11	0.8	1	21.226	0.75	89.53	C
			B	0.309	2.271		0.8	1	21.226			
			C	0.309	2.271		0.8	1	21.226			
T3 108.33-100.00	2.72	3.55	A	0.301	2.294	11	0.8	1	21.648	1.26	150.79	C
			B	0.301	2.294		0.8	1	21.648			
			C	0.301	2.294		0.8	1	21.648			
T4 100.00-91.67	3.30	4.37	A	0.298	2.303	11	0.8	1	22.544	1.46	175.39	C
			B	0.298	2.303		0.8	1	22.544			
			C	0.298	2.303		0.8	1	22.544			
T5 91.67-83.33	4.02	4.50	A	0.291	2.321	11	0.8	1	23.017	1.71	204.95	C
			B	0.291	2.321		0.8	1	23.017			
			C	0.291	2.321		0.8	1	23.017			
T6 83.33-75.00	4.86	4.80	A	0.284	2.338	12	0.8	1	23.502	2.04	245.26	C
			B	0.284	2.338		0.8	1	23.502			
			C	0.284	2.338		0.8	1	23.502			
T7 75.00-50.00	17.49	17.33	A	0.288	2.329	12	0.8	1	78.409	7.54	301.67	C
			B	0.288	2.329		0.8	1	78.409			
			C	0.288	2.329		0.8	1	78.409			
T8 50.00-25.00	19.45	23.85	A	0.352	2.167	13	0.8	1	110.976	9.23	369.23	C
			B	0.352	2.167		0.8	1	110.976			
			C	0.352	2.167		0.8	1	110.976			
T9 25.00-0.00	14.14	21.70	A	0.284	2.338	12	0.8	1	97.108	7.38	295.09	C
			B	0.284	2.338		0.8	1	97.108			
			C	0.284	2.338		0.8	1	97.108			
Sum Weight:	67.05	85.82						OTM	1606.29 kip-ft	31.62		

Tower Forces - With Ice - Wind 90 To Face

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Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	q _z psf	D _F	D _R	A _E ft ²	F K	w plf	Ctrl. Face
ft	K	K										
T1 120.00-116.67	0.03	2.26	A	0.492	1.911	11	0.85	1	14.650	0.26	78.40	C
			B	0.492	1.911		0.85	1	14.650			
			C	0.492	1.911		0.85	1	14.650			
T2 116.67-108.33	1.05	3.46	A	0.309	2.271	11	0.85	1	21.552	0.75	90.35	C
			B	0.309	2.271		0.85	1	21.552			
			C	0.309	2.271		0.85	1	21.552			
T3 108.33-100.00	2.72	3.55	A	0.301	2.294	11	0.85	1	21.986	1.26	151.65	C
			B	0.301	2.294		0.85	1	21.986			
			C	0.301	2.294		0.85	1	21.986			
T4 100.00-91.67	3.30	4.37	A	0.298	2.303	11	0.85	1	22.919	1.47	176.37	C
			B	0.298	2.303		0.85	1	22.919			
			C	0.298	2.303		0.85	1	22.919			
T5 91.67-83.33	4.02	4.50	A	0.291	2.321	11	0.85	1	23.406	1.72	205.99	C
			B	0.291	2.321		0.85	1	23.406			
			C	0.291	2.321		0.85	1	23.406			
T6 83.33-75.00	4.86	4.80	A	0.284	2.338	12	0.85	1	23.903	2.05	246.36	C
			B	0.284	2.338		0.85	1	23.903			
			C	0.284	2.338		0.85	1	23.903			
T7 75.00-50.00	17.49	17.33	A	0.288	2.329	12	0.85	1	79.896	7.58	303.08	C
			B	0.288	2.329		0.85	1	79.896			
			C	0.288	2.329		0.85	1	79.896			
T8 50.00-25.00	19.45	23.85	A	0.352	2.167	13	0.85	1	113.330	9.28	371.40	C
			B	0.352	2.167		0.85	1	113.330			
			C	0.352	2.167		0.85	1	113.330			
T9 25.00-0.00	14.14	21.70	A	0.284	2.338	12	0.85	1	99.158	7.43	297.11	C
			B	0.284	2.338		0.85	1	99.158			
			C	0.284	2.338		0.85	1	99.158			
Sum Weight:	67.05	85.82						OTM	1615.45 kip-ft	31.81		

Tower Forces - Service - Wind Normal To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	q _z psf	D _F	D _R	A _E ft ²	F K	w plf	Ctrl. Face
ft	K	K										
T1 120.00-116.67	0.00	0.48	A	0.195	2.613	15	1	1	6.264	0.21	64.36	C
			B	0.195	2.613		1	1	6.264			
			C	0.195	2.613		1	1	6.264			
T2 116.67-108.33	0.05	0.81	A	0.13	2.846	15	1	1	9.471	0.46	54.73	C
			B	0.13	2.846		1	1	9.471			
			C	0.13	2.846		1	1	9.471			
T3 108.33-100.00	0.13	0.82	A	0.126	2.864	16	1	1	9.668	0.66	78.63	C
			B	0.126	2.864		1	1	9.668			
			C	0.126	2.864		1	1	9.668			
T4 100.00-91.67	0.18	1.14	A	0.126	2.862	16	1	1	10.406	0.76	91.15	C
			B	0.126	2.862		1	1	10.406			
			C	0.126	2.862		1	1	10.406			
T5 91.67-83.33	0.24	1.17	A	0.122	2.876	16	1	1	10.635	0.86	103.75	C
			B	0.122	2.876		1	1	10.635			
			C	0.122	2.876		1	1	10.635			
T6 83.33-75.00	0.30	1.36	A	0.119	2.889	17	1	1	10.866	0.98	118.13	C
			B	0.119	2.889		1	1	10.866			

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	Client SMK-003 / ASM-010 / NSS-044 / (AT&T) / (Sprint) / (T-Mobile)	Designed by MCD

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	q _z psf	D _F	D _R	A _E ft ²	F K	w plf	Ctrl. Face
ft	K	K										
T7 75.00-50.00	1.18	5.38	C A B	0.119 0.129 0.129	2.889 2.852 2.852	17	1 1 1	1 1 1	10.866 39.210 39.210	3.64	145.70	C
T8 50.00-25.00	1.24	7.25	C A B	0.129 0.147 0.147	2.852 2.781 2.781	18	1 1 1	1 1 1	39.210 55.773 55.773	4.60	184.11	C
T9 25.00-0.00	0.95	7.66	C A B	0.147 0.135 0.135	2.781 2.826 2.826	18	1 1 1	1 1 1	55.773 52.788 52.788	3.95	158.03	C
Sum Weight:	4.27	26.06	C	0.135	2.826		1	OTM	52.788 820.98 kip-ft	16.13		

Tower Forces - Service - Wind 45 To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	q _z psf	D _F	D _R	A _E ft ²	F K	w plf	Ctrl. Face
ft	K	K										
T1 120.00-116.67	0.00	0.48	A B C	0.195 0.195 0.195	2.613 2.613 2.613	15	0.825 0.825 0.825	1 1 1	5.390 5.390 5.390	0.18	55.45	C
T2 116.67-108.33	0.05	0.81	A B C	0.13 0.13 0.13	2.846 2.846 2.846	15	0.825 0.825 0.825	1 1 1	8.329 8.329 8.329	0.41	49.60	C
T3 108.33-100.00	0.13	0.82	A B C	0.126 0.126 0.126	2.864 2.864 2.864	16	0.825 0.825 0.825	1 1 1	8.486 8.486 8.486	0.61	73.21	C
T4 100.00-91.67	0.18	1.14	A B C	0.126 0.126 0.126	2.862 2.862 2.862	16	0.825 0.825 0.825	1 1 1	9.092 9.092 9.092	0.71	85.01	C
T5 91.67-83.33	0.24	1.17	A B C	0.122 0.122 0.122	2.876 2.876 2.876	16	0.825 0.825 0.825	1 1 1	9.275 9.275 9.275	0.81	97.26	C
T6 83.33-75.00	0.30	1.36	A B C	0.119 0.119 0.119	2.889 2.889 2.889	17	0.825 0.825 0.825	1 1 1	9.461 9.461 9.461	0.93	111.26	C
T7 75.00-50.00	1.18	5.38	A B C	0.129 0.129 0.129	2.852 2.852 2.852	17	0.825 0.825 0.825	1 1 1	34.006 34.006 34.006	3.43	137.00	C
T8 50.00-25.00	1.24	7.25	A B C	0.147 0.147 0.147	2.781 2.781 2.781	18	0.825 0.825 0.825	1 1 1	47.536 47.536 47.536	4.25	170.07	C
T9 25.00-0.00	0.95	7.66	A B C	0.135 0.135 0.135	2.826 2.826 2.826	18	0.825 0.825 0.825	1 1 1	45.615 45.615 45.615	3.64	145.75	C
Sum Weight:	4.27	26.06						OTM	763.19 kip-ft	14.98		

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Tower Forces - Service - Wind 60 To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	q _z	D _F	D _R	A _E	F	w	Ctrl. Face
ft	K	K				psf			ft ²	K	plf	
T1 120.00-116.67	0.00	0.48	A	0.195	2.613	15	0.8	1	5.265	0.18	54.17	C
			B	0.195	2.613		0.8	1	5.265			
			C	0.195	2.613		0.8	1	5.265			
T2 116.67-108.33	0.05	0.81	A	0.13	2.846	15	0.8	1	8.166	0.41	48.87	C
			B	0.13	2.846		0.8	1	8.166			
			C	0.13	2.846		0.8	1	8.166			
T3 108.33-100.00	0.13	0.82	A	0.126	2.864	16	0.8	1	8.317	0.60	72.43	C
			B	0.126	2.864		0.8	1	8.317			
			C	0.126	2.864		0.8	1	8.317			
T4 100.00-91.67	0.18	1.14	A	0.126	2.862	16	0.8	1	8.904	0.70	84.14	C
			B	0.126	2.862		0.8	1	8.904			
			C	0.126	2.862		0.8	1	8.904			
T5 91.67-83.33	0.24	1.17	A	0.122	2.876	16	0.8	1	9.081	0.80	96.33	C
			B	0.122	2.876		0.8	1	9.081			
			C	0.122	2.876		0.8	1	9.081			
T6 83.33-75.00	0.30	1.36	A	0.119	2.889	17	0.8	1	9.260	0.92	110.28	C
			B	0.119	2.889		0.8	1	9.260			
			C	0.119	2.889		0.8	1	9.260			
T7 75.00-50.00	1.18	5.38	A	0.129	2.852	17	0.8	1	33.262	3.39	135.76	C
			B	0.129	2.852		0.8	1	33.262			
			C	0.129	2.852		0.8	1	33.262			
T8 50.00-25.00	1.24	7.25	A	0.147	2.781	18	0.8	1	46.360	4.20	168.07	C
			B	0.147	2.781		0.8	1	46.360			
			C	0.147	2.781		0.8	1	46.360			
T9 25.00-0.00	0.95	7.66	A	0.135	2.826	18	0.8	1	44.590	3.60	144.00	C
			B	0.135	2.826		0.8	1	44.590			
			C	0.135	2.826		0.8	1	44.590			
Sum Weight:	4.27	26.06						OTM	754.94 kip-ft	14.81		

Tower Forces - Service - Wind 90 To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	q _z	D _F	D _R	A _E	F	w	Ctrl. Face
ft	K	K				psf			ft ²	K	plf	
T1 120.00-116.67	0.00	0.48	A	0.195	2.613	15	0.85	1	5.515	0.19	56.72	C
			B	0.195	2.613		0.85	1	5.515			
			C	0.195	2.613		0.85	1	5.515			
T2 116.67-108.33	0.05	0.81	A	0.13	2.846	15	0.85	1	8.492	0.42	50.33	C
			B	0.13	2.846		0.85	1	8.492			
			C	0.13	2.846		0.85	1	8.492			
T3 108.33-100.00	0.13	0.82	A	0.126	2.864	16	0.85	1	8.655	0.62	73.98	C
			B	0.126	2.864		0.85	1	8.655			
			C	0.126	2.864		0.85	1	8.655			
T4 100.00-91.67	0.18	1.14	A	0.126	2.862	16	0.85	1	9.280	0.72	85.89	C
			B	0.126	2.862		0.85	1	9.280			
			C	0.126	2.862		0.85	1	9.280			
T5 91.67-83.33	0.24	1.17	A	0.122	2.876	16	0.85	1	9.470	0.82	98.19	C
			B	0.122	2.876		0.85	1	9.470			
			C	0.122	2.876		0.85	1	9.470			

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Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	q _z psf	D _F	D _R	A _E	F	w	Ctrl. Face
ft	K	K							ft ²	K	plf	
T6 83.33-75.00	0.30	1.36	A	0.119	2.889	17	0.85	1	9.661	0.94	112.24	C
			B	0.119	2.889		0.85	1	9.661			
			C	0.119	2.889		0.85	1	9.661			
T7 75.00-50.00	1.18	5.38	A	0.129	2.852	17	0.85	1	34.749	3.46	138.25	C
			B	0.129	2.852		0.85	1	34.749			
			C	0.129	2.852		0.85	1	34.749			
T8 50.00-25.00	1.24	7.25	A	0.147	2.781	18	0.85	1	48.713	4.30	172.08	C
			B	0.147	2.781		0.85	1	48.713			
			C	0.147	2.781		0.85	1	48.713			
T9 25.00-0.00	0.95	7.66	A	0.135	2.826	18	0.85	1	46.640	3.69	147.51	C
			B	0.135	2.826		0.85	1	46.640			
			C	0.135	2.826		0.85	1	46.640			
Sum Weight:	4.27	26.06						OTM	771.45 kip-ft	15.14		

Force Totals

Load Case	Vertical Forces	Sum of Forces X	Sum of Forces Z	Sum of Overturning Moments, M _x	Sum of Overturning Moments, M _z	Sum of Torques
	K	K	K	kip-ft	kip-ft	kip-ft
Leg Weight	7.17					
Bracing Weight	18.88					
Total Member Self-Weight	26.06			-6.50	-15.82	
Total Weight	43.07			-6.50	-15.82	
Wind 0 deg - No Ice		-0.15	-74.69	-4841.19	-1.05	57.91
Wind 30 deg - No Ice		35.52	-62.03	-4057.15	-2313.49	8.85
Wind 45 deg - No Ice		49.96	-50.25	-3291.88	-3255.32	-17.46
Wind 60 deg - No Ice		60.81	-35.23	-2311.80	-3967.30	-42.58
Wind 90 deg - No Ice		71.30	0.15	8.26	-4636.74	-82.60
Wind 120 deg - No Ice		64.40	37.47	2423.63	-4153.97	-100.49
Wind 135 deg - No Ice		51.57	51.87	3369.95	-3346.38	-99.36
Wind 150 deg - No Ice		35.78	62.18	4058.91	-2339.06	-91.45
Wind 180 deg - No Ice		0.15	70.72	4629.69	-30.58	-57.91
Wind 210 deg - No Ice		-35.52	62.03	4044.15	2281.86	-8.85
Wind 225 deg - No Ice		-49.96	50.25	3278.89	3223.69	17.46
Wind 240 deg - No Ice		-64.25	37.21	2398.07	4107.58	42.58
Wind 270 deg - No Ice		-71.30	-0.15	-21.26	4605.11	82.60
Wind 300 deg - No Ice		-60.96	-35.49	-2337.37	3950.43	100.49
Wind 315 deg - No Ice		-50.17	-50.46	-3312.76	3244.56	99.36
Wind 330 deg - No Ice		-35.78	-62.18	-4071.91	2307.43	91.45
Member Ice	59.76					
Total Weight Ice	205.75			-260.55	-154.68	
Wind 0 deg - Ice		-0.02	-44.17	-2959.88	-152.99	50.45
Wind 30 deg - Ice		21.77	-37.76	-2573.61	-1484.34	2.92
Wind 45 deg - Ice		30.73	-30.76	-2145.42	-2032.74	-21.98
Wind 60 deg - Ice		37.57	-21.70	-1590.45	-2451.48	-45.39
Wind 90 deg - Ice		43.57	0.02	-258.87	-2816.92	-81.54
Wind 120 deg - Ice		38.23	22.10	1090.57	-2484.88	-95.84
Wind 135 deg - Ice		31.02	31.05	1639.64	-2048.07	-93.33
Wind 150 deg - Ice		21.81	37.78	2054.19	-1487.26	-84.46
Wind 180 deg - Ice		0.02	43.43	2402.15	-156.36	-50.45
Wind 210 deg - Ice		-21.77	37.76	2052.50	1174.99	-2.92
Wind 225 deg - Ice		-30.73	30.76	1624.31	1723.39	21.98

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Load Case	Vertical Forces K	Sum of Forces X K	Sum of Forces Z K	Sum of Overturning Moments, M_x kip-ft	Sum of Overturning Moments, M_z kip-ft	Sum of Torques kip-ft
Wind 240 deg - Ice		-38.20	22.07	1087.65	2173.84	45.39
Wind 270 deg - Ice		-43.57	-0.02	-262.24	2507.57	81.54
Wind 300 deg - Ice		-37.59	-21.73	-1593.37	2143.81	95.84
Wind 315 deg - Ice		-30.76	-30.79	-2147.80	1725.77	93.33
Wind 330 deg - Ice		-21.81	-37.78	-2575.30	1177.90	84.46
Total Weight	43.07			-6.50	-15.82	
Wind 0 deg - Service		-0.05	-24.85	-1610.01	3.89	19.27
Wind 30 deg - Service		11.82	-20.64	-1349.16	-765.47	2.94
Wind 45 deg - Service		16.62	-16.72	-1094.55	-1078.82	-5.81
Wind 60 deg - Service		20.23	-11.72	-768.47	-1315.70	-14.17
Wind 90 deg - Service		23.72	0.05	3.43	-1538.43	-27.48
Wind 120 deg - Service		21.43	12.47	807.04	-1377.81	-33.43
Wind 135 deg - Service		17.16	17.26	1121.88	-1109.12	-33.06
Wind 150 deg - Service		11.90	20.69	1351.11	-773.98	-30.43
Wind 180 deg - Service		0.05	23.53	1541.01	-5.93	-19.27
Wind 210 deg - Service		-11.82	20.64	1346.20	763.44	-2.94
Wind 225 deg - Service		-16.62	16.72	1091.59	1076.79	5.81
Wind 240 deg - Service		-21.38	12.38	798.53	1370.86	14.17
Wind 270 deg - Service		-23.72	-0.05	-6.39	1536.39	27.48
Wind 300 deg - Service		-20.28	-11.81	-776.98	1318.58	33.43
Wind 315 deg - Service		-16.69	-16.79	-1101.49	1083.73	33.06
Wind 330 deg - Service		-11.90	-20.69	-1354.07	771.94	30.43

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice
3	0.9 Dead+1.6 Wind 0 deg - No Ice
4	1.2 Dead+1.6 Wind 30 deg - No Ice
5	0.9 Dead+1.6 Wind 30 deg - No Ice
6	1.2 Dead+1.6 Wind 45 deg - No Ice
7	0.9 Dead+1.6 Wind 45 deg - No Ice
8	1.2 Dead+1.6 Wind 60 deg - No Ice
9	0.9 Dead+1.6 Wind 60 deg - No Ice
10	1.2 Dead+1.6 Wind 90 deg - No Ice
11	0.9 Dead+1.6 Wind 90 deg - No Ice
12	1.2 Dead+1.6 Wind 120 deg - No Ice
13	0.9 Dead+1.6 Wind 120 deg - No Ice
14	1.2 Dead+1.6 Wind 135 deg - No Ice
15	0.9 Dead+1.6 Wind 135 deg - No Ice
16	1.2 Dead+1.6 Wind 150 deg - No Ice
17	0.9 Dead+1.6 Wind 150 deg - No Ice
18	1.2 Dead+1.6 Wind 180 deg - No Ice
19	0.9 Dead+1.6 Wind 180 deg - No Ice
20	1.2 Dead+1.6 Wind 210 deg - No Ice
21	0.9 Dead+1.6 Wind 210 deg - No Ice
22	1.2 Dead+1.6 Wind 225 deg - No Ice
23	0.9 Dead+1.6 Wind 225 deg - No Ice
24	1.2 Dead+1.6 Wind 240 deg - No Ice
25	0.9 Dead+1.6 Wind 240 deg - No Ice
26	1.2 Dead+1.6 Wind 270 deg - No Ice
27	0.9 Dead+1.6 Wind 270 deg - No Ice
28	1.2 Dead+1.6 Wind 300 deg - No Ice
29	0.9 Dead+1.6 Wind 300 deg - No Ice

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<i>Comb. No.</i>	<i>Description</i>
30	1.2 Dead+1.6 Wind 315 deg - No Ice
31	0.9 Dead+1.6 Wind 315 deg - No Ice
32	1.2 Dead+1.6 Wind 330 deg - No Ice
33	0.9 Dead+1.6 Wind 330 deg - No Ice
34	1.2 Dead+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 45 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
39	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
40	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
41	1.2 Dead+1.0 Wind 135 deg+1.0 Ice+1.0 Temp
42	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
43	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
44	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
45	1.2 Dead+1.0 Wind 225 deg+1.0 Ice+1.0 Temp
46	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
47	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
48	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
49	1.2 Dead+1.0 Wind 315 deg+1.0 Ice+1.0 Temp
50	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
51	Dead+Wind 0 deg - Service
52	Dead+Wind 30 deg - Service
53	Dead+Wind 45 deg - Service
54	Dead+Wind 60 deg - Service
55	Dead+Wind 90 deg - Service
56	Dead+Wind 120 deg - Service
57	Dead+Wind 135 deg - Service
58	Dead+Wind 150 deg - Service
59	Dead+Wind 180 deg - Service
60	Dead+Wind 210 deg - Service
61	Dead+Wind 225 deg - Service
62	Dead+Wind 240 deg - Service
63	Dead+Wind 270 deg - Service
64	Dead+Wind 300 deg - Service
65	Dead+Wind 315 deg - Service
66	Dead+Wind 330 deg - Service

Maximum Member Forces

<i>Section No.</i>	<i>Elevation ft</i>	<i>Component Type</i>	<i>Condition</i>	<i>Gov. Load Comb.</i>	<i>Axial K</i>	<i>Major Axis Moment kip-ft</i>	<i>Minor Axis Moment kip-ft</i>
T1	120 - 116.667	Leg	Max Tension	9	0.42	0.00	0.00
			Max. Compression	46	-1.33	0.51	0.10
			Max. Mx	18	0.29	-2.04	-0.20
			Max. My	16	-0.27	0.00	-2.14
			Max. Vy	3	-1.18	2.03	0.20
			Max. Vx	16	1.68	0.00	-2.14
		Diagonal	Max Tension	29	0.17	0.00	0.00
			Max. Compression	41	-0.51	0.00	0.00
			Max. Mx	34	-0.32	0.15	0.00
			Max. My	34	-0.32	0.00	-0.00
			Max. Vy	34	-0.09	0.00	0.00
			Max. Vx	34	0.00	0.00	0.00
		Top Girt	Max Tension	31	0.24	0.00	0.00
			Max. Compression	14	-0.24	0.02	0.00
			Max. Mx	43	-0.07	0.09	0.02
			Max. My	35	0.06	0.09	0.02

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Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft	
T2	116.667 - 108.333	Leg	Max. Vy	43	-0.08	0.09	0.02	
			Max. Vx	35	0.01	0.00	0.00	
			Max Tension	19	0.18	-2.03	-0.20	
		Diagonal	Max. Compression	46	-4.46	0.34	-0.05	
			Max. Mx	18	0.09	-2.04	-0.20	
			Max. My	32	-0.35	-0.06	-2.21	
			Max. Vy	3	1.64	2.03	0.20	
			Max. Vx	16	-1.67	0.00	-2.14	
			Max Tension	5	5.36	0.00	0.00	
			Max. Compression	4	-5.48	0.00	0.00	
			Max. Mx	34	-0.16	0.24	0.00	
			Max. My	34	-0.17	0.00	-0.01	
			Max. Vy	34	-0.09	0.00	0.00	
			Max. Vx	34	-0.00	0.00	0.00	
			Max Tension	18	3.90	0.00	0.00	
			Max. Compression	3	-3.91	0.01	0.00	
			Horizontal	Max. Mx	43	-0.20	0.10	0.03
				Max. My	35	0.74	0.09	0.03
Max. Vy	43	-0.08		0.10	0.03			
Max. Vx	35	0.01		0.00	0.00			
T3	Leg	Max Tension		19	6.85	-1.43	-0.28	
		Max. Compression		35	-10.22	0.25	0.02	
		Max. Mx		18	6.25	-1.84	-0.03	
	Diagonal	Max. My		26	-1.35	-0.02	-2.25	
		Max. Vy		13	-0.68	1.78	0.43	
		Max. Vx	26	1.00	-0.02	-2.25		
		Max Tension	5	9.14	0.00	0.00		
		Max. Compression	4	-9.27	0.00	0.00		
		Max. Mx	34	-0.21	0.26	0.00		
		Max. My	34	-0.18	0.00	-0.01		
		Max. Vy	34	-0.10	0.00	0.00		
		Max. Vx	34	-0.00	0.00	0.00		
		Horizontal	Max Tension	18	5.91	0.00	0.00	
			Max. Compression	3	-6.02	0.02	0.01	
			Max. Mx	48	-0.39	0.11	0.03	
			Max. My	38	-0.29	0.11	0.03	
			Max. Vy	48	0.09	0.11	0.03	
			Max. Vx	35	-0.01	0.00	0.00	
T4	Leg		Max Tension	19	17.84	-1.83	-0.03	
			Max. Compression	2	-23.03	1.24	0.03	
			Max. Mx	8	16.25	3.34	0.46	
	Diagonal	Max. My	10	-1.68	-0.08	-3.38		
		Max. Vy	8	1.66	-1.31	0.20		
		Max. Vx	10	-1.80	-0.03	1.50		
		Max Tension	5	12.94	0.00	0.00		
		Max. Compression	4	-13.16	0.00	0.00		
		Max. Mx	34	-0.41	0.31	0.00		
		Max. My	34	-0.34	0.00	0.01		
		Max. Vy	34	0.12	0.00	0.00		
		Max. Vx	34	0.00	0.00	0.00		
		Top Girt	Max Tension	20	8.26	0.00	0.00	
			Max. Compression	5	-8.25	0.03	-0.00	
			Max. Mx	48	-0.59	0.16	0.00	
			Max. My	2	0.65	0.02	-0.03	
			Max. Vy	48	-0.11	0.16	0.00	
			Max. Vx	2	0.00	0.02	-0.03	
Inner Bracing	Max Tension		5	0.14	0.00	0.00		
	Max. Compression		4	-0.15	0.00	0.00		
	Max. Mx		34	-0.01	-0.11	0.00		
	Max. Vy	34	0.07	0.00	0.00			

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Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
T5	91.6667 - 83.3333	Leg	Max Tension	19	31.95	-1.28	-0.03
			Max. Compression	2	-39.78	2.18	-0.39
			Max. Mx	18	30.74	-2.23	0.39
			Max. My	10	-4.00	-0.08	2.69
			Max. Vy	13	-0.36	2.20	0.66
		Diagonal	Max. Vx	10	-0.63	-0.08	2.69
			Max Tension	21	16.16	0.00	0.00
			Max. Compression	20	-16.39	0.00	0.00
			Max. Mx	34	-0.47	0.34	0.00
			Max. My	34	-0.35	0.00	-0.01
		Top Girt	Max. Vy	34	-0.12	0.00	0.00
			Max. Vx	34	-0.00	0.00	0.00
			Max Tension	6	10.64	0.03	-0.01
			Max. Compression	23	-10.58	0.00	0.00
			Max. Mx	48	-0.79	0.18	0.01
		Inner Bracing	Max. My	2	2.32	0.01	-0.03
			Max. Vy	48	0.12	0.18	0.01
			Max. Vx	2	-0.00	0.01	-0.03
			Max Tension	23	0.18	0.00	0.00
			Max. Compression	22	-0.19	0.00	0.00
T6	83.3333 - 75	Leg	Max. Mx	34	-0.01	-0.12	0.00
			Max. Vy	34	0.07	0.00	0.00
			Max Tension	19	50.60	-2.22	0.39
			Max. Compression	2	-62.18	3.94	-0.50
		Diagonal	Max. Mx	28	46.04	4.78	-0.62
			Max. My	26	-6.52	-0.06	5.17
			Max. Vy	28	-2.21	-2.23	-0.66
			Max. Vx	26	-2.50	-0.01	-2.69
			Max Tension	21	20.13	0.00	0.00
		Top Girt	Max. Compression	20	-20.41	0.00	0.00
			Max. Mx	34	-0.58	0.39	0.00
			Max. My	34	-0.35	0.00	0.01
			Max. Vy	34	-0.14	0.00	0.00
			Max. Vx	34	-0.00	0.00	0.00
		Inner Bracing	Max Tension	6	13.78	0.04	-0.01
			Max. Compression	23	-13.72	0.00	0.00
			Max. Mx	38	-1.25	0.21	0.01
			Max. My	2	2.43	0.01	-0.04
			Max. Vy	38	-0.12	0.21	0.01
T7	75 - 50	Leg	Max. Vx	2	0.01	0.01	-0.04
			Max Tension	23	0.24	0.00	0.00
			Max. Compression	22	-0.24	0.00	0.00
			Max. Mx	34	-0.00	-0.13	0.00
			Max. Vy	34	-0.07	0.00	0.00
		Diagonal	Max Tension	19	134.39	-0.83	0.28
			Max. Compression	2	-155.82	-0.41	-0.15
			Max. Mx	18	71.32	-4.07	0.50
			Max. My	10	-6.79	-0.12	4.30
			Max. Vy	18	-1.70	-4.07	0.50
			Max. Vx	26	-1.81	-0.06	-4.30
		Horizontal	Max Tension	17	29.97	0.00	0.00
			Max. Compression	16	-30.34	0.00	0.00
			Max. Mx	34	-0.70	0.54	0.00
			Max. My	34	-0.68	0.00	-0.02
			Max. Vy	34	-0.18	0.00	0.00
			Max. Vx	34	0.01	0.00	0.00
			Max Tension	32	21.61	0.00	0.00
			Max. Compression	15	-21.51	0.07	0.01
			Max. Mx	38	0.84	0.31	0.02
			Max. My	12	3.25	0.01	-0.06

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Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
T8	50 - 25	Top Girt	Max. Vy	38	0.16	0.31	0.02
			Max. Vx	12	0.01	0.01	-0.06
			Max Tension	30	18.40	0.00	0.00
			Max. Compression	15	-18.57	0.05	0.01
			Max. Mx	38	-1.50	0.23	0.01
			Max. My	2	3.01	0.02	-0.05
		Inner Bracing	Max. Vy	38	-0.14	0.23	0.01
			Max. Vx	2	0.01	0.02	-0.05
			Max Tension	15	0.32	0.00	0.00
			Max. Compression	14	-0.33	0.00	0.00
			Max. Mx	34	-0.01	-0.18	0.00
			Max. Vy	34	0.09	0.00	0.00
		Leg	Max Tension	19	232.39	2.79	0.22
			Max. Compression	2	-263.86	4.82	0.14
			Max. Mx	2	-263.86	4.82	0.14
			Max. My	10	-12.40	-0.43	3.77
			Max. Vy	2	2.40	4.82	0.14
			Max. Vx	10	1.80	-0.29	2.41
		Diagonal	Max Tension	17	37.39	-0.16	0.01
			Max. Compression	14	-38.53	0.00	0.00
			Max. Mx	16	13.77	-0.33	-0.01
			Max. My	35	-1.92	-0.16	0.03
			Max. Vy	37	0.14	-0.18	-0.03
			Max. Vx	48	0.01	0.00	0.00
		Horizontal	Max Tension	32	27.93	0.00	0.00
			Max. Compression	15	-27.98	0.13	0.02
			Max. Mx	38	-1.40	0.50	0.02
			Max. My	2	0.30	-0.04	-0.09
			Max. Vy	38	0.22	0.50	0.02
			Max. Vx	2	-0.01	-0.04	-0.09
		Top Girt	Max Tension	16	23.19	0.09	-0.00
			Max. Compression	15	-23.33	0.09	0.01
			Max. Mx	38	-1.38	0.36	0.01
			Max. My	2	0.25	-0.00	-0.07
			Max. Vy	38	-0.18	0.36	0.01
			Max. Vx	2	0.01	-0.00	-0.07
		Redund Horz 1 Bracing	Max Tension	2	4.58	0.00	0.00
			Max. Compression	2	-4.58	0.00	0.00
			Max. Mx	34	0.95	-0.06	0.00
			Max. My	34	0.74	0.00	0.00
			Max. Vy	34	0.05	0.00	0.00
			Max. Vx	34	-0.00	0.00	0.00
		Redund Diag 1 Bracing	Max Tension	2	3.14	0.00	0.00
			Max. Compression	2	-3.14	0.00	0.00
			Max. Mx	34	0.78	-0.08	0.00
			Max. My	34	0.49	0.00	-0.00
			Max. Vy	34	0.05	0.00	0.00
			Max. Vx	34	-0.00	0.00	0.00
		Inner Bracing	Max Tension	15	0.40	0.00	0.00
			Max. Compression	14	-0.41	0.00	0.00
			Max. Mx	34	-0.02	-0.22	0.00
			Max. Vy	34	0.10	0.00	0.00
			Max Tension	19	321.88	6.41	0.46
			Max. Compression	2	-363.47	0.00	0.00
T9	25 - 0	Leg	Max. Mx	2	-363.22	9.38	0.23
			Max. My	10	-13.73	-0.63	5.45
			Max. Vy	2	-2.92	9.38	0.23
			Max. Vx	10	-1.56	-0.63	5.45
		Diagonal	Max Tension	17	50.35	-0.41	0.01

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Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Compression	14	-51.61	0.00	0.00
			Max. Mx	30	25.19	-0.64	0.02
			Max. My	43	-3.31	-0.04	-0.05
			Max. Vy	37	0.17	-0.34	-0.05
			Max. Vx	46	0.01	0.00	0.00
		Horizontal	Max Tension	32	31.81	0.00	0.00
			Max. Compression	15	-32.33	0.19	0.02
			Max. Mx	38	-2.27	0.56	0.02
			Max. My	2	0.04	-0.06	-0.10
			Max. Vy	38	-0.24	0.56	0.02
			Max. Vx	2	0.01	-0.06	-0.10
		Top Girt	Max Tension	32	29.96	0.00	0.00
			Max. Compression	15	-30.08	0.17	0.02
			Max. Mx	38	-1.57	0.58	0.02
			Max. My	2	-0.58	-0.06	-0.09
			Max. Vy	38	-0.23	0.58	0.02
			Max. Vx	2	0.01	-0.06	-0.09
		Redund Horz 1 Bracing	Max Tension	2	6.30	0.00	0.00
			Max. Compression	2	-6.30	0.00	0.00
			Max. Mx	34	1.16	-0.07	0.00
			Max. My	34	0.91	0.00	0.00
			Max. Vy	34	0.06	0.00	0.00
			Max. Vx	34	-0.00	0.00	0.00
		Redund Diag 1 Bracing	Max Tension	2	5.11	0.00	0.00
			Max. Compression	2	-5.11	0.00	0.00
			Max. Mx	34	1.18	-0.11	0.00
			Max. My	34	0.78	0.00	-0.00
			Max. Vy	34	0.05	0.00	0.00
			Max. Vx	34	-0.00	0.00	0.00
		Inner Bracing	Max Tension	15	0.52	0.00	0.00
			Max. Compression	14	-0.53	0.00	0.00
			Max. Mx	34	-0.02	-0.27	0.00
			Max. Vy	34	0.11	0.00	0.00

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Leg C	Max. Vert	24	420.11	54.77	-33.78
	Max. H _x	24	420.11	54.77	-33.78
	Max. H _z	7	-364.70	-47.29	32.77
	Min. Vert	9	-375.44	-50.12	31.10
	Min. H _x	9	-375.44	-50.12	31.10
	Min. H _z	22	392.89	49.11	-33.81
Leg B	Max. Vert	12	424.17	-53.70	-36.15
	Max. H _x	29	-376.34	49.03	33.43
	Max. H _z	33	-329.24	39.13	36.13
	Min. Vert	29	-376.34	49.03	33.43
	Min. H _x	12	424.17	-53.70	-36.15
	Min. H _z	14	405.16	-48.85	-37.99
Leg A	Max. Vert	2	427.06	2.58	64.76
	Max. H _x	26	18.95	19.01	1.35
	Max. H _z	2	427.06	2.58	64.76
	Min. Vert	19	-379.69	-2.56	-59.36

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Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
	Min. H _x	11	11.94	-18.98	0.78
	Min. H _z	19	-379.69	-2.56	-59.36

Tower Mast Reaction Summary

Load Combination	Vertical K	Shear _x K	Shear _z K	Overturning Moment, M _x kip-ft	Overturning Moment, M _z kip-ft	Torque kip-ft
Dead Only	43.07	-0.00	0.00	-6.50	-15.82	0.00
1.2 Dead+1.6 Wind 0 deg - No Ice	51.68	-0.24	-119.50	-7460.09	4.64	92.66
0.9 Dead+1.6 Wind 0 deg - No Ice	38.76	-0.24	-119.50	-7458.14	9.38	92.66
1.2 Dead+1.6 Wind 30 deg - No Ice	51.68	56.83	-99.24	-6255.06	-3560.30	14.16
0.9 Dead+1.6 Wind 30 deg - No Ice	38.76	56.83	-99.24	-6253.11	-3555.55	14.16
1.2 Dead+1.6 Wind 45 deg - No Ice	51.68	79.93	-80.40	-5075.10	-5012.87	-27.93
0.9 Dead+1.6 Wind 45 deg - No Ice	38.76	79.93	-80.40	-5073.15	-5008.13	-27.93
1.2 Dead+1.6 Wind 60 deg - No Ice	51.68	97.30	-56.37	-3563.53	-6111.40	-68.13
0.9 Dead+1.6 Wind 60 deg - No Ice	38.76	97.30	-56.37	-3561.58	-6106.66	-68.13
1.2 Dead+1.6 Wind 90 deg - No Ice	51.68	114.08	0.24	15.82	-7142.52	-132.16
0.9 Dead+1.6 Wind 90 deg - No Ice	38.76	114.08	0.24	17.77	-7137.77	-132.16
1.2 Dead+1.6 Wind 120 deg - No Ice	51.68	103.04	59.96	3738.81	-6394.76	-160.78
0.9 Dead+1.6 Wind 120 deg - No Ice	38.76	103.04	59.96	3740.75	-6390.01	-160.78
1.2 Dead+1.6 Wind 135 deg - No Ice	51.68	82.52	82.98	5198.94	-5152.31	-158.97
0.9 Dead+1.6 Wind 135 deg - No Ice	38.76	82.52	82.98	5200.89	-5147.57	-158.97
1.2 Dead+1.6 Wind 150 deg - No Ice	51.68	57.25	99.48	6263.09	-3601.20	-146.32
0.9 Dead+1.6 Wind 150 deg - No Ice	38.76	57.25	99.48	6265.04	-3596.46	-146.32
1.2 Dead+1.6 Wind 180 deg - No Ice	51.68	0.24	113.15	7144.58	-42.60	-92.66
0.9 Dead+1.6 Wind 180 deg - No Ice	38.76	0.24	113.15	7146.53	-37.85	-92.66
1.2 Dead+1.6 Wind 210 deg - No Ice	51.68	-56.83	99.24	6239.47	3522.34	-14.16
0.9 Dead+1.6 Wind 210 deg - No Ice	38.76	-56.83	99.24	6241.42	3527.08	-14.16
1.2 Dead+1.6 Wind 225 deg - No Ice	51.68	-79.93	80.40	5059.51	4974.92	27.93
0.9 Dead+1.6 Wind 225 deg - No Ice	38.76	-79.93	80.40	5061.46	4979.66	27.93
1.2 Dead+1.6 Wind 240 deg - No Ice	51.68	-102.80	59.54	3697.90	6333.18	68.13
0.9 Dead+1.6 Wind 240 deg - No Ice	38.76	-102.80	59.54	3699.85	6337.93	68.13

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Load Combination	Vertical K	Shear _x K	Shear _z K	Overturning Moment, M _x kip-ft	Overturning Moment, M _z kip-ft	Torque kip-ft
1.2 Dead+1.6 Wind 270 deg - No Ice	51.68	-114.08	-0.24	-31.41	7104.56	132.16
0.9 Dead+1.6 Wind 270 deg - No Ice	38.76	-114.08	-0.24	-29.46	7109.31	132.16
1.2 Dead+1.6 Wind 300 deg - No Ice	51.68	-97.54	-56.78	-3604.44	6097.06	160.78
0.9 Dead+1.6 Wind 300 deg - No Ice	38.76	-97.54	-56.78	-3602.49	6101.81	160.78
1.2 Dead+1.6 Wind 315 deg - No Ice	51.68	-80.27	-80.74	-5108.50	5008.32	158.97
0.9 Dead+1.6 Wind 315 deg - No Ice	38.76	-80.27	-80.74	-5106.55	5013.06	158.97
1.2 Dead+1.6 Wind 330 deg - No Ice	51.68	-57.25	-99.48	-6278.68	3563.24	146.32
0.9 Dead+1.6 Wind 330 deg - No Ice	38.76	-57.25	-99.48	-6276.73	3567.99	146.32
1.2 Dead+1.0 Ice+1.0 Temp	214.36	-0.00	0.00	-261.85	-157.84	-0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	214.36	-0.02	-44.17	-2826.88	-156.15	50.45
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	214.36	21.77	-37.76	-2460.11	-1421.22	2.92
1.2 Dead+1.0 Wind 45 deg+1.0 Ice+1.0 Temp	214.36	30.73	-30.76	-2053.19	-1942.37	-21.98
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	214.36	37.57	-21.70	-1525.76	-2340.34	-45.39
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	214.36	43.57	0.02	-260.17	-2687.52	-81.54
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	214.36	38.23	22.10	1022.12	-2371.72	-95.84
1.2 Dead+1.0 Wind 135 deg+1.0 Ice+1.0 Temp	214.36	31.02	31.05	1543.99	-1956.88	-93.33
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	214.36	21.81	37.78	1938.09	-1424.14	-84.46
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	214.36	0.02	43.43	2268.87	-159.52	-50.45
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	214.36	-21.77	37.76	1936.40	1105.54	-2.92
1.2 Dead+1.0 Wind 225 deg+1.0 Ice+1.0 Temp	214.36	-30.73	30.76	1529.48	1626.69	21.98
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	214.36	-38.20	22.07	1019.20	2054.36	45.39
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	214.36	-43.57	-0.02	-263.54	2371.84	81.54
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	214.36	-37.59	-21.73	-1528.68	2026.34	95.84
1.2 Dead+1.0 Wind 315 deg+1.0 Ice+1.0 Temp	214.36	-30.76	-30.79	-2055.57	1629.07	93.33
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	214.36	-21.81	-37.78	-2461.79	1108.46	84.46
Dead+Wind 0 deg - Service	43.07	-0.05	-24.85	-1556.14	-10.90	19.27
Dead+Wind 30 deg - Service	43.07	11.82	-20.64	-1305.56	-752.20	2.94
Dead+Wind 45 deg - Service	43.07	16.62	-16.72	-1060.20	-1054.25	-5.81
Dead+Wind 60 deg - Service	43.07	20.23	-11.72	-745.88	-1282.68	-14.17
Dead+Wind 90 deg - Service	43.07	23.72	0.05	-1.59	-1497.09	-27.48
Dead+Wind 120 deg - Service	43.07	21.43	12.47	772.58	-1341.60	-33.43
Dead+Wind 135 deg - Service	43.07	17.16	17.26	1076.20	-1083.25	-33.06
Dead+Wind 150 deg - Service	43.07	11.90	20.69	1297.48	-760.71	-30.43
Dead+Wind 180 deg - Service	43.07	0.05	23.53	1480.78	-20.73	-19.27
Dead+Wind 210 deg - Service	43.07	-11.82	20.64	1292.57	720.57	-2.94
Dead+Wind 225 deg - Service	43.07	-16.62	16.72	1047.21	1022.62	5.81
Dead+Wind 240 deg - Service	43.07	-21.38	12.38	764.07	1305.06	14.17

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Load Combination	Vertical K	Shear _x K	Shear _z K	Overturning Moment, M _x kip-ft	Overturning Moment, M _z kip-ft	Torque kip-ft
Dead+Wind 270 deg - Service	43.07	-23.72	-0.05	-11.41	1465.46	27.48
Dead+Wind 300 deg - Service	43.07	-20.28	-11.81	-754.39	1255.96	33.43
Dead+Wind 315 deg - Service	43.07	-16.69	-16.79	-1067.14	1029.57	33.06
Dead+Wind 330 deg - Service	43.07	-11.90	-20.69	-1310.47	729.08	30.43

Solution Summary

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
1	0.00	-43.07	0.00	0.00	43.07	-0.00	0.000%
2	-0.24	-51.68	-119.50	0.24	51.68	119.50	0.000%
3	-0.24	-38.76	-119.50	0.24	38.76	119.50	0.000%
4	56.83	-51.68	-99.24	-56.83	51.68	99.24	0.000%
5	56.83	-38.76	-99.24	-56.83	38.76	99.24	0.000%
6	79.93	-51.68	-80.40	-79.93	51.68	80.40	0.000%
7	79.93	-38.76	-80.40	-79.93	38.76	80.40	0.000%
8	97.30	-51.68	-56.37	-97.30	51.68	56.37	0.000%
9	97.30	-38.76	-56.37	-97.30	38.76	56.37	0.000%
10	114.08	-51.68	0.24	-114.08	51.68	-0.24	0.000%
11	114.08	-38.76	0.24	-114.08	38.76	-0.24	0.000%
12	103.04	-51.68	59.96	-103.04	51.68	-59.96	0.000%
13	103.04	-38.76	59.96	-103.04	38.76	-59.96	0.000%
14	82.52	-51.68	82.98	-82.52	51.68	-82.98	0.000%
15	82.52	-38.76	82.98	-82.52	38.76	-82.98	0.000%
16	57.25	-51.68	99.48	-57.25	51.68	-99.48	0.000%
17	57.25	-38.76	99.48	-57.25	38.76	-99.48	0.000%
18	0.24	-51.68	113.15	-0.24	51.68	-113.15	0.000%
19	0.24	-38.76	113.15	-0.24	38.76	-113.15	0.000%
20	-56.83	-51.68	99.24	56.83	51.68	-99.24	0.000%
21	-56.83	-38.76	99.24	56.83	38.76	-99.24	0.000%
22	-79.93	-51.68	80.40	79.93	51.68	-80.40	0.000%
23	-79.93	-38.76	80.40	79.93	38.76	-80.40	0.000%
24	-102.80	-51.68	59.54	102.80	51.68	-59.54	0.000%
25	-102.80	-38.76	59.54	102.80	38.76	-59.54	0.000%
26	-114.08	-51.68	-0.24	114.08	51.68	0.24	0.000%
27	-114.08	-38.76	-0.24	114.08	38.76	0.24	0.000%
28	-97.54	-51.68	-56.78	97.54	51.68	56.78	0.000%
29	-97.54	-38.76	-56.78	97.54	38.76	56.78	0.000%
30	-80.27	-51.68	-80.74	80.27	51.68	80.74	0.000%
31	-80.27	-38.76	-80.74	80.27	38.76	80.74	0.000%
32	-57.25	-51.68	-99.48	57.25	51.68	99.48	0.000%
33	-57.25	-38.76	-99.48	57.25	38.76	99.48	0.000%
34	0.00	-214.36	0.00	0.00	214.36	-0.00	0.000%
35	-0.02	-214.36	-44.17	0.02	214.36	44.17	0.000%
36	21.77	-214.36	-37.76	-21.77	214.36	37.76	0.000%
37	30.73	-214.36	-30.76	-30.73	214.36	30.76	0.000%
38	37.57	-214.36	-21.70	-37.57	214.36	21.70	0.000%
39	43.57	-214.36	0.02	-43.57	214.36	-0.02	0.000%
40	38.23	-214.36	22.10	-38.23	214.36	-22.10	0.000%
41	31.02	-214.36	31.05	-31.02	214.36	-31.05	0.000%
42	21.81	-214.36	37.78	-21.81	214.36	-37.78	0.000%
43	0.02	-214.36	43.43	-0.02	214.36	-43.43	0.000%
44	-21.77	-214.36	37.76	21.77	214.36	-37.76	0.000%
45	-30.73	-214.36	30.76	30.73	214.36	-30.76	0.000%
46	-38.20	-214.36	22.07	38.20	214.36	-22.07	0.000%
47	-43.57	-214.36	-0.02	43.57	214.36	0.02	0.000%
48	-37.59	-214.36	-21.73	37.59	214.36	21.73	0.000%

