March 19, 2019

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

Re:	**Notice of Exempt Modification – Antenna Replacement / RRU Add**
Property Address:	**864 Opening Hill Rd, Madison, CT 06443**
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 (9) wireless telecommunication antennas at a center line height of 140 feet on an existing 180-foot lattice tower owned by American Tower Corporation, 10 Presidential Way, Woburn, MA 01801. AT&T now intends to replace (3) existing KMW AM-X-CD-16-65-00T-RET 6' Panel Antennas with (3) new CCI HPA-65R-BU6AA 6' Panel Antennas, replace (3) existing Powerwave 7770 55" Panel Antennas with (3) new Kathrein 800-10965 6' Panel Antennas, replace (3) existing RRUS-11 RRU's with (3) new Radio 4449 B5/B12 RRU's, and add (3) new RRUS-8843 B2/B66A RRU's and (1) DC6-48-60-18-8F Squid with (1) new Fiber cable and (2) new DC cables, all at the existing centerline of 140 feet.

Attached is a summary of the planned modifications including power density calculations reflecting the change in AT&T's operations at the site. Also included is documentation of the structural sufficiency of the tower to accommodate the revised antenna configuration.

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:

Tom Banisch – First Selectman, Town of Madison, CT at 8 Campus Dr., Madison, CT 06443
David Anderson – Town Planner, Town of Madison, CT at 8 Campus Dr., Madison, CT 06443
N. Madison Volunteer Fire Co. -- Property Owners, at 864 Opening Hill Rd, Madison, CT 06443
American Tower Corporation – Structure Owner, at 10 Presidential Way, Woburn, MA 01801

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

- TS-AT&T-076-020724 - AT&T Wireless PCS, LLC d/b/a AT&T Wireless request for an order to approve tower sharing at an existing telecommunications facility located at 864 Opening Hill Road, Madison, Connecticut.
- EM-CING-128-076-048-102-097-061221 - New Cingular Wireless PCS, LLC notice of intent to modify existing telecommunications facilities located at Grist Mill Road, Simsbury; 864 Opening Hill Road, Madison; 101 Burbank Road, Ellington; 273 Boombridge Road, North Stonington; and 5 Fairfield Drive, Newtown, Connecticut.
- EM-CING-076-081124 - New Cingular Wireless PCS, LLC notice of intent to modify an existing telecommunications facility located at 864 Opening Hill Road, Madison, Connecticut.
- EM-AT&T-076-121228 - AT&T Mobility notice of intent to modify an existing telecommunications facility located at 864 Opening Hill Road, Madison, Connecticut.

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 additional antennas will be installed at the 140-foot level of the 180-foot lattice tower.
2. The proposed modifications will involve changes to ground-mounted equipment, however these changes will not require an 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,

Ryan Burgdorfer

Digitally signed by Ryan Burgdorfer
DN: dc=net, dc=truality, ou=smartlinkllc, ou=Users, ou=Sites, ou=Marlborough, MA, cn=Ryan Burgdorfer, email=ryan.burgdorfer@smartlinkllc.com
Date: 2019.03.25 09:32:39 -04'00'

Ryan Burgdorfer

CC w/enclosures:

Tom Banisch – First Selectman, Town of Madison, CT at 8 Campus Dr., Madison, CT 06443
David Anderson – Town Planner, Town of Madison, CT at 8 Campus Dr., Madison, CT 06443
N. Madison Volunteer Fire Co. -- Property Owners, at 864 Opening Hill Rd, Madison, CT 06443
American Tower Corporation – Structure Owner, at 10 Presidential Way, Woburn, MA 01801

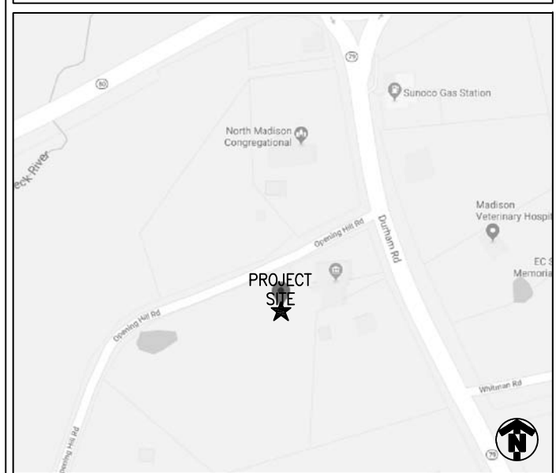
SHEET INDEX

DRIVING DIRECTIONS

FROM 550 COCHITUATE RD.:

GET ON I-90 WEST/MASSACHUSETTS TURNPIKE FROM SPEEN STREET. HEAD NORTHEAST TOWARD SPEEN STREET. TURN RIGHT TOWARD SPEEN STREET. TURN RIGHT ONTO SPEEN STREET. TURN RIGHT ONTO COCHITUATE ROAD. USE THE RIGHT LANE TO TAKE THE RAMP TO I-90/MASSPIKE/SPRINGFIELD/BOSTON. KEEP LEFT AT THE FORK, FOLLOW SIGNS FOR I-90 WEST/MASSACHUSETTS TURNPIKE/WORCESTER/SPRINGFIELD AND MERGE ONTO I-90 WEST/MASSACHUSETTS TURNPIKE. FOLLOW I-90 WEST/MASSACHUSETTS TURNPIKE, I-395 SOUTH AND I-95 SOUTH TO STATE HWY 450 IN MADISON. TAKE EXIT 62 FROM I-95 SOUTH. MERGE ONTO I-90 WEST/MASSACHUSETTS TURNPIKE. TAKE EXIT 10 TOWARD MA-12 NORTH/AUBURN/WORCESTER. KEEP RIGHT AT THE FORK, FOLLOW SIGNS FOR I-395 SOUTH/NORWICH CT. CONTINUE ONTO I-395 SOUTH. MERGE ONTO I-95 SOUTH. TAKE EXIT 62 TOWARD HAMMONASSET/STATE PARK. FOLLOW STATE HWY 450 AND CT-79 NORTH TO OPENING HILL ROAD. TURN RIGHT ONTO STATE HWY 450. TURN RIGHT ONTO CT-79 NORTH. TURN LEFT ONTO OPENING HILL ROAD.

LOCATION MAP



at&t

PROJECT

LTE 2C/3C/4C/RETROFIT

SITE NAME

MADISON-SR 79

CELL SITE ID

CTL02033

FA SITE NUMBER

10035048

PACE ID

MRCTB035097/MRCTB035271
MRCTB035128/MRCTB035296

SITE ADDRESS

864 OPENING HILL ROAD
MADISON, CT 06443

STRUCTURE TYPE

SELF SUPPORT

PROJECT TEAM

smartlink

PROJECT MANAGER

INFINIGY

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

ENGINEER

SCOPE OF WORK (PER LTE RFDS, DATED: 12/14/2018, V2.00):

- HANDICAP ACCESS REQUIREMENTS ARE NOT REQUIRED.
- FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION.
- FACILITY HAS NO PLUMBING OR REFRIGERANTS.
- THIS FACILITY SHALL MEET OR EXCEED ALL FAA AND FCC REGULATORY REQUIREMENTS.
- ALL NEW MATERIAL SHALL BE FURNISHED AND INSTALLED BY CONTRACTOR UNLESS NOTED OTHERWISE. EQUIPMENT, ANTENNAS/RRU AND CABLES FURNISHED BY OWNER AND INSTALLED BY CONTRACTOR.

TOWER SCOPE

- REMOVE (6) PANEL ANTENNAS
- INSTALL (6) PANEL ANTENNAS
- REMOVE (3) RRUS-11
- INSTALL (3) B5/B12 4449
- INSTALL (3) B2/B66A 8843
- INSTALL (1) DC FIBER SQUID W/ (1) FIBER AND (2) DC CABLES

GROUND SCOPE

- SWAP BB WITH 6630
- ADD 6630

PROJECT SUMMARY

SITE NAME:	MADISON-SR 79	
CELL SITE ID:	CTL02033	
FA SITE #:	10035048	
SITE ADDRESS:	864 OPENING HILL ROAD MADISON, CT 06443	
COUNTY:	NEW HAVEN	
SITE COORDINATES: LATITUDE:	41.3572981° N	(NAD 83)
LONGITUDE:	72.6387489° W	(NAD 83)
ELEVATION:	±313'	(AMSL)
RAD CENTER	±140'	(AGL)
LANDLORD:	TBD	
APPLICANT:	AT&T MOBILITY 550 COCHITUATE RD. FRAMINGHAM, MA 01701	
CLIENT REPRESENTATIVE:	SMARTLINK, LLC 85 RANGEWAY RD. SUITE 102 NORTH BILLERICA, MA 01862	
CONTACT:	ED WEISSMAN (917) 528-1857	
ENGINEER:	INFINIGY 1033 WATERVLIET SHAKER ROAD ALBANY, NY 12205	
CONTACT:	ALEX WELLER (518) 690-0790	
BUILDING CODE:	CT BUILDING CODE UNIFORM BUILDING CODE BUILDING OFFICIALS & CODE ADMINISTRATORS UNIFORM MECHANICAL CODE UNIFORM PLUMBING CODE LOCAL BUILDING CODE CITY/COUNTY ORDINANCES	
ELECTRICAL CODE:	NATIONAL ELECTRICAL CODE (LATEST EDITION)	

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

TO OBTAIN LOCATION OF PARTICIPANTS UNDERGROUND FACILITIES BEFORE YOU DIG IN CONNECTICUT, CONTACT CALL BEFORE YOU DIG
TOLL FREE: 1-800-922-4455 OR www.cbyd.com
CONNECTICUT STATUTE REQUIRES MIN OF 2 WORKING DAYS NOTICE BEFORE YOU EXCAVATE

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

at&t

STATE OF CONNECTICUT
JOHN J. STEVENS
02/13/2019
24705
PROFESSIONAL ENGINEER

UNAUTHORIZED ALTERATION OR ADDITION TO THIS DOCUMENT IS A VIOLATION OF APPLICABLE STATE AND/OR LOCAL LAWS

No.	Submittal / Revision	App'd	Date
2	REVISED FOR PERMIT	BMM	02/13/19
1	ISSUED FOR PERMIT	BMM	01/28/19
0	ISSUED FOR REVIEW	BMM	01/02/19

Drawn: BMM Date: 01/02/19
Designed: ASW Date: 01/02/19
Checked: AJD Date: 01/02/19

Project Number: 1106-A0001-C

Project Title:
MADISON-SR 79
CTL02033
FA# 10035048
864 OPENING HILL ROAD
MADISON, CT 06443

Prepared For: smartlink

Drawing Scale: AS NOTED
Date: 02/13/19

CD

Drawing Title
TITLE PAGE

Drawing Number
T1

GENERAL NOTES

PART 1 – GENERAL REQUIREMENTS

1.1 THE WORK SHALL COMPLY WITH APPLICABLE NATIONAL CODES AND STANDARDS, LATEST EDITION, AND PORTIONS THEREOF, INCLUDED BUT NOT LIMITED TO THE FOLLOWING:
A. GR-63-CORE NEBS REQUIREMENTS: PHYSICAL PROTECTION
B. GR-78-CORE GENERIC REQUIREMENTS FOR THE PHYSICAL DESIGN AND MANUFACTURE OF TELECOMMUNICATIONS EQUIPMENT.
C. NATIONAL FIRE PROTECTION ASSOCIATION CODES AND STANDARDS (NFPA) INCLUDING NFPA 70 (NATIONAL ELECTRICAL CODE – "NEC").
D. AND NFPA 101 (LIFE SAFETY CODE).
E. AMERICAN SOCIETY FOR TESTING OF MATERIALS (ASTM).
F. INSTITUTE OF ELECTRONIC AND ELECTRICAL ENGINEERS (IEEE).

1.2 DEFINITIONS:
A: WORK: THE SUM OF TASKS AND RESPONSIBILITIES IDENTIFIED IN THE CONTRACT DOCUMENTS.
B: COMPANY: AT&T CORPORATION
C. ENGINEER: SYNONYMOUS WITH ARCHITECT & ENGINEER AND "A&E". THE DESIGN PROFESSIONAL HAVING PROFESSIONAL RESPONSIBILITY FOR DESIGN OF THE PROJECT.
D: CONTRACTOR: CONSTRUCTION CONTRACTOR; CONSTRUCTION VENDOR; INDIVIDUAL OR ENTITY WHO AFTER EXECUTION OF A CONTRACT IS BOUND TO ACCOMPLISH THE WORK.
E: THIRD PARTY VENDOR OR AGENCY: A VENDOR OR AGENCY ENGAGED SEPARATELY BY THE COMPANY, A&E, OR CONTRACTOR TO PROVIDE MATERIALS OR TO ACCOMPLISH SPECIFIC TASKS RELATED TO BUT NOT INCLUDED IN THE WORK.

1.3 POINT OF CONTACT: COMMUNICATION BETWEEN THE COMPANY AND THE CONTRACTOR SHALL FLOW THROUGH THE SINGLE COMPANY SITE DEVELOPMENT SPECIALIST OR OTHER PROJECT COORDINATOR APPOINTED TO MANAGE THE PROJECT FOR THE COMPANY.

1.4 ON-SITE SUPERVISION: THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK AND SHALL BE RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES IN ACCORDANCE WITH THE CONTRACT DOCUMENTS. THE CONTRACTOR SHALL EMPLOY A COMPETENT SUPERINTENDENT WHO SHALL BE IN ATTENDANCE AT THE SITE AT ALL TIMES DURING PERFORMANCE OF THE WORK.

1.5 DRAWINGS, SPECIFICATIONS AND DETAILS REQUIRED AT JOBSITE: THE CONSTRUCTION CONTRACTOR SHALL MAINTAIN A FULL SET OF THE CONSTRUCTION DRAWINGS, STANDARD CONSTRUCTION DETAILS FOR WIRELESS SITES, AND THE STANDARD CONSTRUCTION SPECIFICATIONS FOR WIRELESS SITES AT THE JOBSITE FROM MOBILIZATION THROUGH CONSTRUCTION COMPLETION.
A. THE JOBSITE DRAWINGS, SPECIFICATIONS AND DETAILS SHALL BE CLEARLY MARKED DAILY IN PENCIL WITH ANY CHANGES IN CONSTRUCTION OVER WHAT IS DEPICTED IN THE DOCUMENTS. AT CONSTRUCTION COMPLETION, THIS JOBSITE MARKUP SET SHALL BE DELIVERED TO THE COMPANY OR COMPANY'S DESIGNATED REPRESENTATIVE TO BE FORWARDED TO THE COMPANY'S A&E VENDOR FOR PRODUCTION OF "AS-BUILT" DRAWINGS.

1.6 USE OF JOB SITE: THE CONTRACTOR SHALL CONFINE ALL CONSTRUCTION AND RELATED OPERATIONS INCLUDING STAGING AND STORAGE OF MATERIALS AND EQUIPMENT, PARKING, TEMPORARY FACILITIES, AND WASTE STORAGE TO THE LEASE PARCEL UNLESS OTHERWISE PERMITTED BY THE CONTRACT DOCUMENTS.

1.7 NOTICE TO PROCEED:
A. NO WORK SHALL COMMENCE PRIOR TO COMPANY'S WRITTEN NOTICE TO PROCEED.
B. UPON RECEIVING NOTICE TO PROCEED, CONTRACTOR SHALL FULLY PERFORM ALL WORK NECESSARY TO PROVIDE AT&T WITH AN OPERATIONAL WIRELESS FACILITY.

PART 2 – EXECUTION

2.1 TEMPORARY UTILITIES AND FACILITIES: THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TEMPORARY UTILITIES AND FACILITIES NECESSARY EXCEPT AS OTHERWISE INDICATED IN THE CONSTRUCTION DOCUMENTS. TEMPORARY UTILITIES AND FACILITIES INCLUDE, POTABLE WATER, HEAT, HVAC, ELECTRICITY, SANITARY FACILITIES, WASTE DISPOSAL FACILITIES, AND TELEPHONE/COMMUNICATION SERVICES. PROVIDE TEMPORARY UTILITIES AND FACILITIES IN ACCORDANCE WITH OSHA AND THE AUTHORITY HAVING JURISDICTION. CONTRACTOR MAY UTILIZE THE COMPANY ELECTRICAL SERVICE IN THE COMPLETION OF THE WORK WHEN IT BECOMES AVAILABLE. USE OF THE LESSORS OR SITE OWNER'S UTILITIES OR FACILITIES IS EXPRESSLY FORBIDDEN EXCEPT AS OTHERWISE ALLOWED IN THE CONTRACT DOCUMENTS.

2.2 ACCESS TO WORK: THE CONTRACTOR SHALL PROVIDE ACCESS TO THE JOB SITE FOR AUTHORIZED COMPANY PERSONNEL AND AUTHORIZED REPRESENTATIVES OF THE ARCHITECT/ENGINEER DURING ALL PHASES OF THE WORK.

2.3 TESTING: REQUIREMENTS FOR TESTING BY THIS CONTRACTOR SHALL BE AS INDICATED HEREWITH, ON THE CONSTRUCTION DRAWINGS, AND IN THE INDIVIDUAL SECTIONS OF THESE SPECIFICATIONS. SHOULD COMPANY CHOOSE TO ENGAGE ANY THIRD-PARTY TO CONDUCT ADDITIONAL TESTING, THE CONTRACTOR SHALL COOPERATE WITH AND PROVIDE A WORK AREA FOR COMPANY'S TEST AGENCY.

2.4 COMPANY FURNISHED MATERIAL AND EQUIPMENT: ALL HANDLING, STORAGE AND INSTALLATION OF COMPANY FURNISHED MATERIAL AND EQUIPMENT SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE CONTRACT DOCUMENTS AND WITH THE MANUFACTURER'S INSTRUCTIONS AND RECOMMENDATIONS.
A. CONTRACTOR SHALL PROCURE ALL OTHER REQUIRED WORK RELATED MATERIALS NOT PROVIDED BY AT&T TO SUCCESSFULLY CONSTRUCT A WIRELESS FACILITY.

2.5 DIMENSIONS: VERIFY DIMENSIONS INDICATED ON DRAWINGS WITH FIELD DIMENSIONS BEFORE FABRICATION OR ORDERING OF MATERIALS. DO NOT SCALE DRAWINGS.

2.6 EXISTING CONDITIONS: NOTIFY THE COMPANY REPRESENTATIVE OF EXISTING CONDITIONS DIFFERING FROM THOSE INDICATED ON THE DRAWINGS. DO NOT REMOVE OR ALTER STRUCTURAL COMPONENTS WITHOUT PRIOR WRITTEN APPROVAL FROM THE ARCHITECT AND ENGINEER.

PART 3 – RECEIPT OF MATERIAL & EQUIPMENT

3.1 RECEIPT OF MATERIAL AND EQUIPMENT: CONTRACTOR IS RESPONSIBLE FOR AT&T PROVIDED MATERIAL AND EQUIPMENT AND UPON RECEIPT SHALL:
A. ACCEPT DELIVERIES AS SHIPPED AND TAKE RECEIPT.
B. VERIFY COMPLETENESS AND CONDITION OF ALL DELIVERIES.
C. TAKE RESPONSIBILITY FOR EQUIPMENT AND PROVIDE INSURANCE PROTECTION AS REQUIRED IN AGREEMENT.
D. RECORD ANY DEFECTS OR DAMAGES AND WITHIN TWENTY-FOUR HOURS AFTER RECEIPT, REPORT TO AT&T OR ITS DESIGNATED PROJECT REPRESENTATIVE OF SUCH.
E. PROVIDE SECURE AND NECESSARY WEATHER PROTECTED WAREHOUSING.
F. COORDINATE SAFE AND SECURE TRANSPORTATION OF MATERIAL AND EQUIPMENT, DELIVERING AND OFF-LOADING FROM CONTRACTOR'S WAREHOUSE TO SITE.

PART 4 – GENERAL REQUIREMENTS FOR CONSTRUCTION

4.1 CONTRACTOR SHALL KEEP THE SITE FREE FROM ACCUMULATING WASTE MATERIAL, DEBRIS, AND TRASH. AT THE COMPLETION OF THE WORK, CONTRACTOR SHALL REMOVE FROM THE SITE ALL REMAINING RUBBISH, IMPLEMENTS, TEMPORARY FACILITIES, AND SURPLUS MATERIALS.

4.2 EQUIPMENT ROOMS SHALL AT ALL TIMES BE MAINTAINED "BROOM CLEAN" AND CLEAR OF DEBRIS.

4.3 CONTRACTOR SHALL TAKE ALL REASONABLE PRECAUTIONS TO DISCOVER AND LOCATE ANY HAZARDOUS CONDITION.
A. IN THE EVENT CONTRACTOR ENCOUNTERS ANY HAZARDOUS CONDITION WHICH HAS NOT BEEN ABATED OR OTHERWISE MITIGATED, CONTRACTOR AND ALL OTHER PERSONS SHALL IMMEDIATELY STOP WORK IN THE AFFECTED AREA AND NOTIFY COMPANY IN WRITING. THE WORK IN THE AFFECTED AREA SHALL NOT BE RESUMED EXCEPT BY WRITTEN NOTIFICATION BY COMPANY.
B. CONTRACTOR AGREES TO USE CARE WHILE ON THE SITE AND SHALL NOT TAKE ANY ACTION THAT WILL OR MAY RESULT IN OR CAUSE THE HAZARDOUS CONDITION TO BE FURTHER RELEASED IN THE ENVIRONMENT, OR TO FURTHER EXPOSE INDIVIDUALS TO THE HAZARD.

4.4 CONTRACTOR'S ACTIVITIES SHALL BE RESTRICTED TO THE PROJECT LIMITS. SHOULD AREAS OUTSIDE THE PROJECT LIMITS BE AFFECTED BY CONTRACTOR'S ACTIVITIES, CONTRACTOR SHALL IMMEDIATELY RETURN THEM TO ORIGINAL CONDITION.

4.5 CONDUCT TESTING AS REQUIRED HEREIN.

PART 5 – TESTS AND INSPECTIONS

5.1 TESTS AND INSPECTIONS:
A. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CONSTRUCTION TESTS, INSPECTIONS AND PROJECT DOCUMENTATION.

B. CONTRACTOR SHALL COORDINATE TEST AND INSPECTION SCHEDULES WITH COMPANY'S REPRESENTATIVE WHO MUST BE ON SITE TO WITNESS SUCH TESTS AND INSPECTIONS.

C. WHEN THE USE OF A THIRD PARTY INDEPENDENT TESTING AGENCY IS REQUIRED, THE AGENCY THAT IS SELECTED MUST PERFORM SUCH WORK ON A REGULAR BASIS IN THE STATE WHERE THE PROJECT IS LOCATED AND HAVE A THOROUGH UNDERSTANDING OF LOCAL AVAILABLE MATERIALS, INCLUDING THE SOIL, ROCK, AND GROUNDWATER CONDITIONS.

D. THE THIRD PARTY TESTING AGENCY IS TO BE FAMILIAR WITH THE APPLICABLE REQUIREMENTS FOR THE TESTS TO BE DONE, EQUIPMENT TO BE USED, AND ASSOCIATED HEALTH AND SAFETY ISSUES.

E. SITE RESISTANCE TO EARTH TESTING PER EXHIBIT: CELL SITE GROUNDING SYSTEM DESIGN.

F. ANTENNA AND COAX SWEEP TESTS PER EXHIBIT: ANTENNA TRANSMISSION LINE ACCEPTANCE STANDARDS.

G. ALL OTHER TESTS REQUIRED BY COMPANY OR JURISDICTION.

PART 6 – TRENCHING AND BACKFILLING

6.1 TRENCHING AND BACKFILLING: THE CONTRACTOR SHALL PERFORM ALL EXCAVATION OF EVERY DESCRIPTION AND OF WHATEVER SUBSTANCES ENCOUNTERED, TO THE DEPTHS INDICATED ON THE CONSTRUCTION DRAWINGS OR AS OTHERWISE SPECIFIED.

A. PROTECTION OF EXISTING UTILITIES: THE CONTRACTOR SHALL CHECK WITH THE LOCAL UTILITIES AND THE RESPECTIVE UTILITY LOCATOR COMPANIES PRIOR TO STARTING EXCAVATION OPERATIONS IN EACH RESPECTIVE AREA TO ASCERTAIN THE LOCATIONS OF KNOWN UTILITY LINES. THE LOCATIONS, NUMBER AND TYPES OF EXISTING UTILITY LINES DETAILED ON THE CONSTRUCTION DRAWINGS ARE APPROXIMATE AND DO NOT REPRESENT EXACT INFORMATION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIRING ALL LINES DAMAGED DURING EXCAVATION AND ALL ASSOCIATED OPERATIONS. ALL UTILITY LINES UNCOVERED DURING THE EXCAVATION OPERATIONS, SHALL BE PROTECTED FROM DAMAGE DURING EXCAVATION AND ASSOCIATED OPERATIONS. ALL REPAIRS SHALL BE APPROVED BY THE UTILITY COMPANY.

B. HAND DIGGING: UNLESS APPROVED IN WRITING OTHERWISE, ALL DIGGING WITHIN AN EXISTING CELL SITE COMPOUND IS TO BE DONE BY HAND.

C. DURING EXCAVATION, MATERIAL SUITABLE FOR BACKFILLING SHALL BE STOCKPILED IN AN ORDERLY MANNER A SUFFICIENT DISTANCE FROM THE BANKS OF THE TRENCH TO AVOID OVERLOADING AND TO PREVENT SLIDES OR CAVE-INS. ALL EXCAVATED MATERIALS NOT REQUIRED OR SUITABLE FOR BACKFILL SHALL BE REMOVED AND DISPOSED OF AT THE CONTRACTOR'S EXPENSE.

D. GRADING SHALL BE DONE AS MAY BE NECESSARY TO PREVENT SURFACE WATER FROM FLOWING INTO TRENCHES OR OTHER EXCAVATIONS, AND ANY WATER ACCUMULATING THEREIN SHALL BE REMOVED BY PUMPING OR BY OTHER APPROVED METHOD.

E. SHEETING AND SHORING SHALL BE DONE AS NECESSARY FOR THE PROTECTION OF THE WORK AND FOR THE SAFETY OF PERSONNEL. UNLESS OTHERWISE INDICATED, EXCAVATION SHALL BE BY OPEN CUT, EXCEPT THAT SHORT SECTIONS OF A TRENCH MAY BE TUNNELED IF, THE CONDUIT CAN BE SAFELY AND PROPERLY INSTALLED AND BACKFILL CAN BE PROPERLY TAMPED IN SUCH TUNNEL SECTIONS. EARTH EXCAVATION SHALL COMPRISE ALL MATERIALS AND SHALL INCLUDE CLAY, SILT, SAND, MUCK, GRAVEL, HARDPAN, LOOSE SHALE, AND LOOSE STONE.

F. TRENCHES SHALL BE OF NECESSARY WIDTH FOR THE PROPER LAYING OF THE CONDUIT OR CABLE, AND THE BANKS SHALL BE AS NEARLY VERTICAL AS PRACTICABLE. THE BOTTOM OF THE TRENCHES SHALL BE ACCURATELY GRADED TO PROVIDE UNIFORM BEARING AND SUPPORT FOR EACH SECTION OF THE CONDUIT OR CABLE ON UNDISTURBED SOIL AT EVERY POINT ALONG ITS ENTIRE LENGTH. EXCEPT WHERE ROCK IS ENCOUNTERED, CARE SHALL BE TAKEN NOT TO EXCAVATE BELOW THE DEPTHS INDICATED. WHERE ROCK EXCAVATIONS ARE NECESSARY, THE ROCK SHALL BE EXCAVATED TO A MINIMUM OVER DEPTH OF 6 INCHES BELOW THE TRENCH DEPTHS INDICATED ON THE CONSTRUCTION DRAWINGS OR SPECIFIED. OVER DEPTHS IN THE ROCK EXCAVATION AND UNAUTHORIZED OVER DEPTHS SHALL BE THOROUGHLY BACK FILLED AND TAMPED TO THE APPROPRIATE GRADE. WHENEVER WET OR OTHERWISE UNSTABLE SOIL THAT IS INCAPABLE OF PROPERLY SUPPORTING THE CONDUIT OR CABLE IS ENCOUNTERED IN THE BOTTOM OF THE TRENCH, SUCH SOLID SHALL BE REMOVED TO A MINIMUM OVER DEPTH OF 6 INCHES AND THE TRENCH BACKFILLED TO THE PROPER GRADE WITH EARTH OF OTHER SUITABLE MATERIAL, AS HEREINAFTER SPECIFIED.

G. BACKFILLING OF TRENCHES. TRENCHES SHALL NOT BE BACKFILLED UNTIL ALL SPECIFIED TESTS HAVE BEEN PERFORMED AND ACCEPTED. WHERE COMPACTED BACKFILL IS NOT INDICATED THE TRENCHES SHALL BE CAREFULLY BACKFILLED WITH SELECT MATERIAL SUCH AS EXCAVATED SOILS THAT ARE FREE OF ROOTS, SOD, RUBBISH OR STONES, DEPOSITED IN 6 INCH LAYERS AND THOROUGHLY AND CAREFULLY RAMMED UNTIL THE CONDUIT OR CABLE HAS A COVER OF NOT LESS THAN 1 FOOT. THE REMAINDER OF THE BACKFILL MATERIAL SHALL BE GRANULAR IN NATURE AND SHALL NOT CONTAIN ROOTS, SOD, RUBBING, OR STONES OF 2-1/2 INCH MAXIMUM DIMENSION. BACKFILL SHALL BE CAREFULLY PLACED IN THE TRENCH AND IN 1 FOOT LAYERS AND EACH LAYER TAMPED. SETTLING THE BACKFILL WITH WATER WILL BE PERMITTED. THE SURFACE SHALL BE GRADED TO A REASONABLE UNIFORMITY AND THE MOUNDING OVER THE TRENCHES LEFT IN A UNIFORM AND NEAT CONDITION.

SYMBOL	DESCRIPTION
	CIRCUIT BREAKER
	NON-FUSIBLE DISCONNECT SWITCH
F	FUSIBLE DISCONNECT SWITCH
	SURFACE MOUNTED PANEL BOARD
T	TRANSFORMER
M	KILOWATT HOUR METER
JB	JUNCTION BOX
PB	PULL BOX TO NEC/TELCO STANDARDS
----------	UNDERGROUND UTILITIES
	EXOTHERMIC WELD CONNECTION
	MECHANICAL CONNECTION
OR	GROUND ROD
OR	GROUND ROD WITH INSPECTION SLEEVE
	GROUND BAR
	120AC DUPLEX RECEPTACLE
G	GROUND CONDUCTOR
	DC POWER AND FIBER OPTIC TRUNK CABLES
	DC POWER CABLES
# / #	REPRESENTS DETAIL NUMBER / REF. DRAWING NUMBER

ABBREVIATIONS

CIGBE	COAX ISOLATED GROUND BAR EXTERNAL
MIGB	MASTER ISOLATED GROUND BAR
SST	SELF SUPPORTING TOWER
GPS	GLOBAL POSITIONING SYSTEM
TYP.	TYPICAL
DWG	DRAWING
BCW	BARE COPPER WIRE
BFG	BELOW FINISH GRADE
PVC	POLYVINYL CHLORIDE
CAB	CABINET
C	CONDUIT
SS	STAINLESS STEEL
G	GROUND
AWG	AMERICAN WIRE GAUGE
RGS	RIGID GALVANIZED STEEL
AHJ	AUTHORITY HAVING JURISDICTION
TTLNA	TOWER TOP LOW NOISE AMPLIFIER
UNO	UNLESS NOTED OTHERWISE
EMT	ELECTRICAL METALLIC TUBING
AGL	ABOVE GROUND LEVEL

INFINIGY
INFINIGY ENGINEERING, PLLC
1033 Watervliet Shaker Rd
Albany, NY 12205
Office # (518) 690-0790
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at&t

STATE OF CONNECTICUT
JOHN S. STEVENS
02/13/2019
24705
PROFESSIONAL ENGINEER
LICENSED

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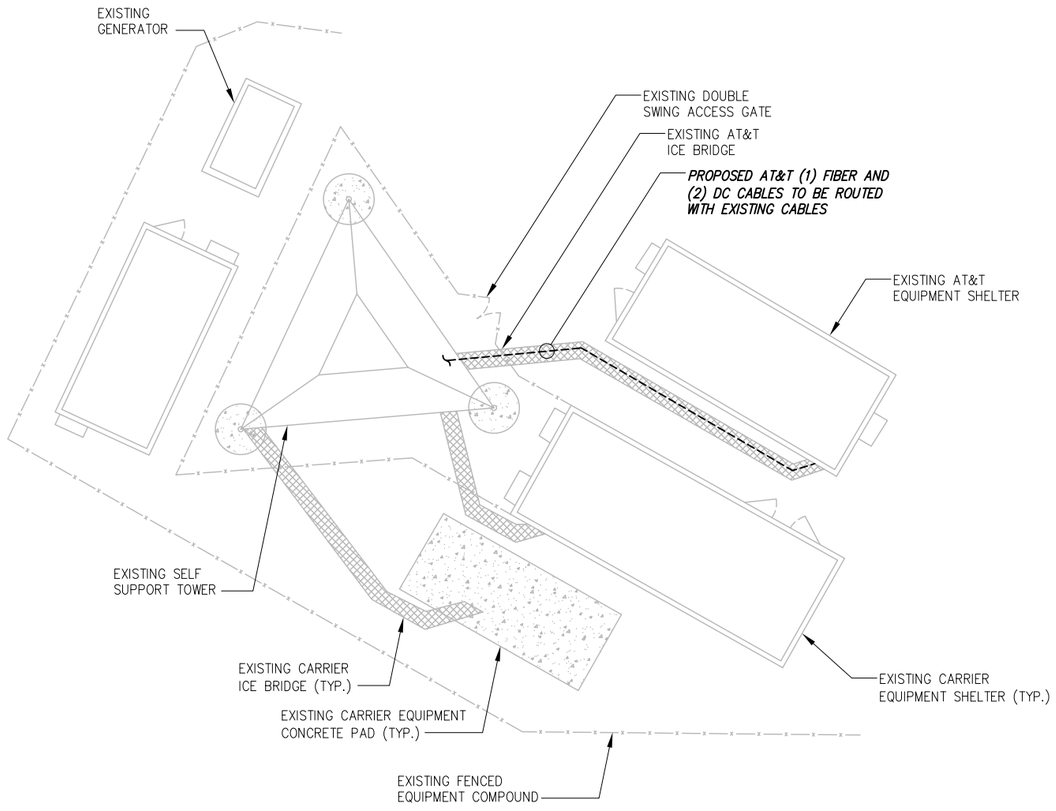
FA# 10035048
864 OPENING HILL ROAD
MADISON, CT 06443

Prepared For: smartlink

Drawing Scale: AS NOTED
Date: 02/13/19
CD

Drawing Title
GENERAL NOTES

Drawing Number
C1

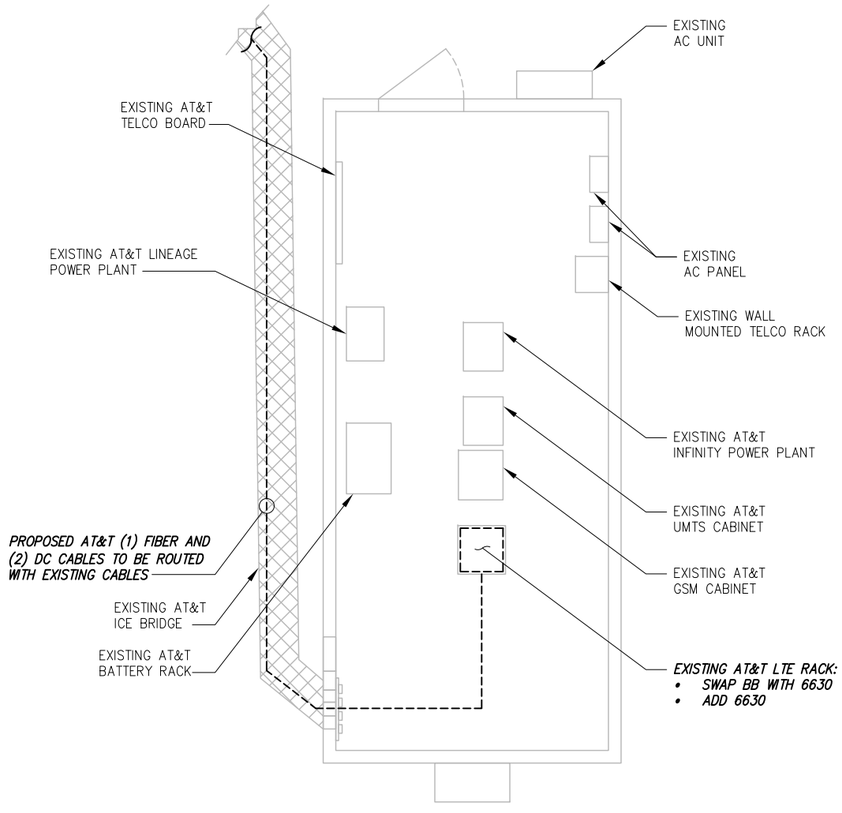


BASEMAPPING PREPARED FROM A SITE WALK PERFORMED BY INFINIGY ENGINEERING ON 11/26/18 AND PROVIDED INFORMATION, AND DOES NOT REPRESENT AN ACTUAL FIELD SURVEY.

TRUE NORTH

1 SITE PLAN
SCALE: AS NOTED

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



TRUE NORTH

2 ENLARGED EQUIPMENT PLAN
SCALE: AS NOTED

GRAPHIC SCALE:
6' 3' 0 3' 6'
SCALE (11x17): 1" = 6'-0"
SCALE (22x34): 1" = 3'-0"

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02/13/2019
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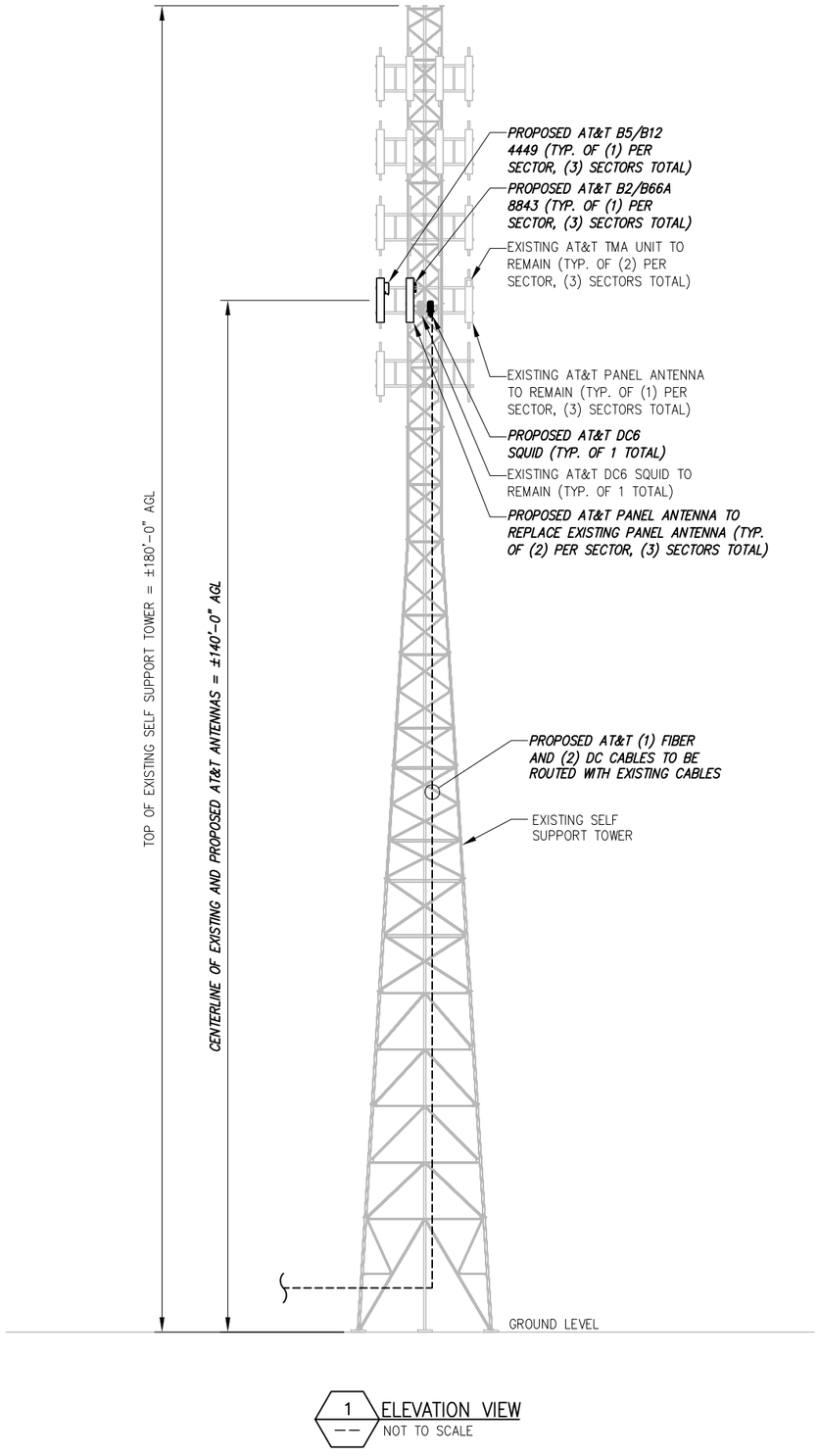
Drawing Title
OVERALL & ENLARGED SITE PLAN

Drawing Number
C2



1 ELEVATION VIEW
NOT TO SCALE

NOTE:
- *INFINIGY ENGINEERING HAS NOT EVALUATED THE TOWER LOADING FOR THIS SITE, AND ASSUMES NO RESPONSIBILITY FOR ITS STRUCTURAL INTEGRITY REGARDING ITS EXISTING OR PROPOSED LOADING. FINAL INSTALLATION TO COMPLY WITH RESULTS OF PASSING STRUCTURAL ANALYSIS.*
- *FOR ADDITIONAL STRUCTURAL INFORMATION PERTAINING TO THE ANTENNA MOUNT, SEE 'POST MOD MOUNT ANALYSIS REPORT' COMPLETED BY INFINIGY, DATED 01/23/19. SEE SHEETS S1-S2 FOR ADDITIONAL MODIFICATION DETAILS.*

SEPARATION NOTE:
- 3 FEET MINIMUM SEPARATION BETWEEN LTE ANTENNA
- 6 FEET MINIMUM SEPARATION BETWEEN 700BC & 700 DE

FINAL ANTENNA CONFIGURATION & CABLE SCHEDULE BASED ON LTE RFDS DATED 12/14/18, V 2.00

SECTOR	ANTENNA POSITION	ANTENNA STATUS & TECHNOLOGY	ANTENNA MANF/MODEL	TMA/ DIPLEXER	RRUS	AZIMUTH	ANTENNA ℄ HEIGHT	CABLE FEEDER TYPE	CABLE FEEDER LENGTH	RAYCAP UNIT
ALPHA	A-1	(E) UMTS 850	POWERWAVE 7770	(2) (E) LGP21401	--	80°	±140'	(2) (E) 1-5/8" COAX	±141'	(1) (E) DC6 'SQUID' *(1) (P) DC6 'SQUID'*
	A-2	--	--	--	--	--	--	--	--	
	A-3	*(P) LTE 1900*	*CCI HPA-65R-BU6AA*	--	*(1) (P) B2/B66A 8843*	*80°*	*±140'*	(2) (E) 1-5/8" COAX	--	
	A-4	*(P) LTE 700/850/WCS /5G 850*	*KATHREIN 800-10965*	--	*(1) (P) B5/B12 4449*	*80°*	*±140'*	(1) (E) FIBER CABLE (2) (E) DC CABLES	--	
BETA	B-1	(E) UMTS 850	POWERWAVE 7770	(2) (E) LGP21401	--	200°	±140'	(2) (E) 1-5/8" COAX	±141'	
	B-2	--	--	--	--	--	--	--	--	
	B-3	*(P) LTE 1900*	*CCI HPA-65R-BU6AA*	--	*(1) (P) B2/B66A 8843*	*200°*	*±140'*	(2) (E) 1-5/8" COAX	--	
	B-4	*(P) LTE 700/850/WCS /5G 850*	*KATHREIN 800-10965*	--	*(1) (P) B5/B12 4449*	*200°*	*±140'*	*(1) (P) FIBER CABLE (2) (P) DC CABLES*	--	
GAMMA	G-1	(E) UMTS 850	POWERWAVE 7770	(2) (E) LGP21401	--	330°	±140'	(2) (E) 1-5/8" COAX	±141'	
	G-2	--	--	--	--	--	--	--	--	
	G-3	*(P) LTE 1900*	*CCI HPA-65R-BU6AA*	--	*(1) (P) B2/B66A 8843*	*330°*	*±140'*	(2) (E) 1-5/8" COAX	--	
	G-4	*(P) LTE 700/850/WCS /5G 850*	*KATHREIN 800-10965*	--	*(1) (P) B5/B12 4449*	*330°*	*±140'*	SEE A-2 FOR CABLE INFORMATION	--	

2 AT&T ANTENNA SCHEDULE
NOT TO SCALE

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CTL02033
FA# 10035048
864 OPENING HILL ROAD
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Drawing Scale: AS NOTED
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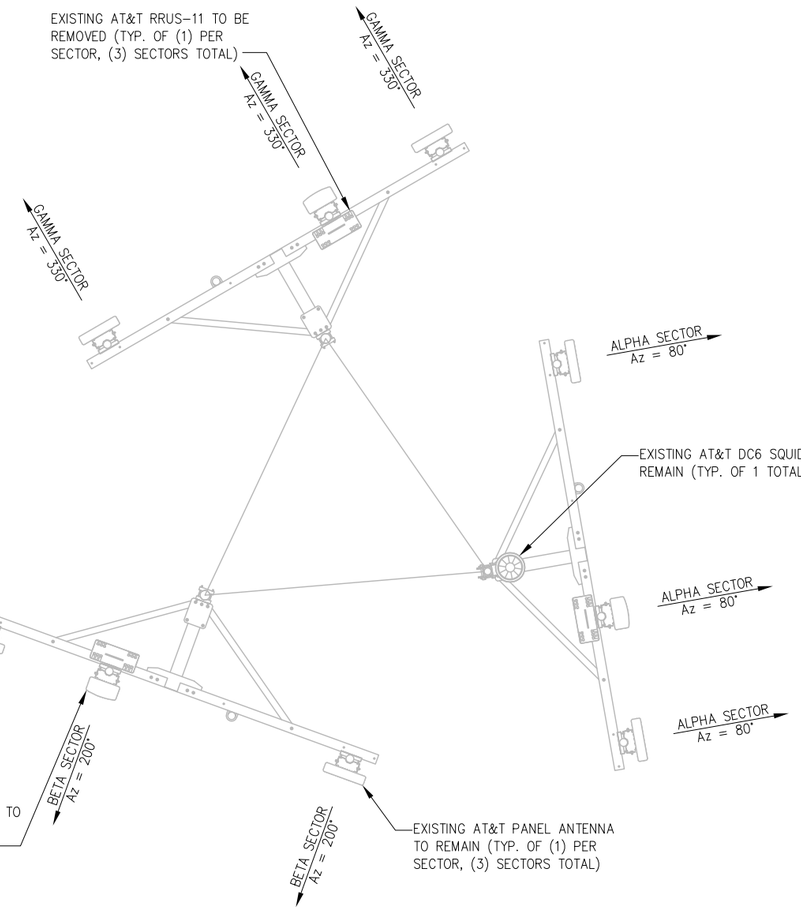
CD

Drawing Title
ELEVATION VIEW

Drawing Number
C3

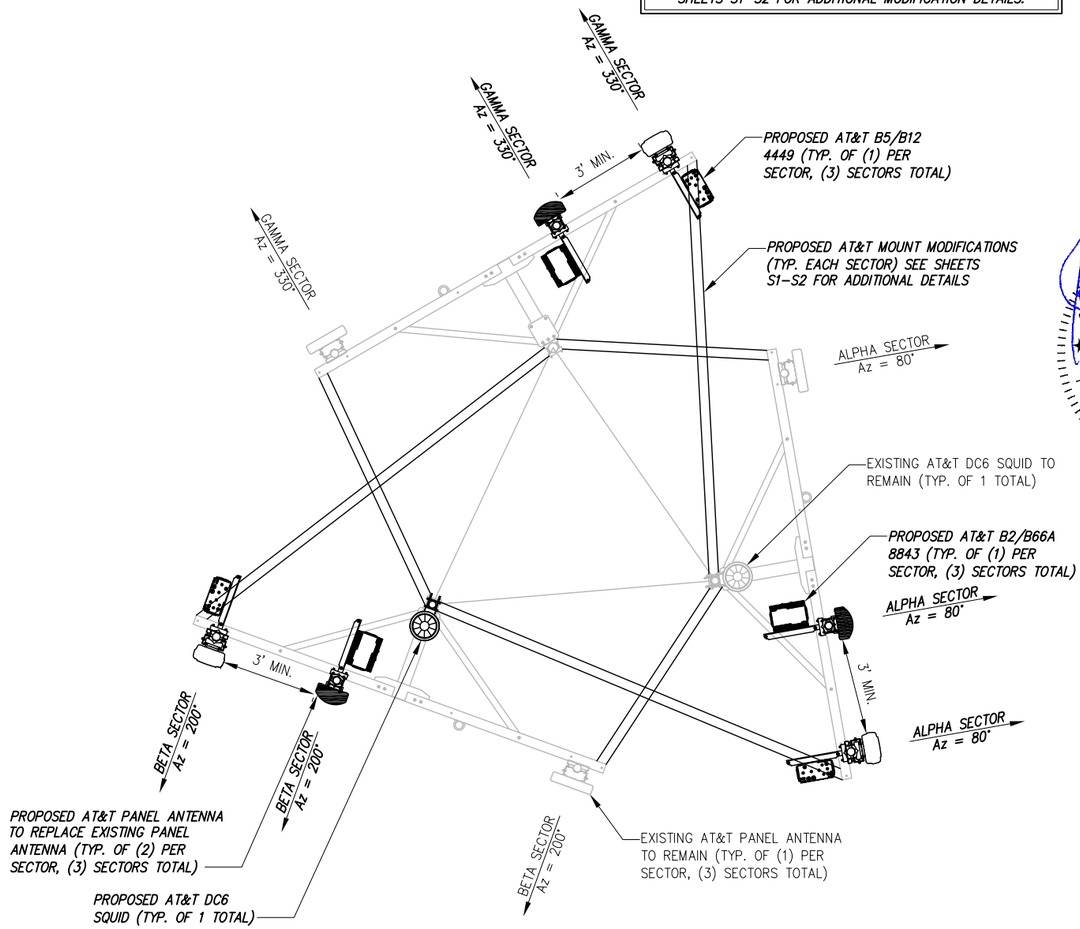


TRUE NORTH

1 ANTENNA ORIENTATION PLAN (EXISTING)
NOT TO SCALE

SEPARATION NOTE:
- 3 FEET MINIMUM SEPARATION BETWEEN LTE ANTENNA
- 6 FEET MINIMUM SEPARATION BETWEEN 700BC & 700 DE

NOTE:
- *INFINIGY ENGINEERING HAS NOT EVALUATED THE TOWER LOADING FOR THIS SITE, AND ASSUMES NO RESPONSIBILITY FOR ITS STRUCTURAL INTEGRITY REGARDING ITS EXISTING OR PROPOSED LOADING. FINAL INSTALLATION TO COMPLY WITH RESULTS OF PASSING STRUCTURAL ANALYSIS.*
- *FOR ADDITIONAL STRUCTURAL INFORMATION PERTAINING TO THE ANTENNA MOUNT, SEE 'POST MOD MOUNT ANALYSIS REPORT' COMPLETED BY INFINIGY, DATED 01/23/19. SEE SHEETS S1-S2 FOR ADDITIONAL MODIFICATION DETAILS.*



