QC Development
PO Box 916
Storrs, CT 06268
860-670-9068
QCDevelopment9068@gmail.com

April 12, 2016

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

Notice of Exempt Modification – New Cingular Wireless PCS, LLC (AT&T)
51 Daniels Avenue, Waterford, CT 06385
N 41-19-48.95
W 72-10-02.00

Dear Ms. Bachman:

AT&T currently maintains nine (9) antennas at the 170-foot level of the existing 180-foot Self Support Tower at 51 Daniels Avenue, Waterford, CT. The tower is owned by SBA. The property is owned by the Town of Waterford. AT&T now intends to replace three (3) of its existing antennas with three (3) new Andrew antennas. These antennas would be installed at the 170-foot level of the tower. AT&T also intends to install three (3) Ericsson RRUS-32 remote radio units and add one Raycap surge arrestor.

This facility was approved under Special Permit #PZ2008-033 by the Town of Waterford Planning & Zoning Commission on November 24, 2008. This approval included no condition(s) that could feasibly be violated by this modification, including total facility height or mounting restrictions. This modification therefore complies with the aforementioned approval.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies § 16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to Daniel M. Steward, First Selectman of the Town of Waterbury, as elected official, tower and property owner.

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

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

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

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

4. The operation of the replacement antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communications Commission safety standard.

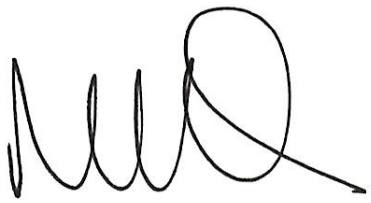
5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.

6. The existing structure and its foundation can support the proposed loading.

For the foregoing reasons, AT&T 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).

Please feel free to call me at (860) 670-9068 with any questions regarding this matter. Thank you for your consideration.

Sincerely,



Mark Roberts
QC Development
Consultant for AT&T

Attachments

cc: Daniel M. Steward - as elected official, and property owner
SBA - as tower owner (via e-mail)

Power Density

Existing Loading on Tower

Carrier	# of Channels	ERP/Ch (W)	Antenna Centerline Height (ft)	Power Density (mW/cm^2)	Freq. Band (MHz**)	Limit S (mW /cm^2)	%MPE
Other Carriers*							3.36%
AT&T LTE	1	500	170	0.0067	740	0.4933	0.14%
AT&T LTE	1	500	170	0.0067	1930	1.0000	0.07%
AT&T UMTS	1	500	170	0.0067	880	0.5867	0.11%
AT&T UMTS	6	427	170	0.0343	1930	1.0000	0.34%
AT&T GSM	2	296	170	0.0079	880	0.5867	0.13%
Site Total							4.15%

*Per CSC Records (available upon request, includes calculation formulas)

** If a range of frequencies are used, such as 880-894, enter the lowest value, i.e. 880

Proposed Loading on Tower

Carrier	# of Channels	ERP/Ch (W)	Antenna Centerline Height (ft)	Power Density (mW/cm^2)	Freq. Band (MHz**)	Limit S (mW /cm^2)	%MPE
Other Carriers*							3.36%
AT&T LTE	2	1791	170	0.0479	700	0.4667	1.03%
AT&T LTE	2	1104	170	0.0295	1900	1.0000	0.30%
AT&T LTE	2	2203	170	0.0589	2300	1.0000	0.59%
AT&T UMTS	2	492	170	0.0132	880	0.5867	0.22%
AT&T UMTS	2	491	170	0.0131	1900	1.0000	0.13%
AT&T GSM	2	817	170	0.0218	880	0.5867	0.37%
Site Total							6.00%

*Per CSC Records (available upon request, includes calculation formulas)

** If a range of frequencies are used, such as 880-894, enter the lowest value, i.e. 880

Note: Proposed Loading may also include corrections to certain Existing Loading values

VOL: 1047 PG: 252
Inst: 00082034

FIFTEEN ROPE FERRY ROAD

WATERFORD, CT 06385-2886

TOWN OF WATERFORD
PLANNING & ZONING COMMISSION

NOTICE OF GRANT OF A SPECIAL PERMIT

This is to certify that on November 24, 2008, the Waterford Planning & Zoning Commission granted Special Permit #PZ2008-033.

Owner of Record: Town of Waterford

Address: 51 Daniels Avenue

Description of Premises:

As recorded in Volumes 107, Page(s) 567 of the Waterford Land Records.

Nature of Special Permit: Special Permit and site plan approval granted for erection of a telecommunications tower

Applicable Zoning Regulations: Sections 5, 22 & 23.

Permit findings, stipulations and conditions are filed in the office of the Town Clerk as stated in the minutes of the Planning & Zoning Commission meeting of November 24, 2008.

PLANNING & ZONING COMMISSION

By: Dawn Choisy
Dawn Choisy
Recording Secretary
Planning & Zoning Commission

This notice is to be recorded on the land records of the Town of Waterford, indexed in the Grantor's Index under the name of the record owner.

RECEIVED FOR RECORD
Dec 12,2008 09:07A
ROBERT M. NYE
TOWN CLERK
WATERFORD, CT

SPECIAL PERMIT – 51 Daniels Avenue Telecommunications Tower

APPLICATION: #PZ2008-033 - Request of the Town of Waterford by its agent SBA Towers II, LLC, applicant; Town of Waterford, owner, Christopher B. Fisher, Esq. agent for special permit and site plan approval to locate a communications tower at 51 Daniels Avenue, R-40 zone, in accordance with Sections 5.2.1, 5.2.2, 22 and 23 of the Zoning Regulations and as shown on plans entitled "Site Name: Southwest School, Site Address: 51 Daniels Avenue, Waterford, CT 06385" dated July 28, 2008 with revisions to September 13, 2008.

HEARING DATE: November 10, 2008

PUBLIC HEARING NOTICE PUBLISHED: New London Day, 10/27 & 11/3/2008

NOTIFICATION OF PROPERTY OWNERS WITHIN 150':

PROJECT DESCRIPTION: Construct 180' lattice tower with antennae to a total height of 195' for the purpose of providing a municipal facility to accommodate the Town's public safety radio system. Project also includes leasing an area 100' by 100' within which will be a 70' x 70' fenced compound for the tower and equipment required to operate the radio system and future collocating telecommunication uses. Improvements are planned to provide vehicular access to the leased area, by way of a 30' wide utility and access easement as detailed on the site plan. Temporary construction easement areas will also be necessary as detailed on the site plan.

FINDINGS: SECTION 23.5

23.5.1 Compliance with the Adopted Land Use Plan and the Zoning Regulations

Sections 5.2.4 Municipal Facilities and 5.2.1 Towers exceeding 40' in height are allowed subject to the issuance of a special permit. The police radio system is considered a necessary municipal improvement as brought forward by the Emergency Management Advisory Council. The tower is one of five locations from which the radio system will operate. The Commission has previously approved the Rogers Hill location and the others involve collocation on existing or reconstructed locations.

The 1998 Plan of Preservation, Conservation and Development, (1998 Plan) Chapter 12 INFRASTRUCTURE, Other Utilities, (p84) Recommends:

"Consider other utility improvements as well" ...

"To encourage economic development and to best meet the needs of local residents and businesses, the Town should encourage a program of continual improvement of: Communications services and capacity."

"The Town should continue to carefully review the evolution of telecommunications technology (such as cellular communications from towers) in order to provide for the reasonable needs of residents and businesses while considering the overall impact on the community."

The Commission finds that the tower as proposed is consistent with the 1998 Plan as a necessary public safety infrastructure project with secondary benefits for users of cellular communications.

23.5.2 ORDERLY DEVELOPMENT:

Access to the site and the location of the tower have been placed to minimize their impact on the current operation of the school and potential adaptive reuse of this site since it is due to close upon completion of the new elementary school project. The leased area has been set back from the property line in accordance with current bulk requirements.

23.5.3 PROPERTY VALUES AND CHARACTER:

The School property, and two open space parcels are adjacent to the site. The millstone station and power transmission lines emanating there from are significant part of the visual landscape. The development of this site for the use intended will not have an impact on property values.

23.5.4 PUBLIC SAFETY:

Adequate access for police and emergency vehicles is provided, to the extent necessary.

23.5.5 TRAFFIC CONSIDERATIONS:

During construction adequate provisions for vehicular access to the site will be provided and separated from the school use. Post construction access will be intermittent and service related. Access at the entrance off of Daniels Ave. is considered adequate for the minimal increase in traffic.

23.5.6 LANDSCAPING AND BUFFERS:

30 feet of the leased area on three sides will be landscaped to minimize the visibility of any of the equipment shelter(s) and fencing within the compound. The design of the tower is consistent with others approved by this commission with the knowledge that they can not be fully screened. Based on the renderings provided the tower height and design is acceptable.

23.5.7 RELATIONSHIP TO UTILITY SYSTEMS, DRAINAGE AND IMPACT ON COMMUNITY FACILITIES.

The project will not require water or sewerage service either public or on site. The majority of the site will be pervious and therefore drainage improvements will be minor. The tower is an essential part of the public safety radio system and as such will have a positive impact on communications necessary to protect the public.

23.5.8 COMPLIANCE WITH THE ZONING REGULATIONS:

The proposed site plan conforms to the requirements of the Zoning Regulations. The development anticipates collocation of telecommunications users which are not subject to Zoning Compliance, but rather the requirements of the CT Siting Council.

MODIFICATIONS & CONDITIONS:

1. Revisions as detailed in 11/5/2008 correspondence from Christopher Fisher, Esq. to sheets Z-3 and Z-8 dated 10/30/08, except as modified herein.
2. Add temporary construction fencing along the western side of the access drive filling in where it is not currently proposed from its current southern terminus to the compound.
3. A permanent 4 foot high chain link fence is to be installed upon completion of the project and removal of the construction fencing.
4. Based on the need of the Town to expedite the construction of the tower, a temporary use permit may be issued in lieu of completion of all site work as determined by the Commission's agent, upon such guarantees that it will be completed as soon as weather permits. Such use may not proceed if the site and access drive are not maintained in compliance with the erosion control plan and regulations.
5. The Tower shall not be considered for co-location until the Town has completed construction and has installed all its antennae and equipment.

COMMISSION ACTION:

The Commission approves application #PZ2008-033 for special permit and site plan approval. All potential adverse impacts have been addressed as modified herein. Approval pursuant to CGS 8-24 is also included in this action.

MODIFICATION, REVISIONS, EXTENSIONS:

All revisions, extensions and modifications to any items, conditions or stipulations in this permit shall be governed by the provisions of section 23.9 of the Waterford Zoning Regulations.

VIOLATIONS:

Any violations of the findings, stipulations or conditions of this permit shall be subject to section 23.8 of the Waterford Zoning Regulations.

LIST OF EXHIBITS:

EXHIBIT A -	Application and support materials.
EXHIBIT B -	Notice of Public Hearing advertised in the Day newspaper on 10/27/08 and 11/3/08
EXHIBIT C -	Notification letter to applicant, along with certificates of mailing.
EXHIBIT D -	Staff and agency condensed comment sheet.
EXHIBIT E -	Plan titled "Southwest School, 51 Daniels Avenue, Waterford, CT 06385" dated 9/13/08.
EXHIBIT F -	Letter dated November 5, 2008 from Christopher B. Fisher, Cuddy & Feder, to the Planning and Zoning Commission addressing Staff and agency comments, with attachments.
EXHIBIT G -	e-mail correspondence from Jonathan Scott regarding the impact of the proposed tower on the view from his future home.
EXHIBIT H -	Map of areas currently covered by communication system.
EXHIBIT I -	Series of photographs submitted by Michael Bonanno

CERTIFICATION:

This is to certify that this Special Permit was approved on November 24, 2008.

Waterford Planning and Zoning Commission

Dawn Choisy

Recording Secretary

PROJECT INFORMATION

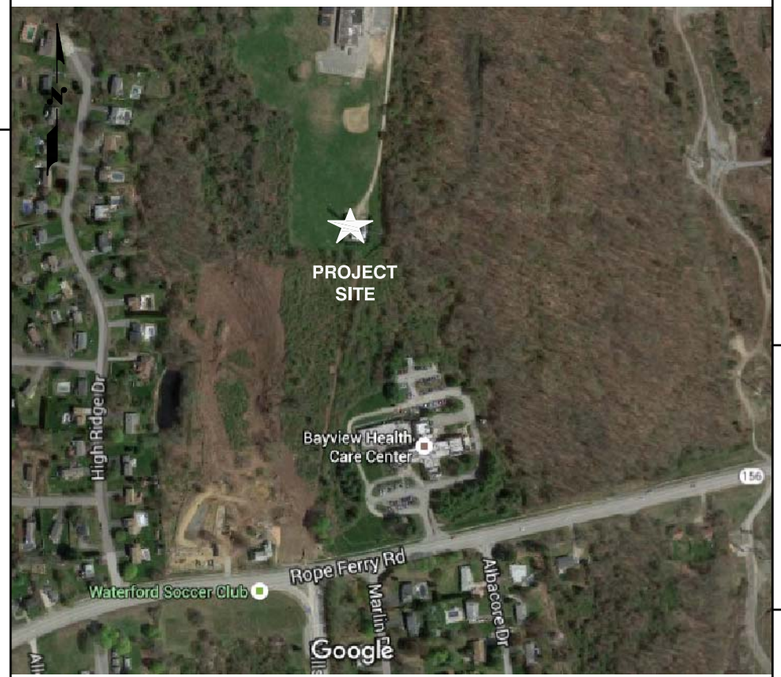
SCOPE OF WORK:	TELECOMMUNICATIONS FACILITY UPGRADE (LTE-3C PROJECT 2016):
SITE ADDRESS:	51 DANIELS AVE WATERFORD, CT 06385
LATITUDE:	41.330556 N 41° 19' 50" N
LONGITUDE:	-72.166944 W -72° 10' 01" W
TYPE OF SITE:	LATTICE TOWER/ INDOOR EQUIPMENT
OVERALL TOWER HEIGHT:	180'-0"±
RAD CENTER:	170'-0"±
JURISDICTION:	NATIONAL, STATE & LOCAL CODES OR ORDINANCES
CURRENT USE:	TELECOMMUNICATIONS FACILITY
PROPOSED USE:	TELECOMMUNICATIONS FACILITY
NOC#	866-915-5600

SITE NUMBER: CT1270
SITE NAME: DANIELS AVENUE - WATERFORD
PROJECT: LTE 3C 2016 UPGRADE

DRAWING INDEX

VICINITY MAP

FROM ROCKY HILL, CT: HEAD NORTHEAST ON ENTERPRISE DR TOWARD CAPITAL BLVD. 0.3 MILES. TURN LEFT AT CAPITAL BLVD. 0.3 MILES. TURN LEFT AT WEST ST. 0.3 MILES. TURN LEFT TO MERGE ONTO I-91 S TOWARD NEW HAVEN. 1.5 MILES. TAKE EXIT 22S ON THE LEFT TO MERGE ONTO CT-9 S TOWARD MIDDLETOWN/OLD SAYBROOK. 5.8 MILES. CONTINUE ONTO CT-17 S. 0.5 MILES. CONTINUE ONTO CT-9 S. 22.9 MILES. TAKE THE EXIT ONTO I-95 N/US-1 N TOWARD NEW LON/PROVIDENCE. CONTINUE TO FOLLOW I-95 N. 10.1 MILES. TAKE EXIT 75 FOR US-1 TOWARD WATERFORD. 0.2 MILES. SLIGHT RIGHT AT US-1 N/BOSTON POST RD. 1.6 MILES. TURN RIGHT AT NIANTIC RIVER RD. 1.7 MILES. TURN LEFT AT DANIELS AVE. DESTINATION WILL BE ON THE RIGHT. 0.3 MILES.



GENERAL NOTES

1. THIS DOCUMENT IS THE CREATION, DESIGN, PROPERTY AND COPYRIGHTED WORK OF AT&T. ANY DUPLICATION OR USE WITHOUT EXPRESS WRITTEN CONSENT IS STRICTLY PROHIBITED. DUPLICATION AND USE BY GOVERNMENT AGENCIES FOR THE PURPOSES OF CONDUCTING THEIR LAWFULLY AUTHORIZED REGULATORY AND ADMINISTRATIVE FUNCTIONS IS SPECIFICALLY ALLOWED.

2. THE FACILITY IS AN UNMANNED PRIVATE AND SECURED EQUIPMENT INSTALLATION. IT IS ONLY ACCESSED BY TRAINED TECHNICIANS FOR PERIODIC ROUTINE MAINTENANCE AND THEREFORE DOES NOT REQUIRE ANY WATER OR SANITARY SEWER SERVICE. THE FACILITY IS NOT GOVERNED BY REGULATIONS REQUIRING PUBLIC ACCESS PER ADA REQUIREMENTS.

3. CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE AT&T REPRESENTATIVE IN WRITING OF DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.

72 HOURS

BEFORE YOU DIG

CALL TOLL FREE 888-DIG-SAFE OR DIAL 811

UNDERGROUND SERVICE ALERT

Hudson Design Group LLC
1600 OSGOOD STREET
BUILDING 20 NORTH, SUITE 3090
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

SAI
27 NORTHWESTERN DR.
SALEM, NH 03079

SITE NUMBER: CT1270
SITE NAME: DANIELS AVENUE
WATERFORD
51 DANIELS AVENUE
WATERFORD, CT 06385
NEW LONDON COUNTY

550 COCHITUATE ROAD
FRAMINGHAM, MA 01701

NO.	DATE	REVISIONS	BY	CHK	APP'D
2	02/25/16	ISSUED FOR CONSTRUCTION	EB	AT	DPH
1	01/25/16	ISSUED FOR REVIEW	RB	AT	DPH
A	12/18/15	ISSUED FOR REVIEW	EB	AT	DPH

SCALE: AS SHOWN | DESIGNED BY: AT | DRAWN BY: EB

STATE OF CONNECTICUT — DEREK B. FRASER — NO. 28357 — LICENSED PROFESSIONAL ENGINEER

AT&T

TITLE SHEET
(LTE-3C 2015)

JOB NUMBER	DRAWING NUMBER	REV
1270.01	T-1	2

GROUNDING NOTES

1. THE SUBCONTRACTOR SHALL REVIEW AND INSPECT THE EXISTING FACILITY GROUNDING SYSTEM AND LIGHTNING PROTECTION SYSTEM (AS DESIGNED AND INSTALLED) FOR STRICT COMPLIANCE WITH THE NEC (AS ADOPTED BY THE AHJ), THE SITE–SPECIFIC (UL, LPI, OR NFPA) LIGHTING PROTECTION CODE, AND GENERAL COMPLIANCE WITH TELCORDIA AND TIA GROUNDING STANDARDS. THE SUBCONTRACTOR SHALL REPORT ANY VIOLATIONS OR ADVERSE FINDINGS TO THE CONTRACTOR FOR RESOLUTION.

2. ALL GROUND ELECTRODE SYSTEMS (INCLUDING TELECOMMUNICATION, RADIO, LIGHTNING PROTECTION, AND AC POWER GES'S) SHALL BE BONDED TOGETHER, AT OR BELOW GRADE, BY TWO OR MORE COPPER BONDING CONDUCTORS IN ACCORDANCE WITH THE NEC.

3. THE SUBCONTRACTOR SHALL PERFORM IEEE FALL–OF–POTENTIAL RESISTANCE TO EARTH TESTING (PER IEEE 1100 AND 81) FOR NEW GROUND ELECTRODE SYSTEMS. THE SUBCONTRACTOR SHALL FURNISH AND INSTALL SUPPLEMENTAL GROUND ELECTRODES AS NEEDED TO ACHIEVE A TEST RESULT OF 5 OHMS OR LESS.

4. METAL RACEWAY SHALL NOT BE USED AS THE NEC REQUIRED EQUIPMENT GROUND CONDUCTOR. STRANDED COPPER CONDUCTORS WITH GREEN INSULATION, SIZED IN ACCORDANCE WITH THE NEC, SHALL BE FURNISHED AND INSTALLED WITH THE POWER CIRCUITS TO BTS EQUIPMENT.

5. EACH BTS CABINET FRAME SHALL BE DIRECTLY CONNECTED TO THE MASTER GROUND BAR WITH GREEN INSULATED SUPPLEMENTAL EQUIPMENT GROUND WIRES, 6 AWG STRANDED COPPER OR LARGER FOR INDOOR BTS 2 AWG STRANDED COPPER FOR OUTDOOR BTS.

6. EXOTHERMIC WELDS SHALL BE USED FOR ALL GROUNDING CONNECTIONS BELOW GRADE.

7. APPROVED ANTIOXIDANT COATINGS (I.E., CONDUCTIVE GEL OR PASTE) SHALL BE USED ON ALL COMPRESSION AND BOLTED GROUND CONNECTIONS.

8. ICE BRIDGE BONDING CONDUCTORS SHALL BE EXOTHERMICALLY BONDED OR BOLTED TO THE BRIDGE AND THE TOWER GROUND BAR.

9. ALUMINUM CONDUCTOR OR COPPER CLAD STEEL CONDUCTOR SHALL NOT BE USED FOR GROUNDING CONNECTIONS.

10. MISCELLANEOUS ELECTRICAL AND NON–ELECTRICAL METAL BOXES, FRAMES AND SUPPORTS SHALL BE BONDED TO THE GROUND RING, IN ACCORDANCE WITH THE NEC.

11. METAL CONDUIT SHALL BE MADE ELECTRICALLY CONTINUOUS WITH LISTED BONDING FITTINGS OR BY BONDING ACROSS THE DISCONTINUITY WITH 6 AWS COPPER WIRE UL APPROVED GROUNDING TYPE CONDUIT CLAMPS.