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Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
49	-30.76	-214.36	-30.79	30.76	214.36	30.79	0.000%
50	-21.81	-214.36	-37.78	21.81	214.36	37.78	0.000%
51	-0.05	-43.07	-24.85	0.05	43.07	24.85	0.000%
52	11.82	-43.07	-20.64	-11.82	43.07	20.64	0.000%
53	16.62	-43.07	-16.72	-16.62	43.07	16.72	0.000%
54	20.23	-43.07	-11.72	-20.23	43.07	11.72	0.000%
55	23.72	-43.07	0.05	-23.72	43.07	-0.05	0.000%
56	21.43	-43.07	12.47	-21.43	43.07	-12.47	0.000%
57	17.16	-43.07	17.26	-17.16	43.07	-17.26	0.000%
58	11.90	-43.07	20.69	-11.90	43.07	-20.69	0.000%
59	0.05	-43.07	23.53	-0.05	43.07	-23.53	0.000%
60	-11.82	-43.07	20.64	11.82	43.07	-20.64	0.000%
61	-16.62	-43.07	16.72	16.62	43.07	-16.72	0.000%
62	-21.38	-43.07	12.38	21.38	43.07	-12.38	0.000%
63	-23.72	-43.07	-0.05	23.72	43.07	0.05	0.000%
64	-20.28	-43.07	-11.81	20.28	43.07	11.81	0.000%
65	-16.69	-43.07	-16.79	16.69	43.07	16.79	0.000%
66	-11.90	-43.07	-20.69	11.90	43.07	20.69	0.000%

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	120 - 116.667	1.866	51	0.1029	0.0203
T2	116.667 - 108.333	1.795	51	0.1029	0.0202
T3	108.333 - 100	1.608	51	0.1031	0.0211
T4	100 - 91.6667	1.418	51	0.1025	0.0220
T5	91.6667 - 83.3333	1.233	51	0.1004	0.0220
T6	83.3333 - 75	1.051	51	0.0966	0.0216
T7	75 - 50	0.878	51	0.0907	0.0202
T8	50 - 25	0.412	51	0.0709	0.0142
T9	25 - 0	0.105	51	0.0346	0.0071

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
138.00	Lightning Rod 5/8x4'	51	1.866	0.1029	0.0203	69414
120.00	16'x3" Omni (inverted)	51	1.866	0.1029	0.0203	69414
117.00	6' DISH (SOLID)	51	1.802	0.1029	0.0202	69414
115.00	6' DISH (SOLID)	51	1.758	0.1030	0.0203	69414
114.00	Rohn 6' Side-Arm(1)	51	1.736	0.1030	0.0204	72552
113.00	Pirot 4' Side Mount Standoff (1)	51	1.714	0.1030	0.0205	80375
112.00	Junction Box	51	1.692	0.1030	0.0206	93505
111.00	6' DISH (SOLID)	51	1.669	0.1031	0.0207	113019
110.00	6'8"x4" Pipe Mount	51	1.646	0.1031	0.0209	142206
109.00	10'x2" Dipole Antenna (inverted)	51	1.624	0.1031	0.0210	190037
107.00	6'8"x4" Pipe Mount	51	1.578	0.1031	0.0213	524856
106.00	16'x3" Omni (inverted)	51	1.555	0.1031	0.0214	Inf
105.00	SE419-SWBPALDF Panel Antenna	51	1.532	0.1030	0.0215	637807

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Elevation	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
ft						
104.00	AP13-850/065D w/Mount Pipe	51	1.509	0.1030	0.0216	342306
103.00	TMA 432-83H-01T	51	1.486	0.1029	0.0217	237202
101.00	SE419-SWBPALDF Panel Antenna	51	1.441	0.1027	0.0219	158120
100.00	PD458-406	51	1.418	0.1025	0.0220	145794
96.00	3'4"x4" Pipe Mount (horizontal)	51	1.329	0.1017	0.0221	191127
95.00	SC479-HF1LDF (inverted)	51	1.306	0.1014	0.0221	226888
92.00	PD458-406	51	1.240	0.1005	0.0221	306964
88.00	SC479-HF1LDF (inverted)	51	1.152	0.0990	0.0219	143323
87.00	4'6"x3" Pipe Mount (horizontal)	51	1.130	0.0985	0.0219	118494
86.00	20' 4-Bay Dipole	51	1.108	0.0981	0.0218	102018
82.00	3' Yagi	51	1.023	0.0957	0.0214	83864
81.00	3' Yagi	51	1.002	0.0951	0.0213	87553
80.00	VFA12-HD-S Antenna Mount Frame	51	0.981	0.0943	0.0211	93931
77.00	20' 4-Bay Dipole	51	0.919	0.0922	0.0206	125548
76.00	3'4"x4" Pipe Mount (horizontal)	51	0.899	0.0914	0.0204	135934
72.00	Face Mount	51	0.818	0.0886	0.0196	130582
67.00	4'6"x3" Pipe Mount (horizontal)	51	0.718	0.0852	0.0185	92509
65.00	6' Yagi w/ Mount	51	0.680	0.0838	0.0180	82604
63.00	GPS	51	0.641	0.0824	0.0175	74614
55.00	20' 4-Bay Dipole w/ 2' Sidearm Mount	51	0.496	0.0760	0.0156	53800
53.00	1.0" Dia 4' Omni w/Pipe Mount	51	0.461	0.0741	0.0150	50309
48.00	10'x6" Dipole Antenna	51	0.380	0.0686	0.0137	43757
47.00	5'x1.5in dia Whip Antenna /w mount	51	0.364	0.0673	0.0134	42748
43.00	3' Whip (3in diameter) /w mount	51	0.305	0.0620	0.0123	39224
41.00	4 FT DISH	51	0.277	0.0592	0.0117	37675
40.00	1'x1' Panel Antenna	51	0.264	0.0578	0.0114	36946
39.00	6'x1" Whip Antenna w/ Mount	51	0.251	0.0563	0.0112	36245

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	120 - 116.667	8.934	2	0.4925	0.0978
T2	116.667 - 108.333	8.592	2	0.4924	0.0972
T3	108.333 - 100	7.700	2	0.4932	0.1015
T4	100 - 91.6667	6.791	2	0.4900	0.1056
T5	91.6667 - 83.3333	5.904	2	0.4799	0.1060
T6	83.3333 - 75	5.035	2	0.4617	0.1038
T7	75 - 50	4.208	2	0.4337	0.0971
T8	50 - 25	1.974	2	0.3394	0.0685
T9	25 - 0	0.504	2	0.1659	0.0342

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
138.00	Lightning Rod 5/8x4'	2	8.934	0.4925	0.0978	14606
120.00	16'x3" Omni (inverted)	2	8.934	0.4925	0.0978	14606

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Elevation	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
ft						
117.00	6' DISH (SOLID)	2	8.627	0.4924	0.0972	14606
115.00	6' DISH (SOLID)	2	8.418	0.4926	0.0975	14606
114.00	Rohn 6' Side-Arm(1)	2	8.312	0.4927	0.0979	15277
113.00	Pirod 4' Side Mount Standoff (1)	2	8.206	0.4928	0.0984	16938
112.00	Junction Box	2	8.098	0.4930	0.0990	19728
111.00	6' DISH (SOLID)	2	7.990	0.4931	0.0996	23884
110.00	6'8"x4" Pipe Mount	2	7.882	0.4931	0.1003	30121
109.00	10'x2" Dipole Antenna (inverted)	2	7.773	0.4932	0.1010	40394
107.00	6'8"x4" Pipe Mount	2	7.554	0.4931	0.1024	113995
106.00	16'x3" Omni (inverted)	2	7.445	0.4929	0.1029	391661
105.00	SE419-SWBPALDF Panel Antenna	2	7.335	0.4926	0.1035	142187
104.00	AP13-850/065D w/Mount Pipe	2	7.226	0.4923	0.1039	73014
103.00	TMA 432-83H-01T	2	7.117	0.4919	0.1043	49668
101.00	SE419-SWBPALDF Panel Antenna	2	6.899	0.4908	0.1051	33032
100.00	PD458-406	2	6.791	0.4900	0.1056	30501
96.00	3'4"x4" Pipe Mount (horizontal)	2	6.363	0.4861	0.1064	40201
95.00	SC479-HF1LDF (inverted)	2	6.256	0.4848	0.1064	47838
92.00	PD458-406	2	5.939	0.4805	0.1060	65333
88.00	SC479-HF1LDF (inverted)	2	5.518	0.4732	0.1054	30399
87.00	4'6"x3" Pipe Mount (horizontal)	2	5.413	0.4710	0.1051	25105
86.00	20' 4-Bay Dipole	2	5.309	0.4687	0.1049	21597
82.00	3' Yagi	2	4.900	0.4577	0.1030	17731
81.00	3' Yagi	2	4.799	0.4545	0.1023	18509
80.00	VFA12-HD-S Antenna Mount Frame	2	4.699	0.4511	0.1016	19856
77.00	20' 4-Bay Dipole	2	4.403	0.4407	0.0990	26529
76.00	3'4"x4" Pipe Mount (horizontal)	2	4.305	0.4372	0.0981	28713
72.00	Face Mount	2	3.918	0.4237	0.0941	27492
67.00	4'6"x3" Pipe Mount (horizontal)	2	3.443	0.4076	0.0888	19416
65.00	6' Yagi w/ Mount	2	3.258	0.4010	0.0866	17323
63.00	GPS	2	3.075	0.3943	0.0844	15638
55.00	20' 4-Bay Dipole w/ 2' Sidearm Mount	2	2.377	0.3636	0.0748	11257
53.00	1.0" Dia 4' Omni w/Pipe Mount	2	2.212	0.3545	0.0723	10524
48.00	10'x6" Dipole Antenna	2	1.821	0.3282	0.0658	9149
47.00	5'x1.5in dia Whip Antenna /w mount	2	1.747	0.3223	0.0645	8937
43.00	3' Whip (3in diameter) /w mount	2	1.463	0.2970	0.0591	8199
41.00	4 FT DISH	2	1.330	0.2834	0.0564	7874
40.00	1'x1' Panel Antenna	2	1.265	0.2764	0.0551	7722
39.00	6'x1" Whip Antenna w/ Mount	2	1.203	0.2694	0.0537	7575

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load per Bolt K	Ratio Load Allowable	Allowable Ratio	Criteria
T1	120	Diagonal	A325X	0.7500	1	0.51	31.32	0.016	1	Member Bearing
		Top Girt	A325X	0.6250	2	0.12	7.19	0.017	1	Member Block Shear
T2	116.667	Diagonal	A325X	0.7500	1	5.36	17.94	0.299	1	Member Block Shear
		Horizontal	A325X	0.6250	2	1.95	7.19	0.271	1	Member Block Shear
T3	108.333	Diagonal	A325X	0.7500	1	9.14	17.94	0.510	1	Member Block Shear

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Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load per Bolt K	Ratio Load Allowable	Allowable Ratio	Criteria
T4	100	Horizontal	A325X	0.6250	2	2.95	7.19	0.411 ✓	1	Member Block Shear
		Leg	A325X	0.7500	6	2.97	29.82	0.100 ✓	1	Bolt Tension
		Diagonal	A325X	0.7500	1	12.94	26.81	0.483 ✓	1	Member Block Shear
T5	91.6667	Top Girt	A325X	0.6250	2	4.13	10.26	0.403 ✓	1	Member Block Shear
		Diagonal	A325X	0.7500	1	16.16	26.81	0.603 ✓	1	Member Block Shear
		Top Girt	A325X	0.6250	2	5.32	10.26	0.518 ✓	1	Member Block Shear
T6	83.3333	Diagonal	A325X	0.7500	1	20.13	35.89	0.561 ✓	1	Member Block Shear
		Top Girt	A325X	0.6250	2	6.89	10.26	0.671 ✓	1	Member Block Shear
		Leg	A325X	0.7500	6	12.18	29.82	0.408 ✓	1	Bolt Tension
T7	75	Diagonal	A325X	0.7500	1	29.97	35.34	0.848 ✓	1	Member Bearing
		Horizontal	A325X	0.6250	2	10.80	13.03	0.829 ✓	1	Member Block Shear
		Top Girt	A325X	0.6250	2	9.20	14.38	0.640 ✓	1	Member Block Shear
T8	50	Leg	A325X	0.7500	6	27.54	29.82	0.924 ✓	1	Bolt Tension
		Diagonal	A325X	0.7500	1	37.39	42.41	0.881 ✓	1	Member Bearing
		Horizontal	A325X	0.6250	2	13.99	15.19	0.921 ✓	1	Bolt Shear
T9	25	Top Girt	A325X	0.6250	2	11.66	15.19	0.768 ✓	1	Bolt Shear
		Leg	A325X	1.0000	8	33.34	53.01	0.629 ✓	1	Bolt Tension
		Diagonal	A325X	1.0000	1	50.35	54.84	0.918 ✓	1	Member Block Shear
		Horizontal	A490X	0.6250	2	16.16	18.98	0.851 ✓	1	Bolt Shear
		Top Girt	A325X	0.6250	2	15.04	15.19	0.990 ✓	1	Bolt Shear

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T1	120 - 116.667	P.5x.250	3.34	3.34	23.8 K=1.00	3.7306	-1.33	161.06	0.008 ¹ ✓
T2	116.667 - 108.333	P.5x.250	8.34	8.34	59.5 K=1.00	3.7306	-4.46	129.56	0.034 ¹ ✓
T3	108.333 - 100	P.5x.250	8.34	8.34	59.5 K=1.00	3.7306	-10.22	129.56	0.079 ¹ ✓
T4	100 - 91.6667	P.5x.250	8.34	8.34	59.5 K=1.00	3.7306	-23.03	129.56	0.178 ¹ ✓

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Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T5	91.6667 - 83.3333	P.5x.250	8.34	8.34	59.5 K=1.00	3.7306	-39.78	129.56	0.307 ¹ ✓
T6	83.3333 - 75	P.5x.250	8.34	8.34	59.5 K=1.00	3.7306	-62.18	129.56	0.480 ¹ ✓
T7	75 - 50	P5x.375	25.03	8.34	54.4 K=1.00	6.1120	-155.82	221.46	0.704 ¹ ✓
T8	50 - 25	P.5x.400	25.03	4.17	30.7 K=1.00	5.7805	-263.86	287.44	0.918 ¹ ✓
T9	25 - 0	P6.875x.400	25.03	6.26	32.7 K=1.00	8.1367	-363.47	399.96	0.909 ¹ ✓

¹ P_u / φP_n controls

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T1	120 - 116.667	2L2 1/2x2x3/16x3/8	6.73	6.21	102.5 K=1.00	1.6200	-0.51	30.19	0.017 ¹ ✓
T2	116.667 - 108.333	2L2 1/2x2x3/16x3/8	10.37	9.75	159.7 K=1.00	1.6200	-5.48	14.34	0.382 ¹ ✓
T3	108.333 - 100	2L2 1/2x2x3/16x3/8	10.58	9.97	163.1 K=1.00	1.6200	-9.27	13.75	0.674 ¹ ✓
T4	100 - 91.6667	2L2 1/2x2 1/2x1/4x3/8	10.78	10.18	158.9 K=1.00	2.3800	-13.16	21.29	0.618 ¹ ✓
T5	91.6667 - 83.3333	2L2 1/2x2 1/2x1/4x3/8	11.00	10.41	162.4 K=1.00	2.3800	-16.39	20.38	0.804 ¹ ✓
T6	83.3333 - 75	2L2 1/2x2x3/8x3/8	11.22	10.64	170.5 K=1.00	3.0900	-20.41	24.02	0.850 ¹ ✓
T7	75 - 50	2L3x3x5/16x3/8	11.91	11.32	147.3 K=1.00	3.5500	-30.34	36.97	0.821 ¹ ✓
T8	50 - 25	2L3x3x3/8x3/8	12.65	12.10	134.3 K=1.00	4.2200	-38.53	52.87	0.729 ¹ ✓
T9	25 - 0	2L 'a' > 45.3266 in - 135 2L3 1/2x3 1/2x3/8x3/8	16.33	15.56	125.4 K=1.00	4.9700	-51.61	71.42	0.723 ¹ ✓

¹ P_u / φP_n controls

Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T2	116.667 - 108.333	L2 1/2x2 1/2x3/16	11.68	5.43	129.0 K=0.98	0.9020	-3.91	12.17	0.321 ¹ ✓

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Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T3	108.333 - 100	L2 1/2x2 1/2x3/16	12.35	5.77	135.1 K=0.97	0.9020	-6.02	11.16	0.540 ¹ ✓
T7	75 - 50	L3 1/2x3 1/2x1/4	16.35	7.75	130.7 K=0.98	1.6900	-21.51	22.37	0.962 ¹ ✓
T8	50 - 25	L4x4x5/16	18.35	8.77	130.0 K=0.98	2.4000	-27.98	32.10	0.872 ¹ ✓
T9	25 - 0	L4x4x3/8	20.02	9.52	139.1 K=0.96	2.8600	-32.33	33.38	0.968 ¹ ✓

¹ P_u / φP_n controls

Top Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T1	120 - 116.667	L2 1/2x2 1/2x3/16	11.41	5.30	126.5 K=0.98	0.9020	-0.24	12.58	0.019 ¹ ✓
T4	100 - 91.6667	L3x3x1/4	13.02	6.10	122.8 K=0.99	1.4400	-8.25	21.08	0.391 ¹ ✓
T5	91.6667 - 83.3333	L3x3x1/4	13.68	6.43	128.0 K=0.98	1.4400	-10.58	19.70	0.537 ¹ ✓
T6	83.3333 - 75	L3x3x1/4	14.35	6.77	133.1 K=0.97	1.4400	-13.72	18.35	0.748 ¹ ✓
T7	75 - 50	L3x3x5/16	15.02	7.10	138.9 K=0.96	1.7800	-18.57	20.86	0.890 ¹ ✓
T8	50 - 25	L3 1/2x3 1/2x5/16	17.02	8.08	135.7 K=0.97	2.0900	-23.33	25.66	0.909 ¹ ✓
T9	25 - 0	L4x4x3/8	19.02	9.10	134.2 K=0.97	2.8600	-30.08	35.86	0.839 ¹ ✓

¹ P_u / φP_n controls

Redundant Horizontal (1) Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T8	50 - 25	L2 1/2x2 1/2x1/4	4.59	4.38	113.5 K=1.06	1.1900	-4.58	20.86	0.219 ¹ ✓
T9	25 - 0	L2 1/2x2 1/2x1/4	5.00	4.72	117.7 K=1.02	1.1900	-6.30	19.42	0.325 ¹ ✓

¹ P_u / φP_n controls

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Redundant Diagonal (1) Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T8	50 - 25	L2 1/2x2 1/2x1/4	6.08	5.79	141.5 K=1.00	1.1900	-3.03	13.43	0.226 ¹ ✓
T9	25 - 0	L2 1/2x2 1/2x1/4	7.85	7.38	180.4 K=1.00	1.1900	-4.95	8.26	0.599 ¹ ✓

¹ P_u / φP_n controls

Inner Bracing Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T4	100 - 91.6667	L2 1/2x2x3/16	6.51	6.51	182.9 K=1.00	0.8090	-0.15	5.46	0.027 ¹ ✓
T5	91.6667 - 83.3333	L2 1/2x2x3/16	6.84	6.84	192.3 K=1.00	0.8090	-0.19	4.94	0.038 ¹ ✓
T6	83.3333 - 75	L2 1/2x2x3/16	7.17	7.17	201.6 K=1.00	0.8090	-0.24	4.50	0.054 ¹ ✓
T7	75 - 50	L2 1/2x2x3/16	7.51	7.51	211.0 K=1.00	0.8090	-0.33	4.11	0.079 ¹ ✓
T8	50 - 25	L2 1/2x2x3/16	8.51	8.51	239.1 K=1.00	0.8090	-0.41	3.20	0.128 ¹ ✓
T9	25 - 0	L2 1/2x2 1/2x3/16	9.51	9.51	230.5 K=1.00	0.9020	-0.53	3.83	0.138 ¹ ✓

¹ P_u / φP_n controls

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T1	120 - 116.667	P.5x.250	3.34	3.34	23.8	3.7306	0.42	167.88	0.002 ¹ ✓
T2	116.667 - 108.333	P.5x.250	8.34	8.34	59.5	3.7306	0.18	167.88	0.001 ¹ ✓
T3	108.333 - 100	P.5x.250	8.34	8.34	59.5	3.7306	6.85	167.88	0.041 ¹ ✓
T4	100 - 91.6667	P.5x.250	8.34	8.34	59.5	3.7306	17.84	167.88	0.106 ¹ ✓

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Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T5	91.6667 - 83.3333	P.5x.250	8.34	8.34	59.5	3.7306	31.95	167.88	0.190 ¹ ✓
T6	83.3333 - 75	P.5x.250	8.34	8.34	59.5	3.7306	50.60	167.88	0.301 ¹ ✓
T7	75 - 50	P5x.375	25.03	8.34	54.4	6.1120	134.38	275.04	0.489 ¹ ✓
T8	50 - 25	P.5x.400	25.03	4.17	30.7	5.7805	232.38	312.15	0.744 ¹ ✓
T9	25 - 0	P6.875x.400	25.03	6.26	32.7	8.1367	321.88	439.38	0.733 ¹ ✓

¹ P_u / φP_n controls

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T1	120 - 116.667	2L2 1/2x2x3/16x3/8	6.73	6.21	98.1	0.9689	0.17	42.15	0.004 ¹ ✓
T2	116.667 - 108.333	2L2 1/2x2x3/16x3/8	10.37	9.75	151.7	0.9689	5.36	42.15	0.127 ¹ ✓
T3	108.333 - 100	2L2 1/2x2x3/16x3/8	10.58	9.97	154.9	0.9689	9.14	42.15	0.217 ¹ ✓
T4	100 - 91.6667	2L2 1/2x2 1/2x1/4x3/8	10.78	10.18	163.1	1.4569	12.94	71.02	0.182 ¹ ✓
T5	91.6667 - 83.3333	2L2 1/2x2 1/2x1/4x3/8	11.00	10.41	166.6	1.4569	16.16	71.02	0.228 ¹ ✓
T6	83.3333 - 75	2L2 1/2x2x3/8x3/8	11.22	10.64	170.4	1.8253	20.13	79.40	0.253 ¹ ✓
T7	75 - 50	2L3x3x5/16x3/8	11.91	11.32	150.8	2.2523	29.97	109.80	0.273 ¹ ✓
T8	50 - 25	2L3x3x3/8x3/8	12.65	12.10	105.3	2.6728	37.39	130.30	0.287 ¹ ✓
T9	25 - 0	2L 'a' > 45.3266 in - 138 2L3 1/2x3 1/2x3/8x3/8	16.33	15.56	118.4	3.0947	50.35	150.87	0.334 ¹ ✓

¹ P_u / φP_n controls

Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T2	116.667 -	L2 1/2x2 1/2x3/16	11.68	5.43	130.3	0.5710	3.90	24.84	0.157 ¹

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Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
	108.333								✓
T3	108.333 - 100	L2 1/2x2 1/2x3/16	12.35	5.77	138.0	0.5710	5.91	24.84	0.238 ¹ ✓
T7	75 - 50	L3 1/2x3 1/2x1/4	16.35	7.75	87.4	1.1269	21.61	54.94	0.393 ¹ ✓
T8	50 - 25	L4x4x5/16	18.35	8.77	86.8	1.6242	27.93	79.18	0.353 ¹ ✓
T9	25 - 0	L4x4x3/8	20.02	9.52	94.9	1.9341	31.81	94.29	0.337 ¹ ✓

¹ P_u / φP_n controls

Top Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T1	120 - 116.667	L2 1/2x2 1/2x3/16	11.41	5.30	127.2	0.5710	0.24	24.84	0.010 ¹ ✓
T4	100 - 91.6667	L3x3x1/4	13.02	6.10	81.3	0.9394	8.26	40.86	0.202 ¹ ✓
T5	91.6667 - 83.3333	L3x3x1/4	13.68	6.43	85.6	0.9394	10.64	40.86	0.260 ¹ ✓
T6	83.3333 - 75	L3x3x1/4	14.35	6.77	89.9	0.9394	13.78	40.86	0.337 ¹ ✓
T7	75 - 50	L3x3x5/16	15.02	7.10	95.0	1.1592	18.40	56.51	0.326 ¹ ✓
T8	50 - 25	L3 1/2x3 1/2x5/16	17.02	8.08	92.0	1.3917	23.19	67.85	0.342 ¹ ✓
T9	25 - 0	L4x4x3/8	19.02	9.10	90.7	1.9341	29.96	94.29	0.318 ¹ ✓

¹ P_u / φP_n controls

Redundant Horizontal (1) Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T8	50 - 25	L2 1/2x2 1/2x1/4	4.59	4.38	68.3	1.1900	4.58	53.55	0.085 ¹ ✓
T9	25 - 0	L2 1/2x2 1/2x1/4	5.00	4.72	73.6	1.1900	6.30	53.55	0.118 ¹ ✓

¹ P_u / φP_n controls

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Redundant Diagonal (1) Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T8	50 - 25	L2 1/2x2 1/2x1/4	5.84	5.55	86.6	1.1900	3.14	53.55	0.059 ¹
T9	25 - 0	L2 1/2x2 1/2x1/4	7.71	7.23	112.9	1.1900	5.11	53.55	0.095 ¹

¹ P_u / φP_n controls

Inner Bracing Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T4	100 - 91.6667	L2 1/2x2x3/16	6.51	6.51	130.2	0.8090	0.14	26.21	0.005 ¹
T5	91.6667 - 83.3333	L2 1/2x2x3/16	6.84	6.84	136.9	0.8090	0.18	26.21	0.007 ¹
T6	83.3333 - 75	L2 1/2x2x3/16	7.17	7.17	143.6	0.8090	0.24	26.21	0.009 ¹
T7	75 - 50	L2 1/2x2x3/16	7.51	7.51	150.2	0.8090	0.32	26.21	0.012 ¹
T8	50 - 25	L2 1/2x2x3/16	8.51	8.51	170.2	0.8090	0.40	26.21	0.015 ¹
T9	25 - 0	L2 1/2x2 1/2x3/16	9.51	9.51	146.7	0.9020	0.52	29.22	0.018 ¹

¹ P_u / φP_n controls

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	φP _{allow} K	% Capacity	Pass Fail
T1	120 - 116.667	Leg	P.5x.250	1	-1.33	161.06	2.0	Pass
		Leg	P.5x.250	2	-1.19	161.06	1.6	Pass
		Leg	P.5x.250	3	-1.11	161.06	1.5	Pass
T2	116.667 - 108.333	Leg	P.5x.250	13	-4.46	129.56	3.4	Pass
		Leg	P.5x.250	14	-4.19	129.56	3.2	Pass
T3	108.333 - 100	Leg	P.5x.250	15	-3.91	129.56	3.0	Pass
		Leg	P.5x.250	25	-8.94	129.56	6.9	Pass
		Leg	P.5x.250	26	-8.63	129.56	6.7	Pass
		Leg	P.5x.250	27	-10.22	129.56	7.9	Pass
T4	100 - 91.6667	Leg	P.5x.250	37	-22.07	129.56	17.0	Pass
		Leg	P.5x.250	38	-21.75	129.56	16.8	Pass

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Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
T5	91.6667 - 83.3333	Leg	P.5x.250	39	-23.03	129.56	17.8	Pass
		Leg	P.5x.250	52	-37.97	129.56	29.3	Pass
T6	83.3333 - 75	Leg	P.5x.250	53	-37.91	129.56	29.3	Pass
		Leg	P.5x.250	54	-39.78	129.56	30.7	Pass
		Leg	P.5x.250	67	-59.58	129.56	46.0	Pass
		Leg	P.5x.250	68	-59.90	129.56	46.2	Pass
T7	75 - 50	Leg	P.5x.250	69	-62.18	129.56	48.0	Pass
		Leg	P5x.375	82	-151.15	221.46	68.3	Pass
		Leg	P5x.375	83	-153.00	221.46	69.1	Pass
T8	50 - 25	Leg	P5x.375	84	-155.82	221.46	70.4	Pass
		Leg	P.5x.400	121	-257.86	287.44	89.7	Pass
		Leg	P.5x.400	122	-260.96	287.44	90.3 (b)	Pass
T9	25 - 0	Leg	P.5x.400	123	-263.86	287.44	91.8	Pass
		Leg	P.5x.400	123	-263.86	287.44	91.8	Pass
		Leg	P.5x.400	123	-263.86	287.44	91.8	Pass
T1	120 - 116.667	Leg	P6.875x.400	196	-356.75	399.96	89.2	Pass
		Leg	P6.875x.400	197	-360.66	399.96	90.2	Pass
		Leg	P6.875x.400	198	-363.47	399.96	90.9	Pass
		Diagonal	2L2 1/2x2x3/16x3/8	7	-0.50	30.19	1.7	Pass
		Diagonal	2L2 1/2x2x3/16x3/8	8	-0.49	30.19	1.6	Pass
		Diagonal	2L2 1/2x2x3/16x3/8	9	-0.51	30.19	1.7	Pass
T2	116.667 - 108.333	Diagonal	2L2 1/2x2x3/16x3/8	10	-0.50	30.19	1.7	Pass
		Diagonal	2L2 1/2x2x3/16x3/8	11	-0.48	30.19	1.6	Pass
		Diagonal	2L2 1/2x2x3/16x3/8	12	-0.50	30.19	1.7	Pass
		Diagonal	2L2 1/2x2x3/16x3/8	17	-5.36	14.34	37.4	Pass
		Diagonal	2L2 1/2x2x3/16x3/8	18	-5.36	14.34	37.4	Pass
		Diagonal	2L2 1/2x2x3/16x3/8	20	-4.23	14.34	29.5	Pass
T3	108.333 - 100	Diagonal	2L2 1/2x2x3/16x3/8	21	-4.23	14.34	29.5	Pass
		Diagonal	2L2 1/2x2x3/16x3/8	23	-5.48	14.34	38.2	Pass
		Diagonal	2L2 1/2x2x3/16x3/8	24	-5.47	14.34	38.1	Pass
		Diagonal	2L2 1/2x2x3/16x3/8	29	-8.41	13.75	61.1	Pass
		Diagonal	2L2 1/2x2x3/16x3/8	30	-8.42	13.75	61.2	Pass
		Diagonal	2L2 1/2x2x3/16x3/8	32	-7.25	13.75	52.7	Pass
T4	100 - 91.6667	Diagonal	2L2 1/2x2x3/16x3/8	33	-7.26	13.75	52.8	Pass
		Diagonal	2L2 1/2x2x3/16x3/8	35	-9.27	13.75	67.4	Pass
		Diagonal	2L2 1/2x2x3/16x3/8	36	-9.25	13.75	67.3	Pass
		Diagonal	2L2 1/2x2 1/2x1/4x3/8	43	-10.73	21.29	50.4	Pass
		Diagonal	2L2 1/2x2 1/2x1/4x3/8	44	-10.74	21.29	50.4	Pass
		Diagonal	2L2 1/2x2 1/2x1/4x3/8	45	-11.08	21.29	52.1	Pass
T5	91.6667 - 83.3333	Diagonal	2L2 1/2x2 1/2x1/4x3/8	46	-11.06	21.29	52.0	Pass
		Diagonal	2L2 1/2x2 1/2x1/4x3/8	47	-13.16	21.29	61.8	Pass
		Diagonal	2L2 1/2x2 1/2x1/4x3/8	48	-13.16	21.29	61.8	Pass
		Diagonal	2L2 1/2x2 1/2x1/4x3/8	58	-13.34	20.38	65.4	Pass
		Diagonal	2L2 1/2x2 1/2x1/4x3/8	59	-13.34	20.38	65.5	Pass
		Diagonal	2L2 1/2x2 1/2x1/4x3/8	60	-14.53	20.38	71.3	Pass
T6	83.3333 - 75	Diagonal	2L2 1/2x2 1/2x1/4x3/8	61	-14.47	20.38	71.0	Pass
		Diagonal	2L2 1/2x2 1/2x1/4x3/8	62	-16.39	20.38	80.4	Pass
		Diagonal	2L2 1/2x2 1/2x1/4x3/8	63	-16.39	20.38	80.4	Pass
		Diagonal	2L2 1/2x2x3/8x3/8	73	-16.71	24.02	69.6	Pass
		Diagonal	2L2 1/2x2x3/8x3/8	74	-16.71	24.02	69.5	Pass
		Diagonal	2L2 1/2x2x3/8x3/8	75	-19.93	24.02	82.9	Pass
T7	75 - 50	Diagonal	2L2 1/2x2x3/8x3/8	76	-19.90	24.02	82.8	Pass
		Diagonal	2L2 1/2x2x3/8x3/8	77	-20.40	24.02	84.9	Pass
		Diagonal	2L2 1/2x2x3/8x3/8	78	-20.41	24.02	85.0	Pass
		Diagonal	2L3x3x5/16x3/8	89	-24.38	36.97	65.9	Pass
		Diagonal	2L3x3x5/16x3/8	90	-24.35	36.97	67.9 (b)	Pass
		Diagonal	2L3x3x5/16x3/8	90	-24.35	36.97	65.9	Pass

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Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
T8	50 - 25	Diagonal	2L3x3x5/16x3/8	92	-30.34	36.97	82.1	Pass
		Diagonal	2L3x3x5/16x3/8	93	-30.34	36.97	84.8 (b)	Pass
		Diagonal	2L3x3x5/16x3/8	95	-27.83	36.97	82.1	Pass
		Diagonal	2L3x3x5/16x3/8	96	-27.86	36.97	84.8 (b)	Pass
		Diagonal	2L3x3x5/16x3/8	101	-23.52	36.97	75.3	Pass
		Diagonal	2L3x3x5/16x3/8	102	-23.50	36.97	77.7 (b)	Pass
		Diagonal	2L3x3x5/16x3/8	104	-23.50	38.56	75.3	Pass
		Diagonal	2L3x3x5/16x3/8	105	-28.62	38.56	77.7 (b)	Pass
		Diagonal	2L3x3x5/16x3/8	107	-28.62	38.56	75.3	Pass
		Diagonal	2L3x3x5/16x3/8	108	-26.92	38.56	77.7 (b)	Pass
		Diagonal	2L3x3x5/16x3/8	112	-26.95	38.56	61.0	Pass
		Diagonal	2L3x3x5/16x3/8	113	-21.94	40.22	65.5 (b)	Pass
		Diagonal	2L3x3x5/16x3/8	114	-21.93	40.22	60.9	Pass
		Diagonal	2L3x3x5/16x3/8	115	-26.55	40.22	65.5 (b)	Pass
		Diagonal	2L3x3x5/16x3/8	116	-26.54	40.22	74.2	Pass
		Diagonal	2L3x3x5/16x3/8	117	-25.64	40.22	80.0 (b)	Pass
		Diagonal	2L3x3x5/16x3/8	118	-25.66	40.22	74.2	Pass
		Diagonal	2L3x3x3/8x3/8	128	-29.57	52.87	80.0 (b)	Pass
		Diagonal	2L3x3x3/8x3/8	131	-29.54	52.87	69.8	Pass
		Diagonal	2L3x3x3/8x3/8	135	-38.53	52.87	75.2 (b)	Pass
		Diagonal	2L3x3x3/8x3/8	138	-38.17	52.87	69.9	Pass
		Diagonal	2L3x3x3/8x3/8	142	-33.60	52.87	75.2 (b)	Pass
		Diagonal	2L3x3x3/8x3/8	145	-33.60	52.87	54.5	Pass
		Diagonal	2L3x3x3/8x3/8	152	-28.17	54.17	61.1 (b)	Pass
		Diagonal	2L3x3x3/8x3/8	155	-28.14	54.17	54.5	Pass
		Diagonal	2L3x3x3/8x3/8	159	-36.55	54.17	61.1 (b)	Pass
		Diagonal	2L3x3x3/8x3/8	162	-36.32	54.17	66.0	Pass
		Diagonal	2L3x3x3/8x3/8	166	-32.21	54.17	74.1 (b)	Pass
		Diagonal	2L3x3x3/8x3/8	169	-32.51	54.17	66.0	Pass
		Diagonal	2L3x3x3/8x3/8	175	-26.27	55.48	74.2 (b)	Pass
		Diagonal	2L3x3x3/8x3/8	178	-26.28	55.48	63.7	Pass
		Diagonal	2L3x3x3/8x3/8	181	-32.67	55.48	71.6 (b)	Pass
		Diagonal	2L3x3x3/8x3/8				63.8	Pass
		Diagonal	2L3x3x3/8x3/8				71.6 (b)	Pass
		Diagonal	2L3x3x3/8x3/8				55.9	Pass
		Diagonal	2L3x3x3/8x3/8				67.8 (b)	Pass
		Diagonal	2L3x3x3/8x3/8				55.9	Pass
		Diagonal	2L3x3x3/8x3/8				67.9 (b)	Pass
		Diagonal	2L3x3x3/8x3/8				72.9	Pass
		Diagonal	2L3x3x3/8x3/8				88.1 (b)	Pass
		Diagonal	2L3x3x3/8x3/8				72.2	Pass
		Diagonal	2L3x3x3/8x3/8				88.1 (b)	Pass
		Diagonal	2L3x3x3/8x3/8				63.6	Pass
		Diagonal	2L3x3x3/8x3/8				77.5 (b)	Pass
		Diagonal	2L3x3x3/8x3/8				64.3	Pass
		Diagonal	2L3x3x3/8x3/8				78.3 (b)	Pass
		Diagonal	2L3x3x3/8x3/8				52.0	Pass
		Diagonal	2L3x3x3/8x3/8				64.7 (b)	Pass
		Diagonal	2L3x3x3/8x3/8				51.9	Pass
		Diagonal	2L3x3x3/8x3/8				64.8 (b)	Pass
		Diagonal	2L3x3x3/8x3/8				67.5	Pass
		Diagonal	2L3x3x3/8x3/8				83.9 (b)	Pass
		Diagonal	2L3x3x3/8x3/8				67.0	Pass
		Diagonal	2L3x3x3/8x3/8				84.0 (b)	Pass
		Diagonal	2L3x3x3/8x3/8				59.5	Pass
		Diagonal	2L3x3x3/8x3/8				74.4 (b)	Pass
		Diagonal	2L3x3x3/8x3/8				60.0	Pass
		Diagonal	2L3x3x3/8x3/8				74.9 (b)	Pass
		Diagonal	2L3x3x3/8x3/8				47.3	Pass
		Diagonal	2L3x3x3/8x3/8				60.4 (b)	Pass
		Diagonal	2L3x3x3/8x3/8				47.4	Pass
		Diagonal	2L3x3x3/8x3/8				60.6 (b)	Pass
		Diagonal	2L3x3x3/8x3/8				58.9	Pass

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Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
T9	25 - 0	Diagonal	2L3x3x3/8x3/8	184	-32.57	55.48	75.3 (b) 58.7	Pass
		Diagonal	2L3x3x3/8x3/8	187	-29.89	55.48	75.3 (b) 53.9	Pass
		Diagonal	2L3x3x3/8x3/8	190	-29.88	55.48	69.1 (b) 53.9	Pass
		Diagonal	2L3 1/2x3 1/2x3/8x3/8	203	-39.10	71.42	69.0 (b) 54.7	Pass
		Diagonal	2L3 1/2x3 1/2x3/8x3/8	206	-39.04	71.42	69.6 (b) 54.7	Pass
		Diagonal	2L3 1/2x3 1/2x3/8x3/8	210	-51.61	71.42	69.7 (b) 72.3	Pass
		Diagonal	2L3 1/2x3 1/2x3/8x3/8	213	-51.22	71.42	91.8 (b) 71.7	Pass
		Diagonal	2L3 1/2x3 1/2x3/8x3/8	217	-44.21	71.42	91.8 (b) 61.9	Pass
		Diagonal	2L3 1/2x3 1/2x3/8x3/8	220	-44.66	71.42	79.2 (b) 62.5	Pass
		Diagonal	2L3 1/2x3 1/2x3/8x3/8	226	-38.26	73.97	79.8 (b) 51.7	Pass
		Diagonal	2L3 1/2x3 1/2x3/8x3/8	229	-38.22	73.97	68.0 (b) 51.7	Pass
		Diagonal	2L3 1/2x3 1/2x3/8x3/8	232	-50.10	73.97	68.1 (b) 67.7	Pass
		Diagonal	2L3 1/2x3 1/2x3/8x3/8	235	-49.59	73.97	88.7 (b) 67.0	Pass
		Diagonal	2L3 1/2x3 1/2x3/8x3/8	238	-43.30	73.97	88.7 (b) 58.5	Pass
		Diagonal	2L3 1/2x3 1/2x3/8x3/8	241	-43.84	73.97	77.4 (b) 59.3	Pass
T2	116.667 - 108.333	Horizontal	L2 1/2x2 1/2x3/16	16	-3.78	12.17	78.2 (b) 31.0	Pass
		Horizontal	L2 1/2x2 1/2x3/16	19	-3.07	12.17	25.3	Pass
T3	108.333 - 100	Horizontal	L2 1/2x2 1/2x3/16	22	-3.91	12.17	32.1	Pass
		Horizontal	L2 1/2x2 1/2x3/16	28	-5.57	11.16	49.9	Pass
T7	75 - 50	Horizontal	L2 1/2x2 1/2x3/16	31	-4.61	11.16	41.3	Pass
		Horizontal	L2 1/2x2 1/2x3/16	34	-6.02	11.16	54.0	Pass
		Horizontal	L3 1/2x3 1/2x1/4	88	-17.12	22.37	76.5	Pass
		Horizontal	L3 1/2x3 1/2x1/4	91	-21.51	22.37	96.2	Pass
		Horizontal	L3 1/2x3 1/2x1/4	94	-19.63	22.37	87.8	Pass
T8	50 - 25	Horizontal	L3 1/2x3 1/2x1/4	100	-16.23	23.95	67.8	Pass
		Horizontal	L3 1/2x3 1/2x1/4	103	-20.04	23.95	83.7	Pass
		Horizontal	L3 1/2x3 1/2x1/4	106	-18.69	23.95	78.1	Pass
		Horizontal	L4x4x5/16	127	-21.20	32.10	66.1	Pass
		Horizontal	L4x4x5/16	134	-27.98	32.10	70.4 (b) 87.2	Pass
		Horizontal	L4x4x5/16	141	-24.58	32.10	92.1 (b) 76.6	Pass
		Horizontal	L4x4x5/16	151	-19.97	34.09	81.5 (b) 58.6	Pass
		Horizontal	L4x4x5/16	158	-26.31	34.09	66.2 (b) 77.2	Pass
		Horizontal	L4x4x5/16	165	-23.38	34.09	86.6 (b) 68.6	Pass
		Horizontal	L4x4x5/16				77.3 (b)	
T9	25 - 0	Horizontal	L4x4x3/8	202	-24.23	33.38	72.6	Pass
		Horizontal	L4x4x3/8	209	-32.33	33.38	96.8	Pass
		Horizontal	L4x4x3/8	216	-28.07	33.38	84.1	Pass
T1	120 - 116.667	Top Girt	L2 1/2x2 1/2x3/16	4	-0.24	12.58	1.9	Pass
		Top Girt	L2 1/2x2 1/2x3/16	5	-0.22	12.58	1.7	Pass

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Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
T9	25 - 0	Redund Horiz 1	L2 1/2x2 1/2x1/4	204	-6.19	19.42	31.9	Pass
		Bracing						
		Redund Horiz 1	L2 1/2x2 1/2x1/4	207	-6.25	19.42	32.2	Pass
		Bracing						
		Redund Horiz 1	L2 1/2x2 1/2x1/4	211	-6.25	19.42	32.2	Pass
		Bracing						
		Redund Horiz 1	L2 1/2x2 1/2x1/4	214	-6.30	19.42	32.5	Pass
		Bracing						
		Redund Horiz 1	L2 1/2x2 1/2x1/4	218	-6.30	19.42	32.5	Pass
		Bracing						
		Redund Horiz 1	L2 1/2x2 1/2x1/4	221	-6.19	19.42	31.9	Pass
		Bracing						
		Redund Horiz 1	L2 1/2x2 1/2x1/4	227	-6.19	20.47	30.2	Pass
		Bracing						
		Redund Horiz 1	L2 1/2x2 1/2x1/4	230	-6.25	20.47	30.6	Pass
		Bracing						
		Redund Horiz 1	L2 1/2x2 1/2x1/4	233	-6.25	20.47	30.6	Pass
		Bracing						
T8	50 - 25	Redund Horiz 1	L2 1/2x2 1/2x1/4	236	-6.30	20.47	30.8	Pass
		Bracing						
		Redund Horiz 1	L2 1/2x2 1/2x1/4	239	-6.30	20.47	30.8	Pass
		Bracing						
		Redund Horiz 1	L2 1/2x2 1/2x1/4	242	-6.19	20.47	30.2	Pass
		Bracing						
		Redund Diag 1	L2 1/2x2 1/2x1/4	130	-2.96	13.43	22.0	Pass
		Bracing						
		Redund Diag 1	L2 1/2x2 1/2x1/4	133	-3.00	13.43	22.3	Pass
		Bracing						
		Redund Diag 1	L2 1/2x2 1/2x1/4	137	-3.00	13.43	22.3	Pass
		Bracing						
		Redund Diag 1	L2 1/2x2 1/2x1/4	140	-3.03	13.43	22.6	Pass
		Bracing						
		Redund Diag 1	L2 1/2x2 1/2x1/4	144	-3.03	13.43	22.6	Pass
		Bracing						
		Redund Diag 1	L2 1/2x2 1/2x1/4	147	-2.96	13.43	22.0	Pass
		Bracing						
		Redund Diag 1	L2 1/2x2 1/2x1/4	154	-3.01	14.00	21.5	Pass
		Bracing						
		Redund Diag 1	L2 1/2x2 1/2x1/4	157	-3.05	14.00	21.8	Pass
		Bracing						
		Redund Diag 1	L2 1/2x2 1/2x1/4	161	-3.05	14.00	21.8	Pass
		Bracing						
		Redund Diag 1	L2 1/2x2 1/2x1/4	164	-3.08	14.00	22.0	Pass
		Bracing						
		Redund Diag 1	L2 1/2x2 1/2x1/4	168	-3.08	14.00	22.0	Pass
		Bracing						
		Redund Diag 1	L2 1/2x2 1/2x1/4	171	-3.01	14.00	21.5	Pass
		Bracing						
		Redund Diag 1	L2 1/2x2 1/2x1/4	177	-3.07	14.60	21.0	Pass
		Bracing						
		Redund Diag 1	L2 1/2x2 1/2x1/4	180	-3.11	14.60	21.3	Pass
		Bracing						
		Redund Diag 1	L2 1/2x2 1/2x1/4	183	-3.11	14.60	21.3	Pass
		Bracing						
		Redund Diag 1	L2 1/2x2 1/2x1/4	186	-3.14	14.60	21.5	Pass
		Bracing						
		Redund Diag 1	L2 1/2x2 1/2x1/4	189	-3.14	14.60	21.5	Pass
		Bracing						
		Redund Diag 1	L2 1/2x2 1/2x1/4	192	-3.07	14.60	21.0	Pass
		Bracing						
T9	25 - 0	Redund Diag 1	L2 1/2x2 1/2x1/4	205	-4.85	8.26	58.8	Pass

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	Client	SMK-003 / ASM-010 / NSS-044 / (AT&T) / (Sprint) / (T-Mobile)	Designed by MCD

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
						Horizontal (T9)	96.8	Pass
						Top Girt (T9)	99.0	Pass
						Redund Horz 1	32.5	Pass
						Bracing (T9)		
						Redund Diag 1	59.9	Pass
						Bracing (T9) Inner	13.8	Pass
						Bracing (T9)		
						Bolt Checks	99.0	Pass
						RATING =	99.0	Pass

ANCHOR BOLT ANALYSIS

Job 120' Stainless Lattice Tower - New Haven, CT
Description Tower Anchor Bolts - TIA-222-G Conditions Check
Existing Anchorage

Project No. _____
Computed by MCD
Checked by _____
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ANCHOR BOLT ANALYSIS

Input Data

Tower Reactions:

Uplift: Uplift := 380·kips *user input*
Shear: Shear := 65·kips *user input*
Compression: Compression := 427·kips *user input*

Anchor Bolt Data:

Use ASTM A36

(actual material strength unknown therefore assume min design values)