TRUE NORTH

2 PROPOSED ANTENNA ORIENTATION PLAN
NOT TO SCALE

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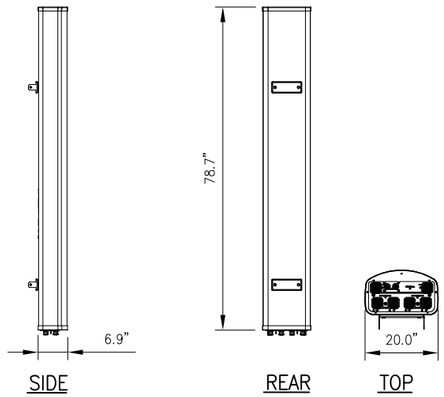
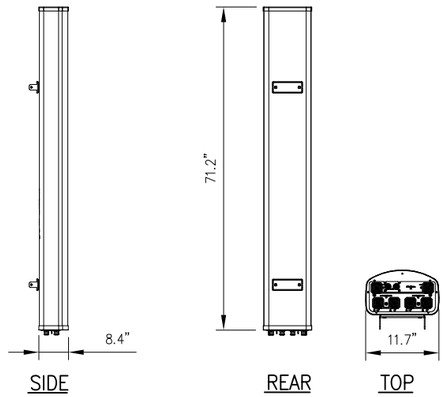
Drawing Title
ANTENNA ORIENTATION PLAN

Drawing Number
C4



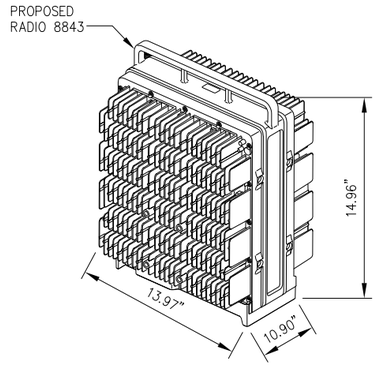
KATHREIN MODEL NO.:	800-10965
RADOME MATERIAL:	FIBERGLASS,
RADOME COLOR:	LIGHT GRAY
DIMENSIONS, HxWxD:	78.7"x20.0"x6.9"
WEIGHT, W/ PRE-MOUNTED BRACKETS:	108.6 LBS
CONNECTOR:	7-16 DIN FEMALE

1 ANTENNA DETAIL
NOT TO SCALE



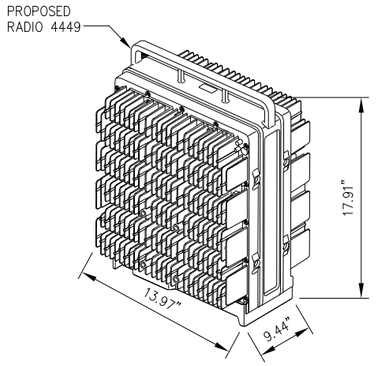
CCI MODEL NO.:	HPA-65R-BU6AA
RADOME MATERIAL:	FIBERGLASS,
RADOME COLOR:	LIGHT GRAY
DIMENSIONS, HxWxD:	71.2"x11.7"x8.4"
WEIGHT, W/ PRE-MOUNTED BRACKETS:	43.0 LBS
CONNECTOR:	7-16 DIN FEMALE

2 ANTENNA DETAIL
NOT TO SCALE



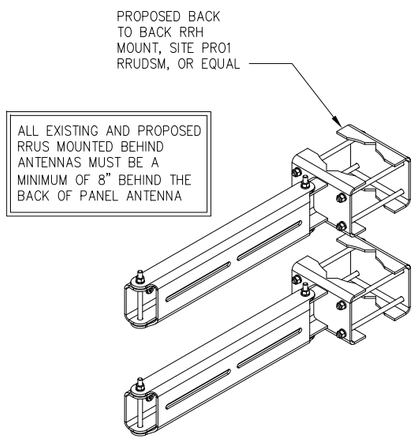
RADIO 8843 SPECIFICATIONS
- HxWxD, (INCHES) : 14.96"x13.97"x10.90"
- WEIGHT (LBS) : 71.87
- COLOR : GRAY

3 ERICSSON RADIO 8843 DETAIL
NOT TO SCALE

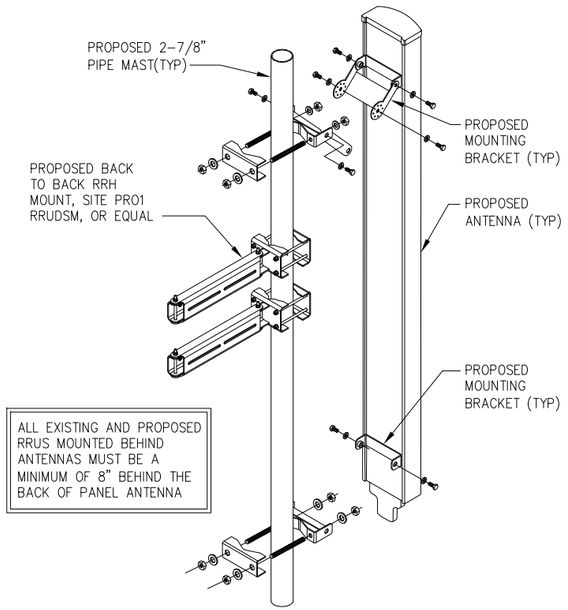


RADIO 4449 SPECIFICATIONS
- HxWxD, (INCHES) : 17.91"x13.97"x9.44"
- WEIGHT (LBS) : 70.54
- COLOR : GRAY

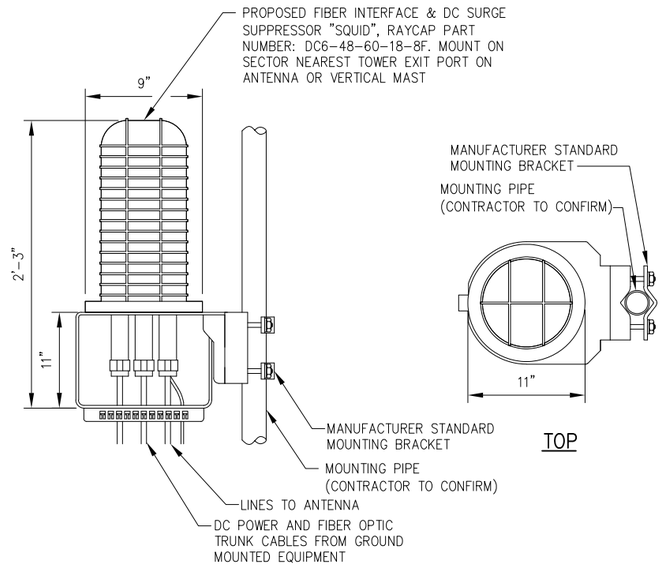
4 ERICSSON RADIO 4449 DETAIL
NOT TO SCALE



5 BACK TO BACK PIPE MOUNT DETAIL
NOT TO SCALE



6 MOUNTING DETAIL
NOT TO SCALE



7 SQUID DETAIL
NOT TO SCALE

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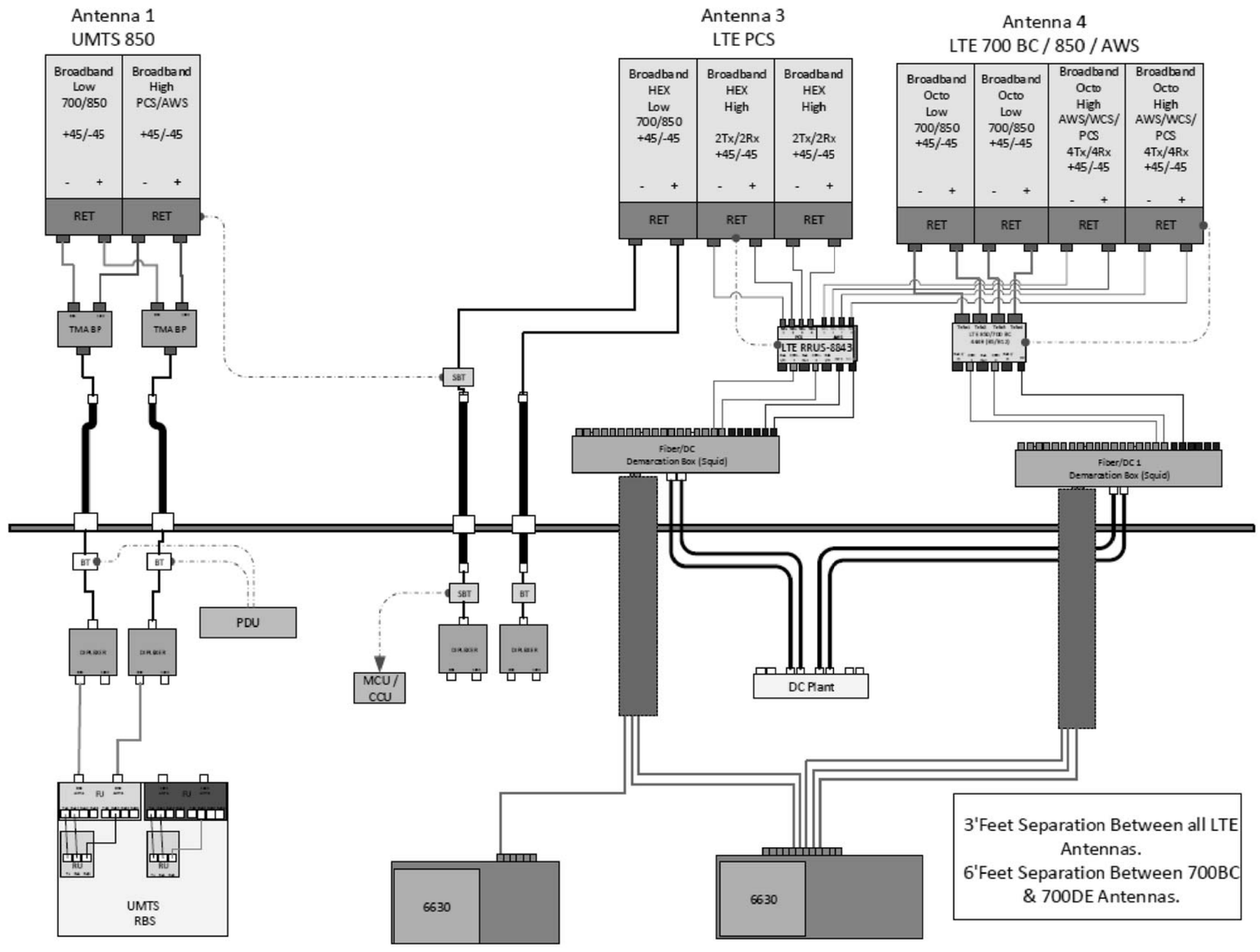
Drawing Title
EQUIPMENT DETAILS

Drawing Number
C5



ALPHA/BETA/GAMMA

1 PLUMBING DIAGRAM (FINAL CONFIGURATION)
NOT TO SCALE

*BASED ON LTE RFDS, V. 2.0, DATED 12/14/18

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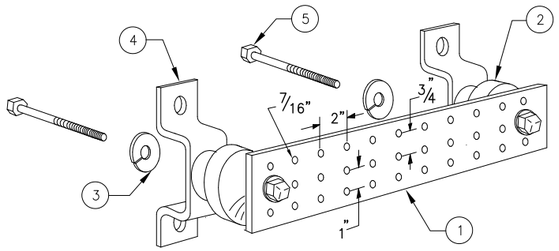
Drawing Title
PLUMBING DIAGRAM

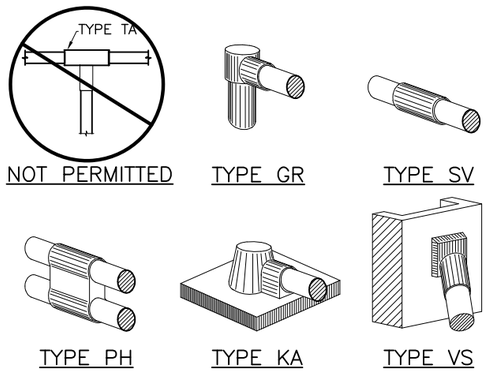
Drawing Number
C6



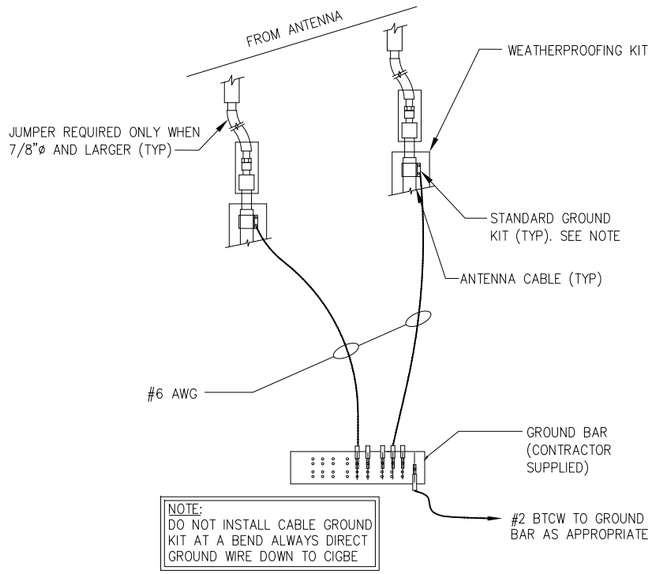
LEGEND

1 – SOLID TINNED COPPER GROUND BAR, 1/4"x 4"x 20" MIN., NEWTON INSTRUMENT CO. HOLE CENTERS TO MATCH NEMA DOUBLE LUG CONFIGURATION
2 – INSULATORS, NEWTON INSTRUMENT CAT. NO. 3061-4
3 – 5/8" LOCKWASHERS, NEWTON INSTRUMENT CO. CAT. NO. 3015-8
4 – WALL MOUNTING BRACKET, NEWTON INSTRUMENT CO. CAT NO. A-6056
5 – 5/8-11 X 1" H.H.C.S. BOLTS, NEWTON INSTRUMENT CO. CAT NO. 3012-1
6 – GROUND BAR SHALL BE SIZED TO ACCOMODATE ALL GROUNDING CONNECTIONS REQUIRED PLUS PROVIDE 50% SPARE CAPACITY
7 – GROUND BARS SHALL NEITHER BE FIELD FABRICATED NOR NEW HOLES DRILLED
8 – GROUND LUGS SHALL MATCH THE HOLE SPACING ON THE BAR
9 – HARDWARE DIAMETER SHALL BE MINIMUM 3/8"

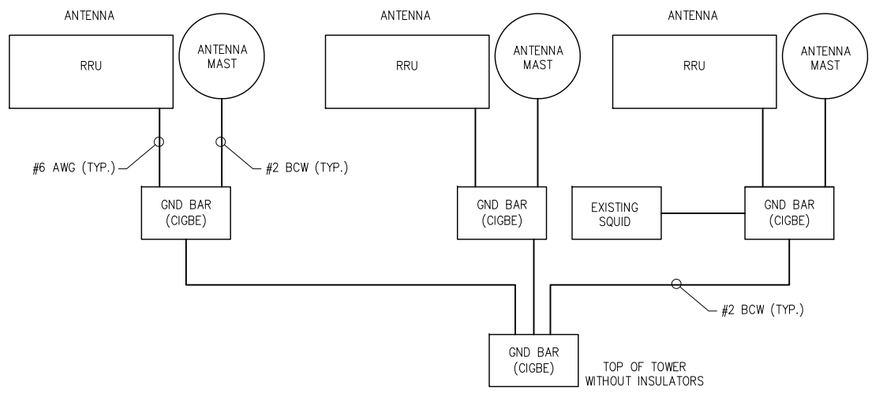
1 — GROUND BAR
NOT TO SCALE



2 — CADWELDS (TYPICAL)
NOT TO SCALE



3 — CONNECTION OF GROUND WIRES TO GROUNDING BARS @ ANTENNAS
NOT TO SCALE



4 — SCHEMATIC DIAGRAM GROUNDING SYSTEM
NOT TO SCALE

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Drawing Title
GROUNDING DETAILS

Drawing Number
C7

GENERAL NOTES:

1. THESE DOCUMENTS WERE DESIGNED IN ACCORDANCE WITH THE LATEST VERSION OF APPLICABLE LOCAL/STATE/COUNTY/CITY BUILDING CODES, AS WELL AS ANSI/TIA-222 STANDARD, AWWA-D100 STANDARD, NDS, NEC, MSJC, AND/OR THE LATEST VERSION OF THE INTERNATIONAL BUILDING CODE, UNLESS NOTED OTHERWISE IN THE CORRESPONDING STRUCTURAL REPORT.
2. ALL CONSTRUCTION METHODS SHOULD FOLLOW STANDARDS OF GOOD CONSTRUCTION PRACTICE.
3. ALL WORK INDICATED ON THESE DRAWINGS SHALL BE PERFORMED BY QUALIFIED CONTRACTORS EXPERIENCED IN SIMILAR CONSTRUCTION.
4. ALL NEW WORK SHALL ACCOMMODATE EXISTING CONDITIONS. IF OBSTRUCTIONS ARE FOUND, CONTRACTOR SHALL NOTIFY ENGINEER OF RECORD PRIOR TO CONTINUING WORK.
5. ANY CHANGES OR ADDITIONS MUST CONFORM TO THE REQUIREMENTS OF THESE NOTES AND SPECIFICATIONS, AND SHOULD BE SIMILAR TO THOSE SHOWN. ALL CHANGES OR ADDITIONS SHALL BE SUBMITTED TO THE ENGINEER OF RECORD FOR REVIEW AND APPROVAL PRIOR TO FABRICATION AND/OR CONSTRUCTION.
6. THE CONTRACTOR IS RESPONSIBLE FOR THE DESIGN AND EXECUTION OF ALL MISCELLANEOUS SHORING, BRACING, TEMPORARY SUPPORTS, ETC. NECESSARY TO PROVIDE A COMPLETE AND STABLE STRUCTURE DURING CONSTRUCTION. TIA-1019-A-2011 IS AN APPROPRIATE REFERENCE FOR THOSE DESIGNS MEETING TIA STANDARDS. THE ENGINEER OF RECORD MAY PROVIDE FORMAL RIGGING PLANS AT THE REQUEST AND EXPENSE OF THE CONTRACTOR.
7. INSTALLATION SHALL NOT INTERFERE NOR DENY ADEQUATE ACCESS TO OR FROM ANY EXISTING OR PROPOSED OPERATIONAL AND SAFETY EQUIPMENT.
8. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS PRIOR TO ANY FABRICATION. CONTACT INFINIGY ENGINEERING IF ANY DISCREPANCIES EXIST.

STEEL CONSTRUCTION NOTES:

1. STRUCTURAL STEEL SHALL CONFORM TO THE AISC MANUAL OF STEEL CONSTRUCTION 14TH EDITION, FOR THE DESIGN AND FABRICATION OF STEEL COMPONENTS.
2. ALL FIELD CUT SURFACES, FIELD DRILLED HOLES, AND GROUND SURFACES WHERE EXISTING PAINT OR GALVANIZATION REMOVAL WAS REQUIRED SHALL BE REPAIRED WITH (2) BRUSHED COATS OF ZRC GALVILITE COLD GALVANIZING COMPOUND PER ASTM A780 AND MANUFACTURERS' RECOMMENDATIONS.
3. ALL FIELD DRILLED HOLES TO BE USED FOR FIELD BOLTING INSTALLATION SHALL BE STANDARD HOLES, AS DEFINED BY AISC, UNLESS NOTED OTHERWISE.
4. ALL EXTERIOR STEEL WORK SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A123.
5. ALL STEEL MEMBERS AND CONNECTIONS SHALL MEET THE FOLLOWING GRADES:
   - ANGLES, CHANNELS, PLATES AND BARS TO BE A36. Fy=36 KSI, U.N.O.
   - W SHAPES TO BE A992. Fy=50 KSI, U.N.O.
   - RECTANGULAR HSS TO BE A500, GRADE B. FY=46 KSI, U.N.O.
   - ROUND HSS TO BE A500, GRADE B. FY=42 KSI, U.N.O.
   - STEEL PIPE TO BE A53, GRADE B. Fy=35 KSI, U.N.O.
   - BOLTS TO BE A325-X. Fu=120 KSI, U.N.O.
   - U-BOLTS AND LAG SCREWS TO BE A307 GR A. Fu=60 KSI, U.N.O.
6. ALL WELDING SHALL BE DONE USING E70XX ELECTRODES, U.N.O.
7. ALL WELDING SHALL CONFORM TO AISC AND AWS D1.1 LATEST EDITION.
8. ALL HILTI ANCHORS TO BE CARBON STEEL, U.N.O.
   - MECHANICAL ANCHORS: KWIK BOLT-TZ, U.N.O.
   - CMU BLOCK ANCHORS: ADHESIVE - HY120, U.N.O.
   - CONCRETE ANCHORS: ADHESIVE - HY150, U.N.O.
   - CONCRETE REBAR: ADHESIVE - RE500, U.N.O.
9. ALL STUDS TO BE NELSON CAPACITOR DISCHARGE 1/4"-20 LOW CARBON STEEL COPPER-FLASH AT 55 KSI ULT/50 KSI YIELD, U.N.O.
10. BOLTS SHALL BE TIGHTENED TO A "SNUG TIGHT" CONDITION AS DEFINED BY AISC.
11. MINIMUM EDGE DISTANCES SHALL CONFORM TO AISC TABLE J3.4.

CONCRETE CONSTRUCTION NOTES:

1. CONCRETE TO BE 4000 PSI @ 28 DAYS. REINFORCING BAR TO CONFORM TO ASTM A615 GRADE 60 SPECIFICATIONS. CONCRETE INSTALLATION TO CONFORM TO ACI-318 BUILDING REQUIREMENTS FOR REINFORCED CONCRETE. ALL CONCRETE TO BE PLACED AGAINST UNDISTURBED EARTH FREE OF WATER AND ALL FOREIGN OBJECTS AND MATERIALS. A MINIMUM OF THREE INCHES OF CONCRETE SHALL COVER ALL REINFORCEMENT. WELDING OF REBAR IS NOT PERMITTED.
2. EXISTING CONCRETE SURFACES THAT ARE TO BE IN CONTACT WITH NEW PROPOSED CONCRETE SHOULD BE WIRE BRUSHED CLEAN AND TREATED WITH APPROPRIATE MECHANICAL SCRATCH COAT AND REPAIR MATERIALS OR APPROPRIATE CHEMICAL METHODS SUCH AS THE APPLICATION OF A BONDING AGENT, EX. SAKRETE OR EQUIVALENT, TO ENSURE A QUALITY BOND BETWEEN EXISTING AND PROPOSED CONCRETE SURFACES.

FIBER REINFORCED POLYMER (FRP) NOTES:

1. FRP PLATES, SHAPES, BOLTS AND NUTS (STUD/NUT ASSEMBLIES) SHALL CONFORM TO ASTM D638, 695, 790. PLATES AND SHAPES TO BE FY = 5.35 KSI LW (SAFETY FACTOR OF 8), .945 KSI CW (SAFETY FACTOR OF 8) MIN.
2. IF FIELD FABRICATION IS REQUIRED, ALL CUT EDGES AND DRILLED HOLES TO BE SEALED USING VINYL ESTER SEALING KIT SUPPLIED BY THE MANUFACTURER.
3. ALL FASTENERS TO BE 1/2" DIA FRP THREADED ROD WITH FIBER REINFORCED THERMOPLASTIC NUT, SPACED AT 12 INCHES ON CENTER MAXIMUM, U.N.O., FOR PANELS AND AS DESIGNED FOR STRUCTURAL MEMBERS.
4. THE COLOR AND SURFACE PATTERN OF EXPOSED FRP PANELS SHALL MATCH THE EXTERIOR OF THE EXISTING BUILDING, U.N.O.
5. STUD/NUT ASSEMBLIES SHOULD BE LUBRICATED FOR INSTALLATION
6. ENSURE BEARING SURFACES OF THE NUTS ARE PARALLEL TO THE SURFACES BEING FASTENED.
7. TORQUE BOLTS ACCORDING TO THE FOLLOWING TABLE:

INSTALLATION TORQUE TABLE

SIZE	ULTIMATE TORQUE STRENGTH	RECOMMENDED MAXIMUM INSTALLATION TORQUE
3/8-16 UNC	8 FT-LBS	4 FT-LBS
1/2-13 UNC	18 FT-LBS	8 FT-LBS
5/8-11 UNC	35 FT-LBS	16 FT-LBS
3/4-10 UNC	50 FT-LBS	24 FT-LBS
1-8 UNC	110 FT-LBS	50 FT-LBS

8. WHEN TIGHTENING FRP STUD/NUT ASSEMBLIES, WRENCHES MUST MAKE FULL CONTACT WITH ALL NUT EDGES. A STANDARD SIX POINT SOCKET IS RECOMMENDED.
9. STUD/NUT ASSEMBLIES SHOULD BE BONDED BY APPLYING BONDING AGENT TO ENTIRE NUT AND EXPOSED STUD.
10. ALL FRP MATERIALS TO BE PROVIDED BY FIBERGRATE COMPOSITE STRUCTURES, DALLAS TX, OR APPROVED EQUAL.
11. ALL FRP SHAPES TO BE DYNAFORM PULTRUDED STRUCTURAL SHAPES.
12. ALL FRP PLATES TO BE FIBERPLATE MOLDED FRP PLATE.
13. ALL FRP PANELS TO BE FIBERPLATE CLADDING PANEL.
14. EACH FRP PANEL TO BE IDENTIFIED WITH LARR#25536 AND FIBERGRATE COMPOSITE STRUCTURAL LABEL.
15. FRP MATERIAL TO BE CLASSIFIED AS CC1 OR BETTER, AND HAVE MAXIMUM FLAME SPREAD OF 50.
16. ALL DESIGN AND CONSTRUCTION TO BE COMPLETED IN ACCORDANCE WITH LOS ANGELES RESEARCH REPORT RR25536, DATED FEBRUARY 1, 2016.
17. SPECIAL INSPECTIONS MUST BE PROVIDED FOR ALL FRP INSTALLMENTS. SEE SPECIAL INSPECTION SECTION, THIS SHEET.

RATIO OF EDGE DISTANCE TO FRP FASTENER DIAMETER

	RANGE	RECOMMENDED
EDGE DISTANCE - CL* BOLT TO END	2.0-4.0	3.0
EDGE DISTANCE - CL* BOLT TO SIDE	1.5-3.5	2.5
BOLT PITCH - CL* TO CL*	4.0-5.0	5.0

WOOD CONSTRUCTION NOTES:

1. ALL EXISTING WOOD SHAPES ARE ASSUMED TO BE DOUGLAS FIR-LARCH WITH A REFERENCE DESIGN BENDING VALUE OF 1000 PSI MIN.
2. ALL PROPOSED WOOD SHAPES ARE TO BE DOUGLAS FIR-LARCH WITH A REFERENCE DESIGN BENDING VALUE OF 1000 PSI MIN. U.N.O.
3. ALL EXISTING AND PROPOSED GLUED LAMINATED TIMBERS ARE TO BE 24F-1.8C DOUGLAS FIR BALANCED WITH A REFERENCE DESIGN BENDING VALUE OF 2400 PSI MIN. U.N.O.

MASONRY CONSTRUCTION NOTES:

1. ALL BRICK TO BE 1500 PSI MIN. REINFORCING BAR (IF APPLICABLE) TO CONFORM TO ASTM A615 GRADE 60 SPECIFICATIONS. ALL MORTAR TO BE 2000 PSI MIN.
   - FOR INTERIOR/ABOVE GRADE APPLICATIONS TYPE N MORTAR HAVING MINIMUM MODULUS OF RUPTURE OF 100 PSI SHALL BE USED. FOR EXTERIOR/BELOW GRADE APPLICATIONS TYPE M OR S MORTAR HAVING A MINIMUM MODULUS OF RUPTURE OF 133 PSI.
   - BRICK AND MORTAR INSTALLATION TO CONFORM TO MSJC BUILDING CODE REQUIREMENTS FOR MASONRY STRUCTURES.
2. ALL CMU TO BE 1500 PSI MIN. REINFORCING BAR (IF APPLICABLE) TO CONFORM TO ASTM A615 GRADE 60 SPECIFICATIONS. ALL MORTAR TO BE 2000 PSI MIN.
   - FOR INTERIOR/ABOVE GRADE APPLICATIONS, TYPE N MORTAR HAVING MINIMUM MODULUS OF RUPTURE OF 64 PSI SHALL BE USED FOR UNGROUTED BLOCKS, AND 158 PSI FOR FULLY GROUTED BLOCKS.
   - FOR EXTERIOR/BELOW GRADE APPLICATIONS TYPE M OR S MORTAR HAVING A MINIMUM MODULUS OF RUPTURE OF 84 PSI SHALL BE USED FOR UNGROUTED BLOCKS, AND 163 PSI FOR FULLY GROUTED BLOCKS.
   - BRICK AND MORTAR INSTALLATION TO CONFORM TO MSJC BUILDING CODE REQUIREMENTS FOR MASONRY STRUCTURES.

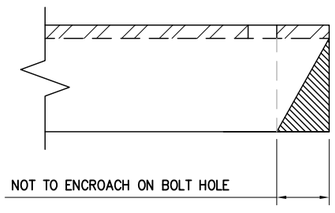
TOWER PLUMB & TENSION NOTES:

1. PLUMB AND TENSION TOWER UPON COMPLETION OF STRUCTURAL MODIFICATIONS DETAILED IN THESE DRAWINGS.
2. RETENSIONING OF EXISTING GUY WIRES SHALL BE PERFORMED AT A TIME WHEN THE WIND VELOCITY IS LESS THAN 10 MPH AT GROUND LEVEL AND WITH NO ICE ON THE STRUCTURE AND GUY WIRES.
3. PLUMB THE TOWER WHILE RETENSIONING THE EXISTING GUY WIRES. THE HORIZONTAL DISTANCE BETWEEN THE VERTICAL CENTERLINES AT ANY TWO ELEVATIONS SHALL NOT EXCEED 0.25% OF THE VERTICAL DISTANCE BETWEEN TWO ELEVATIONS FOR LATTICED STRUCTURES.
4. THE TWIST BETWEEN ANY TWO ELEVATIONS THROUGHOUT THE HEIGHT OF A LATTICE STRUCTURE SHALL NOT EXCEED 0.5 DEGREES IN 10 FEET. THE MAXIMUM TWIST OVER THE LATTICE STRUCTURE HEIGHT SHALL NOT EXCEED 5 DEGREES.

SPECIAL INSPECTIONS NOTES:

1. A QUALIFIED INDEPENDENT TESTING LABORATORY, EMPLOYED BY THE OWNER AND APPROVED BY THE JURISDICTION, SHALL PERFORM INSPECTION AND TESTING IN ACCORDANCE WITH THE THE GOVERNING BUILDING CODE, APPLICABLE SECTION(S) AS REQUIRED BY PROJECT SPECIFICATIONS FOR THE FOLLOWING CONSTRUCTION WORK:
   a. STRUCTURAL WELDING (CONTINUOUS INSPECTION OF FIELD WELDS ONLY).
   b. HIGH STRENGTH BOLTS (PERIODIC INSPECTION OF A325 AND/OR A490 BOLTS) TO BE TIGHTENED PER "TURN-OF-THE-NUT" METHOD.
   c. MECHANICAL AND EPOXIED ANCHORAGES.
   d. FIBER REINFORCED POLYMER.
      - THE SPECIAL INSPECTOR MUST VERIFY THAT THE FRP MATERIAL SPECIFIED ON THE APPROVED DESIGN DOCUMENTS IS BEING INSTALLED.
      - THE SPECIAL INSPECTOR MUST VERIFY THAT ALL CUT EDGES AND DRILLED HOLES ARE PROPERLY SEALED USING A VINYL ESTER SEALING KIT SUPPLIED BY THE MANUFACTURER.
      - THE SPECIAL INSPECTOR MUST VERIFY THAT THE STRUCTURE IS BUILT IN ACCORDANCE WITH THE APPROVED DESIGN DOCUMENTS.
2. THE INSPECTION AGENCY SHALL SUBMIT INSPECTION AND TEST REPORTS TO THE BUILDING DEPARTMENT, THE ENGINEER OF RECORD, AND THE OWNER UNLESS THE FABRICATOR IS APPROVED BY THE BUILDING OFFICIAL TO PERFORM WORK WITHOUT THE SPECIAL INSPECTIONS.

MAXIMUM ALLOWABLE ANGLE CLIP



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STATE OF CONNECTICUT
JOSEPH R. JOHNSTON
24460
LICENSED PROFESSIONAL ENGINEER
1/25/19

No.	Submittal / Revision	App'd	Date
0	ISSUED FOR REVIEW	TAG	01/22/19

Drawn: TAG Date: 01/22/19
Designed: AP Date: 01/22/19
Checked: NO Date: 01/22/19

Project Number:
1106-A0001-B

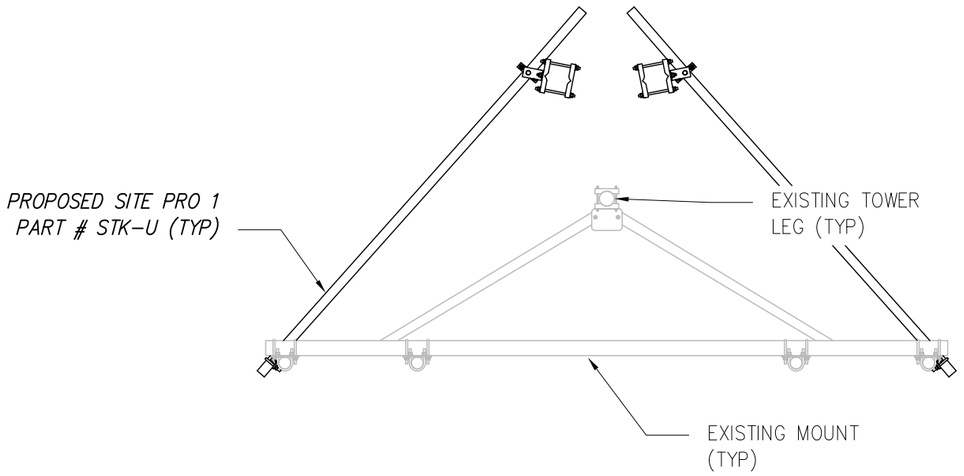
Project Title:
MADISON - SR 79
CTL02033
FA# 10035048
864 OPENING HILL ROAD
MADISON, CT 06443

Prepared For:
smartlink

Drawing Scale: AS NOTED
Date: 01/22/19
SD

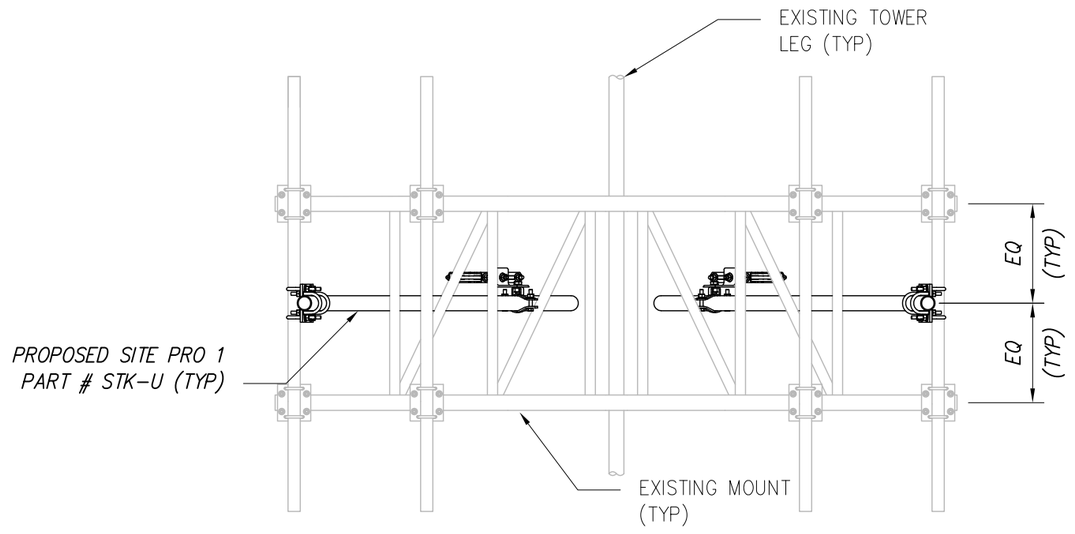
Drawing Title
GENERAL NOTES

Drawing Number
S1

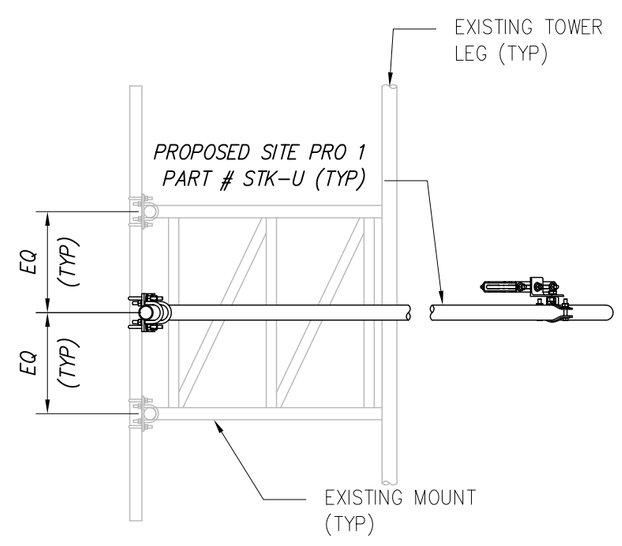


1 PLAN VIEW
SCALE: NOT TO SCALE

NOTE: MODIFICATIONS ARE TYPICAL TO ALL SECTORS



2 ELEVATION VIEW
SCALE: NOT TO SCALE



3 SECTION VIEW
SCALE: NOT TO SCALE

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28460
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Prepared For:
smartlink

Drawing Scale:
AS NOTED
Date:
01/22/19

SD

Drawing Title
MOUNT DESIGN

Drawing Number
S2

AMERICAN TOWER®
CORPORATION

Structural Analysis Report

Structure	:	**180 ft Self Supported Tower**
ATC Site Name	:	**North Madison Volunteer FD, CT**
ATC Site Number	:	**383660**
Engineering Number	:	**OAA745468_C3_01**
Proposed Carrier	:	**AT&T Mobility**
Carrier Site Name	:	**Madison - Opening Hill Road**
Carrier Site Number	:	**CTL02033**
Site Location	:	**864 Opening Hill Road** **Madison, CT 06443-0000** **41.357300,-72.638800**
County	:	**New Haven**
Date	:	**March 14, 2019**
Max Usage	:	**63%**
Result	:	**Pass**

Prepared By:
Robert D. Barrett, E.I.
Structural Engineer II

Robert D. Barrett

Reviewed By:

COA: PEC.0001553

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Table of Contents

Introduction

The purpose of this report is to summarize results of a structural analysis performed on the 180 ft self supported tower to reflect the change in loading by AT&T Mobility.

Supporting Documents

Tower Drawings	Rohn Drawing #C981756, dated December 2, 1998
Foundation Drawing	Rohn Drawing #A992935-1, dated July 21, 1999
Geotechnical Report	Clarence Welti Assoc. Job #35130AE, dated June 9, 1997

Analysis

The tower was analyzed using American Tower Corporation's tower analysis software. This program considers an elastic three-dimensional model and second-order effects per ANSI/TIA-222.

Basic Wind Speed:	101 mph (3-Second Gust, V_{asd}) / 130 mph (3-Second Gust, V_{ult})
Basic Wind Speed w/ Ice:	50 mph (3-Second Gust) w/ 3/4" radial ice concurrent
Code:	ANSI/TIA-222-G / 2015 IBC / 2018 Connecticut State Building Code
Structure Class:	II
Exposure Category:	B
Topographic Category:	1
Crest Height:	0 ft
Spectral Response:	Ss = 0.17, S_1 = 0.06
Site Class:	D - Stiff Soil

Conclusion

Based on the analysis results, the structure meets the requirements per the applicable codes listed above. The tower and foundation can support the equipment as described in this report.

If you have any questions or require additional information, please contact American Tower via email at Engineering@americantower.com. Please include the American Tower site name, site number, and engineering number in the subject line for any questions.

Existing and Reserved Equipment

Elev.[1] (ft)	Qty	Antenna	Mount Type	Lines	Carrier
190.8	2	RFS PD455	Side Arms	(3) 7/8" Coax (1) 1/2" Coax (1) 2" Conduit (1) 1" Conduit	--
186.0	1	4-Bay Dipole			
183.0	1	2-Bay Dipole			
170.0	3	Alcatel Lucent RRH ALU 4X45 AWS	Sector Frames	(12) 1 5/8" Coax (2) 1 5/8" Hybrid (1) 1 1/4" Coax	Verizon Wireless
	3	ALU RRH2X60PCS			
	3	ALU RRH4X60LTE			
	6	Commscope SBNHH-1D65B			
	3	Commscope LNX6514DS-A1M			
	1	Andrew 8' MW Dish			
	1	Antel BXA-70063/6CF			
	2	Antel BXA-70063/4CF			
	6	RFS FD9R6004/2C-3L			
	2	RFS DB-T1-6Z-8AB-0Z			
160.0	12	Andrew DB844H90E-XY	Sector Frames	(12) 1 5/8" Coax	Sprint Nextel
150.0	3	ALU 800MHz 2X50W RRH w/ Filter	Sector Frames	(3) 1 1/4" Hybriflex	
	3	ALU 1900MHz 4X45 RRH			
	3	RFS APXVSPP18-C-A20			
140.0	1	Raycap DC6-48-60-18-8F (23.5" Height)	Sector Frames	-	AT&T Mobility
	6	Powerwave Allgon LGP21401			
130.0	3	EMS RR90-17-02DP	T-Arms	(12) 1 5/8" Coax	T-Mobile
	3	Commscope LNX-6515DS-VTM			
	3	RFS ATMAP1412D-1A20			
125.0	1	Sinclair SC323-HF2LDF	Side Arm	(1) 7/8" Coax	Town of Madison, CT
90.0	1	RFI FSA10-67-DIN	Side Arms	(2) 7/8" Coax	
	1	Sinclair SC323-HF2LDF			
75.0	1	PCTEL GPS-TMG-HR-26N	Stand-Off	(1) 1/2" Coax	Sprint Nextel

Equipment to be Removed

Elev.[1] (ft)	Qty	Antenna	Mount Type	Lines	Carrier
110.0	6	Ericsson RRUS 11 (Band 12) (55 lb)	-	(3) 0.78" 8 AWG 6 (12) 1 1/4" Coax	AT&T Mobility
	3	KMW AM-X-CD-16-65-00T-RET			
	6	Powerwave Allgon 7770.00			

Proposed Equipment

Elev.[1] (ft)	Qty	Antenna	Mount Type	Lines	Carrier
140.0	1	Raycap DC6-48-60-18-8F	Modified Sector Frames	(6) 1 1/4" Coax	AT&T Mobility
	3	Ericsson RRUS 8843 B2, B66A			
	3	Ericsson RRUS 4449 B5, B12			
	3	Powerwave Allgon 7770.00			
	3	CCI HPA65R-BU6A			
	3	Kathrein Scala 80010965			

[1] Contracted elevations are shown for appurtenances within contracted installation tolerances. Appurtenances outside of contract limits are shown at installed elevations.

Install proposed lines in the place of the existing AT&T Mobility lines.

Structure Usages

Structural Component	Controlling Usage	Pass/Fail
Legs	49%	Pass
Diagonals	63%	Pass
Horizontals	51%	Pass
Anchor Bolts	35%	Pass
Leg Bolts	46%	Pass

Foundations

Reaction Component	Calculated Capacities	% of Usage
Uplift (Kips)	441.2	58%
Axial (Kips)	517.1	26%
Shear (Kips)	66.3	10%

The structure base reactions resulting from this analysis were found to be acceptable through analysis based on geotechnical and foundation information, therefore no modification or reinforcement of the foundation will be required.

Deflection, Twist and Sway*

Antenna Elevation (ft)	Antenna	Carrier	Deflection (ft)	Twist (°)	Sway (Rotation) (°)
170.0	Andrew 8' MW Dish	Verizon Wireless	0.172	0.007	0.118
140.0	CCI HPA65R-BU6A	AT&T Mobility	0.120	0.006	0.106
	Ericsson RRUS 4449 B5, B12				
	Ericsson RRUS 8843 B2, B66A				
	Kathrein Scala 80010965				
	Powerwave Allgon 7770.00				
	Raycap DC6-48-60-18-8F				

***Deflection, Twist and Sway was evaluated considering a design wind speed of 60 mph (3-Second Gust) per ANSI/TIA-222-G**

Standard Conditions

All engineering services performed by A.T. Engineering Service, PLLC are prepared on the basis that the information used is current and correct. This information may consist of, but is not limited to the following:

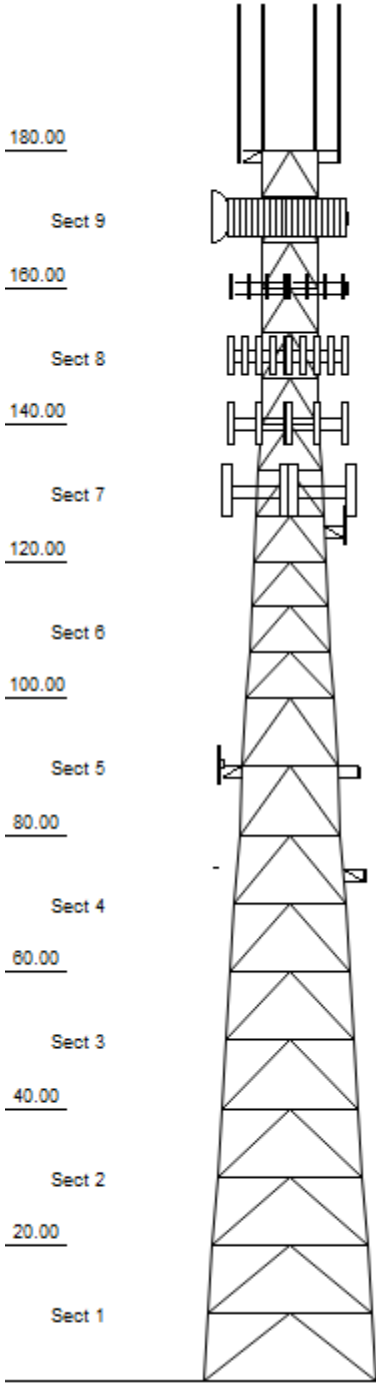
- Information supplied by the client regarding antenna, mounts and feed line loading
- Information from drawings, design and analysis documents, and field notes in the possession of A.T. Engineering Service, PLLC

It is the responsibility of the client to ensure that the information provided to A.T. Engineering Service, PLLC and used in the performance of our engineering services is correct and complete.

All assets of American Tower Corporation, its affiliates and subsidiaries (collectively "American Tower") are inspected at regular intervals. Based upon these inspections and in the absence of information to the contrary, American Tower assumes that all structures were constructed in accordance with the drawings and specifications.

Unless explicitly agreed by both the client and A.T. Engineering Service, PLLC, all services will be performed in accordance with the current revision of ANSI/TIA-222.

All services are performed, results obtained, and recommendations made in accordance with generally accepted engineering principles and practices. A.T. Engineering Service, PLLC is not responsible for the conclusions, opinions and recommendations made by others based on the information supplied herein.