12. ALL NEW STRUCTURES WITH A FOUNDATION AND/OR FOOTIING HAVING 20 FT. OR MORE 1/2" OR GREATER ELECTRICALLY CONDUCTIVE REINFORCING STEEL MUST HAVE IT BONDED TO THE GROUND RING USING AN EXOTHERMIC WELD CONNECTION USING #2 AWG SOLID TINNED COPPER GROUND WIRE, PER NEC 250.50

GENERAL NOTES

1. FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:
CONTRACTOR – SAI
SUBCONTRACTOR – GENERAL CONTRACTOR (CONSTRUCTION)
OWNER – AT&T MOBILITY

2. PRIOR TO THE SUBMISSION OF BIDS, THE BIDDING SUBCONTRACTOR SHALL VISIT THE CELL SITE TO FAMILIARIZE WITH THE EXISTING CONDITIONS AND TO CONFIRM THAT THE WORK CAN BE ACCOMPLISHED AS SHOWN ON THE CONSTRUCTION DRAWINGS. ANY DISCREPANCY FOUND SHALL BE BROUGHT TO THE ATTENTION OF CONTRACTOR.

3. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES. SUBCONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS, AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.

4. DRAWINGS PROVIDED HERE ARE NOT TO BE SCALED AND ARE INTENDED TO SHOW OUTLINE ONLY.

5. UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES, AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.

6. "KITTING LIST" SUPPLIED WITH THE BID PACKAGE IDENTIFIES ITEMS THAT WILL BE SUPPLIED BY CONTRACTOR. ITEMS NOT INCLUDED IN THE BILL OF MATERIALS AND KITTING LIST SHALL BE SUPPLIED BY THE SUBCONTRACTOR.

7. THE SUBCONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.

8. IF THE SPECIFIED EQUIPMENT CANNOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE SUBCONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION SPACE FOR APPROVAL BY THE CONTRACTOR.

9. SUBCONTRACTOR SHALL DETERMINE ACTUAL ROUTING OF CONDUIT, POWER AND T1 CABLES, GROUNDING CABLES AS SHOWN ON THE POWER, GROUNDING AND TELCO PLAN DRAWING. SUBCONTRACTOR SHALL UTILIZE EXISTING TRAYS AND/OR SHALL ADD NEW TRAYS AS NECESSARY. SUBCONTRACTOR SHALL CONFIRM THE ACTUAL ROUTING WITH THE CONTRACTOR.

10. THE SUBCONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT SUBCONTRACTOR'S EXPENSE TO THE SATISFACTION OF OWNER.

11. SUBCONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY. ANTENNAS REMOVED SHALL BE RETURNED TO THE OWNER'S DESIGNATED LOCATION.

12. SUBCONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION.

13. ALL CONCRETE REPAIR WORK SHALL BE DONE IN ACCORDANCE WITH AMERICAN CONCRETE INSTITUTE (ACI) 301.

14. ANY NEW CONCRETE NEEDED FOR THE CONSTRUCTION SHALL BE AIR–ENTRAINED AND SHALL HAVE 4000 PSI STRENGTH AT 28 DAYS. ALL CONCRETE WORK SHALL BE DONE IN ACCORDANCE WITH ACI 318 CODE REQUIREMENTS.

15. ALL STRUCTURAL STEEL WORK SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH AISC SPECIFICATIONS. ALL STRUCTURAL STEEL SHALL BE ASTM A36 (Fy = 36 ksi) UNLESS OTHERWISE NOTED. PIPES SHALL BE ASTM A53 TYPE E (Fy = 36 ksi). ALL STEEL EXPOSED TO WEATHER SHALL BE HOT DIPPED GALVANIZED. TOUCHUP ALL SCRATCHES AND OTHER MARKS IN THE FIELD AFTER STEEL IS ERECTED USING A COMPATIBLE ZINC RICH PAINT.

16. CONSTRUCTION SHALL COMPLY WITH UMTS SPECIFICATIONS AND "GENERAL CONSTRUCTION SERVICES FOR CONSTRUCTION OF AT&T MOBILITY SITES."

17. SUBCONTRACTOR SHALL VERIFY ALL EXISTING DIMENSIONS AND CONDITIONS PRIOR TO COMMENCING ANY WORK. ALL DIMENSIONS OF EXISTING CONSTRUCTION SHOWN ON THE DRAWINGS MUST BE VERIFIED. SUBCONTRACTOR SHALL NOTIFY THE CONTRACTOR OF ANY DISCREPANCIES PRIOR TO ORDERING MATERIAL OR PROCEEDING WITH CONSTRUCTION.

18. THE EXISTING CELL SITE IS IN FULL COMMERCIAL OPERATION. ANY CONSTRUCTION WORK BY SUBCONTRACTOR SHALL NOT DISRUPT THE EXISTING NORMAL OPERATION. ANY WORK ON EXISTING EQUIPMENT MUST BE COORDINATED WITH CONTRACTOR. ALSO, WORK SHOULD BE SCHEDULED FOR AN APPROPRIATE MAINTENANCE WINDOW USUALLY IN LOW TRAFFIC PERIODS AFTER MIDNIGHT.

19. SINCE THE CELL SITE IS ACTIVE, ALL SAFETY PRECAUTIONS MUST BE TAKEN WHEN WORKING AROUND HIGH LEVELS OF ELECTROMAGNETIC RADIATION. EQUIPMENT SHOULD BE SHUTDOWN PRIOR TO PERFORMING ANY WORK THAT COULD EXPOSE THE WORKERS TO DANGER. PERSONAL RF EXPOSURE MONITORS ARE ADVISED TO BE WORN TO ALERT OF ANY DANGEROUS EXPOSURE LEVELS.

20. APPLICABLE BUILDING CODES:
SUBCONTRACTOR'S WORK SHALL COMPLY WITH ALL APPLICABLE NATIONAL, STATE, AND LOCAL CODES AS ADOPTED BY THE LOCAL AUTHORITY HAVING JURISDICTION (AHJ) FOR THE LOCATION. THE EDITION OF THE AHJ ADOPTED CODES AND STANDARDS IN EFFECT ON THE DATE OF CONTRACT AWARD SHALL GOVERN THE DESIGN.

BUILDING CODE: 2003 IBC WITH 2005 CT SUPPLEMENT & 2009/2013 CT AMENDMENTS
ELECTRICAL CODE: REFER TO ELECTRICAL DRAWINGS
LIGHTENING CODE: REFER TO ELECTRICAL DRAWINGS

SUBCONTRACTOR'S WORK SHALL COMPLY WITH THE LATEST EDITION OF THE FOLLOWING STANDARDS:

AMERICAN CONCRETE INSTITUTE (ACI) 318; BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE;

AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC)

MANUAL OF STEEL CONSTRUCTION, ASD, 14TH EDITION;

TELECOMMUNICATIONS INDUSTRY ASSOCIATION (TIA) 222–F, STRUCTURAL STANDARDS FOR STEEL

ANTENNA TOWER AND ANTENNA SUPPORTING STRUCTURES; REFER TO ELECTRICAL DRAWINGS FOR SPECIFIC ELECTRICAL STANDARDS.

FOR ANY CONFLICTS BETWEEN SECTIONS OF LISTED CODES AND STANDARDS REGARDING MATERIAL, METHODS OF CONSTRUCTION, OR OTHER REQUIREMENTS, THE MOST RESTRICTIVE REQUIREMENT SHALL GOVERN. WHERE THERE IS CONFLICT BETWEEN A GENERAL REQUIREMENT AND A SPECIFIC REQUIREMENT, THE SPECIFIC REQUIREMENT SHALL GOVERN.

ABBREVIATIONS

AGL	ABOVE GRADE LEVEL	G.C.	GENERAL CONTRACTOR	RF	RADIO FREQUENCY
AWG	AMERICAN WIRE GAUGE	MGB	MASTER GROUND BUS		
BCW	BARE COPPER WIRE	MIN	MINIMUM	TBD	TO BE DETERMINED
BTS	BASE TRANSCEIVER STATION	PROPOSED	NEW	TBR	TO BE REMOVED
EXISTING	EXISTING	N.T.S.	NOT TO SCALE	TBRR	TO BE REMOVED AND REPLACED
EG	EQUIPMENT GROUND	REF	REFERENCE		
EGR	EQUIPMENT GROUND RING	RE	REQUIRED	TYP	TYPICAL

Hudson Design Group LLC
1600 OSGOOD STREET
BUILDING 20 NORTH, SUITE 3090
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

SAI
27 NORTHWESTERN DR.
SALEM, NH 03079

SITE NUMBER: CT1270
SITE NAME: DANIELS AVENUE
WATERFORD
51 DANIELS AVENUE
WATERFORD, CT 06385
NEW LONDON COUNTY

at&t
550 COCHITUATE ROAD
FRAMINGHAM, MA 01701

NO.	DATE	REVISIONS	BY	CHK	APP'D
2	02/25/16	ISSUED FOR CONSTRUCTION	EB	AT	DPH
1	01/25/16	ISSUED FOR REVIEW	RB	AT	DPH
A	12/18/15	ISSUED FOR REVIEW	EB	AT	DPH

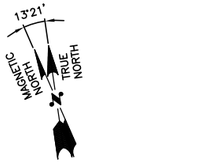
SCALE: AS SHOWN | DESIGNED BY: AT | DRAWN BY: EB

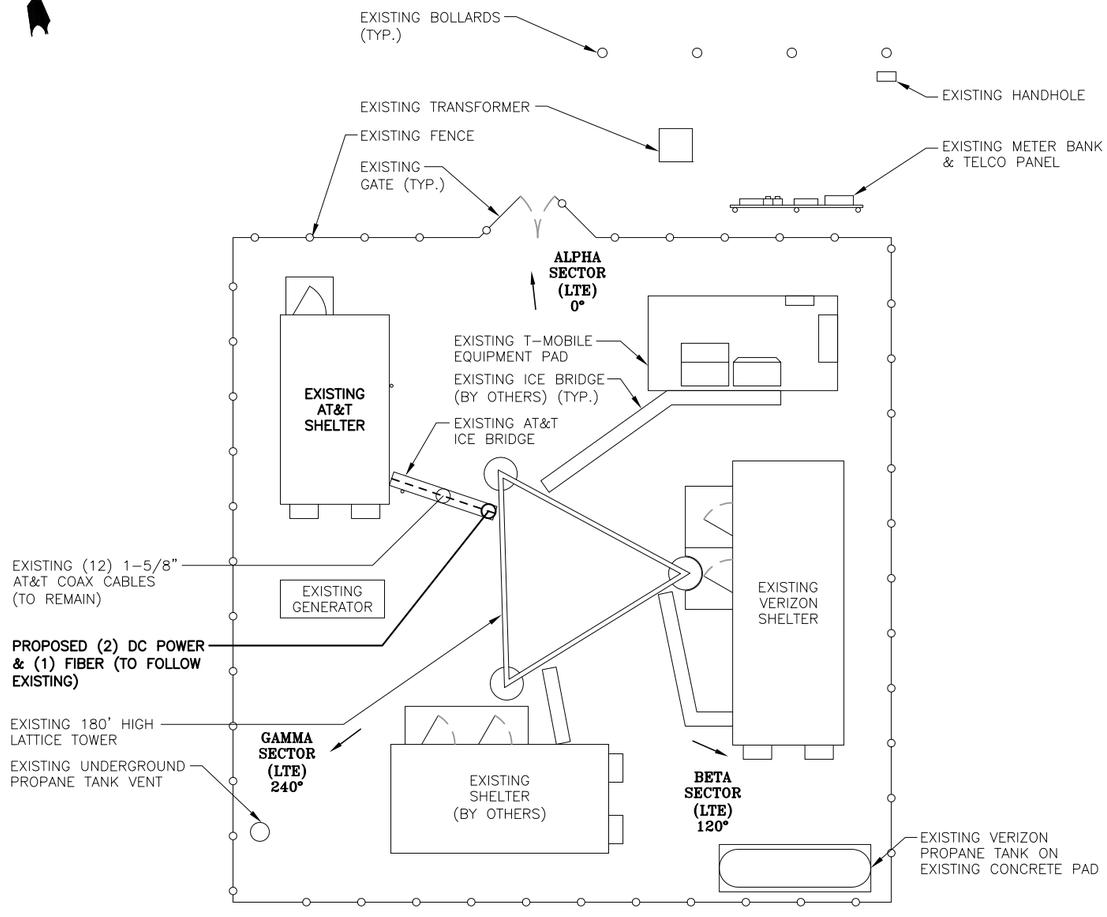
STATE OF CONNECTICUT · DEREK J. CREASEY · No. 25057 · LICENSED PROFESSIONAL ENGINEER

AT&T

GENERAL NOTES
(LTE–3C 2015)

JOB NUMBER	DRAWING NUMBER	REV
1270.01	GN–1	2





COMPOUND PLAN (1 / A-1)
22x34 SCALE: 1/8"=1'-0"
11x17 SCALE: 1/16"=1'-0"

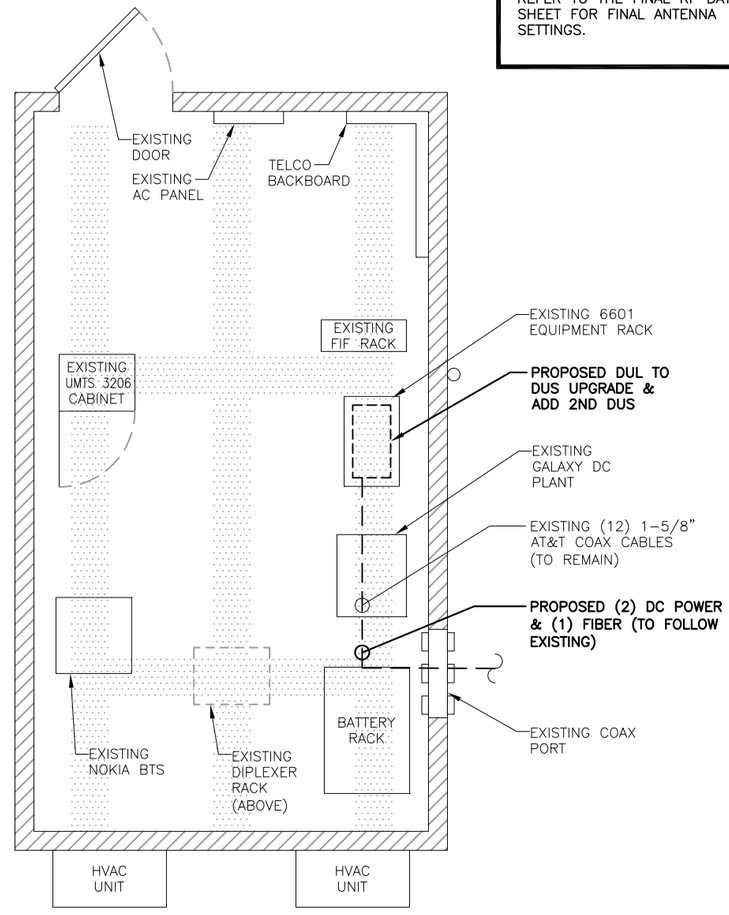
0 4'-0" 8'-0" 16'-0" 24'-0"

NOTE:

AN ANALYSIS FOR THE CAPACITY OF THE EXISTING STRUCTURES TO SUPPORT THE PROPOSED EQUIPMENT SHALL BE DETERMINED PRIOR TO CONSTRUCTION.

NOTE:

REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.



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

0 1'-0" 2'-0" 4'-0" 6'-0"

Hudson Design Group LLC
1600 OSGOOD STREET
BUILDING 20 NORTH, SUITE 3090
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

SAI
27 NORTHWESTERN DR.
SALEM, NH 03079

SITE NUMBER: CT1270
SITE NAME: DANIELS AVENUE
WATERFORD
51 DANIELS AVENUE
WATERFORD, CT 06385
NEW LONDON COUNTY

at&t
550 COCHITUATE ROAD
FRAMINGHAM, MA 01701

NO.	DATE	REVISIONS	BY	CHK	APP'D
2	02/25/16	ISSUED FOR CONSTRUCTION	EB	AT	DPH
1	01/25/16	ISSUED FOR REVIEW	RB	AT	DPH
A	12/18/15	ISSUED FOR REVIEW	EB	AT	DPH

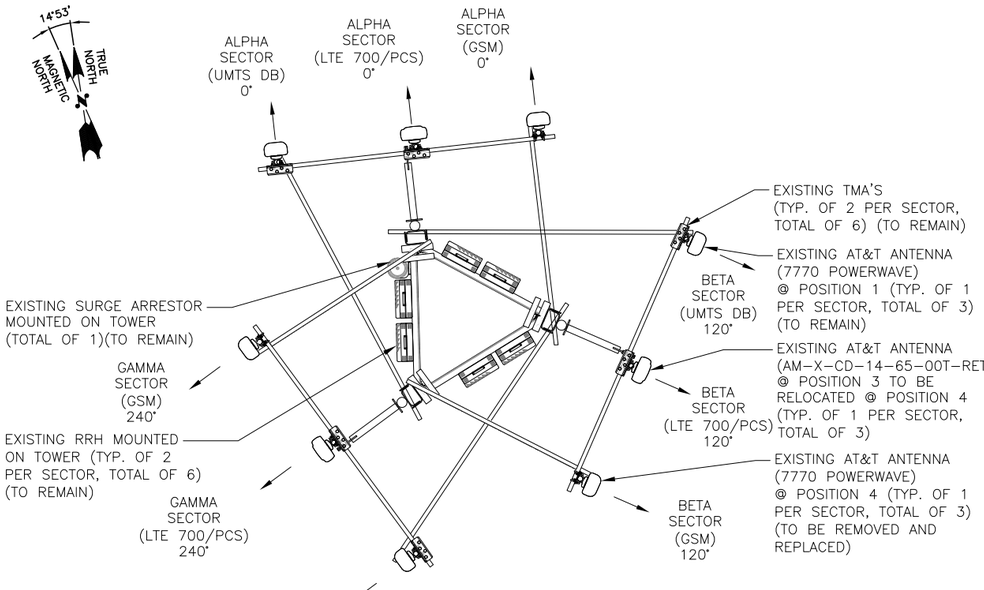
SCALE: AS SHOWN | DESIGNED BY: AT | DRAWN BY: EB

STATE OF CONNECTICUT
DEREK J. CREASER
26,255
LICENSED PROFESSIONAL ENGINEER

AT&T

COMPOUND AND EQUIPMENT PLAN
(LTE-3C 2015)

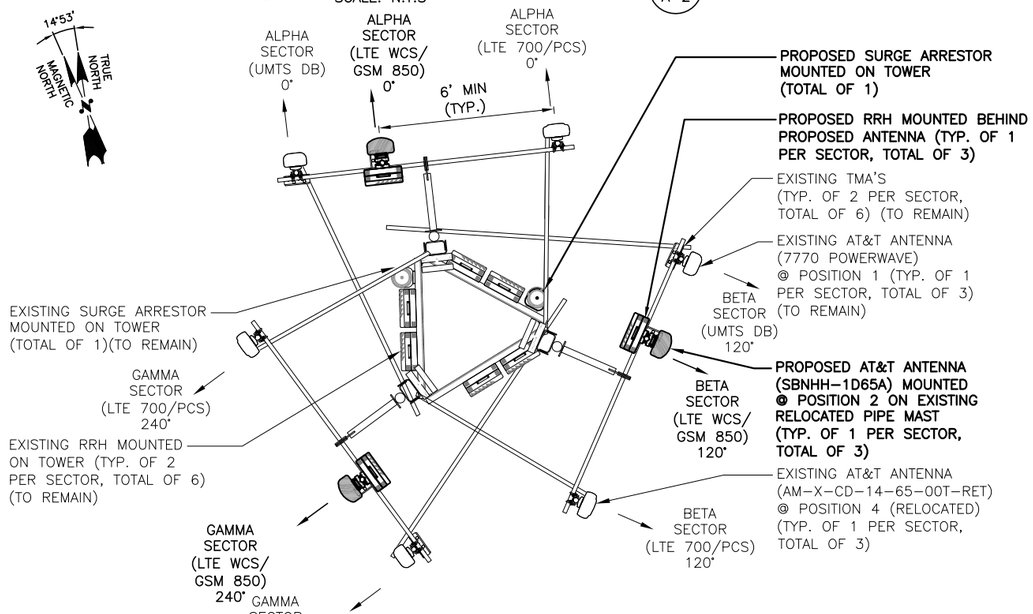
JOB NUMBER	DRAWING NUMBER	REV
1270.01	A-1	2



EXISTING ANTENNA LAYOUT

SCALE: N.T.S

1 / A-2



PROPOSED ANTENNA LAYOUT

SCALE: N.T.S

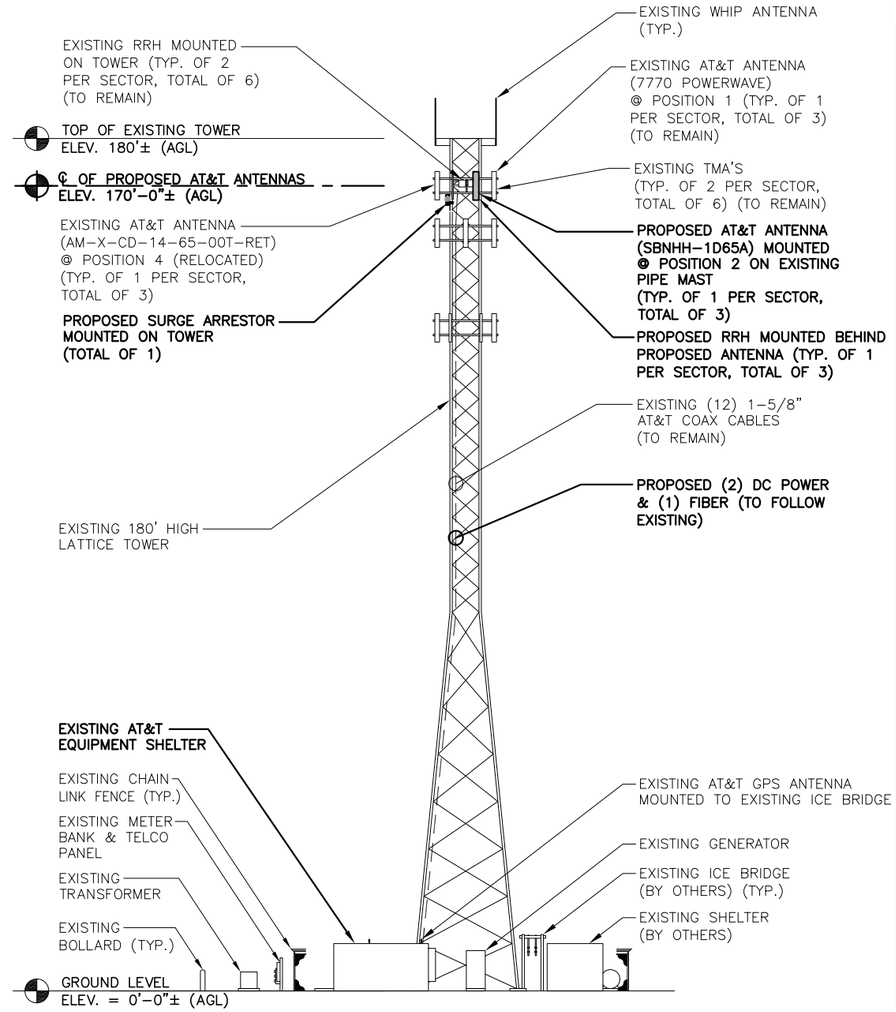
2 / A-2

NOTE:

AN ANALYSIS FOR THE CAPACITY OF THE EXISTING STRUCTURES TO SUPPORT THE PROPOSED EQUIPMENT SHALL BE DETERMINED PRIOR TO CONSTRUCTION.

