August 15, 2019

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

Re:	**Notice of Exempt Modification – Antenna Swap**
Property Address:	**600 OLD HARTFORD ROAD COLCHESTER, CT 06415**
Applicant:	**AT&T Mobility, LLC**

Dear Ms. Bachman:

On behalf of AT&T, please accept this application as notification pursuant to R.C.S.A. §16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. §16-50j-72(b) (2).

AT&T currently maintains a wireless telecommunications facility consisting of nine (8) wireless telecommunication antennas at an antenna center line height of 170-feet on an existing 180 –guyed tower, owned by the Cordless Data Transfer, Inc. AT&T now intends to install (6) NEW ANTENNAS TO REPLACE (6) EXISTING ANTENNAS (3) NEW SECTOR FRAMES (3) NEW RRUS-4478 B14 (3) NEW RRUS-4449 B5/B12 (3) NEW RRUS-8843 B2/B66A (2) NEW RAYCAP UNITS, (1) FIBER CABLE AND (4) DC POWER CABLES.

On February 3, 2003, Gerald Heffernan of the Connecticut Siting Council (Council) and Robert Erling of the Council staff met Christopher Fisher of AT&T Wireless, Bryan R. Lazuka of Site Acquisition Consultants and Christopher K. Daddi of Dewberry-Goodkind, Inc., for a field review of this petition. AT&T is petitioning the Council for a declaratory ruling that the proposed replacement of an existing 60-foot lattice tower with a 60-foot monopole tower would not have a significant adverse environmental impact, and therefore would not require a Certificate of Environmental Compatibility and Public Need.

The following is a list of subsequent decisions by the Connecticut Siting Council:

EM-AT&T-028-020604 - AT&T Wireless notice of intent to modify an existing telecommunications facility located at 600 Old Hartford Road, Colchester, Connecticut

EM-CING-025-026-027-028-064-070815 - New Cingular Wireless PCS, LLC notice of intent to modify existing telecommunications facilities located at 500 Highland Avenue, Cheshire; 49 Wig Hill Road, Chester; 48 Cow Hill Road, Clinton; 600 Old Hartford Road, Colchester; and 305 West Service Road, Hartford, Connecticut.

EM-CING-028-081110A - New Cingular Wireless PCS, LLC notice of intent to modify an existing telecommunications facility located at 600 Old Hartford Road, **Colchester**, Connecticut.

EM-CING-028-081229 - New Cingular Wireless PCS, LLC notice of intent to modify an existing telecommunications facility located at 315 Old Hartford Road, **Colchester**, Connecticut.

EM-CING-028-121031A - New Cingular Wireless PCS, LLC notice of intent to modify an existing telecommunications facility located at 600 Old Hartford Road, Colchester, Connecticut.

EM-CING-028-130114 – New Cingular Wireless PCS, LLC notice of intent to modify an existing telecommunications facility located at 315 Old Hartford Road, **Colchester**, Connecticut.

EM-AT&T-028-160222 - AT&T notice of intent to modify an existing telecommunications facility located at 315 Old Hartford Road, **Colchester**, Connecticut. Decision. Extension Request and CSC Approval

EM-AT&T-028-190215 - AT&T Mobility notice of intent to modify an existing telecommunications facility located at 315 Old Hartford Road, **Colchester**, Connecticut. Decision

Please accept this letter pursuant to Regulation of Connecticut State Agencies §16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-5I0j-72(b) (2). In accordance with R.C.S.A., a copy of this letter is being sent to Art Shilosky First Selectman and Salvatore Tassone Town Engineer, both for Town of Colchester 127 Norwich Avenue Colchester, CT 06415. A copy is also being sent to the Land and tower owner, Mark LeGault Cordless Data Transfer, Inc. 600 Old Hartford Road Colchester, CT 06415.

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

1. The proposed modifications will not result in an increase in the height of the existing tower. AT&T's replacement antennas will be installed at the 80-foot level of the 180-foot guyed tower.
2. The proposed modifications will not involve any changes to ground-mounted equipment and, therefore, will not require and extension of the site boundary.
3. The proposed modifications will not increase the noise levels at the facility by six decibels or more, or to levels that exceed state and local criteria.
4. The operation of the modified facility will not increase radio frequency (RF) emissions at the facility to a level at or above the Federal Communications Commission (FCC) safety standard. A cumulative worst-case RF emissions calculation for AT&T's modified facility is provided in the RF Emissions Compliance Report, included in Tab 2.
5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.
6. The tower and its foundation can support AT&T's proposed modifications. (See Structural Analysis Report included in Tab 3).

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

Sincerely,

David Barbagallo

CC w/enclosures:
Art Shilosky First Selectman and Salvatore Tassone Town Engineer, both for Town of Colchester.
Land and tower owner, Mark LeGault Cordless Data Transfer, Inc.

PROJECT:	LTE 2C/3C/4C/5C/RETROFIT
SITE NUMBER:	CTL02032
FA NUMBER:	10035250
PTN NUMBER:	2051A0KPKE, 2051A0KPJT, 2051A0KPH7, 2051A0KQ8T, 2051A0KQCC
PACE NUMBER:	MRCTB035120, MRCTB035107, MRCTB035160, MRCTB035205, MRCTB035331
SITE NAME:	COLCHESTER CENTRAL
SITE ADDRESS:	600 OLD HARTFORD ROAD COLCHESTER, CT 06415

PROJECT INFORMATION

SITE NAME:	COLCHESTER CENTRAL
SITE NUMBER:	CTL02032
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FA NUMBER:	10035250
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PACE NUMBER:	MRCTB035120, MRCTB035107, MRCTB035160, MRCTB035205, MRCTB035331
USID NUMBER:	24511
APPLICANT:	AT&T WIRELESS 550 COCHITUATE ROAD SUITE 550 13 AND 14 FRAMINGHAM, MA 01701
OWNER:	CDT
JURISDICTION:/ ZONING:	TOWN OF COLCHESTER/ SUBURBAN DISTRICT
COUNTY:	NEW LONDON
SITE COORDINATES FROM	(RFDS)
LATITUDE:	41.5866861° / 41° 35' 12.1"
LONGITUDE:	-72.3782489° / -72° 22' 41.7"
GROUND ELEV.:	389'
PROPOSED USE:	TELECOMMUNICATIONS FACILITY
AT&T RF MANAGER:	DEEPAK RATHORE
PHONE:	(860) 965-3068
EMAIL:	dr701e@att.com

PROJECT CONSULTANTS

PROJECT MANAGER:	SMARTLINK
ADDRESS:	85 RANGEWAY ROAD, SUITE 102 NORTH BILLERICA, MA 01862
CONTACT:	EDWARD WEISSMAN (917) 528-1857
EMAIL:	Edward.Weissman@smartlinkllc.com
SITE AQUISITION:	SMARTLINK
ADDRESS:	85 RANGEWAY ROAD, SUITE 102 NORTH BILLERICA, MA 01862
CONTACT:	SHARON KEEFE (978) 930-3918
EMAIL:	Sharon.Keefe@smartlinkllc.com
ENGINEER/ARCHITECT:	FULLERTON ENGINEERING
ADDRESS:	1100 E. WOODFIELD ROAD, SUITE 500 SCHAUMBURG, IL 60173
CONTACT:	MILEN DIMITROV (847) 908-8439
EMAIL:	MDimitrov@FullertonEngineering.com
CONSTRUCTION:	SMARTLINK
ADDRESS:	85 RANGEWAY ROAD, SUITE 102 NORTH BILLERICA, MA 01862
CONTACT:	MARK DONNELLY (617) 515-2080
EMAIL:	mark.donnelly@smartlinkllc.com

SCOPE OF WORK

LTE 1900/700/850/AWS/700 WILL BE 2C/3C/4C/5C/RETROFIT AT THE SITE WITH BRONZE CONFIGURATION. PROPOSED 2C/3C/4C/5C/RETROFIT PROJECT SCOPE HEREIN BASED ON RFDS ID # 2586609, VERSION 2.00 LAST UPDATED 12/14/18.

- (6) NEW ANTENNAS TO REPLACE (6) EXISTING ANTENNAS
- (3) NEW SECTOR FRAMES
- (3) NEW RRUS-4478 B14
- (3) NEW RRUS-4449 B5/B12
- (3) NEW RRUS-8843 B2/B66A
- (2) NEW RAYCAP UNITS, (1) FIBER CABLE AND (4) DC POWER CABLES
- UPGRADE BB W/ NEW 6630, INSTALL (1) NEW XMU CARD, (1) NEW RBS 6630 FOR 5G
- REPLACE EXISTING PP & BATTERY RACK W/ (1) NEW NETSURE 7100 DC PP & BATTERY RACK
- RE-CABLE EXISTING EQUIPMENT TO NEW PP

- CONTRACTOR SHALL FURNISH ALL MATERIAL WITH THE EXCEPTION OF AT&T SUPPLIED MATERIAL.
- ALL MATERIAL SHALL BE INSTALLED BY THE CONTRACTOR, UNLESS STATED OTHERWISE.

SITE LOCATION MAP

DIRECTIONS

SCAN QR CODE FOR LINK
TO SITE LOCATION MAP

APPLICABLE BUILDING CODES AND STANDARDS

ALL WORK AND MATERIALS SHALL BE PERFORMED AND INSTALLED IN ACCORDANCE WITH THE CURRENT EDITIONS OF THE FOLLOWING CODES AS ADOPTED BY THE LOCAL GOVERNING AUTHORITIES.

BUILDING CODE: 2015 INTERNATIONAL BUILDING CODE
2018 CONNECTICUT STATE BUILDING CODE SUPPLEMENT

ELECTRICAL CODE: 2017 NATIONAL ELECTRIC CODE

- FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION.
- ADA ACCESS REQUIREMENTS ARE NOT REQUIRED.
- THIS FACILITY DOES NOT REQUIRE POTABLE WATER AND WILL NOT PRODUCE ANY SEWAGE

DRAWING INDEX

NOTE: DRAWING SCALES ARE FOR 11"x17" SHEETS UNLESS OTHERWISE NOTED

at&t
550 COCHITUATE ROAD
SUITE 550 13 AND 14
FRAMINGHAM, MA 01701

smartlink
1362 MELLON ROAD
SUITE 140
HANOVER, MD 21076

FULLERTON
ENGINEERING · DESIGN
1100 E. WOODFIELD ROAD, SUITE 500
SCHAUMBURG, ILLINOIS 60173
TEL: 847-908-8400
COA# PEC.0001444
www.FullertonEngineering.com

REV	DATE	DESCRIPTION	BY
0	12/27/18	90% REVIEW	EB
1	03/22/19	FOR PERMIT	EB
2	04/10/19	FOR CONSTRUCTION	KC
3	07/08/19	MOUNT MODIFICATION	RV

I HEREBY CERTIFY THAT THESE DRAWINGS WERE PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND CONTROL, AND TO THE BEST OF MY KNOWLEDGE AND BELIEF COMPLY WITH THE REQUIREMENTS OF ALL APPLICABLE CODES.

SITE NAME
COLCHESTER CENTRAL

SITE NUMBER:
CTL02032

SITE ADDRESS
600 OLD HARTFORD ROAD
COLCHESTER, CT 06415

SHEET NAME
TITLE SHEET

SHEET NUMBER
T1

GENERAL CONSTRUCTION

1. FOR THE PURPOSE OF CONSTRUCTION DRAWINGS, THE FOLLOWING DEFINITIONS SHALL APPLY:
   CONTRACTOR/CM – SMARTLINK
   OWNER – AT&T WIRELESS
2. ALL SITE WORK SHALL BE COMPLETED AS INDICATED ON THE DRAWINGS AND AT&T PROJECT SPECIFICATIONS.
3. GENERAL CONTRACTOR SHALL VISIT THE SITE AND SHALL FAMILIARIZE HIMSELF WITH ALL CONDITIONS AFFECTING THE PROPOSED WORK AND SHALL MAKE PROVISIONS. GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR FAMILIARIZING HIMSELF WITH ALL CONTRACT DOCUMENTS, FIELD CONDITIONS, DIMENSIONS, AND CONFIRMING THAT THE WORK MAY BE ACCOMPLISHED AS SHOWN PRIOR TO PROCEEDING WITH CONSTRUCTION. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO THE COMMENCEMENT OF WORK.
4. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES. GENERAL CONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS, AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF WORK.
5. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES, AND APPLICABLE REGULATIONS.
6. UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES, AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
7. PLANS ARE NOT TO BE SCALED. THESE PLANS ARE INTENDED TO BE A DIAGRAMMATIC OUTLINE ONLY UNLESS OTHERWISE NOTED. DIMENSIONS SHOWN ARE TO FINISH SURFACES UNLESS OTHERWISE NOTED. SPACING BETWEEN EQUIPMENT IS THE MINIMUM REQUIRED CLEARANCE. THEREFORE, IT IS CRITICAL TO FIELD VERIFY DIMENSIONS, SHOULD THERE BE ANY QUESTIONS REGARDING THE CONTRACT DOCUMENTS, THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING A CLARIFICATION FROM THE ENGINEER PRIOR TO PROCEEDING WITH THE WORK. DETAILS ARE INTENDED TO SHOW DESIGN INTENT. MODIFICATIONS MAY BE REQUIRED TO SUIT JOB DIMENSIONS OR CONDITIONS AND SUCH MODIFICATIONS SHALL BE INCLUDED AS PART OF WORK AND PREPARED BY THE ENGINEER PRIOR TO PROCEEDING WITH WORK.
8. THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
9. IF THE SPECIFIED EQUIPMENT CANNOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE CONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION SPACE FOR APPROVAL BY THE ENGINEER PRIOR TO PROCEEDING.
10. GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR THE SAFETY OF WORK AREA, ADJACENT AREAS AND BUILDING OCCUPANTS THAT ARE LIKELY TO BE AFFECTED BY THE WORK UNDER THIS CONTRACT. WORK SHALL CONFIRM TO ALL OSHA REQUIREMENTS AND THE LOCAL JURISDICTION.
11. GENERAL CONTRACTOR SHALL COORDINATE WORK AND SCHEDULE WORK ACTIVITIES WITH OTHER DISCIPLINES.
12. ERECTION SHALL BE DONE IN A WORKMANLIKE MANNER BY COMPETENT EXPERIENCED WORKMAN IN ACCORDANCE WITH APPLICABLE CODES AND THE BEST ACCEPTED PRACTICE. ALL MEMBERS SHALL BE LAID PLUMB AND TRUE AS INDICATED ON THE DRAWINGS.
13. SEAL PENETRATIONS THROUGH FIRE RATED AREAS WITH UL LISTED MATERIALS APPROVED BY LOCAL JURISDICTION. CONTRACTOR SHALL KEEP AREA CLEAN, HAZARD FREE, AND DISPOSE OF ALL DEBRIS.
14. WORK PREVIOUSLY COMPLETED IS REPRESENTED BY LIGHT SHADED LINES AND NOTES. THE SCOPE OF WORK FOR THIS PROJECT IS REPRESENTED BY DARK SHADED LINES AND NOTES. CONTRACTOR SHALL NOTIFY THE GENERAL CONTRACTOR OF ANY EXISTING CONDITIONS THAT DEVIATE FROM THE DRAWINGS PRIOR TO BEGINNING CONSTRUCTION.
15. CONTRACTOR SHALL PROVIDE WRITTEN NOTICE TO THE CONSTRUCTION MANAGER 48 HOURS PRIOR TO COMMENCEMENT OF WORK.
16. THE CONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT CONTRACTOR'S EXPENSE TO THE SATISFACTION OF THE OWNER.
17. THE CONTRACTOR SHALL CONTACT UTILITY LOCATING SERVICES PRIOR TO THE START OF CONSTRUCTION.
18. GENERAL CONTRACTOR SHALL COORDINATE AND MAINTAIN ACCESS FOR ALL TRADES AND CONTRACTORS TO THE SITE AND/OR BUILDING.
19. THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR SECURITY OF THE SITE FOR THE DURATION OF CONSTRUCTION UNTIL JOB COMPLETION.
20. THE GENERAL CONTRACTOR SHALL MAINTAIN IN GOOD CONDITION ONE COMPLETE SET OF PLANS WITH ALL REVISIONS, ADDENDA, AND CHANGE ORDERS ON THE PREMISES AT ALL TIMES.
21. THE GENERAL CONTRACTOR SHALL PROVIDE PORTABLE FIRE EXTINGUISHERS WITH A RATING OF NOT LESS THAN 2–A OT 2–A:10–B:C AND SHALL BE WITHIN 25 FEET OF TRAVEL DISTANCE TO ALL PORTIONS OF WHERE THE WORK IS BEING COMPLETED DURING CONSTRUCTION.
22. ALL EXISTING ACTIVE SEWER, WATER, GAS, ELECTRIC, AND OTHER UTILITIES SHALL BE PROTECTED AT ALL TIMES, AND WHERE REQUIRED FOR THE PROPER EXECUTION OF THE WORK, SHALL BE RELOCATED AS DIRECTED BY THE ENGINEER. EXTREME CAUTION SHOULD BE USED BY THE CONTRACTOR WHEN EXCAVATING OR DRILLING PIERS AROUND OR NEAR UTILITIES. CONTRACTOR SHALL PROVIDE SAFETY TRAINING FOR THE WORKING CREW. THIS SHALL INCLUDE BUT NOT BE LIMITED TO A) FALL PROTECTION, B) CONFINED SPACE, C) ELECTRICAL SAFETY, AND D) TRENCHING & EXCAVATION.
23. ALL EXISTING INACTIVE SEWER, WATER, GAS, ELECTRIC, AND OTHER UTILITIES, WHICH INTERFERE WITH THE EXECUTION OF THE WORK, SHALL BE REMOVED, CAPPED, PLUGGED OR OTHERWISE DISCONNECTED AT POINTS WHICH WILL NOT INTERFERE WITH THE EXECUTION OF THE WORK, AS DIRECTED BY THE RESPONSIBLE ENGINEER, AND SUBJECT TO THE APPROVAL OF THE OWNER AND/OR LOCAL UTILITIES.
24. THE AREAS OF THE OWNER'S PROPERTY DISTURBED BY THE WORK AND NOT COVERED BY THE TOWER, EQUIPMENT OR DRIVEWAY, SHALL BE GRADED TO A UNIFORM SLOPE, AND STABILIZED TO PREVENT EROSION.
25. CONTRACTOR SHALL MINIMIZE DISTURBANCE TO THE EXISTING SITE DURING CONSTRUCTION. EROSION CONTROL MEASURES, IF REQUIRED DURING CONSTRUCTION, SHALL BE IN CONFORMANCE WITH THE FEDERAL AND LOCAL JURISDICTION FOR EROSION AND SEDIMENT CONTROL.
26. NO FILL OR EMBANKMENT MATERIAL SHALL BE PLACED ON FROZEN GROUNDING. FROZEN MATERIALS, SNOW OR ICE SHALL NOT BE PLACED IN ANY FILL OR EMBANKMENT.
27. THE SUBGRADE SHALL BE BROUGHT TO A SMOOTH UNIFORM GRADE AND COMPACTED TO 95 PERCENT STANDARD PROCTOR DENSITY UNDER PAVEMENT AND STRUCTURES AND 80 PERCENT STANDARD PROCTOR DENSITY IN OPEN SPACE. ALL TRENCHES IN PUBLIC RIGHT OF WAY SHALL BE BACKFILLED WITH FLOWABLE FILL OR OTHER MATERIAL PRE–APPROVED BY THE LOCAL JURISDICTION.
28. ALL NECESSARY RUBBISH, STUMPS, DEBRIS, STICKS, STONES, AND OTHER REFUSE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF IN A LAWFUL MANNER.
29. ALL BROCHURES, OPERATING AND MAINTENANCE MANUALS, CATALOGS, SHOP DRAWINGS, AND OTHER DOCUMENTS SHALL BE TURNED OVER TO THE GENERAL CONTRACTOR AT COMPLETION OF CONSTRUCTION AND PRIOR TO PAYMENT.
30. CONTRACTOR SHALL SUBMIT A COMPLETE SET OF AS–BUILT REDLINES TO THE GENERAL CONTRACTOR UPON COMPLETION OF PROJECT AND PRIOR TO FINAL PAYMENT.
31. CONTRACTOR SHALL LEAVE PREMISES IN A CLEAN CONDITION.
32. THE PROPOSED FACILITY WILL BE UNMANNED AND DOES NOT REQUIRE POTABLE WATER OR SEWER SERVICE, AND IS NOT FOR HUMAN HABITAT (NO HANDICAP ACCESS REQUIRED).
33. OCCUPANCY IS LIMITED TO PERIODIC MAINTENANCE AND INSPECTION, APPROXIMATELY 2 TIMES PER MONTH, BY AT&T TECHNICIANS.
34. NO OUTDOOR STORAGE OR SOLID WASTE CONTAINERS ARE PROPOSED.
35. ALL MATERIAL SHALL BE FURNISHED AND WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE LATEST REVISION AT&T MOBILITY GROUNDING STANDARD "TECHNICAL SPECIFICATION FOR CONSTRUCTION OF GSM/GPRS WIRELESS SITES" AND "TECHNICAL SPECIFICATION FOR FACILITY GROUNDING". IN CASE OF A CONFLICT BETWEEN THE CONSTRUCTION SPECIFICATION AND THE DRAWINGS, THE DRAWINGS SHALL GOVERN.
36. CONTRACTORS SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND INSPECTIONS REQUIRED FOR CONSTRUCTION. IF CONTRACTOR CANNOT OBTAIN A PERMIT, THEY MUST NOTIFY THE GENERAL CONTRACTOR IMMEDIATELY.
37. CONTRACTOR SHALL REMOVE ALL TRASH AND DEBRIS FROM THE SITE ON A DAILY BASIS.
38. INFORMATION SHOWN ON THESE DRAWINGS WAS OBTAINED FROM SITE VISITS AND/OR DRAWINGS PROVIDED BY THE SITE OWNER. CONTRACTORS SHALL NOTIFY THE ENGINEER OF ANY DISCREPANCIES PRIOR TO ORDERING MATERIAL OR PROCEEDING WITH CONSTRUCTION.
39. NO WHITE STROBE LIGHTS ARE PERMITTED. LIGHTING IF REQUIRED, WILL MEET FAA STANDARDS AND REQUIREMENTS.

ANTENNA MOUNTING

40. DESIGN AND CONSTRUCTION OF ANTENNA SUPPORTS SHALL CONFORM TO CURRENT ANSI/TIA–222 OR APPLICABLE LOCAL CODES.
41. ALL STEEL MATERIALS SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123 "ZINC (HOT–DIP GALVANIZED) COATINGS ON IRON AND STEEL PRODUCTS", UNLESS NOTED OTHERWISE.
42. ALL BOLTS, ANCHORS AND MISCELLANEOUS HARDWARE SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153 "ZINC–COATING (HOT–DIP) ON IRON AND STEEL HARDWARE", UNLESS NOTED OTHERWISE.
43. DAMAGED GALVANIZED SURFACES SHALL BE REPAIRED BY COLD GALVANIZING IN ACCORDANCE WITH ASTM A780.
44. ALL ANTENNA MOUNTS SHALL BE INSTALLED WITH LOCK NUTS, DOUBLE NUTS AND SHALL BE TORQUED TO MANUFACTURER'S RECOMMENDATIONS.
45. CONTRACTOR SHALL INSTALL ANTENNA PER MANUFACTURER'S RECOMMENDATION FOR INSTALLATION AND GROUNDING.
46. ALL UNUSED PORTS ON ANY ANTENNAS SHALL BE TERMINATED WITH A 50–OHM LOAD TO ENSURE ANTENNAS PERFORM AS DESIGNED.
47. PRIOR TO SETTING ANTENNA AZIMUTHS AND DOWNTILTS, ANTENNA CONTRACTOR SHALL CHECK THE ANTENNA MOUNT FOR TIGHTNESS AND ENSURE THAT THEY ARE PLUMB. ANTENNA AZIMUTHS SHALL BE SET FROM TRUE NORTH AND BE ORIENTED WITHIN +/– 5% AS DEFINED BY THE RFDS. ANTENNA DOWNTILTS SHALL BE WITHIN +/– 0.5% AS DEFINED BY THE RFDS. REFER TO ND–00246.
48. JUMPERS FROM THE TMA'S MUST TERMINATE TO OPPOSITE POLARIZATION'S IN EACH SECTOR.
49. CONTRACTOR SHALL RECORD THE SERIAL #, SECTOR, AND POSITION OF EACH ACTUATOR INSTALLED AT THE ANTENNAS AND PROVIDE THE INFORMATION TO AT&T.
50. TMA'S SHALL BE MOUNTED ON PIPE DIRECTLY BEHIND ANTENNAS AS CLOSE TO ANTENNA AS FEASIBLE IN A VERTICAL POSITION.

TORQUE REQUIREMENTS

51. ALL RF CONNECTIONS SHALL BE TIGHTENED BY A TORQUE WRENCH.
52. ALL RF CONNECTIONS, GROUNDING HARDWARE AND ANTENNA HARDWARE SHALL HAVE A TORQUE MARK INSTALLED IN A CONTINUOUS STRAIGHT LINE FROM BOTH SIDES OF THE CONNECTION.
    A. RF CONNECTION BOTH SIDES OF THE CONNECTOR.
    B. GROUNDING AND ANTENNA HARDWARE ON THE NUT SIDE STARTING FROM THE THREADS TO THE SOLID SURFACE. EXAMPLE OF SOLID SURFACE: GROUND BAR, ANTENNA BRACKET METAL.

FIBER & POWER CABLE MOUNTING

53. THE FIBER OPTIC TRUNK CABLES SHALL BE INSTALLED INTO CONDUITS, CHANNEL CABLE TRAYS, OR CABLE TRAY. WHEN INSTALLING FIBER OPTIC TRUNK CABLES INTO A CABLE TRAY SYSTEM, THEY SHALL BE INSTALLED INTO AN INTER DUCT AND A PARTITION BARRIER SHALL BE INSTALLED BETWEEN THE 600 VOLT CABLES AND THE INTER DUCT IN ORDER TO SEGREGATE CABLE TYPES. OPTIC FIBER TRUNK CABLES SHALL HAVE APPROVED CABLE RESTRAINTS EVERY (60) SIXTY FEET AND SECURELY FASTENED TO THE CABLE TRAY SYSTEM. NFPA 70 (NEC) ARTICLE 770 RULES SHALL APPLY.
54. THE TYPE TC–ER CABLES SHALL BE INSTALLED INTO CONDUITS, CHANNEL CABLE TRAYS, OR CABLE TRAY AND SHALL BE SECURED AT INTERVALS NOT EXCEEDING (6) SIX FEET. AN EXCEPTION; WHERE TYPE TC–ER CABLES ARE NOT SUBJECT TO PHYSICAL DAMAGE, CABLES SHALL BE PERMITTED TO MAKE A TRANSITION BETWEEN CONDUITS, CHANNEL CABLE TRAYS, OR CABLE TRAY WHICH ARE SERVING UTILIZATION EQUIPMENT OR DEVICES, A DISTANCE (6) SIX FEET SHALL NOT BE EXCEEDED WITHOUT CONTINUOUS SUPPORTING. NFPA 70 (NEC) ARTICLES 336 AND 392 RULES SHALL APPLY.
55. WHEN INSTALLING OPTIC FIBER TRUNK CABLES OR TYPE TC–ER CABLES INTO CONDUITS, NFPA 70 (NEC) ARTICLE 300 RULES SHALL APPLY.

COAXIAL CABLE NOTES

62. TYPES AND SIZES OF THE ANTENNA CABLE ARE BASED ON ESTIMATED LENGTHS. PRIOR TO

    ORDERING CABLE, CONTRACTOR SHALL VERIFY ACTUAL LENGTH BASED ON CONSTRUCTION LAYOUT AND NOTIFY THE PROJECT MANAGER IF ACTUAL LENGTHS EXCEED ESTIMATED LENGTHS.
63. CONTRACTOR SHALL VERIFY THE DOWN–TILT OF EACH ANTENNA WITH A DIGITAL LEVEL.
64. CONTRACTOR SHALL CONFIRM COAX COLOR CODING PRIOR TO CONSTRUCTION.
65. ALL JUMPERS TO THE ANTENNAS FROM THE MAIN TRANSMISSION LINE SHALL BE 1/2" DIA. LDF AND SHALL NOT EXCEED 6'–0".
66. ALL COAXIAL CABLE SHALL BE SECURED TO THE DESIGNED SUPPORT STRUCTURE, IN AN APPROVED MANNER, AT DISTANCES NOT TO EXCEED 4'–0" OC.
67. CONTRACTOR SHALL FOLLOW ALL MANUFACTURER'S RECOMMENDATIONS REGARDING BOTH THE INSTALLATION AND GROUNDING OF ALL COAXIAL CABLES, CONNECTORS, ANTENNAS, AND ALL OTHER EQUIPMENT.
68. CONTRACTOR SHALL GROUND ALL EQUIPMENT. INCLUDING ANTENNAS, RET MOTORS, TMA'S, COAX CABLES, AND RET CONTROL CABLES AS A COMPLETE SYSTEM. GROUNDING SHALL BE EXECUTED BY QUALIFIED WIREMEN IN COMPLIANCE WITH MANUFACTURER'S SPECIFICATION AND RECOMMENDATION.
69. CONTRACTOR SHALL PROVIDE STRAIN–RELIEF AND CABLE SUPPORTS FOR ALL CABLE ASSEMBLIES, COAX CABLES, AND RET CONTROL CABLES. CABLE STRAIN–RELIEFS AND CABLE SUPPORTS SHALL BE APPROVED FOR THE PURPOSE. INSTALLATION SHALL BE IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS AND RECOMMENDATIONS.
70. CONTRACTOR TO VERIFY THAT EXISTING COAX HANGERS ARE STACKABLE SNAP IN HANGERS. IF EXISTING HANGERS ARE NOT STACKABLE SNAP IN HANGERS THE CONTRACTOR SHALL REPLACE EXISTING HANGERS WITH NEW SNAP IN HANGERS IF APPLICABLE.

GENERAL CABLE AND EQUIPMENT NOTES

71. CONTRACTOR SHALL BE RESPONSIBLE TO VERIFY ANTENNA, TMAS, DIPLEXERS, AND COAX CONFIGURATION, MAKE AND MODELS PRIOR TO INSTALLATION.
72. ALL CONNECTIONS FOR HANGERS, SUPPORTS, BRACING, ETC. SHALL BE INSTALLED PER TOWER MANUFACTURER'S RECOMMENDATIONS.
73. CONTRACTOR SHALL REFERENCE THE TOWER STRUCTURAL ANALYSIS/DESIGN DRAWINGS FOR DIRECTIONS ON CABLE DISTRIBUTION/ROUTING.
74. ALL OUTDOOR RF CONNECTORS/CONNECTIONS SHALL BE WEATHERPROOFED, EXCEPT THE RET CONNECTORS, USING BUTYL TAPE AFTER INSTALLATION AND FINAL CONNECTIONS ARE MADE. BUTYL TAPE SHALL HAVE A MINIMUM OF ONE–HALF TAPE WIDTH OVERLAP ON EACH TURN AND EACH LAYER SHALL BE WRAPPED THREE TIMES. WEATHERPROOFING SHALL BE SMOOTH WITHOUT BUCKLING. BUTYL BLEEDING IS NOT ALLOWED.
75. IF REQUIRED TO PAINT ANTENNAS AND/OR COAX:
    A. TEMPERATURE SHALL BE ABOVE 50° F.
    B. PAINT COLOR MUST BE APPROVED BY BUILDING OWNER/LANDLORD.
    C. FOR REGULATED TOWERS, FAA/FCC APPROVED PAINT IS REQUIRED.
    D. DO NOT PAINT OVER COLOR CODING OR ON EQUIPMENT MODEL NUMBERS
76. ALL CABLES SHALL BE GROUNDED WITH COAXIAL CABLE GROUND KITS. FOLLOW THE MANUFACTURER'S RECOMMENDATIONS.
    A. GROUNDING AT THE ANTENNA LEVEL.
    B. GROUNDING AT MID LEVEL, TOWERS WHICH ARE OVER 200'–0", ADDITIONAL CABLE GROUNDING REQUIRED.
    C. GROUNDING AT BASE OF TOWER PRIOR TO TURNING HORIZONTAL.
    D. GROUNDING OUTSIDE THE EQUIPMENT SHELTER AT ENTRY PORT.
    E. GROUNDING INSIDE THE EQUIPMENT SHELTER AT THE ENTRY PORT.
77. ALL PROPOSED GROUND BAR DOWNLEADS ARE TO BE TERMINATED TO THE EXISTING ADJACENT GROUND BAR DOWNLEADS A MINIMUM DISTANCE OF 4'–0" BELOW GROUND BAR. TERMINATIONS MAY BE EXOTHERMIC OR COMPRESSION.

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3	07/08/19	MOUNT MODIFICATION	RV

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STATE OF CONNECTICUT · HENRY M. BELLAGAMBA · 25358 · LICENSED PROFESSIONAL ENGINEER

SITE NAME
COLCHESTER CENTRAL

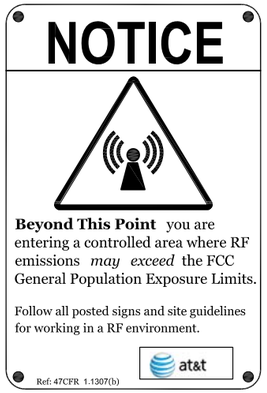
SITE NUMBER:
CTL02032

SITE ADDRESS
600 OLD HARTFORD ROAD
COLCHESTER, CT 06415

SHEET NAME
NOTES AND SPECIFICATIONS

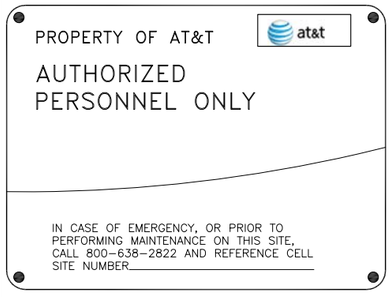
SHEET NUMBER
SP1

PROJECT# 2018.0171.E080



ALERTING SIGNS

ALERTING SIGN



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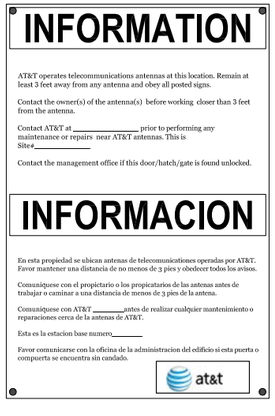

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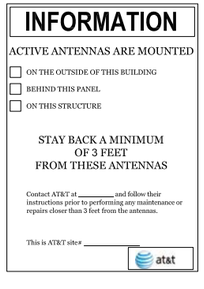

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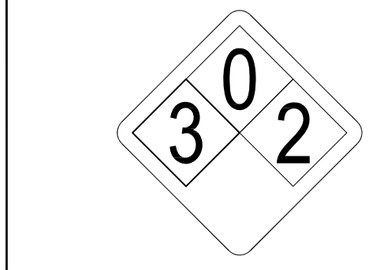

ALERTING SIGN
(FOR CELL SITE BATTERIES)

ALERTING SIGN
(FOR DIESEL FUEL)

ALERTING SIGN
(FOR PROPANE)

INFO SIGN #3

GENERAL SIGNAGE GUIDELINES

STRUCTURE TYPE	INFO SIGN #1	INFO SIGN #2	INFO SIGN #3	INFO SIGN #4	STRIPING	NOTICE SIGN	CAUTION SIGN
TOWERS							
MONOPOLE/MONOPINE/MONOPALM	ENTRANCE GATES, SHELTER DOORS OR ON THE OUTDOOR CABINETS	CLIMBING SIDE OF THE TOWER	ON BACKSIDE OF ANTENNAS	ENTRANCE GATES, SHELTER DOORS OR ON THE OUTDOOR CABINETS			AT THE HEIGHT OF THE FIRST CLIMBING STEP, MIN 9 FT ABOVE GROUND
SEC TOWERS/TOWERS WITH HIGH VOLTAGE	ENTRANCE GATES, SHELTER DOORS OR ON THE OUTDOOR CABINETS	CLIMBING SIDE OF THE TOWER	ON BACKSIDE OF ANTENNAS	ENTRANCE GATES, SHELTER DOORS OR ON THE OUTDOOR CABINETS			
LIGHT POLES/FLAG POLES	ENTRANCE GATES, SHELTER DOORS OR ON THE OUTDOOR CABINETS	ON THE POLE, NO LESS THAN 3FT BELOW THE ANTENNA AND LESS THAN 9FT ABOVE GROUND	ON BACKSIDE OF ANTENNAS	ENTRANCE GATES, SHELTER DOORS OR ON THE OUTDOOR CABINETS			
UTILITY WOOD POLES (JPA)	ENTRANCE GATES, SHELTER DOORS OR ON THE OUTDOOR CABINETS	ON THE POLE, NO LESS THAN 3FT BELOW THE ANTENNA AND LESS THAN 9FT ABOVE GROUND	ON BACKSIDE OF ANTENNAS	ENTRANCE GATES, SHELTER DOORS OR ON THE OUTDOOR CABINETS		IF GP MAX VALUE OF MPE AT ANTENNA LEVEL IS: 0-99%; NOTICE SIGN; OVER 99%: CAUTION SIGN AT NO LESS THAN 3FT BELOW ANTENNA AND 9FT ABOVE GROUND	
MICROCELLS MOUNTED ON NON-JPA POLES	ENTRANCE GATES, SHELTER DOORS OR ON THE OUTDOOR CABINETS	ON THE POLE, NO LESS THAN 3FT BELOW THE ANTENNA AND LESS THAN 9FT ABOVE GROUND	ON BACKSIDE OF ANTENNAS	ENTRANCE GATES, SHELTER DOORS OR ON THE OUTDOOR CABINETS		NOTICE OR CAUTION SIGN AT NO LESS THAN 9FT ABOVE GROUND: ONLY IF THE EXPOSURE EXCEEDS 90% OF THE GENERAL PUBLIC EXPOSURE AT EXPOSURE AT 6FT ABOVE GROUND OR AT OUTSIDE OF SURFACE OF ADJACENT BUILDING	
TOWERS							
AT ALL ACCESS POINTS TO THE ROOF	X			X			
ON ANTENNAS	X		X	X			
CONCEALED ANTENNAS	X	X		X			
ANTENNAS MOUNTED FACING OUTSIDE THE BUILDING	X	X		X			
ANTENNAS ON SUPPORT STRUCTURE	X	X		X			
ROOFVIEW GRAPH							
RADIATION AREA IS WITHIN 3FT FROM ANTENNA	X	ADJACENT TO EACH ANTENNA		X		EITHER NOTICE OR CAUTION SIGN (BASED ON ROOFVIEW RESULTS) AT ANTENNA /BARRIER	
RADIATION AREA IS BEYOND 3FT FROM ANTENNA	X	ADJACENT TO EACH ANTENNA		X	DIAGONAL, YELLOW STRIPING AS TO ROOFVIEW GRAPH		
CHURCH STEEPLES	ACCESS TO STEEPLE	ADJACENT TO ANTENNAS IF ANTENNAS ARE CONCEALED	ON BACKSIDE OF ANTENNAS	ACCESS TO STEEPLE			CAUTION SIGN AT THE ANTENNAS
WATER STATIONS	ACCESS TO LADDER	ADJACENT TO ANTENNAS IF ANTENNAS ARE CONCEALED	ON BACKSIDE OF ANTENNAS	ACCESS TO LADDER			CAUTION SIGN BESIDE INFO SIGN #1, MIN. 9FT ABOVE GROUND

NOTES FOR ROOFTOP SITES:

1. EITHER NOTICE OR CAUTION SIGNS NEED TO BE POSTED AT EACH SECTOR AS CLOSE AS POSSIBLE TO: THE OUTER EDGE OF THE STRIPED OFF AREA OR THE OUTER ANTENNAS OF THE SECTOR
2. IF ROOFVIEWS SHOWS: ONLY BLUE = NOTICE SIGN, BLUE AND YELLOW = CAUTION SIGN, ONLY YELLOW = CAUTION SIGN TO BE INSTALLED
3. SHOULD THE REQUIRED STRIPING AREAS INTERFERE WITH ANY STRUCTURE OR EQUIPMENT (A/C, VENTS, ROOF HATCH, DOORS, OTHER ANTENNAS, DISHES, ETC.). PLEASE NOTIFY AT&T TO MODIFY THE STRIPING AREA, PRIOR TO STARTING THE WORK.

SIGNAGE GUIDELINES CHART

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SHEET NAME
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SHEET NUMBER
SP2

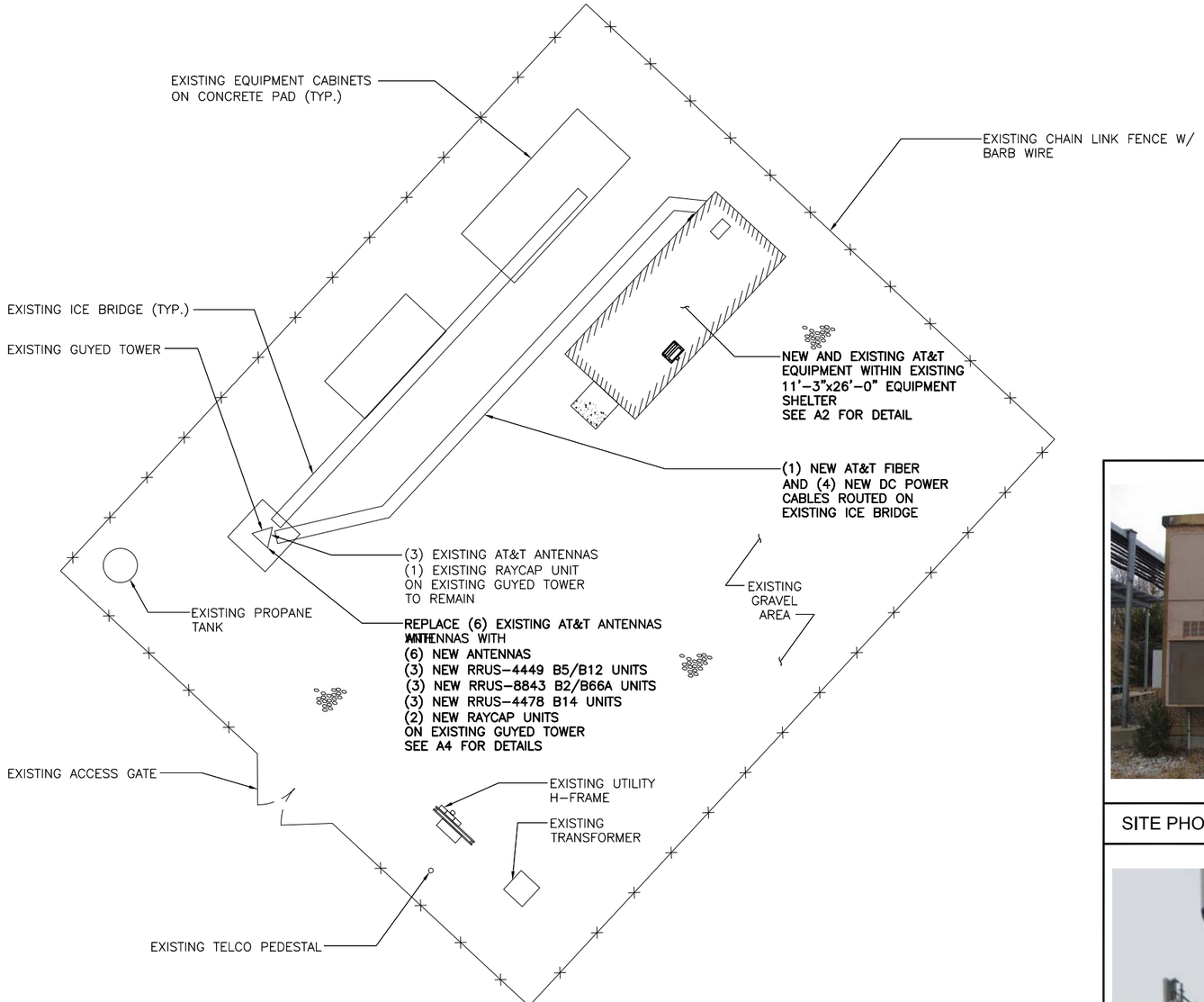
PROJECT# 2018.0171.E080

ABBREVIATIONS

AFF	ABOVE FINISHED FLOOR
AGL	ABOVE GRADE LEVEL
AMSL	ABOVE MEAN SEA LEVEL
APPROX	APPROXIMATE
ATS	AUTOMATIC TRANSFER SWITCH
AWG	AMERICAN WIRE GAUGE
BLDG	BUILDING
BTS	BASE TRANSMISSION STATION
℄	CENTERLINE
CLR	CLEAR
COL	COLUMN
CONC	CONCRETE
CND	CONDUIT
DWG	DRAWING
FT	FOOT(FEET)
EGB	EQUIPMENT GROUND BAR
ELEC	ELECTRICAL
EMT	ELECTRICAL METALLIC TUBING
ELEV	ELEVATION
EQUIP	EQUIPMENT
(E)	EXISTING
EXT	EXTERIOR
FND	FOUNDATION
F	FIBER
FIF	FACILITY INTERFACE FRAME
GA	GAUGE
GALV	GALVANIZED
GPS	GLOBAL POSITIONING SYSTEM
GND	GROUND
GSM	GLOBAL SYSTEM FOR MOBILE COMMUNICATION
LTE	LONG TERM EVOLUTION
MAX	MAXIMUM
MCPA	MULTI-CARRIER POWER AMPLIFIER
MFR	MANUFACTURER
MGB	MASTER GROUND BAR
MIN	MINIMUM
MTS	MANUAL TRANSFER SWITCH
N.T.S.	NOT TO SCALE
O.C.	ON CENTER
OE/OT	OVERHEAD ELECTRIC/TELCO
PPC	POWER PROTECTION CABINET
PL	PROPERY LINE
RBS	RADIO BASED STATION
RET	REMOTE ELECTRIC TILT
RRU	REMOTE RADIO UNIT
RGS	RIGID GALVANIZED STEEL
IN	INCH(ES)
INT	INTERIOR
LB(S), #	POUND(S)
SF	SQUARE FOOT
STL	STEEL
TMA	TOWER MOUNTED AMPLIFIER
TYP	TYPICAL
UE/UT	UNDERGROUND ELECTRIC/TELCO
UNO	UNLESS NOTED OTHERWISE
UMTS	UNIVERSAL MOBILE TELE-COMMUNICATION SYSTEM
VIF	VERIFY IN FIELD
W/	WITH
XFMR	TRANSFORMER

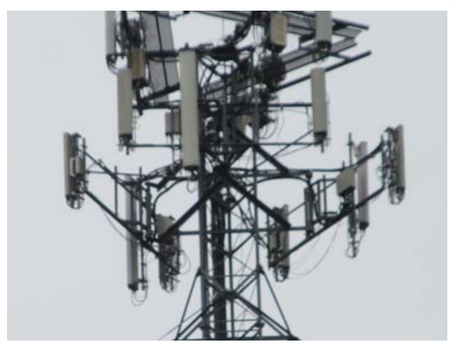
SYMBOLS

- REVISION
- WORK POINT
- UTILITY POLE
- COMPRESSED STONE
- BRICK
- CONCRETE
- EARTH
- GRAVEL
- MASONRY
- STEEL
- CENTERLINE
- PROPERTY LINE
- LEASE LINE
- EASEMENT LINE
- CHAIN LINK FENCE
- WOOD FENCE
- UE — BELOW GRADE ELECTRIC
- UT — BELOW GRADE TELEPHONE
- OE/OT — OVERHEAD ELECTRIC/TELEPHONE
- SECTION REFERENCE (A / S-1)



COMPOUND PLAN — 0 4' 8' 16' 24' — SCALE: 1/16" = 1'-0" | 1

SITE PHOTO 1 — SCALE: N.T.S. | 2



SITE PHOTO 2 — SCALE: N.T.S. | 3

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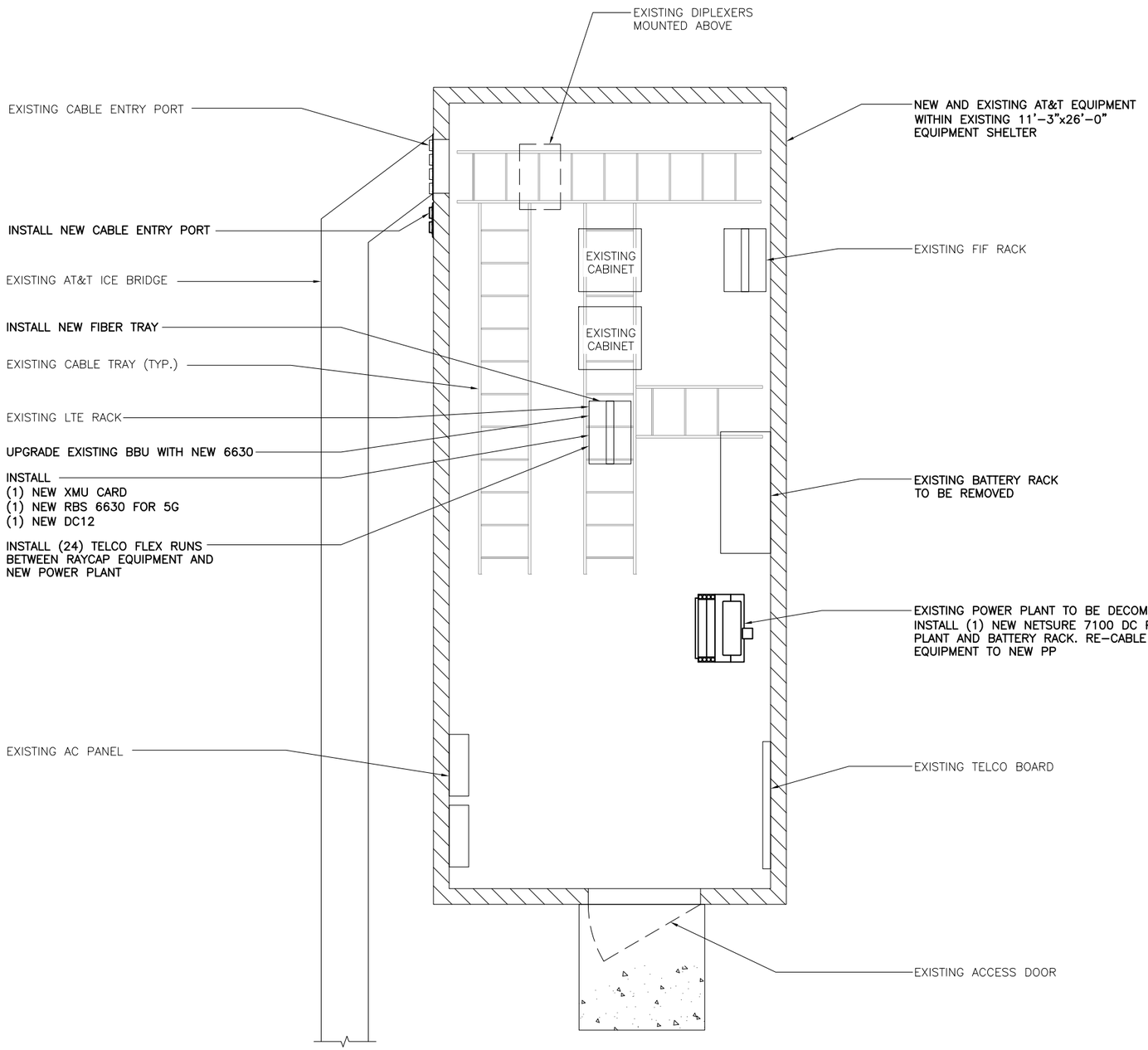
SHEET NAME
COMPOUND PLAN

SHEET NUMBER
A1

PROJECT# 2018.0171.E080



EQUIPMENT PLAN

0 1' 2' 4' 6'

SCALE: 1/4" = 1'-0"

1

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600 OLD HARTFORD ROAD
COLCHESTER, CT 06415

