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2. **Fold the printed label at the solid line below.** Place the label in a UPS Shipping Pouch. If you do not have a pouch, affix the folded label using clear plastic shipping tape over the entire label.

3. **GETTING YOUR SHIPMENT TO UPS**
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   Your driver will pickup your shipment(s) as usual.

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   Take your package to any location of The UPS Store®, UPS Access Point(TM) location, UPS Drop Box, UPS Customer Center, Staples® or Authorized Shipping Outlet near you. Items sent via UPS Return Services(SM) (including via Ground) are also accepted at Drop Boxes. To find the location nearest you, please visit the Resources area of CampusShip and select UPS Locations.
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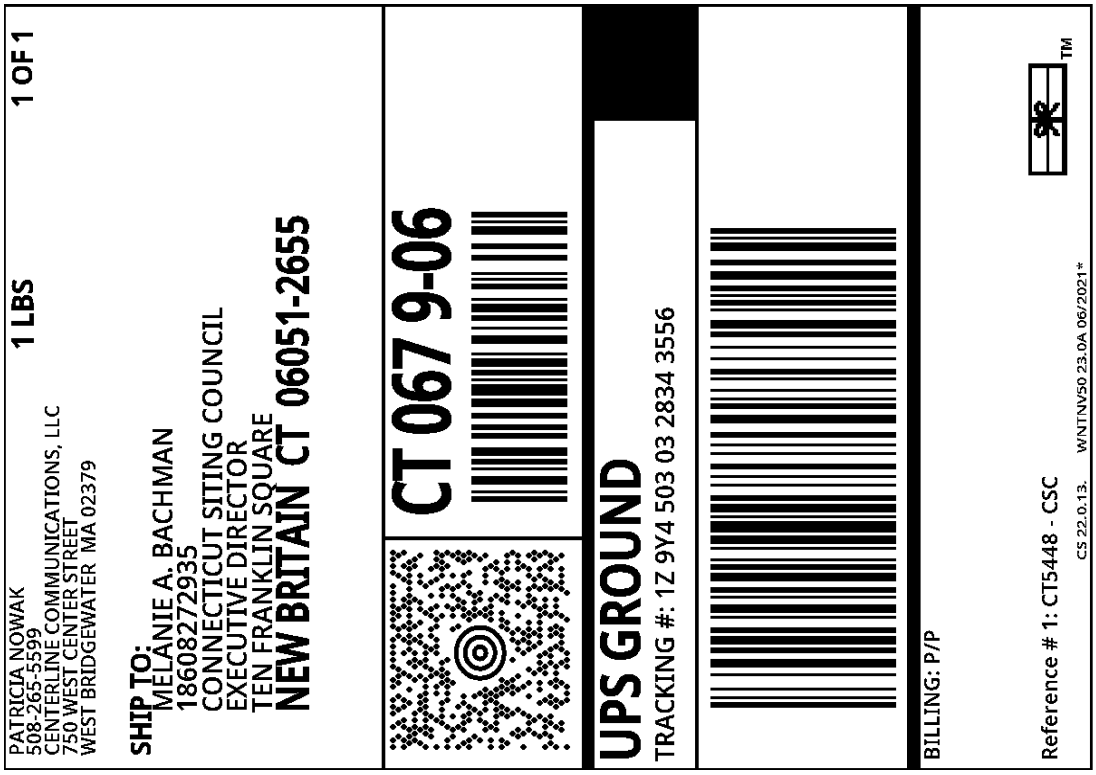

June 8, 2021

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

Regarding: Notice of Exempt Modification – AT&T Site CT5448
Address: 239 Middle Turnpike East, Manchester, CT 06040

Dear Ms. Bachman:

New Cingular Wireless, PCS, LLC ("AT&T") currently maintains a wireless telecommunications facility ("Facility") at a 183' Monopole at the above-referenced address (the "Tower"), Latitude 41.784391, longitude 72.511698. The Tower is owned by the Town of Manchester, CT.

AT&T submitted exempt modification filing EM-AT&T-077-200131 which was approved by the Council on February 24, 2020, however, the modifications will not be completed within the one year deadline and the period of time to request an extension has expired. Additionally, the Town of Manchester requested changes to the Structural Analysis for these proposed modifications and the Structural Analysis and construction drawings have been updated to reflect those changes. AT&T desires to modify its Facility by swapping (3) antennas and (3) remote radio units as well as add (3) remote radio units and (1) surge arrestor with accompanying DC power lines, as more particularly described and detailed in the enclosed Construction Drawings prepared by Hudson Design Group LLC, dated October 9, 2019 and last revised April 16, 2021. Please note this modification includes B2, B5, and B12 hardware that is both 4G (LTE) and 5GNR capable through remote software configuration and either or both services may be turned on or off at various times. Enclosed please also find a Mount Analysis prepared by Hudson Design Group LLC, dated October 9, 2019 and last revised April 14, 2021. The centerline height of the existing and proposed antennas will be at 143 feet.

The Tower was approved by the Town of Manchester, CT Planning and Zoning Commission on March 18, 2002. Enclosed please find a copy of the memorandum to the then acting General Manager, memorializing the above-mentioned approval. Enclosed please also find the most recent exempt modification approval provided to AT&T.

Please accept this letter as notification pursuant to R.C.S.A §16-50j-73 for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to the following individuals: The Honorable Jay Moran, Mayor of the Town of Manchester; Scott Shanley, General Manager of the Town of Manchester; and James Davis, Zoning Enforcement Officer of the Town of

Manchester. Please note that the Town of Manchester is the property owner and Tower owner. Enclosed please find the property card and GIS map for the above-referenced address.

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

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

2. The proposed modifications will not require an 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 modified facility will not increase radio frequency emissions at the facility to a level at or above the Federal Communications Commission safety standard. *Please see the RF Emissions Analysis Report for AT&T's modified facility enclosed herewith.*

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

6. The existing structure and its foundation can support the proposed loading. *Please see the Structural Analysis Report dated April 30, 2021 and prepared by EFI Global.*

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).

Sincerely,

Patricia Nowak
Site Acquisition Consultant
Centerline Communications, LLC
750 West Center Street, Suite 301
West Bridgewater, MA 02379
pnowak@clinellc.com

Enclosures:
Exhibit 1 – Construction Drawings
Exhibit 2 – Mount Analysis Report
Exhibit 3 – Town Approval and CSC Decision
Exhibit 4 – Property Card and GIS Map
Exhibit 5 – RF Emissions Analysis Report
Exhibit 6 – Structural Analysis

cc: The Honorable Jay Moran, Mayor of Town of Manchester
Scott Shanley, General Manager of the Town of Manchester
James Davis, Zoning Enforcement Officer of the Town of Manchester

EXHIBIT 1

PROJECT INFORMATION

SCOPE OF WORK:

ITEMS TO BE MOUNTED ON THE EXISTING MONOPOLE:
- NEW AT&T ANTENNAS: NNH4-65B-R6 (TOTAL OF 1 FOR ALPHA SECTOR).
- NEW AT&T ANTENNAS: NNH4-65C-R6 (TYP. OF 1 PER BETA & GAMMA SECTOR, TOTAL OF 2).
- NEW AT&T RRUS: 4478 B14 (700) (TYP. OF 1 PER SECTOR, TOTAL OF 3).
- NEW AT&T RRUS: RRUS-E2 B29 (700) (TYP. OF 1 PER SECTOR, TOTAL OF 3).
- NEW AT&T DC ONLY SURGE ARRESTOR DC6-48-60-0-8C-EV (TOTAL OF 2) WITH (2) DC POWER.

ITEMS TO BE MOUNTED AT EQUIPMENT LOCATION:
- ADD (1) IDLe CABLE.

ITEMS TO BE REMOVED:
- EXISTING AT&T ANTENNAS: ANTENNAS (TYP. OF 1 PER SECTOR, TOTAL OF 3).

ITEMS TO REMAIN:
- (9) ANTENNAS, (15) RRU'S, (6) TMA'S, (3) SURGE ARRESTORS, (6) COAX CABLES, (6) DC POWER & (2) FIBER.

SITE ADDRESS:	239 MIDDLE TURNPIKE EAST MANCHESTER, CT 06040
LATITUDE:	41.784391° N, 41° 47' 3.81" N
LONGITUDE:	72.511698° W, 72° 30' 42.16" W
TYPE OF SITE:	MONOPOLE / OUTDOOR EQUIPMENT
STRUCTURE HEIGHT:	184'-0"±
RAD CENTER:	143'-0"±
CURRENT USE:	TELECOMMUNICATIONS FACILITY
PROPOSED USE:	TELECOMMUNICATIONS FACILITY

SITE NUMBER: CT5448

SITE NAME: MANCHESTER CENTRAL

FA CODE: 10071105

PACE ID: MRCTB042109 & MRCTB042106

PROJECT: LTE 6C_7C 2021 UPGRADE

DRAWING INDEX

SHEET NO.	DESCRIPTION	REV.
T-1	TITLE SHEET	1
GN-1	GENERAL NOTES	1
A-1	COMPOUND & EQUIPMENT PLANS	1
A-2	ANTENNA LAYOUTS & ELEVATION	1
A-3	DETAILS	1
G-1	GROUNDING DETAILS	1
RF-1	RF PLUMBING DIAGRAM	1

VICINITY MAP

DIRECTIONS TO SITE:

HEAD SOUTH TOWARD ENTERPRISE DR. TURN LEFT ONTO ENTERPRISE DR. TURN LEFT ONTO CAPITAL BLVD. TURN LEFT ONTO STATE HWY 411. TURN LEFT TO MERGE ONTO I-91 N. MERGE ONTO I-91 N. TAKE EXIT 29 TO MERGE ONTO CT-15 N/US-5 N TOWARD I-84 E/E HARTFORD/BOSTON. CONTINUE ONTO CT-15 N, TAKE EXIT ON THE LEFT ONTO I-84 TOWARD BOSTON/ TAKE EXIT 60 FOR US-6/US-44/MIDDLE TURNPIKE W. TURN RIGHT TO STAY ON MIDDLE TURNPIKE W. CONTINUE STRAIGHT ONTO MIDDLE TURNPIKE E. TURN LEFT. 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

CENTERLINE COMMUNICATIONS
750 WEST CENTER STREET, SUITE #301
WEST BRIDGEWATER, MA 02379

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

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

AT&T

TITLE SHEET
LTE 6C_7C 2021 UPGRADE

SITE NUMBER	DRAWING NUMBER	REV
CT5448	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 – CENTERLINE
   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-G, 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

CENTERLINE COMMUNICATIONS
750 WEST CENTER STREET, SUITE #301
WEST BRIDGEWATER, MA 02379

SITE NUMBER: CT5448
SITE NAME: MANCHESTER CENTRAL

239 MIDDLE TURNPIKE EAST
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HARTFORD COUNTY

at&t
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ROCKY HILL, CT 06067

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

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

AT&T

GENERAL NOTES
LTE 6C_7C 2021 UPGRADE

SITE NUMBER	DRAWING NUMBER	REV
CT5448	GN-1	1

NOTE:

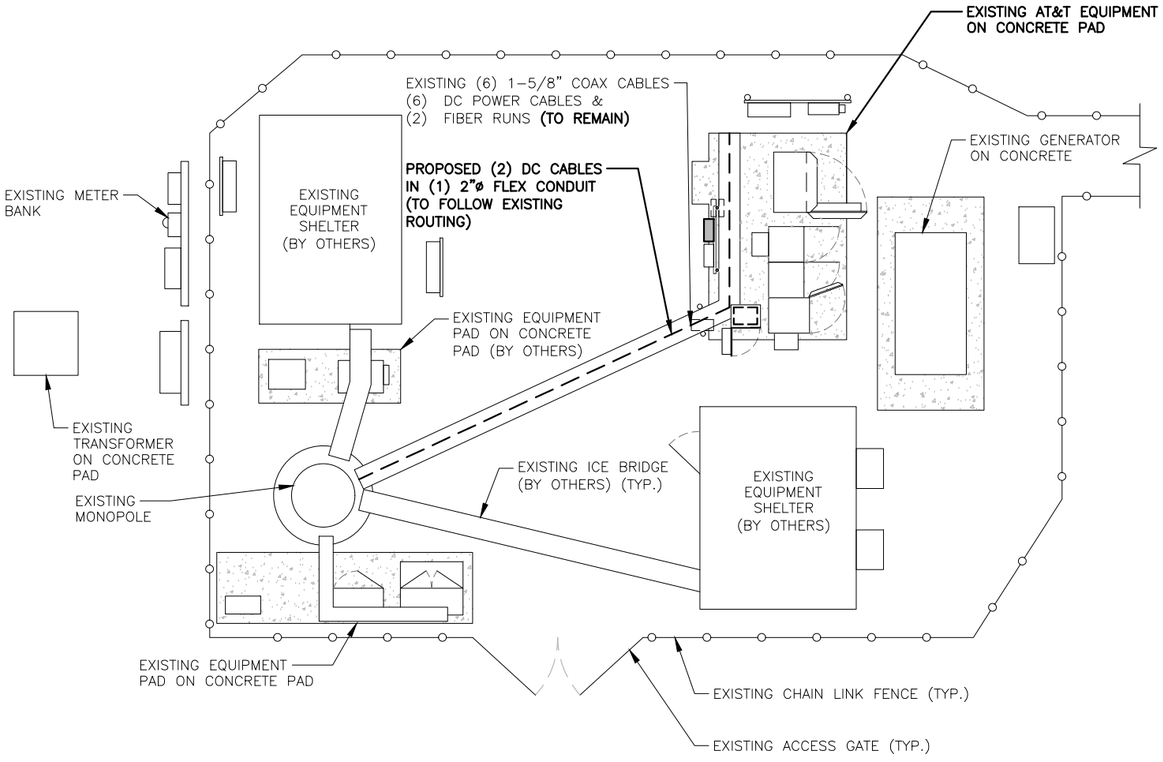
REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.

NOTE:

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

NOTE:

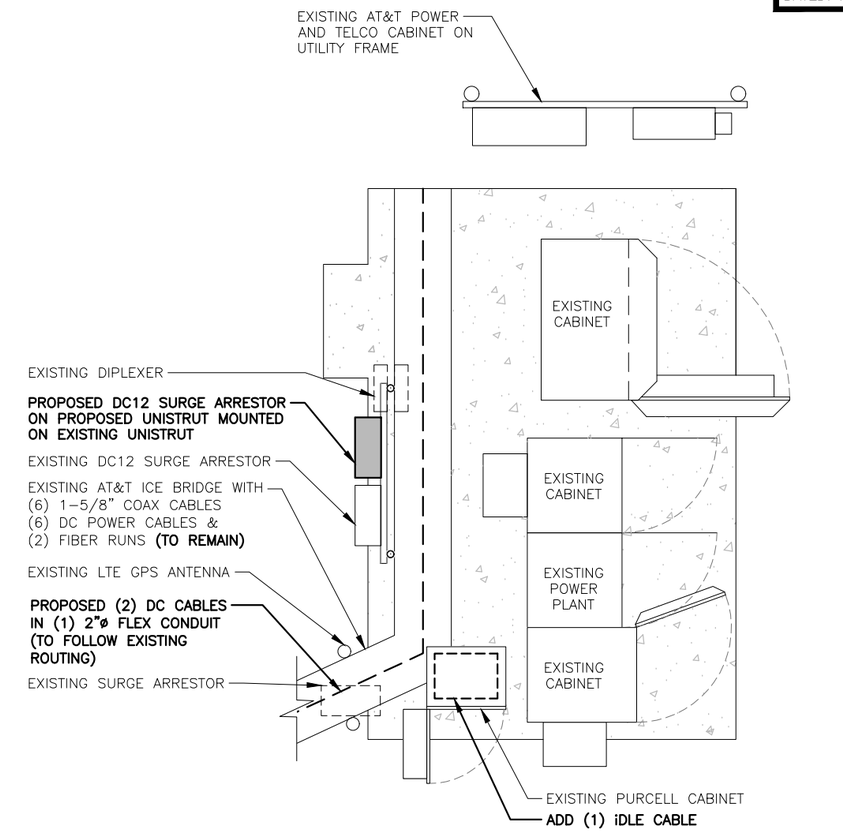
AN ANALYSIS FOR THE CAPACITY OF THE EXISTING **ANTENNA MOUNT** TO SUPPORT THE PROPOSED LOADING HAS BEEN COMPLETED BY:
HUDSON DESIGN GROUP, LLC.
DATED: APRIL 14, 2021 (REV 2)



13°41'
MAGNETIC NORTH
TRUE NORTH

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"



13°41'
MAGNETIC NORTH
TRUE NORTH

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"

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AT&T

COMPOUND & EQUIPMENT PLANS
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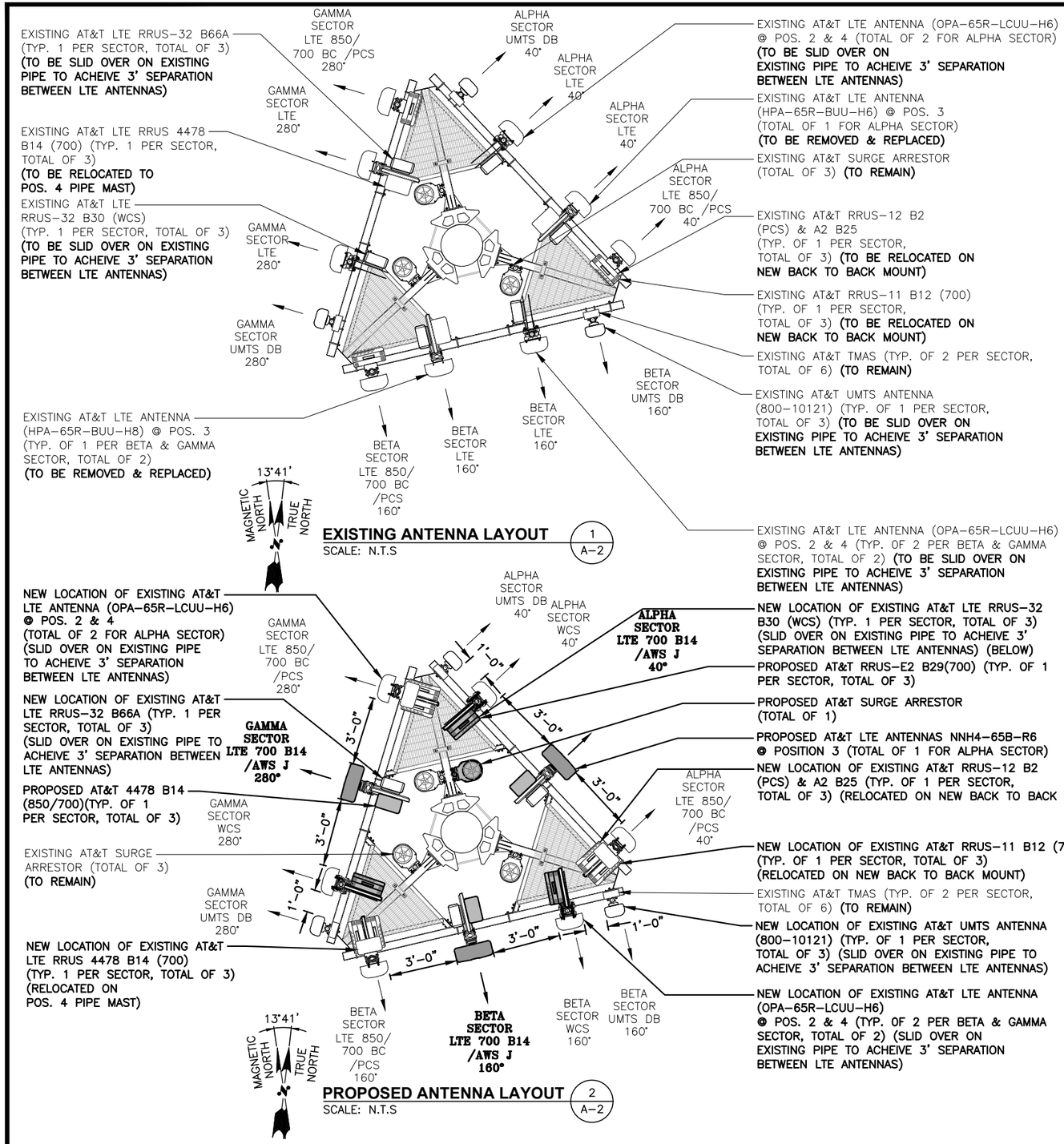


EXISTING AT&T LTE RRUS–32 B66A (TYP. 1 PER SECTOR, TOTAL OF 3) **(TO BE SLID OVER ON EXISTING PIPE TO ACHEIVE 3' SEPARATION BETWEEN LTE ANTENNAS)**

EXISTING AT&T LTE RRUS 4478 B14 (700) (TYP. 1 PER SECTOR, TOTAL OF 3) **(TO BE RELOCATED TO POS. 4 PIPE MAST)**

EXISTING AT&T LTE RRUS–32 B30 (WCS) (TYP. 1 PER SECTOR, TOTAL OF 3) **(TO BE SLID OVER ON EXISTING PIPE TO ACHEIVE 3' SEPARATION BETWEEN LTE ANTENNAS)**

EXISTING AT&T LTE ANTENNA (HPA–65R–BUU–H8) @ POS. 3 (TYP. OF 1 PER BETA & GAMMA SECTOR, TOTAL OF 2) **(TO BE REMOVED & REPLACED)**

EXISTING AT&T LTE ANTENNA (OPA–65R–LCUU–H6) @ POS. 2 & 4 (TOTAL OF 2 FOR ALPHA SECTOR) **(TO BE SLID OVER ON EXISTING PIPE TO ACHEIVE 3' SEPARATION BETWEEN LTE ANTENNAS)**

EXISTING AT&T LTE ANTENNA (HPA–65R–BUU–H6) @ POS. 3 (TOTAL OF 1 FOR ALPHA SECTOR) **(TO BE REMOVED & REPLACED)**

EXISTING AT&T SURGE ARRESTOR (TOTAL OF 3) **(TO REMAIN)**

EXISTING AT&T RRUS–12 B2 (PCS) & A2 B25 (TYP. OF 1 PER SECTOR, TOTAL OF 3) **(TO BE RELOCATED ON NEW BACK TO BACK MOUNT)**

EXISTING AT&T RRUS–11 B12 (700) (TYP. OF 1 PER SECTOR, TOTAL OF 3) **(TO BE RELOCATED ON NEW BACK TO BACK MOUNT)**

EXISTING AT&T TMAS (TYP. OF 2 PER SECTOR, TOTAL OF 6) **(TO REMAIN)**

EXISTING AT&T UMTS ANTENNA (800–10121) (TYP. OF 1 PER SECTOR, TOTAL OF 3) **(TO BE SLID OVER ON EXISTING PIPE TO ACHEIVE 3' SEPARATION BETWEEN LTE ANTENNAS)**

EXISTING AT&T LTE ANTENNA (OPA–65R–LCUU–H6) @ POS. 2 & 4 (TYP. OF 2 PER BETA & GAMMA SECTOR, TOTAL OF 2) **(TO BE SLID OVER ON EXISTING PIPE TO ACHEIVE 3' SEPARATION BETWEEN LTE ANTENNAS)**

EXISTING ANTENNA LAYOUT

SCALE: N.T.S

1 / A–2

NEW LOCATION OF EXISTING AT&T LTE ANTENNA (OPA–65R–LCUU–H6) @ POS. 2 & 4 (TOTAL OF 2 FOR ALPHA SECTOR) (SLID OVER ON EXISTING PIPE TO ACHEIVE 3' SEPARATION BETWEEN LTE ANTENNAS)

NEW LOCATION OF EXISTING AT&T LTE RRUS–32 B66A (TYP. 1 PER SECTOR, TOTAL OF 3) (SLID OVER ON EXISTING PIPE TO ACHEIVE 3' SEPARATION BETWEEN LTE ANTENNAS)

PROPOSED AT&T 4478 B14 (850/700)(TYP. OF 1 PER SECTOR, TOTAL OF 3)

EXISTING AT&T SURGE ARRESTOR (TOTAL OF 3) **(TO REMAIN)**

NEW LOCATION OF EXISTING AT&T RRUS 4478 B14 (700) (TYP. 1 PER SECTOR, TOTAL OF 3) (RELOCATED ON POS. 4 PIPE MAST)

NEW LOCATION OF EXISTING AT&T LTE RRUS–32 B30 (WCS) (TYP. 1 PER SECTOR, TOTAL OF 3) (SLID OVER ON EXISTING PIPE TO ACHEIVE 3' SEPARATION BETWEEN LTE ANTENNAS) (BELOW)

PROPOSED AT&T RRUS–E2 B29(700) (TYP. OF 1 PER SECTOR, TOTAL OF 3)

PROPOSED AT&T SURGE ARRESTOR (TOTAL OF 1)

PROPOSED AT&T LTE ANTENNAS NNH4–65B–R6 @ POSITION 3 (TOTAL OF 1 FOR ALPHA SECTOR)

NEW LOCATION OF EXISTING AT&T RRUS–12 B2 (PCS) & A2 B25 (TYP. OF 1 PER SECTOR, TOTAL OF 3) (RELOCATED ON NEW BACK TO BACK MOUNT)

NEW LOCATION OF EXISTING AT&T RRUS–11 B12 (700) (TYP. OF 1 PER SECTOR, TOTAL OF 3) (RELOCATED ON NEW BACK TO BACK MOUNT)

EXISTING AT&T TMAS (TYP. OF 2 PER SECTOR, TOTAL OF 6) **(TO REMAIN)**

NEW LOCATION OF EXISTING AT&T UMTS ANTENNA (800–10121) (TYP. OF 1 PER SECTOR, TOTAL OF 3) (SLID OVER ON EXISTING PIPE TO ACHEIVE 3' SEPARATION BETWEEN LTE ANTENNAS)

NEW LOCATION OF EXISTING AT&T LTE ANTENNA (OPA–65R–LCUU–H6) @ POS. 2 & 4 (TYP. OF 2 PER BETA & GAMMA SECTOR, TOTAL OF 2) (SLID OVER ON EXISTING PIPE TO ACHEIVE 3' SEPARATION BETWEEN LTE ANTENNAS)

PROPOSED ANTENNA LAYOUT

SCALE: N.T.S

2 / A–2

TOP OF MONOPOLE
ELEV. 184'–0"± (AGL)

NEW LOCATION OF EXISTING AT&T LTE RRUS 4478 B14 (700) (TYP. 1 PER SECTOR, TOTAL OF 3) (RELOCATED ON POS. 4 PIPE MAST)

NEW LOCATION OF EXISTING AT&T LTE ANTENNA (OPA–65R–LCUU–H6) @ POS. 2 & 4 (TOTAL OF 2 FOR ALPHA SECTOR) (SLID OVER ON EXISTING PIPE TO ACHEIVE 3' SEPARATION BETWEEN LTE ANTENNAS)

℄ OF PROPOSED & EXISTING AT&T ANTENNAS
ELEV. 143'–0"± (AGL)

NEW LOCATION OF EXISTING AT&T RRUS–11 B12 (700) (TYP. OF 1 PER SECTOR, TOTAL OF 3) (RELOCATED ON NEW BACK TO BACK MOUNT)

NEW LOCATION OF EXISTING AT&T RRUS–12 B2 (PCS) & A2 B25 (TYP. OF 1 PER SECTOR, TOTAL OF 3) (RELOCATED ON NEW BACK TO BACK MOUNT)

PROPOSED AT&T SURGE ARRESTOR (TOTAL OF 1)

NEW LOCATION OF EXISTING AT&T LTE RRUS–32 B66A (TYP. 1 PER SECTOR, TOTAL OF 3) (SLID OVER ON EXISTING PIPE TO ACHEIVE 3' SEPARATION BETWEEN LTE ANTENNAS)

EXISTING MONOPOLE

EXISTING GPS ANTENNA

EXISTING (6) 1–5/8" COAX CABLES
(6) DC POWER CABLES &
(2) FIBER RUNS **(TO REMAIN)**

PROPOSED (2) DC CABLES IN (1) 2"ø FLEX CONDUIT (TO FOLLOW EXISTING ROUTING)

GROUND LEVEL
ELEV. 0'–0"± (AGL)

EXISTING ANTENNA (BY OTHERS) (TYP.)

PROPOSED AT&T 4478 B14 (850/700)(TYP. OF 1 PER SECTOR, TOTAL OF 3)

PROPOSED AT&T RRUS–E2 B29(700) (TYP. OF 1 PER SECTOR, TOTAL OF 3)

NEW LOCATION OF EXISTING AT&T UMTS ANTENNA (800–10121) (TYP. OF 1 PER SECTOR, TOTAL OF 3) (SLID OVER ON EXISTING PIPE TO ACHEIVE 3' SEPARATION BETWEEN LTE ANTENNAS)

EXISTING AT&T TMAS (TYP. OF 2 PER SECTOR, TOTAL OF 6) **(TO REMAIN)**

NEW LOCATION OF EXISTING AT&T LTE RRUS–32 B30 (WCS) (TYP. 1 PER SECTOR, TOTAL OF 3) (SLID OVER ON EXISTING PIPE TO ACHEIVE 3' SEPARATION BETWEEN LTE ANTENNAS) (BELOW)

PROPOSED AT&T LTE ANTENNAS NNH4–65B–R6 @ POSITION 3 (TOTAL OF 1 FOR ALPHA SECTOR)

NOTE:

GROUND EQUIPMENT NOT SHOWN FOR CLARITY

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.

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: APRIL 14, 2021 (REV 2)

ELEVATION

3 / A–2

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

0 5'–4" 10'–8" 21'–4" 32'–0"

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

CENTERLINE COMMUNICATIONS
750 WEST CENTER STREET, SUITE #301
WEST BRIDGEWATER, MA 02379

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

SITE NUMBER: CT5448
SITE NAME: MANCHESTER CENTRAL

239 MIDDLE TURNPIKE EAST
MANCHESTER, CT 06040
HARTFORD COUNTY

NO.	DATE	REVISIONS	BY	CHK	APP'D
1	04/16/21	ISSUED FOR CONSTRUCTION	EB	AT	DPH
0	10/28/19	ISSUED FOR REVIEW	MR	AT	DPH
A	10/09/19	ISSUED FOR REVIEW	MR	AT	DPH

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

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

AT&T

ANTENNA LAYOUTS & ELEVATION
LTE 6C_7C 2021 UPGRADE

SITE NUMBER	DRAWING NUMBER	REV
CT5448	A–2	1

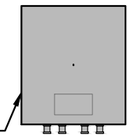
ANTENNA SCHEDULE

SECTOR	EXISTING/ PROPOSED	BAND	ANTENNA	SIZE (INCHES) (L x W x D)	ANTENNA ℄ HEIGHT	AZIMUTH	TMA/ DIPLEXER	RRU	SIZE (INCHES) (L x W x D)	FEEDER	RAYCAP
A1	EXISTING	UMTS DB	80010121	54.5X10.3X5.9	143'-0"±	40°	(2)(E) LGP21401 (2)(E) LGP21901	–	–	(2)(E)-5/8 COAX	(E) (1) RAYCAP DC6-48-60-18-8F
A2	EXISTING	WCS	OPA-65R-LCUU-H6	72x14.8x7.4	143'-0"±	40°	–	**(P)(1) RRUS-E2 B29 (700)** (E)(1) RRUS-32 B30 (WCS)	**20.4"X18.5"X7.5"** –	(2)(E) DC POWER & (1) FIBER	
A3	**PROPOSED**	**LTE 700 B14 /AWS J**	**NNH4-65B-R6**	**72x19.6x7.8**	**143'-0"±**	**40°**	–	**(P)(1) 4478 B14 (700)** (E)(1) RRUS-32 B66A (AWS)	**18.1"X13.4"X8.3"** –	–	
A4	EXISTING	LTE 850/ 700 BC /PCS	OPA-65R-LCUU-H6	72x14.8x7.4	143'-0"±	40°	–	(E)(1) RRUS-11 B12 (700) (E)(1) 4478 B5 (850) (E)(1) RRUS-12 B2 (PCS) & RRUS-A2 B25 (PCS)	– – – –	–	
B1	EXISTING	UMTS DB	80010121	54.5X10.3X5.9	143'-0"±	160°	(2)(E) LGP21401 (2)(E) LGP21901	–	–	(2)(E)-5/8 COAX	(E) (1) RAYCAP DC6-48-60-18-8F
B2	EXISTING	WCS	OPA-65R-LCUU-H8	92.7x14.4x7	143'-0"±	160°	–	**(P)(1) RRUS-E2 B29 (700)** (E)(1) RRUS-32 B30 (WCS)	**20.4"X18.5"X7.5"** –	(2)(E) DC POWER & (1) FIBER	
B3	**PROPOSED**	**LTE 700 B14 /AWS J**	**NNH4-65C-R6**	**96x19.6x7.8**	**143'-0"±**	**160°**	–	**(P)(1) 4478 B14 (700)** (E)(1) RRUS-32 B66A (AWS)	**18.1"X13.4"X8.3"** –	–	
B4	EXISTING	LTE 850/ 700 BC /PCS	OPA-65R-LCUU-H8	92.7x14.4x7	143'-0"±	160°	–	(E)(1) RRUS-11 B12 (700) (E)(1) 4478 B5 (850) (E)(1) RRUS-12 B2 (PCS) & RRUS-A2 B25 (PCS)	– – – –	–	
C1	EXISTING	UMTS DB	80010121	54.5X10.3X5.9	143'-0"±	280°	(2)(E) LGP21401 (2)(E) LGP21901	–	–	(2)(E)-5/8 COAX	(E) (1) RAYCAP DC6-48-60-18-8F **(P) (1) RAYCAP DC6-48-60-0-8C-EV**
C2	EXISTING	WCS	OPA-65R-LCUU-H8	92.7x14.4x7	143'-0"±	280°	–	**(P)(1) RRUS-E2 B29 (700)** (E)(1) RRUS-32 B30 (WCS)	**20.4"X18.5"X7.5"** –	(2)(E) DC POWER **(2)(P) DC POWER**	
C3	**PROPOSED**	**LTE 700 B14 /AWS J**	**NNH4-65C-R6**	**96x19.6x7.8**	**143'-0"±**	**280°**	–	**(P)(1) 4478 B14 (700)** (E)(1) RRUS-32 B66A (AWS)	**18.1"X13.4"X8.3"** –	–	
C4	EXISTING	LTE 850/ 700 BC /PCS	OPA-65R-LCUU-H8	92.7x14.4x7	143'-0"±	280°	–	(E)(1) RRUS-11 B12 (700) (E)(1) 4478 B5 (850) (E)(1) RRUS-12 B2 (PCS) & RRUS-A2 B25 (PCS)	– – – –	–	

RRU CHART

QUANTITY	MODEL	SIZE (L x W x D)
3(P)	**4478 B14 (700)**	**18.1"x13.4"x8.3"**
3(E)	4478 B5 (850)	18.1"x13.4"x8.3"
3(P)	**RRUS-E2 B29 (700)**	**20.4"x18.5"x7.5"**
3(P)	RRUS-12 (PCS) & RRUS-A2 B25 (PCS)	20.4"x18.5"x7.5"
3(E)	RRUS-32 B30 (WCS)	27.2"x12.1"x7.0"
3(E)	RRUS-32 B66A (AWS)	27.2"x12.1"x7.0"
3(E)	RRUS-11 B12 (700)	19.7"x17.0"x7.2"

NOTE:
SEE RFDS FOR RRH FREQUENCY AND MODEL NUMBER



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

NOTE:
MOUNT PER MANUFACTURER'S SPECIFICATIONS.

PROPOSED RRUS DETAIL (2 / 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 STRUCTURES TO SUPPORT THE PROPOSED EQUIPMENT SHALL BE DETERMINED PRIOR TO CONSTRUCTION.

NOTE:
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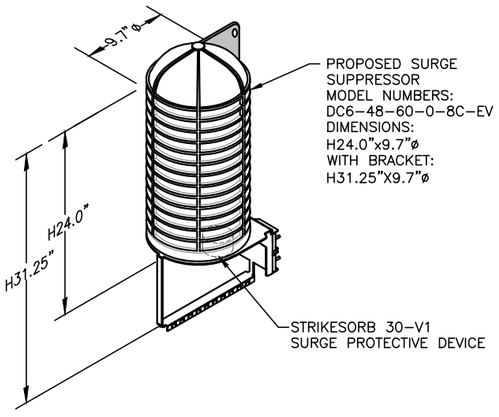
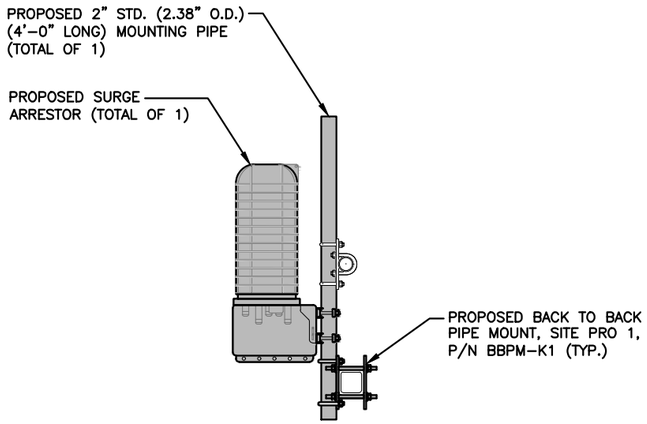
HUDSON DESIGN GROUP, LLC.
DATED: APRIL 14, 2021 (REV 2)

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

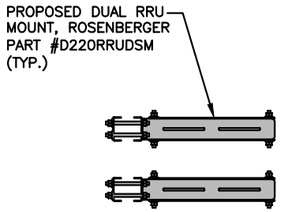


NOTE:
MOUNT PER MANUFACTURER'S SPECIFICATIONS.

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



SURGE ARRESTOR MOUNTING DETAIL (4 / A-3)
22x34 SCALE: 1"=1'-0"
11x17 SCALE: 1/2"=1'-0"



BACK TO BACK RRU MOUNT DETAIL (5 / A-3)
SCALE: N.T.S

PROPOSED LTE ANTENNA MOUNTING DETAIL (6 / A-3)
22x34 SCALE: 3/4"=1'-0"
11x17 SCALE: 3/8"=1'-0"

0 0'-6" 1'-0" 2'-0" 3'-0"

HUDSON Design Group LLC
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NORTH ANDOVER, MA 01845
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FAX: (978) 336-5586

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750 WEST CENTER STREET, SUITE #301
WEST BRIDGEWATER, MA 02379

SITE NUMBER: CT5448
SITE NAME: MANCHESTER CENTRAL

239 MIDDLE TURNPIKE EAST
MANCHESTER, CT 06040
HARTFORD COUNTY

at&t
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ROCKY HILL, CT 06067

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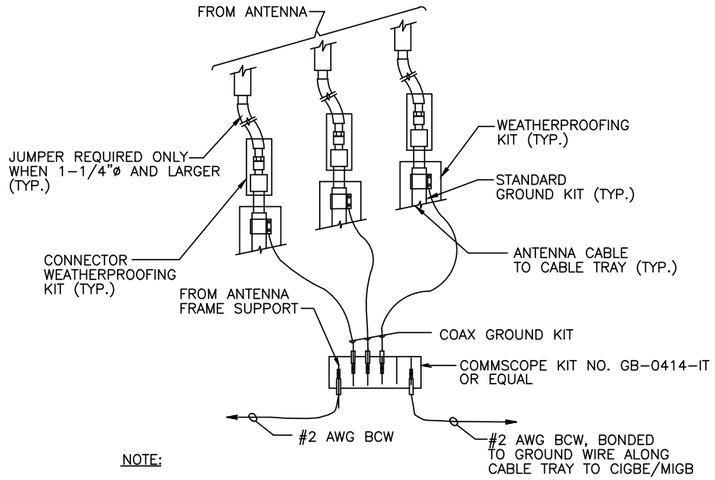
SCALE: AS SHOWN | DESIGNED BY: AT | DRAWN BY: MR

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

AT&T

DETAILS
LTE 6C_7C 2021 UPGRADE

SITE NUMBER	DRAWING NUMBER	REV
CT5448	A-3	1

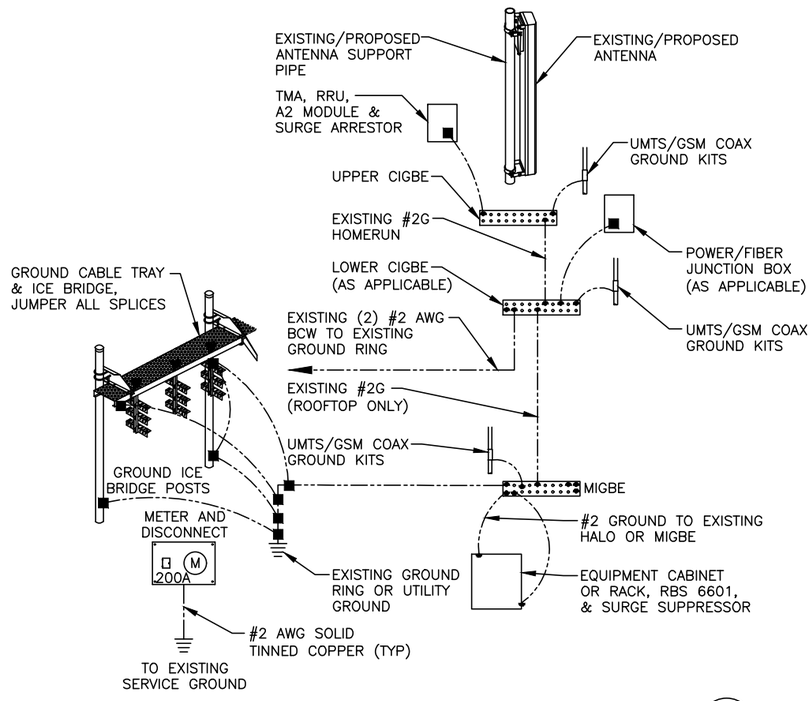


NOTE:

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

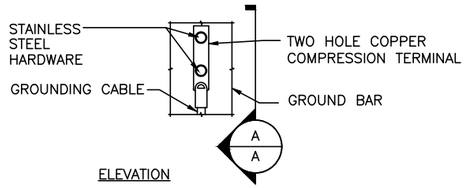
GROUND WIRE TO GROUND BAR CONNECTION DETAIL (1 / G-1)

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

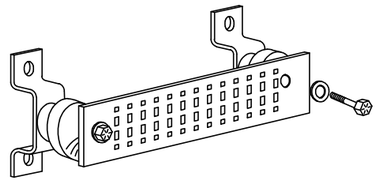
EACH GROUND CONDUCTOR TERMINATING ON ANY GROUND BAR SHALL HAVE AN IDENTIFICATION TAG ATTACHED AT EACH END THAT WILL IDENTIFY ITS ORIGIN AND DESTINATION.

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

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45 BEECHWOOD DRIVE
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WEST BRIDGEWATER, MA 02379

SITE NUMBER: CT5448
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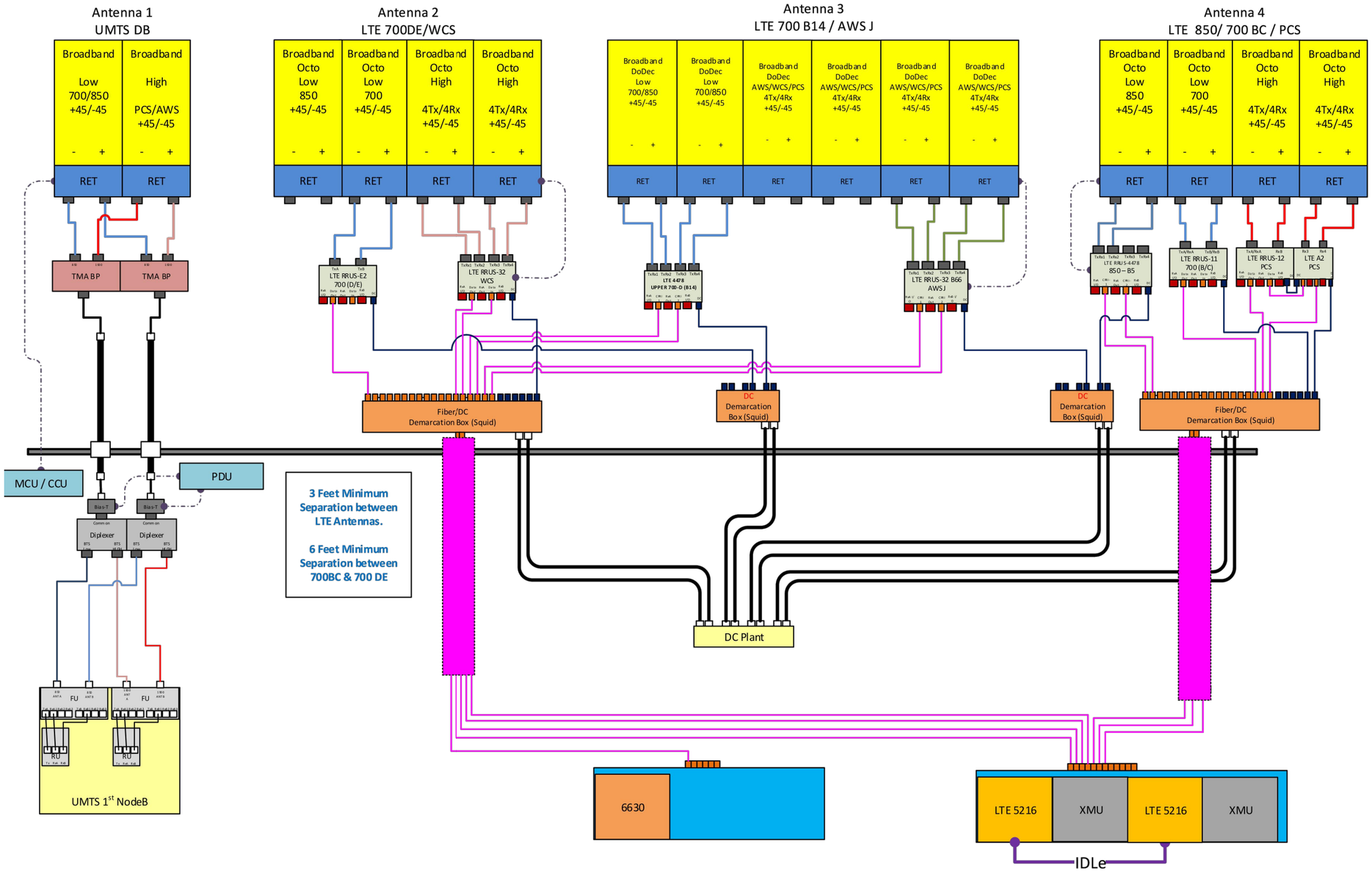
SCALE: AS SHOWN | DESIGNED BY: AT | DRAWN BY: MR

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

AT&T

GROUNDING DETAILS
LTE 6C_7C 2021 UPGRADE

SITE NUMBER	DRAWING NUMBER	REV
CT5448	G-1	1



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

NOTE:

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

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

AT&T

RF PLUMBING DIAGRAM
LTE 6C_7C 2021 UPGRADE

SITE NUMBER	DRAWING NUMBER	REV
CT5448	RF–1	1

EXHIBIT 2

April 14, 2021 (Rev.2)
March 31, 2021 (Rev.1)
October 9, 2019

Centerline Communications
750 West Center Street, Suite #301
West Bridgewater, MA 02379

RE:		
	Site Number:	CT5448 (LTE 6C/7C)
	FA Number:	10071105
	PACE Number:	MRCTB042109
	PT Number:	2051A0Q8QD
	Site Name:	MANCHESTER CENTRAL
	Site Address:	239 Middle Turnpike East Manchester, CT 06040

To Whom It May Concern:

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

- (3) 800-10121 Antennas (54.5"x10.3"x5.9"– Wt. = 47 lbs. /each)
- (2) OPA-65R-LCUU-H6 Antennas (72.0"x14.8"x7.4" – Wt. = 73 lbs. /each)
- (4) OPA-65R-LCUU-H8 Antennas (92.7"x14.4"x7.0" – Wt. = 88 lbs. /each)
- (3) RRUS-32 B30 RRH's (27.2"x12.1"x7.0" – Wt. = 60 lbs. /each)
- (3) RRUS-32 B66A RRH's (27.2"x12.1"x7.0" – Wt. = 60 lbs. /each)
- (3) RRUS-11 B12 RRH's (19.7"x17.0"x7.2" – Wt. = 51 lbs. /each)
- (3) 4478 B5 RRH's (18.1"x13.4"x8.3" – Wt. = 60 lbs. /each)
- (3) RRUS-12 B2 RRH's (20.4"x18.5"x7.5" – Wt. = 58 lbs. /each)
- (3) A2 Modules (16.4"x15.2"x3.4" – Wt. = 22 lbs. /each)
- (6) LGP21401 TMA's (14.4"x9.0"x2.7" – Wt. = 19 lbs. /each)
- (3) Squid Surge Arrestors (24.0"x9.7" Φ – Wt. = 33 lbs. /each)
- **(1) NNH4-65B-R6 Antenna (72.0"x19.6"x7.8"– Wt. = 82 lbs.)**
- **(2) NNH4-65C-R6 Antennas (96.0"x19.6"x7.8"– Wt. = 102 lbs. /each)**
- **(3) RRUS-E2 B29 RRH's (20.4"x18.5"x7.5"– Wt. = 53 lbs. /each)**
- **(3) B14 4478 RRH's (18.1"x13.4"x8.3" – Wt. = 60 lbs. /each)**
- **(1) Squid Surge Arrestors (24.0"x9.7" Φ – Wt. = 33 lbs. /each)**

**Proposed equipment shown in bold.*

No original structural design documents or fabrication drawings were available for the existing mounts. HDG's subconsultant, ProVertic LLC, conducted a survey climb and mapping of the existing AT&T antenna mounts on May 15, 2019.