Number of Anchor Bolts = N	N := 6	<i>user input</i>	MODified Anchorage - Steel Bolts
Bolt Ultimate Strength:	F _u := 58·ksi	<i>user input</i>	Number of Anchor Bolts = N
Bolt Yield Strength:	F _y := 36·ksi	<i>user input</i>	N _{M1} := 0
Bolt Modulus:	E := 29000·ksi	<i>user input</i>	Bolt Ultimate Strength:
Thickness of Anchor Bolts	D := 1.50in	<i>user input</i>	F _{u,M1} := 72.5·ksi
Threads per Inch:	n := 6	<i>user input</i>	Bolt Yield Strength:
Coefficient of Friction:	μ := 0.55	<i>user input</i>	F _{y,M1} := 58·ksi
	(for baseplate with grout ASCE 10-15)		Bolt Modulus:
Length from top of pier to bottom of leveling nut:	L _{ar} := 0in	<i>user input</i>	E _{M1} := 29000·ksi
Bolt Modulus:	E _{ww} := 29000·ksi	<i>user input</i>	Thickness of Anchor Bolts
			D _{M1} := 1.25in
			Threads per Inch:
			n _{M1} := 7

Anchor Bolt Section Properties:

Gross Area of Bolt:

$$A_{ge} := N \frac{\pi}{4} \cdot D^2 \quad A_{ge} = 10.6 \cdot \text{in}^2 \quad A_{g,pm} := N_{M1} \frac{\pi}{4} \cdot D_{M1}^2 \quad A_{g,pm} = 0 \cdot \text{in}^2$$

Net Area of Bolt:

$$A_{ne} := N \left[\frac{\pi}{4} \cdot \left(D - \frac{0.9743 \cdot \text{in}}{n} \right)^2 \right] \quad A_{n,pm} := N_{M1} \left[\frac{\pi}{4} \cdot \left(D_{M1} - \frac{0.9743 \cdot \text{in}}{n_{M1}} \right)^2 \right]$$

$$A_{ne} = 8.43 \cdot \text{in}^2 \quad A_{n,pm} = 0 \cdot \text{in}^2$$

Net Diameter:

$$D_{ne} := N \left(D - \frac{0.9743 \cdot \text{in}}{n} \right) \quad D_{ne} = 8.03 \cdot \text{in} \quad D_{n,pm} := N_{M1} \left(D_{M1} - \frac{0.9743 \cdot \text{in}}{n_{M1}} \right) \quad D_{n,pm} = 0 \cdot \text{in}$$

Radius of Gyration of Bolt:

$$r_e := N \cdot \frac{\left(D - \frac{0.9743 \cdot \text{in}}{n} \right)}{4} \quad r_e = 2.01 \cdot \text{in} \quad r_{pm} := N_{M1} \cdot \frac{\left(D_{M1} - \frac{0.9743 \cdot \text{in}}{n_{M1}} \right)}{4} \quad r_{pm} = 0 \cdot \text{in}$$

Plastic Section Modulus of Bolt:

$$Z_{xe} := N \frac{\left(D - \frac{0.9743 \cdot \text{in}}{n} \right)^3}{6} \quad Z_{xe} = 2.39 \cdot \text{in}^3 \quad Z_{x,pm} := N_{M1} \frac{\left(D_{M1} - \frac{0.9743 \cdot \text{in}}{n_{M1}} \right)^3}{6} \quad Z_{x,pm} = 0 \cdot \text{in}^3$$

Forces:

Tension Force:

$$T_u := \frac{\text{Uplift}}{1}$$

$$T_u = 380 \cdot \text{kip}$$

$$T_{ub} := T_u$$

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

$$\phi_f := 0.9$$

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

$$\phi_b := 0.80$$

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

$$\phi_t := 0.75 \quad \phi_{t,pm} := 0.65$$

Shear Force:

$$V_u := \frac{\text{Shear}}{1}$$

$$V_u = 65 \cdot \text{kip}$$

$$V_{ub} := V_u$$

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

$$\phi_v := 0.75 \quad \phi_{v,pm} := 0.60$$

ANSI/TIA-222-G 4.7.1 Flexural Members:

Nominal Flexure Strength, M_n :

$$M_n := F_y \cdot Z_{xc} + F_y \cdot Z_{x,pm}$$

$$M_n = 7.18 \cdot \text{ft} \cdot \text{kip}$$

$$\phi_f \cdot M_n = 6.46 \cdot \text{ft} \cdot \text{kip}$$

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

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

$$M_u = 0 \cdot \text{ft} \cdot \text{kip}$$

Flexure Check:

$$\text{FlexureCheck} := \text{if}(M_u \leq \phi_f \cdot M_n, \text{"OK"}, \text{"NO GOOD"})$$

$$\text{FlexureCheck} = \text{"OK"}$$

$$\frac{M_u}{\phi_f \cdot M_n} = 0\%$$

ANSI/TIA-222-G 4.9.6.1 Tensile Strength:

Design Tensile Strength, R_{nt} :

$$R_{nt} := F_u \cdot A_{ne} \quad R_{nt,pm} := F_u \cdot A_{n,pm}$$

$$R_{nt} = 489.03 \cdot \text{ft} \cdot \text{kip} \quad R_{nt,pm} = 0 \cdot \text{ft} \cdot \text{kip}$$

$$\phi_t \cdot R_{nt} = 366.77 \cdot \text{ft} \cdot \text{kip} \quad \phi_{t,pm} \cdot R_{nt,pm} = 0 \cdot \text{ft} \cdot \text{kip}$$

Tension Check:

$$\text{TensionCheck} := \text{if}(T_u \leq (\phi_t \cdot R_{nt} + \phi_{t,pm} \cdot R_{nt,pm}), \text{"OK"}, \text{"NO GOOD"})$$

$$\text{TensionCheck} = \text{"NO GOOD"}$$

$$\frac{T_u}{\phi_t \cdot R_{nt} + \phi_{t,pm} \cdot R_{nt,pm}} = 103.61\%$$

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

Design Shear Strength, R_{nv} :

$$R_{nv} := 0.45 \cdot F_u \cdot A_{ge} \quad R_{nv,pm} := 0.45 \cdot F_u \cdot A_{g,pm}$$

$$R_{nv} = 276.74 \cdot \text{ft} \cdot \text{kip} \quad R_{nv,pm} = 0 \cdot \text{ft} \cdot \text{kip}$$

$$\phi_v \cdot R_{nv} = 207.55 \cdot \text{ft} \cdot \text{kip} \quad \phi_{v,pm} \cdot R_{nv,pm} = 0 \cdot \text{ft} \cdot \text{kip}$$

Shear Check:

$$\text{ShearCheck} := \text{if}(V_u \leq (\phi_v \cdot R_{nv} + \phi_{v,pm} \cdot R_{nv,pm}), \text{"OK"}, \text{"NO GOOD"})$$

$$\text{ShearCheck} = \text{"OK"}$$

$$\frac{V_u}{\phi_v \cdot R_{nv} + \phi_{v,pm} \cdot R_{nv,pm}} = 31.32\%$$

Job 120' Stainless Lattice Tower - New Haven, CT
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ANSI/TIA-222-G 4.9.6.4 Combined Shear and Tension:

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

$$\left[\frac{V_{ub}}{(\phi_v \cdot R_{nv} + \phi_{v,pm} \cdot R_{nv,pm})} \right]^2 + \left[\frac{T_{ub}}{(\phi_t \cdot R_{nt} + \phi_{t,pm} \cdot R_{nt,pm})} \right]^2 = 1.17$$

Combined Shear and Tension Check:

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

ShearAndTensionCheck = "NO GOOD"

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

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

$\eta := 0.55$

user input from ANSI/TIA-222-G 4.9.9

$$\frac{\left[T_u + \left(\frac{V_u}{\eta} \right) \right]}{(\phi_b \cdot F_u \cdot A_{ne}) + (\phi_t \cdot F_u \cdot A_{g,pm})} = 1.27$$

Capacity Check:

$$\text{CapacityCheck} := \text{if} \left[\frac{\left[T_u + \left(\frac{V_u}{\eta} \right) \right]}{(\phi_b \cdot F_u \cdot A_{ne}) + (\phi_t \cdot F_u \cdot A_{g,pm})} \leq 1, \text{"OK"}, \text{"NO GOOD"} \right]$$

CapacityCheck = "NO GOOD"

$$T_u + \left(\frac{V_u}{\eta} \right) = 498.18 \cdot \text{kip}$$

$$498.18 \text{kip} - 391.22 \text{kip} = 106.96 \cdot \text{kip}$$

$$\phi_b \cdot F_u \cdot A_{ne} = \text{kip}$$

$$(\phi_b \cdot F_u \cdot A_{ne}) + (\phi_t \cdot F_u \cdot A_{g,pm}) = 391.22 \cdot \text{kip}$$

Above force required for additional anchorage required for uplift resistance for Strength Design (LRFD) - see previously instilled anchors for Strength design check. (Disregard above note if value is negative)

Job 120' Stainless Lattice Tower - New Haven, CT
Description Tower Anchor Bolts - TIA-222-G Conditions Check
MODification Anchorage

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ANCHOR BOLT ANALYSIS

Input Data

Tower Reactions:

Uplift: Uplift := 380·kips *user input*

Shear: Shear := 65·kips *user input*

Compression: Compression := 427·kips *user input*

Anchor Bolt Data:

Use ASTM A36

(actual material strength unknown therefore assume min design values)

Number of Anchor Bolts = N	$N := 6$ <i>user input</i>	MODified Anchorage - Steel Bolts	
Bolt Ultimate Strength:	$F_u := 58\text{·ksi}$ <i>user input</i>	Number of Anchor Bolts = N	$N_{M1} := 2$ <i>user input</i>
Bolt Yield Strength:	$F_y := 36\text{·ksi}$ <i>user input</i>	Bolt Ultimate Strength:	$F_{u,M1} := 150\text{·ksi}$ <i>user input</i>
Bolt Modulus:	$E := 29000\text{·ksi}$ <i>user input</i>	Bolt Yield Strength:	$F_{y,M1} := 120\text{·ksi}$ <i>user input</i>
Thickness of Anchor Bolts	$D := 1.50\text{in}$ <i>user input</i>	Bolt Modulus:	$E_{M1} := 29000\text{·ksi}$ <i>user input</i>
Threads per Inch:	$n := 6$ <i>user input</i>	Thickness of Anchor Bolts	$D_{M1} := 1.42\text{in}$ <i>user input</i>
Coefficient of Friction:	$\mu := 0.55$ <i>user input</i>	Threads per Inch:	$n_{M1} := 7$ <i>user input</i>
(for baseplate with grout ASCE 10-15)			
Length from top of pier to bottom of leveling nut:	$L_{ar} := 0\text{in}$ <i>user input</i>		
Bolt Modulus:	$E := 29000\text{·ksi}$ <i>user input</i>		

Anchor Bolt Section Properties:

Gross Area of Bolt:

$$A_{ge} := N \cdot \frac{\pi}{4} \cdot D^2 \quad A_{ge} = 10.6 \cdot \text{in}^2 \quad A_{g,pm} := N_{M1} \cdot \frac{\pi}{4} \cdot D_{M1}^2 \quad A_{g,pm} = 3.17 \cdot \text{in}^2$$

Net Area of Bolt:

$$A_{ne} := N \cdot \left[\frac{\pi}{4} \cdot \left(D - \frac{0.9743 \cdot \text{in}}{n} \right)^2 \right] \quad A_{n,pm} := N_{M1} \cdot \left[\frac{\pi}{4} \cdot \left(D_{M1} - \frac{0.9743 \cdot \text{in}}{n_{M1}} \right)^2 \right]$$

$$A_{ne} = 8.43 \cdot \text{in}^2 \quad A_{n,pm} = 2.58 \cdot \text{in}^2$$

Net Diameter:

$$D_{ne} := N \cdot \left(D - \frac{0.9743 \cdot \text{in}}{n} \right) \quad D_{ne} = 8.03 \cdot \text{in} \quad D_{n,pm} := N_{M1} \cdot \left(D_{M1} - \frac{0.9743 \cdot \text{in}}{n_{M1}} \right) \quad D_{n,pm} = 2.56 \cdot \text{in}$$

Radius of Gyration of Bolt:

$$r_e := N \cdot \frac{\left(D - \frac{0.9743 \cdot \text{in}}{n} \right)}{4} \quad r_e = 2.01 \cdot \text{in} \quad r_{pm} := N_{M1} \cdot \frac{\left(D_{M1} - \frac{0.9743 \cdot \text{in}}{n_{M1}} \right)}{4} \quad r_{pm} = 0.64 \cdot \text{in}$$

Plastic Section Modulus of Bolt:

$$Z_{xe} := N \cdot \frac{\left(D - \frac{0.9743 \cdot \text{in}}{n} \right)^3}{6} \quad Z_{xe} = 2.39 \cdot \text{in}^3 \quad Z_{x,pm} := N_{M1} \cdot \frac{\left(D_{M1} - \frac{0.9743 \cdot \text{in}}{n_{M1}} \right)^3}{6} \quad Z_{x,pm} = 0.7 \cdot \text{in}^3$$

Forces:

Tension Force:

$$T_u := \frac{\text{Uplift}}{1}$$

$$T_u = 380 \cdot \text{kip}$$

$$T_{ub} := T_u$$

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

$$\phi_f := 0.9$$

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

$$\phi_b := 0.80$$

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

$$\phi_t := 0.75 \quad \phi_{t,pm} := 0.65$$

Shear Force:

$$V_u := \frac{\text{Shear}}{1}$$

$$V_u = 65 \cdot \text{kip}$$

$$V_{ub} := V_u$$

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

$$\phi_v := 0.75 \quad \phi_{v,pm} := 0.60$$

ANSI/TIA-222-G 4.7.1 Flexural Members:

Nominal Flexure Strength, M_n :

$$M_n := F_y \cdot Z_{xc} + F_y \cdot Z_{x,pm}$$

$$M_n = 9.28 \cdot \text{ft} \cdot \text{kip}$$

$$\phi_f \cdot M_n = 8.35 \cdot \text{ft} \cdot \text{kip}$$

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

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

$$M_u = 0 \cdot \text{ft} \cdot \text{kip}$$

Flexure Check:

$$\text{FlexureCheck} := \text{if}(M_u \leq \phi_f \cdot M_n, \text{"OK"}, \text{"NO GOOD"})$$

$$\text{FlexureCheck} = \text{"OK"}$$

$$\frac{M_u}{\phi_f \cdot M_n} = 0.0\%$$

ANSI/TIA-222-G 4.9.6.1 Tensile Strength:

Design Tensile Strength, R_{nt} :

$$R_{nt} := F_u \cdot A_{ne}$$

$$R_{nt,pm} := F_u \cdot A_{n,pm}$$

$$R_{nt} = 489.03 \cdot \text{ft} \cdot \text{kip}$$

$$R_{nt,pm} = 149.46 \cdot \text{ft} \cdot \text{kip}$$

$$\phi_t \cdot R_{nt} = 366.77 \cdot \text{ft} \cdot \text{kip}$$

$$\phi_{t,pm} \cdot R_{nt,pm} = 97.15 \cdot \text{ft} \cdot \text{kip}$$

Tension Check:

$$\text{TensionCheck} := \text{if}(T_u \leq (\phi_t \cdot R_{nt} + \phi_{t,pm} \cdot R_{nt,pm}), \text{"OK"}, \text{"NO GOOD"})$$

$$\text{TensionCheck} = \text{"OK"}$$

$$\frac{T_u}{\phi_t \cdot R_{nt} + \phi_{t,pm} \cdot R_{nt,pm}} = 81.91\%$$

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

Design Shear Strength, R_{nv} :

$$R_{nv} := 0.45 \cdot F_u \cdot A_{ge}$$

$$R_{nv,pm} := 0.45 \cdot F_u \cdot A_{g,pm}$$

$$R_{nv} = 276.74 \cdot \text{ft} \cdot \text{kip}$$

$$R_{nv,pm} = 82.67 \cdot \text{ft} \cdot \text{kip}$$

$$\phi_v \cdot R_{nv} = 207.55 \cdot \text{ft} \cdot \text{kip}$$

$$\phi_{v,pm} \cdot R_{nv,pm} = 49.6 \cdot \text{ft} \cdot \text{kip}$$

Shear Check:

$$\text{ShearCheck} := \text{if}(V_u \leq (\phi_v \cdot R_{nv} + \phi_{v,pm} \cdot R_{nv,pm}), \text{"OK"}, \text{"NO GOOD"})$$

$$\text{ShearCheck} = \text{"OK"}$$

$$\frac{V_u}{\phi_v \cdot R_{nv} + \phi_{v,pm} \cdot R_{nv,pm}} = 25.28\%$$

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

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

$$\left[\frac{V_{ub}}{(\phi_v \cdot R_{nv} + \phi_{v,pm} \cdot R_{nv,pm})} \right]^2 + \left[\frac{T_{ub}}{(\phi_t \cdot R_{nt} + \phi_{t,pm} \cdot R_{nt,pm})} \right]^2 = 0.73$$

Combined Shear and Tension Check:

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

ShearAndTensionCheck = "OK"

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

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

$\eta := 0.55$

user input from ANSI/TIA-222-G 4.9.9

$$\frac{\left[T_u + \left(\frac{V_u}{\eta} \right) \right]}{(\phi_b \cdot F_u \cdot A_{ne}) + (\phi_t \cdot F_u \cdot A_{g,pm})} = 0.942$$

Capacity Check:

$$\text{CapacityCheck} := \text{if} \left[\frac{\left[T_u + \left(\frac{V_u}{\eta} \right) \right]}{(\phi_b \cdot F_u \cdot A_{ne}) + (\phi_t \cdot F_u \cdot A_{g,pm})} \leq 1, \text{"OK"}, \text{"NO GOOD"} \right]$$

CapacityCheck = "OK"

NOTE: Because the reinforcement of additional bolts are within capacity, the anchor bolts are considered to be OK for the design loads. Apply the previously calculated force that is not contained by the existing anchorage (prior to the additional anchorage modifications) with the previously installed anchorage to verify the capacity of the existing anchorage system.

$$T_u + \left(\frac{V_u}{\eta} \right) = 498.18 \cdot \text{kip}$$

$$498.1 \text{kip} - 529 \text{kip} = -30.90 \cdot \text{kip}$$

$$\phi_b \cdot F_{up} \cdot A_{ne} = \text{■} \cdot \text{kip}$$

Above force required for additional anchorage required for uplift resistance for Strength Design (LRFD) - see previously instlled anchors for Strength design check. (Disregard above note if value is negative)

$$(\phi_b \cdot F_u \cdot A_{ne}) + (\phi_t \cdot F_u \cdot A_{g,pm}) = 529 \cdot \text{kip}$$

WELDED BEAM TO LEG ANCHOR ANALYSIS

NOTE: The following calculation sheets are checking the capacity of the welded connection and anchorage for the New Haven / Hamden (CSP), CT Tower.

* From the Mathcad analysis for anchor bolts, the force required to be contained (by the additional anchors) -->

$$Des_{Uplift} := \frac{(500kip - 391.22kip)}{N_{M1}} = 54390 \cdot lbf$$

"d" arm -->

$$d := 1ft + 2in$$

* Identify Existing Conditions (Materials and Weld Length)

Yield Steel (f_y) -->

$$F_y := 50ksi$$

Modulus Steel (E) -->

$$E := 29000ksi$$

WT 10.5x31 -->

$$t_w := 0.40in$$

$$t_f := 0.615in$$

$$d_{WT} := (10.5 - t_f)in$$

Weld Length:

$$l_{weld} := 30in$$

Area (WT 8x45 Stem) -->

$$A_{stem} := t_w \cdot l_{weld} = 12 \cdot in^2$$

Section Modulus (x-axis) (Stem) -->

$$S_{stem} := \frac{t_w \cdot l_{weld}^2}{6} = 60 \cdot in^3$$

$$\sigma_{force.M} := \frac{Des_{Uplift} \cdot d}{S_{stem}} = 12691 \cdot psi$$

$$\sigma_{force.P} := \frac{Des_{Uplift}}{A_{stem}} = 4532.5 \cdot psi$$

* CHECK - Flexure in WT (AISC - LRFD Method):

* Apply AISC Chapter F - Flexure, Section F9, Equation F9-10 (governs design):

$$\theta_f := 0.90$$

$$F_{cr} := \left(1.43 - 0.515 \cdot \frac{d_{WT} + t_f}{t_w} \cdot \sqrt{\frac{F_y}{E}} \right) \cdot F_y = 41.93 \cdot ksi$$

$$M_{capacity.beam} := F_{cr} \cdot \frac{t_w \cdot l_{weld}^2}{6} \cdot \theta_f = 2264.02 \cdot kip \cdot in$$

* CHECK - Flexure in WT (AISC - LRFD Method):

$$CHECK_1 := \text{if} \left(\frac{Des_{Uplift} \cdot d}{M_{capacity.beam}} < 1.0, "OK", "No Good" \right)$$

$$\frac{Des_{Uplift} \cdot d}{M_{capacity.beam}} = 0.34$$

CHECK₁ = "OK"

* CHECK - Axial Stress in WT (AISC - LRFD Method):

$$CHECK_2 := \text{if} \left(\frac{\sigma_{force.M} + \sigma_{force.P}}{F_{cr} \cdot \theta_f} < 1.0, "OK", "No Good" \right)$$

$$\frac{\sigma_{force.M} + \sigma_{force.P}}{F_{cr} \cdot \theta_f} = 0.46$$

CHECK₂ = "OK"



Job	120' Stainless Lattice Tower - New Haven, CT	Project No.		Page	of
Description	Tower Anchor Bolts - TIA-222-G Conditions Check MODification Anchorage	Computed by	MCD	Sheet	6 of 7
		Checked by		Date	03/01/19
				Date	

* CHECK - Shear in WT (AISC - LRFD Method):

* Apply AISC Chapter G - Shear, Section G2, Equation G2-1:

$$\theta_v := 0.90$$

$$V_{cap} := 0.6 \cdot F_y \cdot A_w \cdot C_v \quad \text{--->} \quad C_v := 1.0 \quad A_w := t_w \cdot (d_{WT} - 0.630 \text{ in}) = 3.93 \cdot \text{in}^2 \quad F_y = 50 \cdot \text{ksi}$$

$$V_{cap} := \theta_v \cdot 0.6 \cdot F_y \cdot A_w \cdot C_v = 106.04 \cdot \text{kip}$$

* CHECK - Shear in WT (AISC - LRFD Method):

$$\text{CHECK}_3 := \text{if} \left(\frac{\text{DesUplift}}{V_{cap}} < 1.0, "OK", "No Good" \right)$$

$$\frac{\text{DesUplift}}{V_{cap}} = 0.51$$

CHECK₃ = "OK"

* CHECK - Shear Stress in WT (AISC - LRFD Method):

$$\text{CHECK}_4 := \text{if} \left(\frac{\sigma_{\text{force.P}}}{F_y \cdot \theta_v \cdot 0.6} < 1.0, "OK", "No Good" \right)$$

$$\frac{\sigma_{\text{force.P}}}{F_y \cdot \theta_v \cdot 0.6} = 0.17$$

CHECK₄ = "OK"

* CHECK - Combined Flexure - Shear Stress in WT (AISC - LRFD Method):

$$\text{CHECK}_5 := \text{if} \left[\frac{\sigma_{\text{force.M}} + \sigma_{\text{force.P}}}{F_{cr} \cdot \theta_f} + \frac{\sigma_{\text{force.P}}}{(F_y \cdot \theta_v \cdot 0.6)} < 1.0, "OK", "No Good" \right] \frac{\sigma_{\text{force.M}} + \sigma_{\text{force.P}}}{F_{cr} \cdot \theta_f} + \frac{\sigma_{\text{force.P}}}{(F_y \cdot \theta_v \cdot 0.6)} = 0.62$$

CHECK₅ = "OK"

* CHECK - Combined Flexure - Shear Force in WT (AISC - LRFD Method):

$$\text{CHECK}_6 := \text{if} \left(\frac{\text{DesUplift} \cdot d}{M_{\text{capacity.beam}}} + \frac{\text{DesUplift}}{V_{cap}} < 1.0, "OK", "No Good" \right)$$

$$\frac{\text{DesUplift} \cdot d}{M_{\text{capacity.beam}}} + \frac{\text{DesUplift}}{V_{cap}} = 0.85$$

CHECK₆ = "OK"

Job 120' Stainless Lattice Tower - New Haven, CT
 Description Tower Anchor Bolts - TIA-222-G Conditions Check
MODification Anchorage

Project No. _____
 Computed by MCD
 Checked by _____

* CHECK - Weld in WT (AISC - LRFD Method):

$$t_{\text{weld}} := \frac{3}{8} \text{ in}$$

$$F_{Y\text{Electrode}} := 70 \text{ ksi}$$

$$\theta_{\text{weld}} := 0.75$$

$$S_{x,\text{weld}} := 2 \cdot \frac{t_{\text{weld}} \cdot \left(l_{\text{weld}} - \frac{9}{16} \text{ in} \right)^2}{6} = 108.32 \cdot \text{in}^3$$

* Moment Induced into Weld (AISC - LRFD Method):

$$M_{\text{applied}} := \text{DesUplift} \cdot d = 761.46 \cdot \text{kip} \cdot \text{in}$$

* Stress Caused by Moment on Weld (AISC - LRFD Method):

$$\sigma_{\text{applied.M}} := \frac{M_{\text{applied}}}{S_{x,\text{weld}}} = 7.03 \cdot \text{ksi}$$

* Stress Capacity in Weld (AISC - LRFD Method):

$$\sigma_{\text{weld}} := F_{Y\text{Electrode}} \cdot 0.6 \cdot \theta_{\text{weld}} = 31.5 \cdot \text{ksi}$$

* CHECK - Stress in Weld on WT - Moment Induced (AISC - LRFD Method):

$$\text{CHECK}_7 := \text{if} \left(\frac{\sigma_{\text{applied.M}}}{\sigma_{\text{weld}}} < 1.0, \text{"OK"}, \text{"No Good"} \right)$$

$$\frac{\sigma_{\text{applied.M}}}{\sigma_{\text{weld}}} = 0.22$$

CHECK₇ = "OK"

* CHECK - Stress in Weld on WT - Shear Induced (AISC - LRFD Method):

$$\text{CHECK}_8 := \text{if} \left(\frac{\frac{\text{DesUplift}}{A_w}}{\sigma_{\text{weld}}} < 1.0, \text{"OK"}, \text{"No Good"} \right)$$

$$\frac{\frac{\text{DesUplift}}{A_w}}{\sigma_{\text{weld}}} = 0.44$$

CHECK₈ = "OK"

* CHECK - Combined Flexure - Shear Stress Force in Weld on WT (AISC - LRFD Method):

$$\text{CHECK}_9 := \text{if} \left(\frac{\frac{\text{DesUplift}}{A_w}}{\sigma_{\text{weld}}} + \frac{\sigma_{\text{applied.M}}}{\sigma_{\text{weld}}} < 1.0, \text{"OK"}, \text{"No Good"} \right)$$

$$\frac{\frac{\text{DesUplift}}{A_w}}{\sigma_{\text{weld}}} + \frac{\sigma_{\text{applied.M}}}{\sigma_{\text{weld}}} = 0.66$$

CHECK₉ = "OK"

FOUNDATION ANALYSIS

FOUNDATION CHECK

INPUT DATA

Factored Max Pier Reactions:

Uplift: Uplift := 380 kips
 Shear: Shear := 65 kips
 Compression: Compression := 427 kips

Foundation Structure

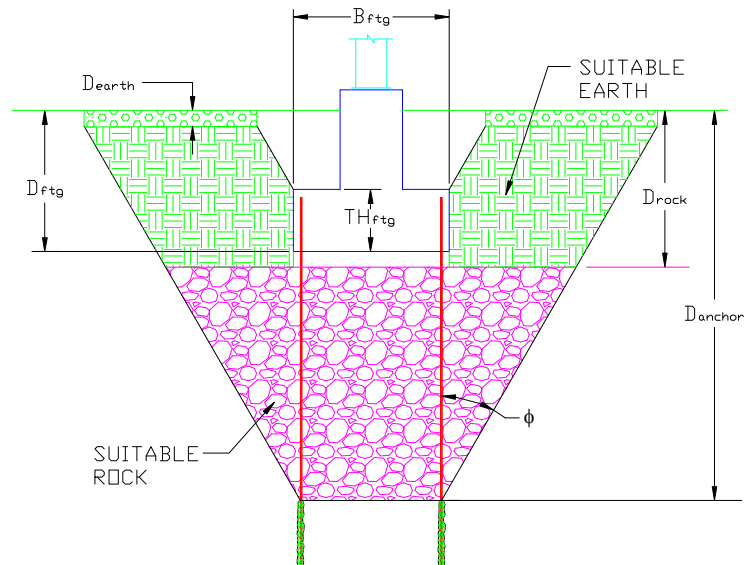
Footing Width: $B_{ftg} := 6\text{ft}$
 Footing Length: $L_{ftg} := 6\text{ft}$
 Footing Thickness: $TH_{ftg} := 2.5\text{ft}$

Depths:

Depth to Bottom of Footing: $D_{ftg} := 3.50\text{ft}$
 (from grade line)
 Depth to Suitable Rock: $D_{rock} := 2.5\text{ft}$
 (from grade line)
 Depth to Suitable Earth: $D_{earth} := 1\text{ft}$
 (from grade line)
 Anchor Depth: $D_{anchor} := 24.5\text{ft}$

Soil Properties:

Internal Friction Angle: $\phi := 30\text{deg}$
 Unit Weight of Earth: $\gamma_{earth} := 120 \frac{\text{lb}}{\text{ft}^3}$
 Unit Weight of Rock: $\gamma_{rock} := 165 \frac{\text{lb}}{\text{ft}^3}$
 Allowable Bearing: Bearing := 11500 psf
 Ultimate Bearing: $U_{Bearing} := 2 \cdot \text{Bearing}$



$$DL_{foot} := \left[(B_{ftg} \cdot L_{ftg} \cdot TH_{ftg}) + \left[\frac{\pi}{4} \cdot (2\text{ft})^2 \cdot 2.0\text{ft} \right] \cdot 0.150 \frac{\text{kips}}{\text{ft}^3} \right]$$

$$DL_{foot} = 14442.48\text{lb}$$

$$DL_{Soil} := \left[B_{ftg} \cdot L_{ftg} \cdot D_{earth} - \left[\frac{\pi}{4} \cdot (3\text{ft})^2 \cdot D_{earth} \right] + \left[\frac{1}{2} \cdot (1.5\text{ft}) \cdot \tan(\phi) \cdot (1.5\text{ft}) \cdot 4 \cdot B_{ftg} \right] \right] \cdot \gamma_{earth}$$

$$DL_{Soil} = 5342.38\text{lb}$$

Job	120' Stainless Lattice Tower - New Haven, CT	Project No.	Sheet 2 of 3
Description	Foundation with Rock Anchors - TIA-222-G Check	Computed by MCD	Date 04/09/20
	Structural Analysis (after Tower Modification)	Checked by	Date

Anchors:

Number of Anchors (along width):	$NW_{\text{anchor}} := 2$	Number of Anchors (along length):	$NL_{\text{anchor}} := 2$
Anchor Spacing* (along width):	$SW_{\text{anchor}} := 3\text{ ft}$	Anchor Spacing* (along length):	$SL_{\text{anchor}} := 3\text{ ft}$
Hole Diameter:	$hole_d := 2.5\text{ in}$	Ultimate Bond Stress:	$\sigma_{\text{bond}} := 200\text{ psi}$

NOTE: Ultimate Bond Stress is 2x allowable per TIA-222-G, Section 9.

Ultimate Bond Stress:

$$P_{\text{design}} := \frac{\text{Uplift} - [0.9 \cdot (DL_{\text{foot}} + DL_{\text{Soil}})]}{NW_{\text{anchor}} + NL_{\text{anchor}}}$$

$$\sigma_{\text{Work.bond}} := \frac{\sigma_{\text{bond}}}{2}$$

$$P_{\text{design}} = 90.55 \cdot \text{kips}$$

CALCULATE RESISTANCE

Intermediate Dimensions:

Suitable Earth Height:	$H := D_{\text{rock}} - D_{\text{earth}}$	$H = 1.50\text{ ft}$
Suitable Rock Height:	$Z := D_{\text{anchor}} - D_{\text{earth}} - D_{\text{rock}}$	$Z = 21.00\text{ ft}$
Total Anchor Width:	$W := (NW_{\text{anchor}} - 1) \cdot SW_{\text{anchor}}$	$W = 3.00\text{ ft}$
Total Anchor Length:	$L := (NL_{\text{anchor}} - 1) \cdot SL_{\text{anchor}}$	$L = 3.00\text{ ft}$
Earth Above Footing:	$PD := D_{\text{ftg}} - TH_{\text{ftg}} + 6\text{ in}$	$PD = 1.50\text{ ft}$

Volumes:

Gross Volume:

$$GV_1 := W \cdot L \cdot (Z + H) \quad GV_1 = 202.50 \cdot \text{ft}^3$$

$$GV_2 := \left[\frac{1}{2} \cdot (Z + H) \cdot \tan(\phi) \cdot (Z + H) \right] \cdot (W + L) \cdot 2 \quad GV_2 = 1753.70 \cdot \text{ft}^3$$

$$GV_3 := \frac{1}{3} \cdot \pi \cdot [(Z + H) \cdot \tan(\phi)]^2 \cdot (Z + H) \quad GV_3 = 3976.08 \cdot \text{ft}^3$$

$$GV := GV_1 + GV_2 + GV_3 \quad GV = 5932.28 \cdot \text{ft}^3$$

Rock Volume:

$$RV_1 := W \cdot L \cdot (Z) \quad RV_1 = 189.00 \cdot \text{ft}^3$$

$$RV_2 := \left[\frac{1}{2} \cdot (Z) \cdot \tan(\phi) \cdot (Z) \right] \cdot (W + L) \cdot 2 \quad RV_2 = 1527.67 \cdot \text{ft}^3$$

$$RV_3 := \frac{1}{3} \cdot \pi \cdot [(Z) \cdot \tan(\phi)]^2 \cdot (Z) \quad RV_3 = 3232.70 \cdot \text{ft}^3$$

$$RV := RV_1 + RV_2 + RV_3 \quad RV = 4949.37 \cdot \text{ft}^3$$

Volume of Neglect Above Footing:

$$NV_1 := B_{\text{ftg}} \cdot L_{\text{ftg}} \cdot H - \frac{\pi}{4} \cdot (3\text{ ft})^2 \cdot H \quad NV_1 = 43.40 \cdot \text{ft}^3$$

$$NV_2 := \left[\frac{1}{2} \cdot (PD) \cdot \tan(\phi) \cdot (PD) \right] \cdot (B_{\text{ftg}} + L_{\text{ftg}}) \cdot 2 \quad NV_2 = 15.59 \cdot \text{ft}^3$$

$$NV_3 := \frac{1}{3} \cdot \pi \cdot [(PD) \cdot \tan(\phi)]^2 \cdot (PD) \quad NV_3 = 1.18 \cdot \text{ft}^3$$

$$NV := NV_1 + NV_2 + NV_3 \quad NV = 60.16 \cdot \text{ft}^3$$

Total Suitable Earth Volume:

$$EV := GV - RV - NV \quad EV = 922.75 \cdot \text{ft}^3$$

Job 120' Stainless Lattice Tower - New Haven, CT
 Description Foundation with Rock Anchors - TIA-222-G Check
Structural Analysis (after Tower MODification)

Project No. _____
 Computed by MCD
 Checked by _____

Resisting Forces:

Resisting Rock Force:	$F_{\text{rock}} := RV \cdot \gamma_{\text{rock}}$	$F_{\text{rock}} = 816.65 \cdot \text{kips}$
Resisting Earth Force:	$F_{\text{earth}} := EV \cdot \gamma_{\text{earth}}$	$F_{\text{earth}} = 110.73 \cdot \text{kips}$
Total Resisting Force:	$F_{\text{total}} := (F_{\text{rock}} + F_{\text{earth}}) \cdot 0.9$	$F_{\text{total}} = 834.64 \cdot \text{kips}$

*NOTE: "0.9" is TIA-222-G
Reducing factor for uplift
resistance (LC2)*

Check Uplift:

$$\text{Condition1} := \text{if} \left(\frac{\text{Uplift}}{F_{\text{total}} \cdot 0.75} \leq 1.00, "OK", "Overstressed" \right) \quad \frac{\text{Uplift}}{F_{\text{total}} \cdot 0.75} = 0.61 \quad \boxed{\text{Condition1} = "OK"}$$

Embedment Length:

$$L_b := \frac{P_{\text{design}}}{\pi \cdot \text{hole}_d \cdot \sigma_{\text{Work.bond}} \cdot 0.60} \quad L_b = 16.01 \text{ ft}$$

*NOTE: "0.60" reduction factor from TIA-222-G for
uplift resistance for Rock Anchor*

$$\text{Condition2} := \text{if} \left(\frac{L_b}{Z} \leq 1.00, "OK", "Overstressed" \right) \quad \frac{L_b}{Z} = 0.76 \quad \boxed{\text{Condition2} = "OK"}$$

Check Bearing:

$$\text{MaxBearing} := \frac{\text{Compression} + 1.2 \cdot DL_{\text{foot}}}{B_{\text{ftg}} \cdot L_{\text{ftg}}} \quad \text{MaxBearing} = 12342.53 \cdot \text{psf}$$

$$\text{Condition3} := \text{if} \left(\frac{\text{MaxBearing}}{U_{\text{Bearing}} \cdot 0.75} \leq 1.00, "OK", "Overstressed" \right)$$

*NOTE: "0.75" is TIA-222-G
Reducing factor for bearing
resistance*

$$\frac{\text{MaxBearing}}{U_{\text{Bearing}} \cdot 0.75} = 0.7155 \quad \boxed{\text{Condition3} = "OK"}$$

GEOTECHNICAL STUDY

WELTI GEOTECHNICAL, P.C.

Formerly Dr. Clarence Welti, PE. PC.

227 Williams Street · P.O. Box 397
Glastonbury, CT 06033-0397

(860) 633-4623 / FAX (860) 657-2514

August 13, 2018

Mr. Ignacio C. Artaiz
AECOM
500 Enterprise Drive, Suite 3B
Rocky Hill, CT 06067

**Ref: Geotechnical Review of Existing State Police Communications Tower #27
West Rock, New Haven, CT**

Dear Naish:

1.0 The existing tower foundation plan notes from Stainless, Inc. dated 12/9/93 indicate that the foundation design was based on a geotechnical assessment by Dr. Clarence Welti, P.E., P.C. (CWPEPC) dated 12/29/93. The foundation plan and notes and foundation design calculations dated 11/16/93 have been reviewed and for conformance with the recommendations in the geotechnical report and to evaluate the adequacy of existing lattice tower foundation with an increase in loading on the structure.

2.0 The geotechnical assessment by CWPEPC dated 12/29/93 was based on boring B-4 which encountered hard Basalt bedrock at 1.5 feet below the ground surface. The report recommended that the foundations be placed at least 2 feet into the bedrock to resist shear loading and that rock anchors be used to resist uplift. The recommended foundation design parameters were as follows.

Parameter	Value
Allowable Bearing on Hard Bedrock	40 Tons/sf
Allowable Lateral Loading on Hard Bedrock	20 Kips/sf
Allowable Cement/Rock Bond Value for the design of rock anchors	100 psi
Friction between Rock and Concrete Foundation	0.70

3.0 The foundation plans and notes by Stainless Inc. dated 12/9/1993 (with revisions to 7/5/94) show the tower foundation design includes a lattice tower with three legs, spaced at 21 feet apart, supported on individual piers and footings. Each of the footings is set a minimum 2'-6" into the bedrock with 4 rock anchors installed to a minimum 20 feet into the bedrock. The plan notes indicated that one anchor from each foundation should be proof tested to 85 Kips and that the foundation design is based on a maximum bearing pressure of 11,500 psf. The rock anchors are 1" dia. (150 ksi) bars with an allowable design loading of 76.5 Kips (0.65Fy).

3.1 The foundation design calculations indicate that the tension load on the anchors was up to 74.12 Kips/anchor and the maximum cement/rock bond stress was up to 39.3 psi. If additional resistance to up lift is needed to address new loading or code requirements, additional anchors or concrete weight would be required.

4.0 This report has been prepared for specific application to the subject project in accordance with generally accepted soil and foundation engineering practices. No other warranty, express or implied, is made. In the event that any changes in the nature, design and location of structures are planned, the conclusions and recommendations contained in this report should not be considered valid unless the changes are reviewed and conclusions of this report modified or verified in writing.

The analyses and recommendations submitted in this report are based in part upon data obtained from referenced explorations. The extent of variations between explorations may not become evident until construction. If variations then appear evident, it will be necessary to re-evaluate the recommendations of this report.

Welti Geotechnical, P.C., should perform a general review of the final design and specifications in order that geotechnical design recommendations may be properly interpreted and implemented as they were intended.

If you have any questions please call me.

Very truly yours,

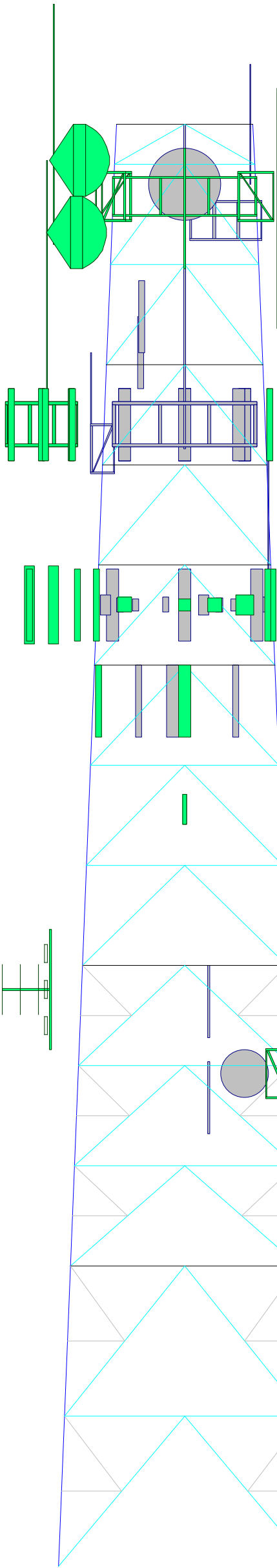
A handwritten signature in dark ink, appearing to read "Max Welti", written in a cursive style.

Max Welti, P. E.