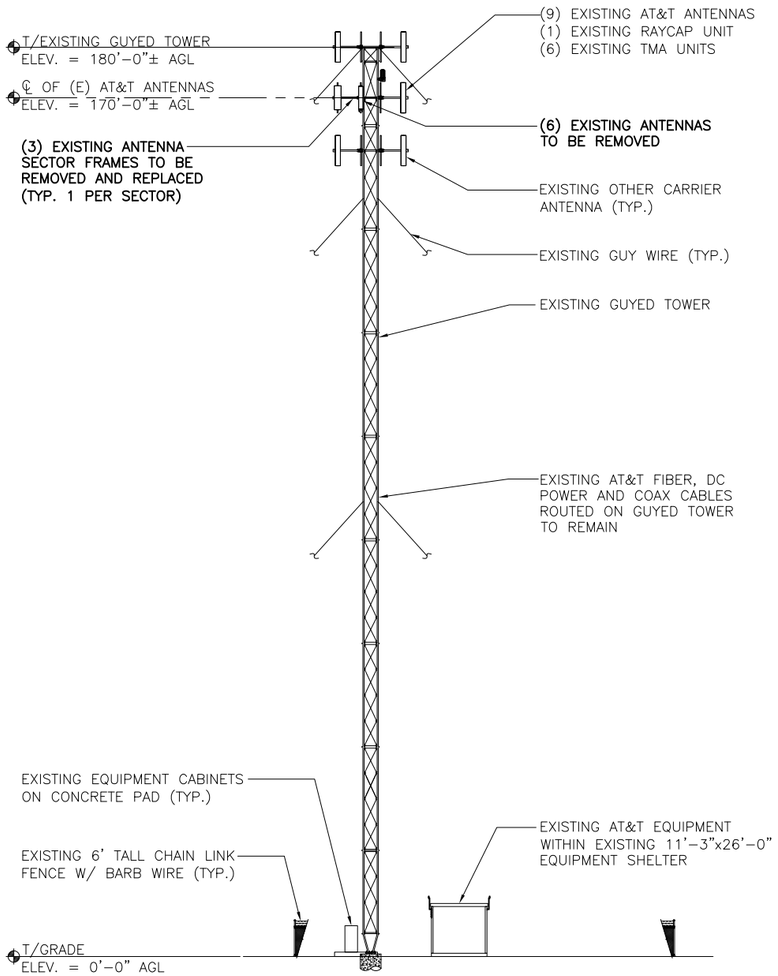
SHEET NAME
EQUIPMENT PLAN

SHEET NUMBER
A2

PROJECT# 2018.0171.E080

NOTES:

1. CALCULATIONS FOR THE STRUCTURE WERE PREPARED BY OTHERS AND THOSE CALCULATIONS CERTIFY THE CAPACITY OF THE STRUCTURE TO SUPPORT THE NEW EQUIPMENT
2. CALCULATIONS FOR THE ANTENNA MOUNTS WERE PREPARED BY FULLERTON AND THOSE CALCULATIONS CERTIFY THE CAPACITY OF THE STRUCTURE TO SUPPORT THE NEW EQUIPMENT
3. CABLES NOT SHOWN FOR CLARITY



EXISTING ELEVATION

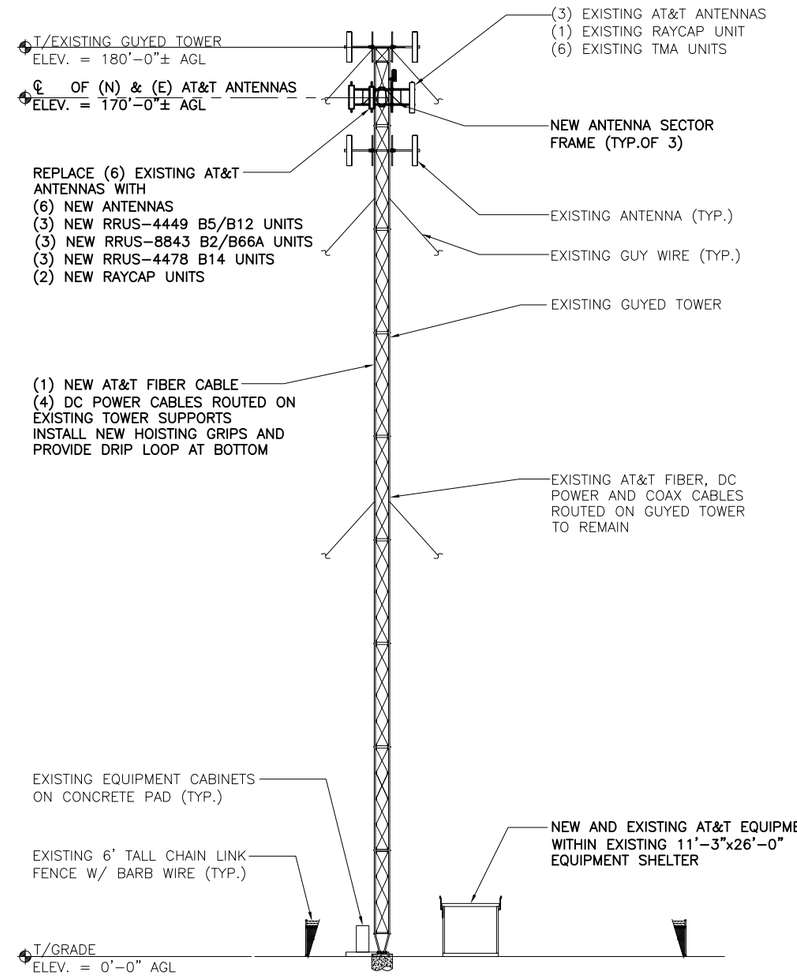
0 15 30 45

SCALE: 1" = 30'-0"

1

NOTES:

1. 3 FEET MINIMUM SEPARATION BETWEEN LTE ANTENNAS
2. 6 FEET MINIMUM SEPARATION BETWEEN 700DE & 700BC



NEW ELEVATION

0 15 30 45

SCALE: 1" = 30'-0"

2

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600 OLD HARTFORD ROAD
COLCHESTER, CT 06415

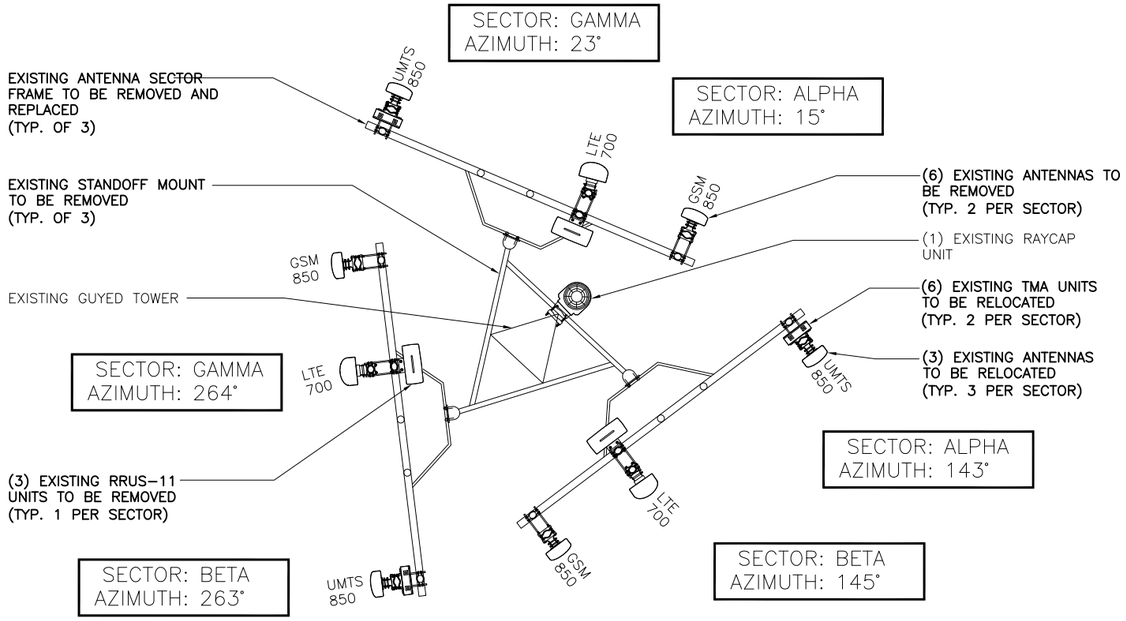
SHEET NAME

ELEVATIONS

SHEET NUMBER

A3

PROJECT# 2018.0171.E080



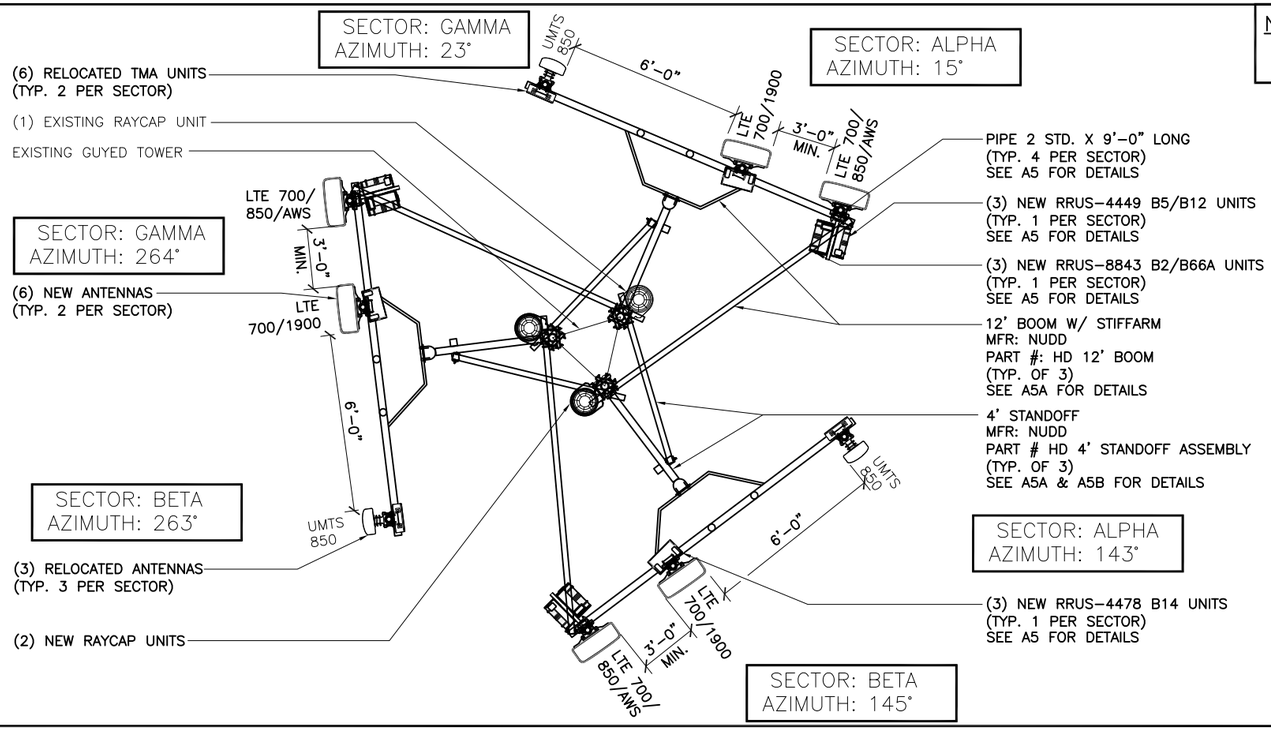
EXISTING ANTENNA PLAN

0 1' 2' 4' 8'

SCALE: 3/16" = 1'-0"

1

NOTES:
1. EXISTING ANTENNA MOUNTING PIPE TO BE REUSED, RELOCATED OR REPLACED AS REQUIRED.



NOTES:
1. 3 FEET MINIMUM SEPARATION BETWEEN LTE ANTENNAS
2. 6 FEET MINIMUM SEPARATION BETWEEN 700DE & 700BC

FINAL ANTENNA PLAN

0 1' 2' 4' 8'

SCALE: 3/16" = 1'-0"

2

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600 OLD HARTFORD ROAD
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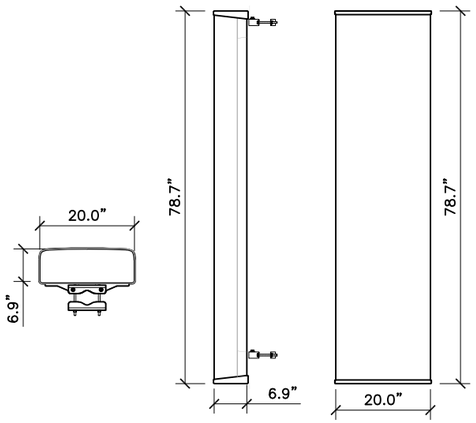
SHEET NAME
ANTENNA PLANS

SHEET NUMBER
A4

PROJECT# 2018.0171.E080

SECTOR BETA



PLAN VIEW SIDE VIEW FRONT VIEW

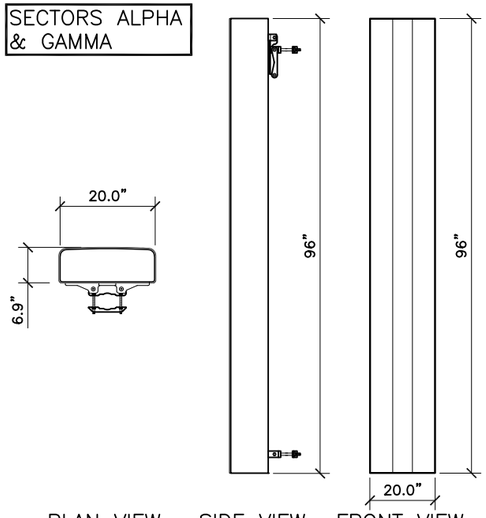
KATHREIN – 80010965

DUAL POLARIZATION – 8–PORT ANTENNA

FREQUENCY RANGE	4 PORT 698–960 MHz 4 PORT 1695–2690 MHz
WEIGHT WITH CLAMPS	108.6 Lbs

ANTENNA SPEC SCALE: N.T.S. 1

SECTORS ALPHA & GAMMA

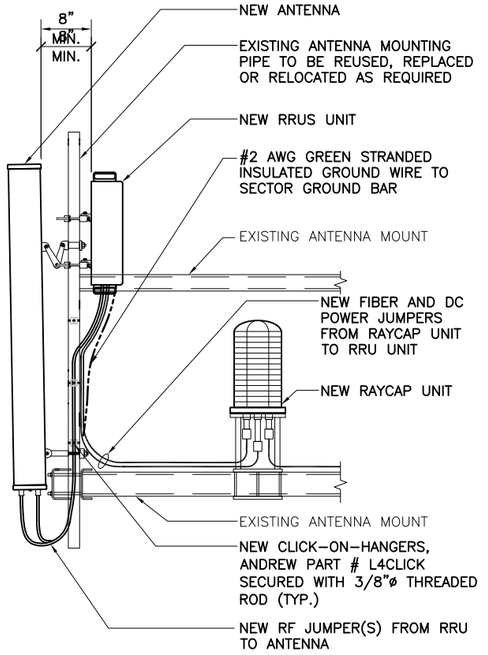


PLAN VIEW SIDE VIEW FRONT VIEW

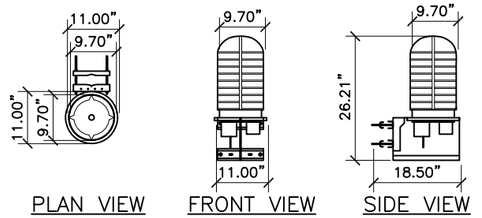
KATHREIN – 80010966

FREQUENCY RANGE	698–806 MHz 791–862 MHz 824–894 MHz 880–960 MHz
ANTENNA (NET WEIGHT)	114.6 Lbs
SIZE	96"x20"x6.9"

ANTENNA SPEC SCALE: N.T.S. 2



ANTENNA SCHEMATIC SCALE: N.T.S. 3



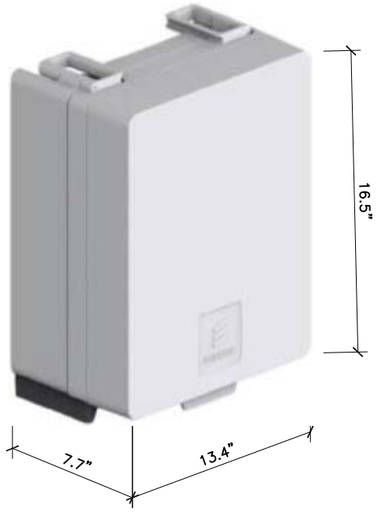
PLAN VIEW FRONT VIEW SIDE VIEW

RAYCAP – DC6–48–60–18–8C–EV

TOWER DC OVER VOLTAGE PROTECTION POWER CONNECTION SOLUTION

UNIT WEIGHT 32.8 Lbs

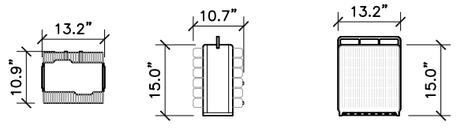
RAYCAP SPEC SCALE: N.T.S. 4



ERICSSON – RRUS 4478 B14

FREQUENCY RANGE	TX 758–768 MHz RX 788–798 MHz
TOTAL WEIGHT	59.9 Lbs

RRU SPEC SCALE: N.T.S. 5



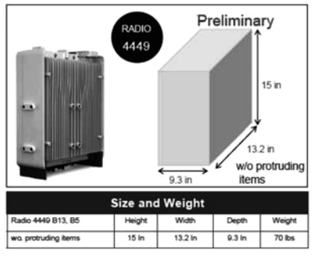
PLAN VIEW SIDE VIEW FRONT VIEW

ERICCSON – RADIO 8843 B2 & B66

DUAL BAND REMOTE RADIO

FREQUENCY B2	UPLINK 1850–1910 MHz DOWNLINK 1930–1990 MHz
FREQUENCY B66	UPLINK 1710–1780 MHz DOWN LINK 2110–2180 MHz
TOTAL WEIGHT	71.9 Lbs

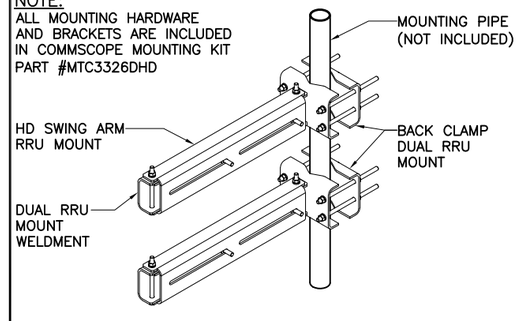
RRU SPEC SCALE: N.T.S. 6



ERICCSON – RADIO 4449

SINGLE BAND B13 AND B5

NOT USED SCALE: N.T.S. 7



RRH MOUNT DETAIL SCALE: N.T.S. 8

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0	12/27/18	90% REVIEW	EB
1	03/22/19	FOR PERMIT	EB
2	04/10/19	FOR CONSTRUCTION	KC
3	07/08/19	MOUNT MODIFICATION	RV

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SITE NAME

COLCHESTER CENTRAL

SITE NUMBER:

CTL02032

SITE ADDRESS

600 OLD HARTFORD ROAD
COLCHESTER, CT 06415

SHEET NAME

EQUIPMENT DETAILS

SHEET NUMBER

A5

PROJECT# 2018.0171.E080

GENERAL NOTES:

1. ALL WELDS SHALL BE 3/16" E70XX FILLET WELDS UNLESS OTHER WISE NOTED.
2. ALL PARTS SHALL BE HOT-DIP GALVANIZED TO ASTM A123.
3. ALL BOLTS SHALL BE A325 HOT-DIP GALVANIZED EXCEPT AT STIFFARM ENDS, WHICH MAY BE A307.
4. ALL U-BOLTS SHALL BE GRADE 5 MATERIAL EQUIVALENT.
5. ALL HOLLOW PARTS SHALL HAVE GALVIZING DRAIN HOLES PROVIDED.
6. 3 X 3 X 3/8 ANGLE IS 50ksi MIN YIELD.
7. ALL PIPE A500 54 ksi MIN YIELD

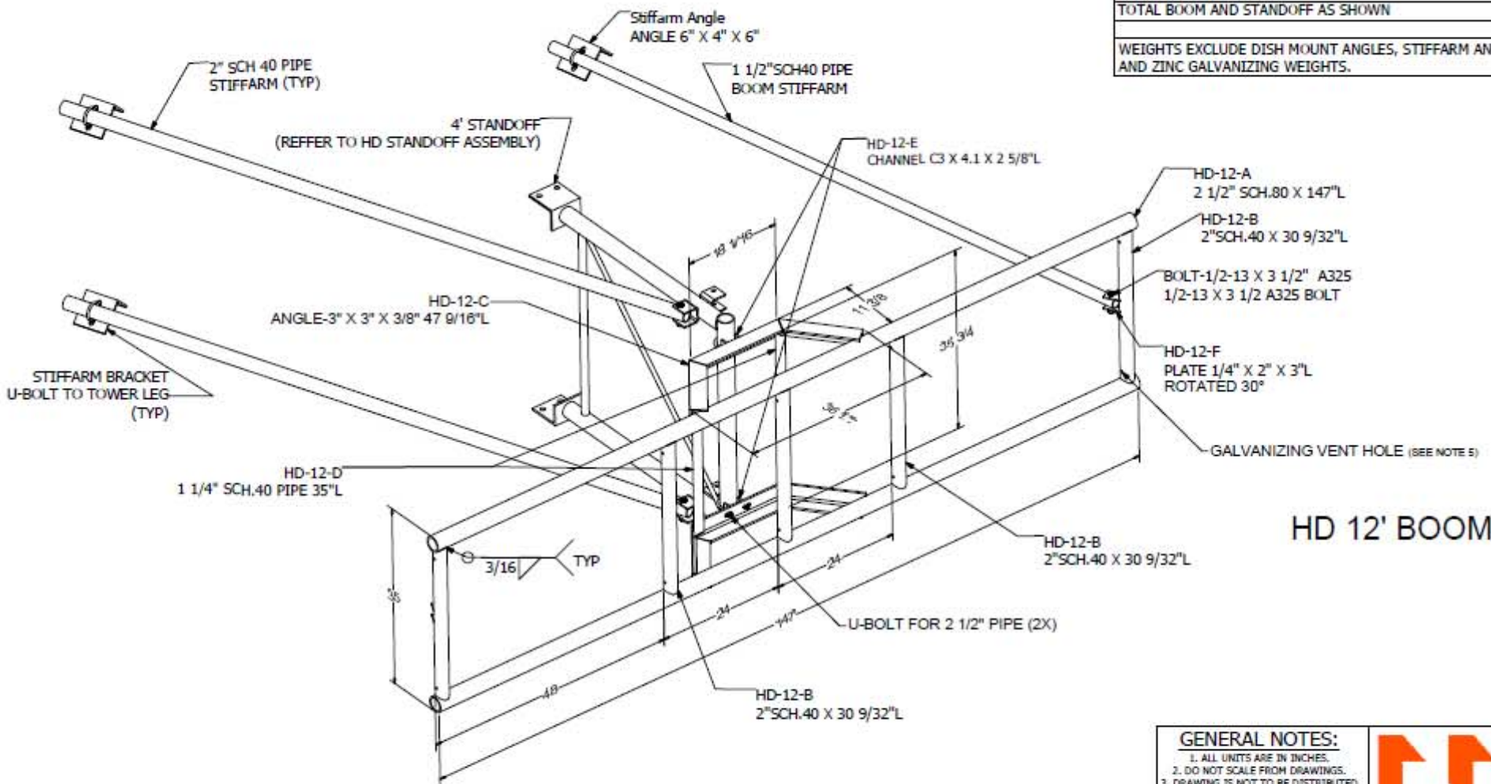
BOOM PART LIST

ITEM	QTY	PART NUMBER	DESCRIPTION	Wgt lbs
1	1	HD-12ft Boom Frame	HD-12' BOOM FRAME WELDMENT	304.1
1.1	2	HD-12-A	2 1/2" SCH.80 X 147"L	93.9
1.2	5	HD-12-B	2"SCH.40 X 30 9/32"L	9
1.3	2	HD-12-C	ANGLE-3" X 3" X 3/8" 47 9/16"L	27.5
1.4	2	HD-12-D	1 1/4" SCH.40 PIPE 35"L	6.3
1.5	2	HD-12-E	CHANNEL C3 X 4.1 X 2 5/8"L	1.1
1.6	4	HD-12-F	PLATE 1/4" X 2" X 3"L	.4
2	2	U-BOLT-FOR 2 1/2in PIPE	U-BOLT FOR 2 1/2" PIPE	.7
3	1	HD 4' Standoff Assembly	4' STANDOFF ASSEMBLY	174.5

STIFFARM REFERENCE

ITEM	QTY	PART NUMBER	DESCRIPTION	LENGTH (in)	Wgt lbs
-	1	STIFFARM	1 1/2 SCH40 10' L	120	28.6
TOTAL STANDOFF AS SHOWN					174.5
TOTAL BOOM AS SHOWN					304.1
TOTAL BOOM AND STANDOFF AS SHOWN					478.6

WEIGHTS EXCLUDE DISH MOUNT ANGLES, STIFFARM ANGLES ON TOWER, FASTENER WEIGHTS, AND ZINC GALVANIZING WEIGHTS.



HD 12' BOOM

GENERAL NOTES:
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2. DO NOT SCALE FROM DRAWINGS.
3. DRAWING IS NOT TO BE DISTRIBUTED OUTSIDE THE FRED A. NUDD CORP.
4. DIMENSIONS REPRESENTED IN CIRCLE ARE FOR REFERENCE ONLY, NOT TO BE USED FOR FABRICATION

DRAWN	E.LaPlant	12/4/2018
CHECKED		
QA		
MFG		
APPROVED		

FRED A. NUDD CORPORATION
1743 ROUTE 104, PO BOX 577, ONTARIO, NEW YORK 14519

TITLE: HD-12ft Boom with 4ft Standoff
HD 12' BOOM DETAILS

SIZE D | DWG NO HD-12ft Boom with 4ft Standoff | REV A
SCALE | JOB #: | SHEET 1 OF 1

SECTOR FRAME SPECS | SCALE: N.T.S. | 1

PROJECT# 2018.0171.E080

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SUITE 550 13 AND 14
FRAMINGHAM, MA 01701

smartlink
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3	07/08/19	MOUNT MODIFICATION	RV

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STATE OF CONNECTICUT
BARBARA T. KOTECKI
33711
LICENSED PROFESSIONAL ENGINEER

SITE NAME
COLCHESTER CENTRAL

SITE NUMBER:
CTL02032

SITE ADDRESS
600 OLD HARTFORD ROAD
COLCHESTER, CT 06415

SHEET NAME
MOUNT MODIFICATION DETAILS

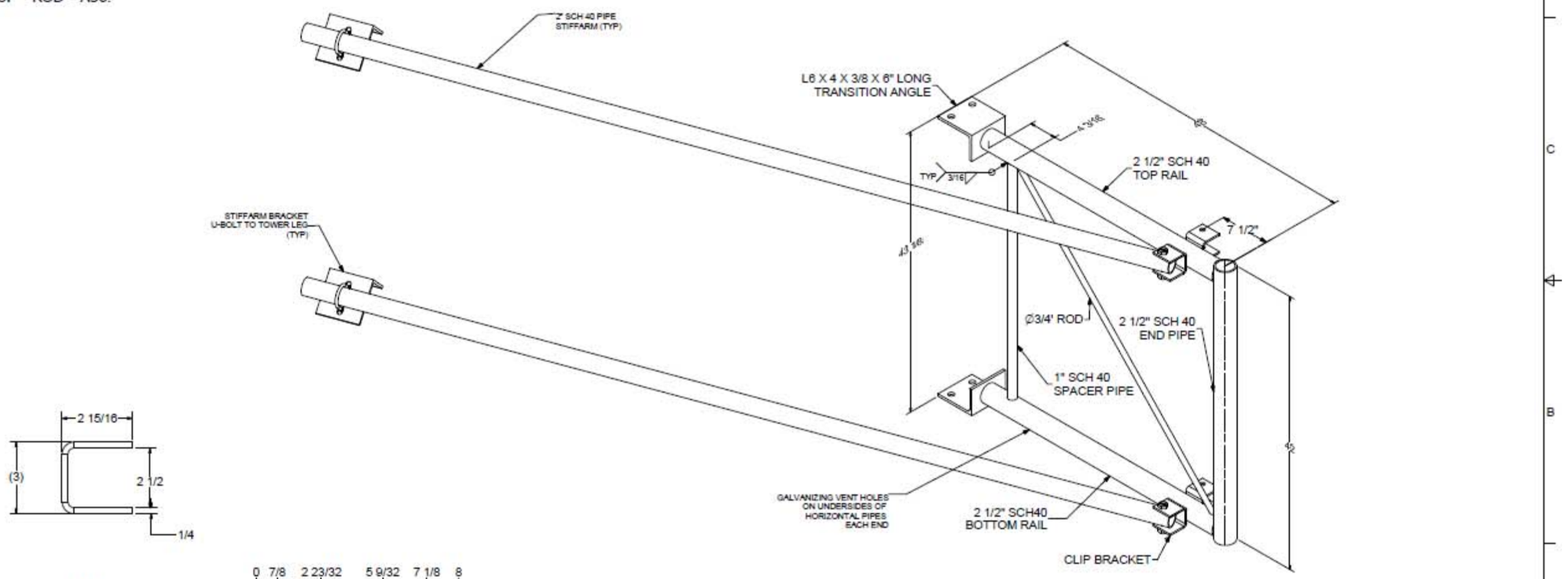
SHEET NUMBER
A5A

GENERAL NOTES:

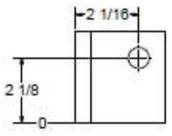
1. ALL WELDS SHALL BE 3/16" E70XX FILLET WELDS UNLESS OTHER WISE NOTED.
2. ALL PARTS SHALL BE HOT-DIP GALVANIZED TO ASTM A123.
3. ALL BOLTS SHALL BE A325 HOT-DIP GALVANIZED EXCEPT AT STIFFARM ENDS, WHICH MAY BE A307.
4. ALL U-BOLTS SHALL BE GRADE 5 MATERIAL EQUIVALENT.
5. ALL HOLLOW PARTS SHALL HAVE GALVIZING DRAIN HOLES PROVIDED.
6. 3 X 3 X 3/8 ANGLE IS 50ksi MIN YIELD.
7. ALL PIPE A500 54 ksi MIN YIELD.
8. ROD =A36.

STANDOFF PARTS LIST

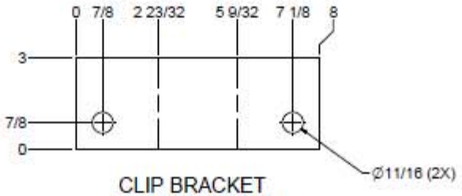
ITEM	QTY	PART NUMBER	DESCRIPTION	LENGTH	Wgt lbs
1	2	Transition Angle	ANGLE-6" X 4" X 3/8"-6"L	6"	6.1
2	2	Rail-Top Bottom with Clip Bracket	RAIL-TOP/BOTTOM with CLIP BRACKETS	41.0781	23
3	1	Standoff End Pipe	2 1/2" SCH40 - 42"L	42"	20.3
4	1	Standoff Spacer	1" SCH.40 - 36 1/4"L	36 1/4"	5.1
5	1	Standoff-Diagonal	3/4" ROD X 50 3/4"L	50 3/4"	6.3
6	2	2in SCH 40 STIFFARM	2" SCH 40 STIFFARM - 120"L	120"	36.5
STIFFARM REFERENCE					
ITEM	QTY	PART NUMBER	DESCRIPTION	LENGTH	Wgt lbs
	2		2" SCH40 PIPE	10'	73
TOTAL STANDOFF AS SHOWN					174.5



4' STANDOFF



CLIP BRACKET
2 REQ'D



CLIP BRACKET
FLAT PATTERN

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DRAWN	B.LaPlant	12/4/2018
CHECKED		
QA		
MFG		
APPROVED		

FRED A. NUDD CORPORATION
1743 ROUTE 104, PO BOX 477, ONTARIO, NEW YORK 14519

TITLE: HD 4' Standoff Assembly
HD STANDOFF DETAILS

SIZE: D | DWG NO: HD 4' Standoff Assembly | REV: A
SCALE | JOB #: | SHEET 1 OF 1

STANDOFF SPEC

SCALE: N.T.S. | 1

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BARBARA T. KOTECKI
33711
PROFESSIONAL ENGINEER

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COLCHESTER CENTRAL

SITE NUMBER:
CTL02032

SITE ADDRESS
600 OLD HARTFORD ROAD
COLCHESTER, CT 06415

SHEET NAME
MOUNT MODIFICATION DETAILS

SHEET NUMBER
A5B

PROJECT# 2018.0171.E080

FINAL ANTENNA CONFIGURATION AND CABLE SCHEDULE
SUPPLIED BY AT&T WIRELESS, FROM RF CONFIG. DATED (12/14/18)

SECTOR	ANTENNA NUMBER	ANTENNA STATUS & TYPE	ANTENNA MODEL NUMBER	ANTENNA VENDOR	TMA/RRU UNIT	AZIMUTH	ANTENNA CL FROM GROUND	CABLE FEEDER TYPE	CABLE FEEDER LENGTH	RAYCAP UNIT
ALPHA	A–1	(E) UMTS DB	7770	POWERWAVE	(2) EXISTING TMA UNITS	143°	170'–0"	(2) 1–5/8"ø LDF7–50A	290'–0"	(1) (E) DC6–48–60–18–8F UNIT (2) (N) DC6–48–60–18–8C–EV UNIT
								(2) 1–5/8"ø LDF7–50A	290'–0"	
	A–2	–	–	–	–	–	–	–	–	
	A–3	(N) LTE 700 B14/PCS	800–10966	KATHRIEN	(1) NEW RRUS–4478 B14	15°	170'–0"	(1) EXISTING FIBER CABLE	290'–0"	
								(2) EXISTING DC POWER CABLES	290'–0"	
	A–4	(N) LTE 700BC 850/AWS	800–10966	KATHRIEN	(1) NEW RRUS–4449 B5/B12 (1) NEW RRUS–8843 B2/B66A	15°	170'–0"	(1) NEW FIBER CABLE	290'–0"	
								(2) NEW DC POWER CABLES	290'–0"	
BETA	B–1	(E) UMTS DB	7770	POWERWAVE	(2) EXISTING TMA UNITS	263°	170'–0"	(2) 1–5/8"ø LDF7–50A	320'–0"	
								(2) 1–5/8"ø LDF7–50A	320'–0"	
	B–2	–	–	–	–	–	–	–	–	
	B–3	(N) LTE 700 B14/PCS	800–10965	KATHRIEN	(1) NEW RRUS–4478 B14	145°	170'–0"	SEE ANTENNA A–3 FOR CABLE TYPE AND LENGTH		
	B–4	(N) LTE 700BC 850/AWS	800–10965	KATHRIEN	(1) NEW RRUS–4449 B5/B12 (1) NEW RRUS–8843 B2/B66A	145°	170'–0"	SEE ANTENNA A–4 FOR FIBER		
								(2) NEW DC POWER CABLES	290'–0"	
GAMMA	C–1	(E) UMTS DB	7770	POWERWAVE	(2) EXISTING TMA UNITS	23°	170'–0"	(2) 1–5/8"ø LDF7–50A	320'–0"	
								(2) 1–5/8"ø LDF7–50A	320'–0"	
	C–2	–	–	–	–	–	–	–	–	
	C–3	(N) LTE 700 B14/PCS	800–10966	KATHRIEN	(1) NEW RRUS–4478 B14	264°	170'–0"	SEE ANTENNA A–3 FOR CABLE TYPE AND LENGTH		
	C–4	(N) LTE 700BC 850/AWS	800–10966	KATHRIEN	(1) NEW RRUS–4449 B5/B12 (1) NEW RRUS–8843 B2/B66A	264°	170'–0"	SEE ANTENNA A–4 FOR CABLE TYPE AND LENGTH		

ANTENNA & CABLE CONFIGURATION

SCALE: N.T.S.

1

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STATE OF CONNECTICUT · HENRY M. BELLAGAMBA · 25358 · LICENSED PROFESSIONAL ENGINEER

SITE NAME
COLCHESTER CENTRAL

SITE NUMBER:
CTL02032

SITE ADDRESS
600 OLD HARTFORD ROAD
COLCHESTER, CT 06415

SHEET NAME
ANTENNA & CABLE CONFIGURATION

SHEET NUMBER
A6

PROJECT# 2018.0171.E080

1. CONTRACTOR IS TO REFER TO AT&T'S MOST CURRENT RADIO FREQUENCY DATA SHEET (RFDS) PRIOR TO CONSTRUCTION.
2. THE SIZE, HEIGHT, AND DIRECTION OF THE ANTENNAS SHALL BE ADJUSTED TO ACHIEVE THE AZIMUTHS SPECIFIED AND LIMIT SHADOWING AND TO MEET THE SYSTEM REQUIREMENTS.
3. CONTRACTOR SHALL VERIFY THE HEIGHT OF THE ANTENNA WITH THE AT&T WIRELESS PROJECT MANAGER.
4. VERIFY TYPE AND SIZE OF TOWER LEG PRIOR TO ORDERING ANY ANTENNA MOUNT.
5. UNLESS NOTED OTHERWISE THE CONTRACTOR MUST PROVIDE ALL MATERIAL NECESSARY.
6. ANTENNA AZIMUTHS ARE DEGREES OFF OF TRUE NORTH, BEARING CLOCKWISE, IN WHICH ANTENNA FACE IS DIRECTED. ALL ANTENNAS (AND SUPPORTING STRUCTURES AS PRACTICAL) SHALL BE ACCURATELY ORIENTED IN THE SPECIFIED DIRECTION.
7. CONTRACTOR SHALL VERIFY ALL RF INFORMATION PRIOR TO CONSTRUCTION.
8. SWEEP TEST SHALL BE PERFORMED BY GENERAL CONTRACTOR AND SUBMITTED TO AT&T WIRELESS CONSTRUCTION SPECIALIST. TEST SHALL BE PERFORMED PER AT&T WIRELESS STANDARDS.
9. CABLE LENGTHS WERE DETERMINED BASED ON THE DESIGN DRAWING. CONTRACTOR TO VERIFY ACTUAL LENGTH DURING PRE-CONSTRUCTION WALK.
10. CONTRACTOR TO USE ROSENBERGER FIBER LINE HANGER COMPONENTS (OR ENGINEER APPROVED EQUAL).

ANTENNA AND CABLING NOTES

SCALE: N.T.S. | 1

RF, DC, & COAX CABLE MARKING LOCATIONS TABLE	
NO	LOCATIONS
1	EACH TOP-JUMPER SHALL BE COLOR CODED WITH (1) SET OF 3" WIDE BANDS.
2	EACH MAIN COAX SHALL BE COLOR CODED WITH (1) SET OF 3" WIDE BANDS NEAR THE TOP-JUMPER CONNECTION AND WITH (1) SET OF 3/4" WIDE COLOR BANDS JUST PRIOR TO ENTERING THE BTS OR TRANSMITTER BUILDING.
3	CABLE ENTRY PORT ON THE INTERIOR OF THE SHELTER.
4	ALL BOTTOM JUMPERS SHALL BE COLOR CODED WITH (1) SET OF 3/4" WIDE BANDS ON EACH END OF THE BOTTOM JUMPER.
5	ALL BOTTOM JUMPERS SHALL BE COLOR CODED WITH (1) SET OF 3/4" WIDE BANDS ON EACH END OF THE BOTTOM JUMPER.

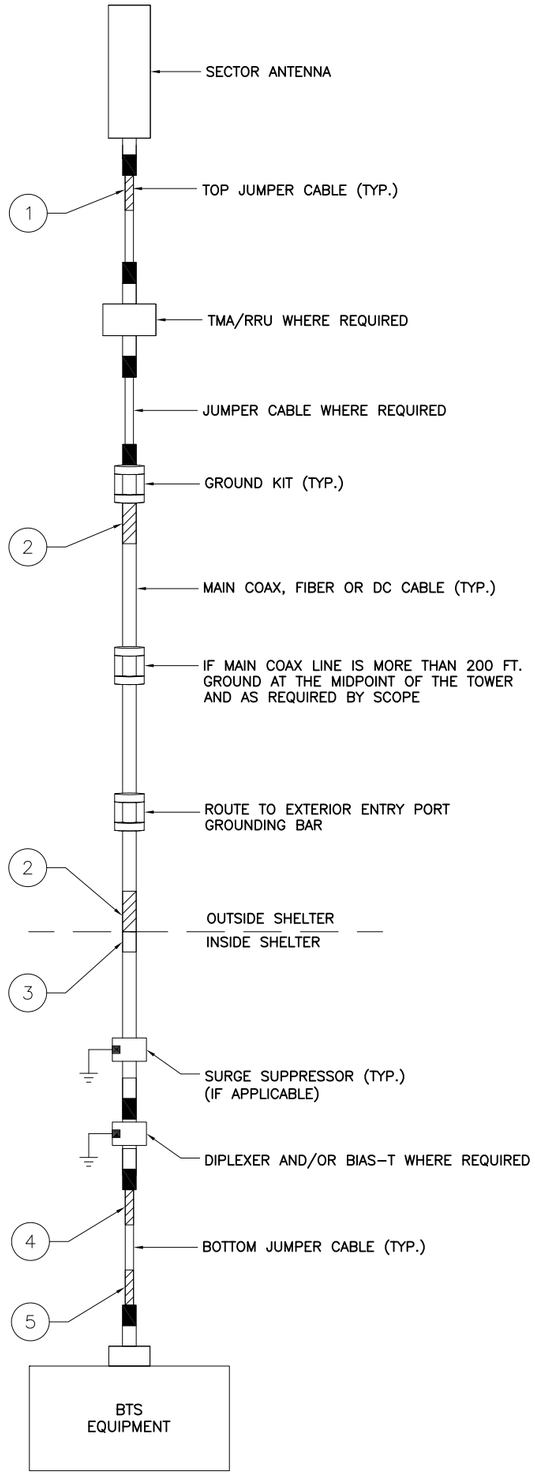
CABLE MARKING DIAGRAM

SCALE: N.T.S. | 2

1. THE ANTENNA SYSTEM COAX SHALL BE LABELED WITH VINYL TAPE.
2. THE STANDARD IS BASED ON EIGHT COLORED TAPES-RED, BLUE, GREEN, YELLOW, ORANGE, BROWN, WHITE, AND VIOLET. THESE TAPES MUST BE 3/4" WIDE & UV RESISTANT SUCH AS SCOTCH 35 VINYL ELECTRICAL COLOR CODING TAPE AND SHOULD BE READILY AVAILABLE TO THE ELECTRICIAN OR CONTRACTOR ON SITE.
3. USING COLOR BANDS ON THE CABLES, MARK ALL RF CABLE BY SECTOR AND CABLE NUMBER AS SHOWN ON "CABLE COLOR CHART".
4. WHEN AN EXISTING COAXIAL LINE THAT IS INTENDED TO BE A SHARED LINE BETWEEN TECHNOLOGIES IS ENCOUNTERED, THE CONTRACTOR SHALL REMOVE THE EXISTING COLOR CODING SCHEME AND REPLACE IT WITH THE COLOR CODING STANDARD. IN THE ABSENCE OF AN EXISTING COLOR CODING AND TAGGING SCHEME, OR WHEN INSTALLING PROPOSED COAXIAL CABLES, THIS GUIDELINE SHALL BE IMPLEMENTED AT THAT SITE REGARDLESS OF TECHNOLOGY.
5. ALL COLOR CODE TAPE SHALL BE 3M-35 AND SHALL BE INSTALLED USING A MINIMUM OF (3) THREE WRAPS OF TAPE AND SHALL BE NEATLY TRIMMED AND SMOOTHED OUT SO AS TO AVOID UNRAVELING.
6. ALL COLOR BANDS INSTALLED AT THE TOP OF THE TOWER SHALL BE A MINIMUM OF 3" WIDE, AND SHALL HAVE A MINIMUM OF 3/4" OF SPACE BETWEEN EACH COLOR.
7. ALL COLOR CODES SHALL BE INSTALLED SO AS TO ALIGN NEATLY WITH ONE ANOTHER FROM SIDE-TO-SIDE.
8. IF EXISTING CABLES AT THE SITE ALREADY HAVE A COLOR CODING SCHEME AND THEY ARE NOT INTENDED TO BE REUSED OR SHARED WITH THE NEW TECHNOLOGY, THE EXISTING COLOR CODING SCHEME SHALL REMAIN UNTOUCHED.

CABLE MARKING NOTES

SCALE: N.T.S. | 3



CABLE COLOR CODING DIAGRAM

SCALE: N.T.S. | 4

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SITE NAME
COLCHESTER CENTRAL

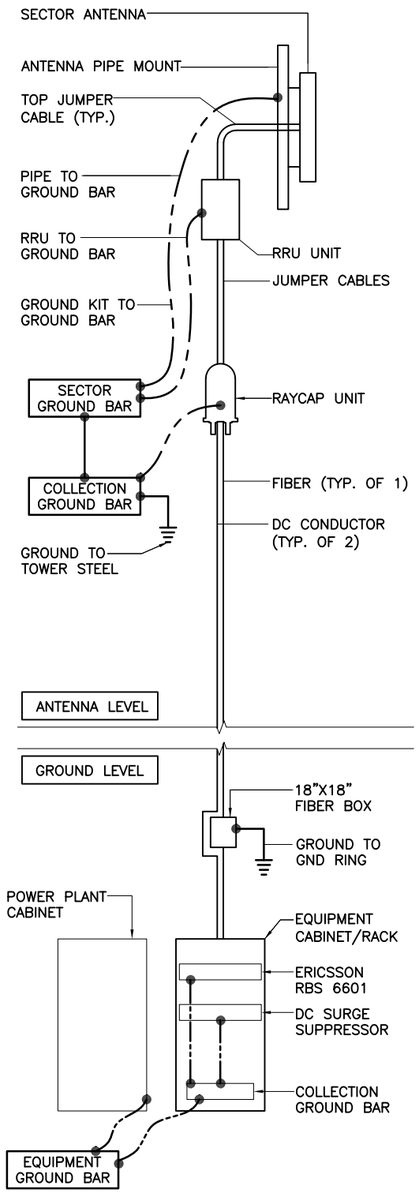
SITE NUMBER:
CTL02032

SITE ADDRESS
600 OLD HARTFORD ROAD
COLCHESTER, CT 06415

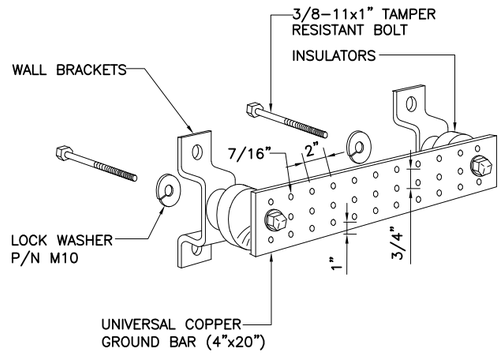
SHEET NAME
CABLE NOTES AND COLOR CODING

SHEET NUMBER
A7

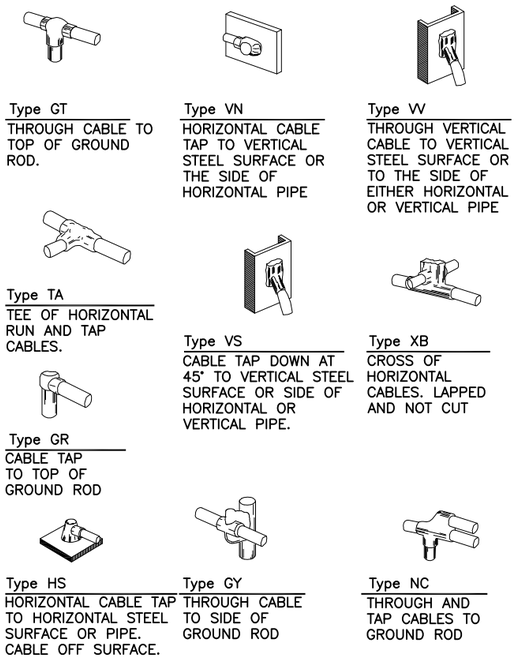
PROJECT# 2018.0171.E080



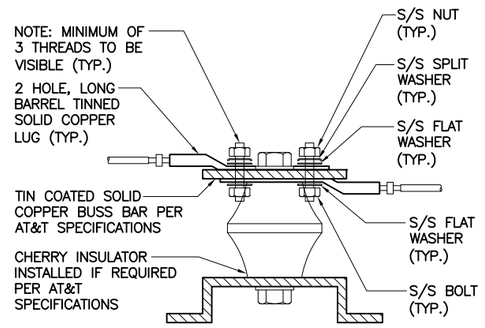
GROUNDING SCHEMATIC SCALE: N.T.S. 1



GROUND BAR DETAIL SCALE: N.T.S. 2



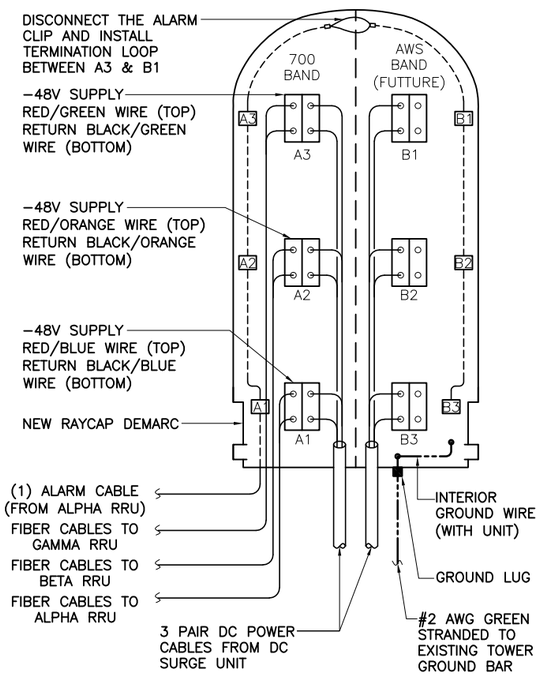
EXOTHERMIC WELD DETAILS SCALE: N.T.S. 4



NOTES:

1. ALL HARDWARE 18-8 STAINLESS STEEL INCLUDING SPLIT WASHERS.
2. COAT WIRE END WITH ANTI-OXIDATION COMPOUND PRIOR TO INSERTION INTO LUG BARREL AND CRIMPING.
3. APPLY ANTI-OXIDATION COMPOUND BETWEEN ALL LUGS AND BUSS BARS PRIOR TO MATING AND BOLTING.