NOTE:

REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.



ELEVATION

22x34 SCALE: 1/16"=1'-0"
11x17 SCALE: 1/32"=1'-0"

3 / A-2

0 8'-0" 16'-0" 32'-0" 48'-0"

Hudson Design Group LLC
1600 OSGOOD STREET
BUILDING 20 NORTH, SUITE 3090
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

SAI
27 NORTHWESTERN DR.
SALEM, NH 03079

SITE NUMBER: CT1270
SITE NAME: DANIELS AVENUE
WATERFORD
51 DANIELS AVENUE
WATERFORD, CT 06385
NEW LONDON COUNTY

at&t
550 COCHITUATE ROAD
FRAMINGHAM, MA 01701

NO.	DATE	REVISIONS	BY	CHK	APP'D
2	02/25/16	ISSUED FOR CONSTRUCTION	EB	AT	DPH
1	01/25/16	ISSUED FOR REVIEW	RB	AT	DPH
A	12/18/15	ISSUED FOR REVIEW	EB	AT	DPH

SCALE: AS SHOWN | DESIGNED BY: AT | DRAWN BY: EB

STATE OF CONNECTICUT
DEREK J. CREASER
No. 25551
LICENSED PROFESSIONAL ENGINEER

AT&T

ANTENNA LAYOUTS & ELEVATION
(LTE-3C 2015)

JOB NUMBER	DRAWING NUMBER	REV
1270.01	A-2	2

NOTE:

AN ANALYSIS FOR THE CAPACITY OF THE EXISTING STRUCTURES TO SUPPORT THE PROPOSED EQUIPMENT SHALL BE DETERMINED PRIOR TO CONSTRUCTION.

NOTE:

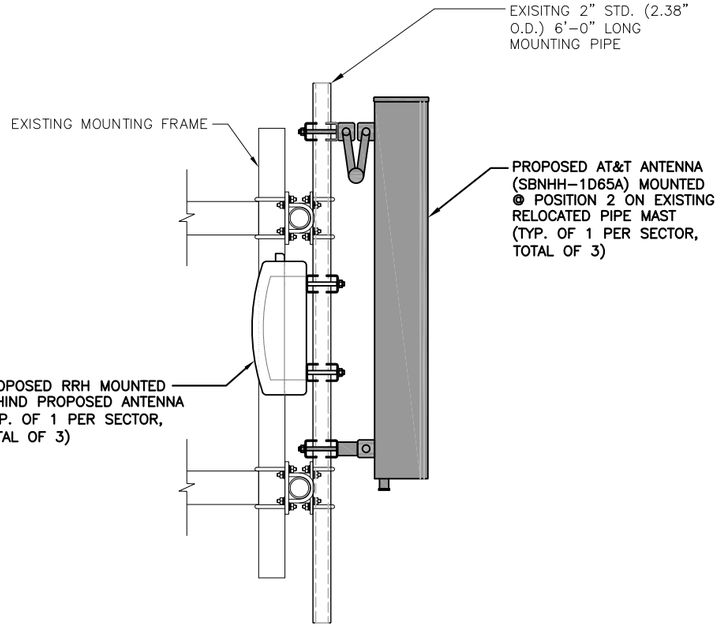
REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.

EXISTING ANTENNA SCHEDULE

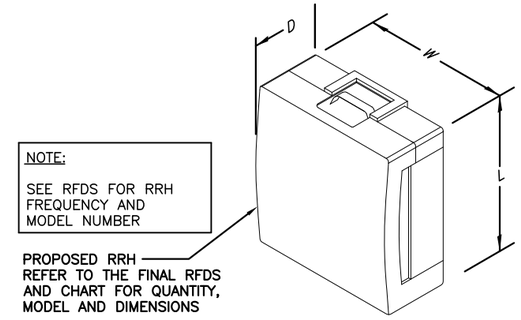
SECTOR	MAKE	MODEL#	SIZE (INCHES)
ALPHA:	POWERWAVE	7770	55X11X5
	–	–	–
	KMW	AM–X–CD–14–65–00T–RET	48X11.8X5.9
	POWERWAVE	7770	55X11X5
BETA:	POWERWAVE	7770	55X11X5
	–	–	–
	KMW	AM–X–CD–14–65–00T–RET	48X11.8X5.9
	POWERWAVE	7770	55X11X5
GAMMA:	POWERWAVE	7770	55X11X5
	–	–	–
	KMW	AM–X–CD–14–65–00T–RET	48X11.8X5.9
	POWERWAVE	7770	55X11X5

PROPOSED ANTENNA SCHEDULE

SECTOR	MAKE	MODEL#	SIZE (INCHES)
ALPHA:	POWERWAVE	7770	55X11X5
	ANDREW	SBNHH–1D65A	55X11.9X7.1
	–	–	–
	KMW	AM–X–CD–14–65–00T–RET	48X11.8X5.9
BETA:	POWERWAVE	7770	55X11X5
	ANDREW	SBNHH–1D65A	55X11.9X7.1
	–	–	–
	KMW	AM–X–CD–14–65–00T–RET	48X11.8X5.9
GAMMA:	POWERWAVE	7770	55X11X5
	ANDREW	SBNHH–1D65A	55X11.9X7.1
	–	–	–
	KMW	AM–X–CD–14–65–00T–RET	48X11.8X5.9



PROPOSED ANTENNA MOUNTING DETAIL (1 / A–3)
SCALE: N.T.S



NOTE:

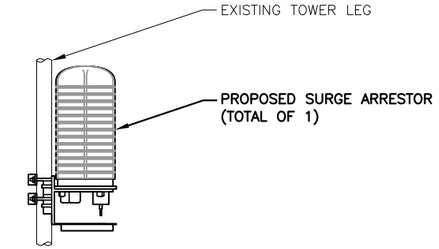
SEE RFDS FOR RRH FREQUENCY AND MODEL NUMBER

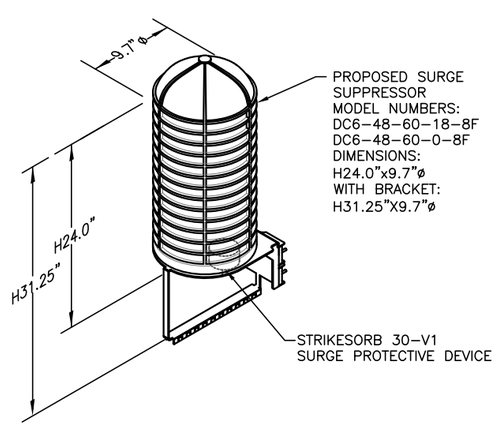
PROPOSED RRH REFER TO THE FINAL RFDS AND CHART FOR QUANTITY, MODEL AND DIMENSIONS

COUNT P/S		L	W	D
6 (E)	RRUS – 11	19.7"	17.0"	7.2"
3 (P)	RRUS – 32	26.7"	12.1"	6.7"
–	RRUS – E2	20"	20.4"	9.5"
–	LTE – A2	16.4"	15.2"	3.4"

NOTE:
MOUNT PER MANUFACTURER'S SPECIFICATIONS.

PROPOSED RRH & MOUNTING DETAIL (2 / A–3)
SCALE: N.T.S





NOTE:
MOUNT PER MANUFACTURER'S SPECIFICATIONS.

PROPOSED SURGE ARRESTOR & MOUNTING DETAIL (3 / A–3)
SCALE: N.T.S

Hudson Design Group LLC
1600 OSGOOD STREET
BUILDING 20 NORTH, SUITE 3090
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

SAI
27 NORTHWESTERN DR.
SALEM, NH 03079

SITE NUMBER: CT1270
SITE NAME: DANIELS AVENUE
WATERFORD
51 DANIELS AVENUE
WATERFORD, CT 06385
NEW LONDON COUNTY

at&t
550 COCHITUATE ROAD
FRAMINGHAM, MA 01701

NO.	DATE	REVISIONS	BY	CHK	APP'D
2	02/25/16	ISSUED FOR CONSTRUCTION	EB	AT	DPH
1	01/25/16	ISSUED FOR REVIEW	RB	AT	DPH
A	12/18/15	ISSUED FOR REVIEW	EB	AT	DPH

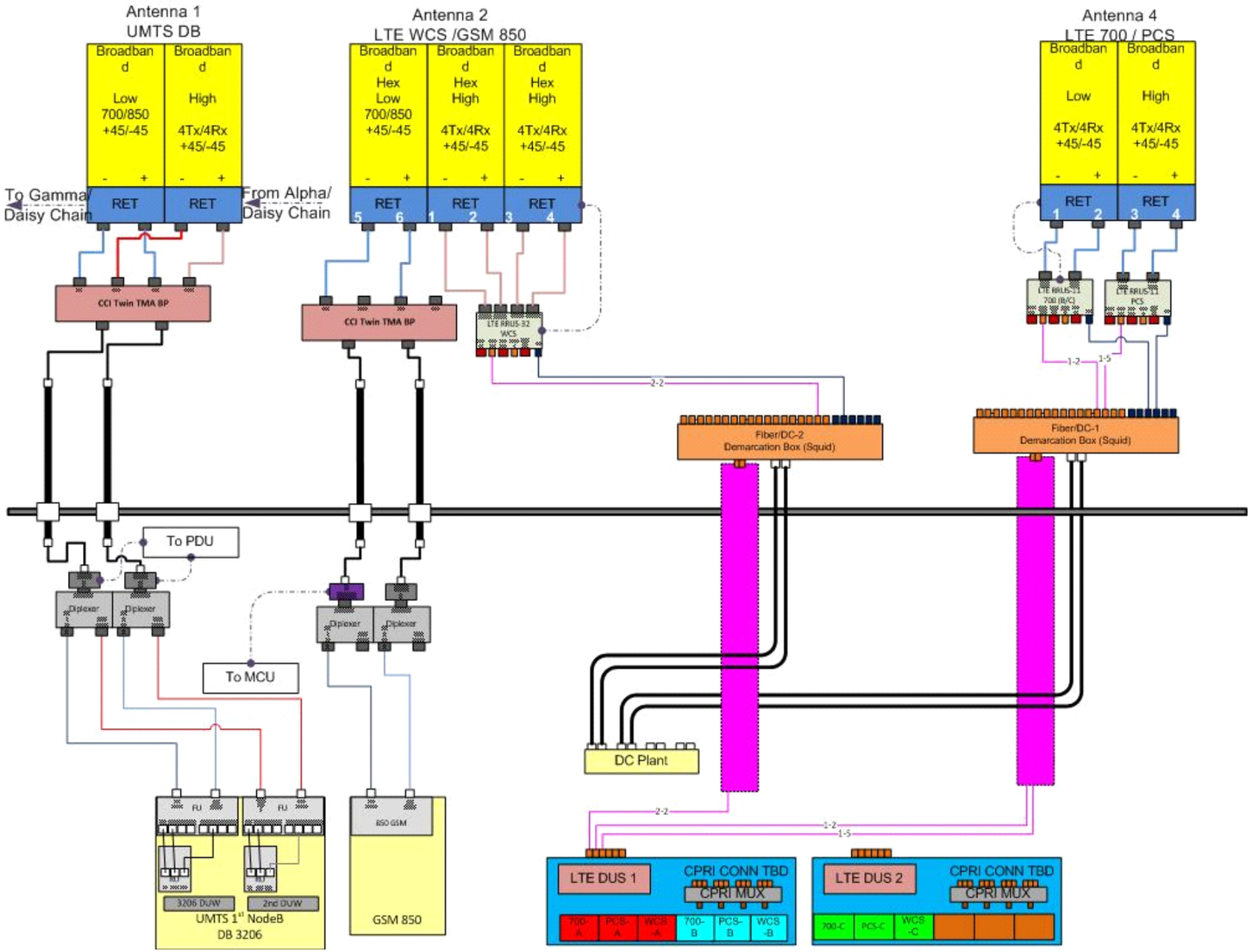
SCALE: AS SHOWN | DESIGNED BY: AT | DRAWN BY: EB

STATE OF CONNECTICUT · DEREK J. CREASER · No. 28357 · LICENSED PROFESSIONAL ENGINEER

AT&T

DETAILS
(LTE–3C 2015)

JOB NUMBER	DRAWING NUMBER	REV
1270.01	A–3	2



RF PLUMBING DIAGRAM (1 / RF–1)
SCALE: N.T.S

NOTES:

1. CONTRACTOR TO CONFIRM ALL PARTS.
2. INSTALL ALL EQUIPMENT TO MANUFACTURER'S RECOMMENDATIONS.

NOTE:

REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.

Hudson Design Group LLC
1600 OSGOOD STREET
BUILDING 20 NORTH, SUITE 3090
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

27 NORTHWESTERN DR.
SALEM, NH 03079

SITE NUMBER: CT1270
SITE NAME: DANIELS AVENUE
WATERFORD
51 DANIELS AVENUE
WATERFORD, CT 06385
NEW LONDON COUNTY

550 COCHITUATE ROAD
FRAMINGHAM, MA 01701

NO.	DATE	REVISIONS	BY	CHK	APP'D
2	02/25/16	ISSUED FOR CONSTRUCTION	EB	AT	DPH
1	01/25/16	ISSUED FOR REVIEW	RB	AT	DPH
A	12/18/15	ISSUED FOR REVIEW	EB	AT	DPH

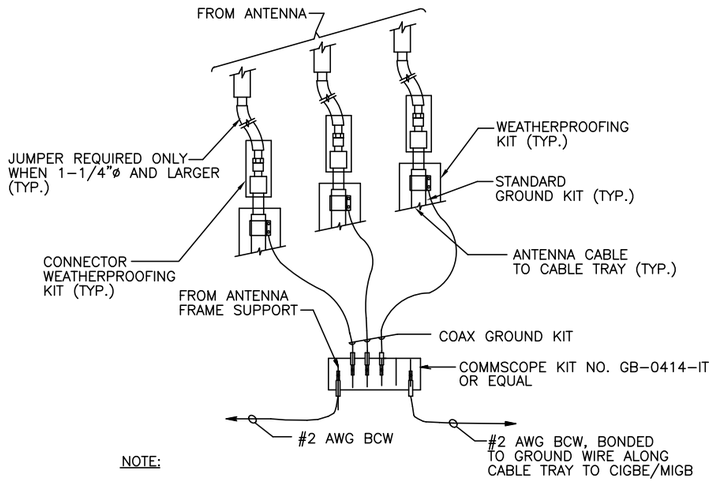
SCALE: AS SHOWN | DESIGNED BY: AT | DRAWN BY: EB

STATE OF CONNECTICUT · DEREK J. CREASER · No. 28351 · LICENSED PROFESSIONAL ENGINEER

AT&T

PLUMBING DIAGRAM
(LTE–3C 2015)

JOB NUMBER	DRAWING NUMBER	REV
1270.01	RF–1	2

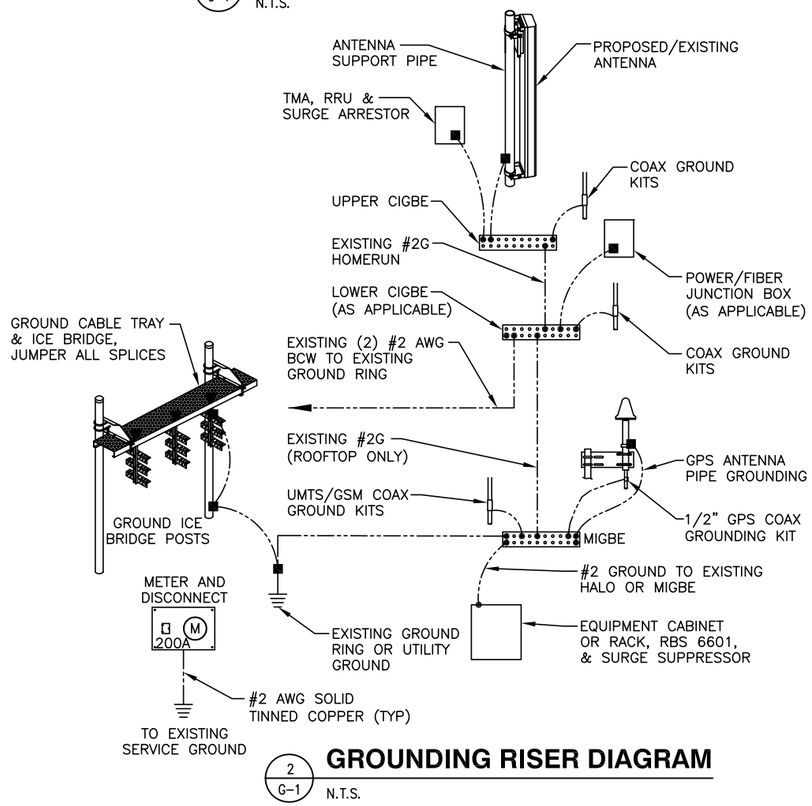


NOTE:

1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO CIGBE.

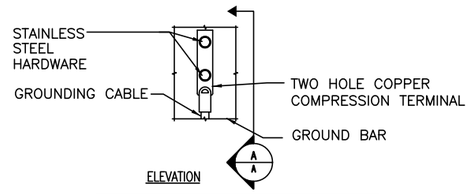
GROUND WIRE TO GROUND BAR CONNECTION DETAIL

1 / G-1 N.T.S.



GROUNDING RISER DIAGRAM

2 / G-1 N.T.S.



NOTE:
1. "DOUBLING UP" OR "STACKING " OF CONNECTION IS NOT PERMITTED.
2. OXIDE INHIBITING COMPOUND TO BE USED AT ALL LOCATIONS.
3. CADWELD DOWNLEADS FROM UPPER EGB, LOWER EGB, AND MGB.

TYPICAL GROUND BAR CONNECTION DETAIL

3 / G-1 N.T.S.

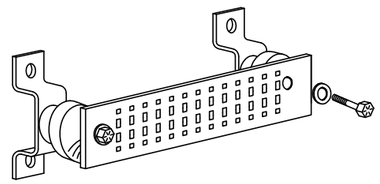
EACH GROUND CONDUCTOR TERMINATING ON ANY GROUND BAR SHALL HAVE AN IDENTIFICATION TAG ATTACHED AT EACH END THAT WILL IDENTIFY ITS ORIGIN AND DESTINATION.

SECTION "P" – SURGE PRODUCERS

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

SECTION "A" – SURGE ABSORBERS

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



GROUND BAR - DETAIL

4 / G-1 N.T.S.

Hudson Design Group LLC
1600 OSGOOD STREET
BUILDING 20 NORTH, SUITE 3090
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

SAI
27 NORTHWESTERN DR.
SALEM, NH 03079

SITE NUMBER: CT1270
SITE NAME: DANIELS AVENUE WATERFORD
51 DANIELS AVENUE
WATERFORD, CT 06385
NEW LONDON COUNTY

at&t
550 COCHITUATE ROAD
FRAMINGHAM, MA 01701

NO.	DATE	REVISIONS	BY	CHK	APP'D
2	02/25/16	ISSUED FOR CONSTRUCTION	EB	AT	DPH
1	01/25/16	ISSUED FOR REVIEW	RB	AT	DPH
A	12/18/15	ISSUED FOR REVIEW	EB	AT	DPH

SCALE: AS SHOWN | DESIGNED BY: AT | DRAWN BY: EB

STATE OF CONNECTICUT
DEREK J. CREASER
No. 23551
LICENSED PROFESSIONAL ENGINEER

AT&T

GROUNDING DETAILS
(LTE-3C 2015)

JOB NUMBER	DRAWING NUMBER	REV
1270.01	G-1	2

ALLPRO
CONSULTING GROUP, INC.
9221 Lyndon B. Johnson Freeway, #204, Dallas, TX 75243 ★ PHONE 972-231-8893 ★ FAX 1-866-364-8375
www.allprocgi.com ★ e-mail: info@allprocgi.com

Tower Structural Analysis Report for
SBA Communications Corporation

Existing 180' Self Supported Tower

SBA Site Name: Niantic
SBA Site ID: CT09865-S-03

Carrier Name: AT&T
Carrier Site Name: CT1270 (FA10133917)

Site Location:
Southwest School 51 Daniels Road
Waterford, CT

Latitude: 41.330264°
Longitude: -72.166672°

ACGI Job # 16-1025

Ref Previous: ACGI Job # 16-0431
ACGI Job # 16-0568

ANALYSIS RESULTS		
Tower Components	56.3 %	**Pass**
Tower Base Foundation	55.0 %	**Pass**

Prepared By:
Moises Perez, EIT
Staff Engineer

04/06/2016
Approved By:
Joji M. George, P.E.
CT PE # 24444

TABLE OF CONTENTS

1. ANALYSIS SUMMARY

The existing 180' Self Supported Tower located in Waterford, CT was analyzed by Allpro Consulting Group, Inc (ACGI) for the existing loads and the proposed **AT&T** antennas and coaxes as authorized by SBA Communication Corp. Based on the results of the analysis, the existing tower with mentioned proposed and existing loading is found **to be in compliance** with *TIA/EIA-222-F, Structural Standards for Steel Antenna Towers and Antenna Supporting Structures and IBC 2003.*

2. SCOPE & SOURCE OF INFORMATION

The purpose of this structural analysis is to determine whether the existing structure is capable of supporting additional proposed loads.