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

Section	T9	T8	T7	T6	T5	T4	T3	T2	T1
Legs	P6.875x.400	P.5x.400	P5x.375			P.5x.250			
Leg Grade						A500-50			
Diagonals	2L13 1/2x3 1/2x3/8x3/8	2L3x3x3/8x3/8	2L3x3x5/16x3/8	2L2 1/2x2x3/8x3/8	2L2 1/2x2 1/2x1/4x3/8		2L2 1/2x2x3/16x3/8		
Diagonal Grade		A572-60		A529-50		A36			
Top Girts	L4x4x3/8	L3 1/2x3 1/2x5/16	L4x4x5/16	L3x3x5/16	L3x3x1/4	A529-50	N.A.	A	
Horizontals	L4x4x3/8						L2 1/2x2 1/2x3/16	N.A.	
Red. Horizontals		L2 1/2x2 1/2x1/4							
Red. Diagonals		L2 1/2x2 1/2x1/4							
Inner Bracing									
Face Width (ft)	21.0188	19.0179		15.0162	13.6822	13.0153	12.3483	11.6814	11.4146
# Panels @ (ft)	2 @ 12.5			11 @ 8.33333					B
Weight (K)	24.8			6.9				0.8	0.5

120.0 ft
116.7 ft
108.3 ft
100.0 ft
91.7 ft
83.3 ft
75.0 ft
50.0 ft
25.0 ft
0.0 ft



MARK	SIZE	MARK	SIZE
A	L2 1/2x2 1/2x3/16	B	1 @ 3.33333

GRADE	Fy	Fu	GRADE	Fy	Fu
A500-50	50 ksi	62 ksi	A529-50	50 ksi	65 ksi
A36	36 ksi	58 ksi	A572-60	60 ksi	75 ksi

TOWER DESIGN NOTES

- Tower designed for a 90 mph basic wind in accordance with the TIA/EIA-222-F Standard.
- Tower is also designed for a 90 mph basic wind with 0.50 in ice.
- Deflections are based upon a 90 mph wind.
- Antenna/Mount/Cable's marked (# ##) refer to site tower climb identification numbers. Tower climb by D and K Nationwide Communications, Inc. (March 30, 2016).
- Antenna/Mount/Cable's marked (CSP-#) refer to Connecticut State Police inventory obtained via e-mail dated April 8, 2016.
- TOWER RATING: 81.8%
SHEAR 66 K
MOMENT 4496 kip-ft
TORQUE 179 kip-ft
90 mph WIND - 0.5000 in ICE
AXIAL 43 K
SHEAR 50 K
MOMENT 3552 kip-ft
TORQUE 99 kip-ft
REACTIONS - 90 mph WIND

AECOM 500 Enterprise Drive, Suite 3B Rocky Hill, CT Phone: 860-263-5800 FAX: 860-812-2094	Job: 120' Self-Supporting Lattice Tower Project: New Haven, CT (West Rock) - DESPP/CSP Load Conditions Client: SMK-003 / ASM-010 / NSS-044 / (AT&T) / (Sprint) / (T-Mobile) Code: TIA/EIA-222-F Path: P:\Projects\Telcom\Structural\By Location\Connected\NewHaven\CSP#2708_Inv\Updates\80MMORTIA-222-F\ToS_MOD_CSP#27.en	Drawn by: MCD Date: 04/09/20 App'd: NTS Dwg No. E-1
--	--	--

SYMBOL LIST

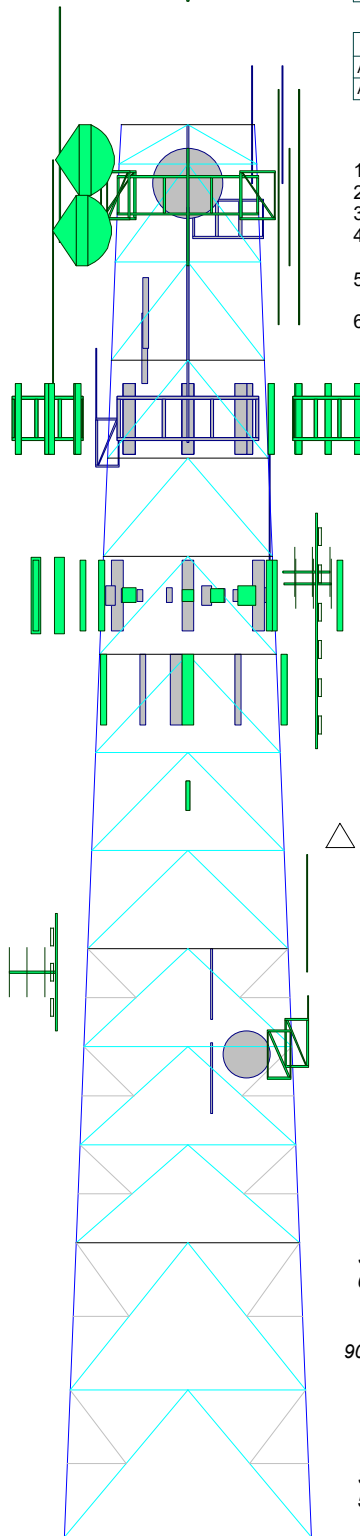
MARK	SIZE	MARK	SIZE
A	2L2 1/2x2x3/8x3/8	C	1 @ 3.33333
B	L2 1/2x2 1/2x3/16		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A500-50	50 ksi	62 ksi	A529-50	50 ksi	65 ksi
A36	36 ksi	58 ksi	A572-60	60 ksi	75 ksi

TOWER DESIGN NOTES

1. Tower designed for a 90 mph basic wind in accordance with the TIA/EIA-222-F Standard.
2. Tower is also designed for a 90 mph basic wind with 0.50 in ice.
3. Deflections are based upon a 90 mph wind.
4. Antenna/Mount/Cable's marked (# ##) refer to site tower climb identification numbers. Tower climb by D and K Nationwide Communications, Inc. (March 30, 2016).
5. Antenna/Mount/Cable's marked (CSP-#) refer to Connecticut State Police inventory obtained via e-mail dated April 8, 2016.
6. TOWER RATING: 81.8%



MAX. CORNER REACTIONS AT BASE:

DOWN: 269 K
SHEAR: 37 K

UPLIFT: -217 K
SHEAR: 33 K

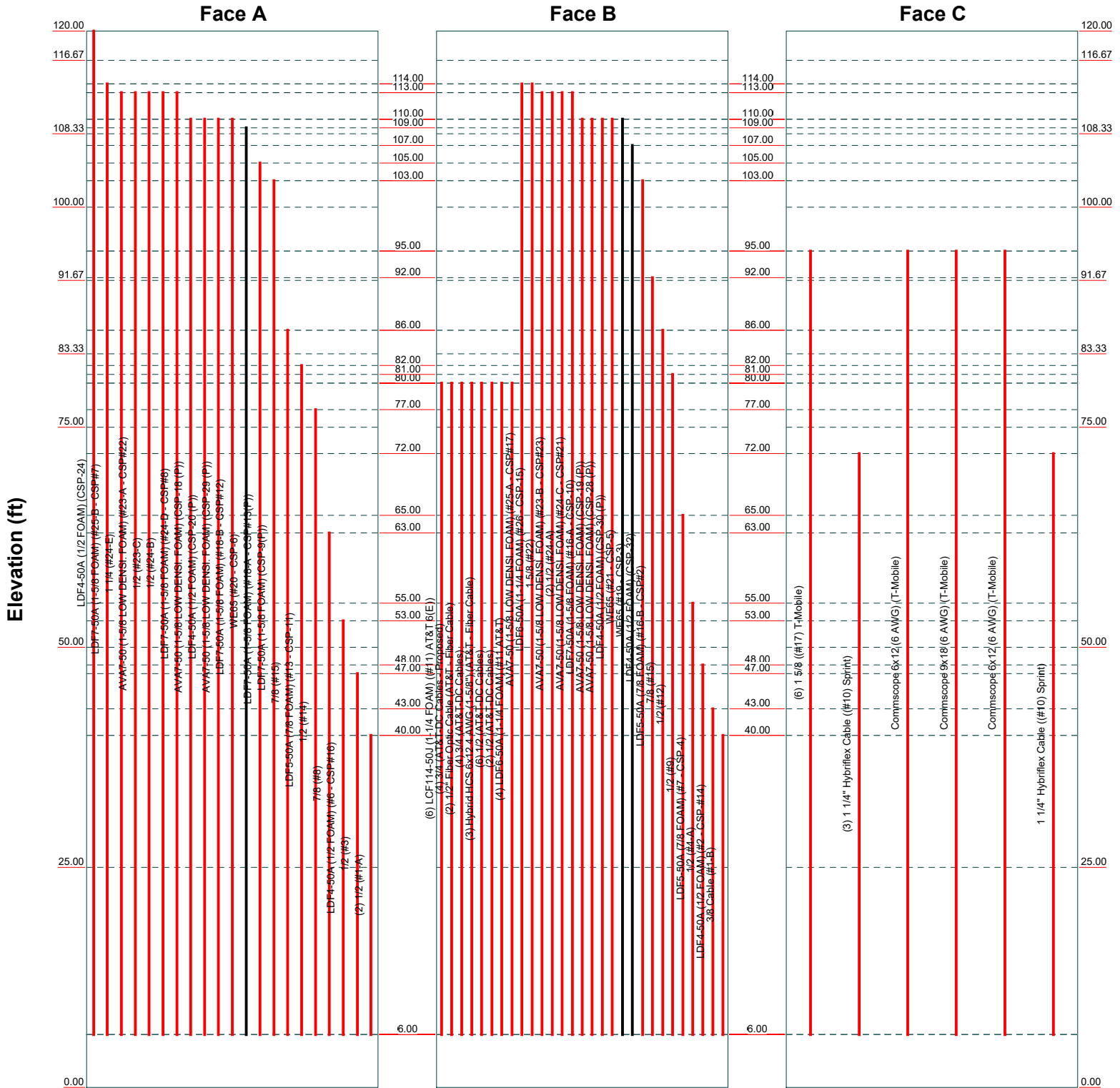
AXIAL
66 K
SHEAR
66 K
MOMENT
4496 kip-ft
TORQUE 179 kip-ft
90 mph WIND - 0.5000 in ICE

AXIAL
43 K
SHEAR
50 K
MOMENT
3552 kip-ft
TORQUE 99 kip-ft
REACTIONS - 90 mph WIND

AECOM
500 Enterprise Drive, Suite 3B
Rocky Hill, CT
Phone: 860-263-5800
FAX: 860-812-2094

Job: **120' Self-Supporting Lattice Tower**
Project: **New Haven, CT (West Rock) - DESPP/CSP Load Conditions**
Client: **SMK-003 / ASM-010 / NSS-044 / (AT&T) / (Sprint) / (T-Mobile)**
Code: **TIA/EIA-222-F**
Path: **P:\Projects\Telcel\Structural\Location\Connecticut\NewHaven\CSP\2708_104\Update\DESPP\TIA-222-F\108_MCD_CSP\2708_104.dwg**
Drawn by: **MCD**
Date: **04/09/20**
App'd: **NTS**
Scale: **NTS**
Dwg No. **E-1**

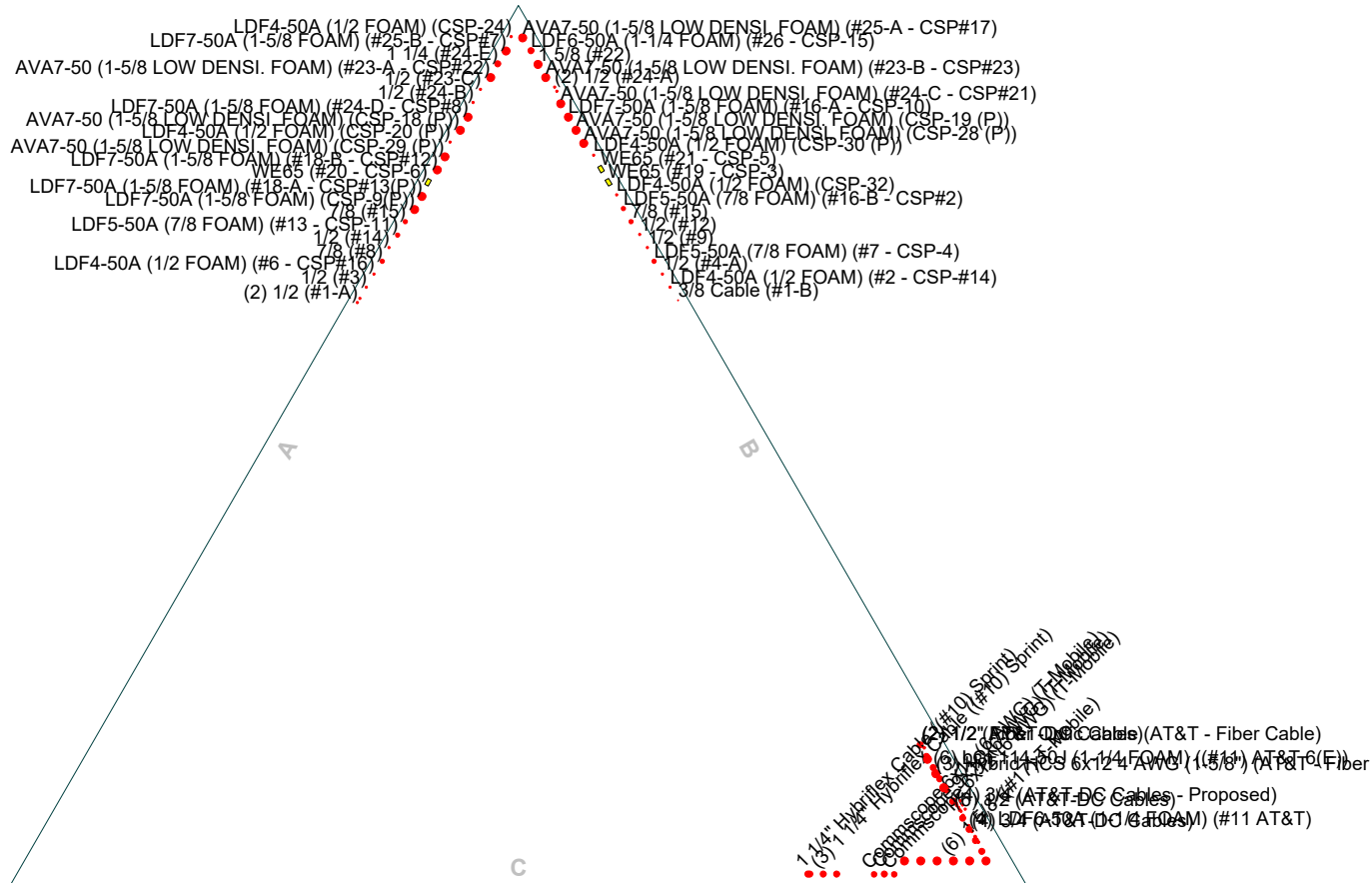
0' - 120'



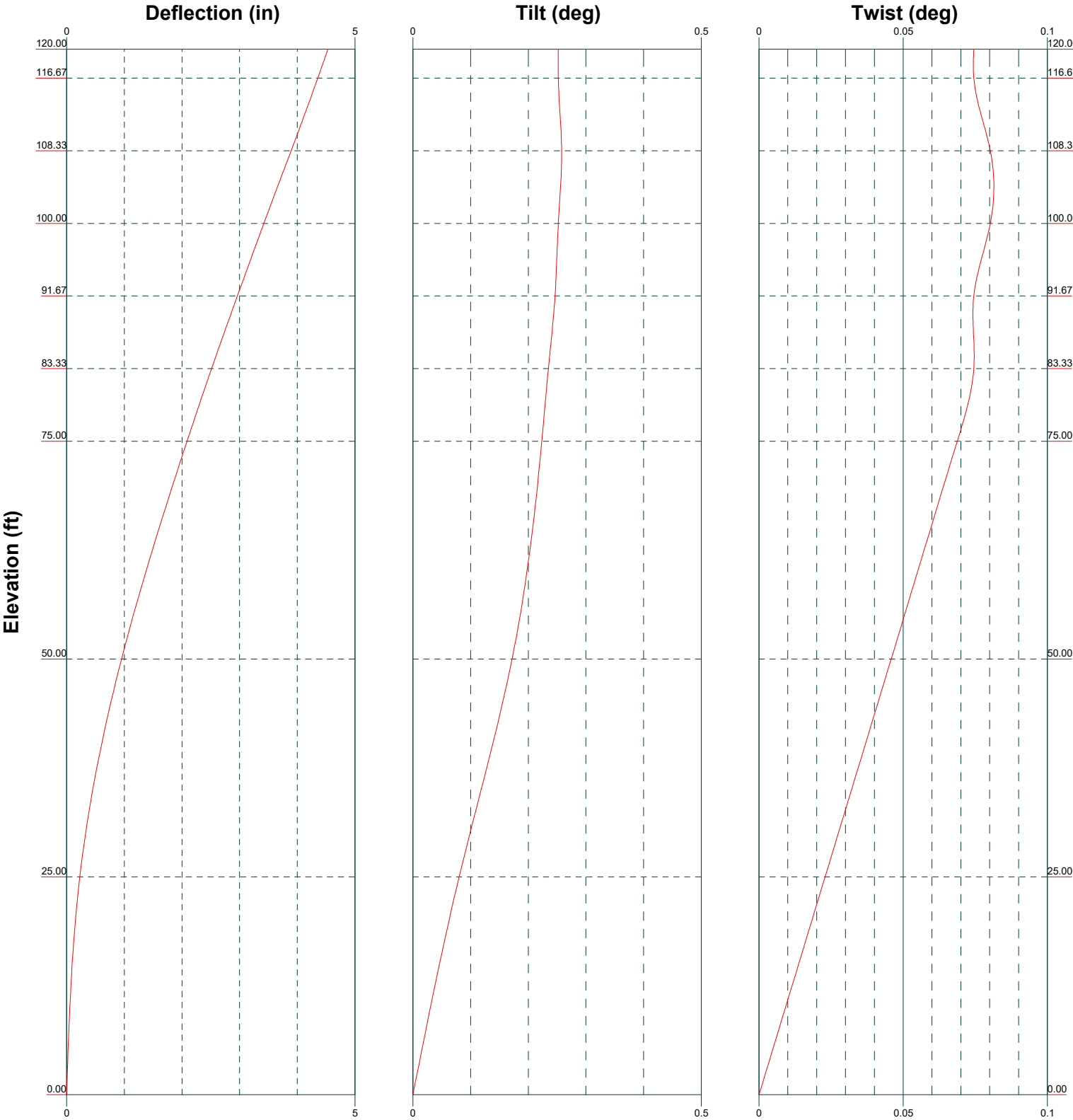
Job: 120' Self-Supporting Lattice Tower			
Project: New Haven, CT (West Rock) - DESPP/CSP Load Conditions			
Client: SMK-003 / ASM-010 / NSS-044 / (AT&T) / (Sprint) / (T-Mobile)	Drawn by: MCD	App'd:	
Code: TIA/EIA-222-F	Date: 04/09/20	Scale: NTS	
Path:			Dwg No. E-7
P:\Projects\Telcom\Sheets\at&t\c0n\Connect\NewHaven\CS976728.mxd In:Location:R99MCD\TIA-222-F\0_MCD_CS976728.mxd			

Feed Line Plan

Round Flat App In Face App Out Face



AECON 500 Enterprise Drive, Suite 3B Rocky Hill, CT Phone: 860-263-5800 FAX: 860-812-2094		Job: 120' Self-Supporting Lattice Tower Project: New Haven, CT (West Rock) - DESPP/CSP Load Conditions Client: SMK-003 / ASM-010 / NSS-044 / (AT&T) / (Sprint) / (T-Mobile) Code: TIA/EIA-222-F Path: P:\Projects\Telcom\Structural\Location\Connecticut\NewHaven\CSP222-F\04_Update\DESPP\TIA-222-F\108_MOD_CSP222-F.dwg	
Drawn by: MCD Date: 04/09/20		App'd: Scale: NTS Dwg No. E-7	



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	Client SMK-003 / ASM-010 / NSS-044 / (AT&T) / (Sprint) / (T-Mobile)	Designed by MCD

Tower Input Data

The main tower is a 3x free standing tower with an overall height of 120.00 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 11.41 ft at the top and 21.02 ft at the base.

This tower is designed using the TIA/EIA-222-F standard.

The following design criteria apply:

Basic wind speed of 90 mph.

Nominal ice thickness of 0.5000 in.

Ice density of 56 pcf.

A wind speed of 90 mph is used in combination with ice.

Temperature drop of 50 °F.

Deflections calculated using a wind speed of 90 mph.

Antenna/Mount/Cable's marked (# ##) refer to site tower climb identification numbers. Tower climb by D and K Nationwide Communications, Inc. (March 30, 2016)..

Antenna/Mount/Cable's marked (CSP-#) refer to Connecticut State Police inventory obtained via e-mail dated April 8, 2016..

A non-linear (P-delta) analysis was used.

Pressures are calculated at each section.

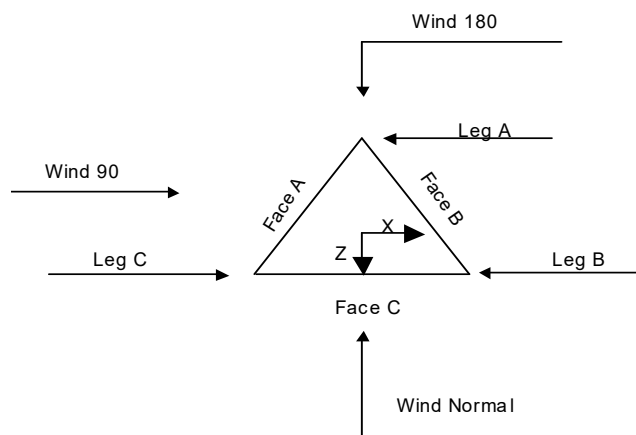
Stress ratio used in tower member design is 1.333.

Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

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

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Triangular Tower

Tower Section Geometry

Tower Section	Tower Elevation	Assembly Database	Description	Section Width	Number of Sections	Section Length
	<i>ft</i>			<i>ft</i>		<i>ft</i>
T1	120.00-116.67			11.41	1	3.33
T2	116.67-108.33			11.68	1	8.33
T3	108.33-100.00			12.35	1	8.33
T4	100.00-91.67			13.02	1	8.33
T5	91.67-83.33			13.68	1	8.33
T6	83.33-75.00			14.35	1	8.33
T7	75.00-50.00			15.02	1	25.00
T8	50.00-25.00			17.02	1	25.00
T9	25.00-0.00			19.02	1	25.00

Tower Section Geometry (cont'd)

Tower Section	Tower Elevation	Diagonal Spacing	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset	Bottom Girt Offset
	<i>ft</i>	<i>ft</i>				<i>in</i>	<i>in</i>
T1	120.00-116.67	3.33	K Brace Down	No	Yes	0.0000	0.0000
T2	116.67-108.33	8.33	K Brace Down	No	Yes	0.0000	0.0000
T3	108.33-100.00	8.33	K Brace Down	No	Yes	0.0000	0.0000
T4	100.00-91.67	8.33	K Brace Down	No	Yes	0.0000	0.0000
T5	91.67-83.33	8.33	K Brace Down	No	Yes	0.0000	0.0000
T6	83.33-75.00	8.33	K Brace Down	No	Yes	0.0000	0.0000

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<i>Tower Section</i>	<i>Tower Elevation</i>	<i>Diagonal Spacing</i>	<i>Bracing Type</i>	<i>Has K Brace End Panels</i>	<i>Has Horizontals</i>	<i>Top Girt Offset</i>	<i>Bottom Girt Offset</i>
	<i>ft</i>	<i>ft</i>				<i>in</i>	<i>in</i>
T7	75.00-50.00	8.33	K Brace Down	No	Yes	0.0000	0.0000
T8	50.00-25.00	8.33	K1 Down	No	Yes	0.0000	0.0000
T9	25.00-0.00	12.50	K1 Down	No	Yes	0.0000	0.0000

Tower Section Geometry (cont'd)

<i>Tower Elevation</i>	<i>Leg Type</i>	<i>Leg Size</i>	<i>Leg Grade</i>	<i>Diagonal Type</i>	<i>Diagonal Size</i>	<i>Diagonal Grade</i>
<i>ft</i>						
T1 120.00-116.67	Pipe	P.5x.250	A500-50 (50 ksi)	Double Angle	2L2 1/2x2x3/16x3/8	A36 (36 ksi)
T2 116.67-108.33	Pipe	P.5x.250	A500-50 (50 ksi)	Double Angle	2L2 1/2x2x3/16x3/8	A36 (36 ksi)
T3 108.33-100.00	Pipe	P.5x.250	A500-50 (50 ksi)	Double Angle	2L2 1/2x2x3/16x3/8	A36 (36 ksi)
T4 100.00-91.67	Pipe	P.5x.250	A500-50 (50 ksi)	Double Angle	2L2 1/2x2 1/2x1/4x3/8	A36 (36 ksi)
T5 91.67-83.33	Pipe	P.5x.250	A500-50 (50 ksi)	Double Equal Angle	2L2 1/2x2 1/2x1/4x3/8	A529-50 (50 ksi)
T6 83.33-75.00	Pipe	P.5x.250	A500-50 (50 ksi)	Double Angle	2L2 1/2x2x3/8x3/8	A36 (36 ksi)
T7 75.00-50.00	Pipe	P5x.375	A500-50 (50 ksi)	Double Equal Angle	2L3x3x5/16x3/8	A529-50 (50 ksi)
T8 50.00-25.00	Pipe	P.5x.400	A572-60 (60 ksi)	Double Equal Angle	2L3x3x3/8x3/8	A529-50 (50 ksi)
T9 25.00-0.00	Pipe	P6.875x.400	A572-60 (60 ksi)	Double Equal Angle	2L3 1/2x3 1/2x3/8x3/8	A529-50 (50 ksi)

Tower Section Geometry (cont'd)

<i>Tower Elevation</i>	<i>Top Girt Type</i>	<i>Top Girt Size</i>	<i>Top Girt Grade</i>	<i>Bottom Girt Type</i>	<i>Bottom Girt Size</i>	<i>Bottom Girt Grade</i>
<i>ft</i>						
T1 120.00-116.67	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)	Solid Round		A36 (36 ksi)
T4 100.00-91.67	Single Angle	L3x3x1/4	A36 (36 ksi)	Solid Round		A36 (36 ksi)
T5 91.67-83.33	Single Angle	L3x3x1/4	A36 (36 ksi)	Solid Round		A36 (36 ksi)
T6 83.33-75.00	Single Angle	L3x3x1/4	A36 (36 ksi)	Solid Round		A36 (36 ksi)
T7 75.00-50.00	Equal Angle	L3x3x5/16	A529-50 (50 ksi)	Solid Round		A36 (36 ksi)
T8 50.00-25.00	Equal Angle	L3 1/2x3 1/2x5/16	A529-50 (50 ksi)	Solid Round		A36 (36 ksi)
T9 25.00-0.00	Equal Angle	L4x4x3/8	A529-50 (50 ksi)	Solid Round		A36 (36 ksi)

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Tower Section Geometry (cont'd)

Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
T1 120.00-116.67	None	Flat Bar		A36 (36 ksi)	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T2 116.67-108.33	None	Flat Bar		A36 (36 ksi)	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T3 108.33-100.00	None	Flat Bar		A36 (36 ksi)	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T4 100.00-91.67	None	Flat Bar		A36 (36 ksi)	Single Angle	L3x3x1/4	A36 (36 ksi)
T5 91.67-83.33	None	Flat Bar		A36 (36 ksi)	Single Angle	L3x3x1/4	A36 (36 ksi)
T6 83.33-75.00	None	Flat Bar		A36 (36 ksi)	Single Angle	L3x3x1/4	A36 (36 ksi)
T7 75.00-50.00	None	Flat Bar		A36 (36 ksi)	Equal Angle	L3 1/2x3 1/2x1/4	A529-50 (50 ksi)
T8 50.00-25.00	None	Flat Bar		A36 (36 ksi)	Equal Angle	L4x4x5/16	A529-50 (50 ksi)
T9 25.00-0.00	None	Flat Bar		A36 (36 ksi)	Equal Angle	L4x4x3/8	A529-50 (50 ksi)

Tower Section Geometry (cont'd)

Tower Elevation ft	Secondary Horizontal Type	Secondary Horizontal Size	Secondary Horizontal Grade	Inner Bracing Type	Inner Bracing Size	Inner Bracing Grade
T4 100.00-91.67	Solid Round		A572-50 (50 ksi)	Single Angle	L2 1/2x2x3/16	A36 (36 ksi)
T5 91.67-83.33	Solid Round		A572-50 (50 ksi)	Single Angle	L2 1/2x2x3/16	A36 (36 ksi)
T6 83.33-75.00	Solid Round		A572-50 (50 ksi)	Single Angle	L2 1/2x2x3/16	A36 (36 ksi)
T7 75.00-50.00	Solid Round		A572-50 (50 ksi)	Single Angle	L2 1/2x2x3/16	A36 (36 ksi)
T8 50.00-25.00	Solid Round		A572-50 (50 ksi)	Single Angle	L2 1/2x2x3/16	A36 (36 ksi)
T9 25.00-0.00	Solid Round		A572-50 (50 ksi)	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)

Tower Section Geometry (cont'd)

Tower Elevation ft	Redundant Bracing Grade	Redundant Type	Redundant Size	K Factor
T8 50.00-25.00	A529-50 (50 ksi)	Horizontal (1) Diagonal (1)	Equal Angle Equal Angle	1 1
T9 25.00-0.00	A529-50 (50 ksi)	Horizontal (1) Diagonal (1)	Equal Angle Equal Angle	1 1

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Tower Section Geometry (cont'd)

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
ft	ft ²	in							
T1 120.00-116.67	0.00	0.0000	A36 (36 ksi)	1	1	1	26.9200	36.0000	36.0000
T2 116.67-108.33	0.00	0.0000	A36 (36 ksi)	1	1	1	41.4800	36.0000	36.0000
T3 108.33-100.00	0.00	0.0000	A36 (36 ksi)	1	1	1	42.3200	36.0000	36.0000
T4 100.00-91.67	0.00	0.0000	A36 (36 ksi)	1	1	1	43.1200	36.0000	36.0000
T5 91.67-83.33	0.00	0.0000	A36 (36 ksi)	1	1	1	44.0000	36.0000	36.0000
T6 83.33-75.00	0.00	0.0000	A36 (36 ksi)	1	1	1	44.8800	36.0000	36.0000
T7 75.00-50.00	0.00	0.0000	A36 (36 ksi)	1	1	1	47.6400	36.0000	36.0000
T8 50.00-25.00	0.00	0.0000	A36 (36 ksi)	1	1	1	50.6000	36.0000	36.0000
T9 25.00-0.00	0.00	0.0000	A36 (36 ksi)	1	1	1	65.3200	36.0000	36.0000

Tower Section Geometry (cont'd)

Tower Elevation	Calc K Single Angles	Calc K Solid Rounds	Legs	K Factors ¹						
				X Brace Diags	K Brace Diags	Single Diags	Girts	Horiz.	Sec. Horiz.	Inner Brace
				X Y	X Y	X Y	X Y	X Y	X Y	X Y
T1 120.00-116.67	Yes	Yes	1	1	1	1	1	1	1	1
T2 116.67-108.33	Yes	Yes	1	1	1	1	1	1	1	1
T3 108.33-100.00	Yes	Yes	1	1	1	1	1	1	1	1
T4 100.00-91.67	Yes	Yes	1	1	1	1	1	1	1	1
T5 91.67-83.33	Yes	Yes	1	1	1	1	1	1	1	1
T6 83.33-75.00	Yes	Yes	1	1	1	1	1	1	1	1
T7 75.00-50.00	Yes	Yes	1	1	1	1	1	1	1	1
T8 50.00-25.00	Yes	Yes	1	1	1	1	1	1	1	1
T9 25.00-0.00	Yes	Yes	1	1	1	1	1	1	1	1

¹Note: 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.

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Tower Section Geometry (cont'd)

Tower Elevation ft	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T1 120.00-116.67	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T2 116.67-108.33	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T3 108.33-100.00	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
T4 100.00-91.67	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T5 91.67-83.33	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 83.33-75.00	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
T7 75.00-50.00	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 50.00-25.00	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 25.00-0.00	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 120.00-116.67	Flange	0.0000	0	0.7500	1	0.6250	2	0.0000	0	0.6250	0	0.6250	2	0.6250	0
T2 116.67-108.33	Flange	0.0000	0	0.7500	1	0.6250	0	0.6250	0	0.6250	0	0.6250	2	0.6250	0
T3 108.33-100.00	Flange	0.0000	0	0.7500	1	0.6250	0	0.6250	0	0.6250	0	0.6250	2	0.6250	0
T4 100.00-91.67	Flange	0.7500	6	0.7500	1	0.6250	2	0.0000	0	0.6250	0	0.6250	2	0.6250	0
T5 91.67-83.33	Flange	0.7500	0	0.7500	1	0.6250	2	0.0000	0	0.6250	0	0.6250	2	0.6250	0
T6 83.33-75.00	Flange	0.7500	0	0.7500	1	0.6250	2	0.6250	0	0.6250	0	0.6250	2	0.6250	0
T7 75.00-50.00	Flange	0.7500	6	0.7500	1	0.6250	2	0.6250	0	0.6250	0	0.6250	2	0.6250	0
T8 50.00-25.00	Flange	0.7500	6	0.7500	1	0.6250	2	0.6250	0	0.6250	0	0.6250	2	0.6250	0
T9 25.00-0.00	Flange	1.0000	8	1.0000	1	0.6250	2	0.6250	0	0.6250	0	0.6250	2	0.6250	0

Feed Line/Linear Appurtenances - Entered As Round Or Flat

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Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
LCF114-50J (1-1/4 FOAM) (#11) AT&T 6(E))	B	Yes	No	Ar (CfAe)	80.00 - 6.00	-4.5000	0.36	6	6	1.5800	1.5800		0.70
3/4 (AT&T-DC Cables - Proposed)	B	Yes	No	Ar (CfAe)	80.00 - 6.00	-4.5000	0.4	4	4	0.7500	0.7500		0.54
1/2" Fiber Optic Cable (AT&T - Fiber Cable)	B	Yes	No	Ar (CfAe)	80.00 - 6.00	-4.5000	0.33	2	2	0.5800	0.5800		0.25
3/4 (AT&T-DC Cables) ****	B	Yes	No	Ar (CfAe)	80.00 - 6.00	-4.5000	0.43	4	4	0.7500	0.7500		0.54
1 5/8 (#17) T-Mobile)	C	Yes	No	Ar (CfAe)	95.00 - 6.00	-5.0000	-0.42	6	6	1.9800	1.9800		1.04
1 1/4" Hybriflex Cable (#10) Sprint)	C	Yes	No	Ar (CfAe)	72.00 - 6.00	-2.0000	-0.3	3	3	1.6250	1.6250		1.60
Commscope 6x12 (6 AWG) (T-Mobile)	C	Yes	No	Ar (CfAe)	95.00 - 6.00	-2.0000	-0.37	1	1	1.4300	1.4300		1.63
Commscope 9x18 (6 AWG) (T-Mobile)	C	Yes	No	Ar (CfAe)	95.00 - 6.00	-2.0000	-0.36	1	1	1.5900	1.5900		2.59
Commscope 6x12 (6 AWG) (T-Mobile)	C	Yes	No	Ar (CfAe)	95.00 - 6.00	-2.0000	-0.35	1	1	1.4300	1.4300		1.63
1 1/4" Hybriflex Cable (#10) Sprint)	C	Yes	No	Ar (CfAe)	72.00 - 6.00	-2.0000	-0.285	1	1	1.6250	1.6250		1.60
Hybrid HCS 6x12 4 AWG (1-5/8") (AT&T - Fiber Cable)	B	Yes	No	Ar (CfAe)	80.00 - 6.00	-4.5000	0.36	3	3	1.9900	1.9900		1.90
1/2 (AT&T-DC Cables)	B	Yes	No	Ar (CfAe)	80.00 - 6.00	-4.5000	0.4	6	3	0.5800	0.5800		0.25
1/2 (AT&T-DC Cables)	B	Yes	No	Ar (CfAe)	80.00 - 6.00	-4.5000	0.33	2	2	0.5800	0.5800		0.25
LDF6-50A (1-1/4 FOAM) (#11 AT&T) * CSP	B	Yes	No	Ar (CfAe)	80.00 - 6.00	-4.5000	0.43	4	4	1.5500	1.5500		0.66
LDF4-50A (1/2 FOAM) (CSP-24)	A	Yes	No	Ar (CfAe)	120.00 - 6.00	-2.0000	0.47	1	1	0.6300	0.6300		0.15
AVA7-50 (1-5/8 LOW DENSI.	B	Yes	No	Ar (CfAe)	114.00 - 6.00	-2.0000	-0.47	1	1	1.9800	1.9800		0.72

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Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
FOAM) (#25-A - CSP#17)													
LDF7-50A (1-5/8 FOAM)	A	Yes	No	Ar (CfAe)	114.00 - 6.00	-2.0000	0.455	1	1	1.9800	1.9800		0.82
(#25-B - CSP#7)													
LDF6-50A (1-1/4 FOAM)	B	Yes	No	Ar (CfAe)	114.00 - 6.00	-2.0000	-0.455	1	1	1.5500	1.5500		0.66
(#26 - CSP-15)													
1 1/4 (#24-E)	A	Yes	No	Ar (CfAe)	113.00 - 6.00	-2.0000	0.44	1	1	1.5500	1.5500		0.66
1 5/8 (#22)	B	Yes	No	Ar (CfAe)	113.00 - 6.00	-2.0000	-0.44	1	1	1.9800	1.9800		1.04
AVA7-50 (1-5/8 LOW DENSI. FOAM)	A	Yes	No	Ar (CfAe)	113.00 - 6.00	-2.0000	0.425	1	1	1.9800	1.9800		0.72
(#23-A - CSP#22)													
AVA7-50 (1-5/8 LOW DENSI. FOAM)	B	Yes	No	Ar (CfAe)	113.00 - 6.00	-2.0000	-0.425	1	1	1.9800	1.9800		0.72
(#23-B - CSP#23)													
1/2 (#23-C)	A	Yes	No	Ar (CfAe)	113.00 - 6.00	-2.0000	0.41	1	1	0.5800	0.5800		0.25
1/2 (#24-A)	B	Yes	No	Ar (CfAe)	113.00 - 6.00	-2.0000	-0.41	2	2	0.5800	0.5800		0.25
1/2 (#24-B)	A	Yes	No	Ar (CfAe)	113.00 - 6.00	-2.0000	0.395	1	1	0.5800	0.5800		0.25
AVA7-50 (1-5/8 LOW DENSI. FOAM)	B	Yes	No	Ar (CfAe)	113.00 - 6.00	-2.0000	-0.395	1	1	1.9800	1.9800		0.72
(#24-C - CSP#21)													
LDF7-50A (1-5/8 FOAM)	A	Yes	No	Ar (CfAe)	113.00 - 6.00	-2.0000	0.38	1	1	1.9800	1.9800		0.82
(#24-D - CSP#8)													
LDF7-50A (1-5/8 FOAM)	B	Yes	No	Ar (CfAe)	110.00 - 6.00	-2.0000	-0.38	1	1	1.9800	1.9800		0.82
(#16-A - CSP-10)													
AVA7-50 (1-5/8 LOW DENSI. FOAM)	A	Yes	No	Ar (CfAe)	110.00 - 6.00	-2.0000	0.365	1	1	1.9800	1.9800		0.72
(CSP-18 (P))													
AVA7-50 (1-5/8 LOW DENSI. FOAM)	B	Yes	No	Ar (CfAe)	110.00 - 6.00	-2.0000	-0.365	1	1	1.9800	1.9800		0.72
(CSP-19 (P))													
LDF4-50A (1/2 FOAM) (CSP-20 (P))	A	Yes	No	Ar (CfAe)	110.00 - 6.00	-2.0000	0.35	1	1	0.6300	0.6300		0.15

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Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
AVA7-50 (1-5/8 LOW DENSL FOAM) (CSP-28 (P))	B	Yes	No	Ar (CfAe)	110.00 - 6.00	-2.0000	-0.35	1	1	1.9800	1.9800		0.72
AVA7-50 (1-5/8 LOW DENSL FOAM) (CSP-29 (P))	A	Yes	No	Ar (CfAe)	110.00 - 6.00	-2.0000	0.335	1	1	1.9800	1.9800		0.72
LDF4-50A (1/2 FOAM) (CSP-30 (P))	B	Yes	No	Ar (CfAe)	110.00 - 6.00	-2.0000	-0.335	1	1	0.6300	0.6300		0.15
LDF7-50A (1-5/8 FOAM) (#18-B - CSP#12)	A	Yes	No	Ar (CfAe)	110.00 - 6.00	-2.0000	0.32	1	1	1.9800	1.9800		0.82
WE65 (#21 - CSP-5)	B	Yes	No	Af (CfAe)	110.00 - 6.00	-2.0000	-0.32	1	1	1.5836	1.5836	5.1284	0.53
WE65 (#20 - CSP-6)	A	Yes	No	Af (CfAe)	109.00 - 6.00	-2.0000	0.305	1	1	1.5836	1.5836	5.1284	0.53
WE65 (#19 - CSP-3)	B	Yes	No	Af (CfAe)	107.00 - 6.00	-2.0000	-0.305	1	1	1.5836	1.5836	5.1284	0.53
LDF7-50A (1-5/8 FOAM) (#18-A - CSP#13(P))	A	Yes	No	Ar (CfAe)	105.00 - 6.00	-2.0000	0.29	1	1	1.9800	1.9800		0.82
LDF4-50A (1/2 FOAM) (CSP-32)	B	Yes	No	Ar (CfAe)	103.00 - 6.00	-2.0000	-0.29	1	1	0.6300	0.6300		0.15
LDF7-50A (1-5/8 FOAM) (CSP-9(P))	A	Yes	No	Ar (CfAe)	103.00 - 6.00	-2.0000	0.275	1	1	1.9800	1.9800		0.82
LDF5-50A (7/8 FOAM) (#16-B - CSP#2)	B	Yes	No	Ar (CfAe)	92.00 - 6.00	-2.0000	-0.275	1	1	1.0900	1.0900		0.33
7/8 (#15)	A	Yes	No	Ar (CfAe)	86.00 - 6.00	-2.0000	0.26	1	1	1.1100	1.1100		0.54
7/8 (#15)	B	Yes	No	Ar (CfAe)	86.00 - 6.00	-2.0000	-0.26	1	1	1.1100	1.1100		0.54
LDF5-50A (7/8 FOAM) (#13 - CSP-11)	A	Yes	No	Ar (CfAe)	82.00 - 6.00	-2.0000	0.245	1	1	1.0900	1.0900		0.33
1/2 (#12)	B	Yes	No	Ar (CfAe)	81.00 - 6.00	-2.0000	-0.245	1	1	0.5800	0.5800		0.25
1/2 (#14)	A	Yes	No	Ar (CfAe)	77.00 - 6.00	-2.0000	0.23	1	1	0.5800	0.5800		0.25
1/2 (#9)	B	Yes	No	Ar (CfAe)	65.00 - 6.00	-2.0000	-0.23	1	1	0.5800	0.5800		0.25
7/8 (#8)	A	Yes	No	Ar (CfAe)	63.00 - 6.00	-2.0000	0.215	1	1	1.1100	1.1100		0.54
LDF5-50A (7/8 FOAM) (#7 - CSP-4)	B	Yes	No	Ar (CfAe)	55.00 - 6.00	-2.0000	-0.215	1	1	1.0900	1.0900		0.33
LDF4-50A (1/2 FOAM) (#6 - CSP#16)	A	Yes	No	Ar (CfAe)	53.00 - 6.00	-2.0000	0.2	1	1	0.6300	0.6300		0.15
1/2	B	Yes	No	Ar (CfAe)	48.00 - 6.00	-2.0000	-0.2	1	1	0.5800	0.5800		0.25

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Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
(#4-A) 1/2 (#3)	A	Yes	No	Ar (CfAe)	47.00 - 6.00	-2.0000	0.185	1	1	0.5800	0.5800		0.25
LDF4-50A (1/2 FOAM) (#2 - CSP-#14)	B	Yes	No	Ar (CfAe)	43.00 - 6.00	-2.0000	-0.185	1	1	0.6300	0.6300		0.15
1/2 (#1-A)	A	Yes	No	Ar (CfAe)	40.00 - 6.00	-2.0000	0.17	2	2	0.5800	0.5800		0.25
3/8 Cable (#1-B)	B	Yes	No	Ar (CfAe)	40.00 - 6.00	-2.0000	-0.17	1	1	0.3750	0.3750		0.20

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft ²	A_F ft ²	$C_A A_A$ In Face ft ²	$C_A A_A$ Out Face ft ²	Weight K
T1	120.00-116.67	A	0.175	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
T2	116.67-108.33	A	4.879	0.088	0.000	0.000	0.02
		B	5.341	0.220	0.000	0.000	0.03
		C	0.000	0.000	0.000	0.000	0.00
T3	108.33-100.00	A	12.327	1.100	0.000	0.000	0.06
		B	12.102	2.023	0.000	0.000	0.06
		C	0.000	0.000	0.000	0.000	0.00
T4	100.00-91.67	A	13.757	1.100	0.000	0.000	0.07
		B	12.412	2.199	0.000	0.000	0.07
		C	4.536	0.000	0.000	0.000	0.04
T5	91.67-83.33	A	14.004	1.100	0.000	0.000	0.07
		B	13.386	2.199	0.000	0.000	0.07
		C	11.340	0.000	0.000	0.000	0.10
T6	83.33-75.00	A	15.260	1.100	0.000	0.000	0.08
		B	27.412	2.199	0.000	0.000	0.17
		C	11.340	0.000	0.000	0.000	0.10
T7	75.00-50.00	A	48.422	3.299	0.000	0.000	0.24
		B	110.179	6.598	0.000	0.000	0.72
		C	45.937	0.000	0.000	0.000	0.44
T8	50.00-25.00	A	53.201	3.299	0.000	0.000	0.26
		B	115.005	6.598	0.000	0.000	0.74
		C	47.563	0.000	0.000	0.000	0.46
T9	25.00-0.00	A	41.278	2.507	0.000	0.000	0.21
		B	87.994	5.015	0.000	0.000	0.56
		C	36.148	0.000	0.000	0.000	0.35

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	$C_A A_A$ In Face ft ²	$C_A A_A$ Out Face ft ²	Weight K
T1	120.00-116.67	A	0.500	0.453	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

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<i>Tower Section</i>	<i>Tower Elevation ft</i>	<i>Face or Leg</i>	<i>Ice Thickness in</i>	<i>A_R</i> <i>ft²</i>	<i>A_F</i> <i>ft²</i>	<i>C_AA_A</i> <i>In Face</i> <i>ft²</i>	<i>C_AA_A</i> <i>Out Face</i> <i>ft²</i>	<i>Weight</i> <i>K</i>
T2	116.67-108.33	A	0.500	8.546	0.125	0.000	0.000	0.07
		B		8.171	0.764	0.000	0.000	0.08
		C		0.000	0.000	0.000	0.000	0.00
T3	108.33-100.00	A	0.500	20.632	1.563	0.000	0.000	0.19
		B		18.894	3.681	0.000	0.000	0.20
		C		0.000	0.000	0.000	0.000	0.00
T4	100.00-91.67	A	0.500	22.785	1.563	0.000	0.000	0.21
		B		19.676	3.931	0.000	0.000	0.21
		C		7.036	0.000	0.000	0.000	0.08
T5	91.67-83.33	A	0.500	23.254	1.563	0.000	0.000	0.22
		B		21.538	3.931	0.000	0.000	0.23
		C		17.590	0.000	0.000	0.000	0.21
T6	83.33-75.00	A	0.500	25.732	1.563	0.000	0.000	0.24
		B		41.196	9.614	0.000	0.000	0.48
		C		17.590	0.000	0.000	0.000	0.21
T7	75.00-50.00	A	0.500	83.089	4.688	0.000	0.000	0.76
		B		163.096	40.209	0.000	0.000	1.97
		C		72.021	0.000	0.000	0.000	0.88
T8	50.00-25.00	A	0.500	93.059	6.138	0.000	0.000	0.84
		B		175.088	40.209	0.000	0.000	2.05
		C		74.646	0.000	0.000	0.000	0.91
T9	25.00-0.00	A	0.500	72.026	5.400	0.000	0.000	0.65
		B		134.860	30.559	0.000	0.000	1.57
		C		56.731	0.000	0.000	0.000	0.69

Feed Line Shielding

<i>Section</i>	<i>Elevation</i> <i>ft</i>	<i>Face</i>	<i>A_R</i> <i>ft²</i>	<i>A_R</i> <i>Ice</i> <i>ft²</i>	<i>A_F</i> <i>ft²</i>	<i>A_F</i> <i>Ice</i> <i>ft²</i>
T1	120.00-116.67	A	0.000	0.024	0.024	0.061
		B	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000
T2	116.67-108.33	A	0.000	0.233	0.333	0.582
		B	0.000	0.241	0.372	0.602
		C	0.000	0.000	0.000	0.000
T3	108.33-100.00	A	0.000	0.589	0.881	1.471
		B	0.000	0.604	0.927	1.509
		C	0.000	0.000	0.000	0.000
T4	100.00-91.67	A	0.000	0.633	1.031	1.706
		B	0.000	0.620	1.014	1.670
		C	0.000	0.181	0.315	0.488
T5	91.67-83.33	A	0.000	0.634	1.032	1.711
		B	0.000	0.657	1.065	1.771
		C	0.000	0.445	0.775	1.202
T6	83.33-75.00	A	0.000	0.686	1.102	1.854
		B	0.000	1.279	1.994	3.453
		C	0.000	0.439	0.764	1.185
T7	75.00-50.00	A	0.000	2.149	3.941	6.741
		B	0.000	4.972	8.898	15.597
		C	0.000	1.749	3.500	5.488
T8	50.00-25.00	A	0.000	4.747	7.847	13.874
		B	0.000	10.297	16.889	30.095
		C	0.000	3.547	6.606	10.367
T9	25.00-0.00	A	0.000	2.732	4.734	8.429
		B	0.000	5.834	10.057	18.000

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Section	Elevation	Face	A_R	A_R	A_F	A_F
	ft		ft ²	Ice ft ²	ft ²	Ice ft ²
		C	0.000	1.988	3.909	6.134

Feed Line Center of Pressure

Section	Elevation	CP_X	CP_Z	CP_X	CP_Z
	ft	in	in	Ice in	Ice in
T1	120.00-116.67	-0.0006	-0.7414	-0.0014	-1.5334
T2	116.67-108.33	-0.0440	-25.9928	-0.1678	-34.2172
T3	108.33-100.00	-0.4648	-65.4032	-0.7416	-84.5271
T4	100.00-91.67	6.5732	-52.9372	8.2922	-67.4847
T5	91.67-83.33	15.2991	-40.5344	18.9252	-51.0263
T6	83.33-75.00	35.0468	-34.2346	42.5836	-44.9009
T7	75.00-50.00	46.6975	-22.7604	56.9605	-31.7348
T8	50.00-25.00	41.4207	-22.8634	50.1738	-32.7746
T9	25.00-0.00	36.8992	-20.8328	46.2885	-30.7266

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	$C_A A_A$ Front ft ²	$C_A A_A$ Side ft ²	Weight K
Pirot 6' Side Mount Standoff (1)	B	From Leg	1.00 4.00	0.0000	41.00	No Ice 1/2" Ice	4.97 6.12	0.07 0.13
(#1-A Dish Mount)			0.00					
1'x1' Panel Antenna	B	From Leg	1.00 4.00	0.0000	40.00	No Ice 1/2" Ice	1.20 1.34	0.01 0.02
(#1-B (mount Share #1-A))			0.00					
3' Whip (3in diameter) /w mount	B	From Leg	0.50 0.00 0.00	0.0000	43.00	No Ice 1/2" Ice	1.18 1.64	0.02 0.03
(#2)			0.00					
5'x1.5in dia Whip Antenna /w mount	A	From Leg	0.50 0.00 0.00	0.0000	47.00	No Ice 1/2" Ice	1.81 2.64	0.03 0.05
(#3)			0.00					
10'x6" Dipole Antenna	C	From Leg	3.00 0.00 0.00	0.0000	48.00	No Ice 1/2" Ice	9.17 9.89	0.05 0.08
(#4-A)			0.00					
3' Yagi	C	From Leg	3.00 0.00 0.00	0.0000	48.00	No Ice 1/2" Ice	2.08 3.79	0.03 0.05
(#4-B)			0.00					
Pirot 4' Side Mount Standoff (1)	C	None		0.0000	48.00	No Ice 1/2" Ice	2.72 4.91	0.05 0.09
(#4-A&B)								
6'x1" Whip Antenna w/ Mount	A	From Leg	1.00 0.00 0.00	0.0000	39.00	No Ice 1/2" Ice	2.02 3.14	0.05 0.07
(#5 - CSP#14)			0.00					
1.0" Dia 4' Omni w/Pipe Mount	B	From Leg	2.00 0.00	0.0000	53.00	No Ice 1/2" Ice	0.94 1.39	0.02 0.03

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	Project New Haven, CT (West Rock) - DESPP/CSP Load Conditions Client SMK-003 / ASM-010 / NSS-044 / (AT&T) / (Sprint) / (T-Mobile)	Date 17:06:27 04/09/20 Designed by MCD