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 – R13.
- 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 135 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 2.17 in was used for this analysis.
- HDG considers this site to be exposure category B; tower is located in an urban/suburban or wooded area with numerous closely spaced obstructions.
- 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 0.178 and a spectral response acceleration parameter at a period of 1 second, S_1, of 0.064.
- 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 mount is secured to the existing monopole with a ring mount. The connection is considered OK by visual inspection.

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

	Component	Controlling Load Case	Stress Ratio	Pass/Fail
Existing (LTE 6C/7C) Mount Rating	43	LC1	82%	**PASS**

Reference Documents:

- Mount mapping report prepared by ProVertic LLC dated May 28, 2019.

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.

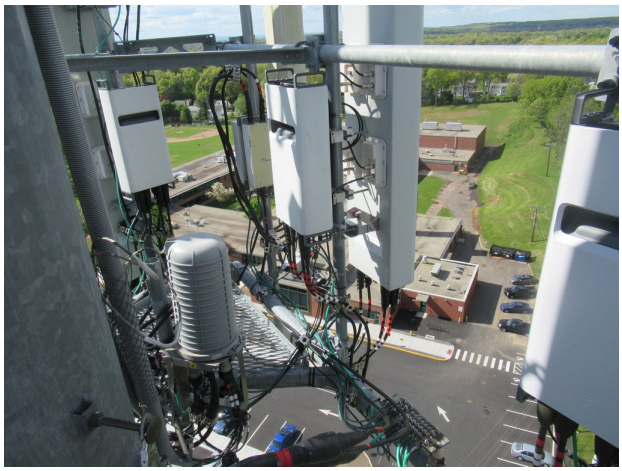
Please feel free to contact our office should you have any questions.

Respectfully Submitted,
Hudson Design Group LLC

Michael Cabral
Vice President

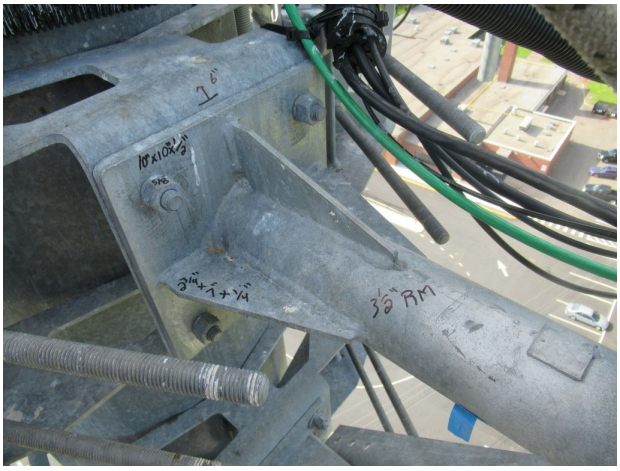
Daniel P. Hamm, PE
Principal

FIELD PHOTOS:










HUDSON
Design Group LLC

Wind & Ice
Calculations

Date: 4/13/2021
Project Name: MANCHESTER CENTRAL
Project No.: CT5448
Designed By: KM **Checked By:** MSC

HUDSON Design Group LLC

2.6.5.2 Velocity Pressure Coeff:

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

z=	143	(ft)
z_g=	1200	(ft)
α=	7.0	

K_z= 1.095

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

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

Category= **1**

K_h=	1	
K_c=	0.9	(from Table 2-4)
K_t=	0	(from Table 2-5)
f=	0	(from Table 2-5)
z=	143	
z_s=	283	(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=	0.99	(from 2.6.8)

2.6.10 Design Ice Thickness

Max Ice Thickness = t_i = 1.50 in
Importance Factor = I= 1.25 (from Table 2-3)
K_{iz} = 1.16 (from Sec. 2.6.10)

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

t_{iz} = 2.17 in

Date: 4/13/2021
Project Name: MANCHESTER CENTRAL
Project No.: CT5448
Designed By: KM 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=	184	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=	1.095	(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=	**48.02**	K_e=	0.99	(from 2.6.8)
$q_{z\ (ice)}$=	**6.59**	K_d=	0.95	(from Table 2-2)
$q_{z\ (30)}$=	**2.37**	V_{max}=	135	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: 4/13/2021
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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 = 2.17 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)
800-10121 Antenna	54.5	10.3	5.9	3.90	5.29	1.32	248	52	12
OPA-65R-LCUU-H6 Antenna	72.0	14.8	7.4	7.40	4.86	1.31	464	87	23
NNH4-65B-R6 Antenna	72.0	19.6	7.8	9.80	3.67	1.25	589	105	29
OPA-65R-LCUU-H8 Antenna	92.7	14.4	7.0	9.27	6.44	1.38	612	114	30
NNH4-65C-R6 Antenna	96.0	19.6	7.8	13.07	4.90	1.31	820	144	40
RRUS-E2 B29 RRH	20.4	7.5	18.5	1.06	2.72	1.21	62	16	3
RRUS-E2 B29 RRH (Shielded)	20.4	3.8	18.5	0.53	5.44	1.33	34	12	2
RRUS-32 B30 RRH	27.2	7.0	12.1	1.32	3.89	1.26	80	21	4
RRUS-32 B30 RRH (Shielded)	27.2	3.5	12.1	0.66	7.77	1.43	45	16	2
B14 4478 RRH	18.1	8.3	13.4	1.04	2.18	1.20	60	16	3
B14 4478 RRH (Shielded)	18.1	4.2	13.4	0.52	4.36	1.28	32	11	2
RRUS-32 B66A RRH	27.2	7.0	12.1	1.32	3.89	1.26	80	21	4
RRUS-32 B66A RRH (Shielded)	27.2	3.5	12.1	0.66	7.77	1.43	45	16	2
4478 B5 RRH	18.1	13.4	8.3	1.68	1.35	1.20	97	22	5
4478 B5 RRH (Shielded)	18.1	0.0	8.3	0.00	0.00	1.20	0	5	0
RRUS-11 B12 RRH	19.7	7.2	17.0	0.99	2.74	1.21	57	15	3
RRUS-11 B12 RRH (Shielded)	19.7	3.8	17.0	0.51	0.00	1.20	30	11	1
RRUS-12 B2 RRH	20.4	7.5	18.5	1.06	2.72	1.21	62	16	3
RRUS-12 B2 RRH (Shielded)	20.4	3.8	18.5	0.53	0.00	1.20	31	11	2
A2 Modules	16.4	15.2	3.4	1.73	1.08	1.20	100	22	5
LGP21401 TMA	14.4	2.7	9.0	0.27	5.33	1.33	17	8	1
Surge Arrestor	24.0	9.7	9.7	1.62	2.47	0.70	54	13	3
PL 6x3/8	0.4	12.0	-	0.03	0.03	1.20	2		
PL 4x1/4	0.3	12.0	-	0.02	0.02	1.20	1		
C 3-3/8x3/16	3.4	12.0	-	0.28	0.28	2.00	27		
L 3x3 Angles	3.0	12.0	-	0.25	0.25	2.00	24		
L 2x2 Angles	2.0	12.0	-	0.17	0.17	2.00	16		
3-1/2" Pipe	4.0	12.0	-	0.33	0.33	1.20	19		
2-1/2" Pipe	2.9	12.0	-	0.24	0.24	1.20	14		
2" Pipe	2.4	12.0	-	0.20	0.20	1.20	11		

Date: 4/13/2021
Project Name: MANCHESTER CENTRAL
Project No.: CT5448
Designed By: KM Checked By: MSC

HUDSON Design Group LLC

WIND LOADS

Angle = 30 (deg) | Ice Thickness = 2.17 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)
800-10121 Antenna	54.5	10.3	5.9	3.90	2.23	5.29	9.24	1.32	1.47	248	158	225
OPA-65R-LCUU-H6 Antenna	72.0	14.8	7.4	7.40	3.70	4.86	9.73	1.31	1.49	464	265	414
NNH4-65B-R6 Antenna	72.0	19.6	7.8	9.80	3.90	3.67	9.23	1.25	1.47	589	276	511
OPA-65R-LCUU-H8 Antenna	92.7	14.4	7.0	9.27	4.51	6.44	13.24	1.38	1.61	612	348	546
NNH4-65C-R6 Antenna	96.0	19.6	7.8	13.07	5.20	4.90	12.31	1.31	1.58	820	394	713
RRUS-E2 B29 RRH	20.4	7.5	18.5	1.06	2.62	2.72	1.10	1.21	1.20	62	151	84
RRUS-E2 B29 RRH (Shielded)	20.4	3.8	18.5	0.53	2.62	5.44	1.10	1.33	1.20	34	151	63
RRUS-32 B30 RRH	27.2	7.0	12.1	1.32	2.29	3.89	2.25	1.26	1.20	80	132	93
RRUS-32 B30 RRH (Shielded)	27.2	3.5	12.1	0.66	2.29	7.77	2.25	1.43	1.20	45	132	67
B14 4478 RRH	18.1	8.3	13.4	1.04	1.68	2.18	1.35	1.20	1.20	60	97	69
B14 4478 RRH (Shielded)	18.1	4.2	13.4	0.52	1.68	4.36	1.35	1.28	1.20	32	97	48
RRUS-32 B66A RRH	27.2	7.0	12.1	1.32	2.29	3.89	2.25	1.26	1.20	80	132	93
RRUS-32 B66A RRH (Shielded)	27.2	3.5	12.1	0.66	2.29	7.77	2.25	1.43	1.20	45	132	67
4478 B5 RRH	18.1	13.4	8.3	1.68	1.04	1.35	2.18	1.20	1.20	97	60	88
4478 B5 RRH (Shielded)	18.1	6.7	8.3	0.84	1.04	2.70	2.18	1.21	1.20	49	60	52
RRUS-11 B12 RRH	19.7	7.2	17.0	0.99	2.33	2.74	1.16	1.21	1.20	57	134	76
RRUS-11 B12 RRH (Shielded)	19.7	3.8	17.0	0.51	2.33	5.25	1.16	1.32	1.20	33	134	58
RRUS-12 B2 RRH	20.4	7.5	18.5	1.06	2.62	2.72	1.10	1.21	1.20	62	151	84
RRUS-12 B2 RRH (Shielded)	20.4	3.8	18.5	0.53	2.62	5.44	1.10	1.33	1.20	34	151	63
A2 Modules	16.4	15.2	3.4	1.73	0.39	1.08	4.82	1.20	1.30	100	24	81
LGP21401 TMA	14.4	2.7	9.0	0.27	0.90	5.33	1.60	1.33	1.20	17	52	26

WIND LOADS WITH ICE:

800-10121 Antenna	58.8	14.6	10.2	5.98	4.19	4.02	5.75	1.27	1.34	50	37	47
OPA-65R-LCUU-H6 Antenna	76.3	19.1	11.7	10.15	6.23	3.99	6.50	1.27	1.38	85	56	78
NNH4-65B-R6 Antenna	76.3	23.9	12.1	12.69	6.44	3.19	6.29	1.23	1.37	103	58	92
OPA-65R-LCUU-H8 Antenna	97.0	18.7	11.3	12.63	7.64	5.18	8.56	1.32	1.45	110	73	101
NNH4-65C-R6 Antenna	100.3	23.9	12.1	16.68	8.46	4.19	8.26	1.28	1.44	140	80	125
RRUS-E2 B29 RRH	24.7	11.8	22.8	2.03	3.92	2.09	1.08	1.20	1.20	16	31	20
RRUS-E2 B29 RRH (Shielded)	24.7	5.9	22.8	1.02	3.92	4.18	1.08	1.27	1.20	9	31	14
RRUS-32 B30 RRH	31.5	11.3	16.4	2.48	3.60	2.78	1.92	1.21	1.20	20	28	22
RRUS-32 B30 RRH (Shielded)	31.5	5.7	16.4	1.24	3.60	5.56	1.92	1.34	1.20	11	28	15
B14 4478 RRH	22.4	12.6	17.7	1.97	2.77	1.78	1.26	1.20	1.20	16	22	17
B14 4478 RRH (Shielded)	22.4	6.3	17.7	0.99	2.77	3.55	1.26	1.25	1.20	8	22	12
RRUS-32 B66A RRH	31.5	11.3	16.4	2.48	3.60	2.78	1.92	1.21	1.20	20	28	22
RRUS-32 B66A RRH (Shielded)	31.5	5.7	16.4	1.24	3.60	5.56	1.92	1.34	1.20	11	28	15
4478 B5 RRH	22.4	17.7	12.6	2.77	1.97	1.26	1.78	1.20	1.20	22	16	20
4478 B5 RRH (Shielded)	22.4	8.9	12.6	1.38	1.97	2.53	1.78	1.20	1.20	11	16	12
RRUS-11 B12 RRH	24.0	11.5	21.3	1.93	3.56	2.08	1.13	1.20	1.20	15	28	18
RRUS-11 B12 RRH (Shielded)	24.0	5.8	21.3	0.96	3.56	4.17	1.13	1.27	1.20	8	28	13
RRUS-12 B2 RRH	24.7	11.8	22.8	2.03	3.92	2.09	1.08	1.20	1.20	16	31	20
RRUS-12 B2 RRH (Shielded)	24.7	5.9	22.8	1.02	3.92	4.18	1.08	1.27	1.20	9	31	14
A2 Modules	20.7	19.5	7.7	2.81	1.12	1.06	2.68	1.20	1.21	22	9	19
LGP21401 TMA	18.7	7.0	13.3	0.92	1.74	2.66	1.40	1.21	1.20	7	14	9

WIND LOADS AT 30 MPH:

800-10121 Antenna	54.5	10.3	5.9	3.90	2.23	5.29	9.24	1.32	1.47	12	8	11
OPA-65R-LCUU-H6 Antenna	72.0	14.8	7.4	7.40	3.70	4.86	9.73	1.31	1.49	23	13	20
NNH4-65B-R6 Antenna	72.0	19.6	7.8	9.80	3.90	3.67	9.23	1.25	1.47	29	14	25
OPA-65R-LCUU-H8 Antenna	92.7	14.4	7.0	9.27	4.51	6.44	13.24	1.38	1.61	30	17	27
NNH4-65C-R6 Antenna	96.0	19.6	7.8	13.07	5.20	4.90	12.31	1.31	1.58	40	19	35
RRUS-E2 B29 RRH	20.4	7.5	18.5	1.06	2.62	2.72	1.10	1.21	1.20	3	7	4
RRUS-E2 B29 RRH (Shielded)	20.4	3.8	18.5	0.53	2.62	5.44	1.10	1.33	1.20	2	7	3
RRUS-32 B30 RRH	27.2	7.0	12.1	1.32	2.29	3.89	2.25	1.26	1.20	4	7	5
RRUS-32 B30 RRH (Shielded)	27.2	3.5	12.1	0.66	2.29	7.77	2.25	1.43	1.20	2	7	3
B14 4478 RRH	18.1	8.3	13.4	1.04	1.68	2.18	1.35	1.20	1.20	3	5	3
B14 4478 RRH (Shielded)	18.1	4.2	13.4	0.52	1.68	4.36	1.35	1.28	1.20	2	5	2
RRUS-32 B66A RRH	27.2	7.0	12.1	1.32	2.29	3.89	2.25	1.26	1.20	4	7	5
RRUS-32 B66A RRH (Shielded)	27.2	3.5	12.1	0.66	2.29	7.77	2.25	1.43	1.20	2	7	3
4478 B5 RRH	18.1	13.4	8.3	1.68	1.04	1.35	2.18	1.20	1.20	5	3	4
4478 B5 RRH (Shielded)	18.1	6.7	8.3	0.84	1.04	2.70	2.18	1.21	1.20	2	3	3
RRUS-11 B12 RRH	19.7	7.2	17.0	0.99	2.33	2.74	1.16	1.21	1.20	3	7	4
RRUS-11 B12 RRH (Shielded)	19.7	3.6	17.0	0.49	2.33	5.47	1.16	1.33	1.20	2	7	3
RRUS-12 B2 RRH	20.4	7.5	18.5	1.06	2.62	2.72	1.10	1.21	1.20	3	7	4
RRUS-12 B2 RRH (Shielded)	20.4	3.8	18.5	0.53	2.62	5.44	1.10	1.33	1.20	2	7	3
A2 Modules	16.4	15.2	3.4	1.73	0.39	1.08	4.82	1.20	1.30	5	1	4
LGP21401 TMA	14.4	2.7	9.0	0.27	0.90	5.33	1.60	1.33	1.20	1	3	1

Date: 4/13/2021
Project Name: MANCHESTER CENTRAL
Project No.: CT5448
Designed By: KM Checked By: MSC

HUDSON Design Group LLC

WIND LOADS

Angle = 60 (deg) | Ice Thickness = 2.17 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)
800-10121 Antenna	54.5	10.3	5.9	3.90	2.23	5.29	9.24	1.32	1.47	248	158	181
OPA-65R-LCUU-H6 Antenna	72.0	14.8	7.4	7.40	3.70	4.86	9.73	1.31	1.49	464	265	315
NNH4-65B-R6 Antenna	72.0	19.6	7.8	9.80	3.90	3.67	9.23	1.25	1.47	589	276	354
OPA-65R-LCUU-H8 Antenna	92.7	14.4	7.0	9.27	4.51	6.44	13.24	1.38	1.61	612	348	414
NNH4-65C-R6 Antenna	96.0	19.6	7.8	13.07	5.20	4.90	12.31	1.31	1.58	820	394	500
RRUS-E2 B29 RRH	20.4	7.5	18.5	1.06	2.62	2.72	1.10	1.21	1.20	62	151	129
RRUS-E2 B29 RRH (Shielded)	20.4	5.6	18.5	0.80	2.62	3.63	1.10	1.25	1.20	48	151	125
RRUS-32 B30 RRH	27.2	7.0	12.1	1.32	2.29	3.89	2.25	1.26	1.20	80	132	119
RRUS-32 B30 RRH (Shielded)	27.2	5.3	12.1	0.99	2.29	5.18	2.25	1.32	1.20	63	132	114
B14 4478 RRH	18.1	8.3	13.4	1.04	1.68	2.18	1.35	1.20	1.20	60	97	88
B14 4478 RRH (Shielded)	18.1	6.2	13.4	0.78	1.68	2.91	1.35	1.22	1.20	46	97	84
RRUS-32 B66A RRH	27.2	7.0	12.1	1.32	2.29	3.89	2.25	1.26	1.20	80	132	119
RRUS-32 B66A RRH (Shielded)	27.2	5.3	12.1	0.99	2.29	5.18	2.25	1.32	1.20	63	132	114
4478 B5 RRH	18.1	13.4	8.3	1.68	1.04	1.35	2.18	1.20	1.20	97	60	69
4478 B5 RRH (Shielded)	18.1	10.1	8.3	1.26	1.04	1.80	2.18	1.20	1.20	73	60	63
RRUS-11 B12 RRH	19.7	7.2	17.0	0.99	2.33	2.74	1.16	1.21	1.20	57	134	115
RRUS-11 B12 RRH (Shielded)	19.7	5.4	17.0	0.74	2.33	3.65	1.16	1.25	1.20	44	134	112
RRUS-12 B2 RRH	20.4	7.5	18.5	1.06	2.62	2.72	1.10	1.21	1.20	62	151	129
RRUS-12 B2 RRH (Shielded)	20.4	5.6	18.5	0.80	2.62	3.63	1.10	1.25	1.20	48	151	125
A2 Modules	16.4	15.2	3.4	1.73	0.39	1.08	4.82	1.20	1.30	100	24	43
LGP21401 TMA	14.4	2.7	9.0	0.27	0.90	5.33	1.60	1.33	1.20	17	52	43

WIND LOADS WITH ICE:

800-10121 Antenna	58.8	14.6	10.2	5.98	4.19	4.02	5.75	1.27	1.34	50	37	40
OPA-65R-LCUU-H6 Antenna	76.3	19.1	11.7	10.15	6.23	3.99	6.50	1.27	1.38	85	56	64
NNH4-65B-R6 Antenna	76.3	23.9	12.1	12.69	6.44	3.19	6.29	1.23	1.37	103	58	69
OPA-65R-LCUU-H8 Antenna	97.0	18.7	11.3	12.63	7.64	5.18	8.56	1.32	1.45	110	73	82
NNH4-65C-R6 Antenna	100.3	23.9	12.1	16.68	8.46	4.19	8.26	1.28	1.44	140	80	95
RRUS-E2 B29 RRH	24.7	11.8	22.8	2.03	3.92	2.09	1.08	1.20	1.20	16	31	27
RRUS-E2 B29 RRH (Shielded)	24.7	8.9	22.8	1.53	3.92	2.79	1.08	1.21	1.20	12	31	26
RRUS-32 B30 RRH	31.5	11.3	16.4	2.48	3.60	2.78	1.92	1.21	1.20	20	28	26
RRUS-32 B30 RRH (Shielded)	31.5	8.5	16.4	1.86	3.60	3.71	1.92	1.25	1.20	15	28	25
B14 4478 RRH	22.4	12.6	17.7	1.97	2.77	1.78	1.26	1.20	1.20	16	22	20
B14 4478 RRH (Shielded)	22.4	9.5	17.7	1.48	2.77	2.37	1.26	1.20	1.20	12	22	19
RRUS-32 B66A RRH	31.5	11.3	16.4	2.48	3.60	2.78	1.92	1.21	1.20	20	28	26
RRUS-32 B66A RRH (Shielded)	31.5	8.5	16.4	1.86	3.60	3.71	1.92	1.25	1.20	15	28	25
4478 B5 RRH	22.4	17.7	12.6	2.77	1.97	1.26	1.78	1.20	1.20	22	16	17
4478 B5 RRH (Shielded)	22.4	13.3	12.6	2.07	1.97	1.69	1.78	1.20	1.20	16	16	16
RRUS-11 B12 RRH	24.0	11.5	21.3	1.93	3.56	2.08	1.13	1.20	1.20	15	28	25
RRUS-11 B12 RRH (Shielded)	24.0	8.7	21.3	1.45	3.56	2.78	1.13	1.21	1.20	12	28	24
RRUS-12 B2 RRH	24.7	11.8	22.8	2.03	3.92	2.09	1.08	1.20	1.20	16	31	27
RRUS-12 B2 RRH (Shielded)	24.7	8.9	22.8	1.53	3.92	2.79	1.08	1.21	1.20	12	31	26
A2 Modules	20.7	19.5	7.7	2.81	1.12	1.06	2.68	1.20	1.21	22	9	12
LGP21401 TMA	18.7	7.0	13.3	0.92	1.74	2.66	1.40	1.21	1.20	7	14	12

WIND LOADS AT 30 MPH:

800-10121 Antenna	54.5	10.3	5.9	3.90	2.23	5.29	9.24	1.32	1.47	12	8	9
OPA-65R-LCUU-H6 Antenna	72.0	14.8	7.4	7.40	3.70	4.86	9.73	1.31	1.49	23	13	16
NNH4-65B-R6 Antenna	72.0	19.6	7.8	9.80	3.90	3.67	9.23	1.25	1.47	29	14	18
OPA-65R-LCUU-H8 Antenna	92.7	14.4	7.0	9.27	4.51	6.44	13.24	1.38	1.61	30	17	20
NNH4-65C-R6 Antenna	96.0	19.6	7.8	13.07	5.20	4.90	12.31	1.31	1.58	40	19	25
RRUS-E2 B29 RRH	20.4	7.5	18.5	1.06	2.62	2.72	1.10	1.21	1.20	3	7	6
RRUS-E2 B29 RRH (Shielded)	20.4	5.6	18.5	0.80	2.62	3.63	1.10	1.25	1.20	2	7	6
RRUS-32 B30 RRH	27.2	7.0	12.1	1.32	2.29	3.89	2.25	1.26	1.20	4	7	6
RRUS-32 B30 RRH (Shielded)	27.2	5.3	12.1	0.99	2.29	5.18	2.25	1.32	1.20	3	7	6
B14 4478 RRH	18.1	8.3	13.4	1.04	1.68	2.18	1.35	1.20	1.20	3	5	4
B14 4478 RRH (Shielded)	18.1	6.2	13.4	0.78	1.68	2.91	1.35	1.22	1.20	2	5	4
RRUS-32 B66A RRH	27.2	7.0	12.1	1.32	2.29	3.89	2.25	1.26	1.20	4	7	6
RRUS-32 B66A RRH (Shielded)	27.2	5.3	12.1	0.99	2.29	5.18	2.25	1.32	1.20	3	7	6
4478 B5 RRH	18.1	13.4	8.3	1.68	1.04	1.35	2.18	1.20	1.20	5	3	3
4478 B5 RRH (Shielded)	18.1	10.1	8.3	1.26	1.04	1.80	2.18	1.20	1.20	4	3	3
RRUS-11 B12 RRH	19.7	7.2	17.0	0.99	2.33	2.74	1.16	1.21	1.20	3	7	6
RRUS-11 B12 RRH (Shielded)	19.7	5.4	17.0	0.74	2.33	3.65	1.16	1.25	1.20	2	7	6
RRUS-12 B2 RRH	20.4	7.5	18.5	1.06	2.62	2.72	1.10	1.21	1.20	3	7	6
RRUS-12 B2 RRH (Shielded)	20.4	5.6	18.5	0.80	2.62	3.63	1.10	1.25	1.20	2	7	6
A2 Modules	16.4	15.2	3.4	1.73	0.39	1.08	4.82	1.20	1.30	5	1	2
LGP21401 TMA	14.4	2.7	9.0	0.27	0.90	5.33	1.60	1.33	1.20	1	3	2

Date: 4/13/2021
Project Name: MANCHESTER CENTRAL
Project No.: CT5448
Designed By: KM Checked By: MSC

HUDSON Design Group LLC

WIND LOADS

Angle = 90 (deg) | Ice Thickness = 2.17 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)
800-10121 Antenna	54.5	10.3	5.9	3.90	2.23	5.29	9.24	1.32	1.47	248	158	158
OPA-65R-LCUU-H6 Antenna	72.0	14.8	7.4	7.40	3.70	4.86	9.73	1.31	1.49	464	265	265
NNH4-65B-R6 Antenna	72.0	19.6	7.8	9.80	3.90	3.67	9.23	1.25	1.47	589	276	276
OPA-65R-LCUU-H8 Antenna	92.7	14.4	7.0	9.27	4.51	6.44	13.24	1.38	1.61	612	348	348
NNH4-65C-R6 Antenna	96.0	19.6	7.8	13.07	5.20	4.90	12.31	1.31	1.58	820	394	394
RRUS-E2 B29 RRH	20.4	7.5	18.5	1.06	2.62	2.72	1.10	1.21	1.20	62	151	151
RRUS-E2 B29 RRH (Shielded)	20.4	3.8	18.5	0.53	2.62	5.44	1.10	1.33	1.20	34	151	151
RRUS-32 B30 RRH	27.2	7.0	12.1	1.32	2.29	3.89	2.25	1.26	1.20	80	132	132
RRUS-32 B30 RRH (Shielded)	27.2	3.5	12.1	0.66	2.29	0.00	2.25	1.20	1.20	38	132	132
B14 4478 RRH	18.1	8.3	13.4	1.04	1.68	2.18	1.35	1.20	1.20	60	97	97
B14 4478 RRH (Shielded)	18.1	4.2	13.4	0.52	1.68	4.36	1.35	1.28	1.20	32	97	97
RRUS-32 B66A RRH	27.2	7.0	12.1	1.32	2.29	3.89	2.25	1.26	1.20	80	132	132
RRUS-32 B66A RRH (Shielded)	27.2	3.5	12.1	0.66	2.29	7.77	2.25	1.43	1.20	45	132	132
4478 B5 RRH	18.1	13.4	8.3	1.68	1.04	1.35	2.18	1.20	1.20	97	60	60
4478 B5 RRH (Shielded)	18.1	0.0	8.3	0.00	1.04	0.00	2.18	1.20	1.20	0	60	60
RRUS-11 B12 RRH	19.7	7.2	17.0	0.99	2.33	2.74	1.16	1.21	1.20	57	134	134
RRUS-11 B12 RRH (Shielded)	19.7	3.8	17.0	0.51	2.33	5.25	1.16	1.32	1.20	33	134	134
RRUS-12 B2 RRH	20.4	7.5	18.5	1.06	2.62	2.72	1.10	1.21	1.20	62	151	151
RRUS-12 B2 RRH (Shielded)	20.4	3.8	18.5	0.53	2.62	5.44	1.10	1.33	1.20	34	151	151
A2 Modules	16.4	15.2	3.4	1.73	0.39	1.08	4.82	1.20	1.30	100	24	24
LGP21401 TMA	14.4	2.7	9.0	0.27	0.90	5.33	1.60	1.33	1.20	17	52	52

WIND LOADS WITH ICE:

800-10121 Antenna	58.8	14.6	10.2	5.98	4.19	4.02	5.75	1.27	1.34	50	37	37
OPA-65R-LCUU-H6 Antenna	76.3	19.1	11.7	10.15	6.23	3.99	6.50	1.27	1.38	85	56	56
NNH4-65B-R6 Antenna	76.3	23.9	12.1	12.69	6.44	3.19	6.29	1.23	1.37	103	58	58
OPA-65R-LCUU-H8 Antenna	97.0	18.7	11.3	12.63	7.64	5.18	8.56	1.32	1.45	110	73	73
NNH4-65C-R6 Antenna	100.3	23.9	12.1	16.68	8.46	4.19	8.26	1.28	1.44	140	80	80
RRUS-E2 B29 RRH	24.7	11.8	22.8	2.03	3.92	2.09	1.08	1.20	1.20	16	31	31
RRUS-E2 B29 RRH (Shielded)	24.7	8.1	22.8	1.39	3.92	3.06	1.08	1.22	1.20	11	31	31
RRUS-32 B30 RRH	31.5	11.3	16.4	2.48	3.60	2.78	1.92	1.21	1.20	20	28	28
RRUS-32 B30 RRH (Shielded)	31.5	7.8	16.4	1.72	3.60	4.02	1.92	1.27	1.20	14	28	28
B14 4478 RRH	22.4	12.6	17.7	1.97	2.77	1.78	1.26	1.20	1.20	16	22	22
B14 4478 RRH (Shielded)	22.4	8.5	17.7	1.32	2.77	2.64	1.26	1.21	1.20	11	22	22
RRUS-32 B66A RRH	31.5	11.3	16.4	2.48	3.60	2.78	1.92	1.21	1.20	20	28	28
RRUS-32 B66A RRH (Shielded)	31.5	7.8	16.4	1.72	3.60	4.02	1.92	1.27	1.20	14	28	28
4478 B5 RRH	22.4	17.7	12.6	2.77	1.97	1.26	1.78	1.20	1.20	22	16	16
4478 B5 RRH (Shielded)	22.4	4.3	12.6	0.68	1.97	5.17	1.78	1.32	1.20	6	16	16
RRUS-11 B12 RRH	24.0	11.5	21.3	1.93	3.56	2.08	1.13	1.20	1.20	15	28	28
RRUS-11 B12 RRH (Shielded)	24.0	8.1	21.3	1.35	3.56	2.97	1.13	1.22	1.20	11	28	28
RRUS-12 B2 RRH	24.7	11.8	22.8	2.03	3.92	2.09	1.08	1.20	1.20	16	31	31
RRUS-12 B2 RRH (Shielded)	24.7	8.1	22.8	1.39	3.92	3.06	1.08	1.22	1.20	11	31	31
A2 Modules	20.7	19.5	7.7	2.81	1.12	1.06	2.68	1.20	1.21	22	9	9
LGP21401 TMA	18.7	7.0	13.3	0.92	1.74	2.66	1.40	1.21	1.20	7	14	14

WIND LOADS AT 30 MPH:

800-10121 Antenna	54.5	10.3	5.9	3.90	2.23	5.29	9.24	1.32	1.47	12	8	8
OPA-65R-LCUU-H6 Antenna	72.0	14.8	7.4	7.40	3.70	4.86	9.73	1.31	1.49	23	13	13
NNH4-65B-R6 Antenna	72.0	19.6	7.8	9.80	3.90	3.67	9.23	1.25	1.47	29	14	14
OPA-65R-LCUU-H8 Antenna	92.7	14.4	7.0	9.27	4.51	6.44	13.24	1.38	1.61	30	17	17
NNH4-65C-R6 Antenna	96.0	19.6	7.8	13.07	5.20	4.90	12.31	1.31	1.58	40	19	19
RRUS-E2 B29 RRH	20.4	7.5	18.5	1.06	2.62	2.72	1.10	1.21	1.20	3	7	7
RRUS-E2 B29 RRH (Shielded)	20.4	3.8	18.5	0.53	2.62	0.00	1.10	1.20	1.20	2	7	7
RRUS-32 B30 RRH	27.2	7.0	12.1	1.32	2.29	3.89	2.25	1.26	1.20	4	7	7
RRUS-32 B30 RRH (Shielded)	27.2	3.5	12.1	0.66	2.29	0.00	2.25	1.20	1.20	2	7	7
B14 4478 RRH	18.1	8.3	13.4	1.04	1.68	2.18	1.35	1.20	1.20	3	5	5
B14 4478 RRH (Shielded)	18.1	4.2	13.4	0.52	1.68	0.00	1.35	1.20	1.20	1	5	5
RRUS-32 B66A RRH	27.2	7.0	12.1	1.32	2.29	3.89	2.25	1.26	1.20	4	7	7
RRUS-32 B66A RRH (Shielded)	27.2	3.5	12.1	0.66	2.29	0.00	2.25	1.20	1.20	2	7	7
4478 B5 RRH	18.1	13.4	8.3	1.68	1.04	1.35	2.18	1.20	1.20	5	3	3
4478 B5 RRH (Shielded)	18.1	0.0	8.3	0.00	1.04	0.00	2.18	1.20	1.20	0	3	3
RRUS-11 B12 RRH	19.7	7.2	17.0	0.99	2.33	2.74	1.16	1.21	1.20	3	7	7
RRUS-11 B12 RRH (Shielded)	19.7	3.8	17.0	0.51	2.33	0.00	1.16	1.20	1.20	1	7	7
RRUS-12 B2 RRH	20.4	7.5	18.5	1.06	2.62	2.72	1.10	1.21	1.20	3	7	7
RRUS-12 B2 RRH (Shielded)	20.4	3.8	18.5	0.53	2.62	0.00	1.10	1.20	1.20	2	7	7
A2 Modules	16.4	15.2	3.4	1.73	0.39	1.08	4.82	1.20	1.30	5	1	1
LGP21401 TMA	14.4	2.7	9.0	0.27	0.90	5.33	1.60	1.33	1.20	1	3	3

Date: 4/13/2021
Project Name: MANCHESTER CENTRAL
Project No.: CT5448
Designed By: KM Checked By: MSC

HUDSON Design Group LLC

WIND LOADS

Angle =	120	(deg)	Ice Thickness =	2.17	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)
800-10121 Antenna	54.5	10.3	5.9	3.90	2.23	5.29	9.24	1.32	1.47	248	158	181
OPA-65R-LCUU-H6 Antenna	72.0	14.8	7.4	7.40	3.70	4.86	9.73	1.31	1.49	464	265	315
NNH4-65B-R6 Antenna	72.0	19.6	7.8	9.80	3.90	3.67	9.23	1.25	1.47	589	276	354
OPA-65R-LCUU-H8 Antenna	92.7	14.4	7.0	9.27	4.51	6.44	13.24	1.38	1.61	612	348	414
NNH4-65C-R6 Antenna	96.0	19.6	7.8	13.07	5.20	4.90	12.31	1.31	1.58	820	394	500
RRUS-E2 B29 RRH	20.4	7.5	18.5	1.06	2.62	2.72	1.10	1.21	1.20	62	151	129
RRUS-E2 B29 RRH (Shielded)	20.4	5.6	18.5	0.80	2.62	3.63	1.10	1.25	1.20	48	151	125
RRUS-32 B30 RRH	27.2	7.0	12.1	1.32	2.29	3.89	2.25	1.26	1.20	80	132	119
RRUS-32 B30 RRH (Shielded)	27.2	5.3	12.1	0.99	2.29	5.18	2.25	1.32	1.20	63	132	114
B14 4478 RRH	18.1	8.3	13.4	1.04	1.68	2.18	1.35	1.20	1.20	60	97	88
B14 4478 RRH (Shielded)	18.1	6.2	13.4	0.78	1.68	2.91	1.35	1.22	1.20	46	97	84
RRUS-32 B66A RRH	27.2	7.0	12.1	1.32	2.29	3.89	2.25	1.26	1.20	80	132	119
RRUS-32 B66A RRH (Shielded)	27.2	5.3	12.1	0.99	2.29	5.18	2.25	1.32	1.20	63	132	114
4478 B5 RRH	18.1	13.4	8.3	1.68	1.04	1.35	2.18	1.20	1.20	97	60	69
4478 B5 RRH (Shielded)	18.1	10.1	8.3	1.26	1.04	1.80	2.18	1.20	1.20	73	60	63
RRUS-11 B12 RRH	19.7	7.2	17.0	0.99	2.33	2.74	1.16	1.21	1.20	57	134	115
RRUS-11 B12 RRH (Shielded)	19.7	5.4	17.0	0.74	2.33	3.65	1.16	1.25	1.20	44	134	112
RRUS-12 B2 RRH	20.4	7.5	18.5	1.06	2.62	2.72	1.10	1.21	1.20	62	151	129
RRUS-12 B2 RRH (Shielded)	20.4	5.6	18.5	0.80	2.62	3.63	1.10	1.25	1.20	48	151	125
A2 Modules	16.4	15.2	3.4	1.73	0.39	1.08	4.82	1.20	1.30	100	24	43
LGP21401 TMA	14.4	2.7	9.0	0.27	0.90	5.33	1.60	1.33	1.20	17	52	43

WIND LOADS WITH ICE:

800-10121 Antenna	58.8	14.6	10.2	5.98	4.19	4.02	5.75	1.27	1.34	50	37	40
OPA-65R-LCUU-H6 Antenna	76.3	19.1	11.7	10.15	6.23	3.99	6.50	1.27	1.38	85	56	64
NNH4-65B-R6 Antenna	76.3	23.9	12.1	12.69	6.44	3.19	6.29	1.23	1.37	103	58	69
OPA-65R-LCUU-H8 Antenna	97.0	18.7	11.3	12.63	7.64	5.18	8.56	1.32	1.45	110	73	82
NNH4-65C-R6 Antenna	100.3	23.9	12.1	16.68	8.46	4.19	8.26	1.28	1.44	140	80	95
RRUS-E2 B29 RRH	24.7	11.8	22.8	2.03	3.92	2.09	1.08	1.20	1.20	16	31	27
RRUS-E2 B29 RRH (Shielded)	24.7	8.9	22.8	1.53	3.92	2.79	1.08	1.21	1.20	12	31	26
RRUS-32 B30 RRH	31.5	11.3	16.4	2.48	3.60	2.78	1.92	1.21	1.20	20	28	26
RRUS-32 B30 RRH (Shielded)	31.5	8.5	16.4	1.86	3.60	3.71	1.92	1.25	1.20	15	28	25
B14 4478 RRH	22.4	12.6	17.7	1.97	2.77	1.78	1.26	1.20	1.20	16	22	20
B14 4478 RRH (Shielded)	22.4	9.5	17.7	1.48	2.77	2.37	1.26	1.20	1.20	12	22	19
RRUS-32 B66A RRH	31.5	11.3	16.4	2.48	3.60	2.78	1.92	1.21	1.20	20	28	26
RRUS-32 B66A RRH (Shielded)	31.5	8.5	16.4	1.86	3.60	3.71	1.92	1.25	1.20	15	28	25
4478 B5 RRH	22.4	17.7	12.6	2.77	1.97	1.26	1.78	1.20	1.20	22	16	17
4478 B5 RRH (Shielded)	22.4	13.3	12.6	2.07	1.97	1.69	1.78	1.20	1.20	16	16	16
RRUS-11 B12 RRH	24.0	11.5	21.3	1.93	3.56	2.08	1.13	1.20	1.20	15	28	25
RRUS-11 B12 RRH (Shielded)	24.0	8.7	21.3	1.45	3.56	2.78	1.13	1.21	1.20	12	28	24
RRUS-12 B2 RRH	24.7	11.8	22.8	2.03	3.92	2.09	1.08	1.20	1.20	16	31	27
RRUS-12 B2 RRH (Shielded)	24.7	8.9	22.8	1.53	3.92	2.79	1.08	1.21	1.20	12	31	26
A2 Modules	20.7	19.5	7.7	2.81	1.12	1.06	2.68	1.20	1.21	22	9	12
LGP21401 TMA	18.7	7.0	13.3	0.92	1.74	2.66	1.40	1.21	1.20	7	14	12

WIND LOADS AT 30 MPH:

800-10121 Antenna	54.5	10.3	5.9	3.90	2.23	5.29	9.24	1.32	1.47	12	8	9
OPA-65R-LCUU-H6 Antenna	72.0	14.8	7.4	7.40	3.70	4.86	9.73	1.31	1.49	23	13	16
NNH4-65B-R6 Antenna	72.0	19.6	7.8	9.80	3.90	3.67	9.23	1.25	1.47	29	14	18
OPA-65R-LCUU-H8 Antenna	92.7	14.4	7.0	9.27	4.51	6.44	13.24	1.38	1.61	30	17	20
NNH4-65C-R6 Antenna	96.0	19.6	7.8	13.07	5.20	4.90	12.31	1.31	1.58	40	19	25
RRUS-E2 B29 RRH	20.4	7.5	18.5	1.06	2.62	2.72	1.10	1.21	1.20	3	7	6
RRUS-E2 B29 RRH (Shielded)	20.4	5.6	18.5	0.80	2.62	3.63	1.10	1.25	1.20	2	7	6
RRUS-32 B30 RRH	27.2	7.0	12.1	1.32	2.29	3.89	2.25	1.26	1.20	4	7	6
RRUS-32 B30 RRH (Shielded)	27.2	5.3	12.1	0.99	2.29	5.18	2.25	1.32	1.20	3	7	6
B14 4478 RRH	18.1	8.3	13.4	1.04	1.68	2.18	1.35	1.20	1.20	3	5	4
B14 4478 RRH (Shielded)	18.1	6.2	13.4	0.78	1.68	2.91	1.35	1.22	1.20	2	5	4
RRUS-32 B66A RRH	27.2	7.0	12.1	1.32	2.29	3.89	2.25	1.26	1.20	4	7	6
RRUS-32 B66A RRH (Shielded)	27.2	5.3	12.1	0.99	2.29	5.18	2.25	1.32	1.20	3	7	6
4478 B5 RRH	18.1	13.4	8.3	1.68	1.04	1.35	2.18	1.20	1.20	5	3	3
4478 B5 RRH (Shielded)	18.1	10.1	8.3	1.26	1.04	1.80	2.18	1.20	1.20	4	3	3
RRUS-11 B12 RRH	19.7	7.2	17.0	0.99	2.33	2.74	1.16	1.21	1.20	3	7	6
RRUS-11 B12 RRH (Shielded)	19.7	5.4	17.0	0.74	2.33	3.65	1.16	1.25	1.20	2	7	6
RRUS-12 B2 RRH	20.4	7.5	18.5	1.06	2.62	2.72	1.10	1.21	1.20	3	7	6
RRUS-12 B2 RRH (Shielded)	20.4	5.6	18.5	0.80	2.62	3.63	1.10	1.25	1.20	2	7	6
A2 Modules	16.4	15.2	3.4	1.73	0.39	1.08	4.82	1.20	1.30	5	1	2
LGP21401 TMA	14.4	2.7	9.0	0.27	0.90	5.33	1.60	1.33	1.20	1	3	2

Date: 4/13/2021
Project Name: MANCHESTER CENTRAL
Project No.: CT5448
Designed By: KM Checked By: MSC