LUG DETAIL SCALE: N.T.S. 3



RAYCAP DC POWER AND ALARM DET. SCALE: N.T.S. 5

NOT USED SCALE: N.T.S. 6

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SITE ADDRESS
600 OLD HARTFORD ROAD
COLCHESTER, CT 06415

SHEET NAME
GROUNDING DETAILS

SHEET NUMBER
A8

PROJECT# 2018.0171.E080

Diagram - Sector A | Diagram File Name - FN_NR_CT2032_A_B_C__5C_R1.2.0.vsd
Atoll Site Name - CTL02032 | Location Name - COLCHESTER CENTRAL | Market - CONNECTICUT | Market Cluster - NEW ENGLAND
Comments: *Important Note: For detailed radio to antenna wiring refer to the latest field notice - Antenna_Radio Connection Drawings Playbook v5.0_Ericsson *

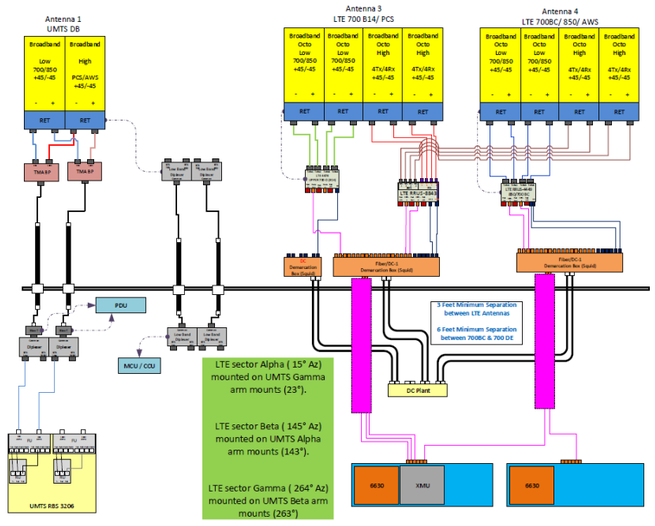


Diagram - Sector B | Diagram File Name - FN_NR_CT2032_A_B_C__5C_R1.2.0.vsd
Atoll Site Name - CTL02032 | Location Name - COLCHESTER CENTRAL | Market - CONNECTICUT | Market Cluster - NEW ENGLAND
Comments: *Important Note: For detailed radio to antenna wiring refer to the latest field notice - Antenna_Radio Connection Drawings Playbook v5.0_Ericsson *

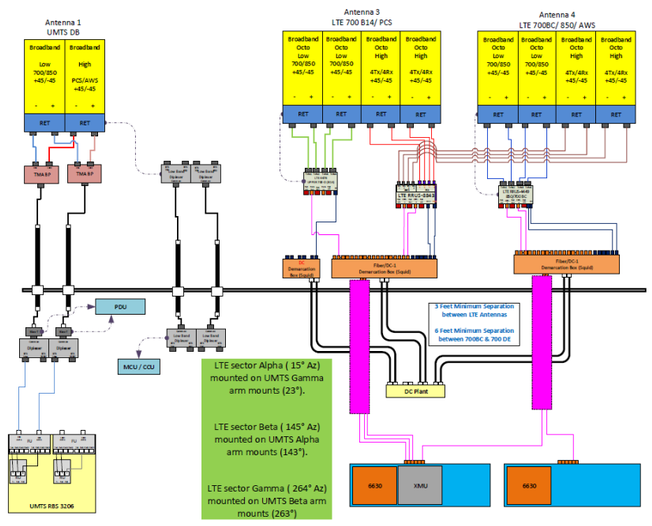
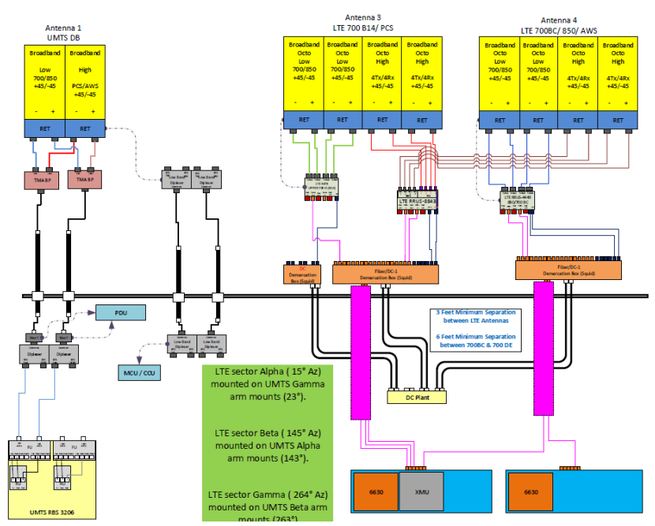


Diagram - Sector C | Diagram File Name - FN_NR_CT2032_A_B_C__5C_R1.2.0.vsd
Atoll Site Name - CTL02032 | Location Name - COLCHESTER CENTRAL | Market - CONNECTICUT | Market Cluster - NEW ENGLAND
Comments: *Important Note: For detailed radio to antenna wiring refer to the latest field notice - Antenna_Radio Connection Drawings Playbook v5.0_Ericsson *



*BASED ON RFDS V2.0, DATED (12/14/18)

PLUMBING DIAGRAMS | SCALE: N.T.S. | 1

at&t
550 COCHITUATE ROAD
SUITE 550 13 AND 14
FRAMINGHAM, MA 01701

smartlink
1362 MELLON ROAD
SUITE 140
HANOVER, MD 21076

FULLERTON ENGINEERING · DESIGN
1100 E. WOODFIELD ROAD, SUITE 500
SCHAUMBURG, ILLINOIS 60173
TEL: 847-908-8400
COA# PEC.0001444
www.FullertonEngineering.com

REV	DATE	DESCRIPTION	BY
0	12/27/18	90% REVIEW	EB
1	03/22/19	FOR PERMIT	EB
2	04/10/19	FOR CONSTRUCTION	KC
3	07/08/19	MOUNT MODIFICATION	RV

I HEREBY CERTIFY THAT THESE DRAWINGS WERE PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND CONTROL, AND TO THE BEST OF MY KNOWLEDGE AND BELIEF COMPLY WITH THE REQUIREMENTS OF ALL APPLICABLE CODES.

SITE NAME
COLCHESTER CENTRAL

SITE NUMBER:
CTL02032

SITE ADDRESS
600 OLD HARTFORD ROAD
COLCHESTER, CT 06415

SHEET NAME
PLUMBING DIAGRAMS

SHEET NUMBER
A9

PROJECT# 2018.0171.E080

FRED A. NUDD CORPORATION

1743 ROUTE 104, BOX 577
ONTARIO, NY 14519
(315) 524-2531 FAX (315) 524-4249

www.nuddtowers.com

Mark LeGault
Cordless Data Transfer, Inc.
600 Old Hartford Road
Colchester, CT 06415
August 12, 2019

Nudd Job Number: 119-23049

Site Location: 600 Old Hartford Road, Colchester, CT 06415, New London County (Latitude and Longitude: 41-35-12, -72-22-40)

Subject: Structural Analysis of an existing 180 ft Guyed Tower

Fred A. Nudd Corporation has completed a three-dimensional, finite element model structural analysis of the above noted guyed tower. This tower was analyzed considered appurtenance loads noted in the appurtenance loading table on the following page. The design loading criteria and strength design are per the TIA/EIA-222-G standard, which is the recommended design standard per the 2015 International Building Code and is the basis of the 2018 Connecticut State Building Code. Tower and foundation dimensions have been taken from original design drawings by Fred A. Nudd Corporation (Drawing Number 00-7265-1 & 00-7265-2, March 10, 2000). Onsite soil conditions were taken from a geotechnical report by Coneco Engineers (dated March 15, 2000). The tower is assumed to be in good, undamaged and equivalent to as new condition and has been maintained / inspected per criteria by TIA-222.

The purpose of this analysis is to determine the structure's ability to support new AT&T equipment installed at a rad center of 170 ft above ground level (AGL). The new equipment to be installed, which includes antennas, and associated hardware are listed on the following page in the appurtenance loading table.

Results of the analysis indicate the tower will be able to the support the design loads noted in the appurtenance loading table on the following page. Specific section design loads, capacities and stress ratios are provided on the following pages. Maximum member usage was found to be 74%.

The tower base foundation and anchors were analyzed considering onsite soil information from the aforementioned geotechnical report. Based on this analysis, the foundation and anchors will be able support the proposed appurtenance loading, in addition to the existing wireless equipment and tower superstructure. Specific design loads, capacities and stress ratios are provided on the following pages.

In conclusion, the tower superstructure and substructure can support the listed existing and proposed appurtenance loading.

We trust this report satisfies your needs. Please contact us with any questions or concerns regarding this report.

Best Regards,
Fred A. Nudd Corporation

Code Design Criteria

TIA/EIA-222-G
Windspeed = 99 mph, V_{asd} / 128 mph, V_{ult}, 3-Second Gust
Radial Ice = 0.75 inch
Ice Windspeed = 50 mph, V_{asd}, 3-Second Gust
Exposure = B
Topographic Category = 1
Structure Class = II
Seismic Accelerations are less than 1.0g, thus seismic loading can be ignored

Appurtenance Loading – Existing / Remaining

Height (ft)	Carrier	Appurtenance	Mount	Coax (in)
180	Sprint	(3) RFS APXV9ERR18-C-A20 (3) Alcatel Lucent 4x45W, 1900 MHz (3) Alcatel Lucent TD-RRH8x200-25 (6) Alcatel Lucent 2x50, 800 MHz (3) Commscope DT465B-2XR	(3) 12 ft Boom / Frame	(4) 1-1/4 Hybrid
150	T-Mobile	(3) RFS APXV18-206516S-C-A20 (3) Commscope LNX-6515DS-A1M (3) TMA	(3) 12 ft Boom / Frame	(12) 1-5/8

- *Height measurement taken as distance from top of base foundation to center of appurtenance.*

Appurtenance Loading – Final Configuration for AT&T

Height (ft)	Carrier	Appurtenance	Mount	Coax (in)
170	AT&T	(3) Powerwave 7770.00 (6) Kathrein 800-10966 (3) Ericsson RRUS 4478 B14 (3) Ericsson 4449 B5/B12 (3) Ericsson RRUS 8843 B2/B66A (6) Powerwave LGP 21401 (6) Powerwave LGP 21901	(3) Nudd NSTD 445 12 ft Booms	(12) 1-1/4 (3) 1.34 Fiber (6) 0.65 DC

- *Height measurement taken as distance from top of base foundation to center of appurtenance.*
- *AT&T's additional coax may be installed alongside or in the same location as their existing coax.*

Maximum Member Usage

Member	Percentage
Leg	69
Diagonal	74
Horizontal	74
Bolts	34
Guys	53
Anchor Rod	56

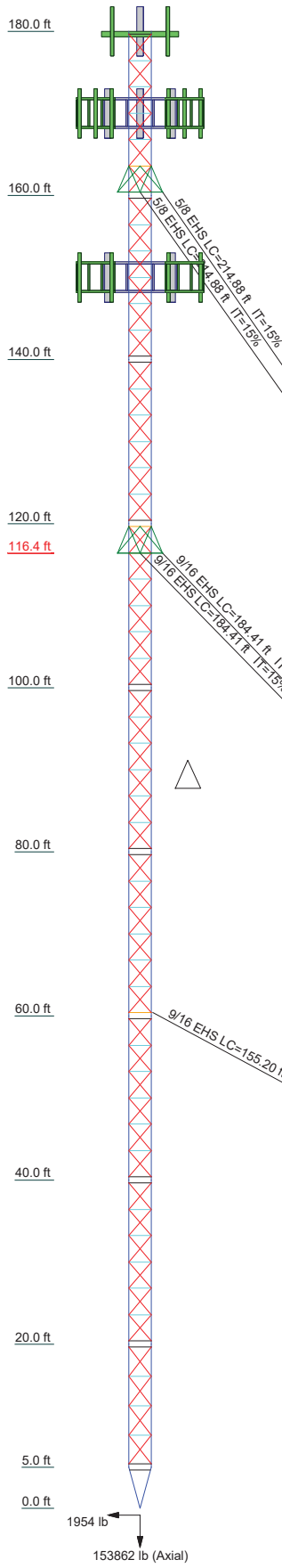
- *Percentage less than 100% denote member stress levels are satisfactory for loading*
- *Percentage greater than 100% indicates member strengthening is required*

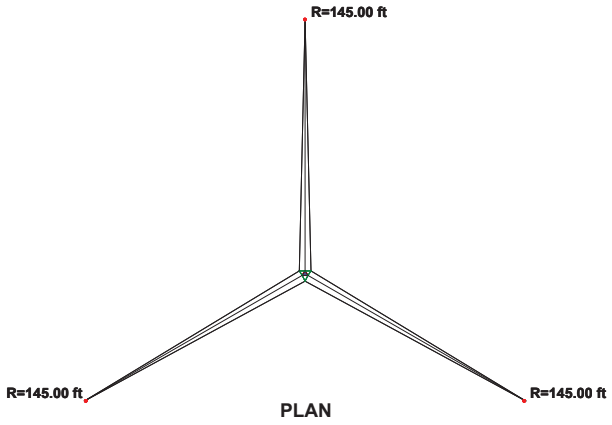
Foundation Usage

Design Load	Capacity (kips)	Analysis (kips)	Percentage
Base Axial	216.0	159.3	74
Anchor Uplift	80.3	33.1	41
Anchor Shear	78.1	38.8	50

- *Percentage less than 100% denote foundation is satisfactory for loading*
- *Percentage greater than 100% indicates foundation analysis is required*

Section	T10	T9	T8	T7	T6	T5	T4	T3	T2	T1
Legs			A500M-63	A500M-60	A500M-63	P2.5x.203	A500M-60	A500M-63	A500M-63	
Leg Grade						SR 5/8				
Diagonals	N.A.									
Diagonal Grade	N.A.					A36				
Top Girts				L1 1/2x1 1/2x3/16			N.A.	L1 1/2x1 1/2x3/16		L1 3/4x1 3/4x3/16
Bottom Girts	N.A.			L1 1/2x1 1/2x3/16	N.A.		L1 1/2x1 1/2x3/16			N.A.
Horizontals	N.A.				L1 1/2x1 1/2x3/16					L1 3/4x1 3/4x3/16
Top Guy Pull-Offs			N.A.		L1 1/2x1 1/2x3/16	N.A.	L1 1/2x1 1/2x3/16		N.A.	L1 1/2x1 1/2x3/16
Bot Guy Pull-Offs				N.A.			L1 1/2x1 1/2x3/16		N.A.	L1 1/2x1 1/2x3/16
Face Width (ft)						48 @ 3.20833				3.5
# Panels @ (ft)	A	4 @ 3.5625								
Weight (lb)	111.2	480.3	658.2	658.2	658.2	658.2	872.6	658.2	658.2	889.4





DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Low Profile Platform (Sprint)	180	Ericsson RRUS 4478 B14 (ATI)	170
RFS APXV9ERR18-C-A20 (Sprint)	180	Ericsson RRUS 4478 B14 (ATI)	170
RFS APXV9ERR18-C-A20 (Sprint)	180	Ericsson RRUS 4478 B14 (ATI)	170
RFS APXV9ERR18-C-A20 (Sprint)	180	Ericsson 4449 B5/B12 (ATI)	170
Commscope DT465B-2XR (Sprint)	180	Ericsson 4449 B5/B12 (ATI)	170
Commscope DT465B-2XR (Sprint)	180	Ericsson 4449 B5/B12 (ATI)	170
Commscope DT465B-2XR (Sprint)	180	Ericsson RRUS 8843 (ATI)	170
Alcatel Lucent 4x45W (Sprint)	180	Ericsson RRUS 8843 (ATI)	170
Alcatel Lucent 4x45W (Sprint)	180	Ericsson RRUS 8843 (ATI)	170
Alcatel Lucent 4x45W (Sprint)	180	(2) Powerwave LGP21901 (ATI)	170
Alcatel Lucent 8x200-25 (Sprint)	180	(2) Powerwave LGP21901 (ATI)	170
Alcatel Lucent 8x200-25 (Sprint)	180	(2) Powerwave LGP21901 (ATI)	170
Alcatel Lucent 8x200-25 (Sprint)	180	Commscope LNX-6515DS-A1M (T-Mobile)	150
(2) Alcatel Lucent 2x50 (Sprint)	180	Commscope LNX-6515DS-A1M (T-Mobile)	150
(2) Alcatel Lucent 2x50 (Sprint)	180	Commscope LNX-6515DS-A1M (T-Mobile)	150
(2) Alcatel Lucent 2x50 (Sprint)	180	TMA (T-Mobile)	150
12 ft Boom / Sector Mount (ATI)	170	TMA (T-Mobile)	150
12 ft Boom / Sector Mount (ATI)	170	TMA (T-Mobile)	150
12 ft Boom / Sector Mount (ATI)	170	RFS APXV18-206516S-C-A20 (T-Mobile)	150
Powerwave 7770.00 (ATI)	170	RFS APXV18-206516S-C-A20 (T-Mobile)	150
Powerwave 7770.00 (ATI)	170	RFS APXV18-206516S-C-A20 (T-Mobile)	150
Powerwave 7770.00 (ATI)	170		
(2) Powerwave LGP21401 (ATI)	170		
(2) Powerwave LGP21401 (ATI)	170		
(2) Powerwave LGP21401 (ATI)	170		
(2) Kathrein 800 10966 (ATI)	170		
(2) Kathrein 800 10966 (ATI)	170		
(2) Kathrein 800 10966 (ATI)	170		

SYMBOL LIST

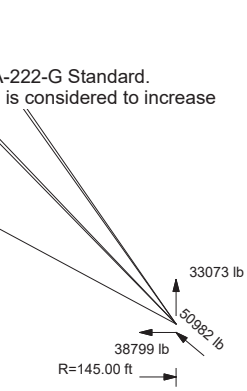
MARK	SIZE	MARK	SIZE
A	1 @ 4.625		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A500M-63	63 ksi	80 ksi	A500M-60	60 ksi	75 ksi
A36	36 ksi	58 ksi			

TOWER DESIGN NOTES

1. Tower is located in New London County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-G Standard.
3. Tower designed for a 99 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. Weld together tower sections have flange connections.
9. TOWER RATING: 78.9%



ALL REACTIONS ARE FACTORED

Fred A. Nudd Corporation
1743 Route 104
Ontario, NY 14519
Phone: 315.524.2531
FAX: 315.524.4249

Job: **119-23049**			
Project: **Colchester, CT**			
Client: CDT	Drawn by: FAN	App'd:	
Code: TIA-222-G	Date: 08/12/19	Scale: NTS	
Path:		Dwg No. E-1	

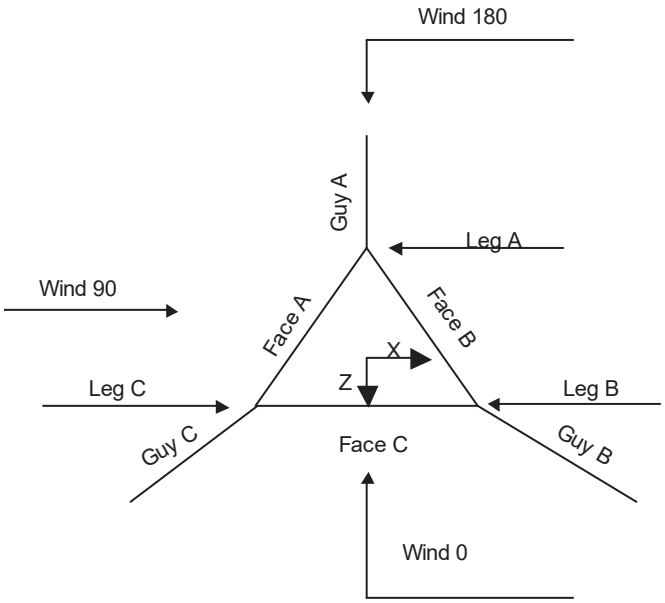
Tower Input Data

The main tower is a 3x guyed 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 3.50 ft at the top and tapered at the base.
This tower is designed using the TIA-222-G standard.
The following design criteria apply:

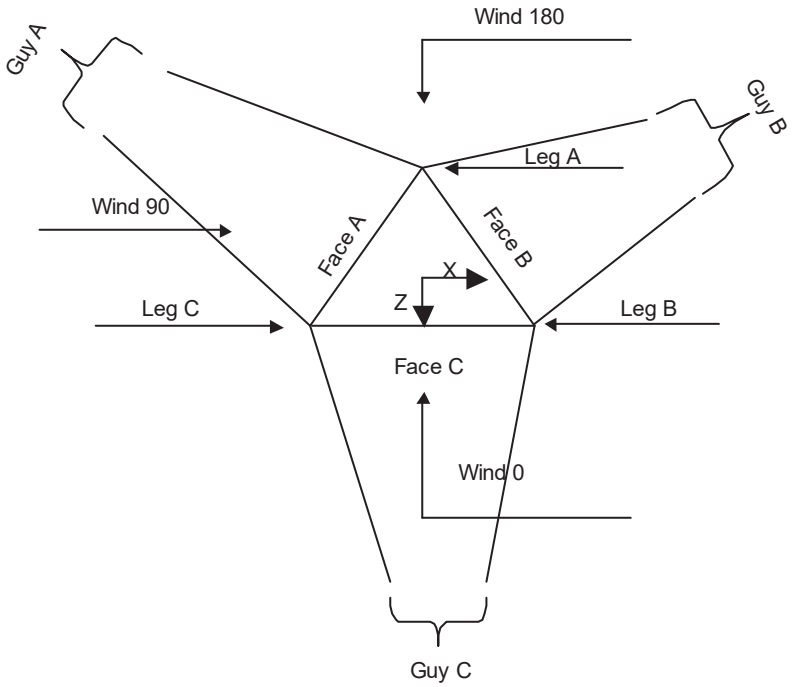
Tower is located in New London County, Connecticut.
Basic wind speed of 99 mph.
Structure Class II.
Exposure Category B.
Topographic Category 1.
Crest Height 0.00 ft.
Nominal ice thickness of 0.7500 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 50 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 60 mph.
Weld together tower sections have flange connections..
Tension only take-up is 0.0313 in.
Pressures are calculated at each section.
Safety factor used in guy design is 1.
Stress ratio used in tower member design is 1.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

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



Corner & Starmount Guyed Tower



Face Guyed

Tower Section Geometry

Tower Section	Tower Elevation	Assembly Database	Description	Section Width	Number of Sections	Section Length
	ft			ft		ft
T1	180.00-160.00			3.50	1	20.00
T2	160.00-140.00			3.50	1	20.00
T3	140.00-120.00			3.50	1	20.00
T4	120.00-100.00			3.50	1	20.00
T5	100.00-80.00			3.50	1	20.00
T6	80.00-60.00			3.50	1	20.00
T7	60.00-40.00			3.50	1	20.00
T8	40.00-20.00			3.50	1	20.00
T9	20.00-5.00			3.50	1	15.00
T10	5.00-0.00			3.50	1	5.00

Tower Section Geometry *(cont'd)*

Tower Section	Tower Elevation ft	Diagonal Spacing ft	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset in	Bottom Girt Offset in
T1	180.00-160.00	3.21	TX Brace	No	Yes	4.5000	4.5000
T2	160.00-140.00	3.21	TX Brace	No	Yes	4.5000	4.5000
T3	140.00-120.00	3.21	TX Brace	No	Yes	4.5000	4.5000
T4	120.00-100.00	3.21	TX Brace	No	Yes	4.5000	4.5000
T5	100.00-80.00	3.21	TX Brace	No	Yes	4.5000	4.5000
T6	80.00-60.00	3.21	TX Brace	No	Yes	4.5000	4.5000
T7	60.00-40.00	3.21	TX Brace	No	Yes	4.5000	4.5000
T8	40.00-20.00	3.21	TX Brace	No	Yes	4.5000	4.5000
T9	20.00-5.00	3.56	TX Brace	No	Yes	4.5000	4.5000
T10	5.00-0.00	4.63	TX Brace	No	Yes	4.5000	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	Pipe	P2.5x.203	A500M-63 (63 ksi)	Solid Round	5/8	A36 (36 ksi)
T2 160.00-140.00	Pipe	P2.5x.203	A500M-63 (63 ksi)	Solid Round	5/8	A36 (36 ksi)
T3 140.00-120.00	Pipe	P2.5x.203	A500M-60 (60 ksi)	Solid Round	5/8	A36 (36 ksi)
T4 120.00-100.00	Pipe	P2.5x.203	A500M-60 (60 ksi)	Solid Round	5/8	A36 (36 ksi)
T5 100.00-80.00	Pipe	P2.5x.203	A500M-63 (63 ksi)	Solid Round	5/8	A36 (36 ksi)
T6 80.00-60.00	Pipe	P2.5x.203	A500M-63 (63 ksi)	Solid Round	5/8	A36 (36 ksi)
T7 60.00-40.00	Pipe	P2.5x.203	A500M-60 (60 ksi)	Solid Round	5/8	A36 (36 ksi)
T8 40.00-20.00	Pipe	P2.5x.203	A500M-63 (63 ksi)	Solid Round	5/8	A36 (36 ksi)
T9 20.00-5.00	Pipe	P2.5x.203	A500M-63 (63 ksi)	Solid Round	5/8	A36 (36 ksi)
T10 5.00-0.00	Pipe	P2.5x.203	A500M-63 (63 ksi)	Solid Round	5/8	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	Equal Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)	Equal Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)
T2 160.00-140.00	Equal Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)	Equal Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)
T3 140.00-120.00	Equal Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)	Equal Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)
T4 120.00-100.00	Equal Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)	Equal Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)
T5 100.00-80.00	Equal Angle	L1 1/2x1 1/2x3/16	A36	Equal Angle	L1 1/2x1 1/2x3/16	A36

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T6 80.00-60.00	Equal Angle	L1 1/2x1 1/2x3/16	(36 ksi) A36 (36 ksi)	Equal Angle	L1 1/2x1 1/2x3/16	(36 ksi) A36 (36 ksi)
T7 60.00-40.00	Equal Angle	L1 1/2x1 1/2x3/16	(36 ksi) A36 (36 ksi)	Equal Angle	L1 1/2x1 1/2x3/16	(36 ksi) A36 (36 ksi)
T8 40.00-20.00	Equal Angle	L1 1/2x1 1/2x3/16	(36 ksi) A36 (36 ksi)	Equal Angle	L1 1/2x1 1/2x3/16	(36 ksi) A36 (36 ksi)
T9 20.00-5.00	Equal Angle	L1 1/2x1 1/2x3/16	(36 ksi) A36 (36 ksi)	Equal Angle	L1 1/2x1 1/2x3/16	(36 ksi) A36 (36 ksi)
T10 5.00-0.00	Equal Angle	L1 1/2x1 1/2x3/16	(36 ksi) A36 (36 ksi)	Equal Angle	L1 1/2x1 1/2x3/16	(36 ksi) A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
T1 180.00-160.00	None	Flat Bar		A36 (36 ksi)	Single Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)
T2 160.00-140.00	None	Flat Bar		A36 (36 ksi)	Single Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)
T3 140.00-120.00	None	Flat Bar		A36 (36 ksi)	Single Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)
T4 120.00-100.00	None	Flat Bar		A36 (36 ksi)	Single Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)
T5 100.00-80.00	None	Flat Bar		A36 (36 ksi)	Single Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)
T6 80.00-60.00	None	Flat Bar		A36 (36 ksi)	Single Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)
T7 60.00-40.00	None	Flat Bar		A36 (36 ksi)	Single Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)
T8 40.00-20.00	None	Flat Bar		A36 (36 ksi)	Single Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)
T9 20.00-5.00	None	Flat Bar		A36 (36 ksi)	Single Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)
T10 5.00-0.00	None	Flat Bar		A36 (36 ksi)	Single Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
T1 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	0.00	0.0000	A36	1	1	1	36.0000	36.0000	36.0000

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals	Double Angle Stitch Bolt Spacing Horizontals	Double Angle Stitch Bolt Spacing Redundants
ft	ft²	in					in	in	in
140.00-120.00			(36 ksi)						
T4	0.00	0.0000	A36	1	1	1	36.0000	36.0000	36.0000
120.00-100.00			(36 ksi)						
T5	0.00	0.0000	A36	1	1	1	36.0000	36.0000	36.0000
100.00-80.00			(36 ksi)						
T6 80.00-60.00	0.00	0.0000	A36	1	1	1	36.0000	36.0000	36.0000
			(36 ksi)						
T7 60.00-40.00	0.00	0.0000	A36	1	1	1	36.0000	36.0000	36.0000
			(36 ksi)						
T8 40.00-20.00	0.00	0.0000	A36	1	1	1	36.0000	36.0000	36.0000
			(36 ksi)						
T9 20.00-5.00	0.00	0.0000	A36	1	1	1	36.0000	36.0000	36.0000
			(36 ksi)						
T10 5.00-0.00	0.00	0.0000	A36	1	1	1	36.0000	36.0000	36.0000
			(36 ksi)						

Tower Section Geometry *(cont'd)*

Tower Elevation	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
ft															
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
120.00-100.00				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
100.00-80.00				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
80.00-60.00				1	1	1	1	1	1	1	1	1	1	1	1
T7	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1
60.00-40.00				1	1	1	1	1	1	1	1	1	1	1	1
T8	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1
40.00-20.00				1	1	1	1	1	1	1	1	1	1	1	1
T9 20.00-5.00	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
T10 5.00-0.00	Yes	Yes	0.33	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		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T1 180.00-160.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	0.75	0.0000	1	0.0000	0.75
T2 160.00-140.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	0.75	0.0000	1	0.0000	0.75
T3 140.00-120.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	0.75	0.0000	1	0.0000	0.75
T4 120.00-100.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	0.75	0.0000	1	0.0000	0.75
T5 100.00-80.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	0.75	0.0000	1	0.0000	0.75
T6 80.00-60.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	0.75	0.0000	1	0.0000	0.75
T7 60.00-40.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	0.75	0.0000	1	0.0000	0.75
T8 40.00-20.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	0.75	0.0000	1	0.0000	0.75
T9 20.00-5.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	0.75	0.0000	1	0.0000	0.75
T10 5.00-0.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	0.75	0.0000	1	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	0.7500 A325N	4	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T2 160.00-140.00	Flange	0.7500 A325N	4	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T3 140.00-120.00	Flange	0.7500 A325N	4	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T4 120.00-100.00	Flange	0.7500 A325N	4	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T5 100.00-80.00	Flange	0.7500 A325N	4	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T6 80.00-60.00	Flange	0.7500 A325N	4	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T7 60.00-40.00	Flange	0.7500 A325N	4	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T8 40.00-20.00	Flange	0.7500 A325N	4	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T9 20.00-5.00	Flange	0.7500 A325N	4	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T10 5.00-0.00	Flange	0.7500 A325N	4	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0

Guy Data

Guy Elevation ft	Guy Grade		Guy Size	Initial Tension lb	%	Guy Modulus ksi	Guy Weight plf	L_u ft	Anchor Radius ft	Anchor Azimuth Adj. °	Anchor Elevation ft	End Fitting Efficiency %
160.375	EHS	A	5/8	6360.00	15%	21000	0.813	214.61	145.00	0.0000	0.00	100%
		B	5/8	6360.00	15%	21000	0.813	214.61	145.00	0.0000	0.00	100%
		C	5/8	6360.00	15%	21000	0.813	214.61	145.00	0.0000	0.00	100%
116.417	EHS	A	9/16	5250.00	15%	21000	0.671	184.18	145.00	0.0000	0.00	100%
		B	9/16	5250.00	15%	21000	0.671	184.18	145.00	0.0000	0.00	100%
		C	9/16	5250.00	15%	21000	0.671	184.18	145.00	0.0000	0.00	100%
60.375	EHS	A	9/16	5250.00	15%	21000	0.671	155.01	145.00	0.0000	0.00	100%
		B	9/16	5250.00	15%	21000	0.671	155.01	145.00	0.0000	0.00	100%
		C	9/16	5250.00	15%	21000	0.671	155.01	145.00	0.0000	0.00	100%

Guy Data *(cont'd)*

Guy Elevation ft	Mount Type	Torque-Arm Spread ft	Torque-Arm Leg Angle °	Torque-Arm Style	Torque-Arm Grade	Torque-Arm Type	Torque-Arm Size
160.375	Torque Arm	7.00	30.0000	Dog Ear	A36 (36 ksi)	Single Angle	L2x2x5/16 L3x3x1/4
116.417	Torque Arm	7.00	30.0000	Dog Ear	A36 (36 ksi)	Single Angle	L2x2x5/16 L3x3x1/4
60.375	Corner						

Guy Data *(cont'd)*

Guy Elevation ft	Diagonal Grade	Diagonal Type	Upper Diagonal Size	Lower Diagonal Size	Is Strap.	Pull-Off Grade	Pull-Off Type	Pull-Off Size
160.38	A572-50 (50 ksi)	Solid Round			No	A36 (36 ksi)	Equal Angle	L1 1/2x1 1/2x3/16
116.42	A572-50 (50 ksi)	Solid Round			No	A36 (36 ksi)	Equal Angle	L1 1/2x1 1/2x3/16
60.38	A572-50 (50 ksi)	Solid Round			No	A36 (36 ksi)	Equal Angle	L1 1/2x1 1/2x3/16

Guy Data *(cont'd)*

Guy Elevation ft	Cable Weight A lb	Cable Weight B lb	Cable Weight C lb	Cable Weight D lb	Tower Intercept A ft	Tower Intercept B ft	Tower Intercept C ft	Tower Intercept D ft
160.375	174.48	174.48	174.48		2.92 2.9 sec/pulse	2.92 2.9 sec/pulse	2.92 2.9 sec/pulse	
116.417	123.58	123.58	123.58		2.15 2.5 sec/pulse	2.15 2.5 sec/pulse	2.15 2.5 sec/pulse	
60.375	104.01	104.01	104.01		1.53 2.1 sec/pulse	1.53 2.1 sec/pulse	1.53 2.1 sec/pulse	

Guy Data *(cont'd)*

Guy Elevation ft	Calc K Single Angles	Calc K Solid Rounds	Torque Arm K_x	Torque Arm K_y	Pull Off K_x	Pull Off K_y	Diagonal K_x	Diagonal K_y
160.375	No	No	1	1	0.65	0.65	1	1
116.417	No	No	1	1	0.65	0.65	1	1
60.375	No	No			0.65	0.65	1	1

Guy Data *(cont'd)*

Guy Elevation ft	Torque-Arm Bolt Size in	Torque-Arm Number	Torque-Arm Net Width Deduct in	Torque-Arm U	Pull Off Bolt Size in	Pull Off Number	Pull Off Net Width Deduct in	Pull Off U	Diagonal Bolt Size in	Diagonal Number	Diagonal Net Width Deduct in	Diagonal U
160.375	0.7500 A325N	2	0.0000	1	0.6250 A325N	0	0.0000	1	0.6250 A325N	0	0.0000	1
116.417	0.7500 A325N	2	0.0000	1	0.6250 A325N	0	0.0000	1	0.6250 A325N	0	0.0000	1
60.375	0.6250 A325N	0	0.0000	0.75	0.6250 A325N	0	0.0000	1	0.6250 A325N	0	0.0000	1

Guy Pressures

Guy Elevation ft	Guy Location	z ft	q_z psf	q_z Ice psf	Ice Thickness in
160.375	A	80.19	20	5	1.6393
	B	80.19	20	5	1.6393
	C	80.19	20	5	1.6393
116.417	A	58.21	18	5	1.5876
	B	58.21	18	5	1.5876
	C	58.21	18	5	1.5876
60.375	A	30.19	15	4	1.4867
	B	30.19	15	4	1.4867
	C	30.19	15	4	1.4867

Guy-Mast Forces (Excluding Wind) - No Ice

Guy Elevation ft	Guy Location	Chord Angle °	Guy Tension Top Bottom lb	F_x lb	F_y lb	F_z lb	M_x lb-ft	M_y lb-ft	M_z lb-ft
160.375	A	48.2735	6490.22 6360.00	-104.64	4882.39	-4274.84	-9865.97	15173.38	-17088.36
	A	48.2735	6490.22	104.64	4882.39	-4274.84	-9865.97	-15173.38	17088.36

Guy Elevation	Guy Location	Chord Angle	Guy Tension Top Bottom lb	F_x	F_y	F_z	M_x	M_y	M_z
ft		°		lb	lb	lb	lb-ft	lb-ft	lb-ft
			6360.00						
	B	48.2735	6490.22	3754.44	4882.39	2046.79	19731.94	15173.38	0.00
			6360.00						
	B	48.2735	6490.22	3649.79	4882.39	2228.04	-9865.97	-15173.38	-17088.36
			6360.00						
	C	48.2735	6490.22	-3649.79	4882.39	2228.04	-9865.97	15173.38	17088.36
			6360.00						
	C	48.2735	6490.22	-3754.44	4882.39	2046.79	19731.94	-15173.38	0.00
			6360.00						
			Sum:	0.00	29294.33	-0.00	-0.00	0.00	0.00
116.417	A	39.1448	5328.01	-100.37	3400.60	-4100.44	-6871.68	14554.35	-11902.11
			5250.00						
	A	39.1448	5328.01	100.37	3400.60	-4100.44	-6871.68	-14554.35	11902.11
			5250.00						
	B	39.1448	5328.01	3601.27	3400.60	1963.29	13743.37	14554.35	0.00
			5250.00						
	B	39.1448	5328.01	3500.89	3400.60	2137.14	-6871.68	-14554.35	-11902.11
			5250.00						
	C	39.1448	5328.01	-3500.89	3400.60	2137.14	-6871.68	14554.35	11902.11
			5250.00						
	C	39.1448	5328.01	-3601.27	3400.60	1963.29	13743.37	-14554.35	0.00
			5250.00						
			Sum:	0.00	20403.61	-0.00	-0.00	0.00	0.00
60.375	A	22.8926	5290.46	0.00	2102.12	-4854.90	-4247.81	0.00	0.00
			5250.00						
	B	22.8926	5290.46	4204.47	2102.12	2427.45	2123.90	0.00	-3678.71
			5250.00						
	C	22.8926	5290.46	-4204.47	2102.12	2427.45	2123.90	-0.00	3678.71
			5250.00						
			Sum:	0.00	6306.36	0.00	0.00	0.00	0.00

Guy-Mast Forces (Excluding Wind) - Ice

Guy Elevation	Guy Location	Chord Angle	Guy Tension Top Bottom lb	F_x	F_y	F_z	M_x	M_y	M_z
ft		°		lb	lb	lb	lb-ft	lb-ft	lb-ft
160.375	A	48.2735	9780.14	-152.09	7551.53	-6213.09	-15259.56	22053.13	-26430.34
			8923.84						
	A	48.2735	9780.14	152.09	7551.53	-6213.09	-15259.56	-22053.13	26430.34
			8923.84						
	B	48.2735	9780.14	5456.74	7551.53	2974.83	30519.13	22053.13	0.00
			8923.84						
	B	48.2735	9780.14	5304.65	7551.53	3238.26	-15259.56	-22053.13	-26430.34
			8923.84						
	C	48.2735	9780.14	-5304.65	7551.53	3238.26	-15259.56	22053.13	26430.34
			8923.84						
	C	48.2735	9780.14	-5456.74	7551.53	2974.83	30519.13	-22053.13	0.00
			8923.84						
			Sum:	0.00	45309.15	0.00	-0.00	0.00	0.00
116.417	A	39.1448	8161.99	-149.36	5419.13	-6101.54	-10950.57	21657.20	-18966.95
			7599.28						
	A	39.1448	8161.99	149.36	5419.13	-6101.54	-10950.57	-21657.20	18966.95

Guy Elevation	Guy Location	Chord Angle	Guy Tension Top Bottom lb	F_x	F_y	F_z	M_x	M_y	M_z
ft		°		lb	lb	lb	lb-ft	lb-ft	lb-ft
			7599.28						
	B	39.1448	8161.99	5358.77	5419.13	2921.42	21901.14	21657.20	0.00
			7599.28						
	B	39.1448	8161.99	5209.41	5419.13	3180.12	-10950.57	-21657.20	-18966.95
			7599.28						
	C	39.1448	8161.99	-5209.41	5419.13	3180.12	-10950.57	21657.20	18966.95
			7599.28						
	C	39.1448	8161.99	-5358.77	5419.13	2921.42	21901.14	-21657.20	0.00
			7599.28						
			Sum:	0.00	32514.76	-0.00	-0.00	0.00	0.00
60.375	A	22.8926	7815.32	0.00	3328.32	-7071.17	-6725.63	0.00	0.00
			7550.50						
	B	22.8926	7815.32	6123.81	3328.32	3535.58	3362.82	0.00	-5824.57
			7550.50						
	C	22.8926	7815.32	-6123.81	3328.32	3535.58	3362.82	-0.00	5824.57
			7550.50						
			Sum:	0.00	9984.97	-0.00	0.00	0.00	0.00

Guy-Mast Forces (Excluding Wind) - Service

Guy Elevation	Guy Location	Chord Angle	Guy Tension Top Bottom lb	F_x	F_y	F_z	M_x	M_y	M_z
ft		°		lb	lb	lb	lb-ft	lb-ft	lb-ft
160.375	A	48.2735	6490.22	-104.64	4882.39	-4274.84	-9865.97	15173.38	-17088.36
			6360.00						
	A	48.2735	6490.22	104.64	4882.39	-4274.84	-9865.97	-15173.38	17088.36
			6360.00						
	B	48.2735	6490.22	3754.44	4882.39	2046.79	19731.94	15173.38	0.00
			6360.00						
	B	48.2735	6490.22	3649.79	4882.39	2228.04	-9865.97	-15173.38	-17088.36
			6360.00						
	C	48.2735	6490.22	-3649.79	4882.39	2228.04	-9865.97	15173.38	17088.36
			6360.00						
	C	48.2735	6490.22	-3754.44	4882.39	2046.79	19731.94	-15173.38	0.00
			6360.00						
			Sum:	0.00	29294.33	-0.00	-0.00	0.00	0.00
116.417	A	39.1448	5328.01	-100.37	3400.60	-4100.44	-6871.68	14554.35	-11902.11
			5250.00						
	A	39.1448	5328.01	100.37	3400.60	-4100.44	-6871.68	-14554.35	11902.11
			5250.00						
	B	39.1448	5328.01	3601.27	3400.60	1963.29	13743.37	14554.35	0.00
			5250.00						
	B	39.1448	5328.01	3500.89	3400.60	2137.14	-6871.68	-14554.35	-11902.11
			5250.00						
	C	39.1448	5328.01	-3500.89	3400.60	2137.14	-6871.68	14554.35	11902.11
			5250.00						
	C	39.1448	5328.01	-3601.27	3400.60	1963.29	13743.37	-14554.35	0.00
			5250.00						
			Sum:	0.00	20403.61	-0.00	-0.00	0.00	0.00
60.375	A	22.8926	5290.46	0.00	2102.12	-4854.90	-4247.81	0.00	0.00
			5250.00						
	B	22.8926	5290.46	4204.47	2102.12	2427.45	2123.90	0.00	-3678.71

Guy Elevation ft	Guy Location	Chord Angle °	Guy Tension Top Bottom lb	F_x lb	F_y lb	F_z lb	M_x lb-ft	M_y lb-ft	M_z lb-ft
	C	22.8926	5250.00 5290.46 5250.00	-4204.47	2102.12	2427.45	2123.90	-0.00	3678.71
			Sum:	0.00	6306.36	0.00	0.00	0.00	0.00

Guy-Tensioning Information

Guy Elevation ft		H ft	V ft	Temperature At Time Of Tensioning: 0 F Initial Tension lb	0 F Intercept ft	20 F Initial Tension lb	20 F Intercept ft	40 F Initial Tension lb	40 F Intercept ft	60 F Initial Tension lb	60 F Intercept ft	80 F Initial Tension lb	80 F Intercept ft	100 F Initial Tension lb	100 F Intercept ft	120 F Initial Tension lb	120 F Intercept ft
160.375	A	143.02	160.38	7202	2.58	6920	2.68	6640	2.80	6360	2.92	6081	3.05	5803	3.20	5526	3.35
	B	143.02	160.38	7202	2.58	6920	2.68	6640	2.80	6360	2.92	6081	3.05	5803	3.20	5526	3.35
	C	143.02	160.38	7202	2.58	6920	2.68	6640	2.80	6360	2.92	6081	3.05	5803	3.20	5526	3.35
116.417	A	143.02	116.42	6193	1.83	5878	1.93	5563	2.03	5250	2.15	4938	2.29	4627	2.44	4319	2.62
	B	143.02	116.42	6193	1.83	5878	1.93	5563	2.03	5250	2.15	4938	2.29	4627	2.44	4319	2.62
	C	143.02	116.42	6193	1.83	5878	1.93	5563	2.03	5250	2.15	4938	2.29	4627	2.44	4319	2.62
60.375	A	142.98	60.38	6582	1.22	6137	1.31	5692	1.41	5250	1.53	4810	1.67	4373	1.84	3942	2.04
	B	142.98	60.38	6582	1.22	6137	1.31	5692	1.41	5250	1.53	4810	1.67	4373	1.84	3942	2.04
	C	142.98	60.38	6582	1.22	6137	1.31	5692	1.41	5250	1.53	4810	1.67	4373	1.84	3942	2.04

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
LDF6-50A (1-1/4 FOAM) (Sprint)	A	No	No	Ar (CaAa)	180.00 - 0.00	0.0000	0.25	4	4	0.5000	1.5500		0.66
Safety Line 3/8	B	No	No	Ar (CaAa)	180.00 - 0.00	0.0000	0.25	1	1	0.5000	0.3750		0.22
LDF6-50A (1-1/4 FOAM) (AT&T)	A	No	No	Ar (CaAa)	170.00 - 0.00	0.0000	-0.25	12	6	0.5000	1.5500		0.66
1.34 in Fiber (AT&T)	A	No	No	Ar (CaAa)	170.00 - 0.00	0.0000	-0.25	3	3	0.5000	1.3400		0.15
0.65 DC (AT&T)	A	No	No	Ar (CaAa)	170.00 - 0.00	0.0000	-0.25	6	6	0.5000	0.6500		0.10
LDF7-50A (1-5/8 FOAM) (T-Mobile)	B	No	No	Ar (CaAa)	150.00 - 0.00	0.0000	0	12	6	0.5000	1.9800		0.82

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
T1	180.00-160.00	A	0.000	0.000	38.920	0.000	142.50
		B	0.000	0.000	0.750	0.000	4.40
		C	0.000	0.000	0.000	0.000	0.00
T2	160.00-140.00	A	0.000	0.000	65.440	0.000	232.20
		B	0.000	0.000	24.510	0.000	102.80
		C	0.000	0.000	0.000	0.000	0.00
T3	140.00-120.00	A	0.000	0.000	65.440	0.000	232.20
		B	0.000	0.000	48.270	0.000	201.20
		C	0.000	0.000	0.000	0.000	0.00
T4	120.00-100.00	A	0.000	0.000	65.440	0.000	232.20
		B	0.000	0.000	48.270	0.000	201.20
		C	0.000	0.000	0.000	0.000	0.00
T5	100.00-80.00	A	0.000	0.000	65.440	0.000	232.20
		B	0.000	0.000	48.270	0.000	201.20
		C	0.000	0.000	0.000	0.000	0.00
T6	80.00-60.00	A	0.000	0.000	65.440	0.000	232.20
		B	0.000	0.000	48.270	0.000	201.20
		C	0.000	0.000	0.000	0.000	0.00
T7	60.00-40.00	A	0.000	0.000	65.440	0.000	232.20
		B	0.000	0.000	48.270	0.000	201.20
		C	0.000	0.000	0.000	0.000	0.00
T8	40.00-20.00	A	0.000	0.000	65.440	0.000	232.20
		B	0.000	0.000	48.270	0.000	201.20
		C	0.000	0.000	0.000	0.000	0.00
T9	20.00-5.00	A	0.000	0.000	49.080	0.000	174.15
		B	0.000	0.000	36.203	0.000	150.90
		C	0.000	0.000	0.000	0.000	0.00
T10	5.00-0.00	A	0.000	0.000	16.360	0.000	58.05
		B	0.000	0.000	12.068	0.000	50.30
		C	0.000	0.000	0.000	0.000	0.00

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
T1	180.00-160.00	A	1.767	0.000	0.000	77.751	0.000	1065.91
		B		0.000	0.000	7.819	0.000	96.90
		C		0.000	0.000	0.000	0.000	0.00
T2	160.00-140.00	A	1.745	0.000	0.000	124.089	0.000	1716.80
		B		0.000	0.000	32.180	0.000	577.07
		C		0.000	0.000	0.000	0.000	0.00
T3	140.00-120.00	A	1.720	0.000	0.000	123.429	0.000	1694.56
		B		0.000	0.000	56.366	0.000	1047.97
		C		0.000	0.000	0.000	0.000	0.00
T4	120.00-100.00	A	1.692	0.000	0.000	122.671	0.000	1669.15
		B		0.000	0.000	56.064	0.000	1034.98
		C		0.000	0.000	0.000	0.000	0.00
T5	100.00-80.00	A	1.658	0.000	0.000	121.779	0.000	1639.39
		B		0.000	0.000	55.708	0.000	1019.76
		C		0.000	0.000	0.000	0.000	0.00
T6	80.00-60.00	A	1.617	0.000	0.000	120.687	0.000	1603.24
		B		0.000	0.000	55.272	0.000	1001.28
		C		0.000	0.000	0.000	0.000	0.00
T7	60.00-40.00	A	1.564	0.000	0.000	119.270	0.000	1556.75
		B		0.000	0.000	54.706	0.000	977.49
		C		0.000	0.000	0.000	0.000	0.00
T8	40.00-20.00	A	1.486	0.000	0.000	117.212	0.000	1490.08

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
		B		0.000	0.000	53.883	0.000	943.38
		C		0.000	0.000	0.000	0.000	0.00
T9	20.00-5.00	A	1.361	0.000	0.000	85.449	0.000	1039.44
		B		0.000	0.000	39.426	0.000	667.55
		C		0.000	0.000	0.000	0.000	0.00
T10	5.00-0.00	A	1.159	0.000	0.000	27.159	0.000	305.79
		B		0.000	0.000	12.609	0.000	201.66
		C		0.000	0.000	0.000	0.000	0.00

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
T1	180.00-160.00	-4.2047	-1.8918	-2.4532	-0.9833
T2	160.00-140.00	-4.7420	-1.8419	-3.6760	-0.9105
T3	140.00-120.00	-3.2321	-2.4811	-2.9990	-1.2994
T4	120.00-100.00	-3.2321	-2.4811	-3.0385	-1.3181
T5	100.00-80.00	-3.2321	-2.4811	-3.0847	-1.3400
T6	80.00-60.00	-3.2321	-2.4811	-3.1407	-1.3668
T7	60.00-40.00	-3.2321	-2.4811	-3.2128	-1.4013
T8	40.00-20.00	-3.2321	-2.4811	-3.3159	-1.4513
T9	20.00-5.00	-3.2600	-2.4965	-3.6010	-1.5779
T10	5.00-0.00	-3.0768	-3.9178	-3.8234	-3.2907

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T1	1	LDF6-50A (1-1/4 FOAM)	160.00 - 180.00	0.6000	0.3843
T1	2	Safety Line 3/8	160.00 - 180.00	0.6000	0.3843
T1	3	LDF6-50A (1-1/4 FOAM)	160.00 - 170.00	0.6000	0.3843
T1	5	1.34 in Fiber	160.00 - 170.00	0.6000	0.3843
T1	6	0.65 DC	160.00 - 170.00	0.6000	0.3843
T2	1	LDF6-50A (1-1/4 FOAM)	140.00 - 160.00	0.6000	0.3932
T2	2	Safety Line 3/8	140.00 - 160.00	0.6000	0.3932
T2	3	LDF6-50A (1-1/4 FOAM)	140.00 - 160.00	0.6000	0.3932
T2	5	1.34 in Fiber	140.00 - 160.00	0.6000	0.3932
T2	6	0.65 DC	140.00 - 160.00	0.6000	0.3932
T2	7	LDF7-50A (1-5/8 FOAM)	140.00 - 150.00	0.6000	0.3932