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K
(#6 - CSP#16)			0.00						
20' 4-Bay Dipole w/ 2'	A	From Leg	2.00	0.0000	55.00	No Ice	4.00	4.00	0.06
Sidearm Mount			0.00			1/2" Ice	6.00	6.00	0.10
(#7 - CSP-4)			0.00						
GPS	B	From Leg	3.00	0.0000	63.00	No Ice	1.00	1.00	0.01
(#8)			0.00			1/2" Ice	1.50	1.50	0.01
			0.00						
2'6"x4" Pipe Mount	B	None		0.0000	63.00	No Ice	0.75	0.75	0.03
(For #8)						1/2" Ice	0.95	0.95	0.04
6' Yagi w/ Mount	B	From Leg	2.00	0.0000	65.00	No Ice	7.59	0.71	0.05
(#9)			0.00			1/2" Ice	8.18	0.98	0.09
			0.00						
3' Yagi	B	From Leg	1.00	40.0000	81.00	No Ice	2.08	2.08	0.03
(#12)			0.00			1/2" Ice	3.79	3.79	0.05
			0.00						
3' Yagi	B	From Leg	1.00	-40.0000	82.00	No Ice	2.08	2.08	0.03
(#13 - CSP-11)			0.00			1/2" Ice	3.79	3.79	0.05
			0.00						
20' 4-Bay Dipole	B	From Leg	4.00	0.0000	77.00	No Ice	4.00	4.00	0.06
(#14)			0.00			1/2" Ice	6.00	6.00	0.10
			0.00						
4'6"x3" Pipe Mount	B	None		0.0000	67.00	No Ice	1.30	1.30	0.03
(horizontal)						1/2" Ice	1.57	1.57	0.08
((Bottom mount) #14)									
4'6"x3" Pipe Mount	B	None		0.0000	87.00	No Ice	1.30	1.30	0.03
(horizontal)						1/2" Ice	1.57	1.57	0.08
((Top Mount) #14)									
20' 4-Bay Dipole	A	From Leg	4.00	0.0000	86.00	No Ice	4.00	4.00	0.06
(#15)			0.00			1/2" Ice	6.00	6.00	0.10
			0.00						
3'4"x4" Pipe Mount	A	None		0.0000	76.00	No Ice	1.05	1.05	0.04
(horizontal)						1/2" Ice	1.27	1.27	0.09
((Bottom mount) #15)									
3'4"x4" Pipe Mount	A	None		0.0000	96.00	No Ice	1.05	1.05	0.04
(horizontal)						1/2" Ice	1.27	1.27	0.09
((Top Mount) #15)									
SC479-HF1LDF (inverted)	B	From Face	4.00	0.0000	81.00 - 95.00	No Ice	1.74	1.74	0.04
(# 16-A - CSP-10)			0.00			1/2" Ice	2.60	2.60	0.05
			0.00						
PD458-406	A	From Face	4.00	0.0000	100.00 - 92.00	No Ice	4.59	4.59	0.02
(# 16-B - CSP-2)			0.00			1/2" Ice	6.89	6.89	0.04
			0.00						
(2) (Horizontal) 8'x2 1/2"	A	None		0.0000	92.00	No Ice	2.30	2.30	0.04
Pipe Mount (Upright # 16-B)						1/2" Ice	3.13	3.13	0.15
(# 16-A&B)									
(2) (Horizontal) 8'x2 1/2"	A	None		0.0000	92.00	No Ice	2.30	2.30	0.04
Pipe Mount (Invert #16-A)						1/2" Ice	3.13	3.13	0.15
(# 16-A&B)									
SE419-SWBALDF Panel	A	From Face	0.50	0.0000	101.00	No Ice	11.64	7.88	0.05
Antenna			0.00			1/2" Ice	12.29	8.51	0.11
(#18-A - CSP 13(P))			0.00						
AP13-850/065D w/Mount	A	From Face	0.50	0.0000	104.00	No Ice	5.61	3.92	0.04
Pipe			0.00			1/2" Ice	6.30	4.96	0.08
(#18-B - CSP-12(E))			0.00						
6'8"x4" Pipe Mount	C	None		0.0000	107.00	No Ice	2.60	2.60	0.07
(#19 - Dish Mount)						1/2" Ice	3.01	3.01	0.09
6'8"x4" Pipe Mount	C	None		0.0000	107.00	No Ice	2.60	2.60	0.07

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<i>Description</i>	<i>Face or Leg</i>	<i>Offset Type</i>	<i>Offsets: Horz Lateral Vert ft ft ft</i>	<i>Azimuth Adjustment °</i>	<i>Placement ft</i>	<i>C_{AA} Front ft²</i>	<i>C_{AA} Side ft²</i>	<i>Weight K</i>
(#20 - Dish Mount)						1/2" Ice	3.01	0.09
6'8"x4" Pipe Mount	A	None		0.0000	110.00	No Ice	2.60	0.07
(#21 - Dish Mount)						1/2" Ice	3.01	0.09
Pirod 4' Side Mount Standoff	B	None		0.0000	113.00	No Ice	2.72	0.05
(1)						1/2" Ice	4.91	0.09
(#22, 23-A, 23-B Mount)								
16'x3" Omni	B	From Leg	4.00	0.0000	113.00	No Ice	5.06	0.03
(#22)			0.00			1/2" Ice	6.54	0.07
			0.00					
16'x3" Omni (inverted)	B	From Leg	4.00	0.0000	106.00 - 120.00	No Ice	5.06	0.03
(#23-A - CSP-22)			0.00			1/2" Ice	6.54	0.07
			0.00					
16'x3" Omni (inverted)	B	From Leg	2.00	0.0000	106.00 - 120.00	No Ice	5.06	0.03
(#23-B - CSP-23)			0.00			1/2" Ice	6.54	0.07
			0.00					
Junction Box	B	From Face	0.50	0.0000	112.00	No Ice	3.15	0.02
(#23-C)			0.00			1/2" Ice	3.39	0.04
			0.00					
Rohn 6' Side-Arm(1)	B	From Leg	0.00	20.0000	114.00	No Ice	10.60	0.14
(#24 Antennas Mount)			0.00			1/2" Ice	15.40	0.21
			0.00					
Rohn 6' Side-Arm(1)	C	From Leg	0.00	-20.0000	114.00	No Ice	10.60	0.14
(#24 Antennas Mount)			0.00			1/2" Ice	15.40	0.21
			0.00					
Junction Box	C	From Face	3.00	0.0000	114.00	No Ice	3.15	0.02
(#24-A)			0.00			1/2" Ice	3.39	0.04
			0.00					
SC479-HF1LDF (inverted)	C	From Face	6.00	0.0000	106.00 - 120.00	No Ice	5.06	0.03
(#24-B)			0.00			1/2" Ice	6.54	0.07
			0.00					
SC479-HF1LDF	B	From Face	6.00	0.0000	120.00	No Ice	5.06	0.03
(#24-C - CSP#21)			0.00			1/2" Ice	6.54	0.07
			0.00					
OGT9-840	B	From Face	3.00	0.0000	120.00	No Ice	2.27	0.02
(#24-D - CSP#8)			0.00			1/2" Ice	3.44	0.04
			0.00					
10'x2" Dipole Antenna	C	From Face	3.00	0.0000	104.00 - 114.00	No Ice	9.17	0.05
(inverted)			0.00			1/2" Ice	9.89	0.08
(#24-E)			0.00					
Rohn 6' Side-Arm(1)	C	From Leg	0.00	60.0000	114.00	No Ice	10.60	0.14
(#25 Antennas Mount)			0.00			1/2" Ice	15.40	0.21
			0.00					
SC479-HF1LDF (inverted)	C	From Leg	6.00	60.0000	100.00 - 114.00	No Ice	5.06	0.03
(#25-A - CSP-17)			0.00			1/2" Ice	6.54	0.07
			0.00					
OGT9-840	C	From Leg	6.00	60.0000	120.00	No Ice	2.27	0.02
(#25-B - CSP#7)			0.00			1/2" Ice	3.44	0.04
			0.00					
10'x2" Dipole Antenna	A	From Leg	0.50	0.0000	120.00	No Ice	9.17	0.05
(#26 - CSP-15)			0.00			1/2" Ice	9.89	0.08
			0.00					
Lightning Rod 5/8x4'	C	None		0.0000	138.00	No Ice	0.25	0.03
(#27)						1/2" Ice	0.66	0.03
16'x2.5" Pipe Mount	C	None		0.0000	138.00	No Ice	4.00	0.09
(#27 Mount)						1/2" Ice	4.80	0.09
TMA 432-83H-01T	C	None		0.0000	103.00	No Ice	1.40	0.03
(CSP-32)						1/2" Ice	1.55	0.04

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Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K
Inventory									
APXVAARR24_43-U-NA20 Panel (RFS)	A	From Leg	3.00 4.50 0.00	0.0000	95.00	No Ice 1/2" Ice	20.24 20.89	10.79 12.21	0.21 0.34
APXVAARR24_43-U-NA20 Panel (RFS)	B	From Leg	3.00 4.50 0.00	0.0000	95.00	No Ice 1/2" Ice	20.24 20.89	10.79 12.21	0.21 0.34
APXVAARR24_43-U-NA20 Panel (RFS)	C	From Leg	3.00 4.50 0.00	0.0000	95.00	No Ice 1/2" Ice	20.24 20.89	10.79 12.21	0.21 0.34
AIR 3246 B66 Panel Antenna (T-Mobile - Proposed)	A	From Leg	3.00 4.50 0.00	0.0000	95.00	No Ice 1/2" Ice	7.99 8.39	6.34 7.01	0.21 0.28
AIR 3246 B66 Panel Antenna (T-Mobile - Proposed)	B	From Leg	3.00 4.50 0.00	0.0000	95.00	No Ice 1/2" Ice	7.99 8.39	6.34 7.01	0.21 0.28
AIR 3246 B66 Panel Antenna (T-Mobile - Proposed)	C	From Leg	3.00 4.50 0.00	0.0000	95.00	No Ice 1/2" Ice	7.99 8.39	6.34 7.01	0.21 0.28
2217 B2 Radio Unit (T-Mobile - Proposed)	A	From Leg	3.00 -4.50 0.00	0.0000	95.00	No Ice 1/2" Ice	2.27 2.45	2.27 2.45	0.05 0.07
2217 B2 Radio Unit (T-Mobile - Proposed)	B	From Leg	3.00 -4.50 0.00	0.0000	95.00	No Ice 1/2" Ice	2.27 2.45	2.27 2.45	0.05 0.07
2217 B2 Radio Unit (T-Mobile - Proposed)	C	From Leg	3.00 -4.50 0.00	0.0000	95.00	No Ice 1/2" Ice	2.27 2.45	2.27 2.45	0.05 0.07
4449 B71 + B12 Radio Unit (T-Mobile - Proposed)	A	From Leg	3.00 -4.50 0.00	0.0000	95.00	No Ice 1/2" Ice	1.66 1.82	1.16 1.29	0.08 0.10
4449 B71 + B12 Radio Unit (T-Mobile - Proposed)	B	From Leg	3.00 -4.50 0.00	0.0000	95.00	No Ice 1/2" Ice	1.66 1.82	1.16 1.29	0.08 0.10
4449 B71 + B12 Radio Unit (T-Mobile - Proposed)	C	From Leg	3.00 -4.50 0.00	0.0000	95.00	No Ice 1/2" Ice	1.66 1.82	1.16 1.29	0.08 0.10
* T-Mobile Propsoed Inventory									
* Sprint Inventory Exist/Proposed									
Face Mount (Sprint)	A	From Face	0.00 0.00 0.00	0.0000	72.00	No Ice 1/2" Ice	9.73 13.12	9.73 13.12	0.31 0.42
Face Mount (Sprint)	B	From Face	0.00 0.00 0.00	0.0000	72.00	No Ice 1/2" Ice	9.73 13.12	9.73 13.12	0.31 0.42
Face Mount (Sprint)	C	From Face	0.00 0.00 0.00	0.0000	72.00	No Ice 1/2" Ice	9.73 13.12	9.73 13.12	0.31 0.42
ALU 4x45W (1900 MHz) (Sprint)	A	From Face	0.00 0.00 0.50	0.0000	72.00	No Ice 1/2" Ice	2.54 2.75	1.61 1.79	0.06 0.08
ALU 4x45W (1900 MHz) (Sprint)	B	From Face	0.00 0.00 0.00	0.0000	72.00	No Ice 1/2" Ice	2.54 2.75	1.61 1.79	0.06 0.08
ALU 4x45W (1900 MHz)	C	From Face	0.00	0.0000	72.00	No Ice	2.54	1.61	0.06

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	Project		Date
	New Haven, CT (West Rock) - DESPP/CSP Load Conditions		17:06:27 04/09/20
	Client		Designed by
	SMK-003 / ASM-010 / NSS-044 / (AT&T) / (Sprint) / (T-Mobile)		MCD

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K
(Sprint)			0.00			1/2" Ice	2.75	1.79	0.08
ALU TD-RRH-8x20-25	A	From Face	0.00	0.0000	72.00	No Ice	4.03	1.53	0.08
(Sprint)			0.00			1/2" Ice	4.28	1.70	0.10
ALU TD-RRH-8x20-25	B	From Face	0.00	0.0000	72.00	No Ice	4.03	1.53	0.08
(Sprint)			0.00			1/2" Ice	4.28	1.70	0.10
ALU TD-RRH-8x20-25	C	From Face	0.00	0.0000	72.00	No Ice	4.03	1.53	0.08
(Sprint)			0.00			1/2" Ice	4.28	1.70	0.10
ALU 800MHz 2x50W	A	From Face	0.00	0.0000	72.00	No Ice	2.06	1.93	0.06
(Sprint)			0.00			1/2" Ice	2.24	2.11	0.09
ALU 800MHz 2x50W	B	From Face	0.00	0.0000	72.00	No Ice	2.06	1.93	0.06
(Sprint)			0.00			1/2" Ice	2.24	2.11	0.09
ALU 800MHz 2x50W	C	From Face	0.00	0.0000	72.00	No Ice	2.06	1.93	0.06
(Sprint)			0.00			1/2" Ice	2.24	2.11	0.09
NNVV-65B-R4 Panel	A	From Leg	0.00	0.0000	72.00	No Ice	12.27	5.75	0.09
Antenna			-1.00			1/2" Ice	12.77	6.21	0.16
(Sprint)			0.00						
NNVV-65B-R4 Panel	B	From Leg	0.00	0.0000	72.00	No Ice	12.27	5.75	0.09
Antenna			-1.00			1/2" Ice	12.77	6.21	0.16
(Sprint)			0.00						
NNVV-65B-R4 Panel	C	From Leg	0.00	0.0000	72.00	No Ice	12.27	5.75	0.09
Antenna			-1.00			1/2" Ice	12.77	6.21	0.16
(Sprint)			0.00						
AAHC Panel Antenna	A	From Face	0.00	0.0000	72.00	No Ice	4.20	2.07	0.10
(Sprint)			0.00			1/2" Ice	4.46	2.26	0.14
AAHC Panel Antenna	B	From Face	0.50	0.0000	72.00	No Ice	4.20	2.07	0.10
(Sprint)			0.00			1/2" Ice	4.46	2.26	0.14
AAHC Panel Antenna	C	From Face	0.50	0.0000	72.00	No Ice	4.20	2.07	0.10
(Sprint)			0.00			1/2" Ice	4.46	2.26	0.14
* Sprint Inventory			0.00						
Exist/Proposed									
* AT&T Inventory Update									
4_2020									
VFA12-HD-S Antenna	A	From Leg	0.00	0.0000	80.00	No Ice	12.50	7.00	0.58
Mount Frame			0.00			1/2" Ice	18.50	11.30	0.69
((#11) ATT)			0.00						
VFA12-HD-S Antenna	B	From Leg	0.00	0.0000	80.00	No Ice	12.50	7.00	0.58
Mount Frame			0.00			1/2" Ice	18.50	11.30	0.69
((#11) ATT)			0.00						
VFA12-HD-S Antenna	C	From Leg	0.00	0.0000	80.00	No Ice	12.50	7.00	0.58
Mount Frame			0.00			1/2" Ice	18.50	11.30	0.69
((#11) ATT)			0.00						
TPA-65R-LCUUUU-H8	A	From Leg	3.00	0.0000	80.00	No Ice	12.86	10.38	0.10
Panel w/ RET			-6.00			1/2" Ice	13.46	11.79	0.20
((#11) ATT)			0.00						
800-10966 Kathrien Panel w/	A	From Leg	3.00	0.0000	80.00	No Ice	17.36	9.40	0.14
Pipe Mt.			-2.00			1/2" Ice	17.99	10.82	0.26
((#11) ATT)			0.00						

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<i>Description</i>	<i>Face or Leg</i>	<i>Offset Type</i>	<i>Offsets: Horz Lateral Vert ft ft ft</i>	<i>Azimuth Adjustment °</i>	<i>Placement ft</i>		<i>C_{AA} Front ft²</i>	<i>C_{AA} Side ft²</i>	<i>Weight K</i>
800-10966 Kathrien Panel w/ Pipe Mt. ((#11) ATT)	A	From Leg	3.00 2.00 0.00	0.0000	80.00	No Ice 1/2" Ice	17.36 17.99	9.40 10.82	0.14 0.26
SBNH-1D6565C ((#11) ATT)	A	From Leg	3.00 6.00 0.00	0.0000	80.00	No Ice 1/2" Ice	11.48 12.11	9.64 11.07	0.08 0.17
RRUS E2 B29 RRH Unit ((#11) ATT)	A	From Face	0.50 -5.00 0.00	0.0000	80.00	No Ice 1/2" Ice	3.67 3.93	1.49 1.67	0.06 0.08
B2/B66a Radio 8843 RRH Unit ((#11) ATT)	A	From Face	0.50 -2.50 0.00	0.0000	80.00	No Ice 1/2" Ice	2.03 2.22	1.59 1.76	0.07 0.09
Radio 4478 B14 RRH ((#11) ATT)	A	From Face	0.50 0.00 0.00	0.0000	80.00	No Ice 1/2" Ice	1.26 1.42	1.26 1.42	0.06 0.07
Ericsson RRUS-32 RRH Unit ((#11) ATT)	A	From Face	0.50 2.50 0.00	0.0000	80.00	No Ice 1/2" Ice	3.31 3.56	2.42 2.64	0.08 0.10
Radio 4449 B5/B12 RRH ((#11) ATT)	A	From Face	0.50 5.00 0.00	0.0000	80.00	No Ice 1/2" Ice	1.93 2.12	1.35 1.51	0.08 0.10
DTMABP7819VG12A TMA ((#11) ATT)	A	From Face	0.50 0.00 0.00	0.0000	80.00	No Ice 1/2" Ice	1.36 1.51	0.51 0.61	0.02 0.03
DC6-48-60-18-8F (Squid) Suppressor ((#11) ATT)	A	From Leg	0.50 0.00 0.00	0.0000	80.00	No Ice 1/2" Ice	0.79 1.27	0.79 1.27	0.02 0.04
TPA-65R-LCUUUU-H8 Panel w/ RET ((#11) ATT)	B	From Leg	3.00 -6.00 0.00	0.0000	80.00	No Ice 1/2" Ice	12.86 13.46	10.38 11.79	0.10 0.20
800-10966 Kathrien Panel w/ Pipe Mt. ((#11) ATT)	B	From Leg	3.00 -2.00 0.00	0.0000	80.00	No Ice 1/2" Ice	17.36 17.99	9.40 10.82	0.14 0.26
800-10966 Kathrien Panel w/ Pipe Mt. ((#11) ATT)	B	From Leg	3.00 2.00 0.00	0.0000	80.00	No Ice 1/2" Ice	17.36 17.99	9.40 10.82	0.14 0.26
SBNH-1D6565C ((#11) ATT)	B	From Leg	3.00 6.00 0.00	0.0000	80.00	No Ice 1/2" Ice	11.48 12.11	9.64 11.07	0.08 0.17
RRUS E2 B29 RRH Unit ((#11) ATT)	B	From Face	0.50 -5.00 0.00	0.0000	80.00	No Ice 1/2" Ice	3.67 3.93	1.49 1.67	0.06 0.08
B2/B66a Radio 8843 RRH Unit ((#11) ATT)	B	From Face	0.50 -2.50 0.00	0.0000	80.00	No Ice 1/2" Ice	2.03 2.22	1.59 1.76	0.07 0.09
Radio 4478 B14 RRH ((#11) ATT)	B	From Face	0.50 0.00 0.00	0.0000	80.00	No Ice 1/2" Ice	1.26 1.42	1.26 1.42	0.06 0.07
Ericsson RRUS-32 RRH Unit ((#11) ATT)	B	From Face	0.50 2.50 0.00	0.0000	80.00	No Ice 1/2" Ice	3.31 3.56	2.42 2.64	0.08 0.10
Radio 4449 B5/B12 RRH ((#11) ATT)	B	From Face	0.50 5.00 0.00	0.0000	80.00	No Ice 1/2" Ice	1.93 2.12	1.35 1.51	0.08 0.10
DTMABP7819VG12A TMA ((#11) ATT)	B	From Face	0.50 0.00 0.00	0.0000	80.00	No Ice 1/2" Ice	1.36 1.51	0.51 0.61	0.02 0.03

tnxTower AECOM 500 Enterprise Drive, Suite 3B Rocky Hill, CT Phone: 860-263-5800 FAX: 860-812-2094	Job	120' Self-Supporting Lattice Tower	Page	19 of 34
	Project	New Haven, CT (West Rock) - DESPP/CSP Load Conditions	Date	17:06:27 04/09/20
	Client	SMK-003 / ASM-010 / NSS-044 / (AT&T) / (Sprint) / (T-Mobile)	Designed by	MCD

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K
DC6-48-60-18-8F (Squid) Suppressor ((#11) ATT)	B	From Leg	0.50 0.00 0.00	0.0000	80.00	No Ice 1/2" Ice	0.79 1.27	0.79 1.27	0.02 0.04
Quintel QS66512-2 Panel ((#11) ATT)	C	From Leg	3.00 -2.00 0.00	0.0000	80.00	No Ice 1/2" Ice	8.40 8.95	6.80 7.27	0.13 0.18
800-10965 Kathrein Panel Antenna ((#11) ATT)	C	From Leg	3.00 2.00 0.00	0.0000	80.00	No Ice 1/2" Ice	15.43 16.11	7.85 8.91	0.15 0.25
800-10965 Kathrein Panel Antenna ((#11) ATT)	C	From Leg	3.00 6.00 0.00	0.0000	80.00	No Ice 1/2" Ice	15.43 16.11	7.85 8.91	0.15 0.25
SBNH-1D6565C ((#11) ATT)	C	From Leg	3.00 6.00 0.00	0.0000	80.00	No Ice 1/2" Ice	11.48 12.11	9.64 11.07	0.08 0.17
RRUS E2 B29 RRH Unit ((#11) ATT)	C	From Face	0.50 -5.00 0.00	0.0000	80.00	No Ice 1/2" Ice	3.67 3.93	1.49 1.67	0.06 0.08
B2/B66a Radio 8843 RRH Unit ((#11) ATT)	C	From Face	0.50 -2.50 0.00	0.0000	80.00	No Ice 1/2" Ice	2.03 2.22	1.59 1.76	0.07 0.09
Radio 4478 B14 RRH ((#11) ATT)	C	From Face	0.50 0.00 0.00	0.0000	80.00	No Ice 1/2" Ice	1.26 1.42	1.26 1.42	0.06 0.07
Ericsson RRUS-32 RRH Unit ((#11) ATT)	C	From Face	0.50 2.50 0.00	0.0000	80.00	No Ice 1/2" Ice	3.31 3.56	2.42 2.64	0.08 0.10
Radio 4449 B5/B12 RRH ((#11) ATT)	C	From Face	0.50 5.00 0.00	0.0000	80.00	No Ice 1/2" Ice	1.93 2.12	1.35 1.51	0.08 0.10
DTMABP7819VG12A TMA ((#11) ATT)	C	From Face	0.50 0.00 0.00	0.0000	80.00	No Ice 1/2" Ice	1.36 1.51	0.51 0.61	0.02 0.03
DC6-48-60-18-8F (Squid) Suppressor ((#11) ATT)	C	From Leg	0.50 0.00 0.00	0.0000	80.00	No Ice 1/2" Ice	0.79 1.27	0.79 1.27	0.02 0.04
* AT&T Inventory Update 4_2020									

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft	Aperture Area ft ²	Weight K
4 FT DISH (#1-A)	A	Paraboloid w/Shroud (HP)	From Leg	1.50 5.00 0.00	Worst		41.00	4.00	No Ice 1/2" Ice	12.57 13.10 0.14 0.28
6' DISH (SOLID) (#19 - CSP-3)	C	Paraboloid w/Radome	From Leg	0.50 0.00	Worst		117.00	6.00	No Ice 1/2" Ice	28.27 29.05 0.09 0.24

tnxTower AECOM 500 Enterprise Drive, Suite 3B Rocky Hill, CT Phone: 860-263-5800 FAX: 860-812-2094	Job	120' Self-Supporting Lattice Tower	Page	20 of 34
	Project	New Haven, CT (West Rock) - DESPP/CSP Load Conditions	Date	17:06:27 04/09/20
	Client	SMK-003 / ASM-010 / NSS-044 / (AT&T) / (Sprint) / (T-Mobile)	Designed by	MCD

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft	Aperture Area ft²	Weight K	
6' DISH (SOLID) (#21 - CSP-5)	A	Paraboloid w/Radome	From Leg	0.00	Worst		115.00	6.00	No Ice	28.27	0.09
				0.50					1/2" Ice	29.05	0.24
				0.00							
6' DISH (SOLID) (#20 - CSP-6)	C	Paraboloid w/Radome	From Leg	0.50	Worst		111.00	6.00	No Ice	28.27	0.09
				0.00					1/2" Ice	29.05	0.24
				0.00							

Tower Pressures - No Ice

$$G_H = 1.149$$

Section Elevation ft	z ft	K _Z	q _z psf	A _G ft ²	F a c e	A _F ft ²	A _R ft ²	A _{leg} ft ²	Leg %	C _A A _A In Face ft ²	C _A A _A Out Face ft ²
T1 120.00-116.67	118.33	1.44	30	39.883	A	4.970	2.956	2.781	35.08	0.000	0.000
					B	4.994	2.781		35.77	0.000	0.000
					C	4.994	2.781		35.77	0.000	0.000
T2 116.67-108.33	112.50	1.42	29	103.599	A	6.278	11.831	6.952	38.39	0.000	0.000
					B	6.371	12.292		37.25	0.000	0.000
					C	6.523	6.952		51.59	0.000	0.000
T3 108.33-100.00	104.17	1.389	29	109.157	A	6.970	19.279	6.952	26.48	0.000	0.000
					B	7.848	19.054		25.84	0.000	0.000
					C	6.751	6.952		50.73	0.000	0.000
T4 100.00-91.67	95.83	1.356	28	114.715	A	7.575	20.709	6.952	24.58	0.000	0.000
					B	8.691	19.364		24.78	0.000	0.000
					C	7.191	11.488		37.22	0.000	0.000
T5 91.67-83.33	87.50	1.321	27	120.273	A	7.834	20.955	6.952	24.15	0.000	0.000
					B	8.901	20.337		23.78	0.000	0.000
					C	6.991	18.292		27.50	0.000	0.000
T6 83.33-75.00	79.17	1.284	27	125.831	A	8.026	22.212	6.952	22.99	0.000	0.000
					B	8.233	34.364		16.32	0.000	0.000
					C	7.264	18.292		27.20	0.000	0.000
T7 75.00-50.00	62.50	1.2	25	412.014	A	29.099	71.626	23.204	23.04	0.000	0.000
					B	27.441	133.383		14.43	0.000	0.000
					C	26.241	69.141		24.33	0.000	0.000
T8 50.00-25.00	37.50	1.037	22	460.861	A	42.521	74.056	20.856	17.89	0.000	0.000
					B	36.778	135.860		12.08	0.000	0.000
					C	40.463	68.418		19.15	0.000	0.000
T9 25.00-0.00	12.50	1	21	514.792	A	38.764	69.954	28.676	26.38	0.000	0.000
					B	35.949	116.670		18.79	0.000	0.000
					C	37.083	64.824		28.14	0.000	0.000

Tower Pressure - With Ice

$$G_H = 1.149$$

Section Elevation ft	z ft	K _Z	q _z psf	t _z in	A _G ft ²	F a c e	A _F ft ²	A _R ft ²	A _{leg} ft ²	Leg %	C _A A _A In Face ft ²	C _A A _A Out Face ft ²
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Section Elevation	z	K _Z	q _z	t _z	A _G	F a c e	A _F	A _R	A _{leg}	Leg %	C _A A _A In Face ft ²	C _A A _A Out Face ft ²
ft	ft		psf	in	ft ²		ft ²	ft ²	ft ²			
T1 120.00-116.67	118.33	1.44	30	0.5000	40.161	A	4.933	5.763	3.337	31.20	0.000	0.000
						B	4.994	5.334		32.31	0.000	0.000
						C	4.994	5.334		32.31	0.000	0.000
T2 116.67-108.33	112.50	1.42	29	0.5000	104.294	A	6.066	19.264	8.342	32.93	0.000	0.000
						B	6.685	18.881		32.63	0.000	0.000
						C	6.523	10.951		47.74	0.000	0.000
T3 108.33-100.00	104.17	1.389	29	0.5000	109.852	A	6.842	31.087	8.342	21.99	0.000	0.000
						B	8.923	29.333		21.81	0.000	0.000
						C	6.751	11.043		46.88	0.000	0.000
T4 100.00-91.67	95.83	1.356	28	0.5000	115.410	A	7.363	33.286	8.342	20.52	0.000	0.000
						B	9.767	30.191		20.88	0.000	0.000
						C	7.018	17.990		33.36	0.000	0.000
T5 91.67-83.33	87.50	1.321	27	0.5000	120.968	A	7.618	33.847	8.342	20.12	0.000	0.000
						B	9.925	32.109		19.85	0.000	0.000
						C	6.564	28.372		23.88	0.000	0.000
T6 83.33-75.00	79.17	1.284	27	0.5000	126.526	A	7.737	36.367	8.342	18.91	0.000	0.000
						B	14.189	51.238		12.75	0.000	0.000
						C	6.843	28.473		23.62	0.000	0.000
T7 75.00-50.00	62.50	1.2	25	0.5000	414.099	A	27.688	117.797	27.375	18.82	0.000	0.000
						B	54.353	194.981		10.98	0.000	0.000
						C	24.253	107.128		20.84	0.000	0.000
T8 50.00-25.00	37.50	1.037	22	0.5000	462.946	A	39.333	128.643	25.027	14.90	0.000	0.000
						B	57.183	205.122		9.54	0.000	0.000
						C	36.702	111.430		16.89	0.000	0.000
T9 25.00-0.00	12.50	1	21	0.5000	516.877	A	37.962	114.539	32.848	21.54	0.000	0.000
						B	53.550	174.271		14.42	0.000	0.000
						C	34.857	99.988		24.36	0.000	0.000

Tower Pressure - Service

$$G_H = 1.149$$

Section Elevation	z	K _Z	q _z	A _G	F a c e	A _F	A _R	A _{leg}	Leg %	C _A A _A In Face ft ²	C _A A _A Out Face ft ²
ft	ft		psf	ft ²		ft ²	ft ²	ft ²			
T1 120.00-116.67	118.33	1.44	30	39.883	A	4.970	2.956	2.781	35.08	0.000	0.000
					B	4.994	2.781		35.77	0.000	0.000
					C	4.994	2.781		35.77	0.000	0.000
T2 116.67-108.33	112.50	1.42	29	103.599	A	6.278	11.831	6.952	38.39	0.000	0.000
					B	6.371	12.292		37.25	0.000	0.000
					C	6.523	6.952		51.59	0.000	0.000
T3 108.33-100.00	104.17	1.389	29	109.157	A	6.970	19.279	6.952	26.48	0.000	0.000
					B	7.848	19.054		25.84	0.000	0.000
					C	6.751	6.952		50.73	0.000	0.000
T4 100.00-91.67	95.83	1.356	28	114.715	A	7.575	20.709	6.952	24.58	0.000	0.000
					B	8.691	19.364		24.78	0.000	0.000
					C	7.191	11.488		37.22	0.000	0.000
T5 91.67-83.33	87.50	1.321	27	120.273	A	7.834	20.955	6.952	24.15	0.000	0.000
					B	8.901	20.337		23.78	0.000	0.000
					C	6.991	18.292		27.50	0.000	0.000
T6 83.33-75.00	79.17	1.284	27	125.831	A	8.026	22.212	6.952	22.99	0.000	0.000
					B	8.233	34.364		16.32	0.000	0.000
					C	7.264	18.292		27.20	0.000	0.000
T7 75.00-50.00	62.50	1.2	25	412.014	A	29.099	71.626	23.204	23.04	0.000	0.000

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Section Elevation	z	K _Z	q _z	A _G	F _{a c e}	A _F	A _R	A _{leg}	Leg %	C _{AA} In Face	C _{AA} Out Face
ft	ft		psf	ft ²		ft ²	ft ²	ft ²		ft ²	ft ²
T8 50.00-25.00	37.50	1.037	22	460.861	B	27.441	133.383		14.43	0.000	0.000
					C	26.241	69.141		24.33	0.000	0.000
					A	42.521	74.056	20.856	17.89	0.000	0.000
					B	36.778	135.860		12.08	0.000	0.000
T9 25.00-0.00	12.50	1	21	514.792	C	40.463	68.418		19.15	0.000	0.000
					A	38.764	69.954	28.676	26.38	0.000	0.000
					B	35.949	116.670		18.79	0.000	0.000
					C	37.083	64.824		28.14	0.000	0.000

Tower Forces - No Ice - Wind Normal To Face

Section Elevation	Add Weight	Self Weight	F _{a c e}	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
ft	K	K							ft ²	K	plf	
T1 120.00-116.67	0.00	0.45	A	0.199	2.6	0.59	1	1	6.714	0.60	179.73	A
			B	0.195	2.613	0.589	1	1	6.632			
			C	0.195	2.613	0.589	1	1	6.632			
T2 116.67-108.33	0.05	0.77	A	0.175	2.682	0.586	1	1	13.206	1.22	146.82	B
			B	0.18	2.664	0.587	1	1	13.581			
			C	0.13	2.846	0.579	1	1	10.546			
T3 108.33-100.00	0.13	0.78	A	0.24	2.466	0.599	1	1	18.527	1.56	187.59	B
			B	0.246	2.448	0.601	1	1	19.299			
			C	0.126	2.864	0.578	1	1	10.769			
T4 100.00-91.67	0.18	1.09	A	0.247	2.448	0.601	1	1	20.021	1.61	193.32	B
			B	0.245	2.454	0.601	1	1	20.320			
			C	0.163	2.725	0.584	1	1	13.895			
T5 91.67-83.33	0.24	1.11	A	0.239	2.47	0.599	1	1	20.391	1.63	196.00	B
			B	0.243	2.458	0.6	1	1	21.106			
			C	0.21	2.562	0.593	1	1	17.830			
T6 83.33-75.00	0.35	1.30	A	0.24	2.467	0.599	1	1	21.341	2.01	240.75	B
			B	0.339	2.199	0.628	1	1	29.829			
			C	0.203	2.586	0.591	1	1	18.075			
T7 75.00-50.00	1.40	5.12	A	0.244	2.454	0.6	1	1	72.109	6.78	271.26	B
			B	0.39	2.083	0.648	1	1	113.834			
			C	0.232	2.494	0.597	1	1	67.541			
T8 50.00-25.00	1.46	6.90	A	0.253	2.429	0.603	1	1	87.150	6.48	259.29	B
			B	0.375	2.116	0.642	1	1	123.941			
			C	0.236	2.479	0.598	1	1	81.409			
T9 25.00-0.00	1.12	7.30	A	0.211	2.559	0.593	1	1	80.229	5.91	236.58	B
			B	0.296	2.305	0.615	1	1	107.681			
			C	0.198	2.603	0.59	1	1	75.328			
Sum Weight:	4.93	24.82						OTM	1568.37 kip-ft	27.81		

Tower Forces - No Ice - Wind 45 To Face

Section Elevation	Add Weight	Self Weight	F _{a c e}	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
ft	K	K							ft ²	K	plf	
T1 120.00-116.67	0.00	0.45	A	0.199	2.6	0.59	0.825	1	5.845	0.52	156.45	A
			B	0.195	2.613	0.589	0.825	1	5.759			

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Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
ft	K	K							ft ²	K	plf	
T2	0.05	0.77	C	0.195	2.613	0.589	0.825	1	5.759			
116.67-108.33			A	0.175	2.682	0.586	0.825	1	12.108	1.12	134.77	B
			B	0.18	2.664	0.587	0.825	1	12.466			
			C	0.13	2.846	0.579	0.825	1	9.404			
T3	0.13	0.78	A	0.24	2.466	0.599	0.825	1	17.308	1.45	174.24	B
108.33-100.00			B	0.246	2.448	0.601	0.825	1	17.925			
			C	0.126	2.864	0.578	0.825	1	9.588			
T4	0.18	1.09	A	0.247	2.448	0.601	0.825	1	18.695	1.49	178.85	B
100.00-91.67			B	0.245	2.454	0.601	0.825	1	18.799			
			C	0.163	2.725	0.584	0.825	1	12.636			
T5	0.24	1.11	A	0.239	2.47	0.599	0.825	1	19.020	1.51	181.54	B
91.67-83.33			B	0.243	2.458	0.6	0.825	1	19.548			
			C	0.21	2.562	0.593	0.825	1	16.607			
T6	0.35	1.30	A	0.24	2.467	0.599	0.825	1	19.936	1.91	229.12	B
83.33-75.00			B	0.339	2.199	0.628	0.825	1	28.388			
			C	0.203	2.586	0.591	0.825	1	16.804			
T7	1.40	5.12	A	0.244	2.454	0.6	0.825	1	67.017	6.50	259.82	B
75.00-50.00			B	0.39	2.083	0.648	0.825	1	109.032			
			C	0.232	2.494	0.597	0.825	1	62.949			
T8	1.46	6.90	A	0.253	2.429	0.603	0.825	1	79.709	6.15	245.82	B
50.00-25.00			B	0.375	2.116	0.642	0.825	1	117.505			
			C	0.236	2.479	0.598	0.825	1	74.328			
T9	1.12	7.30	A	0.211	2.559	0.593	0.825	1	73.445	5.57	222.76	B
25.00-0.00			B	0.296	2.305	0.615	0.825	1	101.390			
			C	0.198	2.603	0.59	0.825	1	68.838			
Sum Weight:	4.93	24.82						OTM	1471.70 kip-ft	26.22		

Tower Forces - No Ice - Wind 60 To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
ft	K	K							ft ²	K	plf	
T1	0.00	0.45	A	0.199	2.6	0.59	0.8	1	5.720	0.51	153.12	A
120.00-116.67			B	0.195	2.613	0.589	0.8	1	5.634			
			C	0.195	2.613	0.589	0.8	1	5.634			
T2	0.05	0.77	A	0.175	2.682	0.586	0.8	1	11.951	1.11	133.05	B
116.67-108.33			B	0.18	2.664	0.587	0.8	1	12.307			
			C	0.13	2.846	0.579	0.8	1	9.241			
T3	0.13	0.78	A	0.24	2.466	0.599	0.8	1	17.133	1.44	172.33	B
108.33-100.00			B	0.246	2.448	0.601	0.8	1	17.729			
			C	0.126	2.864	0.578	0.8	1	9.419			
T4	0.18	1.09	A	0.247	2.448	0.601	0.8	1	18.506	1.47	176.78	B
100.00-91.67			B	0.245	2.454	0.601	0.8	1	18.581			
			C	0.163	2.725	0.584	0.8	1	12.456			
T5	0.24	1.11	A	0.239	2.47	0.599	0.8	1	18.824	1.50	179.47	B
91.67-83.33			B	0.243	2.458	0.6	0.8	1	19.326			
			C	0.21	2.562	0.593	0.8	1	16.432			
T6	0.35	1.30	A	0.24	2.467	0.599	0.8	1	19.736	1.90	227.46	B
83.33-75.00			B	0.339	2.199	0.628	0.8	1	28.182			
			C	0.203	2.586	0.591	0.8	1	16.623			
T7	1.40	5.12	A	0.244	2.454	0.6	0.8	1	66.290	6.45	258.18	B
75.00-50.00			B	0.39	2.083	0.648	0.8	1	108.346			
			C	0.232	2.494	0.597	0.8	1	62.293			
T8	1.46	6.90	A	0.253	2.429	0.603	0.8	1	78.646	6.10	243.90	B

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	Project New Haven, CT (West Rock) - DESPP/CSP Load Conditions Client SMK-003 / ASM-010 / NSS-044 / (AT&T) / (Sprint) / (T-Mobile)	Date 17:06:27 04/09/20 Designed by MCD

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
ft	K	K							ft ²	K	plf	
50.00-25.00			B	0.375	2.116	0.642	0.8	1	116.586			
			C	0.236	2.479	0.598	0.8	1	73.316			
T9 25.00-0.00	1.12	7.30	A	0.211	2.559	0.593	0.8	1	72.476	5.52	220.78	B
			B	0.296	2.305	0.615	0.8	1	100.491			
			C	0.198	2.603	0.59	0.8	1	67.911			
Sum Weight:	4.93	24.82						OTM	1457.89 kip-ft	25.99		

Tower Forces - No Ice - Wind 90 To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
ft	K	K							ft ²	K	plf	
T1	0.00	0.45	A	0.199	2.6	0.59	0.85	1	5.969	0.53	159.77	A
120.00-116.67			B	0.195	2.613	0.589	0.85	1	5.883			
			C	0.195	2.613	0.589	0.85	1	5.883			
T2	0.05	0.77	A	0.175	2.682	0.586	0.85	1	12.265	1.14	136.49	B
116.67-108.33			B	0.18	2.664	0.587	0.85	1	12.625			
			C	0.13	2.846	0.579	0.85	1	9.567			
T3	0.13	0.78	A	0.24	2.466	0.599	0.85	1	17.482	1.47	176.15	B
108.33-100.00			B	0.246	2.448	0.601	0.85	1	18.121			
			C	0.126	2.864	0.578	0.85	1	9.757			
T4	0.18	1.09	A	0.247	2.448	0.601	0.85	1	18.885	1.51	180.91	B
100.00-91.67			B	0.245	2.454	0.601	0.85	1	19.016			
			C	0.163	2.725	0.584	0.85	1	12.816			
T5	0.24	1.11	A	0.239	2.47	0.599	0.85	1	19.216	1.53	183.60	B
91.67-83.33			B	0.243	2.458	0.6	0.85	1	19.771			
			C	0.21	2.562	0.593	0.85	1	16.781			
T6	0.35	1.30	A	0.24	2.467	0.599	0.85	1	20.137	1.92	230.78	B
83.33-75.00			B	0.339	2.199	0.628	0.85	1	28.594			
			C	0.203	2.586	0.591	0.85	1	16.986			
T7	1.40	5.12	A	0.244	2.454	0.6	0.85	1	67.745	6.54	261.45	B
75.00-50.00			B	0.39	2.083	0.648	0.85	1	109.718			
			C	0.232	2.494	0.597	0.85	1	63.605			
T8	1.46	6.90	A	0.253	2.429	0.603	0.85	1	80.772	6.19	247.75	B
50.00-25.00			B	0.375	2.116	0.642	0.85	1	118.424			
			C	0.236	2.479	0.598	0.85	1	75.340			
T9 25.00-0.00	1.12	7.30	A	0.211	2.559	0.593	0.85	1	74.414	5.62	224.73	B
			B	0.296	2.305	0.615	0.85	1	102.288			
			C	0.198	2.603	0.59	0.85	1	69.765			
Sum Weight:	4.93	24.82						OTM	1485.51 kip-ft	26.45		

Tower Forces - With Ice - Wind Normal To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
ft	K	K							ft ²	K	plf	
T1	0.00	0.70	A	0.266	2.389	0.606	1	1	8.426	0.69	207.26	A

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	Client SMK-003 / ASM-010 / NSS-044 / (AT&T) / (Sprint) / (T-Mobile)	Designed by MCD

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
ft	K	K							ft ²	K	plf	
120.00-116.67			B	0.257	2.416	0.604	1	1	8.214			
			C	0.257	2.416	0.604	1	1	8.214			
T2	0.15	1.14	A	0.243	2.459	0.6	1	1	17.626	1.50	179.41	B
116.67-108.33			B	0.245	2.452	0.601	1	1	18.026			
			C	0.168	2.708	0.584	1	1	12.922			
T3	0.40	1.16	A	0.345	2.183	0.631	1	1	26.452	1.98	237.17	B
108.33-100.00			B	0.348	2.176	0.632	1	1	27.457			
			C	0.162	2.728	0.583	1	1	13.193			
T4	0.51	1.56	A	0.352	2.166	0.633	1	1	28.442	2.03	243.63	B
100.00-91.67			B	0.346	2.18	0.631	1	1	28.821			
			C	0.217	2.541	0.594	1	1	17.703			
T5	0.65	1.60	A	0.343	2.188	0.63	1	1	28.938	2.07	248.43	B
91.67-83.33			B	0.347	2.177	0.632	1	1	30.205			
			C	0.289	2.326	0.613	1	1	23.943			
T6	0.93	1.77	A	0.349	2.175	0.632	1	1	30.720	2.90	347.49	B
83.33-75.00			B	0.517	1.879	0.706	1	1	50.382			
			C	0.279	2.353	0.61	1	1	24.204			
T7	3.60	6.89	A	0.351	2.168	0.633	1	1	102.248	10.39	415.55	B
75.00-50.00			B	0.602	1.803	0.755	1	1	201.544			
			C	0.317	2.251	0.621	1	1	90.816			
T8	3.80	9.28	A	0.363	2.142	0.637	1	1	121.297	9.38	375.36	B
50.00-25.00			B	0.567	1.829	0.734	1	1	207.687			
			C	0.32	2.244	0.622	1	1	106.035			
T9	2.92	9.51	A	0.295	2.309	0.614	1	1	108.334	8.06	322.51	B
			B	0.441	1.989	0.669	1	1	170.151			
			C	0.261	2.405	0.605	1	1	95.321			
Sum Weight:	12.96	33.62						OTM	2162.77 kip-ft	38.99		

Tower Forces - With Ice - Wind 45 To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
ft	K	K							ft ²	K	plf	
T1	0.00	0.70	A	0.266	2.389	0.606	0.825	1	7.563	0.62	186.03	A
120.00-116.67			B	0.257	2.416	0.604	0.825	1	7.340			
			C	0.257	2.416	0.604	0.825	1	7.340			
T2	0.15	1.14	A	0.243	2.459	0.6	0.825	1	16.565	1.40	167.77	B
116.67-108.33			B	0.245	2.452	0.601	0.825	1	16.856			
			C	0.168	2.708	0.584	0.825	1	11.781			
T3	0.40	1.16	A	0.345	2.183	0.631	0.825	1	25.254	1.86	223.68	B
108.33-100.00			B	0.348	2.176	0.632	0.825	1	25.895			
			C	0.162	2.728	0.583	0.825	1	12.012			
T4	0.51	1.56	A	0.352	2.166	0.633	0.825	1	27.154	1.91	229.18	B
100.00-91.67			B	0.346	2.18	0.631	0.825	1	27.112			
			C	0.217	2.541	0.594	0.825	1	16.474			
T5	0.65	1.60	A	0.343	2.188	0.63	0.825	1	27.605	1.95	234.15	B
91.67-83.33			B	0.347	2.177	0.632	0.825	1	28.468			
			C	0.289	2.326	0.613	0.825	1	22.795			
T6	0.93	1.77	A	0.349	2.175	0.632	0.825	1	29.366	2.75	330.36	B
83.33-75.00			B	0.517	1.879	0.706	0.825	1	47.899			
			C	0.279	2.353	0.61	0.825	1	23.006			
T7	3.60	6.89	A	0.351	2.168	0.633	0.825	1	97.402	9.90	395.94	B
75.00-50.00			B	0.602	1.803	0.755	0.825	1	192.032			
			C	0.317	2.251	0.621	0.825	1	86.572			

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	Project New Haven, CT (West Rock) - DESPP/CSP Load Conditions Client SMK-003 / ASM-010 / NSS-044 / (AT&T) / (Sprint) / (T-Mobile)	Date 17:06:27 04/09/20 Designed by MCD

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
ft	K	K							ft ²	K	plf	
T8 50.00-25.00	3.80	9.28	A	0.363	2.142	0.637	0.825	1	114.414	8.93	357.28	B
			B	0.567	1.829	0.734	0.825	1	197.680			
			C	0.32	2.244	0.622	0.825	1	99.612			
T9 25.00-0.00	2.92	9.51	A	0.295	2.309	0.614	0.825	1	101.691	7.62	304.75	B
			B	0.441	1.989	0.669	0.825	1	160.780			
			C	0.261	2.405	0.605	0.825	1	89.221			
Sum Weight:	12.96	33.62						OTM	2045.37 kip-ft	36.95		

Tower Forces - With Ice - Wind 60 To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
ft	K	K							ft ²	K	plf	
T1 120.00-116.67	0.00	0.70	A	0.266	2.389	0.606	0.8	1	7.439	0.61	182.99	A
			B	0.257	2.416	0.604	0.8	1	7.215			
			C	0.257	2.416	0.604	0.8	1	7.215			
T2 116.67-108.33	0.15	1.14	A	0.243	2.459	0.6	0.8	1	16.413	1.38	166.10	B
			B	0.245	2.452	0.601	0.8	1	16.689			
			C	0.168	2.708	0.584	0.8	1	11.618			
T3 108.33-100.00	0.40	1.16	A	0.345	2.183	0.631	0.8	1	25.083	1.85	221.76	B
			B	0.348	2.176	0.632	0.8	1	25.672			
			C	0.162	2.728	0.583	0.8	1	11.843			
T4 100.00-91.67	0.51	1.56	A	0.352	2.166	0.633	0.8	1	26.970	1.89	227.11	B
			B	0.346	2.18	0.631	0.8	1	26.868			
			C	0.217	2.541	0.594	0.8	1	16.299			
T5 91.67-83.33	0.65	1.60	A	0.343	2.188	0.63	0.8	1	27.415	1.93	232.11	B
			B	0.347	2.177	0.632	0.8	1	28.220			
			C	0.289	2.326	0.613	0.8	1	22.631			
T6 83.33-75.00	0.93	1.77	A	0.349	2.175	0.632	0.8	1	29.172	2.73	327.91	B
			B	0.517	1.879	0.706	0.8	1	47.545			
			C	0.279	2.353	0.61	0.8	1	22.835			
T7 75.00-50.00	3.60	6.89	A	0.351	2.168	0.633	0.8	1	96.710	9.83	393.14	B
			B	0.602	1.803	0.755	0.8	1	190.673			
			C	0.317	2.251	0.621	0.8	1	85.965			
T8 50.00-25.00	3.80	9.28	A	0.363	2.142	0.637	0.8	1	113.431	8.87	354.69	B
			B	0.567	1.829	0.734	0.8	1	196.250			
			C	0.32	2.244	0.622	0.8	1	98.694			
T9 25.00-0.00	2.92	9.51	A	0.295	2.309	0.614	0.8	1	100.742	7.56	302.21	B
			B	0.441	1.989	0.669	0.8	1	159.441			
			C	0.261	2.405	0.605	0.8	1	88.349			
Sum Weight:	12.96	33.62						OTM	2028.60 kip-ft	36.65		