HUDSON Design Group LLC

WIND LOADS

Angle =	150	(deg)	Ice Thickness =	2.17	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)
800-10121 Antenna	54.5	10.3	5.9	3.90	2.23	5.29	9.24	1.32	1.47	248	158	225
OPA-65R-LCUU-H6 Antenna	72.0	14.8	7.4	7.40	3.70	4.86	9.73	1.31	1.49	464	265	414
NNH4-65B-R6 Antenna	72.0	19.6	7.8	9.80	3.90	3.67	9.23	1.25	1.47	589	276	511
OPA-65R-LCUU-H8 Antenna	92.7	14.4	7.0	9.27	4.51	6.44	13.24	1.38	1.61	612	348	546
NNH4-65C-R6 Antenna	96.0	19.6	7.8	13.07	5.20	4.90	12.31	1.31	1.58	820	394	713
RRUS-E2 B29 RRH	20.4	7.5	18.5	1.06	2.62	2.72	1.10	1.21	1.20	62	151	84
RRUS-E2 B29 RRH (Shielded)	20.4	3.8	18.5	0.53	2.62	5.44	1.10	1.33	1.20	34	151	63
RRUS-32 B30 RRH	27.2	7.0	12.1	1.32	2.29	3.89	2.25	1.26	1.20	80	132	93
RRUS-32 B30 RRH (Shielded)	27.2	3.5	12.1	0.66	2.29	7.77	2.25	1.43	1.20	45	132	67
B14 4478 RRH	18.1	8.3	13.4	1.04	1.68	2.18	1.35	1.20	1.20	60	97	69
B14 4478 RRH (Shielded)	18.1	4.2	13.4	0.52	1.68	4.36	1.35	1.28	1.20	32	97	48
RRUS-32 B66A RRH	27.2	7.0	12.1	1.32	2.29	3.89	2.25	1.26	1.20	80	132	93
RRUS-32 B66A RRH (Shielded)	27.2	3.5	12.1	0.66	2.29	7.77	2.25	1.43	1.20	45	132	67
4478 B5 RRH	18.1	13.4	8.3	1.68	1.04	1.35	2.18	1.20	1.20	97	60	88
4478 B5 RRH (Shielded)	18.1	6.7	8.3	0.84	1.04	2.70	2.18	1.21	1.20	49	60	52
RRUS-11 B12 RRH	19.7	7.2	17.0	0.99	2.33	2.74	1.16	1.21	1.20	57	134	76
RRUS-11 B12 RRH (Shielded)	19.7	3.6	17.0	0.49	2.33	5.47	1.16	1.33	1.20	32	134	57
RRUS-12 B2 RRH	20.4	7.5	18.5	1.06	2.62	2.72	1.10	1.21	1.20	62	151	84
RRUS-12 B2 RRH (Shielded)	20.4	3.8	18.5	0.53	2.62	5.44	1.10	1.33	1.20	34	151	63
A2 Modules	16.4	15.2	3.4	1.73	0.39	1.08	4.82	1.20	1.30	100	24	81
LGP21401 TMA	14.4	2.7	9.0	0.27	0.90	5.33	1.60	1.33	1.20	17	52	26

WIND LOADS WITH ICE:

800-10121 Antenna	58.8	14.6	10.2	5.98	4.19	4.02	5.75	1.27	1.34	50	37	47
OPA-65R-LCUU-H6 Antenna	76.3	19.1	11.7	10.15	6.23	3.99	6.50	1.27	1.38	85	56	78
NNH4-65B-R6 Antenna	76.3	23.9	12.1	12.69	6.44	3.19	6.29	1.23	1.37	103	58	92
OPA-65R-LCUU-H8 Antenna	97.0	18.7	11.3	12.63	7.64	5.18	8.56	1.32	1.45	110	73	101
NNH4-65C-R6 Antenna	100.3	23.9	12.1	16.68	8.46	4.19	8.26	1.28	1.44	140	80	125
RRUS-E2 B29 RRH	24.7	11.8	22.8	2.03	3.92	2.09	1.08	1.20	1.20	16	31	20
RRUS-E2 B29 RRH (Shielded)	24.7	5.9	22.8	1.02	3.92	4.18	1.08	1.27	1.20	9	31	14
RRUS-32 B30 RRH	31.5	11.3	16.4	2.48	3.60	2.78	1.92	1.21	1.20	20	28	22
RRUS-32 B30 RRH (Shielded)	31.5	5.7	16.4	1.24	3.60	5.56	1.92	1.34	1.20	11	28	15
B14 4478 RRH	22.4	12.6	17.7	1.97	2.77	1.78	1.26	1.20	1.20	16	22	17
B14 4478 RRH (Shielded)	22.4	6.3	17.7	0.99	2.77	3.55	1.26	1.25	1.20	8	22	12
RRUS-32 B66A RRH	31.5	11.3	16.4	2.48	3.60	2.78	1.92	1.21	1.20	20	28	22
RRUS-32 B66A RRH (Shielded)	31.5	5.7	16.4	1.24	3.60	5.56	1.92	1.34	1.20	11	28	15
4478 B5 RRH	22.4	17.7	12.6	2.77	1.97	1.26	1.78	1.20	1.20	22	16	20
4478 B5 RRH (Shielded)	22.4	8.9	12.6	1.38	1.97	2.53	1.78	1.20	1.20	11	16	12
RRUS-11 B12 RRH	24.0	11.5	21.3	1.93	3.56	2.08	1.13	1.20	1.20	15	28	18
RRUS-11 B12 RRH (Shielded)	24.0	5.8	21.3	0.96	3.56	4.17	1.13	1.27	1.20	8	28	13
RRUS-12 B2 RRH	24.7	11.8	22.8	2.03	3.92	2.09	1.08	1.20	1.20	16	31	20
RRUS-12 B2 RRH (Shielded)	24.7	5.9	22.8	1.02	3.92	4.18	1.08	1.27	1.20	9	31	14
A2 Modules	20.7	19.5	7.7	2.81	1.12	1.06	2.68	1.20	1.21	22	9	19
LGP21401 TMA	18.7	7.0	13.3	0.92	1.74	2.66	1.40	1.21	1.20	7	14	9

WIND LOADS AT 30 MPH:

800-10121 Antenna	54.5	10.3	5.9	3.90	2.23	5.29	9.24	1.32	1.47	12	8	11
OPA-65R-LCUU-H6 Antenna	72.0	14.8	7.4	7.40	3.70	4.86	9.73	1.31	1.49	23	13	20
NNH4-65B-R6 Antenna	72.0	19.6	7.8	9.80	3.90	3.67	9.23	1.25	1.47	29	14	25
OPA-65R-LCUU-H8 Antenna	92.7	14.4	7.0	9.27	4.51	6.44	13.24	1.38	1.61	30	17	27
NNH4-65C-R6 Antenna	96.0	19.6	7.8	13.07	5.20	4.90	12.31	1.31	1.58	40	19	35
RRUS-E2 B29 RRH	20.4	7.5	18.5	1.06	2.62	2.72	1.10	1.21	1.20	3	7	4
RRUS-E2 B29 RRH (Shielded)	20.4	3.8	18.5	0.53	2.62	5.44	1.10	1.33	1.20	2	7	3
RRUS-32 B30 RRH	27.2	7.0	12.1	1.32	2.29	3.89	2.25	1.26	1.20	4	7	5
RRUS-32 B30 RRH (Shielded)	27.2	3.5	12.1	0.66	2.29	7.77	2.25	1.43	1.20	2	7	3
B14 4478 RRH	18.1	8.3	13.4	1.04	1.68	2.18	1.35	1.20	1.20	3	5	3
B14 4478 RRH (Shielded)	18.1	4.2	13.4	0.52	1.68	4.36	1.35	1.28	1.20	2	5	2
RRUS-32 B66A RRH	27.2	7.0	12.1	1.32	2.29	3.89	2.25	1.26	1.20	4	7	5
RRUS-32 B66A RRH (Shielded)	27.2	3.5	12.1	0.66	2.29	7.77	2.25	1.43	1.20	2	7	3
4478 B5 RRH	18.1	13.4	8.3	1.68	1.04	1.35	2.18	1.20	1.20	5	3	4
4478 B5 RRH (Shielded)	18.1	6.7	8.3	0.84	1.04	2.70	2.18	1.21	1.20	2	3	3
RRUS-11 B12 RRH	19.7	7.2	17.0	0.99	2.33	2.74	1.16	1.21	1.20	3	7	4
RRUS-11 B12 RRH (Shielded)	19.7	3.6	17.0	0.49	2.33	5.47	1.16	1.33	1.20	2	7	3
RRUS-12 B2 RRH	20.4	7.5	18.5	1.06	2.62	2.72	1.10	1.21	1.20	3	7	4
RRUS-12 B2 RRH (Shielded)	20.4	3.8	18.5	0.53	2.62	5.44	1.10	1.33	1.20	2	7	3
A2 Modules	16.4	15.2	3.4	1.73	0.39	1.08	4.82	1.20	1.30	5	1	4
LGP21401 TMA	14.4	2.7	9.0	0.27	0.90	5.33	1.60	1.33	1.20	1	3	1

Date: 4/13/2021
Project Name: MANCHESTER CENTRAL
Project No.: CT5448
Designed By: KM **Checked By:** MSC

HUDSON Design Group LLC

ICE WEIGHT CALCULATIONS

Thickness of ice: 2.17 in.
Density of ice: 56 pcf

800-10121 Antenna

Weight of ice based on total radial SF area:

Height (in):	54.5	
Width (in):	10.3	
Depth (in):	5.9	
Total weight of ice on object:		169 lbs
Weight of object:	47.0 lbs	
Combined weight of ice and object:		216 lbs

OPA-65R-LCUU-H6 Antenna

Weight of ice based on total radial SF area:

Height (in):	72.0	
Width (in):	14.8	
Depth (in):	7.4	
Total weight of ice on object:		298 lbs
Weight of object:	73.0 lbs	
Combined weight of ice and object:		371 lbs

NNH4-65B-R6 Antenna

Weight of ice based on total radial SF area:

Height (in):	72.0	
Width (in):	19.6	
Depth (in):	7.8	
Total weight of ice on object:		370 lbs
Weight of object:	82.0 lbs	
Combined weight of ice and object:		452 lbs

OPA-65R-LCUU-H8 Antenna

Weight of ice based on total radial SF area:

Height (in):	92.7	
Width (in):	14.4	
Depth (in):	7.0	
Total weight of ice on object:		372 lbs
Weight of object:	88.0 lbs	
Combined weight of ice and object:		460 lbs

NNH4-65C-R6 Antenna

Weight of ice based on total radial SF area:

Height (in):	96.0	
Width (in):	19.6	
Depth (in):	7.8	
Total weight of ice on object:		493 lbs
Weight of object:	102.0 lbs	
Combined weight of ice and object:		595 lbs

RRUS-E2 B29 RRH

Weight of ice based on total radial SF area:

Height (in):	20.4	
Width (in):	18.5	
Depth (in):	7.5	
Total weight of ice on object:		100 lbs
Weight of object:	53.0 lbs	
Combined weight of ice and object:		153 lbs

RRUS-32 B30 RRH

Weight of ice based on total radial SF area:

Height (in):	27.2	
Width (in):	12.1	
Depth (in):	7.0	
Total weight of ice on object:		97 lbs
Weight of object:	60.0 lbs	
Combined weight of ice and object:		157 lbs

4478 B5 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:		72 lbs
Weight of object:	60.0 lbs	
Combined weight of ice and object:		132 lbs

RRUS-12 B2 RRH

Weight of ice based on total radial SF area:

Height (in):	20.4	
Width (in):	18.5	
Depth (in):	7.5	
Total weight of ice on object:		100 lbs
Weight of object:	58.0 lbs	
Combined weight of ice and object:		158 lbs

B14 4478 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:		72 lbs
Weight of object:	60.0 lbs	
Combined weight of ice and object:		132 lbs

RRUS-32 B66A RRH

Weight of ice based on total radial SF area:

Height (in):	27.2	
Width (in):	12.1	
Depth (in):	7.0	
Total weight of ice on object:		97 lbs
Weight of object:	60.0 lbs	
Combined weight of ice and object:		157 lbs

RRUS-11 B12 RRH

Weight of ice based on total radial SF area:

Height (in):	19.7	
Width (in):	17.0	
Depth (in):	7.2	
Total weight of ice on object:		90 lbs
Weight of object:	51.0 lbs	
Combined weight of ice and object:		141 lbs

Date: 4/13/2021
Project Name: MANCHESTER CENTRAL
Project No.: CT5448
Designed By: KM **Checked By:** MSC

HUDSON Design Group LLC

A2 Modules

Weight of ice based on total radial SF area:

Height (in):	16.4	
Width (in):	15.2	
Depth (in):	3.4	
Total weight of ice on object:		64 lbs
Weight of object:	22.0 lbs	
Combined weight of ice and object:		86 lbs

LGP21401 TMA

Weight of ice based on total radial SF area:

Height (in):	14.4	
Width (in):	2.7	
Depth (in):	9.0	
Total weight of ice on object:		37 lbs
Weight of object:	19.0 lbs	
Combined weight of ice and object:		56 lbs

Squid Surge Arrestor

Weight of ice based on total radial SF area:

Depth (in):	24.0	
Diameter(in):	9.7	
Total weight of ice on object:		63 lbs
Weight of object:	33 lbs	
Combined weight of ice and object:		96 lbs

PL 4x1/4

Weight of ice based on total radial SF area:

Height (in):	4	
Width (in):	0.25	
Per foot weight of ice on object:		16 plf

PL 6x3/8

Weight of ice based on total radial SF area:

Height (in):	6	
Width (in):	0.375	
Per foot weight of ice on object:		22 plf

C 3-3/8x3/16

Weight of ice based on total radial SF area:

Height (in):	3.375	
Width (in):	0.1875	
Per foot weight of ice on object:		15 plf

L 3x3 Angles

Weight of ice based on total radial SF area:

Height (in):	3	
Width (in):	3	
Per foot weight of ice on object:		17 plf

L 2x2 Angles

Weight of ice based on total radial SF area:

Height (in):	2	
Width (in):	2	
Per foot weight of ice on object:		13 plf

3-1/2" Pipe

Per foot weight of ice:

diameter (in):	4	
Per foot weight of ice on object:		16 plf

2-1/2" pipe

Per foot weight of ice:

diameter (in):	2.88	
Per foot weight of ice on object:		13 plf

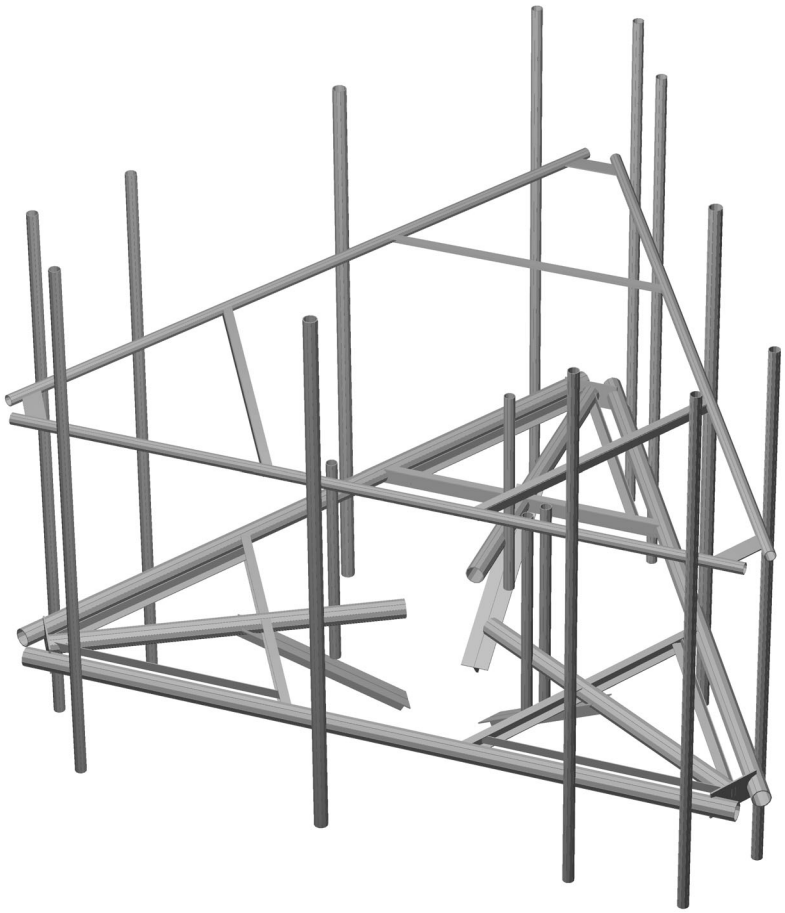
2" pipe

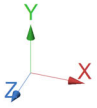
Per foot weight of ice:

diameter (in):	2.38	
Per foot weight of ice on object:		12 plf

HUDSON
Design Group LLC

Mount Calculations
(Existing Conditions)

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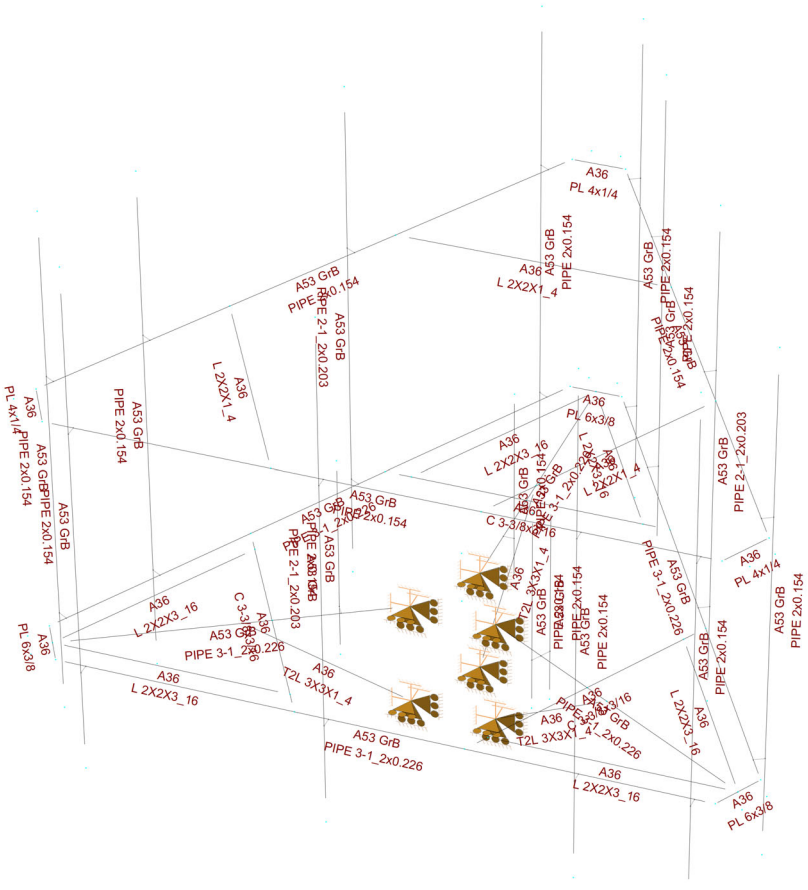
X
Z


A36
PL 4x1/4
A53 GrB
PIPE 2x0.154
A36
L 2X2X1_4
A53 GrB
PIPE 2-1_2x0.203
A36
PL 6x3/8
A36
L 2X2X3_16
C 3-3/8x2-1/2x0.226
A53 GrB
PIPE 3-1_2x0.226
T2L 3X3X1_4
A36
L 2X2X3_16
A53 GrB
PIPE 3-1_2x0.226
A36
L 2X2X3_16
A36
PL 6x3/8
A53 GrB
PIPE 2x0.154
A36
PL 4x1/4
A53 GrB
PIPE 2-1_2x0.203
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PIPE 2x0.154
A36
PL 6x3/8
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PL 4x1/4
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PIPE 2x0.154
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L 2X2X1_4
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PIPE 2x0.154
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PIPE 2x0.154
A36
L 2X2X1_4
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PIPE 2-1_2x0.203
A53 GrB
PIPE 2x0.154
A36
L 2X2X3_16
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PIPE 2x0.154
A36
L 2X2X3_16
A53 GrB
PIPE 2x0.154
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PL 4x1/4
A53 GrB
PIPE 2x0.154
A53 GrB
PIPE 2x0.154
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L 2X2X3_16
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PIPE 2x0.154
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L 2X2X3_16
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PIPE 2x0.154
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PL 6x3/8
A53 GrB
PIPE 2x0.154
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PL 4x1/4
A53 GrB
PIPE 2x0.154
A53 GrB
PIPE 2-1_2x0.203
A53 GrB
PIPE 2x0.154
A36
L 2X2X3_16
A53 GrB
PIPE 3-1_2x0.226
T2L 3X3X1_4
A36
L 2X2X3_16
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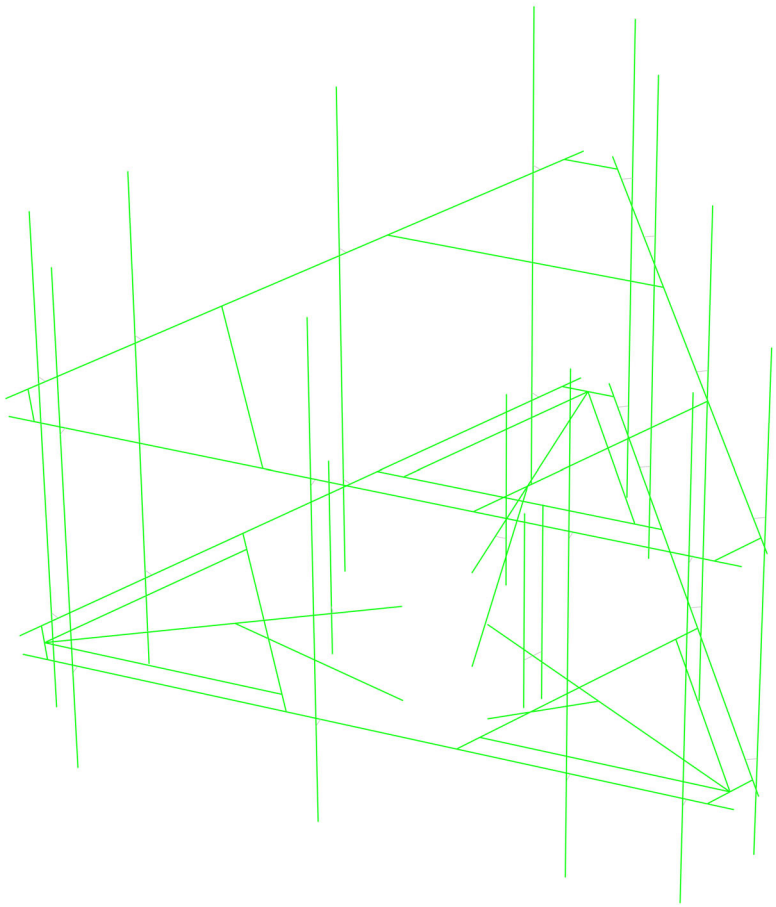
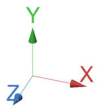
PIPE 3-1_2x0.226
A36
L 2X2X3_16
A36
PL 6x3/8
Y
X
Z




Y
X
Z

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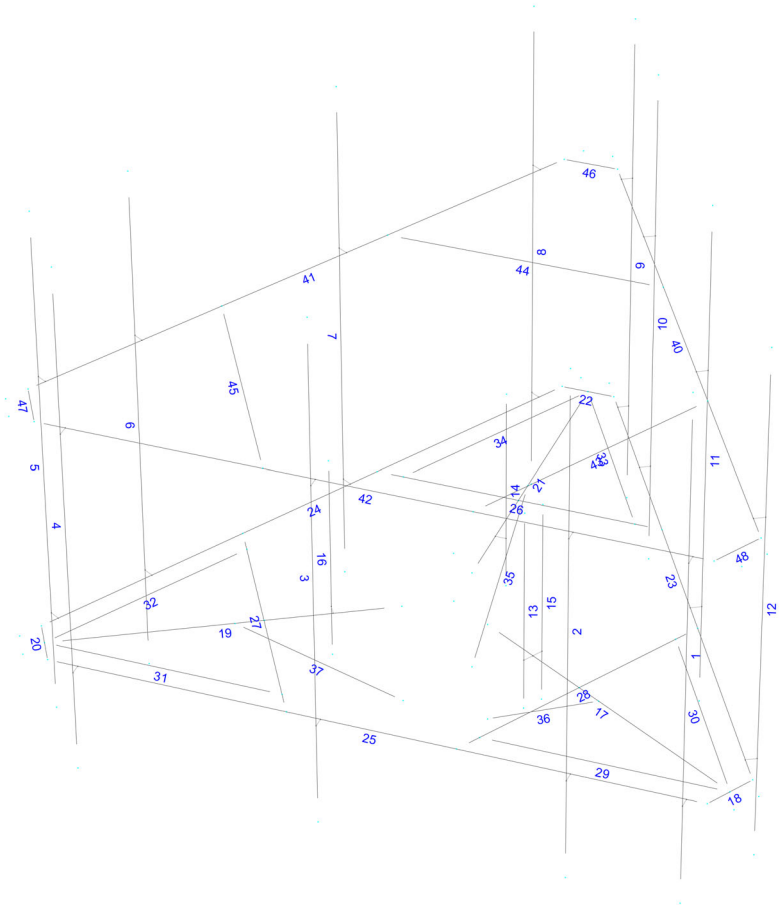

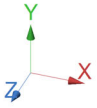

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Load data

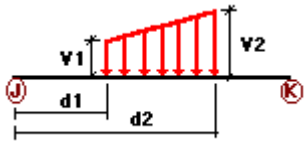
GLOSSARY

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	250 lb Live Load Antenna 1	No	LL
LLa2	250 lb Live Load Antenna 2	No	LL
LLa3	250 lb Live Load Antenna 3	No	LL
LLa4	250 lb Live Load Antenna 4	No	LL

Distributed force on members

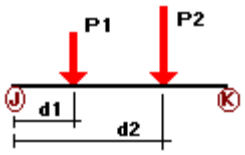


Condition	Member	Dir1	Val1 [Kip/ft]	Val2 [Kip/ft]	Dist1 [ft]	%	Dist2 [ft]	%
DL	26	y	-0.01	-0.01	10.00	Yes	90.00	Yes
	27	y	-0.01	-0.01	10.00	Yes	90.00	Yes
	28	y	-0.01	-0.01	10.00	Yes	90.00	Yes
	29	y	-0.01	-0.01	0.00	No	100.00	Yes
	30	y	-0.01	-0.01	0.00	No	100.00	Yes
	31	y	-0.01	-0.01	0.00	No	100.00	Yes
	32	y	-0.01	-0.01	0.00	No	100.00	Yes
	33	y	-0.01	-0.01	0.00	No	100.00	Yes
	34	y	-0.01	-0.01	0.00	No	100.00	Yes
W0	17	z	-0.019	-0.019	0.00	No	100.00	Yes
	18	z	-0.002	-0.002	0.00	No	100.00	Yes
	19	z	-0.019	-0.019	0.00	No	100.00	Yes
	20	z	-0.002	-0.002	0.00	No	100.00	Yes
	22	z	-0.002	-0.002	0.00	No	100.00	Yes

	23	z	-0.019	-0.019	0.00	No	100.00	Yes
	24	z	-0.019	-0.019	0.00	No	100.00	Yes
	25	z	-0.019	-0.019	0.00	No	100.00	Yes
	26	z	-0.027	-0.027	0.00	No	100.00	Yes
	27	z	-0.027	-0.027	0.00	No	100.00	Yes
	28	z	-0.027	-0.027	0.00	No	100.00	Yes
	29	z	-0.016	-0.016	0.00	No	100.00	Yes
	30	z	-0.016	-0.016	0.00	No	100.00	Yes
	31	z	-0.016	-0.016	0.00	No	100.00	Yes
	32	z	-0.016	-0.016	0.00	No	100.00	Yes
	33	z	-0.016	-0.016	0.00	No	100.00	Yes
	34	z	-0.016	-0.016	0.00	No	100.00	Yes
	36	z	-0.024	-0.024	0.00	No	100.00	Yes
	37	z	-0.024	-0.024	0.00	No	100.00	Yes
	40	z	-0.011	-0.011	0.00	No	100.00	Yes
	41	z	-0.011	-0.011	0.00	No	100.00	Yes
	42	z	-0.011	-0.011	0.00	No	100.00	Yes
	43	z	-0.016	-0.016	0.00	No	100.00	Yes
	44	z	-0.016	-0.016	0.00	No	100.00	Yes
	45	z	-0.016	-0.016	0.00	No	100.00	Yes
	46	z	-0.001	-0.001	0.00	No	100.00	Yes
	47	z	-0.001	-0.001	0.00	No	100.00	Yes
	48	z	-0.001	-0.001	0.00	No	100.00	Yes
	16	z	-0.011	-0.011	0.00	No	100.00	Yes
	13	z	-0.011	-0.011	0.00	No	100.00	Yes
	14	z	-0.011	-0.011	0.00	No	100.00	Yes
	15	z	-0.011	-0.011	0.00	No	100.00	Yes
	5	z	-0.011	-0.011	0.00	No	100.00	Yes
	6	z	-0.011	-0.011	0.00	No	100.00	Yes
	7	z	-0.014	-0.014	0.00	No	100.00	Yes
	8	z	-0.011	-0.011	0.00	No	100.00	Yes
	9	z	-0.011	-0.011	0.00	No	100.00	Yes
	10	z	-0.011	-0.011	0.00	No	100.00	Yes
	11	z	-0.014	-0.014	0.00	No	100.00	Yes
	12	z	-0.011	-0.011	0.00	No	100.00	Yes
W30	17	x	-0.019	-0.019	0.00	No	100.00	Yes
	18	x	-0.002	-0.002	0.00	No	100.00	Yes
	19	x	-0.019	-0.019	0.00	No	100.00	Yes
	20	x	-0.002	-0.002	0.00	No	100.00	Yes
	21	x	-0.019	-0.019	0.00	No	100.00	Yes
	22	x	-0.002	-0.002	0.00	No	100.00	Yes
	23	x	-0.019	-0.019	0.00	No	100.00	Yes
	24	x	-0.019	-0.019	0.00	No	100.00	Yes
	27	x	-0.027	-0.027	0.00	No	100.00	Yes
	28	x	-0.027	-0.027	0.00	No	100.00	Yes
	30	x	-0.016	-0.016	0.00	No	100.00	Yes
	32	x	-0.016	-0.016	0.00	No	100.00	Yes
	33	x	-0.016	-0.016	0.00	No	100.00	Yes
	34	x	-0.016	-0.016	0.00	No	100.00	Yes
	35	x	-0.024	-0.024	0.00	No	100.00	Yes
	36	x	-0.024	-0.024	0.00	No	100.00	Yes
	37	x	-0.024	-0.024	0.00	No	100.00	Yes
	40	x	-0.011	-0.011	0.00	No	100.00	Yes
	41	x	-0.011	-0.011	0.00	No	100.00	Yes
	43	x	-0.016	-0.016	0.00	No	100.00	Yes
	45	x	-0.016	-0.016	0.00	No	100.00	Yes
	46	x	-0.001	-0.001	0.00	No	100.00	Yes
	47	x	-0.001	-0.001	0.00	No	100.00	Yes
	48	x	-0.001	-0.001	0.00	No	100.00	Yes
	16	x	-0.011	-0.011	0.00	No	100.00	Yes

	13	x	-0.011	-0.011	0.00	No	100.00	Yes
	14	x	-0.011	-0.011	0.00	No	100.00	Yes
	15	x	-0.011	-0.011	0.00	No	100.00	Yes
	1	x	-0.011	-0.011	0.00	No	100.00	Yes
	2	x	-0.011	-0.011	0.00	No	100.00	Yes
	3	x	-0.014	-0.014	0.00	No	100.00	Yes
	4	x	-0.011	-0.011	0.00	No	100.00	Yes
	5	x	-0.011	-0.011	0.00	No	100.00	Yes
	6	x	-0.011	-0.011	0.00	No	100.00	Yes
	7	x	-0.014	-0.014	0.00	No	100.00	Yes
	8	x	-0.011	-0.011	0.00	No	100.00	Yes
Di	17	y	-0.016	-0.016	0.00	No	100.00	Yes
	18	y	-0.022	-0.022	0.00	No	100.00	Yes
	19	y	-0.016	-0.016	0.00	No	100.00	Yes
	20	y	-0.022	-0.022	0.00	No	100.00	Yes
	21	y	-0.016	-0.016	0.00	No	100.00	Yes
	22	y	-0.022	-0.022	0.00	No	100.00	Yes
	23	y	-0.016	-0.016	0.00	No	100.00	Yes
	24	y	-0.016	-0.016	0.00	No	100.00	Yes
	25	y	-0.016	-0.016	0.00	No	100.00	Yes
	26	y	-0.015	-0.015	0.00	No	100.00	Yes
	27	y	-0.015	-0.015	0.00	No	100.00	Yes
	28	y	-0.015	-0.015	0.00	No	100.00	Yes
	29	y	-0.013	-0.013	0.00	No	100.00	Yes
	30	y	-0.013	-0.013	0.00	No	100.00	Yes
	31	y	-0.013	-0.013	0.00	No	100.00	Yes
	32	y	-0.013	-0.013	0.00	No	100.00	Yes
	33	y	-0.013	-0.013	0.00	No	100.00	Yes
	34	y	-0.013	-0.013	0.00	No	100.00	Yes
	35	y	-0.017	-0.017	0.00	No	100.00	Yes
	36	y	-0.017	-0.017	0.00	No	100.00	Yes
	37	y	-0.017	-0.017	0.00	No	100.00	Yes
	40	y	-0.012	-0.012	0.00	No	100.00	Yes
	41	y	-0.012	-0.012	0.00	No	100.00	Yes
	42	y	-0.012	-0.012	0.00	No	100.00	Yes
	43	y	-0.013	-0.013	0.00	No	100.00	Yes
	44	y	-0.013	-0.013	0.00	No	100.00	Yes
	45	y	-0.013	-0.013	0.00	No	100.00	Yes
	46	y	-0.016	-0.016	0.00	No	100.00	Yes
	47	y	-0.016	-0.016	0.00	No	100.00	Yes
	48	y	-0.016	-0.016	0.00	No	100.00	Yes
	16	y	-0.012	-0.012	0.00	No	100.00	Yes
	13	y	-0.012	-0.012	0.00	No	100.00	Yes
	14	y	-0.012	-0.012	0.00	No	100.00	Yes
	15	y	-0.012	-0.012	0.00	No	100.00	Yes
	1	y	-0.012	-0.012	0.00	No	100.00	Yes
	2	y	-0.012	-0.012	0.00	No	100.00	Yes
	3	y	-0.013	-0.013	0.00	No	100.00	Yes
	4	y	-0.012	-0.012	0.00	No	100.00	Yes
	5	y	-0.012	-0.012	0.00	No	100.00	Yes
	6	y	-0.012	-0.012	0.00	No	100.00	Yes
	7	y	-0.013	-0.013	0.00	No	100.00	Yes
	8	y	-0.012	-0.012	0.00	No	100.00	Yes
	9	y	-0.012	-0.012	0.00	No	100.00	Yes
	10	y	-0.012	-0.012	0.00	No	100.00	Yes
	11	y	-0.013	-0.013	0.00	No	100.00	Yes
	12	y	-0.012	-0.012	0.00	No	100.00	Yes

Concentrated forces on members



Condition	Member	Dir1	Value1 [Kip]	Dist1 [ft]	%
DL	16	y	-0.033	2.00	No
	13	y	-0.033	2.00	No
	14	y	-0.033	2.00	No
	15	y	-0.033	2.00	No
	1	y	-0.024	3.00	No
		y	-0.024	6.50	No
		y	-0.038	5.00	No
	2	y	-0.044	1.50	No
		y	-0.044	8.50	No
		y	-0.053	5.00	No
		y	-0.06	9.00	No
	3	y	-0.051	1.50	No
		y	-0.051	8.50	No
		y	-0.06	5.00	No
		y	-0.06	5.00	No
	4	y	-0.044	1.50	No
		y	-0.044	8.50	No
		y	-0.06	4.00	No
		y	-0.051	9.00	No
		y	-0.06	9.00	No
	5	y	-0.024	3.00	No
		y	-0.024	6.50	No
		y	-0.038	5.00	No
	6	y	-0.037	2.50	No
		y	-0.037	7.50	No
		y	-0.053	5.00	No
		y	-0.06	9.00	No
	7	y	-0.041	2.50	No
		y	-0.041	7.50	No
		y	-0.06	5.00	No
		y	-0.06	5.00	No
	8	y	-0.037	2.50	No
		y	-0.037	7.50	No
		y	-0.06	4.00	No
		y	-0.051	9.00	No
		y	-0.06	9.00	No
	9	y	-0.024	3.00	No
		y	-0.024	6.50	No
		y	-0.038	5.00	No
	10	y	-0.044	1.50	No
		y	-0.044	8.50	No
		y	-0.053	5.00	No
		y	-0.06	9.00	No
	11	y	-0.051	1.50	No
		y	-0.051	8.50	No
		y	-0.06	5.00	No
		y	-0.06	5.00	No
	12	y	-0.044	1.50	No
		y	-0.044	8.50	No
		y	-0.06	4.00	No
		y	-0.051	9.00	No
		y	-0.06	9.00	No
W0	16	z	-0.054	2.00	No
	13	z	-0.054	2.00	No

	14	z	-0.054	2.00	No
	15	z	-0.054	2.00	No
	1	z	-0.124	3.00	No
		z	-0.124	6.50	No
	2	z	-0.306	1.50	No
		z	-0.306	8.50	No
		z	-0.034	5.00	No
		z	-0.045	9.00	No
	3	z	-0.41	1.50	No
		z	-0.41	8.50	No
		z	-0.032	5.00	No
		z	-0.045	5.00	No
	4	z	-0.306	1.50	No
		z	-0.306	8.50	No
		z	-0.03	9.00	No
		z	-0.031	9.00	No
	5	z	-0.091	3.00	No
		z	-0.091	6.50	No
		z	-0.043	5.00	No
	6	z	-0.158	2.50	No
		z	-0.158	7.50	No
		z	-0.125	5.00	No
		z	-0.114	9.00	No
	7	z	-0.177	2.50	No
		z	-0.177	7.50	No
		z	-0.114	5.00	No
	8	z	-0.158	2.50	No
		z	-0.158	7.50	No
		z	-0.063	4.00	No
		z	-0.125	9.00	No
	9	z	-0.091	3.00	No
		z	-0.091	6.50	No
		z	-0.043	5.00	No
	10	z	-0.207	1.50	No
		z	-0.207	8.50	No
		z	-0.125	5.00	No
		z	-0.114	9.00	No
	11	z	-0.25	1.50	No
		z	-0.25	8.50	No
		z	-0.114	5.00	No
	12	z	-0.207	1.50	No
		z	-0.207	8.50	No
		z	-0.063	4.00	No
		z	-0.125	9.00	No
W30	16	x	-0.054	2.00	No
	13	x	-0.054	2.00	No
	14	x	-0.054	2.00	No
	15	x	-0.054	2.00	No
	1	x	-0.079	3.00	No
		x	-0.079	6.50	No
		x	-0.052	5.00	No
	2	x	-0.174	1.50	No
		x	-0.174	8.50	No
		x	-0.151	5.00	No
		x	-0.132	9.00	No
	3	x	-0.197	1.50	No
		x	-0.197	8.50	No
		x	-0.132	5.00	No
	4	x	-0.174	1.50	No
		x	-0.174	8.50	No

		x	-0.06	4.00	No
		x	-0.151	6.00	No
	5	x	-0.113	3.00	No
		x	-0.113	6.50	No
		x	-0.026	5.00	No
	6	x	-0.207	2.50	No
		x	-0.207	7.50	No
		x	-0.063	5.00	No
		x	-0.067	9.00	No
	7	x	-0.256	2.50	No
		x	-0.256	7.50	No
		x	-0.067	5.00	No
	8	x	-0.207	2.50	No
		x	-0.207	7.50	No
		x	-0.052	4.00	No
		x	-0.063	9.00	No
	9	x	-0.113	3.00	No
		x	-0.113	6.50	No
		x	-0.026	5.00	No
	10	x	-0.273	1.50	No
		x	-0.273	8.50	No
		x	-0.063	5.00	No
		x	-0.067	9.00	No
	11	x	-0.357	1.50	No
		x	-0.357	8.50	No
		x	-0.067	5.00	No
	12	x	-0.273	1.50	No
		x	-0.273	8.50	No
		x	-0.052	4.00	No
		x	-0.063	9.00	No
Di	16	y	-0.063	2.00	No
	13	y	-0.063	2.00	No
	14	y	-0.063	2.00	No
	15	y	-0.063	2.00	No
	1	y	-0.085	3.00	No
		y	-0.085	6.50	No
		y	-0.074	5.00	No
	2	y	-0.186	1.50	No
		y	-0.186	8.50	No
		y	-0.10	5.00	No
		y	-0.097	9.00	No
	3	y	-0.247	1.50	No
		y	-0.247	8.50	No
		y	-0.072	5.00	No
		y	-0.097	5.00	No
	4	y	-0.186	1.50	No
		y	-0.186	8.50	No
		y	-0.072	4.00	No
		y	-0.09	9.00	No
		y	-0.10	9.00	No
	5	y	-0.085	3.00	No
		y	-0.085	6.50	No
		y	-0.074	5.00	No
	6	y	-0.149	2.50	No
		y	-0.149	7.50	No
		y	-0.10	5.00	No
		y	-0.097	9.00	No
	7	y	-0.185	2.50	No
		y	-0.185	7.50	No
		y	-0.072	5.00	No

		y	-0.097	5.00	No
	8	y	-0.149	2.50	No
		y	-0.149	7.50	No
		y	-0.072	4.00	No
		y	-0.09	9.00	No
		y	-0.10	9.00	No
	9	y	-0.085	3.00	No
		y	-0.085	6.50	No
		y	-0.074	5.00	No
	10	y	-0.186	1.50	No
		y	-0.186	8.50	No
		y	-0.10	5.00	No
		y	-0.097	9.00	No
	11	y	-0.247	1.50	No
		y	-0.247	8.50	No
		y	-0.072	5.00	No
		y	-0.097	5.00	No
	12	y	-0.186	1.50	No
		y	-0.186	8.50	No
		y	-0.072	4.00	No
		y	-0.09	9.00	No
		y	-0.10	9.00	No
Wi0	16	z	-0.013	2.00	No
	13	z	-0.013	2.00	No
	14	z	-0.013	2.00	No
	15	z	-0.013	2.00	No
	1	z	-0.026	3.00	No
		z	-0.026	6.50	No
	2	z	-0.057	1.50	No
		z	-0.057	8.50	No
		z	-0.012	5.00	No
		z	-0.016	9.00	No
	3	z	-0.072	1.50	No
		z	-0.072	8.50	No
		z	-0.011	5.00	No
		z	-0.016	5.00	No
	4	z	-0.057	1.50	No
		z	-0.057	8.50	No
		z	-0.011	9.00	No
		z	-0.011	9.00	No
	5	z	-0.02	3.00	No
		z	-0.02	6.50	No
		z	-0.012	5.00	No
	6	z	-0.032	2.50	No
		z	-0.032	7.50	No
		z	-0.026	5.00	No
		z	-0.025	9.00	No
	7	z	-0.035	2.50	No
		z	-0.035	7.50	No
		z	-0.025	5.00	No
	8	z	-0.032	2.50	No
		z	-0.032	7.50	No
		z	-0.016	4.00	No
		z	-0.026	9.00	No
	9	z	-0.02	3.00	No
		z	-0.02	6.50	No
		z	-0.012	5.00	No
	10	z	-0.041	1.50	No
		z	-0.041	8.50	No
		z	-0.026	5.00	No

		z	-0.025	9.00	No
	11	z	-0.048	1.50	No
		z	-0.048	8.50	No
		z	-0.025	5.00	No
	12	z	-0.041	1.50	No
		z	-0.041	8.50	No
		z	-0.016	4.00	No
		z	-0.026	9.00	No
Wi30	16	x	-0.013	2.00	No
	13	x	-0.013	2.00	No
	14	x	-0.013	2.00	No
	15	x	-0.013	2.00	No
	1	x	-0.019	3.00	No
		x	-0.019	6.50	No
		x	-0.014	5.00	No
	2	x	-0.037	1.50	No
		x	-0.037	8.50	No
		x	-0.031	5.00	No
		x	-0.028	9.00	No
	3	x	-0.04	1.50	No
		x	-0.04	8.50	No
		x	-0.028	5.00	No
	4	x	-0.037	1.50	No
		x	-0.037	8.50	No
		x	-0.016	4.00	No
		x	-0.031	9.00	No
	5	x	-0.024	3.00	No
		x	-0.024	6.50	No
		x	-0.009	5.00	No
	6	x	-0.039	2.50	No
		x	-0.039	7.50	No
		x	-0.015	5.00	No
	7	x	-0.046	2.50	No
		x	-0.046	7.50	No
		x	-0.015	5.00	No
	8	x	-0.039	2.50	No
		x	-0.039	7.50	No
		x	-0.012	4.00	No
		x	-0.014	6.00	No
	9	x	-0.024	3.00	No
		x	-0.024	6.50	No
		x	-0.009	5.00	No
	10	x	-0.051	1.50	No
		x	-0.051	8.50	No
		x	-0.015	5.00	No
	11	x	-0.063	1.50	No
		x	-0.063	8.50	No
		x	-0.015	5.00	No
	12	x	-0.051	1.50	No
		x	-0.051	8.50	No
		x	-0.012	4.00	No
		x	-0.014	9.00	No
WL0	16	z	-0.003	2.00	No
	13	z	-0.003	2.00	No
	14	z	-0.003	2.00	No
	15	z	-0.003	2.00	No
	1	z	-0.006	3.00	No
		z	-0.006	6.50	No
	2	z	-0.015	1.50	No
		z	-0.015	8.50	No

		z	-0.002	5.00	No
		z	-0.002	9.00	No
	3	z	-0.02	1.50	No
		z	-0.02	8.50	No
		z	-0.002	5.00	No
		z	-0.002	5.00	No
	4	z	-0.015	1.50	No
		z	-0.015	8.50	No
		z	-0.001	6.00	No
		z	-0.002	9.00	No
	5	z	-0.005	3.00	No
		z	-0.005	6.50	No
		z	-0.002	5.00	No
	6	z	-0.008	2.50	No
		z	-0.008	7.50	No
		z	-0.006	5.00	No
		z	-0.006	9.00	No
	7	z	-0.009	2.50	No
		z	-0.009	7.50	No
		z	-0.006	5.00	No
	8	z	-0.008	2.50	No
		z	-0.008	7.50	No
		z	-0.003	4.00	No
		z	-0.006	9.00	No
	9	z	-0.005	3.00	No
		z	-0.005	6.50	No
		z	-0.002	5.00	No
	10	z	-0.01	1.50	No
		z	-0.01	8.50	No
		z	-0.006	5.00	No
		z	-0.006	9.00	No
	11	z	-0.013	1.50	No
		z	-0.013	8.50	No
		z	-0.006	5.00	No
	12	z	-0.01	1.50	No
		z	-0.01	8.50	No
		z	-0.003	4.00	No
		z	-0.006	9.00	No
WL30	16	x	-0.003	2.00	No
	13	x	-0.003	2.00	No
	14	x	-0.003	2.00	No
	15	x	-0.003	2.00	No
	1	x	-0.004	3.00	No
		x	-0.004	6.50	No
		x	-0.003	5.00	No
	2	x	-0.009	1.50	No
		x	-0.009	8.50	No
		x	-0.007	5.00	No
	3	x	-0.01	1.50	No
		x	-0.01	8.50	No
		x	-0.007	5.00	No
	4	x	-0.009	1.50	No
		x	-0.009	8.50	No
		x	-0.003	4.00	No
		x	-0.007	9.00	No
	5	x	-0.006	3.00	No
		x	-0.006	6.50	No
		x	-0.001	5.00	No
	6	x	-0.01	2.50	No
		x	-0.01	7.50	No

		x	-0.003	5.00	No
	7	x	-0.013	2.50	No
		x	-0.013	7.50	No
		x	-0.003	5.00	No
	8	x	-0.01	2.50	No
		x	-0.01	7.50	No
		x	-0.003	4.00	No
		x	-0.003	9.00	No
	9	x	-0.006	3.00	No
		x	-0.006	6.50	No
		x	-0.001	5.00	No
	10	x	-0.014	1.50	No
		x	-0.014	8.50	No
		x	-0.003	5.00	No
	11	x	-0.018	1.50	No
		x	-0.018	8.50	No
		x	-0.003	5.00	No
	12	x	-0.014	1.50	No
		x	-0.014	8.50	No
		x	-0.003	4.00	No
		x	-0.003	9.00	No
LL1	25	y	-0.25	50.00	Yes
LL2	25	y	-0.25	0.00	Yes
LLa1	1	y	-0.25	50.00	Yes
LLa2	2	y	-0.25	50.00	Yes
LLa3	3	y	-0.25	50.00	Yes
LLa4	4	y	-0.25	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	250 lb Live Load Antenna 1	No	0.00	0.00	0.00
LLa2	250 lb Live Load Antenna 2	No	0.00	0.00	0.00
LLa3	250 lb Live Load Antenna 3	No	0.00	0.00	0.00
LLa4	250 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

