SAI Group
12 Industrial Way
Salem, NH 03079
603-421-0470

May 20, 2022

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

Notice of Exempt Modification – New Cingular Wireless PCS, LLC (AT&T) – CT3459
1325 Cheshire Street, Cheshire, CT 06410
N 41.532588
W -72.87047

Dear Ms. Bachman:

AT&T currently maintains six (6) antennas at the 155-foot level of the existing 170-foot monopole tower located at 1325 Cheshire Street, Cheshire, CT. The property is owned by the Town of Cheshire and the tower is owned by American Tower. AT&T now intends to add (3) Ericsson AIR 6419 B77G antennas and (3) Ericsson AIR 6449 B77 antennas. The new antennas will be installed at the 155-foot level of the tower. This modification may include B2, B5, B17, B14, B29, B30, B66 & n77 hardware that is 4G (LTE) and/or 5GNR capable through remote software configuration and either or both services may be turned on or off at various times.

This facility was originally approved by the Connecticut Siting Council, Docket No. 451 on January 8, 2015. The approval included no conditions that could feasibly be violated by this proposed modification, including total facility height and mounting restrictions. This modification therefore complies with the aforementioned approvals.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies § 16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to Tim Slocum, Town Council Chair and Michael Glidden, Town Planner for the Town of Cheshire, as well as the property owner and tower owner.

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

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

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

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

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

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

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

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

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

Sincerely,

Mark Roberts

Mark Roberts
Consultant for SAI
Mark.Roberts@QCDevelopment.net

Attachments

Cc: Tim Slocum - Town Council Chair & Property Owner
Michael Glidden - Town Planner
American Tower – Tower Owner

PROJECT INFORMATION

SCOPE OF WORK:

ITEMS TO BE MOUNTED ON THE EXISTING MONOPOLE:
- NEW AT&T ANTENNAS: AIR6419 B77G (TYP. OF 1 PER SECTOR, TOTAL OF 3).
- NEW AT&T ANTENNAS: AIR6449 B77 (TYP. OF 1 PER SECTOR, TOTAL OF 3).
- EXISTING AT&T ANTENNAS: TPA65R-BU8DA-K (TYP. OF 1 PER SECTOR, TOTAL OF 3) (TO BE RELOCATED TO POS. 2).
- EXISTING AT&T RRUS-4478 B14 (700) (TYP. OF 1 PER SECTOR, TOTAL OF 3) (TO BE RELOCATED TO POS. 2).
- EXISTING AT&T RRUS-4415 B30 (WCS) (TYP. OF 1 PER SECTOR, TOTAL OF 3) (TO BE RELOCATED TO POS. 2).
- NEW AT&T DC & FIBER SURGE ARRESTOR DC9-48-60-24-8C-EV (TOTAL OF 1) WITH (2) AWG6 DC POWER & (1) 24-PAIR FIBER RUN.

ITEMS TO BE MOUNTED AT EQUIPMENT LOCATION:
- ADD (3) RECTIFIERS.
- ADD 6648 + XCEDE CABLE.

ITEMS TO BE REMOVED:
- EXISTING AT&T SURGE ARRESTOR DC ONLY (TOTAL OF 1).

ITEMS TO REMAIN:
- (6) ANTENNAS, (12) RRU'S, (1) SURGE ARRESTOR, (4) DC POWER & (1) FIBER.

SITE ADDRESS:	1325 CHESHIRE STREET CHESHIRE, CT 06410
LATITUDE:	41.532585° N, 41° 31' 57.31" N
LONGITUDE:	72.870489° W, 72° 52' 13.76" W
TYPE OF SITE:	MONOPOLE / INDOOR EQUIPMENT
STRUCTURE HEIGHT:	101'-0"±
RAD CENTER:	155'-0"± (LTE), 157'-4"± (DOD), 153'-9"± (C-BAND)
CURRENT USE:	TELECOMMUNICATIONS FACILITY
PROPOSED USE:	TELECOMMUNICATIONS FACILITY

DRAWING INDEX

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SITE NUMBER: CT3459

SITE NAME: CHESHIRE WATER TREATMENT FACILITY

FA CODE: 10578304

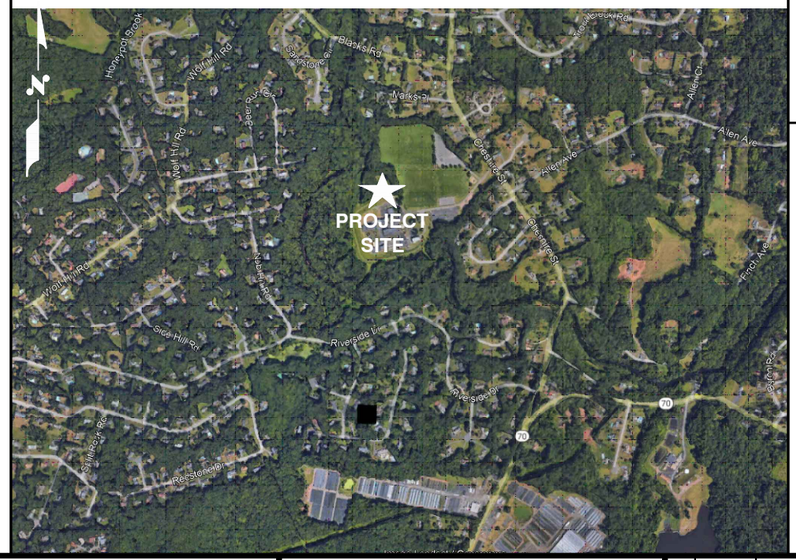
PACE ID: MRCTB057272, MRCTB057274, MRCTB057249, MRCTB057261, MRCTB057247

PROJECT: 5G NR RADIO_5G NR 1SR C-BAND_BBU RECONFIGURATION UPGRADE

VICINITY MAP

DIRECTIONS TO SITE:

DEPART WEST ON MA-30/COCHITUATE ROAD, TAKE RAMP RIGHT FOR I-90 EAST/I-90 WEST TOWARD BOSTON/SPRINGFIELD, AT EXIT 9 TAKE RAMP RIGHT FOR I-84 TOWARD HARTFORD/NEW YORK CITY, KEEP LEFT ONTO CT-15 S/WILBUR CROSS HWY S, KEEP STRAIGHT ONTO US-5 S/CT-15 S/WILBUR CROSS HWY S, AT EXIT 86 TAKE RAMP RIGHT FOR I-91 SOUTH TOWARD NY CITY/NEW HAVEN, AT EXIT 18 TAKE RAMP RIGHT FOR I-691 WEST TOWARD MERIDEN/WATERBURY, AT EXIT 4 TAKE RAMP RIGHT FOR CT-322 TOWARD SOUTHINGTON, TURN SHARP LEFT ONTO CT-322/MERIDEN WATERBURY TURNPIKE, ROAD NAME CHANGES TO W MAIN STREET, TURN RIGHT ONTO GWEN ROAD, TURN RIGHT ONTO JOHNSON AVE, TURN LEFT ONTO FINCH AVE, TURN RIGHT ONTO ALLEN AVE, TURN RIGHT ONTO CHESHIRE STREET, TURN LEFT, KEEP LEFT ONTO ROAD, TURN RIGHT



GENERAL NOTES

1. THIS DOCUMENT IS THE CREATION, DESIGN, PROPERTY AND COPYRIGHTED WORK OF AT&T. ANY DUPLICATION OR USE WITHOUT EXPRESS WRITTEN CONSENT IS STRICTLY PROHIBITED. DUPLICATION AND USE BY GOVERNMENT AGENCIES FOR THE PURPOSES OF CONDUCTING THEIR LAWFULLY AUTHORIZED REGULATORY AND ADMINISTRATIVE FUNCTIONS IS SPECIFICALLY ALLOWED.
2. THE FACILITY IS AN UNMANNED PRIVATE AND SECURED EQUIPMENT INSTALLATION. IT IS ONLY ACCESSED BY TRAINED TECHNICIANS FOR PERIODIC ROUTINE MAINTENANCE AND THEREFORE DOES NOT REQUIRE ANY WATER OR SANITARY SEWER SERVICE. THE FACILITY IS NOT GOVERNED BY REGULATIONS REQUIRING PUBLIC ACCESS PER ADA REQUIREMENTS.
3. CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE AT&T MOBILITY REPRESENTATIVE IN WRITING OF DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.
4. CONSTRUCTION DRAWINGS ARE VALID FOR SIX MONTHS AFTER ENGINEER OF RECORD'S STAMPED AND SIGNED SUBMITTAL DATE LISTED HEREIN.

72 HOURS

CALL
BEFORE YOU DIG
CALL TOLL FREE 1-800-922-4455
OR CALL 811

UNDERGROUND SERVICE ALERT

HUDSON Design Group LLC
45 BEECHWOOD DRIVE
NORTH ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

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SCALE: AS SHOWN | DESIGNED BY: HC | DRAWN BY: JC

STATE OF CONNECTICUT · DANIEL P. HAMM · No. 24178 · LICENSED PROFESSIONAL ENGINEER

AT&T

TITLE SHEET
5G NR RADIO_5G NR 1SR C-BAND _BBU CONFIGURATION UPGRADE

SITE NUMBER	DRAWING NUMBER	REV
CT3459	T-1	1

GROUNDING NOTES

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

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

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

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

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

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

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

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

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

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

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

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

GENERAL NOTES

1. FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:

   CONTRACTOR – SAI
   SUBCONTRACTOR – GENERAL CONTRACTOR (CONSTRUCTION)
   OWNER – AT&T MOBILITY

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

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

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

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

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

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

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

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

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

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

12. SUBCONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION.

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

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

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

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

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

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

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

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

    BUILDING CODE: IBC 2015 WITH 2018 CT STATE BUILDING CODE AMENDMENTS
    ELECTRICAL CODE: 2017 NATIONAL ELECTRICAL CODE (NFPA 70-2017)

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

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

    AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC) MANUAL OF STEEL CONSTRUCTION, ASD, FOURTEENTH EDITION;

    TELECOMMUNICATIONS INDUSTRY ASSOCIATION (TIA) 222-H, STRUCTURAL STANDARDS FOR STEEL

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

ABBREVIATIONS

AGL	ABOVE GRADE LEVEL	EQ	EQUAL	REQ	REQUIRED
AWG	AMERICAN WIRE GAUGE	GC	GENERAL CONTRACTOR	RF	RADIO FREQUENCY
BBU	BATTERY BACKUP UNIT	GRC	GALVANIZED RIGID CONDUIT	TBD	TO BE DETERMINED
BTCW	BARE TINNED SOLID COPPER WIRE	MGB	MASTER GROUND BAR	TBR	TO BE REMOVED
BGR	BURIED GROUND RING	MIN	MINIMUM	TBRR	TO BE REMOVED AND REPLACED
BTS	BASE TRANSCEIVER STATION	P	PROPOSED	TYP	TYPICAL
E	EXISTING	NTS	NOT TO SCALE	UG	UNDER GROUND
EGB	EQUIPMENT GROUND BAR	RAD	RADIATION CENTER LINE (ANTENNA)	VIF	VERIFY IN FIELD
EGR	EQUIPMENT GROUND RING	REF	REFERENCE		

HUDSON Design Group LLC
45 BEECHWOOD DRIVE
NORTH ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

12 INDUSTRIAL WAY
SALEM, NH 03079

SITE NUMBER: CT3459
SITE NAME: CHESHIRE WATER TREATMENT FACILITY

1325 CHESHIRE STREET
CHESHIRE, CT 06410
NEW HAVEN COUNTY

at&t
500 ENTERPRISE DRIVE, SUITE 3A
ROCKY HILL, CT 06067

NO.	DATE	REVISIONS	BY	CHK	APP'D
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A	04/08/22	ISSUED FOR REVIEW	JC	HC	DPH

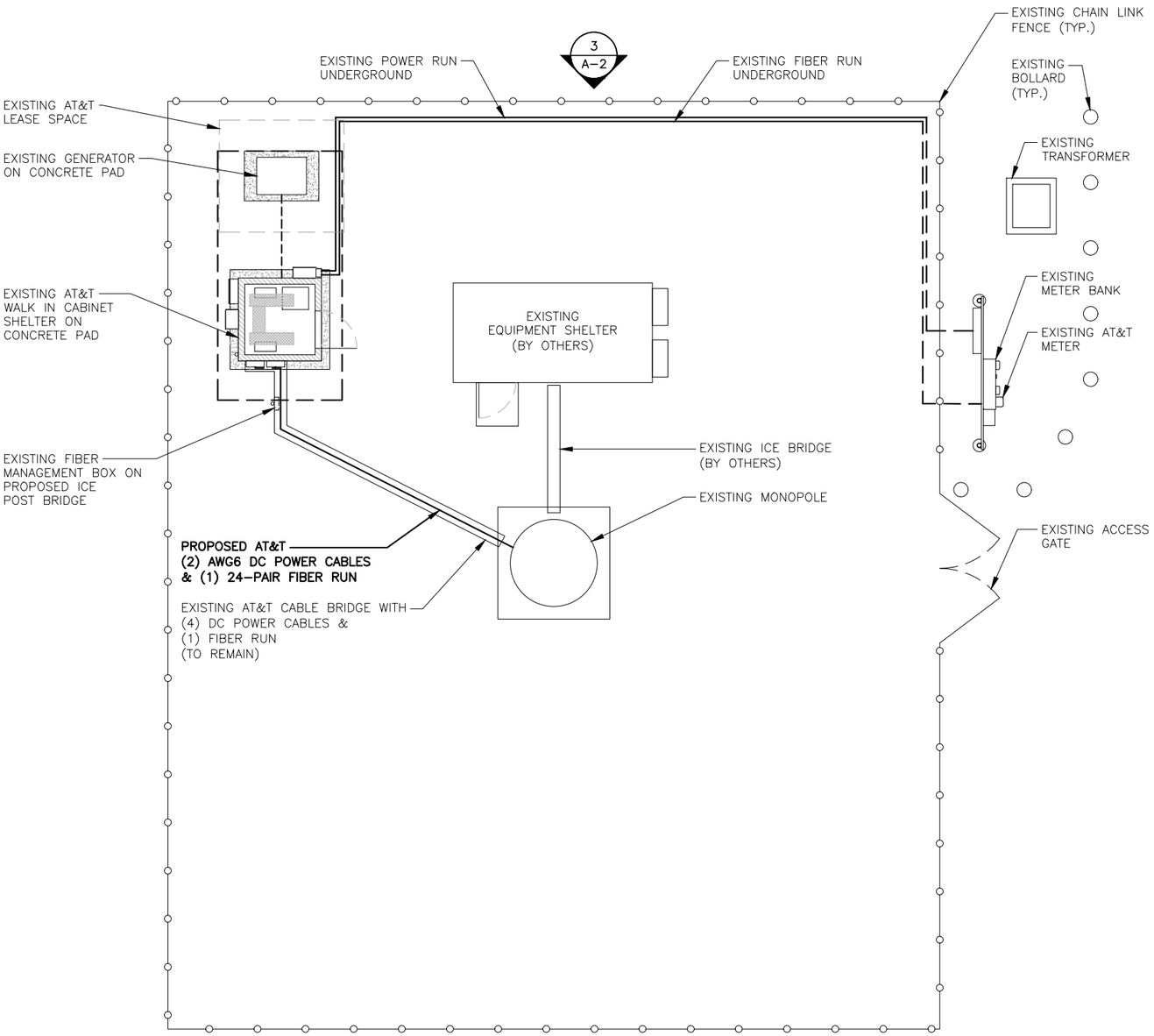
SCALE: AS SHOWN | DESIGNED BY: HC | DRAWN BY: JC

STATE OF CONNECTICUT · DANIEL P. HAMM · No. 24178 · LICENSED PROFESSIONAL ENGINEER

AT&T

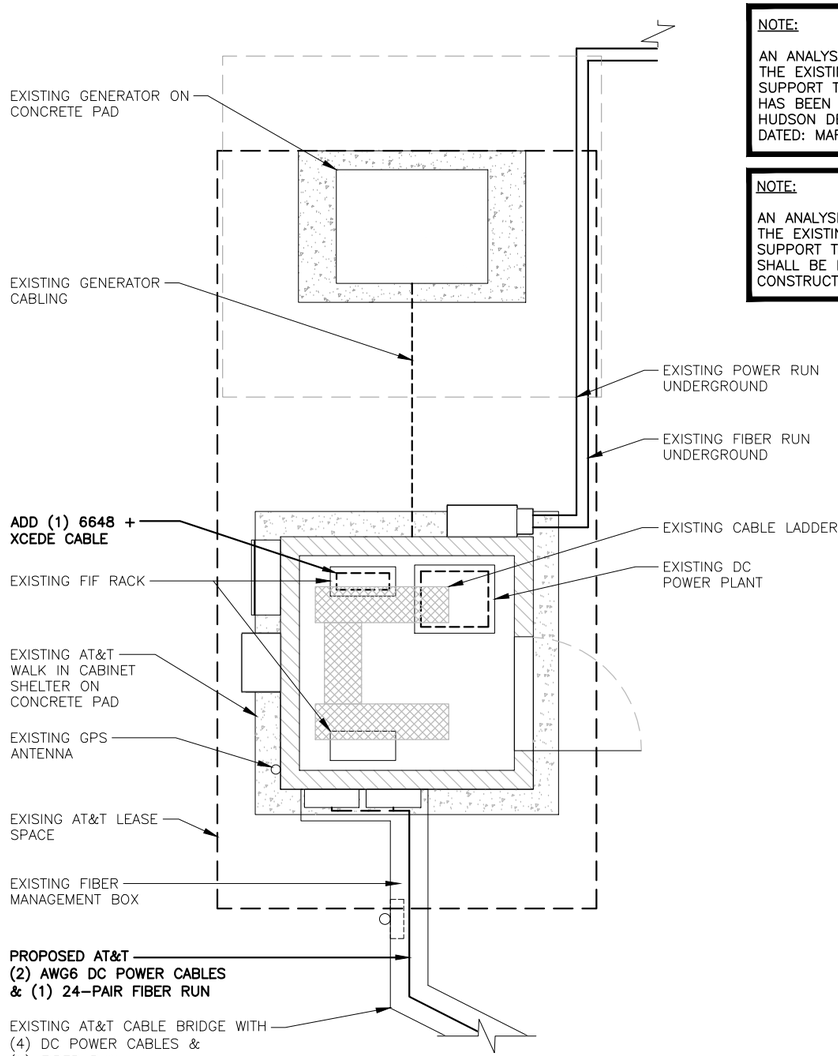
GENERAL NOTES
5G NR RADIO_5G NR 1SR C-BAND
_BBU CONFIGURATION UPGRADE

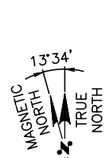
SITE NUMBER	DRAWING NUMBER	REV
CT3459	GN-1	1



COMPOUND PLAN (1 / A-1)
22x34 SCALE: 3/16"=1'-0"
11x17 SCALE: 3/32"=1'-0"

0 2'-8" 5'-4" 10'-8" 16'-0"





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

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

NOTE:

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

NOTE:

AN ANALYSIS FOR THE CAPACITY OF THE EXISTING ANTENNA MOUNT TO SUPPORT THE PROPOSED LOADING HAS BEEN COMPLETED BY:
HUDSON DESIGN GROUP, LLC
DATED: MARCH 29, 2022

NOTE:

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

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NORTH ANDOVER, MA 01845
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DANIEL P. HAMM
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AT&T

ROOFTOP & EQUIPMENT PLANS
5G NR RADIO_5G NR 1SR C-BAND
BBU CONFIGURATION UPGRADE

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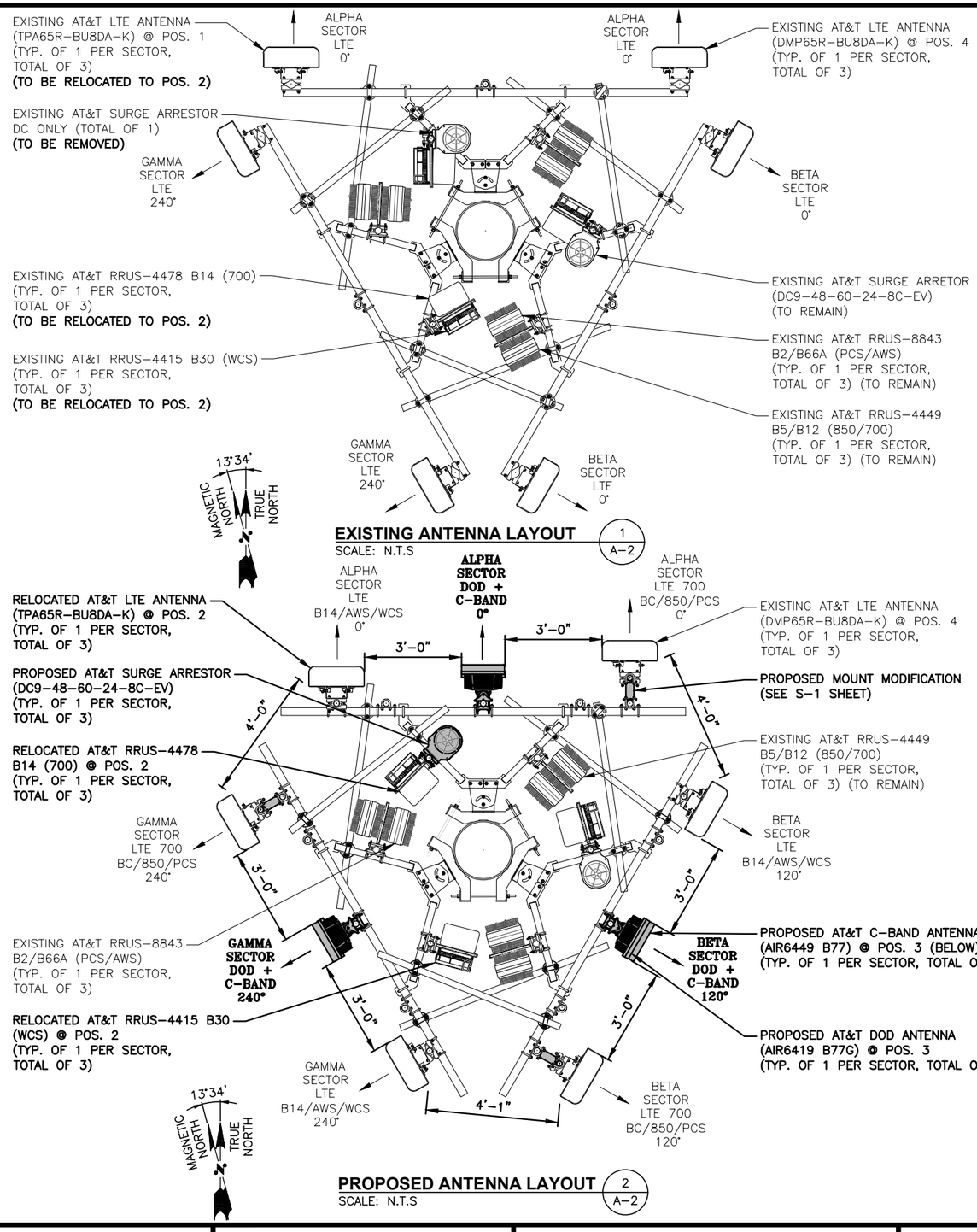
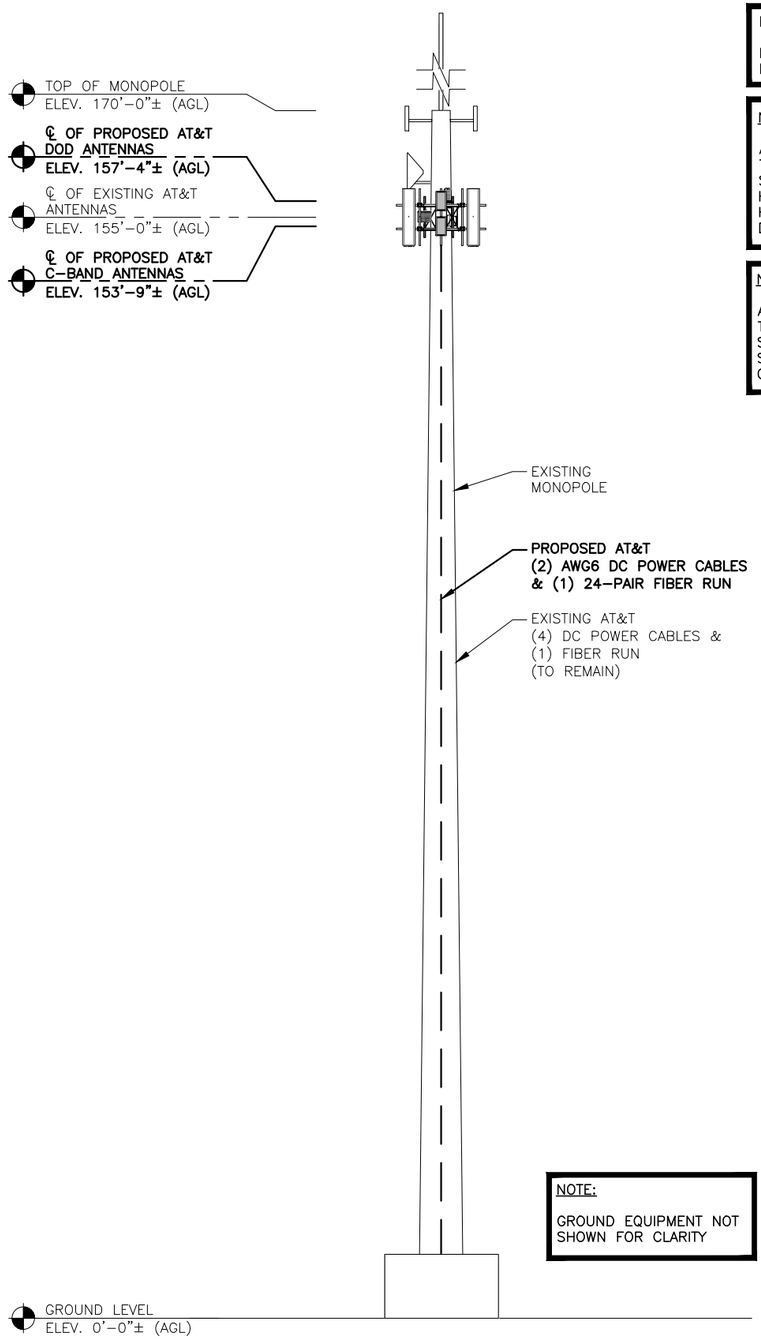
CT3459	A-1	1



PROPOSED ANTENNA LAYOUT

SCALE: N.T.S

2 A-2



ELEVATION

22x34 SCALE: 3/32"=1'-0"
11x17 SCALE: 3/64"=1'-0"

3 A-2

0 8' 16' 32'-0"

NOTE:

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NOTE:

GROUND EQUIPMENT NOT SHOWN FOR CLARITY

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ANTENNA LAYOUTS & ELEVATION
5G NR RADIO_5G NR 1SR C-BAND
BBU CONFIGURATION UPGRADE

SITE NUMBER	DRAWING NUMBER	REV
CT3459	A-2	1

ANTENNA SCHEDULE

SECTOR	EXISTING/ PROPOSED	BAND	ANTENNA	SIZE (INCHES) (L x W x D)	ANTENNA ℄ HEIGHT	ANTENNA TIP HEIGHT	AZIMUTH	TMA/ DIPLEXER	RRU	SIZE (INCHES) (L x W x D)	FEEDER	RAYCAP
–	–	–	–	–	–	–	–	–	–	–	–	(E) (1) RAYCAP DC9-48-60-24-8C-EV
A2	EXISTING	LTE 700 WCS/PCS	TPA65R-BU8DA-K	96X21X7.8	155'-0"±	159'-0"±	0°	–	(E)(1) 4478 B14 (700) (E)(1) 4415 B30 (WCS)	– – –	(E)(2) DC POWER & (E)(1) FIBER, **(P)(1) DC POWER**	
A3	**PROPOSED**	**DOD + C-BAND**	**AIR6419 B77G AIR6449 B77 (STACKED)**	**31.1X16.1X7.3 30.6X15.9X10.6**	**157'-4"± 153'-9"±**	158'-7"± 155'-0"±	0°	–	–	– –	–	
A4	EXISTING	LTE 700 BC/850/PCS	DMP65R-BU8DA-K	96X20.7X7.7	155'-0"±	159'-0"±	0°	–	(E)(1) 4449 B5/B12 (850/700) (E)(1) 8843 B2/B66A (PCS/AWS)	– –	(E)(2) Y-CABLE	
–	–	–	–	–	–	–	–	–	–	–	–	**(P) (1) RAYCAP DC9-48-60-24-8C-EV**
A2	EXISTING	LTE 700 WCS/PCS	TPA65R-BU8DA-K	96X21X7.8	155'-0"±	159'-0"±	120°	–	(E)(1) 4478 B14 (700) (E)(1) 4415 B30 (WCS)	– – –	(E)(2) DC POWER & (E)(1) FIBER, **(P)(1) DC POWER**	
A3	**PROPOSED**	**DOD + C-BAND**	**AIR6419 B77G AIR6449 B77 (STACKED)**	**31.1X16.1X7.3 30.6X15.9X10.6**	**157'-4"± 153'-9"±**	158'-7"± 155'-0"±	120°	–	–	– –	–	
A4	EXISTING	LTE 700 BC/850/PCS	DMP65R-BU8DA-K	96X20.7X7.7	155'-0"±	159'-0"±	120°	–	(E)(1) 4449 B5/B12 (850/700) (E)(1) 8843 B2/B66A (PCS/AWS)	– –	(E)(2) Y-CABLE	
–	–	–	–	–	–	–	–	–	–	–	–	
A2	EXISTING	LTE 700 WCS/PCS	TPA65R-BU8DA-K	96X21X7.8	155'-0"±	159'-0"±	240°	–	(E)(1) 4478 B14 (700) (E)(1) 4415 B30 (WCS)	– – –	–	
A3	**PROPOSED**	**DOD + C-BAND**	**AIR6419 B77G AIR6449 B77 (STACKED)**	**31.1X16.1X7.3 30.6X15.9X10.6**	**157'-4"± 153'-9"±**	158'-7"± 155'-0"±	240°	–	–	– –	–	
A4	EXISTING	LTE 700 BC/850/PCS	DMP65R-BU8DA-K	96X20.7X7.7	155'-0"±	159'-0"±	240°	–	(E)(1) 4449 B5/B12 (850/700) (E)(1) 8843 B2/B66A (PCS/AWS)	– –	(E)(2) Y-CABLE	

FINAL ANTENNA SCHEDULE (1 / A-3)
SCALE: N.T.S

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

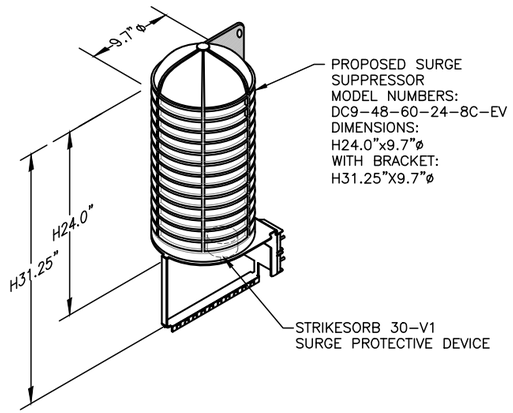
NOTE:
AN ANALYSIS FOR THE CAPACITY OF THE EXISTING ANTENNA MOUNT TO SUPPORT THE PROPOSED LOADING HAS BEEN COMPLETED BY:
HUDSON DESIGN GROUP, LLC
DATED: MARCH 29, 2022

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

RRU CHART

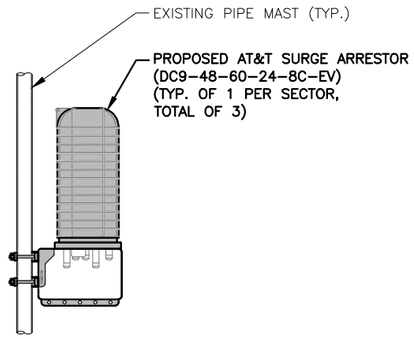
QUANTITY	MODEL	SIZE (L x W x D)
E(1)	4449 (850/700)	17.9"x13.2"x10.4"
E(1)	8843 (PCS/AWS)	14.9"x13.2"x10.9"
E(1)	4478 B14 (700)	18.1"x13.4"x8.3"
E(1)	4415	16.5"x13.4"x5.9"

NOTE:
MOUNT PER MANUFACTURER'S SPECIFICATIONS



NOTE:
MOUNT PER MANUFACTURER'S SPECIFICATIONS.

DC SURGE SUPPRESSOR DETAL (2 / A-3)
SCALE: N.T.S



PROPOSED DC SURGE ARRESTOR MOUNTING DETAIL (3 / A-3)
22x34 SCALE: 1"=1'-0"
11x17 SCALE: 1/2"=1'-0"
0 0'-6" 1'-0" 2'-0" 3'-0"

HUDSON Design Group LLC
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TEL: (978) 557-5553
FAX: (978) 336-5586

12 INDUSTRIAL WAY
SALEM, NH 03079

SITE NUMBER: CT3459
SITE NAME: CHESHIRE WATER TREATMENT FACILITY

1325 CHESHIRE STREET
CHESHIRE, CT 06410
NEW HAVEN COUNTY

at&t
500 ENTERPRISE DRIVE, SUITE 3A
ROCKY HILL, CT 06067

NO.	DATE	REVISIONS	BY	CHK	APP'D
1	05/02/22	ISSUED FOR CONSTRUCTION	MF	HC	DPH
A	04/08/22	ISSUED FOR REVIEW	JC	HC	DPH

SCALE: AS SHOWN | DESIGNED BY: HC | DRAWN BY: JC

STATE OF CONNECTICUT · DANIEL P. HAMM · No. 24178 · LICENSED PROFESSIONAL ENGINEER

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DETAILS
5G NR RADIO_5G NR 1SR C-BAND
_BBU CONFIGURATION UPGRADE

SITE NUMBER	DRAWING NUMBER	REV
CT3459	A-3	1

NOTE:

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

NOTE:

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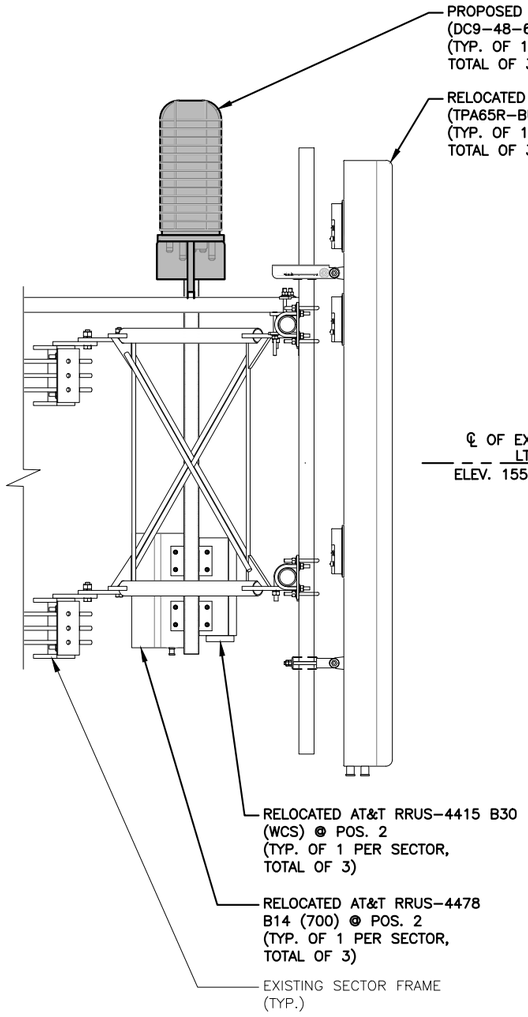

PROPOSED LTE ANTENNAS
MOUNTING DETAIL (1 / A-4)
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11x17 SCALE: 1/2"=1'-0"
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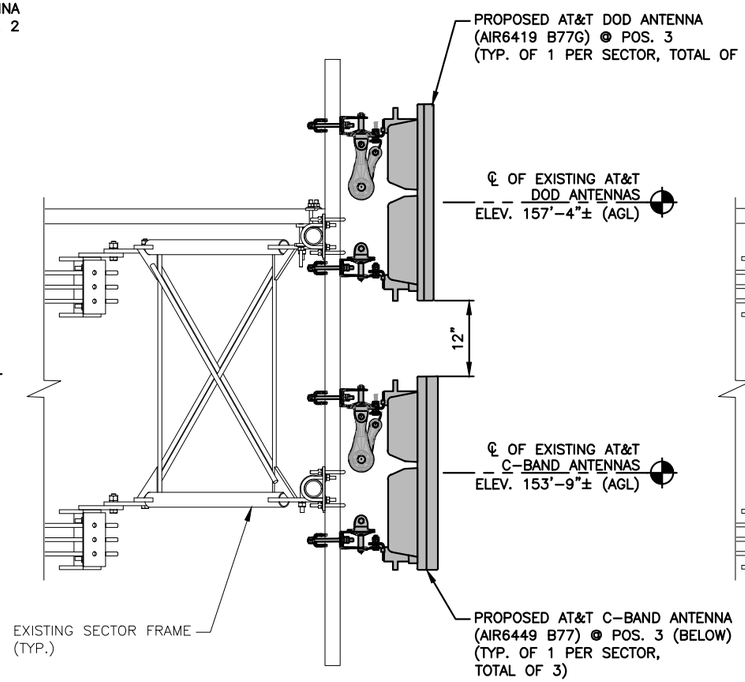
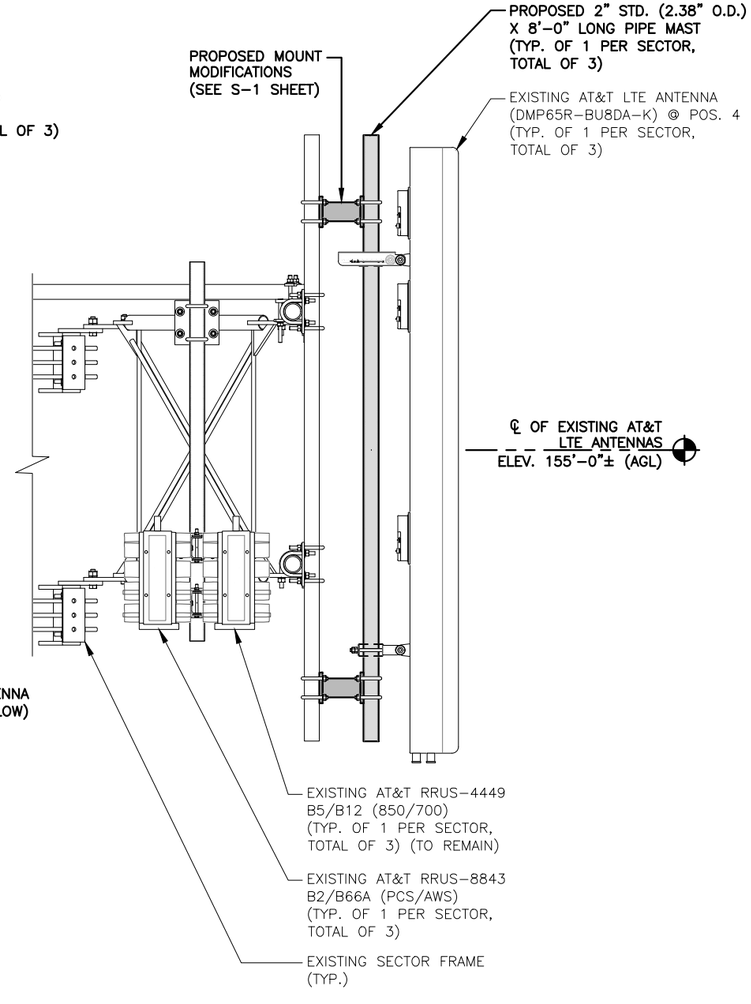


PROPOSED DOD+C-BAND ANTENNAS
MOUNTING DETAIL (2 / A-4)
22x34 SCALE: 1"=1'-0"
11x17 SCALE: 1/2"=1'-0"
0 0'-6" 1'-0" 2'-0" 3'-0"



PROPOSED LTE ANTENNAS
MOUNTING DETAIL (3 / A-4)
22x34 SCALE: 1"=1'-0"
11x17 SCALE: 1/2"=1'-0"
0 8" 1'-4" 2'-8" 4'-0"

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DETAILS
5G NR RADIO_5G NR 1SR C-BAND
_BBU CONFIGURATION UPGRADE

SITE NUMBER	DRAWING NUMBER	REV
CT3459	A-4	1

STRUCTURAL NOTES:

1. DESIGN REQUIREMENTS ARE PER STATE BUILDING CODE AND APPLICABLE SUPPLEMENTS, INTERNATIONAL BUILDING CODE, EIA/TIA-222-H STRUCTURAL STANDARDS FOR STEEL ANTENNA, TOWERS AND ANTENNA SUPPORTING STRUCTURES.
2. CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CONDITIONS IN THE FIELD PRIOR TO FABRICATION AND ERECTION OF ANY MATERIAL. ANY UNUSUAL CONDITIONS SHALL BE REPORTED TO THE ATTENTION OF THE CONSTRUCTION MANAGER AND ENGINEER OF RECORD.
3. DESIGN AND CONSTRUCTION OF STRUCTURAL STEEL SHALL CONFORM TO THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION "SPECIFICATION FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS".
4. STRUCTURAL STEEL SHALL CONFORM TO ASTM A992 (Fy=50 ksi), MISCELLANEOUS STEEL SHALL CONFORM TO ASTM A36 UNLESS OTHERWISE INDICATED.
5. STEEL PIPE SHALL CONFORM TO ASTM A500 "COLD-FORMED WELDED & SEAMLESS CARBON STEEL STRUCTURAL TUBING", GRADE B, OR ASTM A53 PIPE STEEL BLACK AND HOT-DIPPED ZINC-COATED WELDED AND SEAMLESS TYPE E OR S, GRADE B. PIPE SIZES INDICATED ARE NOMINAL. ACTUAL OUTSIDE DIAMETER IS LARGER.
6. STRUCTURAL CONNECTION BOLTS SHALL BE HIGH STRENGTH BOLTS (BEARING TYPE) AND CONFORM TO ASTM A325 TYPE-X "HIGH STRENGTH BOLTS FOR STRUCTURAL JOINTS, INCLUDING SUITABLE NUTS AND PLAIN HARDENED WASHERS". ALL BOLTS SHALL BE 3/4" DIA UON.
7. ALL STEEL MATERIALS SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123 "ZINC (HOT-DIP GALVANIZED) COATINGS ON IRON AND STEEL PRODUCTS", UNLESS OTHERWISE NOTED.
8. ALL BOLTS, ANCHORS AND MISCELLANEOUS HARDWARE SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153 "ZINC-COATING (HOT-DIP) ON IRON AND STEEL HARDWARE", UNLESS OTHERWISE NOTED.
9. FIELD WELDS, DRILL HOLES, SAW CUTS AND ALL DAMAGED GALVANIZED SURFACES SHALL BE REPAIRED WITH AN ORGANIC ZINC REPAIR PAINT COMPLYING WITH REQUIREMENTS OF ASTM A780. GALVANIZING REPAIR PAINT SHALL HAVE 65 PERCENT ZINC BY WEIGHT, ZIRP BY DUNCAN GALVANIZING, GALVA BRIGHT PREMIUM BY CROWN OR EQUAL. THICKNESS OF APPLIED GALVANIZING REPAIR PAINT SHALL BE NOT NOT LESS THAN 4 COATS (ALLOW TIME TO DRY BETWEEN COATS) WITH A RESULTING COATING THICKNESS REQUIRED BY ASTM A123 OR A153 AS APPLICABLE.
10. CONTRACTOR SHALL COMPLY WITH AWS CODE FOR PROCEDURES, APPEARANCE AND QUALITY OF WELDS, AND FOR METHODS USED IN CORRECTING WELDING. ALL WELDERS AND WELDING PROCESSES SHALL BE QUALIFIED IN ACCORDANCE WITH AWS "STANDARD QUALIFICATION PROCEDURES". ALL WELDING SHALL BE DONE USING E70XX ELECTRODES AND WELDING SHALL CONFORM TO AISC AND DI.I. WHERE FILLET WELD SIZES ARE NOT SHOWN, PROVIDE THE MINIMUM SIZE PER TABLE J2.4 IN THE AISC "STEEL CONSTRUCTION MANUAL". 14TH EDITION.
11. INCORRECTLY FABRICATED, DAMAGED OR OTHERWISE MISFITTING OR NON-CONFORMING MATERIALS OR CONDITIONS SHALL BE REPORTED TO THE CONSTRUCTION MANAGER PRIOR TO REMEDIAL OR CORRECTIVE ACTION. ANY SUCH ACTION SHALL REQUIRE CONSTRUCTION MANAGER APPROVAL.
12. UNISTRUT SHALL BE FORMED STEEL CHANNEL STRUT FRAMING AS MANUFACTURED BY UNISTRUT CORP., WAYNE, MI OR EQUAL. STRUT MEMBERS SHALL BE 1 5/8"x1 5/8"x12GA, UNLESS OTHERWISE NOTED, AND SHALL BE HOT-DIP GALVANIZED AFTER FABRICATION.
13. EPOXY ANCHOR ASSEMBLY SHALL CONSIST OF STAINLESS STEEL ANCHOR ROD WITH NUTS & WASHERS. AN INTERNALLY THREADED INSERT, A SCREEN TUBE AND A EPOXY ADHESIVE. THE ANCHORING SYSTEM SHALL BE THE HILTI-HIT HY-270 AND OR HY-200 SYSTEMS (AS SPECIFIED IN DWG.) OR ENGINEERS APPROVED EQUAL.
14. EXPANSION BOLTS SHALL CONFORM TO FEDERAL SPECIFICATION FF-S-325, GROUP II, TYPE 4, CLASS I, HILTI KWIK BOLT III OR APPROVED EQUAL. INSTALLATION SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
15. LUMBER SHALL COMPLY WITH THE REQUIREMENTS OF THE AMERICAN INSTITUTE OF TIMBER CONSTRUCTION AND THE NATIONAL FOREST PRODUCTS ASSOCIATION'S NATIONAL DESIGN SPECIFICATION FOR WOOD CONSTRUCTION. ALL LUMBER SHALL BE PRESSURE TREATED AND SHALL BE STRUCTURAL GRADE NO. 2 OR BETTER.
16. WHERE ROOF PENETRATIONS ARE REQUIRED, THE CONTRACTOR SHALL CONTACT AND COORDINATE RELATED WORK WITH THE BUILDING OWNER AND THE EXISTING ROOF INSTALLER. WORK SHALL BE PERFORMED IN SUCH A MANNER AS TO NOT VOID THE EXISTING ROOF WARRANTY. ROOF SHALL BE WATERTIGHT.
17. ALL FIBERGLASS MEMBERS USED ARE AS MANUFACTURED BY STRONGWELL COMPANY OF BRISTOL, VA 24203. ALL DESIGN CRITERIA FOR THESE MEMBERS IS BASED ON INFORMATION PROVIDED IN THE DESIGN MANUAL. ALL REQUIREMENTS PUBLISHED IN SAID MANUAL MUST BE STRICTLY ADHERED TO.
18. NO MATERIALS TO BE ORDERED AND NO WORK TO BE COMPLETED UNTIL SHOP DRAWINGS HAVE BEEN REVIEWED AND APPROVED IN WRITING.
19. SUBCONTRACTOR SHALL FIREPROOF ALL STEEL TO PRE-EXISTING CONDITIONS.