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T3	1	LDF6-50A (1-1/4 FOAM)	120.00 - 140.00	0.6000	0.3985
T3	2	Safety Line 3/8	120.00 - 140.00	0.6000	0.3985
T3	3	LDF6-50A (1-1/4 FOAM)	120.00 - 140.00	0.6000	0.3985
T3	5	1.34 in Fiber	120.00 - 140.00	0.6000	0.3985
T3	6	0.65 DC	120.00 - 140.00	0.6000	0.3985
T3	7	LDF7-50A (1-5/8 FOAM)	120.00 - 140.00	0.6000	0.3985
T4	1	LDF6-50A (1-1/4 FOAM)	100.00 - 120.00	0.6000	0.4047
T4	2	Safety Line 3/8	100.00 - 120.00	0.6000	0.4047
T4	3	LDF6-50A (1-1/4 FOAM)	100.00 - 120.00	0.6000	0.4047
T4	5	1.34 in Fiber	100.00 - 120.00	0.6000	0.4047
T4	6	0.65 DC	100.00 - 120.00	0.6000	0.4047
T4	7	LDF7-50A (1-5/8 FOAM)	100.00 - 120.00	0.6000	0.4047
T5	1	LDF6-50A (1-1/4 FOAM)	80.00 - 100.00	0.6000	0.4119
T5	2	Safety Line 3/8	80.00 - 100.00	0.6000	0.4119
T5	3	LDF6-50A (1-1/4 FOAM)	80.00 - 100.00	0.6000	0.4119
T5	5	1.34 in Fiber	80.00 - 100.00	0.6000	0.4119
T5	6	0.65 DC	80.00 - 100.00	0.6000	0.4119
T5	7	LDF7-50A (1-5/8 FOAM)	80.00 - 100.00	0.6000	0.4119
T6	1	LDF6-50A (1-1/4 FOAM)	60.00 - 80.00	0.6000	0.4208
T6	2	Safety Line 3/8	60.00 - 80.00	0.6000	0.4208
T6	3	LDF6-50A (1-1/4 FOAM)	60.00 - 80.00	0.6000	0.4208
T6	5	1.34 in Fiber	60.00 - 80.00	0.6000	0.4208
T6	6	0.65 DC	60.00 - 80.00	0.6000	0.4208
T6	7	LDF7-50A (1-5/8 FOAM)	60.00 - 80.00	0.6000	0.4208
T7	1	LDF6-50A (1-1/4 FOAM)	40.00 - 60.00	0.6000	0.4325
T7	2	Safety Line 3/8	40.00 - 60.00	0.6000	0.4325
T7	3	LDF6-50A (1-1/4 FOAM)	40.00 - 60.00	0.6000	0.4325
T7	5	1.34 in Fiber	40.00 - 60.00	0.6000	0.4325
T7	6	0.65 DC	40.00 - 60.00	0.6000	0.4325
T7	7	LDF7-50A (1-5/8 FOAM)	40.00 - 60.00	0.6000	0.4325
T8	1	LDF6-50A (1-1/4 FOAM)	20.00 - 40.00	0.6000	0.4495
T8	2	Safety Line 3/8	20.00 - 40.00	0.6000	0.4495
T8	3	LDF6-50A (1-1/4 FOAM)	20.00 - 40.00	0.6000	0.4495
T8	5	1.34 in Fiber	20.00 - 40.00	0.6000	0.4495
T8	6	0.65 DC	20.00 - 40.00	0.6000	0.4495
T8	7	LDF7-50A (1-5/8 FOAM)	20.00 - 40.00	0.6000	0.4495
T9	1	LDF6-50A (1-1/4 FOAM)	5.00 - 20.00	0.6000	0.4939
T9	2	Safety Line 3/8	5.00 - 20.00	0.6000	0.4939
T9	3	LDF6-50A (1-1/4 FOAM)	5.00 - 20.00	0.6000	0.4939
T9	5	1.34 in Fiber	5.00 - 20.00	0.6000	0.4939
T9	6	0.65 DC	5.00 - 20.00	0.6000	0.4939
T9	7	LDF7-50A (1-5/8 FOAM)	5.00 - 20.00	0.6000	0.4939
T10	1	LDF6-50A (1-1/4 FOAM)	0.00 - 5.00	0.6000	0.4910
T10	2	Safety Line 3/8	0.00 - 5.00	0.6000	0.4910
T10	3	LDF6-50A (1-1/4 FOAM)	0.00 - 5.00	0.6000	0.4910
T10	5	1.34 in Fiber	0.00 - 5.00	0.6000	0.4910
T10	6	0.65 DC	0.00 - 5.00	0.6000	0.4910
T10	7	LDF7-50A (1-5/8 FOAM)	0.00 - 5.00	0.6000	0.4910

Discrete Tower Loads

Description	*Face or Leg*	*Offset Type*	*Offsets: Horz Lateral Vert* *ft* *ft* *ft*	*Azimuth Adjustment* °	*Placement* *ft*		*C_AA_A Front* *ft²*	*C_AA_A Side* *ft²*	*Weight* *lb*
Low Profile Platform	A	None		0.0000	180.00	No Ice	26.30	26.30	1950.00
(Sprint)						1/2" Ice	35.60	35.60	2340.00
						1" Ice	44.90	44.90	2730.00
RFS	A	From Leg	3.00	0.0000	150.00	No Ice	3.62	2.01	18.70
APXV18-206516S-C-A20			0.00			1/2" Ice	4.29	2.72	63.10
(T-Mobile)			0.00			1" Ice	4.97	3.38	125.50
RFS	B	From Leg	3.00	0.0000	150.00	No Ice	3.62	2.01	18.70
APXV18-206516S-C-A20			0.00			1/2" Ice	4.29	2.72	63.10
(T-Mobile)			0.00			1" Ice	4.97	3.38	125.50
RFS	C	From Leg	3.00	0.0000	150.00	No Ice	3.62	2.01	18.70
APXV18-206516S-C-A20			0.00			1/2" Ice	4.29	2.72	63.10
(T-Mobile)			0.00			1" Ice	4.97	3.38	125.50
Commscope	A	From Leg	3.00	0.0000	150.00	No Ice	11.45	7.70	50.30
LNX-6515DS-A1M			0.00			1/2" Ice	12.67	8.99	189.70
(T-Mobile)			0.00			1" Ice	13.89	10.22	360.60
Commscope	B	From Leg	3.00	0.0000	150.00	No Ice	11.45	7.70	50.30
LNX-6515DS-A1M			0.00			1/2" Ice	12.67	8.99	189.70
(T-Mobile)			0.00			1" Ice	13.89	10.22	360.60
Commscope	C	From Leg	3.00	0.0000	150.00	No Ice	11.45	7.70	50.30
LNX-6515DS-A1M			0.00			1/2" Ice	12.67	8.99	189.70
(T-Mobile)			0.00			1" Ice	13.89	10.22	360.60
TMA	A	From Leg	3.00	0.0000	150.00	No Ice	2.06	0.50	22.00
(T-Mobile)			0.00			1/2" Ice	2.39	0.72	49.80
			0.00			1" Ice	2.75	0.97	88.20
TMA	B	From Leg	3.00	0.0000	150.00	No Ice	2.06	0.50	22.00
(T-Mobile)			0.00			1/2" Ice	2.39	0.72	49.80
			0.00			1" Ice	2.75	0.97	88.20
TMA	C	From Leg	3.00	0.0000	150.00	No Ice	2.06	0.50	22.00
(T-Mobile)			0.00			1/2" Ice	2.39	0.72	49.80
			0.00			1" Ice	2.75	0.97	88.20
RFS APXV9ERR18-C-A20	A	From Leg	3.00	0.0000	180.00	No Ice	8.02	5.81	62.00
(Sprint)			0.00			1/2" Ice	8.48	6.27	114.00
			0.00			1" Ice	8.93	6.73	172.10
RFS APXV9ERR18-C-A20	B	From Leg	3.00	0.0000	180.00	No Ice	8.02	5.81	62.00
(Sprint)			0.00			1/2" Ice	8.48	6.27	114.00
			0.00			1" Ice	8.93	6.73	172.10
RFS APXV9ERR18-C-A20	C	From Leg	3.00	0.0000	180.00	No Ice	8.02	5.81	62.00
(Sprint)			0.00			1/2" Ice	8.48	6.27	114.00
			0.00			1" Ice	8.93	6.73	172.10
Commscope DT465B-2XR	A	From Leg	3.00	0.0000	180.00	No Ice	9.22	5.87	50.00
(Sprint)			0.00			1/2" Ice	9.68	6.33	108.00
			0.00			1" Ice	10.14	6.79	172.40
Commscope DT465B-2XR	A	From Leg	3.00	0.0000	180.00	No Ice	9.22	5.87	50.00
(Sprint)			0.00			1/2" Ice	9.68	6.33	108.00
			0.00			1" Ice	10.14	6.79	172.40
Commscope DT465B-2XR	B	From Leg	3.00	0.0000	180.00	No Ice	9.22	5.87	50.00
(Sprint)			0.00			1/2" Ice	9.68	6.33	108.00
			0.00			1" Ice	10.14	6.79	172.40
Alcatel Lucent 4x45W	A	From Leg	3.00	0.0000	180.00	No Ice	2.54	1.61	51.00

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
(Sprint)			0.00				1/2" Ice	2.72	1.78	71.10
			0.00				1" Ice	2.92	1.96	94.30
Alcatel Lucent 4x45W	B	From Leg	3.00		0.0000	180.00	No Ice	2.54	1.61	51.00
(Sprint)			0.00				1/2" Ice	2.72	1.78	71.10
			0.00				1" Ice	2.92	1.96	94.30
Alcatel Lucent 4x45W	C	From Leg	3.00		0.0000	180.00	No Ice	2.54	1.61	51.00
(Sprint)			0.00				1/2" Ice	2.72	1.78	71.10
			0.00				1" Ice	2.92	1.96	94.30
Alcatel Lucent 8x200-25	A	From Leg	3.00		0.0000	180.00	No Ice	4.05	1.53	70.00
(Sprint)			0.00				1/2" Ice	4.27	1.70	97.10
			0.00				1" Ice	4.50	1.88	127.80
Alcatel Lucent 8x200-25	B	From Leg	3.00		0.0000	180.00	No Ice	4.05	1.53	70.00
(Sprint)			0.00				1/2" Ice	4.27	1.70	97.10
			0.00				1" Ice	4.50	1.88	127.80
Alcatel Lucent 8x200-25	C	From Leg	3.00		0.0000	180.00	No Ice	4.05	1.53	70.00
(Sprint)			0.00				1/2" Ice	4.27	1.70	97.10
			0.00				1" Ice	4.50	1.88	127.80
(2) Alcatel Lucent 2x50	A	From Leg	3.00		0.0000	180.00	No Ice	2.27	1.35	42.00
(Sprint)			0.00				1/2" Ice	2.45	1.51	59.30
			0.00				1" Ice	2.64	1.68	79.60
(2) Alcatel Lucent 2x50	B	From Leg	3.00		0.0000	180.00	No Ice	2.27	1.35	42.00
(Sprint)			0.00				1/2" Ice	2.45	1.51	59.30
			0.00				1" Ice	2.64	1.68	79.60
(2) Alcatel Lucent 2x50	C	From Leg	3.00		0.0000	180.00	No Ice	2.27	1.35	42.00
(Sprint)			0.00				1/2" Ice	2.45	1.51	59.30
			0.00				1" Ice	2.64	1.68	79.60
12 ft Boom / Sector Mount	A	From Leg	0.00		0.0000	170.00	No Ice	17.50	8.50	450.00
(AT&T)			0.00				1/2" Ice	22.50	11.00	700.00
			0.00				1" Ice	28.00	14.00	900.00
12 ft Boom / Sector Mount	B	From Leg	0.00		0.0000	170.00	No Ice	17.50	8.50	450.00
(AT&T)			0.00				1/2" Ice	22.50	11.00	700.00
			0.00				1" Ice	28.00	14.00	900.00
12 ft Boom / Sector Mount	C	From Leg	0.00		0.0000	170.00	No Ice	17.50	8.50	450.00
(AT&T)			0.00				1/2" Ice	22.50	11.00	700.00
			0.00				1" Ice	28.00	14.00	900.00
Powerwave 7770.00	A	From Leg	3.00		0.0000	170.00	No Ice	5.51	2.93	35.00
(AT&T)			0.00				1/2" Ice	5.86	3.29	67.60
			0.00				1" Ice	6.21	3.64	105.10
Powerwave 7770.00	B	From Leg	3.00		0.0000	170.00	No Ice	5.51	2.93	35.00
(AT&T)			0.00				1/2" Ice	5.86	3.29	67.60
			0.00				1" Ice	6.21	3.64	105.10
Powerwave 7770.00	C	From Leg	3.00		0.0000	170.00	No Ice	5.51	2.93	35.00
(AT&T)			0.00				1/2" Ice	5.86	3.29	67.60
			0.00				1" Ice	6.21	3.64	105.10
(2) Powerwave LGP21401	A	From Leg	3.00		0.0000	170.00	No Ice	1.67	0.47	31.00
(AT&T)			0.00				1/2" Ice	1.81	0.57	42.00
			0.00				1" Ice	1.96	0.67	55.30
(2) Powerwave LGP21401	B	From Leg	3.00		0.0000	170.00	No Ice	1.67	0.47	31.00
(AT&T)			0.00				1/2" Ice	1.81	0.57	42.00
			0.00				1" Ice	1.96	0.67	55.30
(2) Powerwave LGP21401	C	From Leg	3.00		0.0000	170.00	No Ice	1.67	0.47	31.00
(AT&T)			0.00				1/2" Ice	1.81	0.57	42.00
			0.00				1" Ice	1.96	0.67	55.30
(2) Kathrein 800 10966	A	From Leg	3.00		0.0000	170.00	No Ice	17.36	4.39	125.70
(AT&T)			0.00				1/2" Ice	17.97	5.05	217.90
			0.00				1" Ice	18.58	5.68	318.20
(2) Kathrein 800 10966	B	From Leg	3.00		0.0000	170.00	No Ice	17.36	4.39	125.70

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
(AT&T)			0.00				1/2" Ice	17.97	5.05	217.90
			0.00				1" Ice	18.58	5.68	318.20
(2) Kathrein 800 10966	C	From Leg	3.00		0.0000	170.00	No Ice	17.36	4.39	125.70
(AT&T)			0.00				1/2" Ice	17.97	5.05	217.90
			0.00				1" Ice	18.58	5.68	318.20
Ericsson RRUS 4478 B14	A	From Leg	3.00		0.0000	170.00	No Ice	2.02	1.25	55.00
(AT&T)			0.00				1/2" Ice	2.18	1.38	72.60
			0.00				1" Ice	2.35	1.52	93.00
Ericsson RRUS 4478 B14	B	From Leg	3.00		0.0000	170.00	No Ice	2.02	1.25	55.00
(AT&T)			0.00				1/2" Ice	2.18	1.38	72.60
			0.00				1" Ice	2.35	1.52	93.00
Ericsson RRUS 4478 B14	C	From Leg	3.00		0.0000	170.00	No Ice	2.02	1.25	55.00
(AT&T)			0.00				1/2" Ice	2.18	1.38	72.60
			0.00				1" Ice	2.35	1.52	93.00
Ericsson 4449 B5/B12	A	From Leg	3.00		0.0000	170.00	No Ice	1.65	1.30	20.00
(AT&T)			0.00				1/2" Ice	1.79	1.43	37.20
			0.00				1" Ice	1.94	1.57	57.10
Ericsson 4449 B5/B12	B	From Leg	3.00		0.0000	170.00	No Ice	1.65	1.30	20.00
(AT&T)			0.00				1/2" Ice	1.79	1.43	37.20
			0.00				1" Ice	1.94	1.57	57.10
Ericsson 4449 B5/B12	C	From Leg	3.00		0.0000	170.00	No Ice	1.65	1.30	20.00
(AT&T)			0.00				1/2" Ice	1.79	1.43	37.20
			0.00				1" Ice	1.94	1.57	57.10
Ericsson RRUS 8843	A	From Leg	3.00		0.0000	170.00	No Ice	1.64	1.35	20.00
(AT&T)			0.00				1/2" Ice	1.78	1.48	37.60
			0.00				1" Ice	1.93	1.62	57.90
Ericsson RRUS 8843	B	From Leg	3.00		0.0000	170.00	No Ice	1.64	1.35	20.00
(AT&T)			0.00				1/2" Ice	1.78	1.48	37.60
			0.00				1" Ice	1.93	1.62	57.90
Ericsson RRUS 8843	C	From Leg	3.00		0.0000	170.00	No Ice	1.64	1.35	20.00
(AT&T)			0.00				1/2" Ice	1.78	1.48	37.60
			0.00				1" Ice	1.93	1.62	57.90
(2) Powerwave LGP21901	A	From Leg	3.00		0.0000	170.00	No Ice	0.23	0.11	10.00
(AT&T)			0.00				1/2" Ice	0.29	0.15	12.40
			0.00				1" Ice	0.35	0.20	15.90
(2) Powerwave LGP21901	B	From Leg	3.00		0.0000	170.00	No Ice	0.23	0.11	10.00
(AT&T)			0.00				1/2" Ice	0.29	0.15	12.40
			0.00				1" Ice	0.35	0.20	15.90
(2) Powerwave LGP21901	C	From Leg	3.00		0.0000	170.00	No Ice	0.23	0.11	10.00
(AT&T)			0.00				1/2" Ice	0.29	0.15	12.40
			0.00				1" Ice	0.35	0.20	15.90

Tower Pressures - No Ice

$G_H = 0.850$

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft^2	Face	A_F ft^2	A_R ft^2	A_{leg} ft^2	Leg %	C_AA_A In Face ft^2	C_AA_A Out Face ft^2

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
T1	170.00	1.15	25	74.792	A	3.192	12.348	9.583	61.67	38.920	0.000
180.00-160.00					B	3.192	12.348		61.67	0.750	0.000
					C	3.192	12.348		61.67	0.000	0.000
T2	150.00	1.11	24	74.792	A	2.853	12.348	9.583	63.05	65.440	0.000
160.00-140.00					B	2.853	12.348		63.05	24.510	0.000
					C	2.853	12.348		63.05	0.000	0.000
T3	130.00	1.065	23	74.792	A	2.853	12.348	9.583	63.05	65.440	0.000
140.00-120.00					B	2.853	12.348		63.05	48.270	0.000
					C	2.853	12.348		63.05	0.000	0.000
T4	110.00	1.016	22	74.792	A	2.853	12.348	9.583	63.05	65.440	0.000
120.00-100.00					B	2.853	12.348		63.05	48.270	0.000
					C	2.853	12.348		63.05	0.000	0.000
T5	90.00	0.959	20	74.792	A	2.853	12.348	9.583	63.05	65.440	0.000
100.00-80.00					B	2.853	12.348		63.05	48.270	0.000
					C	2.853	12.348		63.05	0.000	0.000
T6 80.00-60.00	70.00	0.892	19	74.792	A	2.853	12.348	9.583	63.05	65.440	0.000
					B	2.853	12.348		63.05	48.270	0.000
					C	2.853	12.348		63.05	0.000	0.000
T7 60.00-40.00	50.00	0.811	17	74.792	A	2.853	12.348	9.583	63.05	65.440	0.000
					B	2.853	12.348		63.05	48.270	0.000
					C	2.853	12.348		63.05	0.000	0.000
T8 40.00-20.00	30.00	0.701	15	74.792	A	2.853	12.348	9.583	63.05	65.440	0.000
					B	2.853	12.348		63.05	48.270	0.000
					C	2.853	12.348		63.05	0.000	0.000
T9 20.00-5.00	12.50	0.7	15	56.094	A	2.038	9.126	7.188	64.38	49.080	0.000
					B	2.038	9.126		64.38	36.203	0.000
					C	2.038	9.126		64.38	0.000	0.000
T10 5.00-0.00	2.50	0.7	15	10.019	A	0.375	2.584	2.584	87.33	16.360	0.000
					B	0.375	2.584		87.33	12.068	0.000
					C	0.375	2.584		87.33	0.000	0.000

Tower Pressure - With Ice

$G_H = 0.850$

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
T1	170.00	1.15	6	1.7672	80.682	A	3.192	46.484	21.365	43.01	77.751	0.000
180.00-160.00						B	3.192	46.484		43.01	7.819	0.000
						C	3.192	46.484		43.01	0.000	0.000
T2	150.00	1.11	6	1.7452	80.609	A	2.853	46.059	21.218	43.38	124.089	0.000
160.00-140.00						B	2.853	46.059		43.38	32.180	0.000
						C	2.853	46.059		43.38	0.000	0.000
T3	130.00	1.065	6	1.7204	80.526	A	2.853	45.580	21.053	43.47	123.429	0.000
140.00-120.00						B	2.853	45.580		43.47	56.366	0.000
						C	2.853	45.580		43.47	0.000	0.000
T4	110.00	1.016	6	1.6919	80.431	A	2.853	45.030	20.863	43.57	122.671	0.000
120.00-100.00						B	2.853	45.030		43.57	56.064	0.000
						C	2.853	45.030		43.57	0.000	0.000
T5 100.00-80.00	90.00	0.959	5	1.6583	80.319	A	2.853	44.380	20.639	43.70	121.779	0.000
						B	2.853	44.380		43.70	55.708	0.000
						C	2.853	44.380		43.70	0.000	0.000
T6 80.00-60.00	70.00	0.892	5	1.6171	80.182	A	2.853	43.585	20.364	43.85	120.687	0.000
						B	2.853	43.585		43.85	55.272	0.000

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
						C	2.853	43.585		43.85	0.000	0.000
T7 60.00-40.00	50.00	0.811	4	1.5636	80.004	A	2.853	42.552	20.008	44.07	119.270	0.000
						B	2.853	42.552		44.07	54.706	0.000
						C	2.853	42.552		44.07	0.000	0.000
T8 40.00-20.00	30.00	0.701	4	1.4858	79.744	A	2.853	41.048	19.488	44.39	117.212	0.000
						B	2.853	41.048		44.39	53.883	0.000
						C	2.853	41.048		44.39	0.000	0.000
T9 20.00-5.00	12.50	0.7	4	1.3612	59.497	A	2.038	28.074	13.994	46.47	85.449	0.000
						B	2.038	28.074		46.47	39.426	0.000
						C	2.038	28.074		46.47	0.000	0.000
T10 5.00-0.00	2.50	0.7	4	1.1589	11.042	A	0.375	5.246	4.667	83.03	27.159	0.000
						B	0.375	5.246		83.03	12.609	0.000
						C	0.375	5.246		83.03	0.000	0.000

Tower Pressure - Service

$G_H = 0.850$

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
T1	170.00	1.15	9	74.792	A	3.192	12.348	9.583	61.67	38.920	0.000
180.00-160.00					B	3.192	12.348		61.67	0.750	0.000
					C	3.192	12.348		61.67	0.000	0.000
T2	150.00	1.11	9	74.792	A	2.853	12.348	9.583	63.05	65.440	0.000
160.00-140.00					B	2.853	12.348		63.05	24.510	0.000
					C	2.853	12.348		63.05	0.000	0.000
T3	130.00	1.065	8	74.792	A	2.853	12.348	9.583	63.05	65.440	0.000
140.00-120.00					B	2.853	12.348		63.05	48.270	0.000
					C	2.853	12.348		63.05	0.000	0.000
T4	110.00	1.016	8	74.792	A	2.853	12.348	9.583	63.05	65.440	0.000
120.00-100.00					B	2.853	12.348		63.05	48.270	0.000
					C	2.853	12.348		63.05	0.000	0.000
T5	90.00	0.959	8	74.792	A	2.853	12.348	9.583	63.05	65.440	0.000
100.00-80.00					B	2.853	12.348		63.05	48.270	0.000
					C	2.853	12.348		63.05	0.000	0.000
T6 80.00-60.00	70.00	0.892	7	74.792	A	2.853	12.348	9.583	63.05	65.440	0.000
					B	2.853	12.348		63.05	48.270	0.000
					C	2.853	12.348		63.05	0.000	0.000
T7 60.00-40.00	50.00	0.811	6	74.792	A	2.853	12.348	9.583	63.05	65.440	0.000
					B	2.853	12.348		63.05	48.270	0.000
					C	2.853	12.348		63.05	0.000	0.000
T8 40.00-20.00	30.00	0.701	5	74.792	A	2.853	12.348	9.583	63.05	65.440	0.000
					B	2.853	12.348		63.05	48.270	0.000
					C	2.853	12.348		63.05	0.000	0.000
T9 20.00-5.00	12.50	0.7	5	56.094	A	2.038	9.126	7.188	64.38	49.080	0.000
					B	2.038	9.126		64.38	36.203	0.000
					C	2.038	9.126		64.38	0.000	0.000
T10 5.00-0.00	2.50	0.7	5	10.019	A	0.375	2.584	2.584	87.33	16.360	0.000
					B	0.375	2.584		87.33	12.068	0.000
					C	0.375	2.584		87.33	0.000	0.000

Tower Forces - No Ice - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	146.90	674.99	A	0.208	2.57	25	1	1	10.303	1000.13	50.01	A
180.00-160.00		TA 214.38	B	0.208	2.57		1	1	10.303			
			C	0.208	2.57		1	1	10.303			
T2	335.00	658.24	A	0.203	2.585	24	1	1	9.953	1328.21	66.41	A
160.00-140.00			B	0.203	2.585		1	1	9.953			
			C	0.203	2.585		1	1	9.953			
T3	433.40	658.24	A	0.203	2.585	23	1	1	9.953	1375.50	68.78	A
140.00-120.00			B	0.203	2.585		1	1	9.953			
			C	0.203	2.585		1	1	9.953			
T4	433.40	658.24	A	0.203	2.585	22	1	1	9.953	1311.39	65.57	A
120.00-100.00		TA 214.38	B	0.203	2.585		1	1	9.953			
			C	0.203	2.585		1	1	9.953			
T5	433.40	658.24	A	0.203	2.585	20	1	1	9.953	1238.32	61.92	A
100.00-80.00			B	0.203	2.585		1	1	9.953			
			C	0.203	2.585		1	1	9.953			
T6	433.40	658.24	A	0.203	2.585	19	1	1	9.953	1152.52	57.63	A
80.00-60.00			B	0.203	2.585		1	1	9.953			
			C	0.203	2.585		1	1	9.953			
T7	433.40	658.24	A	0.203	2.585	17	1	1	9.953	1046.88	52.34	A
60.00-40.00			B	0.203	2.585		1	1	9.953			
			C	0.203	2.585		1	1	9.953			
T8	433.40	658.24	A	0.203	2.585	15	1	1	9.953	904.71	45.24	A
40.00-20.00			B	0.203	2.585		1	1	9.953			
			C	0.203	2.585		1	1	9.953			
T9 20.00-5.00	325.05	480.27	A	0.199	2.599	15	1	1	7.279	673.15	44.88	A
			B	0.199	2.599		1	1	7.279			
			C	0.199	2.599		1	1	7.279			
T10 5.00-0.00	108.35	111.24	A	0.295	2.309	15	1	1	1.919	200.56	40.11	A
			B	0.295	2.309		1	1	1.919			
			C	0.295	2.309		1	1	1.919			
Sum Weight:	3515.70	6302.97								10231.37		

Tower Forces - No Ice - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	146.90	674.99	A	0.208	2.57	25	0.8	1	9.665	965.91	48.30	B
180.00-160.00		TA 214.38	B	0.208	2.57		0.8	1	9.665			
			C	0.208	2.57		0.8	1	9.665			
T2	335.00	658.24	A	0.203	2.585	24	0.8	1	9.383	1298.54	64.93	B
160.00-140.00			B	0.203	2.585		0.8	1	9.383			
			C	0.203	2.585		0.8	1	9.383			
T3	433.40	658.24	A	0.203	2.585	23	0.8	1	9.383	1347.02	67.35	B
140.00-120.00			B	0.203	2.585		0.8	1	9.383			
			C	0.203	2.585		0.8	1	9.383			
T4	433.40	658.24	A	0.203	2.585	22	0.8	1	9.383	1284.24	64.21	B
120.00-100.00		TA 214.38	B	0.203	2.585		0.8	1	9.383			
			C	0.203	2.585		0.8	1	9.383			
T5	433.40	658.24	A	0.203	2.585	20	0.8	1	9.383	1212.68	60.63	B

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
100.00-80.00			B	0.203	2.585		0.8	1	9.383			
			C	0.203	2.585		0.8	1	9.383			
T6	433.40	658.24	A	0.203	2.585	19	0.8	1	9.383	1128.65	56.43	B
80.00-60.00			B	0.203	2.585		0.8	1	9.383			
			C	0.203	2.585		0.8	1	9.383			
T7	433.40	658.24	A	0.203	2.585	17	0.8	1	9.383	1025.20	51.26	B
60.00-40.00			B	0.203	2.585		0.8	1	9.383			
			C	0.203	2.585		0.8	1	9.383			
T8	433.40	658.24	A	0.203	2.585	15	0.8	1	9.383	885.98	44.30	B
40.00-20.00			B	0.203	2.585		0.8	1	9.383			
			C	0.203	2.585		0.8	1	9.383			
T9 20.00-5.00	325.05	480.27	A	0.199	2.599	15	0.8	1	6.871	659.71	43.98	B
			B	0.199	2.599		0.8	1	6.871			
			C	0.199	2.599		0.8	1	6.871			
T10 5.00-0.00	108.35	111.24	A	0.295	2.309	15	0.8	1	1.844	198.37	39.67	B
			B	0.295	2.309		0.8	1	1.844			
			C	0.295	2.309		0.8	1	1.844			
Sum Weight:	3515.70	6302.97								10006.30		

Tower Forces - No Ice - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	146.90	674.99	A	0.208	2.57	25	0.85	1	9.824	942.41	47.12	C
180.00-160.00		TA 214.38	B	0.208	2.57		0.85	1	9.824			
			C	0.208	2.57		0.85	1	9.824			
T2	335.00	658.24	A	0.203	2.585	24	0.85	1	9.526	1318.93	65.95	C
160.00-140.00			B	0.203	2.585		0.85	1	9.526			
			C	0.203	2.585		0.85	1	9.526			
T3	433.40	658.24	A	0.203	2.585	23	0.85	1	9.526	1438.42	71.92	C
140.00-120.00			B	0.203	2.585		0.85	1	9.526			
			C	0.203	2.585		0.85	1	9.526			
T4	433.40	658.24	A	0.203	2.585	22	0.85	1	9.526	1371.38	68.57	C
120.00-100.00		TA 214.38	B	0.203	2.585		0.85	1	9.526			
			C	0.203	2.585		0.85	1	9.526			
T5	433.40	658.24	A	0.203	2.585	20	0.85	1	9.526	1294.96	64.75	C
100.00-80.00			B	0.203	2.585		0.85	1	9.526			
			C	0.203	2.585		0.85	1	9.526			
T6	433.40	658.24	A	0.203	2.585	19	0.85	1	9.526	1205.24	60.26	C
80.00-60.00			B	0.203	2.585		0.85	1	9.526			
			C	0.203	2.585		0.85	1	9.526			
T7	433.40	658.24	A	0.203	2.585	17	0.85	1	9.526	1094.77	54.74	C
60.00-40.00			B	0.203	2.585		0.85	1	9.526			
			C	0.203	2.585		0.85	1	9.526			
T8	433.40	658.24	A	0.203	2.585	15	0.85	1	9.526	946.10	47.31	C
40.00-20.00			B	0.203	2.585		0.85	1	9.526			
			C	0.203	2.585		0.85	1	9.526			
T9 20.00-5.00	325.05	480.27	A	0.199	2.599	15	0.85	1	6.973	704.61	46.97	C
			B	0.199	2.599		0.85	1	6.973			
			C	0.199	2.599		0.85	1	6.973			
T10 5.00-0.00	108.35	111.24	A	0.295	2.309	15	0.85	1	1.862	212.76	42.55	C
			B	0.295	2.309		0.85	1	1.862			

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
Sum Weight:	3515.70	6302.97	C	0.295	2.309		0.85	1	1.862	10529.60		

Tower Forces - With Ice - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	1162.81	2816.31	A	0.616	1.795	6	1	1	38.232	530.18	26.51	A
180.00-160.00		TA 769.52	B	0.616	1.795		1	1	38.232			
			C	0.616	1.795		1	1	38.232			
T2	2293.87	2719.08	A	0.607	1.8	6	1	1	37.308	623.46	31.17	A
160.00-140.00			B	0.607	1.8		1	1	37.308			
			C	0.607	1.8		1	1	37.308			
T3	2742.53	2673.93	A	0.601	1.803	6	1	1	36.795	622.15	31.11	A
140.00-120.00			B	0.601	1.803		1	1	36.795			
			C	0.601	1.803		1	1	36.795			
T4	2704.13	2622.61	A	0.595	1.807	6	1	1	36.211	591.45	29.57	A
120.00-100.00		TA 738.18	B	0.595	1.807		1	1	36.211			
			C	0.595	1.807		1	1	36.211			
T5	2659.14	2562.85	A	0.588	1.812	5	1	1	35.529	556.62	27.83	A
100.00-80.00			B	0.588	1.812		1	1	35.529			
			C	0.588	1.812		1	1	35.529			
T6	2604.52	2490.82	A	0.579	1.818	5	1	1	34.703	515.96	25.80	A
80.00-60.00			B	0.579	1.818		1	1	34.703			
			C	0.579	1.818		1	1	34.703			
T7	2534.24	2399.07	A	0.568	1.828	4	1	1	33.646	466.26	23.31	A
60.00-40.00			B	0.568	1.828		1	1	33.646			
			C	0.568	1.828		1	1	33.646			
T8	2433.47	2269.35	A	0.551	1.843	4	1	1	32.141	399.98	20.00	A
40.00-20.00			B	0.551	1.843		1	1	32.141			
			C	0.551	1.843		1	1	32.141			
T9 20.00-5.00	1706.99	1497.28	A	0.506	1.892	4	1	1	21.362	297.35	19.82	A
			B	0.506	1.892		1	1	21.362			
			C	0.506	1.892		1	1	21.362			
T10 5.00-0.00	507.45	248.75	A	0.509	1.889	4	1	1	3.994	75.06*	15.01	A
			B	0.509	1.889		1	1	3.994			
			C	0.509	1.889		1	1	3.994			
Sum Weight:	21349.15	23807.75			*2.1A_g limit					4678.47		

Tower Forces - With Ice - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	1162.81	2816.31	A	0.616	1.795	6	0.8	1	37.593	524.09	26.20	B

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
180.00-160.00		TA 769.52	B	0.616	1.795		0.8	1	37.593			
			C	0.616	1.795		0.8	1	37.593			
T2	2293.87	2719.08	A	0.607	1.8	6	0.8	1	36.738	618.19	30.91	B
160.00-140.00			B	0.607	1.8		0.8	1	36.738			
			C	0.607	1.8		0.8	1	36.738			
T3	2742.53	2673.93	A	0.601	1.803	6	0.8	1	36.225	617.08	30.85	B
140.00-120.00			B	0.601	1.803		0.8	1	36.225			
			C	0.601	1.803		0.8	1	36.225			
T4	2704.13	2622.61	A	0.595	1.807	6	0.8	1	35.641	586.61	29.33	B
120.00-100.00		TA 738.18	B	0.595	1.807		0.8	1	35.641			
			C	0.595	1.807		0.8	1	35.641			
T5	2659.14	2562.85	A	0.588	1.812	5	0.8	1	34.958	552.04	27.60	B
100.00-80.00			B	0.588	1.812		0.8	1	34.958			
			C	0.588	1.812		0.8	1	34.958			
T6	2604.52	2490.82	A	0.579	1.818	5	0.8	1	34.133	511.68	25.58	B
80.00-60.00			B	0.579	1.818		0.8	1	34.133			
			C	0.579	1.818		0.8	1	34.133			
T7	2534.24	2399.07	A	0.568	1.828	4	0.8	1	33.076	462.35	23.12	B
60.00-40.00			B	0.568	1.828		0.8	1	33.076			
			C	0.568	1.828		0.8	1	33.076			
T8	2433.47	2269.35	A	0.551	1.843	4	0.8	1	31.571	396.57	19.83	B
40.00-20.00			B	0.551	1.843		0.8	1	31.571			
			C	0.551	1.843		0.8	1	31.571			
T9 20.00-5.00	1706.99	1497.28	A	0.506	1.892	4	0.8	1	20.954	294.86	19.66	B
			B	0.506	1.892		0.8	1	20.954			
			C	0.506	1.892		0.8	1	20.954			
T10 5.00-0.00	507.45	248.75	A	0.509	1.889	4	0.8	1	3.919	75.06*	15.01	B
			B	0.509	1.889		0.8	1	3.919			
			C	0.509	1.889		0.8	1	3.919			
Sum Weight:	21349.15	23807.75			*2.1A_g limit					4638.52		

Tower Forces - With Ice - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	1162.81	2816.31	A	0.616	1.795	6	0.85	1	37.753	512.52	25.63	C
180.00-160.00		TA 769.52	B	0.616	1.795		0.85	1	37.753			
			C	0.616	1.795		0.85	1	37.753			
T2	2293.87	2719.08	A	0.607	1.8	6	0.85	1	36.880	613.92	30.70	C
160.00-140.00			B	0.607	1.8		0.85	1	36.880			
			C	0.607	1.8		0.85	1	36.880			
T3	2742.53	2673.93	A	0.601	1.803	6	0.85	1	36.368	625.09	31.25	C
140.00-120.00			B	0.601	1.803		0.85	1	36.368			
			C	0.601	1.803		0.85	1	36.368			
T4	2704.13	2622.61	A	0.595	1.807	6	0.85	1	35.783	594.34	29.72	C
120.00-100.00		TA 738.18	B	0.595	1.807		0.85	1	35.783			
			C	0.595	1.807		0.85	1	35.783			
T5	2659.14	2562.85	A	0.588	1.812	5	0.85	1	35.101	559.45	27.97	C
100.00-80.00			B	0.588	1.812		0.85	1	35.101			
			C	0.588	1.812		0.85	1	35.101			
T6	2604.52	2490.82	A	0.579	1.818	5	0.85	1	34.275	518.71	25.94	C

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
80.00-60.00			B	0.579	1.818		0.85	1	34.275			
			C	0.579	1.818		0.85	1	34.275			
T7	2534.24	2399.07	A	0.568	1.828	4	0.85	1	33.218	468.89	23.44	C
60.00-40.00			B	0.568	1.828		0.85	1	33.218			
			C	0.568	1.828		0.85	1	33.218			
T8	2433.47	2269.35	A	0.551	1.843	4	0.85	1	31.713	402.42	20.12	C
40.00-20.00			B	0.551	1.843		0.85	1	31.713			
			C	0.551	1.843		0.85	1	31.713			
T9 20.00-5.00	1706.99	1497.28	A	0.506	1.892	4	0.85	1	21.056	299.59	19.97	C
			B	0.506	1.892		0.85	1	21.056			
			C	0.506	1.892		0.85	1	21.056			
T10 5.00-0.00	507.45	248.75	A	0.509	1.889	4	0.85	1	3.938	75.06*	15.01	C
			B	0.509	1.889		0.85	1	3.938			
			C	0.509	1.889		0.85	1	3.938			
Sum Weight:	21349.15	23807.75			*2.1A_g limit					4669.98		

Tower Forces - Service - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	146.90	674.99	A	0.208	2.57	9	1	1	10.303	367.36	18.37	A
180.00-160.00		TA 214.38	B	0.208	2.57		1	1	10.303			
			C	0.208	2.57		1	1	10.303			
T2	335.00	658.24	A	0.203	2.585	9	1	1	9.953	487.86	24.39	A
160.00-140.00			B	0.203	2.585		1	1	9.953			
			C	0.203	2.585		1	1	9.953			
T3	433.40	658.24	A	0.203	2.585	8	1	1	9.953	505.23	25.26	A
140.00-120.00			B	0.203	2.585		1	1	9.953			
			C	0.203	2.585		1	1	9.953			
T4	433.40	658.24	A	0.203	2.585	8	1	1	9.953	481.69	24.08	A
120.00-100.00		TA 214.38	B	0.203	2.585		1	1	9.953			
			C	0.203	2.585		1	1	9.953			
T5	433.40	658.24	A	0.203	2.585	8	1	1	9.953	454.85	22.74	A
100.00-80.00			B	0.203	2.585		1	1	9.953			
			C	0.203	2.585		1	1	9.953			
T6	433.40	658.24	A	0.203	2.585	7	1	1	9.953	423.33	21.17	A
80.00-60.00			B	0.203	2.585		1	1	9.953			
			C	0.203	2.585		1	1	9.953			
T7	433.40	658.24	A	0.203	2.585	6	1	1	9.953	384.53	19.23	A
60.00-40.00			B	0.203	2.585		1	1	9.953			
			C	0.203	2.585		1	1	9.953			
T8	433.40	658.24	A	0.203	2.585	5	1	1	9.953	332.31	16.62	A
40.00-20.00			B	0.203	2.585		1	1	9.953			
			C	0.203	2.585		1	1	9.953			
T9 20.00-5.00	325.05	480.27	A	0.199	2.599	5	1	1	7.279	247.26	16.48	A
			B	0.199	2.599		1	1	7.279			
			C	0.199	2.599		1	1	7.279			
T10 5.00-0.00	108.35	111.24	A	0.295	2.309	5	1	1	1.919	73.67	14.73	A
			B	0.295	2.309		1	1	1.919			
			C	0.295	2.309		1	1	1.919			
Sum Weight:	3515.70	6302.97								3758.08		

Tower Forces - Service - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
T1	146.90	674.99	A	0.208	2.57	9	0.8	1	9.665	354.79	17.74	B
180.00-160.00		TA 214.38	B	0.208	2.57		0.8	1	9.665			
			C	0.208	2.57		0.8	1	9.665			
T2	335.00	658.24	A	0.203	2.585	9	0.8	1	9.383	476.96	23.85	B
160.00-140.00			B	0.203	2.585		0.8	1	9.383			
			C	0.203	2.585		0.8	1	9.383			
T3	433.40	658.24	A	0.203	2.585	8	0.8	1	9.383	494.77	24.74	B
140.00-120.00			B	0.203	2.585		0.8	1	9.383			
			C	0.203	2.585		0.8	1	9.383			
T4	433.40	658.24	A	0.203	2.585	8	0.8	1	9.383	471.71	23.59	B
120.00-100.00		TA 214.38	B	0.203	2.585		0.8	1	9.383			
			C	0.203	2.585		0.8	1	9.383			
T5	433.40	658.24	A	0.203	2.585	8	0.8	1	9.383	445.43	22.27	B
100.00-80.00			B	0.203	2.585		0.8	1	9.383			
			C	0.203	2.585		0.8	1	9.383			
T6	433.40	658.24	A	0.203	2.585	7	0.8	1	9.383	414.57	20.73	B
80.00-60.00			B	0.203	2.585		0.8	1	9.383			
			C	0.203	2.585		0.8	1	9.383			
T7	433.40	658.24	A	0.203	2.585	6	0.8	1	9.383	376.57	18.83	B
60.00-40.00			B	0.203	2.585		0.8	1	9.383			
			C	0.203	2.585		0.8	1	9.383			
T8	433.40	658.24	A	0.203	2.585	5	0.8	1	9.383	325.43	16.27	B
40.00-20.00			B	0.203	2.585		0.8	1	9.383			
			C	0.203	2.585		0.8	1	9.383			
T9 20.00-5.00	325.05	480.27	A	0.199	2.599	5	0.8	1	6.871	242.32	16.15	B
			B	0.199	2.599		0.8	1	6.871			
			C	0.199	2.599		0.8	1	6.871			
T10 5.00-0.00	108.35	111.24	A	0.295	2.309	5	0.8	1	1.844	72.86	14.57	B
			B	0.295	2.309		0.8	1	1.844			
			C	0.295	2.309		0.8	1	1.844			
Sum Weight:	3515.70	6302.97								3675.41		

Tower Forces - Service - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
T1	146.90	674.99	A	0.208	2.57	9	0.85	1	9.824	346.16	17.31	C
180.00-160.00		TA 214.38	B	0.208	2.57		0.85	1	9.824			
			C	0.208	2.57		0.85	1	9.824			
T2	335.00	658.24	A	0.203	2.585	9	0.85	1	9.526	484.45	24.22	C
160.00-140.00			B	0.203	2.585		0.85	1	9.526			
			C	0.203	2.585		0.85	1	9.526			
T3	433.40	658.24	A	0.203	2.585	8	0.85	1	9.526	528.35	26.42	C
140.00-120.00			B	0.203	2.585		0.85	1	9.526			

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
			C	0.203	2.585		0.85	1	9.526			
T4	433.40	658.24	A	0.203	2.585	8	0.85	1	9.526	503.72	25.19	C
120.00-100.00		TA 214.38	B	0.203	2.585		0.85	1	9.526			
			C	0.203	2.585		0.85	1	9.526			
T5	433.40	658.24	A	0.203	2.585	8	0.85	1	9.526	475.65	23.78	C
100.00-80.00			B	0.203	2.585		0.85	1	9.526			
			C	0.203	2.585		0.85	1	9.526			
T6	433.40	658.24	A	0.203	2.585	7	0.85	1	9.526	442.70	22.13	C
80.00-60.00			B	0.203	2.585		0.85	1	9.526			
			C	0.203	2.585		0.85	1	9.526			
T7	433.40	658.24	A	0.203	2.585	6	0.85	1	9.526	402.12	20.11	C
60.00-40.00			B	0.203	2.585		0.85	1	9.526			
			C	0.203	2.585		0.85	1	9.526			
T8	433.40	658.24	A	0.203	2.585	5	0.85	1	9.526	347.51	17.38	C
40.00-20.00			B	0.203	2.585		0.85	1	9.526			
			C	0.203	2.585		0.85	1	9.526			
T9 20.00-5.00	325.05	480.27	A	0.199	2.599	5	0.85	1	6.973	258.81	17.25	C
			B	0.199	2.599		0.85	1	6.973			
			C	0.199	2.599		0.85	1	6.973			
T10 5.00-0.00	108.35	111.24	A	0.295	2.309	5	0.85	1	1.862	78.15	15.63	C
			B	0.295	2.309		0.85	1	1.862			
			C	0.295	2.309		0.85	1	1.862			
Sum Weight:	3515.70	6302.97								3867.62		

Force Totals (Does not include forces on guys)

Load Case	Vertical Forces lb	Sum of Forces X lb	Sum of Forces Z lb	Sum of Torques lb-ft
Leg Weight	3138.04			
Bracing Weight	3164.93			
Total Member Self-Weight	6302.97			
Guy Weight	2100.38			
Total Weight	17833.26			
Wind 0 deg - No Ice		-20.53	-13718.14	-2075.13
Wind 30 deg - No Ice		6774.50	-11824.02	-1314.78
Wind 60 deg - No Ice		12778.90	-7406.30	-2669.08
Wind 90 deg - No Ice		15672.79	20.53	-2827.43
Wind 120 deg - No Ice		13325.03	7745.31	168.21
Wind 150 deg - No Ice		7176.63	12479.47	2464.86
Wind 180 deg - No Ice		20.53	13493.06	2075.13
Wind 210 deg - No Ice		-6774.50	11824.02	1314.78
Wind 240 deg - No Ice		-12973.82	7518.83	2669.08
Wind 270 deg - No Ice		-15672.79	-20.53	2827.43
Wind 300 deg - No Ice		-13130.11	-7632.77	-168.21
Wind 330 deg - No Ice		-7176.63	-12479.47	-2464.86
Member Ice	17504.78			
Guy Ice	12178.48			
Total Weight Ice	86490.51			
Wind 0 deg - Ice		-6.30	-6888.87	-979.65
Wind 30 deg - Ice		3424.33	-5956.32	-854.63
Wind 60 deg - Ice		6120.05	-3540.69	-940.59
Wind 90 deg - Ice		7275.73	6.30	-750.29

Load Case	Vertical Forces lb	Sum of Forces X lb	Sum of Forces Z lb	Sum of Torques lb-ft
Wind 120 deg - Ice		6311.47	3658.48	79.05
Wind 150 deg - Ice		3522.90	6114.44	865.23
Wind 180 deg - Ice		6.30	6848.47	979.65
Wind 210 deg - Ice		-3424.33	5956.32	854.63
Wind 240 deg - Ice		-6155.04	3560.89	940.59
Wind 270 deg - Ice		-7275.73	-6.30	750.29
Wind 300 deg - Ice		-6276.87	-3638.51	-79.04
Wind 330 deg - Ice		-3522.90	-6114.44	-865.23
Total Weight	17833.26			
Wind 0 deg - Service		-7.54	-5038.80	-762.21
Wind 30 deg - Service		2488.34	-4343.08	-482.93
Wind 60 deg - Service		4693.81	-2720.40	-980.38
Wind 90 deg - Service		5756.77	7.54	-1038.54
Wind 120 deg - Service		4894.41	2844.93	61.79
Wind 150 deg - Service		2636.04	4583.83	905.37
Wind 180 deg - Service		7.54	4956.13	762.21
Wind 210 deg - Service		-2488.34	4343.08	482.93
Wind 240 deg - Service		-4765.41	2761.74	980.38
Wind 270 deg - Service		-5756.77	-7.54	1038.54
Wind 300 deg - Service		-4822.81	-2803.59	-61.79
Wind 330 deg - Service		-2636.04	-4583.83	-905.37

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice+1.0 Guy
3	1.2 Dead+1.6 Wind 30 deg - No Ice+1.0 Guy
4	1.2 Dead+1.6 Wind 60 deg - No Ice+1.0 Guy
5	1.2 Dead+1.6 Wind 90 deg - No Ice+1.0 Guy
6	1.2 Dead+1.6 Wind 120 deg - No Ice+1.0 Guy
7	1.2 Dead+1.6 Wind 150 deg - No Ice+1.0 Guy
8	1.2 Dead+1.6 Wind 180 deg - No Ice+1.0 Guy
9	1.2 Dead+1.6 Wind 210 deg - No Ice+1.0 Guy
10	1.2 Dead+1.6 Wind 240 deg - No Ice+1.0 Guy
11	1.2 Dead+1.6 Wind 270 deg - No Ice+1.0 Guy
12	1.2 Dead+1.6 Wind 300 deg - No Ice+1.0 Guy
13	1.2 Dead+1.6 Wind 330 deg - No Ice+1.0 Guy
14	1.2 Dead+1.0 Ice+1.0 Temp+Guy
15	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp+1.0 Guy
16	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp+1.0 Guy
17	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp+1.0 Guy
18	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp+1.0 Guy
19	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp+1.0 Guy
20	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp+1.0 Guy
21	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp+1.0 Guy
22	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp+1.0 Guy
23	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp+1.0 Guy
24	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp+1.0 Guy
25	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp+1.0 Guy
26	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp+1.0 Guy
27	Dead+Wind 0 deg - Service+Guy
28	Dead+Wind 30 deg - Service+Guy

Comb. No.	Description
29	Dead+Wind 60 deg - Service+Guy
30	Dead+Wind 90 deg - Service+Guy
31	Dead+Wind 120 deg - Service+Guy
32	Dead+Wind 150 deg - Service+Guy
33	Dead+Wind 180 deg - Service+Guy
34	Dead+Wind 210 deg - Service+Guy
35	Dead+Wind 240 deg - Service+Guy
36	Dead+Wind 270 deg - Service+Guy
37	Dead+Wind 300 deg - Service+Guy
38	Dead+Wind 330 deg - Service+Guy

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Mast	Max. Vert	15	153861.77	-37.45	390.02
	Max. H_x	11	78207.48	1945.66	-17.36
	Max. H_z	2	77514.06	-2.61	1557.03
	Max. M_x	1	0.00	-3.47	-7.44
	Max. M_z	1	0.00	-3.47	-7.44
	Max. Torsion	1	0.00	-3.47	-7.44
	Min. Vert	1	71732.87	-3.47	-7.44
	Min. H_x	5	78226.67	-1954.04	-18.87
	Min. H_z	8	78042.17	-3.99	-1510.10
	Min. M_x	1	0.00	-3.47	-7.44
	Min. M_z	1	0.00	-3.47	-7.44
	Min. Torsion	1	0.00	-3.47	-7.44
Guy C @ 145 ft Elev 0 ft Azimuth 240 deg	Max. Vert	10	-5099.31	-5745.40	3308.73
	Max. H_x	10	-5099.31	-5745.40	3308.73
	Max. H_z	4	-32585.34	-33184.60	19173.08
	Min. Vert	4	-32585.34	-33184.60	19173.08
	Min. H_x	4	-32585.34	-33184.60	19173.08
	Min. H_z	10	-5099.31	-5745.40	3308.73
Guy B @ 145 ft Elev 0 ft Azimuth 120 deg	Max. Vert	6	-4823.88	5494.37	3173.64
	Max. H_x	12	-33072.95	33600.76	19398.83
	Max. H_z	12	-33072.95	33600.76	19398.83
	Min. Vert	12	-33072.95	33600.76	19398.83
	Min. H_x	6	-4823.88	5494.37	3173.64
	Min. H_z	6	-4823.88	5494.37	3173.64
Guy A @ 145 ft Elev 0 ft Azimuth 0 deg	Max. Vert	2	-5816.93	-6.34	-7787.27
	Max. H_x	11	-19016.57	745.53	-22644.22
	Max. H_z	2	-5816.93	-6.34	-7787.27
	Min. Vert	8	-31832.80	9.05	-37112.87
	Min. H_x	5	-19077.58	-745.65	-22692.37
	Min. H_z	8	-31832.80	9.05	-37112.87