Loads: 101 mph no ice
50 mph w/ 3/4" radial ice
Site Class: D Ss: 0.17 S1: 0.06
60 mph Serviceability

Job Information

Tower : 383660	**Location :** North Madison	**Base Width :** 25.33 ft
Client : AT&T MOBILITY		**Top Width :** 8.54 ft
Code : ANSI/TIA-222-G		**Tower Ht :** 180.00 ft
		Shape : Triangle

Sections Properties

Section	Leg Members	Diagonal Members	Horizontal Members
1	PX 50 ksi 10" DIA PIPE	PX 50 ksi 3-1/2" DIA PIPE	PST 50 ksi 3" DIA PIPE
2	PX 50 ksi 10" DIA PIPE	PST 50 ksi 3" DIA PIPE	PST 50 ksi 2-1/2" DIA PIPE
3	PX 50 ksi 8" DIA PIPE	PST 50 ksi 3" DIA PIPE	PST 50 ksi 2-1/2" DIA PIPE
4	PX 50 ksi 8" DIA PIPE	PST 50 ksi 3" DIA PIPE	PST 50 ksi 2" DIA PIPE
5	PSP 50 ksi ROHN 8 EHS	PST 50 ksi 3" DIA PIPE	PST 50 ksi 2" DIA PIPE
6	PSP 50 ksi ROHN 6 EHS	PST 50 ksi 2-1/2" DIA PIPE	PST 50 ksi 2" DIA PIPE
7	PSP 50 ksi ROHN 5 EH	PX 50 ksi 2" DIA PIPE	PST 50 ksi 1-1/2" DIA PIPE
8	PX 50 ksi 4" DIA PIPE	PX 50 ksi 2" DIA PIPE	PST 50 ksi 1-1/2" DIA PIPE
9	PST 50 ksi 3" DIA PIPE	PST 50 ksi 2" DIA PIPE	PST 50 ksi 1-1/2" DIA PIPE

Discrete Appurtenance

Elev (ft)	Type	Qty	Description
180.00	Straight Arm	3	Flat Side Arm
180.00	Whip	2	RFS PD455
180.00	Whip	1	4-Bay Dipole
180.00	Whip	1	2-Bay Dipole
170.00	Mounting Frame	3	Flat Light Sector Frame
170.00	Dish	1	Andrew 8' MW Dish
170.00	Panel	6	Commscope SBNHH-1D65B
170.00	Panel	1	Antel BXA-70063/6CF
170.00	Panel	3	Commscope LNX6514DS-A1M
170.00	Panel	1	RFS DB-T1-6Z-8AB-0Z
170.00	Panel	1	RFS DB-T1-6Z-8AB-0Z
170.00	Panel	2	Antel BXA-70063/4CF
170.00	Panel	3	Alcatel Lucent RRH ALU 4X45 AW
170.00	Panel	3	ALU RRH2X60PCS
170.00	Panel	3	ALU RRH4X60LTE
170.00	Panel	6	RFS FD9R6004/2C-3L
160.00	Mounting Frame	3	Flat Light Sector Frame
160.00	Panel	12	Andrew DB844H90E-XY
150.00	Mounting Frame	3	Flat Light Sector Frame
150.00	Panel	3	RFS APXVSPP18-C-A20
150.00	Panel	3	RFS APXVTM14-C-I20
150.00	Panel	3	ALU TD-RRH8X20
150.00	Panel	3	ALU 1900 MHz 4X45 RRH
150.00	Panel	3	ALU 800 MHz 2X50W RRH w/ Filte
140.00	Mounting Frame	3	Flat Light Sector Frame
140.00	Panel	3	Kathrein Scala 80010965
140.00	Panel	3	CCI HPA65R-BU6A
140.00	Panel	3	Powerwave Allgon 7770.00
140.00		3	Ericsson RRUS 4449 B5, B12
140.00		3	Ericsson RRUS 8843 B2, B66A
140.00		1	Raycap DC6-48-60-18-8F (23.5"
140.00		1	Raycap DC6-48-60-18-8F
140.00		6	Powerwave Allgon LGP21401
130.00	Straight Arm	3	Flat T-Arm
130.00	Mounting Frame	3	Flat Light Sector Frame
130.00	Panel	3	Commscope LNX-6515DS-VTM
130.00	Panel	3	EMS RR90-17-02DP
130.00		3	RFS ATMAP1412D-1A20
125.00	Straight Arm	1	Flat Side Arm
125.00	Whip	1	Sinclair SC323-HF2LDF
90.00	Straight Arm	2	Flat Side Arm
90.00	Panel	1	RFI FSA10-67-DIN
90.00	Whip	1	Sinclair SC323-HF2LDF
75.00	Straight Arm	1	Stand-Off

Job Information

Tower : 383660	Location : North Madison	Base Width : 25.33 ft
Client : AT&T MOBILITY		Top Width : 8.54 ft
Code : ANSI/TIA-222-G		Tower Ht : 180.00 ft
		Shape : Triangle

75.00	Panel	1	PCTEL GPS-TMG-HR-26N

Linear Appurtenance

Elev (ft) From	To	Qty	Description
0.00	180.00	3	7/8" Coax
0.00	180.00	1	2" Conduit
0.00	180.00	1	1/2" Coax
0.00	180.00	1	1" Conduit
0.00	170.00	1	Waveguide
0.00	170.00	1	1 5/8" Hybrid
0.00	170.00	1	1 5/8" Hybrid
0.00	170.00	12	1 5/8" Coax
0.00	170.00	1	1 1/4" Coax
0.00	160.00	1	Waveguide
0.00	160.00	1	Waveguide
0.00	160.00	12	1 5/8" Coax
0.00	150.00	1	Waveguide
0.00	150.00	1	1 1/4" Hybriflex
0.00	150.00	3	1 1/4" Hybriflex
0.00	140.00	1	Waveguide
0.00	140.00	6	1 1/4" Coax
0.00	130.00	1	Waveguide
0.00	130.00	12	1 5/8" Coax
0.00	125.00	1	7/8" Coax
0.00	90.00	2	7/8" Coax
0.00	75.00	1	1/2" Coax

Global Base Foundation Design Loads

Load Case	Moment (k-ft)	Vertical (kip)	Horizontal (kip)
DL + WL	6,551.99	70.64	61.16
DL + WL + IL	2,186.66	180.25	21.41

Individual Base Foundation Design Loads

Vertical (kip)	Uplift (kip)	Horizontal (kip)
322.19	280.76	37.93

Site Number:	383660	Code:	ANSI/TIA-222-G	
Site Name:	North Madison Volunteer FD, CT	Engineering Number:	OAA745468_C3_01	3/14/2019 7:15:44 PM
Customer:	AT&T MOBILITY			

Analysis Parameters

Location:	New Haven County, CT	Height (ft):	180
Code:	ANSI/TIA-222-G	Base Elevation (ft):	0.00
Shape:	Triangle	Bottom Face Width (ft):	25.33
Tower Manufacturer:	Rohn	Top Face Width (ft):	8.54
Tower Type:	Self Support	Anchor Bolt Detail Type	c
Kd:			
Ke:			

Ice & Wind Parameters

Structure Class:	II	Design Windspeed Without Ice:	101 mph
Exposure Category:	B	Design Windspeed With Ice:	50 mph
Topographic Category:	1	Operational Windspeed:	60 mph
Crest Height:	0 ft	Design Ice Thickness:	0.75 in

Seismic Parameters

Analysis Method:	Equivalent Modal Analysis & Equivalent Lateral Force Methods				
Site Class:	D - Stiff Soil				
Period Based on Rayleigh Method (sec):	0.67				
T_L (sec):	6	p:	1.3	C_S:	0.048
S_S:	0.173	S_1:	0.060	C_S, Max:	0.048
F_a:	1.600	F_V:	2.400	C_S, Min:	0.030
S_{ds}:	0.185	S_{d1}:	0.096		

Load Cases

1.2D + 1.6W Normal	101 mph Normal to Face with No Ice
1.2D + 1.6W 60 deg	101 mph 60 degree with No Ice
1.2D + 1.6W 90 deg	101 mph 90 degree with No Ice
1.2D + 1.6W 120 deg	101 mph 120 degree with No Ice
1.2D + 1.6W 180 deg	101 mph 180 degree with No Ice
1.2D + 1.6W 210 deg	101 mph 210 degree with No Ice
1.2D + 1.6W 240 deg	101 mph 240 degree with No Ice
1.2D + 1.6W 300 deg	101 mph 300 degree with No Ice
1.2D + 1.6W 330 deg	101 mph 330 degree with No Ice
0.9D + 1.6W Normal	101 mph Normal to Face with No Ice (Reduced DL)
0.9D + 1.6W 60 deg	101 mph 60 deg with No Ice (Reduced DL)
0.9D + 1.6W 90 deg	101 mph 90 deg with No Ice (Reduced DL)
0.9D + 1.6W 120 deg	101 mph 120 deg with No Ice (Reduced DL)
0.9D + 1.6W 180 deg	101 mph 180 deg with No Ice (Reduced DL)
0.9D + 1.6W 210 deg	101 mph 210 deg with No Ice (Reduced DL)
0.9D + 1.6W 240 deg	101 mph 240 deg with No Ice (Reduced DL)
0.9D + 1.6W 300 deg	101 mph 300 deg with No Ice (Reduced DL)
0.9D + 1.6W 330 deg	101 mph 330 deg with No Ice (Reduced DL)
1.2D + 1.0Di + 1.0Wi Normal	50 mph Normal with 0.75 in Radial Ice

Analysis Parameters

1.2D + 1.0Di + 1.0Wi 60 deg	50 mph 60 deg with 0.75 in Radial Ice
1.2D + 1.0Di + 1.0Wi 90 deg	50 mph 90 deg with 0.75 in Radial Ice
1.2D + 1.0Di + 1.0Wi 120 deg	50 mph 120 deg with 0.75 in Radial Ice
1.2D + 1.0Di + 1.0Wi 180 deg	50 mph 180 deg with 0.75 in Radial Ice
1.2D + 1.0Di + 1.0Wi 210 deg	50 mph 210 deg with 0.75 in Radial Ice
1.2D + 1.0Di + 1.0Wi 240 deg	50 mph 240 deg with 0.75 in Radial Ice
1.2D + 1.0Di + 1.0Wi 300 deg	50 mph 300 deg with 0.75 in Radial Ice
1.2D + 1.0Di + 1.0Wi 330 deg	50 mph 330 deg with 0.75 in Radial Ice
(1.2 + 0.2Sds) * DL + E Normal	Seismic Normal
(1.2 + 0.2Sds) * DL + E 60 deg	Seismic 60 deg
(1.2 + 0.2Sds) * DL + E 90 deg	Seismic 90 deg
(1.2 + 0.2Sds) * DL + E 120 deg	Seismic 120 deg
(1.2 + 0.2Sds) * DL + E 180 deg	Seismic 180 deg
(1.2 + 0.2Sds) * DL + E 210 deg	Seismic 210 deg
(1.2 + 0.2Sds) * DL + E 240 deg	Seismic 240 deg
(1.2 + 0.2Sds) * DL + E 300 deg	Seismic 300 deg
(1.2 + 0.2Sds) * DL + E 330 deg	Seismic 330 deg
(0.9 - 0.2Sds) * DL + E Normal	Seismic (Reduced DL) Normal
(0.9 - 0.2Sds) * DL + E 60 deg	Seismic (Reduced DL) 60 deg
(0.9 - 0.2Sds) * DL + E 90 deg	Seismic (Reduced DL) 90 deg
(0.9 - 0.2Sds) * DL + E 120 deg	Seismic (Reduced DL) 120 deg
(0.9 - 0.2Sds) * DL + E 180 deg	Seismic (Reduced DL) 180 deg
(0.9 - 0.2Sds) * DL + E 210 deg	Seismic (Reduced DL) 210 deg
(0.9 - 0.2Sds) * DL + E 240 deg	Seismic (Reduced DL) 240 deg
(0.9 - 0.2Sds) * DL + E 300 deg	Seismic (Reduced DL) 300 deg
(0.9 - 0.2Sds) * DL + E 330 deg	Seismic (Reduced DL) 330 deg
1.0D + 1.0W Service Normal	Serviceability - 60 mph Wind Normal
1.0D + 1.0W Service 60 deg	Serviceability - 60 mph Wind 60 deg
1.0D + 1.0W Service 90 deg	Serviceability - 60 mph Wind 90 deg
1.0D + 1.0W Service 120 deg	Serviceability - 60 mph Wind 120 deg
1.0D + 1.0W Service 180 deg	Serviceability - 60 mph Wind 180 deg
1.0D + 1.0W Service 210 deg	Serviceability - 60 mph Wind 210 deg
1.0D + 1.0W Service 240 deg	Serviceability - 60 mph Wind 240 deg
1.0D + 1.0W Service 300 deg	Serviceability - 60 mph Wind 300 deg
1.0D + 1.0W Service 330 deg	Serviceability - 60 mph Wind 330 deg

Tower Loading

Discrete Appurtenance Properties 1.2D + 1.6W

Elevation (ft)	Description	Qty	Wt. (lb)	EPA (sf)	Length (ft)	Width (in)	Depth (in)	K_a	Orient. Factor	Vert. Ecc.(ft)	M_u (lb-ft)	Q_z (psf)	F_a (WL) (lb)	P_a (DL) (lb)
180.0	2-Bay Dipole	1	18	2.0	6.0	4.0	4.0	0.80	1.00	3.0	165.9	26.07	55	21
180.0	4-Bay Dipole	1	35	3.9	12.0	4.0	4.0	0.80	1.00	6.0	666.8	26.19	111	42
180.0	Flat Side Arm	3	150	6.3	0.0	0.0	0.0	1.00	0.67	0.0	0.0	25.95	447	540
180.0	RFS PD455	2	24	6.0	21.5	2.8	2.8	0.80	1.00	10.8	3715.0	26.38	346	58
170.0	Alcatel Lucent RRH	3	63	2.5	2.2	11.4	5.9	0.80	0.67	0.0	0.0	25.53	138	228
170.0	ALU RRH2X60PCS	3	55	2.2	1.8	12.0	9.4	0.80	0.67	0.0	0.0	25.53	123	198
170.0	ALU RRH4X60LTE	3	53	2.1	1.8	12.0	7.2	0.80	0.67	0.0	0.0	25.53	118	191
170.0	Andrew 8' MW Dish	1	400	83.6	8.0	96.0	0.0	1.00	1.00	0.0	0.0	25.53	2904	480
170.0	Antel BXA-70063/4CF	2	10	4.7	4.0	11.2	5.2	0.80	0.77	0.0	0.0	25.53	202	24
170.0	Antel BXA-70063/6CF	1	17	7.6	5.9	11.2	5.2	0.80	0.77	0.0	0.0	25.53	162	20
170.0	Commscope	3	29	5.1	4.0	11.9	7.1	0.80	0.83	0.0	0.0	25.53	352	103
170.0	Commscope SBNHH-	6	41	8.1	6.0	11.9	7.1	0.80	0.83	0.0	0.0	25.53	1118	292
170.0	Flat Light Sector	3	400	17.9	0.0	0.0	0.0	0.75	0.67	0.0	0.0	25.53	937	1440
170.0	RFS DB-T1-6Z-8AB-	1	44	4.8	2.0	24.0	10.0	0.80	0.67	0.0	0.0	25.53	89	53
170.0	RFS DB-T1-6Z-8AB-	1	44	4.8	2.0	24.0	10.0	0.80	0.67	0.0	0.0	25.53	89	53
170.0	RFS FD9R6004/2C-3L	6	3	0.4	0.5	6.5	1.5	0.80	0.50	0.0	0.0	25.53	31	19
160.0	Andrew DB844H90E-	12	14	3.6	4.0	8.0	4.5	0.80	0.82	0.0	0.0	25.09	970	202
160.0	Flat Light Sector	3	400	17.9	0.0	0.0	0.0	0.75	0.75	0.0	0.0	25.09	1031	1440
150.0	ALU 1900 MHz 4X45	3	60	2.3	2.1	11.1	10.7	0.80	0.67	0.0	0.0	24.63	125	216
150.0	ALU 800 MHz 2X50W	3	64	2.1	1.6	13.0	12.2	0.80	0.67	0.0	0.0	24.63	111	230
150.0	ALU TD-RRH8X20	3	66	3.7	2.1	17.5	5.7	0.80	0.67	0.0	0.0	24.63	199	238
150.0	Flat Light Sector	3	400	17.9	0.0	0.0	0.0	0.75	0.75	0.0	0.0	24.63	1012	1440
150.0	RFS APXVSPP18-C-	3	57	8.0	6.0	11.8	7.0	0.80	0.83	0.0	0.0	24.63	535	205
150.0	RFS APXVTM14-C-I20	3	53	6.3	4.7	12.6	6.3	0.80	0.78	0.0	0.0	24.63	398	190
140.0	CCI HPA65R-BU6A	3	42	7.9	5.9	11.7	7.6	0.80	0.70	0.0	0.0	24.15	434	151
140.0	Ericsson RRUS 4449	3	71	2.0	1.5	13.2	9.4	0.80	0.50	0.0	0.0	24.15	78	256
140.0	Ericsson RRUS 8843	3	72	1.6	1.2	13.2	10.9	0.80	0.50	0.0	0.0	24.15	65	259
140.0	Flat Light Sector	3	400	17.9	0.0	0.0	0.0	0.75	0.75	0.0	0.0	24.15	992	1440
140.0	Kathrein Scala	3	98	13.8	6.6	20.0	6.9	0.80	0.62	0.0	0.0	24.15	675	351
140.0	Powerwave Allgon	3	35	5.5	4.6	11.0	5.0	0.80	0.65	0.0	0.0	24.15	282	126
140.0	Powerwave Allgon	6	14	1.1	1.2	9.2	2.6	0.80	0.50	0.0	0.0	24.15	87	102
140.0	Raycap DC6-48-60-	1	20	1.3	2.0	9.7	9.7	0.80	1.00	0.0	0.0	24.15	33	24
140.0	Raycap DC6-48-60-	1	20	1.3	2.0	9.7	9.7	0.80	1.00	0.0	0.0	24.15	33	24
130.0	Commscope LNX-	3	50	11.4	8.0	11.9	7.1	0.80	0.70	0.0	0.0	23.64	618	181
130.0	EMS RR90-17-02DP	3	14	4.4	4.7	8.0	2.8	0.80	0.64	0.0	0.0	23.64	215	49
130.0	Flat Light Sector	3	400	17.9	0.0	0.0	0.0	1.00	0.75	0.0	0.0	23.64	1295	1440
130.0	Flat T-Arm	3	250	12.9	0.0	0.0	0.0	0.75	0.75	0.0	0.0	23.64	700	900
130.0	RFS ATMAP1412D-	3	13	1.0	1.0	10.0	4.0	0.80	0.50	0.0	0.0	23.64	39	47
125.0	Flat Side Arm	1	150	6.3	0.0	0.0	0.0	1.00	1.00	0.0	0.0	23.38	200	180
125.0	Sinclair SC323-	1	6	1.1	5.6	2.0	2.0	1.00	1.00	0.0	0.0	23.38	36	7
90.00	Flat Side Arm	2	150	6.3	0.0	0.0	0.0	0.90	0.90	0.0	0.0	21.29	295	360
90.00	RFI FSA10-67-DIN	1	9	1.4	1.7	23.5	10.0	1.00	1.00	0.0	0.0	21.29	41	11
90.00	Sinclair SC323-	1	6	1.1	5.6	2.0	2.0	1.00	1.00	0.0	0.0	21.29	33	7
75.00	PCTEL GPS-TMG-HR-	1	1	0.2	0.4	3.2	3.2	1.00	1.00	0.0	0.0	20.21	4	1
75.00	Stand-Off	1	75	2.5	0.0	0.0	0.0	1.00	1.00	0.0	0.0	20.21	69	90
	Totals	122	11607	828.3									17824	13928

Discrete Appurtenance Properties 0.9D + 1.6W

Elevation (ft)	Description	Qty	Wt. (lb)	EPA (sf)	Length (ft)	Width (in)	Depth (in)	K_a	Orient. Factor	Vert. Ecc.(ft)	M_u (lb-ft)	Q_z (psf)	F_a (WL) (lb)	P_a (DL) (lb)
180.0	2-Bay Dipole	1	18	2.0	6.0	4.0	4.0	0.80	1.00	3.0	165.9	26.07	55	16

Site Number: 383660 Code: ANSI/TIA-222-G

Site Name: North Madison Volunteer FD, CT Engineering Number: OAA745468_C3_01 3/14/2019 7:15:44 PM

Customer: AT&T MOBILITY

Tower Loading

180.0	4-Bay Dipole	1	35	3.9	12.0	4.0	4.0	0.80	1.00	6.0	666.8	26.19	111	32
180.0	Flat Side Arm	3	150	6.3	0.0	0.0	0.0	1.00	0.67	0.0	0.0	25.95	447	405
180.0	RFS PD455	2	24	6.0	21.5	2.8	2.8	0.80	1.00	10.8	3715.0	26.38	346	43
170.0	Alcatel Lucent RRH	3	63	2.5	2.2	11.4	5.9	0.80	0.67	0.0	0.0	25.53	138	171
170.0	ALU RRH2X60PCS	3	55	2.2	1.8	12.0	9.4	0.80	0.67	0.0	0.0	25.53	123	149
170.0	ALU RRH4X60LTE	3	53	2.1	1.8	12.0	7.2	0.80	0.67	0.0	0.0	25.53	118	143
170.0	Andrew 8' MW Dish	1	400	83.6	8.0	96.0	0.0	1.00	1.00	0.0	0.0	25.53	2904	360
170.0	Antel BXA-70063/4CF	2	10	4.7	4.0	11.2	5.2	0.80	0.77	0.0	0.0	25.53	202	18
170.0	Antel BXA-70063/6CF	1	17	7.6	5.9	11.2	5.2	0.80	0.77	0.0	0.0	25.53	162	15
170.0	Commscope	3	29	5.1	4.0	11.9	7.1	0.80	0.83	0.0	0.0	25.53	352	77
170.0	Commscope SBNHH-	6	41	8.1	6.0	11.9	7.1	0.80	0.83	0.0	0.0	25.53	1118	219
170.0	Flat Light Sector	3	400	17.9	0.0	0.0	0.0	0.75	0.67	0.0	0.0	25.53	937	1080
170.0	RFS DB-T1-6Z-8AB-	1	44	4.8	2.0	24.0	10.0	0.80	0.67	0.0	0.0	25.53	89	40
170.0	RFS DB-T1-6Z-8AB-	1	44	4.8	2.0	24.0	10.0	0.80	0.67	0.0	0.0	25.53	89	40
170.0	RFS FD9R6004/2C-3L	6	3	0.4	0.5	6.5	1.5	0.80	0.50	0.0	0.0	25.53	31	14
160.0	Andrew DB844H90E-	12	14	3.6	4.0	8.0	4.5	0.80	0.82	0.0	0.0	25.09	970	151
160.0	Flat Light Sector	3	400	17.9	0.0	0.0	0.0	0.75	0.75	0.0	0.0	25.09	1031	1080
150.0	ALU 1900 MHz 4X45	3	60	2.3	2.1	11.1	10.7	0.80	0.67	0.0	0.0	24.63	125	162
150.0	ALU 800 MHz 2X50W	3	64	2.1	1.6	13.0	12.2	0.80	0.67	0.0	0.0	24.63	111	173
150.0	ALU TD-RRH8X20	3	66	3.7	2.1	17.5	5.7	0.80	0.67	0.0	0.0	24.63	199	178
150.0	Flat Light Sector	3	400	17.9	0.0	0.0	0.0	0.75	0.75	0.0	0.0	24.63	1012	1080
150.0	RFS APXVSPP18-C-	3	57	8.0	6.0	11.8	7.0	0.80	0.83	0.0	0.0	24.63	535	154
150.0	RFS APXVTM14-C-I20	3	53	6.3	4.7	12.6	6.3	0.80	0.78	0.0	0.0	24.63	398	143
140.0	CCI HPA65R-BU6A	3	42	7.9	5.9	11.7	7.6	0.80	0.70	0.0	0.0	24.15	434	113
140.0	Ericsson RRUS 4449	3	71	2.0	1.5	13.2	9.4	0.80	0.50	0.0	0.0	24.15	78	192
140.0	Ericsson RRUS 8843	3	72	1.6	1.2	13.2	10.9	0.80	0.50	0.0	0.0	24.15	65	194
140.0	Flat Light Sector	3	400	17.9	0.0	0.0	0.0	0.75	0.75	0.0	0.0	24.15	992	1080
140.0	Kathrein Scala	3	98	13.8	6.6	20.0	6.9	0.80	0.62	0.0	0.0	24.15	675	264
140.0	Powerwave Allgon	3	35	5.5	4.6	11.0	5.0	0.80	0.65	0.0	0.0	24.15	282	95
140.0	Powerwave Allgon	6	14	1.1	1.2	9.2	2.6	0.80	0.50	0.0	0.0	24.15	87	76
140.0	Raycap DC6-48-60-	1	20	1.3	2.0	9.7	9.7	0.80	1.00	0.0	0.0	24.15	33	18
140.0	Raycap DC6-48-60-	1	20	1.3	2.0	9.7	9.7	0.80	1.00	0.0	0.0	24.15	33	18
130.0	Commscope LNX-	3	50	11.4	8.0	11.9	7.1	0.80	0.70	0.0	0.0	23.64	618	136
130.0	EMS RR90-17-02DP	3	14	4.4	4.7	8.0	2.8	0.80	0.64	0.0	0.0	23.64	215	36
130.0	Flat Light Sector	3	400	17.9	0.0	0.0	0.0	1.00	0.75	0.0	0.0	23.64	1295	1080
130.0	Flat T-Arm	3	250	12.9	0.0	0.0	0.0	0.75	0.75	0.0	0.0	23.64	700	675
130.0	RFS ATMAP1412D-	3	13	1.0	1.0	10.0	4.0	0.80	0.50	0.0	0.0	23.64	39	35
125.0	Flat Side Arm	1	150	6.3	0.0	0.0	0.0	1.00	1.00	0.0	0.0	23.38	200	135
125.0	Sinclair SC323-	1	6	1.1	5.6	2.0	2.0	1.00	1.00	0.0	0.0	23.38	36	6
90.00	Flat Side Arm	2	150	6.3	0.0	0.0	0.0	0.90	0.90	0.0	0.0	21.29	295	270
90.00	RFI FSA10-67-DIN	1	9	1.4	1.7	23.5	10.0	1.00	1.00	0.0	0.0	21.29	41	8
90.00	Sinclair SC323-	1	6	1.1	5.6	2.0	2.0	1.00	1.00	0.0	0.0	21.29	33	6
75.00	PCTEL GPS-TMG-HR-	1	1	0.2	0.4	3.2	3.2	1.00	1.00	0.0	0.0	20.21	4	1
75.00	Stand-Off	1	75	2.5	0.0	0.0	0.0	1.00	1.00	0.0	0.0	20.21	69	68
	Totals	122	11607	828.3									17824	10446

Discrete Appurtenance Properties 1.2D + 1.0Di + 1.0Wi

Elevation (ft)	Description	Qty	Ice Wt (lb)	Ice EPA (sf)	Length (ft)	Width (in)	Depth (in)	K_a	Orient. Factor	Vert. Ecc.(ft)	M_u (lb-ft)	Q_z (psf)	F_a (WL) (lb)	P_a (DL) (lb)
180.0	2-Bay Dipole	1	71	4.6	6.0	4.0	4.0	0.80	1.00	3.0	60.1	6.39	20	74
180.0	4-Bay Dipole	1	142	9.2	12.0	4.0	4.0	0.80	1.00	6.0	241.6	6.42	40	149
180.0	Flat Side Arm	3	224	8.8	0.0	0.0	0.0	1.00	0.67	0.0	0.0	6.36	96	763
180.0	RFS PD455	2	299	13.8	21.5	2.8	2.8	0.80	1.00	10.8	1304.9	6.47	121	607
170.0	Alcatel Lucent RRH	3	141	3.2	2.2	11.4	5.9	0.80	0.67	0.0	0.0	6.26	27	462
170.0	ALU RRH2X60PCS	3	127	3.2	1.8	12.0	9.4	0.80	0.67	0.0	0.0	6.26	28	414

Tower Loading

170.0	ALU RRH4X60LTE	3	127	2.8	1.8	12.0	7.2	0.80	0.67	0.0	0.0	6.26	24	414
170.0	Andrew 8' MW Dish	1	1396	89.8	8.0	96.0	0.0	1.00	1.00	0.0	0.0	6.26	478	1476
170.0	Antel BXA-70063/4CF	2	133	5.7	4.0	11.2	5.2	0.80	0.77	0.0	0.0	6.26	37	270
170.0	Antel BXA-70063/6CF	1	194	8.8	5.9	11.2	5.2	0.80	0.77	0.0	0.0	6.26	29	197
170.0	Commscope	3	173	6.1	4.0	11.9	7.1	0.80	0.83	0.0	0.0	6.26	65	535
170.0	Commscope SBNHH-	6	245	9.4	6.0	11.9	7.1	0.80	0.83	0.0	0.0	6.26	199	1520
170.0	Flat Light Sector	3	705	33.2	0.0	0.0	0.0	0.75	0.67	0.0	0.0	6.26	266	2356
170.0	RFS DB-T1-6Z-8AB-	1	190	5.7	2.0	24.0	10.0	0.80	0.67	0.0	0.0	6.26	16	199
170.0	RFS DB-T1-6Z-8AB-	1	190	5.7	2.0	24.0	10.0	0.80	0.67	0.0	0.0	6.26	16	199
170.0	RFS FD9R6004/2C-3L	6	16	0.6	0.5	6.5	1.5	0.80	0.50	0.0	0.0	6.26	7	99
160.0	Andrew DB844H90E-	12	111	4.5	4.0	8.0	4.5	0.80	0.82	0.0	0.0	6.15	185	1368
160.0	Flat Light Sector	3	702	33.0	0.0	0.0	0.0	0.75	0.75	0.0	0.0	6.15	291	2345
150.0	ALU 1900 MHz 4X45	3	155	3.0	2.1	11.1	10.7	0.80	0.67	0.0	0.0	6.04	25	502
150.0	ALU 800 MHz 2X50W	3	155	2.7	1.6	13.0	12.2	0.80	0.67	0.0	0.0	6.04	22	503
150.0	ALU TD-RRH8X20	3	156	4.9	2.1	17.5	5.7	0.80	0.67	0.0	0.0	6.04	40	506
150.0	Flat Light Sector	3	702	33.0	0.0	0.0	0.0	0.75	0.75	0.0	0.0	6.04	286	2345
150.0	RFS APXVSPP18-C-	3	257	9.3	6.0	11.8	7.0	0.80	0.83	0.0	0.0	6.04	95	804
150.0	RFS APXVTM14-C-I20	3	191	8.5	4.7	12.6	6.3	0.80	0.78	0.0	0.0	6.04	82	604
140.0	CCI HPA65R-BU6A	3	215	10.6	5.9	11.7	7.6	0.80	0.70	0.0	0.0	5.92	89	670
140.0	Ericsson RRUS 4449	3	135	2.9	1.5	13.2	9.4	0.80	0.50	0.0	0.0	5.92	17	447
140.0	Ericsson RRUS 8843	3	133	2.5	1.2	13.2	10.9	0.80	0.50	0.0	0.0	5.92	15	441
140.0	Flat Light Sector	3	697	32.8	0.0	0.0	0.0	0.75	0.75	0.0	0.0	5.92	278	2332
140.0	Kathrein Scala	3	361	16.8	6.6	20.0	6.9	0.80	0.62	0.0	0.0	5.92	126	1141
140.0	Powerwave Allgon	3	168	6.5	4.6	11.0	5.0	0.80	0.65	0.0	0.0	5.92	51	524
140.0	Powerwave Allgon	6	39	1.8	1.2	9.2	2.6	0.80	0.50	0.0	0.0	5.92	22	249
140.0	Raycap DC6-48-60-	1	72	1.9	2.0	9.7	9.7	0.80	1.00	0.0	0.0	5.92	8	76
140.0	Raycap DC6-48-60-	1	72	1.9	2.0	9.7	9.7	0.80	1.00	0.0	0.0	5.92	8	76
130.0	Commscope LNX-	3	277	14.6	8.0	11.9	7.1	0.80	0.70	0.0	0.0	5.79	121	861
130.0	EMS RR90-17-02DP	3	110	5.3	4.7	8.0	2.8	0.80	0.64	0.0	0.0	5.79	40	339
130.0	Flat Light Sector	3	697	32.8	0.0	0.0	0.0	1.00	0.75	0.0	0.0	5.79	364	2332
130.0	Flat T-Arm	3	456	21.0	0.0	0.0	0.0	0.75	0.75	0.0	0.0	5.79	174	1519
130.0	RFS ATMAP1412D-	3	39	1.7	1.0	10.0	4.0	0.80	0.50	0.0	0.0	5.79	10	125
125.0	Flat Side Arm	1	222	8.7	0.0	0.0	0.0	1.00	1.00	0.0	0.0	5.73	43	252
125.0	Sinclair SC323-	1	66	2.5	5.6	2.0	2.0	1.00	1.00	0.0	0.0	5.73	12	67
90.00	Flat Side Arm	2	220	8.6	0.0	0.0	0.0	0.90	0.90	0.0	0.0	5.22	62	499
90.00	RFI FSA10-67-DIN	1	127	4.7	1.7	23.5	10.0	1.00	1.00	0.0	0.0	5.22	21	128
90.00	Sinclair SC323-	1	62	2.5	5.6	2.0	2.0	1.00	1.00	0.0	0.0	5.22	11	64
75.00	PCTEL GPS-TMG-HR-	1	10	0.3	0.4	3.2	3.2	1.00	1.00	0.0	0.0	4.95	1	10
75.00	Stand-Off	1	109	3.7	0.0	0.0	0.0	1.00	1.00	0.0	0.0	4.95	16	124
	Totals	122	28668	1228.8									3985	30989

Discrete Appurtenance Properties 1.0D + 1.0W Service

Elevation (ft)	Description	Qty	Wt. (lb)	EPA (sf)	Length (ft)	Width (in)	Depth (in)	K_a	Orient. Factor	Vert. Ecc.(ft)	M_u (lb-ft)	Q_z (psf)	F_a (WL) (lb)	P_a (DL) (lb)
180.0	2-Bay Dipole	1	18	2.0	6.0	4.0	4.0	0.80	1.00	3.0	36.6	9.20	12	18
180.0	4-Bay Dipole	1	35	3.9	12.0	4.0	4.0	0.80	1.00	6.0	147.1	9.24	25	35
180.0	Flat Side Arm	3	150	6.3	0.0	0.0	0.0	1.00	0.67	0.0	0.0	9.16	99	450
180.0	RFS PD455	2	24	6.0	21.5	2.8	2.8	0.80	1.00	10.8	819.4	9.31	76	48
170.0	Alcatel Lucent RRH	3	63	2.5	2.2	11.4	5.9	0.80	0.67	0.0	0.0	9.01	30	190
170.0	ALU RRH2X60PCS	3	55	2.2	1.8	12.0	9.4	0.80	0.67	0.0	0.0	9.01	27	165
170.0	ALU RRH4X60LTE	3	53	2.1	1.8	12.0	7.2	0.80	0.67	0.0	0.0	9.01	26	159
170.0	Andrew 8' MW Dish	1	400	83.6	8.0	96.0	0.0	1.00	1.00	0.0	0.0	9.01	640	400
170.0	Antel BXA-70063/4CF	2	10	4.7	4.0	11.2	5.2	0.80	0.77	0.0	0.0	9.01	45	20
170.0	Antel BXA-70063/6CF	1	17	7.6	5.9	11.2	5.2	0.80	0.77	0.0	0.0	9.01	36	17
170.0	Commscope	3	29	5.1	4.0	11.9	7.1	0.80	0.83	0.0	0.0	9.01	78	86

Tower Loading

170.0	Commscope SBNHH-	6	41	8.1	6.0	11.9	7.1	0.80	0.83	0.0	0.0	9.01	246	244
170.0	Flat Light Sector	3	400	17.9	0.0	0.0	0.0	0.75	0.67	0.0	0.0	9.01	207	1200
170.0	RFS DB-T1-6Z-8AB-	1	44	4.8	2.0	24.0	10.0	0.80	0.67	0.0	0.0	9.01	20	44
170.0	RFS DB-T1-6Z-8AB-	1	44	4.8	2.0	24.0	10.0	0.80	0.67	0.0	0.0	9.01	20	44
170.0	RFS FD9R6004/2C-3L	6	3	0.4	0.5	6.5	1.5	0.80	0.50	0.0	0.0	9.01	7	16
160.0	Andrew DB844H90E-	12	14	3.6	4.0	8.0	4.5	0.80	0.82	0.0	0.0	8.85	214	168
160.0	Flat Light Sector	3	400	17.9	0.0	0.0	0.0	0.75	0.75	0.0	0.0	8.85	227	1200
150.0	ALU 1900 MHz 4X45	3	60	2.3	2.1	11.1	10.7	0.80	0.67	0.0	0.0	8.69	28	180
150.0	ALU 800 MHz 2X50W	3	64	2.1	1.6	13.0	12.2	0.80	0.67	0.0	0.0	8.69	24	192
150.0	ALU TD-RRH8X20	3	66	3.7	2.1	17.5	5.7	0.80	0.67	0.0	0.0	8.69	44	198
150.0	Flat Light Sector	3	400	17.9	0.0	0.0	0.0	0.75	0.75	0.0	0.0	8.69	223	1200
150.0	RFS APXVSPP18-C-	3	57	8.0	6.0	11.8	7.0	0.80	0.83	0.0	0.0	8.69	118	171
150.0	RFS APXVTM14-C-I20	3	53	6.3	4.7	12.6	6.3	0.80	0.78	0.0	0.0	8.69	88	159
140.0	CCI HPA65R-BU6A	3	42	7.9	5.9	11.7	7.6	0.80	0.70	0.0	0.0	8.52	96	126
140.0	Ericsson RRUS 4449	3	71	2.0	1.5	13.2	9.4	0.80	0.50	0.0	0.0	8.52	17	213
140.0	Ericsson RRUS 8843	3	72	1.6	1.2	13.2	10.9	0.80	0.50	0.0	0.0	8.52	14	216
140.0	Flat Light Sector	3	400	17.9	0.0	0.0	0.0	0.75	0.75	0.0	0.0	8.52	219	1200
140.0	Kathrein Scala	3	98	13.8	6.6	20.0	6.9	0.80	0.62	0.0	0.0	8.52	149	293
140.0	Powerwave Allgon	3	35	5.5	4.6	11.0	5.0	0.80	0.65	0.0	0.0	8.52	62	105
140.0	Powerwave Allgon	6	14	1.1	1.2	9.2	2.6	0.80	0.50	0.0	0.0	8.52	19	85
140.0	Raycap DC6-48-60-	1	20	1.3	2.0	9.7	9.7	0.80	1.00	0.0	0.0	8.52	7	20
140.0	Raycap DC6-48-60-	1	20	1.3	2.0	9.7	9.7	0.80	1.00	0.0	0.0	8.52	7	20
130.0	Commscope LNX-	3	50	11.4	8.0	11.9	7.1	0.80	0.70	0.0	0.0	8.34	136	151
130.0	EMS RR90-17-02DP	3	14	4.4	4.7	8.0	2.8	0.80	0.64	0.0	0.0	8.34	47	41
130.0	Flat Light Sector	3	400	17.9	0.0	0.0	0.0	1.00	0.75	0.0	0.0	8.34	286	1200
130.0	Flat T-Arm	3	250	12.9	0.0	0.0	0.0	0.75	0.75	0.0	0.0	8.34	154	750
130.0	RFS ATMAP1412D-	3	13	1.0	1.0	10.0	4.0	0.80	0.50	0.0	0.0	8.34	9	39
125.0	Flat Side Arm	1	150	6.3	0.0	0.0	0.0	1.00	1.00	0.0	0.0	8.25	44	150
125.0	Sinclair SC323-	1	6	1.1	5.6	2.0	2.0	1.00	1.00	0.0	0.0	8.25	8	6
90.00	Flat Side Arm	2	150	6.3	0.0	0.0	0.0	0.90	0.90	0.0	0.0	7.51	65	300
90.00	RFI FSA10-67-DIN	1	9	1.4	1.7	23.5	10.0	1.00	1.00	0.0	0.0	7.51	9	9
90.00	Sinclair SC323-	1	6	1.1	5.6	2.0	2.0	1.00	1.00	0.0	0.0	7.51	7	6
75.00	PCTEL GPS-TMG-HR-	1	1	0.2	0.4	3.2	3.2	1.00	1.00	0.0	0.0	7.13	1	1
75.00	Stand-Off	1	75	2.5	0.0	0.0	0.0	1.00	1.00	0.0	0.0	7.13	15	75
	Totals	122	11607	828.3									3931	11607

Tower Loading

Linear Appurtenance Properties

Elev From (ft)	Elev To (ft)	Description	Qty	Width (in)	Weight (lb/ft)	Pct In Block	Spread On Faces	Bundling Arrangement	Cluster Dia (in)	Out Of Zone	Spacing (in)	Orientation Factor	Ka Override
0.00	180.0	1" Conduit	1	1.30	1.68	100	Lin App	Individual	0.00	N	1.00	1.00	0.00
0.00	180.0	1/2" Coax	1	0.63	0.15	100	Lin App	Individual	0.00	N	1.00	1.00	0.00
0.00	180.0	2" Conduit	1	2.38	3.65	100	Lin App	Individual	0.00	N	1.00	1.00	0.00
0.00	180.0	7/8" Coax	3	1.09	0.33	100	Lin App	Individual	0.00	N	1.00	1.00	0.00
0.00	170.0	1 1/4" Coax	1	1.55	0.63	100	Lin App	Individual	0.00	N	1.00	1.00	0.00
0.00	170.0	1 5/8" Coax	12	1.98	0.82	100	Lin App	Individual	0.00	N	1.00	1.00	0.00
0.00	170.0	1 5/8" Hybrid	1	1.63	1.61	100	Lin App	Individual	0.00	N	1.00	1.00	0.01
0.00	170.0	1 5/8" Hybrid	1	1.63	1.61	100	Lin App	Individual	0.00	N	1.00	1.00	0.01
0.00	170.0	Waveguide	1	1.50	6.00	100	Lin App	Individual	0.00	N	1.00	1.00	0.00
0.00	160.0	1 5/8" Coax	12	1.98	0.82	100	Lin App	Individual	0.00	N	1.00	1.00	0.00
0.00	160.0	Waveguide	1	1.50	6.00	100	Lin App	Individual	0.00	N	1.00	1.00	0.00
0.00	160.0	Waveguide	1	1.50	6.00	100	Lin App	Individual	0.00	N	1.00	1.00	0.00
0.00	150.0	1 1/4" Hybriflex	3	1.54	1.00	100	Lin App	Individual	0.00	N	1.00	1.00	0.00
0.00	150.0	1 1/4" Hybriflex	1	1.54	1.00	100	Lin App	Individual	0.00	N	1.00	1.00	0.00
0.00	150.0	Waveguide	1	1.50	6.00	100	Lin App	Individual	0.00	N	1.00	1.00	0.00
0.00	140.0	1 1/4" Coax	6	1.55	0.63	100	Lin App	Individual	0.00	N	1.00	1.00	0.00
0.00	140.0	Waveguide	1	1.50	6.00	100	Lin App	Individual	0.00	N	1.00	1.00	0.00
0.00	130.0	1 5/8" Coax	12	1.98	0.82	50	Lin App	Block	0.00	N	1.00	1.00	0.00
0.00	130.0	Waveguide	1	1.50	6.00	100	Lin App	Individual	0.00	N	1.00	1.00	0.00
0.00	125.0	7/8" Coax	1	1.09	0.33	100	Lin App	Individual	0.00	N	1.00	1.00	0.00
0.00	90.00	7/8" Coax	2	1.09	0.33	100	Lin App	Individual	0.00	N	1.00	1.00	0.00
0.00	75.00	1/2" Coax	1	0.63	0.15	100	Lin App	Individual	0.00	N	1.00	1.00	0.00

Site Number: 383660 Code: ANSI/TIA-222-G

Site Name: North Madison Volunteer FD, CT Engineering Number: OAA745468_C3_01 3/14/2019 7:15:45 PM

Customer: AT&T MOBILITY

Equivalent Lateral Force Method

(Based on ASCE7-10 Chapters 11, 12 & 15)

Spectral Response Acceleration for Short Period (S_s):	0.17
Spectral Response Acceleration at 1.0 Second Period (S_1):	0.06
Long-Period Transition Period (T_L - Seconds):	6
Importance Factor (I_e):	1.00
Site Coefficient F_a:	1.60
Site Coefficient F_v:	2.40
Response Modification Coefficient (R):	3.00
Design Spectral Response Acceleration at Short Period (S_{ds}):	0.18
Design Spectral Response Acceleration at 1.0 Second Period (S_{d1}):	0.10
Seismic Response Coefficient (C_s):	0.05
Upper Limit C_s:	0.05
Lower Limit C_s:	0.03
Period based on Rayleigh Method (sec):	0.67
Redundancy Factor (p):	1.30
Seismic Force Distribution Exponent (k):	1.09
Total Unfactored Dead Load:	58.87 k
Seismic Base Shear (E):	3.64 k

LoadCase (1.2 + 0.2Sds) * DL + E Seismic

Section	Height Above Base (ft)	Weight (lb)	W_z (lb-ft)	C_{vx}	Horizontal Force (lb)	Vertical Force (lb)
9	170.00	1,618	427,838	0.057	209	2,002
8	150.00	2,995	691,220	0.093	338	3,705
7	130.00	3,866	763,753	0.102	373	4,782
6	110.00	4,563	751,901	0.101	367	5,644
5	90.00	5,245	695,076	0.093	339	6,488
4	70.00	6,021	607,292	0.081	297	7,448
3	50.00	6,538	457,618	0.061	224	8,087
2	30.00	7,440	299,008	0.040	146	9,203
1	10.00	8,973	109,377	0.015	53	11,099
2-Bay Dipole	180.00	18	4,923	0.001	2	22
4-Bay Dipole	180.00	35	9,845	0.001	5	43
Flat Side Arm	180.00	450	126,581	0.017	62	557
RFS PD455	180.00	48	13,502	0.002	7	59
Alcatel Lucent RRH ALU 4X45 AWS	170.00	190	50,202	0.007	25	235
ALU RRH2X60PCS	170.00	165	43,620	0.006	21	204
ALU RRH4X60LTE	170.00	159	42,034	0.006	21	197
Andrew 8' MW Dish	170.00	400	105,745	0.014	52	495
Antel BXA-70063/4CF	170.00	20	5,234	0.001	3	24
Antel BXA-70063/6CF	170.00	17	4,494	0.001	2	21
Commscope LNX6514DS-A1M	170.00	86	22,762	0.003	11	106
Commscope SBNHH-1D65B	170.00	244	64,399	0.009	31	301
Flat Light Sector Frame	170.00	1,200	317,235	0.043	155	1,484
RFS DB-T1-6Z-8AB-0Z	170.00	44	11,632	0.002	6	54

Equivalent Lateral Force Method

RFS DB-T1-6Z-8AB-0Z	170.00	44	11,632	0.002	6	54
RFS FD9R6004/2C-3L	170.00	16	4,124	0.001	2	19
Andrew DB844H90E-XY	160.00	168	41,583	0.006	20	208
Flat Light Sector Frame	160.00	1,200	297,022	0.040	145	1,484
ALU 1900 MHz 4X45 RRH	150.00	180	41,538	0.006	20	223
ALU 800 MHz 2X50W RRH w/ Filter	150.00	192	44,307	0.006	22	237
ALU TD-RRH8X20	150.00	198	45,761	0.006	22	245
Flat Light Sector Frame	150.00	1,200	276,918	0.037	135	1,484
RFS APXVSPP18-C-A20	150.00	171	39,461	0.005	19	212
RFS APXVTM14-C-I20	150.00	159	36,622	0.005	18	196
CCI HPA65R-BU6A	140.00	126	26,913	0.004	13	155
Ericsson RRUS 4449 B5, B12	140.00	213	45,605	0.006	22	263
Ericsson RRUS 8843 B2, B66A	140.00	216	46,247	0.006	23	267
Flat Light Sector Frame	140.00	1,200	256,928	0.034	125	1,484
Kathrein Scala 80010965	140.00	293	62,690	0.008	31	362
Powerwave Allgon 7770.00	140.00	105	22,481	0.003	11	130
Powerwave Allgon LGP21401	140.00	85	18,113	0.002	9	105
Raycap DC6-48-60-18-8F	140.00	20	4,282	0.001	2	25
Raycap DC6-48-60-18-8F (23.5" Height)	140.00	20	4,282	0.001	2	25
Commscope LNX-6515DS-VTM	130.00	151	29,810	0.004	15	187
EMS RR90-17-02DP	130.00	41	8,001	0.001	4	50
Flat Light Sector Frame	130.00	1,200	237,061	0.032	116	1,484
Flat T-Arm	130.00	750	148,163	0.020	72	928
RFS ATMAP1412D-1A20	130.00	39	7,704	0.001	4	48
Flat Side Arm	125.00	150	28,397	0.004	14	186
Sinclair SC323-HF2LDF	125.00	6	1,174	0.000	1	8
Flat Side Arm	90.00	300	39,753	0.005	19	371
RFI FSA10-67-DIN	90.00	9	1,193	0.000	1	11
Sinclair SC323-HF2LDF	90.00	6	822	0.000	0	8
PCTEL GPS-TMG-HR-26N	75.00	1	65	0.000	0	1
Stand-Off	75.00	75	8,153	0.001	4	93
		58,868	7,462,096	1.000	3,645	72,815

LoadCase (0.9 - 0.2Sds) * DL + E — Seismic (Reduced DL)