SPECIAL INSPECTIONS (REFERENCE IBC CHAPTER 17):

GENERAL: WHERE APPLICATION IS MADE FOR CONSTRUCTION, THE OWNER OR THE REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE ACTING AS THE OWNER'S AGENT SHALL EMPLOY ONE OR MORE APPROVED AGENCIES TO PERFORM INSPECTIONS DURING CONSTRUCTION ON THE TYPES OF WORK LISTED IN THE INSPECTION CHECKLIST ABOVE.

THE REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE AND ENGINEERS OF RECORD INVOLVED IN THE DESIGN OF THE PROJECT ARE PERMITTED TO ACT AS THE APPROVED AGENCY AND THEIR PERSONNEL ARE PERMITTED TO ACT AS THE SPECIAL INSPECTOR FOR THE WORK DESIGNED BY THEM, PROVIDED THOSE PERSONNEL MEET THE QUALIFICATION REQUIREMENTS.

STATEMENT OF SPECIAL INSPECTIONS: THE APPLICANT SHALL SUBMIT A STATEMENT OF SPECIAL INSPECTIONS PREPARED BY THE REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE IN ACCORDANCE WITH SECTION 107.1 AS A CONDITION FOR ISSUANCE. THIS STATEMENT SHALL BE IN ACCORDANCE WITH SECTION 1705.

REPORT REQUIREMENT: SPECIAL INSPECTORS SHALL KEEP RECORDS OF INSPECTIONS. THE SPECIAL INSPECTOR SHALL FURNISH INSPECTION REPORTS TO THE BUILDING OFFICIAL, AND TO THE REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE. REPORTS SHALL INDICATE THAT WORK INSPECTED WAS OR WAS NOT COMPLETED IN CONFORMANCE TO APPROVED CONSTRUCTION DOCUMENTS. DISCREPANCIES SHALL BE BROUGHT TO THE IMMEDIATE ATTENTION OF THE CONTRACTOR FOR CORRECTION. IF THEY ARE NOT CORRECTED, THE DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE BUILDING OFFICIAL AND TO THE REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE. A FINAL REPORT DOCUMENTING REQUIRED SPECIAL INSPECTIONS SHALL BE SUBMITTED.

NOTES:

1. ALL CONNECTIONS TO BE SHOP WELDED & FIELD BOLTED USING 3/4"ø A325-X BOLTS, UNLESS OTHERWISE NOTIFIED.
2. SHOP DRAWING ENGINEER REVIEW & APPROVAL REQUIRED BEFORE ORDERING MATERIAL.
3. SHOP DRAWING ENGINEER REVIEW & APPROVAL REQUIRED PRIOR TO STEEL FABRICATION.
4. VERIFICATION OF EXISTING ROOF CONSTRUCTION IS REQUIRED PRIOR TO THE INSTALLATION OF THE ROOF PLATFORM. ENGINEER OF RECORD IS TO APPROVE EXISTING CONDITIONS IN ORDER TO MOVE FORWARD.
5. CENTERLINE OF PROPOSED STEEL PLATFORM SUPPORT COLUMNS TO BE CENTRALLY LOCATED OVER THE EXISTING BUILDING COLUMNS.
6. EXISTING BRICK MASONRY COLUMNS/BEARING TO BE REPAIRED/REPLACED AT ALL PROPOSED PLATFORM SUPPORT POINTS. ENGINEER OF RECORD TO REVIEW AND APPROVE.

NOTES:

1. REQUIRED FOR ANY NEW SHOP FABRICATED FRP OR STEEL.
2. PROVIDED BY MANUFACTURER, REQUIRED IF HIGH STRENGTH BOLTS OR STEEL.
3. PROVIDED BY GENERAL CONTRACTOR; PROOF OF MATERIALS.
4. HIGH WIND ZONE INSPECTION CATB 120MPH OR CAT C,D 110MPH INSPECT FRAMING OF WALLS, ANCHORING, FASTENING SCHEDULE.
5. ADHESIVE FOR REBAR AND ANCHORS SHALL HAVE BEEN TESTED IN ACCORDANCE WITH ACI 355.4 AND ICC-ES AC308 FOR CRACKED CONCRETE AND SEISMIC APPLICATIONS. DESIGN ADHESIVE BOND STRENGTH HAS BEEN BASED ON ACI 355.4 TEMPERATURE CATEGORY B WITH INSTALLATIONS INTO DRY HOLES DRILLED USING A CARBIDE BIT INTO CRACKED CONCRETE THAT HAS CURED FOR AT LEAST 21 DAYS. ADHESIVE ANCHORS REQUIRING CERTIFIED INSTALLATIONS SHALL BE INSTALLED BY A CERTIFIED ADHESIVE ANCHOR INSTALLER PER ACI 318-11 D.9.2.2. INSTALLATIONS REQUIRING CERTIFIED INSTALLERS SHALL BE INSPECTED PER ACI 318-11 D.8.2.4.
6. AS REQUIRED; FOR ANY FIELD CHANGES TO THE ITEMS IN THIS TABLE.

SPECIAL INSPECTION CHECKLIST

BEFORE CONSTRUCTION	
CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REQUIRED (COMPLETED BY ENGINEER OF RECORD)	REPORT ITEM
REQUIRED	ENGINEER OF RECORD APPROVED SHOP DRAWINGS [1]
REQUIRED	MATERIAL SPECIFICATIONS REPORT [2]
N/A	FABRICATOR NDE INSPECTION
REQUIRED	PACKING SLIPS [3]
ADDITIONAL TESTING AND INSPECTIONS:	
DURING CONSTRUCTION	
CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REQUIRED (COMPLETED BY ENGINEER OF RECORD)	REPORT ITEM
REQUIRED	STEEL INSPECTIONS
N/A	HIGH STRENGTH BOLT INSPECTIONS
N/A	HIGH WIND ZONE INSPECTIONS [4]
N/A	FOUNDATION INSPECTIONS
N/A	CONCRETE COMP. STRENGTH, SLUMP TESTS AND PLACEMENT
N/A	POST INSTALLED ANCHOR VERIFICATION [5]
N/A	GROUT VERIFICATION
N/A	CERTIFIED WELD INSPECTION
N/A	EARTHWORK: LIFT AND DENSITY
N/A	ON SITE COLD GALVANIZING VERIFICATION
N/A	GUY WIRE TENSION REPORT
ADDITIONAL TESTING AND INSPECTIONS:	
AFTER CONSTRUCTION	
CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REQUIRED (COMPLETED BY ENGINEER OF RECORD)	REPORT ITEM
REQUIRED	MODIFICATION INSPECTOR REDLINE OR RECORD DRAWINGS [6]
N/A	POST INSTALLED ANCHOR PULL-OUT TESTING
REQUIRED	PHOTOGRAPHS
ADDITIONAL TESTING AND INSPECTIONS:	

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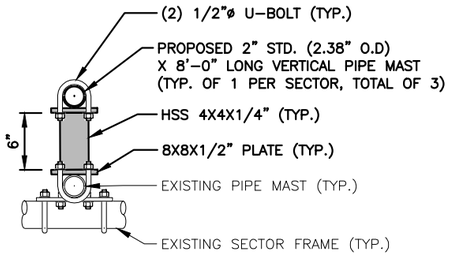
SCALE: AS SHOWN | DESIGNED BY: HC | DRAWN BY: JC

STATE OF CONNECTICUT · DANIEL P. HAMM · No. 24178 · LICENSED PROFESSIONAL ENGINEER

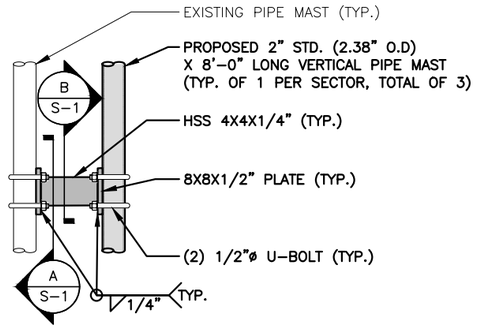
AT&T

DETAILS
5G NR RADIO_5G NR 1SR C-BAND
_BBU CONFIGURATION UPGRADE

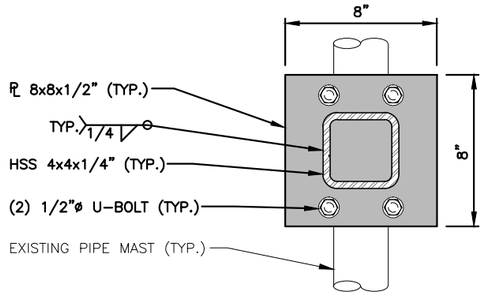
SITE NUMBER	DRAWING NUMBER	REV
CT3459	SN-1	1



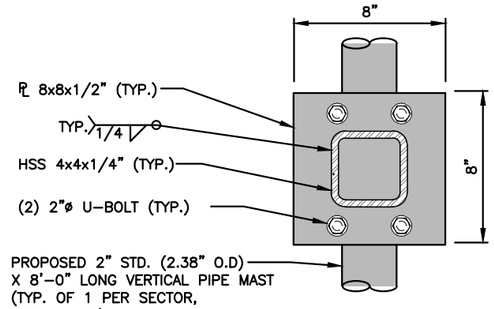
PLAN VIEW



SIDE VIEW



"A" DETAIL



"B" DETAIL

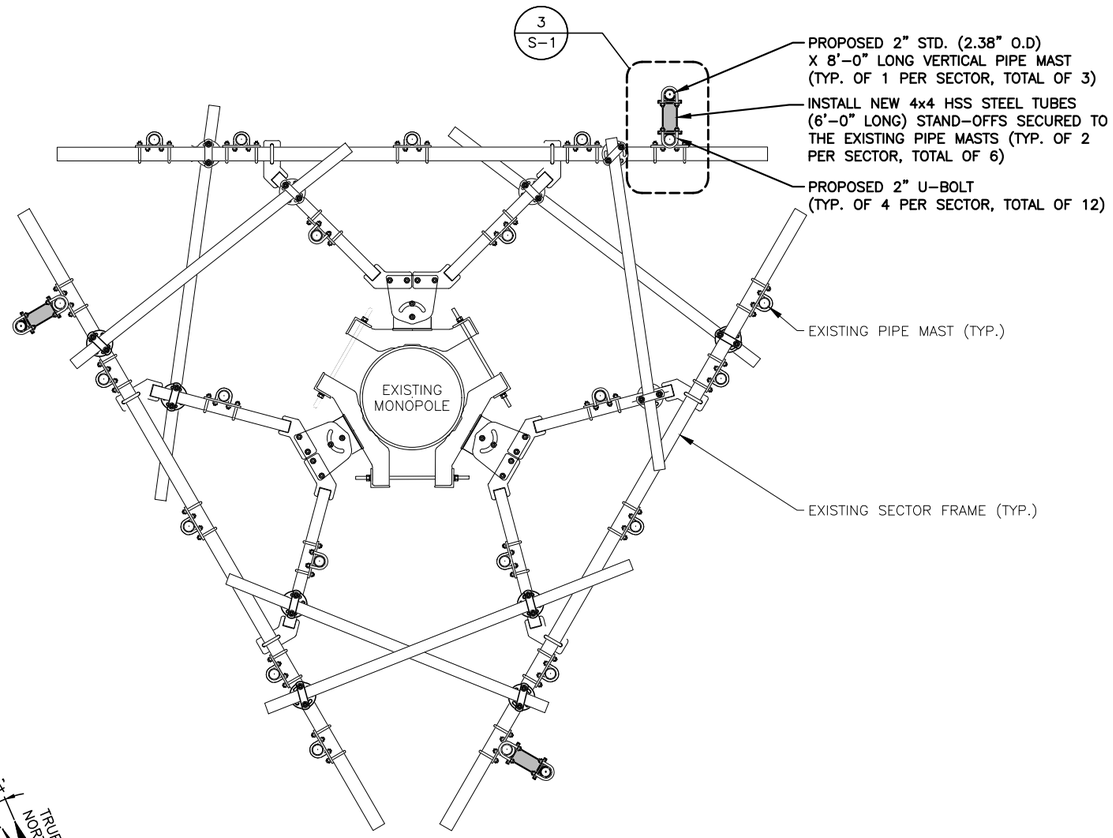
NOTE:

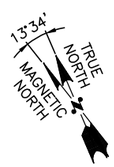
REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.

NOTE:

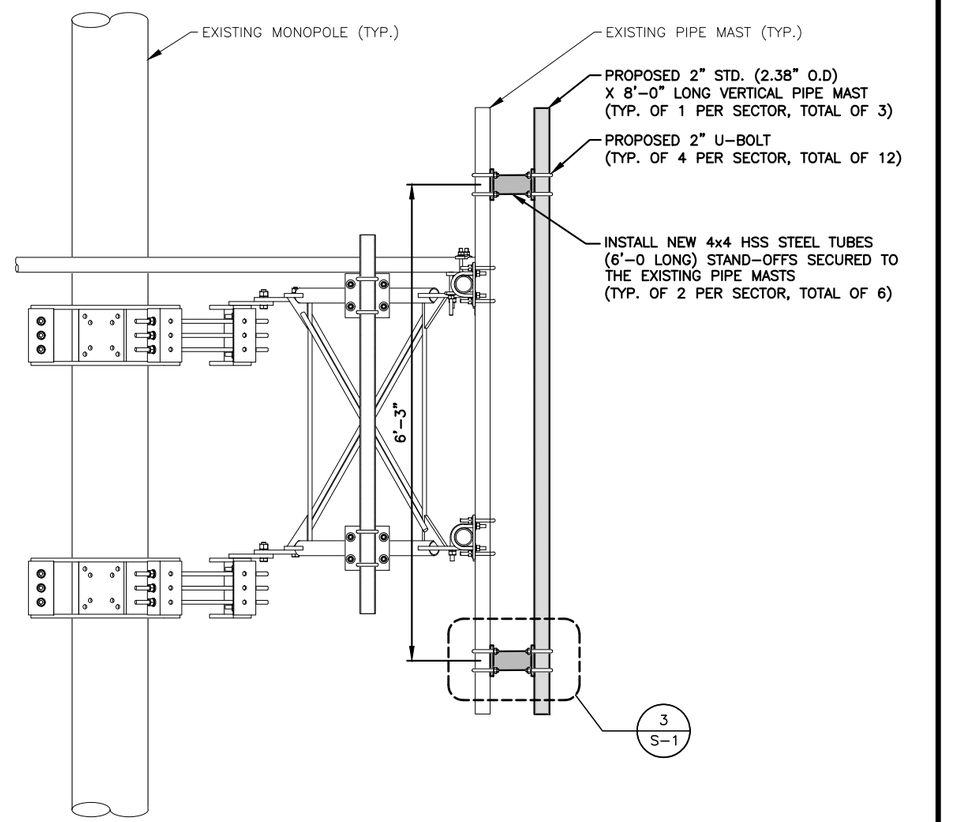
AN ANALYSIS FOR THE CAPACITY OF THE EXISTING STRUCTURES TO SUPPORT THE PROPOSED EQUIPMENT SHALL BE DETERMINED PRIOR TO CONSTRUCTION.

CONNECTION DETAIL (3 / S-1)
22x34 SCALE: 1-1/2"=1'-0"
11x17 SCALE: 3/4"=1'-0"
0 0'-4" 0'-8" 1'-4" 2'-0"





PROPOSED MOUNT MODIFICATIONS PLAN (1 / S-1)
22x34 SCALE: 3/4"=1'-0"
11x17 SCALE: 3/8"=1'-0"
0 8" 1'-4" 2'-8" 4'-0"



PROPOSED MOUNT MODIFICATIONS SIDE ELEVATION DETAIL (2 / S-1)
22x34 SCALE: 1"=1'-0"
11x17 SCALE: 1/2"=1'-0"
0 1'-0" 2'-0" 3'-0"

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SITE NAME: CHESHIRE WATER TREATMENT FACILITY

1325 CHESHIRE STREET
CHESHIRE, CT 06410
NEW HAVEN COUNTY

at&t
500 ENTERPRISE DRIVE, SUITE 3A
ROCKY HILL, CT 06067

NO.	DATE	REVISIONS	BY	CHK	APP'D
1	05/02/22	ISSUED FOR CONSTRUCTION	MF	HC	DPH
A	04/08/22	ISSUED FOR REVIEW	AC	HC	DPH

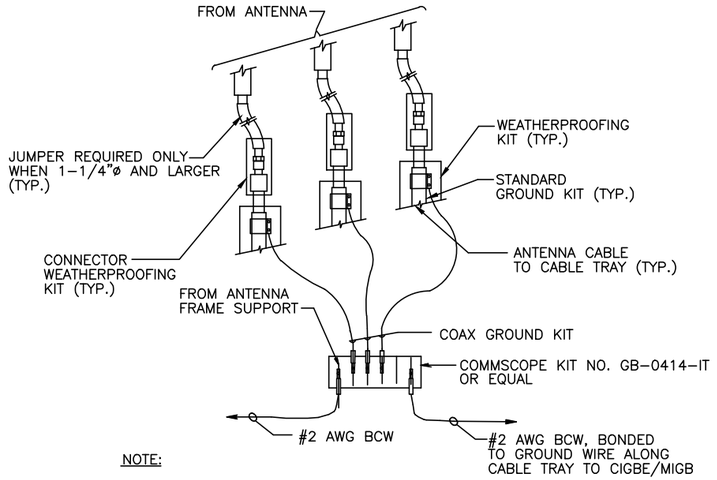
SCALE: AS SHOWN | DESIGNED BY: HC | DRAWN BY: JC

STATE OF CONNECTICUT
DANIEL P. HAMM
No. 24178
LICENSED PROFESSIONAL ENGINEER

AT&T

MOUNT MODIFICATIONS DETAIL
5G NR RADIO_5G NR 1SR C-BAND
_BBU CONFIGURATION UPGRADE

SITE NUMBER	DRAWING NUMBER	REV
CT3459	S-1	1

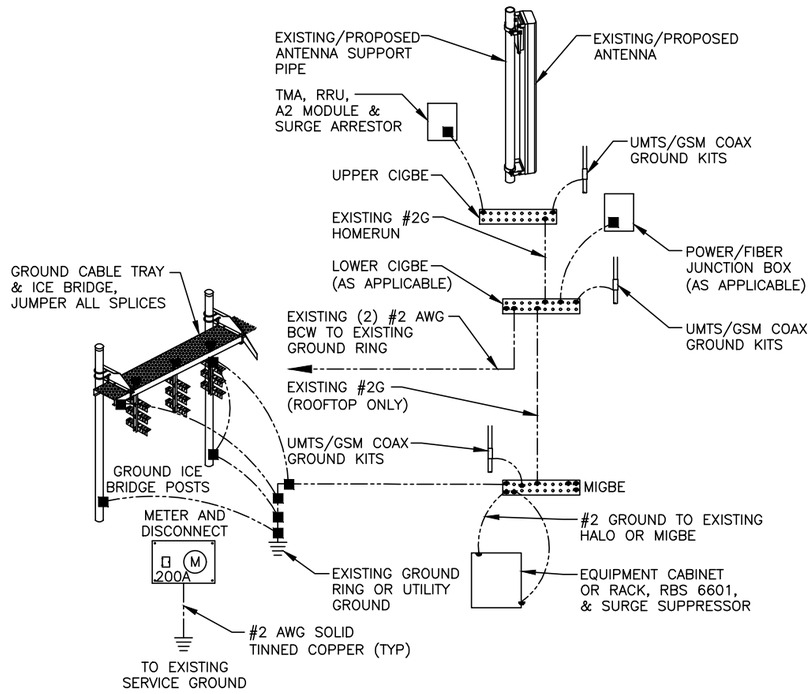


NOTE:

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

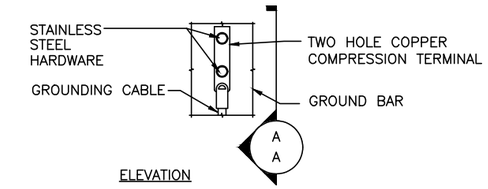
GROUND WIRE TO GROUND BAR CONNECTION DETAIL (1 / G-1)

SCALE: N.T.S



GROUNDING RISER DIAGRAM (2 / G-1)

SCALE: N.T.S



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

TYPICAL GROUND BAR CONNECTION DETAIL (3 / G-1)

SCALE: N.T.S

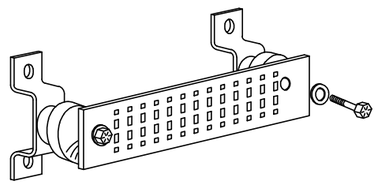
EACH GROUND CONDUCTOR TERMINATING ON ANY GROUND BAR SHALL HAVE AN IDENTIFICATION TAG ATTACHED AT EACH END THAT WILL IDENTIFY ITS ORIGIN AND DESTINATION.

SECTION "P" – SURGE PRODUCERS

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

SECTION "A" – SURGE ABSORBERS

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



GROUND BAR - DETAIL (AS REQUIRED) (4 / G-1)

SCALE: N.T.S

HUDSON Design Group LLC
45 BEECHWOOD DRIVE
NORTH ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

12 INDUSTRIAL WAY
SALEM, NH 03079

SITE NUMBER: CT3459
SITE NAME: CHESHIRE WATER TREATMENT FACILITY

1325 CHESHIRE STREET
CHESHIRE, CT 06410
NEW HAVEN COUNTY

at&t
500 ENTERPRISE DRIVE, SUITE 3A
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1	05/02/22	ISSUED FOR CONSTRUCTION	MB	HC	DPH
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SCALE: AS SHOWN | DESIGNED BY: HC | DRAWN BY: JC

STATE OF CONNECTICUT · DANIEL P. HAMM · No. 24178 · LICENSED PROFESSIONAL ENGINEER

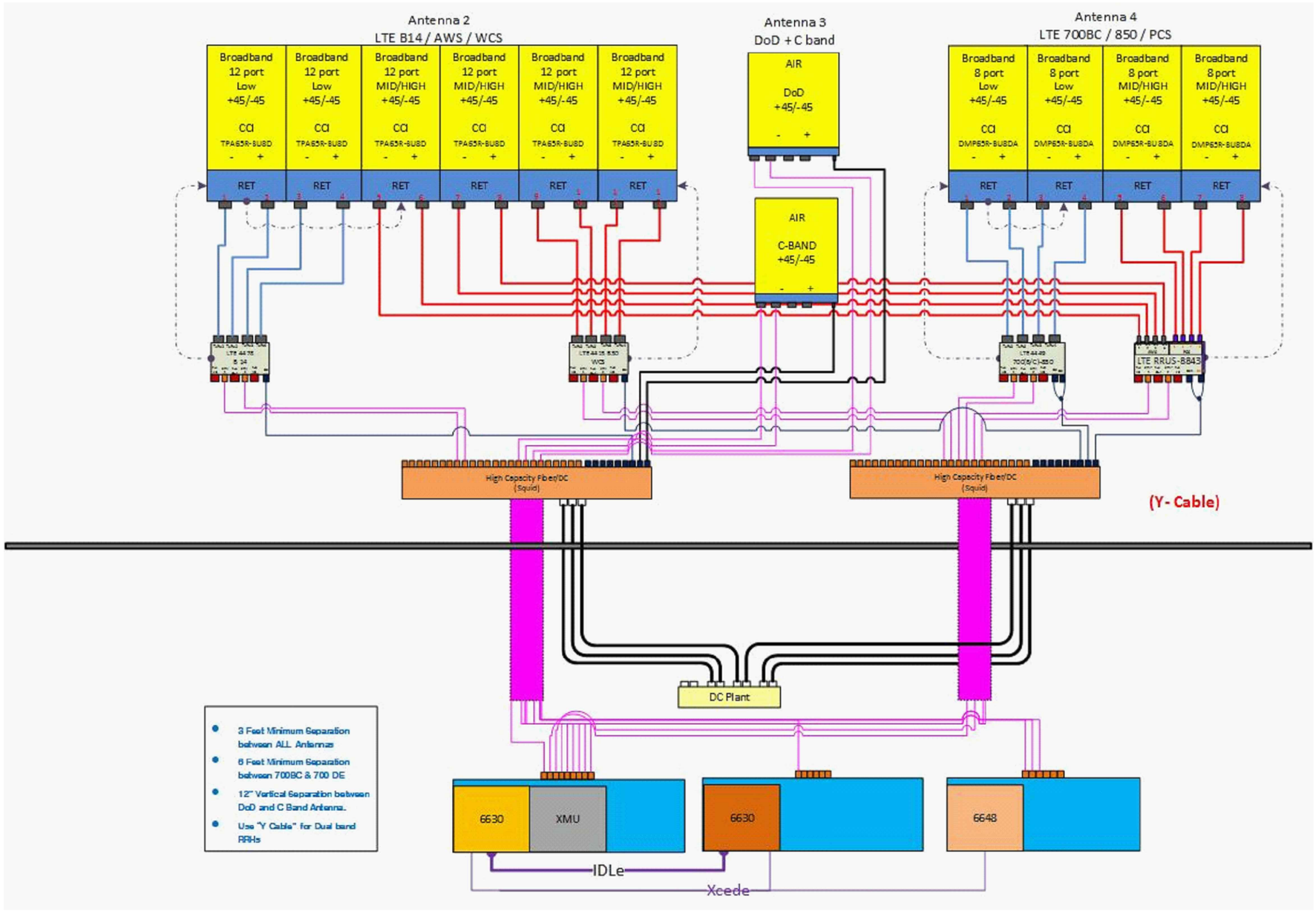
AT&T

GROUNDING DETAILS
5G NR RADIO_5G NR 1SR C-BAND
BBU CONFIGURATION UPGRADE

SITE NUMBER	DRAWING NUMBER	REV
CT3459	G-1	1

NOTE:

REV: 3
DATED: 03/15/2022
RFDS ID: 4885477



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

NOTE:
1. CONTRACTOR TO CONFIRM ALL PARTS.
2. INSTALL ALL EQUIPMENT TO MANUFACTURER'S RECOMMENDATIONS.
3. RFDS USED FOR REFERENCE.

NOTE:

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

HUDSON Design Group LLC
45 BEECHWOOD DRIVE
NORTH ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

12 INDUSTRIAL WAY
SALEM, NH 03079

SITE NUMBER: CT3459
SITE NAME: CHESHIRE WATER TREATMENT FACILITY

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1	05/02/22	ISSUED FOR CONSTRUCTION	MB	HC	DPH
A	04/08/22	ISSUED FOR REVIEW	JC	HC	DPH

SCALE: AS SHOWN | DESIGNED BY: HC | DRAWN BY: JC

AT&T

RF PLUMBING DIAGRAM
5G NR RADIO_5G NR 1SR C–BAND _BBU CONFIGURATION UPGRADE

SITE NUMBER	DRAWING NUMBER	REV
CT3459	RF–1	1

AMERICAN TOWER®
CORPORATION

This report was prepared for American Tower Corporation by

telamon
Tower Engineering PLLC

Structural Analysis Report

Structure	:	**170 ft Monopole**
ATC Site Name	:	**Cheshire,CT**
ATC Site Number	:	**208478**
Engineering Number	:	**OAA775970_C3_01**
Proposed Carrier	:	**AT&T MOBILITY**
Carrier Site Name	:	**CHESHIRE WATER TREATMENT FACILITY**
Carrier Site Number	:	**CT3459**
Site Location	:	**1325 Cheshire Street** **Cheshire, CT 06410** **41.5326, -72.8705**
County	:	**New Haven**
Date	:	**May 5, 2022**
Max Usage	:	**38%**
Result	:	**Pass**

Prepared By:

Temitope Olaniyan
CLS

Reviewed By:

Digitally signed by David W Chickering
Date: 2022.05.05 19:19:27 -04'00'

STATE OF CONNECTICUT
DAVID CHICKERING
No. 35683
LICENSED PROFESSIONAL ENGINEER

David Chickering
Telamon Tower Engineering PLLC
PE # 35683 Exp. 01/31/2023

Table of Contents

Introduction

The purpose of this report is to summarize results of a structural analysis performed on the 170 ft Monopole to reflect the change in loading by AT&T MOBILITY.

Supporting Documents

Tower Drawings	Ambor Structures Job #C15019001, dated September 21, 2015
Foundation Drawing	Bennett & Pless Job #15700064, dated August 24, 2015
Geotechnical Report	Terracon Project #J2145102, dated March 18, 2014
Modifications	CENTEK engineering Project #21085.03, dated July 21, 2021

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:	118 mph (3-second gust)
Basic Wind Speed w/ Ice:	50 mph (3-second gust) w/ 1.00" radial ice concurrent
Code:	ANSI/TIA-222-H / 2015 IBC / 2018 Connecticut State Building Code
Exposure Category:	C
Risk Category:	II
Topographic Factor Procedure:	Method 1
Topographic Category:	1
Crest Height (H):	0 ft
Spectral Response:	Ss = 0.20, S_1 = 0.06
Site Class:	D - Stiff Soil - Default

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	Equipment	Mount Type	Lines	Carrier
181.2	2	dbSpectra DS1F03F36D-N	Stand-Off	-	CITY OF CHESHIRE, CT
170.0	2	RFS SC3-W100AC	Stand-Off	(4) 7/8" Coax (2) E105	
155.0	3	CCI TPA65R-BU8D	Sector Frame	(1) 0.51" (13mm) Hybrid (1) 0.96" (24.3mm) Cable (2) 2" conduit	AT&T MOBILITY
	6	Ericsson RRU22			
	3	Ericsson RRUS 12			
	1	Raycap DC9-48-60-24-8C-EV			
	3	CCI DMP65R-BU8D			
	3	Ericsson RRUS 4415 B30			
	6	Ericsson RRUS A2			
	3	Ericsson RRUS 4449 B5, B12			
145.0	3	Samsung RT4401-48A	Sector Frame	(2) 1.25" (31.8mm) Hybrid	VERIZON WIRELESS
	3	Samsung B2/B66A RRH-BR049			
	6	JMA Wireless MX10FIT665-xx			
	1	RFS DB-C1-12C-24AB-0Z			
	3	Samsung B5/B13 RRH-BR04C			
134.0	3	Ericsson Radio 4460 B25+B66	Triangular Platform with Handrails	(3) 1.99" (50.7mm) Hybrid	T-MOBILE
	3	Ericsson Radio 4480 B71+B85A			
	3	Ericsson Air6449 B41			
	3	RFS APXVAALL24 43-U-NA20			
124.0	3	Fujitsu TA08025-B604	Triangular Platform with Handrails	(1) 1.60" (40.6mm) Hybrid	DISH WIRELESS L.L.C.
	3	Fujitsu TA08025-B605			
	1	Raycap RDIDC-9181-PF-48			
	3	JMA Wireless MX08FRO665-21			

Equipment to be Removed

Elev.[1] (ft)	Qty	Equipment	Mount Type	Lines	Carrier
155.0	1	Raycap DC6-48-60-18-8C-EV	-	-	AT&T MOBILITY
	3	Ericsson 8843			
	6	CCI HPA-65R-BUU-H8			
	3	Ericsson 4478 Band 14 (15" Height)			

Proposed Equipment

Elev.[1] (ft)	Qty	Equipment	Mount Type	Lines	Carrier
156.3	3	Ericsson AIR 6419 B77G	Sector Frame	(1) 0.51" (13mm) Hybrid (5) 0.96" (24.3mm) Cable (2) 2" conduit	AT&T MOBILITY
155.0	3	Ericsson RRUS 8843 B2, B66A			
	3	Ericsson RRUS 4478 B14			
	1	Raycap DC9-48-60-24-8C-EV			
153.7	3	Ericsson Air 6449 B77D			

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

Install proposed lines inside the pole shaft.

Structure Usages

Structural Component	Controlling Usage	Pass/Fail
Anchor Bolts	37%	Pass
Shaft	38%	Pass
Base Plate	16%	Pass

Foundation

Reaction Component	Analysis Reactions	% of Usage
Moment (Kips-Ft)	4607.1	36%
Axial (Kips)	82.8	19%
Shear (Kips)	40.5	34%

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 and Sway*

Antenna Elevation (ft)	Antenna	Carrier	Deflection (ft)	Sway (Rotation) (°)
170.0	RFS SC3-W100AC	CITY OF CHESHIRE, CT	0.980	0.600
156.3	Ericsson AIR 6419 B77G	AT&T MOBILITY	0.838	0.590
155.0	Ericsson RRUS 8843 B2, B66A		0.825	
	Ericsson RRUS 4478 B14			
	Raycap DC9-48-60-24-8C-EV			
153.7	Ericsson Air 6449 B77D		0.812	

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

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.

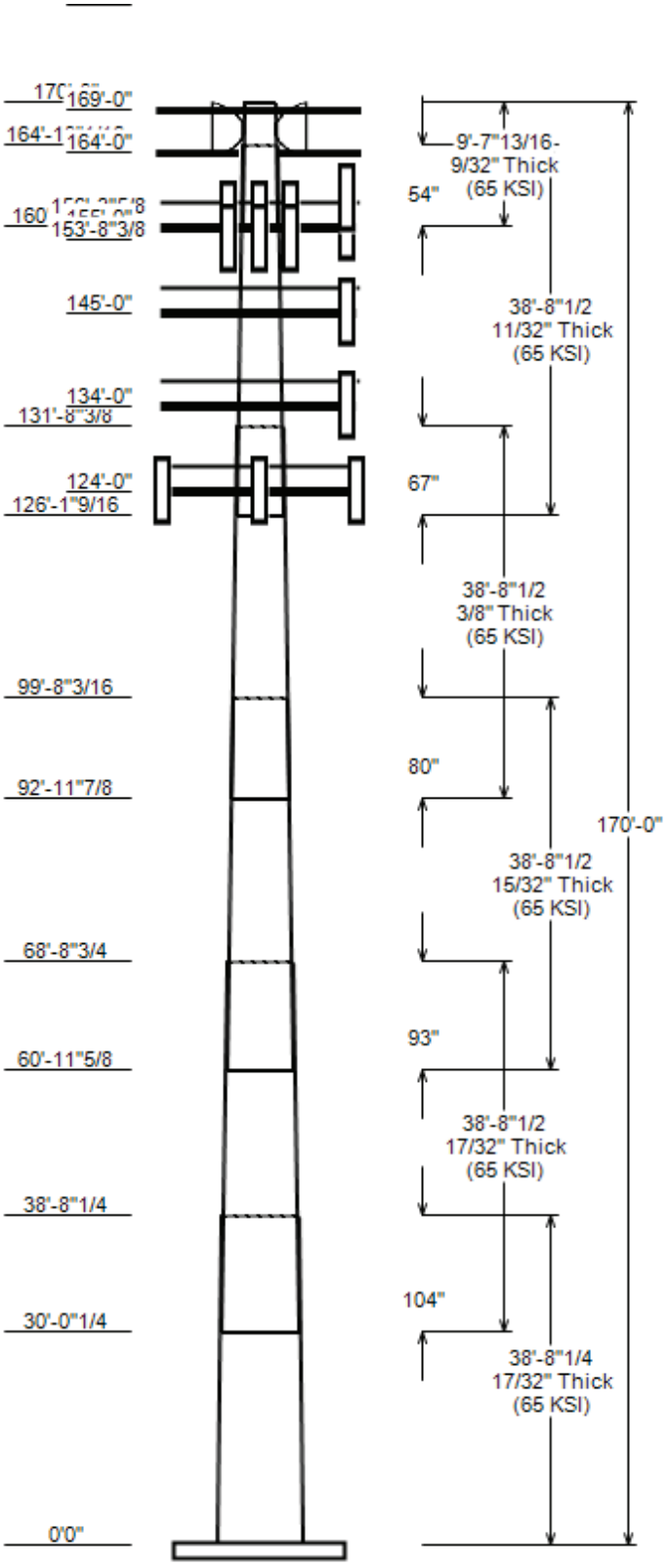
All assets of American Tower Corporation, its affiliates, and subsidiaries (collectively "American Tower") are inspected at regular intervals. Based upon these inspections and in the absence of information to the contrary, American Tower assumes that all structures were constructed in accordance with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

JOB INFORMATION

Asset :	208478, Cheshire	Height :	170 ft
Client :	AT&T MOBILITY	Base Width :	73.69
Code :	ANSI/TIA-222-H	Shape :	18 Sides



SITE PARAMETERS

Nominal Wind: 118 mph wind with no ice **Topo Category:** 1

Ice Wind: 50 mph wind with 1" radial **Topo Method:** Method 1

Base Elev (ft): 0.00 **Taper :** 0.29800(In/ft) **Topo Feature:**

Structure Class: II **Exposure :** C **S_s :** 0.2 **S_1 :** 0.055

SECTION PROPERTIES

Shaft Section	Length (ft)	Diameter (in) Across Flats Top	Diameter (in) Across Flats Bottom	Thick (in)	Joint Type	Overlap Length (in)	Shape	Steel Grade (ksi)
1	38.690	62.17	73.69	0.531		0.000	18 Sides	65
2	38.710	54.30	65.82	0.531	Slip Joint	104.030	18 Sides	65
3	38.710	46.02	57.54	0.469	Slip Joint	93.130	18 Sides	65
4	38.710	37.24	48.76	0.375	Slip Joint	80.280	18 Sides	65
5	38.710	28.06	39.58	0.344	Slip Joint	66.840	18 Sides	65
6	9.650	27.09	29.96	0.281	Slip Joint	53.880	18 Sides	65

DISCRETE APPURTENANCE

Attach Elev (ft)	Force Elev (ft)	Qty	Description
181.2	181.2	2	dbSpectra DS1F03F36D-N
170.0	167.5	2	RFS SC3-W100AC
169.0	169.0	4	Generic Flat Stand-Off
164.0	164.0	2	Generic Flat Stand-Off
156.3	156.3	3	Ericsson AIR 6419 B77G
155.0	155.0	6	Ericsson RRUS A2
155.0	155.0	3	Ericsson RRUS 8843 B2, B66A
155.0	155.0	3	Ericsson RRUS 4415 B30
155.0	155.0	3	Ericsson RRUS 4449 B5, B12
155.0	155.0	3	Ericsson RRUS 4478 B14
155.0	155.0	6	Ericsson RRU22
155.0	155.6	3	Ericsson RRUS 12
155.0	155.0	1	Raycap DC9-48-60-24-8C-EV
155.0	155.0	1	Raycap DC9-48-60-24-8C-EV
155.0	155.0	3	Generic Round Sector Frame
155.0	155.0	3	CCI DMP65R-BU8D
155.0	156.9	3	CCI TPA65R-BU8D
153.7	153.7	3	Ericsson Air 6449 B77D
145.0	145.0	3	Samsung RT4401-48A
145.0	145.0	3	Samsung B2/B66A RRH-BR049
145.0	145.0	3	Samsung B5/B13 RRH-BR04C
145.0	145.0	1	RFS DB-C1-12C-24AB-0Z
145.0	145.0	6	JMA Wireless MX10FIT665-xx
145.0	145.0	3	Generic Flat Light Sector Fram
134.0	134.0	3	Ericsson Radio 4460 B25+B66
134.0	134.0	3	Ericsson Radio 4480 B71+B85A
134.0	134.0	3	Ericsson Air6449 B41
134.0	134.0	3	RFS APXVAALL24 43-U-NA20
134.0	134.0	1	Generic Round Platform with Ha
124.0	124.0	1	Raycap RDIDC-9181-PF-48
124.0	124.0	3	Fujitsu TA08025-B605
124.0	124.0	3	Fujitsu TA08025-B604
124.0	124.0	3	JMA Wireless MX08FRO665-21
124.0	124.0	1	Generic Round Platform with Ha

LINEAR APPURTENANCE

Elev From (ft)	Elev To (ft)	Description	Exp To Wind
0.0	170.0	E105	No
0.0	170.0	7/8" Coax	No

JOB INFORMATION

Asset :	208478, Cheshire	Height :	170 ft
Client :	AT&T MOBILITY	Base Width :	73.69
Code :	ANSI/TIA-222-H	Shape :	18 Sides

LINEAR APPURTENANCE

Elev From (ft)	Elev To (ft)	Description	Exp To Wind
0.0	155.0	2" conduit	No
0.0	155.0	2" conduit	No
0.0	155.0	0.96" (24.3mm) Cable	No
0.0	155.0	0.96" (24.3mm) Cable	No
0.0	155.0	0.51" (13mm) Hybrid	No
0.0	155.0	0.51" (13mm) Hybrid	No
0.0	145.0	1.25" (31.8mm) Hybrid	No
0.0	134.0	1.99" (50.7mm) Hybrid	No
0.0	124.0	1.60" (40.6mm) Hybrid	No

LOAD CASES

1.2D + 1.0W	118 mph wind with no ice
0.9D + 1.0W	118 mph wind with no ice
1.2D + 1.0Di + 1.0Wi	50 mph wind with 1" radial ice
1.2D + 1.0Ev + 1.0Eh	Seismic
0.9D - 1.0Ev + 1.0Eh	Seismic (Reduced DL)
1.0D + 1.0W	60 mph Wind with No Ice

REACTIONS

Load Case	Moment (kip-ft)	Shear (Kip)	Axial (Kip)
1.2D + 1.0W	4607.13	40.46	82.75
0.9D + 1.0W	4578.23	40.44	62.05
1.2D + 1.0Di + 1.0Wi	1250.32	11.25	102.56
1.2D + 1.0Ev + 1.0Eh	281.06	2.26	82.93
0.9D - 1.0Ev + 1.0Eh	278.72	2.26	57.22
1.0D + 1.0W	1061.52	9.36	68.98

DISH DEFLECTIONS

Load Case	Attach Elev (ft)	Deflection (in)	Rotation (deg)
1.0D + 1.0W	170.00	11.760	0.597

ANALYSIS PARAMETERS

Location:	New Haven County,CT	**Height:**	170 ft
Type and Shape:	Taper, 18 Sides	**Base Diameter:**	73.69 in
Manufacturer:	Undetermined	**Top Diameter:**	27.09 in
K_d (non-service):	0.95	**Taper:**	0.2980 in/ft
K_e:	1.00	**Rotation:**	0.000°

ICE & WIND PARAMETERS

Exposure Category:	C	**Design Wind Speed w/o Ice:**	118 mph
Risk Category:	II	**Design Wind Speed w/Ice:**	50 mph
Topo Factor Procedure:	Method 1	**Operational Wind Speed:**	60 mph
Topographic Category:	1	**Design Ice Thickness:**	1.00 in
Crest Height:	0 ft	**HMSL:**	116.00 ft

SEISMIC PARAMETERS

Analysis Method:	Equivalent Lateral Force Method				
Site Class:	D - Stiff Soil			**Period Based on Rayleigh Method (sec):**	1.79
T_L (sec):	6	**P:**	1	**C_s:**	0.033
S_s:	0.200	**S_1:**	0.055	**C_s Max:**	0.033
F_a:	1.600	**F_v:**	2.400	**C_s Min:**	0.030
S_{ds}:	0.213	**S_{d1}:**	0.088		

LOAD CASES

1.2D + 1.0W	118 mph wind with no ice
0.9D + 1.0W	118 mph wind with no ice
1.2D + 1.0Di + 1.0Wi	50 mph wind with 1" radial ice
1.2D + 1.0Ev + 1.0Eh	Seismic
0.9D - 1.0Ev + 1.0Eh	Seismic (Reduced DL)
1.0D + 1.0W	60 mph Wind with No Ice