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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
LC15=1.2DL+1.5LL1
LC16=1.2DL+1.5LL2
LC17=1.2DL+WL0+1.5LLa1
LC18=1.2DL+WL30+1.5LLa1
LC19=1.2DL-WL0+1.5LLa1
LC20=1.2DL-WL30+1.5LLa1
LC21=1.2DL+WL0+1.5LLa2
LC22=1.2DL+WL30+1.5LLa2
LC23=1.2DL-WL0+1.5LLa2
LC24=1.2DL-WL30+1.5LLa2
LC25=1.2DL+WL0+1.5LLa3
LC26=1.2DL+WL30+1.5LLa3
LC27=1.2DL-WL0+1.5LLa3
LC28=1.2DL-WL30+1.5LLa3
LC29=1.2DL+WL0+1.5LLa4
LC30=1.2DL+WL30+1.5LLa4
LC31=1.2DL-WL0+1.5LLa4
LC32=1.2DL-WL30+1.5LLa4

Description	Section	Member	Ctrl Eq.	Ratio	Status	Reference
	C 3-3/8x3/16	**26**	LC9 at 50.00%	0.66	OK	
		27	LC10 at 50.00%	0.68	OK	
		28	LC12 at 50.00%	**0.72**	**OK**	
	L 2X2X1_4	**43**	LC1 at 100.00%	**0.82**	**OK**	
		44	LC2 at 100.00%	0.69	OK	
		45	LC1 at 0.00%	0.78	OK	
	L 2X2X3_16	**29**	LC4 at 0.00%	0.46	OK	
		30	LC4 at 100.00%	0.46	OK	
		31	LC2 at 100.00%	0.47	OK	
		32	LC2 at 0.00%	0.45	OK	
		33	LC1 at 0.00%	0.52	OK	
		34	LC1 at 100.00%	**0.53**	**OK**	
	PIPE 2-1_2x0.203	**3**	LC2 at 79.17%	**0.68**	**OK**	
		7	LC1 at 79.17%	0.65	OK	

	11	LC1 at 79.17%	0.67	OK
PIPE 2x0.154	**40**	LC1 at 57.64%	0.61	OK
	41	LC1 at 56.94%	0.60	OK
	42	LC2 at 56.94%	0.65	OK
	16	LC2 at 71.88%	0.07	OK
	13	LC2 at 71.88%	0.07	OK
	14	LC2 at 71.88%	0.05	OK
	15	LC2 at 71.88%	0.05	OK
	1	LC2 at 79.17%	0.62	OK
	2	LC4 at 79.17%	0.76	OK
	4	LC4 at 79.17%	0.69	OK
	5	LC1 at 79.17%	0.67	OK
	6	LC1 at 79.17%	**0.82**	**OK**
	8	LC3 at 79.17%	0.68	OK
	9	LC3 at 79.17%	0.64	OK
	10	LC3 at 79.17%	0.80	OK
	12	LC1 at 79.17%	0.71	OK
PIPE 3-1_2x0.226	**17**	LC4 at 48.44%	0.63	OK
	19	LC2 at 48.44%	0.62	OK
	21	LC1 at 48.44%	**0.67**	**OK**
	23	LC1 at 37.50%	0.28	OK
	24	LC1 at 22.92%	0.29	OK
	25	LC2 at 22.92%	0.29	OK
PL 4x1/4	**46**	LC2 at 0.00%	0.63	OK
	47	LC1 at 100.00%	**0.68**	**OK**
	48	LC1 at 0.00%	0.67	OK
PL 6x3/8	**18**	LC4 at 50.00%	0.39	OK
	20	LC2 at 46.88%	0.38	OK
	22	LC1 at 50.00%	**0.43**	**OK**
T2L 3X3X1_4	**35**	LC1 at 100.00%	0.43	OK
	36	LC4 at 100.00%	**0.45**	**OK**
	37	LC2 at 100.00%	0.43	OK

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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	0.00	0.00	0.00	0
2	0.7794	0.00	0.45	0
3	6.1055	0.00	3.525	0
4	5.8555	0.00	3.958	0
5	6.3555	0.00	3.092	0
10	-0.7794	0.00	0.45	0
11	-6.1055	0.00	3.525	0
12	-6.3555	0.00	3.092	0
13	-5.8555	0.00	3.958	0
14	0.00	0.00	-0.90	0
15	0.00	0.00	-7.05	0
16	0.50	0.00	-7.05	0
17	-0.50	0.00	-7.05	0
19	0.2715	0.00	-7.4458	0
20	6.584	0.00	3.4878	0
23	-6.584	0.00	3.4878	0
24	-0.2715	0.00	-7.4458	0
27	6.3125	0.00	3.958	0
28	-6.3125	0.00	3.958	0
29	-2.6715	0.00	-3.2889	0
30	-4.184	0.00	-0.6691	0

33	4.184	0.00	-0.6691	0
34	2.6715	0.00	-3.2889	0
37	-1.5125	0.00	3.958	0
38	1.5125	0.00	3.958	0
39	-1.7625	0.00	3.525	0
40	-3.934	0.00	-0.2361	0
43	3.934	0.00	-0.2361	0
44	1.7625	0.00	3.525	0
47	-2.1715	0.00	-3.2889	0
48	2.1715	0.00	-3.2889	0
49	0.7794	-2.00	0.45	0
50	0.00	-2.00	-0.90	0
51	-0.7794	-2.00	0.45	0
52	2.8482	0.00	1.6444	0
53	3.2813	0.00	1.8944	0
58	-2.8482	0.00	1.6444	0
59	-3.2813	0.00	1.8944	0
60	0.00	0.00	-3.2889	0
61	0.00	0.00	-3.7889	0
132	0.2715	4.80	-7.4458	0
133	6.584	4.80	3.4878	0
134	-6.584	4.80	3.4878	0
135	-0.2715	4.80	-7.4458	0
136	6.3125	4.80	3.958	0
137	-6.3125	4.80	3.958	0
138	-2.5215	4.80	-3.5487	0
139	-4.334	4.80	-0.4093	0
142	4.334	4.80	-0.4093	0
143	2.5215	4.80	-3.5487	0
144	-1.8125	4.80	3.958	0
145	1.8125	4.80	3.958	0
146	0.50	4.80	-7.05	0
147	-0.50	4.80	-7.05	0
148	-6.3555	4.80	3.092	0
149	-5.8555	4.80	3.958	0
150	5.8555	4.80	3.958	0
151	6.3555	4.80	3.092	0
166	5.50	-2.00	4.158	0
181	5.50	8.00	4.158	0
184	-1.9138	-1.00	0.874	0
185	-1.9138	3.00	0.874	0
192	1.7138	-1.00	1.2204	0
193	1.7138	3.00	1.2204	0
196	0.20	-1.00	-2.0944	0
197	0.20	3.00	-2.0944	0
201	0.00	1.00	0.00	0
203	1.9138	-1.00	0.874	0
204	1.9138	3.00	0.874	0
209	3.50	-2.00	4.158	0
210	3.50	8.00	4.158	0
215	-0.90	-2.00	4.158	0
216	-0.90	8.00	4.158	0
221	-5.30	-2.00	4.158	0
222	-5.30	8.00	4.158	0
255	0.8509	8.00	-6.8421	0
256	-6.3509	8.00	2.6841	0
257	0.8509	-2.00	-6.8421	0
258	-6.3509	-2.00	2.6841	0
259	1.8509	8.00	-5.1101	0
260	-5.3509	8.00	0.9521	0

261	1.8509	-2.00	-5.1101	0
262	-5.3509	-2.00	0.9521	0
263	4.0509	-2.00	-1.2996	0
264	-3.1509	-2.00	-2.8584	0
265	4.0509	8.00	-1.2996	0
266	-3.1509	8.00	-2.8584	0
267	6.2509	-2.00	2.5109	0
268	-0.9509	-2.00	-6.6689	0
269	6.2509	8.00	2.5109	0
270	-0.9509	8.00	-6.6689	0

Restraints

Node	TX	TY	TZ	RX	RY	RZ
2	1	1	1	1	1	1
10	1	1	1	1	1	1
14	1	1	1	1	1	1
49	1	1	1	1	1	1
50	1	1	1	1	1	1
51	1	1	1	1	1	1

Members

Member	NJ	NK	Description	Section	Material	d0 [in]	dL [in]	lg factor
17	2	3		PIPE 3-1_2x0.226	A53 GrB	0.00	0.00	0.00
18	4	5		PL 6x3/8	A36	0.00	0.00	0.00
19	10	11		PIPE 3-1_2x0.226	A53 GrB	0.00	0.00	0.00
20	12	13		PL 6x3/8	A36	0.00	0.00	0.00
21	14	15		PIPE 3-1_2x0.226	A53 GrB	0.00	0.00	0.00
22	16	17		PL 6x3/8	A36	0.00	0.00	0.00
23	19	20		PIPE 3-1_2x0.226	A53 GrB	0.00	0.00	0.00
24	23	24		PIPE 3-1_2x0.226	A53 GrB	0.00	0.00	0.00
25	27	28		PIPE 3-1_2x0.226	A53 GrB	0.00	0.00	0.00
26	34	29		C 3-3/8x3/16	A36	0.00	0.00	0.00
27	30	37		C 3-3/8x3/16	A36	0.00	0.00	0.00
28	38	33		C 3-3/8x3/16	A36	0.00	0.00	0.00
29	3	44		L 2X2X3_16	A36	0.00	0.00	0.00
30	43	3		L 2X2X3_16	A36	0.00	0.00	0.00
31	39	11		L 2X2X3_16	A36	0.00	0.00	0.00
32	11	40		L 2X2X3_16	A36	0.00	0.00	0.00
33	15	48		L 2X2X3_16	A36	0.00	0.00	0.00
34	47	15		L 2X2X3_16	A36	0.00	0.00	0.00
35	50	61		T2L 3X3X1_4	A36	0.00	0.00	0.00
36	49	53		T2L 3X3X1_4	A36	0.00	0.00	0.00
37	51	59		T2L 3X3X1_4	A36	0.00	0.00	0.00
40	132	133		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
41	134	135		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
42	136	137		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
43	142	145		L 2X2X1_4	A36	0.00	0.00	0.00
44	138	143		L 2X2X1_4	A36	0.00	0.00	0.00

45	144	139	L 2X2X1_4	A36	0.00	0.00	0.00
46	146	147	PL 4x1/4	A36	0.00	0.00	0.00
47	148	149	PL 4x1/4	A36	0.00	0.00	0.00
48	150	151	PL 4x1/4	A36	0.00	0.00	0.00
16	185	184	PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
13	193	192	PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
14	197	196	PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
15	204	203	PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
1	181	166	PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
2	210	209	PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
3	216	215	PIPE 2-1_2x0.203	A53 GrB	0.00	0.00	0.00
4	222	221	PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
5	256	258	PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
6	260	262	PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
7	266	264	PIPE 2-1_2x0.203	A53 GrB	0.00	0.00	0.00
8	270	268	PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
9	255	257	PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
10	259	261	PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
11	265	263	PIPE 2-1_2x0.203	A53 GrB	0.00	0.00	0.00
12	269	267	PIPE 2x0.154	A53 GrB	0.00	0.00	0.00

Orientation of local axes

Member	Rotation [Deg]	Axes23	NX	NY	NZ
43	90.00	0	0.00	0.00	0.00
44	90.00	0	0.00	0.00	0.00
45	90.00	0	0.00	0.00	0.00
46	90.00	0	0.00	0.00	0.00
47	90.00	0	0.00	0.00	0.00
48	90.00	0	0.00	0.00	0.00
16	0.00	2	0.50	0.00	0.866
13	0.00	2	0.50	0.00	-0.866

EXHIBIT 3

TOWN OF MANCHESTER
PLANNING DEPARTMENT

TO: Steven R. Werbner, General Manager

FROM: Mark Pellegrini, Director of Neighborhood Services and Economic Development

DATE: March 21, 2002

RE: Mandatory Referral Report
Police Station Radio Tower and Parking Lot Expansion (MR-0201)

At its meeting of March 18, 2002 the Planning and Zoning Commission voted unanimously to endorse the proposal to construct a monopole tower at the Manchester Police Headquarters, dismantle the existing tower, and build a new parking lot as shown on plans submitted by the Manchester Police Department dated September 11, 2001 and amended to September 26, 2001. In making this decision the Planning and Zoning Commission considered my memorandum of March 14, 2002 (copy attached) as well as a review of the site plan and photo simulations of the proposed new tower presented by Lt. Marc Montminy at their meeting.

MP/s
R:\SHARON09\MARK\MEMOS\Werbner-MR0102.doc

Attach.

TOWN OF MANCHESTER
PLANNING DEPARTMENT

TO: Planning and Zoning Commission

FROM: Mark Pellegrini, Director of Neighborhood Services And Economic Development

DATE: March 14, 2002

RE: Mandatory Referral Report
Police Station Radio Tower and Parking Lot Expansion (MR-0201)

The Planning and Zoning Commission is being asked to report on a proposal developed by the Manchester Police Department to replace its current radio tower and build a new parking lot in the location of the current tower at the Police Headquarters.

Description of Project

The police department has an existing 190' high lattice-type radio tower to serve its radio communications needs. The department wishes to replace this tower and equipment. They also have experienced parking problems, especially on Princeton Street, during daytime hours. The activity at the department's headquarters has created a greater demand for daytime parking than originally anticipated. Relocating the tower would provide room to add parking in front of the garage along Middle Turnpike. Attached is a site plan showing the proposed new tower location and the new parking lot, as well as a series of photo simulations showing the potential visual impact of the new monopole tower proposed to be constructed here.

There is no PZC approval aside from this mandatory referral report required for this project. The parking lot is less than one-half acre and therefore no erosion control plan will be needed. The new monopole tower is a permitted accessory structure and will only require a building permit and zoning permit from the Zoning Enforcement Officer.

Construction and Other Uses

The Police Department, through the Town, issued a request for proposals for the construction of the replacement tower. The proposal favored by the department was received from Sprint PCS. Under this proposal Sprint would pay for the construction of the new tower, provide new radio and related equipment to allow for a "hot" transfer so there will be no interruption in police communication during the switch-over from one tower to the other. Sprint PCS will also construct the parking lot and landscaping as proposed on the attached plans. In exchange for

these services, the police department will allow Sprint to locate a personal communications system antenna array on the tower and related hardware on the ground near the tower. The tower will also be capable of holding additional PCS arrays at the discretion of the Town.

Recommendation

The proposed improvements to the police department's headquarters site would be generally consistent with our Plan of Conservation and Development. The police department does require a tall communications antenna for its communication needs, which has become more sophisticated as communications and computing technology have evolved. It would also be beneficial to have more on-site parking at the police department to relive the traffic problems experienced on Princeton Street and to a lesser extent on Middle Turnpike during certain times of the day.

The construction of a 190±' monopole in this location will have some visual impact. It is possible through the proposed planting around the base of the unit and equipment cabinets to minimize the view of the lowest portions of the tower from passing motorists, but this area would primarily be visible to people driving into the Illing Middle School. The upper portions of the tower will be visible from various locations in the vicinity as shown on the attached photo simulations. The only alternative to a monopole tower would be a lattice-type tower, which in some respects is less intrusive since there is so much open air around the structure itself. However, we have been advised that such towers may become less attractive if multiple antenna arrays are placed on them and increased cabling is run up to the arrays. Lattice towers also require a larger footprint.

MP/s
R:\SHARON09\PZCMEMOS\18MAR02-PZC memos\MR-0201.doc

Attach.

STATE OF CONNECTICUT

CONNECTICUT SITING COUNCIL

Ten Franklin Square, New Britain, CT 06051

Phone: (860) 827-2935 Fax: (860) 827-2950

E-Mail: siting.council@ct.gov

www.ct.gov/csc

February 24, 2020

Patricia Nowak
Site Acquisition Consultant
Centerline Communications, LLC
750 West Center Street, Suite 301
West Bridgewater, MA 02379

RE: **EM-AT&T-077-200131** - New Cingular Wireless PCS, LLC (AT&T) notice of intent to modify an existing telecommunications facility located at 239 Middle Turnpike East, Manchester, Connecticut.

Dear Ms. Nowak:

The Connecticut Siting Council (Council) hereby acknowledges your notice to modify this existing telecommunications facility, pursuant to Section 16-50j-73 of the Regulations of Connecticut State Agencies with the following conditions:

1. Prior to AT&T's antenna installation, the antenna mount modifications shall be installed in accordance with the Mount Analysis prepared by Hudson Design Group, LLC, dated October 9, 2019 and stamped and signed by Daniel Hamm;

2. Within 45 days following completion of equipment installation, AT&T shall provide documentation certified by a Professional Engineer that its installation complied with the recommendations of the Mount Analysis;

3. Any deviation from the proposed modification as specified in this notice and supporting materials with the Council shall render this acknowledgement invalid;

4. Any material changes to this modification as proposed shall require the filing of a new notice with the Council;

5. Within 45 days after completion of construction, the Council shall be notified in writing that construction has been completed;

6. Any nonfunctioning antenna and associated antenna mounting equipment on this facility owned and operated by AT&T shall be removed within 60 days of the date the antenna ceased to function;

7. The validity of this action shall expire one year from the date of this letter; and

8. The applicant may file a request for an extension of time beyond the one year deadline provided that such request is submitted to the Council not less than 60 days prior to the expiration.

The proposed modifications including the placement of all necessary equipment and shelters within the tower compound are to be implemented as specified here and in your notice dated January 30, 2020. The modifications are in compliance with the exception criteria in Section 16-50j-72 (b) of the Regulations of Connecticut State Agencies as changes to an existing facility site that would not increase tower height, extend the boundaries of the tower site by any dimension, increase noise levels at the tower site boundary by six decibels or more, and increase the total radio frequencies electromagnetic radiation power density measured at the tower site boundary to or above the standards adopted by the Federal Communications Commission pursuant to Section 704 of the Telecommunications Act of 1996 and by the state Department of Energy and Environmental Protection pursuant to Connecticut General Statutes § 22a-162. This facility has also been carefully modeled to ensure that radio frequency emissions are conservatively below state and federal standards applicable to the frequencies now used on this tower.

This decision is under the exclusive jurisdiction of the Council. Please be advised that the validity of this action shall expire one year from the date of this letter. Any additional change to this facility will require explicit notice to this agency pursuant to Regulations of Connecticut State Agencies Section 16-50j-73. Such notice shall include all relevant information regarding the proposed change with cumulative worst-case modeling of radio frequency exposure at the closest point of uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin 65. Thank you for your attention and cooperation.

Sincerely,

Melanie A. Bachman
Executive Director

MAB/IN/emr

c: The Honorable Jay Moran, Mayor, Town of Manchester
Scott A. Shanley, General Manager, Town of Manchester
James Davis, Zoning Enforcement Officer, Town of Manchester

EXHIBIT 4

239 MIDDLE TURNPIKE EAST

Location	239 MIDDLE TURNPIKE EAST	**Mblu**	92/ 3950/ 239/ /
Acct#	395000239	**Owner**	MANCHESTER TOWN OF
Assessment	$4,243,700	**Appraisal**	$6,062,100
PID	10705	**Building Count**	2
DISTRICT	X	**CONCRETE**	

Current Value

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2016	$5,573,900	$488,200	$6,062,100
Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2016	$3,901,900	$341,800	$4,243,700

Owner of Record

Owner MANCHESTER TOWN OF
Address 41 CENTER ST
MANCHESTER, CT 06040-5096

Sale Price $0
Certificate C
Book & Page
Sale Date

Ownership History

Ownership History				
Owner	**Sale Price**	**Certificate**	**Book & Page**	**Sale Date**
MANCHESTER TOWN OF	$0	C		

Building Information

Building 1 : Section 1

Year Built: 1995
Living Area: 46,701
Replacement Cost: $6,306,043
Replacement Cost Less Depreciation: $5,044,800

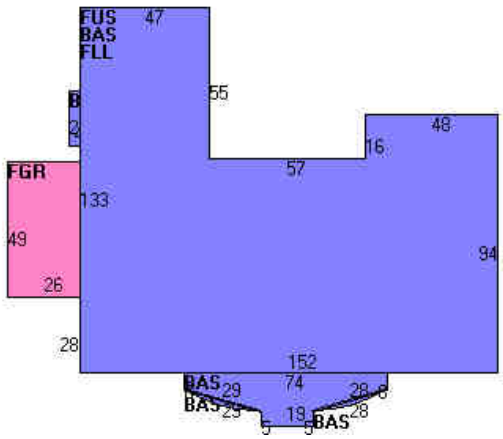
Building Attributes	
Field	**Description**

STYLE	Other Municip
MODEL	Ind/Comm
Grade	Average +10
Stories:	2
Occupancy	1
Exterior Wall 1	Brick Veneer
Exterior Wall 2	Stucco/Masonry
Roof Structure	Flat
Roof Cover	Tar + Gravel
Interior Wall 1	Minim/Masonry
Interior Wall 2	Drywall/Sheetr
Interior Floor 1	Carpet
Interior Floor 2	Tile/Vinyl Cmp
Heating Fuel	Gas
Heating Type	Forced Air-Duc
AC Type	Central
Bldg Use	Municipal 96
Total Rooms	
Total Bedrms	00
Total Baths	0
1st Floor Use:	901I
Heat/AC	Heat/AC Packag
Frame Type	Steel
Baths/Plumbing	Average
Ceiling/Wall	Susp Ceil & Wl
Rooms/Prtns	Average
Wall Height	10
% Comn Wall	0

Building Photo

(http://images.vgsi.com/photos2/ManchesterCTPhotos//\00\03\2

Building Layout



(http://images.vgsi.com/photos2/ManchesterCTPhotos//Sketches

Building Sub-Areas (sq ft)			Legend
Code	**Description**	**Gross Area**	**Living Area**
BAS	First Floor	16,283	16,283
FLL	Finished Lower Level	15,209	15,209
FUS	Upper Story, Finished	15,209	15,209
FGR	Garage	1,274	0
		47,975	46,701

Building 2 : Section 1

Year Built: 1975
Living Area: 7,000
Replacement Cost: $506,690
Replacement Cost Less Depreciation: $309,100

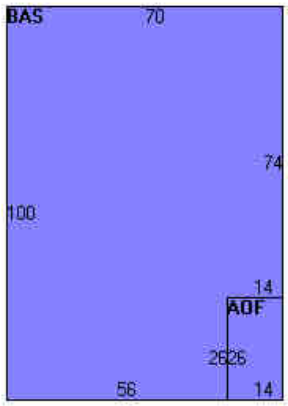
Building Attributes : Bldg 2 of 2	
Field	**Description**
STYLE	Service Shop

MODEL	Ind/Comm
Grade	Average
Stories:	1
Occupancy	1
Exterior Wall 1	Brick Veneer
Exterior Wall 2	
Roof Structure	Gable/Hip
Roof Cover	Asphalt Shingl
Interior Wall 1	Minim/Masonry
Interior Wall 2	
Interior Floor 1	Concr-Finished
Interior Floor 2	
Heating Fuel	Gas
Heating Type	Forced Air-Duc
AC Type	None
Bldg Use	Municipal 96
Total Rooms	
Total Bedrms	00
Total Baths	0
1st Floor Use:	901I
Heat/AC	Heat/AC Packag
Frame Type	Masonry
Baths/Plumbing	Average
Ceiling/Wall	Ceil & Min Wl
Rooms/Prtns	Average
Wall Height	19
% Comn Wall	0

Building Photo

(http://images.vgsi.com/photos2/ManchesterCTPhotos//\00\03\2

Building Layout



(http://images.vgsi.com/photos2/ManchesterCTPhotos//Sketches

Building Sub-Areas (sq ft)			Legend
Code	**Description**	**Gross Area**	**Living Area**
BAS	First Floor	6,636	6,636
AOF	Office, (Average)	364	364
		7,000	7,000

Extra Features

Extra Features				Legend
Code	**Description**	**Size**	**Value**	**Bldg #**
MEZ1	Mezzanine-Unfin	1900 S.F.	$13,300	2
SPR1	Sprinklers-Wet	47975 S.F.	$54,000	1

Land

Land Use

Use Code 901I

Land Line Valuation

Size (Acres) 3.97

Description	Municipal 96	**Frontage**	0
Zone	RA	**Depth**	0
Neighborhood	4000	**Assessed Value**	$341,800
Alt Land Appr	No	**Appraised Value**	$488,200
Category			

Outbuildings

Outbuildings						Legend
Code	**Description**	**Sub Code**	**Sub Description**	**Size**	**Value**	**Bldg #**
PAV1	Paving Asphalt			97700 S.F.	$122,100	1
FN4	Fence 8' Chain			128 L.F.	$1,900	1
LT1	Lights 1Fix			15 UNITS	$12,900	1
CNP1	Canopy Ave			360 S.F.	$7,800	1
SHD2	Shed W/Imp			120 S.F.	$1,300	1
SHD1	Shed			168 S.F.	$1,500	1
FN3	Fence 6' Chain			160 L.F.	$3,700	1
SHD2	Shed W/Imp			140 S.F.	$1,500	1

Valuation History

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2015	$4,365,100	$488,200	$4,853,300
2010	$4,125,100	$423,400	$4,548,500
2005	$3,622,600	$380,200	$4,002,800

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2015	$3,055,600	$341,800	$3,397,400
2010	$2,887,500	$296,400	$3,183,900
2005	$2,535,800	$266,200	$2,802,000

Town of Manchester, CT

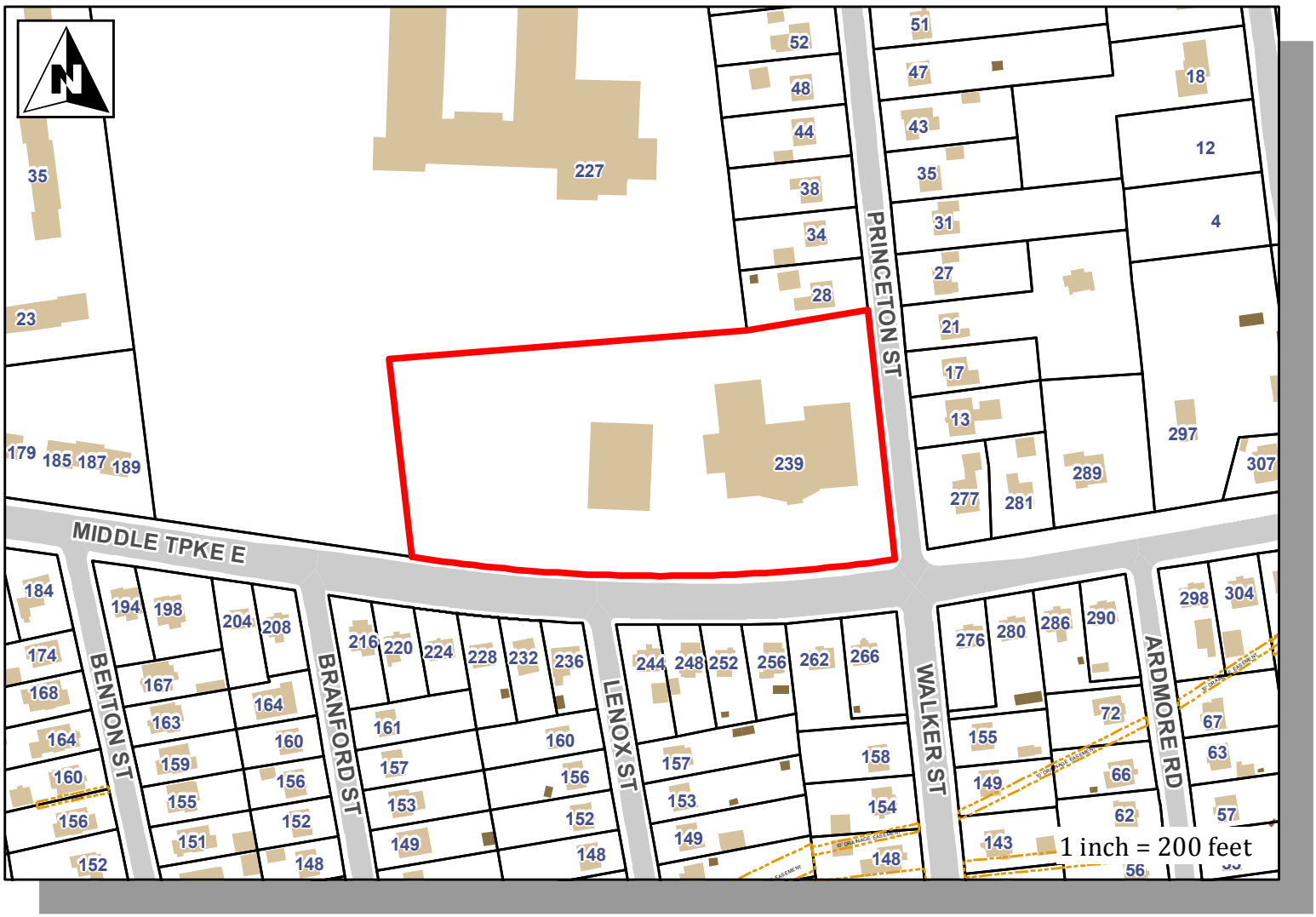
Address: 239 MIDDLE TURNPIKE EAST

RPKEY: 395000239

Property Information:

Mailing Address:	239 MIDDLE TPKE E MANCHESTER, CT
Owner Name:	TOWN OF MANCHESTER
Owner Address:	41 CENTER ST MANCHESTER, CT 06040-5096
Land Class:	Municipal 94
Land Use Code:	901
Zoning:	RA

Acreage:	3.97
Year Built:	1995
Appraisal:	6062100
Assessment:	4243700
Sale Price:	$0.00
Sale Date:	00/00/0000
Book/Page:	0/0



Report Created: 4/5/2019

EXHIBIT 5

Radio Frequency Emissions Analysis Report

Site Name: **CT5448**

239 Middle Turnpike East
Manchester, Connecticut 06040

January 28, 2020

Centerline Communications Project Number: 950012-350

Site Compliance Summary	
Compliance Status:	**Compliant**
Site total MPE% of FCC general population allowable limit:	**19.05%**
AT&T total MPE% of FCC general population allowable limit:	**15.67%**

750 West Center St. Suite 301 | West Bridgewater, MA 02379

January 28, 2020

AT&T Mobility – New England
Attn: John Benedetto, RF Manager
550 Cochituate Road
Suite 550 – 13&14
Framingham, MA 01701

Emissions Analysis for Site: **CT5448**

Centerline Communications, LLC ("Centerline") was directed to analyze the proposed AT&T facility to be located on **a monopole** at **239 Middle Turnpike East, Manchester Connecticut 06040** for the purpose of determining whether the emissions from the proposed facility are within specified federal limits.

All information used in this report was analyzed as a percentage of current Maximum Permissible Exposure (% MPE) as listed in the FCC OET Bulletin 65 Edition 97-01and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter (∝W/cm2). The number of ∝W/cm^2 calculated at each sample point is called the power density. The exposure limit for power density varies depending upon the frequencies being utilized. Wireless Carriers and Paging Services use different frequency bands each with different exposure limits, therefore it is necessary to report results and limits in terms of percent MPE rather than power density.

All results were compared to the FCC (Federal Communications Commission) radio frequency exposure rules, 47 CFR 1.1307(b)(1) – (b)(3), to determine compliance with the Maximum Permissible Exposure (MPE) limits for General Population/Uncontrolled environments as defined below.

General population/uncontrolled exposure limits apply to situations in which the general population may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Therefore, members of the general population would always be considered under this category when exposure is not employment related, for example, in the case of a telecommunications tower that exposes persons in a nearby residential area.

Population exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter (μW/cm^2). The general population exposure limits for the 1900 MHz (PCS) and 5 GHz (B46) bands is 1000 μW/cm^2.

Occupational/controlled exposure limits apply to situations in which persons are exposed as a consequence of their employment and in which those persons who are exposed have been made fully aware of the potential for exposure and can exercise control over their exposure. Occupational/controlled exposure limits also apply where exposure is of a transient nature as a result of incidental passage through a location where exposure levels may be above general population/uncontrolled limits, as long as the exposed person has been made fully aware of the potential for exposure and can exercise control over his or her exposure by leaving the area or by some other appropriate means.

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were performed for the proposed facility using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since AT&T is proposing focused omnidirectional antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was focused at the base of the tower. This is a very conservative estimate since the gain reduction in actual applications is typically greater than 10 dB in the direction of ground immediately surrounding the facility. Real world emissions values from this facility are expected to be lower than values listed in this report at ground level. For this report the sample point is the top of a 6-foot person standing at the base of the tower.

Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. All power values expressed and analyzed are maximum power levels expected to be used on all radios.

For each sector the following channel counts, frequency bands and power levels were utilized as shown in *Table 1*:

Antenna	Technology	Frequency Band	Channel Count	Transmit Power per Channel (W)
ATT A1	LTE	850	1	40
ATT A2	LTE	700	2	40
ATT A2	LTE	2300	4	25
ATT A3	LTE	700	4	40
ATT A3	LTE	2100	4	40
ATT A4	LTE	850	4	40
ATT A4	LTE	700	2	30
ATT A4	LTE	1900	2	60
ATT B1	LTE	850	1	40
ATT B2	LTE	700	2	40
ATT B2	LTE	2300	4	25
ATT B3	LTE	700	4	40
ATT B3	LTE	2100	4	40
ATT B4	LTE	850	4	40
ATT B4	LTE	700	2	30
ATT B4	LTE	1900	2	60
ATT C1	LTE	850	1	40
ATT C2	LTE	700	2	40
ATT C2	LTE	2300	4	25
ATT C3	LTE	700	4	40

ATT C3	LTE	2100	4	40
ATT C4	LTE	850	4	40
ATT C4	LTE	700	2	30
ATT C4	LTE	1900	2	60

Table 1: Channel Data Table

The following antennas listed in *Table 2* were used in the modeling for transmission in the 1900 MHz (PCS), 2100 MHz (AWS) and 5 GHz (Band 46) frequency bands. This is based on information from the carrier with regard to anticipated antenna selection. Maximum gain values for all antennas are listed in the AT&T Antenna Inventory & Power Levels table (Table 3) below in the Results section. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

Sector	Antenna Number	Antenna Make / Model	Antenna Centerline (ft)
A	1	Kathein 80010121	146
A	2	CCI OPA-65R-LCUU-H6	146
A	3	Commscope NNH4-65B-R6	146
A	4	CCI OPA-65R-LCUU-H6	146
B	5	Kathein 80010121	146
B	6	CCI OPA-65R-LCUU-H8	146
B	7	Commscope NNH4-65C-R6	146
B	8	CCI OPA-65R-LCUU-H8	146
C	9	Kathein 80010121	146
C	10	CCI OPA-65R-LCUU-H8	146
C	11	Commscope NNH4-65C-R6	146
C	12	CCI OPA-65R-LCUU-H8	146

Table 2: Antenna Data

All calculations were done with respect to uncontrolled / general population threshold limits.

RESULTS

Per the calculations completed for the proposed AT&T configurations *Table 3* shows resulting emissions power levels and percentages of the FCC's allowable general population limit.

Antenna ID	Antenna Make / Model	Frequency Bands	Antenna Gain (dBd)	Antenna Height (ft)	Channel Count	Total TX Power (W)	ERP (W)	MPE %
ATT A1	Kathein 80010121	850	10.95	146	1	40	497.81	0.1481%
ATT A2	CCI OPA-65R-LCUU-H6	700	12.55	146	2	40	1439.10	0.5197%
ATT A2	CCI OPA-65R-LCUU-H6	2300	15.45	146	4	25	3507.52	0.5916%
ATT A3	Commscope NNH4-65B-R6	700	11.65	146	4	40	2339.48	0.8449%
ATT A3	Commscope NNH4-65B-R6	2100	14.55	146	4	40	4561.63	0.7694%
ATT A4	CCI OPA-65R-LCUU-H6	850	12.45	146	4	40	2812.68	0.8367%
ATT A4	CCI OPA-65R-LCUU-H6	700	11.65	146	2	30	877.31	0.3168%
ATT A4	CCI OPA-65R-LCUU-H6	1900	14.85	146	2	60	3665.91	0.6183%
ATT B1	Kathein 80010121	850	10.95	146	1	40	497.81	0.1481%
ATT B2	CCI OPA-65R-LCUU-H8	700	12.55	146	2	40	1439.10	0.5197%
ATT B2	CCI OPA-65R-LCUU-H8	2300	14.95	146	4	25	3126.08	0.5272%
ATT B3	Commscope NNH4-65C-R6	700	13.55	146	4	40	3623.43	1.3086%
ATT B3	Commscope NNH4-65C-R6	2100	15.55	146	4	40	5742.75	0.9686%
ATT B4	CCI OPA-65R-LCUU-H8	850	13.35	146	4	40	3460.35	1.0293%
ATT B4	CCI OPA-65R-LCUU-H8	700	12.55	146	2	30	1079.32	0.3898%
ATT B4	CCI OPA-65R-LCUU-H8	1900	14.85	146	2	60	3665.91	0.6183%
ATT C1	Kathein 80010121	850	10.95	146	1	40	497.81	0.1481%
ATT C2	CCI OPA-65R-LCUU-H8	700	12.55	146	2	40	1439.10	0.5197%
ATT C2	CCI OPA-65R-LCUU-H8	2300	14.95	146	4	25	3126.08	0.5272%
ATT C3	Commscope NNH4-65C-R6	700	13.55	146	4	40	3623.43	1.3086%
ATT C3	Commscope NNH4-65C-R6	2100	15.55	146	4	40	5742.75	0.9686%
ATT C4	CCI OPA-65R-LCUU-H8	850	13.35	146	4	40	3460.35	1.0293%

ATT C4	CCI OPA-65R-LCUU-H8	700	12.55	146	2	30	1079.32	0.3898%
ATT C4	CCI OPA-65R-LCUU-H8	1900	14.85	146	2	60	3665.91	0.6183%
	All Sectors Composite MPE%							**15.67 %**

FCC OET 65 specifies that for carriers utilizing directional antennas that the highest recorded sector value be used for composite site MPE values due to their greatly reduced emissions contributions in the directions of the adjacent sectors. *Table 6* below details a breakdown by frequency band and technology for the MPE power values for the maximum calculated AT&T sector(s). Since this proposed facility is utilizing an omnidirectional antenna there is only one sector for this site (Sector A).

AT&T _ Frequency Band / Technology	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density (□W/cm²)	Frequency (MHz)	Allowable MPE (□W/cm²)	Calculated % MPE
AT&T 850 MHz	1	497.81	146	0.8396	850 MHz	1000	0.1481%
AT&T 700 MHz	2	1439.10	146	2.4272	700 MHz	1000	0.5197%
AT&T 2300 MHz	4	3507.52	146	5.9158	2300 MHz	1000	0.5916%
AT&T 700 MHz	4	2339.48	146	3.9458	700 MHz	1000	0.8449%
AT&T 2100 MHz	4	4561.63	146	7.6936	2100 MHz	1000	0.7694%
AT&T 850 MHz	4	2812.68	146	4.7438	850 MHz	1000	0.8367%
AT&T 700 MHz	2	877.31	146	1.4797	700 MHz	1000	0.3168%
AT&T 1900MHz	2	3665.91	146	6.1829	1900 MHz	1000	0.6183%
AT&T 850 MHz	1	497.81	146	0.8396	850 MHz	1000	0.1481%
AT&T 700 MHz	2	1439.10	146	2.4272	700 MHz	1000	0.5197%
AT&T 2300 MHz	4	3126.08	146	5.2724	2300 MHz	1000	0.5272%
AT&T 700 MHz	4	3623.43	146	6.1113	700 MHz	1000	1.3086%
AT&T 2100 MHz	4	5742.75	146	9.6857	2100 MHz	1000	0.9686%
AT&T 850 MHz	4	3460.35	146	5.8362	850 MHz	1000	1.0293%
AT&T 700 MHz	2	1079.32	146	1.8204	700 MHz	1000	0.3898%
AT&T 1900MHz	2	3665.91	146	6.1829	1900 MHz	1000	0.6183%
AT&T 850 MHz	1	497.81	146	0.8396	850 MHz	1000	0.1481%
AT&T 700 MHz	2	1439.10	146	2.4272	700 MHz	1000	0.5197%
AT&T 2300 MHz	4	3126.08	146	5.2724	2300 MHz	1000	0.5272%
AT&T 700 MHz	4	3623.43	146	6.1113	700 MHz	1000	1.3086%
AT&T 2100 MHz	4	5742.75	146	9.6857	2100 MHz	1000	0.9686%
AT&T 850 MHz	4	3460.35	146	5.8362	850 MHz	1000	1.0293%
AT&T 700 MHz	2	1079.32	146	1.8204	700 MHz	1000	0.3898%
AT&T 1900MHz	2	3665.91	146	6.1829	1900 MHz	1000	0.6183%
All Sectors						**Total:**	**15.67%**

Table 6: AT&T Maximum Sector MPE Power Values

Summary

All calculations performed for this analysis yielded results that were **within** the allowable limits for general population exposure to RF Emissions.

The anticipated maximum composite contributions from the AT&T facility as well as the site composite emissions value with regards to compliance with FCC's allowable limits for general population exposure to RF Emissions are shown here:

AT&T Sector	Power Density Value (%)
Sector A:	4.65%
Sector B:	5.51%
Sector C:	5.51%
AT&T Maximum Site Total:	15.67%
AT&T Site Total:	**15.67%**
Composite Site Total:	19.05%
Site Compliance Status:	**Compliant**

The anticipated composite MPE value for this site assuming all carriers present is **19.05%** of the allowable FCC established general population limit sampled at the ground level.

FCC guidelines state that if a site is found to be out of compliance (over allowable thresholds), that carriers over a 5% contribution to the composite value will require measures to bring the site into compliance. For this facility, the composite values calculated were well within the allowable 100% threshold standard per the federal government.

Michelle L. Stone
RF Compliance Consultant
Centerline Communications, LLC
750 West Center St. Suite 301
West Bridgewater, MA 02379

EXHIBIT 6

STRUCTURAL ANALYSIS REPORT - REV. 6
MONOPOLE

Prepared For:

T-Mobile Northeast, LLC
35 Griffin Road South
Bloomfield, CT 06002

Structure Rating	
Monopole:	**Pass (94.4%)**
Anchor Rods:	**Pass (90.1%)**
Base Plate:	**Pass (92.2%)**
Foundation	**Pass (81.0%)**

Sincerely,
EFI Global, Inc.
License No: PEC0001429

STATE OF CONNECTICUT
AHMET COLAKOGLU
PEN. 27057
LICENSED
PROFESSIONAL ENGINEER

4/30/2021

Ahmet Colakoglu, PE
Connecticut Professional Engineer
License No: 27057

T-Mobile Site ID: CT11365D
T-Mobile Site Name: CT365/Manchester PD_MP
AT&T Site ID: CT5448
AT&T Site Name: Manchester Central
FA Location Code: 10071105
239 E. Middle Tpk
Manchester, CT 06040

EFI Global, Inc.
1117 Perimeter Center West, Ste E500, Atlanta, GA 30338-Tel: (470) 990-6593

CONTENTS

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1117 Perimeter Center West, Ste E500, Atlanta, GA 30338 - Tel: (470) 990-6593

1.0 SUBJECT AND REFERENCES

The purpose of this analysis is to evaluate the structural capacity of the wireless telecommunication installation on the existing monopole located at 239 East Middle Tpk, Manchester, CT 06040 for additions and alterations proposed by T-Mobile and AT&T.

The structural analysis is based on the following documentation provided to EFI Global, Inc. (EFI):

- RFDS provided by T-Mobile, dated 05/05/2020.
- Tower Mapping Report prepared by Hightower Solutions, Inc., dated 2/10/2021.
- ANSI/TIA-222-G-2005 Inspection Report prepared by Hightower Solutions, Inc., dated 2/10/2021.
- Structural Analysis Report prepared by Hudson Design Group, LLC., dated 12/10/2019.
- Construction Drawings prepared by Hudson Design Group, LLC, dated 10/28/2019.
- Structure and Foundation Design Calculations prepared by Engineered Endeavors Incorporated, dated 10/16/2002.

1.1 STRUCTURE

The structure is a 183 ft. (18) sided monopole, which is attached to the foundation with anchor bolts and a base plate. Please refer to the software output in Appendix A, for tower geometry, member sizes, and other details.