Section	Height Above Base (ft)	Weight (lb)	W_z (lb-ft)	C_{vx}	Horizontal Force (lb)	Vertical Force (lb)
9	170.00	1,618	427,838	0.057	209	1,397
8	150.00	2,995	691,220	0.093	338	2,585
7	130.00	3,866	763,753	0.102	373	3,337
6	110.00	4,563	751,901	0.101	367	3,938
5	90.00	5,245	695,076	0.093	339	4,527
4	70.00	6,021	607,292	0.081	297	5,197
3	50.00	6,538	457,618	0.061	224	5,643
2	30.00	7,440	299,008	0.040	146	6,421
1	10.00	8,973	109,377	0.015	53	7,745
2-Bay Dipole	180.00	18	4,923	0.001	2	15
4-Bay Dipole	180.00	35	9,845	0.001	5	30
Flat Side Arm	180.00	450	126,581	0.017	62	388
RFS PD455	180.00	48	13,502	0.002	7	41
Alcatel Lucent RRH ALU 4X45 AWS	170.00	190	50,202	0.007	25	164
ALU RRH2X60PCS	170.00	165	43,620	0.006	21	142
ALU RRH4X60LTE	170.00	159	42,034	0.006	21	137
Andrew 8' MW Dish	170.00	400	105,745	0.014	52	345

Equivalent Lateral Force Method

Antel BXA-70063/4CF	170.00	20	5,234	0.001	3	17
Antel BXA-70063/6CF	170.00	17	4,494	0.001	2	15
Commscope LNX6514DS-A1M	170.00	86	22,762	0.003	11	74
Commscope SBNHH-1D65B	170.00	244	64,399	0.009	31	210
Flat Light Sector Frame	170.00	1,200	317,235	0.043	155	1,036
RFS DB-T1-6Z-8AB-0Z	170.00	44	11,632	0.002	6	38
RFS DB-T1-6Z-8AB-0Z	170.00	44	11,632	0.002	6	38
RFS FD9R6004/2C-3L	170.00	16	4,124	0.001	2	13
Andrew DB844H90E-XY	160.00	168	41,583	0.006	20	145
Flat Light Sector Frame	160.00	1,200	297,022	0.040	145	1,036
ALU 1900 MHz 4X45 RRH	150.00	180	41,538	0.006	20	155
ALU 800 MHz 2X50W RRH w/ Filter	150.00	192	44,307	0.006	22	166
ALU TD-RRH8X20	150.00	198	45,761	0.006	22	171
Flat Light Sector Frame	150.00	1,200	276,918	0.037	135	1,036
RFS APXVSPP18-C-A20	150.00	171	39,461	0.005	19	148
RFS APXVTM14-C-I20	150.00	159	36,622	0.005	18	137
CCI HPA65R-BU6A	140.00	126	26,913	0.004	13	108
Ericsson RRUS 4449 B5, B12	140.00	213	45,605	0.006	22	184
Ericsson RRUS 8843 B2, B66A	140.00	216	46,247	0.006	23	186
Flat Light Sector Frame	140.00	1,200	256,928	0.034	125	1,036
Kathrein Scala 80010965	140.00	293	62,690	0.008	31	253
Powerwave Allgon 7770.00	140.00	105	22,481	0.003	11	91
Powerwave Allgon LGP21401	140.00	85	18,113	0.002	9	73
Raycap DC6-48-60-18-8F	140.00	20	4,282	0.001	2	17
Raycap DC6-48-60-18-8F (23.5" Height)	140.00	20	4,282	0.001	2	17
Commscope LNX-6515DS-VTM	130.00	151	29,810	0.004	15	130
EMS RR90-17-02DP	130.00	41	8,001	0.001	4	35
Flat Light Sector Frame	130.00	1,200	237,061	0.032	116	1,036
Flat T-Arm	130.00	750	148,163	0.020	72	647
RFS ATMAP1412D-1A20	130.00	39	7,704	0.001	4	34
Flat Side Arm	125.00	150	28,397	0.004	14	129
Sinclair SC323-HF2LDF	125.00	6	1,174	0.000	1	5
Flat Side Arm	90.00	300	39,753	0.005	19	259
RFI FSA10-67-DIN	90.00	9	1,193	0.000	1	8
Sinclair SC323-HF2LDF	90.00	6	822	0.000	0	5
PCTEL GPS-TMG-HR-26N	75.00	1	65	0.000	0	1
Stand-Off	75.00	75	8,153	0.001	4	65
		58,868	7,462,095	1.000	3,645	50,809

Site Number: 383660 Code: ANSI/TIA-222-G

Site Name: North Madison Volunteer FD, CT Engineering Number: OAA745468_C3_01 3/14/2019 7:15:45 PM

Customer: AT&T MOBILITY

Equivalent Modal Analysis Method

(Based on ASCE7-10 Chapters 11, 12 & 15 and ANSI/TIA-G, section 2.7)

Spectral Response Acceleration for Short Period (S_s):	0.17
Spectral Response Acceleration at 1.0 Second Period (S_1):	0.06
Importance Factor (I_e):	1.00
Site Coefficient F_a:	1.60
Site Coefficient F_v:	2.40
Response Modification Coefficient (R):	3.00
Design Spectral Response Acceleration at Short Period (S_{ds}):	0.18
Desing Spectral Response Acceleration at 1.0 Second Period (S_{d1}):	0.10
Period Based on Rayleigh Method (sec):	0.67
Redundancy Factor (p):	1.30

LoadCase (1.2 + 0.2Sds) * DL + E Seismic

Section	Height Above Base (ft)	Weight (lb)	a	b	c	S_{az}	Horizontal Force (lb)	Vertical Force (lb)
9	170.00	1,618	1.686	1.069	0.793	0.325	228	2,002
8	150.00	2,995	1.312	0.138	0.347	0.175	228	3,705
7	130.00	3,866	0.986	-0.113	0.124	0.104	174	4,782
6	110.00	4,563	0.706	-0.089	0.031	0.078	154	5,644
5	90.00	5,245	0.472	-0.006	0.006	0.066	149	6,488
4	70.00	6,021	0.286	0.048	0.013	0.052	135	7,448
3	50.00	6,538	0.146	0.068	0.031	0.036	103	8,087
2	30.00	7,440	0.053	0.071	0.042	0.024	76	9,203
1	10.00	8,973	0.006	0.047	0.027	0.012	46	11,099
2-Bay Dipole	180.00	18	1.890	1.980	1.140	0.436	3	22
4-Bay Dipole	180.00	35	1.890	1.980	1.140	0.436	7	43
Flat Side Arm	180.00	450	1.890	1.980	1.140	0.436	85	557
RFS PD455	180.00	48	1.890	1.980	1.140	0.436	9	59
Alcatel Lucent RRH ALU 4X45	170.00	190	1.686	1.069	0.793	0.325	27	235
ALU RRH2X60PCS	170.00	165	1.686	1.069	0.793	0.325	23	204
ALU RRH4X60LTE	170.00	159	1.686	1.069	0.793	0.325	22	197
Andrew 8' MW Dish	170.00	400	1.686	1.069	0.793	0.325	56	495
Antel BXA-70063/4CF	170.00	20	1.686	1.069	0.793	0.325	3	24
Antel BXA-70063/6CF	170.00	17	1.686	1.069	0.793	0.325	2	21
Commscope LNX6514DS-A1M	170.00	86	1.686	1.069	0.793	0.325	12	106
Commscope SBNHH-1D65B	170.00	244	1.686	1.069	0.793	0.325	34	301
Flat Light Sector Frame	170.00	1,200	1.686	1.069	0.793	0.325	169	1,484
RFS DB-T1-6Z-8AB-0Z	170.00	44	1.686	1.069	0.793	0.325	6	54
RFS DB-T1-6Z-8AB-0Z	170.00	44	1.686	1.069	0.793	0.325	6	54
RFS FD9R6004/2C-3L	170.00	16	1.686	1.069	0.793	0.325	2	19
Andrew DB844H90E-XY	160.00	168	1.493	0.485	0.535	0.239	17	208
Flat Light Sector Frame	160.00	1,200	1.493	0.485	0.535	0.239	124	1,484
ALU 1900 MHz 4X45 RRH	150.00	180	1.312	0.138	0.347	0.175	14	223
ALU 800 MHz 2X50W RRH w/ Filter	150.00	192	1.312	0.138	0.347	0.175	15	237
ALU TD-RRH8X20	150.00	198	1.312	0.138	0.347	0.175	15	245
Flat Light Sector Frame	150.00	1,200	1.312	0.138	0.347	0.175	91	1,484
RFS APXVSPP18-C-A20	150.00	171	1.312	0.138	0.347	0.175	13	212
RFS APXVTM14-C-I20	150.00	159	1.312	0.138	0.347	0.175	12	196
CCI HPA65R-BU6A	140.00	126	1.143	-0.042	0.215	0.132	7	155
Ericsson RRUS 4449 B5, B12	140.00	213	1.143	-0.042	0.215	0.132	12	263
Ericsson RRUS 8843 B2, B66A	140.00	216	1.143	-0.042	0.215	0.132	12	267
Flat Light Sector Frame	140.00	1,200	1.143	-0.042	0.215	0.132	68	1,484
Kathrein Scala 80010965	140.00	293	1.143	-0.042	0.215	0.132	17	362

Equivalent Modal Analysis Method

Powerwave Allgon 7770.00	140.00	105	1.143	-0.042	0.215	0.132	6	130
Powerwave Allgon LGP21401	140.00	85	1.143	-0.042	0.215	0.132	5	105
Raycap DC6-48-60-18-8F	140.00	20	1.143	-0.042	0.215	0.132	1	25
Raycap DC6-48-60-18-8F (23.5"	140.00	20	1.143	-0.042	0.215	0.132	1	25
Commscope LNX-6515DS-VTM	130.00	151	0.986	-0.113	0.124	0.104	7	187
EMS RR90-17-02DP	130.00	41	0.986	-0.113	0.124	0.104	2	50
Flat Light Sector Frame	130.00	1,200	0.986	-0.113	0.124	0.104	54	1,484
Flat T-Arm	130.00	750	0.986	-0.113	0.124	0.104	34	928
RFS ATMAP1412D-1A20	130.00	39	0.986	-0.113	0.124	0.104	2	48
Flat Side Arm	125.00	150	0.911	-0.122	0.092	0.094	6	186
Sinclair SC323-HF2LDF	125.00	6	0.911	-0.122	0.092	0.094	0	8
Flat Side Arm	90.00	300	0.472	-0.006	0.006	0.066	9	371
RFI FSA10-67-DIN	90.00	9	0.472	-0.006	0.006	0.066	0	11
Sinclair SC323-HF2LDF	90.00	6	0.472	-0.006	0.006	0.066	0	8
PCTEL GPS-TMG-HR-26N	75.00	1	0.328	0.039	0.010	0.056	0	1
Stand-Off	75.00	75	0.328	0.039	0.010	0.056	2	93
		58,868	63.420	22.654	21.421	10.246	2,306	72,815

LoadCase (0.9 - 0.2Sds) * DL + E Seismic (Reduced DL)

Section	Height Above Base (ft)	Weight (lb)	a	b	c	S_{az}	Horizontal Force (lb)	Vertical Force (lb)
9	170.00	1,618	1.686	1.069	0.793	0.325	228	1,397
8	150.00	2,995	1.312	0.138	0.347	0.175	228	2,585
7	130.00	3,866	0.986	-0.113	0.124	0.104	174	3,337
6	110.00	4,563	0.706	-0.089	0.031	0.078	154	3,938
5	90.00	5,245	0.472	-0.006	0.006	0.066	149	4,527
4	70.00	6,021	0.286	0.048	0.013	0.052	135	5,197
3	50.00	6,538	0.146	0.068	0.031	0.036	103	5,643
2	30.00	7,440	0.053	0.071	0.042	0.024	76	6,421
1	10.00	8,973	0.006	0.047	0.027	0.012	46	7,745
2-Bay Dipole	180.00	18	1.890	1.980	1.140	0.436	3	15
4-Bay Dipole	180.00	35	1.890	1.980	1.140	0.436	7	30
Flat Side Arm	180.00	450	1.890	1.980	1.140	0.436	85	388
RFS PD455	180.00	48	1.890	1.980	1.140	0.436	9	41
Alcatel Lucent RRH ALU 4X45	170.00	190	1.686	1.069	0.793	0.325	27	164
ALU RRH2X60PCS	170.00	165	1.686	1.069	0.793	0.325	23	142
ALU RRH4X60LTE	170.00	159	1.686	1.069	0.793	0.325	22	137
Andrew 8' MW Dish	170.00	400	1.686	1.069	0.793	0.325	56	345
Antel BXA-70063/4CF	170.00	20	1.686	1.069	0.793	0.325	3	17
Antel BXA-70063/6CF	170.00	17	1.686	1.069	0.793	0.325	2	15
Commscope LNX6514DS-A1M	170.00	86	1.686	1.069	0.793	0.325	12	74
Commscope SBNHH-1D65B	170.00	244	1.686	1.069	0.793	0.325	34	210
Flat Light Sector Frame	170.00	1,200	1.686	1.069	0.793	0.325	169	1,036
RFS DB-T1-6Z-8AB-0Z	170.00	44	1.686	1.069	0.793	0.325	6	38
RFS DB-T1-6Z-8AB-0Z	170.00	44	1.686	1.069	0.793	0.325	6	38
RFS FD9R6004/2C-3L	170.00	16	1.686	1.069	0.793	0.325	2	13
Andrew DB844H90E-XY	160.00	168	1.493	0.485	0.535	0.239	17	145
Flat Light Sector Frame	160.00	1,200	1.493	0.485	0.535	0.239	124	1,036
ALU 1900 MHz 4X45 RRH	150.00	180	1.312	0.138	0.347	0.175	14	155
ALU 800 MHz 2X50W RRH w/ Filter	150.00	192	1.312	0.138	0.347	0.175	15	166
ALU TD-RRH8X20	150.00	198	1.312	0.138	0.347	0.175	15	171
Flat Light Sector Frame	150.00	1,200	1.312	0.138	0.347	0.175	91	1,036
RFS APXVSPP18-C-A20	150.00	171	1.312	0.138	0.347	0.175	13	148
RFS APXVTM14-C-I20	150.00	159	1.312	0.138	0.347	0.175	12	137
CCI HPA65R-BU6A	140.00	126	1.143	-0.042	0.215	0.132	7	108
Ericsson RRUS 4449 B5, B12	140.00	213	1.143	-0.042	0.215	0.132	12	184
Ericsson RRUS 8843 B2, B66A	140.00	216	1.143	-0.042	0.215	0.132	12	186
Flat Light Sector Frame	140.00	1,200	1.143	-0.042	0.215	0.132	68	1,036
Kathrein Scala 80010965	140.00	293	1.143	-0.042	0.215	0.132	17	253
Powerwave Allgon 7770.00	140.00	105	1.143	-0.042	0.215	0.132	6	91
Powerwave Allgon LGP21401	140.00	85	1.143	-0.042	0.215	0.132	5	73
Raycap DC6-48-60-18-8F	140.00	20	1.143	-0.042	0.215	0.132	1	17

Equivalent Modal Analysis Method

Raycap DC6-48-60-18-8F (23.5"	140.00	20	1.143	-0.042	0.215	0.132	1	17
Commscope LNX-6515DS-VTM	130.00	151	0.986	-0.113	0.124	0.104	7	130
EMS RR90-17-02DP	130.00	41	0.986	-0.113	0.124	0.104	2	35
Flat Light Sector Frame	130.00	1,200	0.986	-0.113	0.124	0.104	54	1,036
Flat T-Arm	130.00	750	0.986	-0.113	0.124	0.104	34	647
RFS ATMAP1412D-1A20	130.00	39	0.986	-0.113	0.124	0.104	2	34
Flat Side Arm	125.00	150	0.911	-0.122	0.092	0.094	6	129
Sinclair SC323-HF2LDF	125.00	6	0.911	-0.122	0.092	0.094	0	5
Flat Side Arm	90.00	300	0.472	-0.006	0.006	0.066	9	259
RFI FSA10-67-DIN	90.00	9	0.472	-0.006	0.006	0.066	0	8
Sinclair SC323-HF2LDF	90.00	6	0.472	-0.006	0.006	0.066	0	5
PCTEL GPS-TMG-HR-26N	75.00	1	0.328	0.039	0.010	0.056	0	1
Stand-Off	75.00	75	0.328	0.039	0.010	0.056	2	65
		58,868	63.420	22.654	21.421	10.246	2,306	50,809

Force/Stress Summary

Section: 1 1 Bot Elev (ft): 0.00 Height (ft): 20.000

Max Compression Member	Pu (kip)	Load Case	Len (ft)	Bracing % X	Y	Z	KL/R	F'y (ksi)	Phic Pn (kip)	Num Bolts	Num Holes	Shear phiRnv (kip)	Bear phiRn (kip)	Use %	Controls
LEG PX - 10" DIA PIPE	-308.68	1.2D + 1.6W Normal	10.03	100	100	100	33.1	50.0	668.58	0	0	0.00	0.00	46	Member X
HORIZ PST - 3" DIA PIPE	-8.85	1.2D + 1.6W 90 deg	12.04	100	100	100	124.6	50.0	32.47	2	0	0.00	0.00	27	Member X
DIAG PX - 3-1/2" DIA PIPE	-12.61	1.2D + 1.6W 90 deg	16.14	100	100	100	147.9	50.0	38.02	3	0	0.00	0.00	33	Member X

Max Tension Member	Pu (kip)	Load Case	Fy (ksi)	Fu (ksi)	Phit Pn (kip)	Num Bolts	Num Holes	Shear phiRnv (kip)	Bear phiRn (kip)	Blk Shear phit Pn (kip)	Use %	Controls
LEG PX - 10" DIA PIPE	269.34	0.9D + 1.6W 60 deg	50	65	724.50	0	0	0.00	0.00		37	Member
HORIZ PST - 3" DIA PIPE	9.77	1.2D + 1.6W 90 deg	50	65	100.35	2	0	0.00	32.43	0.00	30	Bolt Bear
DIAG PX - 3-1/2" DIA PIPE	12.24	1.2D + 1.6W 90 deg	50	65	165.60	3	0	0.00	77.51	0.00	15	Bolt Bear

Max Splice Forces	Pu (kip)	Load Case	phiRnt (kip)	Use %	Num Bolts	Bolt Type
Top Tension	255.55	0.9D + 1.6W 180 deg	0.00	0	0	
Top Compression	291.97	1.2D + 1.6W Normal	0.00	0		
Bot Tension	282.99	0.9D + 1.6W 180 deg	969.19	35	16	1" A354-BC
Bot Compression	323.34	1.2D + 1.6W Normal	0.00	0		

Section: 2 2 Bot Elev (ft): 20.00 Height (ft): 20.000

Max Compression Member	Pu (kip)	Load Case	Len (ft)	Bracing % X	Y	Z	KL/R	F'y (ksi)	Phic Pn (kip)	Num Bolts	Num Holes	Shear phiRnv (kip)	Bear phiRn (kip)	Use %	Controls
LEG PX - 10" DIA PIPE	-277.37	1.2D + 1.6W Normal	10.03	100	100	100	33.1	50.0	668.58	0	0	0.00	0.00	41	Member X
HORIZ PST - 2-1/2" DIA PIP	-8.70	1.2D + 1.6W 90 deg	10.79	100	100	100	136.7	50.0	20.59	2	0	0.00	0.00	42	Member X
DIAG PST - 3" DIA PIPE	-13.00	1.2D + 1.6W 90 deg	15.18	100	100	100	157.0	50.0	20.43	3	0	0.00	0.00	63	Member X

Max Tension Member	Pu (kip)	Load Case	Fy (ksi)	Fu (ksi)	Phit Pn (kip)	Num Bolts	Num Holes	Shear phiRnv (kip)	Bear phiRn (kip)	Blk Shear phit Pn (kip)	Use %	Controls
LEG PX - 10" DIA PIPE	243.10	0.9D + 1.6W 60 deg	50	65	724.50	0	0	0.00	0.00		33	Member
HORIZ PST - 2-1/2" DIA PIP	9.22	1.2D + 1.6W 90 deg	50	65	76.68	2	0	0.00	25.33	0.00	36	Bolt Bear
DIAG PST - 3" DIA PIPE	11.87	1.2D + 1.6W 90 deg	50	65	100.35	3	0	0.00	43.80	0.00	27	Bolt Bear

Max Splice Forces	Pu (kip)	Load Case	phiRnt (kip)	Use %	Num Bolts	Bolt Type
Top Tension	228.86	0.9D + 1.6W 180 deg	0.00	0	0	
Top Compression	260.08	1.2D + 1.6W Normal	0.00	0		
Bot Tension	255.55	0.9D + 1.6W 180 deg	654.20	39	12	1 A325
Bot Compression	0.00		0.00	0		

Force/Stress Summary

Section: 3 3 Bot Elev (ft): 40.00 Height (ft): 20.000

Max Compression Member	Pu (kip)	Load Case	Len (ft)	Bracing % X	Y	Z	KL/R	F'y (ksi)	Phic Pn (kip)	Num Bolts	Num Holes	Shear phiRnv (kip)	Bear phiRn (kip)	Use %	Controls
LEG PX - 8" DIA PIPE	-245.23	1.2D + 1.6W Normal	10.03	100	100	100	41.8	50.0	506.95	0	0	0.00	0.00	48	Member X
HORIZ PST - 2-1/2" DIA PIP	-7.99	0.9D + 1.6W 90 deg	9.503	100	100	100	120.4	50.0	26.55	2	0	0.00	0.00	30	Member X
DIAG PST - 3" DIA PIPE	-12.42	1.2D + 1.6W 90 deg	14.26	100	100	100	147.6	50.0	23.13	3	0	0.00	0.00	53	Member X

Max Tension Member	Pu (kip)	Load Case	Fy (ksi)	Fu (ksi)	Phit Pn (kip)	Num Bolts	Num Holes	Shear phiRnv (kip)	Bear phiRn (kip)	Blk Shear phit Pn (kip)	Use %	Controls
LEG PX - 8" DIA PIPE	215.98	0.9D + 1.6W 60 deg	50	65	576.00	0	0	0.00	0.00		37	Member
HORIZ PST - 2-1/2" DIA PIP	8.25	1.2D + 1.6W 90 deg	50	65	76.68	2	0	0.00	25.33	0.00	32	Bolt Bear
DIAG PST - 3" DIA PIPE	11.48	1.2D + 1.6W 90 deg	50	65	100.35	3	0	0.00	43.80	0.00	26	Bolt Bear

Max Splice Forces	Pu (kip)	Load Case	phiRnt (kip)	Use %	Num Bolts	Bolt Type
Top Tension	201.43	0.9D + 1.6W 180 deg	0.00	0	0	
Top Compression	227.93	1.2D + 1.6W Normal	0.00	0		
Bot Tension	228.86	0.9D + 1.6W 180 deg	654.20	35	12	1 A325
Bot Compression	0.00		0.00	0		

Section: 4 4 Bot Elev (ft): 60.00 Height (ft): 20.000

Max Compression Member	Pu (kip)	Load Case	Len (ft)	Bracing % X	Y	Z	KL/R	F'y (ksi)	Phic Pn (kip)	Num Bolts	Num Holes	Shear phiRnv (kip)	Bear phiRn (kip)	Use %	Controls
LEG PX - 8" DIA PIPE	-210.95	1.2D + 1.6W Normal	10.03	100	100	100	41.8	50.0	507.00	0	0	0.00	0.00	41	Member X
HORIZ PST - 2" DIA PIPE	-7.90	0.9D + 1.6W 90 deg	8.214	100	100	100	125.2	50.0	15.41	2	0	0.00	0.00	51	Member X
DIAG PST - 3" DIA PIPE	-13.13	1.2D + 1.6W 90 deg	13.35	100	100	100	138.1	50.0	26.41	3	0	0.00	0.00	49	Member X

Max Tension Member	Pu (kip)	Load Case	Fy (ksi)	Fu (ksi)	Phit Pn (kip)	Num Bolts	Num Holes	Shear phiRnv (kip)	Bear phiRn (kip)	Blk Shear phit Pn (kip)	Use %	Controls
LEG PX - 8" DIA PIPE	186.18	0.9D + 1.6W 60 deg	50	65	576.00	0	0	0.00	0.00		32	Member
HORIZ PST - 2" DIA PIPE	8.09	1.2D + 1.6W 90 deg	50	65	48.15	2	0	0.00	19.22	0.00	42	Bolt Bear
DIAG PST - 3" DIA PIPE	12.33	1.2D + 1.6W 90 deg	50	65	100.35	3	0	0.00	43.80	0.00	28	Bolt Bear

Max Splice Forces	Pu (kip)	Load Case	phiRnt (kip)	Use %	Num Bolts	Bolt Type
Top Tension	169.61	0.9D + 1.6W 180 deg	0.00	0	0	
Top Compression	191.71	1.2D + 1.6W Normal	0.00	0		
Bot Tension	201.43	0.9D + 1.6W 180 deg	436.14	46	8	1 A325
Bot Compression	0.00		0.00	0		

Force/Stress Summary

Section: 5 5 Bot Elev (ft): 80.00 Height (ft): 20.000

Max Compression Member	Pu (kip)	Load Case	Len (ft)	Bracing % X	Y	Z	KL/R	F'y (ksi)	Phic Pn (kip)	Num Bolts	Num Holes	Shear phiRnv (kip)	Bear phiRn (kip)	Use %	Controls
LEG PSP - ROHN 8 EHS	-171.77	1.2D + 1.6W Normal	10.02	100	100	100	41.2	50.0	386.39	0	0	0.00	0.00	44	Member X
HORIZ PST - 2" DIA PIPE	-8.02	1.2D + 1.6W 90 deg	7.026	100	100	100	107.1	50.0	20.80	2	0	0.00	0.00	38	Member X
DIAG PST - 3" DIA PIPE	-14.49	1.2D + 1.6W 90 deg	12.55	100	100	100	129.9	50.0	29.85	3	0	0.00	0.00	48	Member X

Max Tension Member	Pu (kip)	Load Case	Fy (ksi)	Fu (ksi)	Phit Pn (kip)	Num Bolts	Num Holes	Shear phiRnv (kip)	Bear phiRn (kip)	Blk Shear phit Pn (kip)	Use %	Controls
LEG PSP - ROHN 8 EHS	149.03	1.2D + 1.6W 180 deg	50	65	437.40	0	0	0.00	0.00		34	Member
HORIZ PST - 2" DIA PIPE	8.14	1.2D + 1.6W 90 deg	50	65	48.15	2	0	0.00	19.22	0.00	42	Bolt Bear
DIAG PST - 3" DIA PIPE	13.82	1.2D + 1.6W 90 deg	50	65	100.35	3	0	0.00	43.80	0.00	31	Bolt Bear

Max Splice Forces	Pu (kip)	Load Case	phiRnt (kip)	Use %	Num Bolts	Bolt Type
Top Tension	131.95	0.9D + 1.6W 180 deg	0.00	0	0	
Top Compression	149.95	1.2D + 1.6W Normal	0.00	0		
Bot Tension	169.61	0.9D + 1.6W 180 deg	436.14	39	8	1 A325
Bot Compression	0.00		0.00	0		

Section: 6 6 Bot Elev (ft): 100.0 Height (ft): 20.000

Max Compression Member	Pu (kip)	Load Case	Len (ft)	Bracing % X	Y	Z	KL/R	F'y (ksi)	Phic Pn (kip)	Num Bolts	Num Holes	Shear phiRnv (kip)	Bear phiRn (kip)	Use %	Controls
LEG PSP - ROHN 6 EHS	-135.94	1.2D + 1.6W Normal	6.68	100	100	100	36.0	50.0	274.62	0	0	0.00	0.00	49	Member X
HORIZ PST - 2" DIA PIPE	-7.41	0.9D + 1.6W 90 deg	6.108	100	100	100	93.1	50.0	25.54	2	0	0.00	0.00	29	Member X
DIAG PST - 2-1/2" DIA PIP	-11.39	1.2D + 1.6W 90 deg	9.288	100	100	100	117.7	50.0	27.79	3	0	0.00	0.00	40	Member X

Max Tension Member	Pu (kip)	Load Case	Fy (ksi)	Fu (ksi)	Phit Pn (kip)	Num Bolts	Num Holes	Shear phiRnv (kip)	Bear phiRn (kip)	Blk Shear phit Pn (kip)	Use %	Controls
LEG PSP - ROHN 6 EHS	118.76	0.9D + 1.6W 60 deg	50	65	301.95	0	0	0.00	0.00		39	Member
HORIZ PST - 2" DIA PIPE	7.51	1.2D + 1.6W 90 deg	50	65	48.15	2	0	0.00	19.22	0.00	39	Bolt Bear
DIAG PST - 2-1/2" DIA PIP	11.21	1.2D + 1.6W 90 deg	50	65	76.68	3	0	0.00	41.17	0.00	27	Bolt Bear

Max Splice Forces	Pu (kip)	Load Case	phiRnt (kip)	Use %	Num Bolts	Bolt Type
Top Tension	90.38	0.9D + 1.6W 180 deg	0.00	0	0	
Top Compression	104.73	1.2D + 1.6W Normal	0.00	0		
Bot Tension	131.95	0.9D + 1.6W 180 deg	436.14	30	8	1 A325
Bot Compression	0.00		0.00	0		

Force/Stress Summary

Section: 7 7 Bot Elev (ft): 120.0 Height (ft): 20.000

Max Compression Member	Pu (kip)	Load Case	Len (ft)	Bracing % X	Y	Z	KL/R	F'y (ksi)	Phic Pn (kip)	Num Bolts	Num Holes	Shear phiRnv (kip)	Bear phiRn (kip)	Use %	Controls
LEG PSP - ROHN 5 EH	-89.30	1.2D + 1.6W Normal	6.68	100	100	100	43.6	50.0	239.34	0	0	0.00	0.00	37	Member X
HORIZ PST - 1-1/2" DIA PIP	-6.94	1.2D + 1.6W 90 deg	5.049	100	100	100	97.2	50.0	18.01	2	0	0.00	0.00	38	Member X
DIAG PX - 2" DIA PIPE	-11.72	1.2D + 1.6W 90 deg	8.579	99	99	99	133.1	50.0	18.89	3	0	0.00	0.00	62	Member X

Max Tension Member	Pu (kip)	Load Case	Fy (ksi)	Fu (ksi)	Phit Pn (kip)	Num Bolts	Num Holes	Shear phiRnv (kip)	Bear phiRn (kip)	Blk Shear phit Pn (kip)	Use %	Controls
LEG PSP - ROHN 5 EH	75.17	0.9D + 1.6W 60 deg	50	65	274.95	0	0	0.00	0.00		27	Member
HORIZ PST - 1-1/2" DIA PIP	7.00	1.2D + 1.6W 90 deg	50	65	35.96	2	0	0.00	18.10	0.00	38	Bolt Bear
DIAG PX - 2" DIA PIPE	11.39	1.2D + 1.6W 90 deg	50	65	66.60	3	0	0.00	44.21	0.00	25	Bolt Bear

Max Splice Forces	Pu (kip)	Load Case	phiRnt (kip)	Use %	Num Bolts	Bolt Type
Top Tension	48.37	0.9D + 1.6W 180 deg	0.00	0	0	
Top Compression	58.27	1.2D + 1.6W Normal	0.00	0		
Bot Tension	90.38	0.9D + 1.6W 180 deg	327.10	28	6	1 A325
Bot Compression	0.00		0.00	0		

Section: 8 8 Bot Elev (ft): 140.0 Height (ft): 20.000

Max Compression Member	Pu (kip)	Load Case	Len (ft)	Bracing % X	Y	Z	KL/R	F'y (ksi)	Phic Pn (kip)	Num Bolts	Num Holes	Shear phiRnv (kip)	Bear phiRn (kip)	Use %	Controls
LEG PX - 4" DIA PIPE	-41.30	1.2D + 1.6W Normal	6.67	100	100	100	54.1	50.0	160.28	0	0	0.00	0.00	25	Member X
HORIZ PST - 1-1/2" DIA PIP	-5.71	1.2D + 1.6W 90 deg	4.340	100	100	100	83.6	50.0	21.57	2	0	0.00	0.00	26	Member X
DIAG PX - 2" DIA PIPE	-11.10	1.2D + 1.6W 90 deg	7.963	100	100	100	124.7	50.0	21.49	3	0	0.00	0.00	51	Member X

Max Tension Member	Pu (kip)	Load Case	Fy (ksi)	Fu (ksi)	Phit Pn (kip)	Num Bolts	Num Holes	Shear phiRnv (kip)	Bear phiRn (kip)	Blk Shear phit Pn (kip)	Use %	Controls
LEG PX - 4" DIA PIPE	33.84	0.9D + 1.6W 180 deg	50	65	198.45	0	0	0.00	0.00		17	Member
HORIZ PST - 1-1/2" DIA PIP	5.82	1.2D + 1.6W 90 deg	50	65	35.96	2	0	0.00	18.10	0.00	32	Bolt Bear
DIAG PX - 2" DIA PIPE	10.86	1.2D + 1.6W 90 deg	50	65	66.60	3	0	0.00	44.21	0.00	24	Bolt Bear

Max Splice Forces	Pu (kip)	Load Case	phiRnt (kip)	Use %	Num Bolts	Bolt Type
Top Tension	10.92	0.9D + 1.6W 180 deg	0.00	0	0	
Top Compression	15.50	1.2D + 1.6W Normal	0.00	0		
Bot Tension	48.37	0.9D + 1.6W 180 deg	218.07	22	4	1 A325
Bot Compression	0.00		0.00	0		

Force/Stress Summary

Section: 9 9 Bot Elev (ft): 160.0 Height (ft): 20.000

Max Compression Member	Pu (kip)	Load Case	Len (ft)	Bracing % X	Y	Z	KL/R	F'y (ksi)	Phic Pn (kip)	Num Bolts	Num Holes	Shear phiRnv (kip)	Bear phiRn (kip)	Use %	Controls
LEG PST - 3" DIA PIPE	-6.69	1.2D + 1.0Di + 1.0Wi	6.67	100	100	100	69.0	50.0	70.87	0	0	0.00	0.00	9	Member X
HORIZ PST - 1-1/2" DIA PIP	-3.27	1.2D + 1.6W Normal	4.299	100	100	100	82.8	50.0	21.78	2	0	0.00	0.00	15	Member X
DIAG PST - 2" DIA PIPE	-5.85	1.2D + 1.6W 90 deg	7.940	100	100	100	121.1	50.0	16.49	3	0	0.00	0.00	35	Member X

Max Tension Member	Pu (kip)	Load Case	Fy (ksi)	Fu (ksi)	Phit Pn (kip)	Num Bolts	Num Holes	Shear phiRnv (kip)	Bear phiRn (kip)	Blk Shear phit Pn (kip)	Use %	Controls
LEG PST - 3" DIA PIPE	3.05	0.9D + 1.6W 180 deg	50	65	100.35	0	0	0.00	0.00		3	Member
HORIZ PST - 1-1/2" DIA PIP	3.30	1.2D + 1.6W 60 deg	50	65	35.96	2	0	0.00	18.10	0.00	18	Bolt Bear
DIAG PST - 2" DIA PIPE	5.73	1.2D + 1.6W 90 deg	50	65	48.15	3	0	0.00	31.23	0.00	18	Bolt Bear

Max Splice Forces	Pu (kip)	Load Case	phiRnt (kip)	Use %	Num Bolts	Bolt Type
Top Tension	0.00		0.00	0	0	
Top Compression	0.91	1.2D + 1.0Di + 1.0Wi	0.00	0		
Bot Tension	10.92	0.9D + 1.6W 180 deg	166.22	7	4	0.875" A325
Bot Compression	0.00		0.00	0		

Detailed Reactions

Load Case	Radius (ft)	Elevation (ft)	Azimuth (deg)	Node	FX (kip)	FY (kip)	FZ (kip)	(-) = Uplift (+) = Down
1.2D + 1.6W Normal	**14.63**	**00.00**	**0**	**1**	**0.00**	**322.19**	**-37.93**	
	14.63	**00.00**	**120**	**1a**	**11.10**	**-125.77**	**-11.61**	
	14.63	**00.00**	**240**	**1b**	**-11.10**	**-125.77**	**-11.61**	
1.2D + 1.6W 60 deg	**14.63**	**00.00**	**0**	**1**	**-4.41**	**172.87**	**-20.21**	
	14.63	**00.00**	**120**	**1a**	**-19.70**	**172.56**	**6.28**	
	14.63	**00.00**	**240**	**1b**	**-28.85**	**-274.78**	**-16.65**	
1.2D + 1.6W 90 deg	**14.63**	**00.00**	**0**	**1**	**-5.15**	**23.55**	**-2.42**	
	14.63	**00.00**	**120**	**1a**	**-30.00**	**281.82**	**14.40**	
	14.63	**00.00**	**240**	**1b**	**-26.01**	**-234.72**	**-11.98**	
1.2D + 1.6W 120 deg	**14.63**	**00.00**	**0**	**1**	**-4.52**	**-125.77**	**15.42**	
	14.63	**00.00**	**120**	**1a**	**-32.85**	**321.88**	**18.96**	
	14.63	**00.00**	**240**	**1b**	**-15.60**	**-125.46**	**-3.80**	
1.2D + 1.6W 180 deg	**14.63**	**00.00**	**0**	**1**	**0.00**	**-275.10**	**33.32**	
	14.63	**00.00**	**120**	**1a**	**-15.30**	**172.87**	**13.92**	
	14.63	**00.00**	**240**	**1b**	**15.30**	**172.87**	**13.92**	
1.2D + 1.6W 210 deg	**14.63**	**00.00**	**0**	**1**	**2.63**	**-235.09**	**28.52**	
	14.63	**00.00**	**120**	**1a**	**0.47**	**23.73**	**5.67**	
	14.63	**00.00**	**240**	**1b**	**27.48**	**282.00**	**18.77**	
1.2D + 1.6W 240 deg	**14.63**	**00.00**	**0**	**1**	**4.52**	**-125.77**	**15.42**	
	14.63	**00.00**	**120**	**1a**	**15.60**	**-125.46**	**-3.80**	
	14.63	**00.00**	**240**	**1b**	**32.85**	**321.88**	**18.96**	
1.2D + 1.6W 300 deg	**14.63**	**00.00**	**0**	**1**	**4.41**	**172.87**	**-20.21**	
	14.63	**00.00**	**120**	**1a**	**28.85**	**-274.78**	**-16.65**	
	14.63	**00.00**	**240**	**1b**	**19.70**	**172.56**	**6.28**	
1.2D + 1.6W 330 deg	**14.63**	**00.00**	**0**	**1**	**2.53**	**282.18**	**-33.19**	
	14.63	**00.00**	**120**	**1a**	**23.38**	**-234.91**	**-16.53**	
	14.63	**00.00**	**240**	**1b**	**4.67**	**23.37**	**-3.25**	
0.9D + 1.6W Normal	**14.63**	**00.00**	**0**	**1**	**0.00**	**316.08**	**-37.32**	
	14.63	**00.00**	**120**	**1a**	**11.62**	**-131.55**	**-11.92**	
	14.63	**00.00**	**240**	**1b**	**-11.62**	**-131.55**	**-11.92**	
0.9D + 1.6W 60 deg	**14.63**	**00.00**	**0**	**1**	**-4.42**	**166.87**	**-19.60**	
	14.63	**00.00**	**120**	**1a**	**-19.18**	**166.56**	**5.97**	
	14.63	**00.00**	**240**	**1b**	**-29.37**	**-280.45**	**-16.95**	
0.9D + 1.6W 90 deg	**14.63**	**00.00**	**0**	**1**	**-5.16**	**17.66**	**-1.82**	
	14.63	**00.00**	**120**	**1a**	**-29.47**	**275.74**	**14.10**	
	14.63	**00.00**	**240**	**1b**	**-26.53**	**-240.42**	**-12.28**	
0.9D + 1.6W 120 deg	**14.63**	**00.00**	**0**	**1**	**-4.52**	**-131.55**	**16.02**	
	14.63	**00.00**	**120**	**1a**	**-32.32**	**315.76**	**18.65**	
	14.63	**00.00**	**240**	**1b**	**-16.13**	**-131.23**	**-4.10**	
0.9D + 1.6W 180 deg	**14.63**	**00.00**	**0**	**1**	**0.00**	**-280.76**	**33.92**	
	14.63	**00.00**	**120**	**1a**	**-14.77**	**166.87**	**13.62**	
	14.63	**00.00**	**240**	**1b**	**14.77**	**166.87**	**13.62**	
0.9D + 1.6W 210 deg	**14.63**	**00.00**	**0**	**1**	**2.63**	**-240.78**	**29.12**	
	14.63	**00.00**	**120**	**1a**	**1.00**	**17.84**	**5.37**	

	14.63	00.00	240	1b	26.95	275.92	18.47
0.9D + 1.6W 240 deg	14.63	00.00	0	1	4.52	-131.55	16.02
	14.63	00.00	120	1a	16.13	-131.23	-4.10
	14.63	00.00	240	1b	32.32	315.76	18.65
0.9D + 1.6W 300 deg	14.63	00.00	0	1	4.42	166.87	-19.60
	14.63	00.00	120	1a	29.37	-280.45	-16.95
	14.63	00.00	240	1b	19.18	166.56	5.97
0.9D + 1.6W 330 deg	14.63	00.00	0	1	2.53	276.10	-32.58
	14.63	00.00	120	1a	23.90	-240.60	-16.83
	14.63	00.00	240	1b	4.15	17.48	-3.56
1.2D + 1.0Di + 1.0Wi Normal	14.63	00.00	0	1	0.00	159.75	-17.39
	14.63	00.00	120	1a	0.20	10.25	-2.01
	14.63	00.00	240	1b	-0.20	10.25	-2.01
1.2D + 1.0Di + 1.0Wi 60 deg	14.63	00.00	0	1	-1.63	109.92	-11.20
	14.63	00.00	120	1a	-10.52	109.81	4.19
	14.63	00.00	240	1b	-6.39	-39.47	-3.69
1.2D + 1.0Di + 1.0Wi 90 deg	14.63	00.00	0	1	-1.89	60.08	-5.02
	14.63	00.00	120	1a	-14.09	146.27	7.05
	14.63	00.00	240	1b	-5.42	-26.10	-2.03
1.2D + 1.0Di + 1.0Wi 120 deg	14.63	00.00	0	1	-1.65	10.25	1.18
	14.63	00.00	120	1a	-15.05	159.64	8.69
	14.63	00.00	240	1b	-1.84	10.36	0.84
1.2D + 1.0Di + 1.0Wi 180 deg	14.63	00.00	0	1	0.00	-39.59	7.38
	14.63	00.00	120	1a	-8.89	109.92	7.01
	14.63	00.00	240	1b	8.89	109.92	7.01
1.2D + 1.0Di + 1.0Wi 210 deg	14.63	00.00	0	1	0.95	-26.23	5.72
	14.63	00.00	120	1a	-3.40	60.15	4.15
	14.63	00.00	240	1b	13.15	146.34	8.68
1.2D + 1.0Di + 1.0Wi 240 deg	14.63	00.00	0	1	1.65	10.25	1.18
	14.63	00.00	120	1a	1.84	10.36	0.84
	14.63	00.00	240	1b	15.05	159.64	8.69
1.2D + 1.0Di + 1.0Wi 300 deg	14.63	00.00	0	1	1.63	109.92	-11.20
	14.63	00.00	120	1a	6.39	-39.47	-3.69
	14.63	00.00	240	1b	10.52	109.81	4.19
1.2D + 1.0Di + 1.0Wi 330 deg	14.63	00.00	0	1	0.94	146.40	-15.73
	14.63	00.00	120	1a	4.47	-26.17	-3.68
	14.63	00.00	240	1b	5.29	60.02	0.87
(1.2 + 0.2Sds) * DL + E Normal M1	14.63	00.00	0	1	0.00	43.82	-4.65
	14.63	00.00	120	1a	-1.32	13.39	0.52
	14.63	00.00	240	1b	1.32	13.39	0.52
(1.2 + 0.2Sds) * DL + E Normal M2	14.63	00.00	0	1	0.00	37.28	-3.86
	14.63	00.00	120	1a	-1.62	16.66	0.80
	14.63	00.00	240	1b	1.62	16.66	0.80
(1.2 + 0.2Sds) * DL + E 60 deg M1	14.63	00.00	0	1	-0.21	33.67	-3.57
	14.63	00.00	120	1a	-3.19	33.67	1.60
	14.63	00.00	240	1b	0.28	3.25	0.16
(1.2 + 0.2Sds) * DL + E 60 deg M2	14.63	00.00	0	1	-0.11	30.41	-3.17
	14.63	00.00	120	1a	-2.80	30.41	1.49
	14.63	00.00	240	1b	0.97	9.78	0.56

(1.2 + 0.2Sds) * DL + E 90 deg M1	**14.63**	**00.00**	**0**	**1**	**-0.24**	**23.53**	**-2.49**
	14.63	**00.00**	**120**	**1a**	**-3.84**	**41.10**	**2.08**
	14.63	**00.00**	**240**	**1b**	**0.47**	**5.97**	**0.41**
(1.2 + 0.2Sds) * DL + E 90 deg M2	**14.63**	**00.00**	**0**	**1**	**-0.13**	**23.53**	**-2.49**
	14.63	**00.00**	**120**	**1a**	**-3.21**	**35.44**	**1.78**
	14.63	**00.00**	**240**	**1b**	**1.09**	**11.62**	**0.71**
(1.2 + 0.2Sds) * DL + E 120 deg M1	**14.63**	**00.00**	**0**	**1**	**-0.21**	**13.39**	**-1.41**
	14.63	**00.00**	**120**	**1a**	**-4.03**	**43.82**	**2.32**
	14.63	**00.00**	**240**	**1b**	**1.11**	**13.39**	**0.88**
(1.2 + 0.2Sds) * DL + E 120 deg M2	**14.63**	**00.00**	**0**	**1**	**-0.11**	**16.66**	**-1.80**
	14.63	**00.00**	**120**	**1a**	**-3.34**	**37.28**	**1.93**
	14.63	**00.00**	**240**	**1b**	**1.50**	**16.66**	**1.00**
(1.2 + 0.2Sds) * DL + E 180 deg M1	**14.63**	**00.00**	**0**	**1**	**0.00**	**3.25**	**-0.33**
	14.63	**00.00**	**120**	**1a**	**-2.99**	**33.67**	**1.96**
	14.63	**00.00**	**240**	**1b**	**2.99**	**33.67**	**1.96**
(1.2 + 0.2Sds) * DL + E 180 deg M2	**14.63**	**00.00**	**0**	**1**	**0.00**	**9.78**	**-1.12**
	14.63	**00.00**	**120**	**1a**	**-2.69**	**30.41**	**1.68**
	14.63	**00.00**	**240**	**1b**	**2.69**	**30.41**	**1.68**
(1.2 + 0.2Sds) * DL + E 210 deg M1	**14.63**	**00.00**	**0**	**1**	**0.12**	**5.97**	**-0.61**
	14.63	**00.00**	**120**	**1a**	**-2.03**	**23.53**	**1.45**
	14.63	**00.00**	**240**	**1b**	**3.72**	**41.10**	**2.28**
(1.2 + 0.2Sds) * DL + E 210 deg M2	**14.63**	**00.00**	**0**	**1**	**0.06**	**11.62**	**-1.30**
	14.63	**00.00**	**120**	**1a**	**-2.09**	**23.53**	**1.36**
	14.63	**00.00**	**240**	**1b**	**3.15**	**35.44**	**1.89**
(1.2 + 0.2Sds) * DL + E 240 deg M1	**14.63**	**00.00**	**0**	**1**	**0.21**	**13.39**	**-1.41**
	14.63	**00.00**	**120**	**1a**	**-1.11**	**13.39**	**0.88**
	14.63	**00.00**	**240**	**1b**	**4.03**	**43.82**	**2.32**
(1.2 + 0.2Sds) * DL + E 240 deg M2	**14.63**	**00.00**	**0**	**1**	**0.11**	**16.66**	**-1.80**
	14.63	**00.00**	**120**	**1a**	**-1.50**	**16.66**	**1.00**
	14.63	**00.00**	**240**	**1b**	**3.34**	**37.28**	**1.93**
(1.2 + 0.2Sds) * DL + E 300 deg M1	**14.63**	**00.00**	**0**	**1**	**0.21**	**33.67**	**-3.57**
	14.63	**00.00**	**120**	**1a**	**-0.28**	**3.25**	**0.16**
	14.63	**00.00**	**240**	**1b**	**3.19**	**33.67**	**1.60**
(1.2 + 0.2Sds) * DL + E 300 deg M2	**14.63**	**00.00**	**0**	**1**	**0.11**	**30.41**	**-3.17**
	14.63	**00.00**	**120**	**1a**	**-0.97**	**9.78**	**0.56**
	14.63	**00.00**	**240**	**1b**	**2.80**	**30.41**	**1.49**
(1.2 + 0.2Sds) * DL + E 330 deg M1	**14.63**	**00.00**	**0**	**1**	**0.12**	**41.10**	**-4.36**
	14.63	**00.00**	**120**	**1a**	**-0.59**	**5.97**	**0.20**
	14.63	**00.00**	**240**	**1b**	**2.27**	**23.53**	**1.04**
(1.2 + 0.2Sds) * DL + E 330 deg M2	**14.63**	**00.00**	**0**	**1**	**0.06**	**35.44**	**-3.67**
	14.63	**00.00**	**120**	**1a**	**-1.16**	**11.62**	**0.59**
	14.63	**00.00**	**240**	**1b**	**2.22**	**23.53**	**1.13**
(0.9 - 0.2Sds) * DL + E Normal M1	**14.63**	**00.00**	**0**	**1**	**0.00**	**36.68**	**-3.90**
	14.63	**00.00**	**120**	**1a**	**-0.67**	**6.29**	**0.15**
	14.63	**00.00**	**240**	**1b**	**0.67**	**6.29**	**0.15**
(0.9 - 0.2Sds) * DL + E Normal M2	**14.63**	**00.00**	**0**	**1**	**0.00**	**30.16**	**-3.11**
	14.63	**00.00**	**120**	**1a**	**-0.97**	**9.55**	**0.43**
	14.63	**00.00**	**240**	**1b**	**0.97**	**9.55**	**0.43**