SOURCE OF INFORMATION		
Tower Data:	Tower Innovations	-Original Tower Drawings by Tower Innovations (Project Number : 5210 dated 11/05/2008)
	Allpro Consulting Group, Inc.	-Previous Structural Analysis by Allpro Consulting Group Inc., (ACGI Job # 15-4964, dated 09/09/2015)
	FDH Engineering, Inc.	-Previous Structural Analysis by FDH Engineering, Inc.(FDH Project Number 1325881400, dated 4/26/2013)
	Allpro Consulting Group, Inc.	-Previous Structural Analysis by Allpro Consulting Group Inc., (ACGI Job # 16-0431, dated 02/12/2016
	Allpro Consulting Group, Inc.	-Previous Structural Analysis by Allpro Consulting Group Inc., (ACGI Job # 16-0568, dated 02/22/2016
Foundation Data:	Tower Innovations	- Existing MAT foundation data is as per original foundation design by Tower Innovations, Project Number 5210 dated 11/5/2008
Geotechnical Report:	Dr.Clearance Welti, P.E., P.C.Geotechnical Engineering	Soil data is as per Geotechnical Report by Dr.Clearance Welti, P.E., P.C.Geotechnical Engineering (Ref: Geotechnical Study for proposed Cell Tower at Southwest School 51 Daniels Road, Waterford, CT -SBA Network Services, Inc. dated 10/23/2008)

Loading Data:	Allpro Consulting Group, Inc. Allpro Consulting Group, Inc. SBA Communication Corp.	-Previous Structural Analysis by Allpro Consulting Group Inc., (ACGI Job # 16-0568, dated 02/22/2016. -Previous Structural Analysis by Allpro Consulting Group Inc., (ACGI Job # 16-0431, dated 02/12/2016 -AT&T Col. App # 29348, v4
Authorization:	SBA Communication Corp.	

3. ANALYSIS METHODS & DATA

The analysis was performed in accordance with Telecommunication Industry Association specification TIA/EIA-222-F. The tower was modeled using TNX Tower, a 3-D finite element program. TNX Tower is a general-purpose modeling, analysis, and design program created specifically for communication towers using the EIA-222-C, EIA-222-D, TIA/EIA-222-F or TIA/EIA-222-G standards. The 3-D model included the tower, with existing appurtenances and all proposed loads.

SITE DATA	
SBA Site Name:	Niantic
SBA Site Number:	CT09865-S-03
Carrier Site ID:	CT1270 (FA 10133917)
City, State:	Waterford, CT
County:	New London County
Code Wind Load Requirement:	ANSI/TIA-222-F (85 mph basic wind speed) IBC 2003 (85 mph basic wind speed)
Wind Load Used:	ANSI/TIA-222-F Code: • Basic wind speed of 85 mph (Fastest mile wind speed) • A wind speed of 74 mph is used in combination with ice. • Nominal ice thickness of 0.5 in.

TOWER DATA	
Tower Type:	Self Supported Tower
Height:	180'
Cross Section:	Triangular
Steel Strength:	Legs – 50 ksi , Braces – 36 ksi
Type of Foundation:	Mat Foundation with (3) Pedestals

TOWER HISTORY	
Tower Manufacturer / Model:	Tower Innovations
Date of Original Design:	11/05/2008
Previous Modifications:	Unknown
Original Design Code Requirements:	TIA-222-G/ 120 mph wind speed & 3/4 " ice 50 mph wind speed

4. CONCLUSIONS

RESULT SUMMARY		
MEMBER	***% Capacity***	***Results***
Legs	**56.3 %**	**Pass**
Diagonals	**53.8 %**	**Pass**
Top Girt	**4.0 %**	**Pass**
Bottom Girt	**19.4 %**	
Bolt Checks	**47.4 %**	**Pass**
Mat Foundation (see attached MathCAD for details)	**Safety Factor against Overturning: (47.45 %)**	**Pass**
	Soil Bearing Capacity (34.88 %)	**Pass**
	Shear Capacity (55.02 %)	**Pass**
OVERALL TOWER RATING = 56.3 % (Pass)		

As per the results of the analysis, the existing tower **is in code compliance** for the proposed and existing antenna loads.

Maximum tower member stress **is less than allowable,** making **it in code compliance** under the EIA/TIA-222-F code and IBC2003 requirements.

5. DISCLAIMER

Installation procedures and related loading are not within the scope of this analysis. A contractor experienced in similar work should perform all installation work. The engineering services provided by Allpro Consulting Group, Inc. (ACGI) are limited to the computer analysis and calculations of the structure with the proposed and existing loads. This analysis is considered void if the loading mentioned in this report is changed or is different as installed. It is assumed that the existing structure is properly maintained and is in good condition free of any defects. Scope of this analysis does not include existing connections, except as noted in this report.

ACGI does not make any warranties, expressed or implied in connection with this engineering analysis report and disclaims any liability arising from deficiencies or any existing conditions of the original structure. ACGI will not be responsible for consequential or incidental damages sustained by any parties as a result of any data or conclusions included in this Report. The maximum liability of ACGI pursuant to this report shall be limited to the consulting fee received for the preparation of the report.

6. APPURTENANCE LISTING

EXISTING LOAD DESCRIPTION					
ELEV (ft.)	***Qty.***	***Antenna Description***	***Mount Type & Qty.***	***TX. LINE (in)***	***TENANT***
180'±	2	Sinclair SC488-HF2LNF Omnis	(2) SitePRO1 HM6 6' Standoffs	(2) 1-5/8"	Town of Waterford
	1	DBSpectra ATS8TMA10 TMA			
170'±	6	Powerwave 7770	(3) T-Frames	(12) 1-5/8" (2) 3/4"DC (1) 1/2" Fiber	AT&T
	3	Andrew SBNHH-1D65A antennas			
	6	Ericsson RRUS 11 RRUs			
	3	Ericsson RRUS 32 RRUs			
	1	Raycap DC6-48-60-18-8F Surge Suppressor			
160'±	3	RFS APX16DWV-16DWVS antennas	(3) T-Frames	(18) 1-5/8" (1) 1/2" (1) 1-5/8" Fiber	T-Mobile
	3	Commscope LNX-6515DS-VTM antennas			
	3	Ericsson Double TMA 17/21			
	3	RFS ATMAA1412D-1A20			
	3	Kathrein 782 11056 Bias T's			
140'±	3	Antel BXA-80063/6CF	(3) T-Frames	(17) 1-5/8" (2) 1-5/8" Hybriflex Fiber	Verizon
	3	Antel BXA-70063/6CF			
	6	Commscope SBNHH 1 D65B			
	3	Alcatel Lucent RRH 2x60-AWS RRUs			
	3	Alcatel Lucent RRH 2x60-PCS RRUs			
	3	Alcatel Lucent RRH 2x60-700 RRUs			
	2	ODU Celwave DB-T1-6Z			

FINAL AT&T LOAD DESCRIPTION					
ELEV (ft.)	***Qty.***	***Antenna Description***	***Mount Type & Qty.***	***TX. LINE (in)***	***TENANT***
170'±	3	Powerwave 7770 antennas	(3) T-Frames	(12) 1-5/8" (4) 3/4"DC (2) 1/2" Fiber	AT&T
	3	Andrew SBNHH-1D65A antennas			
	3	**KMW AM-X-CD-14-65-00T**			
	6	Ericsson RRUS 11 RRUs			
	3	Ericsson RRUS 32 RRUs			
	6	**TT19-08BP111-001 TMA**			
	2	Raycap DC6-48-60-18-8F Surge Suppressor			

Notes:

1. ACGI should be notified of any discrepancies found in the data listed in this report.

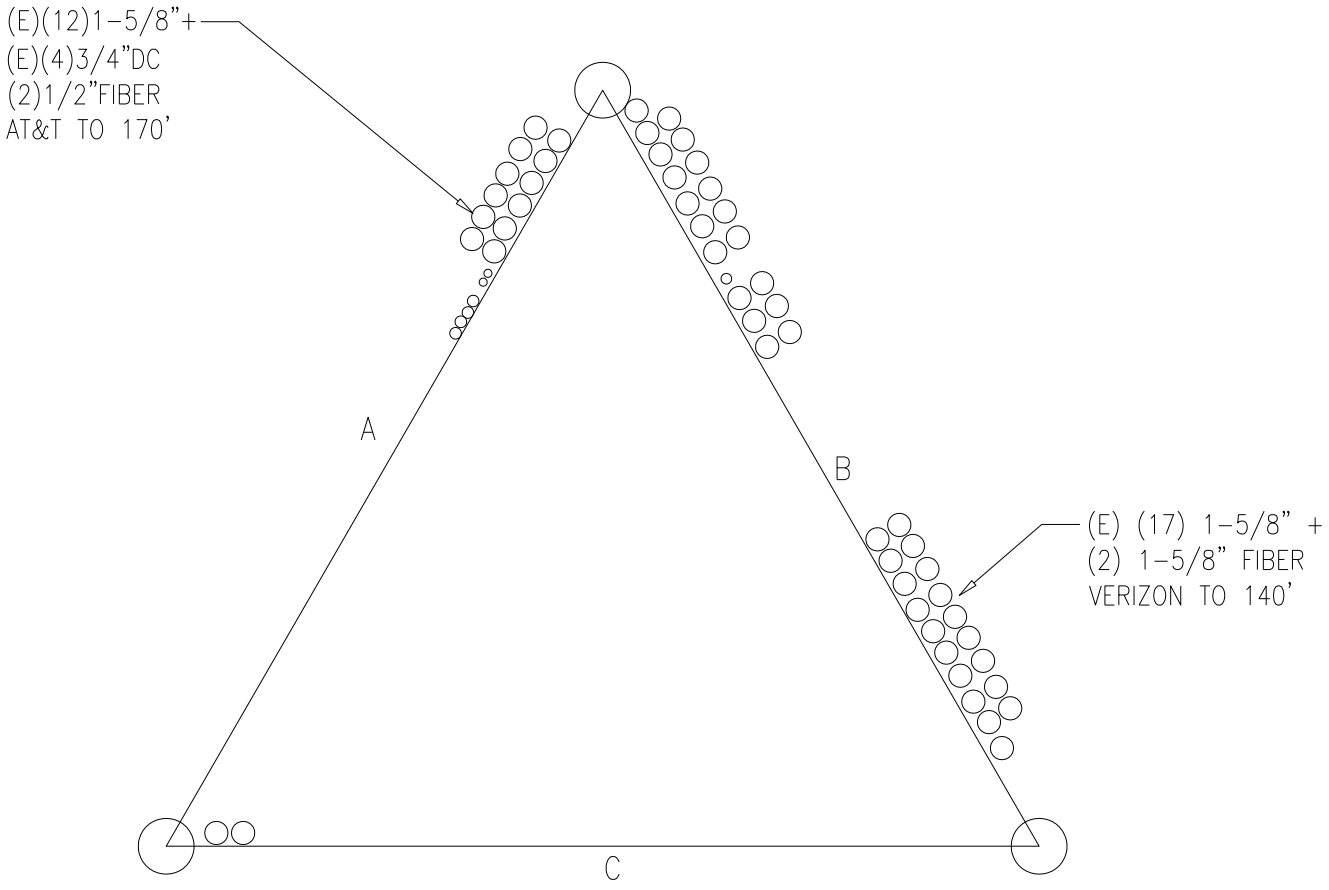
7. SUMMARY OF WORKING PERCENTAGE OF STRUCTURAL COMPONENTS

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	SF*P_{allow} K	% Capacity	Pass Fail
T1	180 - 160	Leg	1 3/4	3	-19.03	53.58	35.5	Pass
		Diagonal	7/8	13	-2.84	5.79	49.0	Pass
		Top Girt	7/8	6	-0.14	3.45	3.9	Pass
		Bottom Girt	7/8	9	-0.16	3.45	4.5	Pass
T2	160 - 140	Leg	2 1/2	48	-68.92	144.72	47.6	Pass
		Diagonal	1	57	-4.92	10.16	48.4	Pass
		Top Girt	1	50	-0.24	6.03	4.0	Pass
		Bottom Girt	1	53	-0.04	6.03	0.7	Pass
T3	140 - 120	Leg	3 1/2	92	-150.85	321.05	47.0	Pass
		Diagonal	1 1/8	102	-9.04	16.81	53.8	Pass
		Top Girt	1 1/8	96	-0.24	10.01	2.4	Pass
		Bottom Girt	1 1/8	99	-1.94	10.01	19.4	Pass
T4	120 - 90	Leg	4 1/4	137	-180.23	340.19	53.0	Pass
		Diagonal	L2 1/2x2 1/2x3/16	141	-2.75	8.97	30.7 31.6 (b)	Pass
T5	90 - 60	Leg	4 1/2	164	-206.10	401.80	51.3	Pass
		Diagonal	L3x3x3/16	168	-3.61	9.11	39.6 42.5 (b)	Pass
T6	60 - 30	Leg	4 3/4	191	-233.28	467.37	49.9	Pass
		Diagonal	L3 1/2x3 1/2x1/4	195	-4.59	12.05	38.1	Pass
T7	30 - 0	Leg	4 3/4	219	-262.90	467.37	56.3	Pass
		Diagonal	L4x4x5/16	228	-7.20	16.44	43.8 47.4 (b)	Pass
							Summary	
						Leg (T7)	56.3	Pass
						Diagonal (T3)	53.8	Pass
						Top Girt (T2)	4.0	Pass
						Bottom Girt (T3)	19.4	Pass
						Bolt Checks	47.4	Pass
						RATING =	**56.3**	**Pass**

APPENDIX

COAX LAYOUT

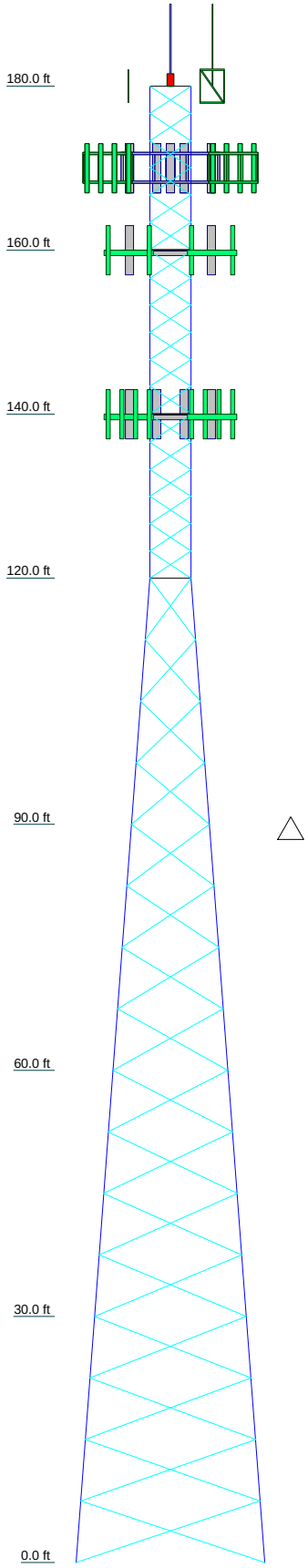


COAX LAYOUT

N.T.S

TOWER ELEVATION DRAWING

Section	T1	T2	T3	T4	T5	T6	T7
Legs	SR 1 3/4	SR 2 1/2	SR 3 1/2	SR 4 1/4	SR 4 1/2	SR 4 3/4	SR 4 3/4
Leg Grade	A572-50						
Diagonals	SR 7/8	SR 1	SR 1 1/8	L2 1/2x2 1/2x3/16	L3x3x3/16	L3 1/2x3 1/2x1/4	L4x4x5/16
Diagonal Grade	A572-50				A36		
Top Girts	SR 7/8	SR 1	SR 1 1/8	N.A.			
Bottom Girts	SR 7/8	SR 1	SR 1 1/8	N.A.			
Face Width (ft)	5				9.5	14	18.5
# Panels @ (ft)	6 @ 3.31944	6 @ 3.30556	6 @ 3.31944	16 @ 7.5			
Weight (K)	1.0	1.7	2.8	5.1	6.1	7.9	9.8



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
(E) Lightning Rod	180	LNX-6515DS-VTM (T-Mobile)	160
(E) Flash Beacon Lighting	180	LNX-6515DS-VTM (T-Mobile)	160
(E)Sinclair SC488-HF2LNF Omni (Town of Waterford)	180	(E)T-Frame (T-Mobile)	160
		(E)T-Frame (T-Mobile)	160
(E)Sinclair SC488-HF2LNF Omni (Town of Waterford)	180	(E)T-Frame (T-Mobile)	160
		LNX-6515DS-VTM (T-Mobile)	160
(E)DBSpectra ATS8TMA10 TMA (Town of Waterford)	180	Double TMA 17/21 (T-Mobile)	160
		Double TMA 17/21 (T-Mobile)	160
(E) SitePRO1 HM6 6' Stanoffs (Town of Waterford)	180	(2) (E)Antenna Pipe Mount (T-Mobile)	160
		(2) (E)Antenna Pipe Mount (T-Mobile)	160
(E) SitePRO1 HM6 6' Stanoffs (Town of Waterford)	180	(2) (E)Antenna Pipe Mount (T-Mobile)	160
		Double TMA 17/21 (T-Mobile)	160
(E)Powerwave 7770.00 (ATI)	170	ATMAA1412D-1A20 (T-Mobile)	160
SBNHH-1D65A (ATI)	170	ATMAA1412D-1A20 (T-Mobile)	160
SBNHH-1D65A (ATI)	170	ATMAA1412D-1A20 (T-Mobile)	160
RRU 32 (ATI)	170	782 11056 (T-Mobile)	160
RRU 32 (ATI)	170	782 11056 (T-Mobile)	160
RRU 32 (ATI)	170	(E)Antel BXA-80063/6CF (Verizon)	140
(2) (E) RRUS 11 (ATI)	170	(E)Antel BXA-80063/6CF (Verizon)	140
(2) (E) RRUS 11 (ATI)	170	(E)Antel BXA-80063/6CF (Verizon)	140
(2) (E) RRUS 11 (ATI)	170	(E)Antel BXA-70063/6CF (Verizon)	140
(E)Raycap DC6-48-60-18-F (ATI)	170	(E)Antel BXA-70063/6CF (Verizon)	140
(E)Raycap DC6-48-60-18-F (ATI)	170	(E)Antel BXA-70063/6CF (Verizon)	140
(E)Powerwave 7770.00 (ATI)	170	(2) (E)SBNHH 1 D65B (Verizon)	140
(E)Powerwave 7770.00 (ATI)	170	(2) (E)SBNHH 1 D65B (Verizon)	140
(E) T-Frame (ATI)	170	(2) (E)SBNHH 1 D65B (Verizon)	140
(E) T-Frame (ATI)	170	(E)Alcatel RRH2-AWS (Verizon)	140
(E) T-Frame (ATI)	170	(E)Alcatel RRH2-AWS (Verizon)	140
(3) (E)Antenna Pipe Mount (ATI)	170	(E)Alcatel RRH2-AWS (Verizon)	140
(3) (E)Antenna Pipe Mount (ATI)	170	(E)Alcatel RRH2-pcs (Verizon)	140
(3) (E)Antenna Pipe Mount (ATI)	170	(E)Alcatel RRH2-pcs (Verizon)	140
(P)AM-X-CD-16-65-00T-RET (ATI)	170	(E)Alcatel RRH2-pcs (Verizon)	140
(P) AM-X-CD-16-65-00T-RET (ATI)	170	(E)Alcatel RRH2--700 (Verizon)	140
(P)AM-X-CD-16-65-00T-RET (ATI)	170	(E)Alcatel RRH2--700 (Verizon)	140
(2) (P) TT19-08BP111-001 TMA (ATI)	170	(E)Alcatel RRH2--700 (Verizon)	140
(2) (P) TT19-08BP111-001 TMA (ATI)	170	(E) ODU Celwave DB-T1-6Z (Verizon)	140
(2) (P) TT19-08BP111-001 TMA (ATI)	170	(E) ODU Celwave DB-T1-6Z (Verizon)	140
782 11056 (T-Mobile)	160	(E)T-Frame (Verizon)	140
APX16DWV-16DWVS-E-A20 (T-Mobile)	160	(E)T-Frame (Verizon)	140
		(E)T-Frame (Verizon)	140
APX16DWV-16DWVS-E-A20 (T-Mobile)	160	(4) (E)Antenna Pipe Mount (Verizon)	140
		(4) (E)Antenna Pipe Mount (Verizon)	140
APX16DWV-16DWVS-E-A20 (T-Mobile)	160	(4) (E)Antenna Pipe Mount (Verizon)	140