Tower Mast Reaction Summary

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	lb	lb	lb	lb-ft	lb-ft	lb-ft
Dead Only	71732.87	3.47	7.44	0.00	0.00	0.00
1.2 Dead+1.6 Wind 0 deg - No Ice+1.0 Guy	77514.06	2.61	-1557.03	0.00	0.00	0.00
1.2 Dead+1.6 Wind 30 deg - No Ice+1.0 Guy	77802.74	781.88	-1362.97	0.00	0.00	0.00
1.2 Dead+1.6 Wind 60 deg - No Ice+1.0 Guy	78136.14	1551.66	-887.14	0.00	0.00	0.00
1.2 Dead+1.6 Wind 90 deg - No Ice+1.0 Guy	78226.67	1954.04	18.87	0.00	0.00	0.00
1.2 Dead+1.6 Wind 120 deg - No Ice+1.0 Guy	77947.05	1634.43	951.84	0.00	0.00	0.00
1.2 Dead+1.6 Wind 150 deg - No Ice+1.0 Guy	78138.44	841.62	1442.73	0.00	0.00	0.00
1.2 Dead+1.6 Wind 180 deg - No Ice+1.0 Guy	78042.17	3.99	1510.10	0.00	0.00	0.00
1.2 Dead+1.6 Wind 210 deg - No Ice+1.0 Guy	77746.67	-792.41	1369.90	0.00	0.00	0.00
1.2 Dead+1.6 Wind 240 deg - No Ice+1.0 Guy	77479.81	-1606.62	938.38	0.00	0.00	0.00
1.2 Dead+1.6 Wind 270 deg - No Ice+1.0 Guy	78207.48	-1945.66	17.36	0.00	0.00	0.00
1.2 Dead+1.6 Wind 300 deg - No Ice+1.0 Guy	78272.92	-1564.06	-898.12	0.00	0.00	0.00
1.2 Dead+1.6 Wind 330 deg - No Ice+1.0 Guy	78188.18	-817.64	-1433.85	0.00	0.00	0.00
1.2 Dead+1.0 Ice+1.0 Temp+Guy	152684.36	37.57	34.43	0.00	0.00	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp+1.0 Guy	153861.77	37.45	-390.02	0.00	0.00	0.00
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp+1.0 Guy	153472.98	234.93	-335.35	0.00	0.00	0.00
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp+1.0 Guy	153129.43	411.89	-182.81	0.00	0.00	0.00
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp+1.0 Guy	153480.95	499.09	46.95	0.00	0.00	0.00
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp+1.0 Guy	153858.95	442.82	267.84	0.00	0.00	0.00
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp+1.0 Guy	153473.23	265.58	401.91	0.00	0.00	0.00
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp+1.0 Guy	153117.42	38.02	434.48	0.00	0.00	0.00
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp+1.0 Guy	153466.04	-182.30	389.16	0.00	0.00	0.00
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp+1.0 Guy	153857.57	-355.91	260.97	0.00	0.00	0.00
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp+1.0 Guy	153489.37	-423.25	46.39	0.00	0.00	0.00
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp+1.0 Guy	153149.87	-347.74	-189.53	0.00	0.00	0.00
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp+1.0 Guy	153488.81	-167.05	-347.79	0.00	0.00	0.00
Dead+Wind 0 deg - Service+Guy	71856.11	3.30	-350.69	0.00	0.00	0.00
Dead+Wind 30 deg - Service+Guy	71818.86	184.43	-308.02	0.00	0.00	0.00
Dead+Wind 60 deg - Service+Guy	71783.69	363.67	-200.75	0.00	0.00	0.00
Dead+Wind 90 deg - Service+Guy	71817.88	453.60	8.29	0.00	0.00	0.00
Dead+Wind 120 deg - Service+Guy	71854.03	376.30	223.06	0.00	0.00	0.00

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	lb	lb	lb	lb-ft	lb-ft	lb-ft
Dead+Wind 150 deg - Service+Guy	71818.40	195.45	338.90	0.00	0.00	0.00
Dead+Wind 180 deg - Service+Guy	71783.45	3.65	356.47	0.00	0.00	0.00
Dead+Wind 210 deg - Service+Guy	71819.23	-178.62	322.19	0.00	0.00	0.00
Dead+Wind 240 deg - Service+Guy	71855.33	-364.64	220.15	0.00	0.00	0.00
Dead+Wind 270 deg - Service+Guy	71817.96	-446.59	7.96	0.00	0.00	0.00
Dead+Wind 300 deg - Service+Guy	71783.70	-361.35	-203.58	0.00	0.00	0.00
Dead+Wind 330 deg - Service+Guy	71818.11	-187.31	-324.69	0.00	0.00	0.00

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX	PY	PZ	PX	PY	PZ	% Error
	lb	lb	lb	lb	lb	lb	
1	0.00	-17832.80	0.00	-0.52	17832.80	-2.20	0.013%
2	-32.85	-21153.56	-24642.90	32.96	21151.12	24584.05	0.181%
3	12182.76	-20979.38	-21245.55	-12169.38	20977.21	21169.03	0.241%
4	22779.21	-20805.20	-13197.02	-22653.12	20803.12	13123.98	0.434%
5	27763.59	-20979.38	32.85	-27688.63	20976.95	-1.24	0.234%
6	23653.02	-21153.56	13739.44	-23599.26	21150.79	-13708.43	0.180%
7	12826.17	-20979.38	22294.27	-12766.84	20977.03	-22249.88	0.223%
8	32.85	-20805.20	24282.78	-30.96	20803.24	-24153.72	0.404%
9	-12182.76	-20979.38	21245.55	12126.16	20977.39	-21197.32	0.231%
10	-23091.09	-21153.56	13377.08	23039.34	21151.25	-13347.06	0.176%
11	-27763.59	-20979.38	-32.85	27689.59	20977.01	63.91	0.231%
12	-23341.15	-20805.20	-13559.38	23212.42	20802.92	13481.97	0.441%
13	-12826.17	-20979.38	-22294.27	12817.45	20976.89	22218.23	0.231%
14	0.00	-89634.00	0.00	-9.44	89633.99	-12.00	0.017%
15	-6.30	-89812.23	-9631.68	6.31	89811.96	9562.44	0.077%
16	4792.28	-89634.00	-8325.68	-4755.86	89633.71	8269.31	0.074%
17	8495.39	-89455.78	-4912.09	-8433.96	89455.40	4876.19	0.079%
18	10011.63	-89634.00	6.30	-9938.92	89633.70	-8.93	0.081%
19	8686.81	-89812.23	5029.88	-8620.94	89811.97	-4991.57	0.084%
20	4890.85	-89634.00	8483.80	-4859.37	89633.72	-8422.14	0.077%
21	6.30	-89455.78	9591.27	-6.53	89455.43	-9523.01	0.076%
22	-4792.28	-89634.00	8325.68	4761.96	89633.73	-8265.66	0.075%
23	-8530.38	-89812.23	4932.29	8466.69	89811.97	-4895.24	0.082%
24	-10011.63	-89634.00	-6.30	9938.60	89633.68	3.90	0.081%
25	-8652.21	-89455.78	-5009.91	8589.04	89455.37	4973.22	0.081%
26	-4890.85	-89634.00	-8483.80	4853.66	89633.68	8425.16	0.077%
27	-7.54	-17872.79	-5657.23	7.51	17872.77	5610.43	0.250%
28	2796.78	-17832.80	-4877.31	-2772.21	17832.77	4836.61	0.254%
29	5229.39	-17792.82	-3029.62	-5193.53	17792.77	3008.90	0.220%
30	6373.64	-17832.80	7.54	-6329.95	17832.76	-8.23	0.231%
31	5429.99	-17872.79	3154.14	-5393.60	17872.76	-3133.10	0.222%
32	2944.48	-17832.80	5118.06	-2920.29	17832.76	-5074.16	0.267%
33	7.54	-17792.82	5574.56	-7.52	17792.77	-5527.30	0.253%
34	-2796.78	-17832.80	4877.31	2773.91	17832.77	-4835.64	0.254%
35	-5300.98	-17872.79	3070.95	5265.32	17872.76	-3050.34	0.218%
36	-6373.64	-17832.80	-7.54	6329.93	17832.76	6.82	0.231%
37	-5358.39	-17792.82	-3112.80	5321.80	17792.77	3091.63	0.224%
38	-2944.48	-17832.80	-5118.06	2918.60	17832.76	5075.10	0.267%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	50	0.00000001	0.00001450
2	Yes	76	0.00135129	0.00046051
3	Yes	73	0.00137905	0.00042747
4	Yes	69	0.00138576	0.00039958
5	Yes	74	0.00133194	0.00044263
6	Yes	77	0.00138046	0.00051061
7	Yes	74	0.00134794	0.00044600
8	Yes	69	0.00137104	0.00038631
9	Yes	73	0.00130145	0.00039976
10	Yes	76	0.00126647	0.00044092
11	Yes	74	0.00130694	0.00043322
12	Yes	69	0.00140528	0.00041736
13	Yes	74	0.00140076	0.00046642
14	Yes	50	0.00056545	0.00008181
15	Yes	71	0.00142043	0.00010951
16	Yes	71	0.00132182	0.00010341
17	Yes	71	0.00130178	0.00010199
18	Yes	71	0.00132390	0.00010048
19	Yes	71	0.00142050	0.00010380
20	Yes	71	0.00130051	0.00009824
21	Yes	71	0.00127562	0.00009866
22	Yes	71	0.00128999	0.00009757
23	Yes	71	0.00140376	0.00010283
24	Yes	71	0.00134314	0.00010277
25	Yes	71	0.00132772	0.00010567
26	Yes	71	0.00135301	0.00010689
27	Yes	66	0.00142019	0.00013342
28	Yes	66	0.00143329	0.00013409
29	Yes	67	0.00120703	0.00011969
30	Yes	67	0.00123404	0.00012719
31	Yes	67	0.00120572	0.00012200
32	Yes	66	0.00147091	0.00014107
33	Yes	66	0.00144341	0.00013427
34	Yes	66	0.00143256	0.00013365
35	Yes	67	0.00119517	0.00011997
36	Yes	67	0.00123421	0.00012722
37	Yes	67	0.00121785	0.00012195
38	Yes	66	0.00147198	0.00014162

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	180 - 160	1.660	37	0.1528	0.0472
T2	160 - 140	1.062	37	0.1188	0.0323
T3	140 - 120	0.694	36	0.0741	0.0362
T4	120 - 100	0.479	36	0.0345	0.0384
T5	100 - 80	0.443	30	0.0055	0.0684
T6	80 - 60	0.441	30	0.0048	0.0986

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T7	60 - 40	0.408	30	0.0061	0.1203
T8	40 - 20	0.380	30	0.0182	0.1368
T9	20 - 5	0.246	30	0.0464	0.1462
T10	5 - 0	0.067	30	0.0607	0.1492

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
180.00	Low Profile Platform	37	1.660	0.1528	0.0472	57494
170.00	12 ft Boom / Sector Mount	37	1.340	0.1370	0.0375	28747
160.38	Guy	37	1.071	0.1196	0.0324	15577
150.00	RFS APXV18-206516S-C-A20	37	0.853	0.0969	0.0339	23223
116.42	Guy	36	0.461	0.0280	0.0420	22813
60.38	Guy	30	0.408	0.0061	0.1200	102260

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	180 - 160	8.417	6	0.7422	0.2767
T2	160 - 140	5.419	6	0.5964	0.2112
T3	140 - 120	3.462	5	0.3966	0.2094
T4	120 - 100	2.273	5	0.1984	0.1949
T5	100 - 80	1.980	5	0.0415	0.3247
T6	80 - 60	1.925	5	0.0296	0.4561
T7	60 - 40	1.774	11	0.0289	0.5503
T8	40 - 20	1.657	11	0.0787	0.6226
T9	20 - 5	1.073	5	0.2026	0.6639
T10	5 - 0	0.292	5	0.2654	0.6774

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
180.00	Low Profile Platform	6	8.417	0.7422	0.2767	13315
170.00	12 ft Boom / Sector Mount	6	6.830	0.6752	0.2360	6657
160.38	Guy	6	5.466	0.5997	0.2116	3601
150.00	RFS APXV18-206516S-C-A20	6	4.309	0.4989	0.2103	5213
116.42	Guy	5	2.162	0.1642	0.2093	4344
60.38	Guy	11	1.776	0.0288	0.5488	23017

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt lb	Allowable Load per Bolt lb	Ratio Load / Allowable	Allowable Ratio	Criteria
T1	180	Leg	A325N	0.7500	4	264.86	29820.60	0.009 ✔	1	Bolt Tension
		Torque Arm Top@160.375	A325N	0.7500	2	6044.97	17892.40	0.338 ✔	1	Bolt Shear
		Torque Arm Bottom@160.375	A325N	0.7500	2	4827.23	17892.40	0.270 ✔	1	Bolt Shear
T2	160	Leg	A325N	0.7500	4	3103.26	29820.60	0.104 ✔	1	Bolt Tension
T3	140	Leg	A325N	0.7500	4	2591.74	29820.60	0.087 ✔	1	Bolt Tension
T4	120	Leg	A325N	0.7500	4	3096.20	29820.60	0.104 ✔	1	Bolt Tension
		Torque Arm Top@116.417	A325N	0.7500	2	3967.52	17892.40	0.222 ✔	1	Bolt Shear
		Torque Arm Bottom@116.417	A325N	0.7500	2	2483.26	17892.40	0.139 ✔	1	Bolt Shear
T5	100	Leg	A325N	0.7500	4	3493.23	29820.60	0.117 ✔	1	Bolt Tension
T6	80	Leg	A325N	0.7500	4	3494.10	29820.60	0.117 ✔	1	Bolt Tension
T7	60	Leg	A325N	0.7500	4	3884.05	29820.60	0.130 ✔	1	Bolt Tension
T8	40	Leg	A325N	0.7500	4	4263.33	29820.60	0.143 ✔	1	Bolt Tension
T9	20	Leg	A325N	0.7500	4	4401.21	29820.60	0.148 ✔	1	Bolt Tension
T10	5	Leg	A325N	0.7500	4	4351.27	29820.60	0.146 ✔	1	Bolt Tension

Guy Design Data

Section No.	Elevation ft	Size	Initial Tension lb	Breaking Load lb	Actual T_u lb	Allowable ϕT_n lb	Required S.F.	Actual S.F.
T1	160.38 (A) (541)	5/8 EHS	6360.00	42399.99	12987.10	25440.00	1.000	1.959 ✔
	160.38 (A) (542)	5/8 EHS	6360.00	42399.99	13140.50	25440.00	1.000	1.936 ✔
	160.38 (B) (535)	5/8 EHS	6360.00	42399.99	13330.60	25440.00	1.000	1.908 ✔
	160.38 (B) (536)	5/8 EHS	6360.00	42399.99	13370.70	25440.00	1.000	1.903 ✔
	160.38 (C) (529)	5/8 EHS	6360.00	42399.99	13204.90	25440.00	1.000	1.927 ✔
	160.38 (C) (530)	5/8 EHS	6360.00	42399.99	12952.20	25440.00	1.000	1.964 ✔
T4	116.42 (A) (559)	9/16 EHS	5250.00	35000.04	8203.65	21000.00	1.000	2.560 ✔
	116.42 (A) (560)	9/16 EHS	5250.00	35000.04	8272.58	21000.00	1.000	2.539 ✔
	116.42 (B) (553)	9/16 EHS	5250.00	35000.04	8396.16	21000.00	1.000	2.501 ✔
	116.42 (B) (554)	9/16 EHS	5250.00	35000.04	8320.58	21000.00	1.000	2.524 ✔

Section No.	Elevation ft	Size	Initial Tension lb	Breaking Load lb	Actual T_u lb	Allowable ϕT_n lb	Required S.F.	Actual S.F.
T6	116.42 (C) (547)	9/16 EHS	5250.00	35000.04	8452.63	21000.00	1.000	2.484 ✔
	116.42 (C) (548)	9/16 EHS	5250.00	35000.04	8227.59	21000.00	1.000	2.552 ✔
	60.38 (A) (567)	9/16 EHS	5250.00	35000.04	8295.24	21000.00	1.000	2.532 ✔
	60.38 (B) (566)	9/16 EHS	5250.00	35000.04	8657.31	21000.00	1.000	2.426 ✔
	60.38 (C) (565)	9/16 EHS	5250.00	35000.04	8641.82	21000.00	1.000	2.430 ✔

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	Mast Stability Index	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	180 - 160	P2.5x.203	20.00	3.21	40.6 K=1.00	1.7040	1.00	-40986.50	82983.90	0.494 [1] ✔
T2	160 - 140	P2.5x.203	20.00	3.21	40.6 K=1.00	1.7040	1.00	-39821.50	82983.90	0.480 [1] ✔
T3	140 - 120	P2.5x.203	20.00	3.21	40.6 K=1.00	1.7040	1.00	-39824.30	79606.90	0.500 [1] ✔
T4	120 - 100	P2.5x.203	20.00	3.21	40.6 K=1.00	1.7040	1.00	-47064.90	79606.90	0.591 [1] ✔
T5	100 - 80	P2.5x.203	20.00	3.21	40.6 K=1.00	1.7040	1.00	-44137.70	82983.90	0.532 [1] ✔
T6	80 - 60	P2.5x.203	20.00	3.21	40.6 K=1.00	1.7040	1.00	-46600.70	82983.90	0.562 [1] ✔
T7	60 - 40	P2.5x.203	20.00	3.21	40.6 K=1.00	1.7040	0.98	-52560.40	78156.90	0.672 [1] ✔
T8	40 - 20	P2.5x.203	20.00	3.21	40.6 K=1.00	1.7040	0.98	-54395.90	81404.20	0.668 [1] ✔
T9	20 - 5	P2.5x.203	15.00	3.56	45.1 K=1.00	1.7040	1.00	-53915.70	80094.30	0.673 [1] ✔
T10	5 - 0	P2.5x.203	5.39	4.99	20.9 K=0.33	1.7040	0.88	-56208.90	81527.00	0.689 [1] ✔

[1] P_u / ϕP_n controls

Horizontal Design Data (Compression)

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

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	180 - 160	L1 3/4x1 3/4x3/16	3.50	3.26	117.0 K=1.03	0.6211	-6075.06	9793.71	0.620 [1] ✔
T2	160 - 140	L1 1/2x1 1/2x3/16	3.50	3.26	128.2 K=0.96	0.5273	-5347.12	7190.10	0.744 [1] ✔
T3	140 - 120	L1 1/2x1 1/2x3/16	3.50	3.26	128.2 K=0.96	0.5273	-5264.42	7190.10	0.732 [1] ✔
T4	120 - 100	L1 1/2x1 1/2x3/16	3.50	3.26	128.2 K=0.96	0.5273	-4369.76	7190.10	0.608 [1] ✔
T5	100 - 80	L1 1/2x1 1/2x3/16	3.50	3.26	128.2 K=0.96	0.5273	-4044.93	7190.10	0.563 [1] ✔
T6	80 - 60	L1 1/2x1 1/2x3/16	3.50	3.26	128.2 K=0.96	0.5273	-4252.14	7190.10	0.591 [1] ✔
T7	60 - 40	L1 1/2x1 1/2x3/16	3.50	3.26	128.2 K=0.96	0.5273	-4013.01	7190.10	0.558 [1] ✔
T8	40 - 20	L1 1/2x1 1/2x3/16	3.50	3.26	128.2 K=0.96	0.5273	-4139.29	7190.10	0.576 [1] ✔
T9	20 - 5	L1 1/2x1 1/2x3/16	3.50	3.26	128.2 K=0.96	0.5273	-3596.33	7190.10	0.500 [1] ✔

[1] P_u / ϕP_n controls

Top Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	180 - 160	L1 3/4x1 3/4x3/16	3.50	3.26	117.0 K=1.03	0.6211	-3603.32	9793.71	0.368 [1] ✔
T2	160 - 140	L1 1/2x1 1/2x3/16	3.50	3.26	128.2 K=0.96	0.5273	-3516.84	7190.10	0.489 [1] ✔
T3	140 - 120	L1 1/2x1 1/2x3/16	3.50	3.26	128.2 K=0.96	0.5273	-2731.79	7190.10	0.380 [1] ✔
T5	100 - 80	L1 1/2x1 1/2x3/16	3.50	3.26	128.2 K=0.96	0.5273	-2469.97	7190.10	0.344 [1] ✔
T6	80 - 60	L1 1/2x1 1/2x3/16	3.50	3.26	128.2 K=0.96	0.5273	-2132.49	7190.10	0.297 [1] ✔
T7	60 - 40	L1 1/2x1 1/2x3/16	3.50	3.26	128.2 K=0.96	0.5273	-2016.84	7190.10	0.281 [1] ✔
T8	40 - 20	L1 1/2x1 1/2x3/16	3.50	3.26	128.2 K=0.96	0.5273	-2030.43	7190.10	0.282 [1] ✔
T9	20 - 5	L1 1/2x1 1/2x3/16	3.50	3.26	128.2 K=0.96	0.5273	-1948.42	7190.10	0.271 [1] ✔

[1] P_u / ϕP_n controls

Bottom Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T2	160 - 140	L1 1/2x1 1/2x3/16	3.50	3.26	128.2 K=0.96	0.5273	-2741.20	7190.10	0.381 [1] ✔
T3	140 - 120	L1 1/2x1 1/2x3/16	3.50	3.26	128.2 K=0.96	0.5273	-3272.07	7190.10	0.455 [1] ✔
T4	120 - 100	L1 1/2x1 1/2x3/16	3.50	3.26	128.2 K=0.96	0.5273	-2263.36	7190.10	0.315 [1] ✔
T5	100 - 80	L1 1/2x1 1/2x3/16	3.50	3.26	128.2 K=0.96	0.5273	-2119.25	7190.10	0.295 [1] ✔
T7	60 - 40	L1 1/2x1 1/2x3/16	3.50	3.26	128.2 K=0.96	0.5273	-2273.98	7190.10	0.316 [1] ✔
T8	40 - 20	L1 1/2x1 1/2x3/16	3.50	3.26	128.2 K=0.96	0.5273	-2034.19	7190.10	0.283 [1] ✔

[1] P_u / ϕP_n controls

Top Guy Pull-Off Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	180 - 160	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	0.5273	-9076.45	11503.00	0.789 [1]
T4	120 - 100	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	0.5273	-3284.75	11503.00	0.286 [1]
T6	80 - 60	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	0.5273	-702.97	11503.00	0.061 [1]

[1] P_u / ϕP_n controls

Top Guy Pull-Off Bending Design Data

Section No.	Elevation ft	Size	M_{ux} lb-ft	ϕM_{nx} lb-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} lb-ft	ϕM_{ny} lb-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
T1	180 - 160	L1 1/2x1 1/2x3/16	0.00	711.05	0.000	0.00	368.03	0.000
T4	120 - 100	L1 1/2x1 1/2x3/16	0.00	711.05	0.000	0.00	368.03	0.000
T6	80 - 60	L1 1/2x1 1/2x3/16	0.00	711.05	0.000	0.00	368.03	0.000

Top Guy Pull-Off Interaction Design Data

Section No.	Elevation ft	Size	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T1	180 - 160	L1 1/2x1 1/2x3/16	0.789	0.000	0.000	0.789 [1]	1.000	4.8.1 ✔

Section No.	Elevation ft	Size	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T4	120 - 100	L1 1/2x1 1/2x3/16	0.286	0.000	0.000	0.286 [1]	1.000	4.8.1
T6	80 - 60	L1 1/2x1 1/2x3/16	0.061	0.000	0.000	0.061 [1]	1.000	4.8.1

[1] P_u / ϕP_n controls

Bottom Guy Pull-Off Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	180 - 160	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	0.5273	-4302.33	11503.00	0.374 [1]
T4	120 - 100	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	0.5273	-6621.49	11503.00	0.576 [1]

[1] P_u / ϕP_n controls

Bottom Guy Pull-Off Bending Design Data

Section No.	Elevation ft	Size	M_{ux} lb-ft	ϕM_{nx} lb-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} lb-ft	ϕM_{ny} lb-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
T1	180 - 160	L1 1/2x1 1/2x3/16	0.00	711.05	0.000	0.00	368.03	0.000
T4	120 - 100	L1 1/2x1 1/2x3/16	0.00	711.05	0.000	0.00	368.03	0.000

Bottom Guy Pull-Off Interaction Design Data

Section No.	Elevation ft	Size	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T1	180 - 160	L1 1/2x1 1/2x3/16	0.374	0.000	0.000	0.374 [1]	1.000	4.8.1
T4	120 - 100	L1 1/2x1 1/2x3/16	0.576	0.000	0.000	0.576 [1]	1.000	4.8.1

[1] P_u / ϕP_n controls

Torque-Arm Bottom Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	180 - 160 (533)	L3x3x1/4	3.50	3.38	68.5 K=1.00	1.4400	-9426.21	36439.50	0.259 [1] ✔
T1	180 - 160 (534)	L3x3x1/4	3.50	3.38	68.5 K=1.00	1.4400	-9423.42	36439.50	0.259 [1] ✔
T1	180 - 160 (539)	L3x3x1/4	3.50	3.38	68.5 K=1.00	1.4400	-9402.95	36439.50	0.258 [1] ✔
T1	180 - 160 (540)	L3x3x1/4	3.50	3.38	68.5 K=1.00	1.4400	-9654.46	36439.50	0.265 [1] ✔
T1	180 - 160 (545)	L3x3x1/4	3.50	3.38	68.5 K=1.00	1.4400	-9542.92	36439.50	0.262 [1] ✔
T1	180 - 160 (546)	L3x3x1/4	3.50	3.38	68.5 K=1.00	1.4400	-9291.93	36439.50	0.255 [1] ✔
T4	120 - 100 (551)	L3x3x1/4	3.50	3.38	68.5 K=1.00	1.4400	-4830.75	36439.50	0.133 [1] ✔
T4	120 - 100 (552)	L3x3x1/4	3.50	3.38	68.5 K=1.00	1.4400	-4692.23	36439.50	0.129 [1] ✔
T4	120 - 100 (557)	L3x3x1/4	3.50	3.38	68.5 K=1.00	1.4400	-4966.53	36439.50	0.136 [1] ✔
T4	120 - 100 (558)	L3x3x1/4	3.50	3.38	68.5 K=1.00	1.4400	-4965.28	36439.50	0.136 [1] ✔
T4	120 - 100 (563)	L3x3x1/4	3.50	3.38	68.5 K=1.00	1.4400	-4663.91	36439.50	0.128 [1] ✔
T4	120 - 100 (564)	L3x3x1/4	3.50	3.38	68.5 K=1.00	1.4400	-4547.92	36439.50	0.125 [1] ✔

[1] P_u / ϕP_n controls

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	180 - 160	P2.5x.203	20.00	3.21	40.6	1.7040	14619.20	96619.60	0.151 [1] ✔
T2	160 - 140	P2.5x.203	20.00	3.21	40.6	1.7040	10745.80	96619.60	0.111 [1] ✔
T3	140 - 120	P2.5x.203	20.00	3.21	40.6	1.7040	5851.50	92018.70	0.064 [1] ✔
T4	120 - 100	P2.5x.203	20.00	3.21	40.6	1.7040	5849.82	92018.70	0.064 [1] ✔

[1] P_u / ϕP_n controls

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	180 - 160	5/8	4.75	4.42	339.7	0.3068	7309.11	9940.20	0.735 [1] ✔
T2	160 - 140	5/8	4.75	4.42	339.7	0.3068	5079.83	9940.20	0.511 [1] ✔
T3	140 - 120	5/8	4.75	4.42	339.7	0.3068	4377.94	9940.20	0.440 [1] ✔
T4	120 - 100	5/8	4.75	4.42	339.7	0.3068	4389.53	9940.20	0.442 [1] ✔
T5	100 - 80	5/8	4.75	4.42	339.7	0.3068	4025.08	9940.20	0.405 [1] ✔
T6	80 - 60	5/8	4.75	4.42	339.7	0.3068	3920.55	9940.20	0.394 [1] ✔
T7	60 - 40	5/8	4.75	4.42	339.7	0.3068	4005.80	9940.20	0.403 [1] ✔
T8	40 - 20	5/8	4.75	4.42	339.7	0.3068	3265.12	9940.20	0.328 [1] ✔
T9	20 - 5	5/8	4.99	4.65	357.3	0.3068	3567.46	9940.20	0.359 [1] ✔

[1] $P_u / \phi P_n$ controls

Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	180 - 160	L1 3/4x1 3/4x3/16	3.50	3.26	72.9	0.6211	709.91	20123.40	0.035 [1] ✔
T2	160 - 140	L1 1/2x1 1/2x3/16	3.50	3.26	85.7	0.5273	689.73	17085.90	0.040 [1] ✔
T3	140 - 120	L1 1/2x1 1/2x3/16	3.50	3.26	85.7	0.5273	689.78	17085.90	0.040 [1] ✔
T4	120 - 100	L1 1/2x1 1/2x3/16	3.50	3.26	85.7	0.5273	815.19	17085.90	0.048 [1] ✔
T5	100 - 80	L1 1/2x1 1/2x3/16	3.50	3.26	85.7	0.5273	764.49	17085.90	0.045 [1] ✔
T6	80 - 60	L1 1/2x1 1/2x3/16	3.50	3.26	85.7	0.5273	798.80	17085.90	0.047 [1] ✔
T7	60 - 40	L1 1/2x1 1/2x3/16	3.50	3.26	85.7	0.5273	910.37	17085.90	0.053 [1] ✔
T8	40 - 20	L1 1/2x1 1/2x3/16	3.50	3.26	85.7	0.5273	942.16	17085.90	0.055 [1] ✔
T9	20 - 5	L1 1/2x1 1/2x3/16	3.50	3.26	85.7	0.5273	933.85	17085.90	0.055 [1] ✔

[1] $P_u / \phi P_n$ controls

Top Girt Design Data (Tension)

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	lb	lb	
T10	5 - 0	L1 1/2x1 1/2x3/16	3.24	3.00	78.8	0.5273	6094.87	17085.90	0.357 [1] ✔

[1] P_u / ϕP_n controls

Bottom Girt Design Data (Tension)

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	lb	lb	
T9	20 - 5	L1 1/2x1 1/2x3/16	3.50	3.26	85.7	0.5273	5314.46	17085.90	0.311 [1] ✔

[1] P_u / ϕP_n controls

Top Guy Pull-Off Design Data (Tension)

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	lb	lb	
T6	80 - 60	L1 1/2x1 1/2x3/16	3.50	3.26	85.7	0.5273	2476.31	17085.90	0.145 [1]

[1] P_u / ϕP_n controls

Top Guy Pull-Off Bending Design Data

Section No.	Elevation	Size	M_{ux}	ϕM_{nx}	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy}	ϕM_{ny}	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
	ft		lb-ft	lb-ft		lb-ft	lb-ft	
T6	80 - 60	L1 1/2x1 1/2x3/16	0.00	711.05	0.000	0.00	368.03	0.000

Top Guy Pull-Off Interaction Design Data

Section No.	Elevation	Size	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
	ft							

Section No.	Elevation ft	Size	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T6	80 - 60	L1 1/2x1 1/2x3/16	0.145	0.000	0.000	0.145 [1] ✔	1.000	4.8.1 ✔

[1] P_u / ϕP_n controls

Torque-Arm Top Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	180 - 160 (531)	L2x2x5/16	4.75	4.59	91.6	1.1500	11767.50	37260.00	0.316 [1] ✔
T1	180 - 160 (532)	L2x2x5/16	4.75	4.59	91.6	1.1500	12089.90	37260.00	0.324 [1] ✔
T1	180 - 160 (537)	L2x2x5/16	4.75	4.59	91.6	1.1500	11721.60	37260.00	0.315 [1] ✔
T1	180 - 160 (538)	L2x2x5/16	4.75	4.59	91.6	1.1500	11690.60	37260.00	0.314 [1] ✔
T1	180 - 160 (543)	L2x2x5/16	4.75	4.59	91.6	1.1500	11493.40	37260.00	0.308 [1] ✔
T1	180 - 160 (544)	L2x2x5/16	4.75	4.59	91.6	1.1500	11809.00	37260.00	0.317 [1] ✔
T4	120 - 100 (549)	L2x2x5/16	4.75	4.59	91.6	1.1500	7919.49	37260.00	0.213 [1] ✔
T4	120 - 100 (550)	L2x2x5/16	4.75	4.59	91.6	1.1500	7893.91	37260.00	0.212 [1] ✔
T4	120 - 100 (555)	L2x2x5/16	4.75	4.59	91.6	1.1500	7852.42	37260.00	0.211 [1] ✔
T4	120 - 100 (556)	L2x2x5/16	4.75	4.59	91.6	1.1500	7897.53	37260.00	0.212 [1] ✔
T4	120 - 100 (561)	L2x2x5/16	4.75	4.59	91.6	1.1500	7935.03	37260.00	0.213 [1] ✔
T4	120 - 100 (562)	L2x2x5/16	4.75	4.59	91.6	1.1500	7863.85	37260.00	0.211 [1] ✔

[1] P_u / ϕP_n controls

Torque-Arm Bottom Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	180 - 160 (533)	L3x3x1/4	3.50	3.38	43.6	1.4400	2866.28	46656.00	0.061 [1] ✔
T1	180 - 160 (534)	L3x3x1/4	3.50	3.38	43.6	1.4400	2938.12	46656.00	0.063 [1] ✔
T1	180 - 160 (539)	L3x3x1/4	3.50	3.38	43.6	1.4400	2957.46	46656.00	0.063 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	180 - 160 (540)	L3x3x1/4	3.50	3.38	43.6	1.4400	3085.01	46656.00	0.066 [1]
T1	180 - 160 (545)	L3x3x1/4	3.50	3.38	43.6	1.4400	2938.49	46656.00	0.063 [1]
T1	180 - 160 (546)	L3x3x1/4	3.50	3.38	43.6	1.4400	2845.05	46656.00	0.061 [1]
T4	120 - 100 (551)	L3x3x1/4	3.50	3.38	43.6	1.4400	2034.21	46656.00	0.044 [1]
T4	120 - 100 (552)	L3x3x1/4	3.50	3.38	43.6	1.4400	1737.13	46656.00	0.037 [1]
T4	120 - 100 (557)	L3x3x1/4	3.50	3.38	43.6	1.4400	2053.13	46656.00	0.044 [1]
T4	120 - 100 (558)	L3x3x1/4	3.50	3.38	43.6	1.4400	2027.37	46656.00	0.043 [1]
T4	120 - 100 (563)	L3x3x1/4	3.50	3.38	43.6	1.4400	1919.81	46656.00	0.041 [1]
T4	120 - 100 (564)	L3x3x1/4	3.50	3.38	43.6	1.4400	1619.73	46656.00	0.035 [1]

[1] P_u / ϕP_n controls

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
T1	180 - 160	Leg	P2.5x.203	2	-40986.50	82983.90	49.4	Pass
		Diagonal	5/8	22	7309.11	9940.20	73.5	Pass
		Horizontal	L1 3/4x1 3/4x3/16	52	-6075.06	9793.71	62.0	Pass
		Top Girt	L1 3/4x1 3/4x3/16	4	-3603.32	9793.71	36.8	Pass
		Guy A@160.375	5/8	542	13140.50	25440.00	51.7	Pass
		Guy B@160.375	5/8	536	13370.70	25440.00	52.6	Pass
		Guy C@160.375	5/8	529	13204.90	25440.00	51.9	Pass
		Top Guy Pull-Off@160.375	L1 1/2x1 1/2x3/16	18	-9076.45	11503.00	78.9	Pass
		Bottom Guy Pull-Off@160.375	L1 1/2x1 1/2x3/16	9	-4302.33	11503.00	37.4	Pass
		Torque Arm Top@160.375	L2x2x5/16	532	12089.90	37260.00	32.4 33.8 (b)	Pass
		Torque Arm Bottom@160.375	L3x3x1/4	540	-9654.46	36439.50	26.5 27.0 (b)	Pass
T2	160 - 140	Leg	P2.5x.203	63	-39821.50	82983.90	48.0	Pass
		Diagonal	5/8	115	5079.83	9940.20	51.1	Pass
		Horizontal	L1 1/2x1 1/2x3/16	112	-5347.12	7190.10	74.4	Pass
		Top Girt	L1 1/2x1 1/2x3/16	66	-3516.84	7190.10	48.9	Pass
		Bottom Girt	L1 1/2x1 1/2x3/16	67	-2741.20	7190.10	38.1	Pass
T3	140 - 120	Leg	P2.5x.203	122	-39824.30	79606.90	50.0	Pass
		Diagonal	5/8	135	4377.94	9940.20	44.0	Pass
		Horizontal	L1 1/2x1 1/2x3/16	136	-5264.42	7190.10	73.2	Pass
		Top Girt	L1 1/2x1 1/2x3/16	124	-2731.79	7190.10	38.0	Pass
		Bottom Girt	L1 1/2x1 1/2x3/16	129	-3272.07	7190.10	45.5	Pass
T4	120 - 100	Leg	P2.5x.203	183	-47064.90	79606.90	59.1	Pass
		Diagonal	5/8	230	4389.53	9940.20	44.2	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
		Horizontal	L1 1/2x1 1/2x3/16	225	-4369.76	7190.10	60.8	Pass
		Bottom Girt	L1 1/2x1 1/2x3/16	188	-2263.36	7190.10	31.5	Pass
		Guy A@116.417	9/16	560	8272.58	21000.00	39.4	Pass
		Guy B@116.417	9/16	553	8396.16	21000.00	40.0	Pass
		Guy C@116.417	9/16	547	8452.63	21000.00	40.3	Pass
		Top Guy Pull-Off@116.417	L1 1/2x1 1/2x3/16	186	-3284.75	11503.00	28.6	Pass
		Bottom Guy Pull-Off@116.417	L1 1/2x1 1/2x3/16	234	-6621.49	11503.00	57.6	Pass
		Torque Arm Top@116.417	L2x2x5/16	561	7935.03	37260.00	21.3 22.2 (b)	Pass
		Torque Arm Bottom@116.417	L3x3x1/4	557	-4966.53	36439.50	13.6 13.9 (b)	Pass
T5	100 - 80	Leg	P2.5x.203	243	-44137.70	82983.90	53.2	Pass
		Diagonal	5/8	299	4025.08	9940.20	40.5	Pass
		Horizontal	L1 1/2x1 1/2x3/16	292	-4044.93	7190.10	56.3	Pass
		Top Girt	L1 1/2x1 1/2x3/16	246	-2469.97	7190.10	34.4	Pass
		Bottom Girt	L1 1/2x1 1/2x3/16	249	-2119.25	7190.10	29.5	Pass
T6	80 - 60	Leg	P2.5x.203	301	-46600.70	82983.90	56.2	Pass
		Diagonal	5/8	310	3920.55	9940.20	39.4	Pass
		Horizontal	L1 1/2x1 1/2x3/16	317	-4252.14	7190.10	59.1	Pass
		Top Girt	L1 1/2x1 1/2x3/16	305	-2132.49	7190.10	29.7	Pass
		Guy A@60.375	9/16	567	8295.24	21000.00	39.5	Pass
		Guy B@60.375	9/16	566	8657.31	21000.00	41.2	Pass
		Guy C@60.375	9/16	565	8641.82	21000.00	41.2	Pass
		Top Guy Pull-Off@60.375	L1 1/2x1 1/2x3/16	309	2476.31	17085.90	14.5	Pass
T7	60 - 40	Leg	P2.5x.203	362	-52560.40	78156.90	67.2	Pass
		Diagonal	5/8	420	4005.80	9940.20	40.3	Pass
		Horizontal	L1 1/2x1 1/2x3/16	377	-4013.01	7190.10	55.8	Pass
		Top Girt	L1 1/2x1 1/2x3/16	365	-2016.84	7190.10	28.1	Pass
		Bottom Girt	L1 1/2x1 1/2x3/16	369	-2273.98	7190.10	31.6	Pass
T8	40 - 20	Leg	P2.5x.203	422	-54395.90	81404.20	66.8	Pass
		Diagonal	5/8	480	3265.12	9940.20	32.8	Pass
		Horizontal	L1 1/2x1 1/2x3/16	474	-4139.29	7190.10	57.6	Pass
		Top Girt	L1 1/2x1 1/2x3/16	425	-2030.43	7190.10	28.2	Pass
		Bottom Girt	L1 1/2x1 1/2x3/16	429	-2034.19	7190.10	28.3	Pass
T9	20 - 5	Leg	P2.5x.203	481	-53915.70	80094.30	67.3	Pass
		Diagonal	5/8	490	3567.46	9940.20	35.9	Pass
		Horizontal	L1 1/2x1 1/2x3/16	497	-3596.33	7190.10	50.0	Pass
		Top Girt	L1 1/2x1 1/2x3/16	486	-1948.42	7190.10	27.1	Pass
		Bottom Girt	L1 1/2x1 1/2x3/16	487	5314.46	17085.90	31.1	Pass
T10	5 - 0	Leg	P2.5x.203	525	-56208.90	81527.00	68.9	Pass
		Top Girt	L1 1/2x1 1/2x3/16	528	6094.87	17085.90	35.7	Pass
							Summary	
							Leg (T10)	68.9 Pass
							Diagonal (T1)	73.5 Pass
							Horizontal (T2)	74.4 Pass
							Top Girt (T2)	48.9 Pass
							Bottom Girt (T3)	45.5 Pass
							Guy A (T1)	51.7 Pass
							Guy B (T1)	52.6 Pass
							Guy C (T1)	51.9 Pass
							Top Guy Pull-Off (T1)	78.9 Pass
							Bottom Guy	57.6 Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
						Pull-Off (T4)		
						Torque Arm Top (T1)	33.8	Pass
						Torque Arm Bottom (T1)	27.0	Pass
						Bolt Checks	33.8	Pass
						RATING =	**78.9**	**Pass**

Site Name:	**Colchester**
Client:	**CDT**
Job Number:	**119-23049**
Date:	**8/12/2019**

Design Base Loads (Factored) per TIA-222-G

Moment (M_u):	0.0	k-ft	Concrete Compressive Strength (f'_c):	3000.0	psi
Shear/Leg (V_u):	2.0	k	Bending/Tension Reduction Factor (ϕ_B):	0.90	
Compression/Leg (P_u):	153.9	k	Shear Reduction Factor (ϕ_V):	0.75	
Uplift/Leg (T_u):	0.0	k	Compression Reduction Factor (ϕ_V):	0.65	
Diameter of Prismatic Portion of Pier (d):	1.0	ft	Steel Elastic Modulus:	29000	ksi
Depth to Base of Foundation:	2.0	ft	Pad Steel Rebar Size #:	4	
Pier Height Above Ground (h):	2.0	ft	Pad Steel Rebar Area:	0.20	in^2
Length / Width of Pad (w):	6.0	ft	Pad Steel Rebar Yield Strength (F_y):	60	ksi
Thickness of Pad (t):	4.0	ft	# of Rebar in Top of Pad:		
Depth Below Ground Surface to Water Table (w):	20.0	ft	# of Rebar in Base of Pad:	2	
Unit Weight of Concrete:	150.0	pcf	Pad Clear Cover:	3	in
Unit Weight of Water:	62.4	pcf			
Unit Weight of Soil Above Water Table:	120.0	pcf			
Unit Weight of Soil Below Water Table:	65.0	pcf			
Friction Angle of Uplift from Top of Pad:	30	Degrees			
Friction Angle of Uplift from Base of Pad:	30	Degrees			
Uplift Angle Started at Top or Base of Pad (T/B):	T				
Ultimate Skin Friction:	0	psf			
Ultimate Compressive Bearing Pressure:	10000	psf			
Capacity Increase (Due to Transient Loads):	1.00				
Bearing Strength Reduction Factor (ϕ_s):	0.60				
Uplift Strength Reduction Factor (ϕ_s):	0.75				

Axial Capacities

Nominal Uplift Capacity per Leg ($\phi_s T_n$):	12.0	k	
Nominal Compressive Capacity per Leg ($\phi_s P_n$):	216.0	k	
P_u:	159.3	k	
$T_u/\phi_s T_n$:	0.00	Result:	OK
$P_u/\phi_s P_n$:	0.74	Result:	OK

Site Name:	**Colchester**
Client:	**CDT**
Job Number:	**119-23049**
Date:	**8/12/2019**

Design Standard per TIA-222-G

Anchor Radius:	145.0	ft
Uplift (Factored - P_u):	33.1	k
Shear (Factored - V_u):	38.8	k
Anchor Base Depth (d):	7.5	ft
Width of Anchor (W):	5.5	ft
Length of Anchor (L):	11.5	ft
Thickness of Anchor (t):	2.0	ft
Depth Below Ground Surface to Water Table (w):	20.0	ft
Soil Uplift at Base / Top of Anchor (B/T):	T	
Unit Weight of Concrete:	150.0	pcf
Unit Weight of Soil Above Water Table:	120.0	pcf
Unit Weight of Water:	62.4	pcf
Submerged Soil Unit Weight:	65.0	pcf
Internal Angle of Friction:	30	Degrees
Cohesion:	500	psf
Ultimate Skin Friction of Pad Sides to Soil:	0	psf
Ultimate Coefficient of Shear Friction:	0.30	
Maximum Top Conical Failure Angle:	30	Degrees
Maximum Base Conical Failure Angle:	30	Degrees
Allowable Capacity Increase:	1.00	(Due to Transient Loads)
Uplift Strength Reduction Factor (ϕ_u):	0.75	
Shear Strength Reduction Factor (ϕ_v):	0.75	
Concrete Uplift Strength Reduction Factor (ϕ_u):	0.90	

Uplift

Weight of Concrete (Buoyancy Effect Considered):	19.0	k
Weight of Soil (Buoyancy Effect Considered):	84.3	k
Ultimate Uplift Resistance from Skin Friction:	0.0	k
Nominal Factored Uplift Resistance ($\phi_u P_n$):::	80.3	k
P_u / $\phi_u P_n$:	0.41	Result: OK

Shear

Ultimate Shear Friction Resistance Due to Normal Force - Uplift:	10.8	k
Passive Pressure:	4072	psf
Ultimate Passure Pressure Resistance:	93.7	k
Nominal Shear Resistance ($\phi_v V_n$):	78.3	k
V_u / $\phi_v V_n$:	0.50	Result: OK

Anchor Rod Capacity

# of Anchor Rods:	1		Rod F_y:	47 ksi
Anchor Rod Gross Area:	2.41	in^2	Rod F_u:	62 ksi
Anchor Rod Net Area:	2.41	in^2	ϕ_y:	0.80
Resultant Tensile Load (T_u):	51.0	k	ϕ_t:	0.65
Anchor Rod Tensile Resistance (ϕT_n):::	90.4	k		
T_u / ϕT_n:	0.56	Result: OK		

Strength Analysis of Reinforced Concrete

Concrete Compressive Srength (f'_c):	3000	psi
Longitudinal Rebar Yield Strength:	60000	psi
# Longitudinal Rebar (Top):	9	
# Longitudinal Rebar (1 Side):	3	
Rebar Size:	4	
Strength Reduction Factor for Shear (ϕ_v):	0.75	
Strength Reduction Factor for Flexure (ϕ_b):	0.9	
Compression Zone Factor (β_1):	0.85	
Area of Single Rebar:	0.20	in^2
One Way Shear due to Shear Load (V_u):	10.7	k
Nominal One Way Shear Capacity for Shear Load ($\phi_c V_n$):	122.3	k
$V_u/\phi_v V_n$:	0.09	Result: OK
One Way Shear due to Uplift (V_u):	14.1	k
Nominal One Way Shear Capacity for Uplift ($\phi_c V_n$):	108.4	k
$V_u/\phi_v V_n$:	0.13	Result: OK
Pad Flexure due to Shear Load (M_u):	55.8	k-ft
Nominal Flexural Capacity for Shear Load ($\phi_b M_n$):	167.4	k-ft
Pad Flexure due to Uplift (M_u):	47.5	k-ft
Nominal Flexural Capacity for Uplift ($\phi_b M_n$):	161.9	k-ft
$M_u/\phi_b M_n$ (Max.):	0.33	Result: OK

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June 17, 2019

RE:	**AT&T LTE 2C/3C/4C/5C/RETROFIT**
Prepared For:	Smartlink / AT&T
Site Number:	CTL02032
FA Location:	10035250
PACE Number:	MRCTB035120/MRCTB035107/MRCTB035160/ MRCTB035205/MRCTB035331
Site Name:	COLCHESTER CENTRAL
Site Address:	600 Old Hartford Road Colchester, CT 06415

To Whom It May Concern,

This structural assessment is in regards to the adequacy of the proposed sector frames with (3) stiff arms per sector for the AT&T LTE 2C/3C/4C/5C/RETROFIT project. The purpose was to determine conformance of existing antenna mounting structure under the Connecticut State Building Code (2015 International Building Code w/ amendments) and the industry standard ANSI/TIA-222-H (Structural Standard for Antenna Supporting Structures, Antennas and Small Wind Turbine Support Structures).

Based on collected information via a Mount Mapping Report by HighTower Solutions, Inc. dated 02/07/2019, existing and proposed loading presented in the RFDS provided by AT&T dated 10/01/2018 Ver. 2, Construction Drawings by Fullerton Engineering (latest version), technical data of the proposed equipment, structural calculations and engineering judgment, the proposed sector frames (Fred A. Nudd Corporation HD-12ft Boom with 4ft Standoff) with (3) stiff arms per sector are **adequate** to support the existing and proposed loading provided by the client, **with a maximum stress ratio of 49.0%.**

This PE certification completed by Fullerton Engineering Consultants is inclusive of the proposed antenna mounting structure that will support the existing and proposed loading provided by the client.

This certification assumes that all the structural members of the proposed antenna mounting structures are in good condition and have not been altered from the original design. Prior to installation of new equipment, contractor shall inspect the condition of all relevant members and connectors. The contractor shall be responsible for the means and methods of construction.

Respectfully,

Barbara T. Kotecki, P.E.