Tower Forces - With Ice - Wind 90 To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
ft	K	K							ft ²	K	plf	

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Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
ft	K	K							ft ²	K	plf	
T1 120.00-116.67	0.00	0.70	A	0.266	2.389	0.606	0.85	1	7.686	0.63	189.06	A
			B	0.257	2.416	0.604	0.85	1	7.465			
			C	0.257	2.416	0.604	0.85	1	7.465			
T2 116.67-108.33	0.15	1.14	A	0.243	2.459	0.6	0.85	1	16.716	1.41	169.43	B
			B	0.245	2.452	0.601	0.85	1	17.024			
			C	0.168	2.708	0.584	0.85	1	11.944			
T3 108.33-100.00	0.40	1.16	A	0.345	2.183	0.631	0.85	1	25.425	1.88	225.61	B
			B	0.348	2.176	0.632	0.85	1	26.118			
			C	0.162	2.728	0.583	0.85	1	12.180			
T4 100.00-91.67	0.51	1.56	A	0.352	2.166	0.633	0.85	1	27.338	1.93	231.24	B
			B	0.346	2.18	0.631	0.85	1	27.356			
			C	0.217	2.541	0.594	0.85	1	16.650			
T5 91.67-83.33	0.65	1.60	A	0.343	2.188	0.63	0.85	1	27.796	1.97	236.19	B
			B	0.347	2.177	0.632	0.85	1	28.716			
			C	0.289	2.326	0.613	0.85	1	22.959			
T6 83.33-75.00	0.93	1.77	A	0.349	2.175	0.632	0.85	1	29.559	2.77	332.81	B
			B	0.517	1.879	0.706	0.85	1	48.254			
			C	0.279	2.353	0.61	0.85	1	23.178			
T7 75.00-50.00	3.60	6.89	A	0.351	2.168	0.633	0.85	1	98.094	9.97	398.74	B
			B	0.602	1.803	0.755	0.85	1	193.391			
			C	0.317	2.251	0.621	0.85	1	87.178			
T8 50.00-25.00	3.80	9.28	A	0.363	2.142	0.637	0.85	1	115.397	9.00	359.86	B
			B	0.567	1.829	0.734	0.85	1	199.110			
			C	0.32	2.244	0.622	0.85	1	100.529			
T9 25.00-0.00	2.92	9.51	A	0.295	2.309	0.614	0.85	1	102.640	7.68	307.28	B
			B	0.441	1.989	0.669	0.85	1	162.119			
			C	0.261	2.405	0.605	0.85	1	90.092			
Sum Weight:	12.96	33.62						OTM	2062.14 kip-ft	37.24		

Tower Forces - Service - Wind Normal To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
ft	K	K							ft ²	K	plf	
T1 120.00-116.67	0.00	0.45	A	0.199	2.6	0.59	1	1	6.714	0.60	179.73	A
			B	0.195	2.613	0.589	1	1	6.632			
			C	0.195	2.613	0.589	1	1	6.632			
T2 116.67-108.33	0.05	0.77	A	0.175	2.682	0.586	1	1	13.206	1.22	146.82	B
			B	0.18	2.664	0.587	1	1	13.581			
			C	0.13	2.846	0.579	1	1	10.546			
T3 108.33-100.00	0.13	0.78	A	0.24	2.466	0.599	1	1	18.527	1.56	187.59	B
			B	0.246	2.448	0.601	1	1	19.299			
			C	0.126	2.864	0.578	1	1	10.769			
T4 100.00-91.67	0.18	1.09	A	0.247	2.448	0.601	1	1	20.021	1.61	193.32	B
			B	0.245	2.454	0.601	1	1	20.320			
			C	0.163	2.725	0.584	1	1	13.895			
T5 91.67-83.33	0.24	1.11	A	0.239	2.47	0.599	1	1	20.391	1.63	196.00	B
			B	0.243	2.458	0.6	1	1	21.106			
			C	0.21	2.562	0.593	1	1	17.830			
T6 83.33-75.00	0.35	1.30	A	0.24	2.467	0.599	1	1	21.341	2.01	240.75	B
			B	0.339	2.199	0.628	1	1	29.829			
			C	0.203	2.586	0.591	1	1	18.075			
T7 75.00-50.00	1.40	5.12	A	0.244	2.454	0.6	1	1	72.109	6.78	271.26	B
			B	0.39	2.083	0.648	1	1	113.834			

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Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
ft	K	K							ft ²	K	plf	
T8 50.00-25.00	1.46	6.90	C	0.232	2.494	0.597	1	1	67.541			
			A	0.253	2.429	0.603	1	1	87.150	6.48	259.29	B
			B	0.375	2.116	0.642	1	1	123.941			
T9 25.00-0.00	1.12	7.30	C	0.236	2.479	0.598	1	1	81.409			
			A	0.211	2.559	0.593	1	1	80.229	5.91	236.58	B
			B	0.296	2.305	0.615	1	1	107.681			
			C	0.198	2.603	0.59	1	1	75.328			
Sum Weight:	4.93	24.82						OTM	1568.37 kip-ft	27.81		

Tower Forces - Service - Wind 45 To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
ft	K	K							ft ²	K	plf	
T1 120.00-116.67	0.00	0.45	A	0.199	2.6	0.59	0.825	1	5.845	0.52	156.45	A
			B	0.195	2.613	0.589	0.825	1	5.759			
			C	0.195	2.613	0.589	0.825	1	5.759			
T2 116.67-108.33	0.05	0.77	A	0.175	2.682	0.586	0.825	1	12.108	1.12	134.77	B
			B	0.18	2.664	0.587	0.825	1	12.466			
			C	0.13	2.846	0.579	0.825	1	9.404			
T3 108.33-100.00	0.13	0.78	A	0.24	2.466	0.599	0.825	1	17.308	1.45	174.24	B
			B	0.246	2.448	0.601	0.825	1	17.925			
			C	0.126	2.864	0.578	0.825	1	9.588			
T4 100.00-91.67	0.18	1.09	A	0.247	2.448	0.601	0.825	1	18.695	1.49	178.85	B
			B	0.245	2.454	0.601	0.825	1	18.799			
			C	0.163	2.725	0.584	0.825	1	12.636			
T5 91.67-83.33	0.24	1.11	A	0.239	2.47	0.599	0.825	1	19.020	1.51	181.54	B
			B	0.243	2.458	0.6	0.825	1	19.548			
			C	0.21	2.562	0.593	0.825	1	16.607			
T6 83.33-75.00	0.35	1.30	A	0.24	2.467	0.599	0.825	1	19.936	1.91	229.12	B
			B	0.339	2.199	0.628	0.825	1	28.388			
			C	0.203	2.586	0.591	0.825	1	16.804			
T7 75.00-50.00	1.40	5.12	A	0.244	2.454	0.6	0.825	1	67.017	6.50	259.82	B
			B	0.39	2.083	0.648	0.825	1	109.032			
			C	0.232	2.494	0.597	0.825	1	62.949			
T8 50.00-25.00	1.46	6.90	A	0.253	2.429	0.603	0.825	1	79.709	6.15	245.82	B
			B	0.375	2.116	0.642	0.825	1	117.505			
			C	0.236	2.479	0.598	0.825	1	74.328			
T9 25.00-0.00	1.12	7.30	A	0.211	2.559	0.593	0.825	1	73.445	5.57	222.76	B
			B	0.296	2.305	0.615	0.825	1	101.390			
			C	0.198	2.603	0.59	0.825	1	68.838			
Sum Weight:	4.93	24.82						OTM	1471.70 kip-ft	26.22		

Tower Forces - Service - Wind 60 To Face

tnxTower AECOM 500 Enterprise Drive, Suite 3B Rocky Hill, CT Phone: 860-263-5800 FAX: 860-812-2094	Job	Page
	120' Self-Supporting Lattice Tower	29 of 34
	Project New Haven, CT (West Rock) - DESPP/CSP Load Conditions Client SMK-003 / ASM-010 / NSS-044 / (AT&T) / (Sprint) / (T-Mobile)	Date 17:06:27 04/09/20 Designed by MCD

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
ft	K	K							ft ²	K	plf	
T1 120.00-116.67	0.00	0.45	A	0.199	2.6	0.59	0.8	1	5.720	0.51	153.12	A
			B	0.195	2.613	0.589	0.8	1	5.634			
			C	0.195	2.613	0.589	0.8	1	5.634			
T2 116.67-108.33	0.05	0.77	A	0.175	2.682	0.586	0.8	1	11.951	1.11	133.05	B
			B	0.18	2.664	0.587	0.8	1	12.307			
			C	0.13	2.846	0.579	0.8	1	9.241			
T3 108.33-100.00	0.13	0.78	A	0.24	2.466	0.599	0.8	1	17.133	1.44	172.33	B
			B	0.246	2.448	0.601	0.8	1	17.729			
			C	0.126	2.864	0.578	0.8	1	9.419			
T4 100.00-91.67	0.18	1.09	A	0.247	2.448	0.601	0.8	1	18.506	1.47	176.78	B
			B	0.245	2.454	0.601	0.8	1	18.581			
			C	0.163	2.725	0.584	0.8	1	12.456			
T5 91.67-83.33	0.24	1.11	A	0.239	2.47	0.599	0.8	1	18.824	1.50	179.47	B
			B	0.243	2.458	0.6	0.8	1	19.326			
			C	0.21	2.562	0.593	0.8	1	16.432			
T6 83.33-75.00	0.35	1.30	A	0.24	2.467	0.599	0.8	1	19.736	1.90	227.46	B
			B	0.339	2.199	0.628	0.8	1	28.182			
			C	0.203	2.586	0.591	0.8	1	16.623			
T7 75.00-50.00	1.40	5.12	A	0.244	2.454	0.6	0.8	1	66.290	6.45	258.18	B
			B	0.39	2.083	0.648	0.8	1	108.346			
			C	0.232	2.494	0.597	0.8	1	62.293			
T8 50.00-25.00	1.46	6.90	A	0.253	2.429	0.603	0.8	1	78.646	6.10	243.90	B
			B	0.375	2.116	0.642	0.8	1	116.586			
			C	0.236	2.479	0.598	0.8	1	73.316			
T9 25.00-0.00	1.12	7.30	A	0.211	2.559	0.593	0.8	1	72.476	5.52	220.78	B
			B	0.296	2.305	0.615	0.8	1	100.491			
			C	0.198	2.603	0.59	0.8	1	67.911			
Sum Weight:	4.93	24.82						OTM	1457.89 kip-ft	25.99		

Tower Forces - Service - Wind 90 To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
ft	K	K							ft ²	K	plf	
T1 120.00-116.67	0.00	0.45	A	0.199	2.6	0.59	0.85	1	5.969	0.53	159.77	A
			B	0.195	2.613	0.589	0.85	1	5.883			
			C	0.195	2.613	0.589	0.85	1	5.883			
T2 116.67-108.33	0.05	0.77	A	0.175	2.682	0.586	0.85	1	12.265	1.14	136.49	B
			B	0.18	2.664	0.587	0.85	1	12.625			
			C	0.13	2.846	0.579	0.85	1	9.567			
T3 108.33-100.00	0.13	0.78	A	0.24	2.466	0.599	0.85	1	17.482	1.47	176.15	B
			B	0.246	2.448	0.601	0.85	1	18.121			
			C	0.126	2.864	0.578	0.85	1	9.757			
T4 100.00-91.67	0.18	1.09	A	0.247	2.448	0.601	0.85	1	18.885	1.51	180.91	B
			B	0.245	2.454	0.601	0.85	1	19.016			
			C	0.163	2.725	0.584	0.85	1	12.816			
T5 91.67-83.33	0.24	1.11	A	0.239	2.47	0.599	0.85	1	19.216	1.53	183.60	B
			B	0.243	2.458	0.6	0.85	1	19.771			
			C	0.21	2.562	0.593	0.85	1	16.781			
T6 83.33-75.00	0.35	1.30	A	0.24	2.467	0.599	0.85	1	20.137	1.92	230.78	B
			B	0.339	2.199	0.628	0.85	1	28.594			
			C	0.203	2.586	0.591	0.85	1	16.986			
T7 75.00-50.00	1.40	5.12	A	0.244	2.454	0.6	0.85	1	67.745	6.54	261.45	B
			B	0.39	2.083	0.648	0.85	1	109.718			

tnxTower AECOM 500 Enterprise Drive, Suite 3B Rocky Hill, CT Phone: 860-263-5800 FAX: 860-812-2094	Job 120' Self-Supporting Lattice Tower	Page 30 of 34
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	Client SMK-003 / ASM-010 / NSS-044 / (AT&T) / (Sprint) / (T-Mobile)	Designed by MCD

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
ft	K	K							ft ²	K	plf	
T8	1.46	6.90	C	0.232	2.494	0.597	0.85	1	63.605			
50.00-25.00			A	0.253	2.429	0.603	0.85	1	80.772	6.19	247.75	B
			B	0.375	2.116	0.642	0.85	1	118.424			
T9 25.00-0.00	1.12	7.30	C	0.236	2.479	0.598	0.85	1	75.340			
			A	0.211	2.559	0.593	0.85	1	74.414	5.62	224.73	B
			B	0.296	2.305	0.615	0.85	1	102.288			
			C	0.198	2.603	0.59	0.85	1	69.765			
Sum Weight:	4.93	24.82						OTM	1485.51 kip-ft	26.45		

Force Totals

Load Case	Vertical Forces	Sum of Forces X	Sum of Forces Z	Sum of Overturning Moments, M _x	Sum of Overturning Moments, M _z	Sum of Torques
	K	K	K	kip-ft	kip-ft	kip-ft
Leg Weight	6.83					
Bracing Weight	17.98					
Total Member Self-Weight	24.82					
Total Weight	42.58			-4.10	-19.69	
Wind 0 deg - No Ice		-0.08	-50.49	-3650.27	-11.55	70.65
Wind 30 deg - No Ice		24.29	-42.50	-3085.95	-1765.94	23.28
Wind 45 deg - No Ice		34.24	-34.51	-2508.22	-2483.70	-1.94
Wind 60 deg - No Ice		41.76	-24.26	-1764.90	-3028.50	-26.64
Wind 90 deg - No Ice		48.73	0.08	4.04	-3526.28	-70.11
Wind 120 deg - No Ice		43.42	25.31	1826.04	-3132.31	-98.89
Wind 135 deg - No Ice		34.35	34.63	2511.53	-2495.21	-96.44
Wind 150 deg - No Ice		24.43	42.58	3085.89	-1780.04	-93.40
Wind 180 deg - No Ice		0.08	48.66	3531.59	-27.83	-66.27
Wind 210 deg - No Ice		-24.29	42.50	3077.75	1726.55	-23.28
Wind 225 deg - No Ice		-34.24	34.51	2500.02	2444.32	1.94
Wind 240 deg - No Ice		-43.34	25.17	1811.94	3084.79	28.23
Wind 270 deg - No Ice		-48.73	-0.08	-12.24	3486.89	70.11
Wind 300 deg - No Ice		-41.84	-24.40	-1779.00	2997.25	92.91
Wind 315 deg - No Ice		-34.35	-34.63	-2519.73	2455.83	96.44
Wind 330 deg - No Ice		-24.43	-42.58	-3094.09	1740.65	93.40
Member Ice	8.80					
Total Weight Ice	66.19			-23.99	-46.26	
Wind 0 deg - Ice		-0.06	-65.78	-4638.54	-40.02	130.86
Wind 30 deg - Ice		31.79	-55.42	-3930.04	-2271.70	45.89
Wind 45 deg - Ice		44.78	-45.02	-3199.54	-3184.88	0.11
Wind 60 deg - Ice		54.61	-31.67	-2258.78	-3878.02	-44.99
Wind 90 deg - Ice		63.68	0.06	-17.75	-4507.95	-124.93
Wind 120 deg - Ice		56.70	32.95	2288.69	-4000.46	-178.42
Wind 135 deg - Ice		44.87	45.11	3160.39	-3193.70	-175.48
Wind 150 deg - Ice		31.89	55.48	3888.30	-2282.50	-170.82
Wind 180 deg - Ice		0.06	63.44	4456.39	-52.49	-123.21
Wind 210 deg - Ice		-31.79	55.42	3882.07	2179.19	-45.89
Wind 225 deg - Ice		-44.78	45.02	3151.57	3092.37	-0.11
Wind 240 deg - Ice		-56.64	32.84	2277.89	3901.71	47.56
Wind 270 deg - Ice		-63.68	-0.06	-30.22	4415.43	124.93
Wind 300 deg - Ice		-54.67	-31.77	-2269.58	3791.75	168.19
Wind 315 deg - Ice		-44.87	-45.11	-3208.36	3101.18	175.48
Wind 330 deg - Ice		-31.89	-55.48	-3936.28	2189.99	170.82
Total Weight	42.58			-4.10	-19.69	
Wind 0 deg - Service		-0.08	-50.49	-3647.52	8.15	70.65

<i>tnxTower</i> AECOM 500 Enterprise Drive, Suite 3B Rocky Hill, CT Phone: 860-263-5800 FAX: 860-812-2094	Job	120' Self-Supporting Lattice Tower	Page 31 of 34
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	Client	SMK-003 / ASM-010 / NSS-044 / (AT&T) / (Sprint) / (T-Mobile)	Designed by MCD

Load Case	Vertical Forces K	Sum of Forces X K	Sum of Forces Z K	Sum of Overturning Moments, M_x kip-ft	Sum of Overturning Moments, M_z kip-ft	Sum of Torques kip-ft
Wind 30 deg - Service		24.29	-42.50	-3083.19	-1746.23	23.28
Wind 45 deg - Service		34.24	-34.51	-2505.47	-2463.99	-1.94
Wind 60 deg - Service		41.76	-24.26	-1762.14	-3008.79	-26.64
Wind 90 deg - Service		48.73	0.08	6.80	-3506.57	-70.11
Wind 120 deg - Service		43.42	25.31	1828.79	-3112.60	-98.89
Wind 135 deg - Service		34.35	34.63	2514.29	-2475.51	-96.44
Wind 150 deg - Service		24.43	42.58	3088.65	-1760.33	-93.40
Wind 180 deg - Service		0.08	48.66	3534.35	-8.12	-66.27
Wind 210 deg - Service		-24.29	42.50	3080.51	1746.26	-23.28
Wind 225 deg - Service		-34.24	34.51	2502.78	2464.03	1.94
Wind 240 deg - Service		-43.34	25.17	1814.69	3104.50	28.23
Wind 270 deg - Service		-48.73	-0.08	-9.48	3506.60	70.11
Wind 300 deg - Service		-41.84	-24.40	-1776.24	3016.96	92.91
Wind 315 deg - Service		-34.35	-34.63	-2516.98	2475.54	96.44
Wind 330 deg - Service		-24.43	-42.58	-3091.33	1760.36	93.40

Load Combinations

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

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<i>Comb. No.</i>	<i>Description</i>
37	Dead+Wind 45 deg - Service
38	Dead+Wind 60 deg - Service
39	Dead+Wind 90 deg - Service
40	Dead+Wind 120 deg - Service
41	Dead+Wind 135 deg - Service
42	Dead+Wind 150 deg - Service
43	Dead+Wind 180 deg - Service
44	Dead+Wind 210 deg - Service
45	Dead+Wind 225 deg - Service
46	Dead+Wind 240 deg - Service
47	Dead+Wind 270 deg - Service
48	Dead+Wind 300 deg - Service
49	Dead+Wind 315 deg - Service
50	Dead+Wind 330 deg - Service

Maximum Tower Deflections - Service Wind

<i>Section No.</i>	<i>Elevation ft</i>	<i>Horz. Deflection in</i>	<i>Gov. Load Comb.</i>	<i>Tilt °</i>	<i>Twist °</i>
T1	120 - 116.667	4.531	35	0.2546	0.0749
T2	116.667 - 108.333	4.354	35	0.2546	0.0743
T3	108.333 - 100	3.892	35	0.2550	0.0775
T4	100 - 91.6667	3.420	35	0.2532	0.0794
T5	91.6667 - 83.3333	2.961	35	0.2476	0.0771
T6	83.3333 - 75	2.513	35	0.2375	0.0732
T7	75 - 50	2.088	35	0.2222	0.0673
T8	50 - 25	0.952	35	0.1717	0.0449
T9	25 - 0	0.228	35	0.0821	0.0214

Critical Deflections and Radius of Curvature - Service Wind

<i>Elevation ft</i>	<i>Appurtenance</i>	<i>Gov. Load Comb.</i>	<i>Deflection in</i>	<i>Tilt °</i>	<i>Twist °</i>	<i>Radius of Curvature ft</i>
138.00	Lightning Rod 5/8x4'	35	4.531	0.2546	0.0749	26846
120.00	16'x3" Omni (inverted)	35	4.531	0.2546	0.0749	26846
117.00	6' DISH (SOLID)	35	4.372	0.2546	0.0744	26846
115.00	6' DISH (SOLID)	35	4.264	0.2547	0.0745	26846
114.00	Rohn 6' Side-Arm(1)	35	4.209	0.2547	0.0748	28080
113.00	Piord 4' Side Mount Standoff (1)	35	4.154	0.2548	0.0752	31141
112.00	Junction Box	35	4.098	0.2549	0.0756	36284
111.00	6' DISH (SOLID)	35	4.042	0.2549	0.0761	43953
110.00	6'8"x4" Pipe Mount	35	3.986	0.2550	0.0766	55488
109.00	10'x2" Dipole Antenna (inverted)	35	3.930	0.2550	0.0771	74558
107.00	6'8"x4" Pipe Mount	35	3.816	0.2549	0.0780	214172
106.00	16'x3" Omni (inverted)	35	3.760	0.2548	0.0784	Inf
105.00	SE419-SWBPALDF Panel Antenna	35	3.703	0.2547	0.0787	249752
104.00	AP13-850/065D w/Mount Pipe	35	3.646	0.2545	0.0790	130328
103.00	TMA 432-83H-01T	35	3.589	0.2543	0.0792	89334
101.00	SE419-SWBPALDF Panel Antenna	35	3.476	0.2536	0.0794	59473
100.00	PD458-406	35	3.420	0.2532	0.0794	54789
96.00	3'4"x4" Pipe Mount (horizontal)	35	3.198	0.2510	0.0787	69619
95.00	SC479-HF1LDF (inverted)	35	3.143	0.2504	0.0784	81176
92.00	PD458-406	35	2.979	0.2479	0.0773	105143

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	Client SMK-003 / ASM-010 / NSS-044 / (AT&T) / (Sprint) / (T-Mobile)	Designed by MCD

<i>Elevation</i>	<i>Appurtenance</i>	<i>Gov. Load Comb.</i>	<i>Deflection in</i>	<i>Tilt °</i>	<i>Twist °</i>	<i>Radius of Curvature ft</i>
<i>ft</i>			<i>in</i>			<i>ft</i>
88.00	SC479-HF1LDF (inverted)	35	2.762	0.2439	0.0756	52710
87.00	4'6"x3" Pipe Mount (horizontal)	35	2.708	0.2427	0.0751	44103
86.00	20' 4-Bay Dipole	35	2.654	0.2414	0.0746	38277
82.00	3' Yagi	35	2.443	0.2353	0.0724	31731
81.00	3' Yagi	35	2.391	0.2336	0.0717	33057
80.00	VFA12-HD-S Antenna Mount	35	2.340	0.2318	0.0711	35339
	Frame					
77.00	20' 4-Bay Dipole	35	2.188	0.2261	0.0689	46419
76.00	3'4"x4" Pipe Mount (horizontal)	35	2.138	0.2241	0.0681	49962
72.00	Face Mount	35	1.939	0.2168	0.0649	47962
67.00	4'6"x3" Pipe Mount (horizontal)	35	1.697	0.2080	0.0607	34558
65.00	6' Yagi w/ Mount	35	1.602	0.2045	0.0589	30997
63.00	GPS	35	1.509	0.2008	0.0571	28100
55.00	20' 4-Bay Dipole w/ 2' Sidearm Mount	35	1.155	0.1845	0.0497	20455
53.00	1.0" Dia 4' Omni w/Pipe Mount	35	1.072	0.1797	0.0478	19163
48.00	10'x6" Dipole Antenna	35	0.875	0.1659	0.0430	16858
47.00	5'x1.5in dia Whip Antenna /w mount	35	0.838	0.1628	0.0420	16529
43.00	3' Whip (3in diameter) /w mount	35	0.697	0.1495	0.0382	15392
41.00	4 FT DISH	35	0.631	0.1425	0.0363	14883
40.00	1'x1' Panel Antenna	35	0.599	0.1389	0.0354	14642
39.00	6'x1" Whip Antenna w/ Mount	35	0.568	0.1352	0.0344	14407

Maximum Tower Deflections - Design Wind

<i>Section No.</i>	<i>Elevation ft</i>	<i>Horz. Deflection in</i>	<i>Gov. Load Comb.</i>	<i>Tilt °</i>	<i>Twist °</i>
T1	120 - 116.667	5.619	19	0.3140	0.1383
T2	116.667 - 108.333	5.401	19	0.3139	0.1374
T3	108.333 - 100	4.832	19	0.3144	0.1411
T4	100 - 91.6667	4.252	19	0.3123	0.1420
T5	91.6667 - 83.3333	3.687	19	0.3055	0.1375
T6	83.3333 - 75	3.134	19	0.2933	0.1302
T7	75 - 50	2.611	19	0.2748	0.1203
T8	50 - 25	1.202	19	0.2136	0.0807
T9	25 - 0	0.292	19	0.1031	0.0386

Critical Deflections and Radius of Curvature - Design Wind

<i>Elevation</i>	<i>Appurtenance</i>	<i>Gov. Load Comb.</i>	<i>Deflection in</i>	<i>Tilt °</i>	<i>Twist °</i>	<i>Radius of Curvature ft</i>
<i>ft</i>			<i>in</i>			<i>ft</i>
138.00	Lightning Rod 5/8x4'	19	5.619	0.3140	0.1383	22567
120.00	16'x3" Omni (inverted)	19	5.619	0.3140	0.1383	22567
117.00	6' DISH (SOLID)	19	5.423	0.3139	0.1374	22567
115.00	6' DISH (SOLID)	19	5.290	0.3140	0.1376	22567
114.00	Rohn 6' Side-Arm(1)	19	5.223	0.3141	0.1379	23604
113.00	Piord 4' Side Mount Standoff (1)	19	5.154	0.3142	0.1384	26177
112.00	Junction Box	19	5.086	0.3143	0.1390	30501
111.00	6' DISH (SOLID)	19	5.017	0.3143	0.1395	36954
110.00	6'8"x4" Pipe Mount	19	4.948	0.3144	0.1401	46676

<i>tnxTower</i> AECOM 500 Enterprise Drive, Suite 3B Rocky Hill, CT Phone: 860-263-5800 FAX: 860-812-2094	Job	Page
	120' Self-Supporting Lattice Tower	34 of 34
	Project New Haven, CT (West Rock) - DESPP/CSP Load Conditions Client SMK-003 / ASM-010 / NSS-044 / (AT&T) / (Sprint) / (T-Mobile)	Date 17:06:27 04/09/20 Designed by MCD

<i>Elevation</i>	<i>Appurtenance</i>	<i>Gov. Load Comb.</i>	<i>Deflection in</i>	<i>Tilt °</i>	<i>Twist °</i>	<i>Radius of Curvature ft</i>
<i>ft</i>			<i>in</i>	<i>°</i>	<i>°</i>	<i>ft</i>
109.00	10'x2" Dipole Antenna (inverted)	19	4.878	0.3144	0.1407	62798
107.00	6'8"x4" Pipe Mount	19	4.739	0.3143	0.1416	183121
106.00	16'x3" Omni (inverted)	19	4.669	0.3142	0.1420	Inf
105.00	SE419-SWBPALDF Panel Antenna	19	4.599	0.3141	0.1422	211884
104.00	AP13-850/065D w/Mount Pipe	19	4.529	0.3138	0.1423	109019
103.00	TMA 432-83H-01T	19	4.460	0.3136	0.1424	73497
101.00	SE419-SWBPALDF Panel Antenna	19	4.321	0.3128	0.1423	49132
100.00	PD458-406	19	4.252	0.3123	0.1420	45322
96.00	3'4"x4" Pipe Mount (horizontal)	19	3.979	0.3097	0.1403	58006
95.00	SC479-HF1LDF (inverted)	19	3.911	0.3088	0.1398	67859
92.00	PD458-406	19	3.709	0.3059	0.1377	88501
88.00	SC479-HF1LDF (inverted)	19	3.441	0.3010	0.1346	43717
87.00	4'6"x3" Pipe Mount (horizontal)	19	3.375	0.2996	0.1337	36493
86.00	20' 4-Bay Dipole	19	3.309	0.2980	0.1328	31629
82.00	3' Yagi	19	3.049	0.2907	0.1288	26316
81.00	3' Yagi	19	2.985	0.2885	0.1277	27512
80.00	VFA12-HD-S Antenna Mount Frame	19	2.922	0.2863	0.1266	29554
77.00	20' 4-Bay Dipole	19	2.734	0.2794	0.1229	39681
76.00	3'4"x4" Pipe Mount (horizontal)	19	2.672	0.2771	0.1216	43044
72.00	Face Mount	19	2.427	0.2682	0.1162	41536
67.00	4'6"x3" Pipe Mount (horizontal)	19	2.127	0.2577	0.1088	29435
65.00	6' Yagi w/ Mount	19	2.010	0.2534	0.1057	26284
63.00	GPS	19	1.895	0.2490	0.1025	23743
55.00	20' 4-Bay Dipole w/ 2' Sidearm Mount	19	1.455	0.2292	0.0893	17121
53.00	1.0" Dia 4' Omni w/Pipe Mount	19	1.352	0.2234	0.0859	16012
48.00	10'x6" Dipole Antenna	19	1.107	0.2065	0.0773	13981
47.00	5'x1.5in dia Whip Antenna /w mount	19	1.060	0.2027	0.0756	13679
43.00	3' Whip (3in diameter) /w mount	19	0.883	0.1864	0.0687	12628
41.00	4 FT DISH	19	0.801	0.1778	0.0653	12163
40.00	1'x1' Panel Antenna	19	0.761	0.1733	0.0636	11943
39.00	6'x1" Whip Antenna w/ Mount	19	0.722	0.1688	0.0619	11731

Program Version 8.0.5.0 - 11/28/2018

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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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Exhibit E



November 5, 2018

Mr. Sheldon Freincle
Northeast Site Solutions
420 Main Street
Sturbridge, MA 01566

Reference: **Analysis of Antenna Mount:
T-Mobile Site: CT11086B
Connecticut State Police Tower #27
Baldwin Drive, New Haven Connecticut
AECOM Project Number: NSS-045**

Dear Mr. Freincle,

AECOM has been authorized by Northeast Site Solutions, on behalf of T-Mobile, to conduct a structural evaluation of the proposed antenna modification to the existing antenna mount frame attached to an existing transmission tower structure located at Baldwin Drive in New Haven, Connecticut.

The proposed antenna modification will consist of the removal of three (3) Ericsson AIR 21 B2A/B4P panel antennas, three (3) Commscope LNX-65615DS-A1M panel antennas and three (3) Ericsson RRUS-11 Remote Radio Units and the installation of three (3) RFS APXVAARR24_43-U-NA20 Panel Antennas, three (3) Ericsson AIR 3246 B66 Panel Antennas, three (3) Ericsson 2217 B2 Remote Radio Units, three (3) Ericsson 4449 B71+B12 Remote Radio Units mounted to the existing antenna mount frame at 95 feet above tower base. The existing antenna mount frame applies the use of SitePro1 Product # EUSF10-U Ultimate Sector Frame (one mount per antenna Sector).

An independent structural analysis was conducted considering the antenna pipe mounted frame mounted to the existing tower structure for its strength design. This analysis did not consider the loading of the proposed antenna mounting frame attached to the tower structure. A previous tower structure analysis has been designed (by AECOM, project # 60579905 / NSS-044) addressing the antenna modifications associated for this mount assembly stated above and herein.

Two load conditions were evaluated as shown below which were compared to allowable stresses according to AISC and TIA-222-G.

Load Condition 1 = 97 mph (3-second gust) Wind Load (without ice) + (Antenna + Mount) Dead Load
Load Condition 2 = 50 mph (3-second gust) Wind Load (with ice) + 0.75" Ice Load + (Antenna + Mount) Dead Load

NOTE: The 0.75" Ice load thickness obtained from the TIA-222-G and the ASCE 7-10 Standard are considered to increase in thickness with the height of the Antenna and Mount assembly.

The independent structural analysis also considered the following site conditions (following the TIA-222-G Standard):

- Structure Class 3 – Substantial Communications
- Topographic Category 4 – Structure located on upper half of ridge – Wind Speed-up considered
 - o Crest Height for surrounding terrain to site location = 150 feet
- Exposure Class C – Open Terrain with scattered obstructions

Mr. Sheldon Freinkle
Northeast Site Solutions
Antenna Upgrade / Mount Structural Analysis
420 Main Street, MA 01566
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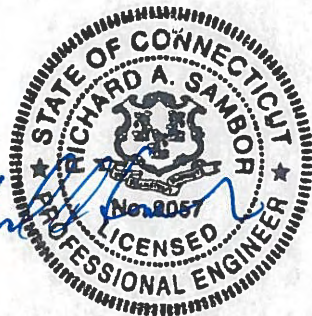
The independent structural analysis was conducted using the STAAD.Pro V8i software design program to assess the strength design of the antenna mount frame. The analysis was conducted in compliance with the Codes and Standards of the TIA-222 Revision G with Addendum 2, the ASCE 7-2010 Minimum Design Loads Standard, the 2015 International Building Code, and the 2018 State of Connecticut Building code amendments to the 2015 International Building Code. The results of our independent structural analysis has determined that the proposed antenna upgrades to the existing antenna pipe mounts are in compliance with the Codes and Standards previously mentioned.

Per the included mount analysis, the controlling stress for the design mount is noted at 94.9% structural capacity rating.

Should there be any questions, please do not hesitate to contact me at (860) 990-6767.

Sincerely,

AECOM



Richard Sambor, P.E.
Senior Structural Engineer

cc: ICA, MJE, CF/Book – AECOM

NEW HAVEN/HAMDEN (CSP#27), CT – ANTENNA STRENGTH DESIGN ANALYSIS CALCULATIONS (ANTENNA MOUNT)

• DESIGN CRITERIA USED FOR PROPOSED ANTENNA ASSESSMENT

- 2015 International Building Code (IBC) with 2018 State of Connecticut Building Code amendments to the 2015 IBC
- Telecommunications Industry Association Design Standard TIA-222-G (Structural Standard for Antenna Supporting Structures and Antennas with Addendum 2 (December 2009))

• DESIGN ASSUMPTIONS CONSIDERED DURING ANALYSIS

- Existing antenna mount pipe is assumed to be 2.5 Schedule 40 ASTM A36 material
- Stresses applied to the existing metal wall and supporting steel members solely for the existing wall were not considered as part of this analysis
- Antenna u-bolted connection points are assumed to be sufficient for installation and were not considered as part of this analysis calculation
- Localized seismic effects are assumed to be contained by the tower structure and are not considered as part of the antenna assessment design.

• DESIGN CALCULATION APPLIED FOR ANTENNA ASSESSMENT OF STRESS AND OF THE MOUNT CLASSIFICATION LISTING REQUIRED FOR BARE AND ICED MOUNTS.

- Topographic Category of Structure = "Category 4" – Structure located on upper half of ridge – wind speed-up considered
 - Crest Height of hill = 150.0 feet
- Exposure Category of Structure = "Exposure C" – Open Terrain
- Antenna supporting stresses checked through STAAD design program considering forces obtained from TIA-222-G Standard (V.asd)
- Antenna supporting stresses checked through STAAD design program considering forces obtained from ASCE 7-2010 (V.ultimate)
- Antenna mount classification for iced considerations following design criteria (design thickness per ASCE 7-2010 and TIA-222-G Standards).
 - **NOTE:** Calculation references to the use of "TIA-222-H" in the STAAD design program (not currently approved design Standard) applied as a design and loading guidance for Serviceability/Maintenance work on mount not specifically identified per the TIA-222-G design Standard. Maintenance loads consist of a 500lbf vertical load @ antenna mount pipes and 250lbf vertical load @ end of horizontal cantilevered member. (Load Combination # 5 & 6 within analysis herein).

- **ANTENNAS LOCATED IN THE ALPHA/BETA/GAMMA SECTOR WITH AN ANTENNA CENTERLINE ELEVATION OF 95'-0" ABOVE GROUND.**

- 3 Antennas in total in per Sector position on tower structure.
 - Antennas to remain (per sector):
 - (1) Ericsson Panel Antenna (Model #: AIR 32 KRD901146-1_B66A_B2A)
 - (1) Generic Twin TMA Unit (AWS)
 - Removed existing antennas (to be removed and/or swapped for Proposed Antennas)
 - (1) Ericsson Panel Antenna (Model #: AIR21 KRC 118023-1_B2A/B4P)
 - (1) Andrew Panel Antenna (Model #: LNX-6515DS-A1M)
 - (1) Ericsson Remote Radio Unit (Model #: RRUS-11 B12)
 - Proposed Antennas to be Installed (per sector):
 - (1) RFS Panel Antenna (Model #: APXVAARR24_43-U-NA20)
 - (1) Ericsson Panel Antenna (Model #: IR3246 B66)
 - (1) Ericsson Remote Radio Unit (Model #: 2217 B2)
 - (1) Ericsson Remote Radio Unit (Model #: 4449 B71+B12)

- **ANTENNA MOUNT DESIGN CONSIDERATION/CONDITIONS USED FOR STRUCTURAL ANALYSIS AND ASSESSMENT OF PROPOSED ANTENNA**

- For the purposes of design, the SitePro1 Product # EUSF10-U was considered for strength design of the antenna mount.
- The following image is a graphical representation of the Antenna Mount Frame with antenna pipe mounts on the existing tower leg as a reference for the STAAD Design Model used for Strength Design cases.
 - Wind loading considered the worst case surface area of contact considering Bare and Iced Antenna conditions
 - Load combinations used are in reference to the TIA-222-G Section 2.3.2 for Strength Design Load Combinations.

- **CALCULATED LOAD COMBINATIONS FOR CONSIDERATION (LRFD):**

- **LC#1: 1.2*Dead Load + 1.0 Wind w/o ice load**
- **LC#2: 0.9*Dead Load + 1.0 Wind w/o ice load**
- **LC#3: 1.2*Dead Load + 1.0 Dead Load (ice) + 1.0 Wind w/ ice load**
- **LC#4: 1.4*Dead Load**
- **LC#5: 1.2*Dead Load + 1.5*Maintenance Load (500 lbf) - Antenna Mounting Pipe + 1.0 Wind w/o ice load**
- **LC#6: 1.2*Dead Load + 1.5*Maintenance Load (250 lbf) - Cantilever end of Mount Pipe Assembly**

• DETERMINE BARE (NO ICE) FORCE APPLIED TO ANTENNA (TIA-222-G STANDARD)

TIA-222-G Section 2.6.6.2 – Design Wind Force on Appurtenances and Mount Frame

$$F_a = q_z * G_h * (EPA)_A$$

$$\text{where: } q_z = 0.00256 * K_z * K_{zt} * K_d * V^2 * I$$

$$\text{where, } K_z = 2.01 * \left(\frac{z}{z_g}\right)^{\frac{2}{\alpha}} \quad [\text{TIA-222-G Section 2.6.5.2}]$$

$$\text{where: } z = \text{height above ground level} = 95 \text{ feet}$$

$$z_g = 900 \quad [\text{TIA-222-G Table 2-4 – Exposure Category "C"}]$$

$$\alpha = 9.5 \quad [\text{TIA-222-G Table 2-4 – Exposure Category "C"}]$$

$$K_{t,min} = 0.72 \quad [\text{TIA-222-G Table 2-5 – Topographic Category 4}]$$

$$K_z = 2.01 * \left(\frac{95}{900}\right)^{\frac{2}{9.5}} = 1.252$$

$$K_{zt} \rightarrow \text{for Topographic Category 4} \quad [\text{TIA-222-G Section 2.6.6.4}]$$

$$\text{where, } K_{zt} = \left[1 + \frac{K_e K_t}{K_h}\right]^2 \quad [\text{TIA-222-G Section 2.6.6.4}]$$

$$\text{where: } K_e = \text{Terrain Constant} = 1.00 \quad [\text{TIA-222-G Table 2-4; Exposure Cat. "C"}]$$

$$K_t = \text{Topographic Constant} = 0.72 \quad [\text{TIA-222-G Table 2-5; Topo. Cat. "4"}]$$

$$K_h = e^{\left(\frac{f*z}{H}\right)}, \text{ where}$$

$$f = \text{Height Attenuation Factor} = 1.50 \quad [\text{TIA-222-G; Table 2-5; Topographic Category "4"}]$$

$$z = \text{height above ground level at the base of the structure} = 95 \text{ feet}$$

$$H = \text{Height of Crest above Surrounding Terrain} = 150 \text{ feet}$$

$$K_h = e^{\left(\frac{1.50*95 \text{ feet}}{150 \text{ feet}}\right)} = 2.5857$$

$$K_{zt} = \left[1 + \frac{1.00*0.72}{2.5857}\right]^2 = 1.6344$$

$$K_d = 0.85 \quad [\text{TIA-222-G Table 2-2}]$$

$V = [\text{Connecticut State Building Code 2016 – Appendix N and IBC 2012 Section 1609.1.1 – Determination of Wind Loads – Exception 5 "Designs using TIA-222" applies for determination for Design Wind load obtained as "V.ult" are to be converted to "V.asd" when applying the TIA-222-G design Standard (under Section 1609.3) for Basic Wind Speed}]$

$$V_{asd} = 97 \text{ mph for Structure Class 3 (Risk Category 3/4)}$$

$$I = \text{Importance Factor} = \text{Structure Class 3} = 1.15 \quad [\text{TIA-222-G Table 2-3}]$$

$$G_h = \text{Gust Height Factor} \quad [\text{TIA-222-G Section 2.6.7}]$$

$$0.85 \leq G_h \leq 1.0 \rightarrow \text{Apply } G_h = 1.0 \text{ for antenna mount frames}$$

$$q_z = 0.00256 * 1.252 * 1.573 * 0.95 * 97^2 * 1.15 = 51.8248 \text{ (psf)}$$

Job New Haven / CSP#27
 Description Antenna Mount Frame
 Analysis

Project No. NSS-045
 Computed by MCD
 Checked by MCD

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 Sheet 11/5/2018
 Date 11/5/2018

Reference

Distributed Wind to Antenna Frame:

Outside Diameter of Pipe = 2.8750 in

Effective Projected Area on Mount Pipe (Pound (force) per linear Inch):

$$F_a = q_z * G_h * C_A * A_A = 51.8248 (psf) * 1.0 * 0.8 * \frac{2.3750in * 126in}{12in} = 86.1587 lbf$$

$$Dist Load = \frac{F_a}{126in} = 0.6838 lb/in$$

(Normal to Surface to Wind), where:

$q_z = 51.8248 (psf)$ design wind pressure (calculated earlier)

$G_h = 1.00$ Gust Height Factor

$C_A = 0.8$ for Round Surfaces (assuming Aspect Ratio = 7 (Slightly Conservative))

$A_A = 2.8750in * 126in = 362.25in^2$ for Round Pipe (for design purposes, height of pipe used to determine load per linear inch.)