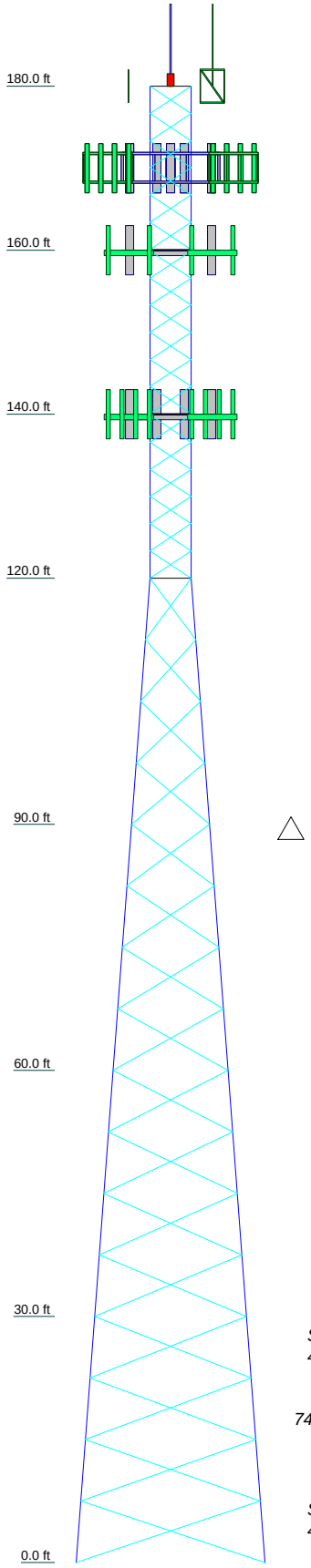
MATERIAL STRENGTH

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

ALLPRO CONSULTING GROUP
9221 LYNDON B. JOHNSON FWY 204
DALLAS, TX
Phone: (972)231-8893
FAX: 866-364-8375

Job: ***16-1025 180' SST***			
Project: ***CT09865-S-03_Niantic AT&T***			
Client: SBA	Drawn by: mperez	App'd:	
Code: TIA/EIA-222-F	Date: 04/06/16	Scale: NTS	
Path: P:\2016\Structural\16-1025 CT09865-S-03-Niantic Structural Analysis\TNX\CT09865-S-03 Niantic AT&T_SA_04052016.eri		Dwg No. E-1	

Section	T1	T2	T3	T4	T5	T6	T7
Legs	SR 1 3/4	SR 2 1/2	SR 3 1/2	SR 4 1/4	SR 4 1/2	SR 4 3/4	
Leg Grade	A572-50						
Diagonals	SR 7/8	SR 1	SR 1 1/8	L2 1/2x2 1/2x3/16	L3x3x3/16	L3 1/2x3 1/2x1/4	L4x4x5/16
Diagonal Grade	A572-50				A36		
Top Girts	SR 7/8	SR 1	SR 1 1/8	N.A.			
Bottom Girts	SR 7/8	SR 1	SR 1 1/8	N.A.			
Face Width (ft)	5				9.5	14	18.5
# Panels @ (ft)	6 @ 3.31944	6 @ 3.30556	6 @ 3.31944	16 @ 7.5			
Weight (K)	1.0	1.7	2.8	5.1	6.1	7.9	9.8

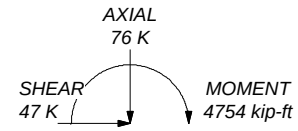


TOWER DESIGN NOTES

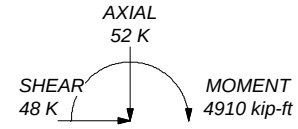
1. Tower is located in New London County, Connecticut.
2. Tower designed for a 85 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 74 mph basic wind with 0.50 in ice.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 56.3%

MAX. CORNER REACTIONS AT BASE:
DOWN: 264 K
SHEAR: 27 K

UPLIFT: -227 K
SHEAR: 27 K



TORQUE 2 kip-ft
74 mph WIND - 0.5000 in ICE



TORQUE 2 kip-ft
REACTIONS - 85 mph WIND

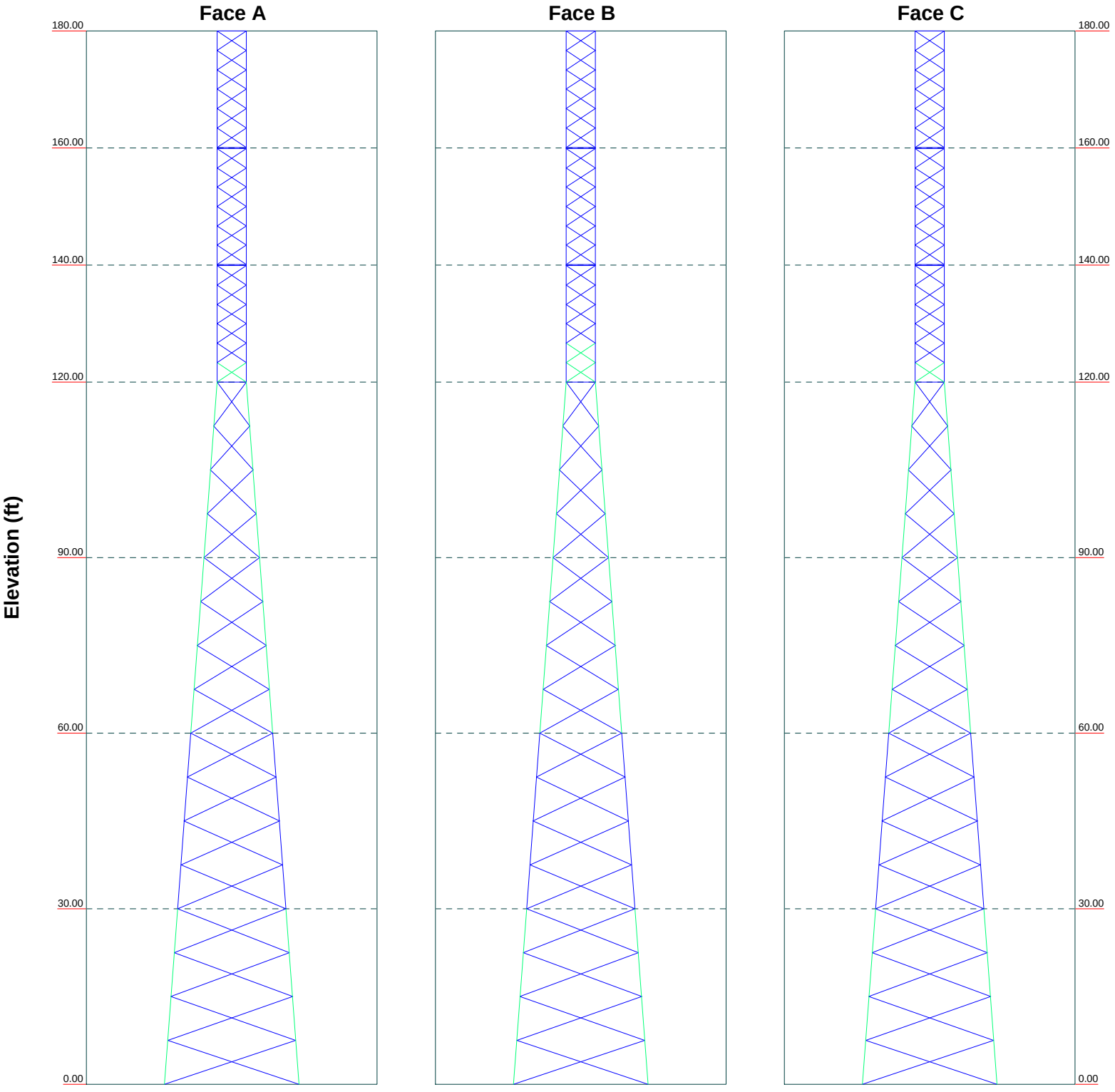
ALLPRO CONSULTING GROUP
9221 LYNDON B. JOHNSON FWY 204
DALLAS, TX
Phone: (972)231-8893
FAX: 866-364-8375

Job: ***16-1025 180' SST***			
Project: ***CT09865-S-03_Niantic AT&T***			
Client: SBA	Drawn by: mperez	App'd:	
Code: TIA/EIA-222-F	Date: 04/06/16	Scale: NTS	
Path: P:\2016\Structural\16-1025 CT09865-S-03-Niantic Structural Analysis\TNX\CT09865-S-03 Niantic_AT&T_SA_04052016.eri		Dwg No. E-1	

MISCELLANEOUS PLOTS

Stress Distribution Chart
0' - 180'

> 100% | 90%-100% | 75%-90% | 50%-75% | < 50% Overstress

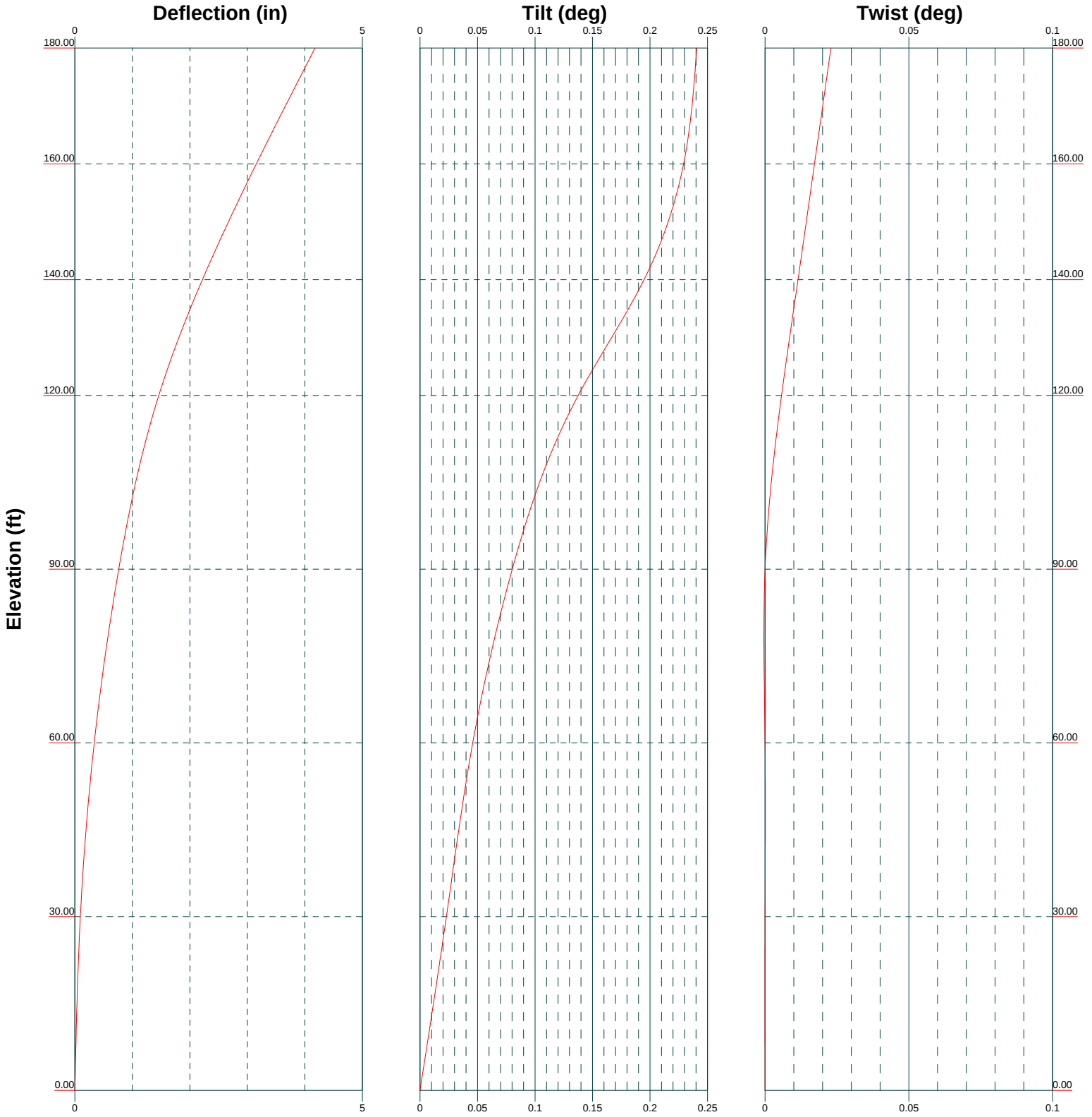


ALLPRO CONSULTING GROUP
9221 LYNDON B. JOHNSON FWY 204
DALLAS, TX
Phone: (972)231-8893
FAX: 866-364-8375

Job: ***16-1025 180' SST***		
Project: ***CT09865-S-03_Niantic AT&T***		
Client: SBA	Drawn by: mperez	App'd:
Code: TIA/EIA-222-F	Date: 04/06/16	Scale: NTS
Path: P:\2016\Structural\16-1025 CT09865-S-03-Niantic Structural Analysis\TNX\CT09865-S-03 Niantic_AT&T_SA_04052016.eri		Dwg No. E-8

TIA/EIA-222-F - Service - 50 mph

Maximum Values



ALLPRO CONSULTING GROUP
9221 LYNDON B. JOHNSON FWY 204
DALLAS, TX
Phone: (972)231-8893
FAX: 866-364-8375

Job: ***16-1025 180' SST***			
Project: ***CT09865-S-03_Niantic AT&T***			
Client: SBA	Drawn by: mperez	App'd:	
Code: TIA/EIA-222-F	Date: 04/06/16	Scale: NTS	
Path: P:\2016\Structural\16-1025 CT09865-S-03-Niantic Structural Analysis\TNX\CT09865-S-03 Niantic_AT&T_SA_04052016.eri		Dwg No. E-5	

CALCULATION PRINTOUT

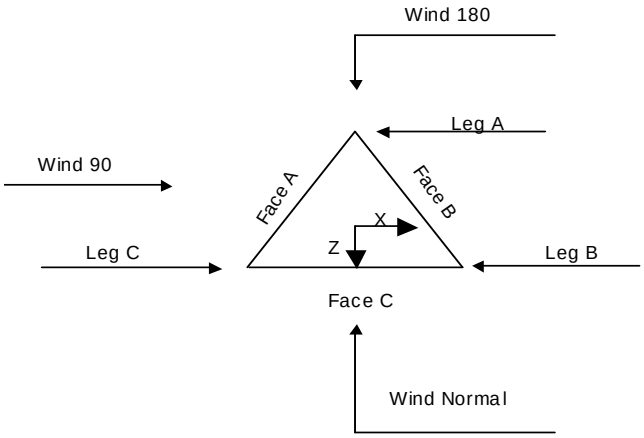
Tower Input Data

The main tower is a 3x free standing tower with an overall height of 180.00 ft above the ground line.
The base of the tower is set at an elevation of 0.00 ft above the ground line.
The face width of the tower is 5.00 ft at the top and 23.00 ft at the base.
This tower is designed using the TIA/EIA-222-F standard.
The following design criteria apply:

Tower is located in New London County, Connecticut.
Basic wind speed of 85 mph.
Nominal ice thickness of 0.5000 in.
Ice density of 56 pcf.
A wind speed of 74 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 50 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in tower member design is 1.333.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

Consider Moments - Legs	Distribute Leg Loads As Uniform	Use ASCE 10 X-Brace Ly Rules
Consider Moments - Horizontals	Assume Legs Pinned	√ Calculate Redundant Bracing Forces
Consider Moments - Diagonals	√ Assume Rigid Index Plate	Ignore Redundant Members in FEA
Use Moment Magnification	√ Use Clear Spans For Wind Area	SR Leg Bolts Resist Compression
√ Use Code Stress Ratios	√ Use Clear Spans For KL/r	√ All Leg Panels Have Same Allowable
√ Use Code Safety Factors - Guys	√ Retension Guys To Initial Tension	Offset Girt At Foundation
Escalate Ice	Bypass Mast Stability Checks	Consider Feed Line Torque
Always Use Max Kz	√ Use Azimuth Dish Coefficients	Include Angle Block Shear Check
Use Special Wind Profile	√ Project Wind Area of Appurt.	Use TIA-222-G Bracing Resist. Exemption
√ Include Bolts In Member Capacity	√ Autocalc Torque Arm Areas	Use TIA-222-G Tension Splice Exemption
√ Leg Bolts Are At Top Of Section	Add IBC .6D+W Combination	Poles
√ Secondary Horizontal Braces Leg	Sort Capacity Reports By Component	Include Shear-Torsion Interaction
Use Diamond Inner Bracing (4 Sided)	√ Triangulate Diamond Inner Bracing	Always Use Sub-Critical Flow
SR Members Have Cut Ends	√ Treat Feed Line Bundles As Cylinder	Use Top Mounted Sockets
SR Members Are Concentric		



Triangular Tower

Tower Section Geometry

Tower Section	Tower Elevation ft	Assembly Database	Description	Section Width ft	Number of Sections	Section Length ft
T1	180.00-160.00			5.00	1	20.00
T2	160.00-140.00			5.00	1	20.00
T3	140.00-120.00			5.00	1	20.00
T4	120.00-90.00			5.00	1	30.00
T5	90.00-60.00			9.50	1	30.00
T6	60.00-30.00			14.00	1	30.00
T7	30.00-0.00			18.50	1	30.00

Tower Section Geometry *(cont'd)*

Tower Section	Tower Elevation ft	Diagonal Spacing ft	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset in	Bottom Girt Offset in
T1	180.00-160.00	3.32	X Brace	No	Yes	0.0000	1.0000
T2	160.00-140.00	3.31	X Brace	No	Yes	1.0000	1.0000
T3	140.00-120.00	3.32	X Brace	No	Yes	1.0000	0.0000
T4	120.00-90.00	7.50	X Brace	No	No	0.0000	0.0000
T5	90.00-60.00	7.50	X Brace	No	No	0.0000	0.0000
T6	60.00-30.00	7.50	X Brace	No	No	0.0000	0.0000
T7	30.00-0.00	7.50	X Brace	No	No	0.0000	0.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 180.00-160.00	Solid Round	1 3/4	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T2 160.00-140.00	Solid Round	2 1/2	A572-50 (50 ksi)	Solid Round	1	A572-50 (50 ksi)
T3 140.00-120.00	Solid Round	3 1/2	A572-50 (50 ksi)	Solid Round	1 1/8	A572-50 (50 ksi)
T4 120.00-90.00	Solid Round	4 1/4	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T5 90.00-60.00	Solid Round	4 1/2	A572-50 (50 ksi)	Equal Angle	L3x3x3/16	A36 (36 ksi)
T6 60.00-30.00	Solid Round	4 3/4	A572-50 (50 ksi)	Equal Angle	L3 1/2x3 1/2x1/4	A36 (36 ksi)
T7 30.00-0.00	Solid Round	4 3/4	A572-50 (50 ksi)	Equal Angle	L4x4x5/16	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T1 180.00-160.00	Solid Round	7/8	A572-50 (50 ksi)	Solid Round	7/8	A570-50 (50 ksi)
T2 160.00-140.00	Solid Round	1	A572-50 (50 ksi)	Solid Round	1	A572-50 (50 ksi)
T3 140.00-120.00	Solid Round	1 1/8	A572-50 (50 ksi)	Solid Round	1 1/8	A572-50 (50 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
T1 180.00-160.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T2 160.00-140.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T3 140.00-120.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T4 120.00-90.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T5 90.00-60.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T6 60.00-30.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
T7 30.00-0.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X	X Brace Diags Y	K Single Diags X	K Single Diags Y	Girts X	Girts Y	Horiz. X	Horiz. Y	Sec. Horiz. X	Sec. Horiz. Y	Inner Brace X	Inner Brace Y
T1	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1
180.00-160.00				1	1	1	1	1	1	1	1	1	1	1	1
T2	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1
160.00-140.00				1	1	1	1	1	1	1	1	1	1	1	1
T3	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1
140.00-120.00				1	1	1	1	1	1	1	1	1	1	1	1
T4	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1
120.00-90.00				1	1	1	1	1	1	1	1	1	1	1	1
T5	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1
90.00-60.00				1	1	1	1	1	1	1	1	1	1	1	1
T6	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1
60.00-30.00				1	1	1	1	1	1	1	1	1	1	1	1
T7 30.00-0.00	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1	1	1	1	1	1

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

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Net Width Deduct in	Leg U	Diagonal Net Width Deduct in	Diagonal U	Top Girt Net Width Deduct in	Top Girt U	Bottom Girt Net Width Deduct in	Bottom Girt U	Mid Girt Net Width Deduct in	Mid Girt U	Long Horizontal Net Width Deduct in	Long Horizontal U	Short Horizontal Net Width Deduct in	Short Horizontal U
T1 180.00-160.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T2 160.00-140.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T3 140.00-120.00	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 120.00-90.00	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
T5 90.00-60.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T6 60.00-30.00	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 30.00-0.00	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 180.00-160.00	Flange	0.0000 A325N	0	0.0000 A325N	0	0.5000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T2 160.00-140.00	Flange	1.1250 A325N	6	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T3 140.00-120.00	Flange	1.2500 A325N	6	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T4 120.00-90.00	Flange	1.2500 A325N	6	0.7500 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T5 90.00-60.00	Flange	1.2500 A325N	6	0.7500 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T6 60.00-30.00	Flange	1.2500 A325N	6	0.8750 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T7 30.00-0.00	Flange	1.5000 A325N	0	0.8750 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number	Number Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
(E)1 5/8" Coaxes (Town of Waterford)	C	Yes	Ar (CfAe)	180.00 - 6.00	2	2	0.5000	1.9800		1.04
(E)1 5/8" Coaxes (AT&T)	A	Yes	Ar (CfAe)	170.00 - 6.00	12	6	0.5000	1.9800		1.04
3/4" DC Power (AT&T)	A	Yes	Ar (CfAe)	170.00 - 6.00	4	4	0.8650	0.8650		0.15
1/2" Fiber (AT&T)	A	No	Ar (CfAe)	170.00 - 6.00	2	2	0.5000	0.5000		0.25
*										
(E)1 5/8" Coaxes (T-Mobile)	B	Yes	Ar (CfAe)	160.00 - 6.00	12	6	0.5000	1.9800		1.04
(E)1 5/8" Coax (T-Mobile)	B	Yes	Ar (CfAe)	160.00 - 6.00	1	1	0.5000	1.9800		1.04
(E) 1/2" Coax (T-Mobile)	B	Yes	Ar (CfAe)	160.00 - 6.00	1	1	0.5800	0.5800		0.25
1 5/8" Coaxes (T-Mobile)	B	Yes	Ar (CfAe)	160.00 - 6.00	6	3	0.5000	1.9800		1.04
*										
*										
(P)1 5/8" Coaxes (Verizon)	B	Yes	Ar (CfAe)	140.00 - 6.00	17	8	0.5000	1.9800		1.04
(E)1 5/8" Fiber (Verizon)	B	Yes	Ar (CfAe)	140.00 - 6.00	2	1	0.5000	1.9800		1.04
*******										