SHAFT SECTION PROPERTIES

Sect Info	Length (ft)	Thick (in)	Fy (ksi)	Joint Type	Slip Joint len (in)	Weight (lb)	Bottom Dia (in)	Bottom Elev (ft)	Bottom Area (in²)	Bottom Ix (in⁴)	Bottom W/t Ratio	Bottom D/t Ratio	Top Dia (in)	Top Elev (in)	Top Area (in²)	Top Ix (in⁴)	Top W/t Ratio	Top D/t Ratio	Taper (in/ft)
1-18	38.69	0.5313	65		0.00	14,962	73.69	0.000	123.37	83,422.3	22.69	138.70	62.17	38.69	103.95	49,903.5	18.87	117.02	0.2976
2-18	38.71	0.5313	65	Slip	104.03	13,220	65.82	30.020	110.09	59,284.2	20.08	123.88	54.30	68.73	90.66	33,109.7	16.26	102.19	0.2976
3-18	38.71	0.4688	65	Slip	93.13	10,056	57.54	60.970	84.92	34,949.6	19.88	122.74	46.02	99.68	67.78	17,768.5	15.55	98.17	0.2976
4-18	38.71	0.3750	65	Slip	80.28	6,683	48.76	92.990	57.59	17,035.7	21.16	130.03	37.24	131.70	43.88	7,533.9	15.75	99.31	0.2976
5-18	38.71	0.3438	65	Slip	66.84	4,812	39.58	126.13 0	42.82	8,331.0	18.54	115.14	28.06	164.84	30.25	2,936.5	12.63	81.63	0.2976
6-18	9.65	0.2813	65	Slip	53.88	828	29.96	160.35 0	26.50	2,949.6	17.02	106.51	27.09	170.00	23.94	2,173.5	15.22	96.30	0.2976

Shaft Weight 50,561

DISCRETE APPURTENANCE PROPERTIES

Attach Elev (ft)	Description	Qty	Ka	Vert Ecc (ft)	No Ice Weight (lb)	No Ice EPAa (sf)	No Ice Orientation Factor	Ice Weight (lb)	Ice EPAa (sf)	Ice Orientation Factor
181.20	dbSpectra DS1F03F36D-N	2	1.00	0.000	71.00	6.750	1.00	185.26	12.127	1.00
170.00	RFS SC3-W100AC	2	1.00	-2.500	40.00	10.737	1.00	187.52	12.032	1.00
169.00	Generic Flat Stand-Off	4	1.00	0.000	187.50	6.300	0.67	277.47	8.404	0.67
164.00	Generic Flat Stand-Off	2	1.00	0.000	187.50	6.300	0.90	277.20	8.398	0.90
156.30	Ericsson AIR 6419 B77G	3	0.80	0.000	66.10	3.797	0.65	131.16	4.680	0.65
155.00	Ericsson RRU22	6	0.80	0.000	52.90	2.222	0.50	93.61	2.891	0.50
155.00	Ericsson RRUS 4478 B14	3	0.80	0.000	59.40	2.021	0.50	100.51	2.653	0.50
155.00	Ericsson RRUS 4449 B5, B12	3	0.80	0.000	71.00	1.969	0.50	114.18	2.594	0.50
155.00	Ericsson RRUS 4415 B30	3	0.80	0.000	46.00	1.842	0.50	78.85	2.443	0.50
155.00	Ericsson RRUS 8843 B2, B66A	3	0.80	0.000	72.00	1.639	0.50	113.06	2.205	0.50
155.00	Ericsson RRUS A2	6	0.80	0.000	15.00	1.600	0.50	39.32	2.160	0.50
155.00	Ericsson RRUS 12	3	0.80	0.600	50.00	3.145	0.50	104.19	3.921	0.50
155.00	Raycap DC9-48-60-24-8C-EV	1	0.80	0.000	16.00	4.788	0.50	102.49	5.773	0.50
155.00	Generic Round Sector Frame	3	0.75	0.000	300.00	14.400	0.67	546.43	25.489	0.67
155.00	CCI DMP65R-BU8D	3	0.80	0.000	95.70	17.871	0.63	323.40	20.340	0.63
155.00	CCI TPA65R-BU8D	3	0.80	1.900	82.50	18.089	0.63	313.49	20.563	0.63
155.00	Raycap DC9-48-60-24-8C-EV	1	0.80	0.000	16.00	4.788	0.50	102.49	5.773	0.50
153.70	Ericsson Air 6449 B77D	3	0.80	0.000	81.60	4.028	0.65	150.38	4.948	0.65
145.00	Samsung B2/B66A RRH-BR049	3	0.80	0.000	84.40	1.875	0.50	126.80	2.475	0.50
145.00	Samsung B5/B13 RRH-BR04C	3	0.80	0.000	70.30	1.875	0.50	108.32	2.475	0.50
145.00	Generic Flat Light Sector Fram	3	0.75	0.000	400.00	17.900	0.75	600.02	27.928	0.75
145.00	RFS DB-C1-12C-24AB-0Z	1	0.80	0.000	32.00	4.056	0.50	116.47	4.963	0.50
145.00	Samsung RT4401-48A	3	0.80	0.000	18.60	0.996	0.50	36.55	1.451	0.50
145.00	JMA Wireless MX10FIT665-xx	6	0.80	0.000	53.40	8.092	0.69	171.93	9.913	0.69
134.00	Ericsson Radio 4460 B25+B66	3	0.75	0.000	109.00	2.564	0.50	167.33	3.260	0.50
134.00	Ericsson Radio 4480 B71+B85A	3	0.75	0.000	84.00	2.852	0.50	133.86	3.589	0.50
134.00	RFS APXVAALL24 43-U-NA20	3	0.75	0.000	122.80	20.243	0.63	379.86	22.691	0.63
134.00	Generic Round Platform with Ha	1	1.00	0.000	2500.00	27.200	1.00	3568.98	43.333	1.00
134.00	Ericsson Air6449 B41	3	0.75	0.000	104.00	5.682	0.63	193.94	6.730	0.63
124.00	JMA Wireless MX08FRO665-21	3	0.75	0.000	64.50	12.489	0.64	232.69	14.328	0.64
124.00	Fujitsu TA08025-B604	3	0.75	0.000	63.90	1.962	0.50	102.06	2.564	0.50
124.00	Fujitsu TA08025-B605	3	0.75	0.000	75.00	1.962	0.50	115.99	2.564	0.50
124.00	Raycap RDIDC-9181-PF-48	1	0.75	0.000	21.90	1.867	0.50	59.14	2.456	0.50
124.00	Generic Round Platform with Ha	1	1.00	0.000	2500.00	27.200	1.00	3559.91	43.196	1.00
Totals	Num Loadings: 34	97			13,523.10			24,267.69		

LINEAR APPURTENANCE PROPERTIES

Load Case Azimuth (deg) : 0.00

Elev From (ft)	Elev To (ft)	Qty	Description	Coax Dia (in)	Coax Wt (lb/ft)	Flat	Max Coax/ Row	Dist Between Rows(in)	Dist Between Cols(in)	Azimuth (deg)	Dist From Face (in)	Exposed To Wind	Carrier
0.00	170.00	4	7/8" Coax	1.09	0.33	N	0	0	0	0	0	N	CITY OF CHESH
0.00	170.00	2	E105	1.3	0.4	N	0	0	0	0	0	N	CITY OF CHESH
0.00	155.00	5	0.96" (24.3mm) Cable	0.96	0.88	N	0	0	0	0	0	N	AT&T MOBILITY
0.00	155.00	2	2" conduit	2.38	3.65	N	0	0	0	0	0	N	AT&T MOBILITY
0.00	155.00	2	2" conduit	2.38	3.65	N	0	0	0	0	0	N	AT&T MOBILITY

Elev From (ft)	Elev To (ft)	Qty	Description	Coax Dia (in)	Coax Wt (lb/ft)	Flat	Max Coax/ Row	Dist Between Rows(in)	Dist Between Cols(in)	Azimuth (deg)	Dist From Face (in)	Exposed To Wind	Carrier
0.00	155.00	1	0.51" (13mm) Hybrid	0.51	0.14	N	0	0	0	0	0	N	AT&T MOBILITY
0.00	155.00	1	0.51" (13mm) Hybrid	0.51	0.14	N	0	0	0	0	0	N	AT&T MOBILITY
0.00	155.00	1	0.96" (24.3mm) Cable	0.96	0.88	N	0	0	0	0	0	N	AT&T MOBILITY
0.00	145.00	2	1.25" (31.8mm) Hybrid	1.25	1.21	N	0	0	0	0	0	N	VERIZON WIREL
0.00	134.00	3	1.99" (50.7mm) Hybrid	1.99	1.9	N	0	0	0	0	0	N	T-MOBILE
0.00	124.00	1	1.60" (40.6mm) Hybrid	1.6	2.34	N	0	0	0	0	0	N	DISH WIRELESS

SEGMENT PROPERTIES

(Max Len: 5.ft)

Seg Top Elev (ft)	Description	Thick (in)	Flat Dia (in)	Area (in^2)	Ix (in^4)	W/t Ratio	D/t Ratio	F'y (ksi)	S (in^3)	Z (in^3)	Weight (lb)
0.00		0.5313	73.690	123.366	83,422.30	22.69	138.70	74.7	2229.7	0.0	0.0
5.00		0.5313	72.202	120.857	78,434.10	22.20	135.90	75.3	2139.6	0.0	2,077.6
10.00		0.5313	70.714	118.347	73,648.80	21.71	133.10	75.9	2051.4	0.0	2,034.9
15.00		0.5313	69.225	115.838	69,062.30	21.21	130.29	76.5	1965.0	0.0	1,992.2
20.00		0.5313	67.737	113.328	64,670.20	20.72	127.49	77	1880.4	0.0	1,949.5
25.00		0.5313	66.249	110.819	60,468.40	20.22	124.69	77.6	1797.8	0.0	1,906.8
30.00		0.5313	64.761	108.309	56,452.60	19.73	121.89	78.2	1716.9	0.0	1,864.1
30.02	Bot - Section 2	0.5313	64.754	108.299	56,436.30	19.73	121.88	78.2	1716.6	0.0	7.7
35.00		0.5313	63.272	105.799	52,618.70	19.24	119.09	78.8	1638.0	0.0	3,657.8
38.69	Top - Section 1	0.5313	63.237	105.739	52,528.90	19.22	119.02	78.8	1636.1	0.0	2,656.1
40.00		0.5313	62.847	105.082	51,555.10	19.09	118.29	78.9	1615.7	0.0	469.9
45.00		0.5313	61.359	102.572	47,948.80	18.60	115.49	79.5	1539.2	0.0	1,766.5
50.00		0.5313	59.870	100.062	44,514.80	18.11	112.69	80.1	1464.5	0.0	1,723.8
55.00		0.5313	58.382	97.553	41,248.80	17.61	109.89	80.7	1391.6	0.0	1,681.1
60.00		0.5313	56.894	95.043	38,146.60	17.12	107.08	81.3	1320.6	0.0	1,638.4
60.97	Bot - Section 3	0.5313	56.605	94.556	37,563.10	17.02	106.54	81.4	1307.0	0.0	313.0
65.00		0.5313	55.406	92.534	35,203.90	16.62	104.28	81.8	1251.5	0.0	2,434.9
68.73	Top - Section 2	0.4688	55.233	81.484	30,875.60	19.01	117.82	79	1101.0	0.0	2,207.8
70.00		0.4688	54.855	80.922	30,241.10	18.87	117.01	79.2	1085.8	0.0	350.7
75.00		0.4688	53.367	78.708	27,825.80	18.31	113.84	79.9	1027.0	0.0	1,358.0
80.00		0.4688	51.879	76.493	25,542.70	17.75	110.66	80.5	969.8	0.0	1,320.3
85.00		0.4688	50.390	74.279	23,388.10	17.19	107.49	81.2	914.2	0.0	1,282.6
90.00		0.4688	48.902	72.065	21,358.10	16.63	104.31	81.8	860.2	0.0	1,244.9
92.99	Bot - Section 4	0.4688	48.012	70.740	20,202.10	16.30	102.41	82.2	828.8	0.0	726.6
95.00		0.4688	47.414	69.850	19,449.10	16.07	101.14	82.5	807.9	0.0	872.1
99.68	Top - Section 3	0.3750	46.771	55.220	15,017.90	20.23	124.72	77.6	632.4	0.0	1,988.6
100.00		0.3750	46.676	55.107	14,925.70	20.18	124.47	77.7	629.8	0.0	60.0
105.00		0.3750	45.187	53.336	13,532.20	19.48	120.50	78.5	589.8	0.0	922.5
110.00		0.3750	43.699	51.565	12,228.30	18.78	116.53	79.3	551.2	0.0	892.4
115.00		0.3750	42.211	49.793	11,010.90	18.08	112.56	80.1	513.8	0.0	862.2
120.00		0.3750	40.723	48.022	9,877.10	17.38	108.59	81	477.7	0.0	832.1
124.00		0.3750	39.532	46.605	9,028.30	16.82	105.42	81.6	449.8	0.0	644.0
125.00		0.3750	39.234	46.251	8,824.00	16.68	104.63	81.8	443.0	0.0	158.0
126.13	Bot - Section 5	0.3750	38.898	45.850	8,596.80	16.53	103.73	82	435.3	0.0	177.1
130.00		0.3750	37.746	44.479	7,848.50	15.99	100.66	82.6	409.5	0.0	1,150.4
131.70	Top - Section 4	0.3438	37.928	41.011	7,319.10	17.69	110.32	80.6	380.1	0.0	494.5
134.00		0.3438	37.243	40.264	6,926.40	17.34	108.33	81	366.3	0.0	318.0
135.00		0.3438	36.946	39.939	6,760.10	17.19	107.46	81.2	360.4	0.0	136.5
140.00		0.3438	35.457	38.315	5,968.60	16.42	103.13	82.1	331.6	0.0	665.7
145.00		0.3438	33.969	36.691	5,241.40	15.66	98.80	82.6	303.9	0.0	638.1
150.00		0.3438	32.481	35.067	4,575.80	14.90	94.48	82.6	277.5	0.0	610.4
153.70		0.3438	31.380	33.866	4,121.30	14.33	91.27	82.6	258.7	0.0	433.9
155.00		0.3438	30.993	33.443	3,969.10	14.13	90.15	82.6	252.2	0.0	148.9
156.30		0.3438	30.606	33.021	3,820.70	13.93	89.02	82.6	245.9	0.0	147.0
160.00		0.3438	29.504	31.820	3,418.50	13.37	85.82	82.6	228.2	0.0	408.2
160.35	Bot - Section 6	0.3438	29.400	31.706	3,382.00	13.32	85.52	82.6	226.6	0.0	37.9
164.00		0.3438	28.314	30.520	3,016.70	12.76	82.36	82.6	209.9	0.0	709.4
164.84	Top - Section 5	0.2813	28.626	25.307	2,568.90	16.18	101.76	82.4	176.8	0.0	159.5
165.00		0.2813	28.579	25.264	2,556.00	16.15	101.60	82.4	176.2	0.0	13.8
169.00		0.2813	27.388	24.201	2,246.70	15.40	97.36	82.6	161.6	0.0	336.6
170.00		0.2813	27.091	23.936	2,173.50	15.22	96.30	82.6	158.0	0.0	81.9
								Totals:			50,564.9

Load Case: 1.2D + 1.0W 118 mph wind with no ice 22 Iterations
Gust Response Factor: 1.10
Dead load Factor: 1.20
Wind Load Factor: 1.00

CALCULATED FORCES

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	Phi Pn (kips)	Phi Vn (kips)	Phi Tn (ft-kips)	Phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-82.75	-40.46	0.00	-4,607.1	0.00	4,607.13	8,295.02	2,165.08	14,306.35	12,493.79	0	0	0.379
5.00	-80.00	-39.86	0.00	-4,404.8	0.00	4,404.85	8,189.47	2,121.04	13,730.28	12,082.08	0.04	-0.08	0.375
10.00	-77.31	-39.27	0.00	-4,205.6	0.00	4,205.55	8,081.29	2,076.99	13,166.04	11,673.09	0.16	-0.15	0.370
15.00	-74.67	-38.68	0.00	-4,009.2	0.00	4,009.20	7,970.49	2,032.95	12,613.65	11,267.07	0.37	-0.23	0.366
20.00	-72.09	-38.07	0.00	-3,815.8	0.00	3,815.79	7,857.06	1,988.91	12,073.09	10,864.26	0.66	-0.31	0.361
25.00	-69.55	-37.44	0.00	-3,625.4	0.00	3,625.42	7,741.01	1,944.87	11,544.37	10,464.90	1.03	-0.4	0.356
30.00	-67.10	-37.11	0.00	-3,438.2	0.00	3,438.21	7,622.33	1,900.82	11,027.49	10,069.24	1.49	-0.48	0.351
30.02	-67.06	-36.79	0.00	-3,437.4	0.00	3,437.44	7,621.83	1,900.64	11,025.36	10,067.60	1.5	-0.48	0.351
35.00	-62.44	-36.18	0.00	-3,254.3	0.00	3,254.28	7,501.03	1,856.78	10,522.45	9,677.52	2.04	-0.56	0.345
38.69	-59.08	-35.81	0.00	-3,120.8	0.00	3,120.79	7,498.09	1,855.72	10,510.47	9,668.17	2.5	-0.63	0.331
40.00	-58.44	-35.38	0.00	-3,073.9	0.00	3,073.88	7,465.86	1,844.18	10,380.18	9,566.25	2.68	-0.65	0.330
45.00	-56.08	-34.69	0.00	-2,897.0	0.00	2,896.96	7,341.18	1,800.14	9,890.36	9,179.95	3.41	-0.73	0.324
50.00	-53.78	-33.98	0.00	-2,723.5	0.00	2,723.53	7,213.88	1,756.10	9,412.38	8,798.15	4.22	-0.82	0.317
55.00	-51.53	-33.28	0.00	-2,553.6	0.00	2,553.61	7,083.96	1,712.05	8,946.23	8,421.09	5.12	-0.9	0.311
60.00	-49.34	-32.85	0.00	-2,387.2	0.00	2,387.21	6,951.42	1,668.01	8,491.93	8,049.01	6.11	-0.99	0.304
60.97	-48.91	-32.50	0.00	-2,355.3	0.00	2,355.34	6,925.39	1,659.46	8,405.13	7,977.39	6.31	-1	0.303
65.00	-45.80	-31.92	0.00	-2,224.4	0.00	2,224.37	6,816.24	1,623.97	8,049.46	7,682.15	7.19	-1.07	0.297
68.73	-42.99	-31.53	0.00	-2,105.3	0.00	2,105.28	5,796.47	1,430.05	7,073.77	6,526.94	8.06	-1.14	0.330
70.00	-42.50	-31.10	0.00	-2,065.3	0.00	2,065.26	5,768.66	1,420.18	6,976.53	6,450.44	8.36	-1.16	0.328
75.00	-40.64	-30.40	0.00	-1,909.8	0.00	1,909.75	5,657.44	1,381.32	6,599.99	6,151.49	9.63	-1.25	0.318
80.00	-38.82	-29.71	0.00	-1,757.7	0.00	1,757.74	5,543.60	1,342.46	6,233.89	5,856.63	10.99	-1.35	0.308
85.00	-37.06	-29.02	0.00	-1,609.2	0.00	1,609.20	5,427.13	1,303.60	5,878.24	5,566.11	12.46	-1.44	0.296
90.00	-35.35	-28.47	0.00	-1,464.1	0.00	1,464.10	5,308.04	1,264.74	5,533.04	5,280.17	14.02	-1.54	0.284
92.99	-34.34	-28.12	0.00	-1,379.0	0.00	1,378.97	5,235.56	1,241.49	5,331.57	5,111.44	15	-1.59	0.277
95.00	-33.20	-27.67	0.00	-1,322.4	0.00	1,322.45	5,186.33	1,225.87	5,198.28	4,999.05	15.68	-1.63	0.271
99.68	-30.62	-27.28	0.00	-1,193.0	0.00	1,192.96	3,857.01	969.12	4,061.20	3,681.17	17.32	-1.72	0.333
100.00	-30.52	-26.95	0.00	-1,184.2	0.00	1,184.24	3,851.71	967.13	4,044.57	3,668.51	17.44	-1.72	0.332
105.00	-29.19	-26.30	0.00	-1,049.5	0.00	1,049.51	3,767.41	936.05	3,788.77	3,471.96	19.3	-1.83	0.311
110.00	-27.90	-25.66	0.00	-918.0	0.00	918.01	3,680.49	904.96	3,541.33	3,278.28	21.27	-1.93	0.288
115.00	-26.65	-25.03	0.00	-789.7	0.00	789.71	3,590.95	873.87	3,302.24	3,087.70	23.35	-2.03	0.264
120.00	-25.44	-24.47	0.00	-664.6	0.00	664.55	3,498.78	842.79	3,071.51	2,900.48	25.53	-2.13	0.237
124.00	-20.84	-21.54	0.00	-566.7	0.00	566.66	3,423.15	817.92	2,892.94	2,753.28	27.34	-2.2	0.213
125.00	-20.61	-21.41	0.00	-545.1	0.00	545.11	3,403.98	811.70	2,849.13	2,716.85	27.8	-2.21	0.207
126.13	-20.36	-21.12	0.00	-520.9	0.00	520.92	3,382.19	804.67	2,800.03	2,675.87	28.33	-2.23	0.201
130.00	-18.83	-20.74	0.00	-439.2	0.00	439.19	3,304.60	780.61	2,635.11	2,535.56	30.17	-2.3	0.180
131.70	-18.18	-20.49	0.00	-403.9	0.00	403.92	2,974.75	719.74	2,443.38	2,297.47	30.99	-2.32	0.183
134.00	-13.35	-16.61	0.00	-356.8	0.00	356.79	2,935.54	706.63	2,355.21	2,225.52	32.12	-2.35	0.165
135.00	-13.16	-16.28	0.00	-340.2	0.00	340.18	2,918.31	700.93	2,317.37	2,194.45	32.61	-2.37	0.160
140.00	-12.22	-15.70	0.00	-258.8	0.00	258.81	2,830.61	672.43	2,132.78	2,041.16	35.13	-2.43	0.132
145.00	-8.98	-11.76	0.00	-180.3	0.00	180.33	2,725.98	643.93	1,955.84	1,881.59	37.7	-2.48	0.099
150.00	-8.12	-11.28	0.00	-121.5	0.00	121.51	2,605.33	615.43	1,786.57	1,717.91	40.33	-2.52	0.074
153.70	-7.23	-10.67	0.00	-79.8	0.00	79.77	2,516.05	594.34	1,666.24	1,601.59	42.29	-2.55	0.053
155.00	-3.94	-5.14	0.00	-63.1	0.00	63.10	2,484.68	586.93	1,624.96	1,561.69	42.99	-2.55	0.042
156.30	-3.55	-4.58	0.00	-56.4	0.00	56.42	2,453.31	579.52	1,584.20	1,522.29	43.69	-2.56	0.039
160.00	-3.06	-4.36	0.00	-39.5	0.00	39.47	2,364.03	558.43	1,471.01	1,412.90	45.67	-2.57	0.029
160.35	-3.02	-4.17	0.00	-37.9	0.00	37.94	2,355.57	556.43	1,460.51	1,402.75	45.86	-2.57	0.028
164.00	-1.74	-3.31	0.00	-22.7	0.00	22.72	2,267.51	535.63	1,353.36	1,299.24	47.83	-2.58	0.018
164.84	-1.55	-3.26	0.00	-19.9	0.00	19.93	1,876.06	444.14	1,137.15	1,091.91	48.29	-2.59	0.019
165.00	-1.54	-3.07	0.00	-19.4	0.00	19.41	1,873.71	443.39	1,133.33	1,088.70	48.38	-2.59	0.019
169.00	-0.28	-1.90	0.00	-7.1	0.00	7.14	1,798.04	424.73	1,039.99	1,000.34	50.54	-2.59	0.007
170.00	0.00	-1.89	0.00	-5.2	0.00	5.24	1,778.30	420.07	1,017.28	978.39	51.09	-2.59	0.005

Load Case: 0.9D + 1.0W 118 mph wind with no ice 22 Iterations
Gust Response Factor: 1.10
Dead load Factor: 0.90
Wind Load Factor: 1.00

CALCULATED FORCES

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	Phi Pn (kips)	Phi Vn (kips)	Phi Tn (ft-kips)	Phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-62.05	-40.44	0.00	-4,578.2	0.00	4,578.23	8,295.02	2,165.08	14,306.35	12,493.79	0	0	0.374
5.00	-59.98	-39.82	0.00	-4,376.0	0.00	4,376.03	8,189.47	2,121.04	13,730.28	12,082.08	0.04	-0.08	0.370
10.00	-57.95	-39.20	0.00	-4,176.9	0.00	4,176.94	8,081.29	2,076.99	13,166.04	11,673.09	0.16	-0.15	0.365
15.00	-55.96	-38.59	0.00	-3,980.9	0.00	3,980.92	7,970.49	2,032.95	12,613.65	11,267.07	0.37	-0.23	0.361
20.00	-54.01	-37.96	0.00	-3,788.0	0.00	3,787.97	7,857.06	1,988.91	12,073.09	10,864.26	0.66	-0.31	0.356
25.00	-52.10	-37.31	0.00	-3,598.2	0.00	3,598.18	7,741.01	1,944.87	11,544.37	10,464.90	1.03	-0.39	0.351
30.00	-50.25	-36.96	0.00	-3,411.6	0.00	3,411.65	7,622.33	1,900.82	11,027.49	10,069.24	1.48	-0.48	0.346
30.02	-50.22	-36.63	0.00	-3,410.9	0.00	3,410.88	7,621.83	1,900.64	11,025.36	10,067.60	1.49	-0.48	0.346
35.00	-46.74	-36.01	0.00	-3,228.5	0.00	3,228.50	7,501.03	1,856.78	10,522.45	9,677.52	2.03	-0.56	0.340
38.69	-44.22	-35.64	0.00	-3,095.6	0.00	3,095.63	7,498.09	1,855.72	10,510.47	9,668.17	2.49	-0.62	0.326
40.00	-43.73	-35.20	0.00	-3,048.9	0.00	3,048.94	7,465.86	1,844.18	10,380.18	9,566.25	2.66	-0.65	0.325
45.00	-41.95	-34.49	0.00	-2,872.9	0.00	2,872.93	7,341.18	1,800.14	9,890.36	9,179.95	3.38	-0.73	0.319
50.00	-40.21	-33.78	0.00	-2,700.5	0.00	2,700.48	7,213.88	1,756.10	9,412.38	8,798.15	4.19	-0.81	0.313
55.00	-38.51	-33.06	0.00	-2,531.6	0.00	2,531.60	7,083.96	1,712.05	8,946.23	8,421.09	5.08	-0.89	0.306
60.00	-36.87	-32.62	0.00	-2,366.3	0.00	2,366.30	6,951.42	1,668.01	8,491.93	8,049.01	6.07	-0.98	0.300
60.97	-36.54	-32.27	0.00	-2,334.6	0.00	2,334.64	6,925.39	1,659.46	8,405.13	7,977.39	6.27	-1	0.298
65.00	-34.21	-31.69	0.00	-2,204.6	0.00	2,204.60	6,816.24	1,623.97	8,049.46	7,682.15	7.14	-1.06	0.292
68.73	-32.09	-31.31	0.00	-2,086.4	0.00	2,086.36	5,796.47	1,430.05	7,073.77	6,526.94	8	-1.13	0.326
70.00	-31.72	-30.87	0.00	-2,046.6	0.00	2,046.63	5,768.66	1,420.18	6,976.53	6,450.44	8.3	-1.15	0.323
75.00	-30.32	-30.16	0.00	-1,892.3	0.00	1,892.28	5,657.44	1,381.32	6,599.99	6,151.49	9.56	-1.24	0.313
80.00	-28.95	-29.46	0.00	-1,741.5	0.00	1,741.47	5,543.60	1,342.46	6,233.89	5,856.63	10.91	-1.34	0.303
85.00	-27.62	-28.77	0.00	-1,594.2	0.00	1,594.17	5,427.13	1,303.60	5,878.24	5,566.11	12.36	-1.43	0.292
90.00	-26.33	-28.21	0.00	-1,450.3	0.00	1,450.32	5,308.04	1,264.74	5,533.04	5,280.17	13.91	-1.52	0.280
92.99	-25.57	-27.87	0.00	-1,366.0	0.00	1,365.95	5,235.56	1,241.49	5,331.57	5,111.44	14.88	-1.58	0.273
95.00	-24.71	-27.41	0.00	-1,309.9	0.00	1,309.94	5,186.33	1,225.87	5,198.28	4,999.05	15.56	-1.62	0.267
99.68	-22.77	-27.03	0.00	-1,181.6	0.00	1,181.64	3,857.01	969.12	4,061.20	3,681.17	17.19	-1.7	0.328
100.00	-22.70	-26.70	0.00	-1,173.0	0.00	1,173.00	3,851.71	967.13	4,044.57	3,668.51	17.3	-1.71	0.326
105.00	-21.69	-26.05	0.00	-1,039.5	0.00	1,039.51	3,767.41	936.05	3,788.77	3,471.96	19.15	-1.81	0.306
110.00	-20.72	-25.41	0.00	-909.3	0.00	909.28	3,680.49	904.96	3,541.33	3,278.28	21.1	-1.92	0.284
115.00	-19.78	-24.78	0.00	-782.2	0.00	782.25	3,590.95	873.87	3,302.24	3,087.70	23.16	-2.01	0.260
120.00	-18.87	-24.22	0.00	-658.4	0.00	658.37	3,498.78	842.79	3,071.51	2,900.48	25.33	-2.11	0.233
124.00	-15.44	-21.33	0.00	-561.5	0.00	561.49	3,423.15	817.92	2,892.94	2,753.28	27.12	-2.18	0.209
125.00	-15.27	-21.20	0.00	-540.2	0.00	540.17	3,403.98	811.70	2,849.13	2,716.85	27.58	-2.2	0.204
126.13	-15.07	-20.90	0.00	-516.2	0.00	516.21	3,382.19	804.67	2,800.03	2,675.87	28.1	-2.21	0.198
130.00	-13.93	-20.54	0.00	-435.3	0.00	435.31	3,304.60	780.61	2,635.11	2,535.56	29.92	-2.28	0.177
131.70	-13.44	-20.29	0.00	-400.4	0.00	400.39	2,974.75	719.74	2,443.38	2,297.47	30.74	-2.3	0.180
134.00	-9.85	-16.46	0.00	-353.7	0.00	353.72	2,935.54	706.63	2,355.21	2,225.52	31.86	-2.33	0.163
135.00	-9.71	-16.13	0.00	-337.3	0.00	337.26	2,918.31	700.93	2,317.37	2,194.45	32.35	-2.35	0.158
140.00	-9.01	-15.55	0.00	-256.6	0.00	256.62	2,830.61	672.43	2,132.78	2,041.16	34.84	-2.41	0.129
145.00	-6.61	-11.66	0.00	-178.8	0.00	178.85	2,725.98	643.93	1,955.84	1,881.59	37.4	-2.46	0.098
150.00	-5.98	-11.18	0.00	-120.6	0.00	120.57	2,605.33	615.43	1,786.57	1,717.91	40	-2.5	0.073
153.70	-5.31	-10.58	0.00	-79.2	0.00	79.19	2,516.05	594.34	1,666.24	1,601.59	41.95	-2.53	0.052
155.00	-2.90	-5.10	0.00	-62.6	0.00	62.63	2,484.68	586.93	1,624.96	1,561.69	42.64	-2.53	0.041
156.30	-2.61	-4.54	0.00	-56.0	0.00	56.01	2,453.31	579.52	1,584.20	1,522.29	43.33	-2.54	0.038
160.00	-2.25	-4.33	0.00	-39.2	0.00	39.22	2,364.03	558.43	1,471.01	1,412.90	45.3	-2.55	0.029
160.35	-2.22	-4.14	0.00	-37.7	0.00	37.71	2,355.57	556.43	1,460.51	1,402.75	45.49	-2.55	0.028
164.00	-1.27	-3.29	0.00	-22.6	0.00	22.61	2,267.51	535.63	1,353.36	1,299.24	47.44	-2.56	0.018
164.84	-1.13	-3.24	0.00	-19.8	0.00	19.85	1,876.06	444.14	1,137.15	1,091.91	47.89	-2.56	0.019
165.00	-1.13	-3.05	0.00	-19.3	0.00	19.33	1,873.71	443.39	1,133.33	1,088.70	47.98	-2.56	0.018
169.00	-0.19	-1.90	0.00	-7.1	0.00	7.13	1,798.04	424.73	1,039.99	1,000.34	50.13	-2.57	0.007
170.00	0.00	-1.89	0.00	-5.2	0.00	5.24	1,778.30	420.07	1,017.28	978.39	50.66	-2.57	0.005

Load Case: 1.2D + 1.0Di + 1.0Wi		50 mph wind with 1" radial ice			21 Iterations
Gust Response Factor:	1.10	Ice Dead Load Factor	1.00		
Dead load Factor:	1.20			Ice Importance Factor	1.00
Wind Load Factor:	1.00				

CALCULATED FORCES

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	Phi Pn (kips)	Phi Vn (kips)	Phi Tn (ft-kips)	Phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-102.56	-11.25	0.00	-1,250.3	0.00	1,250.32	8,295.02	2,165.08	14,306.35	12,493.79	0	0	0.112
5.00	-99.51	-11.07	0.00	-1,194.1	0.00	1,194.08	8,189.47	2,121.04	13,730.28	12,082.08	0.01	-0.02	0.111
10.00	-96.48	-10.90	0.00	-1,138.7	0.00	1,138.72	8,081.29	2,076.99	13,166.04	11,673.09	0.04	-0.04	0.110
15.00	-93.49	-10.72	0.00	-1,084.2	0.00	1,084.23	7,970.49	2,032.95	12,613.65	11,267.07	0.1	-0.06	0.108
20.00	-90.55	-10.54	0.00	-1,030.6	0.00	1,030.61	7,857.06	1,988.91	12,073.09	10,864.26	0.18	-0.09	0.106
25.00	-87.65	-10.35	0.00	-977.9	0.00	977.90	7,741.01	1,944.87	11,544.37	10,464.90	0.28	-0.11	0.105
30.00	-84.81	-10.25	0.00	-926.1	0.00	926.14	7,622.33	1,900.82	11,027.49	10,069.24	0.4	-0.13	0.103
30.02	-84.80	-10.16	0.00	-925.9	0.00	925.92	7,621.83	1,900.64	11,025.36	10,067.60	0.41	-0.13	0.103
35.00	-79.81	-9.98	0.00	-875.4	0.00	875.35	7,501.03	1,856.78	10,522.45	9,677.52	0.55	-0.15	0.101
38.69	-76.17	-9.87	0.00	-838.5	0.00	838.54	7,498.09	1,855.72	10,510.47	9,668.17	0.68	-0.17	0.097
40.00	-75.45	-9.74	0.00	-825.6	0.00	825.61	7,465.86	1,844.18	10,380.18	9,566.25	0.73	-0.18	0.096
45.00	-72.73	-9.53	0.00	-776.9	0.00	776.92	7,341.18	1,800.14	9,890.36	9,179.95	0.92	-0.2	0.095
50.00	-70.06	-9.32	0.00	-729.3	0.00	729.27	7,213.88	1,756.10	9,412.38	8,798.15	1.14	-0.22	0.093
55.00	-67.46	-9.11	0.00	-682.7	0.00	682.69	7,083.96	1,712.05	8,946.23	8,421.09	1.38	-0.24	0.091
60.00	-64.91	-8.97	0.00	-637.2	0.00	637.16	6,951.42	1,668.01	8,491.93	8,049.01	1.65	-0.27	0.089
60.97	-64.42	-8.87	0.00	-628.4	0.00	628.45	6,925.39	1,659.46	8,405.13	7,977.39	1.7	-0.27	0.088
65.00	-61.03	-8.70	0.00	-592.7	0.00	592.70	6,816.24	1,623.97	8,049.46	7,682.15	1.94	-0.29	0.086
68.73	-57.95	-8.58	0.00	-560.3	0.00	560.26	5,796.47	1,430.05	7,073.77	6,526.94	2.17	-0.31	0.096
70.00	-57.38	-8.45	0.00	-549.4	0.00	549.37	5,768.66	1,420.18	6,976.53	6,450.44	2.26	-0.31	0.095
75.00	-55.18	-8.24	0.00	-507.1	0.00	507.13	5,657.44	1,381.32	6,599.99	6,151.49	2.6	-0.34	0.092
80.00	-53.04	-8.03	0.00	-465.9	0.00	465.94	5,543.60	1,342.46	6,233.89	5,856.63	2.96	-0.36	0.089
85.00	-50.95	-7.82	0.00	-425.8	0.00	425.80	5,427.13	1,303.60	5,878.24	5,566.11	3.36	-0.39	0.086
90.00	-48.91	-7.65	0.00	-386.7	0.00	386.71	5,308.04	1,264.74	5,533.04	5,280.17	3.77	-0.41	0.082
92.99	-47.72	-7.54	0.00	-363.8	0.00	363.84	5,235.56	1,241.49	5,331.57	5,111.44	4.04	-0.43	0.080
95.00	-46.45	-7.41	0.00	-348.7	0.00	348.68	5,186.33	1,225.87	5,198.28	4,999.05	4.22	-0.44	0.079
99.68	-43.57	-7.29	0.00	-314.0	0.00	314.02	3,857.01	969.12	4,061.20	3,681.17	4.66	-0.46	0.097
100.00	-43.46	-7.19	0.00	-311.7	0.00	311.69	3,851.71	967.13	4,044.57	3,668.51	4.69	-0.46	0.096
105.00	-41.83	-6.99	0.00	-275.8	0.00	275.75	3,767.41	936.05	3,788.77	3,471.96	5.19	-0.49	0.091
110.00	-40.25	-6.79	0.00	-240.8	0.00	240.80	3,680.49	904.96	3,541.33	3,278.28	5.71	-0.52	0.084
115.00	-38.71	-6.60	0.00	-206.8	0.00	206.83	3,590.95	873.87	3,302.24	3,087.70	6.27	-0.54	0.078
120.00	-37.22	-6.43	0.00	-173.8	0.00	173.83	3,498.78	842.79	3,071.51	2,900.48	6.85	-0.57	0.071
124.00	-30.87	-5.65	0.00	-148.1	0.00	148.12	3,423.15	817.92	2,892.94	2,753.28	7.33	-0.59	0.063
125.00	-30.58	-5.61	0.00	-142.5	0.00	142.46	3,403.98	811.70	2,849.13	2,716.85	7.46	-0.59	0.061
126.13	-30.26	-5.52	0.00	-136.1	0.00	136.12	3,382.19	804.67	2,800.03	2,675.87	7.6	-0.59	0.060
130.00	-28.52	-5.41	0.00	-114.7	0.00	114.74	3,304.60	780.61	2,635.11	2,535.56	8.09	-0.61	0.054
131.70	-27.77	-5.33	0.00	-105.6	0.00	105.55	2,974.75	719.74	2,443.38	2,297.47	8.3	-0.62	0.055
134.00	-20.77	-4.37	0.00	-93.3	0.00	93.29	2,935.54	706.63	2,355.21	2,225.52	8.6	-0.63	0.049
135.00	-20.52	-4.26	0.00	-88.9	0.00	88.93	2,918.31	700.93	2,317.37	2,194.45	8.74	-0.63	0.048
140.00	-19.31	-4.08	0.00	-67.6	0.00	67.62	2,830.61	672.43	2,132.78	2,041.16	9.4	-0.65	0.040
145.00	-14.34	-3.04	0.00	-47.2	0.00	47.23	2,725.98	643.93	1,955.84	1,881.59	10.09	-0.66	0.030
150.00	-13.23	-2.89	0.00	-32.0	0.00	32.02	2,605.33	615.43	1,786.57	1,717.91	10.79	-0.67	0.024
153.70	-11.98	-2.72	0.00	-21.3	0.00	21.34	2,516.05	594.34	1,666.24	1,601.59	11.31	-0.68	0.018
155.00	-5.80	-1.37	0.00	-17.2	0.00	17.22	2,484.68	586.93	1,624.96	1,561.69	11.49	-0.68	0.013
156.30	-5.17	-1.22	0.00	-15.4	0.00	15.44	2,453.31	579.52	1,584.20	1,522.29	11.68	-0.68	0.012
160.00	-4.50	-1.15	0.00	-10.9	0.00	10.91	2,364.03	558.43	1,471.01	1,412.90	12.21	-0.68	0.010
160.35	-4.44	-1.09	0.00	-10.5	0.00	10.51	2,355.57	556.43	1,460.51	1,402.75	12.26	-0.68	0.009
164.00	-2.83	-0.86	0.00	-6.5	0.00	6.52	2,267.51	535.63	1,353.36	1,299.24	12.78	-0.69	0.006
164.84	-2.60	-0.85	0.00	-5.8	0.00	5.79	1,876.06	444.14	1,137.15	1,091.91	12.9	-0.69	0.007
165.00	-2.58	-0.79	0.00	-5.7	0.00	5.66	1,873.71	443.39	1,133.33	1,088.70	12.93	-0.69	0.007
169.00	-0.82	-0.48	0.00	-2.5	0.00	2.51	1,798.04	424.73	1,039.99	1,000.34	13.5	-0.69	0.003
170.00	0.00	-0.47	0.00	-2.0	0.00	2.03	1,778.30	420.07	1,017.28	978.39	13.65	-0.69	0.002

Load Case: 1.0D + 1.0W 60 mph Wind with No Ice 21 Iterations
Gust Response Factor: 1.10
Dead load Factor: 1.00
Wind Load Factor: 1.00