Section Length (ft)	Lap Splice (in)	Shaft Thickness (in)	Top Diameter (in)	Bottom Diameter (in)	Steel Yield Strength (ksi)
17.50	36.00	0.1875	15.50	19.42	65
36.42	46.00	0.2500	18.37	26.41	65
48.92	60.00	0.3750	25.06	35.88	65
49.08	74.00	0.4375	34.02	44.88	65
49.08	--	0.4375	42.64	53.50	65

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2.0 EXISTING AND PROPOSED APPURTENANCES

Existing Configuration of T-Mobile Appurtenances:

RAD CENTER (FT)	ANTENNA & TMA	COAX*	MOUNT
163	(3) AIR32 KRD901146-1_B66A_B2A (3) AIR3246 B66 (3) APXVAARR24_43-U-NA20 (3) KRY 112 144/2 (3) Radio 4449 B71+B12 (1) IBR 1300 radio	(16) 1-5/8” (1) 9x18 HSC (2) 6x12 HSC (2) 0.2”	(1) Platform w/ Handrail

***Feedlines located inside the monopole**

Existing Configuration of AT&T Appurtenances:

RAD CENTER (FT)	ANTENNA & TMA	COAX*	MOUNT
145	(4) CCI OPA-65R-LCUU-H8 (2) CCI OPA-65R-LCUU-H6 (3) Kathrein 80010121 (6) LGP21401 TMA (6) LGP21901 Diplexers (3) RRUS 11 B12 (3) RRUS 32 B66A (3) RRUS 32 B30 (3) Radio 4478 B5 (2) DC6-48-60-18-8C (2) CCI HPA-65R-BUU-H8 (1) CCI HPA-65R-BUU-H6 (3) RRUS 32 B2	(6) 1-5/8” (4) DC Power Cables (2) Fiber Cables	(1) Platform w/ Handrails

***Feedlines located inside the monopole**

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Proposed and Final Configuration of T-Mobile Appurtenances:

RAD CENTER (FT)	ANTENNA & TMA	COAX*	MOUNT
163	(3) AIR32 KRD901146-1_B66A_B2A (3) AIR6449 B41 (3) AIR3246 B66 (3) APXVAARR24_43-U-NA20 (3) Radio 4449 B71+B85 (3) Radio 4415 B25	(16) 1-5/8” (5) 1-5/8”** (1) 9x18 HSC (3) 6X12 HSC	(1) Platform w/ Handrail + Proposed Modifications

***Feedlines located inside the monopole**

**** Future feedline entitlement considered in analysis.**

Proposed and Final Configuration of AT&T Appurtenances:

RAD CENTER (FT)	ANTENNA & TMA	COAX*	MOUNT
145	(4) CCI OPA-65R-LCUU-H8 (2) CCI OPA-65R-LCUU-H6 (3) Kathrein 80010121 (6) LGP21401 TMA (6) LGP21901 Diplexers (3) RRUS 11 B12 (3) RRUS 32 B66A (3) RRUS 32 B30 (3) Radio 4478 B5 (2) DC6-48-60-18-8C (1) NNH4-65B-R6 (2) NNH4-65C-R6 (3) RRUS E2 B29 (3) RRUS 12 B2 (3) Radio 4478 B14 (3) A2 Modules (2) DC6-48-60-0-8C-EV	(6) 1-5/8” (8) DC Power Cables (2) Fiber Cables	(1) Platform w/ Handrails

***Feedlines located inside the monopole**

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Existing Appurtenances by Others:

CARRIER	RAD CENTER (FT)	ANTENNA & TMA	COAX*	MOUNT
Unknown	195.75	(1) Lightning Rod	(4) 7/8” (1) 1/2” (2) 0.32”	(1) Low Profile Platform
	194.25	(2) 12’ Dipole		
	189.5	(2) HPD2-18RS (2’ Dish) (2) 9” x 9” x 3.5” TMA		
	172.25	(2) 12’ Dipole		
Sprint	158.5	(6) RRH1900-4x45 (1) Junction Box	(4) 1-1/4” (2) 2.42” Flex Conduit**	(1) Ring Mount
		(3) RRH8x20 (3) RRH2x50-800		(1) Low Profile Platform
	156	(3) RFS APXVTM14 (3) RFS APXVSPP18		
Unknown	153.83	(1) Motorola MTI1669	(2) 0.2”	
	151.5	(1) VHLP2-23-DW1 (2’ Dish)	(1) 1/2”**	
	150.5	(1) 3’ Dish (1) VHLP2-18-DW1 (2’ Dish)	(2) 1/2”**	
Unknown	132.08	(1) 15’ Whip	(7) 1/2”	(1) Low Profile Platform
	129.42	(1) 5’-6” Whip		
	128.5	(1) Yagi		
	128.17	(1) 20’ Dipole		
	125.08	(1) Yagi		
	121.75	(1) Yagi		
Verizon	115.42	(2) RRFDC-3315-PF-48	(2) 1-1/4”**	(1) Low Profile Platform
	113	(6) HBXX-6517DS-A2M (6) LNX-6514DS-A1M (3) B25 RRH 4x30 (3) B13 RRH4x30 (3) B4 RRH2x60-4R		
Unknown	51.75	(1) GPS (1) 12” x 2.5” x 1.5” TMA	(1) 1/2” (2) 0.2”	(1) Stand Off Mount

***All feedlines are inside shaft unless otherwise noted**

****Outside Shaft**

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3.0 CODES AND LOADING

The tower was analyzed per *ANSI/TIA-222-G* as referenced by the *2018 Connecticut State Building Code* with all of the adopted Addendums and Supplements. The following wind loading was used in compliance with the standard for Manchester, CT:

- Basic wind speed 105 mph without ice (W_o)
- Basic wind speed 50 mph with 1" escalating ice (W_i)
- Exposure Category B
- Topographic Category 1
- Structure Class III

The following load combinations were used with wind blowing at 0°, 30°, 45°, 60°, and 90° measured from a line normal to the face of the tower.

- 1.2 D + 1.6 W_0
- 0.9 D + 1.6 W_0
- 1.2 D + 1.0 D_i + 1.0 W_i

D: Dead Load of structure and appurtenances
W_0: Wind Load, without ice
W_i: Wind Load, with ice
D_i: Weight of Ice

4.0 STANDARD CONDITIONS FOR ENGINEERING SERVICES ON EXISTING STRUCTURES

The analysis is based on the information provided to EFI and is assumed to be current and correct. Unless otherwise noted, the structure and the foundation system are assumed to be in good condition, free of defects and can achieve theoretical strength.

It is assumed that the structure has been maintained and shall be maintained during its service. The superstructure and the foundation system are assumed to be designed with proper engineering practice and fabricated, constructed and erected in accordance with the design documents. EFI will accept no liability which may arise due to any existing deficiency in design, material, fabrication, erection, construction, etc. or lack of maintenance.

The analysis does not include a qualification of the mounts attached on the structure or their connections. The analysis is performed to verify the capacity of the main structural members, which is the current practice in the tower industry.

The analysis results presented in this report are only applicable for the previously mentioned existing and proposed additions and alterations. Any deviation of the proposed equipment and placement, etc., will require EFI to generate an additional structural analysis.

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5.0 ANALYSIS AND ASSUMPTIONS

The Monopole was analyzed by utilizing tnxTower, a non-linear, three-dimensional, finite element-analysis software package, a product of Tower Numerics, Inc. Software output for this analysis is provided in Appendix A of this report.

The structural monopole shaft reinforcement modifications shown in the referenced Tower Mapping Report prepared by Hightower Solutions, Inc., dated 2/10/2021, have been incorporated into our analysis. After analyzing the upgraded structure, EFI has deemed the modifications to be ineffective due to weak compressive capacity in the reinforcement plates. The added wind area of the reinforcement has been considered in this analysis.

6.0 RESULTS AND CONCLUSION

Based on structural analysis per TIA-222-G, the existing monopole is found to have **adequate** structural capacity for the proposed changes by T-Mobile and AT&T. For the code specified load combinations and as a maximum, the monopole shaft is stressed to **94.4%** of its structural capacity. The anchor rods and base plate are stressed to **90.1%** and **92.2%** of their structural capacities, respectively.

The existing base foundation is found to have **adequate** structural capacity for the proposed changes by T-Mobile and AT&T. For the code specified load combinations and as a maximum, the foundation is stressed to **81.0%** of its structural capacity.

Therefore, the proposed additions and alterations by T-Mobile and AT&T **can** be implemented as intended with the conditions outlined in this report.

Should you have any questions about this report, please contact EFI at telecom@efiglobal.com.

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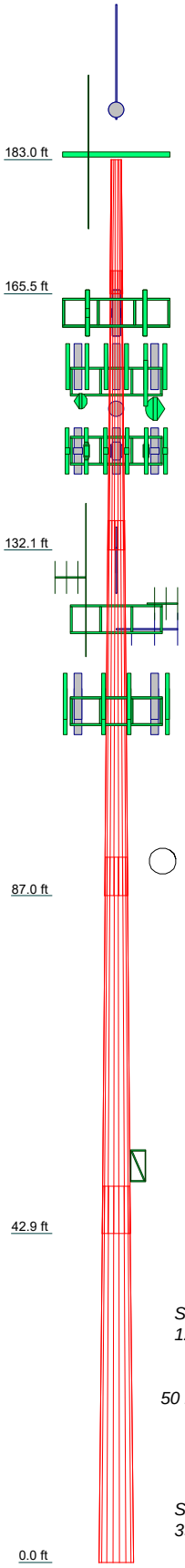
APPENDIX A
CALCULATIONS

Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (K)
1	17.5000	18	0.1875	3.0000	15.5000	19.4200		0.6
2	36.4200	18	0.2500	3.8300	18.3730	26.4100		2.2
3	48.9200	18	0.3750	5.0000	25.0648	35.8800		6.0
4	49.0800	18	0.4375	6.1700	34.0246	44.8800		9.0
5	49.0800	18	0.4375		42.6403	53.5000		11.0
							A572-65	



ALL REACTIONS ARE FACTORED

AXIAL 175 K
SHEAR 12 K
MOME 2014 ki

TORQUE 1 kip-ft
50 mph WIND - 1.0000 in ICE

AXIAL 65 K
SHEAR 39 K
MOME 5266 ki

TORQUE 2 kip-ft
REACTIONS - 105 mph WIND

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Lightning Rod w/ Pipe Extension	189.75	RRUS 32 B30	145
HPD2-18RS	189.5	RRUS 32 B30	145
HPD2-18RS	189.5	RRUS 32 B30	145
24' 4-Bay Dipole	184	DC6-48-60-18-8C	145
9" x 9" x 3.5" TMA	184	DC6-48-60-18-8C	145
9" x 9" x 3.5" TMA	184	RRUS 11 B12	145
14' Low Profile Platform	184	RRUS 11 B12	145
24' 4-Bay Dipole	184	RRUS 11 B12	145
AIR 32 B2a/B66Aa w/ Mount Pipe	163	RRUS 4478 B5	145
Ericsson AIR6449 B41 w/ Mount Pipe	163	RRUS 4478 B5	145
Ericsson AIR6449 B41 w/ Mount Pipe	163	RRUS 4478 B5	145
Ericsson AIR6449 B41 w/ Mount Pipe	163	NNH4-65B-R6	145
AIR 3246 B66 w/ Mount Pipe	163	NNH4-65C-R6	145
AIR 3246 B66 w/ Mount Pipe	163	NNH4-65C-R6	145
AIR 3246 B66 w/ Mount Pipe	163	RRUS E2 B29	145
APXVAARR24_43-U-NA20 w/ Mount Pipe	163	RRUS E2 B29	145
		RRUS E2 B29	145
APXVAARR24_43-U-NA20 w/ Mount Pipe	163	RRUS 12 B2	145
		RRUS 12 B2	145
APXVAARR24_43-U-NA20 w/ Mount Pipe	163	RRUS 12 B2	145
Radio 4449 B71+B85_T-Mobile	163	RRUS 4478 B14	145
Radio 4449 B71+B85_T-Mobile	163	RRUS 4478 B14	145
Radio 4449 B71+B85_T-Mobile	163	RRUS 4478 B14	145
RRUS 4415 B25	163	RRU A2	145
RRUS 4415 B25	163	RRU A2	145
RRUS 4415 B25	163	RRU A2	145
Platform Mount [LP 1201-1_HR-1]	163	DC6-48-60-0-8C	145
Site Pro 1 (P/N: PRK-1245L)	163	DC6-48-60-0-8C	145
AIR 32 B2a/B66Aa w/ Mount Pipe	163	Platform Mount [LP 301-1_KCKR]	145
AIR 32 B2a/B66Aa w/ Mount Pipe	163	800 10121	145
Ring Mount	159	800 10121	145
APXVTM14-C-120 w/ Mount Pipe	154	(2) OPA-65R-LCUU-H6	145
APXVTM14-C-120 w/ Mount Pipe	154	800 10121	145
APXVTM14-C-120 w/ Mount Pipe	154	(2) OPA-65R-LCUU-H8	145
RRH2X50-800	154	15' Whip	132.08
RRH2X50-800	154	5'-6" Whip	129.42
RRH2X50-800	154	24" Yagi	128.5
TD-RRH8x20	154	20' 4-Bay Dipole	128.17
TD-RRH8x20	154	15" Yagi	125.08
TD-RRH8x20	154	13' Low Profile Platform	123
(2) PCS 1900MHz 4x45W-65MHz	154	2'6" Yagi	121.75
(2) PCS 1900MHz 4x45W-65MHz	154	(2) HBXX-6517DS-A2M w/ Mount Pipe	111
(2) PCS 1900MHz 4x45W-65MHz	154	RRFDC-3315-PF-48	111
18" x 18" x 6.5" Junction Box	154	RRFDC-3315-PF-48	111
13' Low Profile Platform	154	B25 RRH4X30	111
APXVSPP18-C w/ Mount Pipe	154	B25 RRH4X30	111
APXVSPP18-C w/ Mount Pipe	154	B25 RRH4X30	111
APXVSPP18-C w/ Mount Pipe	154	B13 RRH 4X30	111
MTI1669	153.83	B13 RRH 4X30	111
Andrew VHLP2-23	151.5	B13 RRH 4X30	111
3' Dish w/ Randome	150.5	B4 RRH2X60-4R	111
Andrew VHLP2-18	150.5	B4 RRH2X60-4R	111
(2) OPA-65R-LCUU-H8	145	B4 RRH2X60-4R	111
(2) LGP21401	145	RMQP 12' Platform w/ handrails	111
(2) LGP21401	145	(2) LNX-6514DS-A1M w/ Mount Pipe	111
(2) LGP21401	145	(2) HBXX-6517DS-A2M w/ Mount Pipe	111
(2) LGP21901	145	(2) HBXX-6517DS-A2M w/ Mount Pipe	111
(2) LGP21901	145	(2) LNX-6514DS-A1M w/ Mount Pipe	111
(2) LGP21901	145	(2) LNX-6514DS-A1M w/ Mount Pipe	111
RRUS 32 B66	145	12" x 2.5" x 1.5" TMA	51.75
RRUS 32 B66	145	3' Side Mount Standoff	51.75
RRUS 32 B66	145	GPS	51.75

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-65	65 ksi	80 ksi			

TOWER DESIGN NOTES

1. Tower is located in Hartford County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-G Standard.
3. Tower designed for a 105 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class III.
7. Topographic Category 1 with Crest Height of 0.0000 ft
8. TOWER RATING: 94.4%

EFI Global, Inc.
1117 Perimeter Center West, Suite E500
Atlanta, GA 30338
Phone: (470) 990-6593
FAX:

Job: ***CT11365D***			
Project: ***049.00421 - 2075019***			
Client: Foresite LLC	Drawn by: Evan.Martin	App'd:	
Code: TIA-222-G	Date: 04/21/21	Scale: NTS	
Path:		Dwg No. E-1	

Tower Input Data

The tower is a monopole.
This tower is designed using the TIA-222-G standard.
The following design criteria apply:

Tower is located in Hartford County, Connecticut.
ASCE 7-10 Wind Data is used (wind speeds converted to nominal values).
Basic wind speed of 105 mph.
Structure Class III.
Exposure Category B.
Topographic Category 1.
Crest Height 0.0000 ft.
Nominal ice thickness of 1.0000 in.
Ice thickness is considered to increase with height.
Ice density of 56.00 pcf.
A wind speed of 50 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 60 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

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

Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	183.0000-165.5000	17.5000	3.00	18	15.5000	19.4200	0.1875	0.7500	A572-65 (65 ksi)
L2	165.5000-132.0800	36.4200	3.83	18	18.3730	26.4100	0.2500	1.0000	A572-65 (65 ksi)
L3	132.0800-86.9900	48.9200	5.00	18	25.0648	35.8800	0.3750	1.5000	A572-65 (65 ksi)
L4	86.9900-42.9100	49.0800	6.17	18	34.0246	44.8800	0.4375	1.7500	A572-65 (65 ksi)
L5	42.9100-0.0000	49.0800		18	42.6403	53.5000	0.4375	1.7500	A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	15.7102	9.1129	269.9504	5.4359	7.8740	34.2838	540.2560	4.5573	2.3980	12.789
	19.6907	11.4457	534.8757	6.8275	9.8654	54.2176	1070.4552	5.7240	3.0879	16.469
L2	19.2901	14.3806	596.7256	6.4337	9.3335	63.9339	1194.2363	7.1917	2.7936	11.175
	26.7789	20.7580	1794.7237	9.2868	13.4163	133.7721	3591.8090	10.3810	4.2082	16.833
L3	26.2534	29.3870	2263.2318	8.7649	12.7329	177.7464	4529.4417	14.6963	3.7514	10.004
	36.3757	42.2598	6730.4514	12.6043	18.2270	369.2564	13469.7589	21.1339	5.6549	15.08
L4	35.6049	46.6399	6647.2213	11.9234	17.2845	384.5770	13303.1892	23.3244	5.2183	11.928
	45.5049	61.7140	15399.8990	15.7771	22.7990	675.4626	30820.0616	30.8628	7.1289	16.295
L5	44.6169	58.6039	13187.0389	14.9820	21.6613	608.7836	26391.4297	29.3075	6.7347	15.394
	54.2578	73.6839	26211.1184	18.8372	27.1780	964.4241	52456.7261	36.8490	8.6460	19.762

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
L1 183.0000-165.5000				1	1	1			
L2 165.5000-132.0800				1	1	1			
L3 132.0800-86.9900				1	1	1			
L4 86.9900-42.9100				1	1	1			
L5 42.9100-0.0000				1	1	1			

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Sector	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight klf
LDF4P-50A(1/2")	A	No	Surface Ar (CaAa)	156.0000 - 5.0000	3	3	0.000 0.000	0.6300		0.00
2-1/2"	A	No	Surface Ar (CaAa)	156.0000 - 5.0000	2	2	0.000 0.000	2.3800		0.00
***										
LDF7-50A(1-5/8")	B	No	Surface Ar (CaAa)	113.0000 - 5.0000	2	2	0.000 0.000	1.9800		0.00
****										
*****										
7" x 0.5" Flat	A	No	Surface Af (CaAa)	43.0800 - 0.0000	1	1	-0.250 -0.083	7.0000	15.0000	0.00
7" x 0.5" Flat	A	No	Surface Af (CaAa)	43.0800 - 0.0000	1	1	0.250 0.417	7.0000	15.0000	0.00
7" x 0.5" Flat	B	No	Surface Af (CaAa)	43.0800 - 0.0000	1	1	-0.417 -0.250	7.0000	15.0000	0.00
7" x 0.5" Flat	B	No	Surface Af (CaAa)	43.0800 - 0.0000	1	1	0.250 0.417	7.0000	15.0000	0.00
7" x 0.5" Flat	C	No	Surface Af (CaAa)	43.0800 - 0.0000	1	1	-0.250 -0.083	7.0000	15.0000	0.00
7" x 0.5" Flat	C	No	Surface Af (CaAa)	43.0800 - 0.0000	1	1	0.083 0.250	7.0000	15.0000	0.00
6" x 0.25" Flat	A	No	Surface Af (CaAa)	87.6700 - 43.0800	1	1	-0.250 -0.083	6.0000	12.5000	0.00
6" x 0.25" Flat	A	No	Surface Af (CaAa)	87.6700 - 43.0800	1	1	0.250 0.417	6.0000	12.5000	0.00
6" x 0.25" Flat	B	No	Surface Af (CaAa)	87.6700 - 43.0800	1	1	-0.417 -0.250	6.0000	12.5000	0.00
6" x 0.25" Flat	B	No	Surface Af (CaAa)	87.6700 - 43.0800	1	1	0.250 0.417	6.0000	12.5000	0.00
6" x 0.25" Flat	C	No	Surface Af (CaAa)	87.6700 - 43.0800	1	1	-0.250 -0.083	6.0000	12.5000	0.00
6" x 0.25" Flat	C	No	Surface Af (CaAa)	87.6700 - 43.0800	1	1	0.083 0.250	6.0000	12.5000	0.00
5" x 0.25" Flat	A	No	Surface Af (CaAa)	117.5800 - 87.6700	1	1	-0.250 -0.083	5.0000	10.5000	0.00
5" x 0.25" Flat	A	No	Surface Af (CaAa)	117.5800 - 87.6700	1	1	0.250 0.417	5.0000	10.5000	0.00
5" x 0.25" Flat	B	No	Surface Af (CaAa)	117.5800 - 87.6700	1	1	-0.417 -0.250	5.0000	10.5000	0.00
5" x 0.25" Flat	B	No	Surface Af (CaAa)	117.5800 - 87.6700	1	1	0.250 0.417	5.0000	10.5000	0.00
5" x 0.25" Flat	C	No	Surface Af (CaAa)	117.5800 - 87.6700	1	1	-0.250 -0.083	5.0000	10.5000	0.00
5" x 0.25" Flat	C	No	Surface Af (CaAa)	117.5800 - 87.6700	1	1	0.083 0.250	5.0000	10.5000	0.00

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight klf
LDF5-50A(7/8")	B	No	No	Inside Pole	183.0000 - 5.0000	4	No Ice	0.0000	0.00
							1/2" Ice	0.0000	0.00
							1" Ice	0.0000	0.00
LDF2-50A(3/8")	B	No	No	Inside Pole	183.0000 - 5.0000	2	No Ice	0.0000	0.00
							1/2" Ice	0.0000	0.00

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight klf
							1" Ice	0.0000	0.00
LCF12-50J-P7(5/8")	B	No	No	Inside Pole	184.2500 - 5.0000	1	No Ice	0.0000	0.00
							1/2" Ice	0.0000	0.00
							1" Ice	0.0000	0.00
***									
LDF6-50A(1-1/4")	A	No	No	Inside Pole	156.0000 - 5.0000	4	No Ice	0.0000	0.00
							1/2" Ice	0.0000	0.00
							1" Ice	0.0000	0.00
LDF4P-50A(1/2")	A	No	No	Inside Pole	156.0000 - 5.0000	2	No Ice	0.0000	0.00
							1/2" Ice	0.0000	0.00
							1" Ice	0.0000	0.00
***									
LDF7-50A(1-5/8")	B	No	No	Inside Pole	145.0000 - 5.0000	6	No Ice	0.0000	0.00
							1/2" Ice	0.0000	0.00
							1" Ice	0.0000	0.00
DC Power Cables	B	No	No	Inside Pole	145.0000 - 5.0000	2	No Ice	0.0000	0.00
							1/2" Ice	0.0000	0.00
							1" Ice	0.0000	0.00
Fiber Cables	B	No	No	Inside Pole	145.0000 - 5.0000	8	No Ice	0.0000	0.00
							1/2" Ice	0.0000	0.00
							1" Ice	0.0000	0.00
***									
LCF12-50J-P7(5/8")	B	No	No	Inside Pole	124.0000 - 5.0000	7	No Ice	0.0000	0.00
							1/2" Ice	0.0000	0.00
							1" Ice	0.0000	0.00
***									
LDF4P-50A(1/2")	A	No	No	Inside Pole	51.7500 - 5.0000	1	No Ice	0.0000	0.00
							1/2" Ice	0.0000	0.00
							1" Ice	0.0000	0.00
0.2" Cable	A	No	No	Inside Pole	51.7500 - 5.0000	2	No Ice	0.0000	0.00
							1/2" Ice	0.0000	0.00
							1" Ice	0.0000	0.00
T-Mobile									
LDF7-50A(1-5/8")	C	No	No	Inside Pole	163.0000 - 5.0000	21	No Ice	0.0000	0.00
							1/2" Ice	0.0000	0.00
							1" Ice	0.0000	0.00
9x18 MLE Hybrid Line - 40mm	C	No	No	Inside Pole	163.0000 - 5.0000	1	No Ice	0.0000	0.00
							1/2" Ice	0.0000	0.00
							1" Ice	0.0000	0.00
HCS 6X12 4AWG (1-5/8")	C	No	No	Inside Pole	163.0000 - 5.0000	3	No Ice	0.0000	0.00
							1/2" Ice	0.0000	0.00
							1" Ice	0.0000	0.00
****									

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	183.0000-165.500	A	0.000	0.000	0.000	0.000	0.00
	0	B	0.000	0.000	0.000	0.000	0.03
		C	0.000	0.000	0.000	0.000	0.00
L2	165.5000-132.080	A	0.000	0.000	15.907	0.000	0.14
	0	B	0.000	0.000	0.000	0.000	0.24

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
		C	0.000	0.000	0.000	0.000	0.68
L3	132.0800-86.9900	A	0.000	0.000	81.195	0.000	0.26
		B	0.000	0.000	61.510	0.000	0.80
		C	0.000	0.000	51.210	0.000	0.99
L4	86.9900-42.9100	A	0.000	0.000	117.530	0.000	0.25
		B	0.000	0.000	105.672	0.000	0.82
		C	0.000	0.000	88.217	0.000	0.96
L5	42.9100-0.0000	A	0.000	0.000	125.333	0.000	0.23
		B	0.000	0.000	115.136	0.000	0.71
		C	0.000	0.000	100.123	0.000	0.83

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	183.0000-165.500	A	2.952	0.000	0.000	0.000	0.000	0.00
	0	B		0.000	0.000	0.000	0.000	0.03
		C		0.000	0.000	0.000	0.000	0.00
L2	165.5000-132.080	A	2.905	0.000	0.000	55.190	0.000	1.12
	0	B		0.000	0.000	0.000	0.000	0.24
		C		0.000	0.000	0.000	0.000	0.68
L3	132.0800-86.9900	A	2.816	0.000	0.000	189.724	0.000	3.55
		B		0.000	0.000	118.517	0.000	2.86
		C		0.000	0.000	86.753	0.000	2.47
L4	86.9900-42.9100	A	2.674	0.000	0.000	236.590	0.000	4.18
		B		0.000	0.000	190.731	0.000	3.99
		C		0.000	0.000	137.875	0.000	3.20
L5	42.9100-0.0000	A	2.388	0.000	0.000	228.206	0.000	3.81
		B		0.000	0.000	190.119	0.000	3.69
		C		0.000	0.000	146.014	0.000	3.07

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	183.0000-165.5000	0.0000	0.0000	0.0000	0.0000
L2	165.5000-132.0800	-3.0674	-1.7710	-3.0951	-1.7870
L3	132.0800-86.9900	-1.2643	-0.7788	-1.6295	-1.3479
L4	86.9900-42.9100	-0.9004	-0.5505	-1.1906	-1.3131
L5	42.9100-0.0000	-0.9494	-0.3005	-1.2512	-1.1592

Note: For pole sections, center of pressure calculations do not consider feed line shielding.

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L1	7	LDF4P-50A(1/2")	165.50 - 156.00	1.0000	1.0000
L1	8	2-1/2"	165.50 - 156.00	1.0000	1.0000
L2	7	LDF4P-50A(1/2")	132.08 - 156.00	1.0000	1.0000
L2	8	2-1/2"	132.08 - 156.00	1.0000	1.0000
L2	16	LDF7-50A(1-5/8")	132.08 - 113.00	1.0000	1.0000
L2	32	6" x 0.25" Flat	132.08 - 87.67	1.0000	1.0000
L2	33	6" x 0.25" Flat	132.08 - 87.67	1.0000	1.0000
L2	34	6" x 0.25" Flat	132.08 - 87.67	1.0000	1.0000
L2	35	6" x 0.25" Flat	132.08 - 87.67	1.0000	1.0000
L2	36	6" x 0.25" Flat	132.08 - 87.67	1.0000	1.0000
L2	37	6" x 0.25" Flat	132.08 - 87.67	1.0000	1.0000
L2	38	5" x 0.25" Flat	132.08 - 117.58	1.0000	1.0000
L2	39	5" x 0.25" Flat	132.08 - 117.58	1.0000	1.0000
L2	40	5" x 0.25" Flat	132.08 - 117.58	1.0000	1.0000
L2	41	5" x 0.25" Flat	132.08 - 117.58	1.0000	1.0000
L2	42	5" x 0.25" Flat	132.08 - 117.58	1.0000	1.0000
L2	43	5" x 0.25" Flat	132.08 - 117.58	1.0000	1.0000
L3	7	LDF4P-50A(1/2")	86.99 - 132.08	1.0000	1.0000
L3	8	2-1/2"	86.99 - 132.08	1.0000	1.0000
L3	16	LDF7-50A(1-5/8")	86.99 - 113.00	1.0000	1.0000
L3	26	7" x 0.5" Flat	86.99 - 43.08	1.0000	1.0000
L3	27	7" x 0.5" Flat	86.99 - 43.08	1.0000	1.0000
L3	28	7" x 0.5" Flat	86.99 - 43.08	1.0000	1.0000
L3	29	7" x 0.5" Flat	86.99 - 43.08	1.0000	1.0000
L3	30	7" x 0.5" Flat	86.99 - 43.08	1.0000	1.0000
L3	31	7" x 0.5" Flat	86.99 - 43.08	1.0000	1.0000
L3	32	6" x 0.25" Flat	86.99 - 87.67	1.0000	1.0000
L3	33	6" x 0.25" Flat	86.99 - 87.67	1.0000	1.0000
L3	34	6" x 0.25" Flat	86.99 - 87.67	1.0000	1.0000
L3	35	6" x 0.25" Flat	86.99 - 87.67	1.0000	1.0000
L3	36	6" x 0.25" Flat	86.99 - 87.67	1.0000	1.0000
L3	37	6" x 0.25" Flat	86.99 - 87.67	1.0000	1.0000
L4	7	LDF4P-50A(1/2")	42.91 - 86.99	1.0000	1.0000
L4	8	2-1/2"	42.91 - 86.99	1.0000	1.0000
L4	16	LDF7-50A(1-5/8")	42.91 - 86.99	1.0000	1.0000
L4	26	7" x 0.5" Flat	42.91 - 43.08	1.0000	1.0000
L4	27	7" x 0.5" Flat	42.91 - 43.08	1.0000	1.0000
L4	28	7" x 0.5" Flat	42.91 - 43.08	1.0000	1.0000
L4	29	7" x 0.5" Flat	42.91 - 43.08	1.0000	1.0000
L4	30	7" x 0.5" Flat	42.91 - 43.08	1.0000	1.0000
L4	31	7" x 0.5" Flat	42.91 - 43.08	1.0000	1.0000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
Lightning Rod w/ Pipe Extension	A	From Leg	1.0000 0.00 6.00	0.0000	189.7500	No Ice 1/2" Ice 1" Ice	2.5800 4.0200 5.4600	2.5800 4.0200 5.4600	0.05 0.08 0.11
14' Low Profile Platform	A	None		0.0000	184.0000	No Ice 1/2" Ice 1" Ice	15.7000 20.1000 24.5000	15.7000 20.1000 24.5000	1.30 1.76 2.23
24' 4-Bay Dipole	C	From Leg	3.5000 0.00 0.00	0.0000	184.0000	No Ice 1/2" Ice 1" Ice	4.7500 6.2500 7.7500	4.7500 6.2500 7.7500	0.05 0.08 0.11
24' 4-Bay Dipole	C	From Leg	3.5000 0.00 0.00	0.0000	184.0000	No Ice 1/2" Ice 1" Ice	4.7500 6.2500 7.7500	4.7500 6.2500 7.7500	0.05 0.08 0.11
9" x 9" x 3.5" TMA	A	From Leg	3.5000 0.00 5.50	0.0000	184.0000	No Ice 1/2" Ice 1" Ice	0.6750 0.7787 0.8898	0.2632 0.3356 0.4162	0.01 0.02 0.02
9" x 9" x 3.5" TMA	C	From Leg	3.5000 0.00 5.50	0.0000	184.0000	No Ice 1/2" Ice 1" Ice	0.6750 0.7787 0.8898	0.2632 0.3356 0.4162	0.01 0.02 0.02
163'									
AIR 32 B2a/B66Aa w/ Mount Pipe	A	From Leg	3.5000 0.00 0.00	0.0000	163.0000	No Ice 1/2" Ice 1" Ice	3.7600 4.1200 4.4800	3.1500 3.4900 3.8400	0.19 0.25 0.32
AIR 32 B2a/B66Aa w/ Mount Pipe	B	From Leg	3.5000 0.00 0.00	0.0000	163.0000	No Ice 1/2" Ice 1" Ice	3.7600 4.1200 4.4800	3.1500 3.4900 3.8400	0.19 0.25 0.32
AIR 32 B2a/B66Aa w/ Mount Pipe	C	From Leg	3.5000 0.00 0.00	0.0000	163.0000	No Ice 1/2" Ice 1" Ice	3.7600 4.1200 4.4800	3.1500 3.4900 3.8400	0.19 0.25 0.32
Ericsson AIR6449 B41 w/ Mount Pipe	A	From Leg	3.5000 0.00 0.00	0.0000	163.0000	No Ice 1/2" Ice 1" Ice	6.8995 7.7436 8.4932	4.3156 5.3695 6.2751	0.13 0.19 0.26
Ericsson AIR6449 B41 w/ Mount Pipe	B	From Leg	3.5000 0.00 0.00	0.0000	163.0000	No Ice 1/2" Ice 1" Ice	6.8995 7.7436 8.4932	4.3156 5.3695 6.2751	0.13 0.19 0.26
Ericsson AIR6449 B41 w/ Mount Pipe	C	From Leg	3.5000 0.00 0.00	0.0000	163.0000	No Ice 1/2" Ice 1" Ice	6.8995 7.7436 8.4932	4.3156 5.3695 6.2751	0.13 0.19 0.26
AIR 3246 B66 w/ Mount Pipe	A	From Leg	3.5000 0.00 0.00	0.0000	163.0000	No Ice 1/2" Ice 1" Ice	8.1769 8.6563 9.1243	6.5590 7.3933 8.1279	0.20 0.27 0.35
AIR 3246 B66 w/ Mount Pipe	B	From Leg	3.5000 0.00 0.00	0.0000	163.0000	No Ice 1/2" Ice 1" Ice	8.1769 8.6563 9.1243	6.5590 7.3933 8.1279	0.20 0.27 0.35
AIR 3246 B66 w/ Mount Pipe	C	From Leg	3.5000 0.00 0.00	0.0000	163.0000	No Ice 1/2" Ice 1" Ice	8.1769 8.6563 9.1243	6.5590 7.3933 8.1279	0.20 0.27 0.35
APXVAARR24_43-U-NA20 w/ Mount Pipe	A	From Leg	3.5000 0.00 0.00	0.0000	163.0000	No Ice 1/2" Ice 1" Ice	14.6900 15.4600 16.2300	6.8700 7.5500 8.2500	0.19 0.31 0.46
APXVAARR24_43-U-NA20 w/ Mount Pipe	B	From Leg	3.5000 0.00 0.00	0.0000	163.0000	No Ice 1/2" Ice 1" Ice	14.6900 15.4600 16.2300	6.8700 7.5500 8.2500	0.19 0.31 0.46
APXVAARR24_43-U-NA20 w/ Mount Pipe	C	From Leg	3.5000 0.00 0.00	0.0000	163.0000	No Ice 1/2" Ice 1" Ice	14.6900 15.4600 16.2300	6.8700 7.5500 8.2500	0.19 0.31 0.46
Radio 4449 B71+B85_T-Mobile	A	From Leg	3.5000 0.00	0.0000	163.0000	No Ice 1/2" Ice	1.9701 2.1466	1.5865 1.7488	0.07 0.09

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00			1" Ice	2.3306	1.9185	0.12
Radio 4449	B	From Leg	3.5000	0.0000	163.0000	No Ice	1.9701	1.5865	0.07
B71+B85_T-Mobile			0.00			1/2" Ice	2.1466	1.7488	0.09
			0.00			1" Ice	2.3306	1.9185	0.12
Radio 4449	C	From Leg	3.5000	0.0000	163.0000	No Ice	1.9701	1.5865	0.07
B71+B85_T-Mobile			0.00			1/2" Ice	2.1466	1.7488	0.09
			0.00			1" Ice	2.3306	1.9185	0.12
RRUS 4415 B25	A	From Leg	3.5000	0.0000	163.0000	No Ice	1.6444	0.6788	0.04
			0.00			1/2" Ice	1.8044	0.7911	0.06
			0.00			1" Ice	1.9719	0.9129	0.07
RRUS 4415 B25	B	From Leg	3.5000	0.0000	163.0000	No Ice	1.6444	0.6788	0.04
			0.00			1/2" Ice	1.8044	0.7911	0.06
			0.00			1" Ice	1.9719	0.9129	0.07
RRUS 4415 B25	C	From Leg	3.5000	0.0000	163.0000	No Ice	1.6444	0.6788	0.04
			0.00			1/2" Ice	1.8044	0.7911	0.06
			0.00			1" Ice	1.9719	0.9129	0.07
Platform Mount [LP 1201-1_HR-1]	C	None		0.0000	163.0000	No Ice	26.3900	26.3900	2.36
						1/2" Ice	31.4000	31.4000	3.06
						1" Ice	36.2000	36.2000	3.86
Site Pro 1 (P/N: PRK-1245L)	C	None		0.0000	163.0000	No Ice	6.3200	4.8500	0.28
						1/2" Ice	7.7900	6.3600	0.42
						1" Ice	9.3600	7.9400	0.60
153									
APXVSPP18-C w/ Mount Pipe	A	From Leg	3.5000	0.0000	154.0000	No Ice	4.6000	4.0100	0.09
			0.00			1/2" Ice	5.0500	4.4500	0.15
			2.00			1" Ice	5.5000	4.8900	0.23
APXVSPP18-C w/ Mount Pipe	B	From Leg	3.5000	0.0000	154.0000	No Ice	4.6000	4.0100	0.09
			0.00			1/2" Ice	5.0500	4.4500	0.15
			2.00			1" Ice	5.5000	4.8900	0.23
APXVSPP18-C w/ Mount Pipe	C	From Leg	3.5000	0.0000	154.0000	No Ice	4.6000	4.0100	0.09
			0.00			1/2" Ice	5.0500	4.4500	0.15
			2.00			1" Ice	5.5000	4.8900	0.23
APXVTM14-C-120 w/ Mount Pipe	A	From Leg	3.5000	0.0000	154.0000	No Ice	4.0900	2.8600	0.08
			0.00			1/2" Ice	4.4800	3.2300	0.13
			2.00			1" Ice	4.8800	3.6100	0.19
APXVTM14-C-120 w/ Mount Pipe	B	From Leg	3.5000	0.0000	154.0000	No Ice	4.0900	2.8600	0.08
			0.00			1/2" Ice	4.4800	3.2300	0.13
			2.00			1" Ice	4.8800	3.6100	0.19
APXVTM14-C-120 w/ Mount Pipe	C	From Leg	3.5000	0.0000	154.0000	No Ice	4.0900	2.8600	0.08
			0.00			1/2" Ice	4.4800	3.2300	0.13
			2.00			1" Ice	4.8800	3.6100	0.19
RRH2X50-800	A	From Leg	3.5000	0.0000	154.0000	No Ice	1.7008	1.2822	0.05
			0.00			1/2" Ice	1.8640	1.4275	0.07
			2.00			1" Ice	2.0345	1.5803	0.09
RRH2X50-800	B	From Leg	3.5000	0.0000	154.0000	No Ice	1.7008	1.2822	0.05
			0.00			1/2" Ice	1.8640	1.4275	0.07
			2.00			1" Ice	2.0345	1.5803	0.09
RRH2X50-800	C	From Leg	3.5000	0.0000	154.0000	No Ice	1.7008	1.2822	0.05
			0.00			1/2" Ice	1.8640	1.4275	0.07
			2.00			1" Ice	2.0345	1.5803	0.09
TD-RRH8x20	A	From Leg	3.5000	0.0000	154.0000	No Ice	3.7042	1.2939	0.07
			0.00			1/2" Ice	3.9462	1.4646	0.09
			4.50			1" Ice	4.1956	1.6424	0.12
TD-RRH8x20	B	From Leg	3.5000	0.0000	154.0000	No Ice	3.7042	1.2939	0.07
			0.00			1/2" Ice	3.9462	1.4646	0.09
			4.50			1" Ice	4.1956	1.6424	0.12
TD-RRH8x20	C	From Leg	3.5000	0.0000	154.0000	No Ice	3.7042	1.2939	0.07

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00			1/2" Ice	3.9462	1.4646	0.09
			4.50			1" Ice	4.1956	1.6424	0.12
(2) PCS 1900MHz 4x45W-65MHz	A	From Leg	1.0000	0.0000	154.0000	No Ice	2.3218	2.2381	0.06
			0.00			1/2" Ice	2.5266	2.4407	0.08
			4.50			1" Ice	2.7388	2.6507	0.11
(2) PCS 1900MHz 4x45W-65MHz	B	From Leg	1.0000	0.0000	154.0000	No Ice	2.3218	2.2381	0.06
			0.00			1/2" Ice	2.5266	2.4407	0.08
			4.50			1" Ice	2.7388	2.6507	0.11
(2) PCS 1900MHz 4x45W-65MHz	C	From Leg	1.0000	0.0000	154.0000	No Ice	2.3218	2.2381	0.06
			0.00			1/2" Ice	2.5266	2.4407	0.08
			4.50			1" Ice	2.7388	2.6507	0.11
18" x 18" x 6.5" Junction Box	A	From Leg	1.0000	0.0000	154.0000	No Ice	2.7000	1.0528	0.05
			0.00			1/2" Ice	3.1148	1.3424	0.07
			0.00			1" Ice	3.5296	1.6320	0.09
13' Low Profile Platform	A	None		0.0000	154.0000	No Ice	15.7000	15.7000	1.30
						1/2" Ice	20.1000	20.1000	1.76
						1" Ice	24.5000	24.5000	2.23
Ring Mount	C	None		0.0000	159.0000	No Ice	1.4000	1.4000	0.09
						1/2" Ice	2.4000	2.4000	0.13
						1" Ice	3.4000	3.4000	0.17
154'									
MTI1669	B	From Leg	3.5000	0.0000	153.8300	No Ice	1.7521	0.5236	0.05
			0.00			1/2" Ice	2.0213	0.7236	0.07
			0.00			1" Ice	2.2905	0.9236	0.09
146									
800 10121	A	From Leg	3.5000	0.0000	145.0000	No Ice	3.7400	2.1700	0.05
			0.00			1/2" Ice	4.1800	2.5800	0.08
			0.00			1" Ice	4.6300	3.0000	0.12
800 10121	B	From Leg	3.5000	0.0000	145.0000	No Ice	3.7400	2.1700	0.05
			0.00			1/2" Ice	4.1800	2.5800	0.08
			0.00			1" Ice	4.6300	3.0000	0.12
800 10121	C	From Leg	3.5000	0.0000	145.0000	No Ice	3.7400	2.1700	0.05
			0.00			1/2" Ice	4.1800	2.5800	0.08
			0.00			1" Ice	4.6300	3.0000	0.12
(2) OPA-65R-LCUU-H6	A	From Leg	3.5000	0.0000	145.0000	No Ice	9.2000	4.6300	0.08
			0.00			1/2" Ice	9.9700	5.3400	0.14
			0.00			1" Ice	10.7600	6.0700	0.20
(2) OPA-65R-LCUU-H8	B	From Leg	3.5000	0.0000	145.0000	No Ice	11.9500	6.0300	0.07
			0.00			1/2" Ice	12.9200	6.9300	0.14
			0.00			1" Ice	13.9000	7.8500	0.22
(2) OPA-65R-LCUU-H8	C	From Leg	3.5000	0.0000	145.0000	No Ice	11.9500	6.0300	0.07
			0.00			1/2" Ice	12.9200	6.9300	0.14
			0.00			1" Ice	13.9000	7.8500	0.22
(2) LGP21401	A	From Leg	3.5000	0.0000	145.0000	No Ice	1.1040	0.2070	0.01
			0.00			1/2" Ice	1.2388	0.2738	0.02
			0.00			1" Ice	1.3810	0.3475	0.03
(2) LGP21401	B	From Leg	3.5000	0.0000	145.0000	No Ice	1.1040	0.2070	0.01
			0.00			1/2" Ice	1.2388	0.2738	0.02
			0.00			1" Ice	1.3810	0.3475	0.03
(2) LGP21401	C	From Leg	3.5000	0.0000	145.0000	No Ice	1.1040	0.2070	0.01
			0.00			1/2" Ice	1.2388	0.2738	0.02
			0.00			1" Ice	1.3810	0.3475	0.03
(2) LGP21901	A	From Leg	3.5000	0.0000	145.0000	No Ice	0.2310	0.1575	0.01
			0.00			1/2" Ice	0.2941	0.2129	0.01
			0.00			1" Ice	0.3647	0.2756	0.01
(2) LGP21901	B	From Leg	3.5000	0.0000	145.0000	No Ice	0.2310	0.1575	0.01
			0.00			1/2" Ice	0.2941	0.2129	0.01

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00			1" Ice	0.3647	0.2756	0.01
(2) LGP21901	C	From Leg	3.5000	0.0000	145.0000	No Ice	0.2310	0.1575	0.01
			0.00			1/2" Ice	0.2941	0.2129	0.01
			0.00			1" Ice	0.3647	0.2756	0.01
RRUS 32 B66	A	From Leg	3.5000	0.0000	145.0000	No Ice	2.7427	1.6681	0.05
			0.00			1/2" Ice	2.9647	1.8552	0.07
			0.00			1" Ice	3.1941	2.0493	0.10
RRUS 32 B66	B	From Leg	3.5000	0.0000	145.0000	No Ice	2.7427	1.6681	0.05
			0.00			1/2" Ice	2.9647	1.8552	0.07
			0.00			1" Ice	3.1941	2.0493	0.10
RRUS 32 B66	C	From Leg	3.5000	0.0000	145.0000	No Ice	2.7427	1.6681	0.05
			0.00			1/2" Ice	2.9647	1.8552	0.07
			0.00			1" Ice	3.1941	2.0493	0.10
RRUS 32 B30	A	From Leg	3.5000	0.0000	145.0000	No Ice	2.6923	1.5727	0.06
			0.00			1/2" Ice	2.9115	1.7556	0.08
			0.00			1" Ice	3.1382	1.9455	0.10
RRUS 32 B30	B	From Leg	3.5000	0.0000	145.0000	No Ice	2.6923	1.5727	0.06
			0.00			1/2" Ice	2.9115	1.7556	0.08
			0.00			1" Ice	3.1382	1.9455	0.10
RRUS 32 B30	C	From Leg	3.5000	0.0000	145.0000	No Ice	2.6923	1.5727	0.06
			0.00			1/2" Ice	2.9115	1.7556	0.08
			0.00			1" Ice	3.1382	1.9455	0.10
DC6-48-60-18-8C	A	From Leg	3.5000	0.0000	145.0000	No Ice	1.1450	1.1450	0.03
			0.00			1/2" Ice	1.7924	1.7924	0.05
			0.00			1" Ice	2.0024	2.0024	0.07
DC6-48-60-18-8C	B	From Leg	3.5000	0.0000	145.0000	No Ice	1.1450	1.1450	0.03
			0.00			1/2" Ice	1.7924	1.7924	0.05
			0.00			1" Ice	2.0024	2.0024	0.07
RRUS 11 B12	A	From Leg	3.5000	0.0000	145.0000	No Ice	2.8333	1.1821	0.05
			0.00			1/2" Ice	3.0426	1.3299	0.07
			0.00			1" Ice	3.2593	1.4848	0.10
RRUS 11 B12	B	From Leg	3.5000	0.0000	145.0000	No Ice	2.8333	1.1821	0.05
			0.00			1/2" Ice	3.0426	1.3299	0.07
			0.00			1" Ice	3.2593	1.4848	0.10
RRUS 11 B12	C	From Leg	3.5000	0.0000	145.0000	No Ice	2.8333	1.1821	0.05
			0.00			1/2" Ice	3.0426	1.3299	0.07
			0.00			1" Ice	3.2593	1.4848	0.10
RRUS 4478 B5	A	From Leg	3.5000	0.0000	145.0000	No Ice	1.8425	1.0588	0.06
			0.00			1/2" Ice	2.0123	1.1969	0.08
			0.00			1" Ice	2.1895	1.3425	0.09
RRUS 4478 B5	B	From Leg	3.5000	0.0000	145.0000	No Ice	1.8425	1.0588	0.06
			0.00			1/2" Ice	2.0123	1.1969	0.08
			0.00			1" Ice	2.1895	1.3425	0.09
RRUS 4478 B5	C	From Leg	3.5000	0.0000	145.0000	No Ice	1.8425	1.0588	0.06
			0.00			1/2" Ice	2.0123	1.1969	0.08
			0.00			1" Ice	2.1895	1.3425	0.09
NNH4-65B-R6	A	From Leg	3.5000	0.0000	145.0000	No Ice	7.6200	3.0100	0.10
			0.00			1/2" Ice	8.1200	3.4500	0.17
			0.00			1" Ice	8.6300	3.9000	0.25
NNH4-65C-R6	B	From Leg	3.5000	0.0000	145.0000	No Ice	9.7500	3.9600	0.10
			0.00			1/2" Ice	10.3600	4.5000	0.19
			0.00			1" Ice	10.9700	5.0600	0.30
NNH4-65C-R6	C	From Leg	3.5000	0.0000	145.0000	No Ice	9.7500	3.9600	0.10
			0.00			1/2" Ice	10.3600	4.5000	0.19
			0.00			1" Ice	10.9700	5.0600	0.30
RRUS E2 B29	A	From Leg	3.5000	0.0000	145.0000	No Ice	3.1450	1.2854	0.06
			0.00			1/2" Ice	3.3648	1.4379	0.08