Distributed Wind to Antenna on Mount Frame:

Antenna #1 Height x Width = 46.6 inches x 17.9 inches

$$C_A A_A * q_z * G_h = 1.4 * \frac{46.6in * 17.9in}{144in^2} * 51.8248 (psf) * 1.0 = 420.3567lbf \rightarrow \frac{420.3567lbf}{36in} = 11.6766lb/in$$

$C_A = 1.4$ for Flat Surfaces (assuming Aspect Ratio = 7 (Slightly Conservative))

Antenna #2 Height x Width = 95.9 inches x 24 inches

$$C_A A_A * q_z * G_h = 1.4 * \frac{95.9in * 24in}{144in^2} * 51.8248 (psf) * 1.0 = 1159.7468lbf \rightarrow \frac{1159.75lbf}{36in} = 32.2152lb/in$$

$C_A = 1.4$ for Flat Surfaces (assuming Aspect Ratio = 7 (Slightly Conservative))

Antenna #3 Height x Width = 58 inches x 15.75 inches

$$C_A A_A * q_z * G_h = 1.4 * \frac{58in * 15.75in}{144in^2} * 51.8248 (psf) * 1.0 = 460.3370lbf \rightarrow \frac{460.3370lbf}{36in} = 12.7871lb/in$$

$C_A = 1.4$ for Flat Surfaces (assuming Aspect Ratio = 7 (Slightly Conservative))

Job New Haven / CSP #27
Description Antenna Mount + Frame
Analysis

Project No. NSS-045
Computed by MCD
Checked by MCD

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Sheet of
Date 11/5/2018
Date 11/5/2018

Reference

Dead Load of Antennas, Connection Frame and Mount Pipe

DL weight of Antenna #1 (w/ Pipe) = 132 lbs

DL weight of Antenna #2 (w/ Pipe) = 327 lbs

DL weight of Antenna #3 (w/ Pipe) = 195 lbs

DL weight of Mount = 285 lbs

DL Weight of Generic Twin TMA Unit = 25 lbs

DL Weight of RRH Unit 2217 B2 = 45 lbs

DL Weight of RRH Unit B71+B12 = 80 lbs

Antenna loading to top of Pipe in STAAD Model shall consist of the following (per RFDS Layout):

Pipe Mount #1:

- (DL) Ericsson AIR 32 KRD901146-1_B66A/B2A Panel w/ Pipe wt: = 132 lbs

Pipe Mount #2:

- (DL) RFS APXVAARR24_43-U-NA20 Panel w/ Pipe wt: = 177 lbs
- (DL) Generic Twin TMA Unit attached to existing Pipe = 25 lbs
- (DL) Ericsson 2271 B12 Unit attached to existing Pipe = 45 lbs
- (DL) Ericsson 4449 B71+B12 Unit attached to existing Pipe = 80 lbs
- Total (Unfactored) DL = 327 lbs

Pipe Mount #3:

- (DL) Ericsson AIR 3246_B66 Panel w/ Pipe wt. = 195 lbs

• DETERMINE ICED FORCES APPLIED TO ANTENNA (TIA-222-G STANDARD)

TIA-222-G Section 2.6.6.2 – Design Wind Force on Appurtenances and Mount Frame

$$F_a = q_z * G_h * (EPA)_A$$

$$\text{where: } q_z = 0.00256 * K_z * K_{zt} * K_d * V^2 * I$$

$$\text{where, } K_z = 2.01 * \left(\frac{z}{z_g} \right)^{\frac{2}{\alpha}} \quad [\text{TIA-222-G Section 2.6.5.2}]$$

$$\text{where: } z = \text{height above ground level} = 95 \text{ feet}$$

$$z_g = 900 \quad [\text{TIA-222-G Table 2-4 – Exposure Category "C"}]$$

$$\alpha = 9.5 \quad [\text{TIA-222-G Table 2-4 – Exposure Category "C"}]$$

$$K_{t,min} = 0.72 \quad [\text{TIA-222-G Table 2-5 – Topographic Category 4}]$$

$$K_z = 2.01 * \left(\frac{95}{900} \right)^{\frac{2}{9.5}} = 1.252$$

$$K_{zt} \rightarrow \text{for Topographic Category 4} \quad [\text{TIA-222-G Section 2.6.6.4}]$$

$$\text{where, } K_{zt} = \left[1 + \frac{K_e K_t}{K_h} \right]^2 \quad [\text{TIA-222-G Section 2.6.6.4}]$$

$$\text{where: } K_e = \text{Terrain Constant} = 1.00 \quad [\text{TIA-222-G Table 2-4; Exposure Cat. "C"}]$$

$$K_t = \text{Topographic Constant} = 0.72 \quad [\text{TIA-222-G Table 2-5; Topo. Cat. "4"}]$$

$$K_h = e^{\left(\frac{f * z}{H} \right)}, \text{ where}$$

$$f = \text{Height Attenuation Factor} = 1.50 \quad [\text{TIA-222-G; Table 2-5; Topographic Category "4"}]$$

$$z = \text{height above ground level at the base of the structure} = 95 \text{ feet}$$

$$H = \text{Height of Crest above Surrounding Terrain} = 150 \text{ feet}$$

$$K_h = e^{\left(\frac{1.50 * 95 \text{ feet}}{150 \text{ feet}} \right)} = 2.5857$$

$$K_{zt} = \left[1 + \frac{1.00 * 0.72}{2.5857} \right]^2 = 1.6344$$

$$K_d = 0.85 \quad [\text{TIA-222-G Table 2-2}]$$

$V = [\text{Connecticut State Building Code 2016 – Appendix N and IBC 2012 Section 1609.1.1 – Determination of Wind Loads – Exception 5 "Designs using TIA-222" applies for determination for Design Wind load obtained as "V.ult" are to be converted to "V.asd" when applying the TIA-222-G design Standard (under Section 1609.3) for Basic Wind Speed}]$

$$V_{asd} = 50 \text{ mph for Structure Class 3 (Risk Category 3/4)}$$

$$I = \text{Importance Factor} = \text{Structure Class 3} = 1.00 \quad [\text{TIA-222-G Table 2-3}]$$

$$G_h = \text{Gust Height Factor} \quad [\text{TIA-222-G Section 2.6.7}]$$

$$0.85 \leq G_h \leq 1.0 \rightarrow \text{Apply } G_h = 1.0 \text{ for antenna mount frames}$$

$$q_z = 0.00256 * 1.252 * 1.573 * 0.95 * 50^2 * 1.00 = 11.974 \text{ (psf)}$$

Design Ice Thickness (TIA-222-G / ASCE 7):

$$t_{iz} = 2.0 * t_i * I * K_{iz} * (K_{zt})^{0.35} = 2.0 * 0.75in * 1.25 * 1.111 * 1.6344^{0.35} = 2.4739in$$

where:

$t_i = 0.75$ inch Ice Thickness – Region Specific

$I = 1.25$ Ice Importance Factor per Structure Class [TIA-222-G Table 2-3]

$$K_{iz} = \left(\frac{z}{33}\right)^{0.10} \leq 1.4 \rightarrow \left(\frac{95ft}{33}\right)^{0.10} = 1.111 \leq 1.4 \rightarrow (1.111 = K_{iz})$$

$$(K_{zt})^{0.35} = (1.6344)^{0.35} \text{ (K.zt calculated earlier)}$$

Area of Design Ice Thickness – for Weight:

Horizontal / Vertical Pipes (2-3/8" O.D.)

$$A_{iz} = \pi * t_{iz} * (D_c + t_{iz}) = \pi * 2.4739in * (2.375in + 2.4739in) = 37.6856in^2$$

$$Wt_{ice} = \frac{A_{iz}}{144in^2} * 56pcf * \frac{Length (in)}{12in} = \frac{37.6856in^2}{144in^2} * \frac{126in}{12in} = 156.3433 lbs \rightarrow \frac{156lb}{126in} = 1.2408lb/in$$

Volume of Design Ice Thickness – for Weight:

Antenna #1 Height x Width x Depth:

- Dimensions with Design Ice thickness = (51.6" x 22.9" x 13.7") = 16188 in³
- Dimensions Antenna = (46.6" x 17.9" x 8.7") = 7257 in³
 - $\frac{(16188 - 7257)}{12^3} * 56pcf = 289.4 lbs \text{ (ice)}$

Antenna #2a Height x Width x Depth (Panel Antenna):

- Dimensions with Design Ice thickness = (101" x 29" x 13.7") = 40127 in³
- Dimensions Antenna = (95.9" x 24" x 8.7") = 20024 in³
 - $\frac{(40127 - 20024)}{12^3} * 56pcf = 651.5 lbs \text{ (ice)}$

Antenna #2b Height x Width x Depth (Generic TMAs):

- Dimensions with Design Ice thickness = (16.8" x 8.7" x 14.8") = 2163 in³
- Dimensions Antenna = (11.8" x 3.7" x 9.8") = 428 in³
 - $\frac{(2163 - 428)}{12^3} * 56pcf = 56.25 lbs \text{ (ice)}$

Antenna #2c Height x Width x Depth (Ericsson 2217 B12):

- Dimensions with Design Ice thickness = (22" x 21" x 21") = 9702 in³
- Dimensions Antenna = (17" x 16" x 16") = 4352 in³
 - $\frac{(9702 - 4352)}{12^3} * 56pcf = 173 lbs \text{ (ice)}$

Antenna #2d Height x Width x Depth:

- Dimensions with Design Ice thickness = (20" x 18.25" x 14.25") = 5201.25 in³
- Dimensions Antenna = (15" x 13.25" x 9.25") = 1838.5 in³
 - $\frac{(5201 - 1839)}{12^3} * 56pcf = 109 lbs \text{ (ice)}$

Total Antenna #2 Weight = (651.5 + 56.25 + 173 + 109) lbs = 989.25 lbs

Antenna #3 Height x Width x Depth:

- Dimensions with Design Ice thickness = (63" x 20.75" x 14.375") = 18792 in³
- Dimensions Antenna = (58" x 15.75" x 9.375") = 8564 in³
 - $\frac{(18792 - 8564)}{12^3} * 56pcf = 331.5 lbs (ice)$

Distributed Wind to Antenna Frame (with ice):

Outside Diameter of Pipe = 2.8750 in + 2*2.5 in

Effective Projected Area on Mount-Pipe (Pound (force) per linear Inch):

$$F_a = q_z * G_h * C_A * A_A = 11.974 (psf) * 1.0 * 0.8 * \frac{966.125in^2}{\left(\frac{12in}{ft}\right)^2} = 64.2682 lbf$$

$$Dist Load = \frac{F_a}{126in} = 0.5101 lb/in$$

(Normal to Surface to Wind), where:

$q_z = 11.974 (psf)$ design wind pressure (calculated earlier)

$G_h = 1.00$ Gust Height Factor

$C_A = 0.8$ for Round Surfaces (assuming Aspect Ratio = 7 (Slightly Conservative))

$A_A = (2.8750in + 5in) * 126in = 966.125in^2$ for Round Pipe (for design purposes, height of pipe used to determine load per linear inch.)

Distributed Wind to Mount Frame (with ice):

Antenna #1 Height x Width = 51.6 inches x 22.9 inches

$$C_A A_A * q_z * G_h = 1.4 * \frac{51.6in * 22.9in}{\frac{144in^2}{ft^2}} * 11.9739 (psf) * 1.0 = 137.6167lbf \rightarrow \frac{137.6167lbf}{36in} = 3.8333lb/in$$

$C_A = 1.4$ for Flat Surfaces (assuming Aspect Ratio = 7 (Slightly Conservative))

Antenna #2 Height x Width = 101 inches x 29 inches

$$C_A A_A * q_z * G_h = 1.4 * \frac{101in * 29in}{\frac{144in^2}{ft^2}} * 11.9739 (psf) * 1.0 = 341lbf \rightarrow \frac{341lbf}{36in} = 9.4724lb/in$$

$C_A = 1.4$ for Flat Surfaces (assuming Aspect Ratio = 7 (Slightly Conservative))

Antenna #3 Height x Width = 63 inches x 20.75 inches

$$C_A A_A * q_z * G_h = 1.4 * \frac{63in * 20.75in}{\frac{144in^2}{ft^2}} * 11.9739 (psf) * 1.0 = 152.1683lbf \rightarrow \frac{152.1683lbf}{36in} = 4.2222lb/in$$

$C_A = 1.4$ for Flat Surfaces (assuming Aspect Ratio = 7 (Slightly Conservative))

• DETERMINE SERVICE/MAINTENANCE FORCE APPLIED TO ANTENNA (TIA-222-G STANDARD)

TIA-222-G Section 2.6.6.2 – Design Wind Force on Appurtenances and Mount Frame

$$F_a = q_z * G_h * (EPA)_A$$

$$\text{where: } q_z = 0.00256 * K_z * K_{zt} * K_d * V^2 * I$$

$$\text{where, } K_z = 2.01 * \left(\frac{z}{z_g}\right)^{\frac{2}{\alpha}} \quad [\text{TIA-222-G Section 2.6.5.2}]$$

$$\text{where: } z = \text{height above ground level} = 95 \text{ feet}$$

$$z_g = 900 \quad [\text{TIA-222-G Table 2-4 – Exposure Category "C"}]$$

$$\alpha = 9.5 \quad [\text{TIA-222-G Table 2-4 – Exposure Category "C"}]$$

$$K_{t,min} = 0.72 \quad [\text{TIA-222-G Table 2-5 – Topographic Category 4}]$$

$$K_z = 2.01 * \left(\frac{95}{900}\right)^{\frac{2}{9.5}} = 1.252$$

$$K_{zt} \rightarrow \text{for Topographic Category 4} \quad [\text{TIA-222-G Section 2.6.6.4}]$$

$$\text{where, } K_{zt} = \left[1 + \frac{K_e K_t}{K_h}\right]^2 \quad [\text{TIA-222-G Section 2.6.6.4}]$$

$$\text{where: } K_e = \text{Terrain Constant} = 1.00 \quad [\text{TIA-222-G Table 2-4; Exposure Cat. "C"}]$$

$$K_t = \text{Topographic Constant} = 0.72 \quad [\text{TIA-222-G Table 2-5; Topo. Cat. "4"}]$$

$$K_h = e^{\left(\frac{f \cdot z}{H}\right)}, \text{ where}$$

$$f = \text{Height Attenuation Factor} = 1.50 \quad [\text{TIA-222-G; Table 2-5; Topographic Category "4"}]$$

$$z = \text{height above ground level at the base of the structure} = 95 \text{ feet}$$

$$H = \text{Height of Crest above Surrounding Terrain} = 150 \text{ feet}$$

$$K_h = e^{\left(\frac{1.50 \cdot 95 \text{ feet}}{150 \text{ feet}}\right)} = 2.5857$$

$$K_{zt} = \left[1 + \frac{1.00 \cdot 0.72}{2.5857}\right]^2 = 1.6344$$

$$K_d = 0.85 \quad [\text{TIA-222-G Table 2-2}]$$

V = [Connecticut State Building Code 2016 – Appendix N and IBC 2012 Section 1609.1.1 – Determination of Wind Loads – Exception 5 "Designs using TIA-222" applies for determination for Design Wind load obtained as " V_{ult} " are to be converted to " V_{asd} " when applying the TIA-222-G design Standard (under Section 1609.3) for Basic Wind Speed)

$$V_{asd} = 30 \text{ mph for Structure Class 3 (Risk Category 3/4)}$$

$$I = \text{Importance Factor} = \text{Structure Class 3} = 1.15 \quad [\text{TIA-222-G Table 2-3}]$$

$$G_h = \text{Gust Height Factor} \quad [\text{TIA-222-G Section 2.6.7}]$$

$$0.85 \leq G_h \leq 1.0 \rightarrow \text{Apply } G_h = 1.0 \text{ for antenna mount frames}$$

$$q_z = 0.00256 * 1.252 * 1.573 * 0.95 * 30^2 * 1.15 = 4.9572 \text{ (psf)}$$

Distributed Wind to Antenna Frame:

Outside Diameter of Pipe = 2.8750 in

Effective Projected Area on Mount Pipe (Pound (force) per linear Inch):

$$F_a = q_z * G_h * C_A * A_A = 4.9572 (psf) * 1.0 * 0.8 * \frac{2.3750in * 126in}{12in} = 8.2413 lbf$$

$$Dist Load = \frac{F_a}{126in} = 0.0654 lb/in$$

(Normal to Surface to Wind), where:

$q_z = 4.9572 (psf)$ design wind pressure (calculated earlier)

$G_h = 1.00$ Gust Height Factor

$C_A = 0.8$ for Round Surfaces (assuming Aspect Ratio = 7 (Slightly Conservative))

$A_A = 2.8750in * 126in = 362.25in^2$ for Round Pipe (for design purposes, height of pipe used to-determine load per linear inch.)

Distributed Wind to Antenna on Mount Frame:

Antenna #1 Height x Width = 46.6 inches x 17.9 inches

$$C_A A_A * q_z * G_h = 1.4 * \frac{46.6in * 17.9in}{144in^2} * 4.9572 (psf) * 1.0 = 40.2084lbf \rightarrow \frac{40.2084lbf}{36in} = 1.1169lb/in$$

$C_A = 1.4$ for Flat Surfaces (assuming Aspect Ratio = 7 (Slightly Conservative))

Antenna #2 Height x Width = 95.9 inches x 24 inches

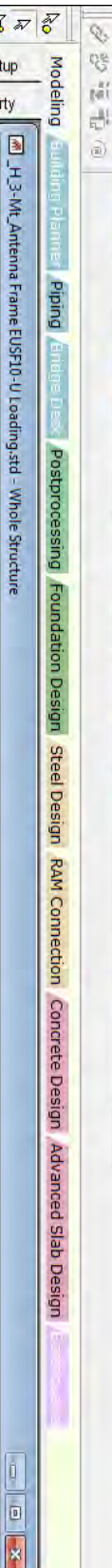
$$C_A A_A * q_z * G_h = 1.4 * \frac{95.9in * 24in}{144in^2} * 4.9572 (psf) * 1.0 = 110.9256lbf \rightarrow \frac{110.9256lbf}{36in} = 3.0813lb/in$$

$C_A = 1.4$ for Flat Surfaces (assuming Aspect Ratio = 7 (Slightly Conservative))

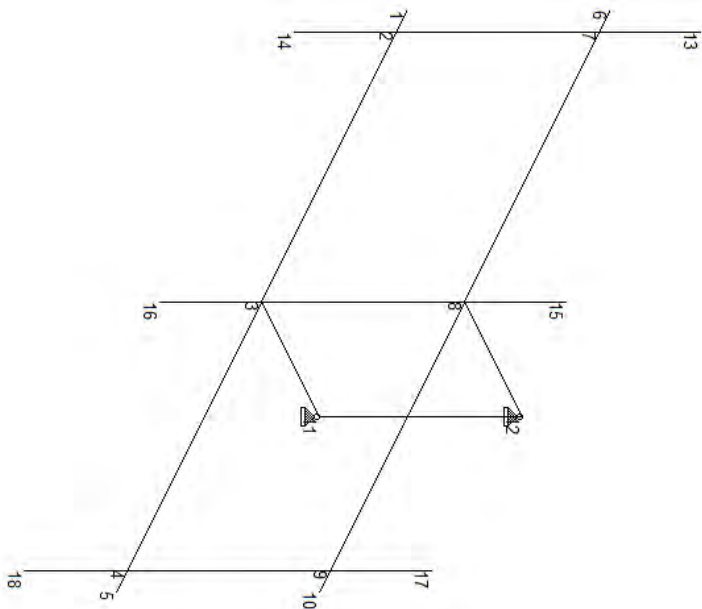
Antenna #3 Height x Width = 58 inches x 15.75 inches

$$C_A A_A * q_z * G_h = 1.4 * \frac{58in * 15.75in}{144in^2} * 4.9572 (psf) * 1.0 = 44.0296lbf \rightarrow \frac{44.0296lbf}{36in} = 1.2230lb/in$$

$C_A = 1.4$ for Flat Surfaces (assuming Aspect Ratio = 7 (Slightly Conservative))



Design Analysis/Print General Geometry Setup Material Load & Definition Support Spec Property



Load 12

Load & Definition

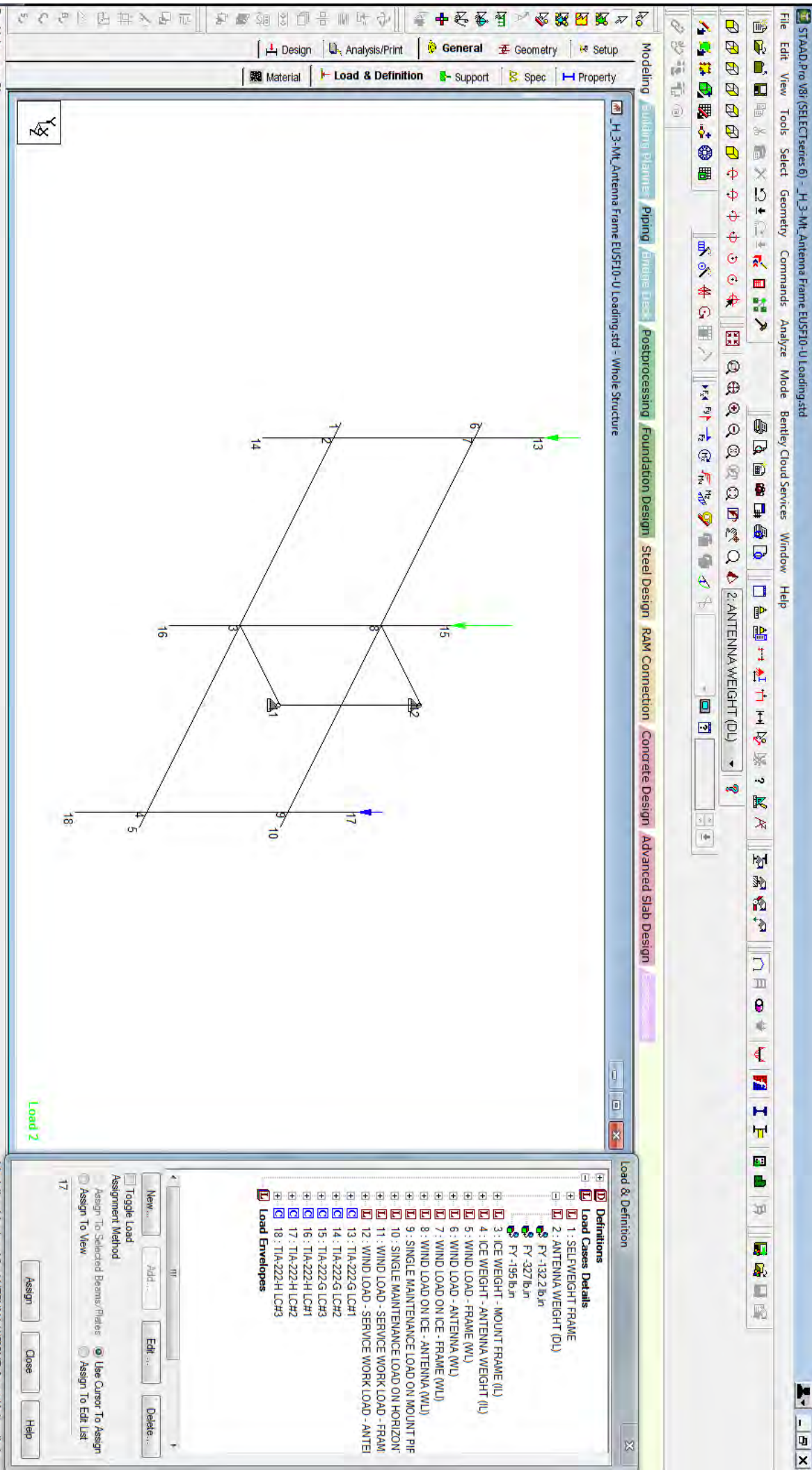
Definitions

- ☒ Load Cases Details
- ☒ 1: SELFWEIGHT FRAME
- ☒ 2: ANTENNA WEIGHT (DL)
- ☒ 3: ICE WEIGHT - MOUNT FRAME (IL)
- ☒ 4: ICE WEIGHT - ANTENNA WEIGHT (IL)
- ☒ 5: WIND LOAD - FRAME (WL)
- ☒ 6: WIND LOAD - ANTENNA (WL)
- ☒ 7: WIND LOAD ON ICE - FRAME (WL)
- ☒ 8: WIND LOAD ON ICE - ANTENNA (WL)
- ☒ 9: SINGLE MAINTENANCE LOAD ON MOUNT PIP
- ☒ 10: SINGLE MAINTENANCE LOAD ON HORIZON
- ☒ 11: WIND LOAD - SERVICE WORK LOAD - FRAM
- ☒ 12: WIND LOAD - SERVICE WORK LOAD - ANTE
- ☒ 13: TIA-222-G LC#1
- ☒ 14: TIA-222-G LC#2
- ☒ 15: TIA-222-G LC#3
- ☒ 16: TIA-222-H LC#1
- ☒ 17: TIA-222-H LC#2
- ☒ 18: TIA-222-H LC#3
- ☒ Load Envelopes

☐ Toggle Load

 Assignment Method
 ☒ Use Cursor To Assign

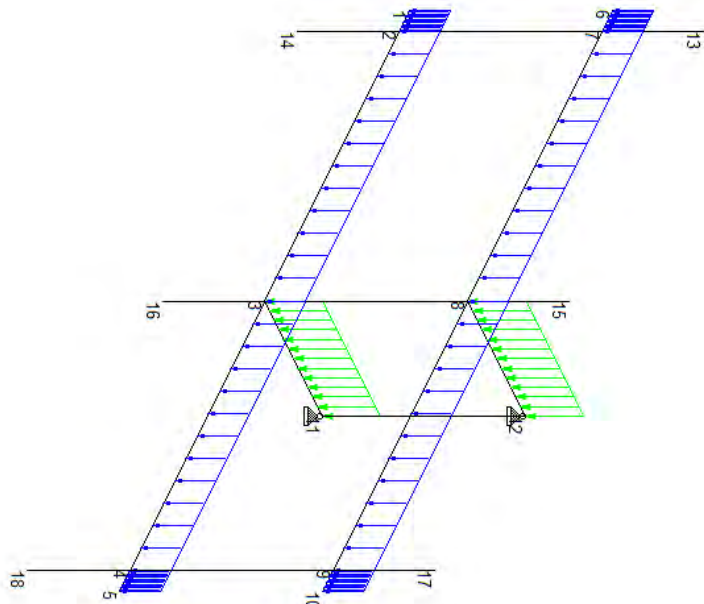
Assign Close Help



For Help, press F1

Modeling Mo Load 2: ANTENNA WEIGHT Input Units: lb-in

H-3-Mt. Antenna Frame EUSF10-U Loading.std - Whole Structure



Load 3

Load & Definition

Definitions

- Load Cases Details
 - 1: SELFWEIGHT FRAME
 - 2: ANTENNA WEIGHT (DL)
 - 3: ICE WEIGHT - MOUNT FRAME (UL)
 - 4: ICE WEIGHT - ANTENNA WEIGHT (UL)
 - 5: WIND LOAD - FRAME (WL)
 - 6: WIND LOAD ON ICE - FRAME (WL)
 - 7: WIND LOAD ON ICE - ANTENNA (WL)
 - 8: SINGLE MAINTENANCE LOAD ON ANTENNA (WL)
 - 9: SINGLE MAINTENANCE LOAD ON MOUNT PIP
 - 10: SINGLE MAINTENANCE LOAD ON HORIZON
 - 11: WIND LOAD - SERVICE WORK LOAD - FRAM
 - 12: WIND LOAD - SERVICE WORK LOAD - ANTE
 - 13: TIA-222-G LC#1
 - 14: TIA-222-G LC#2
 - 15: TIA-222-G LC#3
 - 16: TIA-222-H LC#1
 - 17: TIA-222-H LC#2
 - 18: TIA-222-H LC#3
- Load Envelopes

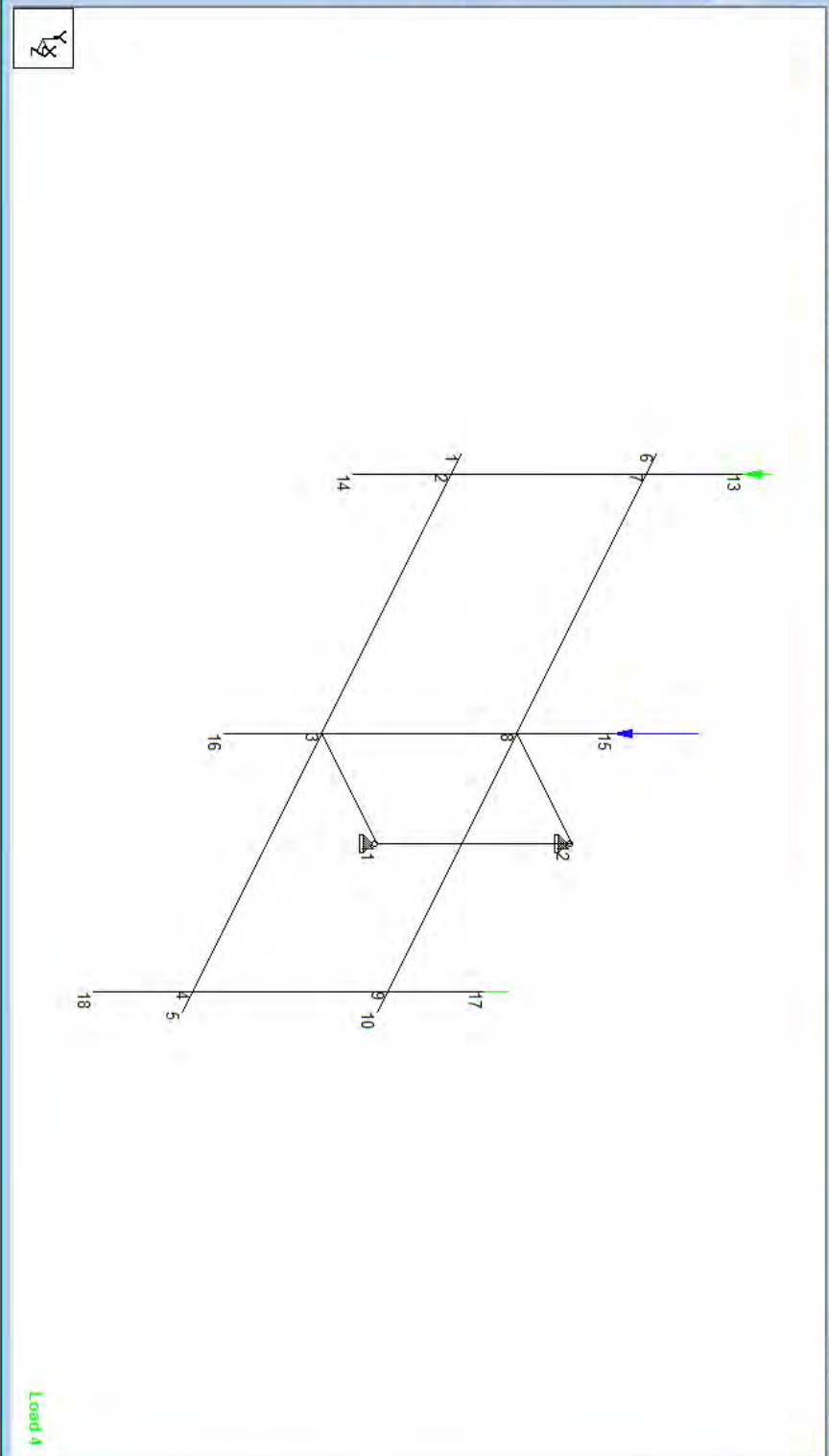
Assignment Method

- Assign To Selected Beams/Plates
 - Use Cursor To Assign
 - Assign To View

Assign Close Help



Modeling Building Frames Piping Finite Truss Postprocessing Foundation Design Steel Design RAM Connection Concrete Design Advanced Slab Design



Load 4

Load & Definition

Definitions

- ☒ Load Cases Details
- ☒ 1: SELFWEIGHT FRAME
- ☒ 2: ANTENNA WEIGHT (DL)
- ☒ 3: ICE WEIGHT - MOUNT FRAME (IL)
- ☒ 4: ICE WEIGHT - ANTENNA WEIGHT (UL)
- ☒ FY -290 b/in
- ☒ FY -989.25 b/in
- ☒ FY -331.5 b/in
- ☒ 5: WIND LOAD - FRAME (WL)
- ☒ 6: WIND LOAD - ANTENNA (WL)
- ☒ 7: WIND LOAD ON ICE - FRAME (WL)
- ☒ 8: WIND LOAD ON ICE - ANTENNA (WL)
- ☒ 9: SINGLE MAINTENANCE LOAD ON MOUNT PIPE
- ☒ 10: SINGLE MAINTENANCE LOAD ON HORIZONTAL
- ☒ 11: WIND LOAD - SERVICE WORK LOAD - FRAME
- ☒ 12: WIND LOAD - SERVICE WORK LOAD - ANTENNA
- ☒ 13: TIA-222-G LC#1
- ☒ 14: TIA-222-G LC#2
- ☒ 15: TIA-222-G LC#3
- ☒ 16: TIA-222-H LC#1
- ☒ 17: TIA-222-H LC#2
- ☒ 18: TIA-222-H LC#3
- ☒ Load Envelopes

Toggle Load

Assignment Method

Assign To Selected Beams/Plates ☒ Use Cursor To Assign

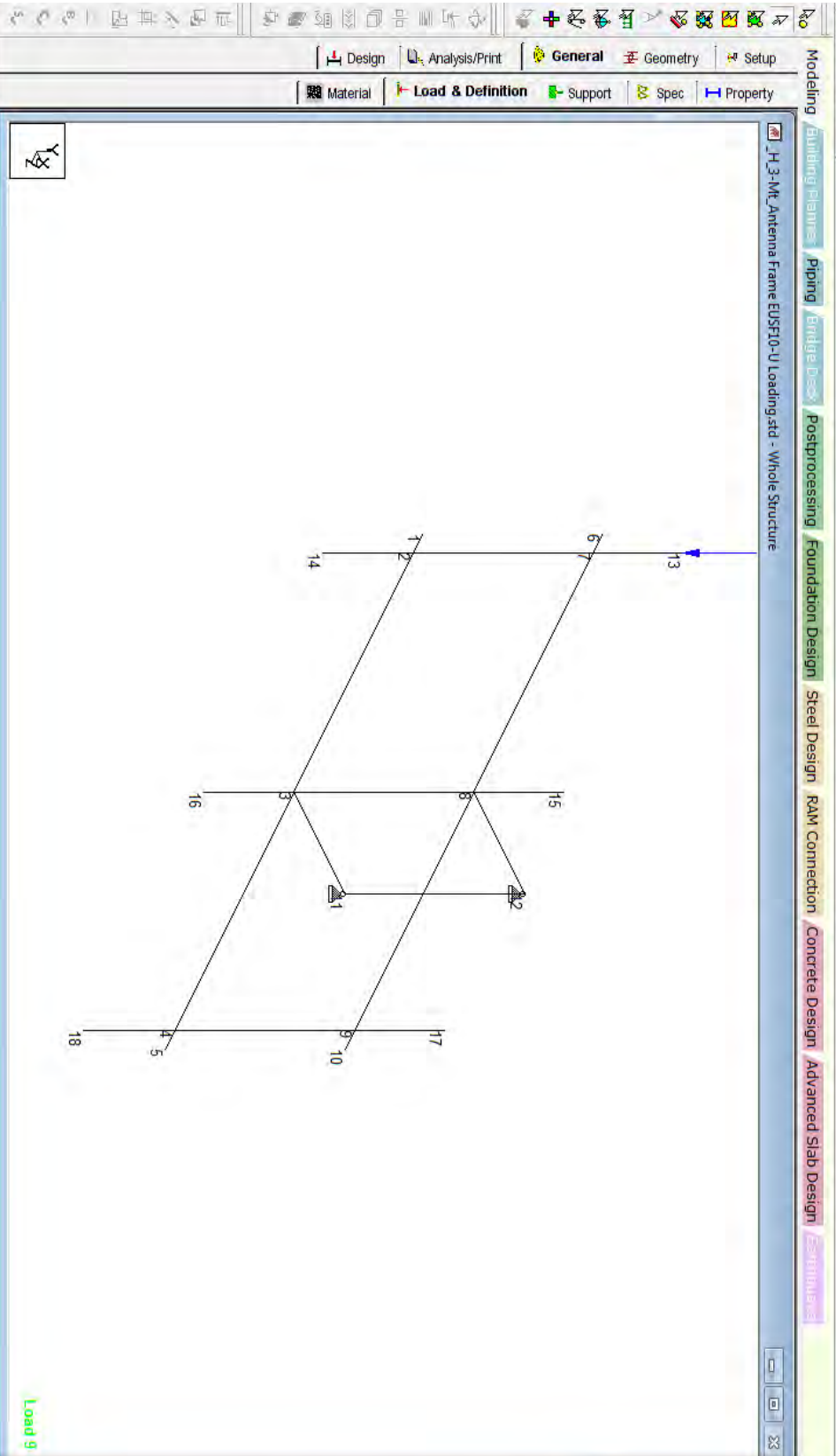
Assign To View ☐ Assign To Edit List

15

Assign Close Help



- Assign Close Help



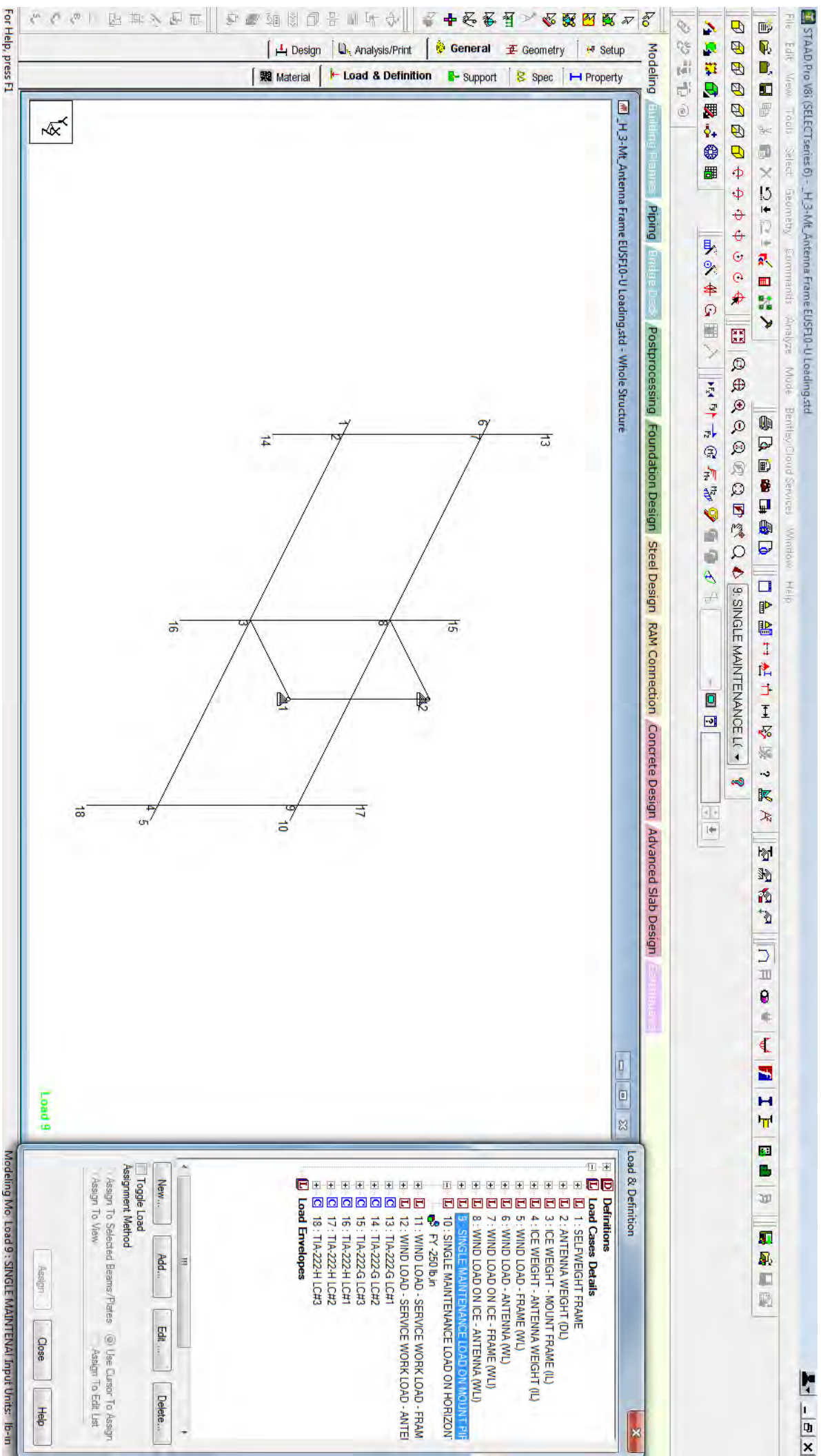
	Definitions
Load Cases Details	
1: SELFWEIGHT FRAME	
2: ANTENNA WEIGHT (DU)	
3: CE WEIGHT - MOUNT FRAME (DU)	
4: ICE WEIGHT - ANTENNA WEIGHT (IU)	
5: WIND LOAD - FRAME (WU)	
6: WIND LOAD - ANTENNA (WU)	
7: WIND LOAD ON ICE - FRAME (WU)	
8: WIND LOAD ON ICE - ANTENNA (WU)	
9: SINGLE MAINTENANCE LOAD ON MOUNT PIPE	
FC-500.b.d	
10: SINGLE MAINTENANCE LOAD ON HORIZON	
11: WIND LOAD - SERVICE WORK LOAD - FRAME	
12: WIND LOAD - SERVICE WORK LOAD - ANTE	
13: TIA-222-G LC#1	
14: TIA-222-G LC#2	
15: TIA-222-G LC#1	
16: TIA-222-H LC#1	
17: TIA-222-H LC#2	
18: TIA-222-H LC#3	
Load Envelopes	

☐ Toggle Load
 Assignment Method
 Assign To Selected Beams/Plates
☐ Assign To New
☒ Use Cursor To Assign
☐ Assign To Edit List

Load 9

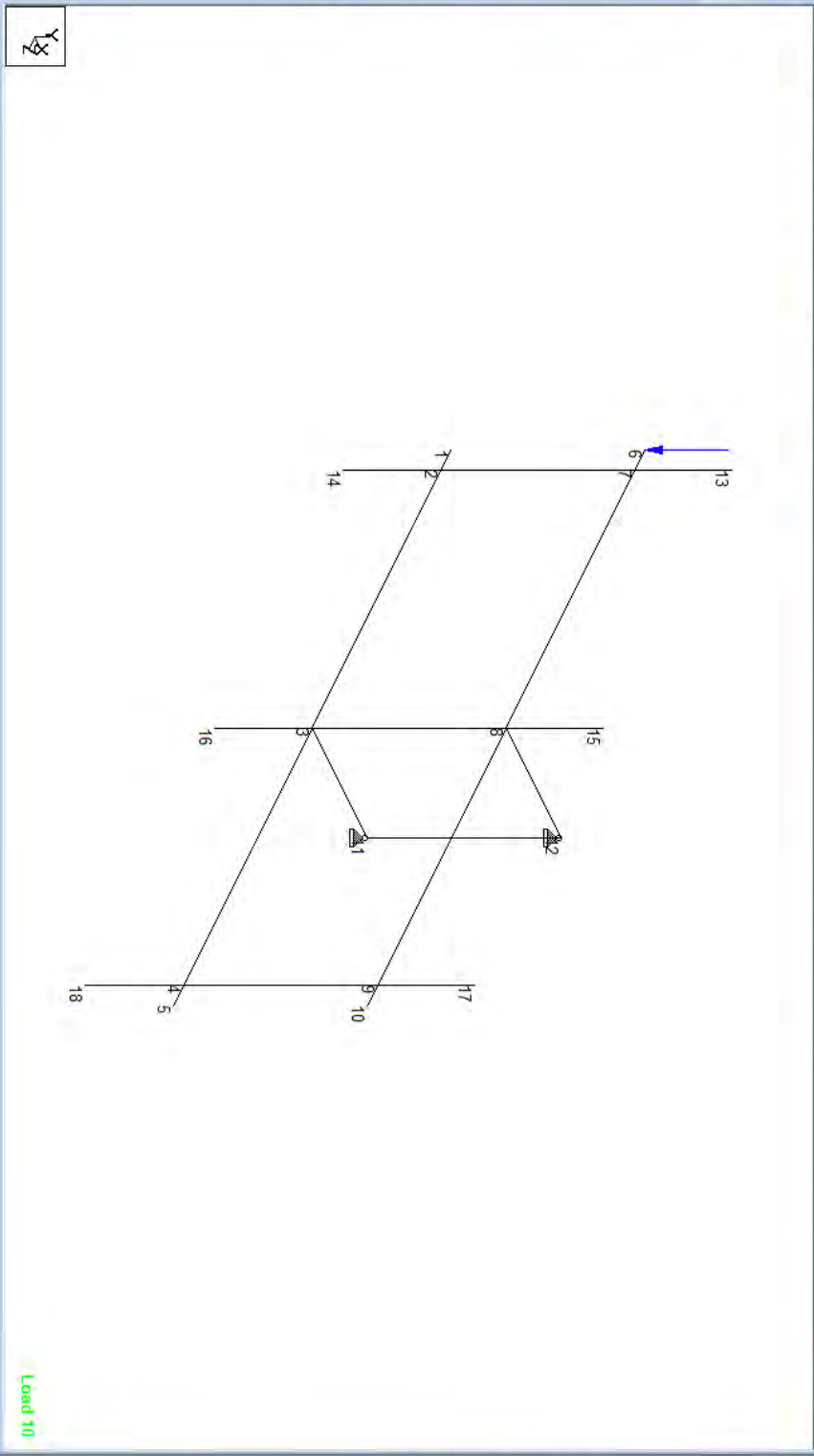
For Help, press F1

Modeling Mo. Load 9 : SINGLE MAINTENAL Input Units: 16-ir



10: SINGLE MAINTENANCE L

10: SINGLE MAINTENANCE L



Load 10

Load & Definition

Definitions

- 1: SELFWEIGHT FRAME
- 2: ANTENNA WEIGHT (DL)
- 3: ICE WEIGHT - MOUNT FRAME (IL)
- 4: ICE WEIGHT - ANTENNA WEIGHT (IL)
- 5: WIND LOAD - FRAME (WL)
- 6: WIND LOAD - ANTENNA (WL)
- 7: WIND LOAD ON ICE - FRAME (WL)
- 8: WIND LOAD ON ICE - ANTENNA (WL)
- 9: SINGLE MAINTENANCE LOAD ON MOUNT PIPE - (LM)
- 10: SINGLE MAINTENANCE LOAD ON HORIZONTAL MOU
- 11: WIND LOAD - SERVICE WORK LOAD - FRAME (WM)
- 12: WIND LOAD - SERVICE WORK LOAD - ANTENNA
- 13: TIA-222-G LCH1
- 14: TIA-222-G LCH2
- 15: TIA-222-G LCH3
- 16: TIA-222-H LCH1
- 17: TIA-222-H LCH2
- 18: TIA-222-H LCH3

Load Envelopes

Toggle Load

Assign To Selected Beams/Plates

Assign To View

Use Cursor To Assign

Assign To Edit List

Assign Close Help

STAAD.Pro v8i (SELECTseries 6) - H_3-Mt_Antenna Frame EUSF10-U Loading.std

File Edit View Tools Select Geometry Commands Analyze Mode Bentley Cloud Services Window Help

Modeling Building Planner Piping Bridge Deck Postprocessing Foundation Design Steel Design RAM Connection Concrete Design Advanced Slab Design

Material Load & Definition Support Spec Property

11: WIND LOAD - SERVICE W...

Diagram showing a 3D model of an antenna frame structure. The structure consists of a central vertical column (nodes 1, 2, 3) and four diagonal bracing members (nodes 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18). The structure is supported by a base (nodes 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18). The diagram shows the structure under a wind load (Load 11) applied to the vertical column.