CALCULATED FORCES

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	Phi Pn (kips)	Phi Vn (kips)	Phi Tn (ft-kips)	Phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-68.98	-9.36	0.00	-1,061.5	0.00	1,061.52	8,295.02	2,165.08	14,306.35	12,493.79	0	0	0.093
5.00	-66.73	-9.21	0.00	-1,014.7	0.00	1,014.74	8,189.47	2,121.04	13,730.28	12,082.08	0.01	-0.02	0.092
10.00	-64.53	-9.07	0.00	-968.7	0.00	968.67	8,081.29	2,076.99	13,166.04	11,673.09	0.04	-0.04	0.091
15.00	-62.37	-8.93	0.00	-923.3	0.00	923.31	7,970.49	2,032.95	12,613.65	11,267.07	0.09	-0.05	0.090
20.00	-60.26	-8.79	0.00	-878.6	0.00	878.64	7,857.06	1,988.91	12,073.09	10,864.26	0.15	-0.07	0.089
25.00	-58.18	-8.64	0.00	-834.7	0.00	834.69	7,741.01	1,944.87	11,544.37	10,464.90	0.24	-0.09	0.087
30.00	-56.15	-8.56	0.00	-791.5	0.00	791.49	7,622.33	1,900.82	11,027.49	10,069.24	0.34	-0.11	0.086
30.02	-56.14	-8.49	0.00	-791.3	0.00	791.31	7,621.83	1,900.64	11,025.36	10,067.60	0.34	-0.11	0.086
35.00	-52.32	-8.34	0.00	-749.1	0.00	749.06	7,501.03	1,856.78	10,522.45	9,677.52	0.47	-0.13	0.084
38.69	-49.54	-8.26	0.00	-718.3	0.00	718.28	7,498.09	1,855.72	10,510.47	9,668.17	0.58	-0.14	0.081
40.00	-49.03	-8.16	0.00	-707.5	0.00	707.46	7,465.86	1,844.18	10,380.18	9,566.25	0.62	-0.15	0.081
45.00	-47.10	-7.99	0.00	-666.7	0.00	666.67	7,341.18	1,800.14	9,890.36	9,179.95	0.78	-0.17	0.079
50.00	-45.21	-7.83	0.00	-626.7	0.00	626.70	7,213.88	1,756.10	9,412.38	8,798.15	0.97	-0.19	0.078
55.00	-43.36	-7.67	0.00	-587.6	0.00	587.55	7,083.96	1,712.05	8,946.23	8,421.09	1.18	-0.21	0.076
60.00	-41.56	-7.56	0.00	-549.2	0.00	549.23	6,951.42	1,668.01	8,491.93	8,049.01	1.41	-0.23	0.074
60.97	-41.21	-7.48	0.00	-541.9	0.00	541.88	6,925.39	1,659.46	8,405.13	7,977.39	1.45	-0.23	0.074
65.00	-38.64	-7.35	0.00	-511.7	0.00	511.73	6,816.24	1,623.97	8,049.46	7,682.15	1.66	-0.25	0.072
68.73	-36.31	-7.26	0.00	-484.3	0.00	484.31	5,796.47	1,430.05	7,073.77	6,526.94	1.86	-0.26	0.080
70.00	-35.92	-7.16	0.00	-475.1	0.00	475.09	5,768.66	1,420.18	6,976.53	6,450.44	1.93	-0.27	0.080
75.00	-34.40	-7.00	0.00	-439.3	0.00	439.29	5,657.44	1,381.32	6,599.99	6,151.49	2.22	-0.29	0.078
80.00	-32.91	-6.84	0.00	-404.3	0.00	404.31	5,543.60	1,342.46	6,233.89	5,856.63	2.53	-0.31	0.075
85.00	-31.46	-6.68	0.00	-370.1	0.00	370.13	5,427.13	1,303.60	5,878.24	5,566.11	2.87	-0.33	0.072
90.00	-30.05	-6.55	0.00	-336.8	0.00	336.75	5,308.04	1,264.74	5,533.04	5,280.17	3.23	-0.35	0.069
92.99	-29.23	-6.47	0.00	-317.2	0.00	317.17	5,235.56	1,241.49	5,331.57	5,111.44	3.45	-0.37	0.068
95.00	-28.29	-6.36	0.00	-304.2	0.00	304.17	5,186.33	1,225.87	5,198.28	4,999.05	3.61	-0.38	0.066
99.68	-26.15	-6.27	0.00	-274.4	0.00	274.38	3,857.01	969.12	4,061.20	3,681.17	3.99	-0.4	0.081
100.00	-26.07	-6.20	0.00	-272.4	0.00	272.38	3,851.71	967.13	4,044.57	3,668.51	4.01	-0.4	0.081
105.00	-24.99	-6.05	0.00	-241.4	0.00	241.39	3,767.41	936.05	3,788.77	3,471.96	4.44	-0.42	0.076
110.00	-23.93	-5.90	0.00	-211.2	0.00	211.15	3,680.49	904.96	3,541.33	3,278.28	4.9	-0.44	0.071
115.00	-22.90	-5.75	0.00	-181.7	0.00	181.66	3,590.95	873.87	3,302.24	3,087.70	5.38	-0.47	0.065
120.00	-21.91	-5.63	0.00	-152.9	0.00	152.88	3,498.78	842.79	3,071.51	2,900.48	5.88	-0.49	0.059
124.00	-18.00	-4.95	0.00	-130.4	0.00	130.38	3,423.15	817.92	2,892.94	2,753.28	6.29	-0.51	0.053
125.00	-17.82	-4.92	0.00	-125.4	0.00	125.43	3,403.98	811.70	2,849.13	2,716.85	6.4	-0.51	0.051
126.13	-17.60	-4.86	0.00	-119.9	0.00	119.87	3,382.19	804.67	2,800.03	2,675.87	6.52	-0.51	0.050
130.00	-16.34	-4.77	0.00	-101.1	0.00	101.08	3,304.60	780.61	2,635.11	2,535.56	6.94	-0.53	0.045
131.70	-15.79	-4.71	0.00	-93.0	0.00	92.96	2,974.75	719.74	2,443.38	2,297.47	7.13	-0.53	0.046
134.00	-11.65	-3.82	0.00	-82.1	0.00	82.13	2,935.54	706.63	2,355.21	2,225.52	7.39	-0.54	0.041
135.00	-11.49	-3.74	0.00	-78.3	0.00	78.30	2,918.31	700.93	2,317.37	2,194.45	7.51	-0.55	0.040
140.00	-10.70	-3.61	0.00	-59.6	0.00	59.58	2,830.61	672.43	2,132.78	2,041.16	8.09	-0.56	0.033
145.00	-7.87	-2.71	0.00	-41.5	0.00	41.52	2,725.98	643.93	1,955.84	1,881.59	8.68	-0.57	0.025
150.00	-7.15	-2.60	0.00	-28.0	0.00	27.98	2,605.33	615.43	1,786.57	1,717.91	9.28	-0.58	0.019
153.70	-6.39	-2.46	0.00	-18.4	0.00	18.38	2,516.05	594.34	1,666.24	1,601.59	9.74	-0.59	0.014
155.00	-3.46	-1.18	0.00	-14.5	0.00	14.54	2,484.68	586.93	1,624.96	1,561.69	9.9	-0.59	0.011
156.30	-3.11	-1.05	0.00	-13.0	0.00	13.00	2,453.31	579.52	1,584.20	1,522.29	10.06	-0.59	0.010
160.00	-2.70	-1.00	0.00	-9.1	0.00	9.10	2,364.03	558.43	1,471.01	1,412.90	10.51	-0.59	0.008
160.35	-2.66	-0.96	0.00	-8.8	0.00	8.75	2,355.57	556.43	1,460.51	1,402.75	10.56	-0.59	0.007
164.00	-1.57	-0.76	0.00	-5.2	0.00	5.24	2,267.51	535.63	1,353.36	1,299.24	11.01	-0.59	0.005
164.84	-1.41	-0.75	0.00	-4.6	0.00	4.60	1,876.06	444.14	1,137.15	1,091.91	11.12	-0.59	0.005
165.00	-1.39	-0.71	0.00	-4.5	0.00	4.48	1,873.71	443.39	1,133.33	1,088.70	11.14	-0.6	0.005
169.00	-0.30	-0.44	0.00	-1.6	0.00	1.65	1,798.04	424.73	1,039.99	1,000.34	11.63	-0.6	0.002
170.00	0.00	-0.44	0.00	-1.2	0.00	1.21	1,778.30	420.07	1,017.28	978.39	11.76	-0.6	0.001

EQUIVALENT LATERAL FORCES METHOD ANALYSIS

(Based on ASCE7-16 Chapters 11, 12 and 15)

Spectral Response Acceleration for Short Period (S_S):	0.200
Spectral Response Acceleration at 1.0 Second Period (S_1):	0.055
Long-Period Transition Period (T_L – Seconds):	6
Importance Factor (I_e):	1.000
Site Coefficient F_a:	1.600
Site Coefficient F_v:	2.400
Response Modification Coefficient (R):	1.500
Design Spectral Response Acceleration at Short Period (S_{ds}):	0.213
Design Spectral Response Acceleration at 1.0 Second Period (S_{d1}):	0.088
Seismic Response Coefficient (C_s):	0.033
Upper Limit C_S:	0.033
Lower Limit C_S:	0.030
Period based on Rayleigh Method (sec):	1.790
Redundancy Factor (p):	1.000
Seismic Force Distribution Exponent (k):	1.650
Total Unfactored Dead Load:	68.980 k
Seismic Base Shear (E):	2.260 k

1.2D + 1.0Ev + 1.0Eh **Seismic**

Segment	Height Above Base (ft)	Weight (lb)	W_z (lb-ft)	C_{vx}	Horizontal Force (lb)	Vertical Force (lb)
50	169.5	84	391	0.003	8	104
49	167	345	1,568	0.014	31	429
48	164.92	14	63	0.000	1	18
47	164.42	161	714	0.006	14	200
46	162.1753	717	3,105	0.027	61	891
45	160.1753	39	164	0.001	3	48
44	158.15	416	1,728	0.015	34	517
43	155.65	150	606	0.005	12	186
42	154.35	178	710	0.006	14	221
41	151.85	516	2,006	0.018	39	642
40	147.5	722	2,674	0.023	53	897
39	142.5	762	2,665	0.023	52	946
38	137.5	789	2,604	0.023	51	981
37	134.5	161	513	0.004	10	200
36	132.8502	388	1,210	0.010	24	482
35	130.8502	546	1,661	0.014	33	679
34	128.065	1,268	3,722	0.032	73	1,576
33	125.565	211	601	0.005	12	263
32	124.5	188	528	0.005	10	234
31	122	775	2,100	0.018	41	963
30	117.5	996	2,537	0.022	50	1,237
29	112.5	1,026	2,433	0.021	48	1,275
28	107.5	1,056	2,324	0.020	46	1,312
27	102.5	1,086	2,210	0.019	43	1,350
26	99.8402	70	137	0.001	3	88
25	97.3402	2,142	4,004	0.035	79	2,662
24	93.9952	938	1,655	0.014	33	1,165
23	91.4952	824	1,392	0.012	27	1,025
22	87.5	1,409	2,210	0.019	43	1,750
21	82.5	1,446	2,059	0.018	41	1,797
20	77.5	1,484	1,906	0.017	37	1,844
19	72.5	1,522	1,752	0.015	34	1,891
18	69.3654	392	420	0.004	8	487
17	66.8654	2,330	2,348	0.020	46	2,895

Segment	Height Above Base (ft)	Weight (lb)	W_z (lb-ft)	C_{vx}	Horizontal Force (lb)	Vertical Force (lb)
16	62.9852	2,567	2,344	0.020	46	3,190
15	60.4852	345	295	0.003	6	428
14	57.5	1,802	1,417	0.012	28	2,239
13	52.5	1,845	1,249	0.011	25	2,292
12	47.5	1,888	1,083	0.009	21	2,346
11	42.5	1,930	923	0.008	18	2,399
10	39.345	513	216	0.002	4	637
9	36.845	2,777	1,050	0.009	21	3,451
8	32.5104	3,821	1,175	0.010	23	4,748
7	30.0104	8	2	0.000	0	10
6	27.5	2,028	474	0.004	9	2,520
5	22.5	2,071	348	0.003	7	2,573
4	17.5	2,113	235	0.002	5	2,626
3	12.5	2,156	138	0.001	3	2,679
2	7.5	2,199	61	0.000	1	2,732
1	2.5	2,241	10	0.000	0	2,785
dbSpectra DS1F03F36D-N	170	142	664	0.006	13	176
RFS SC3-W100AC	170	80	374	0.003	7	99
Generic Flat Stand-Off	169	750	3,475	0.030	68	932
Generic Flat Stand-Off	164	375	1,654	0.014	33	466
Ericsson AIR 6419 B77G	156.3	198	808	0.007	16	246
Ericsson RRUS A2	155	90	362	0.003	7	112
Ericsson RRUS 8843 B2, B66A	155	216	868	0.008	17	268
Ericsson RRUS 4415 B30	155	138	555	0.005	11	171
Ericsson RRUS 4449 B5, B12	155	213	856	0.008	17	265
Ericsson RRUS 4478 B14	155	178	716	0.006	14	221
Ericsson RRU22	155	317	1,276	0.011	25	394
Ericsson RRUS 12	155	150	603	0.005	12	186
Raycap DC9-48-60-24-8C-EV	155	16	64	0.001	1	20
Raycap DC9-48-60-24-8C-EV	155	16	64	0.001	1	20
Generic Round Sector Frame	155	900	3,617	0.032	71	1,118
CCI DMP65R-BU8D	155	287	1,154	0.010	23	357
CCI TPA65R-BU8D	155	248	995	0.009	20	308
Ericsson Air 6449 B77D	153.7	245	970	0.008	19	304
Samsung RT4401-48A	145	56	201	0.002	4	69
Samsung B2/B66A RRH-BR049	145	253	912	0.008	18	315
Samsung B5/B13 RRH-BR04C	145	211	759	0.007	15	262
RFS DB-C1-12C-24AB-0Z	145	32	115	0.001	2	40
JMA Wireless MX10FIT665-xx	145	320	1,154	0.010	23	398
Generic Flat Light Sector Frame	145	1,200	4,321	0.038	85	1,491
Ericsson Radio 4460 B25+B66	134	327	1,034	0.009	20	406
Ericsson Radio 4480 B71+B85A	134	252	797	0.007	16	313
Ericsson Air6449 B41	134	312	987	0.009	19	388
RFS APXVAALL24 43-U-NA20	134	368	1,165	0.010	23	458
Generic Round Platform with Handrails	134	2,500	7,907	0.069	156	3,107
Generic Round Platform with Handrails	124	2,500	6,960	0.061	137	3,107
Raycap RDIDC-9181-PF-48	124	22	61	0.000	1	27
Fujitsu TA08025-B605	124	225	626	0.006	12	280
Fujitsu TA08025-B604	124	192	534	0.005	10	238
JMA Wireless MX08FRO665-21	124	194	539	0.005	11	240
		68,978	114,886	0.999	2,260	85,717

0.9D - 1.0Ev + 1.0Eh **Seismic (Reduced DL)**

Segment	Height Above Base (ft)	Weight (lb)	W_z (lb-ft)	C_{vx}	Horizontal Force (lb)	Vertical Force (lb)
50	169.5	84	391	0.003	8	72
49	167	345	1,568	0.014	31	296
48	164.92	14	63	0.000	1	12
47	164.42	161	714	0.006	14	138
46	162.1753	717	3,105	0.027	61	615
45	160.1753	39	164	0.001	3	33
44	158.15	416	1,728	0.015	34	357

Segment	Height Above Base (ft)	Weight (lb)	W_z (lb-ft)	C_{vx}	Horizontal Force (lb)	Vertical Force (lb)
43	155.65	150	606	0.005	12	128
42	154.35	178	710	0.006	14	152
41	151.85	516	2,006	0.018	39	443
40	147.5	722	2,674	0.023	53	619
39	142.5	762	2,665	0.023	52	653
38	137.5	789	2,604	0.023	51	677
37	134.5	161	513	0.004	10	138
36	132.8502	388	1,210	0.010	24	333
35	130.8502	546	1,661	0.014	33	468
34	128.065	1,268	3,722	0.032	73	1,087
33	125.565	211	601	0.005	12	181
32	124.5	188	528	0.005	10	162
31	122	775	2,100	0.018	41	664
30	117.5	996	2,537	0.022	50	854
29	112.5	1,026	2,433	0.021	48	880
28	107.5	1,056	2,324	0.020	46	905
27	102.5	1,086	2,210	0.019	43	931
26	99.8402	70	137	0.001	3	60
25	97.3402	2,142	4,004	0.035	79	1,836
24	93.9952	938	1,655	0.014	33	804
23	91.4952	824	1,392	0.012	27	707
22	87.5	1,409	2,210	0.019	43	1,208
21	82.5	1,446	2,059	0.018	41	1,240
20	77.5	1,484	1,906	0.017	37	1,272
19	72.5	1,522	1,752	0.015	34	1,305
18	69.3654	392	420	0.004	8	336
17	66.8654	2,330	2,348	0.020	46	1,998
16	62.9852	2,567	2,344	0.020	46	2,201
15	60.4852	345	295	0.003	6	296
14	57.5	1,802	1,417	0.012	28	1,545
13	52.5	1,845	1,249	0.011	25	1,582
12	47.5	1,888	1,083	0.009	21	1,618
11	42.5	1,930	923	0.008	18	1,655
10	39.345	513	216	0.002	4	440
9	36.845	2,777	1,050	0.009	21	2,381
8	32.5104	3,821	1,175	0.010	23	3,276
7	30.0104	8	2	0.000	0	7
6	27.5	2,028	474	0.004	9	1,739
5	22.5	2,071	348	0.003	7	1,775
4	17.5	2,113	235	0.002	5	1,812
3	12.5	2,156	138	0.001	3	1,848
2	7.5	2,199	61	0.000	1	1,885
1	2.5	2,241	10	0.000	0	1,922
dbSpectra DS1F03F36D-N	170	142	664	0.006	13	122
RFS SC3-W100AC	170	80	374	0.003	7	69
Generic Flat Stand-Off	169	750	3,475	0.030	68	643
Generic Flat Stand-Off	164	375	1,654	0.014	33	322
Ericsson AIR 6419 B77G	156.3	198	808	0.007	16	170
Ericsson RRUS A2	155	90	362	0.003	7	77
Ericsson RRUS 8843 B2, B66A	155	216	868	0.008	17	185
Ericsson RRUS 4415 B30	155	138	555	0.005	11	118
Ericsson RRUS 4449 B5, B12	155	213	856	0.008	17	183
Ericsson RRUS 4478 B14	155	178	716	0.006	14	153
Ericsson RRU22	155	317	1,276	0.011	25	272
Ericsson RRUS 12	155	150	603	0.005	12	129
Raycap DC9-48-60-24-8C-EV	155	16	64	0.001	1	14
Raycap DC9-48-60-24-8C-EV	155	16	64	0.001	1	14
Generic Round Sector Frame	155	900	3,617	0.032	71	772
CCI DMP65R-BU8D	155	287	1,154	0.010	23	246
CCI TPA65R-BU8D	155	248	995	0.009	20	212
Ericsson Air 6449 B77D	153.7	245	970	0.008	19	210
Samsung RT4401-48A	145	56	201	0.002	4	48
Samsung B2/B66A RRH-BR049	145	253	912	0.008	18	217
Samsung B5/B13 RRH-BR04C	145	211	759	0.007	15	181
RFS DB-C1-12C-24AB-0Z	145	32	115	0.001	2	27
JMA Wireless MX10FIT665-xx	145	320	1,154	0.010	23	275
Generic Flat Light Sector Frame	145	1,200	4,321	0.038	85	1,029
Ericsson Radio 4460 B25+B66	134	327	1,034	0.009	20	280
Ericsson Radio 4480 B71+B85A	134	252	797	0.007	16	216
Ericsson Air6449 B41	134	312	987	0.009	19	267

Segment	Height Above Base (ft)	Weight (lb)	W_z (lb-ft)	C_{vx}	Horizontal Force (lb)	Vertical Force (lb)
RFS APXVAALL24 43-U-NA20	134	368	1,165	0.010	23	316
Generic Round Platform with Handrails	134	2,500	7,907	0.069	156	2,143
Generic Round Platform with Handrails	124	2,500	6,960	0.061	137	2,143
Raycap RDIDC-9181-PF-48	124	22	61	0.000	1	19
Fujitsu TA08025-B605	124	225	626	0.006	12	193
Fujitsu TA08025-B604	124	192	534	0.005	10	164
JMA Wireless MX08FRO665-21	124	194	539	0.005	11	166
		68,978	114,886	0.999	2,260	59,137

1.2D + 1.0Ev + 1.0Eh **Seismic**

CALCULATED FORCES

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (fr-kips)	Mu Mx (ft-kips)	Resultant Moment (ft-kips)	Phi Pn (kips)	Phi Vn (kips)	Phi Tn (kips)	Phi Mn (kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-82.93	-2.26	0.00	-281.06	0.00	281.06	8,295.02	2,165.08	14,306	12,493.79	0.00	0.00	0.03
5.00	-80.20	-2.27	0.00	-269.75	0.00	269.75	8,189.47	2,121.04	13,730	12,082.08	0.00	0.00	0.03
10.00	-77.52	-2.27	0.00	-258.42	0.00	258.42	8,081.29	2,076.99	13,166	11,673.09	0.01	-0.01	0.03
15.00	-74.89	-2.27	0.00	-247.06	0.00	247.06	7,970.49	2,032.95	12,614	11,267.07	0.02	-0.01	0.03
20.00	-72.32	-2.27	0.00	-235.70	0.00	235.70	7,857.06	1,988.91	12,073	10,864.26	0.04	-0.02	0.03
25.00	-69.80	-2.27	0.00	-224.34	0.00	224.34	7,741.01	1,944.87	11,544	10,464.90	0.06	-0.02	0.03
30.00	-69.79	-2.27	0.00	-213.01	0.00	213.01	7,622.33	1,900.82	11,027	10,069.24	0.09	-0.03	0.03
30.02	-65.04	-2.25	0.00	-212.96	0.00	212.96	7,621.83	1,900.64	11,025	10,067.60	0.09	-0.03	0.03
35.00	-61.59	-2.23	0.00	-201.77	0.00	201.77	7,501.03	1,856.78	10,522	9,677.52	0.13	-0.03	0.03
38.69	-60.95	-2.23	0.00	-193.54	0.00	193.54	7,498.09	1,855.72	10,510	9,668.17	0.15	-0.04	0.03
40.00	-58.55	-2.21	0.00	-190.62	0.00	190.62	7,465.86	1,844.18	10,380	9,566.25	0.16	-0.04	0.03
45.00	-56.21	-2.19	0.00	-179.57	0.00	179.57	7,341.18	1,800.14	9,890	9,179.95	0.21	-0.05	0.03
50.00	-53.92	-2.17	0.00	-168.60	0.00	168.60	7,213.88	1,756.10	9,412	8,798.15	0.26	-0.05	0.03
55.00	-51.68	-2.15	0.00	-157.74	0.00	157.74	7,083.96	1,712.05	8,946	8,421.09	0.32	-0.06	0.03
60.00	-51.25	-2.14	0.00	-147.01	0.00	147.01	6,951.42	1,668.01	8,492	8,049.01	0.38	-0.06	0.03
60.97	-48.06	-2.10	0.00	-144.93	0.00	144.93	6,925.39	1,659.46	8,405	7,977.39	0.39	-0.06	0.03
65.00	-45.16	-2.05	0.00	-136.48	0.00	136.48	6,816.24	1,623.97	8,049	7,682.15	0.44	-0.07	0.02
68.73	-44.68	-2.04	0.00	-128.83	0.00	128.83	5,796.47	1,430.05	7,074	6,526.94	0.50	-0.07	0.03
70.00	-42.78	-2.01	0.00	-126.24	0.00	126.24	5,768.66	1,420.18	6,977	6,450.44	0.52	-0.07	0.03
75.00	-40.94	-1.97	0.00	-116.19	0.00	116.19	5,657.44	1,381.32	6,600	6,151.49	0.59	-0.08	0.03
80.00	-39.14	-1.93	0.00	-106.33	0.00	106.33	5,543.60	1,342.46	6,234	5,856.63	0.68	-0.08	0.03
85.00	-37.39	-1.89	0.00	-96.66	0.00	96.66	5,427.13	1,303.60	5,878	5,566.11	0.77	-0.09	0.02
90.00	-36.37	-1.87	0.00	-87.20	0.00	87.20	5,308.04	1,264.74	5,533	5,280.17	0.86	-0.09	0.02
92.99	-35.20	-1.83	0.00	-81.62	0.00	81.62	5,235.56	1,241.49	5,332	5,111.44	0.92	-0.10	0.02
95.00	-32.54	-1.75	0.00	-77.93	0.00	77.93	5,186.33	1,225.87	5,198	4,999.05	0.97	-0.10	0.02
99.68	-32.45	-1.75	0.00	-69.74	0.00	69.74	3,857.01	969.12	4,061	3,681.17	1.07	-0.10	0.03
100.00	-31.10	-1.71	0.00	-69.18	0.00	69.18	3,851.71	967.13	4,045	3,668.51	1.07	-0.11	0.03
105.00	-29.79	-1.66	0.00	-60.65	0.00	60.65	3,767.41	936.05	3,789	3,471.96	1.19	-0.11	0.03
110.00	-28.52	-1.61	0.00	-52.34	0.00	52.34	3,680.49	904.96	3,541	3,278.28	1.31	-0.12	0.02
115.00	-27.28	-1.56	0.00	-44.27	0.00	44.27	3,590.95	873.87	3,302	3,087.70	1.43	-0.12	0.02
120.00	-26.32	-1.52	0.00	-36.46	0.00	36.46	3,498.78	842.79	3,072	2,900.48	1.56	-0.13	0.02
124.00	-22.19	-1.33	0.00	-30.37	0.00	30.37	3,423.15	817.92	2,893	2,753.28	1.67	-0.13	0.02
125.00	-21.93	-1.32	0.00	-29.04	0.00	29.04	3,403.98	811.70	2,849	2,716.85	1.70	-0.13	0.02
126.13	-20.35	-1.24	0.00	-27.54	0.00	27.54	3,382.19	804.67	2,800	2,675.87	1.73	-0.13	0.02
130.00	-19.67	-1.21	0.00	-22.73	0.00	22.73	3,304.60	780.61	2,635	2,535.56	1.84	-0.14	0.02
131.70	-19.19	-1.19	0.00	-20.67	0.00	20.67	2,974.75	719.74	2,443	2,297.47	1.89	-0.14	0.02
134.00	-14.32	-0.93	0.00	-17.94	0.00	17.94	2,935.54	706.63	2,355	2,225.52	1.96	-0.14	0.01
135.00	-13.34	-0.88	0.00	-17.01	0.00	17.01	2,918.31	700.93	2,317	2,194.45	1.99	-0.14	0.01
140.00	-12.39	-0.82	0.00	-12.63	0.00	12.63	2,830.61	672.43	2,133	2,041.16	2.14	-0.14	0.01
145.00	-8.92	-0.62	0.00	-8.51	0.00	8.51	2,725.98	643.93	1,956	1,881.59	2.29	-0.15	0.01
150.00	-8.28	-0.57	0.00	-5.44	0.00	5.44	2,605.33	615.43	1,787	1,717.91	2.45	-0.15	0.01
153.70	-7.75	-0.54	0.00	-3.31	0.00	3.31	2,516.05	594.34	1,666	1,601.59	2.56	-0.15	0.01
155.00	-4.13	-0.30	0.00	-2.61	0.00	2.61	2,484.68	586.93	1,625	1,561.69	2.60	-0.15	0.00
156.30	-3.36	-0.25	0.00	-2.22	0.00	2.22	2,453.31	579.52	1,584	1,522.29	2.64	-0.15	0.00
160.00	-3.32	-0.24	0.00	-1.30	0.00	1.30	2,364.03	558.43	1,471	1,412.90	2.76	-0.15	0.00
160.35	-2.42	-0.18	0.00	-1.22	0.00	1.22	2,355.57	556.43	1,461	1,402.75	2.77	-0.15	0.00
164.00	-1.76	-0.13	0.00	-0.55	0.00	0.55	2,267.51	535.63	1,353	1,299.24	2.89	-0.15	0.00
164.84	-1.74	-0.13	0.00	-0.44	0.00	0.44	1,876.06	444.14	1,137	1,091.91	2.91	-0.15	0.00
165.00	-1.31	-0.10	0.00	-0.42	0.00	0.42	1,873.71	443.39	1,133	1,088.70	2.92	-0.15	0.00
169.00	-0.28	-0.02	0.00	-0.02	0.00	0.02	1,798.04	424.73	1,040	1,000.34	3.04	-0.15	0.00

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (fr-kips)	Mu Mx (ft-kips)	Resultant Moment (ft-kips)	Phi Pn (kips)	Phi Vn (kips)	Phi Tn (kips)	Phi Mn (kips)	Total Deflect (in)	Rotation (deg)	Ratio
170.00	0.00	-0.02	0.00	0.00	0.00	0.00	1,778.30	420.07	1,017	978.39	3.08	-0.15	0.00

0.9D - 1.0Ev + 1.0Eh **Seismic (Reduced DL)**

CALCULATED FORCES

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (fr-kips)	Mu Mx (ft-kips)	Resultant Moment (ft-kips)	Phi Pn (kips)	Phi Vn (kips)	Phi Tn (kips)	Phi Mn (kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-57.22	-2.26	0.00	-278.72	0.00	278.72	8,295.02	2,165.08	14,306	12,493.79	0.00	0.00	0.03
5.00	-55.33	-2.26	0.00	-267.43	0.00	267.43	8,189.47	2,121.04	13,730	12,082.08	0.00	0.00	0.03
10.00	-53.48	-2.26	0.00	-256.11	0.00	256.11	8,081.29	2,076.99	13,166	11,673.09	0.01	-0.01	0.03
15.00	-51.67	-2.26	0.00	-244.79	0.00	244.79	7,970.49	2,032.95	12,614	11,267.07	0.02	-0.01	0.03
20.00	-49.89	-2.26	0.00	-233.47	0.00	233.47	7,857.06	1,988.91	12,073	10,864.26	0.04	-0.02	0.03
25.00	-48.16	-2.26	0.00	-222.16	0.00	222.16	7,741.01	1,944.87	11,544	10,464.90	0.06	-0.02	0.03
30.00	-48.15	-2.26	0.00	-210.89	0.00	210.89	7,622.33	1,900.82	11,027	10,069.24	0.09	-0.03	0.03
30.02	-44.87	-2.23	0.00	-210.84	0.00	210.84	7,621.83	1,900.64	11,025	10,067.60	0.09	-0.03	0.03
35.00	-42.49	-2.22	0.00	-199.71	0.00	199.71	7,501.03	1,856.78	10,522	9,677.52	0.12	-0.03	0.03
38.69	-42.05	-2.21	0.00	-191.54	0.00	191.54	7,498.09	1,855.72	10,510	9,668.17	0.15	-0.04	0.03
40.00	-40.40	-2.20	0.00	-188.64	0.00	188.64	7,465.86	1,844.18	10,380	9,566.25	0.16	-0.04	0.03
45.00	-38.78	-2.18	0.00	-177.66	0.00	177.66	7,341.18	1,800.14	9,890	9,179.95	0.21	-0.04	0.03
50.00	-37.20	-2.15	0.00	-166.77	0.00	166.77	7,213.88	1,756.10	9,412	8,798.15	0.26	-0.05	0.02
55.00	-35.65	-2.13	0.00	-155.99	0.00	155.99	7,083.96	1,712.05	8,946	8,421.09	0.31	-0.06	0.02
60.00	-35.36	-2.12	0.00	-145.35	0.00	145.35	6,951.42	1,668.01	8,492	8,049.01	0.37	-0.06	0.02
60.97	-33.16	-2.08	0.00	-143.29	0.00	143.29	6,925.39	1,659.46	8,405	7,977.39	0.39	-0.06	0.02
65.00	-31.16	-2.03	0.00	-134.92	0.00	134.92	6,816.24	1,623.97	8,049	7,682.15	0.44	-0.07	0.02
68.73	-30.82	-2.02	0.00	-127.34	0.00	127.34	5,796.47	1,430.05	7,074	6,526.94	0.49	-0.07	0.03
70.00	-29.52	-1.99	0.00	-124.77	0.00	124.77	5,768.66	1,420.18	6,977	6,450.44	0.51	-0.07	0.02
75.00	-28.24	-1.95	0.00	-114.82	0.00	114.82	5,657.44	1,381.32	6,600	6,151.49	0.59	-0.08	0.02
80.00	-27.00	-1.91	0.00	-105.05	0.00	105.05	5,543.60	1,342.46	6,234	5,856.63	0.67	-0.08	0.02
85.00	-25.80	-1.87	0.00	-95.48	0.00	95.48	5,427.13	1,303.60	5,878	5,566.11	0.76	-0.09	0.02
90.00	-25.09	-1.85	0.00	-86.12	0.00	86.12	5,308.04	1,264.74	5,533	5,280.17	0.86	-0.09	0.02
92.99	-24.29	-1.81	0.00	-80.60	0.00	80.60	5,235.56	1,241.49	5,332	5,111.44	0.91	-0.10	0.02
95.00	-22.45	-1.73	0.00	-76.96	0.00	76.96	5,186.33	1,225.87	5,198	4,999.05	0.96	-0.10	0.02
99.68	-22.39	-1.73	0.00	-68.85	0.00	68.85	3,857.01	969.12	4,061	3,681.17	1.06	-0.10	0.03
100.00	-21.46	-1.69	0.00	-68.30	0.00	68.30	3,851.71	967.13	4,045	3,668.51	1.06	-0.10	0.02
105.00	-20.55	-1.64	0.00	-59.87	0.00	59.87	3,767.41	936.05	3,789	3,471.96	1.17	-0.11	0.02
110.00	-19.67	-1.59	0.00	-51.67	0.00	51.67	3,680.49	904.96	3,541	3,278.28	1.29	-0.12	0.02
115.00	-18.82	-1.54	0.00	-43.70	0.00	43.70	3,590.95	873.87	3,302	3,087.70	1.42	-0.12	0.02
120.00	-18.15	-1.50	0.00	-35.98	0.00	35.98	3,498.78	842.79	3,072	2,900.48	1.55	-0.13	0.02
124.00	-15.31	-1.31	0.00	-29.97	0.00	29.97	3,423.15	817.92	2,893	2,753.28	1.66	-0.13	0.02
125.00	-15.13	-1.30	0.00	-28.66	0.00	28.66	3,403.98	811.70	2,849	2,716.85	1.68	-0.13	0.02
126.13	-14.04	-1.23	0.00	-27.18	0.00	27.18	3,382.19	804.67	2,800	2,675.87	1.72	-0.13	0.01
130.00	-13.57	-1.19	0.00	-22.43	0.00	22.43	3,304.60	780.61	2,635	2,535.56	1.82	-0.14	0.01
131.70	-13.24	-1.17	0.00	-20.40	0.00	20.40	2,974.75	719.74	2,443	2,297.47	1.87	-0.14	0.01
134.00	-9.88	-0.92	0.00	-17.71	0.00	17.71	2,935.54	706.63	2,355	2,225.52	1.94	-0.14	0.01
135.00	-9.20	-0.87	0.00	-16.79	0.00	16.79	2,918.31	700.93	2,317	2,194.45	1.97	-0.14	0.01
140.00	-8.55	-0.81	0.00	-12.46	0.00	12.46	2,830.61	672.43	2,133	2,041.16	2.12	-0.14	0.01
145.00	-6.15	-0.61	0.00	-8.40	0.00	8.40	2,725.98	643.93	1,956	1,881.59	2.27	-0.14	0.01
150.00	-5.71	-0.57	0.00	-5.37	0.00	5.37	2,605.33	615.43	1,787	1,717.91	2.42	-0.15	0.01
153.70	-5.35	-0.53	0.00	-3.27	0.00	3.27	2,516.05	594.34	1,666	1,601.59	2.53	-0.15	0.00
155.00	-2.85	-0.30	0.00	-2.57	0.00	2.57	2,484.68	586.93	1,625	1,561.69	2.57	-0.15	0.00
156.30	-2.32	-0.24	0.00	-2.19	0.00	2.19	2,453.31	579.52	1,584	1,522.29	2.61	-0.15	0.00
160.00	-2.29	-0.24	0.00	-1.28	0.00	1.28	2,364.03	558.43	1,471	1,412.90	2.73	-0.15	0.00
160.35	-1.67	-0.18	0.00	-1.20	0.00	1.20	2,355.57	556.43	1,461	1,402.75	2.74	-0.15	0.00
164.00	-1.21	-0.13	0.00	-0.55	0.00	0.55	2,267.51	535.63	1,353	1,299.24	2.85	-0.15	0.00
164.84	-1.20	-0.13	0.00	-0.44	0.00	0.44	1,876.06	444.14	1,137	1,091.91	2.88	-0.15	0.00
165.00	-0.91	-0.10	0.00	-0.42	0.00	0.42	1,873.71	443.39	1,133	1,088.70	2.89	-0.15	0.00
169.00	-0.19	-0.02	0.00	-0.02	0.00	0.02	1,798.04	424.73	1,040	1,000.34	3.01	-0.15	0.00
170.00	0.00	-0.02	0.00	0.00	0.00	0.00	1,778.30	420.07	1,017	978.39	3.04	-0.15	0.00

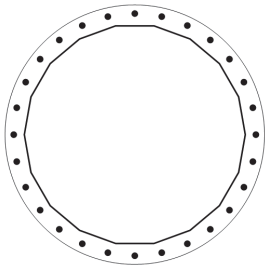
ANALYSIS SUMMARY

	Reactions						Max Usage	
Load Case	Shear FX (kips)	Shear FZ (kips)	Axial FY (kips)	Moment MX (ft-kips)	Moment MY (ft-kips)	Moment MZ (ft-kips)	Elev (ft)	Interaction Ratio
1.2D + 1.0W	40.46	0.00	82.75	0.00	0.00	4607.13	0.00	0.38
0.9D + 1.0W	40.44	0.00	62.05	0.00	0.00	4578.23	0.00	0.37
1.2D + 1.0Di + 1.0Wi	11.25	0.00	102.56	0.00	0.00	1250.32	0.00	0.11
1.2D + 1.0Ev + 1.0Eh	2.27	0.00	82.93	0.00	0.00	281.06	0.00	0.03
0.9D - 1.0Ev + 1.0Eh	2.26	0.00	57.22	0.00	0.00	278.72	0.00	0.03
1.0D + 1.0W	9.36	0.00	68.98	0.00	0.00	1061.52	0.00	0.09

BASE PLATE ANALYSIS @ 0 FT

PLATE PARAMETERS (ID# 5320)

Diameter:	87.4	in
Shape:	Round	
Thickness:	3	in
Grade:	A572-50	
Yield Strength:	50	ksi
Tensile Strength:	65	ksi
Rod Detail Type:	d	
Clear Distance	4.125	in
Base Weld Size:	0.125	in
Orientation Offset:	-	°
Analysis Type:	Plastic	
Neutral Axis:	122	°



ANCHOR ROD PARAMETERS

Class	Arrangement	Quantity	Diameter (in)	Circle (in)	Grade	Fy (ksi)	Fu (ksi)	Spacing (in)	Offset (°)
Original [ID# 966]	Radial	28	2.25	81.56	A615-75	75	100	-	-

ANCHOR ROD GEOMETRY AND APPLIED LOADS --- ORIGINAL (28) 2.25"ø [ID 966]

Position	Radians	X (in)	Y (in)	Moment Arm (in)	Inertia (in^4)	Axial Load (k)	Shear Load (k)
1	0.224	39.76	9.07	-37.285	4515.707	-72.51	0.74
2	0.449	36.74	17.69	-39.230	4999.070	-72.51	0.25
3	0.673	31.88	25.43	-39.208	4993.457	-72.51	0.26
4	0.898	25.43	31.88	-37.220	4499.979	-72.51	0.75
5	1.122	17.69	36.74	-33.366	3616.381	-72.51	1.21
6	1.346	9.07	39.76	-27.838	2517.662	-72.51	1.61
7	1.571	0.00	40.78	-20.915	1421.445	-72.51	1.92
8	1.795	-9.07	39.76	-12.942	544.842	-72.51	2.14
9	2.020	-17.69	36.74	-4.321	61.482	-72.51	2.25
10	2.244	-25.43	31.88	4.517	67.095	84.33	2.25
11	2.468	-31.88	25.43	13.128	560.571	84.33	2.14
12	2.693	-36.74	17.69	21.081	1444.174	84.33	1.92
13	2.917	-39.76	9.07	27.977	2542.888	84.33	1.60
14	3.142	-40.78	0.00	33.470	3639.109	84.33	1.20
15	3.366	-39.76	-9.07	37.285	4515.708	84.33	0.74
16	3.590	-36.74	-17.69	39.230	4999.070	84.33	0.25
17	3.815	-31.88	-25.43	39.208	4993.456	84.33	0.26
18	4.039	-25.43	-31.88	37.220	4499.978	84.33	0.75
19	4.264	-17.69	-36.74	33.366	3616.379	84.33	1.21
20	4.488	-9.07	-39.76	27.838	2517.660	84.33	1.61
21	4.712	0.00	-40.78	20.915	1421.444	84.33	1.92
22	4.937	9.07	-39.76	12.942	544.844	84.33	2.14
23	5.161	17.69	-36.74	4.321	61.481	84.33	2.25
24	5.386	25.43	-31.88	-4.517	67.095	-72.51	2.25
25	5.610	31.88	-25.43	-13.128	560.572	-72.51	2.14
26	5.834	36.74	-17.69	-21.081	1444.171	-72.51	1.92
27	6.059	39.76	-9.07	-27.977	2542.890	-72.51	1.60
28	6.283	40.78	0.00	-33.470	3639.106	-72.51	1.20

REACTION DISTRIBUTION

Component	ID	Moment Mu (k-ft)	Axial Load Pu (k)	Shear Vu (k)	Moment Factor
Pole	73.69"ø x 0.5313" (18 Sides)	4607.1	82.75	40.46	1.000
Bolt Group	Original (28) 2.25"ø	4607.1	-	40.46	1.000
	TOTALS	**4607.13**	**82.75**	**40.46**	

COMPONENT PROPERTIES

Component	ID	Gross Area (in^2)	Net Area (in^2)	Individual Inertia (in^4)	Moment of Inertia (in^4)	Threads/in
Pole	73.69"ø x 0.5313" (18 Sides)	121.4922	-	-	81292.75	-
Bolt Group	Original (28) 2.25"ø	3.9761	3.2477	0.8393	70847.72	4.5

EXTERNAL BASE PLATE BEND LINE ANALYSIS @ 0 FT

POLE PROPERTIES

Flat-to-Flat Diameter:	73.82	in
Point-to-Point Diameter:	74.95	in
Flat Width:	13.016	in
Flat Radians:	0.349	rad

PLATE PROPERTIES

Neutral Axis:	122	°
Bend Line Lower Limit:	3.249	rad
Bend Line Upper Limit:	4.156	rad

Bend Line	Chord Length (in)	Additional Length (in)	Section Modulus (in^3)	Applied Moment Mu (k-in)	Moment Capacity ϕMn (k-in)	Ratio
Flat	42.046	0.00	94.603	540.4	4257.1	0.127
Corner	39.981	0.00	89.956	356.7	4048.0	0.088
Circumferential	49.765	0.00	111.972	795.1	5038.7	0.158

PLASTIC ANCHOR ROD ANALYSIS

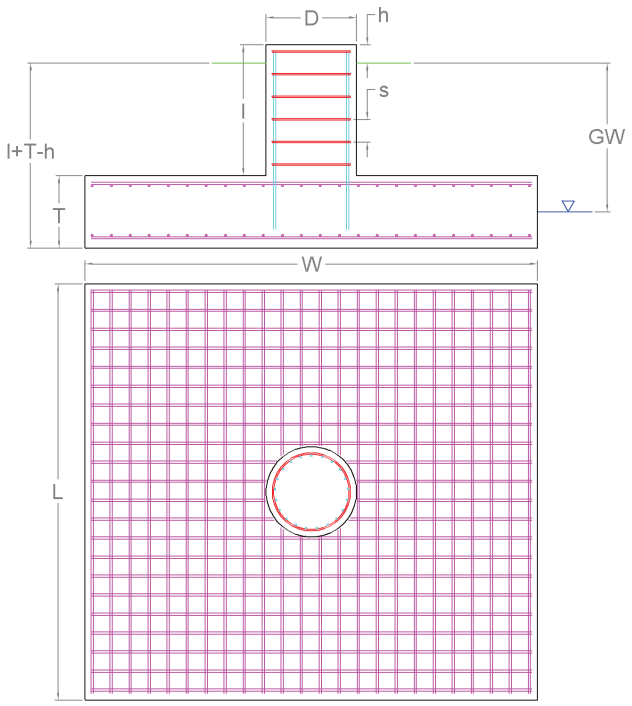
Class	Group Quantity	Rod Diameter (in)	Applied Axial Load Pu (k)	Applied Shear Load Vu (k)	Compressive Capacity ϕPn (k)	Ratio
Original	28	2.25	84.3	2.3	243.6	0.365

Monolithic Mat Foundation Analysis (ANSI/TIA-222-H)

Foundation & Tower Parameters			
Ignore Mat Rebar?		N	
Ignore Pier Rebar?		N	
Foundation has Pier(s)?		Y	
Pier Shape		Round	
Pier Diameter	*D*	9	ft
Pier Height Above Ground	*h*	0.5	ft
Pier Length	*l*	4	ft
Mat Base Depth	*l+T-h*	6	ft
Mat Length	*L*	33	ft
Mat Width	*W*	33	ft
Mat Thickness	*T*	2.5	ft
Unit Weight of Concrete		150	pcf
Tower Eccentricity	ecc	0	ft
Tower Face Width	FW	6.14	ft
Tower Leg Count		1	

Soil Parameters			
Water Table Depth [BGL]	*GW*	11	ft
Unit Weight of Soil		125	pcf
Unit Weight of Soil [Submerged]		62.6	pcf
Shear Friction Coefficient		0.5	
Ultimate Bearing Pressure		7,500	psf
Bearing Pressure Type		Net	
Conical Failure Angle		15	°
Capacity Increase (Transient Loads)		1.00	
Soil Strength Reduction Factor, ϕ_s		0.75	
Dead Load Factor		1.2	

Reactions		
Moment, M_u	4,607.13	k-ft
Shear, V_u	40.46	k
Axial, P_u	82.75	k
Uplift, T_u	0	k
Tower Weight	82.75	k
Tower Dead Load Factor	0.9	



Soil Capacities		
Design Moment, M_u	4,870.12	k-ft
Nominal Moment Capacity, $\phi_m M_n$	14,863.34	k-ft
$M_u / \phi_s M_n$	**32.8%**	
Net Bearing Pressure	1,199	k
Nominal Bearing Capacity, $\phi_b P_n$	6,188	k
Bearing Pressure Controlling Load Direction	Diagonal to Pad Edge	
$P_u / \phi_s P_n$	**19.4%**	
Ultimate Friction Resistance	482.05	k
Ultimate Passive Pressure Resistance	48.98	k
Nominal Shear Capacity, $\phi_s V_n$	398.28	k
$V_u / \phi_s V_n$	**10.0%**	

Mat Reinforcement Parameters		
Concrete Compressive Strength, f'_c	3,000	psi
Mat Rebar Quantity [Lower]	56	
Mat Rebar Size # [Lower]	9	
Mat Single Rebar Area [Lower]	1	in^2
Mat Rebar Quantity [Upper]	56	
Mat Rebar Size # [Upper]	9	
Mat Single Rebar Area [Upper]	1	in^2
Mat Rebar Yield Strength, F_y	60	ksi
Mat Clear Cover	3	in
Bending Reduction Factor, ϕ_B	0.9	
Shear Reduction Factor, ϕ_V	0.75	
Compression Reduction Factor, ϕ_C	0.65	
Steel Elastic Modulus	29,000	ksi

Mat Reinforcement Capacities		
Compression Zone Factor, β_1	0.85	
Lower Reinforcement Spacing	7.08	in
Upper Reinforcement Spacing	7.08	in
One Way Design Shear, V_u	125.02	k
One Way Shear Capacity, ϕV_c	850.93	k
One Way Shear Controlling Load Direction	Diagonal to Pad Edge	
$V_u / \phi V_c$	**14.7%**	
Punching Design Shear Stress, v_u	55.09	psi
Punching Shear Capacity, $\phi_c V_n$	164.32	psi
$v_u / \phi_c V_n$	**33.5%**	
Moment Transfer Effective Flexural Width, $_f$	16.5	in
Neutral Axis Depth	3.44	In
Moment Transfer Flexural Capacity, $\phi M_{sc,f}$	38,181.27	k-in
$\gamma_f M_{sc} / \phi M_{sc,f}$	**0.0%**	
Flexure Due to Soil Pressure, M_u	1,996.5	k-ft
Lower Steel Mat Moment Capacity, ϕM_n	6,164.14	k-ft
Flexural Steel Controlling Load Direction	Parallel to Pad Edge	
$M_u / \phi M_n$	**32.4%**	
Flexure Due to Uplift, M_u	1,865.63	k-ft
Upper Steel Mat Moment Capacity, ϕM_n	6,164.14	k-ft
$M_u / \phi M_n$	**30.3%**	

Pier Reinforcement Parameters			
Concrete Compressive Strength (f'_c)		3,000	psi
Pier Rebar Quantity		48	
Pier Rebar Size #		10	
Pier Single Rebar Area		1.27	in^2
Pier Rebar Yield Strength (F_y)		60	ksi
Tie Rebar Size #		5	
Tie Rebar Area (Single)		0.31	in^2
Tie Rebar Spacing	*s*	6	in
Tie Rebar Yield Strength (F_y)		60	ksi
Rebar Cage Diameter		99.5	in

Pier Reinforcement Capacities		
Design Moment (M_u)	4,768.97	k-ft
Nominal Moment Capacity ($\phi_B M_n$)	13,347.04	k-ft
$M_u / \phi_B M_n$	**35.7%**	
Design Shear (V_u)	40.46	k
Nominal Shear Capacity ($\phi_V V_n$)	1,157.8	k
$V_u / \phi_V V_n$	**3.5%**	
Design Compression (P_u)	82.75	k
Nominal Compression Capacity ($\phi_P P_n$)	12,106.12	k
$P_u / \phi_P P_n$	**0.7%**	
Pier Reinforcement Ratio	0	-
$M_u / \phi_B M_n + T_u / \phi_T T_n$	**35.7%**	

March 29, 2022

SAI Communications
12 Industrial Way
Salem NH, 03079

RE:

Site Number:	CT3459
FA Number:	10578304
PACE Number:	MRCTB057274
PT Number:	2051A12D7W
Site Name:	CHESHIRE WATER TREATMENT FACILITY
Site Address:	1325 Cheshire Street Cheshire, CT 06410

To Whom It May Concern:

Hudson Design Group LLC (HDG) has been authorized by SAI Communications to perform a mount analysis on the existing AT&T antenna/RRH mounts to determine their capability of supporting the following additional loading:

- (3) TPA-65R-BU8DA-K Antennas (96.0"x20.7"x7.7" – Wt. = 87 lbs. /each)
- (3) DMP65R-BU8DA-K Antennas (96.0"x20.7"x7.7" – Wt. = 119 lbs. /each)
- (3) 4478 B14 RRH's (18.1"x13.4"x8.3" – Wt. = 60 lbs. /each)
- (3) 4415 B30 RRH's (16.5"x13.4"x5.9" – Wt. = 46 lbs. /each)
- (3) 4449 B5/B12 RRH's (17.9"x13.2"x9.4" – Wt. = 73 lbs. /each)
- (3) 8843 B2/B66A RRH's (14.9"x13.2"x10.9" – Wt. = 72 lbs. /each)
- (1) DC9-48-60-24-8C-EV Surge Arrestor (31.4"x10.2"Ø – Wt. = 29 lbs.)
- **(3) AIR6419 Antennas (31.1"x16.1"x7.3" – Wt. = 66 lbs. /each)**
- **(3) AIR6449 Antennas (30.6"x15.9"x10.6" – Wt. 82 lbs. /each)**
- **(1) DC9-48-60-24-8C-EV Surge Arrestor (31.4"x10.2"Ø – Wt. = 29 lbs.)**

**Proposed equipment shown in bold*

Mount fabrication drawings prepared by SitePro1, P/N VFA12-M3-WLL, dated October 29, 2018, were used to perform this analysis. HDG conducted a ground audit of the existing AT&T antenna mounts on February 10, 2022.