(0.9 - 0.2Sds) * DL + E 60 deg M1	**14.63**	**00.00**	**0**	**1**	**-0.21**	**26.55**	**-2.82**
	14.63	**00.00**	**120**	**1a**	**-2.54**	**26.55**	**1.23**
	14.63	**00.00**	**240**	**1b**	**-0.37**	**-3.84**	**-0.21**
(0.9 - 0.2Sds) * DL + E 60 deg M2	**14.63**	**00.00**	**0**	**1**	**-0.11**	**23.29**	**-2.42**
	14.63	**00.00**	**120**	**1a**	**-2.15**	**23.29**	**1.11**
	14.63	**00.00**	**240**	**1b**	**0.32**	**2.68**	**0.18**
(0.9 - 0.2Sds) * DL + E 90 deg M1	**14.63**	**00.00**	**0**	**1**	**-0.24**	**16.42**	**-1.74**
	14.63	**00.00**	**120**	**1a**	**-3.18**	**33.97**	**1.70**
	14.63	**00.00**	**240**	**1b**	**-0.18**	**-1.13**	**0.04**
(0.9 - 0.2Sds) * DL + E 90 deg M2	**14.63**	**00.00**	**0**	**1**	**-0.13**	**16.42**	**-1.74**
	14.63	**00.00**	**120**	**1a**	**-2.56**	**28.32**	**1.41**
	14.63	**00.00**	**240**	**1b**	**0.44**	**4.52**	**0.33**
(0.9 - 0.2Sds) * DL + E 120 deg M1	**14.63**	**00.00**	**0**	**1**	**-0.21**	**6.29**	**-0.65**
	14.63	**00.00**	**120**	**1a**	**-3.38**	**36.68**	**1.95**
	14.63	**00.00**	**240**	**1b**	**0.46**	**6.29**	**0.51**
(0.9 - 0.2Sds) * DL + E 120 deg M2	**14.63**	**00.00**	**0**	**1**	**-0.11**	**9.55**	**-1.05**
	14.63	**00.00**	**120**	**1a**	**-2.69**	**30.16**	**1.55**
	14.63	**00.00**	**240**	**1b**	**0.85**	**9.55**	**0.62**
(0.9 - 0.2Sds) * DL + E 180 deg M1	**14.63**	**00.00**	**0**	**1**	**0.00**	**-3.84**	**0.43**
	14.63	**00.00**	**120**	**1a**	**-2.34**	**26.55**	**1.59**
	14.63	**00.00**	**240**	**1b**	**2.34**	**26.55**	**1.59**
(0.9 - 0.2Sds) * DL + E 180 deg M2	**14.63**	**00.00**	**0**	**1**	**0.00**	**2.68**	**-0.36**
	14.63	**00.00**	**120**	**1a**	**-2.04**	**23.29**	**1.31**
	14.63	**00.00**	**240**	**1b**	**2.04**	**23.29**	**1.31**
(0.9 - 0.2Sds) * DL + E 210 deg M1	**14.63**	**00.00**	**0**	**1**	**0.12**	**-1.13**	**0.14**
	14.63	**00.00**	**120**	**1a**	**-1.38**	**16.42**	**1.08**
	14.63	**00.00**	**240**	**1b**	**3.06**	**33.97**	**1.91**
(0.9 - 0.2Sds) * DL + E 210 deg M2	**14.63**	**00.00**	**0**	**1**	**0.06**	**4.52**	**-0.55**
	14.63	**00.00**	**120**	**1a**	**-1.44**	**16.42**	**0.98**
	14.63	**00.00**	**240**	**1b**	**2.50**	**28.32**	**1.52**
(0.9 - 0.2Sds) * DL + E 240 deg M1	**14.63**	**00.00**	**0**	**1**	**0.21**	**6.29**	**-0.65**
	14.63	**00.00**	**120**	**1a**	**-0.46**	**6.29**	**0.51**
	14.63	**00.00**	**240**	**1b**	**3.38**	**36.68**	**1.95**
(0.9 - 0.2Sds) * DL + E 240 deg M2	**14.63**	**00.00**	**0**	**1**	**0.11**	**9.55**	**-1.05**
	14.63	**00.00**	**120**	**1a**	**-0.85**	**9.55**	**0.62**
	14.63	**00.00**	**240**	**1b**	**2.69**	**30.16**	**1.55**
(0.9 - 0.2Sds) * DL + E 300 deg M1	**14.63**	**00.00**	**0**	**1**	**0.21**	**26.55**	**-2.82**
	14.63	**00.00**	**120**	**1a**	**0.37**	**-3.84**	**-0.21**
	14.63	**00.00**	**240**	**1b**	**2.54**	**26.55**	**1.23**
(0.9 - 0.2Sds) * DL + E 300 deg M2	**14.63**	**00.00**	**0**	**1**	**0.11**	**23.29**	**-2.42**
	14.63	**00.00**	**120**	**1a**	**-0.32**	**2.68**	**0.18**
	14.63	**00.00**	**240**	**1b**	**2.15**	**23.29**	**1.11**
(0.9 - 0.2Sds) * DL + E 330 deg M1	**14.63**	**00.00**	**0**	**1**	**0.12**	**33.97**	**-3.61**
	14.63	**00.00**	**120**	**1a**	**0.06**	**-1.13**	**-0.17**
	14.63	**00.00**	**240**	**1b**	**1.62**	**16.42**	**0.66**
(0.9 - 0.2Sds) * DL + E 330 deg M2	**14.63**	**00.00**	**0**	**1**	**0.06**	**28.32**	**-2.92**
	14.63	**00.00**	**120**	**1a**	**-0.51**	**4.52**	**0.22**
	14.63	**00.00**	**240**	**1b**	**1.57**	**16.42**	**0.76**
1.0D + 1.0W Service Normal	**14.63**	**00.00**	**0**	**1**	**0.00**	**86.30**	**-10.02**

	14.63	**00.00**	**120**	**1a**	**1.22**	**-13.72**	**-1.88**
	14.63	**00.00**	**240**	**1b**	**-1.22**	**-13.72**	**-1.88**
1.0D + 1.0W Service 60 deg	**14.63**	**00.00**	**0**	**1**	**-1.01**	**52.96**	**-6.02**
	14.63	**00.00**	**120**	**1a**	**-5.72**	**52.89**	**2.13**
	14.63	**00.00**	**240**	**1b**	**-5.20**	**-46.99**	**-3.00**
1.0D + 1.0W Service 90 deg	**14.63**	**00.00**	**0**	**1**	**-1.17**	**19.62**	**-2.01**
	14.63	**00.00**	**120**	**1a**	**-8.04**	**77.29**	**3.97**
	14.63	**00.00**	**240**	**1b**	**-4.56**	**-38.04**	**-1.95**
1.0D + 1.0W Service 120 deg	**14.63**	**00.00**	**0**	**1**	**-1.02**	**-13.72**	**2.00**
	14.63	**00.00**	**120**	**1a**	**-8.68**	**86.23**	**5.01**
	14.63	**00.00**	**240**	**1b**	**-2.24**	**-13.65**	**-0.12**
1.0D + 1.0W Service 180 deg	**14.63**	**00.00**	**0**	**1**	**0.00**	**-47.06**	**6.01**
	14.63	**00.00**	**120**	**1a**	**-4.70**	**52.96**	**3.88**
	14.63	**00.00**	**240**	**1b**	**4.70**	**52.96**	**3.88**
1.0D + 1.0W Service 210 deg	**14.63**	**00.00**	**0**	**1**	**0.59**	**-38.12**	**4.93**
	14.63	**00.00**	**120**	**1a**	**-1.16**	**19.66**	**2.02**
	14.63	**00.00**	**240**	**1b**	**7.46**	**77.33**	**4.98**
1.0D + 1.0W Service 240 deg	**14.63**	**00.00**	**0**	**1**	**1.02**	**-13.72**	**2.00**
	14.63	**00.00**	**120**	**1a**	**2.24**	**-13.65**	**-0.12**
	14.63	**00.00**	**240**	**1b**	**8.68**	**86.23**	**5.01**
1.0D + 1.0W Service 300 deg	**14.63**	**00.00**	**0**	**1**	**1.01**	**52.96**	**-6.02**
	14.63	**00.00**	**120**	**1a**	**5.20**	**-46.99**	**-3.00**
	14.63	**00.00**	**240**	**1b**	**5.72**	**52.89**	**2.13**
1.0D + 1.0W Service 330 deg	**14.63**	**00.00**	**0**	**1**	**0.58**	**77.37**	**-8.95**
	14.63	**00.00**	**120**	**1a**	**3.98**	**-38.08**	**-2.97**
	14.63	**00.00**	**240**	**1b**	**2.33**	**19.58**	**-0.01**

Max Uplift:	280.76 (kip)	Moment Ice:	2,186.66 (kip-ft)	Moment:	6,551.99 (kip-ft)	1.2D + 1.6W 180 deg	
Max Down:	322.19 (kip)	Total Down Ice:	180.25 (kip)	Total Down:	70.64 (kip)		
Max Shear:	37.93 (kip)	Total Shear Ice:	21.41 (kip)	Total Shear:	61.16 (kip)		

Deflections and Rotations

Load Case	Elevation (ft)	Deflection (ft)	Twist (deg)	Sway (deg)	Resultant (deg)
101 mph Normal to Face with No Ice	70.00	0.127	0.0096	0.2056	0.2058
101 mph Normal to Face with No Ice	90.00	0.210	0.0122	0.2686	0.2689
101 mph Normal to Face with No Ice	126.67	0.434	0.0178	0.4358	0.4359
101 mph Normal to Face with No Ice	140.00	0.541	0.0183	0.4809	0.4812
101 mph Normal to Face with No Ice	146.67	0.598	0.0175	0.5027	0.5027
101 mph Normal to Face with No Ice	160.00	0.717	0.0159	0.5209	0.5211
101 mph Normal to Face with No Ice	166.67	0.778	0.0133	0.5359	0.5359
101 mph Normal to Face with No Ice	180.00	0.897	0.0087	0.7930	0.7930
101 mph 60 degree with No Ice	70.00	0.127	0.0120	0.2053	0.2054
101 mph 60 degree with No Ice	90.00	0.209	0.0157	0.2681	0.2683
101 mph 60 degree with No Ice	126.67	0.433	0.0265	0.4345	0.4346
101 mph 60 degree with No Ice	140.00	0.540	0.0302	0.4787	0.4791
101 mph 60 degree with No Ice	146.67	0.596	0.0331	0.4994	0.4997
101 mph 60 degree with No Ice	160.00	0.715	0.0388	0.5206	0.5221
101 mph 60 degree with No Ice	166.67	0.775	0.0478	0.5039	0.5053
101 mph 60 degree with No Ice	180.00	0.892	0.0644	0.4412	0.4459
101 mph 90 degree with No Ice	70.00	0.127	-0.0124	0.2055	0.2059
101 mph 90 degree with No Ice	90.00	0.209	-0.0159	0.2679	0.2684
101 mph 90 degree with No Ice	126.67	0.433	-0.0250	0.4338	0.4340
101 mph 90 degree with No Ice	140.00	0.539	-0.0272	0.4785	0.4793
101 mph 90 degree with No Ice	146.67	0.596	-0.0281	0.4981	0.4983
101 mph 90 degree with No Ice	160.00	0.714	-0.0300	0.5212	0.5220
101 mph 90 degree with No Ice	166.67	0.775	-0.0327	0.4926	0.4932
101 mph 90 degree with No Ice	180.00	0.891	-0.0379	0.2199	0.2232
101 mph 120 degree with No Ice	70.00	0.127	-0.0126	0.2054	0.2056
101 mph 120 degree with No Ice	90.00	0.209	-0.0165	0.2682	0.2684
101 mph 120 degree with No Ice	126.67	0.433	-0.0285	0.4344	0.4345
101 mph 120 degree with No Ice	140.00	0.540	-0.0330	0.4790	0.4794
101 mph 120 degree with No Ice	146.67	0.597	-0.0366	0.5002	0.5003
101 mph 120 degree with No Ice	160.00	0.715	-0.0439	0.5207	0.5224
101 mph 120 degree with No Ice	166.67	0.776	-0.0553	0.5039	0.5065
101 mph 120 degree with No Ice	180.00	0.892	-0.0765	0.4412	0.4462
101 mph 180 degree with No Ice	70.00	0.127	0.0096	0.2055	0.2057
101 mph 180 degree with No Ice	90.00	0.210	0.0122	0.2685	0.2688
101 mph 180 degree with No Ice	126.67	0.434	0.0177	0.4359	0.4359
101 mph 180 degree with No Ice	140.00	0.541	0.0182	0.4807	0.4810
101 mph 180 degree with No Ice	146.67	0.598	0.0174	0.5020	0.5020
101 mph 180 degree with No Ice	160.00	0.717	0.0157	0.5209	0.5211
101 mph 180 degree with No Ice	166.67	0.778	0.0131	0.5359	0.5359
101 mph 180 degree with No Ice	180.00	0.897	0.0083	0.7929	0.7929
101 mph 210 degree with No Ice	70.00	0.127	0.0080	0.2060	0.2062
101 mph 210 degree with No Ice	90.00	0.210	0.0107	0.2686	0.2689
101 mph 210 degree with No Ice	126.67	0.434	0.0193	0.4352	0.4355
101 mph 210 degree with No Ice	140.00	0.541	0.0230	0.4812	0.4814
101 mph 210 degree with No Ice	146.67	0.598	0.0263	0.5007	0.5011
101 mph 210 degree with No Ice	160.00	0.716	0.0329	0.5215	0.5215
101 mph 210 degree with No Ice	166.67	0.777	0.0434	0.5253	0.5271
101 mph 210 degree with No Ice	180.00	0.895	0.0626	0.6964	0.6970
101 mph 240 degree with No Ice	70.00	0.127	0.0126	0.2054	0.2056
101 mph 240 degree with No Ice	90.00	0.209	0.0165	0.2682	0.2684
101 mph 240 degree with No Ice	126.67	0.433	0.0285	0.4344	0.4345
101 mph 240 degree with No Ice	140.00	0.540	0.0330	0.4790	0.4794
101 mph 240 degree with No Ice	146.67	0.597	0.0366	0.5002	0.5003
101 mph 240 degree with No Ice	160.00	0.715	0.0439	0.5207	0.5224
101 mph 240 degree with No Ice	166.67	0.776	0.0553	0.5039	0.5065

101 mph 240 degree with No Ice	180.00	0.892	0.0765	0.4412	0.4462
101 mph 300 degree with No Ice	70.00	0.127	0.0089	0.2053	0.2054
101 mph 300 degree with No Ice	90.00	0.209	0.0111	0.2681	0.2683
101 mph 300 degree with No Ice	126.67	0.433	0.0149	0.4345	0.4346
101 mph 300 degree with No Ice	140.00	0.540	0.0143	0.4787	0.4791
101 mph 300 degree with No Ice	146.67	0.596	0.0123	0.4994	0.4997
101 mph 300 degree with No Ice	160.00	0.715	0.0081	0.5206	0.5221
101 mph 300 degree with No Ice	166.67	0.775	0.0014	0.5039	0.5053
101 mph 300 degree with No Ice	180.00	0.892	-0.0107	0.4412	0.4459
101 mph 330 degree with No Ice	70.00	0.127	0.0044	0.2057	0.2061
101 mph 330 degree with No Ice	90.00	0.210	0.0053	0.2684	0.2688
101 mph 330 degree with No Ice	126.67	0.434	0.0058	0.4355	0.4355
101 mph 330 degree with No Ice	140.00	0.541	0.0043	0.4804	0.4815
101 mph 330 degree with No Ice	146.67	0.598	0.0020	0.5006	0.5007
101 mph 330 degree with No Ice	160.00	0.716	-0.0029	0.5214	0.5229
101 mph 330 degree with No Ice	166.67	0.777	-0.0105	0.5254	0.5261
101 mph 330 degree with No Ice	180.00	0.895	-0.0246	0.6963	0.6989
101 mph Normal to Face with No Ice (Reduced DL)	70.00	0.127	0.0096	0.2054	0.2056
101 mph Normal to Face with No Ice (Reduced DL)	90.00	0.209	0.0122	0.2683	0.2685
101 mph Normal to Face with No Ice (Reduced DL)	126.67	0.434	0.0177	0.4353	0.4353
101 mph Normal to Face with No Ice (Reduced DL)	140.00	0.540	0.0182	0.4802	0.4806
101 mph Normal to Face with No Ice (Reduced DL)	146.67	0.597	0.0174	0.5020	0.5020
101 mph Normal to Face with No Ice (Reduced DL)	160.00	0.716	0.0159	0.5202	0.5204
101 mph Normal to Face with No Ice (Reduced DL)	166.67	0.777	0.0133	0.5352	0.5352
101 mph Normal to Face with No Ice (Reduced DL)	180.00	0.895	0.0087	0.7923	0.7924
101 mph 60 deg with No Ice (Reduced DL)	70.00	0.127	0.0120	0.2051	0.2053
101 mph 60 deg with No Ice (Reduced DL)	90.00	0.209	0.0157	0.2678	0.2680
101 mph 60 deg with No Ice (Reduced DL)	126.67	0.433	0.0264	0.4339	0.4340
101 mph 60 deg with No Ice (Reduced DL)	140.00	0.539	0.0302	0.4781	0.4785
101 mph 60 deg with No Ice (Reduced DL)	146.67	0.596	0.0330	0.4989	0.4991
101 mph 60 deg with No Ice (Reduced DL)	160.00	0.714	0.0387	0.5199	0.5214
101 mph 60 deg with No Ice (Reduced DL)	166.67	0.774	0.0478	0.5033	0.5046
101 mph 60 deg with No Ice (Reduced DL)	180.00	0.891	0.0644	0.4406	0.4453
101 mph 90 deg with No Ice (Reduced DL)	70.00	0.127	-0.0124	0.2053	0.2057
101 mph 90 deg with No Ice (Reduced DL)	90.00	0.209	-0.0159	0.2676	0.2681
101 mph 90 deg with No Ice (Reduced DL)	126.67	0.433	-0.0250	0.4332	0.4334
101 mph 90 deg with No Ice (Reduced DL)	140.00	0.539	-0.0272	0.4778	0.4786
101 mph 90 deg with No Ice (Reduced DL)	146.67	0.595	-0.0281	0.4974	0.4976
101 mph 90 deg with No Ice (Reduced DL)	160.00	0.713	-0.0299	0.5205	0.5213
101 mph 90 deg with No Ice (Reduced DL)	166.67	0.774	-0.0327	0.4919	0.4925
101 mph 90 deg with No Ice (Reduced DL)	180.00	0.890	-0.0379	0.2193	0.2225
101 mph 120 deg with No Ice (Reduced DL)	70.00	0.127	-0.0125	0.2052	0.2054
101 mph 120 deg with No Ice (Reduced DL)	90.00	0.209	-0.0165	0.2679	0.2681
101 mph 120 deg with No Ice (Reduced DL)	126.67	0.433	-0.0284	0.4339	0.4340
101 mph 120 deg with No Ice (Reduced DL)	140.00	0.539	-0.0329	0.4783	0.4787
101 mph 120 deg with No Ice (Reduced DL)	146.67	0.596	-0.0365	0.4994	0.4995
101 mph 120 deg with No Ice (Reduced DL)	160.00	0.714	-0.0438	0.5200	0.5217
101 mph 120 deg with No Ice (Reduced DL)	166.67	0.775	-0.0553	0.5033	0.5058
101 mph 120 deg with No Ice (Reduced DL)	180.00	0.891	-0.0764	0.4406	0.4456
101 mph 180 deg with No Ice (Reduced DL)	70.00	0.127	0.0096	0.2053	0.2055
101 mph 180 deg with No Ice (Reduced DL)	90.00	0.209	0.0122	0.2682	0.2685
101 mph 180 deg with No Ice (Reduced DL)	126.67	0.434	0.0177	0.4353	0.4353
101 mph 180 deg with No Ice (Reduced DL)	140.00	0.540	0.0181	0.4801	0.4804
101 mph 180 deg with No Ice (Reduced DL)	146.67	0.597	0.0174	0.5014	0.5014
101 mph 180 deg with No Ice (Reduced DL)	160.00	0.716	0.0157	0.5202	0.5204
101 mph 180 deg with No Ice (Reduced DL)	166.67	0.777	0.0131	0.5352	0.5352
101 mph 180 deg with No Ice (Reduced DL)	180.00	0.895	0.0083	0.7922	0.7923
101 mph 210 deg with No Ice (Reduced DL)	70.00	0.127	0.0080	0.2058	0.2060
101 mph 210 deg with No Ice (Reduced DL)	90.00	0.209	0.0106	0.2683	0.2686
101 mph 210 deg with No Ice (Reduced DL)	126.67	0.434	0.0193	0.4347	0.4349
101 mph 210 deg with No Ice (Reduced DL)	140.00	0.540	0.0230	0.4805	0.4807
101 mph 210 deg with No Ice (Reduced DL)	146.67	0.597	0.0262	0.4999	0.5003

101 mph 210 deg with No Ice (Reduced DL)	160.00	0.716	0.0329	0.5208	0.5208
101 mph 210 deg with No Ice (Reduced DL)	166.67	0.777	0.0433	0.5246	0.5264
101 mph 210 deg with No Ice (Reduced DL)	180.00	0.894	0.0626	0.6958	0.6963
101 mph 240 deg with No Ice (Reduced DL)	70.00	0.127	0.0125	0.2052	0.2054
101 mph 240 deg with No Ice (Reduced DL)	90.00	0.209	0.0165	0.2679	0.2681
101 mph 240 deg with No Ice (Reduced DL)	126.67	0.433	0.0284	0.4339	0.4340
101 mph 240 deg with No Ice (Reduced DL)	140.00	0.539	0.0329	0.4783	0.4787
101 mph 240 deg with No Ice (Reduced DL)	146.67	0.596	0.0365	0.4994	0.4995
101 mph 240 deg with No Ice (Reduced DL)	160.00	0.714	0.0438	0.5200	0.5217
101 mph 240 deg with No Ice (Reduced DL)	166.67	0.775	0.0553	0.5033	0.5058
101 mph 240 deg with No Ice (Reduced DL)	180.00	0.891	0.0764	0.4406	0.4456
101 mph 300 deg with No Ice (Reduced DL)	70.00	0.127	0.0089	0.2051	0.2053
101 mph 300 deg with No Ice (Reduced DL)	90.00	0.209	0.0111	0.2678	0.2680
101 mph 300 deg with No Ice (Reduced DL)	126.67	0.433	0.0149	0.4339	0.4340
101 mph 300 deg with No Ice (Reduced DL)	140.00	0.539	0.0143	0.4781	0.4785
101 mph 300 deg with No Ice (Reduced DL)	146.67	0.596	0.0122	0.4989	0.4991
101 mph 300 deg with No Ice (Reduced DL)	160.00	0.714	0.0081	0.5199	0.5214
101 mph 300 deg with No Ice (Reduced DL)	166.67	0.774	0.0014	0.5033	0.5046
101 mph 300 deg with No Ice (Reduced DL)	180.00	0.891	-0.0107	0.4406	0.4453
101 mph 330 deg with No Ice (Reduced DL)	70.00	0.127	0.0044	0.2055	0.2059
101 mph 330 deg with No Ice (Reduced DL)	90.00	0.209	0.0053	0.2680	0.2685
101 mph 330 deg with No Ice (Reduced DL)	126.67	0.434	0.0058	0.4349	0.4349
101 mph 330 deg with No Ice (Reduced DL)	140.00	0.540	0.0043	0.4798	0.4808
101 mph 330 deg with No Ice (Reduced DL)	146.67	0.597	0.0020	0.4999	0.4999
101 mph 330 deg with No Ice (Reduced DL)	160.00	0.716	-0.0029	0.5207	0.5222
101 mph 330 deg with No Ice (Reduced DL)	166.67	0.776	-0.0105	0.5247	0.5254
101 mph 330 deg with No Ice (Reduced DL)	180.00	0.894	-0.0246	0.6956	0.6982
50 mph Normal with 0.75 in Radial Ice	70.00	0.044	0.0032	0.0676	0.0677
50 mph Normal with 0.75 in Radial Ice	90.00	0.070	0.0040	0.0865	0.0866
50 mph Normal with 0.75 in Radial Ice	126.67	0.141	0.0055	0.1349	0.1350
50 mph Normal with 0.75 in Radial Ice	140.00	0.174	0.0055	0.1475	0.1476
50 mph Normal with 0.75 in Radial Ice	146.67	0.191	0.0053	0.1541	0.1541
50 mph Normal with 0.75 in Radial Ice	160.00	0.227	0.0047	0.1571	0.1572
50 mph Normal with 0.75 in Radial Ice	166.67	0.246	0.0037	0.1637	0.1637
50 mph Normal with 0.75 in Radial Ice	180.00	0.282	0.0021	0.2557	0.2557
50 mph 60 deg with 0.75 in Radial Ice	70.00	0.044	0.0036	0.0674	0.0674
50 mph 60 deg with 0.75 in Radial Ice	90.00	0.071	0.0045	0.0864	0.0864
50 mph 60 deg with 0.75 in Radial Ice	126.67	0.141	0.0069	0.1346	0.1346
50 mph 60 deg with 0.75 in Radial Ice	140.00	0.174	0.0074	0.1465	0.1465
50 mph 60 deg with 0.75 in Radial Ice	146.67	0.191	0.0077	0.1518	0.1520
50 mph 60 deg with 0.75 in Radial Ice	160.00	0.227	0.0083	0.1570	0.1572
50 mph 60 deg with 0.75 in Radial Ice	166.67	0.245	0.0092	0.1523	0.1524
50 mph 60 deg with 0.75 in Radial Ice	180.00	0.281	0.0109	0.1361	0.1364
50 mph 90 deg with 0.75 in Radial Ice	70.00	0.044	-0.0042	0.0674	0.0675
50 mph 90 deg with 0.75 in Radial Ice	90.00	0.071	-0.0052	0.0863	0.0864
50 mph 90 deg with 0.75 in Radial Ice	126.67	0.141	-0.0079	0.1343	0.1344
50 mph 90 deg with 0.75 in Radial Ice	140.00	0.173	-0.0085	0.1463	0.1464
50 mph 90 deg with 0.75 in Radial Ice	146.67	0.191	-0.0089	0.1524	0.1525
50 mph 90 deg with 0.75 in Radial Ice	160.00	0.226	-0.0095	0.1571	0.1574
50 mph 90 deg with 0.75 in Radial Ice	166.67	0.245	-0.0104	0.1484	0.1486
50 mph 90 deg with 0.75 in Radial Ice	180.00	0.280	-0.0122	0.0534	0.0544
50 mph 120 deg with 0.75 in Radial Ice	70.00	0.044	-0.0038	0.0675	0.0676
50 mph 120 deg with 0.75 in Radial Ice	90.00	0.070	-0.0048	0.0863	0.0864
50 mph 120 deg with 0.75 in Radial Ice	126.67	0.141	-0.0076	0.1344	0.1345
50 mph 120 deg with 0.75 in Radial Ice	140.00	0.173	-0.0084	0.1467	0.1468
50 mph 120 deg with 0.75 in Radial Ice	146.67	0.191	-0.0089	0.1532	0.1532
50 mph 120 deg with 0.75 in Radial Ice	160.00	0.226	-0.0100	0.1571	0.1574
50 mph 120 deg with 0.75 in Radial Ice	166.67	0.245	-0.0118	0.1524	0.1526
50 mph 120 deg with 0.75 in Radial Ice	180.00	0.280	-0.0152	0.1358	0.1365
50 mph 180 deg with 0.75 in Radial Ice	70.00	0.045	0.0032	0.0675	0.0675
50 mph 180 deg with 0.75 in Radial Ice	90.00	0.071	0.0040	0.0866	0.0866
50 mph 180 deg with 0.75 in Radial Ice	126.67	0.141	0.0055	0.1351	0.1351

50 mph 180 deg with 0.75 in Radial Ice	140.00	0.174	0.0055	0.1472	0.1472
50 mph 180 deg with 0.75 in Radial Ice	146.67	0.191	0.0052	0.1527	0.1527
50 mph 180 deg with 0.75 in Radial Ice	160.00	0.228	0.0047	0.1570	0.1571
50 mph 180 deg with 0.75 in Radial Ice	166.67	0.246	0.0037	0.1636	0.1636
50 mph 180 deg with 0.75 in Radial Ice	180.00	0.282	0.0020	0.2554	0.2554
50 mph 210 deg with 0.75 in Radial Ice	70.00	0.044	0.0023	0.0675	0.0676
50 mph 210 deg with 0.75 in Radial Ice	90.00	0.071	0.0029	0.0865	0.0865
50 mph 210 deg with 0.75 in Radial Ice	126.67	0.141	0.0047	0.1348	0.1349
50 mph 210 deg with 0.75 in Radial Ice	140.00	0.174	0.0052	0.1471	0.1472
50 mph 210 deg with 0.75 in Radial Ice	146.67	0.191	0.0057	0.1533	0.1534
50 mph 210 deg with 0.75 in Radial Ice	160.00	0.227	0.0066	0.1572	0.1573
50 mph 210 deg with 0.75 in Radial Ice	166.67	0.246	0.0080	0.1599	0.1601
50 mph 210 deg with 0.75 in Radial Ice	180.00	0.282	0.0107	0.2228	0.2228
50 mph 240 deg with 0.75 in Radial Ice	70.00	0.044	0.0038	0.0675	0.0676
50 mph 240 deg with 0.75 in Radial Ice	90.00	0.070	0.0048	0.0863	0.0864
50 mph 240 deg with 0.75 in Radial Ice	126.67	0.141	0.0076	0.1344	0.1345
50 mph 240 deg with 0.75 in Radial Ice	140.00	0.173	0.0084	0.1467	0.1468
50 mph 240 deg with 0.75 in Radial Ice	146.67	0.191	0.0089	0.1532	0.1532
50 mph 240 deg with 0.75 in Radial Ice	160.00	0.226	0.0100	0.1571	0.1574
50 mph 240 deg with 0.75 in Radial Ice	166.67	0.245	0.0118	0.1524	0.1526
50 mph 240 deg with 0.75 in Radial Ice	180.00	0.280	0.0152	0.1358	0.1365
50 mph 300 deg with 0.75 in Radial Ice	70.00	0.044	0.0034	0.0674	0.0674
50 mph 300 deg with 0.75 in Radial Ice	90.00	0.071	0.0043	0.0864	0.0864
50 mph 300 deg with 0.75 in Radial Ice	126.67	0.141	0.0062	0.1346	0.1346
50 mph 300 deg with 0.75 in Radial Ice	140.00	0.174	0.0064	0.1465	0.1465
50 mph 300 deg with 0.75 in Radial Ice	146.67	0.191	0.0064	0.1518	0.1520
50 mph 300 deg with 0.75 in Radial Ice	160.00	0.227	0.0063	0.1570	0.1572
50 mph 300 deg with 0.75 in Radial Ice	166.67	0.245	0.0062	0.1523	0.1524
50 mph 300 deg with 0.75 in Radial Ice	180.00	0.281	0.0060	0.1361	0.1364
50 mph 330 deg with 0.75 in Radial Ice	70.00	0.044	0.0019	0.0675	0.0676
50 mph 330 deg with 0.75 in Radial Ice	90.00	0.071	0.0023	0.0865	0.0865
50 mph 330 deg with 0.75 in Radial Ice	126.67	0.141	0.0033	0.1349	0.1349
50 mph 330 deg with 0.75 in Radial Ice	140.00	0.174	0.0033	0.1471	0.1472
50 mph 330 deg with 0.75 in Radial Ice	146.67	0.191	0.0032	0.1533	0.1534
50 mph 330 deg with 0.75 in Radial Ice	160.00	0.227	0.0029	0.1572	0.1574
50 mph 330 deg with 0.75 in Radial Ice	166.67	0.246	0.0024	0.1599	0.1600
50 mph 330 deg with 0.75 in Radial Ice	180.00	0.282	0.0015	0.2231	0.2232
Seismic Normal M1	70.00	0.009	0.0007	0.0146	0.0146
Seismic Normal M1	90.00	0.014	0.0009	0.0194	0.0194
Seismic Normal M1	126.67	0.031	0.0013	0.0321	0.0322
Seismic Normal M1	140.00	0.039	0.0013	0.0352	0.0352
Seismic Normal M1	146.67	0.043	0.0013	0.0374	0.0374
Seismic Normal M1	160.00	0.052	0.0013	0.0381	0.0381
Seismic Normal M1	166.67	0.056	0.0012	0.0386	0.0386
Seismic Normal M1	180.00	0.065	0.0012	0.0381	0.0381
Seismic Normal M2	70.00	0.006	0.0004	0.0101	0.0101
Seismic Normal M2	90.00	0.010	0.0005	0.0138	0.0138
Seismic Normal M2	126.67	0.022	0.0008	0.0248	0.0248
Seismic Normal M2	140.00	0.028	0.0008	0.0282	0.0282
Seismic Normal M2	146.67	0.032	0.0008	0.0307	0.0307
Seismic Normal M2	160.00	0.039	0.0008	0.0318	0.0318
Seismic Normal M2	166.67	0.042	0.0008	0.0325	0.0325
Seismic Normal M2	180.00	0.050	0.0007	0.0319	0.0319
Seismic 60 deg M1	70.00	0.009	-0.0007	0.0146	0.0146
Seismic 60 deg M1	90.00	0.014	-0.0009	0.0194	0.0194
Seismic 60 deg M1	126.67	0.031	-0.0013	0.0322	0.0322
Seismic 60 deg M1	140.00	0.039	-0.0013	0.0353	0.0353
Seismic 60 deg M1	146.67	0.043	-0.0013	0.0371	0.0371
Seismic 60 deg M1	160.00	0.052	-0.0013	0.0381	0.0381
Seismic 60 deg M1	166.67	0.056	-0.0012	0.0386	0.0386
Seismic 60 deg M1	180.00	0.065	-0.0012	0.0382	0.0382
Seismic 60 deg M2	70.00	0.006	-0.0004	0.0101	0.0101

Seismic 60 deg M2	90.00	0.010	-0.0005	0.0139	0.0139
Seismic 60 deg M2	126.67	0.022	-0.0008	0.0248	0.0248
Seismic 60 deg M2	140.00	0.028	-0.0008	0.0283	0.0283
Seismic 60 deg M2	146.67	0.032	-0.0008	0.0303	0.0303
Seismic 60 deg M2	160.00	0.039	-0.0008	0.0318	0.0318
Seismic 60 deg M2	166.67	0.042	-0.0008	0.0325	0.0325
Seismic 60 deg M2	180.00	0.050	-0.0007	0.0320	0.0320
Seismic 90 deg M1	70.00	0.009	-0.0008	0.0146	0.0146
Seismic 90 deg M1	90.00	0.014	-0.0010	0.0194	0.0194
Seismic 90 deg M1	126.67	0.031	-0.0015	0.0322	0.0322
Seismic 90 deg M1	140.00	0.039	-0.0015	0.0353	0.0353
Seismic 90 deg M1	146.67	0.043	-0.0015	0.0373	0.0373
Seismic 90 deg M1	160.00	0.052	-0.0015	0.0381	0.0381
Seismic 90 deg M1	166.67	0.056	-0.0014	0.0386	0.0386
Seismic 90 deg M1	180.00	0.065	-0.0014	0.0381	0.0382
Seismic 90 deg M2	70.00	0.006	-0.0005	0.0101	0.0101
Seismic 90 deg M2	90.00	0.010	-0.0006	0.0139	0.0139
Seismic 90 deg M2	126.67	0.022	-0.0009	0.0248	0.0248
Seismic 90 deg M2	140.00	0.028	-0.0010	0.0282	0.0282
Seismic 90 deg M2	146.67	0.032	-0.0009	0.0306	0.0306
Seismic 90 deg M2	160.00	0.039	-0.0009	0.0318	0.0318
Seismic 90 deg M2	166.67	0.042	-0.0009	0.0325	0.0325
Seismic 90 deg M2	180.00	0.050	-0.0008	0.0320	0.0320
Seismic 120 deg M1	70.00	0.009	-0.0007	0.0146	0.0146
Seismic 120 deg M1	90.00	0.014	-0.0009	0.0194	0.0194
Seismic 120 deg M1	126.67	0.031	-0.0013	0.0321	0.0322
Seismic 120 deg M1	140.00	0.039	-0.0013	0.0352	0.0352
Seismic 120 deg M1	146.67	0.043	-0.0013	0.0374	0.0374
Seismic 120 deg M1	160.00	0.052	-0.0013	0.0381	0.0381
Seismic 120 deg M1	166.67	0.056	-0.0012	0.0386	0.0386
Seismic 120 deg M1	180.00	0.065	-0.0012	0.0381	0.0381
Seismic 120 deg M2	70.00	0.006	0.0004	0.0101	0.0101
Seismic 120 deg M2	90.00	0.010	0.0005	0.0138	0.0138
Seismic 120 deg M2	126.67	0.022	-0.0008	0.0248	0.0248
Seismic 120 deg M2	140.00	0.028	0.0008	0.0282	0.0282
Seismic 120 deg M2	146.67	0.032	0.0008	0.0307	0.0307
Seismic 120 deg M2	160.00	0.039	0.0008	0.0318	0.0318
Seismic 120 deg M2	166.67	0.042	0.0008	0.0325	0.0325
Seismic 120 deg M2	180.00	0.050	0.0007	0.0319	0.0319
Seismic 180 deg M1	70.00	0.009	0.0007	0.0146	0.0146
Seismic 180 deg M1	90.00	0.014	0.0009	0.0194	0.0194
Seismic 180 deg M1	126.67	0.031	0.0013	0.0322	0.0322
Seismic 180 deg M1	140.00	0.039	0.0013	0.0353	0.0353
Seismic 180 deg M1	146.67	0.043	0.0013	0.0371	0.0371
Seismic 180 deg M1	160.00	0.052	0.0013	0.0381	0.0381
Seismic 180 deg M1	166.67	0.056	0.0012	0.0386	0.0386
Seismic 180 deg M1	180.00	0.065	0.0012	0.0382	0.0382
Seismic 180 deg M2	70.00	0.006	0.0004	0.0101	0.0101
Seismic 180 deg M2	90.00	0.010	0.0005	0.0139	0.0139
Seismic 180 deg M2	126.67	0.022	0.0008	0.0248	0.0248
Seismic 180 deg M2	140.00	0.028	0.0008	0.0283	0.0283
Seismic 180 deg M2	146.67	0.032	0.0008	0.0303	0.0303
Seismic 180 deg M2	160.00	0.039	0.0008	0.0318	0.0318
Seismic 180 deg M2	166.67	0.042	0.0008	0.0325	0.0325
Seismic 180 deg M2	180.00	0.050	0.0007	0.0320	0.0320
Seismic 210 deg M1	70.00	0.009	0.0004	0.0146	0.0146
Seismic 210 deg M1	90.00	0.014	0.0005	0.0194	0.0194
Seismic 210 deg M1	126.67	0.031	0.0007	0.0322	0.0322
Seismic 210 deg M1	140.00	0.039	0.0008	0.0353	0.0353
Seismic 210 deg M1	146.67	0.043	0.0007	0.0373	0.0373
Seismic 210 deg M1	160.00	0.052	0.0007	0.0381	0.0381
Seismic 210 deg M1	166.67	0.056	0.0007	0.0386	0.0386

Seismic 210 deg M1	180.00	0.065	0.0007	0.0381	0.0382
Seismic 210 deg M2	70.00	0.006	0.0002	0.0101	0.0101
Seismic 210 deg M2	90.00	0.010	0.0003	0.0139	0.0139
Seismic 210 deg M2	126.67	0.022	0.0005	0.0248	0.0248
Seismic 210 deg M2	140.00	0.028	0.0005	0.0282	0.0282
Seismic 210 deg M2	146.67	0.032	0.0005	0.0306	0.0306
Seismic 210 deg M2	160.00	0.039	0.0005	0.0318	0.0318
Seismic 210 deg M2	166.67	0.042	0.0004	0.0325	0.0325
Seismic 210 deg M2	180.00	0.050	0.0004	0.0320	0.0320
Seismic 240 deg M1	70.00	0.009	0.0007	0.0146	0.0146
Seismic 240 deg M1	90.00	0.014	0.0009	0.0194	0.0194
Seismic 240 deg M1	126.67	0.031	0.0013	0.0321	0.0322
Seismic 240 deg M1	140.00	0.039	0.0013	0.0352	0.0352
Seismic 240 deg M1	146.67	0.043	0.0013	0.0374	0.0374
Seismic 240 deg M1	160.00	0.052	0.0013	0.0381	0.0381
Seismic 240 deg M1	166.67	0.056	0.0012	0.0386	0.0386
Seismic 240 deg M1	180.00	0.065	0.0012	0.0381	0.0381
Seismic 240 deg M2	70.00	0.006	0.0004	0.0101	0.0101
Seismic 240 deg M2	90.00	0.010	0.0005	0.0138	0.0138
Seismic 240 deg M2	126.67	0.022	0.0008	0.0248	0.0248
Seismic 240 deg M2	140.00	0.028	0.0008	0.0282	0.0282
Seismic 240 deg M2	146.67	0.032	0.0008	0.0307	0.0307
Seismic 240 deg M2	160.00	0.039	0.0008	0.0318	0.0318
Seismic 240 deg M2	166.67	0.042	0.0008	0.0325	0.0325
Seismic 240 deg M2	180.00	0.050	0.0007	0.0319	0.0319
Seismic 300 deg M1	70.00	0.009	0.0007	0.0146	0.0146
Seismic 300 deg M1	90.00	0.014	0.0009	0.0194	0.0194
Seismic 300 deg M1	126.67	0.031	0.0013	0.0322	0.0322
Seismic 300 deg M1	140.00	0.039	0.0013	0.0353	0.0353
Seismic 300 deg M1	146.67	0.043	0.0013	0.0371	0.0371
Seismic 300 deg M1	160.00	0.052	0.0013	0.0381	0.0381
Seismic 300 deg M1	166.67	0.056	0.0012	0.0386	0.0386
Seismic 300 deg M1	180.00	0.065	0.0012	0.0382	0.0382
Seismic 300 deg M2	70.00	0.006	0.0004	0.0101	0.0101
Seismic 300 deg M2	90.00	0.010	0.0005	0.0139	0.0139
Seismic 300 deg M2	126.67	0.022	0.0008	0.0248	0.0248
Seismic 300 deg M2	140.00	0.028	0.0008	0.0283	0.0283
Seismic 300 deg M2	146.67	0.032	0.0008	0.0303	0.0303
Seismic 300 deg M2	160.00	0.039	0.0008	0.0318	0.0318
Seismic 300 deg M2	166.67	0.042	0.0008	0.0325	0.0325
Seismic 300 deg M2	180.00	0.050	0.0007	0.0320	0.0320
Seismic 330 deg M1	70.00	0.009	0.0004	0.0146	0.0146
Seismic 330 deg M1	90.00	0.014	0.0005	0.0194	0.0194
Seismic 330 deg M1	126.67	0.031	0.0007	0.0322	0.0322
Seismic 330 deg M1	140.00	0.039	0.0008	0.0353	0.0353
Seismic 330 deg M1	146.67	0.043	0.0007	0.0373	0.0373
Seismic 330 deg M1	160.00	0.052	0.0007	0.0381	0.0381
Seismic 330 deg M1	166.67	0.056	0.0007	0.0386	0.0386
Seismic 330 deg M1	180.00	0.065	0.0007	0.0381	0.0382
Seismic 330 deg M2	70.00	0.006	0.0002	0.0101	0.0101
Seismic 330 deg M2	90.00	0.010	0.0003	0.0139	0.0139
Seismic 330 deg M2	126.67	0.022	0.0005	0.0248	0.0248
Seismic 330 deg M2	140.00	0.028	0.0005	0.0282	0.0282
Seismic 330 deg M2	146.67	0.032	0.0005	0.0306	0.0306
Seismic 330 deg M2	160.00	0.039	0.0005	0.0318	0.0318
Seismic 330 deg M2	166.67	0.042	0.0004	0.0325	0.0325
Seismic 330 deg M2	180.00	0.050	0.0004	0.0320	0.0320
Seismic (Reduced DL) Normal M1	70.00	0.009	0.0007	0.0146	0.0146
Seismic (Reduced DL) Normal M1	90.00	0.014	0.0009	0.0193	0.0193
Seismic (Reduced DL) Normal M1	126.67	0.031	0.0013	0.0321	0.0321
Seismic (Reduced DL) Normal M1	140.00	0.039	0.0013	0.0351	0.0351
Seismic (Reduced DL) Normal M1	146.67	0.043	0.0013	0.0372	0.0372

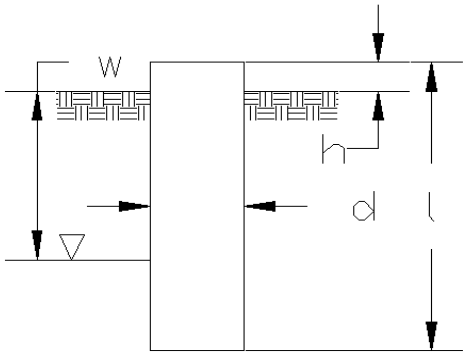
Seismic (Reduced DL) Normal M1	160.00	0.052	0.0013	0.0380	0.0380
Seismic (Reduced DL) Normal M1	166.67	0.056	0.0012	0.0385	0.0385
Seismic (Reduced DL) Normal M1	180.00	0.065	0.0012	0.0380	0.0380
Seismic (Reduced DL) Normal M2	70.00	0.006	0.0004	0.0101	0.0101
Seismic (Reduced DL) Normal M2	90.00	0.010	0.0005	0.0138	0.0138
Seismic (Reduced DL) Normal M2	126.67	0.022	0.0008	0.0247	0.0247
Seismic (Reduced DL) Normal M2	140.00	0.028	0.0008	0.0281	0.0281
Seismic (Reduced DL) Normal M2	146.67	0.031	0.0008	0.0305	0.0305
Seismic (Reduced DL) Normal M2	160.00	0.039	0.0008	0.0317	0.0318
Seismic (Reduced DL) Normal M2	166.67	0.042	0.0008	0.0324	0.0324
Seismic (Reduced DL) Normal M2	180.00	0.050	0.0007	0.0318	0.0318
Seismic (Reduced DL) 60 deg M1	70.00	0.009	-0.0007	0.0145	0.0145
Seismic (Reduced DL) 60 deg M1	90.00	0.014	-0.0009	0.0193	0.0193
Seismic (Reduced DL) 60 deg M1	126.67	0.031	-0.0013	0.0321	0.0321
Seismic (Reduced DL) 60 deg M1	140.00	0.039	-0.0013	0.0351	0.0351
Seismic (Reduced DL) 60 deg M1	146.67	0.043	-0.0013	0.0369	0.0370
Seismic (Reduced DL) 60 deg M1	160.00	0.052	-0.0013	0.0381	0.0381
Seismic (Reduced DL) 60 deg M1	166.67	0.056	-0.0012	0.0385	0.0385
Seismic (Reduced DL) 60 deg M1	180.00	0.065	-0.0012	0.0380	0.0380
Seismic (Reduced DL) 60 deg M2	70.00	0.006	-0.0004	0.0100	0.0100
Seismic (Reduced DL) 60 deg M2	90.00	0.010	-0.0005	0.0138	0.0138
Seismic (Reduced DL) 60 deg M2	126.67	0.022	-0.0008	0.0247	0.0247
Seismic (Reduced DL) 60 deg M2	140.00	0.028	-0.0008	0.0281	0.0281
Seismic (Reduced DL) 60 deg M2	146.67	0.031	-0.0008	0.0302	0.0302
Seismic (Reduced DL) 60 deg M2	160.00	0.039	-0.0008	0.0318	0.0318
Seismic (Reduced DL) 60 deg M2	166.67	0.042	-0.0008	0.0324	0.0324
Seismic (Reduced DL) 60 deg M2	180.00	0.050	-0.0007	0.0319	0.0319
Seismic (Reduced DL) 90 deg M1	70.00	0.009	-0.0008	0.0145	0.0146
Seismic (Reduced DL) 90 deg M1	90.00	0.014	-0.0010	0.0193	0.0193
Seismic (Reduced DL) 90 deg M1	126.67	0.031	-0.0015	0.0321	0.0321
Seismic (Reduced DL) 90 deg M1	140.00	0.039	-0.0015	0.0351	0.0351
Seismic (Reduced DL) 90 deg M1	146.67	0.043	-0.0015	0.0371	0.0371
Seismic (Reduced DL) 90 deg M1	160.00	0.052	-0.0015	0.0380	0.0380
Seismic (Reduced DL) 90 deg M1	166.67	0.056	-0.0014	0.0385	0.0385
Seismic (Reduced DL) 90 deg M1	180.00	0.065	-0.0014	0.0380	0.0380
Seismic (Reduced DL) 90 deg M2	70.00	0.006	-0.0005	0.0100	0.0100
Seismic (Reduced DL) 90 deg M2	90.00	0.010	-0.0006	0.0138	0.0138
Seismic (Reduced DL) 90 deg M2	126.67	0.022	-0.0009	0.0247	0.0247
Seismic (Reduced DL) 90 deg M2	140.00	0.028	-0.0010	0.0281	0.0281
Seismic (Reduced DL) 90 deg M2	146.67	0.031	-0.0009	0.0304	0.0304
Seismic (Reduced DL) 90 deg M2	160.00	0.039	-0.0009	0.0318	0.0318
Seismic (Reduced DL) 90 deg M2	166.67	0.042	-0.0009	0.0324	0.0324
Seismic (Reduced DL) 90 deg M2	180.00	0.050	-0.0008	0.0319	0.0319
Seismic (Reduced DL) 120 deg M1	70.00	0.009	-0.0007	0.0146	0.0146
Seismic (Reduced DL) 120 deg M1	90.00	0.014	-0.0009	0.0193	0.0193
Seismic (Reduced DL) 120 deg M1	126.67	0.031	-0.0013	0.0321	0.0321
Seismic (Reduced DL) 120 deg M1	140.00	0.039	-0.0013	0.0351	0.0351
Seismic (Reduced DL) 120 deg M1	146.67	0.043	-0.0013	0.0372	0.0372
Seismic (Reduced DL) 120 deg M1	160.00	0.052	-0.0013	0.0380	0.0380
Seismic (Reduced DL) 120 deg M1	166.67	0.056	-0.0012	0.0385	0.0385
Seismic (Reduced DL) 120 deg M1	180.00	0.065	-0.0012	0.0380	0.0380
Seismic (Reduced DL) 120 deg M2	70.00	0.006	0.0004	0.0101	0.0101
Seismic (Reduced DL) 120 deg M2	90.00	0.010	0.0005	0.0138	0.0138
Seismic (Reduced DL) 120 deg M2	126.67	0.022	-0.0008	0.0247	0.0247
Seismic (Reduced DL) 120 deg M2	140.00	0.028	-0.0008	0.0281	0.0281
Seismic (Reduced DL) 120 deg M2	146.67	0.031	-0.0008	0.0305	0.0305
Seismic (Reduced DL) 120 deg M2	160.00	0.039	-0.0008	0.0317	0.0318
Seismic (Reduced DL) 120 deg M2	166.67	0.042	0.0008	0.0324	0.0324
Seismic (Reduced DL) 120 deg M2	180.00	0.050	0.0007	0.0318	0.0318
Seismic (Reduced DL) 180 deg M1	70.00	0.009	0.0007	0.0145	0.0145
Seismic (Reduced DL) 180 deg M1	90.00	0.014	0.0009	0.0193	0.0193
Seismic (Reduced DL) 180 deg M1	126.67	0.031	0.0013	0.0321	0.0321