Load 11

Load & Definition

Definitions

Load Cases Details

1: SELFWEIGHT FRAME

2: ANTENNA WEIGHT (DL)

3: ICE WEIGHT - MOUNT FRAME (IL)

4: ICE WEIGHT - ANTENNA WEIGHT (IL)

5: WIND LOAD - FRAME (WL)

6: WIND LOAD - ANTENNA (WL)

7: WIND LOAD ON ICE - FRAME (WL)

8: WIND LOAD ON ICE - ANTENNA (WL)

9: SINGLE MAINTENANCE LOAD ON MOUNT PIP

10: SINGLE MAINTENANCE LOAD ON HORIZON

11: WIND LOAD - SERVICE WORK LOAD - FRAM

UNI GX 0.0664 b/m

12: WIND LOAD - SERVICE WORK LOAD - ANTE

13: TIA-222-G LC#1

14: TIA-222-G LC#2

15: TIA-222-G LC#3

16: TIA-222-H LC#1

17: TIA-222-H LC#2

18: TIA-222-H LC#3

Load Envelopes

Toggle Load

Assignment Method

Assign To Selected Beams/Plates

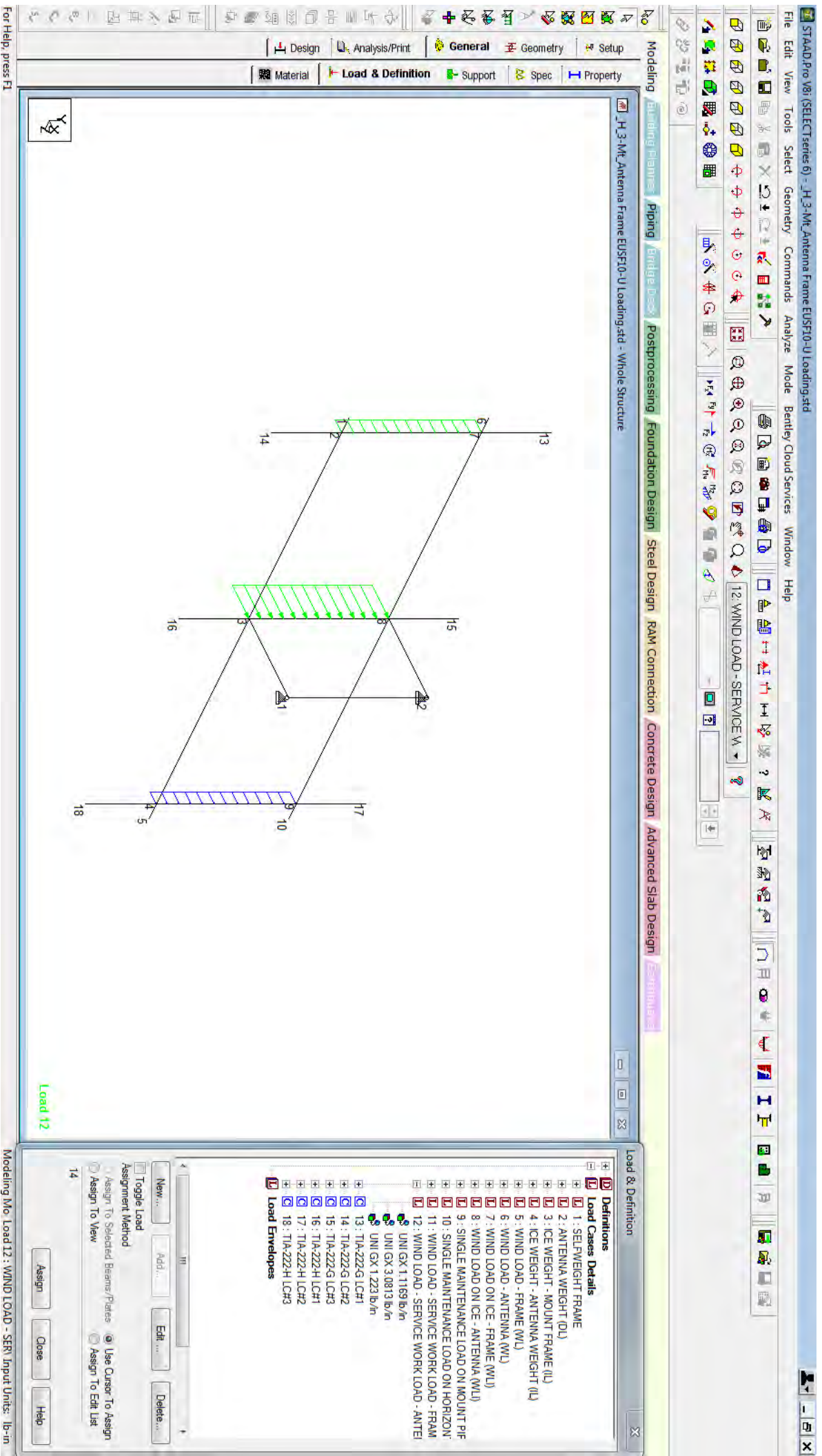
Assign To View

1 To 8 12 To 20

Assign Close Help

For Help, press F1

Modeling Mo Load 11: WIND LOAD - SER Input Units: lb-in



```

*****
*
*          STAAD.Pro V8i SELECTseries6          *
*          Version  20.07.11.90                  *
*          Proprietary Program of                 *
*          Bentley Systems, Inc.                  *
*          Date=    NOV  5, 2018                  *
*          Time=    18:42:41                      *
*
*          USER ID: AECOM                        *
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```

1. STAAD SPACE

INPUT FILE: P:\Projects\Telcom\StructuralsByLocation\Connecticut\NewHavenCSP#27\06a_NSS-045 Mount Anal.. .STD

2. START JOB INFORMATION

3. ENGINEER DATE 22-OCT-18

4. ENGINEER NAME MCD

5. CHECKER NAME MCD

6. CHECKER DATE 23-OCT-18

7. END JOB INFORMATION

8. INPUT WIDTH 79

9. UNIT INCHES POUND

10. JOINT COORDINATES

11. 1 0 0 0; 2 0 0 4.5; 3 0 0 63; 4 0 0 121.5; 5 0 0 126; 6 0 36 0; 7 0 36 4.5

12. 8 0 36 63; 9 0 36 121.5; 10 0 36 126; 11 25 0 63; 12 25 36 63; 13 0 54 4.5

13. 14 0 -18 4.5; 15 0 54 63; 16 0 -18 63; 17 0 54 121.5; 18 0 -18 121.5

14. MEMBER INCIDENCES

15. 1 1 2; 2 2 3; 3 3 4; 4 4 5; 5 6 7; 6 7 8; 7 8 9; 8 9 10; 9 8 12; 10 3 11

16. 11 12 11; 12 7 2; 13 8 3; 14 4 9; 15 7 13; 16 8 15; 17 9 17; 18 2 14; 19 3 16

17. 20 4 18

18. DEFINE MATERIAL START

19. ISOTROPIC STEEL

20. E 2.9E+007

21. POISSON 0.3

22. DENSITY 0.283

23. ALPHA 6E-006

24. DAMP 0.03

25. TYPE STEEL

26. STRENGTH FY 36000 FU 58000 RY 1.5 RT 1.2

27. END DEFINE MATERIAL

28. MEMBER PROPERTY AMERICAN

29. 6 TABLE ST PIPS20

30. 1 TO 3 5 7 11 TO 20 TABLE ST PIPS20

31. 4 8 TABLE ST PIPS20

32. 9 10 TABLE ST HSST3X3X0.188

33. CONSTANTS

34. MATERIAL STEEL ALL

35. SUPPORTS

36. 11 12 PINNED

37. LOAD 1 LOADTYPE NONE TITLE SELFWEIGHT FRAME

38. SELFWEIGHT Y -1

STAAD SPACE

-- PAGE NO. 2

```

39. LOAD 2 LOADTYPE NONE TITLE ANTENNA WEIGHT (DL)
40. JOINT LOAD
41. 17 FY -132.2
42. 15 FY -327
43. 13 FY -195
44. LOAD 3 LOADTYPE NONE TITLE ICE WEIGHT - MOUNT FRAME (IL)
45. MEMBER LOAD
46. 1 TO 8 UNI GX -1.2408
47. 9 10 UNI GX -1.782
48. LOAD 4 LOADTYPE NONE TITLE ICE WEIGHT - ANTENNA WEIGHT (IL)
49. JOINT LOAD
50. 17 FY -290
51. 15 FY -989.25
52. 13 FY -331.5
53. LOAD 5 LOADTYPE NONE TITLE WIND LOAD - FRAME (WL)
54. MEMBER LOAD
55. 1 TO 8 12 TO 20 UNI GX 0.6838
56. LOAD 6 LOADTYPE NONE TITLE WIND LOAD - ANTENNA (WL)
57. MEMBER LOAD
58. 14 UNI GX 11.6766
59. 13 UNI GX 32.2152
60. 12 UNI GX 12.7871
61. LOAD 7 LOADTYPE NONE TITLE WIND LOAD ON ICE - FRAME (WLI)
62. MEMBER LOAD
63. 1 TO 8 UNI GX 0.5101
64. LOAD 8 LOADTYPE NONE TITLE WIND LOAD ON ICE - ANTENNA (WLI)
65. MEMBER LOAD
66. 14 UNI GX 3.83333
67. 13 UNI GX 9.4724
68. 12 UNI GX 4.22222
69. LOAD 9 LOADTYPE NONE TITLE SINGLE MAINTENANCE LOAD ON MOUNT PIPE - (LM)
70. JOINT LOAD
71. 13 FY -500
WARNING- Load Command line is too long and will be truncated.
72. LOAD 10 LOADTYPE NONE TITLE SINGLE MAINTENANCE LOAD ON HORIZONTAL MOUNT FRAME
73. JOINT LOAD
74. 6 FY -250
75. LOAD 11 LOADTYPE NONE TITLE WIND LOAD - SERVICE WORK LOAD - FRAME (WM)
76. MEMBER LOAD
77. 1 TO 8 12 TO 20 UNI GX 0.0654
78. LOAD 12 LOADTYPE NONE TITLE WIND LOAD - SERVICE WORK LOAD - ANTENNA
79. MEMBER LOAD
80. 14 UNI GX 1.1169
81. 13 UNI GX 3.0813
82. 12 UNI GX 1.223
83. LOAD COMB 13 TIA-222-G LC#1
84. 1 1.2 2 1.2 5 1.0 6 1.0
85. LOAD COMB 14 TIA-222-G LC#2
86. 1 0.9 2 0.9 5 1.0 6 1.0
87. LOAD COMB 15 TIA-222-G LC#3
88. 1 1.2 2 1.2 3 1.0 4 1.0 7 1.0 8 1.0
89. LOAD COMB 16 TIA-222-H LC#1
90. 1 1.4 2 1.4
91. LOAD COMB 17 TIA-222-H LC#2
92. 1 1.2 2 1.2 9 1.5 11 1.0
93. LOAD COMB 18 TIA-222-H LC#3

```

STAAD SPACE

-- PAGE NO. 3

94. 1 1.2 2 1.2 10 1.5
 95. *****
 96. PERFORM ANALYSIS

P R O B L E M S T A T I S T I C S

NUMBER OF JOINTS	18	NUMBER OF MEMBERS	20
NUMBER OF PLATES	0	NUMBER OF SOLIDS	0
NUMBER OF SURFACES	0	NUMBER OF SUPPORTS	2

SOLVER USED IS THE OUT-OF-CORE BASIC SOLVER

ORIGINAL/FINAL BAND-WIDTH= 14/ 8/ 51 DOF
 TOTAL PRIMARY LOAD CASES = 12, TOTAL DEGREES OF FREEDOM = 102
 TOTAL LOAD COMBINATION CASES = 6 SO FAR.
 SIZE OF STIFFNESS MATRIX = 6 DOUBLE KILO-WORDS
 REQ'D/AVAIL. DISK SPACE = 12.1/***** MB

***WARNING - INSTABILITY AT JOINT 17 DIRECTION = MY
 PROBABLE CAUSE SINGULAR-ADDING WEAK SPRING
 K-MATRIX DIAG= 7.7705139E+02 L-MATRIX DIAG= 2.9536977E-09 EQN NO 101
 ***NOTE - VERY WEAK SPRING ADDED FOR STABILITY

NOTE STAAD DETECTS INSTABILITIES AS EXCESSIVE LOSS OF SIGNIFICANT DIGITS
 DURING DECOMPOSITION. WHEN A DECOMPOSED DIAGONAL IS LESS THAN THE
 BUILT-IN REDUCTION FACTOR TIMES THE ORIGINAL STIFFNESS MATRIX DIAGONAL,
 STAAD PRINTS A SINGULARITY NOTICE. THE BUILT-IN REDUCTION FACTOR
 IS 1.000E-09

THE ABOVE CONDITIONS COULD ALSO BE CAUSED BY VERY STIFF OR VERY WEAK
 ELEMENTS AS WELL AS TRUE SINGULARITIES.

97. LOAD LIST 13 TO 18
 98. PARAMETER 1
 99. CODE AISC UNIFIED 2010
 100. CHECK CODE ALL

STAAD.PRO CODE CHECKING - (AISC-360-10-LRFD) v1.4a

ALL UNITS ARE - POUN INCH (UNLESS OTHERWISE NOTED)

MEMBER	TABLE	RESULT/ FX	CRITICAL COND/ MY	RATIO/ MZ	LOADING/ LOCATION
=====					
1 ST	PIPS20	(AISC SECTIONS)			
		PASS	Eq. H1-1b	0.001	15
		0.00	-5.17	16.07	4.50
2 ST	PIPS20	(AISC SECTIONS)			
		PASS	Eq. H1-1b	0.941	17
		760.86 C	-4874.95	16500.98	58.50
3 ST	PIPS20	(AISC SECTIONS)			
		PASS	Eq. H1-1b	0.859	13
		146.38 C	-16345.63	3425.75	0.00
4 ST	PIPS20	(AISC SECTIONS)			
		PASS	Eq. H1-1b	0.001	15
		0.00	-5.16	16.07	0.00
5 ST	PIPS20	(AISC SECTIONS)			
		PASS	Eq. H1-1b	0.073	18
		0.00	0.00	1691.01	4.50
6 ST	PIPS20	(AISC SECTIONS)			
		PASS	Eq. H1-1b	0.914	17
		760.86 T	4339.92	16506.01	58.50

STAAD SPACE

-- PAGE NO. 5

7 ST	PIPS20		(AISC SECTIONS)		
	PASS	Eq. H1-1b	0.851	13	
	146.38 T	-16178.11	3418.85	0.00	
8 ST	PIPS20		(AISC SECTIONS)		
	PASS	Eq. H1-1b	0.001	15	
	0.00	-5.16	16.07	0.00	
9 ST	HSST3X3X0.188		(AISC SECTIONS)		
	PASS	Eq. H3-6	0.469	17	
	591.02 T	12249.75	-10923.95	0.00	
10 ST	HSST3X3X0.188		(AISC SECTIONS)		
	PASS	Eq. H3-6	0.470	17	
	621.62 C	-12249.75	-10903.57	0.00	
11 ST	PIPS20		(AISC SECTIONS)		
	PASS	Eq. H1-1b	0.949	17	
	6.24 T	-11408.50	10506.00	0.00	
12 ST	PIPS20		(AISC SECTIONS)		
	PASS	Eq. H1-1b	0.670	17	
	498.16 C	13693.28	-1597.82	36.00	
13 ST	PIPS20		(AISC SECTIONS)		
	PASS	Eq. H1-1b	0.804	15	
	738.00 C	215.18	-18288.60	36.00	

STAAD SPACE

-- PAGE NO. 6

14 ST	PIPS20		(AISC SECTIONS)		
	PASS	Eq. H1-1b	0.342	15	
	230.75 C	-7259.65	541.02	0.00	
15 ST	PIPS20		(AISC SECTIONS)		
	PASS	Sec. E1	0.031	17	
	990.24 C	0.00	10.59	0.00	
16 ST	PIPS20		(AISC SECTIONS)		
	PASS	Sec. E1	0.043	15	
	1387.89 C	0.00	0.00	0.00	
17 ST	PIPS20		(AISC SECTIONS)		
	PASS	Eq. H3-1	0.107	13	
	164.88 C	0.00	110.78	0.00	
18 ST	PIPS20		(AISC SECTIONS)		
	PASS	Eq. H1-1b	0.005	13	
	6.24 T	0.00	-110.78	0.00	
19 ST	PIPS20		(AISC SECTIONS)		
	PASS	Eq. H1-1b	0.005	13	
	6.24 T	0.00	-110.78	0.00	
20 ST	PIPS20		(AISC SECTIONS)		
	PASS	Eq. H1-1b	0.005	13	
	6.24 T	0.00	-110.78	0.00	

101. FINISH

***** END OF THE STAAD.Pro RUN *****

**** DATE= NOV 5,2018 TIME= 18:42:45 ****

```
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*   For technical assistance on STAAD.Pro, please visit   *
*   http://selectservices.bentley.com/en-US/              *
*                                                         *
*   Details about additional assistance from              *
*   Bentley and Partners can be found at program menu    *
*   Help->Technical Support                               *
*                                                         *
*   Copyright (c) 1997-2016 Bentley Systems, Inc.        *
*   http://www.bentley.com                                *
*****
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120.0 米

116.7 米

108.3 米

100.0 米

91.7 米

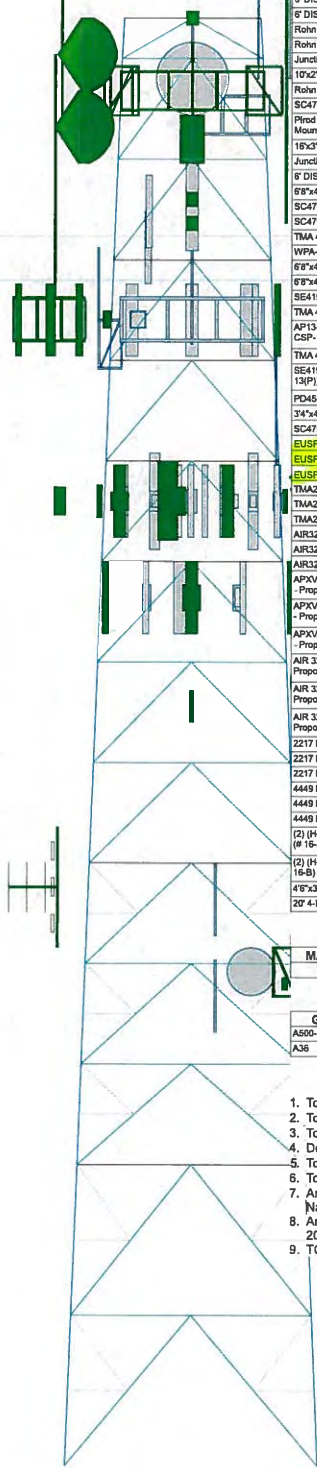
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75.0 米

50.0 米

25.0 米

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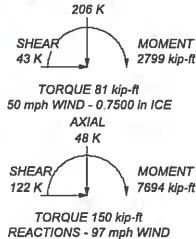


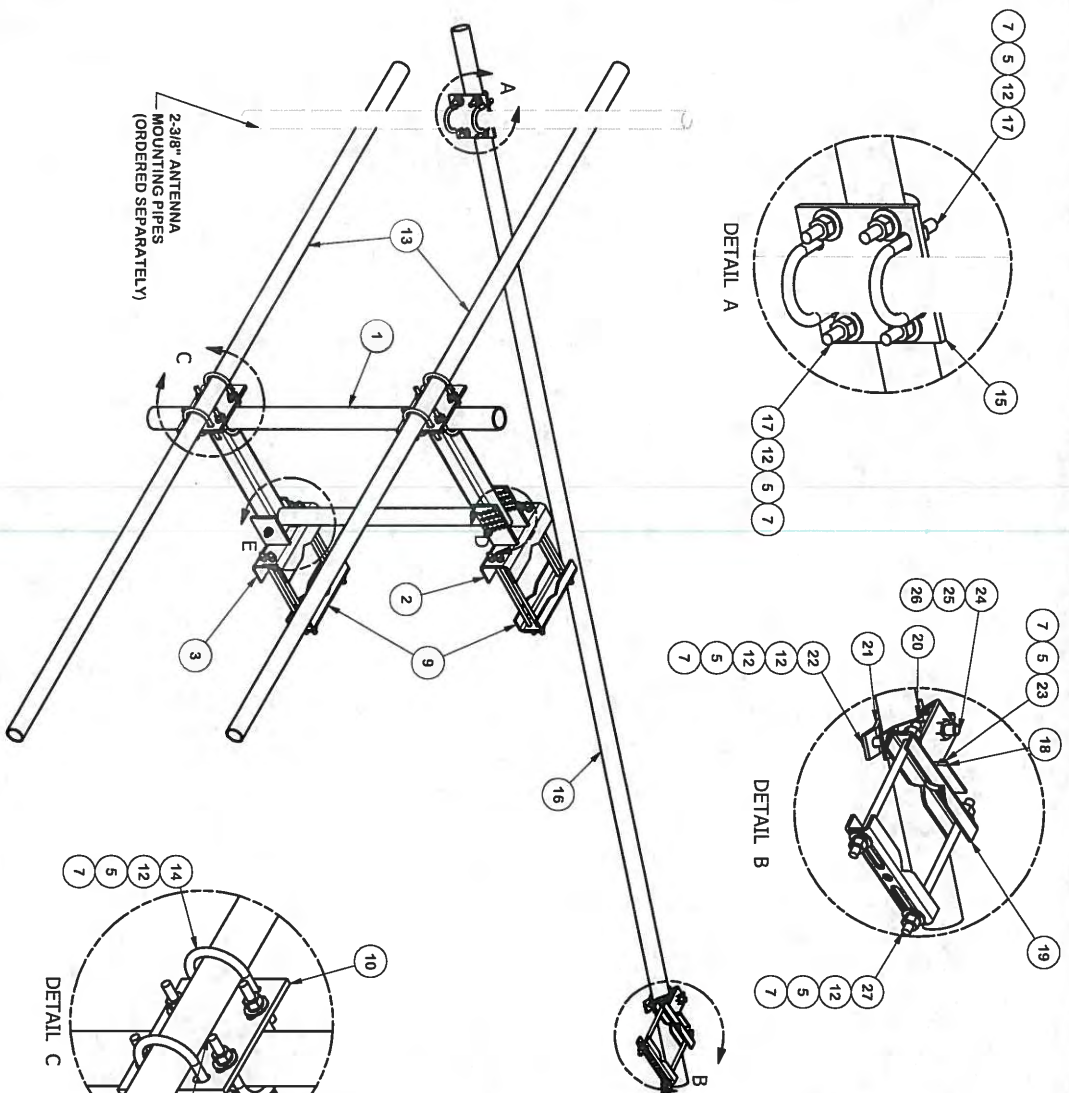
Lighting Rod 5/8"x4" (#27)	138	3 Yagi (#13 - CSP-11)	81
16x2.5" Pipe Mount (#27 Mount)	138	3 Yagi (#12)	82
16x3" Omni (inverted) (#23-A - CSP-22)	120 - 106	RRUS-32 (ATT)	80
16x3" Omni (inverted) (#23-B - CSP-23)	120 - 106	SRIN-1D0565C (ATT)	80
SC479-HF1LDF (inverted) (#24-B)	120 - 106	DCS-46-60-18-6F (Solid) Suppressor (ATT)	80
SC479-HF1LDF (#24-C - CSPW21)	120 - 106	TPA-6SR-LCUUUU-H8 Panel w/ RET (ATT)	80
OGT9-B40 (#24-D - CSPW8)	120	RRUS-11 (ATT)	80
OGT9-B40 (#24-E - CSPW7)	120	RRUS-32 (ATT)	80
10x2" Dipole Antenna (#26 - CSP-15)	120	HPA-6SR-BULU-H8 Panel (ATT)	80
TMA 432-83H-01T (CSP-34)	120	RRUS-32 (ATT)	80
SC479-HF1LDF (inverted) (CSP-9 (P))	120 - 106	SRIN-1D0565C (ATT)	80
TMA 432-83H-01T (CSP-24)	120	(2) DTMA8P718VIG12A TMA (ATT)	80
6" DISH (SOLID) (#19 - CSP-3)	117	SG56512-2 Panel Antenna (ATT)	80
6" DISH (SOLID) (#21 - CSP-5)	115	RRUS-11 (ATT)	80
Rohn 6" Side-Arm(1) (#24 Antennas Mount)	114	(2) RRUS-32 (ATT)	80
Rohn 6" Side-Arm(1) (#24 Antennas Mount)	114	HPA-6SR-BULU-H8 Panel (ATT)	80
Junction Box (#24-A)	114	800-10965 Kathrein Panel w/ Pipe Mt. (ATT - Proposed)	80
10x2" Dipole Antenna (inverted) (#24-E)	114 - 104	RRUS-12 (ATT - Proposed)	80
Rohn 6" Side-Arm(1) (#25 Antennas Mount)	114	4478 Radio Unit (4x40W) (ATT - Proposed)	80
SC479-HF1LDF (inverted) (#25-A - CSP-17)	114 - 100	800-10965 Kathrein Panel w/ Pipe Mt. (ATT - Proposed)	80
Prod 4" Side Mount Standoff (1) (#22, 23-A, 23-B Mount)	110	RRUS-12 (ATT - Proposed)	80
16x3" Omni (#22)	113	4478 Radio Unit (4x40W) (ATT - Proposed)	80
Junction Box (#23-C)	112	800-10965 Kathrein Panel w/ Pipe Mount (ATT - Proposed)	80
6" DISH (SOLID) (#20 - CSP-6)	111	RRUS-12 (ATT - Proposed)	80
68"x4" Pipe Mount (#21 - Dish Mount)	110	4478 Radio Unit (4x40W) (ATT - Proposed)	80
SC479-HF1LDF (CSP-18 (New Install))	110	RRUS-12 (ATT - Proposed)	80
SC479-HF1LDF (inverted) (CSP-19 (New Install))	110 - 96	4478 Radio Unit (4x40W) (ATT - Proposed)	80
TMA 432-83H-01T (CSP-20)	110	DCS-46-60-18-6F (Solid) Unit (ATT - Proposed)	80
WPA-70040-CD-EDIN Panel (CSP-28)	110	RRUS-11 (ATT)	80
68"x4" Pipe Mount (#19 - Dish Mount)	107	RRUS-32 (ATT)	80
68"x4" Pipe Mount (#20 - Dish Mount)	107	DCS-46-60-18-6F (Solid) Suppressor (ATT)	80
SC479-SWBPALDF Panel Antenna (CSP-29)	105	Face Mount (#11) ATT)	80
TMA 432-83H-01T (CSP-30)	105	Face Mount (#11) ATT)	80
AP13-8500650 w/Mount Pipe (#19-B - CSP-12(E))	104	Face Mount (#11) ATT)	80
TMA 432-83H-01T (CSP-32)	103	HPA-6SR-BULU-H8 Panel (ATT)	80
SE419-SWBPALDF Panel Antenna (#18-A - CSP 13(P))	101	TPA-6SR-LCUUUU-H8 Panel w/ RET (ATT)	80
PD458-406 (#16-B - CSP-2)	100 - 92	20' 4-Bay Dipole (#14)	77
34"x4" Pipe Mount (horizontal) ((Top Mount) #15)	95	3'4"x4" Pipe Mount (horizontal) ((Bottom mount) #15)	78
SC479-HF1LDF (#16-A - CSP-10)	95 - 81	Face Mount (Sprint)	72
ELFSP101U (#17) T-Mobile	95	Face Mount (Sprint)	72
ELFSP101U (#17) T-Mobile	95	Face Mount (Sprint)	72
ELFSP101U (#17) T-Mobile	95	ALU 4x45W (1500 KHz) (Sprint)	72
TMA2093FD0V1-1 Twin TMA (#17) T-Mobile	95	ALU 4x45W (1500 KHz) (Sprint)	72
TMA2093FD0V1-1 Twin TMA (#17) T-Mobile	95	ALU 4x45W (1500 KHz) (Sprint)	72
AIJR32 B66A/B2a Antenna Panel (#17) T-Mobile	95	ALU TD-NRH-8x20-25 (Sprint)	72
AIJR32 B66A/B2a Antenna Panel (#17) T-Mobile	95	ALU TD-NRH-8x20-25 (Sprint)	72
AIJR32 B66A/B2a Antenna Panel (#17) T-Mobile	95	ALU TD-NRH-8x20-25 (Sprint)	72
AIJR32 B66A/B2a Antenna Panel (#17) T-Mobile	95	ALU 800MHz 2x50W (Sprint)	72
APXVAAR24_43-U-NA20 Panel (RFS) (T-Mobile - Proposed)	95	ALU 800MHz 2x50W (Sprint)	72
APXVAAR24_43-U-NA20 Panel (RFS) (T-Mobile - Proposed)	95	NNV-65B-R4 Panel Antenna (Sprint)	72
APXVAAR24_43-U-NA20 Panel (RFS) (T-Mobile - Proposed)	95	NNV-65B-R4 Panel Antenna (Sprint)	72
AIJR 32A B66 Panel Antenna (T-Mobile - Proposed)	95	A4HC Panel Antenna (Sprint)	72
AIJR 32A B66 Panel Antenna (T-Mobile - Proposed)	95	A4HC Panel Antenna (Sprint)	72
AIJR 32A B66 Panel Antenna (T-Mobile - Proposed)	95	A4HC Panel Antenna (Sprint)	72
AIJR 32A B66 Panel Antenna (T-Mobile - Proposed)	95	4'6"x3" Pipe Mount (horizontal) ((Bottom mount) #14)	67
AIJR 32A B66 Panel Antenna (T-Mobile - Proposed)	95	6" Yagi w/ Mount (#9)	66
2217 B2 Radio Unit (T-Mobile - Proposed)	95	GPS (#8)	63
2217 B2 Radio Unit (T-Mobile - Proposed)	95	2'6"x4" Pipe Mount (For #8)	63
2217 B2 Radio Unit (T-Mobile - Proposed)	95	20' 4-Bay Dipole w/ Z Sidearm Mount (#7 - CSP-4)	55
2217 B2 Radio Unit (T-Mobile - Proposed)	95	1' 0" Dia 4" Omni w/ Mount (#6 - CSPW16)	53
4449 B71 + B12 Radio Unit (T-Mobile - Proposed)	95	3 Yagi (#4-B)	48
4449 B71 + B12 Radio Unit (T-Mobile - Proposed)	95	Prod 4" Side Mount Standoff (1) (#4-A)	48
4449 B71 + B12 Radio Unit (T-Mobile - Proposed)	95	10"x2" Dipole Antenna (#4-A)	48
(2) Horizontal) 8x2 1/2" Pipe Mount (Invert #16-A) (#16-A)	92	5x1.5in dia Whip Antenna w/ Mount (#3)	47
(2) Horizontal) 8x2 1/2" Pipe Mount (Invert #16-A) (#16-A)	92	3" Whig (Dn diameter) w/ mount (#2)	43
(2) Horizontal) 8x2 1/2" Pipe Mount (Upright #16-B) (#16-B)	92	4 FT DISH (#1-A)	41
4'6"x3" Pipe Mount (horizontal) ((Top Mount) #14)	87	Prod 6" Side Mount Standoff (1) (#1-A Dish Mount)	41
20' 4-Bay Dipole (#15)	86	1'x1" Panel Antenna (#1-B (mount Share #1-A))	40
		6x1" Whip Antenna w/ Mount (#5 - CSPW14)	39

MARK	SIZE	MARK	SIZE
A	L2 1/2x2 1/2x3/16	B	1 @ 3.33333

GRADE	F _y	F _u	GRADE	F _y	F _u
A500-50	50 ksi	62 ksi	A529-50	50 ksi	65 ksi
A36	36 ksi	58 ksi	A572-60	60 ksi	75 ksi

1. Tower designed for Exposure C to the TIA-222-G Standard.
2. Tower designed for a 97 mph basic wind in accordance with the TIA-222-G Standard.
3. Tower is also designed for a 50 mph basic wind with 0.75 in Ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 60 mph wind ¹¹ basic.
5. Tower Structure Class II ^{30 ft} _{See P}
6. Topographic Category 4 with Crest Height of 150.00 ft
7. Antenna/Mount/Cable's marked (# #) refer to site tower climb identification numbers. Tower climb by D and K Nationwide Communications, Inc. (March 30, 2016).
8. Antenna/Mount/Cable's marked (CSP-#) refer to Connecticut State Police inventory obtained via e-mail dated April 8, 2016.
9. TOWER RATING: 97.7%





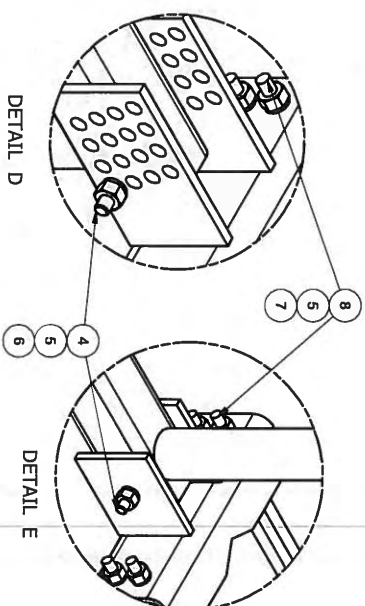
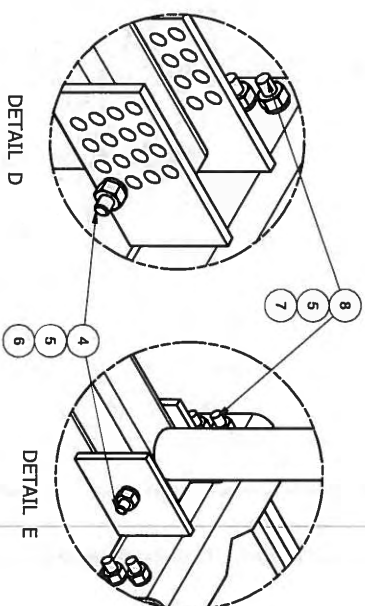
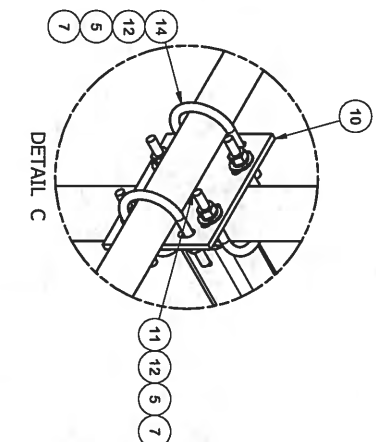
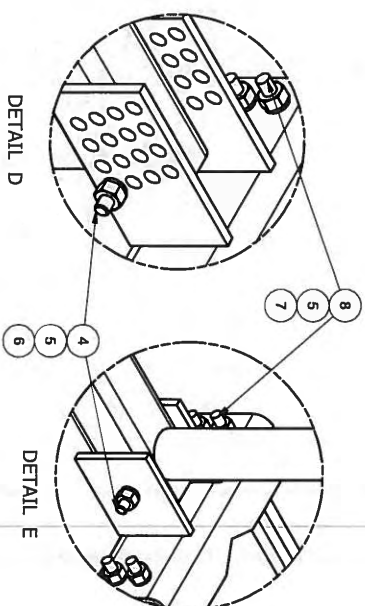
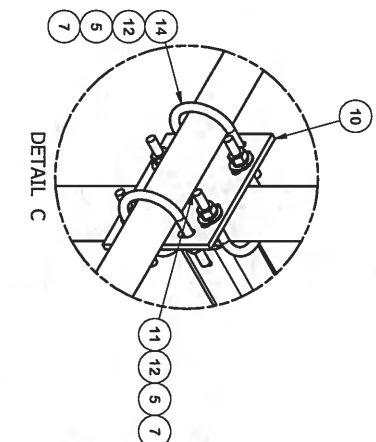
TOLERANCE NOTES

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

UNLESS OTHERWISE NOTED, DIMENSIONS CONTAINED IN THIS DRAWING ARE PROPRIETARY INFORMATION OF YALLOUT INDUSTRIES AND CONSIDERED A TRADE SECRET. ANY USE OR REPRODUCTION WITHOUT THE CONSENT OF YALLOUT INDUSTRIES IS STRICTLY PROHIBITED.

PARTS LIST

ITEM	QTY	PART NO.	PART DESCRIPTION	LENGTH	UNIT WT.	NET WT.
1	1	2PBG	24" PIPE MOUNT STANDOFF ARM		71.96	71.96
2	1	CFM	UPPER GATE FOOT WELDMENT		13.90	13.90
3	1	CFS	LOWER GATE FOOT WELDMENT		12.72	12.72
4	2	A1205	1/2" x 5" A325 HDG BOLT	5 in.	0.34	0.69
5	49	G12LW	1/2" HDG LOCKWASHER		0.01	0.68
6	2	A12NUT	1/2" HDG A325 HEX NUT		0.07	0.14
7	47	G12NUT	1/2" HDG HEAVY 2H HEX NUT		0.07	3.37
8	8	G12R-12	1/2" x 12" THREADED ROD (HDG.)		0.35	2.81
8	8	G12R-15	1/2" x 15" THREADED ROD (HDG.)		0.84	6.69
9	2	G8B	GATE BACKING BAR		4.53	9.06
10	2	SCX4	CROSSOVER PLATE	8.500 in	6.02	12.04
11	4	X-UB138	1/2" X 3-5/8" X 5-1/2" X 3" U-BOLT (HDG.)		0.66	2.63
12	32	G12FW	1/2" HDG USS FLATWASHER		0.03	1.09
13	2	P2126	2-3/8" OD X 126" SCH 40 GALVANIZED PIPE	126	40.37	80.74
14	4	X-UB1300	1/2" X 3" X 5" X 2" U-BOLT (HDG.)		0.66	2.63
15	1	SCX1	CROSSOVER PLATE 2-3/8" X 2-3/8"		3.71	3.71
16	1	P2150	2-3/8" OD X 150" SCH 40 GALVANIZED PIPE	150.0000 in	48.06	48.06
17	4	X-UB1212	1/2" X 2-1/2" X 4-1/2" X 2" U-BOLT (HDG.)		0.63	2.50
18	1	X-STA3	STIFF ARM ANGLE BRACKET	2.500 in	1.39	1.39
19	2	X-STU	STIFF ARM CHANNEL BRACKET		1.37	2.74
20	1	SAM	STIFF ARM MOUNT CLAMP		0.77	0.77
21	1	ACP	4-1/16" CLAMP HALF, 1/4" THK.		0.65	0.65
22	2	G1203	1/2" x 3" HDG HEX BOLT GR5 FULL THREAD	3	0.22	0.43
23	1	G12112	1/2" x 1-1/2" HDG HEX BOLT GR5	1 1/2	0.15	0.15
24	1	G58112	5/8" x 1-1/2" HDG BOLT	1.5	0.25	0.25
25	1	G58LW	5/8" HDG LOCKWASHER		0.03	0.03
26	1	G58NUT	5/8" HDG HEAVY 2H HEX NUT		0.13	0.13
27	2	G12R-10	1/2" x 10" THREADED ROD (HDG.)		0.35	0.70
TOTAL WT. #						286.24



DESCRIPTION

BUILD-A-FRAME
 ULTIMATE SECTOR FRAME
 WITH ONE STIFF ARM



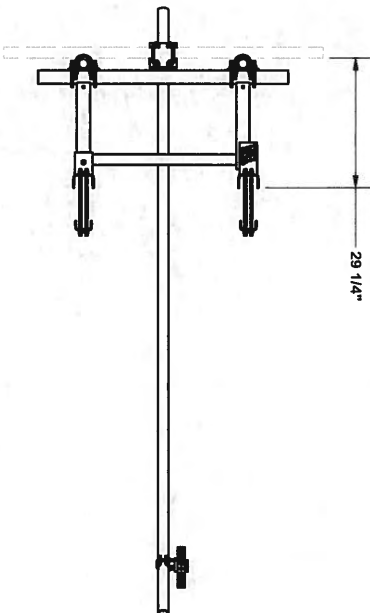
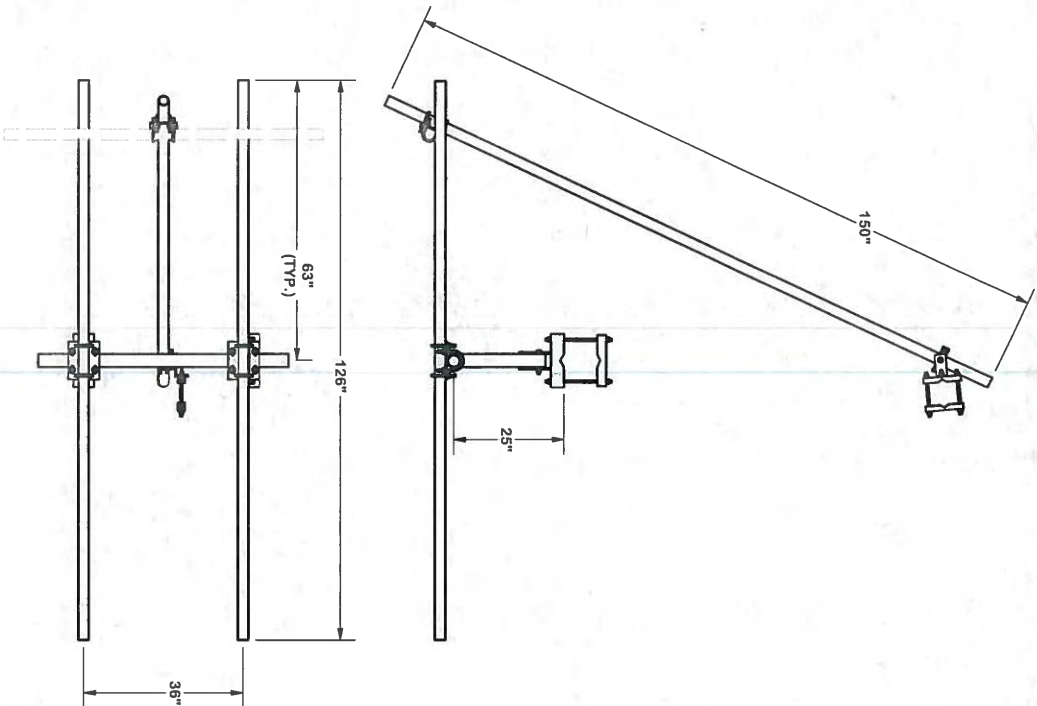
Engineering
 Support Team:
 1-888-753-7446
 New York, NY
 Atlanta, GA
 Los Angeles, CA
 Plymouth, IN
 Salem, OR
 Dallas, TX

CPD NO. 5001
 CLASS SUB 81 01
 DRAWN BY CEK
 DRAWING USAGE CUSTOMER
 ENG. APPROVAL
 CHECKED BY BMC
 DATE 4/28/2011

PART NO. EUSF-10-U
 DWG. NO. EUSF-10-U

1 OF 2

PAGE



TOLERANCE NOTES

TOLERANCES ON DIMENSIONS, UNLESS OTHERWISE NOTED ARE:
 SAWED, SHEARED AND GAS CUT EDGES ($\pm 0.090'$)
 DRILLED AND GAS CUT HOLES ($\pm 0.090'$) - NO CONING OF HOLES
 LASER CUT EDGES AND HOLES ($\pm 0.010'$) - NO CONING OF HOLES
 BENDS ARE $\pm 1/2$ DEGREE
 ALL OTHER MACHINING ($\pm 0.090'$)
 ALL OTHER ASSEMBLY ($\pm 0.090'$)

PROTECTIVE NOTE:
 DIMENSIONS AND TOLERANCES CONTAINED IN THIS DRAWING ARE PROPRIETARY INFORMATION OF VALMONT INDUSTRIES AND CONSIDERED A TRADE SECRET. ANY USE OR DISCLOSURE WITHOUT THE CONSENT OF VALMONT INDUSTRIES IS STRICTLY PROHIBITED.

DESCRIPTION

BUILD-A-FRAME
ULTIMATE SECTOR FRAME
WITH ONE STIFF ARM

Engineering Support Team:
 1-888-753-7446

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

CPD NO.	DRAWN BY	ENG. APPROVAL	PART NO.
5001	CEK	4/11/2011	EUSF10-U
CLASS SUB	DRAWING USAGE	CHECKED BY	DWG. NO.
81 01	CUSTOMER	BMC	4/28/2011
			EUSF10-U

Exhibit F



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

T-Mobile Existing Facility

Site ID: CT11086B

New Haven/ WC X59
240 Baldwin Drive (West Rock State Park)
New Haven, CT 06514

August 28, 2018

EBI Project Number: 6218005885

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general population allowable limit:	40.28%



August 28, 2018

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

Emissions Analysis for Site: **CT11086B – New Haven/ WC X59**

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **240 Baldwin Drive (West Rock State Park), New Haven, 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 97-01 and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter ($\mu\text{W}/\text{cm}^2$). The number of $\mu\text{W}/\text{cm}^2$ calculated at each sample point is called the power density. The exposure limit for power density varies depending upon the frequencies being utilized. Wireless Carriers and Paging Services use different frequency bands each with different exposure limits, therefore it is necessary to report results and limits in terms of percent MPE rather than power density.

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

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

Public exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu\text{W}/\text{cm}^2$). The general population exposure limits for the 600 MHz and 700 MHz frequency bands are approximately $400 \mu\text{W}/\text{cm}^2$ and $467 \mu\text{W}/\text{cm}^2$ respectively. The general population exposure limit for the 1900 MHz (PCS) and 2100 MHz (AWS) frequency bands is $1000 \mu\text{W}/\text{cm}^2$. 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 **240 Baldwin Drive (West Rock State Park), New Haven, 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 for directional panel antennas, 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) 1 GSM channels (PCS Band - 1900 MHz) was considered for each sector of the proposed installation. These Channels have a transmit power of 15 Watts per Channel.
- 2) 1 UMTS channel (PCS Band - 1900 MHz) was considered for each sector of the proposed installation. These Channels have a transmit power of 40 Watts per Channel.
- 3) 1 UMTS channel (AWS Band – 2100 MHz) was considered for each sector of the proposed installation. These Channels have a transmit power of 40 Watts per Channel.
- 4) 2 LTE channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 40 Watts per Channel.
- 5) 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.
- 6) 2 LTE channels (600 MHz Band) were considered for each sector of the proposed installation. These Channels have a transmit power of 40 Watts per Channel.



- 7) 2 LTE channels (700 MHz Band) were considered for each sector of the proposed installation. These Channels have a transmit power of 20 Watts per Channel.
- 8) 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.
- 9) 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 for directional panel antennas, 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.
- 10) The antennas used in this modeling are the **Ericsson AIR 3246 B66, Ericsson AIR32 B66A/B2A** and the **RFS APXVAARR24_43-U-NA20** for 600 MHz, 700 MHz, 1900 MHz and 2100 MHz channel. This is based on feedback from the carrier with regard to anticipated antenna selection. All Antenna gain values and associated transmit power levels are shown in the Site Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB for directional panel antennas, 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.
- 11) The antenna mounting height centerline of the proposed antennas is **95 feet** above ground level (AGL).
- 12) 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.
- 13) All calculations were done with respect to uncontrolled / general population threshold limits.



T-Mobile Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	1	Antenna #:	1	Antenna #:	1
Make / Model:	Ericsson AIR 3246 B66	Make / Model:	Ericsson AIR 3246 B66	Make / Model:	Ericsson AIR 3246 B66
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	95 feet	Height (AGL):	95 feet	Height (AGL):	95 feet
Frequency Bands	2100 MHz (AWS)	Frequency Bands	2100 MHz (AWS)	Frequency Bands	2100 MHz (AWS)
Channel Count	4	Channel Count	4	Channel Count	4
Total TX Power(W):	160	Total TX Power(W):	160	Total TX Power(W):	160
ERP (W):	6,224.72	ERP (W):	6,224.72	ERP (W):	6,224.72
Antenna A1 MPE%	2.83	Antenna B1 MPE%	2.83	Antenna C1 MPE%	2.83
Antenna #:	2	Antenna #:	2	Antenna #:	2
Make / Model:	Ericsson AIR32 B66A/B2A	Make / Model:	Ericsson AIR32 B66A/B2A	Make / Model:	Ericsson AIR32 B66A/B2A
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	95 feet	Height (AGL):	95 feet	Height (AGL):	95 feet
Frequency Bands	1900 MHz (PCS)	Frequency Bands	1900 MHz (PCS)	Frequency Bands	1900 MHz (PCS)
Channel Count	2	Channel Count	2	Channel Count	2
Total TX Power(W):	80	Total TX Power(W):	80	Total TX Power(W):	80
ERP (W):	3,112.36	ERP (W):	3,112.36	ERP (W):	3,112.36
Antenna A2 MPE%	1.41	Antenna B2 MPE%	1.41	Antenna C2 MPE%	1.41
Antenna #:	3	Antenna #:	3	Antenna #:	3
Make / Model:	RFS APXVAARR24_43-U-NA20	Make / Model:	RFS APXVAARR24_43-U-NA20	Make / Model:	RFS APXVAARR24_43-U-NA20
Gain:	12.95 / 13.35 / 15.65 / 16.35 dBd	Gain:	12.95 / 13.35 / 15.65 / 16.35 dBd	Gain:	12.95 / 13.35 / 15.65 / 16.35 dBd
Height (AGL):	95 feet	Height (AGL):	95 feet	Height (AGL):	95 feet
Frequency Bands	600 MHz / 700 MHz / 1900 MHz / 2100 MHz	Frequency Bands	600 MHz / 700 MHz / 1900 MHz / 2100 MHz	Frequency Bands	600 MHz / 700 MHz / 1900 MHz / 2100 MHz
Channel Count	7	Channel Count	7	Channel Count	7
Total TX Power(W):	215	Total TX Power(W):	215	Total TX Power(W):	215
ERP (W):	6,189.15	ERP (W):	6,189.15	ERP (W):	6,189.15
Antenna A3 MPE%	4.33	Antenna B3 MPE%	4.33	Antenna C3 MPE%	4.33

Site Composite MPE%	
Carrier	MPE%
T-Mobile (Per Sector Max)	8.57 %
AT&T	7.80 %
CTT	1.73 %
CSP	3.17 %
Sprint	2.86 %
DOT	1.40 %
FBI	8.50 %
IRS	3.35 %
OEM	2.90 %
Site Total MPE %:	40.28 %

T-Mobile Sector A Total:	8.57 %
T-Mobile Sector B Total:	8.57 %
T-Mobile Sector C Total:	8.57 %
Site Total:	40.28 %



T-Mobile Maximum MPE Power Values (Per Sector)

T-Mobile _Frequency Band / Technology (Per Sector)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu\text{W}/\text{cm}^2$)	Frequency (MHz)	Allowable MPE ($\mu\text{W}/\text{cm}^2$)	Calculated % MPE
T-Mobile AWS - 2100 MHz LTE	4	1,556.18	95	28.25	AWS - 2100 MHz	1000.00	2.83%
T-Mobile PCS - 1900 MHz LTE	2	1,556.18	95	14.13	PCS - 1900 MHz	1000.00	1.41%
T-Mobile 600 MHz LTE	2	788.97	95	7.16	600 MHz	400.00	1.79%
T-Mobile 700 MHz LTE	2	432.54	95	3.93	700 MHz	467.00	0.84%
T-Mobile PCS - 1900 MHz GSM	1	550.92	95	2.50	PCS - 1900 MHz	1000.00	0.25%
T-Mobile PCS - 1900 MHz UMTS	1	1,469.13	95	6.67	PCS - 1900 MHz	1000.00	0.67%
T-Mobile AWS - 2100 MHz UMTS	1	1,726.08	95	7.83	AWS - 2100 MHz	1000.00	0.78%
						Total:	8.57%



Summary

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

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

T-Mobile Sector	Power Density Value (%)
Sector A:	8.57 %
Sector B:	8.57 %
Sector C:	8.57 %
T-Mobile Maximum MPE % (Per Sector):	8.57 %
Site Total:	40.28 %
Site Compliance Status:	COMPLIANT

The anticipated composite MPE value for this site assuming all carriers present is **40.28%** of the allowable FCC established general population limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

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

Exhibit G

From: [Deborah Chase](#)
To: ["AWoods@newhavenct.gov"](#); ["jelicker@newhavenct.gov"](#); ["agrcia@newhavenct.gov"](#)
Cc: ["Benito, Brian"](#)
Subject: CT11086B- L700 4x2 - 142 (aka 240) Baldwin Drive, New Haven CT 06051
Date: Wednesday, April 22, 2020 4:41:00 PM
Attachments: [image001.png](#)

Good afternoon,

On behalf of our client, (T-Mobile), I am forwarding a copy of T-Mobile's CT Siting Council Exempt Modification Application. The application is to update a wireless telecommunications facility, on the CT State Police owned facility located at 142 (aka 240) Baldwin Drive in New Haven.

Please note this is a refile. We received an approval on January 22, 2019 (EM-T-MOBILE-093-190103) the application expired. The scope of work is the same and the documents have been updated.

Hard copies will be sent out for your records.

Please do not hesitate to contact me with any questions regarding T-Mobile's Exempt Modification Application.

Thank you,

Deborah Chase

Senior Project Coordinator & Analyst

Mobile: 860-490-8839



 Save a tree. Refuse. Reduce. Reuse. Recycle.