Mount Analysis Methods:

- This analysis was conducted in accordance with EIA/TIA-222-H, Structural Standards for Steel Antenna Towers and Antenna Supporting Structures, the International Building Code 2015 with 2018 Connecticut State Building Code, and AT&T Mount Technical Directive – R16.
- HDG considers this mount to be asymmetrical and has applied wind loads in 30 degree increments all around the mount. Per TIA-222-H and Appendix N of the Connecticut State Building Code, the max basic wind speed for this site is equal to 125 mph with a max basic wind speed with ice of 50 mph and a max ice thickness of 1.5 in. An escalated ice thickness of 1.75 in was used for this analysis.
- HDG considers this site to be exposure category C; tower is located near large, flat, open, terrain/grasslands.
- HDG considers this site to be topographic category 1; tower is located on flat terrain or the bottom of a hill or ridge.
- HDG considers this site to have a spectral response acceleration parameter at short periods, S_S, of 0.185 and a spectral response acceleration parameter at a period of 1 second, S_1, of 0.063.
- The mount has been analyzed with load combinations consisting of 500 lbs live load using a service wind speed of 30 mph wind on the worst case antenna. Analysis performed on each antenna pipe to determine worst case location; worst case location was antenna position 1.
- The mount has been analyzed with load combinations consisting of a 250 lbs live load in a worst case location on the mount.
- The existing mounts are secured to the existing monopole with ring mounts and threaded rods. HDG considers the threaded rods to be the governing connection member.

Based on our evaluation, we have determined that the existing mounts **ARE CAPABLE** of supporting the proposed installation.

	Component	Controlling Load Case	Stress Ratio	Pass/Fail
Existing Mount Rating	7	LC2	89%	**PASS**

Reference Documents:

- Fabrication drawings prepared by SitePro1, P/N VFA12-M3-WLL, dated October 29, 2018.

This determination was based on the following limitations and assumptions:

1. HDG is not responsible for any modifications completed prior to and hereafter which HDG was not directly involved.
2. All structural members and their connections are assumed to be in good condition and are free from defects with no deterioration to its member capacities.
3. All antennas, coax cables and waveguide cables are assumed to be properly installed and supported as per the manufacturer's requirements.
4. The existing mount has been adequately secured to the tower structure per the mount manufacturer's specifications.
5. All components pertaining to AT&T's mounts must be tightened and re-plumbed prior to the installation of new appurtenances.
6. HDG performed a localized analysis on the mount itself and not on the supporting tower structure.

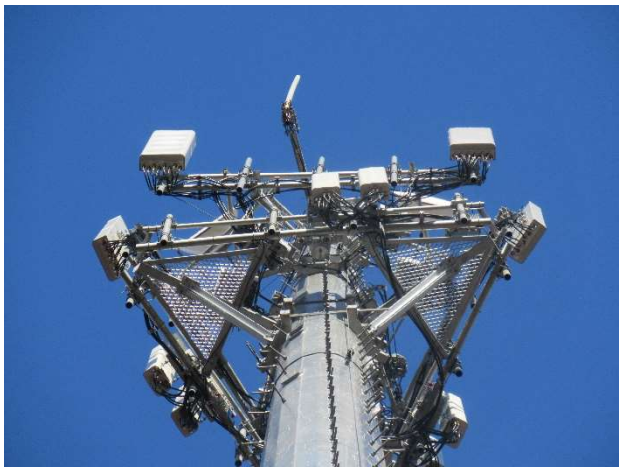
Please feel free to contact our office should you have any questions.

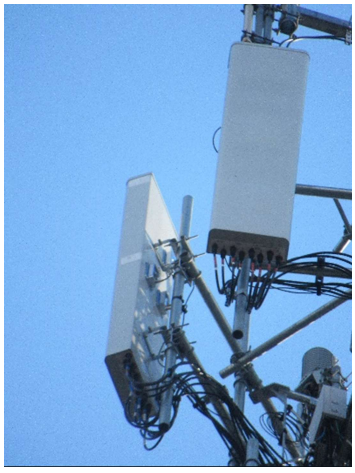
Respectfully Submitted,
Hudson Design Group LLC

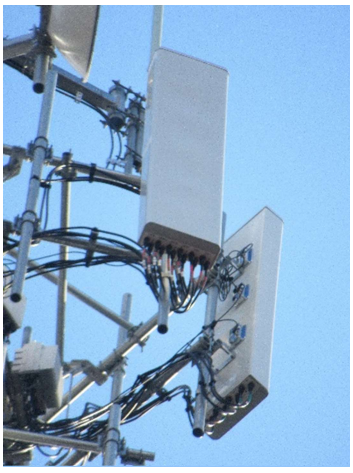
Michael Cabral
Vice President

Daniel P. Hamm, PE
Principal

FIELD PHOTOS:







HUDSON
Design Group LLC

Wind & Ice
Calculations

Date: 3/29/2022
Project Name: CHESHIRE WATER TREATMENT FACILITY
Project No.: CT3459
Designed By: CL **Checked By:** MSC

HUDSON Design Group LLC

2.6.5.2 Velocity Pressure Coeff:

$K_z = 2.01\ (z/z_g)^{2/\alpha}$

z=	155	(ft)
z_g=	900	(ft)
α=	9.5	
K_z=	**1.388**	

Kzmin ≤ Kz ≤ 2.01

Table 2-4

Exposure	Z_g	α	K_{zmin}	K_c
B	1200 ft	7.0	0.70	0.9
C	900 ft	9.5	0.85	1.0
D	700 ft	11.5	1.03	1.1

2.6.6.2 Topographic Factor:

Table 2-5

Topo. Category	K_t	f
2	0.43	1.25
3	0.53	2.0
4	0.72	1.5

$K_{zt} = [1+(K_c\ K_t/K_h)]^2$ $K_h = e^{(f*z/H)}$

K_{zt}=	**1**	
K_h=	1	
K_c=	1	(from Table 2-4)
K_t=	0	(from Table 2-5)
f=	0	(from Table 2-5)
Category=	1	
z=	155	
z_s=	109	(Mean elevation of base of structure above sea level)
H=	0	(Ht. of the crest above surrounding terrain)
K_{zt}=	1.00	(from 2.6.6.2.1)
K_e=	1.00	(from 2.6.8)

(If Category 1 then K_{zt} =1.0)

2.6.10 Design Ice Thickness

Max Ice Thickness = t_i = 1.50 in
Importance Factor = I= 1.0 (from Table 2-3)
K_{iz} = 1.17 (from Sec. 2.6.10)

$t_{iz} = t_i * I * K_{iz} * (K_{zt})^{0.35}$ t_{iz} = 1.75 in

Date: 3/29/2022
Project Name: CHESHIRE WATER TREATMENT FACILITY
Project No.: CT3459
Designed By: CL Checked By: MSC

HUDSON Design Group LLC

2.6.9 Gust Effect Factor

2.6.9.1 Self Supporting Lattice Structures

G_h = 1.0 Latticed Structures > 600 ft

G_h = 0.85 Latticed Structures 450 ft or less

G_h = 0.85 + 0.15 [h/150 - 3.0] h= ht. of structure

h=	170	G_h=	0.85

2.6.9.2 Guyed Masts G_h= 0.85

2.6.9.3 Pole Structures G_h= 1.1

2.6.9 Appurtenances G_h= 1.0

2.6.9.4 Structures Supported on Other Structures

(Cantilivered tubular or latticed spines, pole, structures on buildings (ht. : width ratio > 5)

G_h=	1.35	**Gh=**	**1.00**

2.6.11.2 Design Wind Force on Appurtenances

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

q_z= $0.00256 * K_z * K_{zt} * K_s * K_e * K_d * V_{max}^2$

		K_z=	1.388	(from 2.6.5.2)
		K_{zt}=	1.0	(from 2.6.6.2.1)
		K_s=	1.0	(from 2.6.7)
q_z=	**52.53**	K_e=	1.00	(from 2.6.8)
$q_{z\,(ice)}$=	**8.41**	K_d=	0.95	(from Table 2-2)
$q_{z\,(30)}$=	**3.03**	V_{max}=	125	mph (Ultimate Wind Speed)
		$V_{max\,(ice)}$=	50	mph
		V_{30}=	30	mph

Table 2-2

Structure Type	Wind Direction Probability Factor, Kd
Latticed structures with triangular, square or rectangular cross sections	0.85
Tubular pole structures, latticed structures with other cross sections, appurtenances	0.95
Tubular pole structures supporting antennas enclosed within a cylindrical shroud	1.00

Date: 3/29/2022
Project Name: CHESHIRE WATER TREATMENT FACILITY
Project No.: CT3459
Designed By: CL Checked By: MSC

HUDSON Design Group LLC

Determine Ca:

Table 2-9

Force Coefficients (Ca) for Appurtenances				
Member Type		Aspect Ratio ≤ 2.5	Aspect Ratio = 7	Aspect Ratio ≥ 25
		Ca	Ca	Ca
Flat		1.2	1.4	2.0
Square/Rectangular HSS		1.2 - 2.8(r_s) ≥ 0.85	1.4 - 4.0(r_s) ≥ 0.90	2.0 - 6.0(r_s) ≥ 1.25
Round	C < 39 (Subcritical)	0.7	0.8	1.2
	39 ≤ C ≤ 78 (Transitional)	$4.14/(C^{0.485})$	$3.66/(C^{0.415})$	$46.8/(C^{1.0})$
	C > 78 (Supercritical)	0.5	0.6	0.6

Aspect Ratio is the overall length/width ratio in the plane normal to the wind direction.
(Aspect ratio is independent of the spacing between support points of a linear appurtenance,

Note: Linear interpolation may be used for aspect ratios other than those shown.

Ice Thickness = 1.75 in | **Angle =** 0 (deg) | **Equivalent Angle =** 180 (deg)

Appurtenances	Height	Width	Depth	Flat Area	Aspect Ratio	Ca	Force (lbs)	Force (lbs) (w/ Ice)	Force (lbs) (30 mph)
TPA-65R-BU8DA-K Antenna	96.0	20.7	7.7	13.80	4.64	1.30	939	182	54
DMP65R-BU8DA-K Antenna	96.0	20.7	7.7	13.80	4.64	1.30	939	182	54
AIR6419 Antenna	31.1	16.1	7.3	3.48	1.93	1.20	219	48	13
AIR6449 Antenna	30.6	15.9	10.6	3.38	1.92	1.20	213	46	12
4478 B14 RRH	18.1	8.3	13.4	1.04	2.18	1.20	66	18	4
4415 B30 RRH	16.5	5.9	13.4	0.68	2.80	1.21	43	13	2
4449 B5/B12 RRH	17.9	9.4	13.2	1.17	1.90	1.20	74	19	4
8843 B2/B66A RRH	14.9	10.9	13.2	1.13	1.37	1.20	71	19	4
DC9-48-60-24-8C-EV Surge Arrestor	31.4	10.2	10.2	2.22	3.08	0.70	82	20	5
HSS 4x4	4.0	12.0		0.33	0.33	2.00	35		
5/8" Round Bar	0.6	12.0		0.05	0.05	1.20	3		
3/4" Round Bar	0.8	12.0		0.06	0.06	1.20	4		
2" Pipe	2.4	12.0		0.20	0.20	1.20	13		
2-1/2" Pipe	2.9	12.0		0.24	0.24	1.20	15		
PL 3-1/2x5/8"	0.6	12.0		0.05	0.05	2.00	5		
PL 11-1/4x5/8"	0.6	12.0		0.05	0.05	2.00	5		

Date: 3/29/2022
Project Name: CHESHIRE WATER TREATMENT FACILITY
Project No.: CT3459
Designed By: CL Checked By: MSC

HUDSON Design Group LLC

WIND LOADS

Angle =	30	(deg)	Ice Thickness =	1.75	in.	Equivalent Angle =	210	(deg)

WIND LOADS WITH NO ICE:

Appurtenances	Height	Width	Depth	Flat Area (normal)	Flat Area (side)	Aspect Ratio	Aspect Ratio	Ca (normal)	Ca (side)	Force (lbs) (normal)	Force (lbs) (side)	Force (lbs) (angle)
TPA-65R-BU8DA-K Antenna	96.0	20.7	7.7	13.80	5.13	4.64	12.47	1.30	1.58	939	427	811
DMP65R-BU8DA-K Antenna	96.0	20.7	7.7	13.80	5.13	4.64	12.47	1.30	1.58	939	427	811
AIR6419 Antenna	31.1	16.1	7.3	3.48	1.58	1.93	4.26	1.20	1.28	219	106	191
AIR6449 Antenna	30.6	15.9	10.6	3.38	2.25	1.92	2.89	1.20	1.22	213	144	196
4478 B14 RRH	18.1	8.3	13.4	1.04	1.68	2.18	1.35	1.20	1.20	66	106	76
4415 B30 RRH	16.5	5.9	13.4	0.68	1.54	2.80	1.23	1.21	1.20	43	97	57
4449 B5/B12 RRH	17.9	9.4	13.2	1.17	1.64	1.90	1.36	1.20	1.20	74	103	81
8843 B2/B66A RRH	14.9	10.9	13.2	1.13	1.37	1.37	1.13	1.20	1.20	71	86	75

WIND LOADS WITH ICE:

TPA-65R-BU8DA-K Antenna	99.5	24.2	11.2	16.72	7.74	4.11	8.88	1.27	1.46	179	95	158
DMP65R-BU8DA-K Antenna	99.5	24.2	11.2	16.72	7.74	4.11	8.88	1.27	1.46	179	95	158
AIR6419 Antenna	34.6	19.6	10.8	4.71	2.60	1.77	3.20	1.20	1.23	48	27	42
AIR6449 Antenna	34.1	19.4	14.1	4.59	3.34	1.76	2.42	1.20	1.20	46	34	43
4478 B14 RRH	21.6	11.8	16.9	1.77	2.54	1.83	1.28	1.20	1.20	18	26	20
4415 B30 RRH	20.0	9.4	16.9	1.31	2.35	2.13	1.18	1.20	1.20	13	24	16
4449 B5/B12 RRH	21.4	12.9	16.7	1.92	2.48	1.66	1.28	1.20	1.20	19	25	21
8843 B2/B66A RRH	18.4	14.4	16.7	1.84	2.13	1.28	1.10	1.20	1.20	19	22	19

WIND LOADS AT 30 MPH:

TPA-65R-BU8DA-K Antenna	96.0	20.7	7.7	13.80	5.13	4.64	12.47	1.30	1.58	54	25	47
DMP65R-BU8DA-K Antenna	96.0	20.7	7.7	13.80	5.13	4.64	12.47	1.30	1.58	54	25	47
AIR6419 Antenna	31.1	16.1	7.3	3.48	1.58	1.93	4.26	1.20	1.28	13	6	11
AIR6449 Antenna	30.6	15.9	10.6	3.38	2.25	1.92	2.89	1.20	1.22	12	8	11
4478 B14 RRH	18.1	8.3	13.4	1.04	1.68	2.18	1.35	1.20	1.20	4	6	4
4415 B30 RRH	16.5	5.9	13.4	0.68	1.54	2.80	1.23	1.21	1.20	2	6	3
4449 B5/B12 RRH	17.9	9.4	13.2	1.17	1.64	1.90	1.36	1.20	1.20	4	6	5
8843 B2/B66A RRH	14.9	10.9	13.2	1.13	1.37	1.37	1.13	1.20	1.20	4	5	4

Date: 3/29/2022
Project Name: CHESHIRE WATER TREATMENT FACILITY
Project No.: CT3459
Designed By: CL Checked By: MSC

HUDSON Design Group LLC

WIND LOADS

Angle =	60	(deg)	Ice Thickness =	1.75	in.	Equivalent Angle =	240	(deg)

WIND LOADS WITH NO ICE:

Appurtenances	Height	Width	Depth	Flat Area (normal)	Flat Area (side)	Ratio (normal)	Ratio (side)	Ca (normal)	Ca (side)	Force (lbs) (normal)	Force (lbs) (side)	Force (lbs) (angle)
TPA-65R-BU8DA-K Antenna	96.0	20.7	7.7	13.80	5.13	4.64	12.47	1.30	1.58	939	427	555
DMP65R-BU8DA-K Antenna	96.0	20.7	7.7	13.80	5.13	4.64	12.47	1.30	1.58	939	427	555
AIR6419 Antenna	31.1	16.1	7.3	3.48	1.58	1.93	4.26	1.20	1.28	219	106	134
AIR6449 Antenna	30.6	15.9	10.6	3.38	2.25	1.92	2.89	1.20	1.22	213	144	161
4478 B14 RRH	18.1	8.3	13.4	1.04	1.68	2.18	1.35	1.20	1.20	66	106	96
4415 B30 RRH	16.5	5.9	13.4	0.68	1.54	2.80	1.23	1.21	1.20	43	97	83
4449 B5/B12 RRH	17.9	9.4	13.2	1.17	1.64	1.90	1.36	1.20	1.20	74	103	96
8843 B2/B66A RRH	14.9	10.9	13.2	1.13	1.37	1.37	1.13	1.20	1.20	71	86	82

WIND LOADS WITH ICE:

TPA-65R-BU8DA-K Antenna	99.5	24.2	11.2	16.72	7.74	4.11	8.88	1.27	1.46	179	95	116
DMP65R-BU8DA-K Antenna	99.5	24.2	11.2	16.72	7.74	4.11	8.88	1.27	1.46	179	95	116
AIR6419 Antenna	34.6	19.6	10.8	4.71	2.60	1.77	3.20	1.20	1.23	48	27	32
AIR6449 Antenna	34.1	19.4	14.1	4.59	3.34	1.76	2.42	1.20	1.20	46	34	37
4478 B14 RRH	21.6	11.8	16.9	1.77	2.54	1.83	1.28	1.20	1.20	18	26	24
4415 B30 RRH	20.0	9.4	16.9	1.31	2.35	2.13	1.18	1.20	1.20	13	24	21
4449 B5/B12 RRH	21.4	12.9	16.7	1.92	2.48	1.66	1.28	1.20	1.20	19	25	24
8843 B2/B66A RRH	18.4	14.4	16.7	1.84	2.13	1.28	1.10	1.20	1.20	19	22	21

WIND LOADS AT 30 MPH:

TPA-65R-BU8DA-K Antenna	96.0	20.7	7.7	13.80	5.13	4.64	12.47	1.30	1.58	54	25	32
DMP65R-BU8DA-K Antenna	96.0	20.7	7.7	13.80	5.13	4.64	12.47	1.30	1.58	54	25	32
AIR6419 Antenna	31.1	16.1	7.3	3.48	1.58	1.93	4.26	1.20	1.28	13	6	8
AIR6449 Antenna	30.6	15.9	10.6	3.38	2.25	1.92	2.89	1.20	1.22	12	8	9
4478 B14 RRH	18.1	8.3	13.4	1.04	1.68	2.18	1.35	1.20	1.20	4	6	6
4415 B30 RRH	16.5	5.9	13.4	0.68	1.54	2.80	1.23	1.21	1.20	2	6	5
4449 B5/B12 RRH	17.9	9.4	13.2	1.17	1.64	1.90	1.36	1.20	1.20	4	6	6
8843 B2/B66A RRH	14.9	10.9	13.2	1.13	1.37	1.37	1.13	1.20	1.20	4	5	5

Date: 3/29/2022
Project Name: CHESHIRE WATER TREATMENT FACILITY
Project No.: CT3459
Designed By: CL Checked By: MSC

HUDSON Design Group LLC

WIND LOADS

Angle =	90	(deg)	Ice Thickness =	1.75	in.	Equivalent Angle =	270	(deg)

WIND LOADS WITH NO ICE:

Appurtenances	Height	Width	Depth	Flat Area (normal)	Flat Area (side)	Ratio (normal)	Ratio (side)	Ca (normal)	Ca (side)	Force (lbs) (normal)	Force (lbs) (side)	Force (lbs) (angle)
TPA-65R-BU8DA-K Antenna	96.0	20.7	7.7	13.80	5.13	4.64	12.47	1.30	1.58	939	427	427
DMP65R-BU8DA-K Antenna	96.0	20.7	7.7	13.80	5.13	4.64	12.47	1.30	1.58	939	427	427
AIR6419 Antenna	31.1	16.1	7.3	3.48	1.58	1.93	4.26	1.20	1.28	219	106	106
AIR6449 Antenna	30.6	15.9	10.6	3.38	2.25	1.92	2.89	1.20	1.22	213	144	144
4478 B14 RRH	18.1	8.3	13.4	1.04	1.68	2.18	1.35	1.20	1.20	66	106	106
4415 B30 RRH	16.5	5.9	13.4	0.68	1.54	2.80	1.23	1.21	1.20	43	97	97
4449 B5/B12 RRH	17.9	9.4	13.2	1.17	1.64	1.90	1.36	1.20	1.20	74	103	103
8843 B2/B66A RRH	14.9	10.9	13.2	1.13	1.37	1.37	1.13	1.20	1.20	71	86	86

WIND LOADS WITH ICE:

TPA-65R-BU8DA-K Antenna	99.5	24.2	11.2	16.72	7.74	4.11	8.88	1.27	1.46	179	95	95
DMP65R-BU8DA-K Antenna	99.5	24.2	11.2	16.72	7.74	4.11	8.88	1.27	1.46	179	95	95
AIR6419 Antenna	34.6	19.6	10.8	4.71	2.60	1.77	3.20	1.20	1.23	48	27	27
AIR6449 Antenna	34.1	19.4	14.1	4.59	3.34	1.76	2.42	1.20	1.20	46	34	34
4478 B14 RRH	21.6	11.8	16.9	1.77	2.54	1.83	1.28	1.20	1.20	18	26	26
4415 B30 RRH	20.0	9.4	16.9	1.31	2.35	2.13	1.18	1.20	1.20	13	24	24
4449 B5/B12 RRH	21.4	12.9	16.7	1.92	2.48	1.66	1.28	1.20	1.20	19	25	25
8843 B2/B66A RRH	18.4	14.4	16.7	1.84	2.13	1.28	1.10	1.20	1.20	19	22	22

WIND LOADS AT 30 MPH:

TPA-65R-BU8DA-K Antenna	96.0	20.7	7.7	13.80	5.13	4.64	12.47	1.30	1.58	54	25	25
DMP65R-BU8DA-K Antenna	96.0	20.7	7.7	13.80	5.13	4.64	12.47	1.30	1.58	54	25	25
AIR6419 Antenna	31.1	16.1	7.3	3.48	1.58	1.93	4.26	1.20	1.28	13	6	6
AIR6449 Antenna	30.6	15.9	10.6	3.38	2.25	1.92	2.89	1.20	1.22	12	8	8
4478 B14 RRH	18.1	8.3	13.4	1.04	1.68	2.18	1.35	1.20	1.20	4	6	6
4415 B30 RRH	16.5	5.9	13.4	0.68	1.54	2.80	1.23	1.21	1.20	2	6	6
4449 B5/B12 RRH	17.9	9.4	13.2	1.17	1.64	1.90	1.36	1.20	1.20	4	6	6
8843 B2/B66A RRH	14.9	10.9	13.2	1.13	1.37	1.37	1.13	1.20	1.20	4	5	5

Date: 3/29/2022
Project Name: CHESHIRE WATER TREATMENT FACILITY
Project No.: CT3459
Designed By: CL Checked By: MSC

HUDSON Design Group LLC

WIND LOADS

Angle =	120	(deg)	Ice Thickness =	1.75	in.	Equivalent Angle =	300	(deg)

WIND LOADS WITH NO ICE:

Appurtenances	Height	Width	Depth	Flat Area (normal)	Flat Area (side)	Ratio (normal)	Ratio (side)	Ca (normal)	Ca (side)	Force (lbs) (normal)	Force (lbs) (side)	Force (lbs) (angle)
TPA-65R-BU8DA-K Antenna	96.0	20.7	7.7	13.80	5.13	4.64	12.47	1.30	1.58	939	427	555
DMP65R-BU8DA-K Antenna	96.0	20.7	7.7	13.80	5.13	4.64	12.47	1.30	1.58	939	427	555
AIR6419 Antenna	31.1	16.1	7.3	3.48	1.58	1.93	4.26	1.20	1.28	219	106	134
AIR6449 Antenna	30.6	15.9	10.6	3.38	2.25	1.92	2.89	1.20	1.22	213	144	161
4478 B14 RRH	18.1	8.3	13.4	1.04	1.68	2.18	1.35	1.20	1.20	66	106	96
4415 B30 RRH	16.5	5.9	13.4	0.68	1.54	2.80	1.23	1.21	1.20	43	97	83
4449 B5/B12 RRH	17.9	9.4	13.2	1.17	1.64	1.90	1.36	1.20	1.20	74	103	96
8843 B2/B66A RRH	14.9	10.9	13.2	1.13	1.37	1.37	1.13	1.20	1.20	71	86	82

WIND LOADS WITH ICE:

TPA-65R-BU8DA-K Antenna	99.5	24.2	11.2	16.72	7.74	4.11	8.88	1.27	1.46	179	95	116
DMP65R-BU8DA-K Antenna	99.5	24.2	11.2	16.72	7.74	4.11	8.88	1.27	1.46	179	95	116
AIR6419 Antenna	34.6	19.6	10.8	4.71	2.60	1.77	3.20	1.20	1.23	48	27	32
AIR6449 Antenna	34.1	19.4	14.1	4.59	3.34	1.76	2.42	1.20	1.20	46	34	37
4478 B14 RRH	21.6	11.8	16.9	1.77	2.54	1.83	1.28	1.20	1.20	18	26	24
4415 B30 RRH	20.0	9.4	16.9	1.31	2.35	2.13	1.18	1.20	1.20	13	24	21
4449 B5/B12 RRH	21.4	12.9	16.7	1.92	2.48	1.66	1.28	1.20	1.20	19	25	24
8843 B2/B66A RRH	18.4	14.4	16.7	1.84	2.13	1.28	1.10	1.20	1.20	19	22	21

WIND LOADS AT 30 MPH:

TPA-65R-BU8DA-K Antenna	96.0	20.7	7.7	13.80	5.13	4.64	12.47	1.30	1.58	54	25	32
DMP65R-BU8DA-K Antenna	96.0	20.7	7.7	13.80	5.13	4.64	12.47	1.30	1.58	54	25	32
AIR6419 Antenna	31.1	16.1	7.3	3.48	1.58	1.93	4.26	1.20	1.28	13	6	8
AIR6449 Antenna	30.6	15.9	10.6	3.38	2.25	1.92	2.89	1.20	1.22	12	8	9
4478 B14 RRH	18.1	8.3	13.4	1.04	1.68	2.18	1.35	1.20	1.20	4	6	6
4415 B30 RRH	16.5	5.9	13.4	0.68	1.54	2.80	1.23	1.21	1.20	2	6	5
4449 B5/B12 RRH	17.9	9.4	13.2	1.17	1.64	1.90	1.36	1.20	1.20	4	6	6
8843 B2/B66A RRH	14.9	10.9	13.2	1.13	1.37	1.37	1.13	1.20	1.20	4	5	5

Date: 3/29/2022
Project Name: CHESHIRE WATER TREATMENT FACILITY
Project No.: CT3459
Designed By: CL Checked By: MSC

HUDSON Design Group LLC

WIND LOADS

Angle =	150	(deg)	Ice Thickness =	1.75	in.	Equivalent Angle =	330	(deg)

WIND LOADS WITH NO ICE:

Appurtenances	Height	Width	Depth	Flat Area (normal)	Flat Area (side)	Ratio (normal)	Ratio (side)	Ca (normal)	Ca (side)	Force (lbs) (normal)	Force (lbs) (side)	Force (lbs) (angle)
TPA-65R-BU8DA-K Antenna	96.0	20.7	7.7	13.80	5.13	4.64	12.47	1.30	1.58	939	427	811
DMP65R-BU8DA-K Antenna	96.0	20.7	7.7	13.80	5.13	4.64	12.47	1.30	1.58	939	427	811
AIR6419 Antenna	31.1	16.1	7.3	3.48	1.58	1.93	4.26	1.20	1.28	219	106	191
AIR6449 Antenna	30.6	15.9	10.6	3.38	2.25	1.92	2.89	1.20	1.22	213	144	196
4478 B14 RRH	18.1	8.3	13.4	1.04	1.68	2.18	1.35	1.20	1.20	66	106	76
4415 B30 RRH	16.5	5.9	13.4	0.68	1.54	2.80	1.23	1.21	1.20	43	97	57
4449 B5/B12 RRH	17.9	9.4	13.2	1.17	1.64	1.90	1.36	1.20	1.20	74	103	81
8843 B2/B66A RRH	14.9	10.9	13.2	1.13	1.37	1.37	1.13	1.20	1.20	71	86	75

WIND LOADS WITH ICE:

TPA-65R-BU8DA-K Antenna	99.5	24.2	11.2	16.72	7.74	4.11	8.88	1.27	1.46	179	95	158
DMP65R-BU8DA-K Antenna	99.5	24.2	11.2	16.72	7.74	4.11	8.88	1.27	1.46	179	95	158
AIR6419 Antenna	34.6	19.6	10.8	4.71	2.60	1.77	3.20	1.20	1.23	48	27	42
AIR6449 Antenna	34.1	19.4	14.1	4.59	3.34	1.76	2.42	1.20	1.20	46	34	43
4478 B14 RRH	21.6	11.8	16.9	1.77	2.54	1.83	1.28	1.20	1.20	18	26	20
4415 B30 RRH	20.0	9.4	16.9	1.31	2.35	2.13	1.18	1.20	1.20	13	24	16
4449 B5/B12 RRH	21.4	12.9	16.7	1.92	2.48	1.66	1.28	1.20	1.20	19	25	21
8843 B2/B66A RRH	18.4	14.4	16.7	1.84	2.13	1.28	1.10	1.20	1.20	19	22	19

WIND LOADS AT 30 MPH:

TPA-65R-BU8DA-K Antenna	96.0	20.7	7.7	13.80	5.13	4.64	12.47	1.30	1.58	54	25	47
DMP65R-BU8DA-K Antenna	96.0	20.7	7.7	13.80	5.13	4.64	12.47	1.30	1.58	54	25	47
AIR6419 Antenna	31.1	16.1	7.3	3.48	1.58	1.93	4.26	1.20	1.28	13	6	11
AIR6449 Antenna	30.6	15.9	10.6	3.38	2.25	1.92	2.89	1.20	1.22	12	8	11
4478 B14 RRH	18.1	8.3	13.4	1.04	1.68	2.18	1.35	1.20	1.20	4	6	4
4415 B30 RRH	16.5	5.9	13.4	0.68	1.54	2.80	1.23	1.21	1.20	2	6	3
4449 B5/B12 RRH	17.9	9.4	13.2	1.17	1.64	1.90	1.36	1.20	1.20	4	6	5
8843 B2/B66A RRH	14.9	10.9	13.2	1.13	1.37	1.37	1.13	1.20	1.20	4	5	4

Date: 3/29/2022
Project Name: CHESHIRE WATER TREATMENT FACILITY
Project No.: CT3459
Designed By: CL **Checked By:** MSC

HUDSON Design Group LLC

ICE WEIGHT CALCULATIONS

Thickness of ice: 1.75 in.
Density of ice: 56 pcf

TPA-65R-BU8DA-K Antenna
Weight of ice based on total radial SF area:
Height (in): 96.0
Width (in): 20.7
Depth (in): 7.7
Total weight of ice on object: 408 lbs
Weight of object: 87.0 lbs
Combined weight of ice and object: 495 lbs

DMP65R-BU8DA-K Antenna
Weight of ice based on total radial SF area:
Height (in): 96.0
Width (in): 20.7
Depth (in): 7.7
Total weight of ice on object: 408 lbs
Weight of object: 119.0 lbs
Combined weight of ice and object: 527 lbs

AIR6419 Antenna
Weight of ice based on total radial SF area:
Height (in): 31.1
Width (in): 16.1
Depth (in): 7.3
Total weight of ice on object: 108 lbs
Weight of object: 66.0 lbs
Combined weight of ice and object: 174 lbs

AIR6449 Antenna
Weight of ice based on total radial SF area:
Height (in): 30.6
Width (in): 15.9
Depth (in): 10.6
Total weight of ice on object: 114 lbs
Weight of object: 82.0 lbs
Combined weight of ice and object: 196 lbs

4478 B14 RRH
Weight of ice based on total radial SF area:
Height (in): 18.1
Width (in): 13.4
Depth (in): 8.3
Total weight of ice on object: 56 lbs
Weight of object: 60.0 lbs
Combined weight of ice and object: 116 lbs

4415 B30 RRH
Weight of ice based on total radial SF area:
Height (in): 16.5
Width (in): 13.4
Depth (in): 5.9
Total weight of ice on object: 48 lbs
Weight of object: 46.0 lbs
Combined weight of ice and object: 94 lbs

4449 B5/B12 RRH
Weight of ice based on total radial SF area:
Height (in): 17.9
Width (in): 13.2
Depth (in): 9.4
Total weight of ice on object: 57 lbs
Weight of object: 73.0 lbs
Combined weight of ice and object: 130 lbs

8843 B2/B66A RRH
Weight of ice based on total radial SF area:
Height (in): 14.9
Width (in): 13.2
Depth (in): 10.9
Total weight of ice on object: 50 lbs
Weight of object: 72.0 lbs
Combined weight of ice and object: 122 lbs

DC9-48-60-24-8C-EV Surge Arrestor
Weight of ice based on total radial SF area:
Depth (in): 31.4
Diameter(in): 10.2
Total weight of ice on object: 67 lbs
Weight of object: 29 lbs
Combined weight of ice and object: 96 lbs

HSS 4x4
Weight of ice based on total radial SF area:
Height (in): 4
Width (in): 4
Per foot weight of ice on object: 16 plf

5/8" Round Bar
Per foot weight of ice:
diameter (in): 0.625
Per foot weight of ice on object: 5 plf

3/4" Round Bar
Per foot weight of ice:
diameter (in): 0.75
Per foot weight of ice on object: 5 plf

2" Pipe
Per foot weight of ice:
diameter (in): 2.38
Per foot weight of ice on object: 9 plf

2-1/2" Pipe
Per foot weight of ice:
diameter (in): 2.88
Per foot weight of ice on object: 10 plf

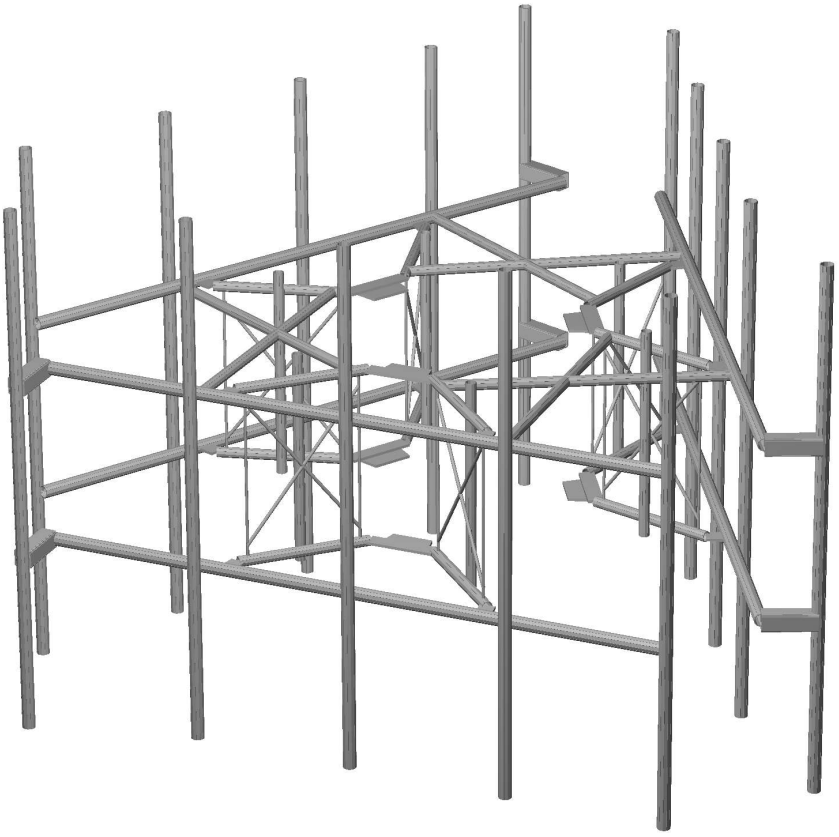
PL 3-1/2x5/8"
Weight of ice based on total radial SF area:
Height (in): 3.5
Width (in): 0.625
Per foot weight of ice on object: 11 plf

PL 11-1/4x5/8"
Weight of ice based on total radial SF area:
Height (in): 11.25
Width (in): 0.625
Per foot weight of ice on object: 28 plf

HUDSON
Design Group LLC

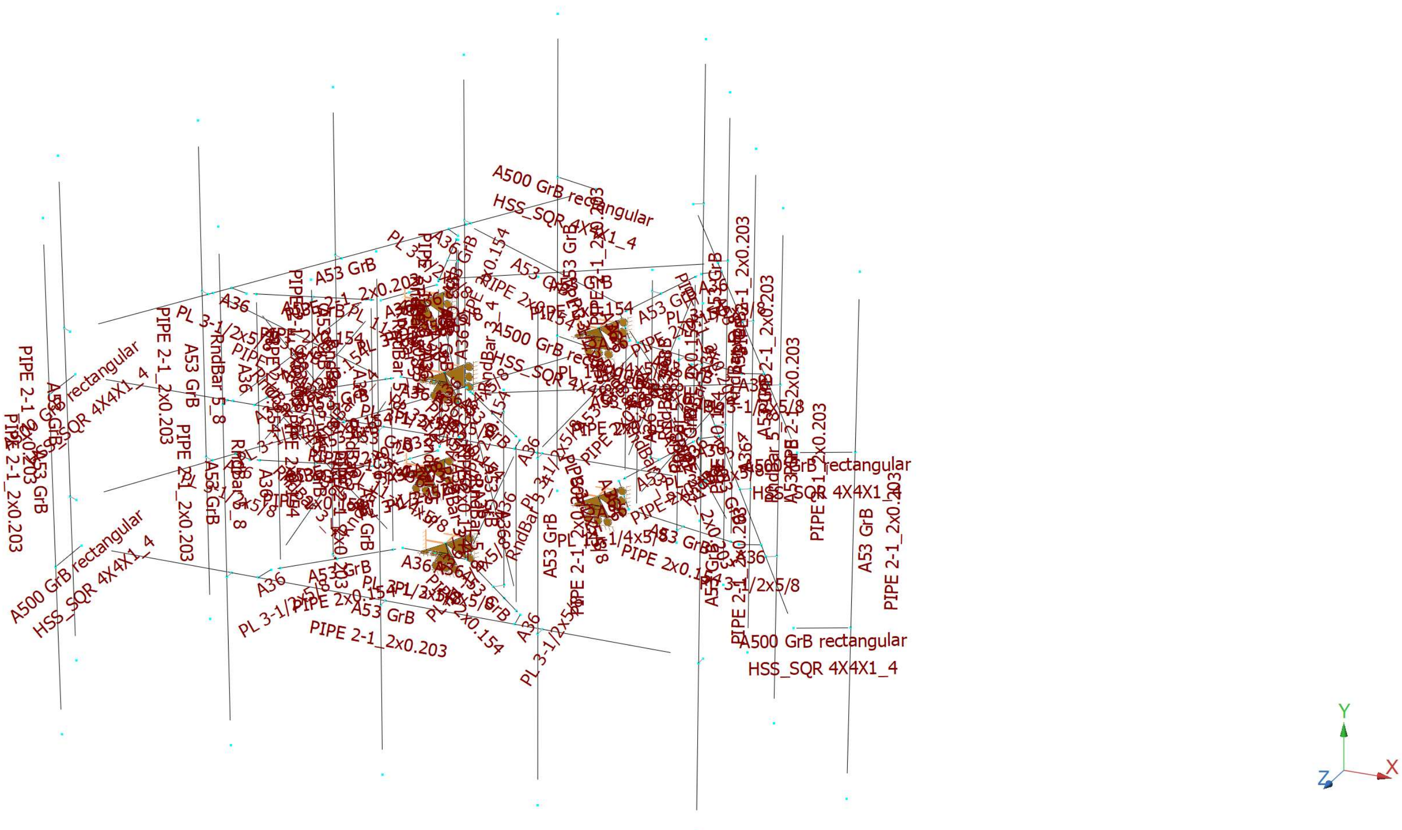
Mount Calculations
(Existing Conditions)