Seismic (Reduced DL) 180 deg M1	140.00	0.039	0.0013	0.0351	0.0351
Seismic (Reduced DL) 180 deg M1	146.67	0.043	0.0013	0.0369	0.0370
Seismic (Reduced DL) 180 deg M1	160.00	0.052	0.0013	0.0381	0.0381
Seismic (Reduced DL) 180 deg M1	166.67	0.056	0.0012	0.0385	0.0385
Seismic (Reduced DL) 180 deg M1	180.00	0.065	0.0012	0.0380	0.0380
Seismic (Reduced DL) 180 deg M2	70.00	0.006	0.0004	0.0100	0.0100
Seismic (Reduced DL) 180 deg M2	90.00	0.010	0.0005	0.0138	0.0138
Seismic (Reduced DL) 180 deg M2	126.67	0.022	0.0008	0.0247	0.0247
Seismic (Reduced DL) 180 deg M2	140.00	0.028	0.0008	0.0281	0.0281
Seismic (Reduced DL) 180 deg M2	146.67	0.031	0.0008	0.0302	0.0302
Seismic (Reduced DL) 180 deg M2	160.00	0.039	0.0008	0.0318	0.0318
Seismic (Reduced DL) 180 deg M2	166.67	0.042	0.0008	0.0324	0.0324
Seismic (Reduced DL) 180 deg M2	180.00	0.050	0.0007	0.0319	0.0319
Seismic (Reduced DL) 210 deg M1	70.00	0.009	0.0004	0.0145	0.0146
Seismic (Reduced DL) 210 deg M1	90.00	0.014	0.0005	0.0193	0.0193
Seismic (Reduced DL) 210 deg M1	126.67	0.031	0.0007	0.0321	0.0321
Seismic (Reduced DL) 210 deg M1	140.00	0.039	0.0008	0.0351	0.0351
Seismic (Reduced DL) 210 deg M1	146.67	0.043	0.0007	0.0371	0.0371
Seismic (Reduced DL) 210 deg M1	160.00	0.052	0.0007	0.0380	0.0380
Seismic (Reduced DL) 210 deg M1	166.67	0.056	0.0007	0.0385	0.0385
Seismic (Reduced DL) 210 deg M1	180.00	0.065	0.0007	0.0380	0.0380
Seismic (Reduced DL) 210 deg M2	70.00	0.006	0.0002	0.0100	0.0100
Seismic (Reduced DL) 210 deg M2	90.00	0.010	0.0003	0.0138	0.0138
Seismic (Reduced DL) 210 deg M2	126.67	0.022	0.0005	0.0247	0.0247
Seismic (Reduced DL) 210 deg M2	140.00	0.028	0.0005	0.0281	0.0281
Seismic (Reduced DL) 210 deg M2	146.67	0.031	0.0005	0.0304	0.0304
Seismic (Reduced DL) 210 deg M2	160.00	0.039	0.0005	0.0318	0.0318
Seismic (Reduced DL) 210 deg M2	166.67	0.042	0.0004	0.0324	0.0324
Seismic (Reduced DL) 210 deg M2	180.00	0.050	0.0004	0.0319	0.0319
Seismic (Reduced DL) 240 deg M1	70.00	0.009	0.0007	0.0146	0.0146
Seismic (Reduced DL) 240 deg M1	90.00	0.014	0.0009	0.0193	0.0193
Seismic (Reduced DL) 240 deg M1	126.67	0.031	0.0013	0.0321	0.0321
Seismic (Reduced DL) 240 deg M1	140.00	0.039	0.0013	0.0351	0.0351
Seismic (Reduced DL) 240 deg M1	146.67	0.043	0.0013	0.0372	0.0372
Seismic (Reduced DL) 240 deg M1	160.00	0.052	0.0013	0.0380	0.0380
Seismic (Reduced DL) 240 deg M1	166.67	0.056	0.0012	0.0385	0.0385
Seismic (Reduced DL) 240 deg M1	180.00	0.065	0.0012	0.0380	0.0380
Seismic (Reduced DL) 240 deg M2	70.00	0.006	0.0004	0.0101	0.0101
Seismic (Reduced DL) 240 deg M2	90.00	0.010	0.0005	0.0138	0.0138
Seismic (Reduced DL) 240 deg M2	126.67	0.022	0.0008	0.0247	0.0247
Seismic (Reduced DL) 240 deg M2	140.00	0.028	0.0008	0.0281	0.0281
Seismic (Reduced DL) 240 deg M2	146.67	0.031	0.0008	0.0305	0.0305
Seismic (Reduced DL) 240 deg M2	160.00	0.039	0.0008	0.0317	0.0318
Seismic (Reduced DL) 240 deg M2	166.67	0.042	0.0008	0.0324	0.0324
Seismic (Reduced DL) 240 deg M2	180.00	0.050	0.0007	0.0318	0.0318
Seismic (Reduced DL) 300 deg M1	70.00	0.009	0.0007	0.0145	0.0145
Seismic (Reduced DL) 300 deg M1	90.00	0.014	0.0009	0.0193	0.0193
Seismic (Reduced DL) 300 deg M1	126.67	0.031	0.0013	0.0321	0.0321
Seismic (Reduced DL) 300 deg M1	140.00	0.039	0.0013	0.0351	0.0351
Seismic (Reduced DL) 300 deg M1	146.67	0.043	0.0013	0.0369	0.0370
Seismic (Reduced DL) 300 deg M1	160.00	0.052	0.0013	0.0381	0.0381
Seismic (Reduced DL) 300 deg M1	166.67	0.056	0.0012	0.0385	0.0385
Seismic (Reduced DL) 300 deg M1	180.00	0.065	0.0012	0.0380	0.0380
Seismic (Reduced DL) 300 deg M2	70.00	0.006	0.0004	0.0100	0.0100
Seismic (Reduced DL) 300 deg M2	90.00	0.010	0.0005	0.0138	0.0138
Seismic (Reduced DL) 300 deg M2	126.67	0.022	0.0008	0.0247	0.0247
Seismic (Reduced DL) 300 deg M2	140.00	0.028	0.0008	0.0281	0.0281
Seismic (Reduced DL) 300 deg M2	146.67	0.031	0.0008	0.0302	0.0302
Seismic (Reduced DL) 300 deg M2	160.00	0.039	0.0008	0.0318	0.0318
Seismic (Reduced DL) 300 deg M2	166.67	0.042	0.0008	0.0324	0.0324
Seismic (Reduced DL) 300 deg M2	180.00	0.050	0.0007	0.0319	0.0319
Seismic (Reduced DL) 330 deg M1	70.00	0.009	0.0004	0.0145	0.0146

Seismic (Reduced DL) 330 deg M1	90.00	0.014	0.0005	0.0193	0.0193
Seismic (Reduced DL) 330 deg M1	126.67	0.031	0.0007	0.0321	0.0321
Seismic (Reduced DL) 330 deg M1	140.00	0.039	0.0008	0.0351	0.0351
Seismic (Reduced DL) 330 deg M1	146.67	0.043	0.0007	0.0371	0.0371
Seismic (Reduced DL) 330 deg M1	160.00	0.052	0.0007	0.0380	0.0380
Seismic (Reduced DL) 330 deg M1	166.67	0.056	0.0007	0.0385	0.0385
Seismic (Reduced DL) 330 deg M1	180.00	0.065	0.0007	0.0380	0.0380
Seismic (Reduced DL) 330 deg M2	70.00	0.006	0.0002	0.0100	0.0100
Seismic (Reduced DL) 330 deg M2	90.00	0.010	0.0003	0.0138	0.0138
Seismic (Reduced DL) 330 deg M2	126.67	0.022	0.0005	0.0247	0.0247
Seismic (Reduced DL) 330 deg M2	140.00	0.028	0.0005	0.0281	0.0281
Seismic (Reduced DL) 330 deg M2	146.67	0.031	0.0005	0.0304	0.0304
Seismic (Reduced DL) 330 deg M2	160.00	0.039	0.0005	0.0318	0.0318
Seismic (Reduced DL) 330 deg M2	166.67	0.042	0.0004	0.0324	0.0324
Seismic (Reduced DL) 330 deg M2	180.00	0.050	0.0004	0.0319	0.0319
Serviceability - 60 mph Wind Normal	70.00	0.028	0.0021	0.0458	0.0459
Serviceability - 60 mph Wind Normal	90.00	0.047	0.0027	0.0597	0.0597
Serviceability - 60 mph Wind Normal	126.67	0.096	0.0039	0.0963	0.0964
Serviceability - 60 mph Wind Normal	140.00	0.120	0.0040	0.1063	0.1064
Serviceability - 60 mph Wind Normal	146.67	0.133	0.0038	0.1112	0.1112
Serviceability - 60 mph Wind Normal	160.00	0.159	0.0034	0.1150	0.1150
Serviceability - 60 mph Wind Normal	166.67	0.172	0.0028	0.1183	0.1183
Serviceability - 60 mph Wind Normal	180.00	0.199	0.0018	0.1750	0.1750
Serviceability - 60 mph Wind 60 deg	70.00	0.028	0.0023	0.0456	0.0457
Serviceability - 60 mph Wind 60 deg	90.00	0.047	0.0030	0.0596	0.0596
Serviceability - 60 mph Wind 60 deg	126.67	0.096	0.0046	0.0961	0.0961
Serviceability - 60 mph Wind 60 deg	140.00	0.120	0.0050	0.1056	0.1057
Serviceability - 60 mph Wind 60 deg	146.67	0.132	0.0051	0.1101	0.1101
Serviceability - 60 mph Wind 60 deg	160.00	0.158	0.0053	0.1149	0.1150
Serviceability - 60 mph Wind 60 deg	166.67	0.172	0.0056	0.1112	0.1112
Serviceability - 60 mph Wind 60 deg	180.00	0.198	0.0064	0.0972	0.0974
Serviceability - 60 mph Wind 90 deg	70.00	0.028	-0.0027	0.0457	0.0458
Serviceability - 60 mph Wind 90 deg	90.00	0.047	-0.0035	0.0595	0.0596
Serviceability - 60 mph Wind 90 deg	126.67	0.096	-0.0054	0.0960	0.0960
Serviceability - 60 mph Wind 90 deg	140.00	0.120	-0.0059	0.1057	0.1059
Serviceability - 60 mph Wind 90 deg	146.67	0.132	-0.0061	0.1102	0.1102
Serviceability - 60 mph Wind 90 deg	160.00	0.158	-0.0064	0.1150	0.1152
Serviceability - 60 mph Wind 90 deg	166.67	0.172	-0.0070	0.1087	0.1088
Serviceability - 60 mph Wind 90 deg	180.00	0.197	-0.0081	0.0486	0.0492
Serviceability - 60 mph Wind 120 deg	70.00	0.028	-0.0024	0.0458	0.0458
Serviceability - 60 mph Wind 120 deg	90.00	0.047	-0.0031	0.0596	0.0596
Serviceability - 60 mph Wind 120 deg	126.67	0.096	-0.0050	0.0960	0.0961
Serviceability - 60 mph Wind 120 deg	140.00	0.120	-0.0055	0.1059	0.1059
Serviceability - 60 mph Wind 120 deg	146.67	0.132	-0.0058	0.1107	0.1107
Serviceability - 60 mph Wind 120 deg	160.00	0.158	-0.0064	0.1149	0.1151
Serviceability - 60 mph Wind 120 deg	166.67	0.172	-0.0072	0.1112	0.1113
Serviceability - 60 mph Wind 120 deg	180.00	0.198	-0.0090	0.0972	0.0972
Serviceability - 60 mph Wind 180 deg	70.00	0.028	0.0021	0.0457	0.0457
Serviceability - 60 mph Wind 180 deg	90.00	0.047	0.0027	0.0597	0.0597
Serviceability - 60 mph Wind 180 deg	126.67	0.097	0.0039	0.0964	0.0964
Serviceability - 60 mph Wind 180 deg	140.00	0.120	0.0040	0.1061	0.1062
Serviceability - 60 mph Wind 180 deg	146.67	0.133	0.0038	0.1106	0.1106
Serviceability - 60 mph Wind 180 deg	160.00	0.159	0.0034	0.1150	0.1150
Serviceability - 60 mph Wind 180 deg	166.67	0.172	0.0028	0.1182	0.1182
Serviceability - 60 mph Wind 180 deg	180.00	0.199	0.0017	0.1749	0.1749
Serviceability - 60 mph Wind 210 deg	70.00	0.028	0.0014	0.0458	0.0459
Serviceability - 60 mph Wind 210 deg	90.00	0.047	0.0019	0.0596	0.0597
Serviceability - 60 mph Wind 210 deg	126.67	0.096	0.0030	0.0963	0.0963
Serviceability - 60 mph Wind 210 deg	140.00	0.120	0.0034	0.1062	0.1063
Serviceability - 60 mph Wind 210 deg	146.67	0.133	0.0036	0.1107	0.1108
Serviceability - 60 mph Wind 210 deg	160.00	0.159	0.0040	0.1151	0.1152
Serviceability - 60 mph Wind 210 deg	166.67	0.172	0.0047	0.1159	0.1160

Serviceability - 60 mph Wind 210 deg	180.00	0.198	0.0060	0.1535	0.1535
Serviceability - 60 mph Wind 240 deg	70.00	0.028	0.0024	0.0458	0.0458
Serviceability - 60 mph Wind 240 deg	90.00	0.047	0.0031	0.0596	0.0596
Serviceability - 60 mph Wind 240 deg	126.67	0.096	0.0050	0.0960	0.0961
Serviceability - 60 mph Wind 240 deg	140.00	0.120	0.0055	0.1059	0.1059
Serviceability - 60 mph Wind 240 deg	146.67	0.132	0.0058	0.1107	0.1107
Serviceability - 60 mph Wind 240 deg	160.00	0.158	0.0064	0.1149	0.1151
Serviceability - 60 mph Wind 240 deg	166.67	0.172	0.0072	0.1112	0.1113
Serviceability - 60 mph Wind 240 deg	180.00	0.198	0.0090	0.0972	0.0972
Serviceability - 60 mph Wind 300 deg	70.00	0.028	0.0023	0.0456	0.0457
Serviceability - 60 mph Wind 300 deg	90.00	0.047	0.0029	0.0596	0.0596
Serviceability - 60 mph Wind 300 deg	126.67	0.096	0.0044	0.0961	0.0961
Serviceability - 60 mph Wind 300 deg	140.00	0.120	0.0047	0.1056	0.1057
Serviceability - 60 mph Wind 300 deg	146.67	0.132	0.0047	0.1101	0.1101
Serviceability - 60 mph Wind 300 deg	160.00	0.158	0.0048	0.1149	0.1150
Serviceability - 60 mph Wind 300 deg	166.67	0.172	0.0048	0.1112	0.1112
Serviceability - 60 mph Wind 300 deg	180.00	0.198	0.0050	0.0972	0.0974
Serviceability - 60 mph Wind 330 deg	70.00	0.028	0.0013	0.0458	0.0459
Serviceability - 60 mph Wind 330 deg	90.00	0.047	0.0016	0.0596	0.0597
Serviceability - 60 mph Wind 330 deg	126.67	0.096	0.0024	0.0963	0.0963
Serviceability - 60 mph Wind 330 deg	140.00	0.120	0.0025	0.1062	0.1063
Serviceability - 60 mph Wind 330 deg	146.67	0.133	0.0025	0.1107	0.1108
Serviceability - 60 mph Wind 330 deg	160.00	0.159	0.0024	0.1151	0.1152
Serviceability - 60 mph Wind 330 deg	166.67	0.172	0.0023	0.1159	0.1160
Serviceability - 60 mph Wind 330 deg	180.00	0.198	0.0020	0.1535	0.1536

Site Name:	North Madison Volunteer FD, CT	*Program Last Updated:*	*5/13/2014*
Site Number:	383660	*American Tower Corporation*	
Engineer:	RDB		
Engineering Number:	OAA745468_C3_01		
Date:	03/14/19		



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

Analyze or Design a Foundation?	Analyze	
Foundation Mapped:	N	
Moment (M):	0.0	k-ft
Shear/Leg (V):	38.3	k
Compression/Leg (P):	323.3	k
Uplift/Leg (U):	282.3	k
Tower Type (GT / SST / MP):	SST	
Diameter of Caisson (d):	6.0	ft
Caisson Embedment (L-h):	18.0	ft
Caisson Height Above Ground (h):	0.5	ft
Depth Below Ground Surface to Water Table (w):	2.5	ft
Unit Weight of Concrete:	150.0	pcf
Unit Weight of Water:	62.4	pcf
Tension Skin Friction/Compression Skin Friction:	1.00	
Pullout Angle:	30.0	degrees

Engineer Notes

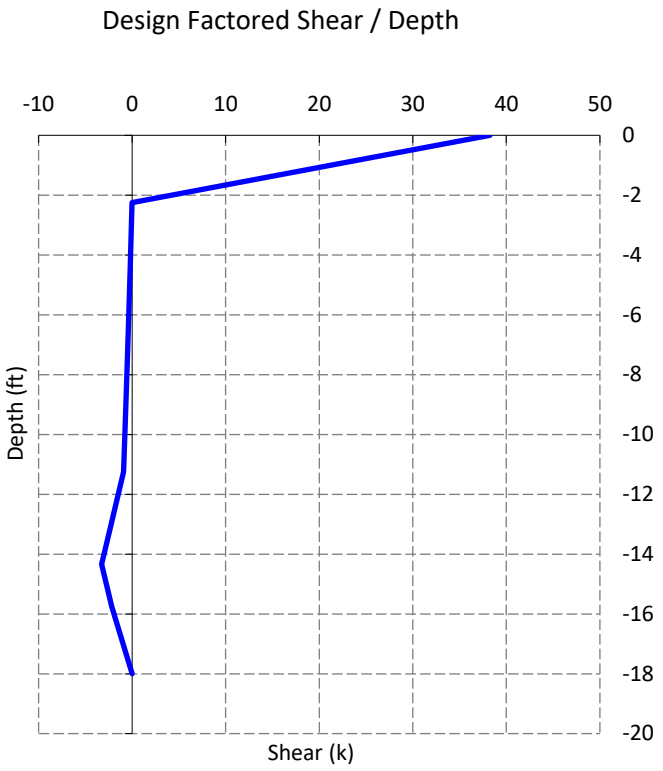
Soil Mechanical Properties

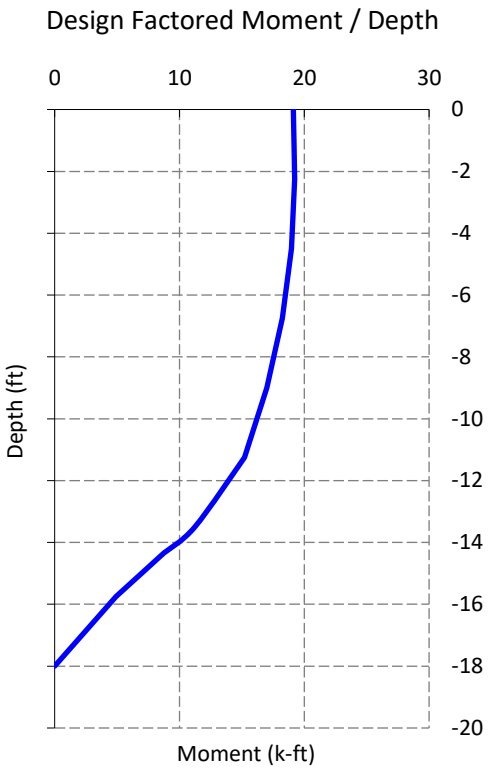
Depth (ft) Top	Depth (ft) Bottom	γ_{Soil} (pcf)	Cohesion (psf)	ϕ (degree)	Ultimate Skin Friction (psf)	Ultimate Bearing Pressure (psf)
0.0	2.0	125	0	0	0	0
2.0	10.0	125	625	0	313	0
10.0	14.0	135	6250	0	3125	0
14.0	19.0	145	8000	0	5000	36719

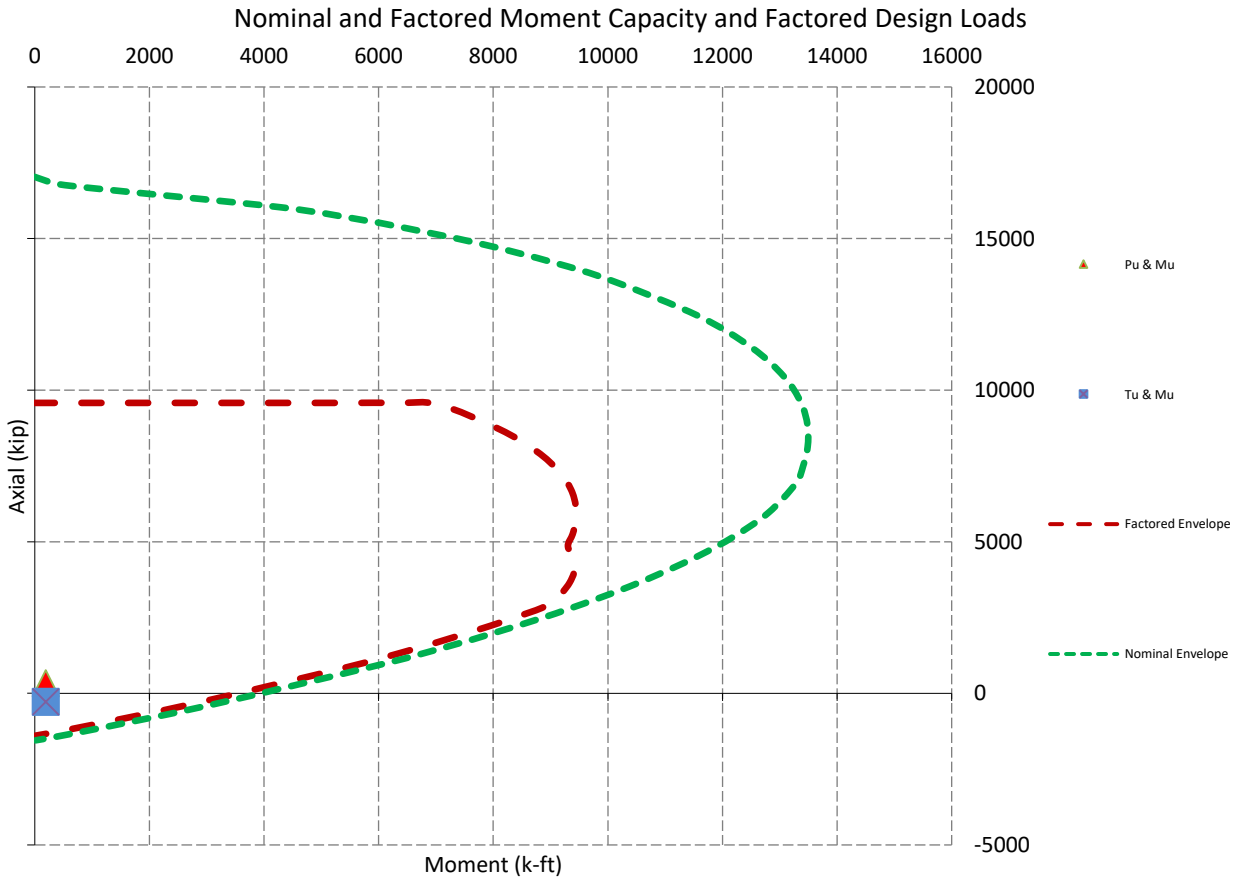
Volume of Concrete:	523.1 ft^3 = 19.4 yd^3	
Weight of Concrete (Buoyancy Effect Considered):	51.1	k
Average Soil Unit Weight:	77.9	pcf
Skin Friction Resistance:	659.8	k
Compressive Bearing Resistance:	1038.2	k
Pullout Weight (Minus Concrete Weight):	647.7	k
Nominal Uplift Capacity per Leg ($\phi_s T_n$):	485.8	k
Nominal Compressive Capacity per Leg ($\phi_s P_n$):	1273.5	k
P_u:	334.5	k
$T_u/\phi_s T_n$:	0.58	Result: OK
$P_u/\phi_s P_n$:	0.26	Result: OK
Total Lateral Resistance:	2347.2	k
Inflection Point (Below Ground Surface):	14.3	ft
Design Overturning Moment At Inflection Point (M_D):	567.6	k-ft
Nominal Moment Capacity ($\phi_s M_n$):	4527.1	k-ft
$M_D/\phi_s M_n$:	0.13	Result: OK
ϕ_s:	0.75	

Caisson Strength Capacity

Concrete Compressive Strength (f'_c):	4500	psi
Vertical Steel Rebar Size #:	9	
Vertical Steel Rebar Area:	1.00	in^2
# of Vertical Steel Rebars:	26	
Vertical Steel Rebar Yield Strength (F_y):	60	ksi
Horizontal Tie / Stirrup Size #:	5	
Horizontal Tie / Stirrup Area:	0.31	in^2
Design Horizontal Tie / Stirrup Spacing:	12.0	in
Horizontal Tie / Stirrup Steel Yield Strength (F_y):	60	ksi
Rebar Cage Diameter:	64.0	in
Strength Bending/Tension Reduction Factor (ϕ_B):	0.90	ACI318-05 - 9.3.2.1
Strength Shear Reduction Factor (ϕ_V):	0.75	ACI318-05 - 9.3.2.3
Strength Compression Reduction Factor (ϕ_V):	0.65	ACI318-05 - 9.3.2.2
Steel Elastic Modulus:	29000	ksi
Design Moment (M_u):	191.3	k-ft
Nominal Moment Capacity ($\phi_B M_n$):	3662.7	k-ft - ACI318-005 - 10.2
$M_u/\phi_B M_n$:	0.05	Result: OK
Design Shear (V_u):	38.3	k
Nominal Shear Capacity ($\phi_V V_n$):	395.5	k - ACI318-05 - 11.3.1.1 or 11.5.7.2
$V_u/\phi_V V_n$:	0.10	Result: OK
Design Tension (T_u):	282.3	k
Nominal Tension Capacity ($\phi_T T_n$):	1404.0	k - ACI318-05 - 10.2
$T_u/\phi_T T_n$:	0.20	Result: OK
Design Compression (P_u):	334.5	k
Nominal Compression Capacity ($\phi_P P_n$):	8046.5	k - ACI318-05 - 10.3.6.2
$P_u/\phi_P P_n$:	0.04	Result: OK
Bending Reinforcement Ratio:	0.006	ACI318-05 - 10.8.4 & 10.9.1
$M_u/\phi_B M_n + T_u/\phi_T T_n$:	0.25	Result: OK


Design Factored Shear / Depth
-10
0
10
20
30
40
50
0
-2
-4
-6
-8
-10
-12
-14
-16
-18
-20
Depth (ft)
Shear (k)


Design Factored Moment / Depth
0
10
20
30
0
-2
-4
-6
-8
-10
-12
-14
-16
-18
-20
Depth (ft)
Moment (k-ft)


Nominal and Factored Moment Capacity and Factored Design Loads
0
2000
4000
6000
8000
10000
12000
14000
16000
20000
15000
10000
5000
0
-5000
Axial (kip)
Moment (k-ft)
Pu & Mu
Tu & Mu
Factored Envelope
Nominal Envelope

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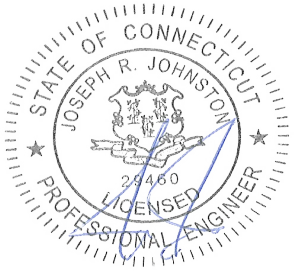
1033 WATERVLIET SHAKER RD, ALBANY, NY 12205

Post Mod Mount Analysis Report

January 23, 2019

Site Name	MADISON - SR 79
Site Number	CTL02033
FA Number	10035048
Pace Number	MRCTB035097; MRCTB035271; MRCTB035128; MRCTB035296
PTN Number	2051A0KPKA; 2051A0KPJJ; 2051A0KQ8B; 2051A0KQBZ
Infinigy Job Number	1106-A0001-B
Client	AT&T
Carrier	Smartlink
Site Location	864 Opening Hill Road, Madison, CT 06443 41° 21' 26.27" N NAD83 72° 38' 19.50" W NAD83
Mount Centerline EL.	140.0 ft
Structure Type	Sector Frame
Passing Usage Ratio	**49.8%**
Overall Result	**Pass**
Note	**See appended documents for mount modifications**

Upon reviewing the results of this analysis, it is our opinion that the proposed mount does meet the specified TIA code requirements. The mounts and connections for the proposed carrier are therefore deemed adequate to support the final loading configuration as listed in this report.



1/25/19

Ashim Pant

Project Engineer I

Contents

Introduction

Infinigy Engineering has been requested to perform a post mount modification analysis on the existing antenna supporting structures. All supporting documents have been obtained from the client and are assumed to be accurate and applicable to this site. The mount was analyzed using RISA 3D v. 17.0.2 software.

Supporting Documentation

RFDS	AT&T RFDS ID # 2574800, dated December 14, 2018
Construction Drawings	Infinigy Project #1106-A0001-C, dated January 02, 2019
Previous Analysis	Infinigy Job#1106-A0001-B, dated January 4, 2019
Mount Design Drawings	Pinnacle Wireless, dated January 28. 2013

Analysis Code Requirements

Wind Speed	101 mph (3-Second Gust, V_{ASD})/ 130 mph (3-Second Gust, V_{ULT})
Wind Speed w/ ice	50 mph (3-Second Gust, V_{ASD}) w/ 0.75" ice
TIA Revision	ANSI/TIA-222-G
Adopted IBC	2015 IBC / 2018 Connecticut Building Code
Structure Class	II
Exposure Category	C
Topographic Category	1
Calculated Crest Height	0 ft.

Conclusion

Upon reviewing the results of this analysis, it is our opinion that the proposed mount does meet the specified TIA code requirements. The mounts and connections for the proposed carrier are therefore deemed adequate to support the final loading configuration as listed in this report.

If you have any questions, require additional information, or actual conditions differ from those as detailed in this report please contact me via the information below:

Ashim Pant
Project Engineer I | **INFINIGY**
1490 W. 121st Ave. Suite 101 Westminster, CO 80234
(M) (817) 709-5893
apant@infinigy.com | www.infinigy.com

Final Configuration Loading

Mount CL (ft)	Rad. HT (ft)	Horiz. O/S (ft)*	Qty	Appurtenance (1) (2) (3)	Carrier
140.0	140.0	12.0	3	Powerwave 7770	AT&T
		2.3	3	CCI HPA-65R-BU6AA	
		0.0	3	Kathrien 800-10965	
		2.3	3	Ericcson B2/B66A 8843	
		0.0	3	Ericcson B5/B12 4449	
		12.0	6	Powerwave LGP 21401	
		-	2	Raycap DC6-48-60-18-8F	

(1) Horizontal Offset is defined as the distance from the left most edge of the mount face horizontal when viewed facing the tower
(2) Radios are to be mounted behind antennas at respective locations see appended documents for vertical locations
(3) Raycaps are to be attached to the tower

Structure Usages

Standoff	36.8%	Pass
Mount Pipe	49.8%	Pass
Horizontal	20.4%	Pass
Tower Connection	14.7%	Pass
Rating	**49.8%**	**Pass**

Mount Connection Analysis

Reaction Data	Design Capacity	Analysis Reactions	Result
Max Axial (lbs.)	20340	1354	**6.7%**
Max Shear (lbs.)	12425	1825	**14.7%**

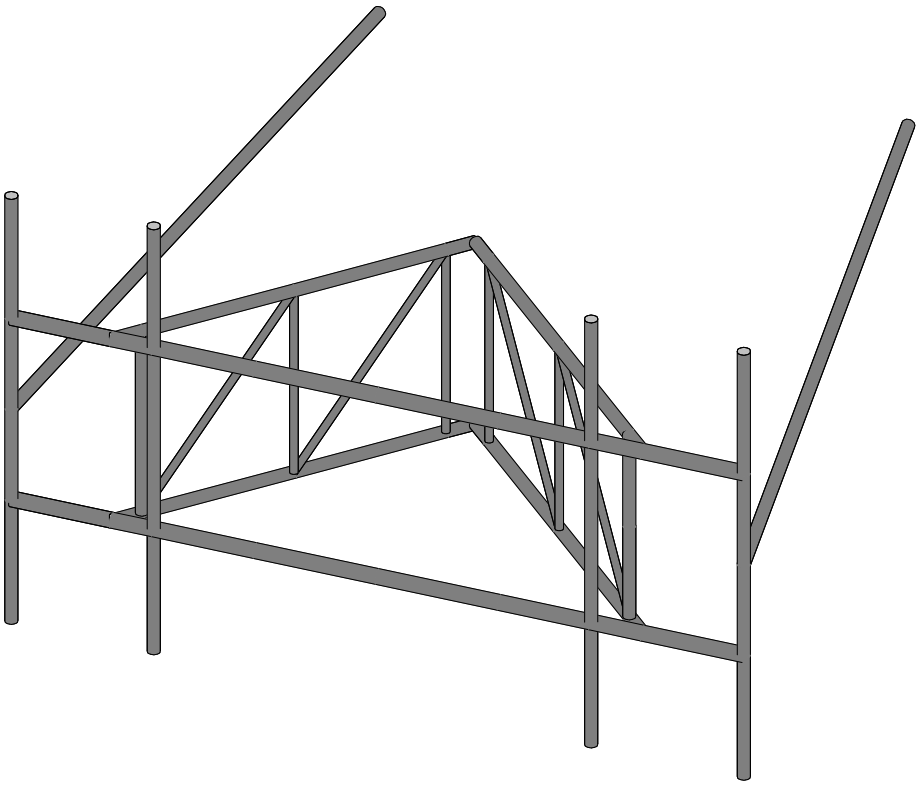
***Assumed (2) A325 bolt per connection. Contractor to field verify diameters before proposed installation.**

Assumptions and Limitations

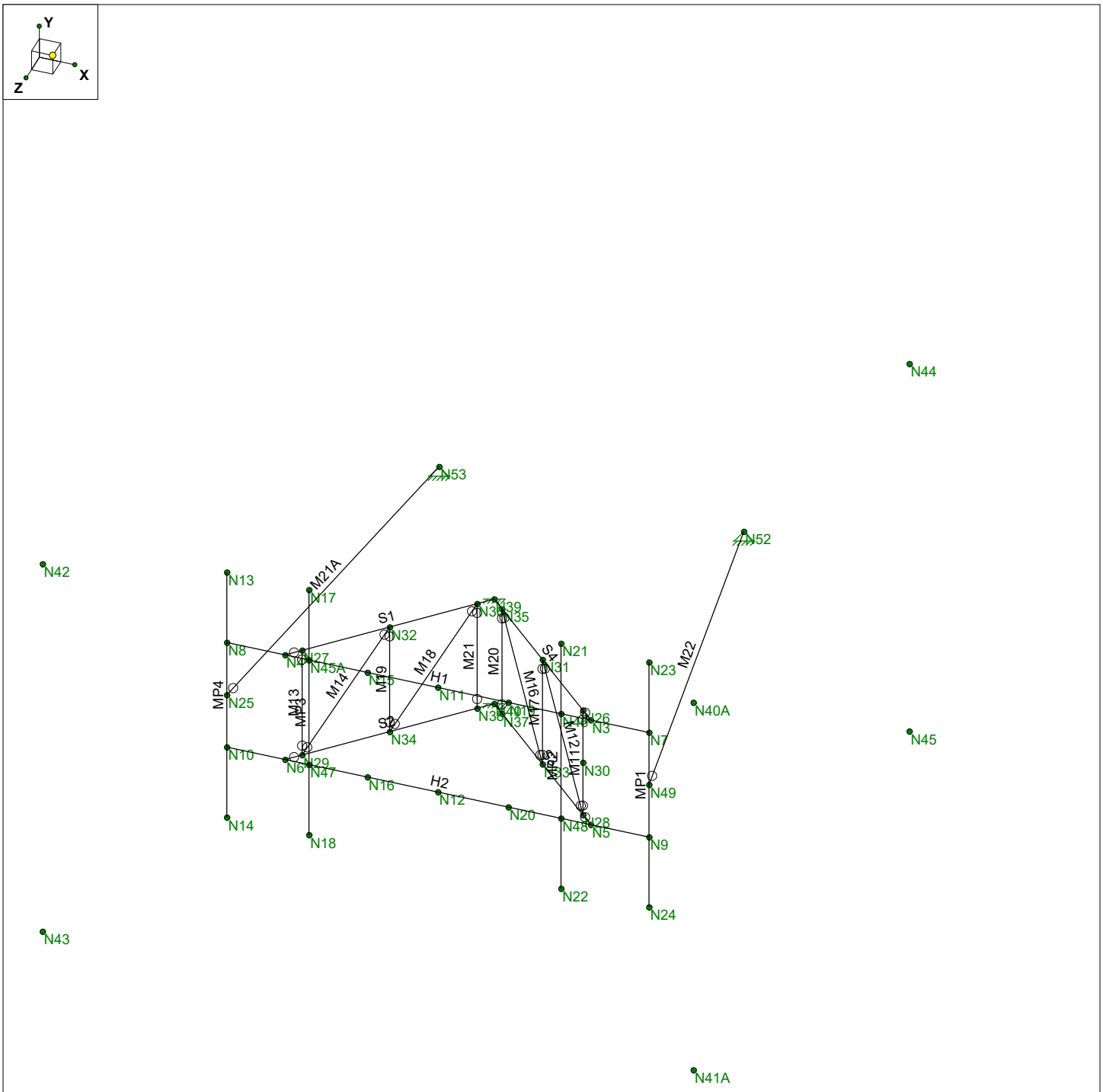
Our structural calculations are completed assuming all information provided to Infinigy Engineering is accurate and applicable to this site. For the purposes of calculations, we assume an overall structure condition of "like new" and all members, connections, anchors, and masonry to be free of corrosion and/or structural defects. The structure owner and/or contractor shall verify the structure's condition prior to installation of any proposed equipment. If actual conditions differ from those described in this report Infinigy Engineering should be notified immediately to complete a revised evaluation.

Our evaluation is completed using standard TIA, AISC, ACI, and ASCE methods and procedures. Our structural results are proprietary and should not be used by others as their own. Infinigy Engineering is not responsible for decisions made by others that are or are not based on our supplied assumptions and conclusions.

This report is an evaluation of the all rooftop mounted equipment and/or antenna supporting structures as well as rooftop element adequacy to support these structures.



Infinigy Engineering, PLLC	CTL02033	Rendered
AP		Jan 11, 2019 at 10:38 AM
1106-A0001-B		CTL02033_Mod.r3d



Infinigy Engineering, PLLC	CTL02033	Member Label and Nodes
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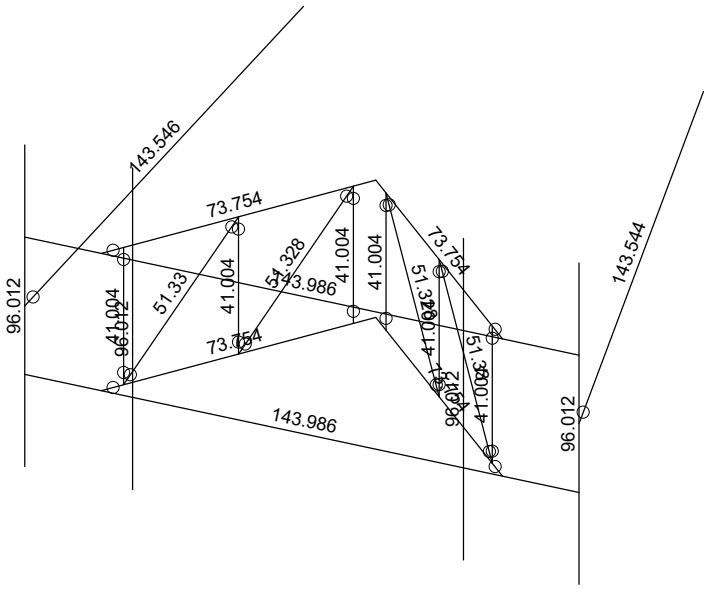
1106-A0001-B		CTL02033_Mod.r3d



Member Length (in) Displayed

Infinigy Engineering, PLLC	CTL02033	Member Length
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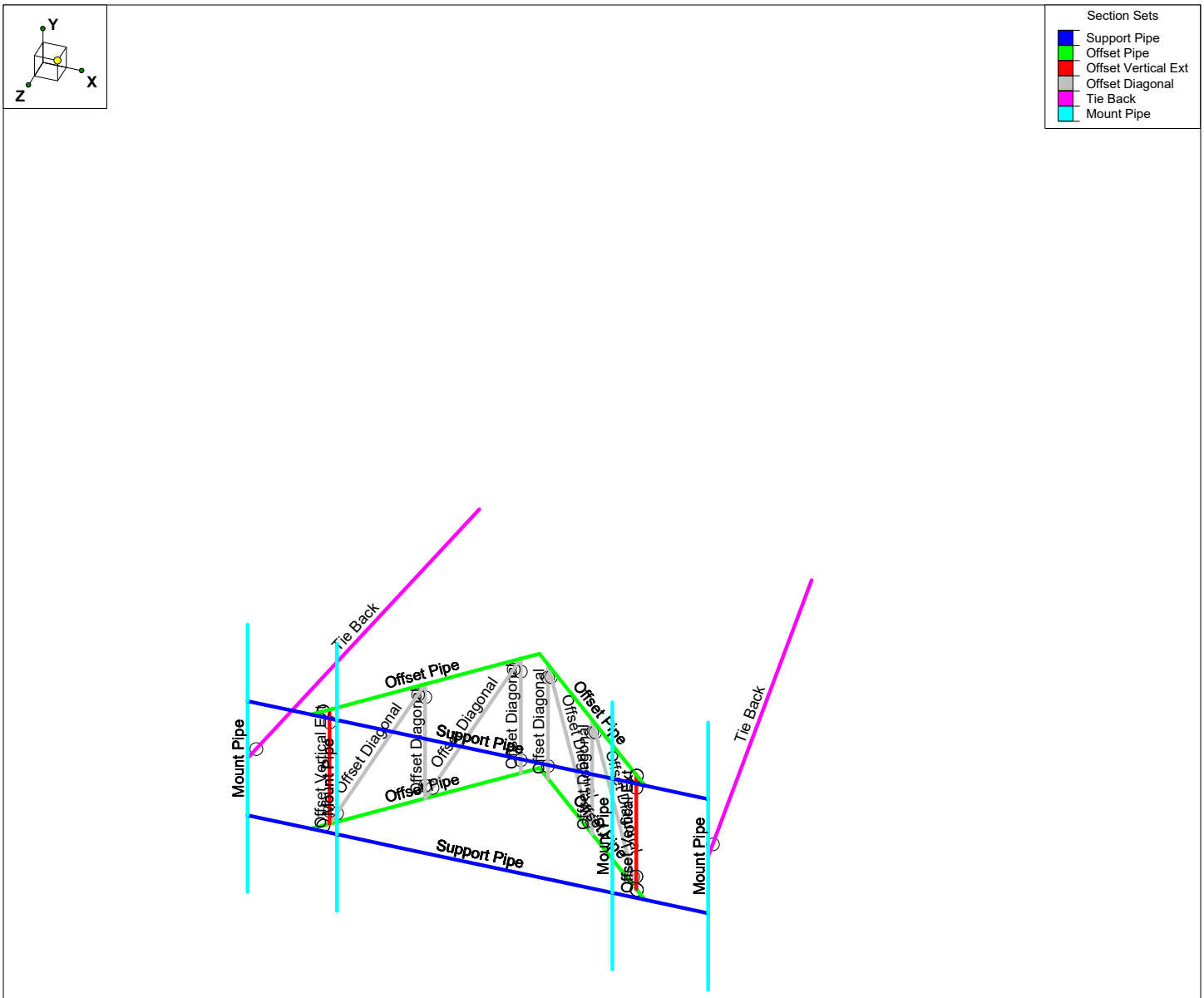

Infinigy Engineering, PLLC	CTL02033	Section Sets
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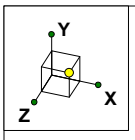
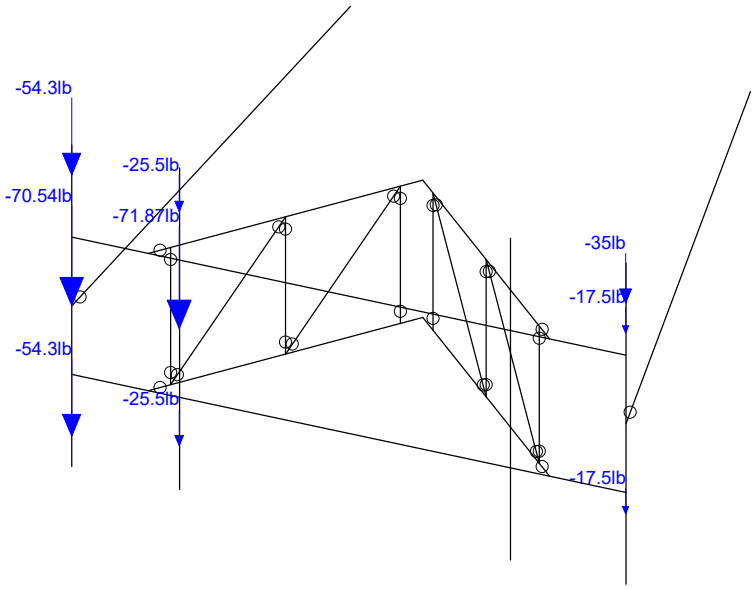
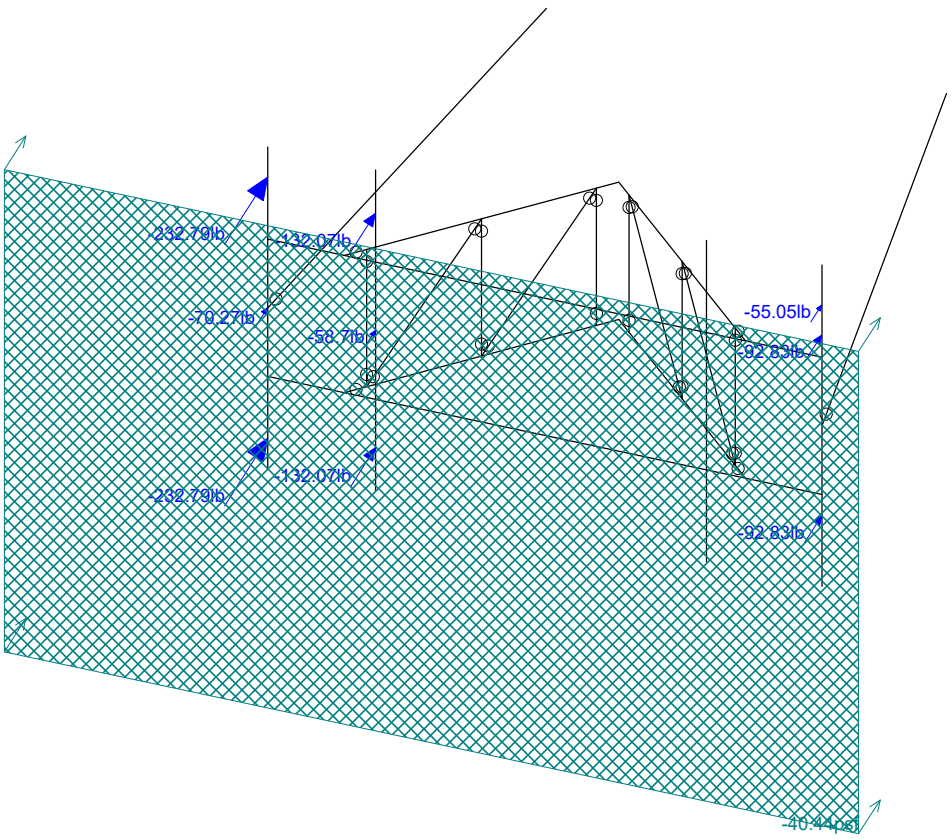




Loads: BLC 1, Self Weight

Infinigy Engineering, PLLC	CTL02033	Dead Load
AP		Jan 11, 2019 at 10:50 AM
1106-A0001-B		CTL02033_Mod.r3d