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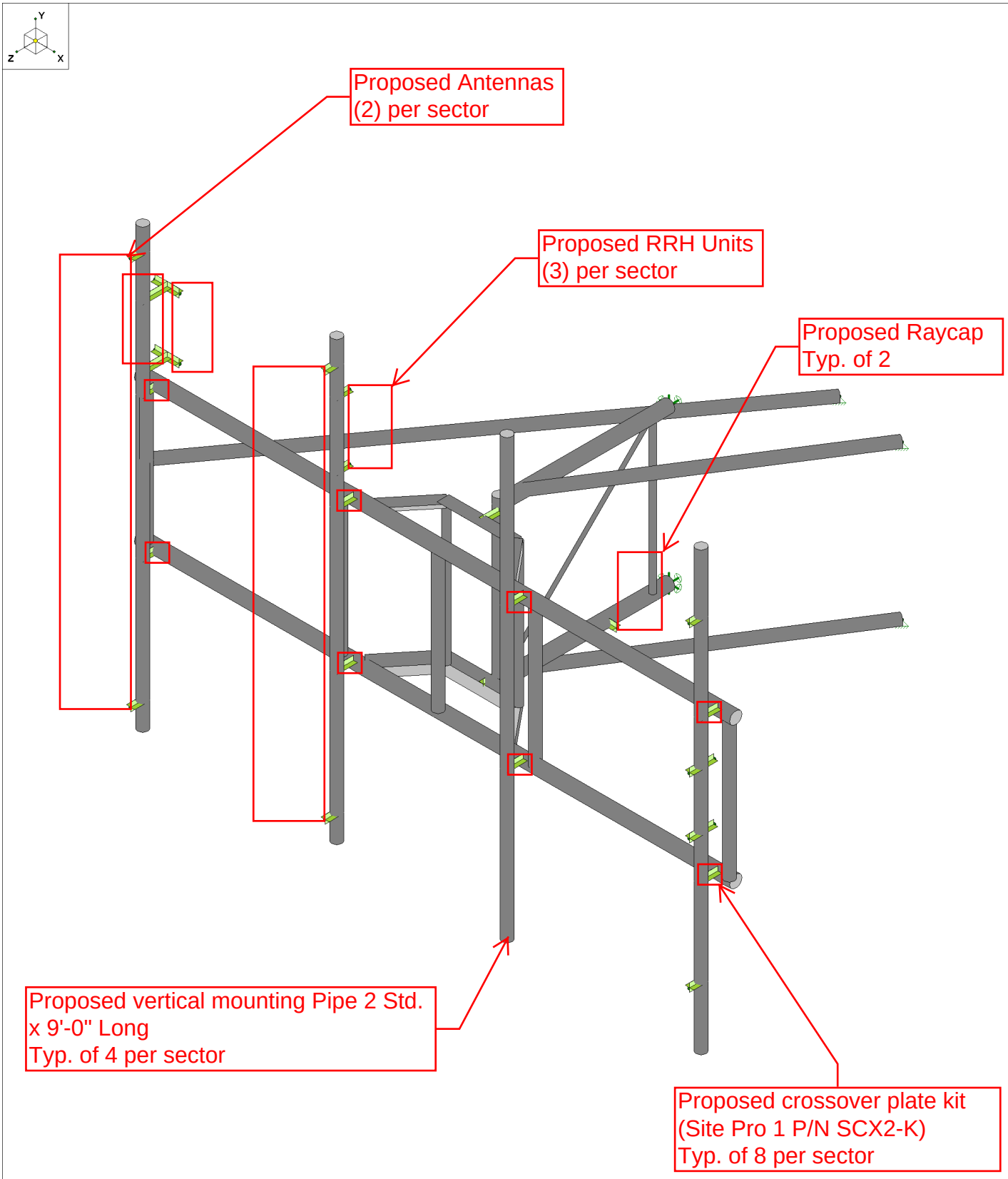
Site Number: **CTL02032**
Site Name: COLCHESTER CENTRAL
Created By: LA
Checked By: BTK
Date: 6/14/2019
Code: ANSI/TIA-222-H

Ka=	0.9		
Base Structure Type	**Type**	Guyed Tower	
Structure Height Above Grade (ft)	**Ht**	180.00	
RAD Center (ft)	**z**	170.00	
Windspeed no ice (mph, 3-sec gust)	**V**	121.00	see wind maps
Windspeed with ice (mph, 3-sec gust)	**Vi**	50.00	see ice maps
Windspeed for maintenance (mph, 3-sec gust)	**Vm**	30.00	Section 16.6
Ice Thickness	**ti**	1.50	see ice maps
Exposure Category (B/C/D)	**Exposure**	B	Section 2.6.5.1.2
Topographic Category (1,2,3,4)	**Topo**	1.00	Section 2.6.6.1
Structure Class (I,II,III)	**Class**	II	Table 2-1
Crest Height	**H**	0.00	Section 2.6.6.2.1
Height above sea level	**Zs**	384.00	
Gust Effect Factor	**Gh**	1.00	Section 16.6
Design Ice Thickness	**tiz**	1.77	Section 2.6.10
Velocity Pressure for Maintenance	**qzm**	2.48	Section 2.6.11.6
Velocity Pressure With Ice	**qzi**	6.90	Section 2.6.11.6
Velocity Pressure No Ice	**qz**	40.38	Section 2.6.11.6

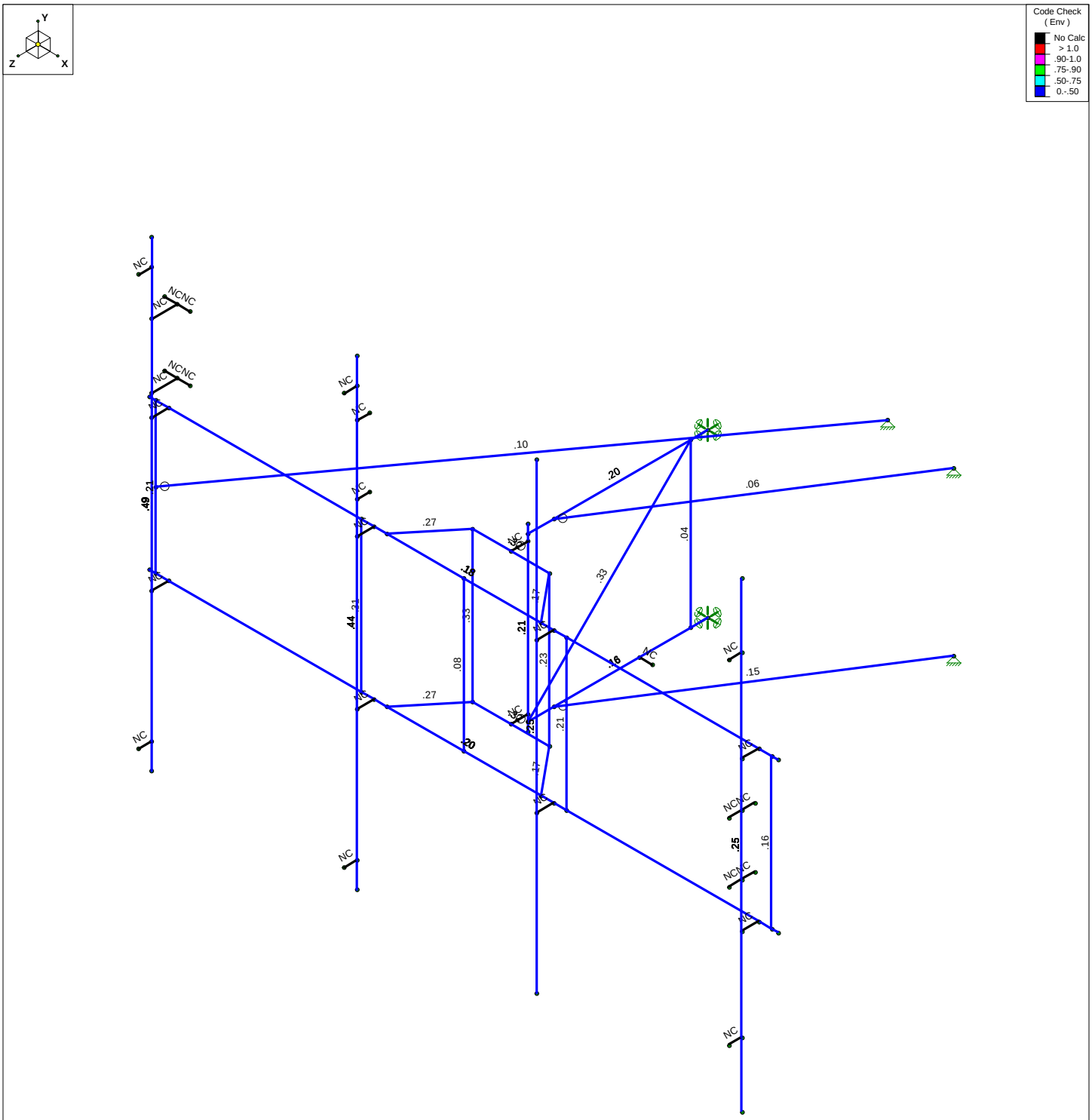
Appurtenance Properties								Loads (force per connection)								
Manufacturer	**Model**	**R/F**	**L**	**W**	**D**	**Weight**	**# Conn**	**Wt**	**Ice Wt**	**F no ice**	**S no ice**	**F ice**	**S ice**	**Fm**	**Sm**	**EPA.F**
Powerwave	7770	Flat	55	11	5	35	2	17.5	44.4	100	53	23	15	6	3	6
Kathrein	800-10966	Flat	96	20	6.9	114.6	2	57.3	93.7	316	136	64	33	19	8	17
Kathrein	800-10965	Flat	78.7	20	6.9	108.6	2	54.3	77.9	251	106	52	26	15	7	14
Ericsson	RRUS 4478 B14	Flat	16.5	13.4	7.7	59.9	2	30.0	23.3	33	19	9	6	2	1	2
Ericsson	RRUS B2/B66A 8843	Flat	15	13.2	10.9	71.9	2	36.0	28.2	30	25	8	7	2	2	2
Ericsson	RRUS B5/B12 4449	Flat	15	13.2	9.3	70	2	35.0	25.1	30	21	8	6	2	1	2
Raycap	DC6-48-60-18-8F	Round	24	9.7	9.7	32.8	1	32.8	27.3	29	29	8	8	2	2	1
Powerwave	LGP21401	Flat	14.5	9	3	15	2	7.5	11.1	20	7	6	3	1	0.44	1
Powerwave	LGP 32901	Flat	7	4.5	3	10	2	5.0	5.9	5	3	2	2	0.29	0.20	0.26

Shape Properties								Loads (force per connection)								
Shape	**R/F**	**L**	**W**	**D**	**Weight**	**# Conn**	**Wt**	**Ice Wt**	**F no ice**	**S no ice**	**F ice**	**S ice**	**Fm**	**Sm**	**EPA.F**	
L3x3x6	Flat	18	3	3	0	1.5	0.0	13.0	12	12	5	5	1	1		
PIPE_1.0	Round	38	1.32	1.32	0	3.16667	0.0	6.7	5	5	2	2	0.29	0.29		
PIPE_1.25	Round	35	1.66	1.66	0	2.91667	0.0	7.4	6	6	2	2	0.34	0.34		
PIPE_2.0	Round	108	2.4	2.4	0	9	0.0	9.0	9	9	3	3	1	1		
PIPE_2.5	Round	122.4	2.9	2.9	0	10.2	0.0	10.1	11	11	4	4	1	1		
PIPE_2.5X	Round	147	2.9	2.9	0	12.25	0.0	10.1	11	11	4	4	1	1		
SR 3/4" dia.	Round	53.7	0.75	0.75	0	4.475	0.0	5.4	3	3	2	2	0.17	0.17		



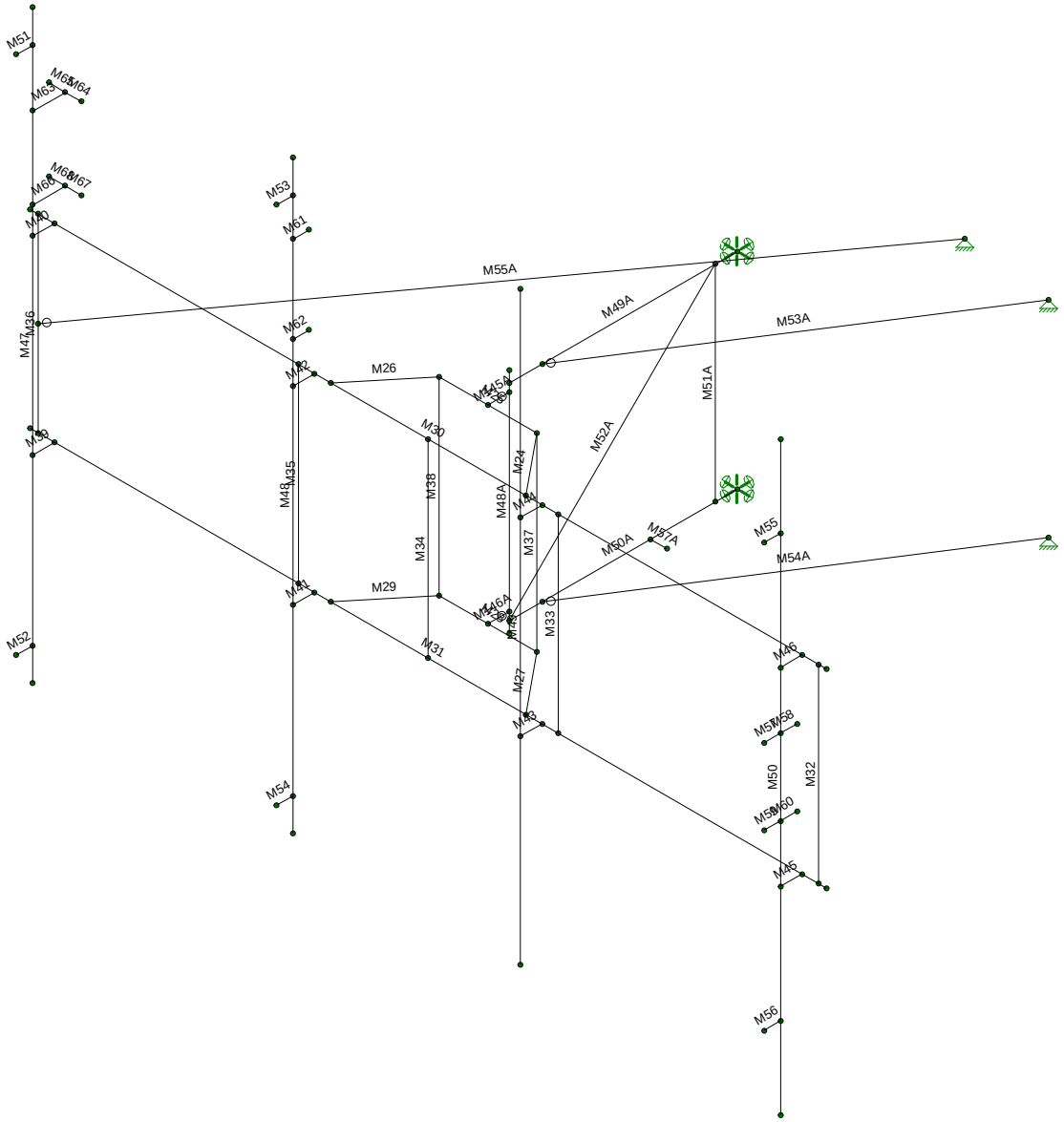
Envelope Only Solution

Fullerton Engineering Cons...		SK - 1
LA	Mount Analysis	June 14, 2019 at 2:02 PM
CTL02032	3D Render	CTL02032 - Mount Analysis.r3d



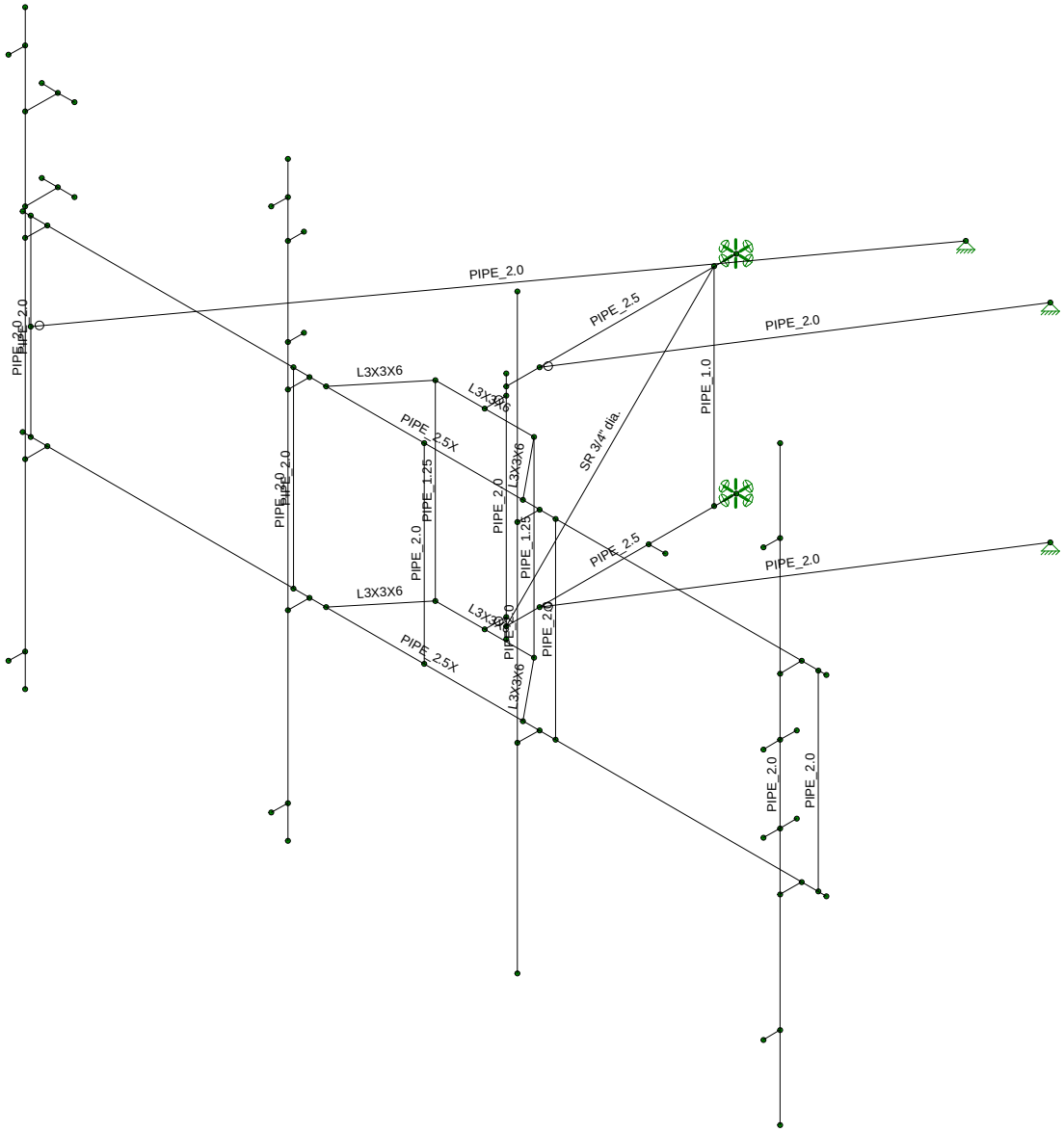
Member Code Checks Displayed (Enveloped)
Envelope Only Solution

Fullerton Engineering Cons...		SK - 2
LA	Mount Analysis	June 17, 2019 at 7:57 AM
CTL02032	Unity Graphic	CTL02032 - Mount Analysis.r3d



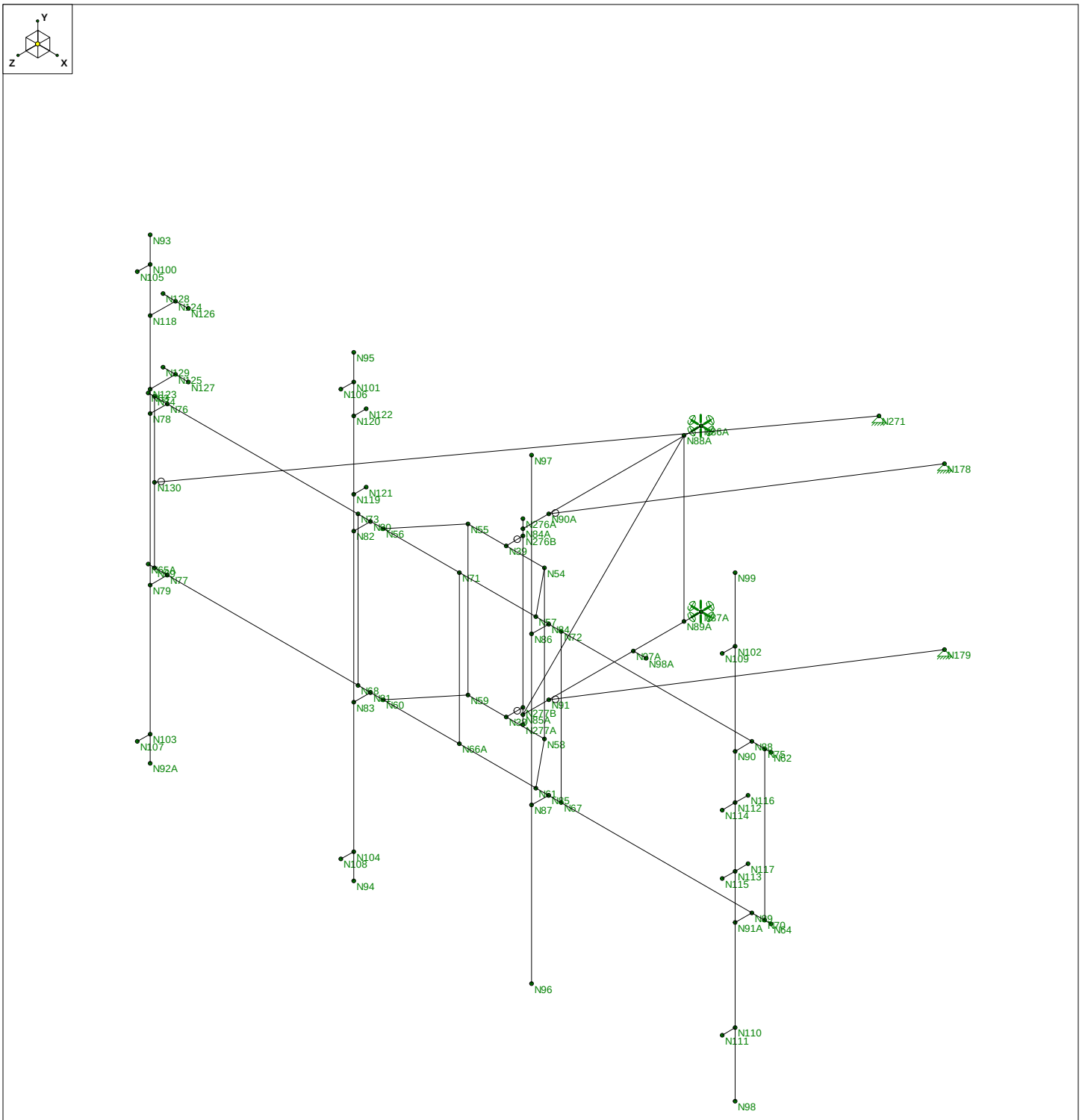
Envelope Only Solution

Fullerton Engineering Cons...		SK - 3
LA	Mount Analysis	June 14, 2019 at 2:02 PM
CTL02032	Member Label	CTL02032 - Mount Analysis.r3d



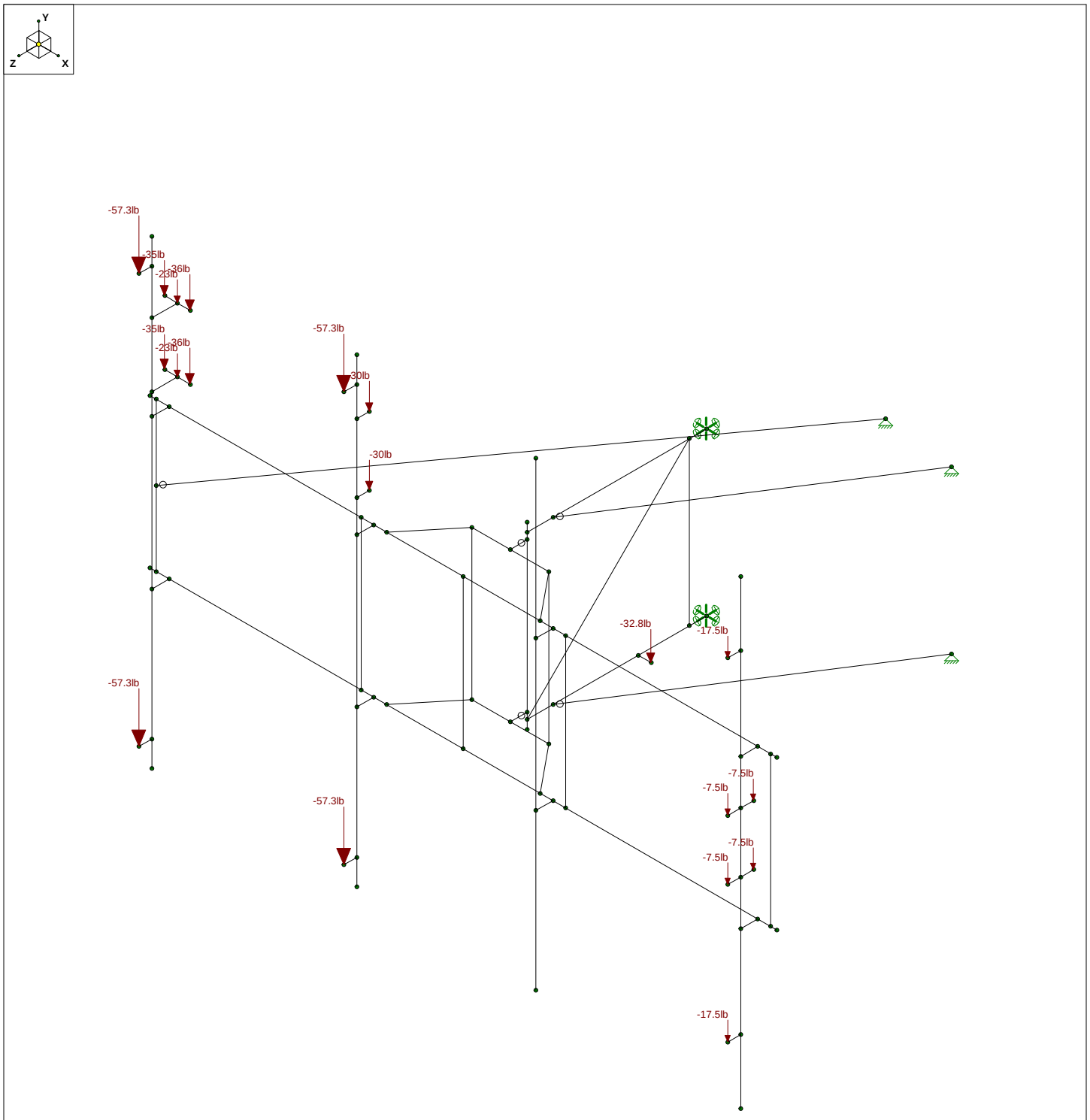
Envelope Only Solution

Fullerton Engineering Cons...		SK - 4
LA	Mount Analysis	June 14, 2019 at 2:02 PM
CTL02032	Shape	CTL02032 - Mount Analysis.r3d



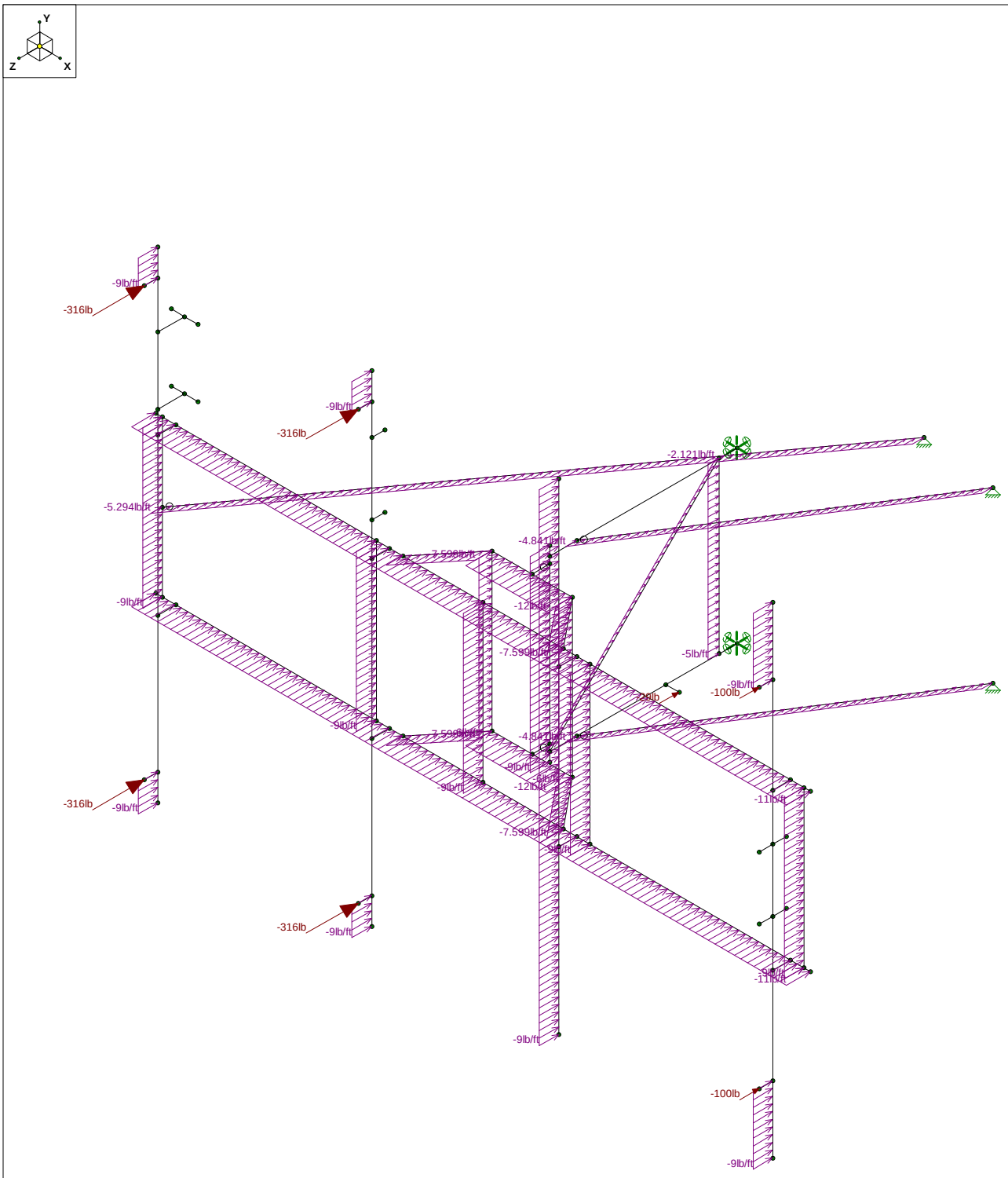
Envelope Only Solution

Fullerton Engineering Cons...		SK - 5
LA	Mount Analysis	June 14, 2019 at 2:02 PM
CTL02032	Nodes	CTL02032 - Mount Analysis.r3d



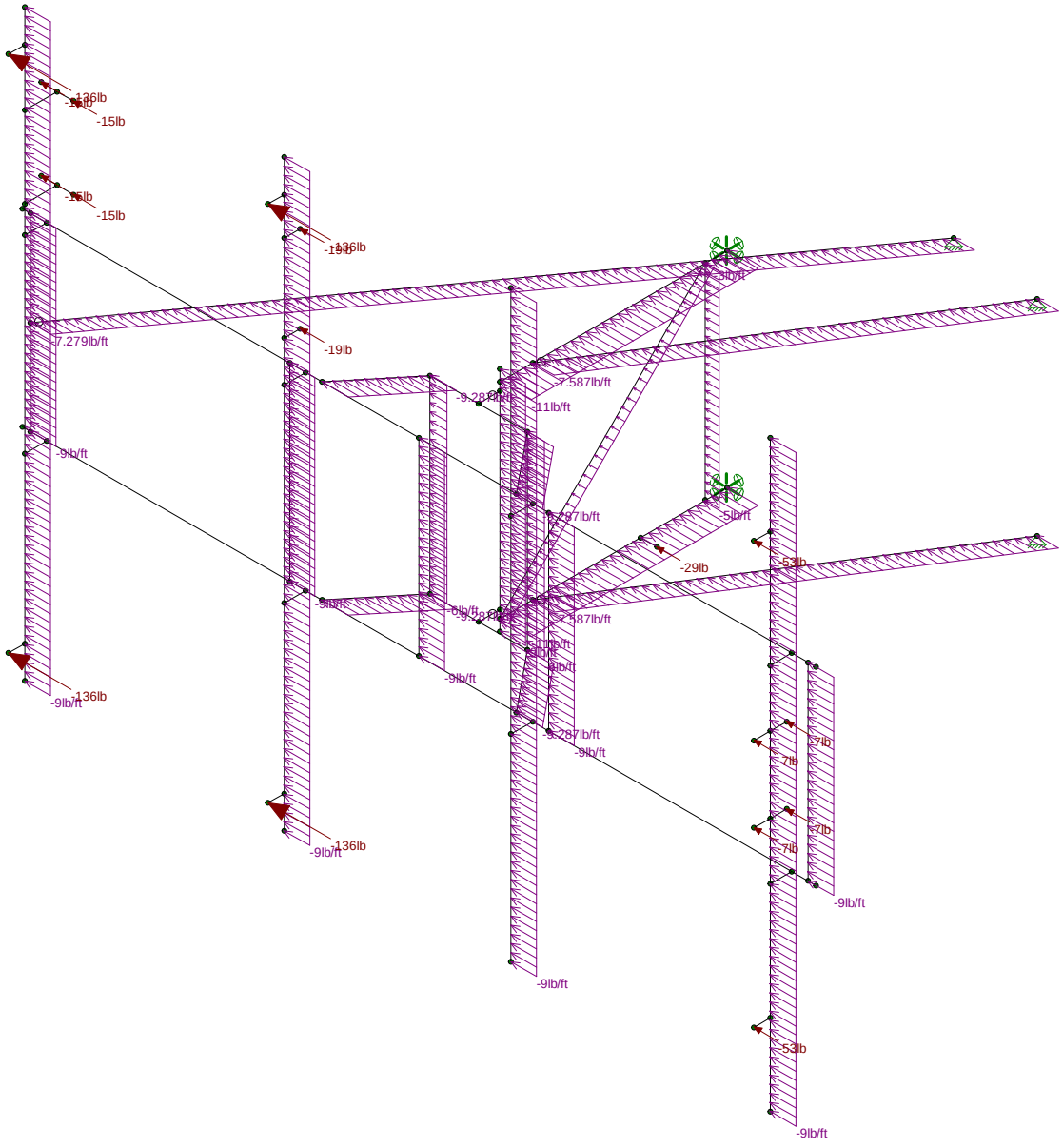
Loads: BLC 1, DL
Envelope Only Solution

Fullerton Engineering Cons...		SK - 6
LA	Mount Analysis	June 14, 2019 at 2:03 PM
CTL02032	Dead Load	CTL02032 - Mount Analysis.r3d



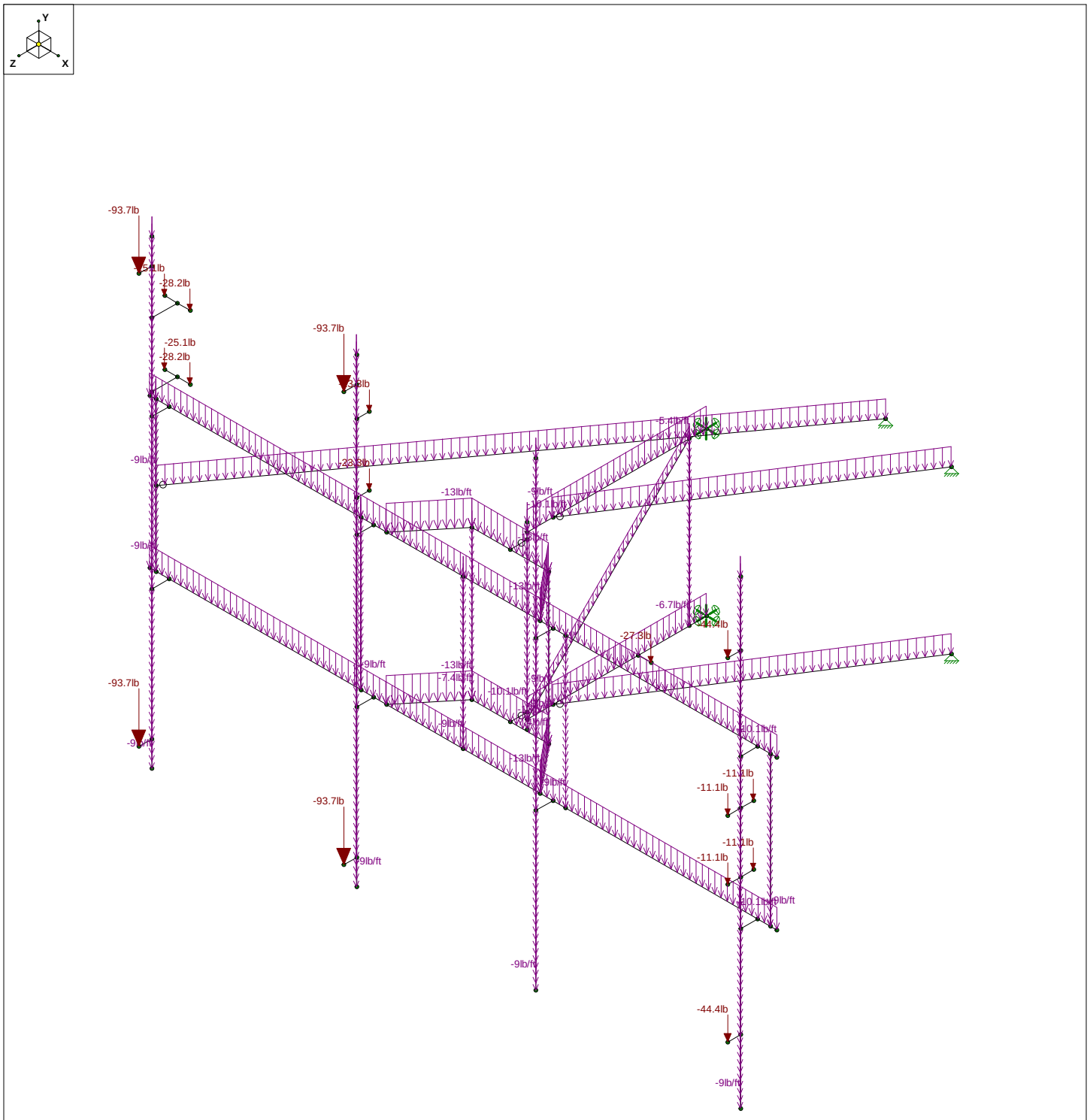
Loads: BLC 3, WL(0)
Envelope Only Solution

Fullerton Engineering Cons...		SK - 7
LA	Mount Analysis	June 14, 2019 at 2:03 PM
CTL02032	Wind Load (Z-Direction)	CTL02032 - Mount Analysis.r3d



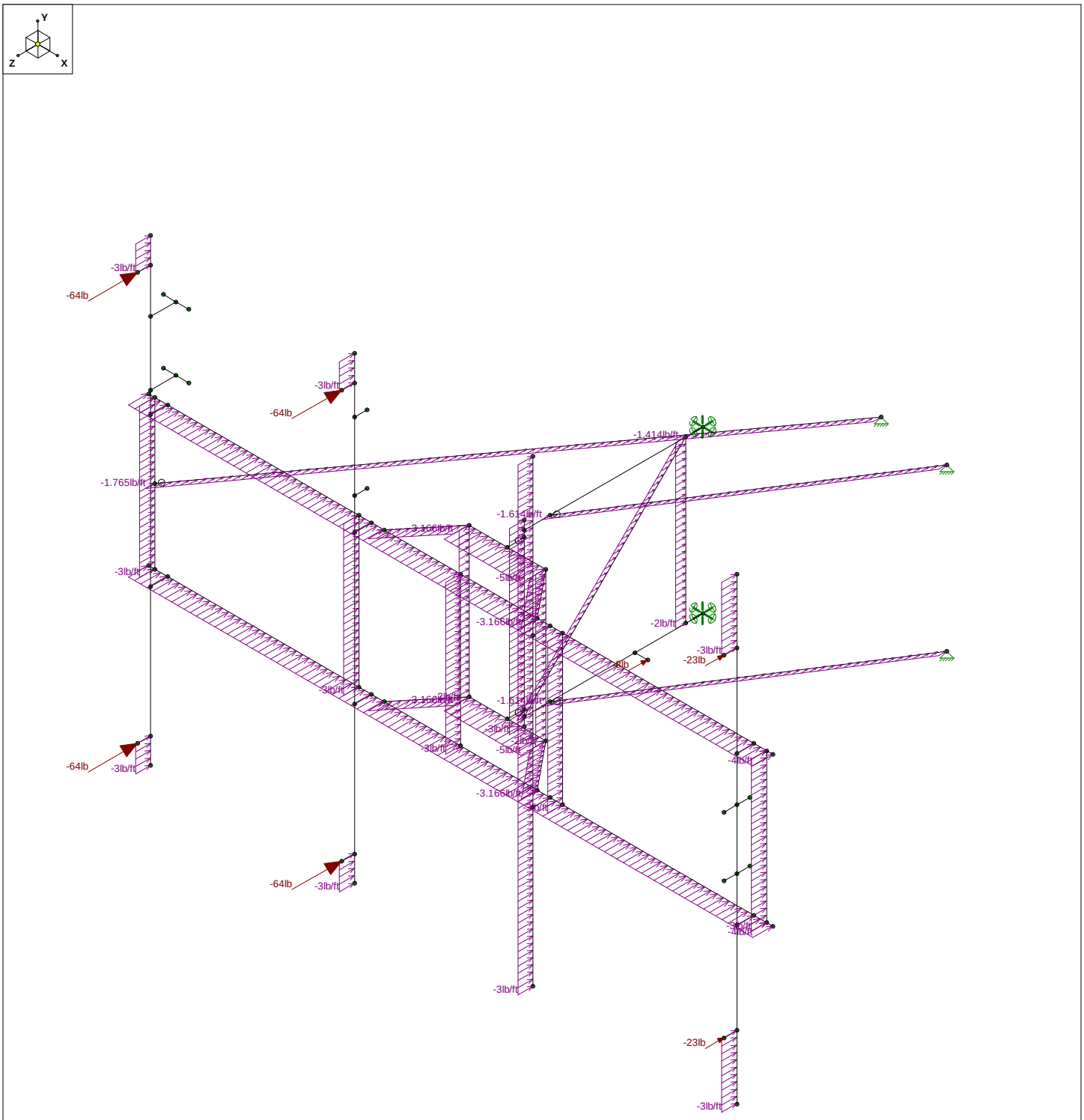
Loads: BLC 4, WL(90)
Envelope Only Solution

Fullerton Engineering Cons...		SK - 8
LA	Mount Analysis	June 14, 2019 at 2:03 PM
CTL02032	Wind Load (X-Direction)	CTL02032 - Mount Analysis.r3d



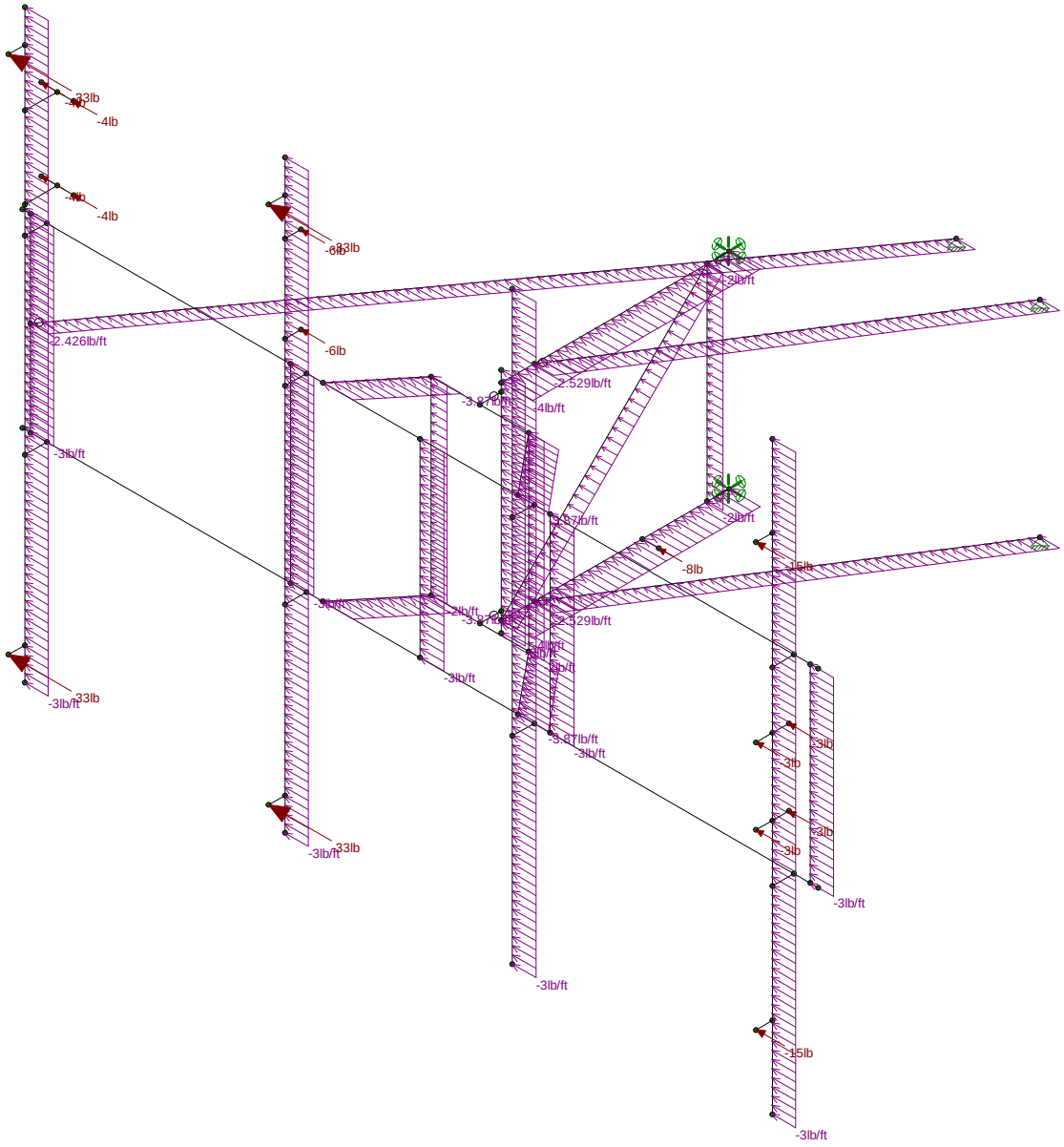
Loads: BLC 2, DLi
Envelope Only Solution

Fullerton Engineering Cons...		SK - 9
LA	Mount Analysis	June 14, 2019 at 2:03 PM
CTL02032	Ice Load	CTL02032 - Mount Analysis.r3d



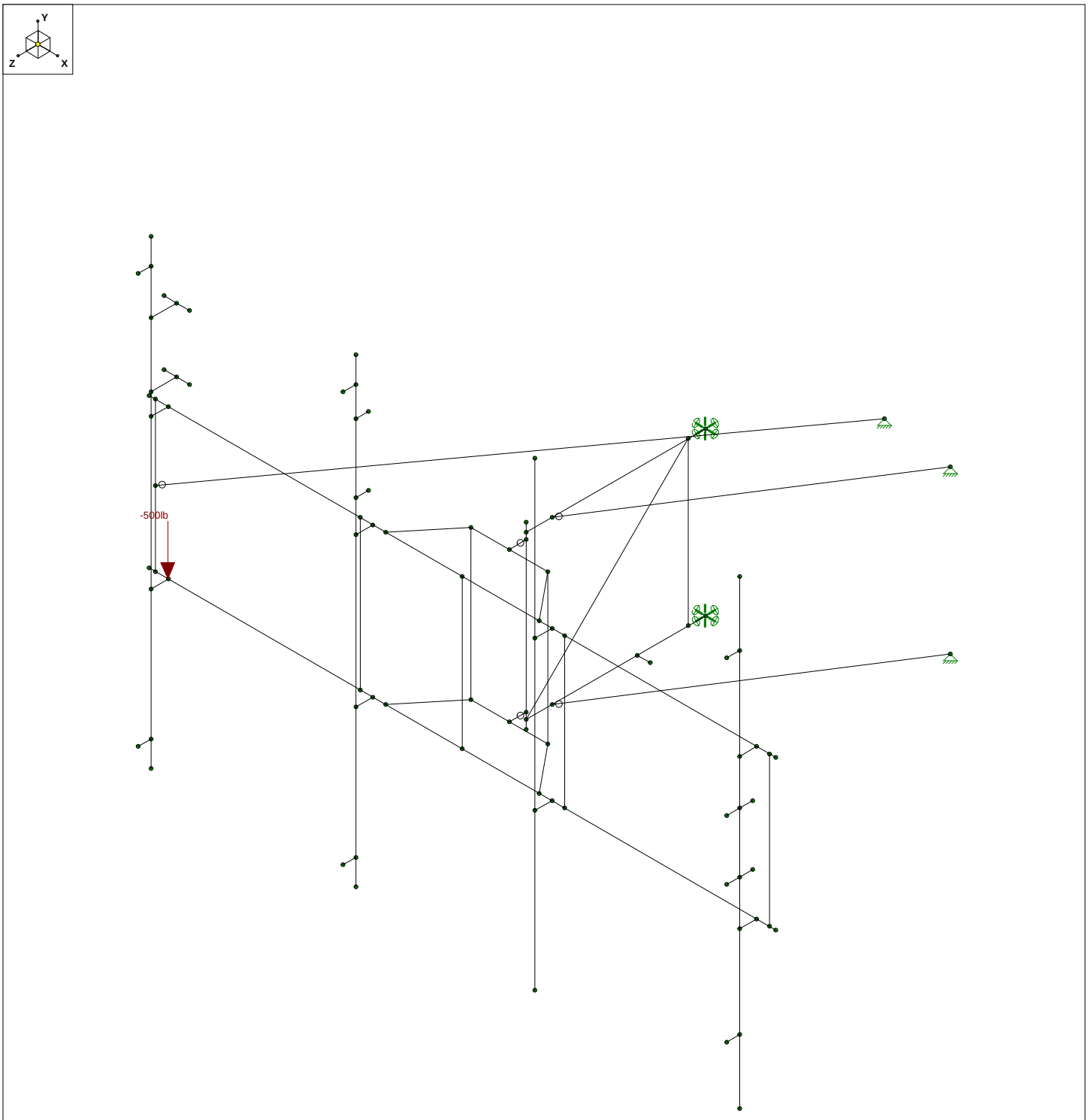
Loads: BLC 5, WL.i(0)
Envelope Only Solution

Fullerton Engineering Cons...		SK - 10
LA	Mount Analysis	June 14, 2019 at 2:04 PM
CTL02032	Wind Load with Ice (Z-Direction)	CTL02032 - Mount Analysis.r3d



Loads: BLC 6, WL.i(90)
Envelope Only Solution

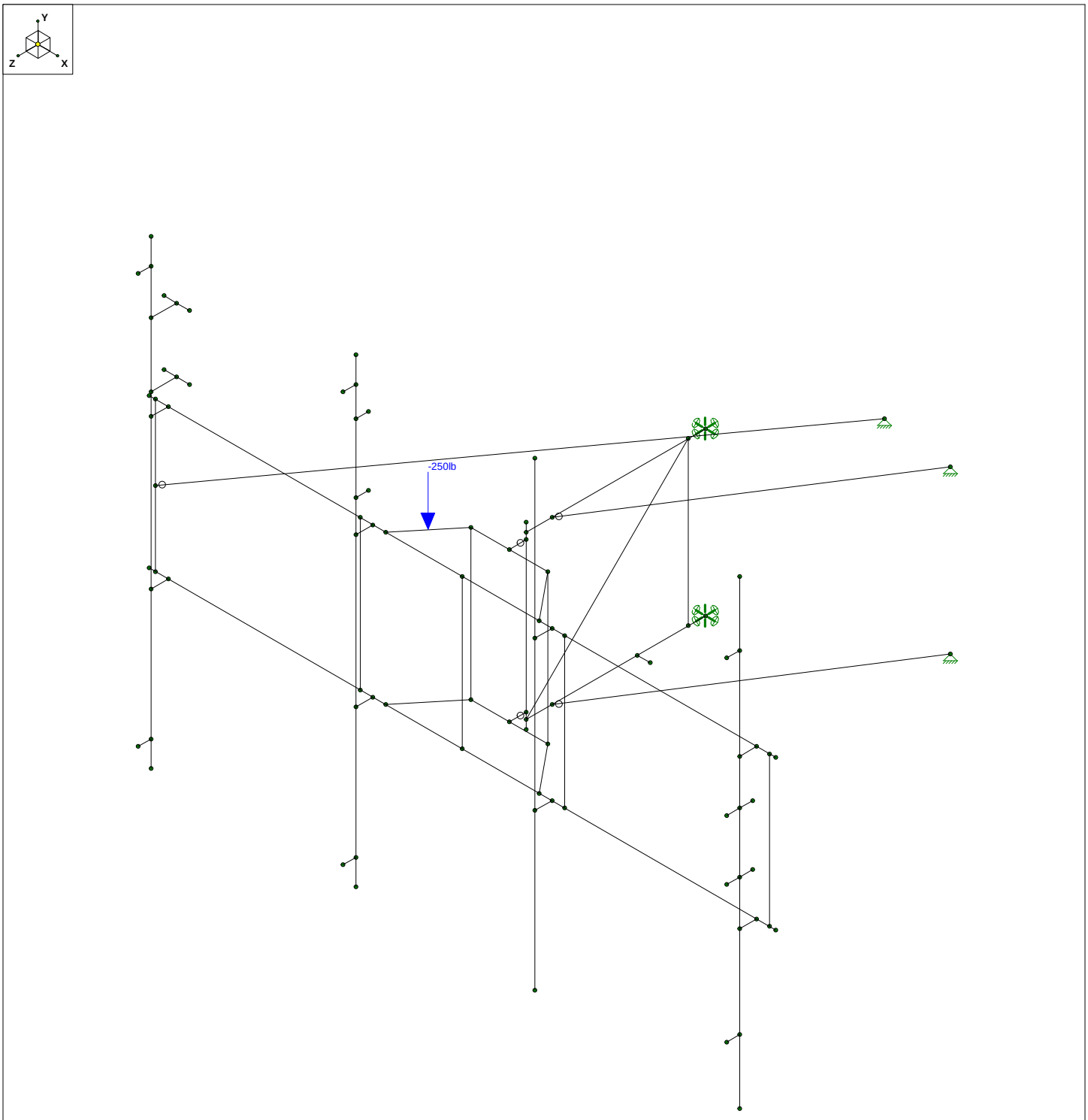
Fullerton Engineering Cons...		SK - 11
LA	Mount Analysis	June 14, 2019 at 2:04 PM
CTL02032	Wind Load with Ice (X-Direction)	CTL02032 - Mount Analysis.r3d



500lb Live Loads are applied at mounting pipe positions.
Only one is shown for clarification purposes, but all are considered in the calculations.