Current Date: 3/29/2022 2:09 PM
Units system: English

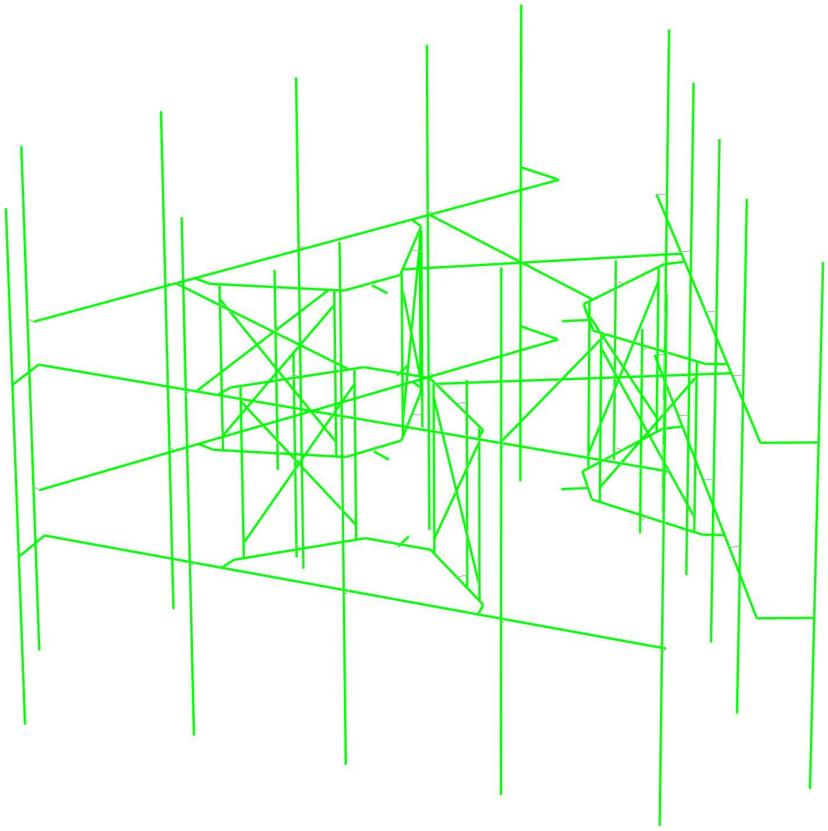


RAM® Elements
CONNECT Edition

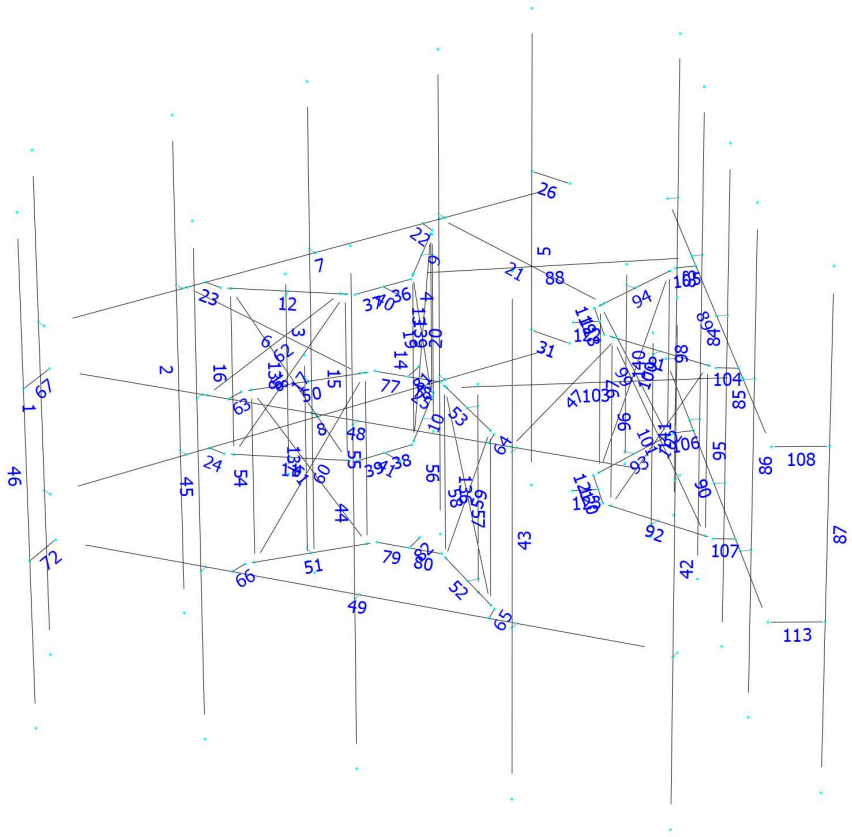
Current Date: 3/29/2022 2:10 PM
Units system: English



Design status
- Not designed
- Error on design
- Design O.K.
- With warnings



Current Date: 3/29/2022 2:10 PM
Units system: English



RAM® Elements
CONNECT Edition

Current Date: 3/29/2022 2:10 PM
Units system: English

Load data

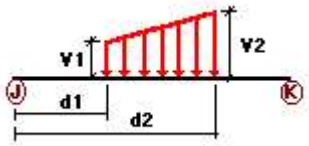
GLOSSARY

Comb : Indicates if load condition is a load combination

Load Conditions

Condition	Description	Comb.	Category
DL	Dead Load	No	DL
W0	Wind Load 0/60/120 deg	No	WIND
W30	Wind Load 30/90/150 deg	No	WIND
Di	Ice Load	No	LL
Wi0	Ice Wind Load 0/60/120 deg	No	WIND
Wi30	Ice Wind Load 30/90/150 deg	No	WIND
WL0	WL 30 mph 0/60/120 deg	No	WIND
WL30	WL 30 mph 30/90/150 deg	No	WIND
LL1	250 lb Live Load Center of Mount	No	LL
LL2	250 lb Live Load End of Mount	No	LL
LLa1	500 lb Live Load Antenna 1	No	LL
LLa2	500 lb Live Load Antenna 2	No	LL
LLa3	500 lb Live Load Antenna 3	No	LL
LLa4	500 lb Live Load Antenna 4	No	LL

Distributed force on members



Condition	Member	Dir1	Val1 [Kip/ft]	Val2 [Kip/ft]	Dist1 [ft]	%	Dist2 [ft]	%
W0	1	z	-0.015	-0.015	0.00	No	100.00	Yes
	2	z	-0.015	-0.015	0.00	No	100.00	Yes
	3	z	-0.015	-0.015	0.00	No	100.00	Yes
	4	z	-0.015	-0.015	0.00	No	100.00	Yes
	5	z	-0.015	-0.015	0.00	No	100.00	Yes
	6	z	-0.013	-0.013	0.00	No	100.00	Yes
	7	z	-0.015	-0.015	0.00	No	100.00	Yes
	8	z	-0.015	-0.015	0.00	No	100.00	Yes
	9	z	-0.013	-0.013	0.00	No	100.00	Yes
	10	z	-0.013	-0.013	0.00	No	100.00	Yes
	11	z	-0.013	-0.013	0.00	No	100.00	Yes
	12	z	-0.013	-0.013	0.00	No	100.00	Yes
	13	z	-0.003	-0.003	0.00	No	100.00	Yes
	14	z	-0.003	-0.003	0.00	No	100.00	Yes
	15	z	-0.003	-0.003	0.00	No	100.00	Yes
	16	z	-0.003	-0.003	0.00	No	100.00	Yes

17	z	-0.004	-0.004	0.00	No	100.00	Yes
18	z	-0.004	-0.004	0.00	No	100.00	Yes
19	z	-0.004	-0.004	0.00	No	100.00	Yes
20	z	-0.004	-0.004	0.00	No	100.00	Yes
21	z	-0.013	-0.013	0.00	No	100.00	Yes
22	z	-0.005	-0.005	0.00	No	100.00	Yes
23	z	-0.005	-0.005	0.00	No	100.00	Yes
24	z	-0.005	-0.005	0.00	No	100.00	Yes
25	z	-0.005	-0.005	0.00	No	100.00	Yes
26	z	-0.035	-0.035	0.00	No	100.00	Yes
31	z	-0.035	-0.035	0.00	No	100.00	Yes
36	z	-0.005	-0.005	0.00	No	100.00	Yes
37	z	-0.005	-0.005	0.00	No	100.00	Yes
38	z	-0.005	-0.005	0.00	No	100.00	Yes
39	z	-0.005	-0.005	0.00	No	100.00	Yes
40	z	-0.005	-0.005	0.00	No	100.00	Yes
41	z	-0.005	-0.005	0.00	No	100.00	Yes
43	z	-0.015	-0.015	0.00	No	100.00	Yes
45	z	-0.015	-0.015	0.00	No	100.00	Yes
47	z	-0.013	-0.013	0.00	No	100.00	Yes
48	z	-0.015	-0.015	0.00	No	100.00	Yes
49	z	-0.015	-0.015	0.00	No	100.00	Yes
50	z	-0.013	-0.013	0.00	No	100.00	Yes
51	z	-0.013	-0.013	0.00	No	100.00	Yes
52	z	-0.013	-0.013	0.00	No	100.00	Yes
53	z	-0.013	-0.013	0.00	No	100.00	Yes
54	z	-0.003	-0.003	0.00	No	100.00	Yes
55	z	-0.003	-0.003	0.00	No	100.00	Yes
56	z	-0.003	-0.003	0.00	No	100.00	Yes
57	z	-0.003	-0.003	0.00	No	100.00	Yes
58	z	-0.004	-0.004	0.00	No	100.00	Yes
59	z	-0.004	-0.004	0.00	No	100.00	Yes
60	z	-0.004	-0.004	0.00	No	100.00	Yes
61	z	-0.004	-0.004	0.00	No	100.00	Yes
62	z	-0.013	-0.013	0.00	No	100.00	Yes
63	z	-0.005	-0.005	0.00	No	100.00	Yes
64	z	-0.005	-0.005	0.00	No	100.00	Yes
65	z	-0.005	-0.005	0.00	No	100.00	Yes
66	z	-0.005	-0.005	0.00	No	100.00	Yes
77	z	-0.005	-0.005	0.00	No	100.00	Yes
78	z	-0.005	-0.005	0.00	No	100.00	Yes
79	z	-0.005	-0.005	0.00	No	100.00	Yes
80	z	-0.005	-0.005	0.00	No	100.00	Yes
81	z	-0.005	-0.005	0.00	No	100.00	Yes
82	z	-0.005	-0.005	0.00	No	100.00	Yes
83	z	-0.015	-0.015	0.00	No	100.00	Yes
84	z	-0.015	-0.015	0.00	No	100.00	Yes
85	z	-0.015	-0.015	0.00	No	100.00	Yes
86	z	-0.015	-0.015	0.00	No	100.00	Yes
87	z	-0.015	-0.015	0.00	No	100.00	Yes
88	z	-0.013	-0.013	0.00	No	100.00	Yes
89	z	-0.015	-0.015	0.00	No	100.00	Yes
90	z	-0.015	-0.015	0.00	No	100.00	Yes
91	z	-0.013	-0.013	0.00	No	100.00	Yes
92	z	-0.013	-0.013	0.00	No	100.00	Yes
93	z	-0.013	-0.013	0.00	No	100.00	Yes
94	z	-0.013	-0.013	0.00	No	100.00	Yes
95	z	-0.003	-0.003	0.00	No	100.00	Yes
96	z	-0.003	-0.003	0.00	No	100.00	Yes
97	z	-0.003	-0.003	0.00	No	100.00	Yes

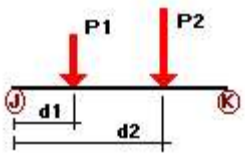
	98	z	-0.003	-0.003	0.00	No	100.00	Yes
	99	z	-0.004	-0.004	0.00	No	100.00	Yes
	100	z	-0.004	-0.004	0.00	No	100.00	Yes
	101	z	-0.004	-0.004	0.00	No	100.00	Yes
	102	z	-0.004	-0.004	0.00	No	100.00	Yes
	103	z	-0.013	-0.013	0.00	No	100.00	Yes
	104	z	-0.005	-0.005	0.00	No	100.00	Yes
	105	z	-0.005	-0.005	0.00	No	100.00	Yes
	106	z	-0.005	-0.005	0.00	No	100.00	Yes
	107	z	-0.005	-0.005	0.00	No	100.00	Yes
	108	z	-0.035	-0.035	0.00	No	100.00	Yes
	113	z	-0.035	-0.035	0.00	No	100.00	Yes
	118	z	-0.005	-0.005	0.00	No	100.00	Yes
	119	z	-0.005	-0.005	0.00	No	100.00	Yes
	120	z	-0.005	-0.005	0.00	No	100.00	Yes
	121	z	-0.005	-0.005	0.00	No	100.00	Yes
	122	z	-0.005	-0.005	0.00	No	100.00	Yes
	123	z	-0.005	-0.005	0.00	No	100.00	Yes
	136	z	-0.013	-0.013	0.00	No	100.00	Yes
	137	z	-0.013	-0.013	0.00	No	100.00	Yes
	138	z	-0.013	-0.013	0.00	No	100.00	Yes
	139	z	-0.013	-0.013	0.00	No	100.00	Yes
	140	z	-0.013	-0.013	0.00	No	100.00	Yes
	141	z	-0.013	-0.013	0.00	No	100.00	Yes
W30	1	x	-0.015	-0.015	0.00	No	100.00	Yes
	2	x	-0.015	-0.015	0.00	No	100.00	Yes
	3	x	-0.015	-0.015	0.00	No	100.00	Yes
	4	x	-0.015	-0.015	0.00	No	100.00	Yes
	5	x	-0.015	-0.015	0.00	No	100.00	Yes
	6	x	-0.013	-0.013	0.00	No	100.00	Yes
	7	x	-0.015	-0.015	0.00	No	100.00	Yes
	8	x	-0.015	-0.015	0.00	No	100.00	Yes
	9	x	-0.013	-0.013	0.00	No	100.00	Yes
	10	x	-0.013	-0.013	0.00	No	100.00	Yes
	11	x	-0.013	-0.013	0.00	No	100.00	Yes
	12	x	-0.013	-0.013	0.00	No	100.00	Yes
	13	x	-0.003	-0.003	0.00	No	100.00	Yes
	14	x	-0.003	-0.003	0.00	No	100.00	Yes
	15	x	-0.003	-0.003	0.00	No	100.00	Yes
	16	x	-0.003	-0.003	0.00	No	100.00	Yes
	17	x	-0.004	-0.004	0.00	No	100.00	Yes
	18	x	-0.004	-0.004	0.00	No	100.00	Yes
	19	x	-0.004	-0.004	0.00	No	100.00	Yes
	20	x	-0.004	-0.004	0.00	No	100.00	Yes
	21	x	-0.013	-0.013	0.00	No	100.00	Yes
	22	x	-0.005	-0.005	0.00	No	100.00	Yes
	23	x	-0.005	-0.005	0.00	No	100.00	Yes
	24	x	-0.005	-0.005	0.00	No	100.00	Yes
	25	x	-0.005	-0.005	0.00	No	100.00	Yes
	26	x	-0.035	-0.035	0.00	No	100.00	Yes
	31	x	-0.035	-0.035	0.00	No	100.00	Yes
	36	x	-0.005	-0.005	0.00	No	100.00	Yes
	37	x	-0.005	-0.005	0.00	No	100.00	Yes
	38	x	-0.005	-0.005	0.00	No	100.00	Yes
	39	x	-0.005	-0.005	0.00	No	100.00	Yes
	40	x	-0.005	-0.005	0.00	No	100.00	Yes
	41	x	-0.005	-0.005	0.00	No	100.00	Yes
	42	x	-0.015	-0.015	0.00	No	100.00	Yes
	43	x	-0.015	-0.015	0.00	No	100.00	Yes
	44	x	-0.015	-0.015	0.00	No	100.00	Yes

45	x	-0.015	-0.015	0.00	No	100.00	Yes
46	x	-0.015	-0.015	0.00	No	100.00	Yes
47	x	-0.013	-0.013	0.00	No	100.00	Yes
50	x	-0.013	-0.013	0.00	No	100.00	Yes
51	x	-0.013	-0.013	0.00	No	100.00	Yes
52	x	-0.013	-0.013	0.00	No	100.00	Yes
53	x	-0.013	-0.013	0.00	No	100.00	Yes
54	x	-0.003	-0.003	0.00	No	100.00	Yes
55	x	-0.003	-0.003	0.00	No	100.00	Yes
56	x	-0.003	-0.003	0.00	No	100.00	Yes
57	x	-0.003	-0.003	0.00	No	100.00	Yes
58	x	-0.004	-0.004	0.00	No	100.00	Yes
59	x	-0.004	-0.004	0.00	No	100.00	Yes
60	x	-0.004	-0.004	0.00	No	100.00	Yes
61	x	-0.004	-0.004	0.00	No	100.00	Yes
62	x	-0.013	-0.013	0.00	No	100.00	Yes
63	x	-0.005	-0.005	0.00	No	100.00	Yes
64	x	-0.005	-0.005	0.00	No	100.00	Yes
65	x	-0.005	-0.005	0.00	No	100.00	Yes
66	x	-0.005	-0.005	0.00	No	100.00	Yes
67	x	-0.035	-0.035	0.00	No	100.00	Yes
72	x	-0.035	-0.035	0.00	No	100.00	Yes
78	x	-0.005	-0.005	0.00	No	100.00	Yes
80	x	-0.005	-0.005	0.00	No	100.00	Yes
81	x	-0.005	-0.005	0.00	No	100.00	Yes
82	x	-0.005	-0.005	0.00	No	100.00	Yes
83	x	-0.015	-0.015	0.00	No	100.00	Yes
84	x	-0.015	-0.015	0.00	No	100.00	Yes
85	x	-0.015	-0.015	0.00	No	100.00	Yes
86	x	-0.015	-0.015	0.00	No	100.00	Yes
87	x	-0.015	-0.015	0.00	No	100.00	Yes
88	x	-0.013	-0.013	0.00	No	100.00	Yes
89	x	-0.015	-0.015	0.00	No	100.00	Yes
90	x	-0.015	-0.015	0.00	No	100.00	Yes
91	x	-0.013	-0.013	0.00	No	100.00	Yes
92	x	-0.013	-0.013	0.00	No	100.00	Yes
93	x	-0.013	-0.013	0.00	No	100.00	Yes
94	x	-0.013	-0.013	0.00	No	100.00	Yes
95	x	-0.003	-0.003	0.00	No	100.00	Yes
96	x	-0.003	-0.003	0.00	No	100.00	Yes
97	x	-0.003	-0.003	0.00	No	100.00	Yes
98	x	-0.003	-0.003	0.00	No	100.00	Yes
99	x	-0.004	-0.004	0.00	No	100.00	Yes
100	x	-0.004	-0.004	0.00	No	100.00	Yes
101	x	-0.004	-0.004	0.00	No	100.00	Yes
102	x	-0.004	-0.004	0.00	No	100.00	Yes
103	x	-0.013	-0.013	0.00	No	100.00	Yes
104	x	-0.005	-0.005	0.00	No	100.00	Yes
105	x	-0.005	-0.005	0.00	No	100.00	Yes
106	x	-0.005	-0.005	0.00	No	100.00	Yes
107	x	-0.005	-0.005	0.00	No	100.00	Yes
108	x	-0.035	-0.035	0.00	No	100.00	Yes
113	x	-0.035	-0.035	0.00	No	100.00	Yes
118	x	-0.005	-0.005	0.00	No	100.00	Yes
119	x	-0.005	-0.005	0.00	No	100.00	Yes
120	x	-0.005	-0.005	0.00	No	100.00	Yes
121	x	-0.005	-0.005	0.00	No	100.00	Yes
122	x	-0.005	-0.005	0.00	No	100.00	Yes
123	x	-0.005	-0.005	0.00	No	100.00	Yes
136	x	-0.013	-0.013	0.00	No	100.00	Yes

	137	x	-0.013	-0.013	0.00	No	100.00	Yes
	138	x	-0.013	-0.013	0.00	No	100.00	Yes
	139	x	-0.013	-0.013	0.00	No	100.00	Yes
	140	x	-0.013	-0.013	0.00	No	100.00	Yes
	141	x	-0.013	-0.013	0.00	No	100.00	Yes
Di	1	y	-0.01	-0.01	0.00	No	100.00	Yes
	2	y	-0.01	-0.01	0.00	No	100.00	Yes
	3	y	-0.01	-0.01	0.00	No	100.00	Yes
	4	y	-0.01	-0.01	0.00	No	100.00	Yes
	5	y	-0.01	-0.01	0.00	No	100.00	Yes
	6	y	-0.009	-0.009	0.00	No	100.00	Yes
	7	y	-0.01	-0.01	0.00	No	100.00	Yes
	8	y	-0.01	-0.01	0.00	No	100.00	Yes
	9	y	-0.009	-0.009	0.00	No	100.00	Yes
	10	y	-0.009	-0.009	0.00	No	100.00	Yes
	11	y	-0.009	-0.009	0.00	No	100.00	Yes
	12	y	-0.009	-0.009	0.00	No	100.00	Yes
	13	y	-0.005	-0.005	0.00	No	100.00	Yes
	14	y	-0.005	-0.005	0.00	No	100.00	Yes
	15	y	-0.005	-0.005	0.00	No	100.00	Yes
	16	y	-0.005	-0.005	0.00	No	100.00	Yes
	17	y	-0.005	-0.005	0.00	No	100.00	Yes
	18	y	-0.005	-0.005	0.00	No	100.00	Yes
	19	y	-0.005	-0.005	0.00	No	100.00	Yes
	20	y	-0.005	-0.005	0.00	No	100.00	Yes
	21	y	-0.009	-0.009	0.00	No	100.00	Yes
	22	y	-0.011	-0.011	0.00	No	100.00	Yes
	23	y	-0.011	-0.011	0.00	No	100.00	Yes
	24	y	-0.011	-0.011	0.00	No	100.00	Yes
	25	y	-0.011	-0.011	0.00	No	100.00	Yes
	26	y	-0.016	-0.016	0.00	No	100.00	Yes
	31	y	-0.016	-0.016	0.00	No	100.00	Yes
	36	y	-0.011	-0.011	0.00	No	100.00	Yes
	37	y	-0.011	-0.011	0.00	No	100.00	Yes
	38	y	-0.011	-0.011	0.00	No	100.00	Yes
	39	y	-0.011	-0.011	0.00	No	100.00	Yes
	40	y	-0.028	-0.028	0.00	No	100.00	Yes
	41	y	-0.028	-0.028	0.00	No	100.00	Yes
	42	y	-0.01	-0.01	0.00	No	100.00	Yes
	43	y	-0.01	-0.01	0.00	No	100.00	Yes
	44	y	-0.01	-0.01	0.00	No	100.00	Yes
	45	y	-0.01	-0.01	0.00	No	100.00	Yes
	46	y	-0.01	-0.01	0.00	No	100.00	Yes
	47	y	-0.009	-0.009	0.00	No	100.00	Yes
	48	y	-0.01	-0.01	0.00	No	100.00	Yes
	49	y	-0.01	-0.01	0.00	No	100.00	Yes
	50	y	-0.009	-0.009	0.00	No	100.00	Yes
	51	y	-0.009	-0.009	0.00	No	100.00	Yes
	52	y	-0.009	-0.009	0.00	No	100.00	Yes
	53	y	-0.009	-0.009	0.00	No	100.00	Yes
	54	y	-0.005	-0.005	0.00	No	100.00	Yes
	55	y	-0.005	-0.005	0.00	No	100.00	Yes
	56	y	-0.005	-0.005	0.00	No	100.00	Yes
	57	y	-0.005	-0.005	0.00	No	100.00	Yes
	58	y	-0.005	-0.005	0.00	No	100.00	Yes
	59	y	-0.005	-0.005	0.00	No	100.00	Yes
	60	y	-0.005	-0.005	0.00	No	100.00	Yes
	61	y	-0.005	-0.005	0.00	No	100.00	Yes
	62	y	-0.009	-0.009	0.00	No	100.00	Yes
	63	y	-0.011	-0.011	0.00	No	100.00	Yes

64	y	-0.011	-0.011	0.00	No	100.00	Yes
65	y	-0.011	-0.011	0.00	No	100.00	Yes
66	y	-0.011	-0.011	0.00	No	100.00	Yes
67	y	-0.016	-0.016	0.00	No	100.00	Yes
72	y	-0.016	-0.016	0.00	No	100.00	Yes
77	y	-0.011	-0.011	0.00	No	100.00	Yes
78	y	-0.011	-0.011	0.00	No	100.00	Yes
79	y	-0.011	-0.011	0.00	No	100.00	Yes
80	y	-0.011	-0.011	0.00	No	100.00	Yes
81	y	-0.028	-0.028	0.00	No	100.00	Yes
82	y	-0.028	-0.028	0.00	No	100.00	Yes
83	y	-0.01	-0.01	0.00	No	100.00	Yes
84	y	-0.01	-0.01	0.00	No	100.00	Yes
85	y	-0.01	-0.01	0.00	No	100.00	Yes
86	y	-0.01	-0.01	0.00	No	100.00	Yes
87	y	-0.01	-0.01	0.00	No	100.00	Yes
88	y	-0.009	-0.009	0.00	No	100.00	Yes
89	y	-0.01	-0.01	0.00	No	100.00	Yes
90	y	-0.01	-0.01	0.00	No	100.00	Yes
91	y	-0.009	-0.009	0.00	No	100.00	Yes
92	y	-0.009	-0.009	0.00	No	100.00	Yes
93	y	-0.009	-0.009	0.00	No	100.00	Yes
94	y	-0.009	-0.009	0.00	No	100.00	Yes
95	y	-0.005	-0.005	0.00	No	100.00	Yes
96	y	-0.005	-0.005	0.00	No	100.00	Yes
97	y	-0.005	-0.005	0.00	No	100.00	Yes
98	y	-0.005	-0.005	0.00	No	100.00	Yes
99	y	-0.005	-0.005	0.00	No	100.00	Yes
100	y	-0.005	-0.005	0.00	No	100.00	Yes
101	y	-0.005	-0.005	0.00	No	100.00	Yes
102	y	-0.005	-0.005	0.00	No	100.00	Yes
103	y	-0.009	-0.009	0.00	No	100.00	Yes
104	y	-0.011	-0.011	0.00	No	100.00	Yes
105	y	-0.011	-0.011	0.00	No	100.00	Yes
106	y	-0.011	-0.011	0.00	No	100.00	Yes
107	y	-0.011	-0.011	0.00	No	100.00	Yes
108	y	-0.016	-0.016	0.00	No	100.00	Yes
113	y	-0.016	-0.016	0.00	No	100.00	Yes
118	y	-0.011	-0.011	0.00	No	100.00	Yes
119	y	-0.011	-0.011	0.00	No	100.00	Yes
120	y	-0.011	-0.011	0.00	No	100.00	Yes
121	y	-0.011	-0.011	0.00	No	100.00	Yes
122	y	-0.028	-0.028	0.00	No	100.00	Yes
123	y	-0.028	-0.028	0.00	No	100.00	Yes
136	y	-0.009	-0.009	0.00	No	100.00	Yes
137	y	-0.009	-0.009	0.00	No	100.00	Yes
138	y	-0.009	-0.009	0.00	No	100.00	Yes
139	y	-0.009	-0.009	0.00	No	100.00	Yes
140	y	-0.009	-0.009	0.00	No	100.00	Yes
141	y	-0.009	-0.009	0.00	No	100.00	Yes

Concentrated forces on members



Condition	Member	Dir1	Value1 [Kip]	Dist1 [ft]	%
DL	1	y	-0.044	1.50	No
		y	-0.044	8.50	No
	3	y	-0.033	2.00	No
		y	-0.033	4.50	No
		y	-0.041	5.50	No
		y	-0.041	8.00	No
	5	y	-0.06	1.50	No
		y	-0.06	8.50	No
	42	y	-0.044	1.50	No
		y	-0.044	8.50	No
	44	y	-0.033	2.00	No
		y	-0.033	4.50	No
		y	-0.041	5.50	No
		y	-0.041	8.00	No
	46	y	-0.06	1.50	No
		y	-0.06	8.50	No
	83	y	-0.044	1.50	No
		y	-0.044	8.50	No
	85	y	-0.033	2.00	No
		y	-0.033	4.50	No
		y	-0.041	5.50	No
		y	-0.041	8.00	No
	87	y	-0.06	1.50	No
		y	-0.06	8.50	No
	136	y	-0.06	3.50	No
		y	-0.046	3.50	No
		y	-0.029	1.50	No
	137	y	-0.073	3.50	No
		y	-0.072	3.50	No
	138	y	-0.06	3.50	No
		y	-0.046	3.50	No
		y	-0.029	1.50	No
	139	y	-0.073	3.50	No
		y	-0.072	3.50	No
	140	y	-0.06	3.50	No
		y	-0.046	3.50	No
		y	-0.029	1.50	No
	141	y	-0.073	3.50	No
		y	-0.072	3.50	No
W0	1	z	-0.278	1.50	No
		z	-0.278	8.50	No
	3	z	-0.067	2.00	No
		z	-0.067	4.50	No
		z	-0.081	5.50	No
		z	-0.081	8.00	No
	5	z	-0.278	1.50	No
		z	-0.278	8.50	No
	42	z	-0.47	1.50	No
		z	-0.47	8.50	No
	44	z	-0.11	2.00	No
		z	-0.11	4.50	No
		z	-0.107	5.50	No
		z	-0.107	8.00	No
	46	z	-0.47	1.50	No

		z	-0.47	8.50	No
	83	z	-0.278	1.50	No
		z	-0.278	8.50	No
	85	z	-0.067	2.00	No
		z	-0.067	4.50	No
		z	-0.081	5.50	No
		z	-0.081	8.00	No
	87	z	-0.278	1.50	No
		z	-0.278	8.50	No
	136	z	-0.066	3.50	No
		z	-0.043	3.50	No
		z	-0.082	1.50	No
	137	z	-0.074	3.50	No
		z	-0.071	3.50	No
	138	z	-0.096	3.50	No
		z	-0.083	3.50	No
		z	-0.082	1.50	No
	139	z	-0.096	3.50	No
		z	-0.082	3.50	No
	140	z	-0.096	3.50	No
		z	-0.083	3.50	No
		z	-0.082	1.50	No
	141	z	-0.096	3.50	No
		z	-0.082	3.50	No
W30	1	x	-0.406	1.50	No
		x	-0.406	8.50	No
	3	x	-0.096	2.00	No
		x	-0.096	4.50	No
		x	-0.098	5.50	No
		x	-0.098	8.00	No
	5	x	-0.406	1.50	No
		x	-0.406	8.50	No
	42	x	-0.214	1.50	No
		x	-0.214	8.50	No
	44	x	-0.053	2.00	No
		x	-0.053	4.50	No
		x	-0.072	5.50	No
		x	-0.072	8.00	No
	46	x	-0.214	1.50	No
		x	-0.214	8.50	No
	83	x	-0.406	1.50	No
		x	-0.406	8.50	No
	85	x	-0.096	2.00	No
		x	-0.096	4.50	No
		x	-0.098	5.50	No
		x	-0.098	8.00	No
	87	x	-0.406	1.50	No
		x	-0.406	8.50	No
	136	x	-0.106	3.50	No
		x	-0.082	1.50	No
	137	x	-0.103	3.50	No
	138	x	-0.076	3.50	No
		x	-0.057	3.50	No
		x	-0.082	1.50	No
	139	x	-0.081	3.50	No
		x	-0.075	3.50	No
	140	x	-0.076	3.50	No
		x	-0.057	3.50	No
		x	-0.082	1.50	No
	141	x	-0.081	3.50	No

		x	-0.075	3.50	No
Di	1	y	-0.204	1.50	No
		y	-0.204	8.50	No
	3	y	-0.054	2.00	No
		y	-0.054	4.50	No
		y	-0.057	5.50	No
		y	-0.057	8.00	No
	5	y	-0.204	1.50	No
		y	-0.204	8.50	No
	42	y	-0.204	1.50	No
		y	-0.204	8.50	No
	44	y	-0.054	2.00	No
		y	-0.054	4.50	No
		y	-0.057	5.50	No
		y	-0.057	8.00	No
	46	y	-0.204	1.50	No
		y	-0.204	8.50	No
	83	y	-0.204	1.50	No
		y	-0.204	8.50	No
	85	y	-0.054	2.00	No
		y	-0.054	4.50	No
		y	-0.057	5.50	No
		y	-0.057	8.00	No
	87	y	-0.204	1.50	No
		y	-0.204	8.50	No
	136	y	-0.056	3.50	No
		y	-0.048	3.50	No
		y	-0.067	1.50	No
	137	y	-0.057	3.50	No
		y	-0.05	3.50	No
	138	y	-0.056	3.50	No
		y	-0.048	3.50	No
		y	-0.067	1.50	No
	139	y	-0.057	3.50	No
		y	-0.05	3.50	No
	140	y	-0.056	3.50	No
		y	-0.048	3.50	No
		y	-0.067	1.50	No
	141	y	-0.057	3.50	No
		y	-0.05	3.50	No
Wi0	1	z	-0.058	1.50	No
		z	-0.058	8.50	No
	3	z	-0.016	2.00	No
		z	-0.016	4.50	No
		z	-0.019	5.50	No
		z	-0.019	8.00	No
	5	z	-0.058	1.50	No
		z	-0.058	8.50	No
	42	z	-0.091	1.50	No
		z	-0.091	8.50	No
	44	z	-0.024	2.00	No
		z	-0.024	4.50	No
		z	-0.023	5.50	No
		z	-0.023	8.00	No
	46	z	-0.091	1.50	No
		z	-0.091	8.50	No
	83	z	-0.058	1.50	No
		z	-0.058	8.50	No
	85	z	-0.016	2.00	No
		z	-0.016	4.50	No

		z	-0.019	5.50	No
		z	-0.019	8.00	No
	87	z	-0.058	1.50	No
		z	-0.058	8.50	No
	136	z	-0.018	3.50	No
		z	-0.013	3.50	No
		z	-0.02	1.50	No
	137	z	-0.019	3.50	No
		z	-0.019	3.50	No
	138	z	-0.024	3.50	No
		z	-0.021	3.50	No
		z	-0.02	1.50	No
	139	z	-0.024	3.50	No
		z	-0.021	3.50	No
	140	z	-0.024	3.50	No
		z	-0.021	3.50	No
		z	-0.02	1.50	No
	141	z	-0.024	3.50	No
		z	-0.021	3.50	No
Wi30	1	x	-0.08	1.50	No
		x	-0.08	8.50	No
	3	x	-0.021	2.00	No
		x	-0.021	4.50	No
		x	-0.022	5.50	No
		x	-0.022	8.00	No
	5	x	-0.08	1.50	No
		x	-0.08	8.50	No
	42	x	-0.048	1.50	No
		x	-0.048	8.50	No
	44	x	-0.014	2.00	No
		x	-0.014	4.50	No
		x	-0.017	5.50	No
		x	-0.017	8.00	No
	46	x	-0.048	1.50	No
		x	-0.048	8.50	No
	83	x	-0.08	1.50	No
		x	-0.08	8.50	No
	85	x	-0.021	2.00	No
		x	-0.021	4.50	No
		x	-0.022	5.50	No
		x	-0.022	8.00	No
	87	x	-0.08	1.50	No
		x	-0.08	8.50	No
	136	x	-0.026	3.50	No
		x	-0.02	1.50	No
	137	x	-0.025	3.50	No
	138	x	-0.02	3.50	No
		x	-0.016	3.50	No
		x	-0.02	1.50	No
	139	x	-0.021	3.50	No
		x	-0.019	3.50	No
	140	x	-0.02	3.50	No
		x	-0.016	3.50	No
		x	-0.02	1.50	No
	141	x	-0.021	3.50	No
		x	-0.019	3.50	No
WL0	1	z	-0.016	1.50	No
		z	-0.016	8.50	No
	3	z	-0.004	2.00	No
		z	-0.004	4.50	No

		z	-0.005	5.50	No
		z	-0.005	8.00	No
	5	z	-0.016	1.50	No
		z	-0.016	8.50	No
	42	z	-0.027	1.50	No
		z	-0.027	8.50	No
	44	z	-0.007	2.00	No
		z	-0.007	4.50	No
		z	-0.006	5.50	No
		z	-0.006	8.00	No
	46	z	-0.027	1.50	No
		z	-0.027	8.50	No
	83	z	-0.016	1.50	No
		z	-0.016	8.50	No
	85	z	-0.004	2.00	No
		z	-0.004	4.50	No
		z	-0.005	5.50	No
		z	-0.005	8.00	No
	87	z	-0.016	1.50	No
		z	-0.016	8.50	No
	136	z	-0.004	3.50	No
		z	-0.002	3.50	No
		z	-0.005	1.50	No
	137	z	-0.004	3.50	No
		z	-0.004	3.50	No
	138	z	-0.006	3.50	No
		z	-0.005	3.50	No
		z	-0.005	1.50	No
	139	z	-0.006	3.50	No
		z	-0.005	3.50	No
	140	z	-0.006	3.50	No
		z	-0.005	3.50	No
		z	-0.005	1.50	No
	141	z	-0.006	3.50	No
		z	-0.005	3.50	No
WL30	1	x	-0.024	1.50	No
		x	-0.024	8.50	No
	3	x	-0.006	2.00	No
		x	-0.006	4.50	No
		x	-0.006	5.50	No
		x	-0.006	8.00	No
	5	x	-0.024	1.50	No
		x	-0.024	8.50	No
	42	x	-0.013	1.50	No
		x	-0.013	8.50	No
	44	x	-0.003	2.00	No
		x	-0.003	4.50	No
		x	-0.004	5.50	No
		x	-0.004	8.00	No
	46	x	-0.013	1.50	No
		x	-0.013	8.50	No
	83	x	-0.024	1.50	No
		x	-0.024	8.50	No
	85	x	-0.006	2.00	No
		x	-0.006	4.50	No
		x	-0.006	5.50	No
		x	-0.006	8.00	No
	87	x	-0.024	1.50	No
		x	-0.024	8.50	No
	136	x	-0.006	3.50	No

		x	-0.005	1.50	No
	137	x	-0.006	3.50	No
	138	x	-0.004	3.50	No
		x	-0.003	3.50	No
		x	-0.005	1.50	No
	139	x	-0.005	3.50	No
		x	-0.004	3.50	No
	140	x	-0.004	3.50	No
		x	-0.003	3.50	No
		x	-0.005	1.50	No
	141	x	-0.005	3.50	No
		x	-0.004	3.50	No
LL1	49	y	-0.25	50.00	Yes
LL2	49	y	-0.25	100.00	Yes
LLa1	42	y	-0.50	50.00	Yes
LLa2	43	y	-0.50	50.00	Yes
LLa3	44	y	-0.50	50.00	Yes
LLa4	46	y	-0.50	50.00	Yes

Self weight multipliers for load conditions

Condition	Description	Self weight multiplier			
		Comb.	MultX	MultY	MultZ
DL	Dead Load	No	0.00	-1.00	0.00
W0	Wind Load 0/60/120 deg	No	0.00	0.00	0.00
W30	Wind Load 30/90/150 deg	No	0.00	0.00	0.00
Di	Ice Load	No	0.00	0.00	0.00
Wi0	Ice Wind Load 0/60/120 deg	No	0.00	0.00	0.00
Wi30	Ice Wind Load 30/90/150 deg	No	0.00	0.00	0.00
WL0	WL 30 mph 0/60/120 deg	No	0.00	0.00	0.00
WL30	WL 30 mph 30/90/150 deg	No	0.00	0.00	0.00
LL1	250 lb Live Load Center of Mount	No	0.00	0.00	0.00
LL2	250 lb Live Load End of Mount	No	0.00	0.00	0.00
LLa1	500 lb Live Load Antenna 1	No	0.00	0.00	0.00
LLa2	500 lb Live Load Antenna 2	No	0.00	0.00	0.00
LLa3	500 lb Live Load Antenna 3	No	0.00	0.00	0.00
LLa4	500 lb Live Load Antenna 4	No	0.00	0.00	0.00

Earthquake (Dynamic analysis only)

Condition	a/g	Ang. [Deg]	Damp. [%]
DL	0.00	0.00	0.00
W0	0.00	0.00	0.00
W30	0.00	0.00	0.00
Di	0.00	0.00	0.00
Wi0	0.00	0.00	0.00
Wi30	0.00	0.00	0.00
WL0	0.00	0.00	0.00
WL30	0.00	0.00	0.00
LL1	0.00	0.00	0.00

LL2	0.00	0.00	0.00
LLa1	0.00	0.00	0.00
LLa2	0.00	0.00	0.00
LLa3	0.00	0.00	0.00
LLa4	0.00	0.00	0.00

RAM® Elements
CONNECT Edition

Current Date: 3/29/2022 2:11 PM
Units system: English

Steel Code Check

Report: Summary - Group by member

Load conditions to be included in design :

LC1=1.2DL+W0
LC2=1.2DL+W30
LC3=1.2DL-W0
LC4=1.2DL-W30
LC5=0.9DL+W0
LC6=0.9DL+W30
LC7=0.9DL-W0
LC8=0.9DL-W30
LC9=1.2DL+Di+Wi0
LC10=1.2DL+Di+Wi30
LC11=1.2DL+Di-Wi0
LC12=1.2DL+Di-Wi30
LC13=1.4DL
LC14=1.2DL+1.6LL1
LC15=1.2DL+1.6LL2
LC16=1.2DL+WL0+1.6LLa1
LC17=1.2DL+WL30+1.6LLa1
LC18=1.2DL-WL0+1.6LLa1
LC19=1.2DL-WL30+1.6LLa1
LC20=1.2DL+WL0+1.6LLa2
LC21=1.2DL+WL30+1.6LLa2
LC22=1.2DL-WL0+1.6LLa2
LC23=1.2DL-WL30+1.6LLa2
LC24=1.2DL+WL0+1.6LLa3
LC25=1.2DL+WL30+1.6LLa3
LC26=1.2DL-WL0+1.6LLa3
LC27=1.2DL-WL30+1.6LLa3
LC28=1.2DL+WL0+1.6LLa4
LC29=1.2DL+WL30+1.6LLa4
LC30=1.2DL-WL0+1.6LLa4
LC31=1.2DL-WL30+1.6LLa4

Description	Section	Member	Ctrl Eq.	Ratio	Status	Reference
	HSS_SQR 4X4X1_4	**26**	LC11 at 0.00%	0.07	OK	Eq. H3-1
		31	LC9 at 0.00%	0.07	OK	Eq. H3-1
		67	LC31 at 0.00%	**0.09**	**OK**	Eq. H3-1
		72	LC29 at 0.00%	0.09	OK	Eq. H3-1
		108	LC10 at 0.00%	0.07	OK	Eq. H3-1
		113	LC12 at 0.00%	0.07	OK	Eq. H3-1
	PIPE 2-1_2x0.203	**1**	LC2 at 66.67%	0.42	OK	Eq. H1-1b
		2	LC3 at 33.33%	0.22	OK	Eq. H1-1b
		3	LC1 at 33.33%	0.30	OK	Eq. H1-1b
		4	LC12 at 33.33%	0.23	OK	Eq. H1-1b
		5	LC2 at 33.33%	0.43	OK	Eq. H1-1b
		7	LC2 at 25.78%	**0.89**	**OK**	Eq. H1-1b
		8	LC4 at 70.83%	0.88	OK	Eq. H1-1b
		42	LC3 at 66.67%	0.51	OK	Eq. H1-1b
		43	LC19 at 33.33%	0.28	OK	Eq. H1-1b
		44	LC2 at 33.33%	0.29	OK	Eq. H1-1b
		45	LC29 at 33.33%	0.28	OK	Eq. H1-1b
		46	LC29 at 33.33%	0.51	OK	Eq. H1-1b

	48	LC1 at 25.78%	0.74	OK	Eq. H1-1b
	49	LC3 at 29.17%	0.82	OK	Eq. H1-1b
	83	LC4 at 66.67%	0.42	OK	Eq. H1-1b
	84	LC1 at 33.33%	0.21	OK	Eq. H1-1b
	85	LC3 at 33.33%	0.31	OK	Eq. H1-1b
	86	LC3 at 33.33%	0.24	OK	Eq. H1-1b
	87	LC4 at 66.67%	0.42	OK	Eq. H1-1b
	89	LC4 at 74.22%	0.87	OK	Eq. H1-1b
	90	LC2 at 29.17%	0.83	OK	Eq. H1-1b
PIPE 2x0.154	**6**	LC3 at 100.00%	0.21	OK	Eq. H1-1b
	9	LC2 at 88.75%	0.60	OK	Eq. H1-1b
	10	LC12 at 93.75%	0.35	OK	Eq. H1-1b
	11	LC4 at 93.75%	0.39	OK	Eq. H1-1b
	12	LC4 at 100.00%	0.43	OK	Eq. H1-1b
	21	LC8 at 100.00%	0.29	OK	Eq. H1-1b
	47	LC2 at 100.00%	0.28	OK	Eq. H1-1b
	50	LC31 at 93.75%	0.45	OK	Eq. H1-1b
	51	LC1 at 93.75%	0.40	OK	Eq. H1-1b
	52	LC1 at 93.75%	0.38	OK	Eq. H1-1b
	53	LC18 at 93.75%	0.44	OK	Eq. H1-1b
	62	LC5 at 100.00%	0.28	OK	Eq. H1-1b
	88	LC2 at 100.00%	0.24	OK	Eq. H1-1b
	91	LC2 at 100.00%	0.47	OK	Eq. H1-1b
	92	LC2 at 93.75%	0.39	OK	Eq. H1-1b
	93	LC10 at 93.75%	0.33	OK	Eq. H1-1b
	94	LC4 at 88.75%	**0.62**	**OK**	Eq. H1-1b
	103	LC2 at 100.00%	0.17	OK	Eq. H1-1b
	136	LC12 at 12.50%	0.15	OK	Eq. H1-1b
	137	LC10 at 12.50%	0.15	OK	Eq. H1-1b
	138	LC3 at 10.42%	0.14	OK	Eq. H1-1b
	139	LC12 at 12.50%	0.15	OK	Eq. H1-1b
	140	LC9 at 12.50%	0.15	OK	Eq. H1-1b
	141	LC3 at 12.50%	0.13	OK	Eq. H1-1b
PL 11-1/4x5/8	**40**	LC9 at 100.00%	**0.45**	**OK**	Eq. H1-1b
	41	LC10 at 100.00%	0.34	OK	Eq. H1-1b
	81	LC11 at 100.00%	0.45	OK	Eq. H1-1b
	82	LC11 at 100.00%	0.34	OK	Eq. H1-1b
	122	LC9 at 100.00%	0.45	OK	Eq. H1-1b
	123	LC12 at 100.00%	0.34	OK	Eq. H1-1b
PL 3-1/2x5/8	**22**	LC3 at 100.00%	0.41	OK	Eq. H1-1b
	23	LC12 at 100.00%	0.41	OK	Eq. H1-1b
	24	LC9 at 100.00%	0.47	OK	Eq. H1-1b
	25	LC11 at 100.00%	0.49	OK	Eq. H1-1b
	36	LC3 at 100.00%	0.66	OK	Eq. H1-1b
	37	LC4 at 0.00%	0.64	OK	Eq. H1-1b
	38	LC11 at 100.00%	0.73	OK	Eq. H1-1b
	39	LC12 at 0.00%	0.71	OK	Eq. H1-1b
	63	LC28 at 100.00%	0.47	OK	Eq. H1-1b
	64	LC16 at 100.00%	0.46	OK	Eq. H1-1b
	65	LC17 at 100.00%	0.59	OK	Eq. H1-1b
	66	LC31 at 100.00%	0.60	OK	Eq. H1-1b
	77	LC30 at 100.00%	0.66	OK	Eq. H1-1b
	78	LC17 at 0.00%	0.65	OK	Eq. H1-1b
	79	LC31 at 100.00%	**0.74**	**OK**	Eq. H1-1b
	80	LC17 at 0.00%	0.71	OK	Eq. H1-1b
	104	LC9 at 100.00%	0.40	OK	Eq. H1-1b
	105	LC11 at 100.00%	0.41	OK	Eq. H1-1b
	106	LC11 at 100.00%	0.47	OK	Eq. H1-1b
	107	LC9 at 100.00%	0.50	OK	Eq. H1-1b
	118	LC2 at 100.00%	0.65	OK	Eq. H1-1b
	119	LC3 at 0.00%	0.65	OK	Eq. H1-1b