Loads: BLC 2, Wind Load AZI 000

Infinigy Engineering, PLLC	CTL02033	Wind Load AZI 000
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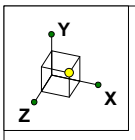
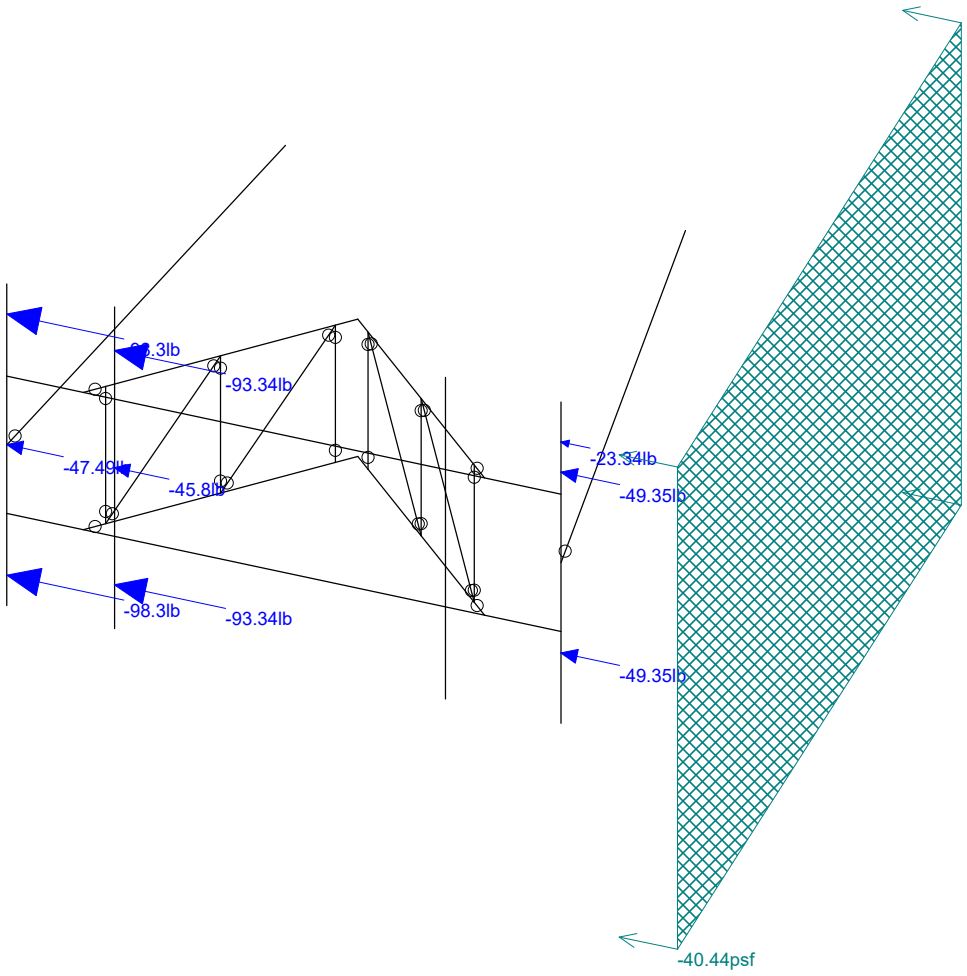
1106-A0001-B		CTL02033_Mod.r3d





Loads: BLC 3, Wind Load AZI 090

Infinigy Engineering, PLLC	CTL02033	Wind Load AZI 090
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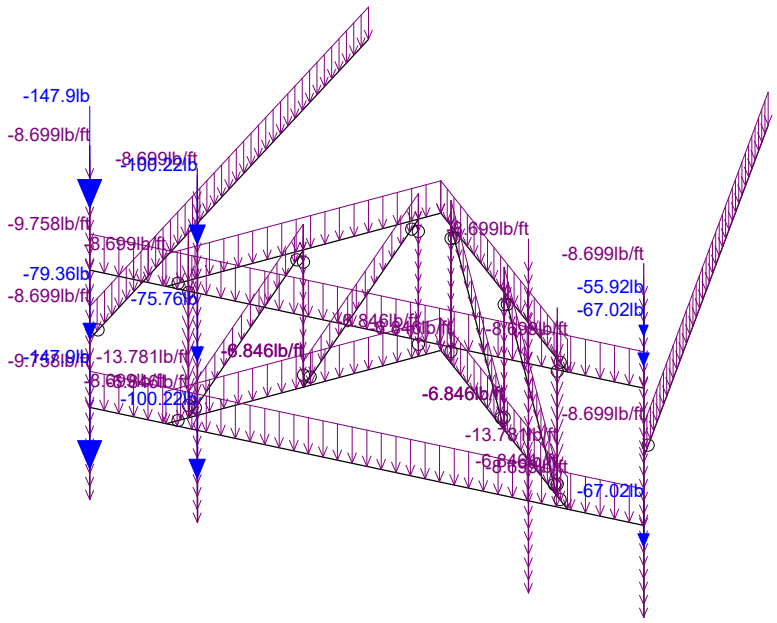
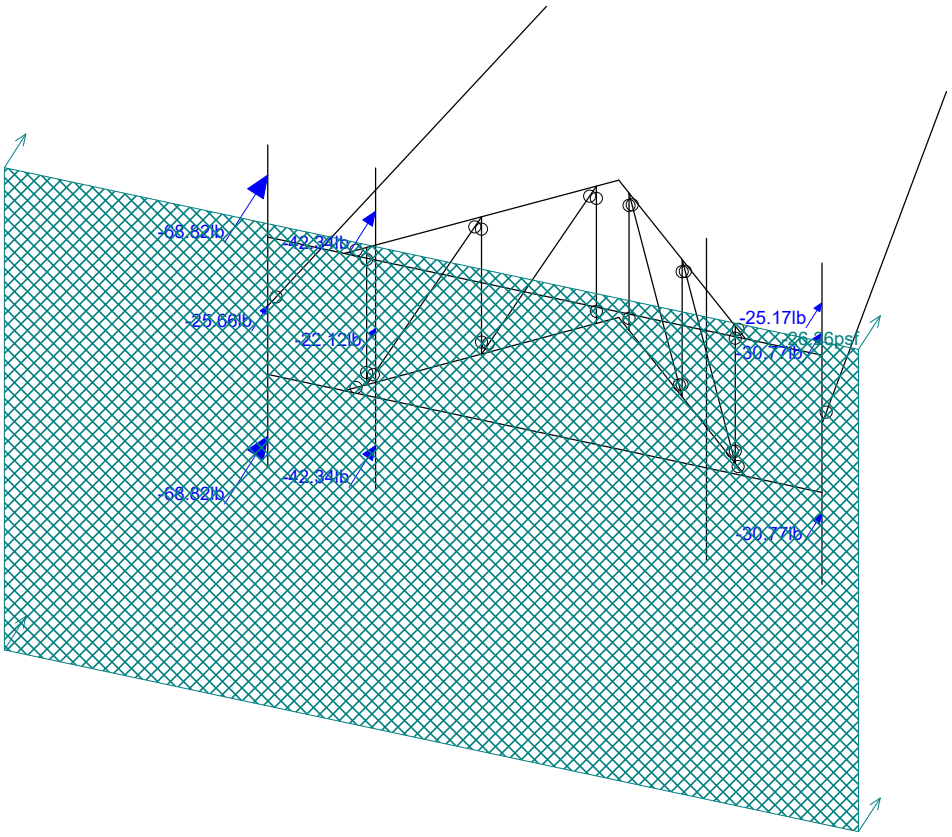


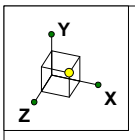
Loads: BLC 4, Ice Weight

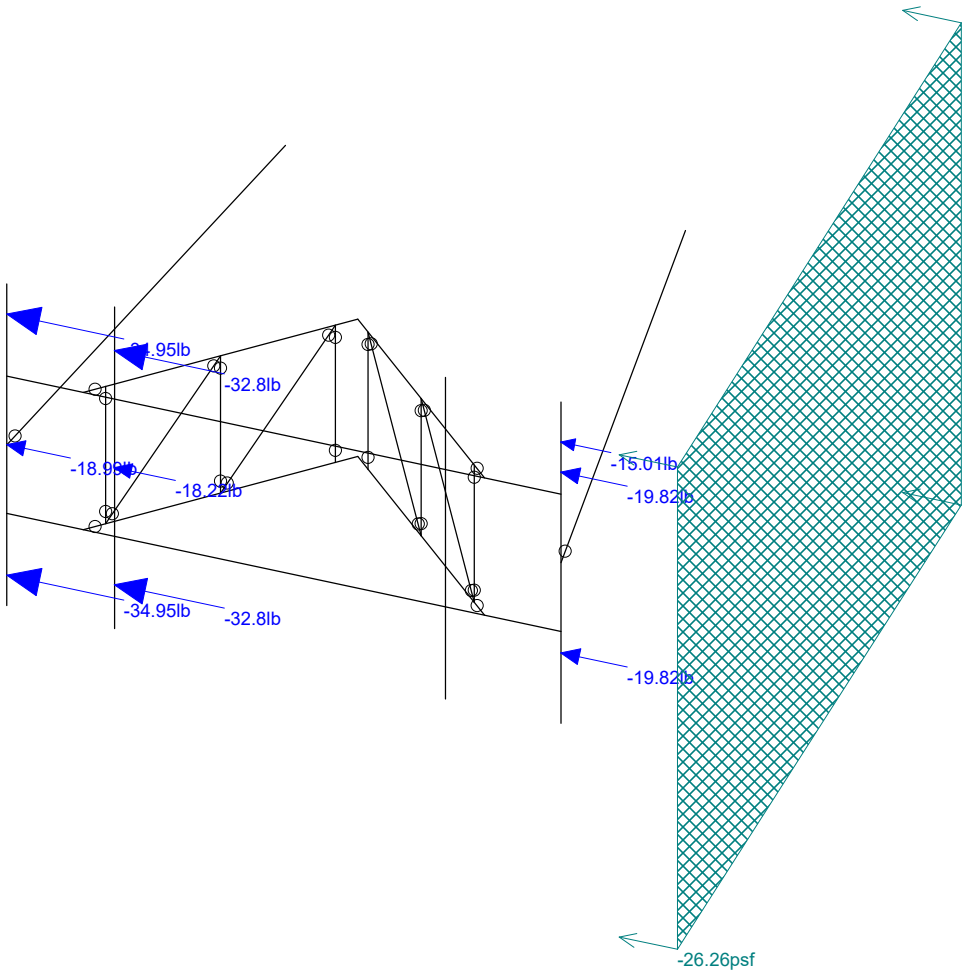
Infinigy Engineering, PLLC	CTL02033	Ice Dead Load
AP		Jan 11, 2019 at 10:53 AM
1106-A0001-B		CTL02033_Mod.r3d



Loads: BLC 5, Wind + Ice Load AZI 000

Infinigy Engineering, PLLC	CTL02033	Ice Wind Load AZI 000
AP		Jan 11, 2019 at 10:54 AM
1106-A0001-B		CTL02033_Mod.r3d





Loads: BLC 6, Wind + Ice Load AZI 090

Infinigy Engineering, PLLC	CTL02033	Ice Wind Load AZI 090
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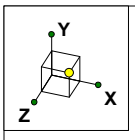

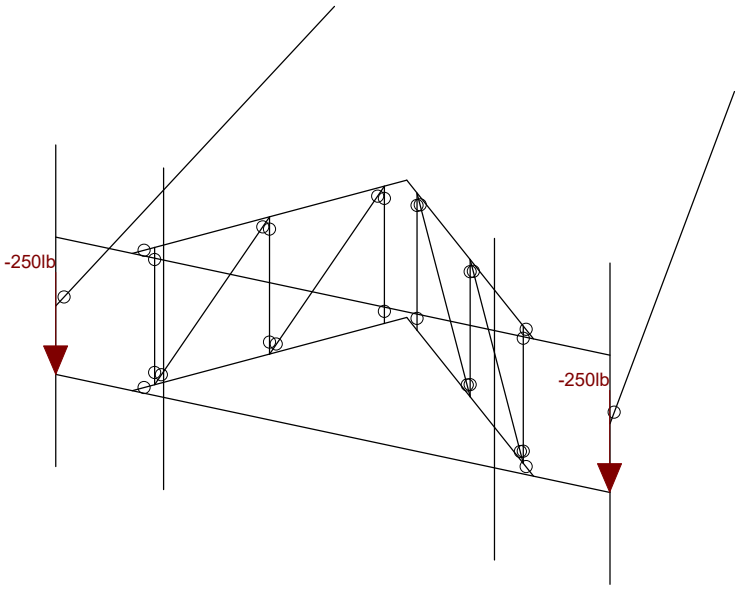

Loads: BLC 7, Service Live 1

Infinigy Engineering, PLLC	CTL02033	Live Load
AP		Jan 11, 2019 at 10:55 AM
1106-A0001-B		CTL02033_Mod.r3d

Site Name:	CTL02033
Client:	Smartlink
Carrier:	AT&T
Engineer:	AP
Date:	1/11/2019

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INFINIGY WIND LOAD CALCULATOR 3.0.2

Site Information Inputs:

Adopted Building Code:	2015 IBC
Structure Load Standard:	TIA-222-G
Antenna Load Standard:	TIA-222-G
Structure Risk Category:	II
Structure Type:	Mount - Sector
Number of Sectors:	3
Structure Shape 1:	Round

Rooftop Inputs:

Rooftop Wind Speed-Up?:	No

Wind Loading Inputs:

Design Wind Velocity:	101	mph (nominal 3-second gust)
Wind Centerline 1 (z_1):	140.0	ft
Side Face Angle (θ):	60	degrees
Exposure Category:	C	
Topographic Category:	1	

Wind with No Ice		
q_z (psf)	Gh	F_{ST} (psf)
33.70	1.00	**40.44**

Wind with Ice		
q_z (psf)	Gh	F_{ST} (psf)
8.26	1.00	**26.26**

Ice Loading Inputs:

Is Ice Loading Needed?:	Yes	
Ice Wind Velocity:	50	mph (nominal 3-second gust)
Base Ice Thickness:	0.75	in

Input Appurtenance Information and Load Placements:

Appurtenance Name	Elevation (ft)	Total Quantity	Ka	Front Shape	Side Shape	q_z (psf)	EPA (ft^2)	Fz (lbs)	Fx (lbs)	Fz(60) (lbs)	Fx(30) (lbs)
Powerwave 7770	140.0	3	1.00	Flat	Flat	33.70	5.51	185.65	98.69	120.43	163.91
CCI HPA-65R-BU6AA	140.0	3	1.00	Flat	Flat	33.70	7.84	264.15	186.67	206.04	244.78
Kathrien 800-10965	140.0	3	1.00	Flat	Flat	33.70	13.81	465.57	196.60	263.84	398.33
Ericcson B2/B66A 8843	140.0	3	1.00	Flat	Flat	33.70	1.74	58.70	45.80	49.02	55.47
Ericcson B5/B12 4449	140.0	3	1.00	Flat	Flat	33.70	2.09	70.27	47.49	53.18	64.58
Powerwave LGP 21401	140.0	6	1.00	Flat	Flat	33.70	0.82	27.52	11.67	15.64	23.56
Raycap DC6-48-60-18-8F	140.0	2	1.00	Round	Round	33.70	1.21	40.84	40.84	40.84	40.84

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rules
1	S4	N3	N39			Offset Pipe	Beam	Pipe	A53 Gr. B	Typical
2	S1	N4	N39			Offset Pipe	Beam	Pipe	A53 Gr. B	Typical
3	S3	N5	N40			Offset Pipe	Beam	Pipe	A53 Gr. B	Typical
4	S2	N6	N40			Offset Pipe	Beam	Pipe	A53 Gr. B	Typical
5	H1	N8	N7			Support Pipe	Beam	Pipe	A53 Gr. B	Typical
6	H2	N10	N9			Support Pipe	Beam	Pipe	A53 Gr. B	Typical
7	MP4	N13	N14			Mount Pipe	Beam	Pipe	A53 Gr. B	Typical
8	MP3	N17	N18			Mount Pipe	Beam	Pipe	A53 Gr. B	Typical
9	MP2	N21	N22			Mount Pipe	Beam	Pipe	A53 Gr. B	Typical
10	MP1	N23	N24			Mount Pipe	Beam	Pipe	A53 Gr. B	Typical
11	M11	N28	N26			Offset Vertical ...	Beam	Pipe	A53 Gr. B	Typical
12	M12	N28	N31			Offset Diagonal	Beam	Pipe	A53 Gr. B	Typical
13	M13	N29	N27			Offset Vertical ...	Beam	Pipe	A53 Gr. B	Typical
14	M14	N29	N32			Offset Diagonal	Beam	Pipe	A53 Gr. B	Typical
15	M16	N33	N35			Offset Diagonal	Beam	Pipe	A53 Gr. B	Typical
16	M17	N33	N31			Offset Diagonal	Beam	Pipe	A53 Gr. B	Typical
17	M18	N34	N36			Offset Diagonal	Beam	Pipe	A53 Gr. B	Typical
18	M19	N34	N32			Offset Diagonal	Beam	Pipe	A53 Gr. B	Typical
19	M20	N37	N35			Offset Diagonal	Beam	Pipe	A53 Gr. B	Typical
20	M21	N38	N36			Offset Diagonal	Beam	Pipe	A53 Gr. B	Typical
21	M21A	N25	N53			Tie Back	Beam	Pipe	A53 Gr. B	Typical
22	M22	N49	N52			Tie Back	Beam	Pipe	A53 Gr. B	Typical

Material Takeoff

	Material	Size	Pieces	Length[in]	Weight[K]
1	Hot Rolled Steel				
2	A53 Gr. B	1.5" OD 16 Gauge	8	369.3	0
3	A53 Gr. B	PIPE_2.0	12	1048.2	.3
4	A53 Gr. B	PIPE_2.5	2	288	.1
5	Total HR Steel		22	1705.5	.5

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design ...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	Support Pipe	PIPE_2.5	Beam	Pipe	A53 Gr. B	Typical	1.61	1.45	1.45	2.89
2	Offset Pipe	PIPE_2.0	Beam	Pipe	A53 Gr. B	Typical	1.02	.627	.627	1.25
3	Offset Vertical Ext	PIPE_2.0	Beam	Pipe	A53 Gr. B	Typical	1.02	.627	.627	1.25
4	Offset Diagonal	1.5" OD 16 Gauge	Beam	Pipe	A53 Gr. B	Typical	.271	.07	.07	.141
5	Tie Back	PIPE_2.0	Beam	Pipe	A53 Gr. B	Typical	1.02	.627	.627	1.25
6	Mount Pipe	PIPE_2.0	Beam	Pipe	A53 Gr. B	Typical	1.02	.627	.627	1.25
7	Offset Vertical Int	PIPE_2.0	Beam	Pipe	A53 Gr. B	Typical	1.02	.627	.627	1.25

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (\1E...	Density[k/ft...	Yield[ksi]	Ry	Fu[ksi]	Rt
1	A36 Gr.36	29000	11154	.3	.65	.49	36	1.5	58	1.2
2	A572 Gr.50	29000	11154	.3	.65	.49	50	1.1	58	1.2
3	A992	29000	11154	.3	.65	.49	50	1.1	58	1.2
4	A500 Gr.42	29000	11154	.3	.65	.49	42	1.3	58	1.1
5	A500 Gr.46	29000	11154	.3	.65	.49	46	1.2	58	1.1
6	A53 Gr. B	29000	11154	.3	.65	.49	35	1.5	60	1.2

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed	Area(Me...	Surface(...
1	Self Weight	DL		-1			9			
2	Wind Load AZI 000	WLZ					9		1	
3	Wind Load AZI 090	WLX					9		1	
4	Ice Weight	OL1					9	22		
5	Wind + Ice Load AZI 000	OL2					9		1	
6	Wind + Ice Load AZI 090	OL3					9		1	
7	Service Live 1	LL				2				
8	Seismic Load AZI 000	ELZ								
9	Seismic Load AZI 090	ELX								
10	BLC 2 Transient Area Loads	None						22		
11	BLC 3 Transient Area Loads	None						20		
12	BLC 5 Transient Area Loads	None						22		
13	BLC 6 Transient Area Loads	None						20		

Load Combinations

	Description	S...	P...	S...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
1	1.4D	Yes	Y		DL	1.4																		
2	1.2D + 1.6W AZI 000	Yes	Y		DL	1.2	W...	1.6																
3	1.2D + 1.6W AZI 030	Yes	Y		DL	1.2	W...	1.3...	W...	.8														
4	1.2D + 1.6W AZI 060	Yes	Y		DL	1.2	W...	.8	W...	1.3...														
5	1.2D + 1.6W AZI 090	Yes	Y		DL	1.2			W...	1.6														
6	1.2D + 1.6W AZI 120	Yes	Y		DL	1.2	W...	-.8	W...	1.3...														
7	1.2D + 1.6W AZI 150	Yes	Y		DL	1.2	W...	-1....	W...	.8														
8	1.2D + 1.6W AZI 180	Yes	Y		DL	1.2	W...	-1.6																
9	1.2D + 1.6W AZI 210	Yes	Y		DL	1.2	W...	-1....	W...	-.8														
10	1.2D + 1.6W AZI 240	Yes	Y		DL	1.2	W...	-.8	W...	-1....														
11	1.2D + 1.6W AZI 270	Yes	Y		DL	1.2			W...	-1.6														
12	1.2D + 1.6W AZI 300	Yes	Y		DL	1.2	W...	.8	W...	-1....														
13	1.2D + 1.6W AZI 330	Yes	Y		DL	1.2	W...	1.3...	W...	-.8														
14	0.9D + 1.6W AZI 000	Yes	Y		DL	.9	W...	1.6																
15	0.9D + 1.6W AZI 030	Yes	Y		DL	.9	W...	1.3...	W...	.8														
16	0.9D + 1.6W AZI 060	Yes	Y		DL	.9	W...	.8	W...	1.3...														
17	0.9D + 1.6W AZI 090	Yes	Y		DL	.9			W...	1.6														
18	0.9D + 1.6W AZI 120	Yes	Y		DL	.9	W...	-.8	W...	1.3...														
19	0.9D + 1.6W AZI 150	Yes	Y		DL	.9	W...	-1....	W...	.8														
20	0.9D + 1.6W AZI 180	Yes	Y		DL	.9	W...	-1.6																
21	0.9D + 1.6W AZI 210	Yes	Y		DL	.9	W...	-1....	W...	-.8														
22	0.9D + 1.6W AZI 240	Yes	Y		DL	.9	W...	-.8	W...	-1....														
23	0.9D + 1.6W AZI 270	Yes	Y		DL	.9			W...	-1.6														
24	0.9D + 1.6W AZI 300	Yes	Y		DL	.9	W...	.8	W...	-1....														
25	0.9D + 1.6W AZI 330	Yes	Y		DL	.9	W...	1.3...	W...	-.8														
26	1.2D + 1.0Di	Yes	Y		DL	1.2	O...	1																
27	1.2D + 1.0Di + 1.0Wi AZI ...	Yes	Y		DL	1.2	O...	1	O...	1														
28	1.2D + 1.0Di + 1.0Wi AZI ...	Yes	Y		DL	1.2	O...	1	O...	.866	O...	.5												
29	1.2D + 1.0Di + 1.0Wi AZI ...	Yes	Y		DL	1.2	O...	1	O...	.5	O...	.866												
30	1.2D + 1.0Di + 1.0Wi AZI ...	Yes	Y		DL	1.2	O...	1			O...	1												
31	1.2D + 1.0Di + 1.0Wi AZI ...	Yes	Y		DL	1.2	O...	1	O...	-.5	O...	.866												
32	1.2D + 1.0Di + 1.0Wi AZI ...	Yes	Y		DL	1.2	O...	1	O...	-.866	O...	.5												
33	1.2D + 1.0Di + 1.0Wi AZI ...	Yes	Y		DL	1.2	O...	1	O...	-1														
34	1.2D + 1.0Di + 1.0Wi AZI ...	Yes	Y		DL	1.2	O...	1	O...	-.866	O...	-.5												
35	1.2D + 1.0Di + 1.0Wi AZI ...	Yes	Y		DL	1.2	O...	1	O...	-.5	O...	-.866												
36	1.2D + 1.0Di + 1.0Wi AZI ...	Yes	Y		DL	1.2	O...	1			O...	-1												
37	1.2D + 1.0Di + 1.0Wi AZI ...	Yes	Y		DL	1.2	O...	1	O...	.5	O...	-.866												
38	1.2D + 1.0Di + 1.0Wi AZI ...	Yes	Y		DL	1.2	O...	1	O...	.866	O...	-.5												

Load Combinations (Continued)

	Description	S...	P...	S...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
39	1.2D + 1.5L + 1.0WL (30 ...	Yes	Y		DL	1.2	LL	1.5	W...	.088																
40	1.2D + 1.5L + 1.0WL (30 ...	Yes	Y		DL	1.2	LL	1.5	W...	.076	W...	.044														
41	1.2D + 1.5L + 1.0WL (30 ...	Yes	Y		DL	1.2	LL	1.5	W...	.044	W...	.076														
42	1.2D + 1.5L + 1.0WL (30 ...	Yes	Y		DL	1.2	LL	1.5			W...	.088														
43	1.2D + 1.5L + 1.0WL (30 ...	Yes	Y		DL	1.2	LL	1.5	W...	-.044	W...	.076														
44	1.2D + 1.5L + 1.0WL (30 ...	Yes	Y		DL	1.2	LL	1.5	W...	-.076	W...	.044														
45	1.2D + 1.5L + 1.0WL (30 ...	Yes	Y		DL	1.2	LL	1.5	W...	-.088																
46	1.2D + 1.5L + 1.0WL (30 ...	Yes	Y		DL	1.2	LL	1.5	W...	-.076	W...	-.044														
47	1.2D + 1.5L + 1.0WL (30 ...	Yes	Y		DL	1.2	LL	1.5	W...	-.044	W...	-.076														
48	1.2D + 1.5L + 1.0WL (30 ...	Yes	Y		DL	1.2	LL	1.5			W...	-.088														
49	1.2D + 1.5L + 1.0WL (30 ...	Yes	Y		DL	1.2	LL	1.5	W...	.044	W...	-.076														
50	1.2D + 1.5L + 1.0WL (30 ...	Yes	Y		DL	1.2	LL	1.5	W...	.076	W...	-.044														

Joint Loads and Enforced Displacements (BLC 7 : Service Live 1)

	Joint Label	L,D,M	Direction	Magnitude[(lb,lb-ft), (in,rad), (lb*s^2...
1	N9	L	Y	-250
2	N10	L	Y	-250

Member Point Loads (BLC 1 : Self Weight)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	Y	-17.5	21
2	MP3	Y	-25.5	13
3	MP4	Y	-54.3	9
4	MP3	Y	-71.87	48
5	MP4	Y	-70.54	48
6	MP1	Y	-35	12
7	MP1	Y	-17.5	75
8	MP3	Y	-25.5	83
9	MP4	Y	-54.3	87

Member Point Loads (BLC 2 : Wind Load AZI 000)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	Z	-92.83	21
2	MP3	Z	-132.07	13
3	MP4	Z	-232.79	9
4	MP3	Z	-58.7	48
5	MP4	Z	-70.27	48
6	MP1	Z	-55.05	12
7	MP1	Z	-92.83	75
8	MP3	Z	-132.07	83
9	MP4	Z	-232.79	87

Member Point Loads (BLC 3 : Wind Load AZI 090)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	X	-49.35	21
2	MP3	X	-93.34	13
3	MP4	X	-98.3	9
4	MP3	X	-45.8	48
5	MP4	X	-47.49	48
6	MP1	X	-23.34	12
7	MP1	X	-49.35	75
8	MP3	X	-93.34	83
9	MP4	X	-98.3	87

Member Point Loads (BLC 4 : Ice Weight)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	Y	-67.02	21
2	MP3	Y	-100.22	13
3	MP4	Y	-147.9	9
4	MP3	Y	-75.76	48
5	MP4	Y	-79.36	48
6	MP1	Y	-55.92	12
7	MP1	Y	-67.02	75
8	MP3	Y	-100.22	83
9	MP4	Y	-147.9	87

Member Point Loads (BLC 5 : Wind + Ice Load AZI 000)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	Z	-30.77	21
2	MP3	Z	-42.34	13
3	MP4	Z	-68.82	9
4	MP3	Z	-22.12	48
5	MP4	Z	-25.66	48
6	MP1	Z	-25.17	12
7	MP1	Z	-30.77	75
8	MP3	Z	-42.34	83
9	MP4	Z	-68.82	87

Member Point Loads (BLC 6 : Wind + Ice Load AZI 090)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	X	-19.82	21
2	MP3	X	-32.8	13
3	MP4	X	-34.95	9
4	MP3	X	-18.22	48
5	MP4	X	-18.99	48
6	MP1	X	-15.01	12
7	MP1	X	-19.82	75
8	MP3	X	-32.8	83
9	MP4	X	-34.95	87

Member Distributed Loads (BLC 4 : Ice Weight)

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magnitude[lb/ft,F...	Start Location[in,%]	End Location[in,%]
1	S4	Y	-8.699	-8.699	0	%100
2	S1	Y	-8.699	-8.699	0	%100
3	S3	Y	-8.699	-8.699	0	%100
4	S2	Y	-8.699	-8.699	0	%100
5	H1	Y	-9.758	-9.758	0	%100
6	H2	Y	-9.758	-9.758	0	%100
7	MP4	Y	-8.699	-8.699	0	%100
8	MP3	Y	-8.699	-8.699	0	%100
9	MP2	Y	-8.699	-8.699	0	%100
10	MP1	Y	-8.699	-8.699	0	%100
11	M11	Y	-13.781	-13.781	0	%100
12	M12	Y	-6.846	-6.846	0	%100
13	M13	Y	-13.781	-13.781	0	%100
14	M14	Y	-6.846	-6.846	0	%100
15	M16	Y	-6.846	-6.846	0	%100
16	M17	Y	-6.846	-6.846	0	%100
17	M18	Y	-6.846	-6.846	0	%100
18	M19	Y	-6.846	-6.846	0	%100

Member Distributed Loads (BLC 4 : Ice Weight) (Continued)

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magnitude[lb/ft,F...	Start Location[in,%]	End Location[in,%]
19	M20	Y	-6.846	-6.846	0	%100
20	M21	Y	-6.846	-6.846	0	%100
21	M21A	Y	-8.699	-8.699	0	%100
22	M22	Y	-8.699	-8.699	0	%100

Member Distributed Loads (BLC 10 : BLC 2 Transient Area Loads)

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magnitude[lb/ft,F...	Start Location[in,%]	End Location[in,%]
1	S4	Z	-5.661	-5.661	0	73.754
2	S1	Z	-5.661	-5.661	0	73.754
3	S3	Z	-5.661	-5.661	0	73.754
4	S2	Z	-5.661	-5.661	0	73.754
5	H1	Z	-9.689	-9.689	0	143.986
6	H2	Z	-9.689	-9.689	0	143.986
7	MP4	Z	-8.004	-8.004	0	96.012
8	MP3	Z	-8.004	-8.004	0	96.012
9	MP2	Z	-8.004	-8.004	0	96.012
10	MP1	Z	-8.004	-8.004	0	96.012
11	M11	Z	-8.004	-8.004	0	41.004
12	M12	Z	-4.575	-4.575	0	51.33
13	M13	Z	-8.004	-8.004	0	41.004
14	M14	Z	-4.575	-4.575	0	51.33
15	M16	Z	-4.575	-4.575	0	51.328
16	M17	Z	-5.055	-5.055	0	41.004
17	M18	Z	-4.575	-4.575	0	51.328
18	M19	Z	-5.055	-5.055	0	41.004
19	M20	Z	-5.055	-5.055	0	41.004
20	M21	Z	-5.055	-5.055	0	41.004
21	M21A	Z	-1.117	-1.117	0	143.546
22	M22	Z	-1.117	-1.117	0	143.544

Member Distributed Loads (BLC 11 : BLC 3 Transient Area Loads)

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magnitude[lb/ft,F...	Start Location[in,%]	End Location[in,%]
1	S4	X	-5.658	-5.658	0	73.754
2	S1	X	-5.658	-5.658	0	73.754
3	S3	X	-5.658	-5.658	0	73.754
4	S2	X	-5.658	-5.658	0	73.754
5	MP4	X	-8.004	-8.004	0	96.012
6	MP3	X	-8.004	-8.004	0	96.012
7	MP2	X	-8.004	-8.004	0	96.012
8	MP1	X	-8.004	-8.004	0	96.012
9	M11	X	-8.004	-8.004	0	41.004
10	M12	X	-4.575	-4.575	0	51.33
11	M13	X	-8.004	-8.004	0	41.004
12	M14	X	-4.575	-4.575	0	51.33
13	M16	X	-4.575	-4.575	0	51.328
14	M17	X	-5.055	-5.055	0	41.004
15	M18	X	-4.575	-4.575	0	51.328
16	M19	X	-5.055	-5.055	0	41.004
17	M20	X	-5.055	-5.055	0	41.004
18	M21	X	-5.055	-5.055	0	41.004
19	M21A	X	-7.925	-7.925	0	143.546
20	M22	X	-7.925	-7.925	0	143.544

Member Distributed Loads (BLC 12 : BLC 5 Transient Area Loads)

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magnitude[lb/ft,F...	Start Location[in,%]	End Location[in,%]

Member Distributed Loads (BLC 12 : BLC 5 Transient Area Loads) (Continued)

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magnitude[lb/ft,F...	Start Location[in,%]	End Location[in,%]
1	S4	Z	-3.676	-3.676	0	73.754
2	S1	Z	-3.676	-3.676	0	73.754
3	S3	Z	-3.676	-3.676	0	73.754
4	S2	Z	-3.676	-3.676	0	73.754
5	H1	Z	-6.291	-6.291	0	143.986
6	H2	Z	-6.291	-6.291	0	143.986
7	MP4	Z	-5.197	-5.197	0	96.012
8	MP3	Z	-5.197	-5.197	0	96.012
9	MP2	Z	-5.197	-5.197	0	96.012
10	MP1	Z	-5.197	-5.197	0	96.012
11	M11	Z	-5.197	-5.197	0	41.004
12	M12	Z	-2.971	-2.971	0	51.33
13	M13	Z	-5.197	-5.197	0	41.004
14	M14	Z	-2.971	-2.971	0	51.33
15	M16	Z	-2.971	-2.971	0	51.328
16	M17	Z	-3.283	-3.283	0	41.004
17	M18	Z	-2.971	-2.971	0	51.328
18	M19	Z	-3.283	-3.283	0	41.004
19	M20	Z	-3.283	-3.283	0	41.004
20	M21	Z	-3.283	-3.283	0	41.004
21	M21A	Z	-.726	-.726	0	143.546
22	M22	Z	-.725	-.725	0	143.544

Member Distributed Loads (BLC 13 : BLC 6 Transient Area Loads)

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magnitude[lb/ft,F...	Start Location[in,%]	End Location[in,%]
1	S4	X	-3.674	-3.674	0	73.754
2	S1	X	-3.674	-3.674	0	73.754
3	S3	X	-3.674	-3.674	0	73.754
4	S2	X	-3.674	-3.674	0	73.754
5	MP4	X	-5.197	-5.197	0	96.012
6	MP3	X	-5.197	-5.197	0	96.012
7	MP2	X	-5.197	-5.197	0	96.012
8	MP1	X	-5.197	-5.197	0	96.012
9	M11	X	-5.197	-5.197	0	41.004
10	M12	X	-2.971	-2.971	0	51.33
11	M13	X	-5.197	-5.197	0	41.004
12	M14	X	-2.971	-2.971	0	51.33
13	M16	X	-2.971	-2.971	0	51.328
14	M17	X	-3.283	-3.283	0	41.004
15	M18	X	-2.971	-2.971	0	51.328
16	M19	X	-3.283	-3.283	0	41.004
17	M20	X	-3.283	-3.283	0	41.004
18	M21	X	-3.283	-3.283	0	41.004
19	M21A	X	-5.146	-5.146	0	143.546
20	M22	X	-5.146	-5.146	0	143.544

Member Area Loads (BLC 2 : Wind Load AZI 000)

	Joint A	Joint B	Joint C	Joint D	Direction	Distribution	Magnitude[psf]
1	N41A	N40A	N42	N43	Z	Open Structure	-40.44

Member Area Loads (BLC 3 : Wind Load AZI 090)

	Joint A	Joint B	Joint C	Joint D	Direction	Distribution	Magnitude[psf]
1	N41A	N40A	N44	N45	X	Open Structure	-40.44

Member Area Loads (BLC 5 : Wind + Ice Load AZI 000)

	Joint A	Joint B	Joint C	Joint D	Direction	Distribution	Magnitude[psf]
1	N40A	N41A	N43	N42	Z	Open Structure	-26.26

Member Area Loads (BLC 6 : Wind + Ice Load AZI 090)

	Joint A	Joint B	Joint C	Joint D	Direction	Distribution	Magnitude[psf]
1	N41A	N40A	N44	N45	X	Open Structure	-26.26

Envelope Joint Reactions

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [lb-ft]	LC	MY [lb-ft]	LC	MZ [lb-ft]	LC
1	N39	max	1515.705	5	1918.622	35	524.974	14	-95.169	14	376.039	4	-21.835	22
2		min	-892.833	23	467.146	16	-3435.626	33	-667.508	33	-359.688	22	-197.447	29
3	N40	max	825.641	17	1010.627	29	3383.886	27	-21.111	20	357.169	16	23.338	15
4		min	-1447.842	11	245.638	22	-366.934	20	-384.757	27	-380.079	10	-126.009	34
5	N52	max	21.031	10	77.029	30	665.311	11	0	50	0	50	0	50
6		min	-19.644	16	18.611	23	-660.301	17	0	1	0	1	0	1
7	N53	max	106.74	20	77.177	35	1002.408	3	0	50	0	50	0	50
8		min	-107.864	2	18.458	16	-998.41	21	0	1	0	1	0	1
9	Totals:	max	2216.859	17	3082.731	38	3129.628	14						
10		min	-2216.859	11	751.484	14	-3129.628	8						

Envelope AISC 13th(360-05): LRFD Steel Code Checks

	Memb...	Shape	Code Che...	Loc[in]	LC	Shear Check	Loc[in]	Dir	LC	phi*Pn...	phi*P...	phi*M...	phi*Mn z-z [...	Cb	Eqn
1	MP4	PIPE_2.0	.498	48.006	3	.059	48.0...		3	31024....	32130	1871....	1871.625	2.182	H1-1b
2	S1	PIPE_2.0	.368	73.754	31	.145	73.7...		28	20427....	32130	1871....	1871.625	2.536	H1-1b
3	M14	1.5" OD 16 G...	.334	25.665	37	.042	0		2	5070.9...	8522...	325.7...	325.781	1.137	H1-1a
4	M19	1.5" OD 16 G...	.312	18.344	33	.011	0		8	6119.0...	8522...	325.7...	325.781	1	H1-1a
5	M18	1.5" OD 16 G...	.291	25.664	37	.017	0		12	5071.09	8522...	325.7...	325.781	1.137	H1-1a
6	S2	PIPE_2.0	.259	73.754	36	.100	5.823		34	20427....	32130	1871....	1871.625	1	H1-1b
7	MP3	PIPE_2.0	.237	27.793	8	.025	25.2...		2	27932....	32130	1871....	1871.625	2.258	H1-1b
8	MP1	PIPE_2.0	.235	48.006	11	.045	27.7...		10	31024....	32130	1871....	1871.625	1.813	H1-1b
9	S4	PIPE_2.0	.215	73.754	36	.079	73.7...		38	20427....	32130	1871....	1871.625	1	H1-1b
10	H1	PIPE_2.5	.204	125.04	4	.118	0		3	27325....	50715	3596....	3596.25	1	H1-1b
11	H2	PIPE_2.5	.192	121.2...	10	.121	0		9	27325....	50715	3596....	3596.25	1.979	H1-1b
12	M21A	PIPE_2.0	.183	71.773	4	.009	0		36	6874.2...	32130	1871....	1871.625	1.137	H1-1b
13	M22	PIPE_2.0	.175	71.772	11	.009	143....		36	6874.4...	32130	1871....	1871.625	1.137	H1-1b
14	M17	1.5" OD 16 G...	.167	0	38	.011	0		8	6119.0...	8522...	325.7...	325.781	1.137	H1-1b*
15	S3	PIPE_2.0	.152	73.754	29	.044	73.7...		37	20427....	32130	1871....	1871.625	1.858	H1-1b
16	M12	1.5" OD 16 G...	.127	25.665	28	.028	51.33		7	5070.9...	8522...	325.7...	325.781	1.137	H1-1b
17	M16	1.5" OD 16 G...	.121	25.664	28	.021	51.3...		9	5071.09	8522...	325.7...	325.781	1.137	H1-1b
18	MP2	PIPE_2.0	.096	27.793	13	.016	27.7...		8	27932....	32130	1871....	1871.625	1.703	H1-1b
19	M21	1.5" OD 16 G...	.095	0	32	.007	0		7	6119.0...	8522...	325.7...	325.781	1.137	H1-1b*
20	M20	1.5" OD 16 G...	.056	0	38	.007	0		7	6119.0...	8522...	325.7...	325.781	1.137	H1-1b*
21	M13	PIPE_2.0	.037	0	31	.008	0		8	27932....	32130	1871....	1871.625	1.137	H1-1b*
22	M11	PIPE_2.0	.020	0	38	.010	0		8	27932....	32130	1871....	1871.625	1.137	H1-1b*

Date:	1/11/2019
Client	ATC
Carrier	Verizon
Engineer:	AP
Site:	CTL02033
Job #:	1106-A0001-B

Code:	LRFD
Bolt Diameter	0.625
Bolt Grade:	A325
Threads Excluded?:	N
Axial (lbs):	1354.09
Shear (lbs):	1824.58

Bolt Info:

Yield Strength (F_{yb})	92.0 kips
Ultimate Strength (F_{ub})	120.0 kips
Threads/in (n)	11
Gross Area (A_{gb})	0.307 in²
Net Area (A_{nb})	0.226 in²

Bolt Capacity (5/8" A325 Through Bolt), Total of (4) per Connection				
	Ult Load / Bolt	Factored Load (ϕ=0.75)	# of Bolts	Factor Joint Capacity
Axial (lb)	27120.2	20340.1	1	20340
Shear(lb)	16567.0	12425.2	1	12425

*Assumed (4) A325 bolt per connection. Contractor to field verify diameters before proposed installation.

Interaction Check	
$T/\phi T_n$	6.7%
$V/\phi Vn$	14.7%
≤1.0	2.6%
	OK

GENERAL NOTES:

1. THESE DOCUMENTS WERE DESIGNED IN ACCORDANCE WITH THE LATEST VERSION OF APPLICABLE LOCAL/STATE/COUNTY/CITY BUILDING CODES, AS WELL AS ANSI/TIA-222 STANDARD, AWWA-D100 STANDARD, NDS, NEC, MSJC, AND/OR THE LATEST VERSION OF THE INTERNATIONAL BUILDING CODE, UNLESS NOTED OTHERWISE IN THE CORRESPONDING STRUCTURAL REPORT.
2. ALL CONSTRUCTION METHODS SHOULD FOLLOW STANDARDS OF GOOD CONSTRUCTION PRACTICE.
3. ALL WORK INDICATED ON THESE DRAWINGS SHALL BE PERFORMED BY QUALIFIED CONTRACTORS EXPERIENCED IN SIMILAR CONSTRUCTION.
4. ALL NEW WORK SHALL ACCOMMODATE EXISTING CONDITIONS. IF OBSTRUCTIONS ARE FOUND, CONTRACTOR SHALL NOTIFY ENGINEER OF RECORD PRIOR TO CONTINUING WORK.
5. ANY CHANGES OR ADDITIONS MUST CONFORM TO THE REQUIREMENTS OF THESE NOTES AND SPECIFICATIONS, AND SHOULD BE SIMILAR TO THOSE SHOWN. ALL CHANGES OR ADDITIONS SHALL BE SUBMITTED TO THE ENGINEER OF RECORD FOR REVIEW AND APPROVAL PRIOR TO FABRICATION AND/OR CONSTRUCTION.
6. THE CONTRACTOR IS RESPONSIBLE FOR THE DESIGN AND EXECUTION OF ALL MISCELLANEOUS SHORING, BRACING, TEMPORARY SUPPORTS, ETC. NECESSARY TO PROVIDE A COMPLETE AND STABLE STRUCTURE DURING CONSTRUCTION. TIA-1019-A-2011 IS AN APPROPRIATE REFERENCE FOR THOSE DESIGNS MEETING TIA STANDARDS. THE ENGINEER OF RECORD MAY PROVIDE FORMAL RIGGING PLANS AT THE REQUEST AND EXPENSE OF THE CONTRACTOR.
7. INSTALLATION SHALL NOT INTERFERE NOR DENY ADEQUATE ACCESS TO OR FROM ANY EXISTING OR PROPOSED OPERATIONAL AND SAFETY EQUIPMENT.
8. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS PRIOR TO ANY FABRICATION. CONTACT INFINIGY ENGINEERING IF ANY DISCREPANCIES EXIST.

STEEL CONSTRUCTION NOTES:

1. STRUCTURAL STEEL SHALL CONFORM TO THE AISC MANUAL OF STEEL CONSTRUCTION 14TH EDITION, FOR THE DESIGN AND FABRICATION OF STEEL COMPONENTS.
2. ALL FIELD CUT SURFACES, FIELD DRILLED HOLES, AND GROUND SURFACES WHERE EXISTING PAINT OR GALVANIZATION REMOVAL WAS REQUIRED SHALL BE REPAIRED WITH (2) BRUSHED COATS OF ZRC GALVILITE COLD GALVANIZING COMPOUND PER ASTM A780 AND MANUFACTURERS' RECOMMENDATIONS.
3. ALL FIELD DRILLED HOLES TO BE USED FOR FIELD BOLTING INSTALLATION SHALL BE STANDARD HOLES, AS DEFINED BY AISC, UNLESS NOTED OTHERWISE.
4. ALL EXTERIOR STEEL WORK SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A123.
5. ALL STEEL MEMBERS AND CONNECTIONS SHALL MEET THE FOLLOWING GRADES:
   - ANGLES, CHANNELS, PLATES AND BARS TO BE A36. Fy=36 KSI, U.N.O.
   - W SHAPES TO BE A992. Fy=50 KSI, U.N.O.
   - RECTANGULAR HSS TO BE A500, GRADE B. FY=46 KSI, U.N.O.
   - ROUND HSS TO BE A500, GRADE B. FY=42 KSI, U.N.O.
   - STEEL PIPE TO BE A53, GRADE B. Fy=35 KSI, U.N.O.
   - BOLTS TO BE A325-X. Fu=120 KSI, U.N.O.
   - U-BOLTS AND LAG SCREWS TO BE A307 GR A. Fu=60 KSI, U.N.O.
6. ALL WELDING SHALL BE DONE USING E70XX ELECTRODES, U.N.O.
7. ALL WELDING SHALL CONFORM TO AISC AND AWS D1.1 LATEST EDITION.
8. ALL HILTI ANCHORS TO BE CARBON STEEL, U.N.O.
   - MECHANICAL ANCHORS: KWIK BOLT-TZ, U.N.O.
   - CMU BLOCK ANCHORS: ADHESIVE - HY120, U.N.O.
   - CONCRETE ANCHORS: ADHESIVE - HY150, U.N.O.
   - CONCRETE REBAR: ADHESIVE - RE500, U.N.O.
9. ALL STUDS TO BE NELSON CAPACITOR DISCHARGE 1/4"-20 LOW CARBON STEEL COPPER-FLASH AT 55 KSI ULT/50 KSI YIELD, U.N.O.
10. BOLTS SHALL BE TIGHTENED TO A "SNUG TIGHT" CONDITION AS DEFINED BY AISC.
11. MINIMUM EDGE DISTANCES SHALL CONFORM TO AISC TABLE J3.4.

CONCRETE CONSTRUCTION NOTES:

1. CONCRETE TO BE 4000 PSI @ 28 DAYS. REINFORCING BAR TO CONFORM TO ASTM A615 GRADE 60 SPECIFICATIONS. CONCRETE INSTALLATION TO CONFORM TO ACI-318 BUILDING REQUIREMENTS FOR REINFORCED CONCRETE. ALL CONCRETE TO BE PLACED AGAINST UNDISTURBED EARTH FREE OF WATER AND ALL FOREIGN OBJECTS AND MATERIALS. A MINIMUM OF THREE INCHES OF CONCRETE SHALL COVER ALL REINFORCEMENT. WELDING OF REBAR IS NOT PERMITTED.
2. EXISTING CONCRETE SURFACES THAT ARE TO BE IN CONTACT WITH NEW PROPOSED CONCRETE SHOULD BE WIRE BRUSHED CLEAN AND TREATED WITH APPROPRIATE MECHANICAL SCRATCH COAT AND REPAIR MATERIALS OR APPROPRIATE CHEMICAL METHODS SUCH AS THE APPLICATION OF A BONDING AGENT, EX. SAKRETE OR EQUIVALENT, TO ENSURE A QUALITY BOND BETWEEN EXISTING AND PROPOSED CONCRETE SURFACES.