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
*								
Feedline Ladder	A	No	CaAa (In Face)	170.00 - 0.00	1	No Ice	0.00	8.40
						1/2" Ice	0.00	13.50
Feedline Ladder	B	No	CaAa (In Face)	160.00 - 0.00	1	No Ice	0.00	8.40
						1/2" Ice	0.00	13.50
*******								

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
T1	180.00-160.00	A	15.905	0.000	0.000	0.000	0.22
		B	0.000	0.000	0.000	0.000	0.00
		C	6.600	0.000	0.000	0.000	0.04
T2	160.00-140.00	A	31.809	0.000	0.000	0.000	0.44
		B	41.185	0.000	0.000	0.000	0.57
		C	6.600	0.000	0.000	0.000	0.04
T3	140.00-120.00	A	31.809	0.000	0.000	0.000	0.44
		B	81.176	0.000	0.000	0.000	0.96
		C	6.600	0.000	0.000	0.000	0.04
T4	120.00-90.00	A	47.714	0.000	0.000	0.000	0.66
		B	121.764	0.000	0.000	0.000	1.45
		C	9.900	0.000	0.000	0.000	0.06
T5	90.00-60.00	A	47.714	0.000	0.000	0.000	0.66
		B	121.764	0.000	0.000	0.000	1.45
		C	9.900	0.000	0.000	0.000	0.06
T6	60.00-30.00	A	47.714	0.000	0.000	0.000	0.66
		B	121.764	0.000	0.000	0.000	1.45
		C	9.900	0.000	0.000	0.000	0.06
T7	30.00-0.00	A	38.171	0.000	0.000	0.000	0.58
		B	97.411	0.000	0.000	0.000	1.21
		C	7.920	0.000	0.000	0.000	0.05

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
T1	180.00-160.00	A	0.500	5.287	15.696	0.000	0.000	0.50
		B		0.000	0.000	0.000	0.000	0.00
		C		4.967	4.133	0.000	0.000	0.11
T2	160.00-140.00	A	0.500	10.575	31.393	0.000	0.000	0.99
		B		17.533	30.318	0.000	0.000	1.24
		C		4.967	4.133	0.000	0.000	0.11
T3	140.00-120.00	A	0.500	10.575	31.393	0.000	0.000	0.99
		B		31.600	60.409	0.000	0.000	2.19
		C		4.967	4.133	0.000	0.000	0.11
T4	120.00-90.00	A	0.500	15.862	47.089	0.000	0.000	1.49
		B		47.400	90.614	0.000	0.000	3.29
		C		7.450	6.200	0.000	0.000	0.16
T5	90.00-60.00	A	0.500	15.862	47.089	0.000	0.000	1.49
		B		47.400	90.614	0.000	0.000	3.29
		C		7.450	6.200	0.000	0.000	0.16
T6	60.00-30.00	A	0.500	15.862	47.089	0.000	0.000	1.49

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
		B		47.400	90.614	0.000	0.000	3.29
		C		7.450	6.200	0.000	0.000	0.16
T7	30.00-0.00	A	0.500	12.690	37.671	0.000	0.000	1.27
		B		37.920	72.491	0.000	0.000	2.71
		C		5.960	4.960	0.000	0.000	0.13

Feed Line Shielding

Section	Elevation ft	Face	A_R ft^2	A_R Ice ft^2	A_F ft^2	A_F Ice ft^2
T1	180.00-160.00	A	0.765	2.396	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	0.395	1.166	0.000	0.000
T2	160.00-140.00	A	1.745	5.106	0.000	0.000
		B	2.319	6.345	0.000	0.000
		C	0.451	1.243	0.000	0.000
T3	140.00-120.00	A	1.966	5.431	0.000	0.000
		B	4.895	12.394	0.000	0.000
		C	0.507	1.322	0.000	0.000
T4	120.00-90.00	A	0.000	1.829	3.126	4.572
		B	0.000	4.174	7.785	10.434
		C	0.000	0.445	0.807	1.113
T5	90.00-60.00	A	0.000	1.485	3.047	4.456
		B	0.000	3.390	7.587	10.169
		C	0.000	0.361	0.787	1.084
T6	60.00-30.00	A	0.000	1.375	3.290	4.812
		B	0.000	3.137	8.193	10.981
		C	0.000	0.335	0.849	1.171
T7	30.00-0.00	A	0.000	1.061	2.902	4.244
		B	0.000	2.421	7.225	9.684
		C	0.000	0.258	0.749	1.033

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(E) Lightning Rod	C	From Leg	3.00 0.00 0.00	0.0000	180.00	No Ice 1/2" Ice	0.25 0.66	0.25 0.66	0.03 0.04
(E) Flash Beacon Lighting	C	None		0.0000	180.00	No Ice 1/2" Ice	2.70 3.10	2.70 3.10	0.05 0.07
(E)Sinclair SC488-HF2LNF Omni (Town of Waterford)	A	From Leg	3.00 0.00 5.00	0.0000	180.00	No Ice 1/2" Ice	4.39 5.95	4.39 5.95	0.03 0.06
(E)Sinclair SC488-HF2LNF Omni	B	From Leg	3.00 0.00	0.0000	180.00	No Ice 1/2" Ice	4.39 5.95	4.39 5.95	0.03 0.06

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(Town of Waterford)			5.00						
(E)DBSpectra ATS8TMA10	C	From Leg	3.00	0.0000	180.00	No Ice	2.74	2.74	0.03
TMA			0.00			1/2" Ice	3.03	3.03	0.04
(Town of Waterford)			0.00						
**									
(E)Powerwave 7770.00	A	From Leg	3.00	0.0000	170.00	No Ice	6.74	3.47	0.04
(AT&T)			0.00			1/2" Ice	7.36	3.90	0.08
			0.00						
(E)Powerwave 7770.00	B	From Leg	3.00	0.0000	170.00	No Ice	6.74	3.47	0.04
(AT&T)			0.00			1/2" Ice	7.36	3.90	0.08
			0.00						
(E)Powerwave 7770.00	C	From Leg	3.00	0.0000	170.00	No Ice	6.74	3.47	0.04
(AT&T)			0.00			1/2" Ice	7.36	3.90	0.08
			0.00						
SBNHH-1D65A	A	From Leg	3.00	0.0000	170.00	No Ice	6.43	3.91	0.03
(AT&T)			0.00			1/2" Ice	6.87	4.27	0.07
			0.00						
SBNHH-1D65A	B	From Leg	3.00	0.0000	170.00	No Ice	6.43	3.91	0.03
(AT&T)			0.00			1/2" Ice	6.87	4.27	0.07
			0.00						
SBNHH-1D65A	C	From Leg	3.00	0.0000	170.00	No Ice	6.43	3.91	0.03
(AT&T)			0.00			1/2" Ice	6.87	4.27	0.07
			0.00						
RRU 32	A	From Leg	3.00	0.0000	170.00	No Ice	4.04	2.76	0.08
(AT&T)			0.00			1/2" Ice	4.33	3.02	0.11
			0.00						
RRU 32	B	From Leg	3.00	0.0000	170.00	No Ice	4.04	2.76	0.08
(AT&T)			0.00			1/2" Ice	4.33	3.02	0.11
			0.00						
RRU 32	C	From Leg	3.00	0.0000	170.00	No Ice	4.04	2.76	0.08
(AT&T)			0.00			1/2" Ice	4.33	3.02	0.11
			0.00						
(2) (E) RRUS 11	A	From Leg	3.00	0.0000	170.00	No Ice	2.17	1.66	0.05
(AT&T)			0.00			1/2" Ice	2.44	1.90	0.07
			0.00						
(2) (E) RRUS 11	B	From Leg	3.00	0.0000	170.00	No Ice	2.17	1.66	0.05
(AT&T)			0.00			1/2" Ice	2.44	1.90	0.07
			0.00						
(2) (E) RRUS 11	C	From Leg	3.00	0.0000	170.00	No Ice	2.17	1.66	0.05
(AT&T)			0.00			1/2" Ice	2.44	1.90	0.07
			0.00						
(E)Raycap DC6-48-60-18-F	A	From Leg	3.00	0.0000	170.00	No Ice	3.34	0.73	0.03
(AT&T)			0.00			1/2" Ice	3.70	0.95	0.04
			0.00						
(E)Raycap DC6-48-60-18-F	B	From Leg	3.00	0.0000	170.00	No Ice	3.34	0.73	0.03
(AT&T)			0.00			1/2" Ice	3.70	0.95	0.04
			0.00						
**									
***									
APX16DWV-16DWVS-E-A	A	From Leg	3.00	0.0000	160.00	No Ice	7.23	2.15	0.04
20			0.00			1/2" Ice	7.68	2.49	0.07
(T-Mobile)			0.00						
APX16DWV-16DWVS-E-A	B	From Leg	3.00	0.0000	160.00	No Ice	7.23	2.15	0.04
20			0.00			1/2" Ice	7.68	2.49	0.07
(T-Mobile)			0.00						
APX16DWV-16DWVS-E-A	C	From Leg	3.00	0.0000	160.00	No Ice	7.23	2.15	0.04
20			0.00			1/2" Ice	7.68	2.49	0.07

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(T-Mobile)			0.00						
LNX-6515DS-VTM	A	From Leg	3.00	0.0000	160.00	No Ice	11.45	7.70	0.05
(T-Mobile)			0.00			1/2" Ice	12.06	8.29	0.12
			0.00						
LNX-6515DS-VTM	B	From Leg	3.00	0.0000	160.00	No Ice	11.45	7.70	0.05
(T-Mobile)			0.00			1/2" Ice	12.06	8.29	0.12
			0.00						
LNX-6515DS-VTM	C	From Leg	3.00	0.0000	160.00	No Ice	11.45	7.70	0.05
(T-Mobile)			0.00			1/2" Ice	12.06	8.29	0.12
			0.00						
Double TMA 17/21	A	From Leg	3.00	0.0000	160.00	No Ice	0.41	0.16	0.01
(T-Mobile)			0.00			1/2" Ice	0.50	0.22	0.01
			0.00						
Double TMA 17/21	B	From Leg	3.00	0.0000	160.00	No Ice	0.41	0.16	0.01
(T-Mobile)			0.00			1/2" Ice	0.50	0.22	0.01
			0.00						
Double TMA 17/21	C	From Leg	3.00	0.0000	160.00	No Ice	0.41	0.16	0.01
(T-Mobile)			0.00			1/2" Ice	0.50	0.22	0.01
			0.00						
ATMAA1412D-1A20	A	From Leg	3.00	0.0000	160.00	No Ice	1.17	0.47	0.01
(T-Mobile)			0.00			1/2" Ice	1.31	0.57	0.02
			0.00						
ATMAA1412D-1A20	B	From Leg	3.00	0.0000	160.00	No Ice	1.17	0.47	0.01
(T-Mobile)			0.00			1/2" Ice	1.31	0.57	0.02
			0.00						
ATMAA1412D-1A20	C	From Leg	3.00	0.0000	160.00	No Ice	1.17	0.47	0.01
(T-Mobile)			0.00			1/2" Ice	1.31	0.57	0.02
			0.00						
782 11056	A	From Leg	3.00	0.0000	160.00	No Ice	0.17	0.10	0.00
(T-Mobile)			0.00			1/2" Ice	0.23	0.15	0.00
			0.00						
782 11056	B	From Leg	3.00	0.0000	160.00	No Ice	0.17	0.10	0.00
(T-Mobile)			0.00			1/2" Ice	0.23	0.15	0.00
			0.00						
782 11056	C	From Leg	3.00	0.0000	160.00	No Ice	0.17	0.10	0.00
(T-Mobile)			0.00			1/2" Ice	0.23	0.15	0.00
			0.00						
****									
*****									
(E) SitePRO1 HM6 6'	A	From Leg	3.00	0.0000	180.00	No Ice	2.64	4.40	0.08
Stanoffs			0.00			1/2" Ice	3.69	6.20	0.10
(Town of Waterford)			0.00						
(E) SitePRO1 HM6 6'	B	From Leg	3.00	0.0000	180.00	No Ice	2.64	4.40	0.08
Stanoffs			0.00			1/2" Ice	3.69	6.20	0.10
(Town of Waterford)			0.00						
(E) T-Frame	A	From Leg	3.00	0.0000	170.00	No Ice	18.81	9.20	0.30
(AT&T)			0.00			1/2" Ice	25.20	13.30	0.40
			0.00						
(E) T-Frame	B	From Leg	3.00	0.0000	170.00	No Ice	18.81	9.20	0.30
(AT&T)			0.00			1/2" Ice	25.20	13.30	0.40
			0.00						
(E) T-Frame	C	From Leg	3.00	0.0000	170.00	No Ice	18.81	9.20	0.30
(AT&T)			0.00			1/2" Ice	25.20	13.30	0.40
			0.00						
(E)T-Frame	A	From Leg	3.00	0.0000	160.00	No Ice	10.60	5.00	0.26
(T-Mobile)			0.00			1/2" Ice	16.80	8.00	0.36
			0.00						

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(E)T-Frame	B	From Leg	3.00	0.0000	160.00	No Ice	10.60	5.00	0.26
(T-Mobile)			0.00			1/2" Ice	16.80	8.00	0.36
			0.00						
(E)T-Frame	C	From Leg	3.00	0.0000	160.00	No Ice	10.60	5.00	0.26
(T-Mobile)			0.00			1/2" Ice	16.80	8.00	0.36
			0.00						
(E)T-Frame	A	From Leg	3.00	0.0000	140.00	No Ice	10.60	5.00	0.26
(Verizon)			0.00			1/2" Ice	16.80	8.00	0.36
			0.00						
(E)T-Frame	B	From Leg	3.00	0.0000	140.00	No Ice	10.60	5.00	0.26
(Verizon)			0.00			1/2" Ice	16.80	8.00	0.36
			0.00						
(E)T-Frame	C	From Leg	3.00	0.0000	140.00	No Ice	10.60	5.00	0.26
(Verizon)			0.00			1/2" Ice	16.80	8.00	0.36
			0.00						
(3) (E)Antenna Pipe Mount	A	From Leg	3.00	0.0000	170.00	No Ice	1.32	1.32	0.04
(AT&T)			0.00			1/2" Ice	1.58	1.58	0.06
			0.00						
(3) (E)Antenna Pipe Mount	B	From Leg	3.00	0.0000	170.00	No Ice	1.32	1.32	0.04
(AT&T)			0.00			1/2" Ice	1.58	1.58	0.06
			0.00						
(3) (E)Antenna Pipe Mount	C	From Leg	3.00	0.0000	170.00	No Ice	1.32	1.32	0.04
(AT&T)			0.00			1/2" Ice	1.58	1.58	0.06
			0.00						
(2) (E)Antenna Pipe Mount	A	From Leg	4.00	0.0000	160.00	No Ice	1.32	1.32	0.04
(T-Mobile)			0.00			1/2" Ice	1.58	1.58	0.06
			0.00						
(2) (E)Antenna Pipe Mount	B	From Leg	4.00	0.0000	160.00	No Ice	1.32	1.32	0.04
(T-Mobile)			0.00			1/2" Ice	1.58	1.58	0.06
			0.00						
(2) (E)Antenna Pipe Mount	C	From Leg	4.00	0.0000	160.00	No Ice	1.32	1.32	0.04
(T-Mobile)			0.00			1/2" Ice	1.58	1.58	0.06
			0.00						
(4) (E)Antenna Pipe Mount	A	From Leg	4.00	0.0000	140.00	No Ice	1.32	1.32	0.04
(Verizon)			0.00			1/2" Ice	1.58	1.58	0.06
			0.00						
(4) (E)Antenna Pipe Mount	B	From Leg	4.00	0.0000	140.00	No Ice	1.32	1.32	0.04
(Verizon)			0.00			1/2" Ice	1.58	1.58	0.06
			0.00						
(4) (E)Antenna Pipe Mount	C	From Leg	4.00	0.0000	140.00	No Ice	1.32	1.32	0.04
(Verizon)			0.00			1/2" Ice	1.58	1.58	0.06
			0.00						
*									
**									
***									
(E)Antel BXA-80063/6CF	A	From Leg	3.00	0.0000	140.00	No Ice	7.74	4.17	0.02
(Verizon)			0.00			1/2" Ice	8.44	4.63	0.06
			0.00						
(E)Antel BXA-80063/6CF	B	From Leg	3.00	0.0000	140.00	No Ice	7.74	4.17	0.02
(Verizon)			0.00			1/2" Ice	8.44	4.63	0.06
			0.00						
(E)Antel BXA-80063/6CF	C	From Leg	3.00	0.0000	140.00	No Ice	7.74	4.17	0.02
(Verizon)			0.00			1/2" Ice	8.44	4.63	0.06
			0.00						
(E)Antel BXA-70063/6CF	A	From Leg	3.00	0.0000	140.00	No Ice	7.74	4.17	0.02
(Verizon)			0.00			1/2" Ice	8.44	4.63	0.06
			0.00						

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(E)Antel BXA-70063/6CF	B	From Leg	3.00	0.0000	140.00	No Ice	7.74	4.17	0.02
(Verizon)			0.00			1/2" Ice	8.44	4.63	0.06
			0.00						
(E)Antel BXA-70063/6CF	C	From Leg	3.00	0.0000	140.00	No Ice	7.74	4.17	0.02
(Verizon)			0.00			1/2" Ice	8.44	4.63	0.06
			0.00						
(2) (E)SBNHH 1 D65B	A	From Leg	3.00	0.0000	140.00	No Ice	8.40	5.40	0.05
(Verizon)			0.00			1/2" Ice	9.11	5.93	0.10
			0.00						
(2) (E)SBNHH 1 D65B	B	From Leg	3.00	0.0000	140.00	No Ice	8.40	5.40	0.05
(Verizon)			0.00			1/2" Ice	9.11	5.93	0.10
			0.00						
(2) (E)SBNHH 1 D65B	C	From Leg	3.00	0.0000	140.00	No Ice	8.40	5.40	0.05
(Verizon)			0.00			1/2" Ice	9.11	5.93	0.10
			0.00						
(E)Alcatel RRH2-AWS	A	From Leg	3.00	0.0000	140.00	No Ice	3.96	1.82	0.06
(Verizon)			0.00			1/2" Ice	4.37	2.16	0.08
			0.00						
(E)Alcatel RRH2-AWS	B	From Leg	3.00	0.0000	140.00	No Ice	3.96	1.82	0.06
(Verizon)			0.00			1/2" Ice	4.37	2.16	0.08
			0.00						
(E)Alcatel RRH2-AWS	C	From Leg	3.00	0.0000	140.00	No Ice	3.96	1.82	0.06
(Verizon)			0.00			1/2" Ice	4.37	2.16	0.08
			0.00						
(E)Alcatel RRH2-pcs	A	From Leg	3.00	0.0000	140.00	No Ice	2.57	2.01	0.06
(Verizon)			0.00			1/2" Ice	2.86	2.28	0.07
			0.00						
(E)Alcatel RRH2-pcs	B	From Leg	3.00	0.0000	140.00	No Ice	2.57	2.01	0.06
(Verizon)			0.00			1/2" Ice	2.86	2.28	0.07
			0.00						
(E)Alcatel RRH2-pcs	C	From Leg	3.00	0.0000	140.00	No Ice	2.57	2.01	0.06
(Verizon)			0.00			1/2" Ice	2.86	2.28	0.07
			0.00						
(E)Alcatel RRH2--700	A	From Leg	3.00	0.0000	140.00	No Ice	3.96	1.82	0.06
(Verizon)			0.00			1/2" Ice	4.37	2.16	0.08
			0.00						
(E)Alcatel RRH2--700	B	From Leg	3.00	0.0000	140.00	No Ice	3.96	1.82	0.06
(Verizon)			0.00			1/2" Ice	4.37	2.16	0.08
			0.00						
(E)Alcatel RRH2--700	C	From Leg	3.00	0.0000	140.00	No Ice	3.96	1.82	0.06
(Verizon)			0.00			1/2" Ice	4.37	2.16	0.08
			0.00						
(E) ODU Celwave DB-T1-6Z	A	From Leg	3.00	0.0000	140.00	No Ice	5.60	2.33	0.04
(Verizon)			0.00			1/2" Ice	6.01	2.63	0.08
			0.00						
(E) ODU Celwave DB-T1-6Z	B	From Leg	3.00	0.0000	140.00	No Ice	5.60	2.33	0.04
(Verizon)			0.00			1/2" Ice	6.01	2.63	0.08
			0.00						
**									
**									
*****									
(P)AM-X-CD-16-65-00T-RE	A	From Leg	3.00	0.0000	170.00	No Ice	5.51	2.83	0.03
T			0.00			1/2" Ice	6.01	3.22	0.06
(AT&T)			0.00						
(P)	B	From Leg	3.00	0.0000	170.00	No Ice	5.51	2.83	0.03
AM-X-CD-16-65-00T-RET			0.00			1/2" Ice	6.01	3.22	0.06
(AT&T)			0.00						