	120	LC10 at 100.00%	0.74	OK	Eq. H1-1b
	121	LC11 at 0.00%	0.71	OK	Eq. H1-1b
RndBar 3_4	**17**	LC9 at 0.00%	0.32	OK	Eq. H1-1a
	18	LC12 at 0.00%	0.26	OK	Eq. H1-1b
	19	LC10 at 100.00%	0.33	OK	Eq. H1-1a
	20	LC11 at 100.00%	0.26	OK	Eq. H1-1b
	58	LC17 at 100.00%	0.32	OK	Eq. H1-1a
	59	LC9 at 0.00%	0.26	OK	Eq. H1-1b
	60	LC12 at 100.00%	0.33	OK	Eq. H1-1a
	61	LC9 at 100.00%	0.26	OK	Eq. H1-1b
	99	LC12 at 0.00%	0.32	OK	Eq. H1-1a
	100	LC11 at 0.00%	0.26	OK	Eq. H1-1b
	101	LC9 at 100.00%	**0.33**	**OK**	Eq. H1-1a
	102	LC10 at 100.00%	0.26	OK	Eq. H1-1b
RndBar 5_8	**13**	LC11 at 87.50%	0.70	OK	Eq. H1-1a
	14	LC11 at 87.50%	0.70	OK	Eq. H1-1a
	15	LC9 at 87.50%	0.69	OK	Eq. H1-1a
	16	LC12 at 87.50%	0.73	OK	Eq. H1-1a
	54	LC28 at 87.50%	0.77	OK	Eq. H1-1a
	55	LC31 at 87.50%	0.75	OK	Eq. H1-1a
	56	LC17 at 87.50%	0.75	OK	Eq. H1-1a
	57	LC16 at 87.50%	**0.79**	**OK**	Eq. H1-1a
	95	LC10 at 87.50%	0.71	OK	Eq. H1-1a
	96	LC9 at 87.50%	0.71	OK	Eq. H1-1a
	97	LC11 at 87.50%	0.69	OK	Eq. H1-1a
	98	LC11 at 87.50%	0.71	OK	Eq. H1-1a

RAM® Elements
CONNECT Edition

Current Date: 3/29/2022 2:11 PM
Units system: English

Geometry data

GLOSSARY

Cb22, Cb33	: Moment gradient coefficients
Cm22, Cm33	: Coefficients applied to bending term in interaction formula
d0	: Tapered member section depth at J end of member
DJX	: Rigid end offset distance measured from J node in axis X
DJY	: Rigid end offset distance measured from J node in axis Y
DJZ	: Rigid end offset distance measured from J node in axis Z
DKX	: Rigid end offset distance measured from K node in axis X
DKY	: Rigid end offset distance measured from K node in axis Y
DKZ	: Rigid end offset distance measured from K node in axis Z
dL	: Tapered member section depth at K end of member
Ig factor	: Inertia reduction factor (Effective Inertia/Gross Inertia) for reinforced concrete members
K22	: Effective length factor about axis 2
K33	: Effective length factor about axis 3
L22	: Member length for calculation of axial capacity
L33	: Member length for calculation of axial capacity
LB pos	: Lateral unbraced length of the compression flange in the positive side of local axis 2
LB neg	: Lateral unbraced length of the compression flange in the negative side of local axis 2
RX	: Rotation about X
RY	: Rotation about Y
RZ	: Rotation about Z
TO	: 1 = Tension only member 0 = Normal member
TX	: Translation in X
TY	: Translation in Y
TZ	: Translation in Z

Nodes

Node	X [ft]	Y [ft]	Z [ft]	Rigid Floor
1	-1.7321	0.00	-1.00	0
2	-1.8282	0.00	-1.7901	0
3	-1.7321	-3.3333	-1.00	0
4	-1.8282	-3.3333	-1.7901	0
5	-2.4644	-3.3333	-0.6882	0
6	-2.4644	0.00	-0.6882	0
7	-7.1829	-6.6667	2.7812	0
8	-7.1829	3.3333	2.7812	0
9	-1.9529	-6.6667	-7.8512	0
10	-1.9529	3.3333	-7.8512	0
11	-5.4576	0.00	0.1929	0
12	-0.8376	0.00	2.6778	0
13	-1.0097	0.00	-7.5112	0
14	-7.0097	0.00	2.8812	0
15	-1.0097	-3.3333	-7.5112	0
16	-7.0097	-3.3333	2.8812	0
17	-2.4634	0.00	-4.2081	0
18	-2.4634	-3.3333	-4.2081	0
19	-4.876	-3.3333	-0.0293	0
20	-4.876	0.00	-0.0293	0
21	-2.4173	0.00	-4.0324	0
22	-2.4173	-3.3333	-4.0324	0
23	-1.8744	0.00	-1.9658	0

24	-1.8744	-3.3333	-1.9658	0
25	-2.6396	0.00	-0.6404	0
26	-2.6396	-3.3333	-0.6404	0
27	-4.7008	0.00	-0.0772	0
28	-4.7008	-3.3333	-0.0772	0
29	-2.5618	0.00	-4.8229	0
30	1.9002	0.00	-2.0642	0
31	-2.6829	-6.6667	-5.0131	0
32	-2.6829	3.3333	-5.0131	0
33	-5.6829	-6.6667	0.1831	0
34	-5.6829	3.3333	0.1831	0
35	-2.7701	0.00	-4.462	0
36	-5.2493	0.00	-0.168	0
37	-5.2493	-3.3333	-0.168	0
38	-2.7701	-3.3333	-4.462	0
39	-4.1829	-6.6667	-2.415	0
40	-4.1829	3.3333	-2.415	0
41	-1.9529	3.33E-06	-7.8512	0
42	-7.1829	3.33E-06	2.7812	0
43	-2.6829	3.33E-06	-5.0131	0
44	-2.5097	3.33E-06	-4.9131	0
45	-5.5097	3.33E-06	0.2831	0
46	-5.6829	3.33E-06	0.1831	0
47	-4.1829	3.33E-06	-2.415	0
48	-4.0097	3.33E-06	-2.315	0
49	-1.9529	-3.3333	-7.8512	0
50	-2.6829	-3.3333	-5.0131	0
51	-2.5097	-3.3333	-4.9131	0
52	-4.1829	-3.3333	-2.415	0
53	-4.0097	-3.3333	-2.315	0
54	-5.5097	-3.3333	0.2831	0
55	-5.6829	-3.3333	0.1831	0
56	-7.1829	-3.3333	2.7812	0
57	-2.1463	0.00	-1.2392	0
58	-2.1463	-3.3333	-1.2392	0
59	0.00	0.00	2.00	0
60	-0.6362	0.00	2.4783	0
61	0.00	-3.3333	2.00	0
62	-0.6362	-3.3333	2.4783	0
63	0.6362	-3.3333	2.4783	0
64	0.6362	0.00	2.4783	0
65	6.00	-6.6667	4.83	0
66	6.00	3.3333	4.83	0
67	-6.00	-6.6667	5.63	0
68	-6.00	3.3333	5.63	0
69	2.8958	0.00	4.63	0
70	2.7378	0.00	-0.6135	0
71	-6.00	0.00	4.63	0
72	6.00	0.00	4.63	0
73	-6.00	-3.3333	4.63	0
74	6.00	-3.3333	4.63	0
75	-2.4126	0.00	4.2374	0
76	-2.4126	-3.3333	4.2374	0
77	2.4126	-3.3333	4.2374	0
78	2.4126	0.00	4.2374	0
79	-2.2835	0.00	4.1096	0
80	-2.2835	-3.3333	4.1096	0
81	-0.7653	0.00	2.6062	0
82	-0.7653	-3.3333	2.6062	0
83	0.7653	0.00	2.6062	0

84	0.7653	-3.3333	2.6062	0
85	2.2835	0.00	4.1096	0
86	2.2835	-3.3333	4.1096	0
87	-2.8958	0.00	4.63	0
88	-2.7378	0.00	-0.6135	0
89	-3.00	-6.6667	4.83	0
90	-3.00	3.3333	4.83	0
91	3.00	-6.6667	4.83	0
92	3.00	3.3333	4.83	0
93	-2.4792	0.00	4.63	0
94	2.4792	0.00	4.63	0
95	2.4792	-3.3333	4.63	0
96	-2.4792	-3.3333	4.63	0
97	0.00	-6.6667	4.83	0
98	0.00	3.3333	4.83	0
99	-6.00	3.33E-06	5.63	0
100	6.00	3.33E-06	4.83	0
101	-3.00	3.33E-06	4.83	0
102	-3.00	3.33E-06	4.63	0
103	3.00	3.33E-06	4.63	0
104	3.00	3.33E-06	4.83	0
105	0.00	3.33E-06	4.83	0
106	0.00	3.33E-06	4.63	0
107	-6.00	-3.3333	5.63	0
108	-3.00	-3.3333	4.83	0
109	-3.00	-3.3333	4.63	0
110	0.00	-3.3333	4.83	0
111	0.00	-3.3333	4.63	0
112	3.00	-3.3333	4.63	0
113	3.00	-3.3333	4.83	0
114	6.00	-3.3333	4.83	0
115	0.00	0.00	2.4783	0
116	0.00	-3.3333	2.4783	0
117	1.7321	0.00	-1.00	0
118	2.4644	0.00	-0.6882	0
119	1.7321	-3.3333	-1.00	0
120	2.4644	-3.3333	-0.6882	0
121	1.8282	-3.3333	-1.7901	0
122	1.8282	0.00	-1.7901	0
123	1.1829	-6.6667	-7.6112	0
124	1.1829	3.3333	-7.6112	0
125	7.9239	-6.6667	2.4762	0
126	7.9239	3.3333	2.4762	0
127	2.5618	0.00	-4.8229	0
128	-1.9002	0.00	-2.0642	0
129	7.0097	0.00	2.8812	0
130	1.0097	0.00	-7.5112	0
131	7.0097	-3.3333	2.8812	0
132	1.0097	-3.3333	-7.5112	0
133	4.876	0.00	-0.0293	0
134	4.876	-3.3333	-0.0293	0
135	2.4634	-3.3333	-4.2081	0
136	2.4634	0.00	-4.2081	0
137	4.7008	0.00	-0.0772	0
138	4.7008	-3.3333	-0.0772	0
139	2.6396	0.00	-0.6404	0
140	2.6396	-3.3333	-0.6404	0
141	1.8744	0.00	-1.9658	0
142	1.8744	-3.3333	-1.9658	0
143	2.4173	0.00	-4.0324	0

144	2.4173	-3.3333	-4.0324	0
145	5.4576	0.00	0.1929	0
146	0.8376	0.00	2.6778	0
147	5.6829	-6.6667	0.1831	0
148	5.6829	3.3333	0.1831	0
149	2.6829	-6.6667	-5.0131	0
150	2.6829	3.3333	-5.0131	0
151	5.2493	0.00	-0.168	0
152	2.7701	0.00	-4.462	0
153	2.7701	-3.3333	-4.462	0
154	5.2493	-3.3333	-0.168	0
155	4.1829	-6.6667	-2.415	0
156	4.1829	3.3333	-2.415	0
157	7.9239	3.33E-06	2.4762	0
158	1.1829	3.33E-06	-7.6112	0
159	5.6829	3.33E-06	0.1831	0
160	5.5097	3.33E-06	0.2831	0
161	2.5097	3.33E-06	-4.9131	0
162	2.6829	3.33E-06	-5.0131	0
163	4.1829	3.33E-06	-2.415	0
164	4.0097	3.33E-06	-2.315	0
165	7.9239	-3.3333	2.4762	0
166	5.6829	-3.3333	0.1831	0
167	5.5097	-3.3333	0.2831	0
168	4.1829	-3.3333	-2.415	0
169	4.0097	-3.3333	-2.315	0
170	2.5097	-3.3333	-4.9131	0
171	2.6829	-3.3333	-5.0131	0
172	1.1829	-3.3333	-7.6112	0
173	2.1463	0.00	-1.2392	0
174	2.1463	-3.3333	-1.2392	0
175	-3.6702	0.00	-0.3588	0
176	-3.6702	-3.3333	-0.3588	0
177	-3.6184	0.00	-0.1656	0
178	-3.6184	-3.3333	-0.1656	0
179	-2.1458	0.00	-2.9991	0
180	-2.1458	-3.3333	-2.9991	0
181	-1.9526	0.00	-3.0509	0
182	-1.9526	-3.3333	-3.0509	0
183	2.1458	0.00	-2.9991	0
184	2.1458	-3.3333	-2.9991	0
185	1.9526	0.00	-3.0509	0
186	1.9526	-3.3333	-3.0509	0
187	3.6702	0.00	-0.3588	0
188	3.6702	-3.3333	-0.3588	0
189	3.6184	0.00	-0.1656	0
190	3.6184	-3.3333	-0.1656	0
191	1.5244	0.00	3.3579	0
192	1.5244	-3.3333	3.3579	0
193	1.6658	0.00	3.2165	0
194	1.6658	-3.3333	3.2165	0
195	-1.5244	0.00	3.3579	0
196	-1.5244	-3.3333	3.3579	0
197	-1.6658	0.00	3.2165	0
198	-1.6658	-3.3333	3.2165	0
199	-1.6658	-3.5833	3.2165	0
200	1.6658	-3.5833	3.2165	0
201	-3.6184	-3.5833	-0.1656	0
202	-1.9526	-3.5833	-3.0509	0
203	3.6184	-3.5833	-0.1656	0

204	1.9526	-3.5833	-3.0509	0
205	-1.6658	0.4167	3.2165	0
206	1.6658	0.4167	3.2165	0
207	-3.6184	0.4167	-0.1656	0
208	-1.9526	0.4167	-3.0509	0
209	3.6184	0.4167	-0.1656	0
210	1.9526	0.4167	-3.0509	0

Restraints

Node	TX	TY	TZ	RX	RY	RZ
1	1	1	1	1	0	1
3	1	1	1	1	0	1
59	1	1	1	1	0	1
61	1	1	1	1	0	1
117	1	1	1	1	0	1
119	1	1	1	1	0	1

Members

Member	NJ	NK	Description	Section	Material	d0 [in]	dL [in]	lg factor
1	8	7		PIPE 2-1_2x0.203	A53 GrB	0.00	0.00	0.00
2	34	33		PIPE 2-1_2x0.203	A53 GrB	0.00	0.00	0.00
3	40	39		PIPE 2-1_2x0.203	A53 GrB	0.00	0.00	0.00
4	32	31		PIPE 2-1_2x0.203	A53 GrB	0.00	0.00	0.00
5	10	9		PIPE 2-1_2x0.203	A53 GrB	0.00	0.00	0.00
6	11	12		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
7	13	14		PIPE 2-1_2x0.203	A53 GrB	0.00	0.00	0.00
8	15	16		PIPE 2-1_2x0.203	A53 GrB	0.00	0.00	0.00
9	17	2		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
10	18	4		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
11	19	5		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
12	20	6		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
13	21	22		RndBar 5_8	A36	0.00	0.00	0.00
14	23	24		RndBar 5_8	A36	0.00	0.00	0.00
15	25	26		RndBar 5_8	A36	0.00	0.00	0.00
16	27	28		RndBar 5_8	A36	0.00	0.00	0.00
17	25	28		RndBar 3_4	A36	0.00	0.00	0.00
18	26	27		RndBar 3_4	A36	0.00	0.00	0.00
19	22	23		RndBar 3_4	A36	0.00	0.00	0.00
20	21	24		RndBar 3_4	A36	0.00	0.00	0.00
21	29	30		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
22	17	35		PL 3-1/2x5/8	A36	0.00	0.00	0.00
23	20	36		PL 3-1/2x5/8	A36	0.00	0.00	0.00
24	19	37		PL 3-1/2x5/8	A36	0.00	0.00	0.00
25	18	38		PL 3-1/2x5/8	A36	0.00	0.00	0.00
26	41	13		HSS_SQR 4X4X1_4	A500 GrB rectangular	0.00	0.00	0.00
31	49	15		HSS_SQR 4X4X1_4	A500 GrB rectangular	0.00	0.00	0.00
36	2	57		PL 3-1/2x5/8	A36	0.00	0.00	0.00
37	57	6		PL 3-1/2x5/8	A36	0.00	0.00	0.00

38	4	58	PL 3-1/2x5/8	A36	0.00	0.00	0.00
39	58	5	PL 3-1/2x5/8	A36	0.00	0.00	0.00
40	57	1	PL 11-1/4x5/8	A36	11.25	9.25	0.00
41	58	3	PL 11-1/4x5/8	A36	11.25	9.25	0.00
42	66	65	PIPE 2-1_2x0.203	A53 GrB	0.00	0.00	0.00
43	92	91	PIPE 2-1_2x0.203	A53 GrB	0.00	0.00	0.00
44	98	97	PIPE 2-1_2x0.203	A53 GrB	0.00	0.00	0.00
45	90	89	PIPE 2-1_2x0.203	A53 GrB	0.00	0.00	0.00
46	68	67	PIPE 2-1_2x0.203	A53 GrB	0.00	0.00	0.00
47	69	70	PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
48	71	72	PIPE 2-1_2x0.203	A53 GrB	0.00	0.00	0.00
49	73	74	PIPE 2-1_2x0.203	A53 GrB	0.00	0.00	0.00
50	75	60	PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
51	76	62	PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
52	77	63	PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
53	78	64	PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
54	79	80	RndBar 5_8	A36	0.00	0.00	0.00
55	81	82	RndBar 5_8	A36	0.00	0.00	0.00
56	83	84	RndBar 5_8	A36	0.00	0.00	0.00
57	85	86	RndBar 5_8	A36	0.00	0.00	0.00
58	83	86	RndBar 3_4	A36	0.00	0.00	0.00
59	84	85	RndBar 3_4	A36	0.00	0.00	0.00
60	80	81	RndBar 3_4	A36	0.00	0.00	0.00
61	79	82	RndBar 3_4	A36	0.00	0.00	0.00
62	87	88	PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
63	75	93	PL 3-1/2x5/8	A36	0.00	0.00	0.00
64	78	94	PL 3-1/2x5/8	A36	0.00	0.00	0.00
65	77	95	PL 3-1/2x5/8	A36	0.00	0.00	0.00
66	76	96	PL 3-1/2x5/8	A36	0.00	0.00	0.00
67	99	71	HSS_SQR 4X4X1_4	A500 GrB rectangular	0.00	0.00	0.00
72	107	73	HSS_SQR 4X4X1_4	A500 GrB rectangular	0.00	0.00	0.00
77	60	115	PL 3-1/2x5/8	A36	0.00	0.00	0.00
78	115	64	PL 3-1/2x5/8	A36	0.00	0.00	0.00
79	62	116	PL 3-1/2x5/8	A36	0.00	0.00	0.00
80	116	63	PL 3-1/2x5/8	A36	0.00	0.00	0.00
81	115	59	PL 11-1/4x5/8	A36	11.25	9.25	0.00
82	116	61	PL 11-1/4x5/8	A36	11.25	9.25	0.00
83	124	123	PIPE 2-1_2x0.203	A53 GrB	0.00	0.00	0.00
84	150	149	PIPE 2-1_2x0.203	A53 GrB	0.00	0.00	0.00
85	156	155	PIPE 2-1_2x0.203	A53 GrB	0.00	0.00	0.00
86	148	147	PIPE 2-1_2x0.203	A53 GrB	0.00	0.00	0.00
87	126	125	PIPE 2-1_2x0.203	A53 GrB	0.00	0.00	0.00
88	127	128	PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
89	129	130	PIPE 2-1_2x0.203	A53 GrB	0.00	0.00	0.00
90	131	132	PIPE 2-1_2x0.203	A53 GrB	0.00	0.00	0.00
91	133	118	PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
92	134	120	PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
93	135	121	PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
94	136	122	PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
95	137	138	RndBar 5_8	A36	0.00	0.00	0.00
96	139	140	RndBar 5_8	A36	0.00	0.00	0.00
97	141	142	RndBar 5_8	A36	0.00	0.00	0.00
98	143	144	RndBar 5_8	A36	0.00	0.00	0.00
99	141	144	RndBar 3_4	A36	0.00	0.00	0.00
100	142	143	RndBar 3_4	A36	0.00	0.00	0.00
101	138	139	RndBar 3_4	A36	0.00	0.00	0.00
102	137	140	RndBar 3_4	A36	0.00	0.00	0.00
103	145	146	PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
104	133	151	PL 3-1/2x5/8	A36	0.00	0.00	0.00
105	136	152	PL 3-1/2x5/8	A36	0.00	0.00	0.00

106	135	153	PL 3-1/2x5/8	A36	0.00	0.00	0.00
107	134	154	PL 3-1/2x5/8	A36	0.00	0.00	0.00
108	157	129	HSS_SQR 4X4X1_4	A500 GrB rectangular	0.00	0.00	0.00
113	165	131	HSS_SQR 4X4X1_4	A500 GrB rectangular	0.00	0.00	0.00
118	118	173	PL 3-1/2x5/8	A36	0.00	0.00	0.00
119	173	122	PL 3-1/2x5/8	A36	0.00	0.00	0.00
120	120	174	PL 3-1/2x5/8	A36	0.00	0.00	0.00
121	174	121	PL 3-1/2x5/8	A36	0.00	0.00	0.00
122	173	117	PL 11-1/4x5/8	A36	11.25	9.25	0.00
123	174	119	PL 11-1/4x5/8	A36	11.25	9.25	0.00
136	206	200	PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
137	205	199	PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
138	207	201	PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
139	208	202	PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
140	210	204	PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
141	209	203	PIPE 2x0.154	A53 GrB	0.00	0.00	0.00

Orientation of local axes

Member	Rotation [Deg]	Axes23	NX	NY	NZ
1	0.00	2	0.2588	0.00	0.9659
2	0.00	2	0.2588	0.00	0.9659
3	0.00	2	0.2588	0.00	0.9659
4	0.00	2	0.2588	0.00	0.9659
5	0.00	2	0.2588	0.00	0.9659
13	0.00	2	-0.866	0.00	-0.50
14	0.00	2	-0.866	0.00	-0.50
15	0.00	2	-0.866	0.00	-0.50
16	0.00	2	-0.866	0.00	-0.50
22	90.00	0	0.00	0.00	0.00
23	90.00	0	0.00	0.00	0.00
24	90.00	0	0.00	0.00	0.00
25	90.00	0	0.00	0.00	0.00
36	90.00	0	0.00	0.00	0.00
37	90.00	0	0.00	0.00	0.00
38	90.00	0	0.00	0.00	0.00
39	90.00	0	0.00	0.00	0.00
40	90.00	0	0.00	0.00	0.00
41	90.00	0	0.00	0.00	0.00
42	315.00	0	0.00	0.00	0.00
43	315.00	0	0.00	0.00	0.00
44	315.00	0	0.00	0.00	0.00
45	315.00	0	0.00	0.00	0.00
46	315.00	0	0.00	0.00	0.00
54	0.00	2	0.00	0.00	1.00
55	0.00	2	0.00	0.00	1.00
56	0.00	2	0.00	0.00	1.00
57	0.00	2	0.00	0.00	1.00
63	90.00	0	0.00	0.00	0.00
64	90.00	0	0.00	0.00	0.00
65	90.00	0	0.00	0.00	0.00
66	90.00	0	0.00	0.00	0.00
77	90.00	0	0.00	0.00	0.00
78	90.00	0	0.00	0.00	0.00
79	90.00	0	0.00	0.00	0.00

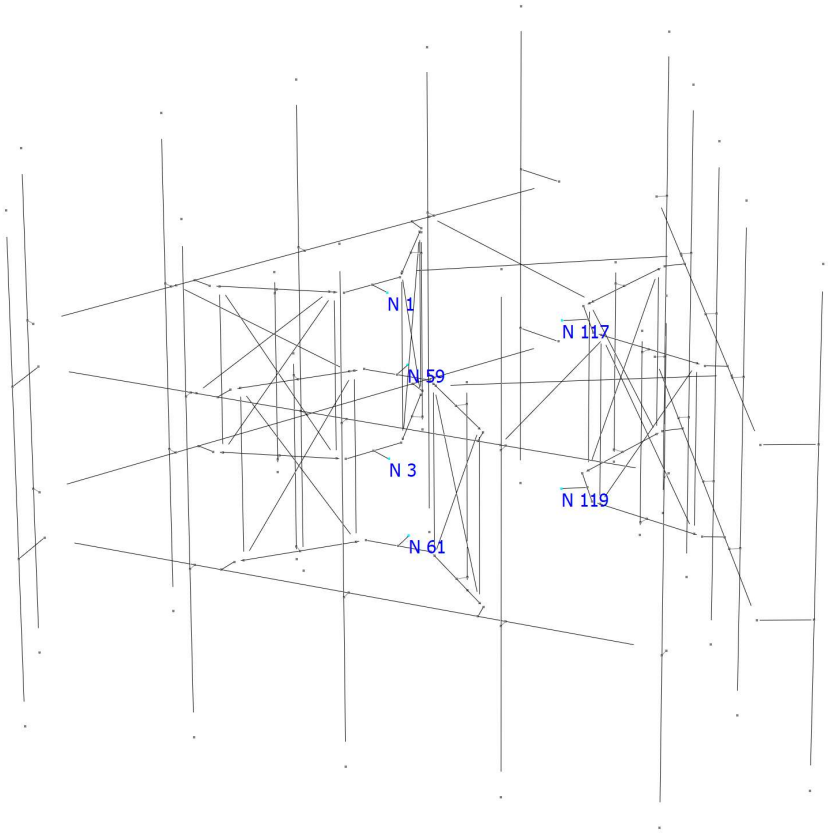
80	90.00	0	0.00	0.00	0.00
81	90.00	0	0.00	0.00	0.00
82	90.00	0	0.00	0.00	0.00
83	0.00	2	-0.9659	0.00	-0.2588
84	0.00	2	-0.9659	0.00	-0.2588
85	0.00	2	-0.9659	0.00	-0.2588
86	0.00	2	-0.9659	0.00	-0.2588
87	0.00	2	-0.9659	0.00	-0.2588
95	0.00	2	0.866	0.00	-0.50
96	0.00	2	0.866	0.00	-0.50
97	0.00	2	0.866	0.00	-0.50
98	0.00	2	0.866	0.00	-0.50
104	90.00	0	0.00	0.00	0.00
105	90.00	0	0.00	0.00	0.00
106	90.00	0	0.00	0.00	0.00
107	90.00	0	0.00	0.00	0.00
118	90.00	0	0.00	0.00	0.00
119	90.00	0	0.00	0.00	0.00
120	90.00	0	0.00	0.00	0.00
121	90.00	0	0.00	0.00	0.00
122	90.00	0	0.00	0.00	0.00
123	90.00	0	0.00	0.00	0.00

Rigid end offsets

Member	DJX [in]	DJY [in]	DJZ [in]	DKX [in]	DKY [in]	DKZ [in]
17	0.00	-3.50	0.00	0.00	3.50	0.00
18	0.00	3.50	0.00	0.00	-3.50	0.00
19	0.00	3.50	0.00	0.00	-3.50	0.00
20	0.00	-3.50	0.00	0.00	3.50	0.00
40	0.00	-0.625	0.00	0.00	-0.625	0.00
41	0.00	-0.625	0.00	0.00	-0.625	0.00
58	0.00	-3.50	0.00	0.00	3.50	0.00
59	0.00	3.50	0.00	0.00	-3.50	0.00
60	0.00	3.50	0.00	0.00	-3.50	0.00
61	0.00	-3.50	0.00	0.00	3.50	0.00
81	0.00	-0.625	0.00	0.00	-0.625	0.00
82	0.00	-0.625	0.00	0.00	-0.625	0.00
99	0.00	-3.50	0.00	0.00	3.50	0.00
100	0.00	3.50	0.00	0.00	-3.50	0.00
101	0.00	3.50	0.00	0.00	-3.50	0.00
102	0.00	-3.50	0.00	0.00	3.50	0.00
122	0.00	-0.625	0.00	0.00	-0.625	0.00
123	0.00	-0.625	0.00	0.00	-0.625	0.00

Hinges

	Node-J				Node-K						
Member	**M33**	**M22**	**V3**	**V2**	**M33**	**M22**	**V3**	**V2**	**TOR**	**AXL**	**Axial rigidity**
6	1	1	0	0	0	0	0	0	0	0	Full
18	0	0	0	0	0	0	0	0	0	0	Tension only
20	0	0	0	0	0	0	0	0	0	0	Tension only
21	1	1	0	0	0	0	0	0	0	0	Full
22	1	1	0	0	0	0	0	0	0	0	Full
23	1	1	0	0	0	0	0	0	0	0	Full
24	1	1	0	0	0	0	0	0	0	0	Full
25	1	1	0	0	0	0	0	0	0	0	Full
47	1	1	0	0	0	0	0	0	0	0	Full
59	0	0	0	0	0	0	0	0	0	0	Tension only
61	0	0	0	0	0	0	0	0	0	0	Tension only
62	1	1	0	0	0	0	0	0	0	0	Full
63	1	1	0	0	0	0	0	0	0	0	Full
64	1	1	0	0	0	0	0	0	0	0	Full
65	1	1	0	0	0	0	0	0	0	0	Full
66	1	1	0	0	0	0	0	0	0	0	Full
88	1	1	0	0	0	0	0	0	0	0	Full
100	0	0	0	0	0	0	0	0	0	0	Tension only
102	0	0	0	0	0	0	0	0	0	0	Tension only
103	1	1	0	0	0	0	0	0	0	0	Full
104	1	1	0	0	0	0	0	0	0	0	Full
105	1	1	0	0	0	0	0	0	0	0	Full
106	1	1	0	0	0	0	0	0	0	0	Full
107	1	1	0	0	0	0	0	0	0	0	Full


N 1
N 117
N 59
N 3
N 119
N 61

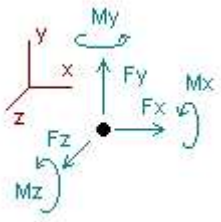

Y
Z
X

RAM® Elements
CONNECT Edition

Current Date: 3/29/2022 2:12 PM
Units system: English

Analysis result

Reactions



Direction of positive forces and moments

	Forces [Kip]			Moments [Kip*ft]		
Node	**FX**	**FY**	**FZ**	**MX**	**MY**	**MZ**
Condition **LC1=1.2DL+W0**						
1	-0.33638	0.81139	2.44804	-0.01442	0.00000	-0.34313
3	-0.64305	0.64095	1.04780	0.02219	0.00000	-0.28670
59	-0.05217	0.85016	0.45125	-0.32234	0.00000	-0.00747
61	-0.10563	0.75690	2.77605	-0.34571	0.00000	-0.00742
117	0.39457	0.81497	2.16696	-0.02907	0.00000	0.35929
119	0.74266	0.64032	1.22573	-0.00098	0.00000	0.29636
SUM	0.00000	4.51470	10.11583	-0.69033	0.00000	0.01093
Condition **LC2=1.2DL+W30**						
1	1.79522	0.81748	-1.18836	0.27446	0.00000	-0.18185
3	1.20677	0.61001	-0.42835	0.19711	0.00000	-0.15173
59	1.92183	0.82909	-0.31756	-0.30524	0.00000	0.17010
61	1.09904	0.67423	0.88998	-0.28497	0.00000	0.11895
117	1.53898	0.84628	1.48657	0.03824	0.00000	0.35424
119	2.75039	0.73762	-0.44227	0.08835	0.00000	0.33485
SUM	10.31223	4.51470	0.00000	0.00796	0.00000	0.64457
Condition **LC3=1.2DL-W0**						
1	0.64036	0.84927	-2.04461	0.33332	0.00000	-0.18493
3	-0.79606	0.70630	-2.10095	0.27634	0.00000	-0.19442
59	0.26543	0.81443	-0.91851	-0.29580	0.00000	-0.00646
61	-0.10873	0.59215	-1.00362	-0.22063	0.00000	-0.01288
117	-0.90911	0.84559	-2.13204	0.32240	0.00000	0.18346
119	0.90811	0.70696	-1.91610	0.26346	0.00000	0.20559
SUM	0.00000	4.51470	-10.11583	0.67909	0.00000	-0.00964
Condition **LC4=1.2DL-W30**						
1	-1.49796	0.84487	1.59839	0.04557	0.00000	-0.34635
3	-2.64544	0.73820	-0.62619	0.10249	0.00000	-0.32899
59	-1.70309	0.83175	-0.15948	-0.31126	0.00000	-0.18507
61	-1.31307	0.67432	0.88523	-0.28160	0.00000	-0.14019
117	-2.04970	0.81570	-1.45036	0.25781	0.00000	0.18771
119	-1.10296	0.60987	-0.24759	0.17609	0.00000	0.16570
SUM	-10.31223	4.51470	0.00000	-0.01090	0.00000	-0.64720

Condition **LC5=0.9DL+W0**

1	-0.37476	0.60481	2.39817	-0.05371	0.00000	-0.27722
3	-0.46335	0.47205	1.17924	-0.01501	0.00000	-0.22645
59	-0.07839	0.64081	0.50925	-0.24451	0.00000	-0.00568
61	-0.07895	0.58903	2.55403	-0.27496	0.00000	-0.00487
117	0.45855	0.61361	2.16268	-0.06356	0.00000	0.29268
119	0.53691	0.46571	1.31246	-0.03545	0.00000	0.23300
SUM	0.00000	3.38603	10.11583	-0.68721	0.00000	0.01146

Condition **LC6=0.9DL+W30**

1	1.75621	0.61084	-1.23901	0.23452	0.00000	-0.11640
3	1.38633	0.44109	-0.29693	0.15957	0.00000	-0.09163
59	1.89607	0.62115	-0.25867	-0.22800	0.00000	0.17167
61	1.12569	0.50578	0.66828	-0.21415	0.00000	0.12134
117	1.60377	0.63727	1.48210	0.00127	0.00000	0.28584
119	2.54416	0.56988	-0.35577	0.05559	0.00000	0.27216
SUM	10.31223	3.38603	0.00000	0.00879	0.00000	0.64297

Condition **LC7=0.9DL-W0**

1	0.60227	0.64074	-2.09536	0.29297	0.00000	-0.11869
3	-0.61621	0.53829	-1.96934	0.23880	0.00000	-0.13444
59	0.23872	0.60807	-0.85907	-0.21916	0.00000	-0.00460
61	-0.08199	0.42292	-1.22501	-0.14967	0.00000	-0.01025
117	-0.84473	0.63701	-2.13724	0.28511	0.00000	0.11545
119	0.70195	0.53900	-1.82981	0.23032	0.00000	0.14309
SUM	0.00000	3.38603	-10.11583	0.67838	0.00000	-0.00943

Condition **LC8=0.9DL-W30**

1	-1.53632	0.63579	1.54848	0.00554	0.00000	-0.27968
3	-2.46552	0.57044	-0.49439	0.06535	0.00000	-0.26881
59	-1.73078	0.62386	-0.10049	-0.23406	0.00000	-0.18299
61	-1.28631	0.50587	0.66354	-0.21079	0.00000	-0.13737
117	-1.98451	0.60905	-1.45562	0.22103	0.00000	0.12041
119	-1.30879	0.44103	-0.16153	0.14303	0.00000	0.10304
SUM	-10.31223	3.38603	0.00000	-0.00991	0.00000	-0.64541

Condition **LC9=1.2DL+Di+Wi0**

1	0.36097	1.87020	0.72067	0.30987	0.00000	-0.61478
3	-1.74591	1.51452	-0.93483	0.29895	0.00000	-0.56126
59	0.14484	1.87440	-0.57088	-0.68943	0.00000	0.00909
61	-0.15522	1.53395	2.40133	-0.65008	0.00000	-0.00038
117	-0.50076	1.87002	0.43005	0.32715	0.00000	0.60584
119	1.89608	1.51407	-0.67534	0.29849	0.00000	0.56042
SUM	0.00000	10.17716	1.37100	-0.10506	0.00000	-0.00107

Condition **LC10=1.2DL+Di+Wi30**

1	0.61557	1.87159	0.18272	0.35080	0.00000	-0.59363
3	-1.48359	1.50917	-1.14550	0.32260	0.00000	-0.54186
59	0.40010	1.87372	-0.59223	-0.68945	0.00000	0.03344
61	0.00906	1.52047	2.10394	-0.63984	0.00000	0.01712
117	-0.39122	1.87396	0.36540	0.33462	0.00000	0.60462
119	2.17907	1.52825	-0.91433	0.31050	0.00000	0.56710
SUM	1.32900	10.17716	0.00000	-0.01077	0.00000	0.08680

Condition **LC11=1.2DL+Di-Wi0**

1	0.51511	1.87561	0.07908	0.35945	0.00000	-0.59228
3	-1.76716	1.52340	-1.38263	0.33461	0.00000	-0.54823
59	0.16853	1.87298	-0.59555	-0.69041	0.00000	0.00901
61	-0.15588	1.50707	1.80541	-0.62881	0.00000	-0.00077
117	-0.67886	1.87507	-0.15190	0.37451	0.00000	0.58215
119	1.91825	1.52302	-1.12542	0.33466	0.00000	0.54875
SUM	0.00000	10.17716	-1.37100	0.08402	0.00000	-0.00138

Condition **LC12=1.2DL+Di-Wi30**

1	0.26046	1.87426	0.61711	0.31857	0.00000	-0.61343
3	-2.02948	1.52877	-1.17198	0.31099	0.00000	-0.56762
59	-0.08673	1.87360	-0.57428	-0.69036	0.00000	-0.01538
61	-0.32013	1.52053	2.10285	-0.63905	0.00000	-0.01830
117	-0.78832	1.87115	-0.08729	0.36711	0.00000	0.58334
119	1.63520	1.50885	-0.88642	0.32270	0.00000	0.54203
SUM	-1.32900	10.17716	0.00000	-0.01005	0.00000	-0.08936

Condition **LC13=1.4DL**

1	0.18075	0.96957	0.23481	0.18644	0.00000	-0.30823
3	-0.83870	0.78596	-0.61417	0.17439	0.00000	-0.28065
59	0.12474	0.96985	-0.27548	-0.36011	0.00000	-0.00850
61	-0.12469	0.78657	1.03453	-0.33049	0.00000	-0.01214
117	-0.30351	0.96942	0.02293	0.17192	0.00000	0.31653
119	0.96141	0.78579	-0.40262	0.15368	0.00000	0.29249
SUM	0.00000	5.26715	0.00000	-0.00417	0.00000	-0.00050

Condition **LC14=1.2DL+1.6LL1**

1	0.11444	0.83284	0.15555	0.15938	0.00000	-0.26513
3	-0.71842	0.67545	-0.52427	0.14830	0.00000	-0.24195
59	0.10685	1.05184	-0.41813	-0.39134	0.00000	-0.00728
61	-0.10688	0.84655	1.15592	-0.35891	0.00000	-0.01040
117	-0.21957	0.83272	-0.02613	0.14694	0.00000	0.27225
119	0.82358	0.67530	-0.34295	0.13055	0.00000	0.25210
SUM	0.00000	4.91470	0.00000	-0.16507	0.00000	-0.00041

Condition **LC15=1.2DL+1.6LL2**

1	0.10385	0.82596	0.15605	0.16325	0.00000	-0.26352
3	-0.71411	0.66247	-0.53148	0.15022	0.00000	-0.23458
59	-0.47714	1.04816	-0.44495	-0.38694	0.00000	0.08905
61	0.49869	0.84095	1.16029	-0.35257	0.00000	0.09068
117	-0.25308	0.84249	-0.01083	0.14162	0.00000	0.27541
119	0.84180	0.69467	-0.32909	0.12785	0.00000	0.26316
SUM	0.00000	4.91470	0.00000	-0.15657	0.00000	0.22020

Condition **LC16=1.2DL+WL0+1.6LLa1**

1	0.02553	0.82148	0.18684	0.16007	0.00000	-0.26644
3	-0.70710	0.65082	-0.47717	0.14596	0.00000	-0.23088
59	-1.07237	1.26458	-0.67174	-0.46437	0.00000	0.17842
61	1.11162	1.01180	1.56182	-0.42608	0.00000	0.18708
117	-0.21394	0.85314	0.02580	0.13015	0.00000	0.28273
119	0.85625	0.71289	-0.25455	0.11919	0.00000	0.27638
SUM	0.00000	5.31470	0.37100	-0.33509	0.00000	0.42729

Condition **LC17=1.2DL+WL30+1.6LLa1**

1	0.09825	0.82213	0.02543	0.17151	0.00000	-0.26071
3	-0.63574	0.64922	-0.53212	0.15220	0.00000	-0.22563
59	-1.00460	1.26472	-0.67253	-0.46462	0.00000	0.18481
61	1.15357	1.00805	1.48140	-0.42325	0.00000	0.19163
117	-0.17962	0.85384	0.01527	0.13179	0.00000	0.28241
119	0.93313	0.71675	-0.31746	0.12234	0.00000	0.27824
SUM	0.36500	5.31470	0.00000	-0.31003	0.00000	0.45075

Condition **LC18=1.2DL-WL0+1.6LLa1**

1	0.06744	0.82274	0.00384	0.17337	0.00000	-0.26036
3	-0.71277	0.65302	-0.59463	0.15526	0.00000	-0.22742
59	-1.06567	1.26492	-0.66847	-0.46513	0.00000	0.17848
61	1.11162	1.00443	1.40062	-0.42026	0.00000	0.18702
117	-0.26268	0.85434	-0.13976	0.14286	0.00000	0.27636
119	0.86206	0.71524	-0.37260	0.12865	0.00000	0.27330
SUM	0.00000	5.31470	-0.37100	-0.28526	0.00000	0.42737

Condition **LC19=1.2DL-WL30+1.6LLa1**

1	-0.00528	0.82210	0.16526	0.16194	0.00000	-0.26609
3	-0.78414	0.65462	-0.53969	0.14902	0.00000	-0.23268
59	-1.13344	1.26477	-0.66769	-0.46488	0.00000	0.17209
61	1.06967	1.00818	1.48105	-0.42309	0.00000	0.18246
117	-0.29699	0.85365	-0.12923	0.14122	0.00000	0.27667
119	0.78517	0.71138	-0.30970	0.12551	0.00000	0.27144
SUM	-0.36500	5.31470	0.00000	-0.31030	0.00000	0.40390

Condition **LC20=1.2DL+WL0+1.6LLa2**

1	0.03763	0.82919	0.18726	0.15635	0.00000	-0.26854
3	-0.71278	0.66437	-0.46989	0.14410	0.00000	-0.23849
59	-0.48597	1.26824	-0.64755	-0.46862	0.00000	0.09988
61	0.50339	1.01855	1.55687	-0.43275	0.00000	0.10026
117	-0.17747	0.84198	0.01334	0.13530	0.00000	0.27876
119	0.83520	0.69237	-0.26903	0.12194	0.00000	0.26474
SUM	0.00000	5.31470	0.37100	-0.34368	0.00000	0.23662

Condition **LC21=1.2DL+WL30+1.6LLa2**

1	0.11036	0.82984	0.02584	0.16779	0.00000	-0.26281
3	-0.64141	0.66277	-0.52484	0.15034	0.00000	-0.23324
59	-0.41813	1.26840	-0.64827	-0.46888	0.00000	0.10623
61	0.54524	1.01483	1.47646	-0.42992	0.00000	0.10478
117	-0.14315	0.84266	0.00274	0.13695	0.00000	0.27843
119	0.91210	0.69621	-0.33193	0.12509	0.00000	0.26659
SUM	0.36500	5.31470	0.00000	-0.31865	0.00000	0.25999

Condition **LC22=1.2DL-WL0+1.6LLa2**

1	0.07949	0.83047	0.00428	0.16965	0.00000	-0.26247
3	-0.71843	0.66658	-0.58736	0.15340	0.00000	-0.23503
59	-0.47919	1.26861	-0.64409	-0.46940	0.00000	0.09989
61	0.50332	1.01119	1.39573	-0.42692	0.00000	0.10017
117	-0.22623	0.84317	-0.15248	0.14802	0.00000	0.27239
119	0.84104	0.69469	-0.38708	0.13139	0.00000	0.26165
SUM	0.00000	5.31470	-0.37100	-0.29387	0.00000	0.23660

Condition **LC23=1.2DL-WL30+1.6LLa2**

1	0.00675	0.82983	0.16570	0.15822	0.00000	-0.26820
3	-0.78980	0.66818	-0.53242	0.14716	0.00000	-0.24028
59	-0.54704	1.26843	-0.64339	-0.46914	0.00000	0.09354
61	0.46148	1.01491	1.47614	-0.42975	0.00000	0.09565
117	-0.26054	0.84250	-0.14188	0.14637	0.00000	0.27271
119	0.76414	0.69086	-0.32417	0.12825	0.00000	0.25980
SUM	-0.36500	5.31470	0.00000	-0.31889	0.00000	0.21323