Loads: BLC 12, LM3
Envelope Only Solution

Fullerton Engineering Cons...		SK - 12
LA	Mount Analysis	June 14, 2019 at 2:07 PM
CTL02032	500 lb Live Load	CTL02032 - Mount Analysis.r3d



250lb Live Loads are applied on each face horizontal and standoff members.
Only one is shown for clarification purposes, but all are considered in the calculations.

Loads: BLC 13, LV1
Envelope Only Solution

Fullerton Engineering Cons...		SK - 13
LA	Mount Analysis	June 14, 2019 at 2:07 PM
CTL02032	250 lb Live Load	CTL02032 - Mount Analysis.r3d

(Global) Model Settings

Display Sections for Member Calcs	5
Max Internal Sections for Member Calcs	97
Include Shear Deformation?	Yes
Increase Nailing Capacity for Wind?	Yes
Include Warping?	Yes
Trans Load Btwn Intersecting Wood Wall?	Yes
Area Load Mesh (in^2)	144
Merge Tolerance (in)	.12
P-Delta Analysis Tolerance	0.50%
Include P-Delta for Walls?	Yes
Automatically Iterate Stiffness for Walls?	Yes
Max Iterations for Wall Stiffness	3
Gravity Acceleration (in/sec^2)	386.4
Wall Mesh Size (in)	12
Eigensolution Convergence Tol. (1.E-)	4
Vertical Axis	Y
Global Member Orientation Plane	XZ
Static Solver	Sparse Accelerated
Dynamic Solver	Accelerated Solver

Hot Rolled Steel Code	AISC 15th(360-16): LRFD
Adjust Stiffness?	Yes(Iterative)
RISAConnection Code	AISC 14th(360-10): LRFD
Cold Formed Steel Code	None
Wood Code	None
Wood Temperature	< 100F
Concrete Code	None
Masonry Code	None
Aluminum Code	None - Building
Stainless Steel Code	AISC 14th(360-10): ASD
Adjust Stiffness?	Yes(Iterative)

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

(Global) Model Settings, Continued

Seismic Code	ASCE 7-10
Seismic Base Elevation (in)	Not Entered
Add Base Weight?	Yes
Ct X	.02
Ct Z	.02
T X (sec)	Not Entered
T Z (sec)	Not Entered
R X	3
R Z	3
Ct Exp. X	.75
Ct Exp. Z	.75
SD1	1
SDS	1
S1	1
TL (sec)	5
Risk Cat	I or II
Drift Cat	Other
Om Z	1
Om X	1
Cd Z	4
Cd X	4
Rho Z	1
Rho X	1

Hot Rolled Steel Design Parameters

	Label	Shape	Length[in]	Lbyy[in]	Lbzz[in]	Lcomp top[...	Lcomp bot[...	L-torq...	Kyy	Kzz	Cb	Functi...
1	M24	L3X3X6	14.213			Lbyy			.65	.65		Lateral
2	M25	L3X3X6	18			Lbyy			.65	.65		Lateral
3	M26	L3X3X6	14.213			Lbyy			.65	.65		Lateral
4	M27	L3X3X6	14.213			Lbyy			.65	.65		Lateral
5	M28	L3X3X6	18			Lbyy			.65	.65		Lateral
6	M29	L3X3X6	14.213			Lbyy			.65	.65		Lateral
7	M51A	PIPE_1.0	38			Lbyy			.65	.65		Lateral
8	M37	PIPE_1.25	35			Lbyy			.65	.65		Lateral
9	M38	PIPE_1.25	35			Lbyy			.65	.65		Lateral
10	M32	PIPE_2.0	35			Lbyy			.65	.65		Lateral
11	M33	PIPE_2.0	35			Lbyy			.65	.65		Lateral
12	M34	PIPE_2.0	35			Lbyy			.65	.65		Lateral
13	M35	PIPE_2.0	35			Lbyy			.65	.65		Lateral
14	M36	PIPE_2.0	35			Lbyy			.65	.65		Lateral
15	M47	PIPE_2.0	108	35	35	35	35	35	2.1	2.1		Lateral
16	M48	PIPE_2.0	108	35	35	35	35	35	2.1	2.1		Lateral
17	M49	PIPE_2.0	108	35	35	35	35	35	2.1	2.1		Lateral
18	M50	PIPE_2.0	108	35	35	35	35	35	2.1	2.1		Lateral
19	M48A	PIPE_2.0	42	35	35	35	35	35	2.1	2.1		Lateral
20	M53A	PIPE_2.0	67.617			Lbyy			1	1		Lateral
21	M54A	PIPE_2.0	67.617			Lbyy			1	1		Lateral
22	M55A	PIPE_2.0	122.413			Lbyy			1	1		Lateral
23	M49A	PIPE_2.5	42			Lbyy			.65	.65		Lateral
24	M50A	PIPE_2.5	42			Lbyy			.65	.65		Lateral
25	M30	PIPE_2.5X	147	48	48	48	48	48	2.1	2.1		Lateral

Hot Rolled Steel Design Parameters (Continued)

	Label	Shape	Length[in]	Lbyy[in]	Lbzz[in]	Lcomp top[...	Lcomp bot[...	L-torq...	Kyy	Kzz	Cb	Functi...
26	M31	PIPE_2.5X	147	48	48	48	48	48	2.1	2.1		Lateral
27	M52A	SR 3/4" dia.	53.74			Lbyy			.65	.65		Lateral

Material Takeoff

	Material	Size	Pieces	Length[in]	Weight[K]
1	General				
2	RIGID		29	103	0
3	Total General		29	103	0
4					
5	Hot Rolled Steel				
6	A36 Gr.36	SR 3/4" dia.	1	53.7	0
7	A500 Gr.50	PIPE_1.0	1	38	0
8	A500 Gr.50	PIPE_1.25	2	70	0
9	A500 Gr.50	PIPE_2.0	9	474.6	.1
10	A500 Gr.50	PIPE_2.5	2	84	0
11	A500 Gr.50	PIPE_2.5X	2	294	.2
12	A53 Gr. B	PIPE_2.0	4	432	.1
13	A572 Gr.50	L3X3X6	6	92.9	0
14	Total HR Steel		27	1539.2	.6

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed	Area(Me...	Surface(P...
1	DL	None		-1		19				
2	DLi	None				17		27		
3	WL(0)	None				7		28		
4	WL(90)	None				17		23		
5	WL.i(0)	None				7		28		
6	WL.i(90)	None				17		23		
7	T	None								
8	WM(0)	None				7		28		
9	WM(90)	None				17		23		
10	LM1	None				1				
11	LM2	None				1				
12	LM3	None				1				
13	LV1	None					1			
14	LV2	None					1			
15	LV3	None					1			
16	LV4	None					1			
17	LV5	None					1			
18	LV6	None					1			
19	LV7	None					1			
20	LV8	None					1			
21	LV9	None					1			
22	LV10	None					1			

Load Combinations

	Description	S...	P...	S...	B...	Fac..	B...	Fac..	B...	Fac..	B...	Fac..	B...	Fac..	B...	Fac..	B...	Fac..	B...	Fac..	B...	Fac..	B...	Fac..	B...	Fac...
1	1.4*DL	Yes	Y		1	1.4																				
2	1.2*DL + 1.0* WL(0)	Yes	Y		1	1.2	3	1																		
3	1.2*DL + 1.0* WL(30)	Yes	Y		1	1.2	3	.869	4	.5																
4	1.2*DL + 1.0* WL(60)	Yes	Y		1	1.2	3	.5	4	.869																
5	1.2*DL + 1.0*WL(90)	Yes	Y		1	1.2	4	1																		
6	1.2*DL + 1.0*WL(120)	Yes	Y		1	1.2	3	-.5	4	.869																
7	1.2*DL +1.0*WL(150)	Yes	Y		1	1.2	3	-.869	4	.5																
8	1.2*DL + 1.0 * WL(180)	Yes	Y		1	1.2	3	-1																		
9	1.2*DL + 1.0* WL(210)	Yes	Y		1	1.2	3	-.869	4	-.5																
10	1.2*DL + 1.0* WL(240)	Yes	Y		1	1.2	3	-.5	4	-.869																
11	1.2*DL + 1.0*WL(270)	Yes	Y		1	1.2	4	-1																		
12	1.2*DL + 1.0*WL(300)	Yes	Y		1	1.2	3	.5	4	-.869																
13	1.2*DL +1.0*WL(330)	Yes	Y		1	1.2	3	.869	4	-.5																
14	1.2*DL+1.0*DLi+1.0*WL.i(..	Yes	Y		1	1.2	2	1	5	1	7	1														
15	1.2*DL+1.0*DLi+1.0*WL.i(..	Yes	Y		1	1.2	2	1	5	.866	6	.5	7	1												
16	1.2*DL+1.0*DLi+1.0*WL.i(..	Yes	Y		1	1.2	2	1	5	.5	6	.866	7	1												
17	1.2*DL+1.0*DLi+1.0*WL.i(..	Yes	Y		1	1.2	2	1	6	1	7	1														
18	1.2*DL+1.0*DLi+1.0*WL.i(..	Yes	Y		1	1.2	2	1	5	-.5	6	.866	7	1												
19	1.2*DL+1.0*DLi+1.0*WL.i(..	Yes	Y		1	1.2	2	1	5	-.866	6	.5	7	1												
20	1.2*DL+1.0*DLi+1.0*WL.i(..	Yes	Y		1	1.2	2	1	5	-1	7	1														
21	1.2*DL+1.0*DLi+1.0*WL.i(..	Yes	Y		1	1.2	2	1	5	-.866	6	-.5	7	1												
22	1.2*DL+1.0*DLi+1.0*WL.i(..	Yes	Y		1	1.2	2	1	5	-.5	6	-.866	7	1												
23	1.2*DL+1.0*DLi+1.0*WL.i(..	Yes	Y		1	1.2	2	1	6	-1	7	1														
24	1.2*DL+1.0*DLi+1.0*WL.i(..	Yes	Y		1	1.2	2	1	5	.5	6	-.866	7	1												
25	1.2*DL+1.0*DLi+1.0*WL.i(..	Yes	Y		1	1.2	2	1	5	.866	6	-.5	7	1												
26	1.2*DL+1.5*LM1+1.0*WM..	Yes	Y		1	1.2	10	1.5	8	1																
27	1.2*DL+1.5*LM1+1.0*WM..	Yes	Y		1	1.2	10	1.5	8	.866	9	.5														
28	1.2*DL+1.5*LM1+1.0*WM..	Yes	Y		1	1.2	10	1.5	8	.5	9	.866														
29	1.2*DL+1.5*LM1+1.0*WM..	Yes	Y		1	1.2	10	1.5	9	1																
30	1.2*DL+1.5*LM1+1.0*WM..	Yes	Y		1	1.2	10	1.5	8	-.5	9	.866														
31	1.2*DL+1.5*LM1+1.0*WM..	Yes	Y		1	1.2	10	1.5	8	-.866	9	.5														
32	1.2*DL+1.5*LM1+1.0*WM..	Yes	Y		1	1.2	10	1.5	8	-1																
33	1.2*DL+1.5*LM1+1.0*WM..	Yes	Y		1	1.2	10	1.5	8	-.866	9	-.5														
34	1.2*DL+1.5*LM1+1.0*WM..	Yes	Y		1	1.2	10	1.5	8	-.5	9	-.866														
35	1.2*DL+1.5*LM1+1.0*WM..	Yes	Y		1	1.2	10	1.5	9	-1																
36	1.2*DL+1.5*LM1+1.0*WM..	Yes	Y		1	1.2	10	1.5	8	.5	9	-.866														
37	1.2*DL+1.5*LM1+1.0*WM..	Yes	Y		1	1.2	10	1.5	8	.866	9	-.5														
38	1.2*DL+1.5*LM2+1.0*WM..	Yes	Y		1	1.2	11	1.5	8	1																
39	1.2*DL+1.5*LM2+1.0*WM..	Yes	Y		1	1.2	11	1.5	8	.866	9	.5														
40	1.2*DL+1.5*LM2+1.0*WM..	Yes	Y		1	1.2	11	1.5	8	.5	9	.866														
41	1.2*DL+1.5*LM2+1.0*WM..	Yes	Y		1	1.2	11	1.5	9	1																
42	1.2*DL+1.5*LM2+1.0*WM..	Yes	Y		1	1.2	11	1.5	8	-.5	9	.866														
43	1.2*DL+1.5*LM2+1.0*WM..	Yes	Y		1	1.2	11	1.5	8	-.866	9	.5														
44	1.2*DL+1.5*LM2+1.0*WM..	Yes	Y		1	1.2	11	1.5	8	-1																
45	1.2*DL+1.5*LM2+1.0*WM..	Yes	Y		1	1.2	11	1.5	8	-.866	9	-.5														
46	1.2*DL+1.5*LM2+1.0*WM..	Yes	Y		1	1.2	11	1.5	8	-.5	9	-.866														
47	1.2*DL+1.5*LM2+1.0*WM..	Yes	Y		1	1.2	11	1.5	9	-1																
48	1.2*DL+1.5*LM2+1.0*WM..	Yes	Y		1	1.2	11	1.5	8	.5	9	-.866														
49	1.2*DL+1.5*LM2+1.0*WM..	Yes	Y		1	1.2	11	1.5	8	.866	9	-.5														
50	1.2*DL+1.5*LM3+1.0*WM..	Yes	Y		1	1.2	12	1.5	8	1																
51	1.2*DL+1.5*LM3+1.0*WM..	Yes	Y		1	1.2	12	1.5	8	.866	9	.5														

Load Combinations (Continued)

	Description	S...	P...	S...	B...	Fac...	B...	Fac...	B...	Fac...	B...	Fac...	B...	Fac...	B...	Fac...	B...	Fac...	B...	Fac...	B...	Fac...	B...	Fac...
52	1.2*DL+1.5*LM3+1.0*WM...	Yes	Y		1	1.2	12	1.5	8	.5	9	.866												
53	1.2*DL+1.5*LM3+1.0*WM...	Yes	Y		1	1.2	12	1.5	9	1														
54	1.2*DL+1.5*LM3+1.0*WM...	Yes	Y		1	1.2	12	1.5	8	-.5	9	.866												
55	1.2*DL+1.5*LM3+1.0*WM...	Yes	Y		1	1.2	12	1.5	8	-.866	9	.5												
56	1.2*DL+1.5*LM3+1.0*WM...	Yes	Y		1	1.2	12	1.5	8	-1														
57	1.2*DL+1.5*LM3+1.0*WM...	Yes	Y		1	1.2	12	1.5	8	-.866	9	-.5												
58	1.2*DL+1.5*LM3+1.0*WM...	Yes	Y		1	1.2	12	1.5	8	-.5	9	-.866												
59	1.2*DL+1.5*LM3+1.0*WM...	Yes	Y		1	1.2	12	1.5	9	-1														
60	1.2*DL+1.5*LM3+1.0*WM...	Yes	Y		1	1.2	12	1.5	8	.5	9	-.866												
61	1.2*DL+1.5*LM3+1.0*WM...	Yes	Y		1	1.2	12	1.5	8	.866	9	-.5												
62	1.2*DL+1.5*LV1	Yes	Y		1	1.2	13	1.5																
63	1.2*DL+1.5*LV2	Yes	Y		1	1.2	14	1.5																
64	1.2*DL+1.5*LV3	Yes	Y		1	1.2	15	1.5																
65	1.2*DL+1.5*LV4	Yes	Y		1	1.2	16	1.5																
66	1.2*DL+1.5*LV5	Yes	Y		1	1.2	17	1.5																
67	1.2*DL+1.5*LV6	Yes	Y		1	1.2	18	1.5																
68	1.2*DL+1.5*LV7	Yes	Y		1	1.2	19	1.5																
69	1.2*DL+1.5*LV8	Yes	Y		1	1.2	20	1.5																
70	1.2*DL+1.5*LV9	Yes	Y		1	1.2	21	1.5																
71	1.2*DL+1.5*LV10	Yes	Y		1	1.2	22	1.5																

Envelope Joint Reactions

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N271	max	543.689	9	68.216	21	796.962	3	0	71	0	71	0	71
2		min	-545.064	3	18.782	3	-797.988	9	0	1	0	1	0	1
3	N178	max	2192.033	53	38.554	17	1240.655	35	0	71	0	71	0	71
4		min	-793.789	35	11.198	35	-3428.896	53	0	1	0	1	0	1
5	N179	max	787.774	29	36.284	17	3425.044	59	0	71	0	71	0	71
6		min	-2186.595	59	10.568	59	-1230.249	29	0	1	0	1	0	1
7	N86A	max	116.635	11	2416.557	24	1402.526	4	-.375	13	0	71	.077	28
8		min	-241.251	5	1020.478	6	-3981.351	34	-.941	18	0	1	-.193	58
9	N87A	max	216.149	10	676.413	16	3971.646	28	-.163	8	0	71	.084	34
10		min	-92.455	4	282.83	11	-1202.667	10	-.46	14	0	1	-.189	52
11	Totals:	max	1636.744	5	3232.272	15	2287.601	2						
12		min	-1636.757	11	1356.484	9	-2287.596	8						

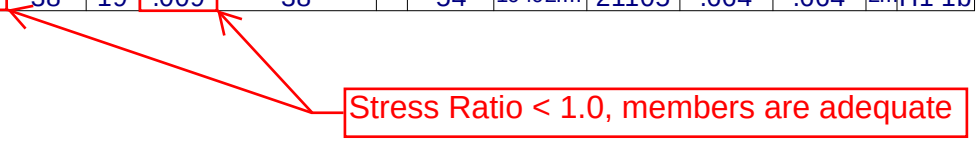
Stress Ratio < 1.0, members are adequate

Envelope AISC 15th(360-16): LRFD Steel Code Checks

	Member	Shape	Code Che...	Loc[in]	LC	Shear...	Loc[in]	Dir	LC	phi*Pnc...	phi*Pnt ...	phi*Mn ...	phi*Mn ...	Cb	Eqn
1	M47	PIPE_2.0	.490	72	2	.050	70.875		53	20490....	32130	1.872	1.872	1	H1-1b
2	M48	PIPE_2.0	.439	36	2	.112	70.875		53	20490....	32130	1.872	1.872	1	H1-1b
3	M38	PIPE_1.25	.330	0	15	.054	35		54	24732....	28125	1.144	1.144	2...	H1-1b
4	M52A	SR 3/4" dia.	.327	53.74	24	.014	0		5	2875.616	14313....	.179	.179	2...	H1-1a
5	M25	L3X3X6	.322	9	53	.351	9	z	18	92175....	94950	3.205	7.392	1...	H2-1
6	M28	L3X3X6	.320	9	59	.361	9	y	25	92175....	94950	3.205	7.392	1...	H2-1
7	M35	PIPE_2.0	.308	0	50	.074	35		53	43159....	45900	2.674	2.674	2...	H1-1b
8	M26	L3X3X6	.268	14.213	25	.067	0	y	51	93210....	94950	3.205	7.392	2...	H2-1
9	M29	L3X3X6	.267	14.213	19	.067	0	z	56	93210....	94950	3.205	7.392	2...	H2-1
10	M49	PIPE_2.0	.251	37.125	29	.064	70.875		34	20490....	32130	1.872	1.872	1	H1-1b
11	M50	PIPE_2.0	.251	70.875	35	.038	37.125		29	20490....	32130	1.872	1.872	1	H1-1b

Envelope AISC 15th(360-16): LRFD Steel Code Checks (Continued)

	Member	Shape	Code Che...	Loc[in]	LC	Shear...	Loc[in]	Dir	LC	phi*Pnc...	phi*Pnt ...	phi*Mn ...	phi*Mn ...	Cb	Eqn
12	M37	PIPE_1.25	.226	35	36	.053	35		54	24732....	28125	1.144	1.144	2...	H1-1b
13	M36	PIPE_2.0	.214	35	53	.044	17.5		3	43159....	45900	2.674	2.674	2...	H1-1b
14	M33	PIPE_2.0	.212	0	28	.044	35		34	43159....	45900	2.674	2.674	2...	H1-1b
15	M48A	PIPE_2.0	.210	3.5	59	.314	38.5		61	24140....	45900	2.674	2.674	1	H1-1b
16	M49A	PIPE_2.5	.200	42	21	.136	5.688		53	68196.28	72450	5.138	5.138	3...	H1-1b
17	M31	PIPE_2.5X	.195	142.406	56	.173	91.875		56	40288....	94500	6.638	6.638	1	H1-1b
18	M30	PIPE_2.5X	.182	142.406	61	.175	91.875		51	40288....	94500	6.638	6.638	1	H1-1b
19	M24	L3X3X6	.173	0	26	.047	14.213	y	26	93210....	94950	3.205	7.392	2...	H2-1
20	M27	L3X3X6	.172	0	32	.047	14.213	z	34	93210....	94950	3.205	7.392	2...	H2-1
21	M32	PIPE_2.0	.160	35	33	.023	0		29	43159....	45900	2.674	2.674	2...	H1-1b
22	M50A	PIPE_2.5	.158	5.688	11	.137	5.688		59	68196.28	72450	5.138	5.138	2...	H1-1b
23	M54A	PIPE_2.0	.152	67.617	59	.003	0		22	26646.04	45900	2.674	2.674	1...	H1-1b*
24	M55A	PIPE_2.0	.102	122.413	3	.005	0		22	9452.586	45900	2.674	2.674	1...	H1-1b*
25	M34	PIPE_2.0	.082	0	25	.060	35		54	43159....	45900	2.674	2.674	2...	H1-1b
26	M53A	PIPE_2.0	.055	67.617	35	.003	0		22	26646.04	45900	2.674	2.674	1...	H1-1b*
27	M51A	PIPE_1.0	.042	38	19	.009	38		54	16402....	21105	.664	.664	2...	H1-1b



Site Name: COLCHESTER CENTRAL
Site No. : CTL02032
Prepared By: LA
Checked By: BTK

Fullerton Engineering Consultants, Inc.
1100 E. Woodfield Road, Suite 500
Schaumburg, IL 60173
(847) 908-8400

Date: 6/17/2019

Mount-to-Tower Connection Calculations

New Fred A. Nudd Corporation sector frames will be connected to tower leg via U-Bolts 5/8" Ø (tensile strength Fu=120 ksi according to manufacturer specification)

Maximum Reactions from Risa Mount Analysis per one U-Bolt:

Envelope Joint Reactions

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N86A	max	116.635	11	2416.557	24	1402.526	4	-.375	13	0	71	.077	28
2		min	-241.251	5	1020.478	6	-3981.351	34	-.941	18	0	1	-.193	58
3	N87A	max	216.149	10	676.413	16	3971.646	28	-.163	8	0	71	.084	34
4		min	-92.455	4	282.83	11	-1202.667	10	-.46	14	0	1	-.189	52

$X := 241.251 lbf$ — *Maximum Factored Reaction - X direction*

$Y := 2416.557 lbf$ — *Maximum Factored Reaction - Y direction*

$Z := 3981.351 lbf$ — *Maximum Factored Reaction - Z direction*

$M_x := 0.941 \, kip \cdot ft$ — *Maximum Factored Moment - X direction*

$M_z := 0.193 \, kip \cdot ft$ — *Maximum Factored Moment - Z direction*

$d := 2 in$ — *Vertical spacing between the U-Bolt*

$$P_t := \frac{Z}{4} + \frac{M_x}{2.d}$$

$P_t = 3818.34 \cdot lbf$ — *Factored Tensile Force*

$$P_v := \frac{\sqrt{X^2 + Y^2}}{4} + \frac{M_z}{2 \cdot d}$$

$P_v = 1186.14 \cdot lbf$ — *Factored Shear Force*

$d_b := 0.625 in$ — *Diameter of U-Bolt*

$A_b := 0.25 \pi \cdot d_b^2$ $\quad A_b = 0.31 \cdot in^2$ — *Area of U-Bolt*

$P_{t\_rod} := P_t$ $\quad P_{t\_rod} = 3818.34 \cdot lbf$ — *Tension at U-Bolt*

$P_{v\_rod} := P_v$ $\quad P_{v\_rod} = 1186.14 \cdot lbf$ — *Shear at U-Bolt*

Site Name: COLCHESTER CENTRAL
Site No. : CTL02032
Prepared By: LA
Checked By: BTK

Fullerton Engineering Consultants, Inc.
1100 E. Woodfield Road, Suite 500
Schaumburg, IL 60173
(847) 908-8400

Date: 6/17/2019

Tensile and Shear Strength of U-Bolts

$F_u := 120ksi$ — *Ultimate Tensile Strength*

$F_{nt} := 0.75 \cdot F_u$ $\quad F_{nt} = 90 \cdot ksi$ — *Nominal tensile strength per AISC 360, Table J3.2*

$F_{nv} := 0.45 \cdot F_u$ $\quad F_{nv} = 54 \cdot ksi$ — *Nominal shear strength per AISC 360, Table J3.2*

$\phi_{rod} := 0.75$ — *Resistance Factor (LRFD - AISC 360, Section J3-6)*

$R_{nt} := \phi_{rod} \cdot F_{nt} \cdot A_b$ $\quad R_{nt} = 20.71 \cdot kip$ — *Design Nominal Tensile Strength (AISC 360, Section J3-1)*

$R_{nv} := \phi_{rod} \cdot F_{nv} \cdot A_b$ $\quad R_{nv} = 12.43 \cdot kip$ — *Design Nominal Shear Strength (AISC 360, Section J3-1)*

$\frac{P_{t\_rod}}{R_{nt}} = 18.44 \cdot \%$ ***< 30%*** $\quad \frac{P_{v\_rod}}{R_{nv}} = 9.55 \cdot \%$ ***< 30%***

Check = "U-Bolts are adequate. Effects of combined stress don't need to be investigated because ratio of either tension or shear is < 30%"

Mount Analysisand Mapping Checklist

Mount Detail	
Mount Type	T-Boom
Mount Model Number	Fred A. Nudd Corporation HD-12ft Boom with 4ft Standoff
If RT, then how is it attached	
If WT, then how is it attached	

Inspector
(Vendor name)
(Inspector name)
(Contact phone)
(Contact email)

Mount Mapping Detail	
Material condition (discoloration, cracks, pitting)	
Mfg. drawing, cutsheet, spec. available?	
Date of mount mapping	
Searched prior OOM for material?	
Photos of installation available?	
Original tower drawings show mounts?	
Searched for previous mapping?	
Is latest mod design (dwgs) available?	
Is the latest structural analysis available?	

Project Detail	
Market	New England
PACE Project ID	MRCTB035120, MRCTB035107 MRCTB035160, MRCTB035205 MRCTB035331
Site Name	COLCHESTER CENTRAL
City, State	Colchester, CT
RFDS Version Number	2
Initiative (list mult., if applicable)	2C,3C, 4C, 5C, Retrofit
Tower Owner	
SA Vendor	
A&E firm (for structural analysis)	
A&E firm (for mapping, if different)	
Last amendment date or last site visit	

Site Information	
Original Lease Date	
FA Code	10035250
Tower Type	Guyed Tower
Tower Height (Ft)	180
AT&T Rad Center # 1	170
AT&T Rad Center # 2	

Measurements and Deliverables on sketches	
Pipe / Angle dimenions and lengths	PIPE_2.0X (13')
bolt diameters and lengths	
U-Bolt diameters and lengths	
Steel Grade if indicated	
welds :length and sizes	
appurtenance relative locations	
Grounding Condition	

Equipment Detail Alpha Sector	Model Number for Ant, MW, RRU, TMA, Squid / Size of Coax, DC-Fiber Trunks & Jumpers	Height / COAX-DC-Fiber Trunk & Jumper Lengths in feet	Approz Az	mount position location
Antennas	(1) Powewave 7770			
Antennas	(2) Kathrein 800-10966			
MW	0			
RRU	(1) Ericsson 4478 B14			
RRU	(1) Ericsson B2/B66A 8843			
RRU	(1) Ericsson B5/B12 4449			
TMA	(2) Powerwave LGP 21401			
Coax	(4) 1-5/8" LDF7-50A			
RET (not imbedded in antenna)	(2) Powerwave 7020			
DC Cable	(4) DC			
Fiber Cable	(2) Fiber			
Squid	(3) Raycap DC6-48-60-18-8F			

Equipment Detail Beta Sector	Model Number for Ant, MW, RRU, TMA, Squid / Size of Coax, DC-Fiber Trunks & Jumpers	Height / COAX-DC-Fiber Trunk & Jumper Lengths in feet	Approz Az	mount position location
Antennas	(1) Powewave 7770			
Antennas	(2) Kathrein 800-10966			
MW	0			
RRU	(1) Ericsson 4478 B14			
RRU	(1) Ericsson B2/B66A 8843			
RRU	(1) Ericsson B5/B12 4449			
TMA	(2) Powerwave LGP 21401			
Coax	(4) 1-5/8" LDF7-50A			
RET (not imbedded in antenna)	(2) Powerwave 7020			
DC Cable	(4) DC			
Fiber Cable	(2) Fiber			
Squid	0			

Equipment Detail Gamma Sector	Model Number for Ant, MW, RRU, TMA, Squid / Size of Coax, DC-Fiber Trunks & Jumpers	Height / COAX-DC-Fiber Trunk & Jumper Lengths in feet	Approz Az	mount position location
Antennas	(1) Powewave 7770			
Antennas	(2) Kathrein 800-10966			
MW	0			
RRU	(1) Ericsson 4478 B14			
RRU	(1) Ericsson B2/B66A 8843			
RRU	(1) Ericsson B5/B12 4449			
TMA	(2) Powerwave LGP 21401			
Coax	(4) 1-5/8" LDF7-50A			
RET (not imbedded in antenna)	(2) Powerwave 7020			
DC Cable	(4) DC			
Fiber Cable	(2) Fiber			
Squid	0			

Comments

GENERAL NOTES:

1. ALL WELDS SHALL BE 3/16” E70XX FILLET WELDS UNLESS OTHER WISE NOTED.
2. ALL PARTS SHALL BE HOT-DIP GALVANIZED TO ASTM A123.
3. ALL BOLTS SHALL BE A325 HOT-DIP GALVANIZED EXCEPT AT STIFFARM ENDS, WHICH MAY BE A307.
4. ALL U-BOLTS SHALL BE GRADE 5 MATERIAL EQUIVALENT.
5. ALL HOLLOW PARTS SHALL HAVE GALVIZING DRAIN HOLES PROVIDED.
6. 3 X 3 X 3/8 ANGLE IS 50ksi MIN YIELD.
7. ALL PIPE A500 54 ksi MIN YIELD

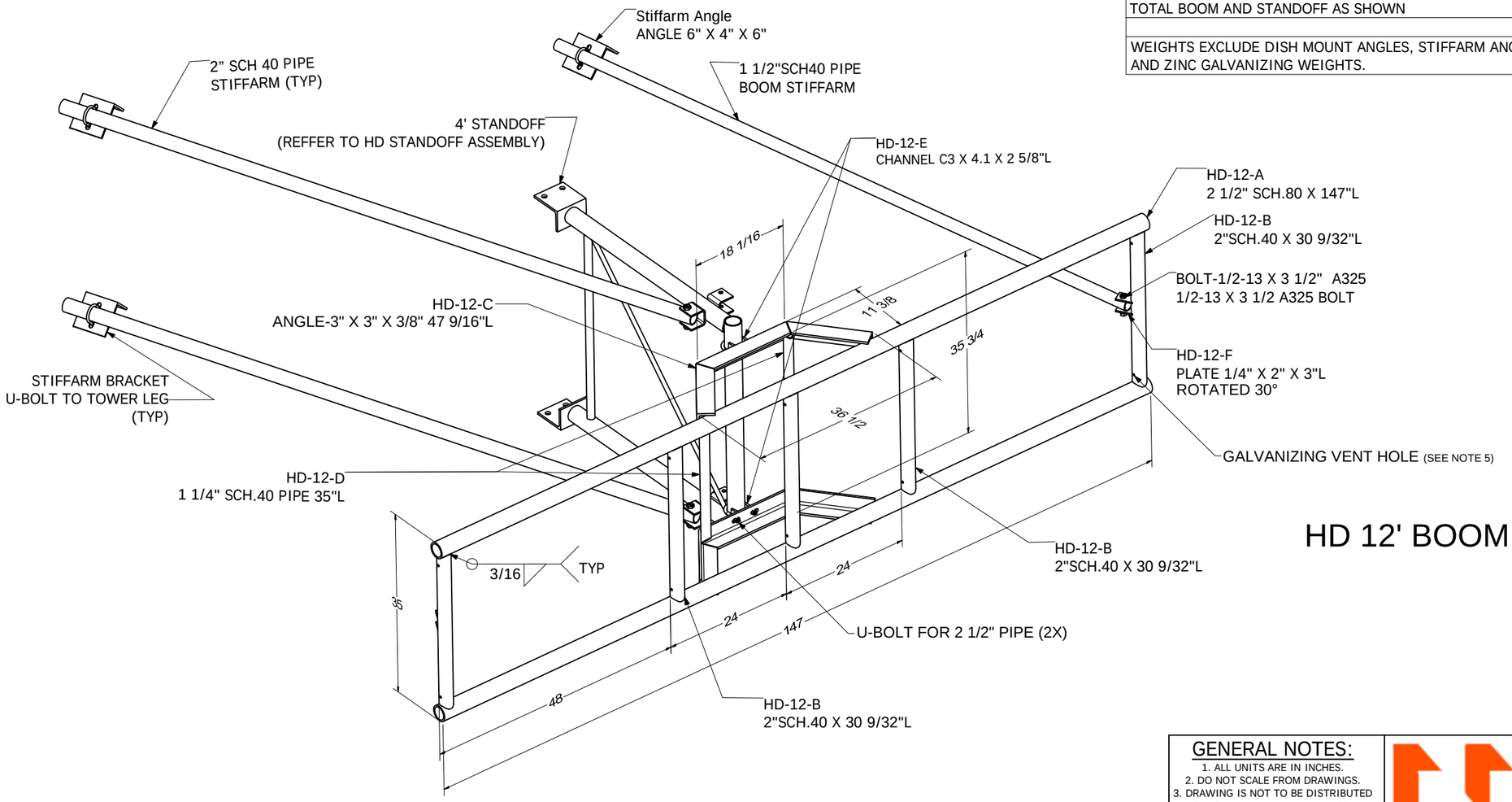
BOOM PART LIST

ITEM	QTY	PART NUMBER	DESCRIPTION	Wgt lbs
1	1	HD-12ft Boom Frame	HD-12' BOOM FRAME WELDMENT	304.1
1.1	2	HD-12-A	2 1/2" SCH.80 X 147"L	93.9
1.2	5	HD-12-B	2"SCH.40 X 30 9/32"L	9
1.3	2	HD-12-C	ANGLE-3" X 3" X 3/8" 47 9/16"L	27.5
1.4	2	HD-12-D	1 1/4" SCH.40 PIPE 35"L	6.3
1.5	2	HD-12-E	CHANNEL C3 X 4.1 X 2 5/8"L	1.1
1.6	4	HD-12-F	PLATE 1/4" X 2" X 3"L	.4
2	2	U-BOLT-FOR 2 1/2in PIPE	U-BOLT FOR 2 1/2' PIPE	.7
3	1	HD 4' Standoff Assembly	4' STANDOFF ASSEMBLY	174.5

STIFFARM REFERENCE

ITEM	QTY	PART NUMBER	DESCRIPTION	LENGTH (in)	Wgt lbs
-	1	STIFFARM	1 1/2 SCH40 10' L	120	28.6
TOTAL STANDOFF AS SHOWN					174.5
TOTAL BOOM AS SHOWN					304.1
TOTAL BOOM AND STANDOFF AS SHOWN					478.6

WEIGHTS EXCLUDE DISH MOUNT ANGLES, STIFFARM ANGLES ON TOWER, FASTENER WEIGHTS, AND ZINC GALVANIZING WEIGHTS.



HD 12' BOOM

GENERAL NOTES:

1. ALL UNITS ARE IN INCHES.
2. DO NOT SCALE FROM DRAWINGS.
3. DRAWING IS NOT TO BE DISTRIBUTED OUTSIDE THE FRED A. NUDD CORP.
4. DIMENSIONS REPRESENTED IN CIRCLE ARE FOR REFERENCE ONLY, NOT TO BE USED FOR FABRICATION

DRAWN	B.LaPlant	12/4/2018
CHECKED		
QA		
MFG		
APPROVED		

FRED A. NUDD CORPORATION
1743 ROUTE 104, PO BOX 577, ONTARIO, NEW YORK 14519

TITLE
HD-12ft Boom with 4ft Standoff
HD 12' BOOM DETAILS

SIZE	DWG NO	REV
D	HD-12ft Boom with 4ft Standoff	A

SCALE | JOB #: | SHEET 1 OF 1

GENERAL NOTES:

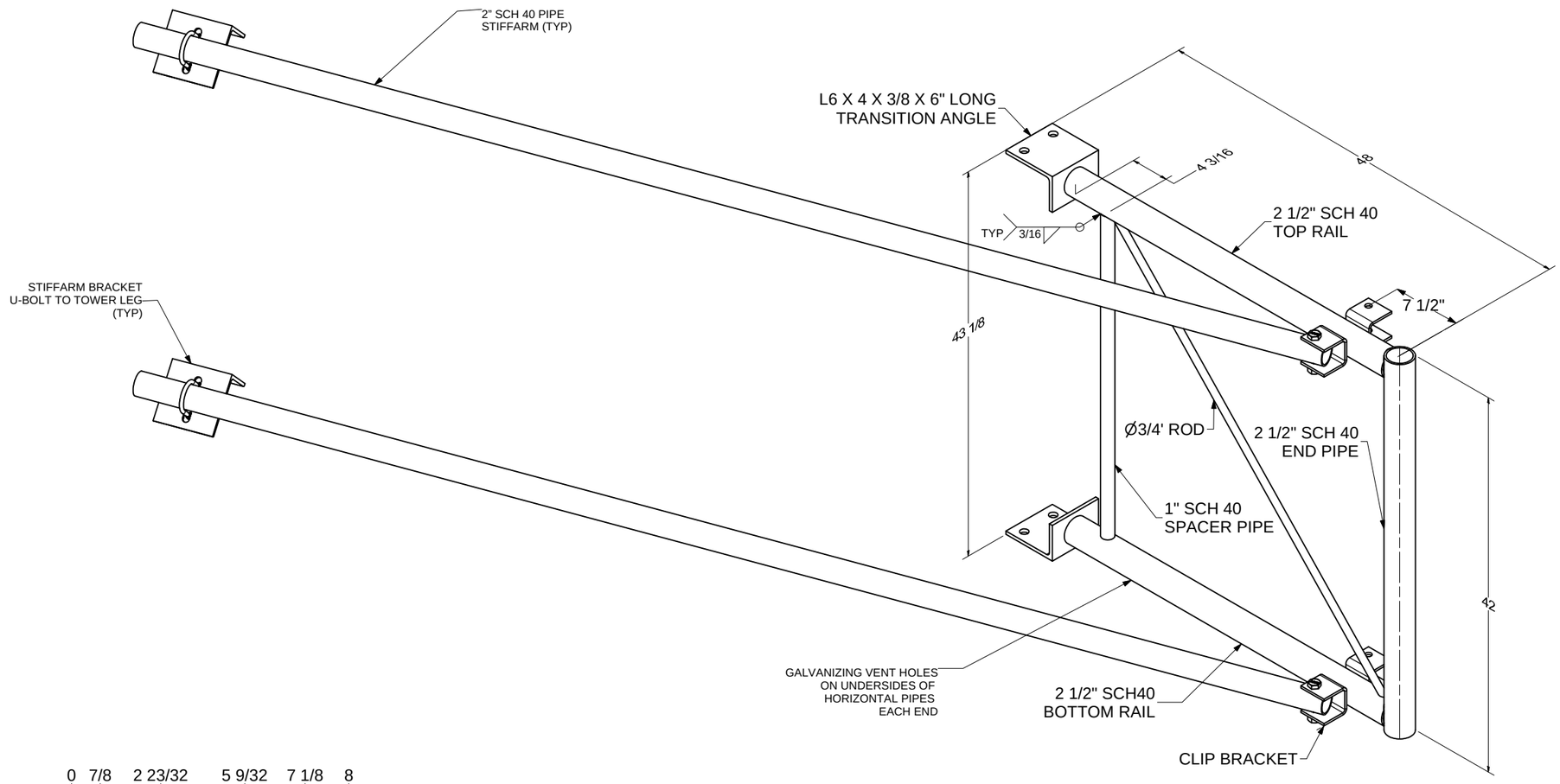
1. ALL WELDS SHALL BE 3/16” E70XX FILLET WELDS UNLESS OTHER WISE NOTED.
2. ALL PARTS SHALL BE HOT-DIP GALVANIZED TO ASTM A123.
3. ALL BOLTS SHALL BE A325 HOT-DIP GALVANIZED EXCEPT AT STIFFARM ENDS, WHICH MAY BE A307.
4. ALL U-BOLTS SHALL BE GRADE 5 MATERIAL EQUIVALENT.
5. ALL HOLLOW PARTS SHALL HAVE GALVIZING DRAIN HOLES PROVIDED.
6. 3 X 3 X 3/8 ANGLE IS 50ksi MIN YIELD.
7. ALL PIPE A500 54 ksi MIN YIELD.
8. ROD =A36.

STANDOFF PARTS LIST

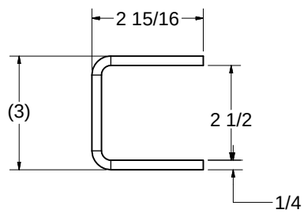
ITEM	QTY	PART NUMBER	DESCRIPTION	LENGTH	Wgt lbs
1	2	Transition Angle	ANGLE-6" X 4" X 3/8"-6"L	6"	6.1
2	2	Rail-Top Bottom with Clip Bracket	RAIL-TOP/BOTTOM with CLIP BRACKETS	41.0781	23
3	1	Standoff End Pipe	2 1/2" SCH40 - 42"L	42"	20.3
4	1	Standoff Spacer	1" SCH.40 - 36 1/4"L	36 1/4"	5.1
5	1	Standoff-Diagonal	3/4" ROD X 50 3/4"L	50 3/4"	6.3
6	2	2in SCH 40 STIFFARM	2" SCH 40 STIFFARM - 120"L	120"	36.5

STIFFARM REFERENCE

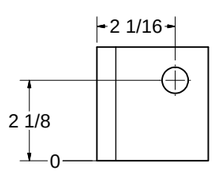
ITEM	QTY	PART NUMBER	DESCRIPTION	LENGTH	Wgt lbs
	2		2" SCH40 PIPE	10'	73
TOTAL STANDOFF AS SHOWN					174.5

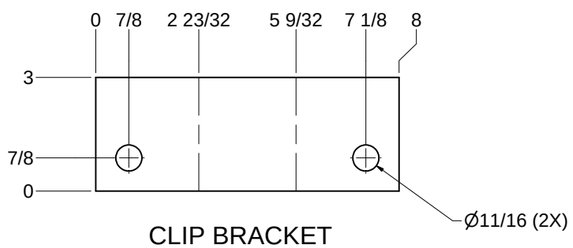


4' STANDOFF



CLIP BRACKET
2 REQ'D





CLIP BRACKET
FLAT PATTERN

GENERAL NOTES:

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4. DIMENSIONS REPRESENTED IN CIRCLE ARE FOR REFERENCE ONLY, NOT TO BE USED FOR FABRICATION

DRAWN	B.LaPlant	12/4/2018
CHECKED		
QA		
MFG		
APPROVED		

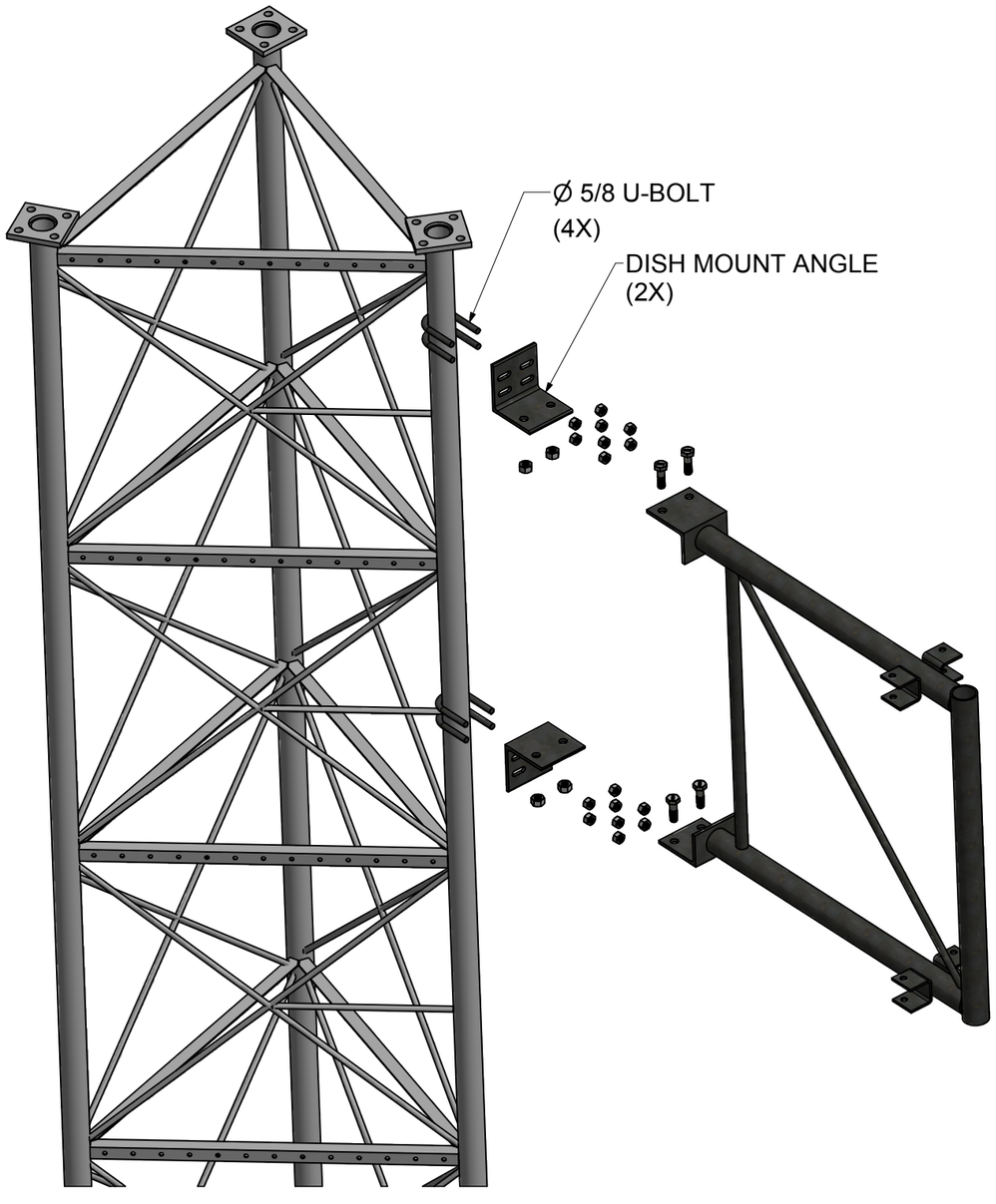
FRED A. NUDD CORPORATION
1743 ROUTE 104, PO BOX 577, ONTARIO, NEW YORK 14519

TITLE: HD 4' Standoff Assembly
HD STANDOFF DETAILS

SIZE	DWG NO	REV
D	HD 4' Standoff Assembly	A

SCALE | JOB #: | SHEET 1 OF 1

GENERAL NOTES:
1. ALL U-BOLTS SHALL BE GRADE 5 MATERIAL EQUIVALENT.
2. DISH MOUNT ANGLE 6 X 6 X 3/8, ASTM A572 GR 50.
3. U-BOLT AND ANGLE LENGTH ARE SIZED TO FIT TOWER LEG DIAMETERS.