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00				1" Ice	3.5920	1.5998	0.11
RRUS E2 B29	B	From Leg	3.5000		0.0000	145.0000	No Ice	3.1450	1.2854	0.06
			0.00				1/2" Ice	3.3648	1.4379	0.08
			0.00				1" Ice	3.5920	1.5998	0.11
RRUS E2 B29	C	From Leg	3.5000		0.0000	145.0000	No Ice	3.1450	1.2854	0.06
			0.00				1/2" Ice	3.3648	1.4379	0.08
			0.00				1" Ice	3.5920	1.5998	0.11
RRUS 12 B2	A	From Leg	3.5000		0.0000	145.0000	No Ice	3.1435	1.2816	0.05
			0.00				1/2" Ice	3.3632	1.4340	0.07
			0.00				1" Ice	3.5904	1.5955	0.10
RRUS 12 B2	B	From Leg	3.5000		0.0000	145.0000	No Ice	3.1435	1.2816	0.05
			0.00				1/2" Ice	3.3632	1.4340	0.07
			0.00				1" Ice	3.5904	1.5955	0.10
RRUS 12 B2	C	From Leg	3.5000		0.0000	145.0000	No Ice	3.1435	1.2816	0.05
			0.00				1/2" Ice	3.3632	1.4340	0.07
			0.00				1" Ice	3.5904	1.5955	0.10
RRUS 4478 B14	A	From Leg	3.5000		0.0000	145.0000	No Ice	1.8425	1.0588	0.06
			0.00				1/2" Ice	2.0123	1.1969	0.08
			0.00				1" Ice	2.1895	1.3425	0.09
RRUS 4478 B14	B	From Leg	3.5000		0.0000	145.0000	No Ice	1.8425	1.0588	0.06
			0.00				1/2" Ice	2.0123	1.1969	0.08
			0.00				1" Ice	2.1895	1.3425	0.09
RRUS 4478 B14	C	From Leg	3.5000		0.0000	145.0000	No Ice	1.8425	1.0588	0.06
			0.00				1/2" Ice	2.0123	1.1969	0.08
			0.00				1" Ice	2.1895	1.3425	0.09
RRU A2	A	From Leg	3.5000		0.0000	145.0000	No Ice	2.0637	0.5047	0.02
			0.00				1/2" Ice	2.2424	0.6147	0.03
			0.00				1" Ice	2.4285	0.7318	0.05
RRU A2	B	From Leg	3.5000		0.0000	145.0000	No Ice	2.0637	0.5047	0.02
			0.00				1/2" Ice	2.2424	0.6147	0.03
			0.00				1" Ice	2.4285	0.7318	0.05
RRU A2	C	From Leg	3.5000		0.0000	145.0000	No Ice	2.0637	0.5047	0.02
			0.00				1/2" Ice	2.2424	0.6147	0.03
			0.00				1" Ice	2.4285	0.7318	0.05
DC6-48-60-0-8C	A	From Leg	3.5000		0.0000	145.0000	No Ice	0.8498	0.8498	0.02
			0.00				1/2" Ice	1.3563	1.3563	0.04
			0.00				1" Ice	1.5325	1.5325	0.05
DC6-48-60-0-8C	B	From Leg	3.5000		0.0000	145.0000	No Ice	0.8498	0.8498	0.02
			0.00				1/2" Ice	1.3563	1.3563	0.04
			0.00				1" Ice	1.5325	1.5325	0.05
Platform Mount [LP 301-1_KCKR]	A	None			0.0000	145.0000	No Ice	35.0300	35.0300	1.86
							1/2" Ice	44.4600	44.4600	2.52
							1" Ice	53.7200	53.7200	3.33
123										
20' 4-Bay Dipole	C	From Leg	3.5000		0.0000	128.1700	No Ice	4.7500	4.7500	0.05
			0.00				1/2" Ice	6.2500	6.2500	0.08
			0.00				1" Ice	7.7500	7.7500	0.11
15' Whip	A	From Leg	3.5000		0.0000	132.0800	No Ice	3.7500	3.7500	0.04
			0.00				1/2" Ice	4.5000	4.5000	0.07
			0.00				1" Ice	5.2500	5.2500	0.10
5'-6" Whip	A	From Leg	3.5000		0.0000	129.4200	No Ice	1.2000	1.2000	0.03
			0.00				1/2" Ice	1.8000	1.8000	0.03
			0.00				1" Ice	2.4000	2.4000	0.04
24" Yagi	C	From Leg	3.5000		0.0000	128.5000	No Ice	1.5000	1.5000	0.01
			0.00				1/2" Ice	2.2500	2.2500	0.02
			0.00				1" Ice	3.0000	3.0000	0.03
15" Yagi	B	From Leg	3.5000		0.0000	125.0800	No Ice	0.7500	0.7500	0.01

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00			1/2" Ice	1.2500	1.2500	0.01
			0.00			1" Ice	1.7500	1.7500	0.01
2'6" Yagi	A	From Leg	3.5000	0.0000	121.7500	No Ice	1.5000	1.5000	0.01
			0.00			1/2" Ice	2.2500	2.2500	0.02
			0.00			1" Ice	3.0000	3.0000	0.03
13' Low Profile Platform	A	None		0.0000	123.0000	No Ice	15.7000	15.7000	1.30
						1/2" Ice	20.1000	20.1000	1.76
						1" Ice	24.5000	24.5000	2.23
112'									
(2) LNX-6514DS-A1M w/ Mount Pipe	A	From Leg	3.5000	0.0000	111.0000	No Ice	4.0900	3.3000	0.06
			0.00			1/2" Ice	4.4900	3.6800	0.13
			0.00			1" Ice	4.8900	4.0600	0.20
(2) LNX-6514DS-A1M w/ Mount Pipe	B	From Leg	3.5000	0.0000	111.0000	No Ice	4.0900	3.3000	0.06
			0.00			1/2" Ice	4.4900	3.6800	0.13
			0.00			1" Ice	4.8900	4.0600	0.20
(2) LNX-6514DS-A1M w/ Mount Pipe	C	From Leg	3.5000	0.0000	111.0000	No Ice	4.0900	3.3000	0.06
			0.00			1/2" Ice	4.4900	3.6800	0.13
			0.00			1" Ice	4.8900	4.0600	0.20
(2) HBXX-6517DS-A2M w/ Mount Pipe	A	From Leg	3.5000	0.0000	111.0000	No Ice	7.9700	5.9900	0.08
			0.00			1/2" Ice	8.7300	6.7200	0.14
			2.00			1" Ice	9.5000	7.4700	0.22
(2) HBXX-6517DS-A2M w/ Mount Pipe	B	From Leg	3.5000	0.0000	111.0000	No Ice	7.9700	5.9900	0.08
			0.00			1/2" Ice	8.7300	6.7200	0.14
			2.00			1" Ice	9.5000	7.4700	0.22
(2) HBXX-6517DS-A2M w/ Mount Pipe	C	From Leg	3.5000	0.0000	111.0000	No Ice	7.9700	5.9900	0.08
			0.00			1/2" Ice	8.7300	6.7200	0.14
			2.00			1" Ice	9.5000	7.4700	0.22
RRFDC-3315-PF-48	B	From Leg	1.0000	0.0000	111.0000	No Ice	3.7079	2.1921	0.02
			0.00			1/2" Ice	3.9505	2.3950	0.05
			4.42			1" Ice	4.2005	2.6056	0.09
RRFDC-3315-PF-48	C	From Leg	1.0000	0.0000	111.0000	No Ice	3.7079	2.1921	0.02
			0.00			1/2" Ice	3.9505	2.3950	0.05
			4.42			1" Ice	4.2005	2.6056	0.09
B25 RRH4X30	A	From Leg	3.5000	0.0000	111.0000	No Ice	2.2000	1.7417	0.06
			0.00			1/2" Ice	2.3926	1.9204	0.08
			2.00			1" Ice	2.5926	2.1065	0.10
B25 RRH4X30	B	From Leg	3.5000	0.0000	111.0000	No Ice	2.2000	1.7417	0.06
			0.00			1/2" Ice	2.3926	1.9204	0.08
			2.00			1" Ice	2.5926	2.1065	0.10
B25 RRH4X30	C	From Leg	3.5000	0.0000	111.0000	No Ice	2.2000	1.7417	0.06
			0.00			1/2" Ice	2.3926	1.9204	0.08
			2.00			1" Ice	2.5926	2.1065	0.10
B13 RRH 4X30	A	From Leg	3.5000	0.0000	111.0000	No Ice	2.0552	1.3201	0.06
			0.00			1/2" Ice	2.2405	1.4754	0.07
			2.00			1" Ice	2.4333	1.6376	0.09
B13 RRH 4X30	B	From Leg	3.5000	0.0000	111.0000	No Ice	2.0552	1.3201	0.06
			0.00			1/2" Ice	2.2405	1.4754	0.07
			2.00			1" Ice	2.4333	1.6376	0.09
B13 RRH 4X30	C	From Leg	3.5000	0.0000	111.0000	No Ice	2.0552	1.3201	0.06
			0.00			1/2" Ice	2.2405	1.4754	0.07
			2.00			1" Ice	2.4333	1.6376	0.09
B4 RRH2X60-4R	A	From Leg	3.5000	0.0000	111.0000	No Ice	3.3554	2.0048	0.06
			0.00			1/2" Ice	3.6120	2.2369	0.08
			2.00			1" Ice	3.8757	2.4759	0.10
B4 RRH2X60-4R	B	From Leg	3.5000	0.0000	111.0000	No Ice	3.3554	2.0048	0.06
			0.00			1/2" Ice	3.6120	2.2369	0.08
			2.00			1" Ice	3.8757	2.4759	0.10

Description	Face or Leg	Offset Type	Offsets: Horz Lateral / Vert (ft / ft / ft)	Azimuth Adjustment (°)	Placement (ft)		C_AA_A Front (ft^2)	C_AA_A Side (ft^2)	Weight (K)
B4 RRH2X60-4R	C	From Leg	3.5000 0.00 2.00	0.0000	111.0000	No Ice 1/2" Ice 1" Ice	3.3554 3.6120 3.8757	2.0048 2.2369 2.4759	0.06 0.08 0.10
RMQP 12' Platform w/ handrails ***55***	C	None		0.0000	111.0000	No Ice 1/2" Ice 1" Ice	26.3000 35.6000 44.9000	26.3000 35.6000 44.9000	1.92 2.34 2.76
3' Side Mount Standoff	B	From Leg	1.5000 0.00 0.00	0.0000	51.7500	No Ice 1/2" Ice 1" Ice	1.5000 2.2000 2.9000	1.5000 2.2000 2.9000	0.04 0.07 0.10
GPS	B	From Leg	3.0000 0.00 0.00	0.0000	51.7500	No Ice 1/2" Ice 1" Ice	0.2100 0.3100 0.4100	0.2100 0.3100 0.4100	0.01 0.01 0.01
12" x 2.5" x 1.5" TMA	B	From Leg	3.0000 0.00 0.00	0.0000	51.7500	No Ice 1/2" Ice 1" Ice	0.5602 0.6590 0.7652	0.3658 0.4493 0.5429	0.02 0.02 0.03

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral / Vert (ft)	Azimuth Adjustment (°)	3 dB Beam Width (°)	Elevation (ft)	Outside Diameter (ft)		Aperture Area (ft^2)	Weight (K)
HPD2-18RS	A	Paraboloid w/Shroud (HP)	From Leg	3.0000 0.00 0.00	70.0000		189.5000	2.0000	No Ice 1/2" Ice 1" Ice	3.1400 3.4100 3.6800	0.03 0.04 0.06
HPD2-18RS	A	Paraboloid w/Shroud (HP)	From Leg	3.0000 0.00 0.00	-60.0000		189.5000	2.0000	No Ice 1/2" Ice 1" Ice	3.1400 3.4100 3.6800	0.03 0.04 0.06
3' Dish w/ Randome	B	Paraboloid w/Radome	From Leg	3.5000 0.00 0.00	-10.0000		150.5000	3.0000	No Ice 1/2" Ice 1" Ice	7.1000 7.9000 8.7000	0.05 0.08 0.11
Andrew VHLP2-23	C	Paraboloid w/Radome	From Leg	3.5000 0.00 0.00	10.0000		151.5000	2.0000	No Ice 1/2" Ice 1" Ice	3.1400 6.4100 9.6800	0.03 0.04 0.05
Andrew VHLP2-18	A	Paraboloid w/Radome	From Leg	3.5000 0.00 0.00	-40.0000		150.5000	2.0000	No Ice 1/2" Ice 1" Ice	3.1400 6.4100 9.6800	0.03 0.04 0.05

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice
3	0.9 Dead+1.6 Wind 0 deg - No Ice
4	1.2 Dead+1.6 Wind 30 deg - No Ice

Comb. No.	Description
5	0.9 Dead+1.6 Wind 30 deg - No Ice
6	1.2 Dead+1.6 Wind 60 deg - No Ice
7	0.9 Dead+1.6 Wind 60 deg - No Ice
8	1.2 Dead+1.6 Wind 90 deg - No Ice
9	0.9 Dead+1.6 Wind 90 deg - No Ice
10	1.2 Dead+1.6 Wind 120 deg - No Ice
11	0.9 Dead+1.6 Wind 120 deg - No Ice
12	1.2 Dead+1.6 Wind 150 deg - No Ice
13	0.9 Dead+1.6 Wind 150 deg - No Ice
14	1.2 Dead+1.6 Wind 180 deg - No Ice
15	0.9 Dead+1.6 Wind 180 deg - No Ice
16	1.2 Dead+1.6 Wind 210 deg - No Ice
17	0.9 Dead+1.6 Wind 210 deg - No Ice
18	1.2 Dead+1.6 Wind 240 deg - No Ice
19	0.9 Dead+1.6 Wind 240 deg - No Ice
20	1.2 Dead+1.6 Wind 270 deg - No Ice
21	0.9 Dead+1.6 Wind 270 deg - No Ice
22	1.2 Dead+1.6 Wind 300 deg - No Ice
23	0.9 Dead+1.6 Wind 300 deg - No Ice
24	1.2 Dead+1.6 Wind 330 deg - No Ice
25	0.9 Dead+1.6 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice+1.0 Temp
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service
41	Dead+Wind 60 deg - Service
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	183 - 165.5	Pole	Max Tension	8	0.00	0.00	-0.00
			Max. Compression	26	-7.11	2.06	0.42
			Max. Mx	20	-1.89	45.59	0.03
			Max. My	2	-1.92	0.21	42.71
			Max. Vy	20	-3.13	45.59	0.03
			Max. Vx	14	3.02	-0.27	-42.69
			Max. Torque	16			-2.39

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L2	165.5 - 132.08	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-70.99	0.93	0.32
			Max. Mx	20	-16.75	521.23	1.11
			Max. My	2	-16.87	1.19	511.74
			Max. Vy	8	24.44	-521.13	-1.94
			Max. Vx	2	-24.03	1.19	511.74
			Max. Torque	16			-2.48
L3	132.08 - 86.99	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-111.25	4.31	3.71
			Max. Mx	20	-31.76	1829.42	3.09
			Max. My	2	-31.86	4.69	1800.48
			Max. Vy	8	34.56	-1828.65	-4.90
			Max. Vx	2	-34.09	4.69	1800.48
			Max. Torque	16			-2.48
L4	86.99 - 42.91	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-139.49	4.96	6.88
			Max. Mx	20	-45.95	3375.47	4.79
			Max. My	2	-46.00	7.61	3326.74
			Max. Vy	8	37.42	-3375.15	-7.95
			Max. Vx	2	-36.96	7.61	3326.74
			Max. Torque	16			-2.36
L5	42.91 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-175.12	5.94	10.47
			Max. Mx	20	-65.06	5266.41	6.96
			Max. My	2	-65.06	11.16	5195.84
			Max. Vy	8	39.43	-5265.98	-11.19
			Max. Vx	2	-39.00	11.16	5195.84
			Max. Torque	16			-2.05

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	26	175.12	-0.00	-0.00
	Max. H_x	21	48.83	39.35	0.04
	Max. H_z	3	48.83	0.07	38.92
	Max. M_x	2	5195.84	0.07	38.92
	Max. M_z	8	5265.98	-39.36	-0.07
	Max. Torsion	2	1.88	0.07	38.92
	Min. Vert	21	48.83	39.35	0.04
	Min. H_x	9	48.83	-39.36	-0.07
	Min. H_z	15	48.83	-0.05	-38.89
	Min. M_x	14	-5189.32	-0.05	-38.89
	Min. M_z	20	-5266.41	39.35	0.04
	Min. Torsion	16	-2.04	19.67	-33.65

Tower Mast Reaction Summary

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead Only	54.25	0.00	0.00	-0.73	0.23	0.00

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
1.2 Dead+1.6 Wind 0 deg - No Ice	65.10	-0.07	-38.92	-5195.84	11.16	-1.88
0.9 Dead+1.6 Wind 0 deg - No Ice	48.83	-0.07	-38.92	-5076.87	10.82	-1.87
1.2 Dead+1.6 Wind 30 deg - No Ice	65.10	19.55	-33.66	-4491.90	-2613.28	-1.82
0.9 Dead+1.6 Wind 30 deg - No Ice	48.83	19.55	-33.66	-4389.03	-2553.57	-1.80
1.2 Dead+1.6 Wind 60 deg - No Ice	65.10	34.00	-19.35	-2576.42	-4547.61	-1.06
0.9 Dead+1.6 Wind 60 deg - No Ice	48.83	34.00	-19.35	-2517.42	-4443.64	-1.04
1.2 Dead+1.6 Wind 90 deg - No Ice	65.10	39.36	0.07	11.19	-5265.98	-0.11
0.9 Dead+1.6 Wind 90 deg - No Ice	48.83	39.36	0.07	11.14	-5145.64	-0.09
1.2 Dead+1.6 Wind 120 deg - No Ice	65.10	34.14	19.54	2607.82	-4570.67	0.43
0.9 Dead+1.6 Wind 120 deg - No Ice	48.83	34.14	19.54	2548.51	-4466.16	0.45
1.2 Dead+1.6 Wind 150 deg - No Ice	65.10	19.75	33.74	4503.01	-2648.02	0.96
0.9 Dead+1.6 Wind 150 deg - No Ice	48.83	19.75	33.74	4400.37	-2587.42	0.96
1.2 Dead+1.6 Wind 180 deg - No Ice	65.10	0.05	38.89	5189.32	-7.97	1.68
0.9 Dead+1.6 Wind 180 deg - No Ice	48.83	0.05	38.89	5070.98	-7.82	1.67
1.2 Dead+1.6 Wind 210 deg - No Ice	65.10	-19.67	33.65	4487.33	2636.51	2.04
0.9 Dead+1.6 Wind 210 deg - No Ice	48.83	-19.67	33.65	4385.04	2576.03	2.02
1.2 Dead+1.6 Wind 240 deg - No Ice	65.10	-34.06	19.45	2593.86	4559.43	1.09
0.9 Dead+1.6 Wind 240 deg - No Ice	48.83	-34.06	19.45	2534.86	4455.01	1.07
1.2 Dead+1.6 Wind 270 deg - No Ice	65.10	-39.35	-0.04	-6.96	5266.41	-0.01
0.9 Dead+1.6 Wind 270 deg - No Ice	48.83	-39.35	-0.04	-6.54	5145.89	-0.02
1.2 Dead+1.6 Wind 300 deg - No Ice	65.10	-34.13	-19.49	-2600.07	4569.21	-0.80
0.9 Dead+1.6 Wind 300 deg - No Ice	48.83	-34.13	-19.49	-2540.48	4464.56	-0.81
1.2 Dead+1.6 Wind 330 deg - No Ice	65.10	-19.71	-33.79	-4511.56	2639.00	-1.39
0.9 Dead+1.6 Wind 330 deg - No Ice	48.83	-19.71	-33.79	-4408.22	2578.52	-1.39
1.2 Dead+1.0 Ice+1.0 Temp	175.12	0.00	0.00	-10.47	5.94	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	175.12	-0.00	-11.52	-1998.35	6.63	-1.18
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	175.12	5.79	-9.97	-1731.18	-994.46	-1.23
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	175.12	10.05	-5.74	-998.88	-1733.30	-0.82
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	175.12	11.65	0.02	-5.93	-2011.37	-0.26
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	175.12	10.10	5.80	990.88	-1744.33	0.28
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	175.12	5.84	10.00	1715.46	-1006.15	0.71

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	175.12	0.02	11.52	1978.47	1.39	1.10
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	175.12	-5.79	9.96	1708.53	1007.19	1.17
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	175.12	-10.03	5.77	984.89	1740.19	0.76
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	175.12	-11.59	-0.01	-12.89	2011.50	0.14
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	175.12	-10.05	-5.76	-1004.74	1744.94	-0.32
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	175.12	-5.79	-10.00	-1736.65	1007.15	-0.83
Dead+Wind 0 deg - Service	54.25	-0.01	-7.11	-939.02	2.24	-0.36
Dead+Wind 30 deg - Service	54.25	3.57	-6.15	-811.76	-471.66	-0.35
Dead+Wind 60 deg - Service	54.25	6.21	-3.53	-465.91	-821.00	-0.22
Dead+Wind 90 deg - Service	54.25	7.19	0.01	1.38	-951.06	-0.02
Dead+Wind 120 deg - Service	54.25	6.23	3.57	470.34	-825.23	0.10
Dead+Wind 150 deg - Service	54.25	3.61	6.16	812.54	-477.96	0.20
Dead+Wind 180 deg - Service	54.25	0.01	7.10	936.56	-1.21	0.32
Dead+Wind 210 deg - Service	54.25	-3.59	6.14	809.67	476.31	0.37
Dead+Wind 240 deg - Service	54.25	-6.22	3.55	467.79	823.61	0.19
Dead+Wind 270 deg - Service	54.25	-7.19	-0.01	-1.89	951.57	-0.00
Dead+Wind 300 deg - Service	54.25	-6.23	-3.56	-470.20	825.39	-0.13
Dead+Wind 330 deg - Service	54.25	-3.60	-6.17	-815.35	476.78	-0.25

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX	PY	PZ	PX	PY	PZ	% Error
	K	K	K	K	K	K	
1	0.00	-54.25	0.00	-0.00	54.25	-0.00	0.000%
2	-0.07	-65.10	-38.93	0.07	65.10	38.92	0.007%
3	-0.07	-48.83	-38.93	0.07	48.83	38.92	0.008%
4	19.55	-65.10	-33.66	-19.55	65.10	33.66	0.000%
5	19.55	-48.83	-33.66	-19.55	48.83	33.66	0.000%
6	34.00	-65.10	-19.35	-34.00	65.10	19.35	0.000%
7	34.00	-48.83	-19.35	-34.00	48.83	19.35	0.000%
8	39.36	-65.10	0.07	-39.36	65.10	-0.07	0.011%
9	39.36	-48.83	0.07	-39.36	48.83	-0.07	0.013%
10	34.14	-65.10	19.54	-34.14	65.10	-19.54	0.000%
11	34.14	-48.83	19.54	-34.14	48.83	-19.54	0.000%
12	19.75	-65.10	33.74	-19.75	65.10	-33.74	0.000%
13	19.75	-48.83	33.74	-19.75	48.83	-33.74	0.000%
14	0.05	-65.10	38.90	-0.05	65.10	-38.89	0.007%
15	0.05	-48.83	38.90	-0.05	48.83	-38.89	0.008%
16	-19.67	-65.10	33.65	19.67	65.10	-33.65	0.000%
17	-19.67	-48.83	33.65	19.67	48.83	-33.65	0.000%
18	-34.06	-65.10	19.45	34.06	65.10	-19.45	0.000%
19	-34.06	-48.83	19.45	34.06	48.83	-19.45	0.000%
20	-39.36	-65.10	-0.04	39.35	65.10	0.04	0.011%
21	-39.36	-48.83	-0.04	39.35	48.83	0.04	0.013%
22	-34.13	-65.10	-19.49	34.13	65.10	19.49	0.000%
23	-34.13	-48.83	-19.49	34.13	48.83	19.49	0.000%
24	-19.71	-65.10	-33.79	19.71	65.10	33.79	0.000%
25	-19.71	-48.83	-33.79	19.71	48.83	33.79	0.000%
26	0.00	-175.12	0.00	-0.00	175.12	-0.00	0.000%
27	-0.00	-175.12	-11.52	0.00	175.12	11.52	0.002%
28	5.79	-175.12	-9.97	-5.79	175.12	9.97	0.002%

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
29	10.06	-175.12	-5.74	-10.05	175.12	5.74	0.002%
30	11.65	-175.12	0.02	-11.65	175.12	-0.02	0.002%
31	10.11	-175.12	5.80	-10.10	175.12	-5.80	0.002%
32	5.84	-175.12	10.00	-5.84	175.12	-10.00	0.002%
33	0.02	-175.12	11.53	-0.02	175.12	-11.52	0.002%
34	-5.79	-175.12	9.97	5.79	175.12	-9.96	0.002%
35	-10.03	-175.12	5.77	10.03	175.12	-5.77	0.002%
36	-11.60	-175.12	-0.01	11.59	175.12	0.01	0.002%
37	-10.05	-175.12	-5.76	10.05	175.12	5.76	0.002%
38	-5.79	-175.12	-10.00	5.79	175.12	10.00	0.002%
39	-0.01	-54.25	-7.11	0.01	54.25	7.11	0.002%
40	3.57	-54.25	-6.15	-3.57	54.25	6.15	0.002%
41	6.21	-54.25	-3.53	-6.21	54.25	3.53	0.002%
42	7.19	-54.25	0.01	-7.19	54.25	-0.01	0.002%
43	6.23	-54.25	3.57	-6.23	54.25	-3.57	0.002%
44	3.61	-54.25	6.16	-3.61	54.25	-6.16	0.002%
45	0.01	-54.25	7.10	-0.01	54.25	-7.10	0.002%
46	-3.59	-54.25	6.14	3.59	54.25	-6.14	0.002%
47	-6.22	-54.25	3.55	6.22	54.25	-3.55	0.002%
48	-7.19	-54.25	-0.01	7.19	54.25	0.01	0.002%
49	-6.23	-54.25	-3.56	6.23	54.25	3.56	0.002%
50	-3.60	-54.25	-6.17	3.60	54.25	6.17	0.002%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	6	0.00000001	0.00000001
2	Yes	22	0.00007158	0.00012411
3	Yes	21	0.00007024	0.00014512
4	Yes	29	0.00000001	0.00009240
5	Yes	28	0.00000001	0.00009176
6	Yes	29	0.00000001	0.00009558
7	Yes	28	0.00000001	0.00009504
8	Yes	21	0.00011410	0.00008927
9	Yes	20	0.00011363	0.00010804
10	Yes	29	0.00000001	0.00009650
11	Yes	28	0.00000001	0.00009587
12	Yes	29	0.00000001	0.00009492
13	Yes	28	0.00000001	0.00009428
14	Yes	22	0.00007160	0.00009574
15	Yes	21	0.00007026	0.00011346
16	Yes	29	0.00000001	0.00009713
17	Yes	28	0.00000001	0.00009669
18	Yes	29	0.00000001	0.00009420
19	Yes	28	0.00000001	0.00009349
20	Yes	21	0.00011409	0.00009572
21	Yes	20	0.00011362	0.00011461
22	Yes	29	0.00000001	0.00009523
23	Yes	28	0.00000001	0.00009449
24	Yes	29	0.00000001	0.00009690
25	Yes	28	0.00000001	0.00009633
26	Yes	20	0.00000001	0.00000156
27	Yes	30	0.00012600	0.00001541
28	Yes	30	0.00012488	0.00009078
29	Yes	30	0.00012485	0.00009792

30	Yes	30	0.00012593	0.00001169
31	Yes	30	0.00012481	0.00009693
32	Yes	30	0.00012486	0.00009233
33	Yes	30	0.00012604	0.00001459
34	Yes	30	0.00012487	0.00009937
35	Yes	30	0.00012484	0.00009314
36	Yes	30	0.00012593	0.00001177
37	Yes	30	0.00012478	0.00009668
38	Yes	30	0.00012480	0.00010074
39	Yes	21	0.00009658	0.00002071
40	Yes	21	0.00009638	0.00002422
41	Yes	21	0.00009638	0.00003022
42	Yes	21	0.00009657	0.00001991
43	Yes	21	0.00009637	0.00002883
44	Yes	21	0.00009637	0.00002586
45	Yes	21	0.00009658	0.00002040
46	Yes	21	0.00009637	0.00003170
47	Yes	21	0.00009637	0.00002573
48	Yes	21	0.00009657	0.00001994
49	Yes	21	0.00009637	0.00002713
50	Yes	21	0.00009637	0.00003044

Maximum Tower Deflections - Service Wind

Section No.	*Elevation*	*Horz. Deflection*	*Gov. Load Comb.*	*Tilt*	*Twist*
	ft	*in*		°	°
L1	183 - 165.5	41.85	48	2.0395	0.0126
L2	168.5 - 132.08	35.72	48	1.9876	0.0065
L3	135.91 - 86.99	22.94	48	1.6802	0.0025
L4	91.99 - 42.91	10.09	48	1.0723	0.0010
L5	49.08 - 0	2.80	48	0.5325	0.0003

Critical Deflections and Radius of Curvature - Service Wind

Elevation	*Appurtenance*	*Gov. Load Comb.*	*Deflection*	*Tilt*	*Twist*	*Radius of Curvature*
ft			*in*	°	°	*ft*
189.7500	Lightning Rod w/ Pipe Extension	48	41.85	2.0395	0.0126	37706
189.5000	HPD2-18RS	48	41.85	2.0395	0.0126	37706
184.0000	14' Low Profile Platform	48	41.85	2.0395	0.0126	37706
163.0000	AIR 32 B2a/B66Aa w/ Mount Pipe	48	33.44	1.9543	0.0050	9535
159.0000	Ring Mount	48	31.80	1.9244	0.0042	7986
154.0000	APXVSPP18-C w/ Mount Pipe	48	29.79	1.8810	0.0035	6638
153.8300	MTI1669	48	29.72	1.8794	0.0035	6600
151.5000	Andrew VHLP2-23	48	28.80	1.8570	0.0032	6122
150.5000	3' Dish w/ Randome	48	28.41	1.8470	0.0032	5937
145.0000	800 10121	48	26.28	1.7884	0.0028	5091
132.0800	15' Whip	48	21.60	1.6313	0.0024	4132
129.4200	5'-6" Whip	48	20.70	1.5964	0.0023	4147
128.5000	24" Yagi	48	20.39	1.5842	0.0023	4152
128.1700	20' 4-Bay Dipole	48	20.28	1.5798	0.0023	4154
125.0800	15" Yagi	48	19.26	1.5382	0.0022	4172
123.0000	13' Low Profile Platform	48	18.59	1.5097	0.0021	4184
121.7500	2'6" Yagi	48	18.20	1.4925	0.0021	4191
111.0000	(2) LNX-6514DS-A1M w/ Mount	48	14.98	1.3411	0.0016	4251

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
	Pipe					
51.7500	3' Side Mount Standoff	48	3.10	0.5634	0.0003	3989

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	183 - 165.5	231.12	20	11.2789	0.0647
L2	168.5 - 132.08	197.42	20	11.0124	0.0324
L3	135.91 - 86.99	126.94	20	9.3177	0.0131
L4	91.99 - 42.91	55.89	20	5.9466	0.0051
L5	49.08 - 0	15.54	20	2.9514	0.0018

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
189.7500	Lightning Rod w/ Pipe Extension	20	231.12	11.2789	0.0647	7687
189.5000	HPD2-18RS	20	231.12	11.2789	0.0647	7687
184.0000	14' Low Profile Platform	20	231.12	11.2789	0.0647	7687
163.0000	AIR 32 B2a/B66Aa w/ Mount Pipe	20	184.84	10.8326	0.0265	1895
159.0000	Ring Mount	20	175.82	10.6691	0.0225	1569
154.0000	APXVSPP18-C w/ Mount Pipe	20	164.72	10.4303	0.0189	1290
153.8300	MTI1669	20	164.35	10.4215	0.0188	1283
151.5000	Andrew VHLP2-23	20	159.27	10.2978	0.0176	1185
150.5000	3' Dish w/ Randome	20	157.10	10.2426	0.0171	1147
145.0000	800 10121	20	145.40	9.9181	0.0152	976
132.0800	15' Whip	20	119.54	9.0465	0.0126	782
129.4200	5'-6" Whip	20	114.53	8.8531	0.0122	783
128.5000	24" Yagi	20	112.83	8.7853	0.0121	784
128.1700	20' 4-Bay Dipole	20	112.22	8.7609	0.0120	784
125.0800	15" Yagi	20	106.61	8.5299	0.0115	785
123.0000	13' Low Profile Platform	20	102.92	8.3721	0.0112	786
121.7500	2'6" Yagi	20	100.74	8.2765	0.0109	787
111.0000	(2) LNX-6514DS-A1M w/ Mount Pipe	20	82.96	7.4375	0.0088	792
51.7500	3' Side Mount Standoff	20	17.18	3.1230	0.0019	723

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
L1	183 - 181.964	TP19.42x15.5x0.1875	17.5000	0.0000	0.0	9.2509	-1.44	687.30	0.002
	181.964 - 180.929					9.3890	-1.47	697.55	0.002
	180.929 - 179.893					9.5271	-1.50	707.81	0.002
	179.893 - 178.857					9.6651	-1.53	718.07	0.002
	178.857 - 177.821					9.8032	-1.56	728.33	0.002
	177.821 - 176.786					9.9413	-1.60	738.59	0.002
	176.786 - 175.75					10.0793	-1.63	748.84	0.002
	175.75 - 174.714					10.2174	-1.67	759.10	0.002
	174.714 - 173.679					10.3555	-1.70	769.36	0.002
	173.679 - 172.643					10.4935	-1.74	779.62	0.002
	172.643 - 171.607					10.6316	-1.77	789.88	0.002
	171.607 - 170.571					10.7697	-1.81	800.13	0.002
	170.571 - 169.536					10.9077	-1.85	810.39	0.002
	169.536 - 168.5					11.0458	-1.89	820.65	0.002
	168.5 - 165.5					11.4457	-0.94	845.01	0.001
L2	168.5 - 165.5	TP26.41x18.373x0.25	36.4200	0.0000	0.0	14.9059	-1.24	1107.44	0.001
	165.5 - 163.856					15.1938	-2.32	1128.82	0.002
	163.856 - 162.212					15.4816	-7.40	1150.21	0.006
	162.212 - 160.568					15.7695	-7.55	1171.59	0.006
	160.568 - 158.924					16.0573	-7.80	1192.98	0.007
	158.924 - 157.281					16.3452	-7.96	1214.37	0.007
	157.281 - 155.637					16.6330	-8.12	1235.75	0.007
	155.637 - 153.993					16.9209	-10.78	1257.14	0.009
	153.993 - 152.349					17.2088	-11.00	1278.52	0.009
	152.349 - 150.705					17.4966	-11.19	1299.91	0.009
	150.705 - 149.061					17.7845	-11.40	1321.30	0.009
	149.061 - 147.417					18.0723	-11.59	1342.68	0.009
	147.417 - 145.773					18.3602	-11.78	1364.07	0.009
	145.773 - 144.129					18.6480	-15.63	1385.46	0.011
	144.129 - 142.486					18.9359	-15.84	1406.84	0.011
	142.486 - 140.842					19.2237	-16.06	1428.23	0.011
	140.842 -					19.5116	-16.29	1449.61	0.011

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
	139.198								
	139.198 - 137.554					19.7994	-16.52	1471.00	0.011
	137.554 - 135.91					20.0873	-16.75	1487.91	0.011
	135.91 - 132.08					20.7580	-7.21	1524.51	0.005
L3	135.91 - 132.08	TP35.88x25.0648x0.375	48.9200	0.0000	0.0	30.3949	-10.48	2258.19	0.005
	132.08 - 129.853					30.9809	-18.15	2301.73	0.008
	129.853 - 127.626					31.5670	-18.63	2345.27	0.008
	127.626 - 125.398					32.1531	-19.09	2388.81	0.008
	125.398 - 123.171					32.7392	-19.55	2432.36	0.008
	123.171 - 120.944					33.3252	-21.46	2475.90	0.009
	120.944 - 118.717					33.9113	-21.94	2519.44	0.009
	118.717 - 116.489					34.4974	-22.42	2562.98	0.009
	116.489 - 114.262					35.0834	-22.92	2606.52	0.009
	114.262 - 112.035					35.6695	-23.42	2650.07	0.009
	112.035 - 109.808					36.2556	-27.30	2693.61	0.010
	109.808 - 107.581					36.8416	-27.83	2737.15	0.010
	107.581 - 105.353					37.4277	-28.37	2780.69	0.010
	105.353 - 103.126					38.0138	-28.92	2824.23	0.010
	103.126 - 100.899					38.5998	-29.48	2867.78	0.010
	100.899 - 98.6717					39.1859	-30.04	2911.32	0.010
	98.6717 - 96.4444					39.7720	-30.61	2954.86	0.010
	96.4444 - 94.2172					40.3581	-31.18	2998.40	0.010
	94.2172 - 91.99					40.9441	-31.76	3041.94	0.010
	91.99 - 86.99					42.2598	-15.91	3139.69	0.005
L4	91.99 - 86.99	TP44.88x34.0246x0.4375	49.0800	0.0000	0.0	48.1756	-18.00	3579.20	0.005
	86.99 - 84.8839					48.8224	-34.54	3627.26	0.010
	84.8839 - 82.7778					49.4693	-35.16	3675.32	0.010
	82.7778 - 80.6717					50.1161	-35.78	3723.38	0.010
	80.6717 - 78.5656					50.7630	-36.42	3771.44	0.010
	78.5656 - 76.4594					51.4098	-37.05	3819.49	0.010
	76.4594 - 74.3533					52.0567	-37.70	3867.55	0.010
	74.3533 -					52.7035	-38.35	3915.61	0.010

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
	72.2472								
	72.2472 - 70.1411					53.3504	-39.00	3963.67	0.010
	70.1411 - 68.035					53.9973	-39.66	4011.73	0.010
	68.035 - 65.9289					54.6441	-40.33	4059.78	0.010
	65.9289 - 63.8228					55.2910	-41.00	4107.84	0.010
	63.8228 - 61.7167					55.9378	-41.68	4155.90	0.010
	61.7167 - 59.6106					56.5847	-42.37	4203.96	0.010
	59.6106 - 57.5044					57.2315	-43.06	4252.02	0.010
	57.5044 - 55.3983					57.8784	-43.75	4300.08	0.010
	55.3983 - 53.2922					58.5252	-44.45	4348.13	0.010
	53.2922 - 51.1861					59.1721	-45.24	4396.19	0.010
	51.1861 - 49.08					59.8190	-45.95	4444.25	0.010
	49.08 - 42.91					61.7140	-25.03	4567.55	0.005
L5	49.08 - 42.91	TP53.5x42.6403x0.4375	49.0800	0.0000	0.0	60.4997	-24.38	4494.82	0.005
	42.91 - 40.6516					61.1936	-50.19	4538.80	0.011
	40.6516 - 38.3932					61.8875	-50.97	4577.10	0.011
	38.3932 - 36.1347					62.5814	-51.75	4615.11	0.011
	36.1347 - 33.8763					63.2753	-52.54	4652.81	0.011
	33.8763 - 31.6179					63.9692	-53.33	4690.23	0.011
	31.6179 - 29.3595					64.6631	-54.13	4727.34	0.011
	29.3595 - 27.1011					65.3570	-54.93	4764.17	0.012
	27.1011 - 24.8426					66.0509	-55.74	4800.69	0.012
	24.8426 - 22.5842					66.7448	-56.56	4836.92	0.012
	22.5842 - 20.3258					67.4387	-57.38	4872.86	0.012
	20.3258 - 18.0674					68.1327	-58.21	4908.50	0.012
	18.0674 - 15.8089					68.8266	-59.05	4943.85	0.012
	15.8089 - 13.5505					69.5205	-59.89	4978.90	0.012
	13.5505 - 11.2921					70.2144	-60.73	5013.65	0.012
	11.2921 - 9.03368					70.9083	-61.59	5048.11	0.012
	9.03368 - 6.77526					71.6022	-62.44	5082.28	0.012
	6.77526 - 4.51684					72.2961	-63.31	5116.15	0.012
	4.51684 -					72.9900	-64.18	5149.72	0.012

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	K	K	
	2.25842 2.25842 - 0					73.6839	-65.06	5183.00	0.013

Pole Bending Design Data

Section No.	Elevation	Size	M_{ux}	ϕM_{nx}	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy}	ϕM_{ny}	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
	ft		kip-ft	kip-ft		kip-ft	kip-ft	
L1	183 - 181.964	TP19.42x15.5x0.1875	8.89	218.78	0.041	0.00	218.78	0.000
	181.964 - 180.929		11.35	225.40	0.050	0.00	225.40	0.000
	180.929 - 179.893		13.86	232.12	0.060	0.00	232.12	0.000
	179.893 - 178.857		16.44	238.93	0.069	0.00	238.93	0.000
	178.857 - 177.821		19.07	245.85	0.078	0.00	245.85	0.000
	177.821 - 176.786		21.76	252.86	0.086	0.00	252.86	0.000
	176.786 - 175.75		24.52	259.97	0.094	0.00	259.97	0.000
	175.75 - 174.714		27.34	267.18	0.102	0.00	267.18	0.000
	174.714 - 173.679		30.22	274.49	0.110	0.00	274.49	0.000
	173.679 - 172.643		33.16	281.90	0.118	0.00	281.90	0.000
	172.643 - 171.607		36.17	289.41	0.125	0.00	289.41	0.000
	171.607 - 170.571		39.24	297.01	0.132	0.00	297.01	0.000
	170.571 - 169.536		42.39	304.71	0.139	0.00	304.71	0.000
	169.536 - 168.5		45.59	312.52	0.146	0.00	312.52	0.000
	168.5 - 165.5		24.70	333.56	0.074	0.00	333.56	0.000
L2	168.5 - 165.5	TP26.41x18.373x0.25	30.62	425.48	0.072	0.00	425.48	0.000
	165.5 - 163.856		60.94	442.18	0.138	0.00	442.18	0.000
	163.856 - 162.212		72.04	459.21	0.157	0.00	459.21	0.000
	162.212 - 160.568		89.05	476.55	0.187	0.00	476.55	0.000
	160.568 - 158.924		106.26	494.22	0.215	0.00	494.22	0.000
	158.924 - 157.281		123.82	512.21	0.242	0.00	512.21	0.000
	157.281 - 155.637		141.58	530.52	0.267	0.00	530.52	0.000
	155.637 - 153.993		165.97	549.15	0.302	0.00	549.15	0.000
	153.993 - 152.349		189.72	568.10	0.334	0.00	568.10	0.000
	152.349 - 150.705		214.13	587.38	0.365	0.00	587.38	0.000
	150.705 -		239.05	606.97	0.394	0.00	606.97	0.000

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
	149.061							
	149.061 - 147.417		264.48	626.89	0.422	0.00	626.89	0.000
	147.417 - 145.773		290.10	647.13	0.448	0.00	647.13	0.000
	145.773 - 144.129		322.75	667.69	0.483	0.00	667.69	0.000
	144.129 - 142.486		362.09	688.57	0.526	0.00	688.57	0.000
	142.486 - 140.842		401.61	709.78	0.566	0.00	709.78	0.000
	140.842 - 139.198		441.31	731.30	0.603	0.00	731.30	0.000
	139.198 - 137.554		481.18	753.15	0.639	0.00	753.15	0.000
	137.554 - 135.91		521.23	772.99	0.674	0.00	772.99	0.000
	135.91 - 132.08		257.18	818.71	0.314	0.00	818.71	0.000
L3	135.91 - 132.08	TP35.88x25.0648x0.375	358.27	1177.83	0.304	0.00	1177.83	0.000
	132.08 - 129.853		671.30	1224.03	0.548	0.00	1224.03	0.000
	129.853 - 127.626		728.13	1271.11	0.573	0.00	1271.11	0.000
	127.626 - 125.398		785.59	1319.08	0.596	0.00	1319.08	0.000
	125.398 - 123.171		843.48	1367.94	0.617	0.00	1367.94	0.000
	123.171 - 120.944		903.88	1417.69	0.638	0.00	1417.69	0.000
	120.944 - 118.717		964.94	1468.33	0.657	0.00	1468.33	0.000
	118.717 - 116.489		1026.36	1519.86	0.675	0.00	1519.86	0.000
	116.489 - 114.262		1088.13	1572.28	0.692	0.00	1572.28	0.000
	114.262 - 112.035		1150.28	1625.58	0.708	0.00	1625.58	0.000
	112.035 - 109.808		1224.76	1679.77	0.729	0.00	1679.77	0.000
	109.808 - 107.581		1299.20	1734.85	0.749	0.00	1734.85	0.000
	107.581 - 105.353		1373.97	1790.82	0.767	0.00	1790.82	0.000
	105.353 - 103.126		1449.08	1847.68	0.784	0.00	1847.68	0.000
	103.126 - 100.899		1524.51	1905.43	0.800	0.00	1905.43	0.000
	100.899 - 98.6717		1600.26	1964.06	0.815	0.00	1964.06	0.000
	98.6717 - 96.4444		1676.33	2023.58	0.828	0.00	2023.58	0.000
	96.4444 - 94.2172		1752.72	2084.00	0.841	0.00	2084.00	0.000
	94.2172 - 91.99		1829.43	2145.30	0.853	0.00	2145.30	0.000
	91.99 - 86.99		959.89	2286.16	0.420	0.00	2286.16	0.000
L4	91.99 - 86.99	TP44.88x34.0246x0.4375	1043.43	2541.43	0.411	0.00	2541.43	0.000
	86.99 -		2077.29	2610.57	0.796	0.00	2610.57	0.000