Condition **LC24=1.2DL+WL0+1.6LLa3**

1	0.04613	0.83423	0.19349	0.15251	0.00000	-0.26930
3	-0.71523	0.67554	-0.46333	0.14237	0.00000	-0.24491
59	0.10343	1.27097	-0.63337	-0.47269	0.00000	-0.00722
61	-0.10682	1.02439	1.55276	-0.43954	0.00000	-0.01030
117	-0.14775	0.83420	0.00319	0.14036	0.00000	0.27659
119	0.82026	0.67537	-0.28173	0.12453	0.00000	0.25489
SUM	0.00000	5.31470	0.37100	-0.35246	0.00000	-0.00025

Condition **LC25=1.2DL+WL30+1.6LLa3**

1	0.11888	0.83487	0.03208	0.16395	0.00000	-0.26357
3	-0.64385	0.67395	-0.51828	0.14860	0.00000	-0.23965
59	0.17128	1.27116	-0.63405	-0.47297	0.00000	-0.00090
61	-0.06504	1.02069	1.47234	-0.43672	0.00000	-0.00581
117	-0.11344	0.83484	-0.00746	0.14201	0.00000	0.27625
119	0.89716	0.67918	-0.34463	0.12768	0.00000	0.25672
SUM	0.36500	5.31470	0.00000	-0.32744	0.00000	0.02304

Condition **LC26=1.2DL-WL0+1.6LLa3**

1	0.08799	0.83552	0.01055	0.16582	0.00000	-0.26324
3	-0.72085	0.67776	-0.58080	0.15166	0.00000	-0.24145
59	0.11022	1.27136	-0.62986	-0.47349	0.00000	-0.00726
61	-0.10699	1.01703	1.39164	-0.43371	0.00000	-0.01044
117	-0.19649	0.83536	-0.16275	0.15308	0.00000	0.27020
119	0.82612	0.67766	-0.39977	0.13399	0.00000	0.25178
SUM	0.00000	5.31470	-0.37100	-0.30265	0.00000	-0.00040

Condition **LC27=1.2DL-WL30+1.6LLa3**

1	0.01523	0.83488	0.17196	0.15438	0.00000	-0.26897
3	-0.79223	0.67936	-0.52585	0.14543	0.00000	-0.24670
59	0.04237	1.27116	-0.62919	-0.47321	0.00000	-0.01358
61	-0.14877	1.02073	1.47206	-0.43654	0.00000	-0.01493
117	-0.23080	0.83472	-0.15211	0.15144	0.00000	0.27054
119	0.74921	0.67385	-0.33687	0.13084	0.00000	0.24995
SUM	-0.36500	5.31470	0.00000	-0.32765	0.00000	-0.02370

Condition **LC28=1.2DL+WL0+1.6LLa4**

1	0.07784	0.85039	0.15974	0.14483	0.00000	-0.27499
3	-0.74659	0.70571	-0.43978	0.13720	0.00000	-0.26263
59	1.31777	1.26030	-0.74723	-0.46186	0.00000	-0.16276
61	-1.35893	1.01891	1.75140	-0.43313	0.00000	-0.18695
117	-0.10434	0.82531	-0.05995	0.14782	0.00000	0.27545
119	0.81425	0.65409	-0.29317	0.12689	0.00000	0.24314
SUM	0.00000	5.31470	0.37100	-0.33826	0.00000	-0.36874

Condition **LC29=1.2DL+WL30+1.6LLa4**

1	0.15062	0.85103	-0.00143	0.15626	0.00000	-0.26926
3	-0.67520	0.70413	-0.49473	0.14344	0.00000	-0.25738
59	1.38565	1.26048	-0.74803	-0.46214	0.00000	-0.15648
61	-1.31717	1.01525	1.67090	-0.43032	0.00000	-0.18248
117	-0.07009	0.82592	-0.07065	0.14947	0.00000	0.27510
119	0.89119	0.65789	-0.35607	0.13003	0.00000	0.24497
SUM	0.36500	5.31470	0.00000	-0.31325	0.00000	-0.34552

Condition **LC30=1.2DL-WL0+1.6LLa4**

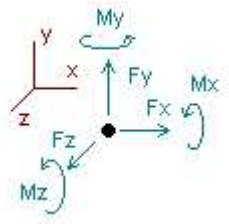
1	0.11977	0.85173	-0.02284	0.15812	0.00000	-0.26894
3	-0.75219	0.70799	-0.55725	0.14650	0.00000	-0.25920
59	1.32463	1.26065	-0.74399	-0.46263	0.00000	-0.16293
61	-1.35927	1.01153	1.59016	-0.42730	0.00000	-0.18718
117	-0.15310	0.82643	-0.22588	0.16053	0.00000	0.26906
119	0.82016	0.65637	-0.41120	0.13634	0.00000	0.24003
SUM	0.00000	5.31470	-0.37100	-0.28844	0.00000	-0.36916

Condition **LC31=1.2DL-WL30+1.6LLa4**

1	0.04698	0.85110	0.13833	0.14669	0.00000	-0.27467
3	-0.82358	0.70957	-0.50230	0.14026	0.00000	-0.26445
59	1.25675	1.26045	-0.74320	-0.46234	0.00000	-0.16922
61	-1.40103	1.01519	1.67066	-0.43010	0.00000	-0.19165
117	-0.18734	0.82582	-0.21519	0.15889	0.00000	0.26941
119	0.74322	0.65256	-0.34830	0.13320	0.00000	0.23820
SUM	-0.36500	5.31470	0.00000	-0.31342	0.00000	-0.39239

Envelope for nodal reactions

Note.- **Ic** is the controlling load condition



Direction of positive forces and moments

Envelope of nodal reactions for :

LC1=1.2DL+W0
LC2=1.2DL+W30
LC3=1.2DL-W0
LC4=1.2DL-W30
LC5=0.9DL+W0
LC6=0.9DL+W30
LC7=0.9DL-W0
LC8=0.9DL-W30
LC9=1.2DL+Di+Wi0
LC10=1.2DL+Di+Wi30
LC11=1.2DL+Di-Wi0
LC12=1.2DL+Di-Wi30
LC13=1.4DL

LC14=1.2DL+1.6LL1
LC15=1.2DL+1.6LL2
LC16=1.2DL+WL0+1.6LLa1
LC17=1.2DL+WL30+1.6LLa1
LC18=1.2DL-WL0+1.6LLa1
LC19=1.2DL-WL30+1.6LLa1
LC20=1.2DL+WL0+1.6LLa2
LC21=1.2DL+WL30+1.6LLa2
LC22=1.2DL-WL0+1.6LLa2
LC23=1.2DL-WL30+1.6LLa2
LC24=1.2DL+WL0+1.6LLa3
LC25=1.2DL+WL30+1.6LLa3
LC26=1.2DL-WL0+1.6LLa3
LC27=1.2DL-WL30+1.6LLa3
LC28=1.2DL+WL0+1.6LLa4
LC29=1.2DL+WL30+1.6LLa4
LC30=1.2DL-WL0+1.6LLa4
LC31=1.2DL-WL30+1.6LLa4

		Forces						Moments					
Node		**Fx** [Kip]	**lc**	**Fy** [Kip]	**lc**	**Fz** [Kip]	**lc**	**Mx** [Kip*ft]	**lc**	**My** [Kip*ft]	**lc**	**Mz** [Kip*ft]	**lc**
1	Max	1.795	LC2	1.876	LC11	2.448	LC1	0.35945	LC11	0.00000	LC1	-0.11640	LC6
	Min	-1.536	LC8	0.605	LC5	-2.095	LC7	-0.05371	LC5	0.00000	LC1	-0.61478	LC9
3	Max	1.386	LC6	1.529	LC12	1.179	LC5	0.33461	LC11	0.00000	LC1	-0.09163	LC6
	Min	-2.645	LC4	0.441	LC6	-2.101	LC3	-0.01501	LC5	0.00000	LC1	-0.56762	LC12
59	Max	1.922	LC2	1.874	LC9	0.509	LC5	-0.21916	LC7	0.00000	LC1	0.18481	LC17
	Min	-1.731	LC8	0.608	LC7	-0.919	LC3	-0.69041	LC11	0.00000	LC1	-0.18507	LC4
61	Max	1.154	LC17	1.534	LC9	2.776	LC1	-0.14967	LC7	0.00000	LC1	0.19163	LC17
	Min	-1.401	LC31	0.423	LC7	-1.225	LC7	-0.65008	LC9	0.00000	LC1	-0.19165	LC31
117	Max	1.604	LC6	1.875	LC11	2.167	LC1	0.37451	LC11	0.00000	LC1	0.60584	LC9
	Min	-2.050	LC4	0.609	LC8	-2.137	LC7	-0.06356	LC5	0.00000	LC1	0.11545	LC7
119	Max	2.750	LC2	1.528	LC10	1.312	LC5	0.33466	LC11	0.00000	LC1	0.56710	LC10
	Min	-1.309	LC8	0.441	LC8	-1.916	LC3	-0.03545	LC5	0.00000	LC1	0.10304	LC8

HUDSON
Design Group LLC

Connection Check

Date: 3/29/2022
Project Name: CHESHIRE WATER TREATMENT FACILITY
Project No.: CT3459
Designed By: CL **Checked By:** MSC

HUDSON Design Group LLC

CHECK CONNECTION CAPACITY (Worst Case)

Reference: AISC Steel Construction Manual 14th Edition (ASD)

Bolt Type = A36 5/8" Threaded Rod

Allowable Tensile Load =

F_{Tall} = 6673 lbs.

Allowable Shear Load =

F_{Vall}= 4004 lbs.

TENSILE FORCES

Reaction **F =** 2776 lbs. (See Bentley Output)

SHEAR FORCES

Reactions in X direction: 1401 lbs. (See Bentley Output)
Reactions in Y direction: 1534 lbs. (See Bentley Output)

Resultant: 2077 lbs.

No. of Supports = 1
No. of Bolts / Support = 3

Tension Design Load /Bolts =

f_t= 925.33 lbs. < 6673 lbs. **Therefore, OK !**

Shear Design Load / Bolts=

f_v= 692.50 lbs. < 4004 lbs. **Therefore, OK !**

CHECK COMBINED TENSION AND SHEAR

f_t / F_T	+	f_v / F_V	≤	1.0			
0.139	+	0.173	=	0.312	<	1.0	**Therefore, OK !**

C Squared Systems, LLC
65 Dartmouth Drive
Auburn, NH 03032
603-644-2800
support@csquaredsystems.com

Calculated Radio Frequency Exposure

CT3459

1325 Cheshire Road, Cheshire, CT

May 12, 2022

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1. Introduction

The purpose of this report is to investigate compliance with applicable FCC regulations for the proposed installation of AT&T antenna arrays on top of the existing water tank located at 1325 Cheshire Road in Cheshire, CT. The coordinates of the existing water tank are 41-41-50.73 N, 70-30-27.23 W.

AT&T is proposing the following:

1) Install twelve (12) multi-band antennas (four (4) per sector) to support its commercial LTE network and the FirstNet National Public Safety Broadband Network ("NPSBN").

This report considers the planned antenna configuration for AT&T[1] to derive the resulting % Maximum Permissible Exposure of its proposed installation.

2. FCC Guidelines for Evaluating RF Radiation Exposure Limits

In 1985, the FCC established rules to regulate radio frequency (RF) exposure from FCC licensed antenna facilities. In 1996, the FCC updated these rules, which were further amended in August 1997 by OET Bulletin 65 Edition 97-01. These new rules include Maximum Permissible Exposure (MPE) limits for transmitters operating between 300 kHz and 100 GHz. The FCC MPE limits are based upon those recommended by the National Council on Radiation Protection and Measurements (NCRP), developed by the Institute of Electrical and Electronics Engineers, Inc., (IEEE) and adopted by the American National Standards Institute (ANSI).

The FCC general population/uncontrolled limits set the maximum exposure to which most people may be subjected. General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or cannot exercise control over their exposure.

Public exposure to radio frequencies is regulated and enforced in units of milliwatts per square centimeter (mW/cm^2). The general population exposure limits for the various frequency ranges are defined in the attached "FCC Limits for Maximum Permissible Exposure (MPE)" in Attachment B of this report.

Higher exposure limits are permitted under the occupational/controlled exposure category, but only for persons who are exposed as a consequence of their employment and who have been made fully aware of the potential for exposure, and they must be able to exercise control over their exposure. General population/uncontrolled limits are five times more stringent than the levels that are acceptable for occupational, or radio frequency trained individuals. Attachment B contains excerpts from OET Bulletin 65 and defines the Maximum Exposure Limit.

Finally, it should be noted that the MPE limits adopted by the FCC for both general population/uncontrolled exposure and for occupational/controlled exposure incorporate a substantial margin of safety and have been established to be well below levels generally accepted as having the potential to cause adverse health effects.

[1] As referenced to AT&T's Radio Frequency Design Sheet dated 1/20/22.

3. RF Exposure Calculation Methods

The power density calculation results were generated using the following formula as outlined in FCC bulletin OET 65:

$$\text{Power Density} = \left(\frac{1.6^2 \times 1.64 \times \text{ERP}}{4\pi \times R^2}\right) \text{X Off Beam Loss}$$

Where:

ERP = Effective Radiated Power

R = Radial Distance = $\sqrt{\left(H^2 + V^2\right)}$

H = Horizontal Distance from antenna

V = Vertical Distance from radiation center of antenna

Ground reflection factor of 1.6

Off Beam Loss is determined by the selected antenna pattern

These calculations assume that the antennas are operating at 100 percent capacity and power, and that all antenna channels are transmitting simultaneously. Obstructions (trees, buildings, etc.) that would normally attenuate the signal are not taken into account. The calculations assume even terrain in the area of study and do not consider actual terrain elevations which could attenuate the signal. As a result, the predicted signal levels reported below are much higher than the actual signal levels will be from the final installations.

4. Calculation Results

Table 1 below outlines the cumulative power density information for the AT&T installation on the existing water tank at the site. The proposed antennas are directional in nature; therefore, the majority of the RF power is focused out towards the horizon. As a result, there will be less RF power directed below the antennas relative to the horizon, and consequently lower power density levels around the base of the water tank. Please refer to Attachment C for the vertical pattern of the proposed AT&T antennas. The calculated results for AT&T in Table 1 include a nominal 10 dB off-beam pattern loss to account for the lower relative gain below the antennas.

Carrier	Antenna Height (Feet)	Operating Frequency (MHz)	Number of Trans.	ERP Per Transmitter (Watts)	Power Density (mw/cm^2)	Limit	% MPE
T-Mobile	129	600	2	592	0.0281	0.4000	0.70%
T-Mobile	129	600	2	1578	0.0750	0.4000	1.88%
T-Mobile	129	700	2	695	0.0330	0.4667	0.71%
T-Mobile	129	1900	4	1052	0.1000	1.0000	1.00%
T-Mobile	129	1900	2	2105	0.1001	1.0000	1.00%
T-Mobile	129	2100	2	1325	0.0630	1.0000	0.63%
T-Mobile	129	2100	2	2649	0.1259	1.0000	1.26%
T-Mobile	129	2500	1	11045	0.2625	1.0000	2.63%
T-Mobile	129	2500	1	1074	0.0255	1.0000	0.26%
T-Mobile	129	2500	1	22089	0.5251	1.0000	5.25%
T-Mobile	129	2500	1	2148	0.0511	1.0000	0.51%
Verizon	145	54	4	54	0.0040	0.2000	0.20%
Verizon	145	1970	4	1288	0.0959	1.0000	0.96%
Verizon	145	880	4	617	0.0459	0.5867	0.78%
Verizon	145	2145	4	1413	0.1052	1.0000	1.05%
Verizon	145	746	4	537	0.0400	0.4973	0.80%
AT&T	155	739	1	3541	0.0057	0.4927	1.16%
AT&T	155	763	1	3156	0.0051	0.5087	1.01%
AT&T	155	885	1	3883	0.0063	0.5900	1.07%
AT&T	155	1900	3	5877	0.0286	1.0000	2.86%
AT&T	155	2100	2	9890	0.0321	1.0000	3.21%
AT&T	155	2300	1	6153	0.0100	1.0000	1.00%
AT&T	157.33	3500	1	24286	0.0382	1.0000	3.82%
AT&T	153.75	3500	1	24286	0.0400	1.0000	4.00%
						Total	**37.73%**

Table 1: Carrier Information[2]

[2] The existing record in the CSC Power Density Table for AT&T should be removed and replaced with the updated AT&T technologies and values provided in Table 1. The power density information for Verizon and T-Mobile was taken directly from the CSC database dated 01/21/2022. Please note that % MPE values listed are rounded to two decimal points and the total % MPE listed is a summation of each unrounded contribution. Therefore, summing each rounded value may not identically match the total value reflected in the table.

5. Conclusion

The above analysis concludes that RF exposure at ground level from the proposed facility will be below the maximum power density levels as outlined by the FCC in the OET Bulletin 65 Ed. 97-01. Using conservative calculation methods, the highest expected percent of Maximum Permissible Exposure at ground level for AT&T's equipment is **37.73% of the FCC General Population/Uncontrolled limit**.

As noted previously, the calculated % MPE levels are more conservative (higher) than the actual signal levels will be from the finished modifications.

6. Statement of Certification

I certify to the best of my knowledge that the statements in this report are true and accurate. The calculations follow guidelines set forth in FCC OET Bulletin 65 Edition 97-01, ANSI/IEEE Std. C95.1 and ANSI/IEEE Std. C95.3.

May 12, 2022
Date

Reviewed/Approved By: Martin J. Lavin
Senior RF Engineer
C Squared Systems, LLC

Attachment A: References

OET Bulletin 65 - Edition 97-01 - August 1997 Federal Communications Commission Office of Engineering & Technology

IEEE C95.1-2005, IEEE Standard Safety Levels With Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz IEEE-SA Standards Board

IEEE C95.3-2002 (R2008), IEEE Recommended Practice for Measurements and Computations of Radio Frequency Electromagnetic Fields With Respect to Human Exposure to Such Fields, 100 kHz-300 GHz IEEE-SA Standards Board

Attachment B: FCC Limits for Maximum Permissible Exposure (MPE)

(A) Limits for Occupational/Controlled Exposure[3]

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (E) (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

(B) Limits for General Population/Uncontrolled Exposure[4]

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (E) (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

Table 2: FCC Limits for Maximum Permissible Exposure (MPE)

[3] Occupational/controlled limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occupational/controlled limits apply provided he or she is made aware of the potential for exposure

[4] General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or cannot exercise control over their exposure

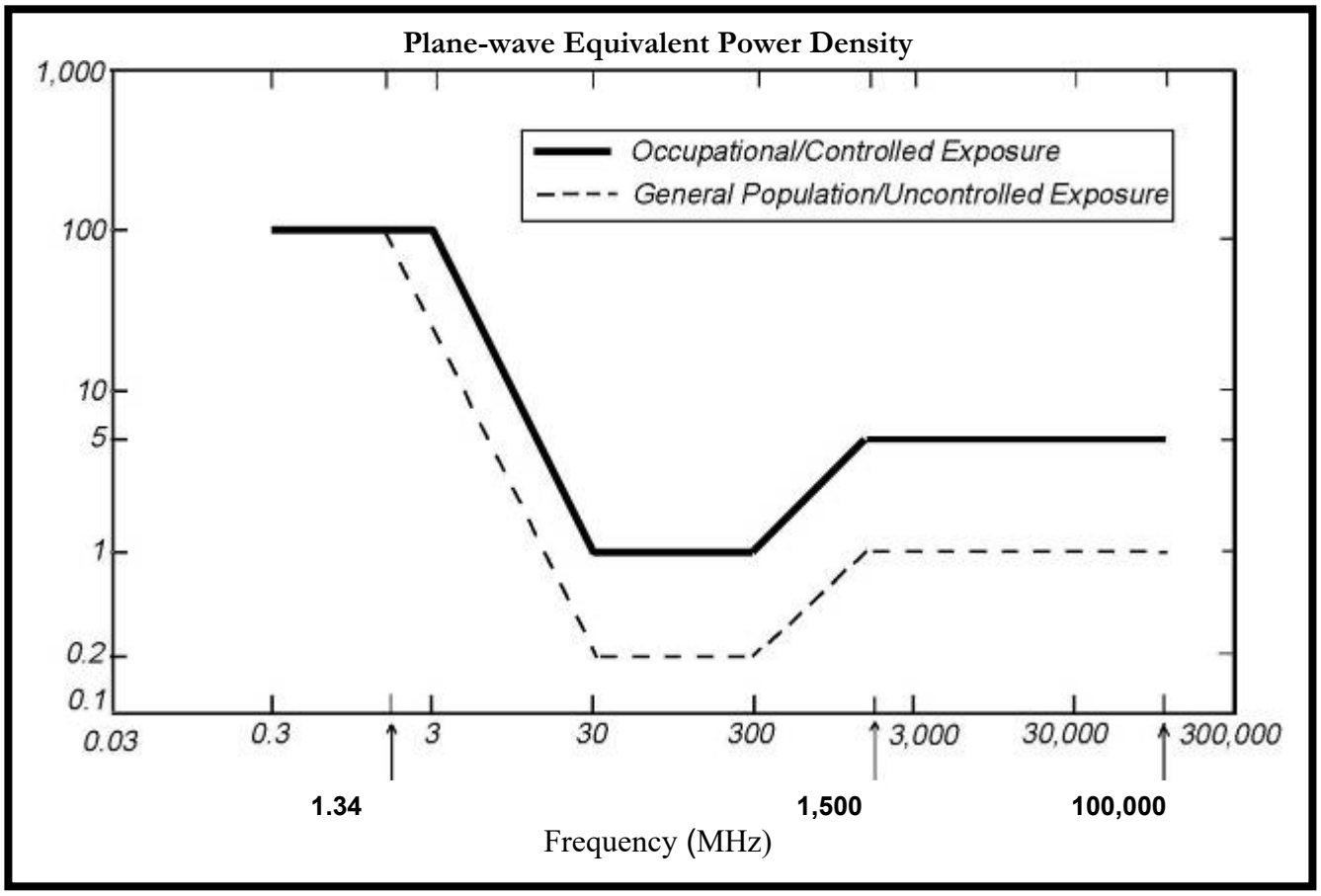
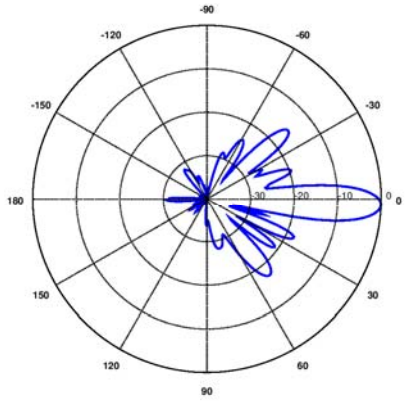
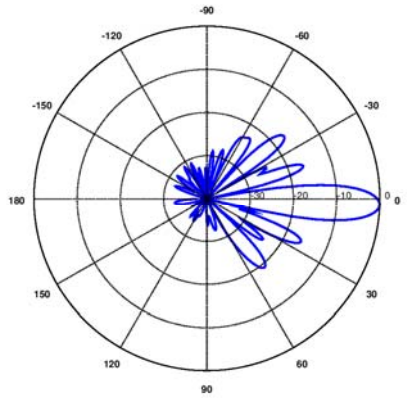
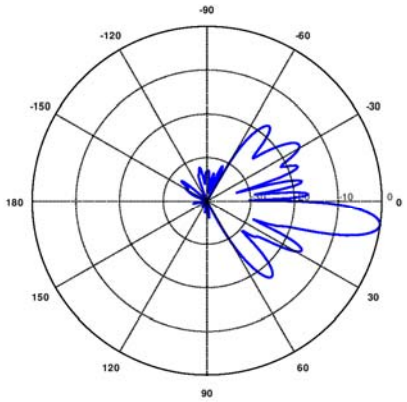
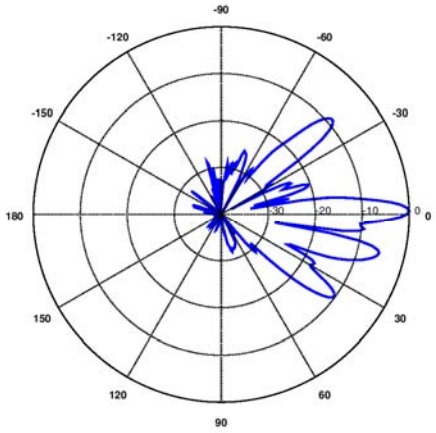
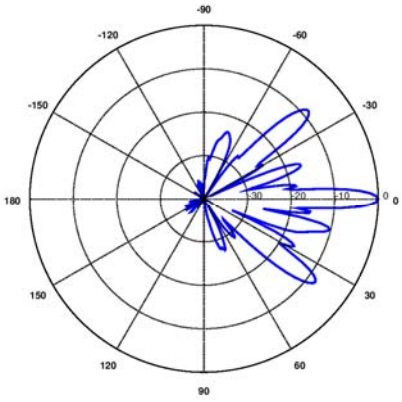
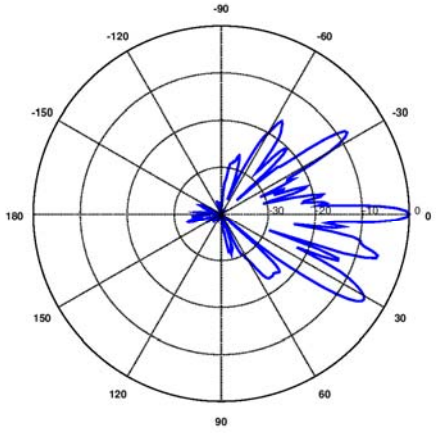


Figure 1: Graph of FCC Limits for Maximum Permissible Exposure (MPE)

Attachment C: AT&T Antenna Data Sheets and Electrical Patterns

700 MHz Manufacturer: CCI Products Model #: TPA65R-BU8D Frequency Band: 698-798 MHz Gain: 15.6 dBi Vertical Beamwidth: 9.5° Horizontal Beamwidth: 74° Polarization: Dual Linear 45° Size L x W x D: 96.0” x 20.7” x 7.7”	
700 MHz Manufacturer: CCI Products Model #: DMP65R-BU8D Frequency Band: 698 - 806MHz Gain: 15.1 dBi Vertical Beamwidth: 9.5° Horizontal Beamwidth: 75° Polarization: Dual Linear 45° Size L x W x D: 96.0” x 20.7” x 7.7”	
885 MHz Manufacturer: CCI Products Model #: DMP65R-BU8D Frequency Band: 824 - 896 MHz Gain: 16.0 dBi Vertical Beamwidth: 8.0° Horizontal Beamwidth: 64° Polarization: Dual Linear 45° Size L x W x D: 96.0” x 20.7” x 7.7”	

1900 MHz Manufacturer: CCI Products Model #: DMP65R-BU8D Frequency Band: 1850-1990 MHz Gain: 17.8 dBi Vertical Beamwidth: 5.1° Horizontal Beamwidth: 68° Polarization: Dual Linear 45° Size L x W x D: 96.0” x 20.7” x 7.7”	
2100 MHz Manufacturer: CCI Products Model #: TPA65R-BU8D Frequency Band: 1920-2180 MHz Gain: 18.3 dBi Vertical Beamwidth: 4.7° Horizontal Beamwidth: 67° Polarization: Dual Linear 45° Size L x W x D: 96.0” x 20.7” x 7.7”	
2300 MHz Manufacturer: CCI Products Model #: TPA65R-BU8D Frequency Band: 2300-2400 MHz Gain: 18.1 dBi Vertical Beamwidth: 4.1° Horizontal Beamwidth: 54° Polarization: Dual Linear 45° Size L x W x D: 96.0” x 20.7” x 7.7”	

DOCKET NO. 451 – Homeland Towers, LLC and New Cingular Wireless PCS, LLC application for a Certificate of Environmental Compatibility and Public Need for the construction, maintenance, and operation of a telecommunications facility located at the Cheshire Wastewater Treatment Plant, Cheshire Tax Assessor Map 38, Lot 180, 1325 Cheshire Street, Cheshire, Connecticut.	}	Connecticut
	}	Siting
	}	Council
		January 8, 2015

Decision and Order

Pursuant to Connecticut General Statutes §16-50p and the foregoing Findings of Fact and Opinion, the Connecticut Siting Council (Council) finds that the effects associated with the construction, maintenance, and operation of a telecommunications facility, including effects on the natural environment; ecological integrity and balance; public health and safety; scenic, historic, and recreational values; forests and parks; air and water purity; and fish and wildlife are not disproportionate, either alone or cumulatively with other effects, when compared to need, are not in conflict with the policies of the State concerning such effects, and are not sufficient reason to deny the application, and therefore directs that a Certificate of Environmental Compatibility and Public Need, as provided by General Statutes § 16-50k, be issued to Homeland Towers, LLC, hereinafter referred to as the Certificate Holder, for a telecommunications facility at at the Cheshire Wastewater Treatment Plant, Cheshire Tax Assessor Map 38, Lot 180 located at 1325 Cheshire Street, Cheshire, Connecticut.

Unless otherwise approved by the Council, the facility shall be constructed, operated, and maintained substantially as specified in the Council's record in this matter, and subject to the following conditions:

1. The tower shall be constructed as a monopole, no taller than necessary to provide the proposed telecommunications services, sufficient to accommodate the antennas of New Cingular Wireless PCS, LLC and other entities, both public and private, but such tower shall not exceed a height of 170 feet above ground level. The height at the top of any antennas shall not exceed 190 feet above ground level.

2. The Certificate Holder shall prepare a Development and Management (D&M) Plan for this site in compliance with Sections 16-50j-75 through 16-50j-77 of the Regulations of Connecticut State Agencies. The D&M Plan shall be served on the Town of Cheshire for comment, and all parties and intervenors as listed in the service list, and submitted to and approved by the Council prior to the commencement of facility construction and shall include:
    a) final site plan(s) for development of the facility to include specifications for the tower, tower foundation, antennas, equipment compound including, but not limited to, fence with less than two inch mesh, radio equipment, access road, utility line, emergency backup generator and landscaping that employ the governing standard in the State of Connecticut for tower design in accordance with the currently adopted International Building Code; and
    b) construction plans for site clearing, grading, landscaping, water drainage, and erosion and sedimentation controls consistent with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control, as amended; and
    c) a protection plan for box and wood turtles.

3. Prior to the commencement of operation, the Certificate Holder shall provide the Council worst-case modeling of the electromagnetic radio frequency power density of all proposed entities' antennas at the closest point of uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin No. 65, August 1997. The Certificate Holder shall ensure a recalculated report of the electromagnetic radio frequency power density be submitted to the Council if and when circumstances in operation cause a change in power density above the levels calculated and provided pursuant to this Decision and Order.

4. Upon the establishment of any new federal radio frequency standards applicable to frequencies of this facility, the facility granted herein shall be brought into compliance with such standards.

5. The Certificate Holder shall permit public or private entities to share space on the proposed tower for fair consideration, or shall provide any requesting entity with specific legal, technical, environmental, or economic reasons precluding such tower sharing.

6. Unless otherwise approved by the Council, if the facility authorized herein is not fully constructed with at least one fully operational wireless telecommunications carrier providing wireless service within eighteen months from the date of the mailing of the Council's Findings of Fact, Opinion, and Decision and Order (collectively called "Final Decision"), this Decision and Order shall be void, and the Certificate Holder shall dismantle the tower and remove all associated equipment or reapply for any continued or new use to the Council before any such use is made. The time between the filing and resolution of any appeals of the Council's Final Decision shall not be counted in calculating this deadline. Authority to monitor and modify this schedule, as necessary, is delegated to the Executive Director. The Certificate Holder shall provide written notice to the Executive Director of any schedule changes as soon as is practicable.

7. Any request for extension of the time period referred to in Condition 6 shall be filed with the Council not later than 60 days prior to the expiration date of this Certificate and shall be served on all parties and intervenors, as listed in the service list, and the Town of Cheshire. Any proposed modifications to this Decision and Order shall likewise be so served.

8. If the facility ceases to provide wireless services for a period of one year, this Decision and Order shall be void, and the Certificate Holder shall dismantle the tower and remove all associated equipment or reapply for any continued or new use to the Council within 90 days from the one year period of cessation of service. The Certificate Holder may submit a written request to the Council for an extension of the 90 day period not later than 60 days prior to the expiration of the 90 day period.

9. Any nonfunctioning antenna, and associated antenna mounting equipment, on this facility shall be removed within 60 days of the date the antenna ceased to function.

10. In accordance with Section 16-50j-77 of the Regulations of Connecticut State Agencies, the Certificate Holder shall provide the Council with written notice two weeks prior to the commencement of site construction activities. In addition, the Certificate Holder shall provide the Council with written notice of the completion of site construction, and the commencement of site operation.

11. The Certificate Holder shall remit timely payments associated with annual assessments and invoices submitted by the Council for expenses attributable to the facility under Conn. Gen. Stat. §16-50v.

12. This Certificate may be transferred in accordance with Conn. Gen. Stat. §16-50k(b), provided both the Certificate Holder/transferor and the transferee are current with payments to the Council for their respective annual assessments and invoices under Conn. Gen. Stat. §16-50v. In addition, both the Certificate Holder/transferor and the transferee shall provide the Council a written agreement as to the entity responsible for any quarterly assessment charges under Conn. Gen. Stat. §16-50v(b)(2) that may be associated with this facility.

13. The Certificate Holder shall maintain the facility and associated equipment, including but not limited to, the tower, tower foundation, antennas, equipment compound, radio equipment, access road, utility line and landscaping in a reasonable physical and operational condition that is consistent with this Decision and Order and a Development and Management Plan to be approved by the Council.

14. If the Certificate Holder is a wholly-owned subsidiary of a corporation or other entity and is sold/transferred to another corporation or other entity, the Council shall be notified of such sale and/or transfer and of any change in contact information for the individual or representative responsible for management and operations of the Certificate Holder within 30 days of the sale and/or transfer.

15. This Certificate may be surrendered by the Certificate Holder upon written notification and approval by the Council.

We hereby direct that a copy of the Findings of Fact, Opinion, and Decision and Order be served on each person listed in the Service List, dated October 2, 2014, and notice of issuance published in the Cheshire Herald.

By this Decision and Order, the Council disposes of the legal rights, duties, and privileges of each party named or admitted to the proceeding in accordance with Section 16-50j-17 of the Regulations of Connecticut State Agencies.

Town of Cheshire, CT

Property Listing Report

Map Block Lot	Building #	Unique Identifier
38180	1	00258300

Property Information

Property Location	1325 CHESHIRE ST
Mailing Address	CHESHIRE CT 06410
Land Use	Light Industrial
Zoning Code	R-40
Neighborhood	I-1B

Owner	CHESHIRE TOWN OF
Co-Owner	SEWER FILTRATION PLANT
Book / Page	0150/0376
Land Class	Industrial
Census Tract	3431
Acreage	59

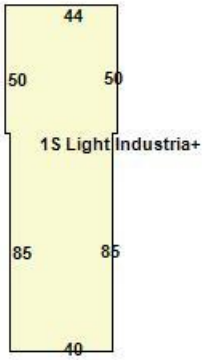
Valuation Summary

(Assessed value = 70% of Appraised Value)

Item	Appraised	Assessed
Buildings	4106621	2874630
Outbuildings	19282346	13497640
Land	1914679	1340280
Total	25303646	17712550

Utility Information

Electric	No
Gas	No
Sewer	No
Public Water	No
Well	No



Primary Construction Details

Year Built	1971
Building Desc.	Commercial
Building Style	
Stories	1.00
Exterior Walls	B. V. Solid
Exterior Walls 2	
Interior Walls	
Interior Walls 2	
Interior Floors 1	Composite
Interior Floors 2	

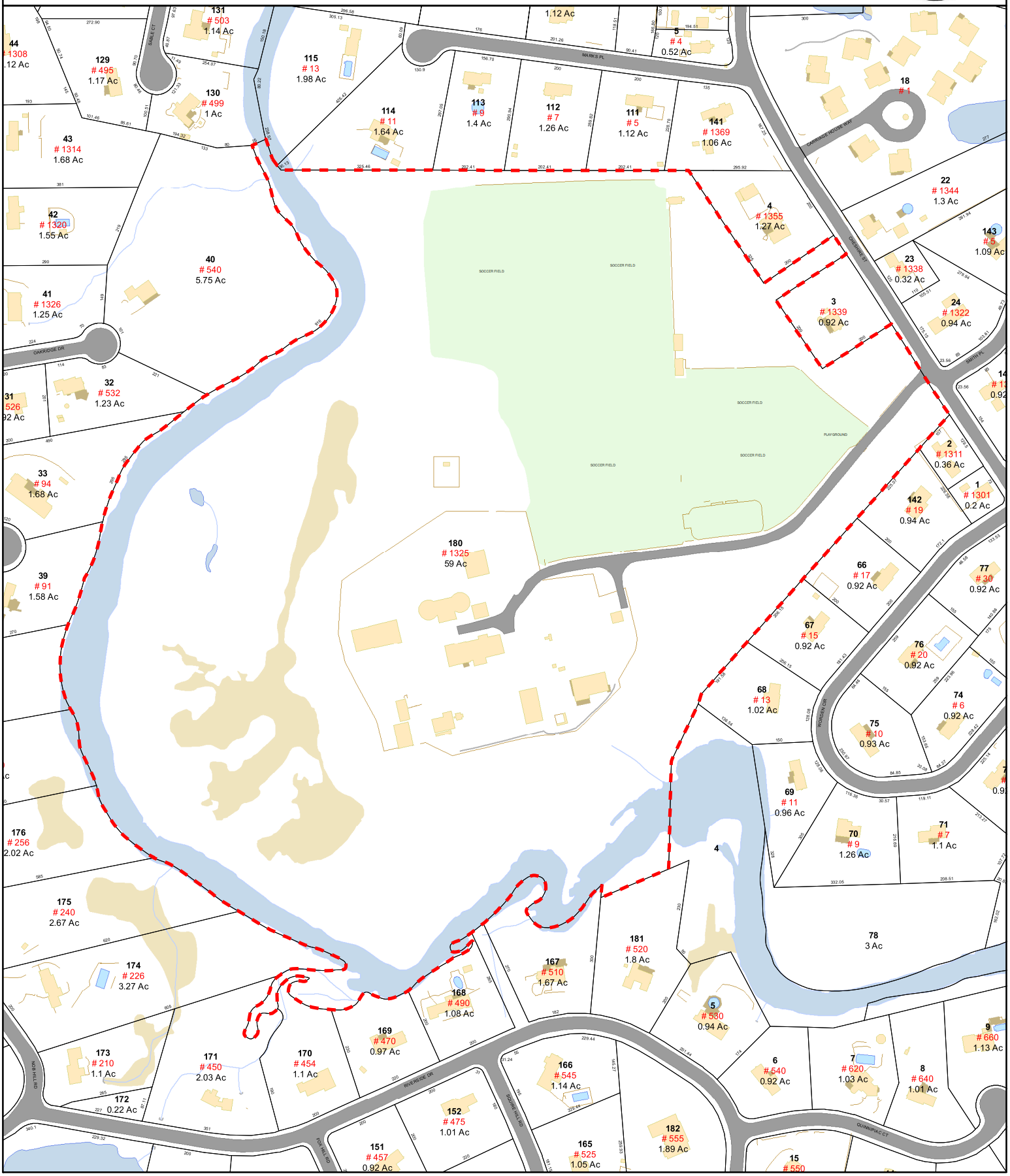
Heating Fuel	Oil
Heating Type	FHA
AC Type	Central
Bedrooms	0
Full Bathrooms	0
Half Bathrooms	0
Extra Fixtures	0
Total Rooms	0
Bath Style	NA
Kitchen Style	
Occupancy	0

Building Use	Light Industrial
Building Condition	Good
Frame Type	Excellent
Fireplaces	0
Bsmt Gar	0
Fin Bsmt Area	
Fin Bsmt Quality	
Building Grade	0
Roof Style	Flat
Roof Cover	Composite Built Up

Report Created On 5/18/2022

Town of Cheshire, Connecticut - Assessment Parcel Map

Parcel: 00258300 **Location: 1325 CHESHIRE ST**



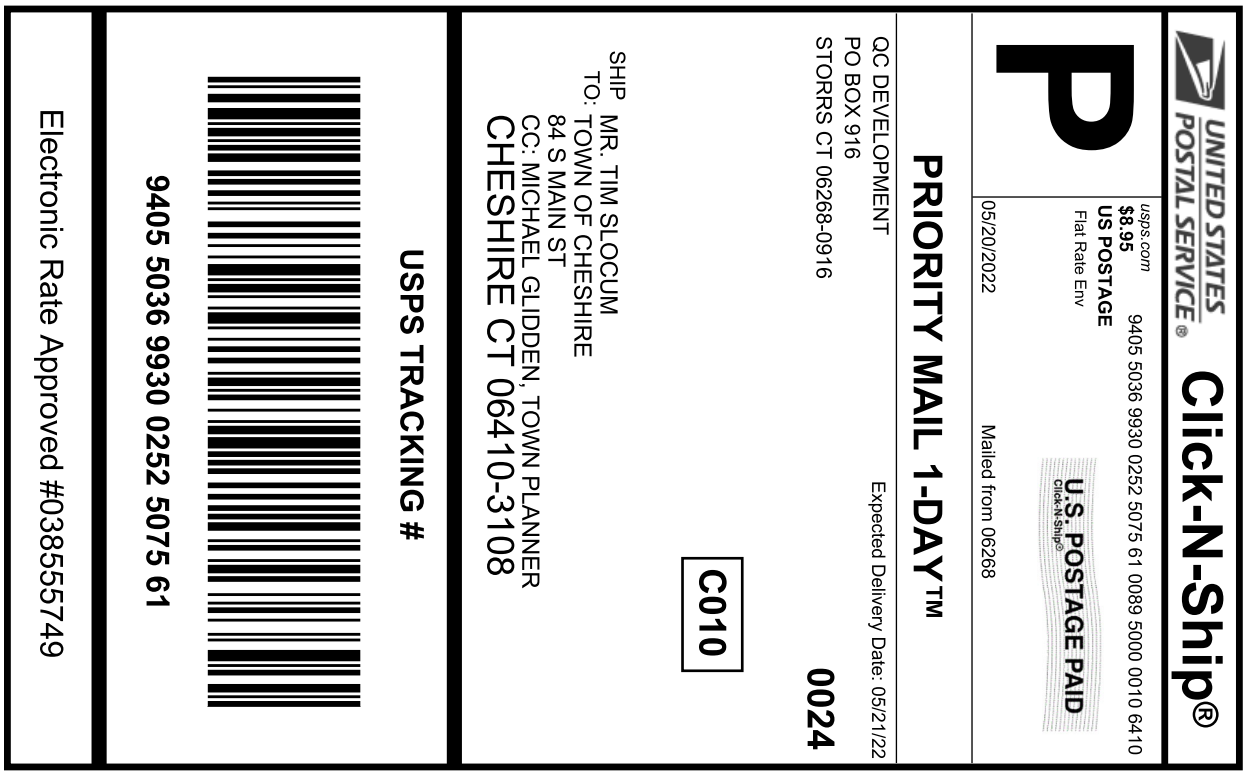
Approximate Scale: 1 inch = 308 feet

0 160 320 480 640

Feet

Map Produced: July 2021

Disclaimer: This map is for informational purposes only All information is subject to verification by any user. The Town of Cheshire and its mapping contractors assume no legal responsibility for the information contained herein.



Cut on dotted line.

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1. **Each Click-N-Ship® label is unique. Labels are to be used as printed and used only once. DO NOT PHOTO COPY OR ALTER LABEL.**
2. **Place your label so it does not wrap around the edge of the package.**
3. **Adhere your label to the package. A self-adhesive label is recommended. If tape or glue is used, DO NOT TAPE OVER BARCODE. Be sure all edges are secure.**
4. **To mail your package with PC Postage®, you may schedule a Package Pickup online, hand to your letter carrier, take to a Post Office™, or drop in a USPS collection box.**
5. **Mail your package on the "Ship Date" you selected when creating this label.**

Click-N-Ship® Label Record

USPS TRACKING # :
9405 5036 9930 0252 5075 61

Trans. #:	563811709
Print Date:	05/18/2022
Ship Date:	05/20/2022
Expected Delivery Date:	05/21/2022

Priority Mail® Postage:	**$8.95**
Total:	**$8.95**

From: QC DEVELOPMENT
PO BOX 916
STORRS CT 06268-0916

To: MR. TIM SLOCUM
TOWN OF CHESHIRE
84 S MAIN ST
CC: MICHAEL GLIDDEN, TOWN PLANNER
CHESHIRE CT 06410-3108

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Check the status of your shipment on the USPS Tracking® page at usps.com

USPS Tracking®

FAQs >

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Tracking Number: 9405503699300252507561

Remove ×

Your package is on its way to a USPS facility. Sign up to **get updates**, and we'll send you a delivery date and time when available.

USPS Tracking Plus® Available ⌄

USPS in possession of item

May 20, 2022 at 11:16 am
STORRS MANSFIELD, CT 06268

Change Delivery Instructions ⌄

Feedback

Text & Email Updates ⌄

Delivery Instructions ⌄

Tracking History ⌃

May 20, 2022, 11:16 am
USPS in possession of item
STORRS MANSFIELD, CT 06268
USPS is now in possession of your item as of 11:16 am on May 20, 2022 in STORRS MANSFIELD, CT 06268.

May 18, 2022
Pre-Shipment Info Sent to USPS, USPS Awaiting Item