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(P)AM-X-CD-16-65-00T-RE	C	From Leg	3.00	0.0000	170.00	No Ice	5.51	2.83	0.03
T			0.00			1/2" Ice	6.01	3.22	0.06
(AT&T)			0.00						
(2) (P) TT19-08BP111-001	A	From Leg	2.00	0.0000	170.00	No Ice	0.64	0.52	0.02
TMA			0.00			1/2" Ice	0.76	0.62	0.02
(AT&T)			0.00						
(2) (P) TT19-08BP111-001	B	From Leg	2.00	0.0000	170.00	No Ice	0.64	0.52	0.02
TMA			0.00			1/2" Ice	0.76	0.62	0.02
(AT&T)			0.00						
(2) (P) TT19-08BP111-001	C	From Leg	2.00	0.0000	170.00	No Ice	0.64	0.52	0.02
TMA			0.00			1/2" Ice	0.76	0.62	0.02
(AT&T)			0.00						

Tower Forces - No Ice - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
T1	0.26	0.99	A	0.26	2.407	0.605	1	1	16.189	1.36	67.76	A
180.00-160.00			B	0.113	2.912	0.577	1	1	6.710			
			C	0.173	2.687	0.585	1	1	10.445			
T2	1.05	1.66	A	0.431	2.005	0.665	1	1	29.882	2.39	119.63	B
160.00-140.00			B	0.516	1.88	0.706	1	1	37.929			
			C	0.202	2.59	0.591	1	1	12.421			
T3	1.44	2.80	A	0.461	1.956	0.678	1	1	33.064	5.79	289.65	B
140.00-120.00			B	0.899	1.923	0.983	1	1	93.528			
			C	0.236	2.479	0.598	1	1	14.961			
T4	2.17	5.13	A	0.362	2.145	0.637	1	1	57.452	6.61	220.43	B
120.00-90.00			B	0.666	1.778	0.796	1	1	122.753			
			C	0.206	2.576	0.592	1	1	34.286			
T5	2.17	6.13	A	0.259	2.41	0.604	1	1	66.464	6.33	211.15	B
90.00-60.00			B	0.45	1.973	0.673	1	1	116.649			
			C	0.161	2.73	0.583	1	1	45.194			
T6	2.17	7.92	A	0.218	2.536	0.594	1	1	80.008	6.41	213.71	B
60.00-30.00			B	0.357	2.156	0.635	1	1	125.027			
			C	0.148	2.781	0.581	1	1	59.530			
T7 30.00-0.00	1.83	9.77	A	0.184	2.65	0.587	1	1	91.248	6.42	214.11	B
			B	0.271	2.377	0.607	1	1	124.151			
			C	0.14	2.809	0.58	1	1	75.402			
Sum Weight:	11.09	34.41						OTM	2896.63 kip-ft	35.32		

Tower Forces - No Ice - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.26	0.99	A	0.26	2.407	0.605	0.8	1	16.189	1.36	67.76	A
180.00-160.00			B	0.113	2.912	0.577	0.8	1	6.710			
			C	0.173	2.687	0.585	0.8	1	10.445			
T2	1.05	1.66	A	0.431	2.005	0.665	0.8	1	29.882	2.39	119.63	B
160.00-140.00			B	0.516	1.88	0.706	0.8	1	37.929			
			C	0.202	2.59	0.591	0.8	1	12.421			
T3	1.44	2.80	A	0.461	1.956	0.678	0.8	1	33.064	5.79	289.65	B
140.00-120.00			B	0.899	1.923	0.983	0.8	1	93.528			
			C	0.236	2.479	0.598	0.8	1	14.961			
T4	2.17	5.13	A	0.362	2.145	0.637	0.8	1	54.754	6.52	217.25	B
120.00-90.00			B	0.666	1.778	0.796	0.8	1	120.987			
			C	0.206	2.576	0.592	0.8	1	31.125			
T5	2.17	6.13	A	0.259	2.41	0.604	0.8	1	61.667	6.12	204.11	B
90.00-60.00			B	0.45	1.973	0.673	0.8	1	112.760			
			C	0.161	2.73	0.583	0.8	1	39.945			
T6	2.17	7.92	A	0.218	2.536	0.594	0.8	1	72.511	6.08	202.57	B
60.00-30.00			B	0.357	2.156	0.635	0.8	1	118.511			
			C	0.148	2.781	0.581	0.8	1	51.545			
T7 30.00-0.00	1.83	9.77	A	0.184	2.65	0.587	0.8	1	80.282	5.90	196.69	B
			B	0.271	2.377	0.607	0.8	1	114.050			
			C	0.14	2.809	0.58	0.8	1	64.005			
Sum Weight:	11.09	34.41						OTM	2847.93 kip-ft	34.16		

Tower Forces - No Ice - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.26	0.99	A	0.26	2.407	0.605	0.85	1	16.189	1.36	67.76	A
180.00-160.00			B	0.113	2.912	0.577	0.85	1	6.710			
			C	0.173	2.687	0.585	0.85	1	10.445			
T2	1.05	1.66	A	0.431	2.005	0.665	0.85	1	29.882	2.39	119.63	B
160.00-140.00			B	0.516	1.88	0.706	0.85	1	37.929			
			C	0.202	2.59	0.591	0.85	1	12.421			
T3	1.44	2.80	A	0.461	1.956	0.678	0.85	1	33.064	5.79	289.65	B
140.00-120.00			B	0.899	1.923	0.983	0.85	1	93.528			
			C	0.236	2.479	0.598	0.85	1	14.961			
T4	2.17	5.13	A	0.362	2.145	0.637	0.85	1	55.429	6.54	218.05	B
120.00-90.00			B	0.666	1.778	0.796	0.85	1	121.428			
			C	0.206	2.576	0.592	0.85	1	31.915			
T5	2.17	6.13	A	0.259	2.41	0.604	0.85	1	62.866	6.18	205.87	B
90.00-60.00			B	0.45	1.973	0.673	0.85	1	113.732			
			C	0.161	2.73	0.583	0.85	1	41.257			
T6	2.17	7.92	A	0.218	2.536	0.594	0.85	1	74.386	6.16	205.35	B
60.00-30.00			B	0.357	2.156	0.635	0.85	1	120.140			
			C	0.148	2.781	0.581	0.85	1	53.541			
T7 30.00-0.00	1.83	9.77	A	0.184	2.65	0.587	0.85	1	83.024	6.03	201.04	B
			B	0.271	2.377	0.607	0.85	1	116.575			
			C	0.14	2.809	0.58	0.85	1	66.854			
Sum Weight:	11.09	34.41						OTM	2860.11 kip-ft	34.45		

Tower Forces - With Ice - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
T1	0.60	1.28	A	0.384	2.096	0.645	1	1	31.507	1.72	86.10	A
180.00-160.00			B	0.207	2.574	0.592	1	1	12.787			
			C	0.282	2.344	0.611	1	1	19.650			
T2	2.34	1.99	A	0.582	1.816	0.743	1	1	53.843	2.61	130.61	B
160.00-140.00			B	0.626	1.79	0.77	1	1	57.989			
			C	0.308	2.275	0.618	1	1	21.744			
T3	3.29	3.19	A	0.607	1.8	0.758	1	1	57.018	5.19*	259.67	B
140.00-120.00			B	1	2.1	1	1	1	108.292			
			C	0.339	2.197	0.629	1	1	24.452			
T4	4.94	5.98	A	0.46	1.957	0.678	1	1	91.019	6.59	219.51	B
120.00-90.00			B	0.75	1.788	0.857	1	1	162.113			
			C	0.268	2.386	0.606	1	1	45.962			
T5	4.94	7.32	A	0.329	2.221	0.625	1	1	101.552	6.39	212.85	B
90.00-60.00			B	0.514	1.883	0.704	1	1	164.277			
			C	0.207	2.573	0.592	1	1	58.014			
T6	4.94	9.54	A	0.275	2.365	0.609	1	1	116.520	6.42	214.15	B
60.00-30.00			B	0.409	2.047	0.655	1	1	175.950			
			C	0.186	2.643	0.588	1	1	73.789			
T7 30.00-0.00	4.11	11.91	A	0.229	2.501	0.597	1	1	123.936	6.26	208.52	B
			B	0.313	2.262	0.62	1	1	169.384			
			C	0.174	2.686	0.585	1	1	90.338			
Sum Weight:	25.17	41.22			*2A_g limit			OTM	2913.02 kip-ft	35.18		

Tower Forces - With Ice - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
T1	0.60	1.28	A	0.384	2.096	0.645	0.8	1	28.368	1.55	77.53	A
180.00-160.00			B	0.207	2.574	0.592	0.8	1	12.787			
			C	0.282	2.344	0.611	0.8	1	18.824			
T2	2.34	1.99	A	0.582	1.816	0.743	0.8	1	47.564	2.34	116.95	B
160.00-140.00			B	0.626	1.79	0.77	0.8	1	51.926			
			C	0.308	2.275	0.618	0.8	1	20.917			
T3	3.29	3.19	A	0.607	1.8	0.758	0.8	1	50.740	4.88	244.02	B
140.00-120.00			B	1	2.1	1	0.8	1	96.211			
			C	0.339	2.197	0.629	0.8	1	23.626			
T4	4.94	5.98	A	0.46	1.957	0.678	0.8	1	79.193	5.80	193.30	B
120.00-90.00			B	0.75	1.788	0.857	0.8	1	142.753			
			C	0.268	2.386	0.606	0.8	1	41.622			
T5	4.94	7.32	A	0.329	2.221	0.625	0.8	1	87.619	5.55	185.00	B
90.00-60.00			B	0.514	1.883	0.704	0.8	1	142.782			
			C	0.207	2.573	0.592	0.8	1	51.585			
T6	4.94	9.54	A	0.275	2.365	0.609	0.8	1	99.909	5.55	184.84	B
60.00-30.00			B	0.409	2.047	0.655	0.8	1	151.869			
			C	0.186	2.643	0.588	0.8	1	64.628			
T7 30.00-0.00	4.11	11.91	A	0.229	2.501	0.597	0.8	1	105.705	5.37	178.84	B
			B	0.313	2.262	0.62	0.8	1	145.276			
			C	0.174	2.686	0.585	0.8	1	78.007			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
Sum Weight:	25.17	41.22						OTM	2604.02 kip-ft	31.03		

Tower Forces - With Ice - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.60	1.28	A	0.384	2.096	0.645	0.85	1	29.153	1.59	79.67	A
180.00-160.00			B	0.207	2.574	0.592	0.85	1	12.787			
			C	0.282	2.344	0.611	0.85	1	19.030			
T2	2.34	1.99	A	0.582	1.816	0.743	0.85	1	49.134	2.41	120.36	B
160.00-140.00			B	0.626	1.79	0.77	0.85	1	53.441			
			C	0.308	2.275	0.618	0.85	1	21.124			
T3	3.29	3.19	A	0.607	1.8	0.758	0.85	1	52.309	5.03	251.68	B
140.00-120.00			B	1	2.1	1	0.85	1	99.231			
			C	0.339	2.197	0.629	0.85	1	23.832			
T4	4.94	5.98	A	0.46	1.957	0.678	0.85	1	82.149	6.00	199.85	B
120.00-90.00			B	0.75	1.788	0.857	0.85	1	147.593			
			C	0.268	2.386	0.606	0.85	1	42.707			
T5	4.94	7.32	A	0.329	2.221	0.625	0.85	1	91.103	5.76	191.96	B
90.00-60.00			B	0.514	1.883	0.704	0.85	1	148.156			
			C	0.207	2.573	0.592	0.85	1	53.192			
T6	4.94	9.54	A	0.275	2.365	0.609	0.85	1	104.062	5.77	192.17	B
60.00-30.00			B	0.409	2.047	0.655	0.85	1	157.889			
			C	0.186	2.643	0.588	0.85	1	66.919			
T7 30.00-0.00	4.11	11.91	A	0.229	2.501	0.597	0.85	1	110.263	5.59	186.26	B
			B	0.313	2.262	0.62	0.85	1	151.303			
			C	0.174	2.686	0.585	0.85	1	81.089			
Sum Weight:	25.17	41.22						OTM	2691.02 kip-ft	32.14		

Tower Forces - Service - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.26	0.99	A	0.26	2.407	0.605	1	1	16.189	0.47	23.44	A
180.00-160.00			B	0.113	2.912	0.577	1	1	6.710			
			C	0.173	2.687	0.585	1	1	10.445			
T2	1.05	1.66	A	0.431	2.005	0.665	1	1	29.882	0.83	41.39	B
160.00-140.00			B	0.516	1.88	0.706	1	1	37.929			
			C	0.202	2.59	0.591	1	1	12.421			
T3	1.44	2.80	A	0.461	1.956	0.678	1	1	33.064	2.00	100.23	B
140.00-120.00			B	0.899	1.923	0.983	1	1	93.528			
			C	0.236	2.479	0.598	1	1	14.961			
T4	2.17	5.13	A	0.362	2.145	0.637	1	1	57.452	2.29	76.27	B
120.00-90.00			B	0.666	1.778	0.796	1	1	122.753			
			C	0.206	2.576	0.592	1	1	34.286			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T5	2.17	6.13	A	0.259	2.41	0.604	1	1	66.464	2.19	73.06	B
90.00-60.00			B	0.45	1.973	0.673	1	1	116.649			
			C	0.161	2.73	0.583	1	1	45.194			
T6	2.17	7.92	A	0.218	2.536	0.594	1	1	80.008	2.22	73.95	B
60.00-30.00			B	0.357	2.156	0.635	1	1	125.027			
			C	0.148	2.781	0.581	1	1	59.530			
T7 30.00-0.00	1.83	9.77	A	0.184	2.65	0.587	1	1	91.248	2.22	74.09	B
			B	0.271	2.377	0.607	1	1	124.151			
			C	0.14	2.809	0.58	1	1	75.402			
Sum Weight:	11.09	34.41						OTM	1002.30 kip-ft	12.22		

Tower Forces - Service - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.26	0.99	A	0.26	2.407	0.605	0.8	1	16.189	0.47	23.44	A
180.00-160.00			B	0.113	2.912	0.577	0.8	1	6.710			
			C	0.173	2.687	0.585	0.8	1	10.445			
T2	1.05	1.66	A	0.431	2.005	0.665	0.8	1	29.882	0.83	41.39	B
160.00-140.00			B	0.516	1.88	0.706	0.8	1	37.929			
			C	0.202	2.59	0.591	0.8	1	12.421			
T3	1.44	2.80	A	0.461	1.956	0.678	0.8	1	33.064	2.00	100.23	B
140.00-120.00			B	0.899	1.923	0.983	0.8	1	93.528			
			C	0.236	2.479	0.598	0.8	1	14.961			
T4	2.17	5.13	A	0.362	2.145	0.637	0.8	1	54.754	2.26	75.17	B
120.00-90.00			B	0.666	1.778	0.796	0.8	1	120.987			
			C	0.206	2.576	0.592	0.8	1	31.125			
T5	2.17	6.13	A	0.259	2.41	0.604	0.8	1	61.667	2.12	70.63	B
90.00-60.00			B	0.45	1.973	0.673	0.8	1	112.760			
			C	0.161	2.73	0.583	0.8	1	39.945			
T6	2.17	7.92	A	0.218	2.536	0.594	0.8	1	72.511	2.10	70.09	B
60.00-30.00			B	0.357	2.156	0.635	0.8	1	118.511			
			C	0.148	2.781	0.581	0.8	1	51.545			
T7 30.00-0.00	1.83	9.77	A	0.184	2.65	0.587	0.8	1	80.282	2.04	68.06	B
			B	0.271	2.377	0.607	0.8	1	114.050			
			C	0.14	2.809	0.58	0.8	1	64.005			
Sum Weight:	11.09	34.41						OTM	985.44 kip-ft	11.82		

Tower Forces - Service - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.26	0.99	A	0.26	2.407	0.605	0.85	1	16.189	0.47	23.44	A
180.00-160.00			B	0.113	2.912	0.577	0.85	1	6.710			
			C	0.173	2.687	0.585	0.85	1	10.445			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
T2	1.05	1.66	A	0.431	2.005	0.665	0.85	1	29.882	0.83	41.39	B
160.00-140.00			B	0.516	1.88	0.706	0.85	1	37.929			
			C	0.202	2.59	0.591	0.85	1	12.421			
T3	1.44	2.80	A	0.461	1.956	0.678	0.85	1	33.064	2.00	100.23	B
140.00-120.00			B	0.899	1.923	0.983	0.85	1	93.528			
			C	0.236	2.479	0.598	0.85	1	14.961			
T4	2.17	5.13	A	0.362	2.145	0.637	0.85	1	55.429	2.26	75.45	B
120.00-90.00			B	0.666	1.778	0.796	0.85	1	121.428			
			C	0.206	2.576	0.592	0.85	1	31.915			
T5	2.17	6.13	A	0.259	2.41	0.604	0.85	1	62.866	2.14	71.24	B
90.00-60.00			B	0.45	1.973	0.673	0.85	1	113.732			
			C	0.161	2.73	0.583	0.85	1	41.257			
T6	2.17	7.92	A	0.218	2.536	0.594	0.85	1	74.386	2.13	71.06	B
60.00-30.00			B	0.357	2.156	0.635	0.85	1	120.140			
			C	0.148	2.781	0.581	0.85	1	53.541			
T7 30.00-0.00	1.83	9.77	A	0.184	2.65	0.587	0.85	1	83.024	2.09	69.57	B
			B	0.271	2.377	0.607	0.85	1	116.575			
			C	0.14	2.809	0.58	0.85	1	66.854			
Sum Weight:	11.09	34.41						OTM	989.66 kip-ft	11.92		

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 60 deg - No Ice
5	Dead+Wind 90 deg - No Ice
6	Dead+Wind 120 deg - No Ice
7	Dead+Wind 150 deg - No Ice
8	Dead+Wind 180 deg - No Ice
9	Dead+Wind 210 deg - No Ice
10	Dead+Wind 240 deg - No Ice
11	Dead+Wind 270 deg - No Ice
12	Dead+Wind 300 deg - No Ice
13	Dead+Wind 330 deg - No Ice
14	Dead+Ice+Temp
15	Dead+Wind 0 deg+Ice+Temp
16	Dead+Wind 30 deg+Ice+Temp
17	Dead+Wind 60 deg+Ice+Temp
18	Dead+Wind 90 deg+Ice+Temp
19	Dead+Wind 120 deg+Ice+Temp
20	Dead+Wind 150 deg+Ice+Temp
21	Dead+Wind 180 deg+Ice+Temp
22	Dead+Wind 210 deg+Ice+Temp
23	Dead+Wind 240 deg+Ice+Temp
24	Dead+Wind 270 deg+Ice+Temp
25	Dead+Wind 300 deg+Ice+Temp
26	Dead+Wind 330 deg+Ice+Temp
27	Dead+Wind 0 deg - Service
28	Dead+Wind 30 deg - Service
29	Dead+Wind 60 deg - Service
30	Dead+Wind 90 deg - Service
31	Dead+Wind 120 deg - Service

Comb. No.	Description
32	Dead+Wind 150 deg - Service
33	Dead+Wind 180 deg - Service
34	Dead+Wind 210 deg - Service
35	Dead+Wind 240 deg - Service
36	Dead+Wind 270 deg - Service
37	Dead+Wind 300 deg - Service
38	Dead+Wind 330 deg - Service

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	180 - 160	4.177	31	0.2430	0.0241
T2	160 - 140	3.156	31	0.2317	0.0179
T3	140 - 120	2.218	31	0.1925	0.0128
T4	120 - 90	1.459	31	0.1392	0.0076
T5	90 - 60	0.763	31	0.0817	0.0021
T6	60 - 30	0.337	31	0.0471	0.0007
T7	30 - 0	0.095	31	0.0219	0.0002

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
180.00	(E) Lightning Rod	31	4.177	0.2430	0.0241	233133
170.00	(E)Powerwave 7770.00	31	3.661	0.2397	0.0209	116567
160.00	APX16DWV-16DWVS-E-A20	31	3.156	0.2317	0.0179	57911
140.00	(E)T-Frame	31	2.218	0.1925	0.0128	26940

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	180 - 160	12.059	6	0.7010	0.0732
T2	160 - 140	9.113	6	0.6686	0.0538
T3	140 - 120	6.406	6	0.5558	0.0380
T4	120 - 90	4.216	6	0.4020	0.0224
T5	90 - 60	2.203	6	0.2360	0.0062
T6	60 - 30	0.973	6	0.1361	0.0022
T7	30 - 0	0.275	6	0.0634	0.0007

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
180.00	(E) Lightning Rod	6	12.059	0.7010	0.0732	82383
170.00	(E)Powerwave 7770.00	6	10.572	0.6916	0.0631	41191
160.00	APX16DWV-16DWVS-E-A20	6	9.113	0.6686	0.0538	20431
140.00	(E)T-Frame	6	6.406	0.5558	0.0380	9351

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load K	Ratio Load / Allowable	Allowable Ratio	Criteria
T2	160	Leg	A325N	1.1250	6	2.69	43.71	0.061 ✔	1.333	Bolt Tension
T3	140	Leg	A325N	1.2500	6	10.49	53.93	0.194 ✔	1.333	Bolt Tension
T4	120	Leg	A325N	1.2500	6	25.32	54.00	0.469 ✔	1.333	Bolt Tension
		Diagonal	A325N	0.7500	1	2.58	6.12	0.421 ✔	1.333	Member Bearing
T5	90	Leg	A325N	1.2500	6	28.54	54.00	0.529 ✔	1.333	Bolt Tension
		Diagonal	A325N	0.7500	1	3.46	6.12	0.566 ✔	1.333	Member Bearing
T6	60	Leg	A325N	1.2500	6	31.89	54.00	0.591 ✔	1.333	Bolt Tension
		Diagonal	A325N	0.8750	1	4.73	9.52	0.498 ✔	1.333	Member Bearing
T7	30	Diagonal	A325N	0.8750	1	7.52	11.89	0.632 ✔	1.333	Member Bearing