FIBER REINFORCED POLYMER (FRP) NOTES:

1. FRP PLATES, SHAPES, BOLTS AND NUTS (STUD/NUT ASSEMBLIES) SHALL CONFORM TO ASTM D638, 695, 790. PLATES AND SHAPES TO BE FY = 5.35 KSI LW (SAFETY FACTOR OF 8), .945 KSI CW (SAFETY FACTOR OF 8) MIN.
2. IF FIELD FABRICATION IS REQUIRED, ALL CUT EDGES AND DRILLED HOLES TO BE SEALED USING VINYL ESTER SEALING KIT SUPPLIED BY THE MANUFACTURER.
3. ALL FASTENERS TO BE 1/2" DIA FRP THREADED ROD WITH FIBER REINFORCED THERMOPLASTIC NUT, SPACED AT 12 INCHES ON CENTER MAXIMUM, U.N.O., FOR PANELS AND AS DESIGNED FOR STRUCTURAL MEMBERS.
4. THE COLOR AND SURFACE PATTERN OF EXPOSED FRP PANELS SHALL MATCH THE EXTERIOR OF THE EXISTING BUILDING, U.N.O.
5. STUD/NUT ASSEMBLIES SHOULD BE LUBRICATED FOR INSTALLATION
6. ENSURE BEARING SURFACES OF THE NUTS ARE PARALLEL TO THE SURFACES BEING FASTENED.
7. TORQUE BOLTS ACCORDING TO THE FOLLOWING TABLE:

INSTALLATION TORQUE TABLE

SIZE	ULTIMATE TORQUE STRENGTH	RECOMMENDED MAXIMUM INSTALLATION TORQUE
3/8-16 UNC	8 FT-LBS	4 FT-LBS
1/2-13 UNC	18 FT-LBS	8 FT-LBS
5/8-11 UNC	35 FT-LBS	16 FT-LBS
3/4-10 UNC	50 FT-LBS	24 FT-LBS
1-8 UNC	110 FT-LBS	50 FT-LBS

8. WHEN TIGHTENING FRP STUD/NUT ASSEMBLIES, WRENCHES MUST MAKE FULL CONTACT WITH ALL NUT EDGES. A STANDARD SIX POINT SOCKET IS RECOMMENDED.
9. STUD/NUT ASSEMBLIES SHOULD BE BONDED BY APPLYING BONDING AGENT TO ENTIRE NUT AND EXPOSED STUD.
10. ALL FRP MATERIALS TO BE PROVIDED BY FIBERGRATE COMPOSITE STRUCTURES, DALLAS TX, OR APPROVED EQUAL.
11. ALL FRP SHAPES TO BE DYNAFORM PULTRUDED STRUCTURAL SHAPES.
12. ALL FRP PLATES TO BE FIBERPLATE MOLDED FRP PLATE.
13. ALL FRP PANELS TO BE FIBERPLATE CLADDING PANEL.
14. EACH FRP PANEL TO BE IDENTIFIED WITH LARR#25536 AND FIBERGRATE COMPOSITE STRUCTURAL LABEL.
15. FRP MATERIAL TO BE CLASSIFIED AS CC1 OR BETTER, AND HAVE MAXIMUM FLAME SPREAD OF 50.
16. ALL DESIGN AND CONSTRUCTION TO BE COMPLETED IN ACCORDANCE WITH LOS ANGELES RESEARCH REPORT RR25536, DATED FEBRUARY 1, 2016.
17. SPECIAL INSPECTIONS MUST BE PROVIDED FOR ALL FRP INSTALLMENTS. SEE SPECIAL INSPECTION SECTION, THIS SHEET.

RATIO OF EDGE DISTANCE TO FRP FASTENER DIAMETER

	RANGE	RECOMMENDED
EDGE DISTANCE - CL* BOLT TO END	2.0-4.0	3.0
EDGE DISTANCE - CL* BOLT TO SIDE	1.5-3.5	2.5
BOLT PITCH - CL* TO CL*	4.0-5.0	5.0

WOOD CONSTRUCTION NOTES:

1. ALL EXISTING WOOD SHAPES ARE ASSUMED TO BE DOUGLAS FIR-LARCH WITH A REFERENCE DESIGN BENDING VALUE OF 1000 PSI MIN.
2. ALL PROPOSED WOOD SHAPES ARE TO BE DOUGLAS FIR-LARCH WITH A REFERENCE DESIGN BENDING VALUE OF 1000 PSI MIN. U.N.O.
3. ALL EXISTING AND PROPOSED GLUED LAMINATED TIMBERS ARE TO BE 24F-1.8C DOUGLAS FIR BALANCED WITH A REFERENCE DESIGN BENDING VALUE OF 2400 PSI MIN. U.N.O.

MASONRY CONSTRUCTION NOTES:

1. ALL BRICK TO BE 1500 PSI MIN. REINFORCING BAR (IF APPLICABLE) TO CONFORM TO ASTM A615 GRADE 60 SPECIFICATIONS. ALL MORTAR TO BE 2000 PSI MIN.
   - FOR INTERIOR/ABOVE GRADE APPLICATIONS TYPE N MORTAR HAVING MINIMUM MODULUS OF RUPTURE OF 100 PSI SHALL BE USED. FOR EXTERIOR/BELOW GRADE APPLICATIONS TYPE M OR S MORTAR HAVING A MINIMUM MODULUS OF RUPTURE OF 133 PSI.
   - BRICK AND MORTAR INSTALLATION TO CONFORM TO MSJC BUILDING CODE REQUIREMENTS FOR MASONRY STRUCTURES.
2. ALL CMU TO BE 1500 PSI MIN. REINFORCING BAR (IF APPLICABLE) TO CONFORM TO ASTM A615 GRADE 60 SPECIFICATIONS. ALL MORTAR TO BE 2000 PSI MIN.
   - FOR INTERIOR/ABOVE GRADE APPLICATIONS, TYPE N MORTAR HAVING MINIMUM MODULUS OF RUPTURE OF 64 PSI SHALL BE USED FOR UNGROUTED BLOCKS, AND 158 PSI FOR FULLY GROUTED BLOCKS.
   - FOR EXTERIOR/BELOW GRADE APPLICATIONS TYPE M OR S MORTAR HAVING A MINIMUM MODULUS OF RUPTURE OF 84 PSI SHALL BE USED FOR UNGROUTED BLOCKS, AND 163 PSI FOR FULLY GROUTED BLOCKS.
   - BRICK AND MORTAR INSTALLATION TO CONFORM TO MSJC BUILDING CODE REQUIREMENTS FOR MASONRY STRUCTURES.

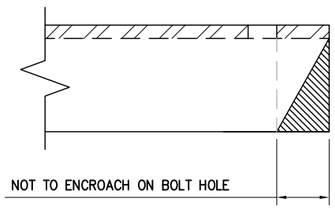
TOWER PLUMB & TENSION NOTES:

1. PLUMB AND TENSION TOWER UPON COMPLETION OF STRUCTURAL MODIFICATIONS DETAILED IN THESE DRAWINGS.
2. RETENSIONING OF EXISTING GUY WIRES SHALL BE PERFORMED AT A TIME WHEN THE WIND VELOCITY IS LESS THAN 10 MPH AT GROUND LEVEL AND WITH NO ICE ON THE STRUCTURE AND GUY WIRES.
3. PLUMB THE TOWER WHILE RETENSIONING THE EXISTING GUY WIRES. THE HORIZONTAL DISTANCE BETWEEN THE VERTICAL CENTERLINES AT ANY TWO ELEVATIONS SHALL NOT EXCEED 0.25% OF THE VERTICAL DISTANCE BETWEEN TWO ELEVATIONS FOR LATTICED STRUCTURES.
4. THE TWIST BETWEEN ANY TWO ELEVATIONS THROUGHOUT THE HEIGHT OF A LATTICE STRUCTURE SHALL NOT EXCEED 0.5 DEGREES IN 10 FEET. THE MAXIMUM TWIST OVER THE LATTICE STRUCTURE HEIGHT SHALL NOT EXCEED 5 DEGREES.

SPECIAL INSPECTIONS NOTES:

1. A QUALIFIED INDEPENDENT TESTING LABORATORY, EMPLOYED BY THE OWNER AND APPROVED BY THE JURISDICTION, SHALL PERFORM INSPECTION AND TESTING IN ACCORDANCE WITH THE THE GOVERNING BUILDING CODE, APPLICABLE SECTION(S) AS REQUIRED BY PROJECT SPECIFICATIONS FOR THE FOLLOWING CONSTRUCTION WORK:
   a. STRUCTURAL WELDING (CONTINUOUS INSPECTION OF FIELD WELDS ONLY).
   b. HIGH STRENGTH BOLTS (PERIODIC INSPECTION OF A325 AND/OR A490 BOLTS) TO BE TIGHTENED PER "TURN-OF-THE-NUT" METHOD.
   c. MECHANICAL AND EPOXIED ANCHORAGES.
   d. FIBER REINFORCED POLYMER.
      - THE SPECIAL INSPECTOR MUST VERIFY THAT THE FRP MATERIAL SPECIFIED ON THE APPROVED DESIGN DOCUMENTS IS BEING INSTALLED.
      - THE SPECIAL INSPECTOR MUST VERIFY THAT ALL CUT EDGES AND DRILLED HOLES ARE PROPERLY SEALED USING A VINYL ESTER SEALING KIT SUPPLIED BY THE MANUFACTURER.
      - THE SPECIAL INSPECTOR MUST VERIFY THAT THE STRUCTURE IS BUILT IN ACCORDANCE WITH THE APPROVED DESIGN DOCUMENTS.
2. THE INSPECTION AGENCY SHALL SUBMIT INSPECTION AND TEST REPORTS TO THE BUILDING DEPARTMENT, THE ENGINEER OF RECORD, AND THE OWNER UNLESS THE FABRICATOR IS APPROVED BY THE BUILDING OFFICIAL TO PERFORM WORK WITHOUT THE SPECIAL INSPECTIONS.

MAXIMUM ALLOWABLE ANGLE CLIP



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

at&t

STATE OF CONNECTICUT
JOSEPH R. JOHNSTON
24460
LICENSED PROFESSIONAL ENGINEER
1/25/19

No.	Submittal / Revision	App'd	Date
0	ISSUED FOR REVIEW	TAG	01/22/19

Drawn: TAG Date: 01/22/19
Designed: AP Date: 01/22/19
Checked: NO Date: 01/22/19

Project Number:
1106-A0001-B

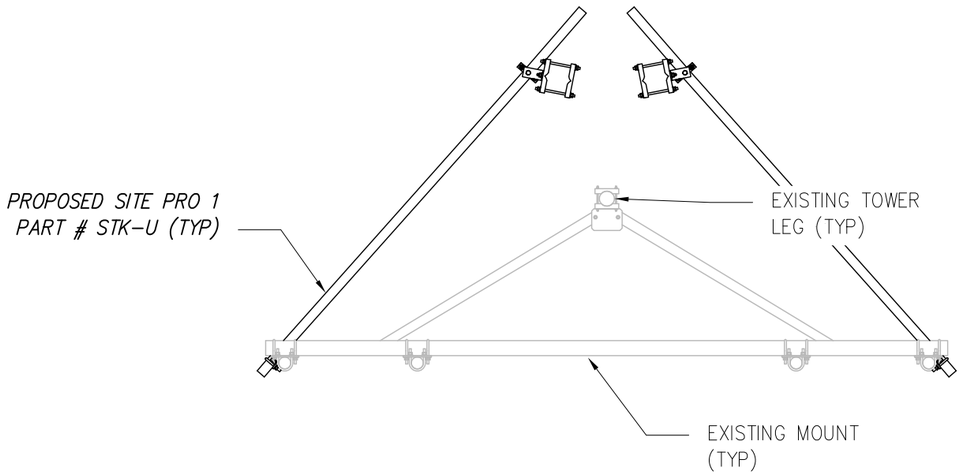
Project Title:
MADISON - SR 79
CTL02033
FA# 10035048
864 OPENING HILL ROAD
MADISON, CT 06443

Prepared For:
smartlink

Drawing Scale: AS NOTED
Date: 01/22/19
SD

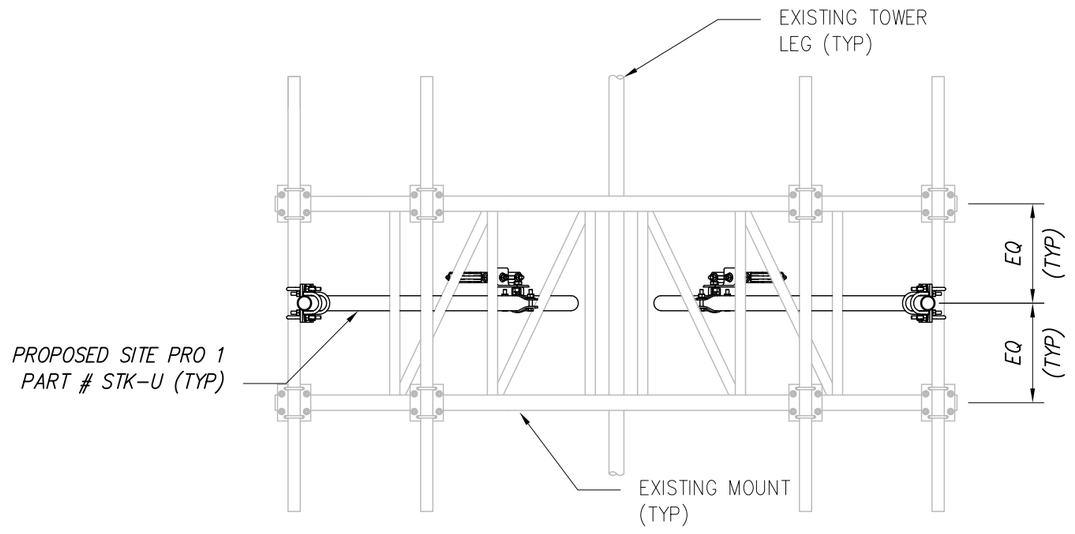
Drawing Title
GENERAL NOTES

Drawing Number
S1

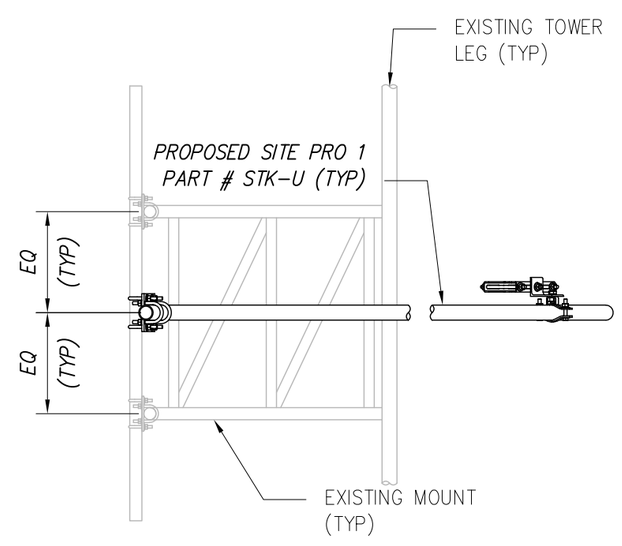


1 PLAN VIEW
SCALE: NOT TO SCALE

NOTE: MODIFICATIONS ARE TYPICAL TO ALL SECTORS



2 ELEVATION VIEW
SCALE: NOT TO SCALE



3 SECTION VIEW
SCALE: NOT TO SCALE

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

at&t

STATE OF CONNECTICUT
JOSEPH R. JOHNSTON
28460
LICENSED PROFESSIONAL ENGINEER
1/25/19

No.	Submittal / Revision	App'd	Date
0	ISSUED FOR REVIEW	TAG	01/22/19

Drawn: TAG Date: 01/22/19
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Checked: NO Date: 01/22/19

Project Number:
1106-A0001-B

Project Title:
MADISON - SR 79
CTL02033
FA# 10035048
864 OPENING HILL ROAD
MADISON, CT 06443

Prepared For:
smartlink

Drawing Scale:
AS NOTED
Date:
01/22/19

SD

Drawing Title
MOUNT DESIGN

Drawing Number
S2

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 – 10035048
Site ID – CT2033 (MRCTB035097-MRCTB035271)
USID – 26049
Site Name – MADISON - SR 79

864 OPENING HILL ROAD
MADISON, CT 06443

Latitude: N41-21-26.27
Longitude: W72-38-19.50
Structure Type: Self-Support

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_CTL02033_2018-LTE-Next-Carrier_LTE_mm093q_2051A0KPKA_10035048_26049_09-21-2018_Final-Approved_v2.00

CD's: 10035048_AE201_190102_CTL02033_REV0.JMRL

RF Powers Used: NEW-ENGLAND_CONNECTICUT_CTL02033_2018-LTE-Next-Carrier_LTE_mm093q_2051A0KPKA_10035048_26049_09-21-2018_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

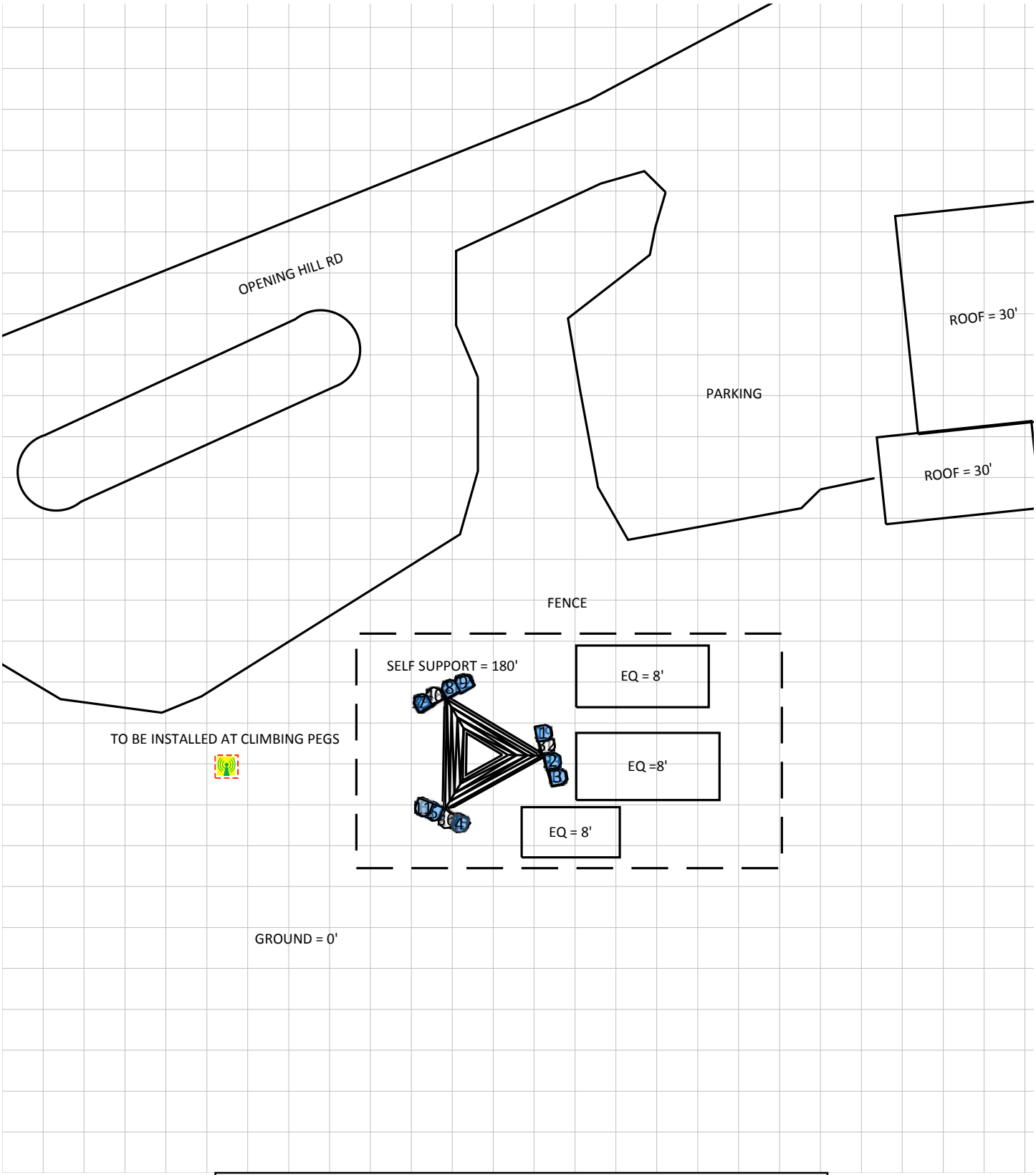
Fall Arrest Anchor & Parapet Info	Parapet Available (Y/N)	Parapet Height (inches)	Fall Arrest Anchor Available (Y/N)
Roof Safety Info	N	NA	N

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: MADISON - SR 79



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 | RF Safety Plan

Barrier

Proposed Barriers/ Signs

(Feet)

0 12.6 25.2

www.sitesafe.com
Site Name:MADISON - SR 79
2/5/2019 8:31:07 AM

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	80	82	4.6	40	TPO	Watt	1	566.3	11.51	137.7'	0'	0'
2	AT&T MOBILITY LLC (Proposed)	CCI Antennas HPA65R-BU6A	Panel	1900	LTE	80	61.7	5.9	160	TPO	Watt	1	6311.3	15.96	137'	0'	3'
3	AT&T MOBILITY LLC (Proposed)	Kathrein-Scala 800-10965	Panel	850	LTE	80	61.7	6.6	40	TPO	Watt	1	920.6	13.62	136.7'	0'	8'
3	AT&T MOBILITY LLC (Proposed)	Kathrein-Scala 800-10965	Panel	850	5G	80	61.7	6.6	40	TPO	Watt	1	920.6	13.62	136.7'	0'	8'
3	AT&T MOBILITY LLC (Proposed)	Kathrein-Scala 800-10965	Panel	2100	LTE	80	65.2	6.6	160	TPO	Watt	1	7114.1	16.48	136.7'	0'	3'
3	AT&T MOBILITY LLC (Proposed)	Kathrein-Scala 800-10965	Panel	737	LTE	80	63.9	6.6	80	TPO	Watt	1	1422.6	12.5	136.7'	0'	8'
4	AT&T MOBILITY LLC	Powerwave 7770	Panel	850	UMTS	200	82	4.6	40	TPO	Watt	1	566.3	11.51	137.7'	0'	0'
5	AT&T MOBILITY LLC (Proposed)	CCI Antennas HPA65R-BU6A	Panel	1900	LTE	200	61.7	5.9	160	TPO	Watt	1	6311.3	15.96	137'	0'	6'
6	AT&T MOBILITY LLC (Proposed)	Kathrein-Scala 800-10965	Panel	850	LTE	200	61.7	6.6	40	TPO	Watt	1	920.6	13.62	136.7'	0'	6'
6	AT&T MOBILITY LLC (Proposed)	Kathrein-Scala 800-10965	Panel	850	5G	200	61.7	6.6	40	TPO	Watt	1	920.6	13.62	136.7'	0'	6'
6	AT&T MOBILITY LLC (Proposed)	Kathrein-Scala 800-10965	Panel	2100	LTE	200	65.2	6.6	160	TPO	Watt	1	7114.1	16.48	136.7'	0'	6'
6	AT&T MOBILITY LLC (Proposed)	Kathrein-Scala 800-10965	Panel	737	LTE	200	63.9	6.6	80	TPO	Watt	1	1422.6	12.5	136.7'	0'	6'
7	AT&T MOBILITY LLC	Powerwave 7770	Panel	850	UMTS	330	82	4.6	40	TPO	Watt	1	566.3	11.51	137.7'	0'	0'
8	AT&T MOBILITY LLC (Proposed)	CCI Antennas HPA65R-BU6A	Panel	1900	LTE	330	61.7	5.9	160	TPO	Watt	1	6311.3	15.96	137'	0'	2'
9	AT&T MOBILITY LLC (Proposed)	Kathrein-Scala 800-10965	Panel	850	LTE	330	61.7	6.6	40	TPO	Watt	1	920.6	13.62	136.7'	0'	8'
9	AT&T MOBILITY LLC (Proposed)	Kathrein-Scala 800-10965	Panel	850	5G	330	61.7	6.6	40	TPO	Watt	1	920.6	13.62	136.7'	0'	8'
9	AT&T MOBILITY LLC (Proposed)	Kathrein-Scala 800-10965	Panel	2100	LTE	330	65.2	6.6	160	TPO	Watt	1	7114.1	16.48	136.7'	0'	6'
9	AT&T MOBILITY LLC (Proposed)	Kathrein-Scala 800-10965	Panel	737	LTE	330	63.9	6.6	80	TPO	Watt	1	1422.6	12.5	136.7'	0'	8'

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
10	UNKNOWN CARRIER	Generic	Panel	850		80	65	6.3	60	TPO	Watt		1321.8	13.43	126.9'	0'	0'
11	UNKNOWN CARRIER	Generic	Panel	850		200	65	6.3	60	TPO	Watt		1321.8	13.43	126.9'	0'	0'
12	UNKNOWN CARRIER	Generic	Panel	850		330	65	6.3	60	TPO	Watt		1321.8	13.43	126.9'	0'	0'
13	UNKNOWN CARRIER	Generic	Panel	850		80	65	6.3	60	TPO	Watt		1321.8	13.43	146.9'	0'	0'
14	UNKNOWN CARRIER	Generic	Panel	850		80	65	6.3	60	TPO	Watt		1321.8	13.43	146.9'	0'	0'
15	UNKNOWN CARRIER	Generic	Panel	850		200	65	6.3	60	TPO	Watt		1321.8	13.43	146.9'	0'	0'
16	UNKNOWN CARRIER	Generic	Panel	850		200	65	6.3	60	TPO	Watt		1321.8	13.43	146.9'	0'	0'
17	UNKNOWN CARRIER	Generic	Panel	850		330	65	6.3	60	TPO	Watt		1321.8	13.43	146.9'	0'	0'
18	UNKNOWN CARRIER	Generic	Panel	850		330	65	6.3	60	TPO	Watt		1321.8	13.43	146.9'	0'	0'
19	UNKNOWN CARRIER	Generic	Panel	850		80	65	6.3	60	TPO	Watt		1321.8	13.43	156.9'	0'	0'
20	UNKNOWN CARRIER	Generic	Panel	850		80	65	6.3	60	TPO	Watt		1321.8	13.43	156.9'	0'	0'
21	UNKNOWN CARRIER	Generic	Panel	850		80	65	6.3	60	TPO	Watt		1321.8	13.43	156.9'	0'	0'
22	UNKNOWN CARRIER	Generic	Panel	850		80	65	6.3	60	TPO	Watt		1321.8	13.43	156.9'	0'	0'
23	UNKNOWN CARRIER	Generic	Panel	850		220	65	6.3	60	TPO	Watt		1321.8	13.43	156.9'	0'	0'
24	UNKNOWN CARRIER	Generic	Panel	850		220	65	6.3	60	TPO	Watt		1321.8	13.43	156.9'	0'	0'
25	UNKNOWN CARRIER	Generic	Panel	850		220	65	6.3	60	TPO	Watt		1321.8	13.43	156.9'	0'	0'
26	UNKNOWN CARRIER	Generic	Panel	850		220	65	6.3	60	TPO	Watt		1321.8	13.43	156.9'	0'	0'
27	UNKNOWN CARRIER	Generic	Panel	850		330	65	6.3	60	TPO	Watt		1321.8	13.43	156.9'	0'	0'
28	UNKNOWN CARRIER	Generic	Panel	850		330	65	6.3	60	TPO	Watt		1321.8	13.43	156.9'	0'	0'
29	UNKNOWN CARRIER	Generic	Panel	850		330	65	6.3	60	TPO	Watt		1321.8	13.43	156.9'	0'	0'
30	UNKNOWN CARRIER	Generic	Panel	850		330	65	6.3	60	TPO	Watt		1321.8	13.43	156.9'	0'	0'
31	UNKNOWN CARRIER	Generic	Panel	850		80	65	6.3	60	TPO	Watt		1321.8	13.43	166.9'	0'	0'
32	UNKNOWN CARRIER	Generic	Panel	850		80	65	6.3	60	TPO	Watt		1321.8	13.43	166.9'	0'	0'
33	UNKNOWN CARRIER	Generic	Panel	850		80	65	6.3	60	TPO	Watt		1321.8	13.43	166.9'	0'	0'
34	UNKNOWN CARRIER	Generic	Panel	850		80	65	6.3	60	TPO	Watt		1321.8	13.43	166.9'	0'	0'
35	UNKNOWN CARRIER	Generic	Panel	850		220	65	6.3	60	TPO	Watt		1321.8	13.43	166.9'	0'	0'
36	UNKNOWN CARRIER	Generic	Panel	850		220	65	6.3	60	TPO	Watt		1321.8	13.43	166.9'	0'	0'
37	UNKNOWN CARRIER	Generic	Panel	850		220	65	6.3	60	TPO	Watt		1321.8	13.43	166.9'	0'	0'
38	UNKNOWN CARRIER	Generic	Panel	850		220	65	6.3	60	TPO	Watt		1321.8	13.43	166.9'	0'	0'
39	UNKNOWN CARRIER	Generic	Panel	850		330	65	6.3	60	TPO	Watt		1321.8	13.43	166.9'	0'	0'
40	UNKNOWN CARRIER	Generic	Panel	850		330	65	6.3	60	TPO	Watt		1321.8	13.43	166.9'	0'	0'
41	UNKNOWN CARRIER	Generic	Panel	850		330	65	6.3	60	TPO	Watt		1321.8	13.43	166.9'	0'	0'

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
42	UNKNOWN CARRIER	Generic	Panel	850		330	65	6.3	60	TPO	Watt		1321.8	13.43	166.9'	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.

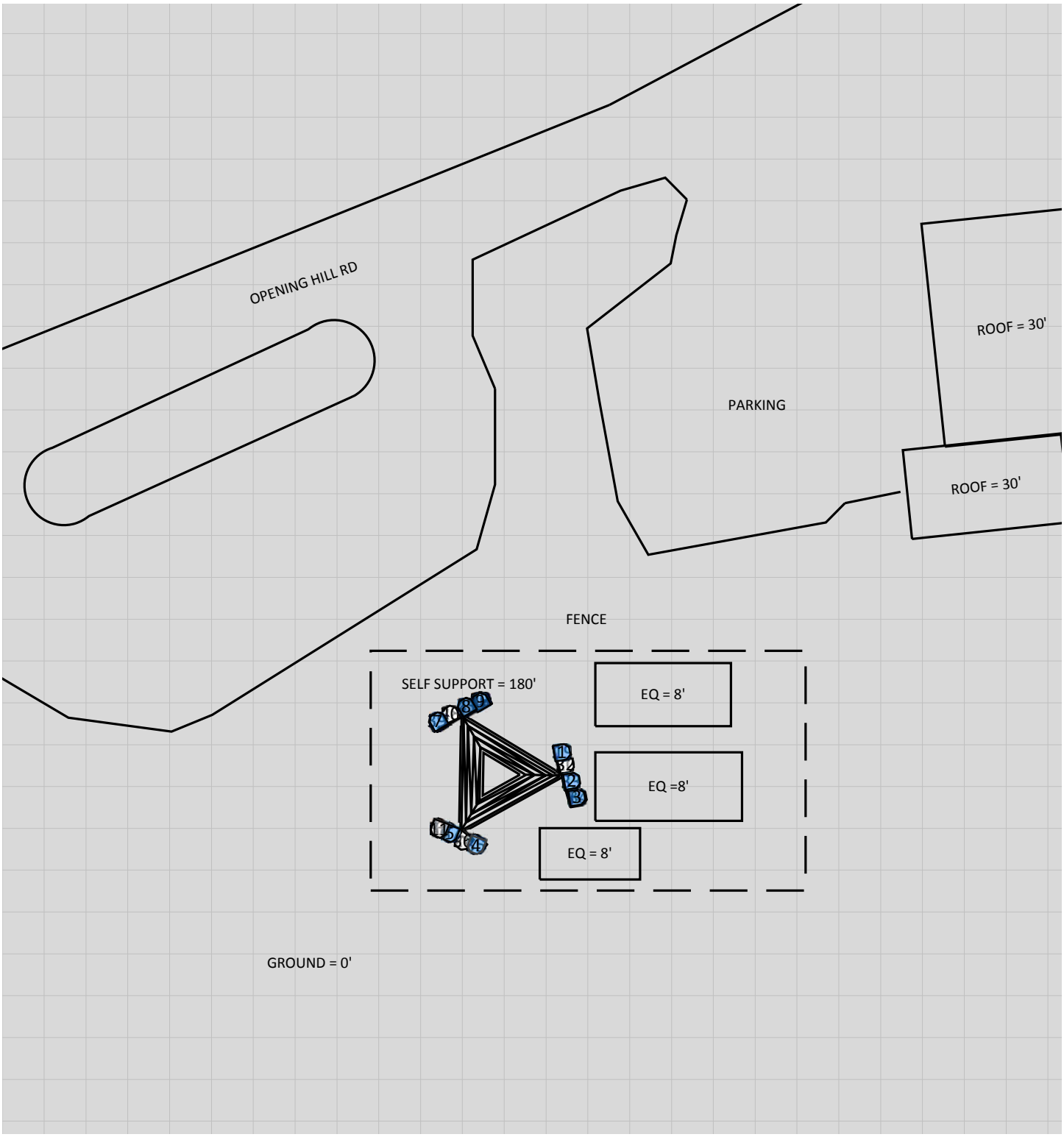
4 Emission Predictions

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 = 8'
- ROOF = 30'

The Antenna Inventory heights are referenced to the same level.

RF Exposure Simulation For: MADISON - SR 79
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

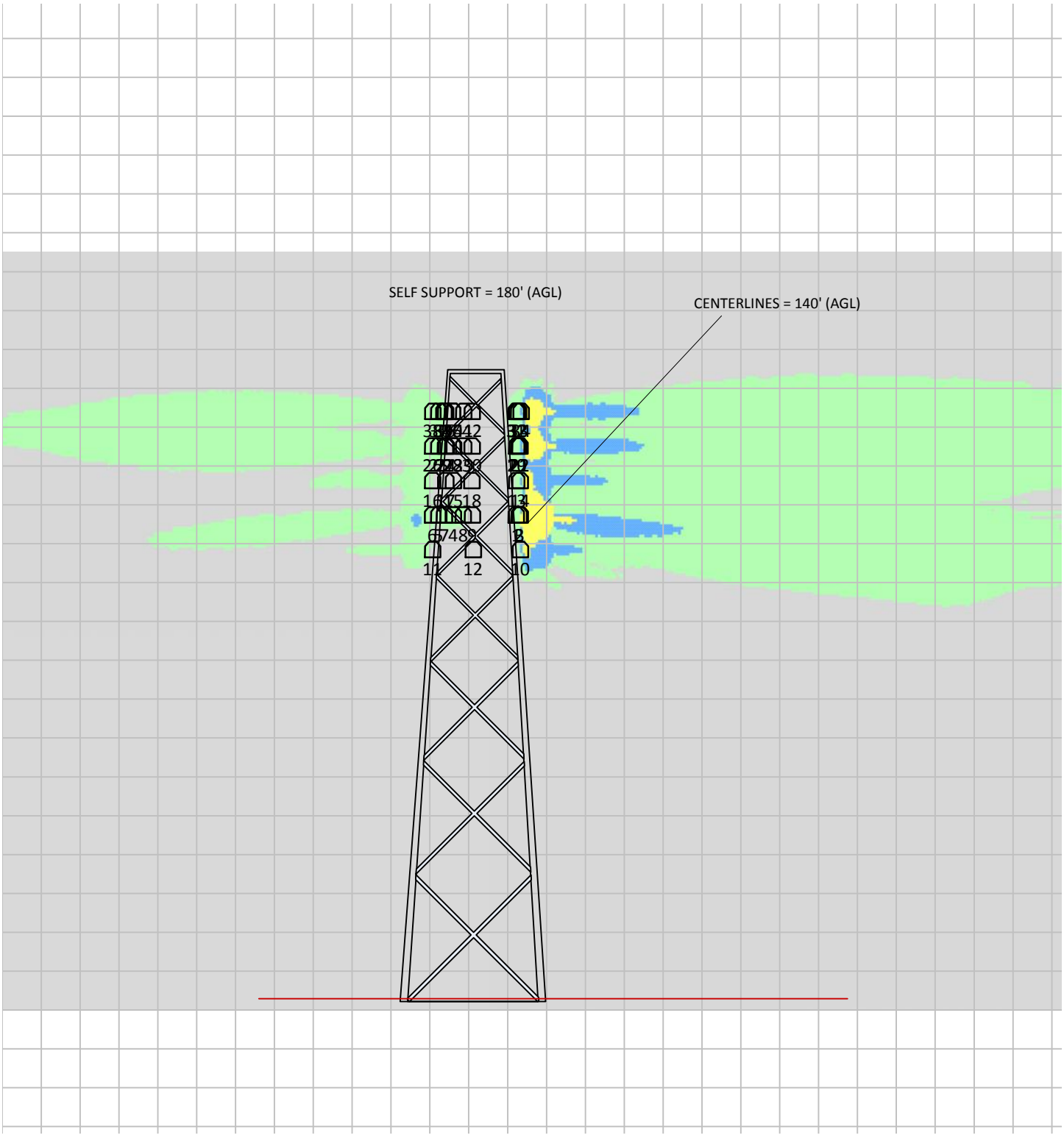
(Feet)

0 12.7 25.3

www.sitesafe.com
Site Name:MADISON - SR 79
2/5/2019 8:33:28 AM

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

RF Exposure Simulation For: MADISON - SR 79
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

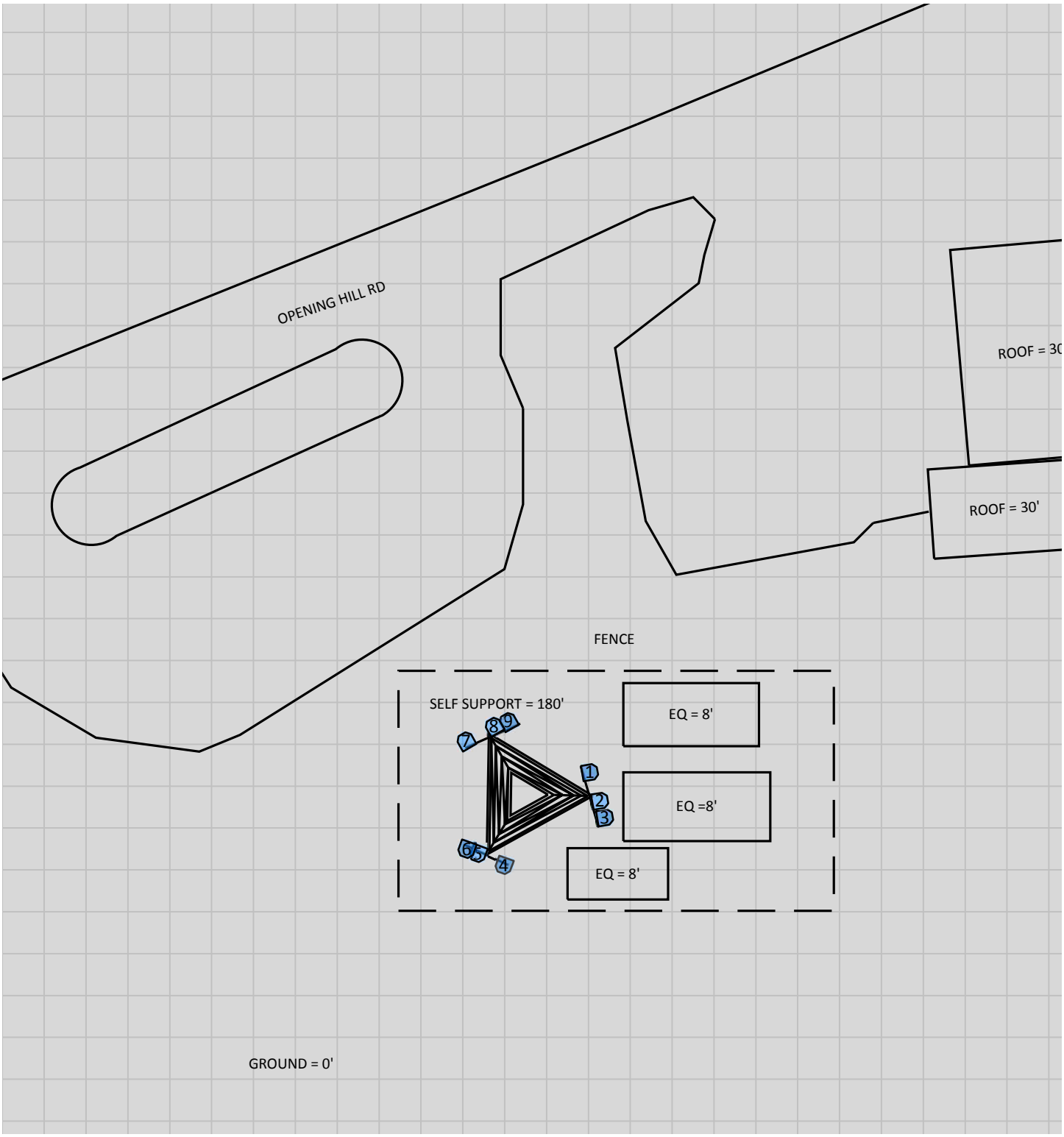
(Feet)

0 20.4 40.9

www.sitesafe.com
Site Name:MADISON - SR 79
2/5/2019 9:00:05 AM

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

RF Exposure Simulation For: MADISON - SR 79
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 13.4 26.9

www.sitesafe.com
Site Name:MADISON - SR 79
2/5/2019 8:57:01 AM

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

(2) 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.

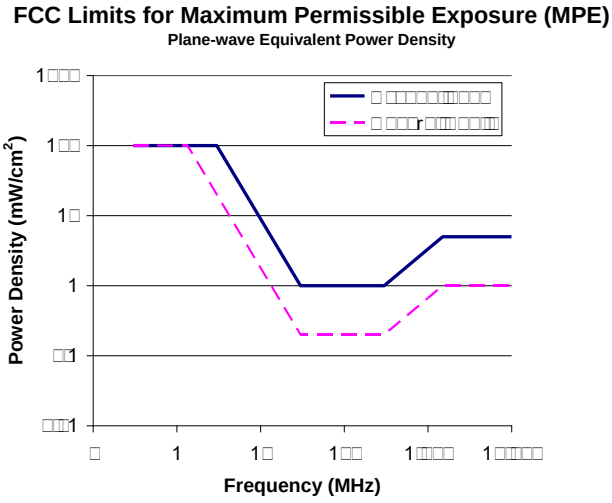
FCC regulations define two separate tiers of exposure limits: Occupational or "Controlled environment" and General Public or "Uncontrolled environment". The General Public limits are generally five times more conservative or restrictive than the Occupational limit. These limits apply to *accessible* 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

864 OPENING HILL RD

Location	864 OPENING HILL RD	**MBLU**	134/ 17/ / /
Acct#	00665700	**Owner**	NORTH MADISON VOLUNTEER FIRE COMPANY INC
Assessment	$938,700	**Appraisal**	$1,341,000
PID	7027	**Building Count**	1

Current Value

Appraisal					
Valuation Year	**Building**	**Extra Features**	**Outbuildings**	**Land**	**Total**
2018	$1,211,400	$0	$7,000	$122,600	$1,341,000

Assessment					
Valuation Year	**Building**	**Extra Features**	**Outbuildings**	**Land**	**Total**
2018	$848,000	$0	$4,900	$85,800	$938,700

Parcel Addreses

Additional Addresses		
Address	**City, State Zip**	**Type**
864 OPENING HILL RD		Primary

Owner of Record

Owner	NORTH MADISON VOLUNTEER FIRE COMPANY INC	**Sale Price**	$0
Co-Owner		**Book & Page**	44/ 130
Care Of		**Sale Date**	

Ownership History

Ownership History			
Owner	**Sale Price**	**Book & Page**	**Sale Date**
NORTH MADISON VOLUNTEER FIRE COMPANY INC	$0	44/ 130	

Building Information

Building 1 : Section 1

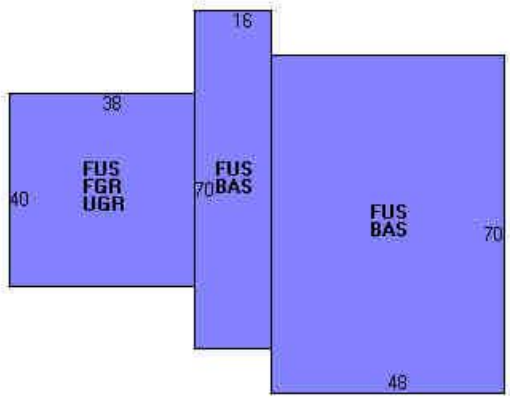
Year Built:	1971
Living Area:	10,480

Building Attributes	
Field	**Description**
STYLE	Fire Station
MODEL	Commercial
Stories:	2
Exterior Wall 1	Brick Veneer
Exterior Wall 2	Vinyl Siding
Roof Structure	Gambrel
Roof Cover	Asphalt Shngl.
Interior Wall 1	Minim/Masonry
Interior Wall 2	Plywood Panel
Interior Floor 1	Concr-Finished
Interior Floor 2	Carpet
Heating Fuel	Oil
Heating Type	Hot Water
AC Type	None
Bldg Use	Municipal Fire
Total Rooms	
Total Bedrms	00
Total Baths	0
Fireplace	
Xtra Fireplaces	
Heat/AC	None
Frame Type	Masonary
Baths/Plumbing	Average
Ceiling/Wall	None
Rooms/Prtns	Average
Wall Height	10

Building Photo

(http://images.vgsi.com/photos/MadisonCTPhotos//\01\01\63/75

Building Layout



(http://images.vgsi.com/photos/MadisonCTPhotos//Sketches/702

Building Sub-Areas (sq ft)			
Code	**Description**	**Gross Area**	**Living Area**
FUS	Finished Upper Story	6,000	6,000
BAS	First Floor	4,480	4,480
FGR	Garage	1,520	0
UGR	Basement Garage	1,520	0
		13,520	10,480

Extra Features

Extra Features
No Data for Extra Features

Land

Land Use

Land Line Valuation

Use Code	903L	**Size (Acres)**	0.38
Description	Municipal Fire		
Zone	RU-1		

Outbuildings

Outbuildings						
Code	**Description**	**Sub Code**	**Sub Description**	**Size**	**Value**	**Bldg #**
PAV1	Paving Asphalt			10000 S.F.	$7,000	1

Ryan Burgdorfer

From: TrackingUpdates@fedex.com
Sent: Friday, March 22, 2019 11:48 AM
To: Ryan Burgdorfer
Subject: FedEx Shipment 774739876522 Delivered

Your package has been delivered

Tracking # 774739876522

Ship date:
Wed, 3/20/2019

Smartlink LLC
NORTH BILLERICA, MA 01862
US

Delivered

Delivery date:
Fri, 3/22/2019 11:44 am

Tom Banisch, First Selectman
TOWN OF MADISON
8 CAMPUS DR
MADISON, CT 06443256208
US

Shipment Facts

Our records indicate that the following package has been delivered.

Tracking number:	774739876522
Status:	Delivered: 03/22/2019 11:44 AM Signed for By: Signature Not Req
Reference:	CTL02033 Elected Official
Signed for by:	Signature Not Req
Service type:	FedEx Ground
Packaging type:	Package
Number of pieces:	1
Weight:	1.00 lb.
Standard transit:	3/21/2019

Please do not respond to this message. This email was sent from an unattended mailbox. This report was generated at approximately 10:48 AM CDT on 03/22/2019.

All weights are estimated.

To track the latest status of your shipment, click on the tracking number above.

Ryan Burgdorfer

From: TrackingUpdates@fedex.com
Sent: Thursday, March 21, 2019 1:40 PM
To: Ryan Burgdorfer
Subject: FedEx Shipment 774739976558 Delivered

Your package has been delivered

Tracking # 774739976558

Ship date:
Wed, 3/20/2019

Ryan Burgdorfer
Smartlink LLC
NORTH BILLERICA, MA 01862
US

Delivery date:
Thu, 3/21/2019 1:35 pm

Chief David Cone
NORTH MADISON
VOLUNTEER FIRE CO.
864 OPENING HILL RD
MADISON, CT 06443820264
US

Shipment Facts

Our records indicate that the following package has been delivered.

Tracking number:	774739976558
Status:	Delivered: 03/21/2019 1:35 PM Signed for By: Signature Not Req
Reference:	CTL02033 Property Owner
Signed for by:	Signature Not Req
Service type:	FedEx Ground
Packaging type:	Package
Number of pieces:	1
Weight:	1.00 lb.
Standard transit:	3/21/2019

Please do not respond to this message. This email was sent from an unattended mailbox. This report was generated at approximately 12:39 PM CDT on 03/21/2019.

All weights are estimated.

To track the latest status of your shipment, click on the tracking number above.

Ryan Burgdorfer

From: TrackingUpdates@fedex.com
Sent: Thursday, March 21, 2019 1:10 PM
To: Ryan Burgdorfer
Subject: FedEx Shipment 774740021208 Delivered

Your package has been delivered

Tracking # 774740021208

Ship date:
Wed, 3/20/2019

Ryan Burgdorfer
Smartlink LLC
NORTH BILLERICA, MA 01862
US

Delivery date:
Thu, 3/21/2019 1:06 pm

ZONING
AMERICAN TOWER CORPORATION
10 PRESIDENTIAL WAY
WOBURN, MA 01801105399
US

Shipment Facts

Our records indicate that the following package has been delivered.

Tracking number:	774740021208
Status:	Delivered: 03/21/2019 1:06 PM Signed for By: ALONG
Reference:	CTL02033 Structure Owner
Signed for by:	ALONG
Delivery location:	Woburn, MA
Service type:	FedEx Ground
Packaging type:	Package
Number of pieces:	1
Weight:	1.00 lb.
Standard transit:	3/21/2019

Please do not respond to this message. This email was sent from an unattended mailbox. This report was generated at approximately 12:10 PM CDT on 03/21/2019.

All weights are estimated.

To track the latest status of your shipment, click on the tracking number above.

Ryan Burgdorfer

From: TrackingUpdates@fedex.com
Sent: Thursday, March 21, 2019 11:50 AM
To: Ryan Burgdorfer
Subject: FedEx Shipment 774739898869 Delivered

Your package has been delivered

Tracking # 774739898869

Ship date:
Wed, 3/20/2019

Ryan Burgdorfer
Smartlink LLC
NORTH BILLERICA, MA 01862
US

Delivery date:
Thu, 3/21/2019 11:45 am

David Anderson, Town Planner
TOWN OF MADISON
8 CAMPUS DR
MADISON, CT 06443256208
US

Shipment Facts

Our records indicate that the following package has been delivered.

Tracking number:	774739898869
Status:	Delivered: 03/21/2019 11:45 AM Signed for By: Signature Not Req
Reference:	CTL02033 Zoning Official
Signed for by:	Signature Not Req
Service type:	FedEx Ground
Packaging type:	Package
Number of pieces:	1
Weight:	1.00 lb.
Standard transit:	3/21/2019