GENERAL NOTES:
1. ALL UNITS ARE IN INCHES.
2. DO NOT SCALE FROM DRAWINGS.
3. DRAWING IS NOT TO BE DISTRIBUTED OUTSIDE THE FRED A. NUDD CORP.
4. DIMENSIONS REPRESENTED IN CIRCLE ARE FOR REFERENCE ONLY, NOT TO BE USED FOR FABRICATION

DRAWN	B.LaPlant	6/12/2019
CHECKED		
QA		
MFG		
APPROVED		

FRED A. NUDD CORPORATION
1743 ROUTE 104, PO BOX 577, ONTARIO, NEW YORK 14519

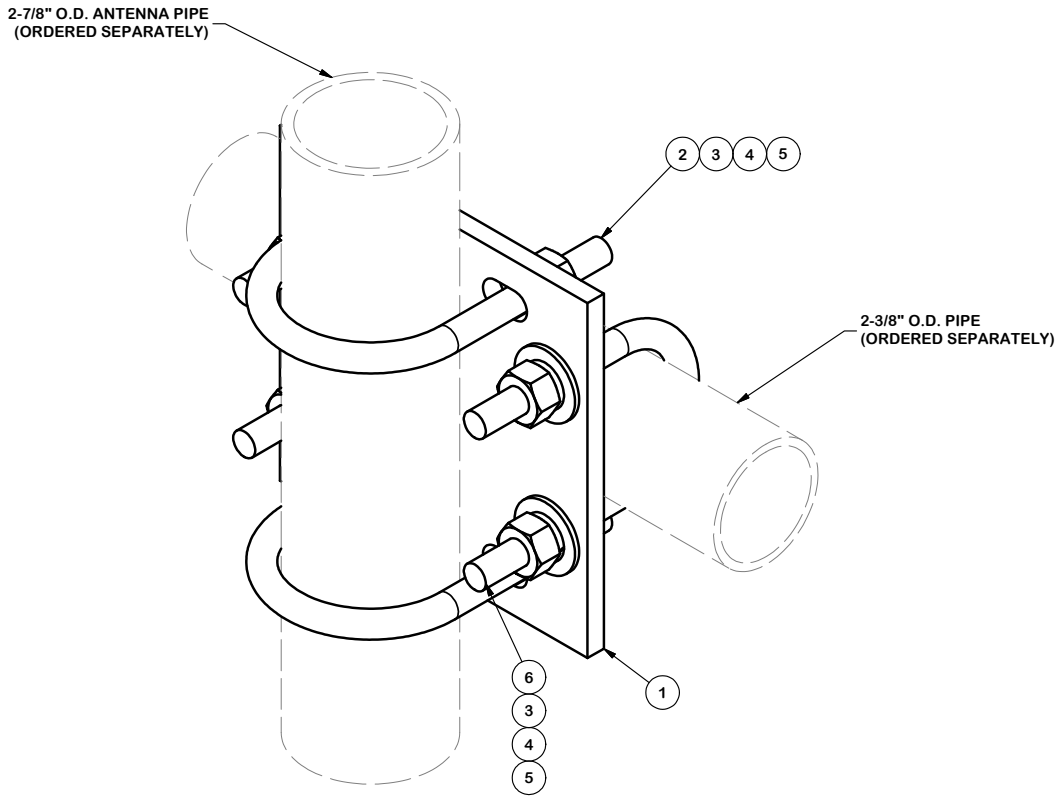
TITLE: Guy Tower -HDB Install

SIZE	DWG NO	REV
D	G42-HDB-00	A

SCALE | JOB #: | SHEET 1 OF 1

Z:\CADFILES\Booms\Boom Fit to tower section\Cad File Reference\G42-HDB-00- Install.idw

PARTS LIST						
ITEM	QTY	PART NO.	PART DESCRIPTION	LENGTH	UNIT WT.	NET WT.
1	1	SCX2	CROSSOVER PLATE	7 in	4.80	4.80
2	2	X-UB1300	1/2" X 3" X 5" X 2" U-BOLT (HDG.)		0.66	1.31
3	8	G12FW	1/2" HDG USS FLATWASHER		0.03	0.27
4	8	G12LW	1/2" HDG LOCKWASHER		0.01	0.11
5	8	G12NUT	1/2" HDG HEAVY 2H HEX NUT		0.07	0.57
6	2	X-UB1212	1/2" X 2-1/2" X 4-1/2" X 2" U-BOLT (HDG.)		0.63	1.25
					TOTAL WT. #	8.39



TOLERANCE NOTES

TOLERANCES ON DIMENSIONS, UNLESS OTHERWISE NOTED ARE:
SAWED, SHEARED AND GAS CUT EDGES *(± 0.030")*
DRILLED AND GAS CUT HOLES *(± 0.030")* - NO CONING OF HOLES
LASER CUT EDGES AND HOLES *(± 0.010")* - NO CONING OF HOLES
BENDS ARE ± 1/2 DEGREE
ALL OTHER MACHINING *(± 0.030")*
ALL OTHER ASSEMBLY *(± 0.060")*

DESCRIPTION: CROSSOVER PLATE KIT

SITE PRO 1 — A valmont COMPANY

Engineering Support Team: 1-888-753-7446

Locations:
New York, NY
Atlanta, GA
Los Angeles, CA
Plymouth, IN
Salem, OR
Dallas, TX

CPD NO.	DRAWN BY	ENG. APPROVAL	PART NO.	PAGE
	CEK 6/30/2011		SCX2-K	1 OF 1

CLASS	SUB	DRAWING USAGE	CHECKED BY	DWG. NO.
		SHOP	BMC 7/1/2011	SCX2-K

SITESAFE
RF COMPLIANCE EXPERTS

8618 Westwood Center Drive, Suite 315, Vienna, VA 22182
703.276.1100 ● 703.276.1169 fax
info@sitesafe.com ● www.sitesafe.com

Smartlink on behalf of AT&T Mobility, LLC
Site FA – 10035250
Site ID – CT2032 (MRCTB035120-MRCTB035107-MRCTB035160)
USID – 24511
Site Name – COLCHESTER CENTRAL

600 OLD HARTFORD ROAD
COLCHESTER, CT 06415

Latitude: N41-35-12.07
Longitude: W72-22-41.70
Structure Type: Guyed

Report generated date: February 5, 2019
Report by: Nick Kutzke
Customer Contact: Ryan Burgdorfer

AT&T Mobility, LLC will be compliant when the remediation recommended in Section 5.2 or other appropriate remediation is implemented.

sealed 6feb2019 mike@h2dc.com
H2DC PLLC CT CoA#: 0001714

Table of Contents

1 General Site Summary

1.1 Report Summary

AT&T Mobility, LLC	Summary
Access to Antennas Locked?	Yes
Max Cumulative Simulated RFE Level on the Ground	<1% General Public Limit
FCC & AT&T Compliant?	Will Be Compliant
Optional AT&T Mitigation Items?	No

The following documents were provided by the client and were utilized to create this report:

RFDS: NEW-ENGLAND_CONNECTICUT_CTL02032_2019-LTE-Next-Carrier_LTE_rx855w_2051A0KPKE_10035250_24511_10-01-2018_Final-Approved_v2.00

CD's: 10035250_AE201_190102_CTL02032_REV0_2C-3C-4C-5C-Retro.JMRL

RF Powers Used: NEW-ENGLAND_CONNECTICUT_CTL02032_2019-LTE-Next-Carrier_LTE_rx855w_2051A0KPKE_10035250_24511_10-01-2018_Final-Approved_v2.00

1.2 Signage Summary

AT&T Signage Locations	 Information 1	 Information 2	 Notice	 Notice 2	 Caution	 Caution 2	 Warning	 Warning 2	 Barriers
Access Point(s)									
Alpha									
Beta									
Gamma									

1.3 Fall Arrest Anchor Point Summary

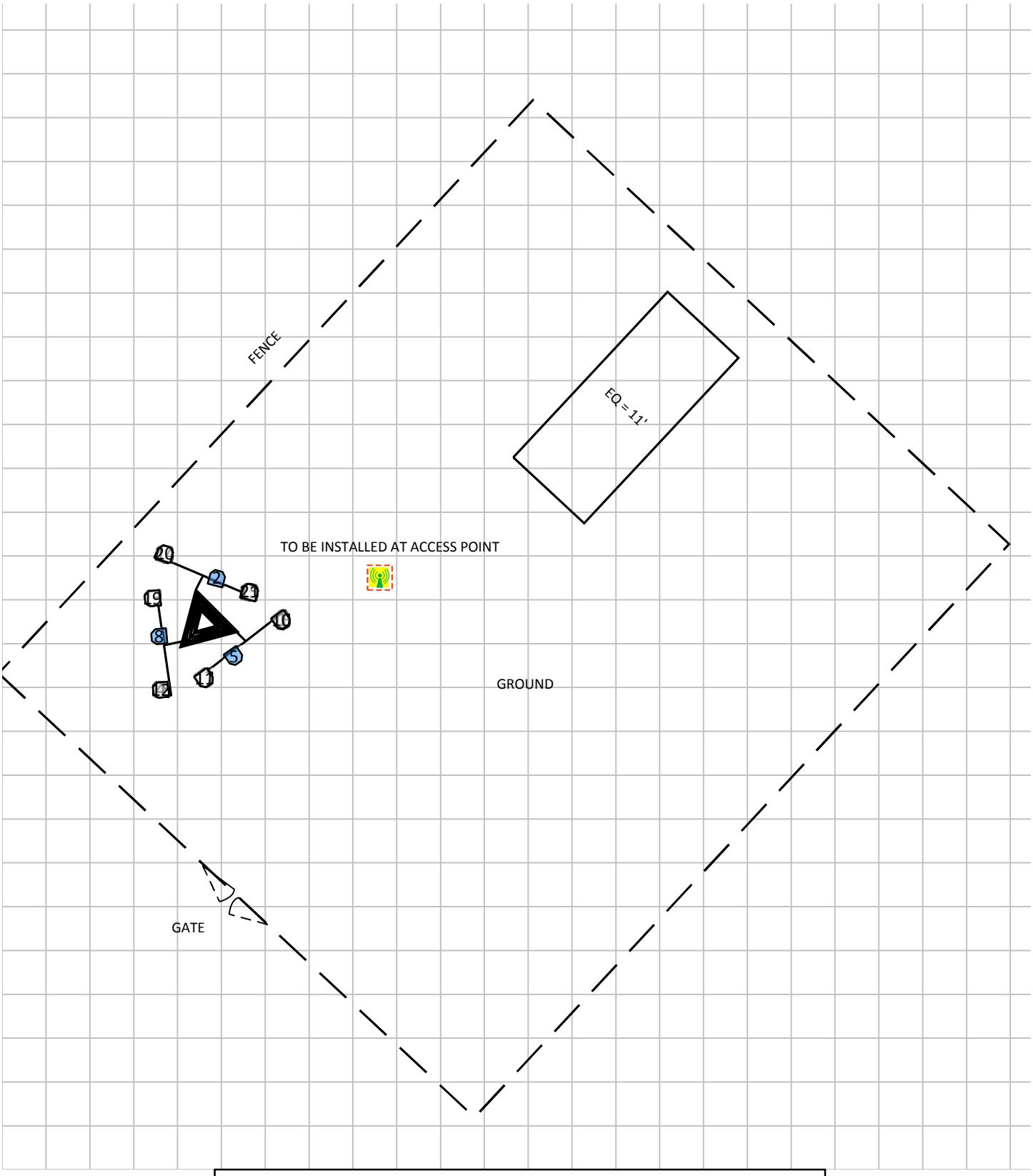
Fall Arrest Anchor & Parapet Info	Parapet Available (Y/N)	Parapet Height (inches)	Fall Arrest Anchor Available (Y/N)
Roof Safety Info	N	NA	N

2 Scale Maps of Site

The following diagrams are included:

- Site Scale Map
- RF Exposure Diagram
- RF Exposure Diagram – Side View
- AT&T Mobility, LLC Contribution

Site Scale Map For: COLCHESTER CENTRAL



(Feet)

0 7.8 15.6

www.sitesafe.com
Site Name:COLCHESTER CENTRAL
2/5/2019 2:12:23 PM

Carrier Identification

AT&T MOBILITY LLC | VERIZON WIRELESS | T-MOBILE | SPRINT | UNKNOWN CARRIER

Sign Legend

Caution 1 | Caution 2 | Notice 2 | Notice 1 | Warning | Warning 2 | Info 1 | Info 2 | RSP RF Safety Plan

Barrier

Proposed Barriers/ Signs

3 Antenna Inventory

The following antenna inventory was obtained by the customer and was utilized to create the site model diagrams:

Ant ID	Operator	Antenna Make & Model	Type	TX Freq (MHz)	Technology	Az (Deg)	Hor BW (Deg)	Ant Len (ft)	Power	Power Type	Power Unit	Radio Count	Total ERP (Watts)	Ant Gain (dBd)	Z (AGL)	MDT	EDT
1	AT&T MOBILITY LLC	Powerwave 7770	Panel	850	UMTS	143	82	4.6	40	TPO	Watt	1	566.3	11.51	167.7'	0'	0'
2	AT&T MOBILITY LLC (Proposed)	Kathrein-Scala 800-10966	Panel	763	LTE	15	67.9	8	160	TPO	Watt	1	3623.4	13.55	166'	0'	4'
2	AT&T MOBILITY LLC (Proposed)	Kathrein-Scala 800-10966	Panel	1900	LTE	15	66	8	160	TPO	Watt	1	6153.5	15.85	166'	0'	3'
3	AT&T MOBILITY LLC (Proposed)	Kathrein-Scala 800-10966	Panel	737	LTE	15	67.9	8	160	TPO	Watt	1	3623.4	13.55	166'	0'	4'
3	AT&T MOBILITY LLC (Proposed)	Kathrein-Scala 800-10966	Panel	850	LTE	15	66	8	80	TPO	Watt	1	2128.6	14.25	166'	0'	4'
3	AT&T MOBILITY LLC (Proposed)	Kathrein-Scala 800-10966	Panel	2100	LTE	15	64.4	8	160	TPO	Watt	1	6593.6	16.15	166'	0'	3'
3	AT&T MOBILITY LLC (Proposed)	Kathrein-Scala 800-10966	Panel	850	5G	15	66	8	80	TPO	Watt	1	2128.6	14.25	166'	0'	4'
4	AT&T MOBILITY LLC	Powerwave 7770	Panel	850	UMTS	263	82	4.6	40	TPO	Watt	1	566.3	11.51	167.7'	0'	8'
5	AT&T MOBILITY LLC (Proposed)	Kathrein-Scala 800-10965	Panel	763	LTE	145	63.9	6.6	160	TPO	Watt	1	2845.2	12.5	166.7'	0'	12'
5	AT&T MOBILITY LLC (Proposed)	Kathrein-Scala 800-10965	Panel	1900	LTE	145	65.1	6.6	160	TPO	Watt	1	6196.1	15.88	166.7'	0'	3'
6	AT&T MOBILITY LLC (Proposed)	Kathrein-Scala 800-10965	Panel	737	LTE	145	63.9	6.6	160	TPO	Watt	1	2845.2	12.5	166.7'	0'	8'
6	AT&T MOBILITY LLC (Proposed)	Kathrein-Scala 800-10965	Panel	850	LTE	145	61.7	6.6	80	TPO	Watt	1	1841.2	13.62	166.7'	0'	8'
6	AT&T MOBILITY LLC (Proposed)	Kathrein-Scala 800-10965	Panel	2100	LTE	145	65.2	6.6	160	TPO	Watt	1	7114.1	16.48	166.7'	0'	3'
6	AT&T MOBILITY LLC (Proposed)	Kathrein-Scala 800-10965	Panel	850	5G	145	61.7	6.6	80	TPO	Watt	1	1841.2	13.62	166.7'	0'	8'
7	AT&T MOBILITY LLC	Powerwave 7770	Panel	850	UMTS	23	82	4.6	40	TPO	Watt	1	566.3	11.51	167.7'	0'	4'
8	AT&T MOBILITY LLC (Proposed)	Kathrein-Scala 800-10966	Panel	763	LTE	264	67.9	8	160	TPO	Watt	1	3623.4	13.55	166'	2'	5'
8	AT&T MOBILITY LLC (Proposed)	Kathrein-Scala 800-10966	Panel	1900	LTE	264	66	8	160	TPO	Watt	1	6153.5	15.85	166'	2'	8'
9	AT&T MOBILITY LLC (Proposed)	Kathrein-Scala 800-10966	Panel	737	LTE	264	67.9	8	160	TPO	Watt	1	3623.4	13.55	166'	2'	5'
9	AT&T MOBILITY LLC (Proposed)	Kathrein-Scala 800-10966	Panel	850	LTE	264	66	8	80	TPO	Watt	1	2128.6	14.25	166'	2'	5'

Ant ID	Operator	Antenna Make & Model	Type	TX Freq (MHz)	Technology	Az (Deg)	Hor BW (Deg)	Ant Len (ft)	Power	Power Type	Power Unit	Radio Count	Total ERP (Watts)	Ant Gain (dBd)	Z (AGL)	MDT	EDT
9	AT&T MOBILITY LLC (Proposed)	Kathrein-Scala 800-10966	Panel	2100	LTE	264	64.4	8	160	TPO	Watt	1	6593.6	16.15	166'	2'	8'
9	AT&T MOBILITY LLC (Proposed)	Kathrein-Scala 800-10966	Panel	850	5G	264	66	8	80	TPO	Watt	1	2128.6	14.25	166'	2'	5'
10	UNKNOWN CARRIER	Generic	Panel	850		145	65	6.3	40	TPO	Watt		881.2	13.43	156.9'	0'	0'
11	UNKNOWN CARRIER	Generic	Panel	850		145	65	6.3	40	TPO	Watt		881.2	13.43	156.9'	0'	0'
12	UNKNOWN CARRIER	Generic	Panel	850		263	65	6.3	40	TPO	Watt		881.2	13.43	156.9'	0'	0'
13	UNKNOWN CARRIER	Generic	Panel	850		263	65	6.3	40	TPO	Watt		881.2	13.43	156.9'	0'	0'
14	UNKNOWN CARRIER	Generic	Panel	850		15	65	6.3	40	TPO	Watt		881.2	13.43	156.9'	0'	0'
15	UNKNOWN CARRIER	Generic	Panel	850		15	65	6.3	40	TPO	Watt		881.2	13.43	156.9'	0'	0'
16	UNKNOWN CARRIER	Generic	Panel	850		145	65	6.3	40	TPO	Watt		881.2	13.43	176.9'	0'	0'
17	UNKNOWN CARRIER	Generic	Panel	850		145	65	6.3	40	TPO	Watt		881.2	13.43	176.9'	0'	0'
18	UNKNOWN CARRIER	Generic	Panel	850		263	65	6.3	40	TPO	Watt		881.2	13.43	176.9'	0'	0'
19	UNKNOWN CARRIER	Generic	Panel	850		263	65	6.3	40	TPO	Watt		881.2	13.43	176.9'	0'	0'
20	UNKNOWN CARRIER	Generic	Panel	850		15	65	6.3	40	TPO	Watt		881.2	13.43	176.9'	0'	0'
21	UNKNOWN CARRIER	Generic	Panel	850		15	65	6.3	40	TPO	Watt		881.2	13.43	176.9'	0'	0'

NOTE: X, Y and Z indicate relative position of the bottom of the antenna to the origin location on the site, displayed in the model results diagram. Specifically, the Z reference indicates the bottom of the antenna height above the main site level unless otherwise indicated. The distance to the bottom of the antenna is calculated by subtracting half of the length of the antenna from the antenna centerline. Effective Radiated Power (ERP) is provided by the operator or based on Sitesafe experience. The values used in the modeling may be greater than are currently deployed. For other operators at this site the use of "Generic" as an antenna model or "Unknown" for a wireless operator means the information with regard to operator, their FCC license and/or antenna information was not available nor could it be secured while on site. Other operator's equipment, antenna models and powers used for modeling are based on obtained information or Sitesafe experience.

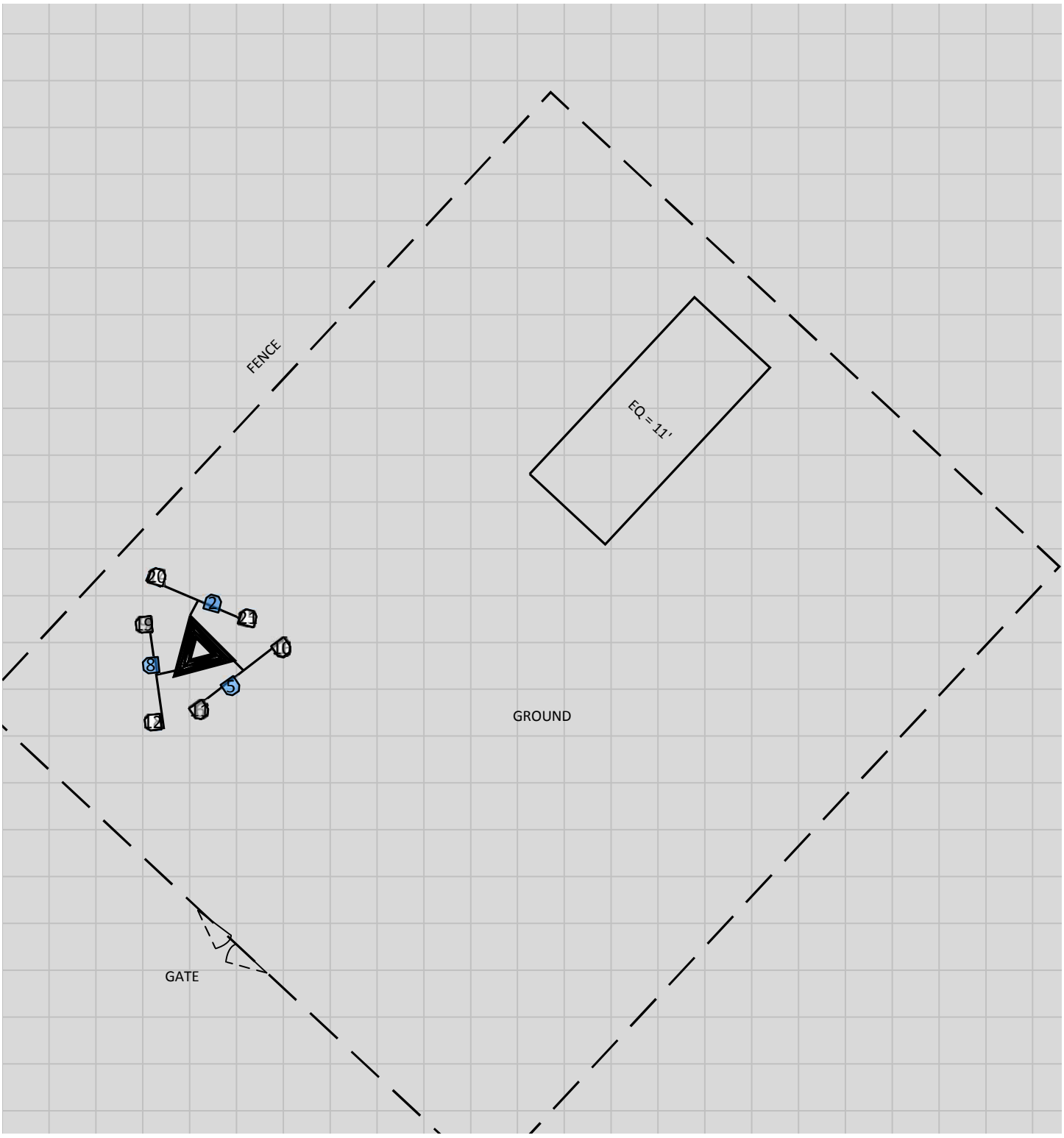
4 Emission Predictions

In the RF Exposure Simulations below all heights are reflected with respect to main site level. In most rooftop cases this is the height of the main rooftop and in other cases this can be ground level. Each different height area, rooftop, or platform level is labeled with its height relative to the main site level. Emissions are calculated appropriately based on the relative height and location of that area to all antennas. The total analyzed elevations in the below RF Exposure Simulations are listed below.

- GROUND = 0'
- EQ = 11'

The Antenna Inventory heights are referenced to the same level.

RF Exposure Simulation For: COLCHESTER CENTRAL
Composite View



% of FCC Public Exposure Limit
Spatial average 0' - 6'

% of FCC Public Exposure Limit

>= 5000	>= 500	>= 100	>= 5	< 5

Carrier Identification

AT&T MOBILITY LLC | VERIZON WIRELESS | T-MOBILE | SPRINT | UNKNOWN CARRIER

Barrier

Proposed Barriers/ Signs

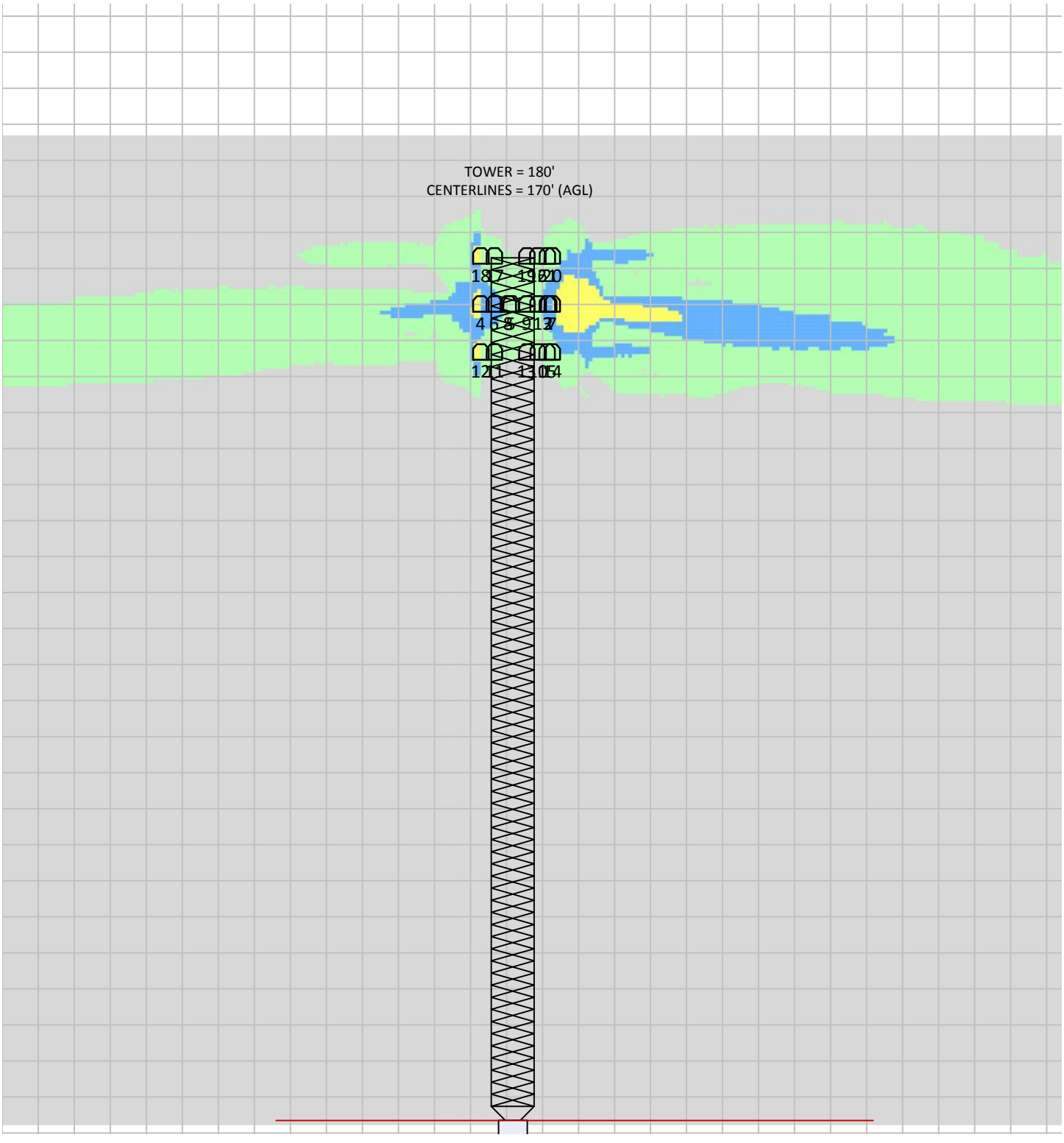
(Feet)

0 8 16

www.sitesafe.com
Site Name:COLCHESTER CENTRAL
2/5/2019 2:13:44 PM

Sitesafe OET-65 Model
Near Field Boundary:
1.5 * Aperture
Reflection Factor: 1
Spatially Averaged

RF Exposure Simulation For: COLCHESTER CENTRAL
Side View



% of FCC Public Exposure Limit

>= 5000	>= 500	>= 100	>= 5	< 5

Carrier Identification

AT&T MOBILITY LLC | VERIZON WIRELESS | T-MOBILE | SPRINT | UNKNOWN CARRIER

Barrier

Proposed Barriers/ Signs

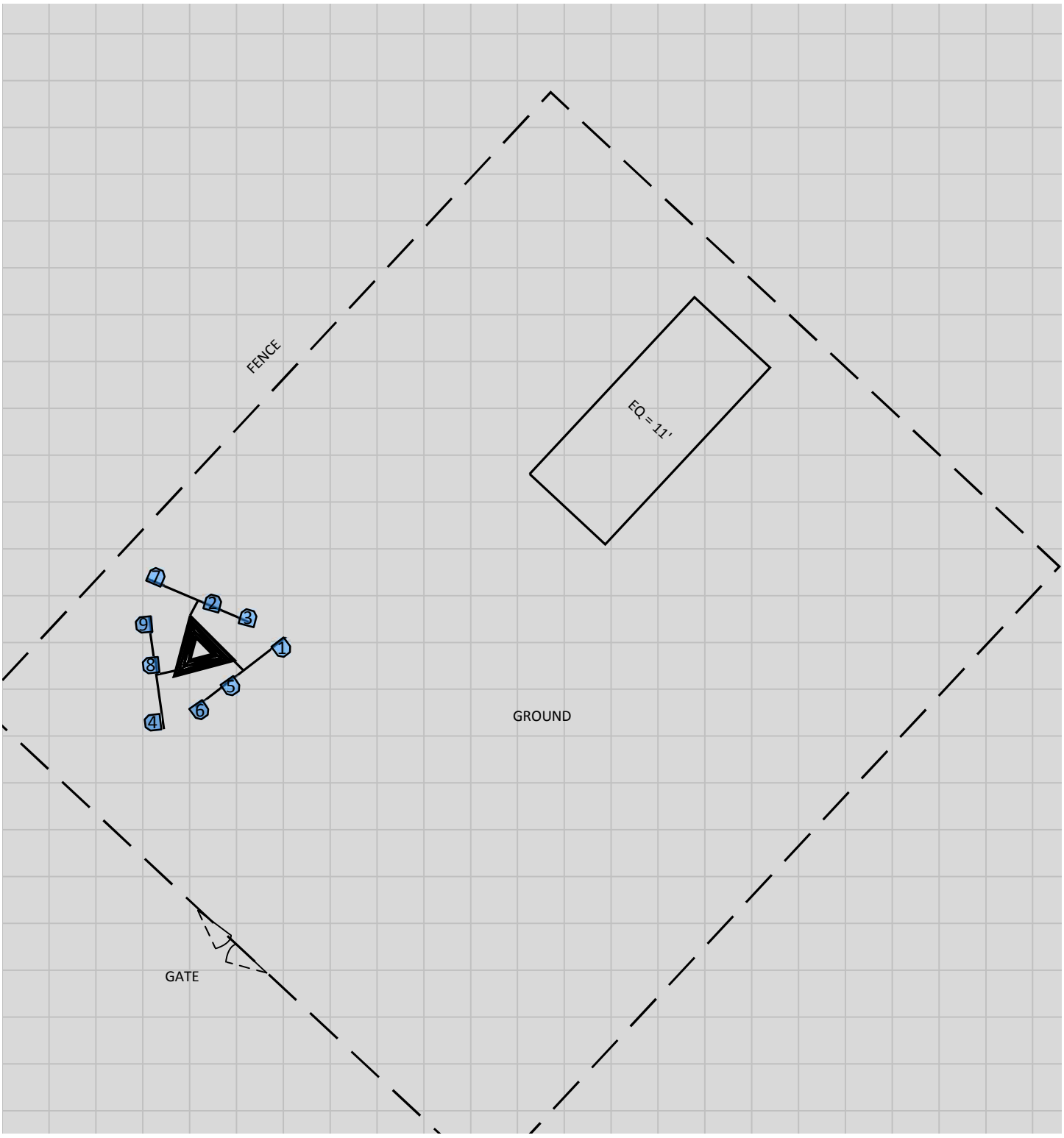
(Feet)

0 14.7 29.4

www.sitesafe.com
Site Name:COLCHESTER CENTRAL
2/5/2019 2:15:37 PM

Sitesafe OET-65 Model
Near Field Boundary:
1.5 * Aperture
Reflection Factor: 1
Single Level (0)

RF Exposure Simulation For: COLCHESTER CENTRAL
AT&T Mobility, LLC Contribution



% of FCC Public Exposure Limit
Spatial average 0' - 6'

% of FCC Public Exposure Limit

>= 5000	>= 500	>= 100	>= 5	< 5

Carrier Identification

AT&T MOBILITY LLC | VERIZON WIRELESS | T-MOBILE | SPRINT | UNKNOWN CARRIER

Barrier

Proposed Barriers/ Signs

(Feet)

0 8 16

www.sitesafe.com
Site Name:COLCHESTER CENTRAL
2/5/2019 2:13:44 PM

Sitesafe OET-65 Model
Near Field Boundary:
1.5 * Aperture
Reflection Factor: 1
Spatially Averaged

5 Site Compliance

5.1 Site Compliance Statement

Upon evaluation of the cumulative RF emission levels from all operators at this site, RF hazard signage and antenna locations, Sitesafe has determined that:

AT&T Mobility, LLC will be compliant when the remediation recommended in Section 5.2 or other appropriate remediation is implemented.

The compliance determination is based on General Public RFE levels derived from theoretical modeling, RF signage placement, proposed antenna inventory and the level of restricted access to the antennas at the site. Any deviation from the AT&T Mobility, LLC's proposed deployment plan could result in the site being rendered non-compliant.

Modeling is used for determining compliance and the percentage of MPE contribution.

5.2 Actions for Site Compliance

Based on FCC regulations, common industry practice, and our understanding of AT&T Mobility, LLC RF Safety Policy requirements, this section provides a statement of recommendations for site compliance. Recommendations have been proposed based on our understanding of existing access restrictions, signage, and an analysis of predicted RFE levels.

AT&T Mobility, LLC will be made compliant if the following changes are implemented:

Site Access Location

(1) Yellow Caution 2B sign(s) required.

Notes:

- This report's diagrams do not show the Access locations because the data provided did not include them.
- Specific data concerning all other carriers on site was unavailable and therefore not included in this report.
- Signage may already be in place. Sitesafe does not have record of any existing signage because there were no previous visits or data supplied regarding them. All remediation is based on a worst-case scenario.

6 Engineer Certification

The professional engineer whose seal appears on the cover of this document hereby certifies and affirms:

That I, Michael A McGuire, am currently and actively licensed to provide (in this state/jurisdiction as indicated within the professional electrical engineering seal on the cover of this document) professional electrical engineering services, as an employee of Hurricane Hill Development Company, PLLC , a duly authorized/registered engineering firm (in this state, as applicable) on behalf of SiteSafe, LLC; and

That I am thoroughly familiar with the Rules and Regulations of the Federal Communications Commission (FCC) as well as the regulations of the Occupational Safety and Health Administration (OSHA), both in general and specifically as they apply to the FCC Guidelines for Human Exposure to Radio-frequency Radiation; and

That I have thoroughly reviewed this Site Compliance Report and believe it to be true and accurate to the best of my knowledge as assembled by and attested to by Nick Kutzke.

February 5, 2019

Appendix A – Statement of Limiting Conditions

Sitesafe has provided computer generated model(s) in this Site Compliance Report to show approximate dimensions of the site, and the model is included to assist the reader of the compliance report to visualize the site area, and to provide supporting documentation for Sitesafe's recommendations.

Sitesafe may note in the Site Compliance Report any adverse physical conditions, such as needed repairs, that Sitesafe became aware of during the normal research involved in creating this report. Sitesafe will not be responsible for any such conditions that do exist or for any engineering or testing that might be required to discover whether such conditions exist. Because Sitesafe is not an expert in the field of mechanical engineering or building maintenance, the Site Compliance Report must not be considered a structural or physical engineering report.

Sitesafe obtained information used in this Site Compliance Report from sources that Sitesafe considers reliable and believes them to be true and correct. Sitesafe does not assume any responsibility for the accuracy of such items that were furnished by other parties. When conflicts in information occur between data collected by Sitesafe provided by a second party and data collected by Sitesafe, the data will be used.

Appendix B – Regulatory Background Information

FCC Rules and Regulations

In 1996, the Federal Communications Commission (FCC) adopted regulations for the evaluating of the effects of RF emissions in 47 CFR § 1.1307 and 1.1310. The guideline from the FCC Office of Engineering and Technology is Bulletin 65 ("OET Bulletin 65"), *Evaluating Compliance with FCC Guidelines for Human Exposure to Radio Frequency Electromagnetic Fields*, Edition 97-01, published August 1997. Since 1996 the FCC periodically reviews these rules and regulations as per their congressional mandate.

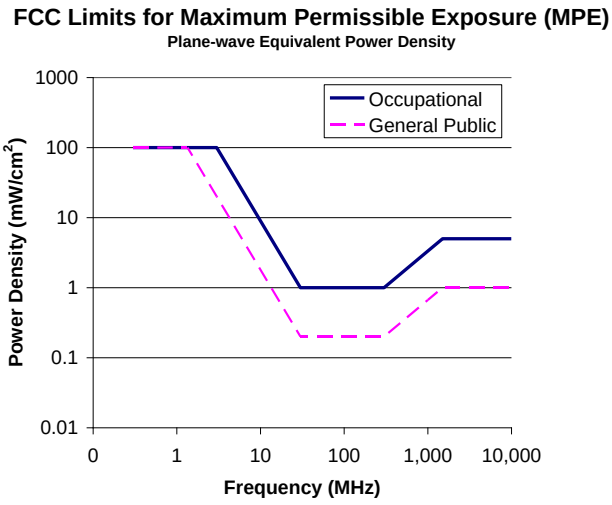
FCC regulations define two separate tiers of exposure limits: Occupational or "Controlled environment" and General Public or "Uncontrolled environment". The General Public limits are generally five times more conservative or restrictive than the Occupational limit. These limits apply to *accessible* areas where workers or the general public may be exposed to Radio Frequency (RF) electromagnetic fields.

Occupational or Controlled limits apply in situations in which persons are exposed as a consequence of their employment and where those persons exposed have been made fully aware of the potential for exposure and can exercise control over their exposure.

An area is considered a Controlled environment when access is limited to these aware personnel. Typical criteria are restricted access (i.e. locked or alarmed doors, barriers, etc.) to the areas where antennas are located coupled with proper RF warning signage. A site with Controlled environments is evaluated with Occupational limits.

All other areas are considered Uncontrolled environments. If a site has no access controls or no RF warning signage it is evaluated with General Public limits.

The theoretical modeling of the RF electromagnetic fields has been performed in accordance with OET Bulletin 65. The Maximum Permissible Exposure (MPE) limits utilized in this analysis are outlined in the following diagram:



Limits for Occupational/Controlled Exposure (MPE)

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm^2)	Averaging Time $\|E\|^2$, $\|H\|^2$ or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842/f	4.89/f	($900/f^2$)*	6
30-300	61.4	0.163	1.0	6
300-1500	--	--	f/300	6
1500-100,000	--	--	5	6

Limits for General Population/Uncontrolled Exposure (MPE)

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm^2)	Averaging Time $\|E\|^2$, $\|H\|^2$ or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	($180/f^2$)*	30
30-300	27.5	0.073	0.2	30
300-1500	--	--	f/1500	30
1500-100,000	--	--	1.0	30

f = frequency in MHz *Plane-wave equivalent power density

OSHA Statement

The General Duty clause of the OSHA Act (Section 5) outlines the occupational safety and health responsibilities of the employer and employee. The General Duty clause in Section 5 states:

(a) Each employer –
- (1) shall furnish to each of his employees employment and a place of employment which are free from recognized hazards that are causing or are likely to cause death or serious physical harm to his employees;
- (2) shall comply with occupational safety and health standards promulgated under this Act.

(b) Each employee shall comply with occupational safety and health standards and all rules, regulations, and orders issued pursuant to this Act which are applicable to his own actions and conduct.

OSHA has defined Radiofrequency and Microwave Radiation safety standards for workers who may enter hazardous RF areas. Regulation Standards 29 CFR § 1910.147 identify a generic Lock Out Tag Out procedure aimed to control the unexpected energization or start up of machines when maintenance or service is being performed.

Appendix C – Safety Plan and Procedures

The following items are general safety recommendations that should be administered on a site by site basis as needed by the carrier.

General Maintenance Work: Any maintenance personnel required to work immediately in front of antennas and / or in areas indicated as above 100% of the Occupational MPE limits should coordinate with the wireless operators to disable transmitters during their work activities.

Training and Qualification Verification: All personnel accessing areas indicated as exceeding the General Population MPE limits should have a basic understanding of EME awareness and RF Safety procedures when working around transmitting antennas. Awareness training increases a workers understanding to potential RF exposure scenarios. Awareness can be achieved in a number of ways (e.g. videos, formal classroom lecture or internet based courses).

Physical Access Control: Access restrictions to transmitting antennas locations is the primary element in a site safety plan. Examples of access restrictions are as follows:

- Locked door or gate
- Alarmed door
- Locked ladder access
- Restrictive Barrier at antenna (e.g. Chain link with posted RF Sign)

RF Signage: Everyone should obey all posted signs at all times. RF signs play an important role in properly warning a worker prior to entering into a potential RF Exposure area.

Assume all antennas are active: Due to the nature of telecommunications transmissions, an antenna transmits intermittently. Always assume an antenna is transmitting. Never stop in front of an antenna. If you have to pass by an antenna, move through as quickly and safely as possible thereby reducing any exposure to a minimum.

Maintain a 3 foot clearance from all antennas: There is a direct correlation between the strength of an EME field and the distance from the transmitting antenna. The further away from an antenna, the lower the corresponding EME field is.

Site RF Emissions Diagram: Section 4 of this report contains an RF Diagram that outlines various theoretical Maximum Permissible Exposure (MPE) areas at the site. The modeling is a worst case scenario assuming a duty cycle of 100% for each transmitting antenna at full power. This analysis is based on one of two access control criteria: General Public criteria means the access to the site is uncontrolled and anyone can gain access. Occupational criteria means the access is restricted and only properly trained individuals can gain access to the antenna locations.

Appendix D – RF Emissions

The RF Emissions Simulation(s) in this report display theoretical spatially averaged percentage of the Maximum Permissible Exposure for all systems at the site unless otherwise noted. These diagrams use modeling as prescribed in OET Bulletin 65 and assumptions detailed in Appendix E.

The key at the bottom of each RF Emissions Simulation indicates percentages displayed referenced to FCC General Public Maximum Permissible Exposure (MPE) limits. Color coding on the diagram is as follows:

- Areas indicated as Gray are predicted to be below 5% of the MPE limits. Gray represents areas more than 20 times below the most conservative exposure limit.
- Green represents areas are predicted to be between 5% and 100% of the MPE limits. **Green areas are accessible to anyone**.
- Blue represents areas predicted to exceed the General Public MPE limits but are less than Occupational limits. **Blue areas should be accessible only to RF trained workers**.
- Yellow represents areas predicted to exceed Occupational MPE limits. Yellow areas should be accessible only to RF trained workers able to assess current exposure levels.
- Red represents areas predicted to have exposure more than 10 times the Occupational MPE limits. **Red indicates that the RF levels must be reduced prior to access.** An RF Safety Plan is required which outlines how to reduce the RF energy in these areas prior to access.

Appendix E – Assumptions and Definitions

General Model Assumptions

In this site compliance report, it is assumed that all antennas are operating at **full power at all times**. Software modeling was performed for all transmitting antennas located on the site. Sitesafe has further assumed a 100% duty cycle and maximum radiated power.

The modeling is based on recommendations from the FCC's OET-65 bulletin with the following variances per AT&T guidance. Reflection has not been considered in the modeling, i.e. the reflection factor is 1.0. The near / far field boundary has been set to 1.5 times the aperture height of the antenna and modeling beyond that point is the lesser of the near field cylindrical model and the far field model taking into account the gain of the antenna.

The site has been modeled with these assumptions to show the maximum RF energy density. Areas modeled with exposure greater than 100% of the General Public MPE level may not actually occur, but are shown as a prediction that could be realized. Sitesafe believes these areas to be safe for entry by occupationally trained personnel utilizing appropriate personal protective equipment (in most cases, a personal monitor).

Use of Generic Antennas

For the purposes of this report, the use of "Generic" as an antenna model, or "Unknown" for an operator means the information about a carrier, their FCC license and/or antenna information was not provided and could not be obtained while on site. In the event of unknown information, Sitesafe will use our industry specific knowledge of equipment, antenna models, and transmit power to model the site. If more specific information can be obtained for the unknown measurement criteria, Sitesafe recommends remodeling of the site utilizing the more complete and accurate data. Information about similar facilities is used when the service is identified and associated with a particular antenna. If no information is available regarding the transmitting service associated with an unidentified antenna, using the antenna manufacturer's published data regarding the antenna's physical characteristics makes more conservative assumptions.

Where the frequency is unknown, Sitesafe uses the closest frequency in the antenna's range that corresponds to the highest Maximum Permissible Exposure (MPE), resulting in a conservative analysis.

Definitions

5% Rule – The rules adopted by the FCC specify that, in general, at multiple transmitter sites actions necessary to bring the area into compliance with the guidelines are the shared responsibility of all licensees whose transmitters produce field strengths or power density levels at the area in question in excess of 5% of the exposure limits. In other words, any wireless operator that contributes 5% or greater of the MPE limit in an area that is identified to be greater than 100% of the MPE limit is responsible taking corrective actions to bring the site into compliance.

Compliance – The determination of whether a site is safe or not with regards to Human Exposure to Radio Frequency Radiation from transmitting antennas.

Decibel (dB) – A unit for measuring power or strength of a signal.

Duty Cycle – The percent of pulse duration to the pulse period of a periodic pulse train. Also, may be a measure of the temporal transmission characteristic of an intermittently transmitting RF source such as a paging antenna by dividing average transmission duration by the average period for transmission. A duty cycle of 100% corresponds to continuous operation.

Effective (or Equivalent) Isotropic Radiated Power (EIRP) – The product of the power supplied to the antenna and the antenna gain in a given direction relative to an isotropic antenna.

Effective Radiated Power (ERP) – In a given direction, the relative gain of a transmitting antenna with respect to the maximum directivity of a half wave dipole multiplied by the net power accepted by the antenna from the connecting transmitter.

Gain (of an antenna) – The ratio of the maximum intensity in a given direction to the maximum radiation in the same direction from an isotropic radiator. Gain is a measure of the relative efficiency of a directional antennas as compared to an omni directional antenna.

General Population/Uncontrolled Environment – Defined by the FCC, as an area where exposure to RF energy may occur to persons who are **unaware** of the potential for exposure and who have no control of their exposure. General Population is also referenced as General Public.

Generic Antenna – For the purposes of this report, the use of "Generic" as an antenna model means the antenna information was not provided and could not be obtained while on site. In the event of unknown information, Sitesafe will use our industry specific knowledge of antenna models to select a worst case scenario antenna to model the site.

Isotropic Antenna – An antenna that is completely non-directional. In other words, an antenna that radiates energy equally in all directions.

Maximum Measurement – This measurement represents the single largest measurement recorded when performing a spatial average measurement.

Maximum Permissible Exposure (MPE) – The maximum levels of RF exposure a person may be exposed to without harmful effect and with acceptable safety factor.

Occupational/Controlled Environment – Defined by the FCC, as an area where Radio Frequency Radiation (RFR) exposure may occur to persons who are **aware** of the

potential for exposure as a condition of employment or specific activity and can exercise control over their exposure.

OET Bulletin 65 – Technical guideline developed by the FCC's Office of Engineering and Technology to determine the impact of Radio Frequency radiation on Humans. The guideline was published in August 1997.

OSHA (Occupational Safety and Health Administration) – Under the Occupational Safety and Health Act of 1970, employers are responsible for providing a safe and healthy workplace for their employees. OSHA's role is to promote the safety and health of America's working men and women by setting and enforcing standards; providing training, outreach and education; establishing partnerships; and encouraging continual process improvement in workplace safety and health. For more information, visit www.osha.gov.

Radio Frequency (RF) – The frequencies of electromagnetic waves which are used for radio communications. Approximately 3 kHz to 300 GHz.

Radio Frequency Exposure (RFE) – The amount of RF power density that a person is or might be exposed to.

Spatial Average Measurement – A technique used to average a minimum of ten (10) measurements taken in a ten (10) second interval from zero (0) to six (6) feet. This measurement is intended to model the average power density an average sized human will be exposed to at a location.

Transmitter Power Output (TPO) – The radio frequency output power of a transmitter's final radio frequency stage as measured at the output terminal while connected to a load.

Appendix F – References

The following references can be followed for further information about RF Health and Safety.

Sitesafe, LLC.
http://www.sitesafe.com
FCC Radio Frequency Safety
http://www.fcc.gov/encyclopedia/radio-frequency-safety
National Council on Radiation Protection and Measurements (NCRP)
http://www.ncrponline.org
Institute of Electrical and Electronics Engineers, Inc., (IEEE)
http://www.ieee.org
American National Standards Institute (ANSI)
http://www.ansi.org
Environmental Protection Agency (EPA)
http://www.epa.gov/radtown/wireless-tech.html
National Institutes of Health (NIH)
http://www.niehs.nih.gov/health/topics/agents/emf/
Occupational Safety and Health Agency (OSHA)
http://www.osha.gov/SLTC/radiofrequencyradiation/
International Commission on Non-Ionizing Radiation Protection (ICNIRP)
http://www.icnirp.org
World Health Organization (WHO)
http://www.who.int/peh-emf/en/
National Cancer Institute
http://www.cancer.gov/cancertopics/factsheet/Risk/cellphones
American Cancer Society (ACS)
http://www.cancer.org/docroot/PED/content/PED_1_3X_Cellular_Phone_Towers.asp?siteareа=PED
European Commission Scientific Committee on Emerging and Newly Identified Health Risks
http://ec.europa.eu/health/ph_risk/committees/04_scenihr/docs/scenihr_o_022.pdf
Fairfax County, Virginia Public School Survey
http://www.fcps.edu/fts/safety-security/RFEESurvey/
UK Health Protection Agency Advisory Group on Non-ionising Radiation
http://www.hpa.org.uk/webw/HPAweb&HPAwebStandard/HPAweb_C/1317133826368
Norwegian Institute of Public Health
http://www.fhi.no/dokumenter/545eea7147.pdf

600 OLD HARTFORD RD

Location	600 OLD HARTFORD RD	**Mblu**	06-10/ / 051-000/ TWR/
Acct#	11AT0006	**Owner**	AT&T MOBILITY
Assessment	$345,300	**Appraisal**	$493,400
PID	105116	**Building Count**	1

Current Value

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2016	$493,400	$0	$493,400
Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2016	$345,300	$0	$345,300

Owner of Record

Owner	AT&T MOBILITY	**Sale Price**	$0
Co-Owner	ATTN TAX MANAGER	**Certificate**	
Address	909 CHESTNUT ST ST LOUIS, MO 63101	**Book & Page**	000/ 000
		Sale Date	10/01/2011

Ownership History

Ownership History				
Owner	**Sale Price**	**Certificate**	**Book & Page**	**Sale Date**
AT&T MOBILITY	$0		000/ 000	10/01/2011

Building Information

Building 1 : Section 1

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

Building Attributes	
Field	**Description**

Style	Outbuildings
Model	
Grade:	
Stories:	
Occupancy	
Exterior Wall 1	
Exterior Wall 2	
Roof Structure:	
Roof Cover	
Interior Wall 1	
Interior Wall 2	
Interior Flr 1	
Interior Flr 2	
Heat Fuel	
Heat Type:	
AC Type:	
Total Bedrooms:	
Total Bthrms:	
Total Half Baths:	
Total Xtra Fixtrs:	
Total Rooms:	
Bath Style:	
Kitchen Style:	

Building Photo

(http://images.vgsi.com/photos2/colchesterCTPhotos//default.jpg

Building Layout

Building Layout

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

Extra Features

Extra Features	Legend
No Data for Extra Features	

Land

Land Use

Use Code	4310
Description	Tel Rel Tw
Zone	
Neighborhood	
Alt Land Appr	No
Category	

Land Line Valuation

Size (Acres)	0
Frontage	
Depth	
Assessed Value	$0
Appraised Value	$0

Outbuildings

Outbuildings	Legend

Code	Description	Sub Code	Sub Description	Size	Value	Bldg #
TWR2	Cell Tower			2 SITES	$420,000	1
SHD9	Cell Shed			312 S.F.	$70,200	1
FN4	Fence 8' Chain			360 L.F.	$3,200	1

Valuation History

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2015	$554,000	$0	$554,000

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2015	$387,800	$0	$387,800

775997966210

Delivered
Tuesday 8/20/2019 at 11:40 am

DELIVERED

Signed for by: Signature on File

GET STATUS UPDATES

OBTAIN PROOF OF DELIVERY

FROM

Smartlink LLC
Dave Barbagallo
265 Lincoln St
KENSINGTON, CT US 06037
860 681-7708

TO

Town of Colchester
Art Shilosky
Colchester, CT US 06415
860 537-7200

Shipment Facts

Ask FedEx

DELIVERY ATTEMPTS
1

TOTAL PIECES
1

TERMS
Shipper

PACKAGING
Package

STANDARD TRANSIT
8/20/2019

SHIP DATE
Mon 8/19/2019

ACTUAL DELIVERY
Tue 8/20/2019 11:40 am

Travel History

Local Scan Time

Expand History

775998040792

Delivered
Tuesday 8/20/2019 at 11:40 am

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FROM

Smartlink LLC
Dave Barbagallo
265 Lincoln St
KENSINGTON, CT US 06037
860 681-7708

TO

Town of Colchester
Town of Colchester
Colchester, CT US 06415
860 537-7200

Shipment Facts

Ask FedEx

DELIVERY ATTEMPTS
1

TOTAL PIECES
1

TERMS
Shipper

PACKAGING
Package

STANDARD TRANSIT
8/20/2019

SHIP DATE
Mon 8/19/2019

ACTUAL DELIVERY
Tue 8/20/2019 11:40 am

Travel History

Local Scan Time

Expand History

775998470421

Delivered
Wednesday 8/21/2019 at 1:37 pm

DELIVERED

Signed for by: Signature on File

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OBTAIN PROOF OF DELIVERY

FROM

Smartlink LLC
Dave Barbagallo
265 Lincoln St
KENSINGTON, CT US 06037
860 681-7708

TO

Cordless Data Transfer
Mark Legault
Colchester, CT US 06415
860 729-9399

Shipment Facts

DELIVERY ATTEMPTS
1

TOTAL PIECES
1

TERMS
Shipper

PACKAGING
Package

STANDARD TRANSIT
8/20/2019

SHIP DATE
Mon 8/19/2019

ACTUAL DELIVERY
Wed 8/21/2019 1:37 pm

Travel History

Local Scan Time

Expand History