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
	84.8839							
	84.8839 - 82.7778		2151.53	2680.63	0.803	0.00	2680.63	0.000
	82.7778 - 80.6717		2226.06	2751.63	0.809	0.00	2751.63	0.000
	80.6717 - 78.5656		2300.86	2823.54	0.815	0.00	2823.54	0.000
	78.5656 - 76.4594		2375.93	2896.39	0.820	0.00	2896.39	0.000
	76.4594 - 74.3533		2451.28	2970.17	0.825	0.00	2970.17	0.000
	74.3533 - 72.2472		2526.88	3044.88	0.830	0.00	3044.88	0.000
	72.2472 - 70.1411		2602.76	3120.51	0.834	0.00	3120.51	0.000
	70.1411 - 68.035		2678.89	3197.07	0.838	0.00	3197.07	0.000
	68.035 - 65.9289		2755.29	3274.55	0.841	0.00	3274.55	0.000
	65.9289 - 63.8228		2831.95	3352.97	0.845	0.00	3352.97	0.000
	63.8228 - 61.7167		2908.86	3432.32	0.847	0.00	3432.32	0.000
	61.7167 - 59.6106		2986.02	3512.58	0.850	0.00	3512.58	0.000
	59.6106 - 57.5044		3063.43	3593.78	0.852	0.00	3593.78	0.000
	57.5044 - 55.3983		3141.08	3675.91	0.855	0.00	3675.91	0.000
	55.3983 - 53.2922		3218.98	3758.97	0.856	0.00	3758.97	0.000
	53.2922 - 51.1861		3296.90	3842.95	0.858	0.00	3842.95	0.000
	51.1861 - 49.08		3375.47	3927.87	0.859	0.00	3927.87	0.000
	49.08 - 42.91		1858.63	4166.01	0.446	0.00	4166.01	0.000
L5	49.08 - 42.91	TP53.5x42.6403x0.4375	1749.15	4018.22	0.435	0.00	4018.22	0.000
	42.91 - 40.6516		3693.53	4104.54	0.900	0.00	4104.54	0.000
	40.6516 - 38.3932		3779.46	4186.57	0.903	0.00	4186.57	0.000
	38.3932 - 36.1347		3865.56	4269.13	0.905	0.00	4269.13	0.000
	36.1347 - 33.8763		3951.83	4352.18	0.908	0.00	4352.18	0.000
	33.8763 - 31.6179		4038.29	4435.75	0.910	0.00	4435.75	0.000
	31.6179 - 29.3595		4124.92	4519.81	0.913	0.00	4519.81	0.000
	29.3595 - 27.1011		4211.71	4604.35	0.915	0.00	4604.35	0.000
	27.1011 - 24.8426		4298.68	4689.37	0.917	0.00	4689.37	0.000
	24.8426 - 22.5842		4385.82	4774.85	0.919	0.00	4774.85	0.000
	22.5842 - 20.3258		4473.13	4860.78	0.920	0.00	4860.78	0.000
	20.3258 - 18.0674		4560.61	4947.17	0.922	0.00	4947.17	0.000
	18.0674 -		4648.25	5033.98	0.923	0.00	5033.98	0.000

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
	15.8089							
	15.8089 - 13.5505		4736.07	5121.23	0.925	0.00	5121.23	0.000
	13.5505 - 11.2921		4824.05	5208.90	0.926	0.00	5208.90	0.000
	11.2921 - 9.03368		4912.19	5296.98	0.927	0.00	5296.98	0.000
	9.03368 - 6.77526		5000.50	5385.46	0.929	0.00	5385.46	0.000
	6.77526 - 4.51684		5088.98	5474.33	0.930	0.00	5474.33	0.000
	4.51684 - 2.25842		5177.62	5563.58	0.931	0.00	5563.58	0.000
	2.25842 - 0		5266.42	5653.21	0.932	0.00	5653.21	0.000

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Section No.	Elevation ft	Size	Actual V_u K	ϕV_n K	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	183 - 181.964	TP19.42x15.5x0.1875	2.34	343.65	0.007	0.57	438.89	0.001
	181.964 - 180.929		2.40	348.78	0.007	0.57	452.15	0.001
	180.929 - 179.893		2.46	353.91	0.007	0.57	465.62	0.001
	179.893 - 178.857		2.51	359.04	0.007	0.57	479.28	0.001
	178.857 - 177.821		2.57	364.16	0.007	0.57	493.14	0.001
	177.821 - 176.786		2.63	369.29	0.007	0.57	507.19	0.001
	176.786 - 175.75		2.69	374.42	0.007	0.57	521.45	0.001
	175.75 - 174.714		2.75	379.55	0.007	0.57	535.90	0.001
	174.714 - 173.679		2.81	384.68	0.007	0.57	550.55	0.001
	173.679 - 172.643		2.87	389.81	0.007	0.57	565.39	0.001
	172.643 - 171.607		2.94	394.94	0.007	0.57	580.44	0.001
	171.607 - 170.571		3.00	400.07	0.008	0.57	595.68	0.001
	170.571 - 169.536		3.07	405.20	0.008	0.57	611.12	0.001
	169.536 - 168.5		3.13	410.32	0.008	0.57	626.75	0.001
	168.5 - 165.5		1.55	422.50	0.004	0.25	668.92	0.000
L2	168.5 - 165.5	TP26.41x18.373x0.25	1.81	553.72	0.003	0.32	853.71	0.000
	165.5 - 163.856		3.48	564.41	0.006	0.57	887.18	0.001
	163.856 - 162.212		10.29	575.10	0.018	0.57	921.31	0.001
	162.212 - 160.568		10.41	585.80	0.018	0.57	956.08	0.001
	160.568 -		10.62	596.49	0.018	0.57	991.48	0.001

Section No.	Elevation ft	Size	Actual V_u K	ϕV_n K	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
	158.924							
	158.924 - 157.281		10.74	607.18	0.018	0.57	1027.54	0.001
	157.281 - 155.637		10.86	617.88	0.018	0.57	1064.24	0.001
	155.637 - 153.993		14.46	628.57	0.023	0.67	1101.58	0.001
	153.993 - 152.349		14.66	639.26	0.023	0.67	1139.57	0.001
	152.349 - 150.705		14.89	649.96	0.023	0.60	1178.20	0.001
	150.705 - 149.061		15.42	660.65	0.023	0.36	1217.47	0.000
	149.061 - 147.417		15.53	671.34	0.023	0.14	1257.39	0.000
	147.417 - 145.773		15.65	682.03	0.023	0.14	1297.95	0.000
	145.773 - 144.129		23.89	692.73	0.034	0.38	1339.16	0.000
	144.129 - 142.486		24.00	703.42	0.034	0.38	1381.01	0.000
	142.486 - 140.842		24.11	714.11	0.034	0.38	1423.50	0.000
	140.842 - 139.198		24.22	724.81	0.033	0.38	1466.64	0.000
	139.198 - 137.554		24.33	735.50	0.033	0.38	1510.42	0.000
	137.554 - 135.91		24.43	743.95	0.033	0.38	1550.18	0.000
	135.91 - 132.08		10.45	762.25	0.014	0.16	1641.78	0.000
L3	135.91 - 132.08	TP35.88x25.0648x0.375	14.36	1129.09	0.013	0.22	2363.74	0.000
	132.08 - 129.853		25.18	1150.86	0.022	0.51	2456.35	0.000
	129.853 - 127.626		25.74	1172.64	0.022	0.51	2550.73	0.000
	127.626 - 125.398		25.91	1194.41	0.022	0.08	2646.90	0.000
	125.398 - 123.171		26.12	1216.18	0.021	0.08	2744.84	0.000
	123.171 - 120.944		27.36	1237.95	0.022	0.33	2844.57	0.000
	120.944 - 118.717		27.53	1259.72	0.022	0.33	2946.07	0.000
	118.717 - 116.489		27.69	1281.49	0.022	0.33	3049.35	0.000
	116.489 - 114.262		27.85	1303.26	0.021	0.33	3154.41	0.000
	114.262 - 112.035		28.02	1325.03	0.021	0.33	3261.25	0.000
	112.035 - 109.808		33.39	1346.80	0.025	0.33	3369.88	0.000
	109.808 - 107.581		33.54	1368.57	0.025	0.14	3480.28	0.000
	107.581 - 105.353		33.69	1390.35	0.024	0.14	3592.45	0.000
	105.353 - 103.126		33.84	1412.12	0.024	0.14	3706.41	0.000
	103.126 -		33.99	1433.89	0.024	0.14	3822.15	0.000

Section No.	Elevation ft	Size	Actual V_u K	ϕV_n K	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
	100.899							
	100.899 - 98.6717		34.13	1455.66	0.023	0.14	3939.67	0.000
	98.6717 - 96.4444		34.28	1477.43	0.023	0.14	4058.97	0.000
	96.4444 - 94.2172		34.42	1499.20	0.023	0.14	4180.04	0.000
	94.2172 - 91.99		34.56	1520.97	0.023	0.14	4302.90	0.000
	91.99 - 86.99		16.94	1569.85	0.011	0.07	4585.19	0.000
L4	91.99 - 86.99	TP44.88x34.0246x0.4375	18.17	1789.60	0.010	0.07	5098.73	0.000
	86.99 - 84.8839		35.23	1813.63	0.019	0.14	5237.30	0.000
	84.8839 - 82.7778		35.37	1837.66	0.019	0.14	5377.73	0.000
	82.7778 - 80.6717		35.50	1861.69	0.019	0.14	5520.02	0.000
	80.6717 - 78.5656		35.63	1885.72	0.019	0.14	5664.17	0.000
	78.5656 - 76.4594		35.76	1909.75	0.019	0.14	5810.17	0.000
	76.4594 - 74.3533		35.89	1933.78	0.019	0.14	5958.04	0.000
	74.3533 - 72.2472		36.02	1957.81	0.018	0.14	6107.77	0.000
	72.2472 - 70.1411		36.14	1981.83	0.018	0.14	6259.35	0.000
	70.1411 - 68.035		36.27	2005.86	0.018	0.14	6412.79	0.000
	68.035 - 65.9289		36.39	2029.89	0.018	0.14	6568.09	0.000
	65.9289 - 63.8228		36.51	2053.92	0.018	0.14	6725.24	0.000
	63.8228 - 61.7167		36.63	2077.95	0.018	0.14	6884.26	0.000
	61.7167 - 59.6106		36.75	2101.98	0.017	0.14	7045.13	0.000
	59.6106 - 57.5044		36.87	2126.01	0.017	0.14	7207.86	0.000
	57.5044 - 55.3983		36.99	2150.04	0.017	0.14	7372.45	0.000
	55.3983 - 53.2922		37.10	2174.07	0.017	0.14	7538.90	0.000
	53.2922 - 51.1861		37.31	2198.10	0.017	0.14	7707.20	0.000
	51.1861 - 49.08		37.42	2222.12	0.017	0.01	7877.37	0.000
	49.08 - 42.91		19.73	2283.78	0.009	0.00	8354.58	0.000
L5	49.08 - 42.91	TP53.5x42.6403x0.4375	18.29	2247.41	0.008	0.00	8058.44	0.000
	42.91 - 40.6516		38.08	2269.40	0.017	0.01	8231.41	0.000
	40.6516 - 38.3932		38.16	2288.55	0.017	0.01	8395.75	0.000
	38.3932 - 36.1347		38.23	2307.55	0.017	0.01	8561.17	0.000
	36.1347 - 33.8763		38.31	2326.41	0.016	0.01	8727.67	0.000
	33.8763 - 31.6179		38.39	2345.11	0.016	0.01	8895.08	0.000
	31.6179 -		38.46	2363.67	0.016	0.01	9063.50	0.000

Section No.	Elevation ft	Size	Actual V_u K	ϕV_n K	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
	29.3595							
	29.3595 - 27.1011		38.54	2382.08	0.016	0.01	9232.92	0.000
	27.1011 - 24.8426		38.62	2400.35	0.016	0.01	9403.25	0.000
	24.8426 - 22.5842		38.69	2418.46	0.016	0.01	9574.50	0.000
	22.5842 - 20.3258		38.77	2436.43	0.016	0.01	9746.67	0.000
	20.3258 - 18.0674		38.84	2454.25	0.016	0.01	9919.75	0.000
	18.0674 - 15.8089		38.92	2471.92	0.016	0.01	10093.67	0.000
	15.8089 - 13.5505		38.99	2489.45	0.016	0.01	10268.50	0.000
	13.5505 - 11.2921		39.06	2506.83	0.016	0.01	10444.17	0.000
	11.2921 - 9.03368		39.14	2524.06	0.016	0.01	10620.67	0.000
	9.03368 - 6.77526		39.21	2541.14	0.015	0.01	10797.92	0.000
	6.77526 - 4.51684		39.28	2558.07	0.015	0.01	10975.92	0.000
	4.51684 - 2.25842		39.36	2574.86	0.015	0.01	11154.75	0.000
	2.25842 - 0		39.43	2591.50	0.015	0.01	11334.33	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	183 - 181.964	0.002	0.041	0.000	0.007	0.001	0.043	1.000	4.8.2
	181.964 - 180.929	0.002	0.050	0.000	0.007	0.001	0.053	1.000	4.8.2
	180.929 - 179.893	0.002	0.060	0.000	0.007	0.001	0.062	1.000	4.8.2
	179.893 - 178.857	0.002	0.069	0.000	0.007	0.001	0.071	1.000	4.8.2
	178.857 - 177.821	0.002	0.078	0.000	0.007	0.001	0.080	1.000	4.8.2
	177.821 - 176.786	0.002	0.086	0.000	0.007	0.001	0.088	1.000	4.8.2
	176.786 - 175.75	0.002	0.094	0.000	0.007	0.001	0.097	1.000	4.8.2
	175.75 - 174.714	0.002	0.102	0.000	0.007	0.001	0.105	1.000	4.8.2
	174.714 - 173.679	0.002	0.110	0.000	0.007	0.001	0.112	1.000	4.8.2
	173.679 - 172.643	0.002	0.118	0.000	0.007	0.001	0.120	1.000	4.8.2
	172.643 - 171.607	0.002	0.125	0.000	0.007	0.001	0.127	1.000	4.8.2
	171.607 - 170.571	0.002	0.132	0.000	0.008	0.001	0.134	1.000	4.8.2

Section No.	Elevation ft	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
	170.571 - 169.536	0.002	0.139	0.000	0.008	0.001	0.141	1.000	4.8.2
	169.536 - 168.5	0.002	0.146	0.000	0.008	0.001	0.148	1.000	4.8.2
	168.5 - 165.5	0.001	0.074	0.000	0.004	0.000	0.075	1.000	4.8.2
L2	168.5 - 165.5	0.001	0.072	0.000	0.003	0.000	0.073	1.000	4.8.2
	165.5 - 163.856	0.002	0.138	0.000	0.006	0.001	0.140	1.000	4.8.2
	163.856 - 162.212	0.006	0.157	0.000	0.018	0.001	0.164	1.000	4.8.2
	162.212 - 160.568	0.006	0.187	0.000	0.018	0.001	0.194	1.000	4.8.2
	160.568 - 158.924	0.007	0.215	0.000	0.018	0.001	0.222	1.000	4.8.2
	158.924 - 157.281	0.007	0.242	0.000	0.018	0.001	0.249	1.000	4.8.2
	157.281 - 155.637	0.007	0.267	0.000	0.018	0.001	0.274	1.000	4.8.2
	155.637 - 153.993	0.009	0.302	0.000	0.023	0.001	0.311	1.000	4.8.2
	153.993 - 152.349	0.009	0.334	0.000	0.023	0.001	0.343	1.000	4.8.2
	152.349 - 150.705	0.009	0.365	0.000	0.023	0.001	0.374	1.000	4.8.2
	150.705 - 149.061	0.009	0.394	0.000	0.023	0.000	0.403	1.000	4.8.2
	149.061 - 147.417	0.009	0.422	0.000	0.023	0.000	0.431	1.000	4.8.2
	147.417 - 145.773	0.009	0.448	0.000	0.023	0.000	0.457	1.000	4.8.2
	145.773 - 144.129	0.011	0.483	0.000	0.034	0.000	0.496	1.000	4.8.2
	144.129 - 142.486	0.011	0.526	0.000	0.034	0.000	0.538	1.000	4.8.2
	142.486 - 140.842	0.011	0.566	0.000	0.034	0.000	0.578	1.000	4.8.2
	140.842 - 139.198	0.011	0.603	0.000	0.033	0.000	0.616	1.000	4.8.2
	139.198 - 137.554	0.011	0.639	0.000	0.033	0.000	0.651	1.000	4.8.2
	137.554 - 135.91	0.011	0.674	0.000	0.033	0.000	0.687	1.000	4.8.2
	135.91 - 132.08	0.005	0.314	0.000	0.014	0.000	0.319	1.000	4.8.2
L3	135.91 - 132.08	0.005	0.304	0.000	0.013	0.000	0.309	1.000	4.8.2
	132.08 - 129.853	0.008	0.548	0.000	0.022	0.000	0.557	1.000	4.8.2
	129.853 - 127.626	0.008	0.573	0.000	0.022	0.000	0.581	1.000	4.8.2
	127.626 - 125.398	0.008	0.596	0.000	0.022	0.000	0.604	1.000	4.8.2
	125.398 - 123.171	0.008	0.617	0.000	0.021	0.000	0.625	1.000	4.8.2
	123.171 - 120.944	0.009	0.638	0.000	0.022	0.000	0.647	1.000	4.8.2
	120.944 - 118.717	0.009	0.657	0.000	0.022	0.000	0.666	1.000	4.8.2
	118.717 - 116.489	0.009	0.675	0.000	0.022	0.000	0.685	1.000	4.8.2

Section No.	Elevation ft	Ratio $P_u/\phi P_n$	Ratio $M_{ux}/\phi M_{nx}$	Ratio $M_{uy}/\phi M_{ny}$	Ratio $V_u/\phi V_n$	Ratio $T_u/\phi T_n$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
	116.489 - 114.262	0.009	0.692	0.000	0.021	0.000	0.701	1.000	4.8.2
	114.262 - 112.035	0.009	0.708	0.000	0.021	0.000	0.717	1.000	4.8.2
	112.035 - 109.808	0.010	0.729	0.000	0.025	0.000	0.740	1.000	4.8.2
	109.808 - 107.581	0.010	0.749	0.000	0.025	0.000	0.760	1.000	4.8.2
	107.581 - 105.353	0.010	0.767	0.000	0.024	0.000	0.778	1.000	4.8.2
	105.353 - 103.126	0.010	0.784	0.000	0.024	0.000	0.795	1.000	4.8.2
	103.126 - 100.899	0.010	0.800	0.000	0.024	0.000	0.811	1.000	4.8.2
	100.899 - 98.6717	0.010	0.815	0.000	0.023	0.000	0.826	1.000	4.8.2
	98.6717 - 96.4444	0.010	0.828	0.000	0.023	0.000	0.839	1.000	4.8.2
	96.4444 - 94.2172	0.010	0.841	0.000	0.023	0.000	0.852	1.000	4.8.2
	94.2172 - 91.99	0.010	0.853	0.000	0.023	0.000	0.864	1.000	4.8.2
	91.99 - 86.99	0.005	0.420	0.000	0.011	0.000	0.425	1.000	4.8.2
L4	91.99 - 86.99	0.005	0.411	0.000	0.010	0.000	0.416	1.000	4.8.2
	86.99 - 84.8839	0.010	0.796	0.000	0.019	0.000	0.806	1.000	4.8.2
	84.8839 - 82.7778	0.010	0.803	0.000	0.019	0.000	0.813	1.000	4.8.2
	82.7778 - 80.6717	0.010	0.809	0.000	0.019	0.000	0.819	1.000	4.8.2
	80.6717 - 78.5656	0.010	0.815	0.000	0.019	0.000	0.825	1.000	4.8.2
	78.5656 - 76.4594	0.010	0.820	0.000	0.019	0.000	0.830	1.000	4.8.2
	76.4594 - 74.3533	0.010	0.825	0.000	0.019	0.000	0.835	1.000	4.8.2
	74.3533 - 72.2472	0.010	0.830	0.000	0.018	0.000	0.840	1.000	4.8.2
	72.2472 - 70.1411	0.010	0.834	0.000	0.018	0.000	0.844	1.000	4.8.2
	70.1411 - 68.035	0.010	0.838	0.000	0.018	0.000	0.848	1.000	4.8.2
	68.035 - 65.9289	0.010	0.841	0.000	0.018	0.000	0.852	1.000	4.8.2
	65.9289 - 63.8228	0.010	0.845	0.000	0.018	0.000	0.855	1.000	4.8.2
	63.8228 - 61.7167	0.010	0.847	0.000	0.018	0.000	0.858	1.000	4.8.2
	61.7167 - 59.6106	0.010	0.850	0.000	0.017	0.000	0.860	1.000	4.8.2
	59.6106 - 57.5044	0.010	0.852	0.000	0.017	0.000	0.863	1.000	4.8.2
	57.5044 - 55.3983	0.010	0.855	0.000	0.017	0.000	0.865	1.000	4.8.2
	55.3983 - 53.2922	0.010	0.856	0.000	0.017	0.000	0.867	1.000	4.8.2
	53.2922 - 51.1861	0.010	0.858	0.000	0.017	0.000	0.868	1.000	4.8.2
	51.1861 - 49.08	0.010	0.859	0.000	0.017	0.000	0.870	1.000	4.8.2

Section No.	Elevation ft	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
	49.08 - 42.91	0.005	0.446	0.000	0.009	0.000	0.452	1.000	4.8.2
L5	49.08 - 42.91	0.005	0.435	0.000	0.008	0.000	0.441	1.000	4.8.2
	42.91 - 40.6516	0.011	0.900	0.000	0.017	0.000	0.911	1.000	4.8.2
	40.6516 - 38.3932	0.011	0.903	0.000	0.017	0.000	0.914	1.000	4.8.2
	38.3932 - 36.1347	0.011	0.905	0.000	0.017	0.000	0.917	1.000	4.8.2
	36.1347 - 33.8763	0.011	0.908	0.000	0.016	0.000	0.920	1.000	4.8.2
	33.8763 - 31.6179	0.011	0.910	0.000	0.016	0.000	0.922	1.000	4.8.2
	31.6179 - 29.3595	0.011	0.913	0.000	0.016	0.000	0.924	1.000	4.8.2
	29.3595 - 27.1011	0.012	0.915	0.000	0.016	0.000	0.927	1.000	4.8.2
	27.1011 - 24.8426	0.012	0.917	0.000	0.016	0.000	0.929	1.000	4.8.2
	24.8426 - 22.5842	0.012	0.919	0.000	0.016	0.000	0.930	1.000	4.8.2
	22.5842 - 20.3258	0.012	0.920	0.000	0.016	0.000	0.932	1.000	4.8.2
	20.3258 - 18.0674	0.012	0.922	0.000	0.016	0.000	0.934	1.000	4.8.2
	18.0674 - 15.8089	0.012	0.923	0.000	0.016	0.000	0.936	1.000	4.8.2
	15.8089 - 13.5505	0.012	0.925	0.000	0.016	0.000	0.937	1.000	4.8.2
	13.5505 - 11.2921	0.012	0.926	0.000	0.016	0.000	0.938	1.000	4.8.2
	11.2921 - 9.03368	0.012	0.927	0.000	0.016	0.000	0.940	1.000	4.8.2
	9.03368 - 6.77526	0.012	0.929	0.000	0.015	0.000	0.941	1.000	4.8.2
	6.77526 - 4.51684	0.012	0.930	0.000	0.015	0.000	0.942	1.000	4.8.2
	4.51684 - 2.25842	0.012	0.931	0.000	0.015	0.000	0.943	1.000	4.8.2
	2.25842 - 0	0.013	0.932	0.000	0.015	0.000	0.944	1.000	4.8.2

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	183 - 165.5	Pole	TP19.42x15.5x0.1875	1	-1.89	820.65	14.8	Pass
L2	165.5 - 132.08	Pole	TP26.41x18.373x0.25	2	-16.75	1487.91	68.7	Pass
L3	132.08 - 86.99	Pole	TP35.88x25.0648x0.375	3	-31.76	3041.94	86.4	Pass
L4	86.99 - 42.91	Pole	TP44.88x34.0246x0.4375	4	-45.95	4444.25	87.0	Pass
L5	42.91 - 0	Pole	TP53.5x42.6403x0.4375	5	-65.06	5183.00	94.4	Pass
							Summary	
						Pole (L5)	94.4	Pass
						RATING =	**94.4**	**Pass**

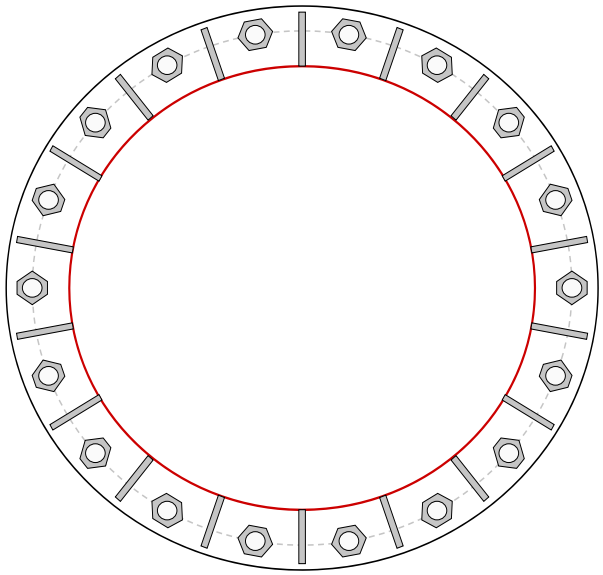
Program Version 8.0.5.0 - 11/28/2018 File:C:/Users/Evan.Martin/Sedgwick/Destek Server - Documents/Projects/2020/75 - ForeSite LLC/049.00421 - 019 - CT11365D/Rev. 5/TNXTower/CT11365D_rev.5.eri

Monopole Base Plate Connection

Site Info	
Site Name	CT11365D

Analysis Considerations	
TIA-222 Revision	G
Grout Considered:	No
l_{ar} (in)	1
Eta Factor, η	0.5

Applied Loads	
Moment (kip-ft)	5266.42
Axial Force (kips)	65.06
Shear Force (kips)	39.43



Connection Properties

Anchor Rod Data

(18) 2-1/4" ø bolts (A615-75 N; Fy=75 ksi, Fu=100 ksi) on 62" BC

Base Plate Data

68" OD x 2" Plate (A572-60; Fy=60 ksi, Fu=75 ksi)

Stiffener Data

(18) 15"H x 6.5"W x 0.75"T, Notch: 1"
plate: Fy= 50 ksi ; weld: Fy= 70 ksi
horiz. weld: 0.375" groove, 45° dbl bevel, 0.375" fillet
vert. weld: 0.375" fillet

Pole Data

53.5" x 0.4375" 18-sided pole (A572-65; Fy=65 ksi, Fu=80 ksi)

Analysis Results

Anchor Rod Summary		*(units of kips, kip-in)*
Pu_c = 230	ϕPn_t = 260	**Stress Rating**
Vu = 2.19	ϕVn = n/a	**90.1%**
Mu = n/a	ϕMn = n/a	Pass

Base Plate Summary		
Max Stress (ksi):	40.44	(Roark's Flexural)
Allowable Stress (ksi):	54	
Stress Rating:	**74.9%**	Pass

Stiffener Summary		
Horizontal Weld:	**85.9%**	Pass
Vertical Weld:	**69.2%**	Pass
Plate Flexure+Shear:	**41.5%**	Pass
Plate Tension+Shear:	**91.1%**	Pass
Plate Compression:	**92.2%**	Pass
Pole Summary		
Punching Shear:	**21.6%**	Pass

Analysis Date: 4/21/2021

Drilled Pier Foundation

BU # :	
Site Name:	CT11365D
Order Number:	

TIA-222 Revison:	G
Tower Type:	Monopole

Applied Loads	Comp.	Uplift
Moment (kip-ft)	5266	
Axial Force (kips)	65	
Shear Force (kips)	39	

Material Properties		
Concrete Strength, f'c:	4	ksi
Rebar Strength, Fy:	60	ksi

Pier Design Data		
Depth	31	ft
Ext. Above Grade	1	ft
Pier Section 1		
From 1' above grade to 31' below grade		
Pier Diameter	7	ft
Rebar Quantity	27	
Rebar Size	11	
Clear Cover to Ties	3	in
Tie Size	5	

Analysis Results		
Soil Lateral Capacity	*Compression*	*Uplift*
$D_{v=0}$ (ft from TOC)	7.17	-
Soil Safety Factor	3.68	-
Max Moment (kip-ft)	5498.84	-
Rating	*36.1%*	-
Soil Vertical Capacity	*Compression*	*Uplift*
Skin Friction (kips)	415.61	-
End Bearing (kips)	202.04	-
Weight of Concrete (kips)	146.75	-
Total Capacity (kips)	617.65	-
Axial (kips)	211.75	-
Rating	*34.3%*	-
Reinforced Concrete Capacity	*Compression*	*Uplift*
Critical Depth (ft from TOC)	7.26	-
Critical Moment (kip-ft)	5498.75	-
Critical Moment Capacity	6789.77	-
Rating	*81.0%*	-

Soil Interaction Rating	**36.1%**
Structural Foundation Rating	**81.0%**

Check Limitation	
N/A	☑
Load Z Normalization:	☐

Soil Profile

Groundwater Depth	5	ft	
# of Layers	4		

Layer	Top (ft)	Bottom (ft)	Thickness (ft)	γ_{soil} (pcf)	$\gamma_{concrete}$ (pcf)	Cohesion (ksf)	Angle of Friction (degrees)	Calculated Ultimate Skin Friction Comp (ksf)	Calculated Ultimate Skin Friction Uplift (ksf)	Ultimate Skin Friction Comp Override (ksf)	Ultimate Skin Friction Uplift Override (ksf)	Ult. Gross Bearing Capacity (ksf)	SPT Blow Count	Soil Type
1	0	3.5	3.5	130	150	0	0	0.000	0.000					Cohesionless
2	3.5	5	1.5	130	150	0	38	0.450	0.450				10	Cohesionless
3	5	15	10	70	87.6	0	38	0.715	0.715				10	Cohesionless
4	15	31	16	70	87.6	0	38	1.086	1.086			7	10	Cohesionless

APPENDIX B
MOUNT STRUCTURAL ANALYSIS REPORT – UPGRADE (DATED 06/19/2020)

Date: 6/19/2020

To: T-Mobile Northeast, LLC
35 Griffin Road South
Bloomfield, CT 06002

Subject:	**Mount Structural Analysis Report - Upgrade**	
T-Mobile Designation:	**Site Name:**	CT365/Manchester PD_MP
	Site ID:	CT11365D
EFI Designation:	**Project Number:**	049.00421 - 2075019
Site Data:	**239 E.Middle Tpk, Manchester, CT 06040** **Latitude 41.78438900°, Longitude -72.51177100°**	

EFI Global, Inc. is pleased to submit this **"Mount Structural Analysis Report - Upgrade"** to determine the structural capacity of the antenna mounts utilized by T-Mobile at the above referenced site.

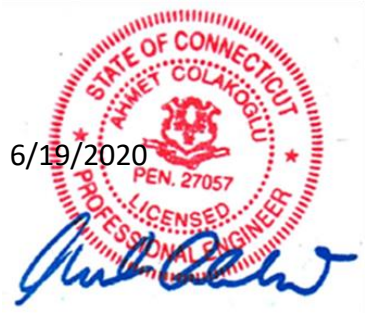
The purpose of the analysis is to determine acceptability of the mount stress level for the changes proposed by T-Mobile. Under the following load case we have determined the mounts to have:

Existing + Proposed Equipment **Adequate Capacity/ with Modifications (71.6%)**
Note: See Analysis Criteria for loading configuration

The analysis has been performed in accordance with the TIA-222-G Standard and 2018 Connecticut State Building Code (2015 IBC).

We at *EFI Global, Inc.* appreciate the opportunity of providing our continuing professional services to you. If you have any questions or need further assistance on this or any other projects, please give us a call.

Sincerely,
EFI Global, Inc.
License No: PEC0001245



6/19/2020

Ahmet Colakoglu, PE
Connecticut Professional Engineer
License No: 27057

EFI Global, Inc.
1117 Perimeter Center West, Suite E500, Atlanta, GA 30338 - Tel: (770) 693-0835

1) ANALYSIS CRITERIA

The analysis was performed for the existing and proposed appurtenances as specified in the loading information referenced below, and per the following loading criteria of Table 1.

Table 1 – Loading and Analysis Criteria

Rad Center	163’
Structure Type	Monopole
Exposure Category	B
Basic Wind Speed (3-Second Gust)	125 * √0.6 = 97 mph (ASD)
Ice Loading	1.00” with 50 mph Wind
Risk Category	II
Topographic Factor	Kzt = 1.0

Table 1.1 – Existing Appurtenance Configuration

Qty	Model
3	Ericsson AIR32 KRD901146-1_B66A_B2A – Antennas
3	RFS APXVAARR24_43-U-NA20 – Antennas
3	Ericsson AIR3246 B66 – Antennas
3	Generic Twin Style 1B-AWS – TMAs
3	Radio 4449 B71+B85 – RRUs

Table 1.2 – Proposed and Final Appurtenance Configuration

Qty	Model
3	Ericsson AIR32 KRD901146-1_B66A_B2A – Antennas
3	Ericsson AIR6449 B41 – Antennas
3	RFS APXVAARR24_43-U-NA20 – Antennas
3	Ericsson AIR3246 B66 – Antennas
3	Radio 4449 B71+B85 – RRUs*
3	Radio 4415 B25 – RRUs*

*** To be mounted behind the antenna**

Table 1.3 – Assumed Material Properties

Member Type	ASTM Material Designation	Fy (ksi)	Fu (ksi)
Pipes	A53 Gr. B	35	60
Angles/Channels	A36	36	58
Rectangular HSS	A500 Gr. B - 46	46	58
Round HSS	A500 Gr. B - 42	42	58
Others (UNO)	A572 Gr. 50	50	65

2) ANALYSIS PROCEDURE

The analysis is based on the following information:

Table 2 – Documents

Document	Provided By	Date
RFDS	T-Mobile	05/19/2020
Structural Analysis Report	Tectonic	07/21/2016
Mount Assessment Letter	Destek Engineering, LLC	05/02/2018
Construction Drawings	Northeast Site Solutions	07/12/2018
Site Photos	-	04/23/2020

2.1) Analysis Method

Risa-3D, a commercially available analysis software package, was used to create a three-dimensional model of the mount and calculate member stresses for various loading cases. Selected output from the analysis is included in the Appendix.

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2.2) Analysis Conditions and Assumptions

1) The mount was built and installed in accordance with the manufacturer's specifications.
2) The mount has been maintained and will be maintained in accordance with the manufacturer's specifications. All structural members and connections of the mount are in good condition and can achieve theoretical strength.
3) The configuration of antennas is as specified in "1) Analysis Criteria".
4) The analysis was performed for the subject mount only. It does not include an evaluation of the other mounts or the tower, which should be analyzed by others.
5) The evaluation does not include any antenna rigging loads. The equipment should not be rigged using the subject antenna mount as the support.
6) The analysis includes a minimum 250 lbf maintenance point load at the worst-case location on the mount, as well as a minimum 250 lbf maintenance point load at each antenna location in conjunction with a 30 mph wind load.
7) Any steel grating represented in this model is for loading purposes only and it is not considered to provide any structural restraint or support.
8) Member sizes per the structural analysis report, site photos and assumed based on our experience with similar structures. Please refer to calculation output in the appendix of this report for sizes and lengths assumed.
9) All member connections are assumed to have been designed to meet or exceed the load carrying capacity of the connected member unless otherwise specified in this report.

EFI Global, Inc. (EFI), must be notified immediately if any of these assumptions are discovered to be incorrect. The results of this analysis may be affected if any of the assumptions are not valid or have been made in error.

3) ANALYSIS RESULTS AND CONCLUSION

The analysis results are shown on the table below.

Table 3.1 – Mount Component Stresses vs. Capacity

Component	% Capacity	Pass / Fail
Horizontal Face Angles	55.0	Fail
Support Rail Pipes	38.0	Pass
Platform Support Double Angle	46.0	Pass
Standoff Tube Arm	49.0	Pass
Grating Angles	29.0	Pass
Support Rail Bracing Angles	37.0	Pass
Antenna Mount Pipe	71.6	Pass

Platform Mount: The existing platform mount **will have adequate** capacity for the proposed changes by T-Mobile, **once the mount is upgraded as per the attached EFI drawings, dated 06/19/2020**. For the code specified load combinations and as a maximum, the mount members are stressed to **71.6%** of their structural capacity.

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APPENDIX

INPUT LOADS
ANALYSIS OUTPUT
UPGRADE DRAWINGS

EFI Global, Inc.
1117 Perimeter Center West, Suite E500, Atlanta, GA 30338 - Tel: (770) 693-0835

CLIENT: ForeSite LLC - T-Mobile

PROJECT: CT11365D

SUBJECT: Antenna Loads -TIA 222 G Stanadard (chapter 16 revisions)

Tower Height	184.00	ft	Type of Mount: Platform
Basic Wind Speed, V	97	mph (=Ultimate Speed*Sqrt(0.6))	
Basic Wind Speed with Ice, V_i	50	mph	
Maintanence Load Factor, L_{FM}	0.0957	Load Factor for Maint. Load Cases (Basic Wind Speed=30 mph)	
Design Ice Thickness, t_i	1	inches	

Table 2-3 Importance Factors

Structure Classification	Wind Load Without Ice	Wind Load With Ice	Ice Thickness	Earthquake
II	1	1	1	1

1

Table 2-4 Exposure Category Coefficients

Exposure Category	Zg	α	Kzmin	Ke	m
B	1200	7	0.7	0.9	0.55

Table 2-5 Topographic Categories

Kzt 1.000

Table 2-2 Wind Directionality Factor, Kd

Structure Type	Kd	
2	0.95	DOES NOT CHANGE

Monopole

Gust Effect Factor Gh

Structure Type	Gh	
2	1.00	DOES NOT CHANGE

Monopole

Shielding Factor, Ka

Structure Type	Ka	
	0.90	DOES NOT CHANGE

Monopole

Seismic Factors

Ss	0.178	
S1	0.064	
Fa	1.6	
Fv	2.4	
R	1.5	Truss or Pole

CLIENT: ForeSite LLC - T-Mobile

PROJECT: CT11365D

SUBJECT: Antenna Loads -TIA 222 G Stanadard (chapter 16 revisions)

Rad Center **163.00** ft

Antenna AND Mount Without Ice

Mounting Pole	Height (ft)	Model Number	#	Weight (lbs)	H (in)	*W (in)	D (in)	Ka	**A_N (ft2)	***A_T (ft2)	Aspect (FRONT)	Aspect (SIDE)	Ca (FRONT)	Ca (SIDE)	K_z	q_z (psf)	Pounds: Wind Load (Front)	Wind Load (Side)	Dead Load	Total Wind Load (Front)	Total Wind Load (Side)	Total Dead Load	Lateral Load (Seismic)	Vertical Load (Seismic)
Pos. 1	**163.00**	Ericsson AIR32 KRD 901 146-1 B66A-B2A	1	143.0	59.3	12.9	8.7	0.90	5.30	3.56	4.60	6.84	1.29	1.39	1.136	26.0	160.3	116.1	143	160	116	143	10	5
		Empty		0.0	-	-	-	0.90	-	-	-	-	-	-	-	-	0.0	0.0	0					
		Empty		0.0	-	-	-	0.90	-	-	-	-	-	-	-	-	0.0	0.0	0					
		Empty		0.0	-	-	-	0.90	-	-	-	-	-	-	-	-	0.0	0.0	0					
		Empty		0.0	-	-	-	0.90	-	-	-	-	-	-	-	-	0.0	0.0	0					
																				81	**59**	**72**	**5**	**3**
Pos.2	**163.00**	Ericsson AIR6449 B41	1	103.0	33.1	20.5	8.3	0.90	4.71	1.91	1.61	3.99	1.20	1.27	1.136	26.0	132.3	56.5	103	132	57	103	7	4
		Empty		0.0	-	-	-	0.90	-	-	-	-	-	-	-	-	0.0	0.0	0					
		Empty		0.0	-	-	-	0.90	-	-	-	-	-	-	-	-	0.0	0.0	0					
		Empty		0.0	-	-	-	0.90	-	-	-	-	-	-	-	-	0.0	0.0	0					
		Empty		0.0	-	-	-	0.90	-	-	-	-	-	-	-	-	0.0	0.0	0					
																				67	**29**	**52**	**4**	**2**
Pos.3	**163.00**	RFS APXVAARR24_43-U-NA20	1	153.3	95.9	24.0	8.7	0.90	15.98	5.79	4.00	11.02	1.27	1.53	1.136	26.0	473.7	208.0	153.3	474	261	273	19	10
	163.00	Radio 4449 B71+B85	1	73.2	17.9	N/A	10.6	0.90	-	1.32	-	1.68	-	1.20	1.136	26.0	0.0	37.1	73.21					
	163.00	Radio 4415 B25	1	46.3	14.9	N/A	5.4	0.90	-	0.56	-	2.76	-	1.21	1.136	26.0	0.0	15.8	46.3					
		Empty		0.0	-	-	-	0.90	-	-	-	-	-	-	-	-	0.0	0.0	0					
		Empty		0.0	-	-	-	0.90	-	-	-	-	-	-	-	-	0.0	0.0	0					
																				237	**131**	**137**	**9**	**5**
Pos.4	**163.00**	Ericsson AIR3246 B66	1	226.0	58.7	15.7	9.4	0.90	6.40	3.83	3.74	6.24	1.26	1.37	1.136	26.0	188.0	122.5	226	188	123	226	15	9
		Empty		0.0	-	-	-	0.90	-	-	-	-	-	-	-	-	0.0	0.0	0					
		Empty		0.0	-	-	-	0.90	-	-	-	-	-	-	-	-	0.0	0.0	0					
		Empty		0.0	-	-	-	0.90	-	-	-	-	-	-	-	-	0.0	0.0	0					
		Empty		0.0	-	-	-	0.90	-	-	-	-	-	-	-	-	0.0	0.0	0					
																				94	**62**	**113**	**8**	**4**

* Enter N/A in the W column for front sheilded apurtanances.