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio P / P_a
T1	180 - 160	1 3/4	20.00	3.32	91.0 K=1.00	16.71	2.4053	-19.03	40.20	0.473 ✔
T2	160 - 140	2 1/2	20.00	3.31	63.5 K=1.00	22.12	4.9087	-68.92	108.57	0.635 ✔
T3	140 - 120	3 1/2	20.00	3.32	45.5 K=1.00	25.03	9.6211	-150.85	240.85	0.626 ✔
T4	120 - 90	4 1/4	30.11	7.53	85.0 K=1.00	17.99	14.1863	-180.23	255.20	0.706 ✔
T5	90 - 60	4 1/2	30.11	7.53	80.3 K=1.00	18.95	15.9043	-206.10	301.43	0.684 ✔
T6	60 - 30	4 3/4	30.11	7.53	76.1 K=1.00	19.79	17.7205	-233.28	350.62	0.665 ✔
T7	30 - 0	4 3/4	30.11	7.53	76.1 K=1.00	19.79	17.7205	-262.90	350.62	0.750 ✔

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	180 - 160	7/8	6.00	2.91	143.8 K=0.90	7.22	0.6013	-2.84	4.34	0.653 ✔
T2	160 - 140	1	5.99	2.87	124.1 K=0.90	9.70	0.7854	-4.92	7.62	0.646 ✔
T3	140 - 120	1 1/8	6.00	2.83	108.5 K=0.90	12.68	0.9940	-9.04	12.61	0.717 ✔
T4	120 - 90	L2 1/2x2 1/2x3/16	11.67	5.84	141.5 K=1.00	7.46	0.9023	-2.75	6.73	0.409 ✔
T5	90 - 60	L3x3x3/16	15.39	7.67	154.3 K=1.00	6.27	1.0898	-3.61	6.83	0.528 ✔
T6	60 - 30	L3 1/2x3 1/2x1/4	19.44	9.66	167.1 K=1.00	5.35	1.6900	-4.59	9.04	0.507 ✔
T7	30 - 0	L4x4x5/16	22.60	11.24	170.5 K=1.00	5.14	2.4000	-7.20	12.33	0.584 ✔

Top Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	180 - 160	7/8	5.00	4.85	186.4 K=0.70	4.30	0.6013	-0.14	2.58	0.052 ✔
T2	160 - 140	1	5.00	4.79	161.0 K=0.70	5.76	0.7854	-0.24	4.52	0.053 ✔
T3	140 - 120	1 1/8	5.00	4.71	140.6 K=0.70	7.55	0.9940	-0.24	7.51	0.031 ✔

Bottom Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	180 - 160	7/8	5.00	4.85	186.4 K=0.70	4.30	0.6013	-0.16	2.58	0.060 ✔
T2	160 - 140	1	5.00	4.79	161.0 K=0.70	5.76	0.7854	-0.04	4.52	0.009 ✔
T3	140 - 120	1 1/8	5.00	4.71	140.6 K=0.70	7.55	0.9940	-1.94	7.51	0.258 ✔

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	180 - 160	1 3/4	20.00	3.32	91.0	30.00	2.4053	16.12	72.16	0.223 ✔
T2	160 - 140	2 1/2	20.00	3.31	63.5	30.00	4.9087	62.92	147.26	0.427 ✔
T3	140 - 120	3 1/2	20.00	3.32	45.5	30.00	9.6211	141.64	288.63	0.491 ✔
T4	120 - 90	4 1/4	30.11	7.53	85.0	30.00	14.1863	166.35	425.59	0.391 ✔
T5	90 - 60	4 1/2	30.11	7.53	80.3	30.00	15.9043	186.31	477.13	0.390 ✔
T6	60 - 30	4 3/4	30.11	7.53	76.1	30.00	17.7205	206.16	531.62	0.388 ✔
T7	30 - 0	4 3/4	30.11	7.53	76.1	30.00	17.7205	225.38	531.62	0.424 ✔

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	180 - 160	7/8	6.00	2.91	159.8	30.00	0.6013	2.81	18.04	0.156 ✔
T2	160 - 140	1	5.99	2.87	137.9	30.00	0.7854	4.86	23.56	0.206 ✔
T3	140 - 120	1 1/8	6.00	2.83	120.6	30.00	0.9940	8.84	29.82	0.296 ✔
T4	120 - 90	L2 1/2x2 1/2x3/16	11.67	5.84	92.1	29.00	0.5537	2.58	16.06	0.161 ✔
T5	90 - 60	L3x3x3/16	15.39	7.67	99.7	29.00	0.6943	3.46	20.14	0.172 ✔
T6	60 - 30	L3 1/2x3 1/2x1/4	19.44	9.66	108.0	29.00	1.0800	4.73	31.32	0.151 ✔
T7	30 - 0	L4x4x5/16	23.66	11.77	115.3	29.00	1.5656	7.52	45.40	0.166 ✔

Top Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	180 - 160	7/8	5.00	4.85	266.3	30.00	0.6013	0.11	18.04	0.006 ✔
T2	160 - 140	1	5.00	4.79	230.0	30.00	0.7854	0.26	23.56	0.011 ✔
T3	140 - 120	1 1/8	5.00	4.71	200.9	30.00	0.9940	0.26	29.82	0.009 ✔

Bottom Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	180 - 160	7/8	5.00	4.85	266.3	30.00	0.6013	0.17	18.04	0.009 ✔
T2	160 - 140	1	5.00	4.79	230.0	30.00	0.7854	0.06	23.56	0.002 ✔
T3	140 - 120	1 1/8	5.00	4.71	200.9	30.00	0.9940	1.62	29.82	0.054 ✔

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
T1	180 - 160	Leg	1 3/4	3	-19.03	53.58	35.5	Pass
		Diagonal	7/8	13	-2.84	5.79	49.0	Pass
		Top Girt	7/8	6	-0.14	3.45	3.9	Pass
		Bottom Girt	7/8	9	-0.16	3.45	4.5	Pass
T2	160 - 140	Leg	2 1/2	48	-68.92	144.72	47.6	Pass
		Diagonal	1	57	-4.92	10.16	48.4	Pass
		Top Girt	1	50	-0.24	6.03	4.0	Pass
		Bottom Girt	1	53	-0.04	6.03	0.7	Pass
T3	140 - 120	Leg	3 1/2	92	-150.85	321.05	47.0	Pass
		Diagonal	1 1/8	102	-9.04	16.81	53.8	Pass
		Top Girt	1 1/8	96	-0.24	10.01	2.4	Pass
		Bottom Girt	1 1/8	99	-1.94	10.01	19.4	Pass
T4	120 - 90	Leg	4 1/4	137	-180.23	340.19	53.0	Pass
		Diagonal	L2 1/2x2 1/2x3/16	141	-2.75	8.97	30.7	Pass
							31.6 (b)	
T5	90 - 60	Leg	4 1/2	164	-206.10	401.80	51.3	Pass
		Diagonal	L3x3x3/16	168	-3.61	9.11	39.6	Pass
							42.5 (b)	
T6	60 - 30	Leg	4 3/4	191	-233.28	467.37	49.9	Pass
		Diagonal	L3 1/2x3 1/2x1/4	195	-4.59	12.05	38.1	Pass
T7	30 - 0	Leg	4 3/4	219	-262.90	467.37	56.3	Pass
		Diagonal	L4x4x5/16	228	-7.20	16.44	43.8	Pass
							47.4 (b)	
							Summary	

ALLPRO CONSULTING GROUP
9221 LYNDON B. JOHNSON FWY 204
DALLAS, TX
Phone: (972)231-8893
FAX: 866-364-8375

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
						Leg (T7)	56.3	Pass
						Diagonal (T3)	53.8	Pass
						Top Girt (T2)	4.0	Pass
						Bottom Girt (T3)	19.4	Pass
						Bolt Checks	47.4	Pass
						RATING =	**56.3**	**Pass**

MATHCAD CALCULATION PRINTOUT

Existing 180 ft. Self Supported Tower Foundation Check

Customer Name: SBA Communications Corp
Customer Site Name: Niantic
Customer Site ID: CT09865-S-02

Carrier Name: Verizon
Carrier Site Name: Waterford South

Site Location:
Southwest School 51 Daniels Road
Waterford, CT

Latitude: 41.330264
Longitude:-72.166672

ACGI Job # 16-1025

(Previous Job ACGI Job # 16-0568
Job ACGI Job # 16-0431)

Foundation check

-Foundation Factored Reactions-

As per TNX output results:

Total Shear	$S := 48 \cdot kips$	Compression on Pedestal:	$P_c := 264 \cdot kips$
Moment	$M := 4910 \cdot ft\_K$	Uplift on Pedestal:	$P_{up} := 227 \cdot kips$
Down load	$Pv := 52 \cdot kips$	Shear on Pedestal:	$Sh := 27 \cdot kips$

-Soil Properties- **Soil data is as per Geotechnical Report by Dr.Clearance Welti, P.E., P.C.Geotechnical Engineering (Ref: Geotechnical Study for proposed Cell Tower at Southwest School 51 Daniels Road, Waterford,CT -SBA Network Services, Inc. dated 10/23/2008)**

Allowable Bearing Capacity	$Brg_{allw} := 4408 \cdot psf$	$SF_b := 2$
Ultimate Bearing Capacity	$Brg_{ult} := Brg_{allw} \cdot SF_b = 8.816 \cdot ksf$	
Internal angle of friction for soil,	$\phi := 34 \cdot deg$	
Unit wt. of soil,	$\gamma_s := 0.125 \cdot kcf$	
Alowable Passive Pressure	see next page	
Cohesion of soil,	$c_u := 0 \cdot ksf$	
Friction Factor	$FF := 0.6$	
Depth to be neglected	$L_{neg} := 1 \cdot ft$	

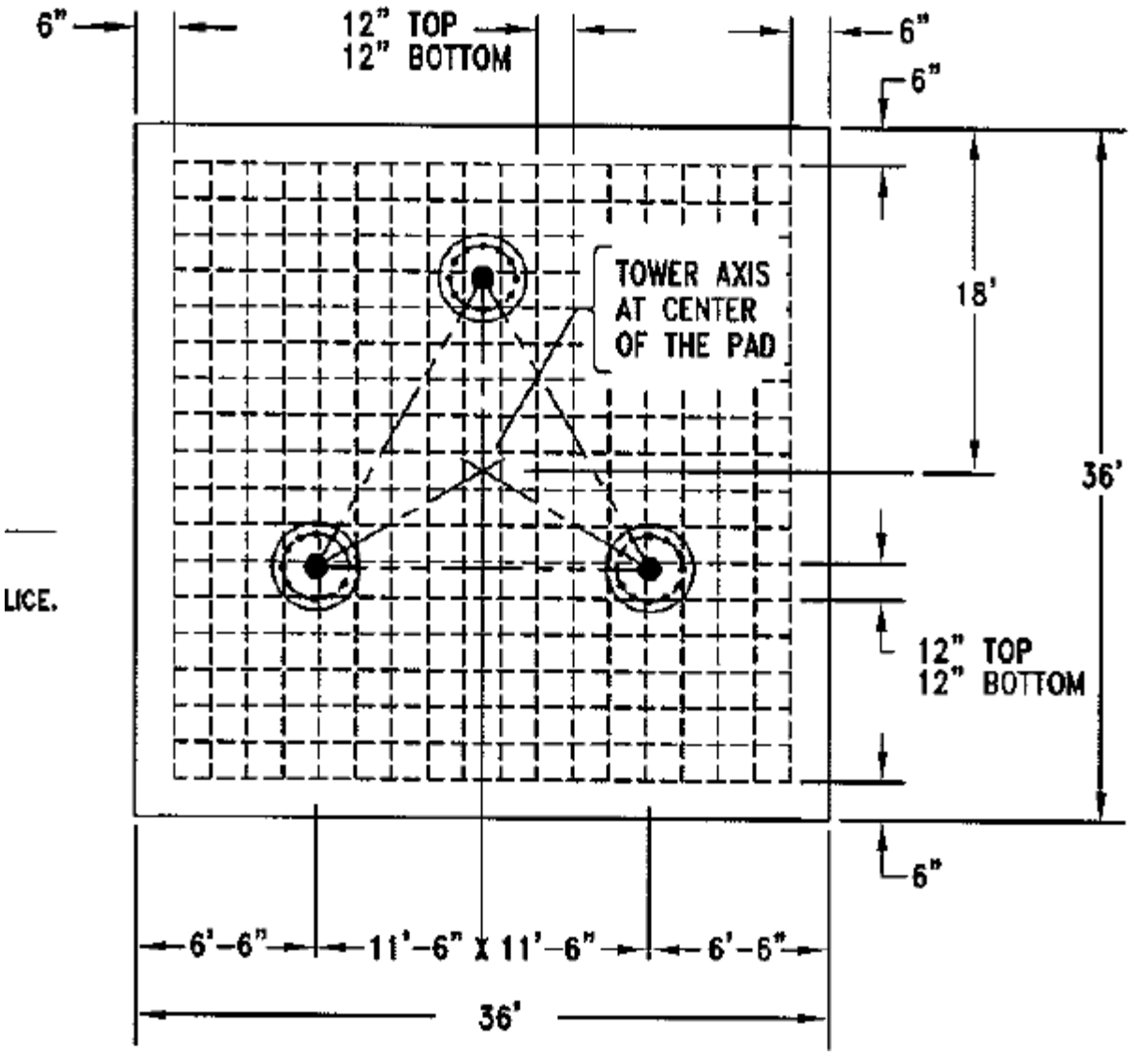
-Material Parameters-

Conforming to the design requirements as in ACI 318

Unit wt. of concrete,	$\gamma_c := 0.150 \cdot kcf$
Concrete compressive strength,	$f_c := 3000 \cdot psi$

-Factor of Safety- **Assumed**

FS concrete weight	$FS_c := 1.25$
FS soil weight	$FS_s := 1.50$
FS passive pressure	$FS_{pp} := 2.00$
FS bearing pressure	$FS_{bp} := 2.00$



DIMENSIONS

Tower face width $TWFW := 23 \cdot ft$ Tower ht. $Tw_{ht} := 180 \cdot ft$

The tower location is eccentric by $L_{pe} := 0 \cdot ft$ with respect to the mat foundation center towards the base

Type of column, col.t=0 for circular,=1 for rectangular/square $col_t := 0$

(Existing MAT foundation data is as per original foundation design by Tower Innovations, Project Number 5210 dated 11/5/2008).

Depth of mat, $D_f := 6.5 \cdot ft$

Thickness of mat, $T_f := 2 \cdot ft$

Pedestal size, $Ped_s := 3.5 \cdot ft$ No. of pedestals $Nped := 3$

Extension above the grade, $E_g := 0.5 \cdot ft$

Mat Dimensions, LxB $L := 36 \cdot ft$ x $B := 36 \cdot ft$ $Brg_{allw} = 4.408 \cdot ksf$

MAT CALCULATIONS

$K_p := \tan\left(45\cdot deg + \frac{\phi}{2}\right)^2$ $K_p = 3.537$

$P_{pave} := \frac{\left(D_f - T_f - L_{neg}\right)\cdot K_p\cdot\gamma_s + \left(D_f - L_{neg}\right)\cdot K_p\cdot\gamma_s}{2}$ $P_{pave} = 1.99\cdot ksf$

Safety against overturning and location of resultant on the base

Resisting Moments about mid axis parallel to base $Area_{ped} := if\left(col_t = 1\ , Ped_s^2\ , \frac{\pi}{4}\cdot Ped_s^2\right)$ $Area_{ped} = 9.621\ ft^2$

component	value, kips	lever arm, ft	resisting moment, ft-kips
1) Concrete wt.	$C_w := L\cdot B\cdot T_f\cdot\left(\gamma_c\right) + Area_{ped}\cdot\gamma_c\cdot\left(D_f + E_g - T_f\right)\cdot Nped$	$L_c := \frac{L}{2}$	$R_c := C_w\cdot L_c$
	$C_w = 410.448\cdot kips$	$L_c = 18\ ft$	$R_c = 7388.056\cdot ft\_K$
2) Soil wt.	$S_w := \left[L\cdot B\cdot\left(D_f - T_f\right) - Area_{ped}\cdot\left(D_f - T_f\right)\cdot Nped\right]\cdot\gamma_s$	$L_s := \frac{L}{2}$	$R_s := S_w\cdot L_s$
	$S_w = 712.764\cdot kips$	$L_s = 18\ ft$	$R_s = 12829.758\cdot ft\_K$
3) Wt. of soil wedge	$W_w := \left(D_f\right)\cdot\frac{1}{2}\cdot\left(D_f\cdot\tan(\phi)\right)\cdot B\cdot\left(\gamma_s\right)$	$L_w := \left(L + D_f\cdot\frac{\tan(\phi)}{3}\right)$	$R_w := W_w\cdot L_w$
	$W_w = 64.12\cdot kips$	$L_w = 37.461\ ft$	$R_w = 2402.045\cdot ft\_K$
4) Passive pressure	$Pe_p := T_f\cdot B\cdot P_{pave}$	$L_p := \frac{T_f}{3}$	$R_p := Pe_p\cdot L_p$
	$Pe_p = 143.254\cdot kips$	$L_p = 0.667\ ft$	$R_p = 95.503\cdot ft\_K$
5) Vertical	$Pv = 52\cdot kips$	$L_v := \frac{L}{2}$	$R_v := Pv\cdot L_v$
$S_{w1} := L\cdot B\cdot D_f\cdot\gamma_s$	$S_{w1} = 1053\cdot kips$ <--- for net calcs		
Total weight	$T_w := C_w + S_w + W_w + Pv$ $T_w = 1239.332\cdot kips$	$L_v = 18\ ft$	$R_v = 936\cdot ft\_K$

Total resisting Moment= $M_r := \frac{R_c}{FS_c} + \frac{R_s}{FS_s} + \frac{R_w}{FS_s} + \frac{R_p}{FS_{pp}} + \frac{R_v}{FS_{bp}}$ $M_r = 16580.731\cdot ft\_K$

Overturning Moments

component	value, kips	lever arm, ft	Overturning Moment ft-kips
1) Moment on foundation due to eccentric location of tower	$Pv = 52\cdot kips$	$L_{pe} = 0$	$M_{pe} := L_{pe}\cdot Pv$ $M_{pe} = 0\cdot ft\_K$
2) Moment on foundation	-	-	$M = 4910\cdot ft\_K$
3) Moment due to horizontal shear	$S_t := S$	$L_{hs} := D_f + E_g$ $L_{hs} = 7\ ft$	$O_{hs} := L_{hs}\cdot S_t$ $O_{hs} = 336\cdot ft\_K$

Total Overturning Moment= $M_o := M + O_{hs} + M_{pe}$ $M_o = 5246\cdot ft\_K$

Check Safety Factor against Overturning about mid axis parallel to base

$SF := \frac{M_r}{M_o}$ $SF = 3.161$ > 1.5 **O.K!**

Calculate eccentricity, e

$e := \frac{M_o}{T_w}$ $e = 4.233\,ft$

Check location of eccentricity and determine pressure distribution under the mat

$L_{loc} := \frac{L}{6}$ $L_{loc} = 6\,ft$ For net bearing calcs $T_{w1} := S_{w1} + W_w$ $T_{w1} = 1117.12 \cdot kips$

$P_{max1} := if\left[e \le L_{loc}, \frac{T_w}{L \cdot B} \cdot \left[1 + \left(6 \cdot \frac{e}{L}\right)\right], 4 \cdot \frac{T_w}{3 \cdot B \cdot (L - 2 \cdot e)}\right]$ $P_{max1} = 1.631 \cdot ksf$

$P_{max2} := \left(\frac{T_{w1}}{L \cdot B}\right)$ $P_{max2} = 0.862 \cdot ksf$ $P_{net} := P_{max1} - P_{max2}$ $P_{max} := P_{net}$

Net soil pressure, $P_{net} = 0.769 \cdot ksf$ < $Brg_{allw} = 4.408 \cdot ksf$ **O.K.!**

$P_{min} := if\left[e \le L_{loc}, \frac{T_w}{L \cdot B} \cdot \left[1 - \left(6 \cdot \frac{e}{L}\right)\right], 0 \cdot ksf\right]$ $P_{min} = 0.282 \cdot ksf$ $FS_{shear} := 2$

Check for horizontal shear $P_{hor} := \frac{(Pe_p + Pv \cdot FF)}{FS_{shear}}$

$P_{hor} = 87.227 \cdot kips$ > $S = 48 \cdot kips$ Since P.hor > S it is safe!

Summary

-Foundation Factored Reactions-

Shear $S = 48 \cdot kips$

Down load $Pv = 52 \cdot kips$ (Weight)

Uplift load $P_{up} = 227 \cdot kips$

Moment; $M = 4910 \cdot ft \cdot kip$

Size of Mat

$L = 36\,ft$ $B = 36\,ft$

Depth of base of mat $D_f = 6.5\,ft$ Thickness of Mat $T_f = 2\,ft$

Pedestal size $Ped_s = 3.5\,ft$

The tower location is eccentric by $L_{pe} = 0$ with respect to the mat foundation center towards the base

Stability Calculations

Safety Factor against Overturning	$SF = 3.161$	>	1.5	$\frac{1.5}{SF} = 47.459 \cdot \%$	**O.K.!**
Net soil pressure,	$P_{net} = 0.769 \cdot ksf$	<	$\frac{Brg_{allw}}{FS_{bp}} = 2.204 \cdot ksf$	$\frac{P_{net}}{\left(\frac{Brg_{allw}}{FS_{bp}}\right)} = 34.888 \cdot \%$	**O.K.!**
Check for horizontal shear	$P_{hor} = 87.227 \cdot kips$	>	$S = 48 \cdot kips$	$\frac{S}{P_{hor}} = 55.029 \cdot \%$	**O.K.!**