** A_N is the product of H and W

*** A_T is the product of H and D

DL 745

Mount	Height (ft)	Member	*L (in)	**W (in)	D (in)	Weight (lb/ft)	*** Ca	K_z	q_z (psf)	Wind Load (PLF)	Lateral Load (Seismic)	Vertical Load (Seismic)
	163.00	2 STD Pipe	12.00	2.38	0.00		1.20	1.136	23.4	6	-	-
	163.00	2.5 STD Pipe	0.00	2.88	0.00		-	-	-	-	-	-
	163.00	3 STD Pipe	0.00	3.50	0.00		-	-	-	-	-	-
	163.00	Angle Horizontal	0.00	0.00	0.00		-	-	-	-	-	-
	163.00	Angle (L3x3x4)	12.00	3.00	3.00		2.00	1.136	23.4	12	-	-
	163.00	Angle Diagonal	0.00	0.00	0.00		-	-	-	-	-	-
	163.00	Tube Standoff (4x4x4)	12.00	4.00	4.00		2.00	1.136	23.4	16	-	-
	163.00	Tube Horizontal	0.00	0.00	0.00		-	-	-	-	-	-
	163.00	Plate	0.00	0.00	0.00		-	-	-	-	-	-
	163.00	Double Angle (LL2.5x2.5x3)	12.00	2.50	2.50		2.00	1.136	23.4	10	-	-
	163.00	Double Angle	0.00	0.00	0.00		-	-	-	-	-	-
	163.00	Channel (Weak Axis Bending)	0.00	0.00	0.00		-	-	-	-	-	-
	163.00	Channel (Strong Axis Bending)	0.00	0.00	0.00		-	-	-	-	-	-

* The dimension L is the longest dimension of the member

** The dimension W is the height or width of the member that resists wind load

*** Ca will equal 1.2 for round members and 2.0 for flat members

CLIENT: ForeSite LLC - T-Mobile

PROJECT: CT11365D

SUBJECT: Antenna Loads -TIA 222 G Stanadard (chapter 16 revisions)

ti (in) 2.346375 Kiz 1.1731873 reduction 0.2657

Antenna AND Mount With Ice

Mounting Pole	Height (ft)	Model Number	#	H (in)	W (in)	D (in)	Ka	*A_N (ft2)	*A_T (ft2)	*Volume Ice (ft3)	*Weight Ice (lbs)	**Ca (FRONT)	**Ca (SIDE)	Kz	q_z (psf)	Pounds: Ice Wind Load (Front)	Ice Wind Load (Side)	Combined Wind Load (Front)	Combined Wind Load (Side)	Ice Dead Load	**Total Wind Load (Front)	**Total Wind Load (Side)	Total Ice Load
Pos. 1	**163.00**	Ericsson AIR32 KRD 901 146-1 B66A-B2A	1	59.3	12.9	8.7	0.90	2.50	2.37	4.86	271.95	0.73	0.75	1.136	6.9	11.3	11.0	53.9	41.9	272	54	42	272
		Empty		-	-	-	0.90	-	-	-	0.00	-	-	-	-	0.0	0.0	0.0	0.0	0			
		Empty		-	-	-	0.90	-	-	-	0.00	-	-	-	-	0.0	0.0	0.0	0.0	0			
		Empty		-	-	-	0.90	-	-	-	0.00	-	-	-	-	0.0	0.0	0.0	0.0	0			
		Empty		-	-	-	0.90	-	-	-	0.00	-	-	-	-	0.0	0.0	0.0	0.0	0			
																					27	**21**	**136**
Pos.2	**163.00**	Ericsson AIR6449 B41	1	33.1	20.5	8.3	0.90	1.90	1.50	3.90	218.38	0.70	0.71	1.136	6.9	8.3	6.6	43.4	21.6	218	43	22	218
		Empty		-	-	-	0.90	-	-	-	0.00	-	-	-	-	0.0	0.0	0.0	0.0	0			
		Empty		-	-	-	0.90	-	-	-	0.00	-	-	-	-	0.0	0.0	0.0	0.0	0			
		Empty		-	-	-	0.90	-	-	-	0.00	-	-	-	-	0.0	0.0	0.0	0.0	0			
		Empty		-	-	-	0.90	-	-	-	0.00	-	-	-	-	0.0	0.0	0.0	0.0	0			
																					22	**11**	**110**
Pos.3	**163.00**	RFS APXVAARR24_43-U-NA20	1	95.9	24.0	8.7	0.90	4.06	3.56	10.78	603.79	0.72	0.81	1.136	6.9	18.2	18.0	144.1	73.2	604	144	96	803
	163.00	Radio 4449 B71+B85	1	17.9	13.2	10.6	0.90	-	1.08	2.13	119.38	0.70	0.70	1.136	6.9	0.0	4.7	0.0	14.6	119			
	163.00	Radio 4415 B25	1	14.9	13.2	5.4	0.90	-	0.81	1.43	80.24	0.70	0.70	1.136	6.9	0.0	3.5	0.0	7.8	80			
		Empty		-	-	-	0.90	-	-	-	0.00	-	-	-	-	0.0	0.0	0.0	0.0	0			
		Empty		-	-	-	0.90	-	-	-	0.00	-	-	-	-	0.0	0.0	0.0	0.0	0			
																					73	**48**	**402**
Pos.4	**163.00**	Ericsson AIR3246 B66	1	58.7	15.7	9.4	0.90	2.58	2.37	5.53	309.67	0.71	0.74	1.136	6.9	11.4	11.0	61.4	43.5	310	61	44	310
		Empty		-	-	-	0.90	-	-	-	0.00	-	-	-	-	0.0	0.0	0.0	0.0	0			
		Empty		-	-	-	0.90	-	-	-	0.00	-	-	-	-	0.0	0.0	0.0	0.0	0			
		Empty		-	-	-	0.90	-	-	-	0.00	-	-	-	-	0.0	0.0	0.0	0.0	0			
		Empty		-	-	-	0.90	-	-	-	0.00	-	-	-	-	0.0	0.0	0.0	0.0	0			
																					31	**22**	**155**

* A_N ,A_T, Volume Ice and Weight Ice are calculated per unit

** Ca will equal 1.2 for all ice load calculations

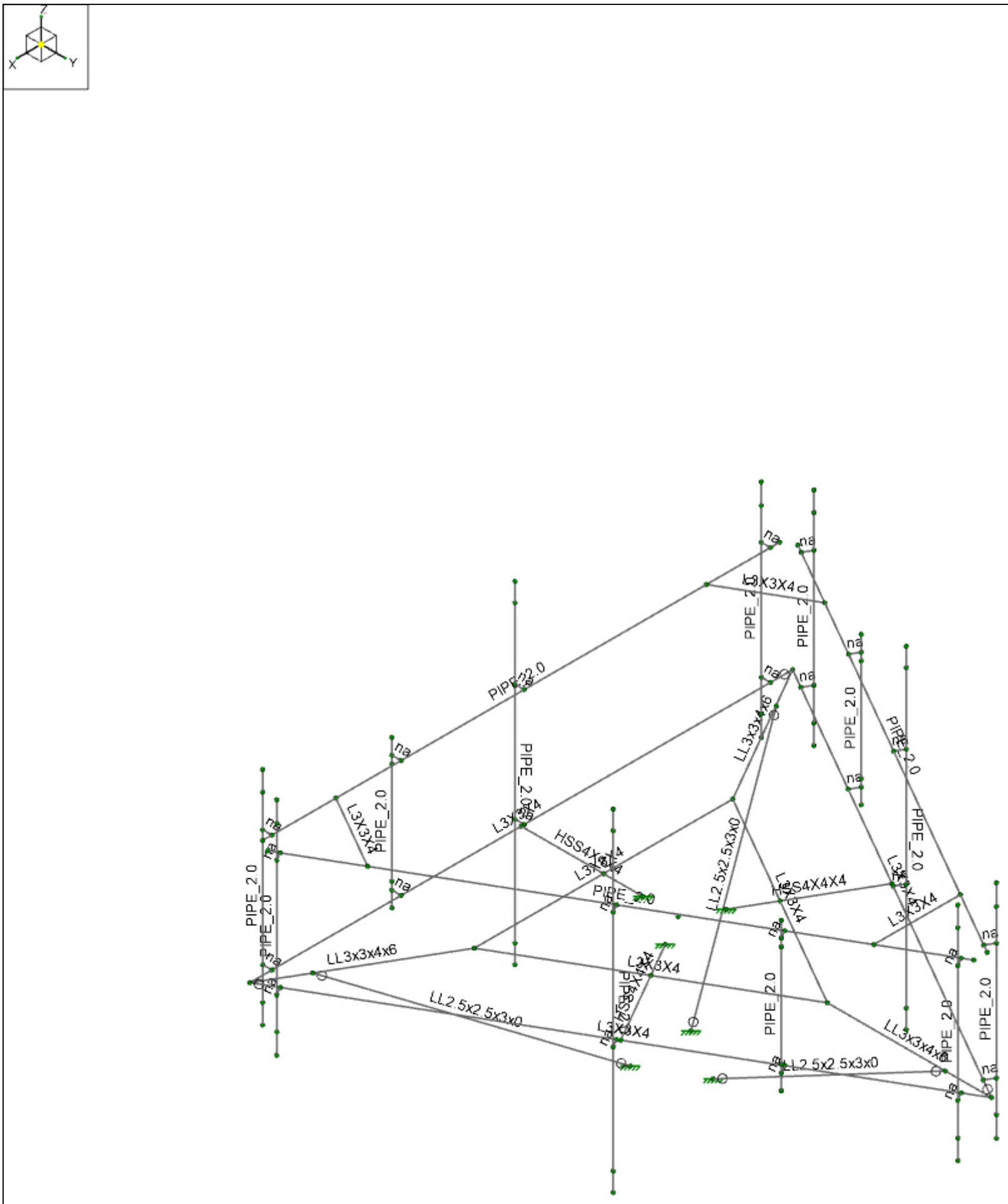
Mount	Height (ft)	Member	*L (in)	**W (in)	D (in)	***A_N (ft2)	Volume Ice (ft3)	Weight Ice (lbs)	****Ca (FRONT)	Kz	q_z (psf)	PLF: Ice Wind Load (Front)	Combined Wind Load (Front)	Ice Dead Load
	163.00	2 STD Pipe	12.00	2.38	0.00	0.62	0.24	13.55	1.20	1.136	6.2	4.6	6.1	14
	163.00	2.5 STD Pipe	0.00	2.88	0.00	-	-	-	-	-	-	-	-	-
	163.00	3 STD Pipe	0.00	3.50	0.00	-	-	-	-	-	-	-	-	-
	163.00	Angle Horizontal	0.00	0.00	0.00	-	-	-	-	-	-	-	-	-
	163.00	Angle (L3x3x4)	12.00	3.00	3.00	0.64	0.20	10.95	1.20	1.136	6.2	4.8	7.9	11
	163.00	Angle Diagonal	0.00	0.00	0.00	-	-	-	-	-	-	-	-	-
	163.00	Tube Standoff (4x4x4)	12.00	4.00	4.00	0.67	0.62	34.66	1.20	1.136	6.2	5.0	9.2	35
	163.00	Tube Horizontal	0.00	0.00	0.00	-	-	-	-	-	-	-	-	-
	163.00	Plate	0.00	0.00	0.00	-	-	-	-	-	-	-	-	-
	163.00	Double Angle (LL2.5x2.5x3)	12.00	2.50	2.50	0.63	0.24	13.69	1.20	1.136	6.2	4.7	7.3	14
	163.00	Double Angle	0.00	0.00	0.00	-	-	-	-	-	-	-	-	-
	163.00	Channel (Weak Axis Bending)	0.00	0.00	0.00	-	-	-	-	-	-	-	-	-
	163.00	Channel (Strong Axis Bending)	0.00	0.00	0.00	-	-	-	-	-	-	-	-	-

* The dimension L is the longest dimension of the member

** The dimension W is the height or width of the member that resists wind load

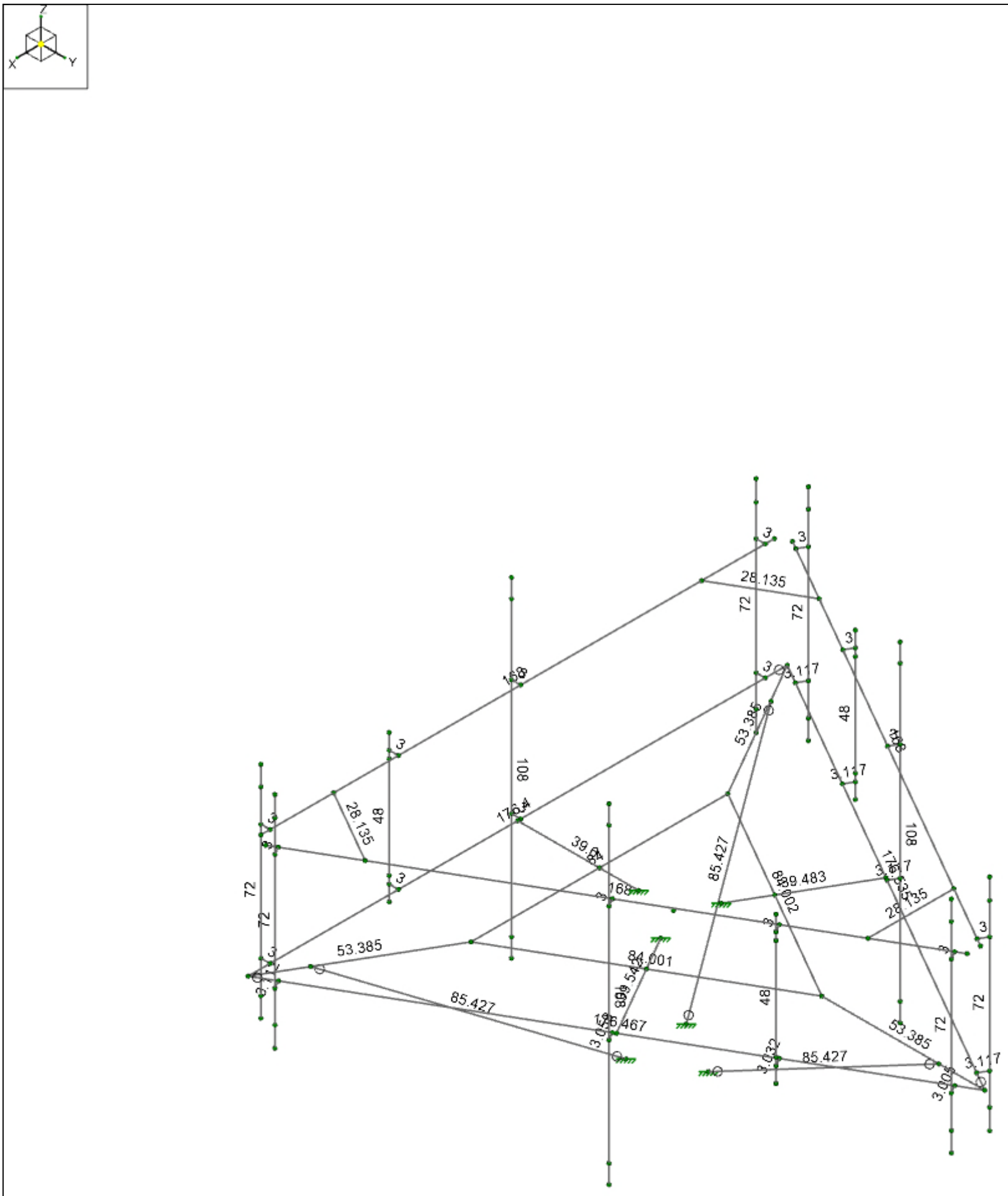
*** A_N is the area of ice built up on the LW plane

**** Ca will equal 1.2 for all ice load calculations



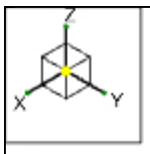
Envelope Only Solution

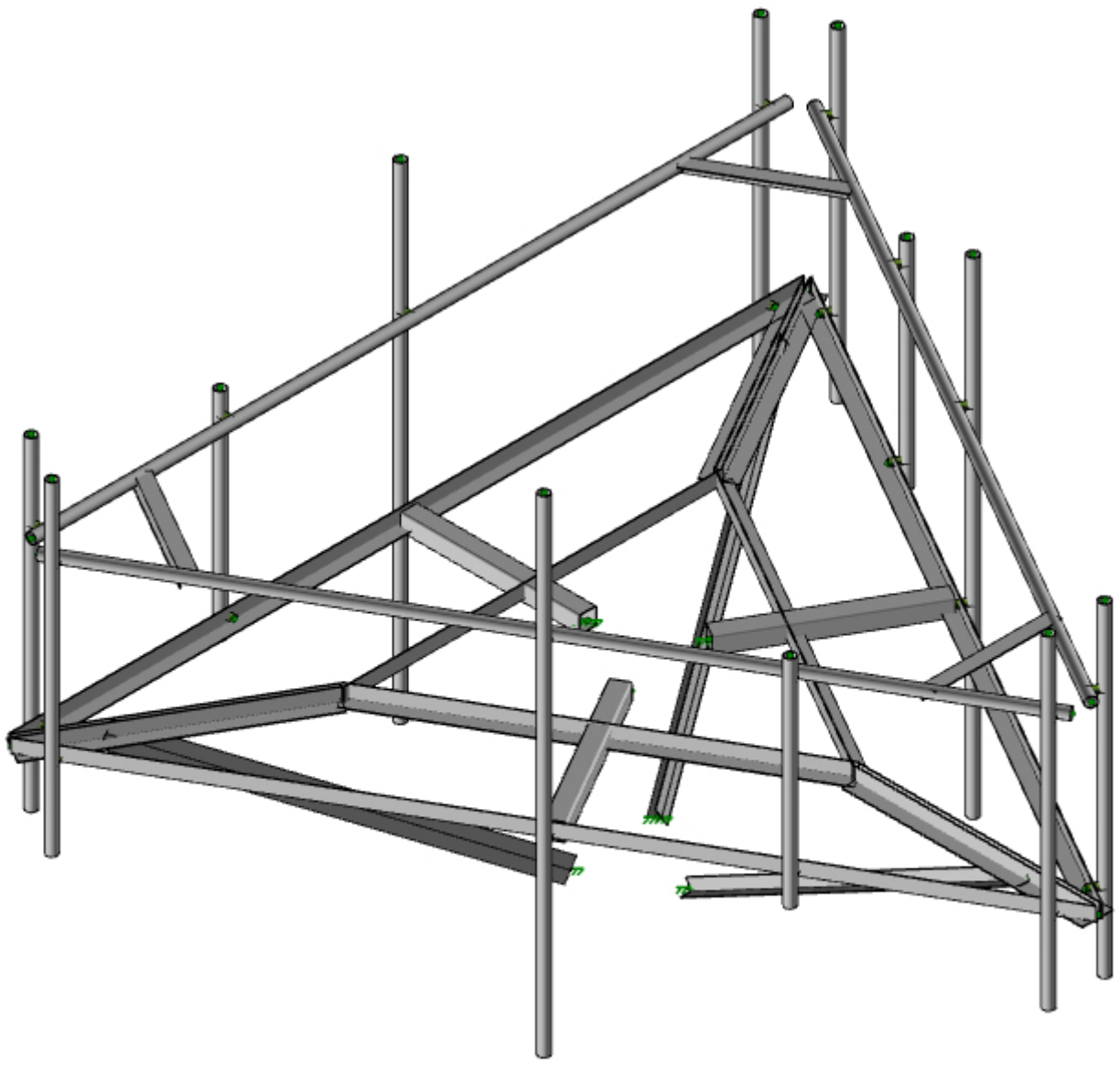
Foresite/ EFI Global	CT11365D - Upgrade	SK-1
SK		Jun 18, 2020
049.00421 - 2075019		CT11365D - Upgrade.r3d



Member Length (in) Displayed
Envelope Only Solution

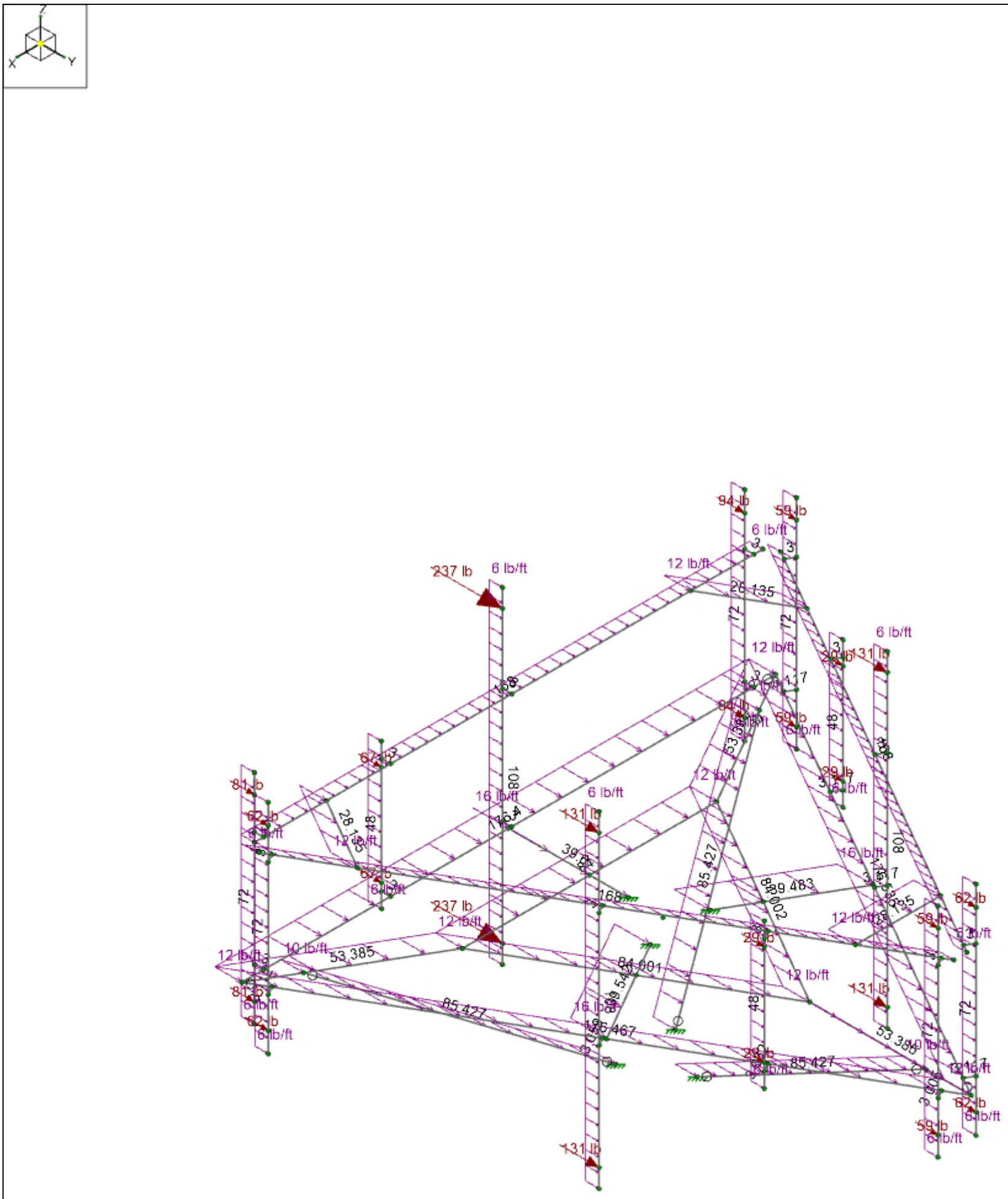
Foresite/ EFI Global	CT11365D - Upgrade	SK-2
SK		Jun 18, 2020
049.00421 - 2075019		CT11365D - Upgrade.r3d





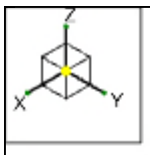
Member Length (in) Displayed
Envelope Only Solution

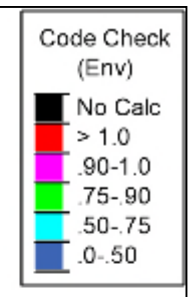
Foresite/ EFI Global	CT11365D - Upgrade	SK-3
SK		Jun 18, 2020
049.00421 - 2075019		CT11365D - Upgrade.r3d

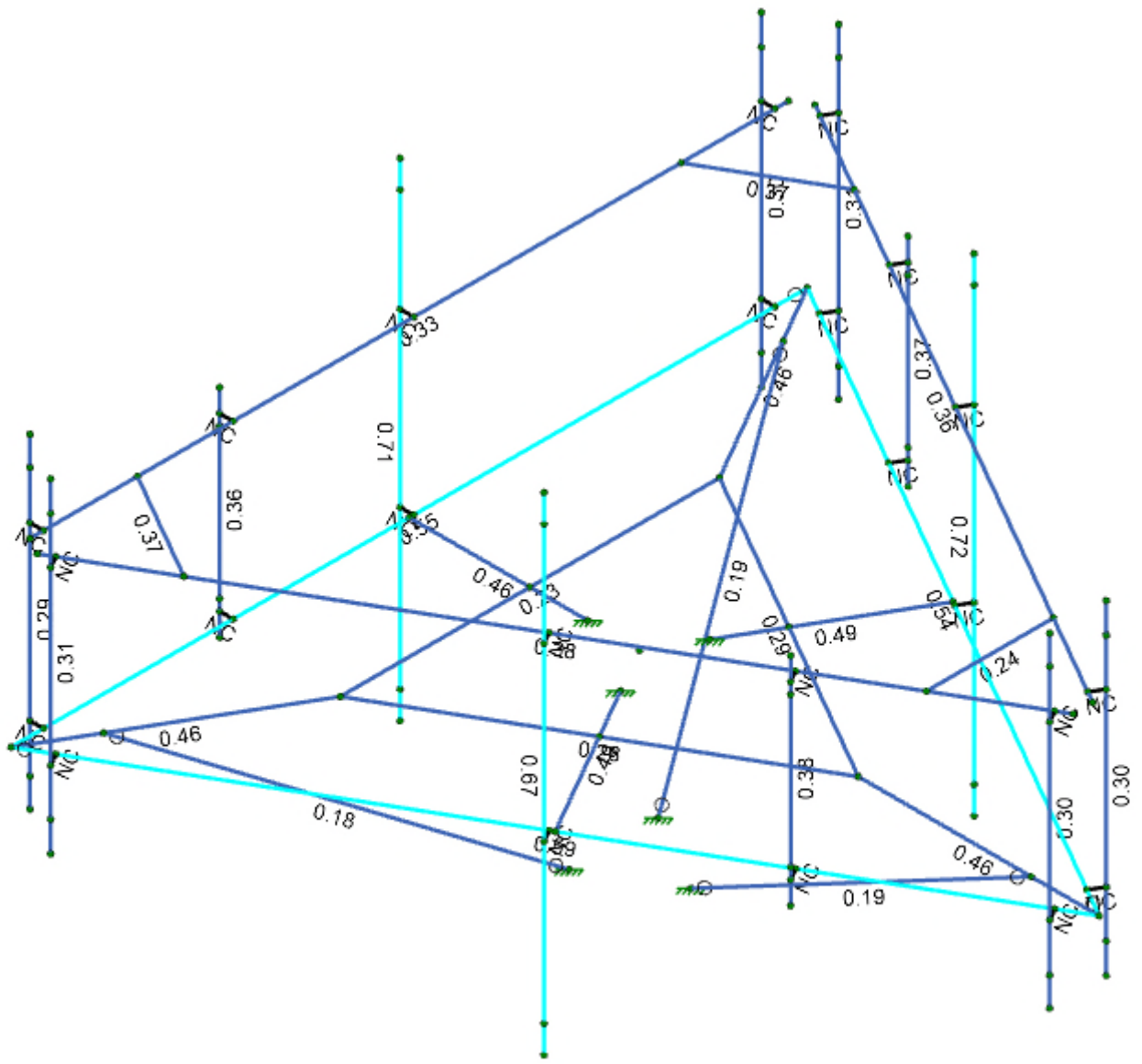


Member Length (in) Displayed
Loads: BLC 3, WIND LOAD (NO ICE) FRONT
Envelope Only Solution

Foresite/ EFI Global	CT11365D - Upgrade	SK-4
SK		Jun 18, 2020
049.00421 - 2075019		CT11365D - Upgrade.r3d







Member Code Checks Displayed (Enveloped)
Envelope Only Solution

Foresite/ EFI Global	CT11365D - Upgrade	SK-5
SK		Jun 18, 2020
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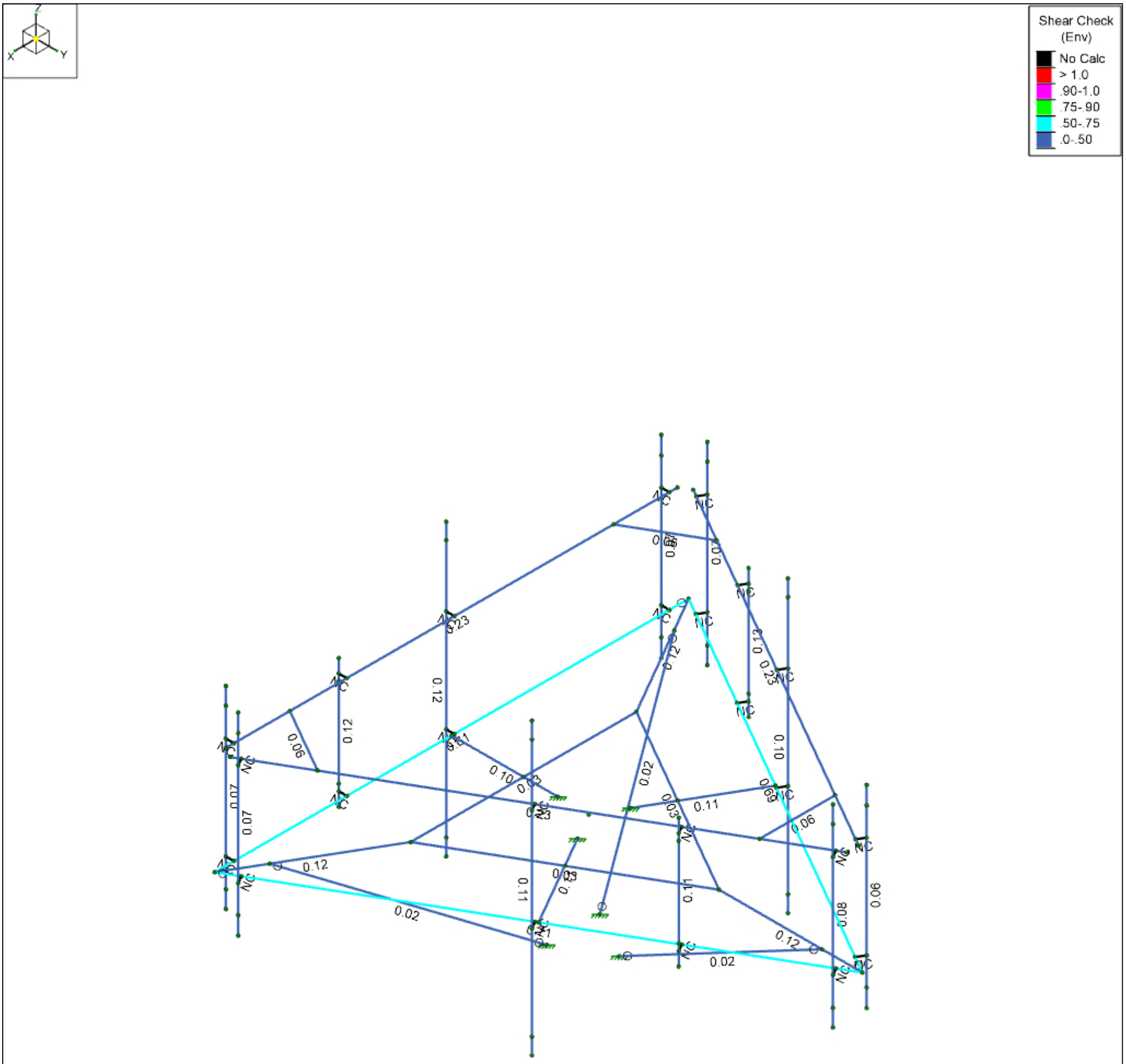
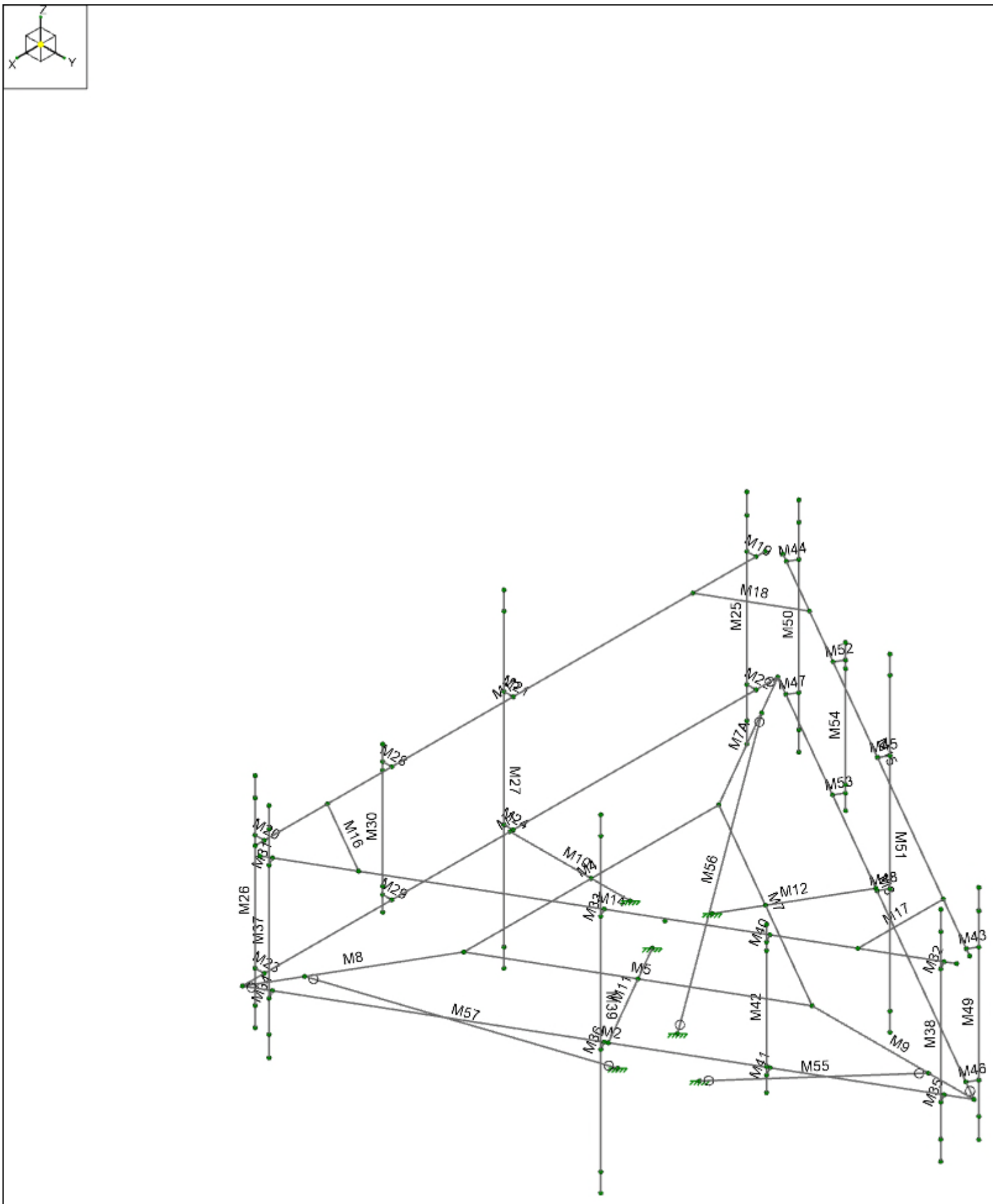


Member Shear Checks Displayed (Enveloped)
Envelope Only Solution

Foresite/ EFI Global	CT11365D - Upgrade	SK-6
SK		Jun 18, 2020
049.00421 - 2075019		CT11365D - Upgrade.r3d



Envelope Only Solution

Foresite/ EFI Global	CT11365D - Upgrade	SK-7
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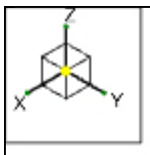
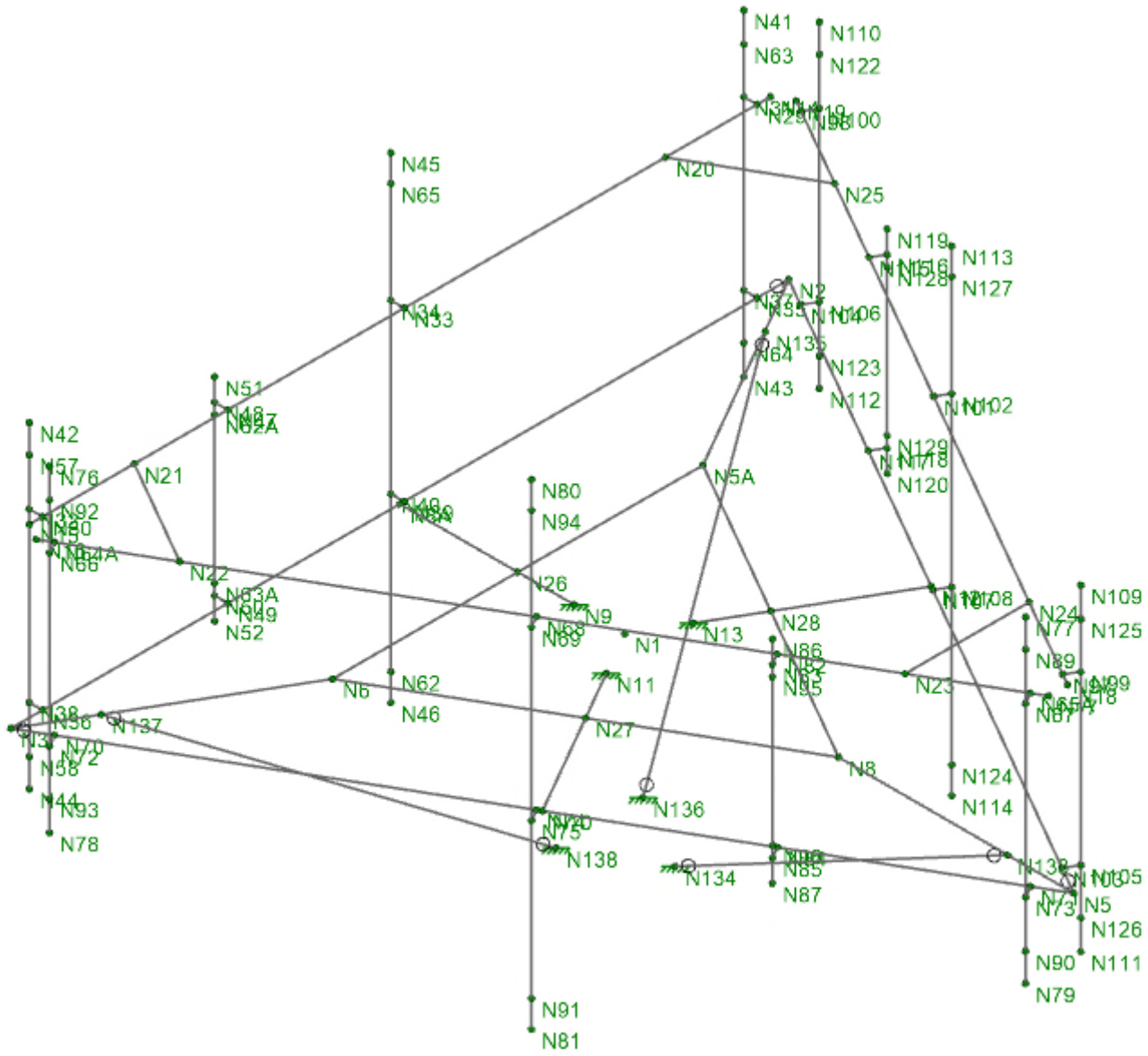




Envelope Only Solution

Foresite/ EFI Global	CT11365D - Upgrade	SK-8
SK		Jun 18, 2020
049.00421 - 2075019		CT11365D - Upgrade.r3d

Model Settings

Number of Reported Sections	5
Number of Internal Sections	97
Member Area Load Mesh Size (in²)	144
Consider Shear Deformation	Yes
Consider Torsional Warping	Yes

Approximate Mesh Size (in)	12
Transfer Forces Between Intersecting Wood Walls	No
Increase Wood Wall Nailing Capacity for Wind Loads	Yes
Include P-Delta for Walls	Yes
Optimize Masonry and Wood Walls	Yes
Maximum Number of Iterations	3

Single	No
Multiple (Optimum)	Yes
Maximum	No

Global Axis corresponding to vertical direction	Z
Convert Existing Data	Yes

Default Global Plane for z-axis	XZ

Plate Local Axis Orientation	Nodal

Hot Rolled Steel	AISC 14th (360-10): LRFD
Stiffness Adjustment	Yes (Iterative)
Notional Annex	None
Connections	AISC 14th (360-10): LRFD
Cold Formed Steel	AISI NAS-01: ASD
Stiffness Adjustment	Yes (Iterative)
Wood	AF&PA NDS-05/08: ASD
Temperature	< 100F
Concrete	ACI 318-05
Masonry	ACI 530-05: ASD
Aluminum	AA ADM1-05: ASD
Structure Type	Building
Stiffness Adjustment	Yes (Iterative)
Stainless	AISC 14th (360-10): ASD
Stiffness Adjustment	Yes (Iterative)

Analysis Methodology	Exact Integration Method
Parme Beta Factor	0.65
Compression Stress Block	Rectangular Stress Block
Analyze using Cracked Sections	Yes
Leave room for horizontal rebar splices (2*d bar spacing)	No
List forces which were ignored for design in the Detail Report	Yes

Column Min Steel	1
Column Max Steel	8
Rebar Material Spec	ASTM A615
Warn if beam-column framing arrangement is not understood	No
Number of Shear Regions	4
Region 2 & 3 Spacing Increase Increment (in)	4

Code	ASCE 7-05
Risk Category	I
Drift Cat	Other
Base Elevation (ft)	-999999
Include the weight of the structure in base shear calcs	Yes

S_s(g)	1
SD_1(g)	1
SD_s(g)	1
T_L(sec)	-1

T (sec)	
T (sec)	
C_t	0.035
C_t	0.035
C_tExp.	0.75
C_tExp.	0.75
R	8.5
R	8.5
Ω_o	1
Ω_o	1
C_d	4
C_d	4
ρ	1
ρ	1

Line Project Grid

No Data to Print...

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm. Coeff. [...	Density [k/ft³]	Yield [ksi]	Ry	Fu [ksi]	Rt
1	A36 Gr.36	29000	11154	0.3	0.65	0.49	36	1.5	58	1.2
2	A572 Gr.50	29000	11154	0.3	0.65	0.49	50	1.1	65	1.2
3	A992	29000	11154	0.3	0.65	0.49	50	1.1	65	1.2
4	A500 Gr.42	29000	11154	0.3	0.65	0.49	42	1.3	58	1.1
5	A500 Gr.46	29000	11154	0.3	0.65	0.49	46	1.2	58	1.1
6	A53 Gr.B	29000	11154	0.3	0.65	0.49	35	1.5	60	1.2
7	A529 Gr.50	29000	11154	0.3	0.65	0.49	50	1.1	65	1.2

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design Rule	Area [in²]	Iyy [in⁴]	Izz [in⁴]	J [in⁴]
1	Standoff Tube...	HSS4X4X4	Beam	None	A500 Gr.46	Typical	3.37	7.8	7.8	12.8
2	Face Pipe Hori...	PIPE_3.0	Beam	None	A53 Gr.B	Typical	2.07	2.85	2.85	5.69
3	Antenna Pipe...	PIPE_2.5	Column	None	A53 Gr.B	Typical	1.61	1.45	1.45	2.89
4	Pipe Rail	PIPE_2.5	Beam	None	A53 Gr.B	Typical	1.61	1.45	1.45	2.89
5	Pipe Rail Brace	PIPE_2.5	VBrace	None	A53 Gr.B	Typical	1.61	1.45	1.45	2.89

Primary Member Properties

	Label	I Node	J Node	K Node	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rule
1	M19	N29	N31			RIGID	None	None	LINK	Typical
2	M20	N30	N32			RIGID	None	None	LINK	Typical
3	M21	N33	N34			RIGID	None	None	LINK	Typical
4	M22	N35	N37			RIGID	None	None	LINK	Typical
5	M23	N36	N38			RIGID	None	None	LINK	Typical
6	M24	N39	N40			RIGID	None	None	LINK	Typical
7	M28	N47	N48			RIGID	None	None	LINK	Typical
8	M29	N49	N50			RIGID	None	None	LINK	Typical
9	M31	N64A	N66			RIGID	None	None	LINK	Typical
10	M32	N65A	N67			RIGID	None	None	LINK	Typical
11	M33	N68	N69			RIGID	None	None	LINK	Typical
12	M34	N70	N72			RIGID	None	None	LINK	Typical
13	M35	N71	N73			RIGID	None	None	LINK	Typical
14	M36	N74	N75			RIGID	None	None	LINK	Typical
15	M40	N82	N83			RIGID	None	None	LINK	Typical
16	M41	N84	N85			RIGID	None	None	LINK	Typical
17	M43	N97	N99			RIGID	None	None	LINK	Typical
18	M44	N98	N100			RIGID	None	None	LINK	Typical
19	M45	N101	N102			RIGID	None	None	LINK	Typical
20	M46	N103	N105			RIGID	None	None	LINK	Typical
21	M47	N104	N106			RIGID	None	None	LINK	Typical
22	M48	N107	N108			RIGID	None	None	LINK	Typical
23	M52	N115	N116			RIGID	None	None	LINK	Typical
24	M53	N117	N118			RIGID	None	None	LINK	Typical
25	M13	N14	N15			PIPE_2.0	Beam	Wide Flange	A53 Gr.B	Typical
26	M14	N16	N17			PIPE_2.0	Beam	Wide Flange	A53 Gr.B	Typical
27	M15	N18	N19			PIPE_2.0	Beam	Wide Flange	A53 Gr.B	Typical
28	M25	N43	N41			PIPE_2.0	Beam	Wide Flange	A53 Gr.B	Typical
29	M26	N44	N42			PIPE_2.0	Beam	Wide Flange	A53 Gr.B	Typical
30	M27	N45	N46			PIPE_2.0	Beam	Wide Flange	A53 Gr.B	Typical
31	M30	N52	N51			PIPE_2.0	Beam	Wide Flange	A53 Gr.B	Typical
32	M37	N78	N76			PIPE_2.0	Beam	Wide Flange	A53 Gr.B	Typical
33	M38	N79	N77			PIPE_2.0	Beam	Wide Flange	A53 Gr.B	Typical
34	M39	N80	N81			PIPE_2.0	Beam	Wide Flange	A53 Gr.B	Typical
35	M42	N87	N86			PIPE_2.0	Beam	Wide Flange	A53 Gr.B	Typical
36	M49	N111	N109			PIPE_2.0	Beam	Wide Flange	A53 Gr.B	Typical
37	M50	N112	N110			PIPE_2.0	Beam	Wide Flange	A53 Gr.B	Typical
38	M51	N113	N114			PIPE_2.0	Beam	Wide Flange	A53 Gr.B	Typical
39	M54	N120	N119			PIPE_2.0	Beam	Wide Flange	A53 Gr.B	Typical
40	M7A	N2	N5A		270	LL3x3x4x6	Beam	Wide Flange	A36 Gr.36	Typical
41	M8	N3	N6		90	LL3x3x4x6	Beam	Wide Flange	A36 Gr.36	Typical
42	M9	N5	N8		90	LL3x3x4x6	Beam	Wide Flange	A36 Gr.36	Typical
43	M1	N2	N3			L3X3X4	Beam	Wide Flange	A36 Gr.36	Typical
44	M2	N3	N5		180	L3X3X4	Beam	Wide Flange	A36 Gr.36	Typical
45	M3	N5	N2		180	L3X3X4	Beam	Wide Flange	A36 Gr.36	Typical
46	M4	N5A	N6		90	L3X3X4	Beam	Wide Flange	A36 Gr.36	Typical
47	M5	N6	N8		270	L3X3X4	Beam	Wide Flange	A36 Gr.36	Typical
48	M7	N8	N5A		270	L3X3X4	Beam	Wide Flange	A36 Gr.36	Typical
49	M16	N22	N21			L3X3X4	Beam	Wide Flange	A36 Gr.36	Typical
50	M17	N23	N24			L3X3X4	Beam	Wide Flange	A36 Gr.36	Typical
51	M18	N20	N25			L3X3X4	Beam	Wide Flange	A36 Gr.36	Typical
52	M10	N8A	N9			HSS4X4X4	Beam	Wide Flange	A500 Gr.46	Typical
53	M11	N10	N11			HSS4X4X4	Beam	Wide Flange	A500 Gr.46	Typical
54	M12	N12	N13			HSS4X4X4	Beam	Wide Flange	A500 Gr.46	Typical
55	M55	N133	N134			LL2.5x2.5x3x0	Beam	Double Angle (...	A36 Gr.36	Typical
56	M56	N135	N136			LL2.5x2.5x3x0	Beam	Double Angle (...	A36 Gr.36	Typical
57	M57	N137	N138			LL2.5x2.5x3x0	Beam	Double Angle (...	A36 Gr.36	Typical

Advanced Member Properties

	Label	I Release	J Release	I Offset [in]	J Offset [in]	T/C Only	Physical	Deflection Ra...	Analysis Offs...	Activation	Seismic DR
1	M19						Yes	** NA **			None
2	M20						Yes	** NA **			None
3	M21						Yes	** NA **			None
4	M22						Yes	** NA **			None
5	M23						Yes	** NA **			None
6	M24						Yes	** NA **			None
7	M28						Yes	** NA **			None
8	M29						Yes	** NA **			None
9	M31						Yes	** NA **			None
10	M32						Yes	** NA **			None
11	M33						Yes	** NA **			None
12	M34						Yes	** NA **			None
13	M35						Yes	** NA **			None
14	M36						Yes	** NA **			None

Advanced Member Properties (Continued)

	Label	I Release	J Release	I Offset [in]	J Offset [in]	T/C Only	Physical	Deflection Ra...	Analysis Offs...	Activation	Seismic DR
15	M40						Yes	** NA **			None
16	M41						Yes	** NA **			None
17	M43						Yes	** NA **			None
18	M44						Yes	** NA **			None
19	M45						Yes	** NA **			None
20	M46						Yes	** NA **			None
21	M47						Yes	** NA **			None
22	M48						Yes	** NA **			None
23	M52						Yes	** NA **			None
24	M53						Yes	** NA **			None
25	M13						Yes				None
26	M14						Yes				None
27	M15						Yes				None
28	M25						Yes				None
29	M26						Yes				None
30	M27						Yes				None
31	M30						Yes				None
32	M37						Yes				None
33	M38						Yes				None
34	M39						Yes				None
35	M42						Yes				None
36	M49						Yes				None
37	M50						Yes				None
38	M51						Yes				None
39	M54						Yes				None
40	M7A						Yes				None
41	M8						Yes				None
42	M9						Yes				None
43	M1	BenPIN					Yes				None
44	M2	BenPIN					Yes				None
45	M3	BenPIN					Yes				None
46	M4						Yes				None
47	M5						Yes				None
48	M7						Yes				None
49	M16						Yes				None
50	M17						Yes				None
51	M18						Yes				None
52	M10						Yes				None
53	M11						Yes				None
54	M12						Yes				None
55	M55	BenPIN	BenPIN				Yes	Default			None
56	M56	BenPIN	BenPIN				Yes	Default			None
57	M57	BenPIN	BenPIN				Yes	Default			None

Hot Rolled Member Properties

	Label	Shape	Length [in]	Lb y-y [in]	Lb z-z [in]	Lcomp top [in]	Lcomp bot [in]	L-Torque [in]	K y-y	K z-z	Cb	Function
1	M13	PIPE_2.0	168			Lbyy						Lateral
2	M14	PIPE_2.0	168			Lbyy						Lateral
3	M15	PIPE_2.0	168			Lbyy						Lateral
4	M25	PIPE_2.0	72			Lbyy						Lateral
5	M26	PIPE_2.0	72			Lbyy						Lateral
6	M27	PIPE_2.0	108			Lbyy						Lateral
7	M30	PIPE_2.0	48			Lbyy						Lateral
8	M37	PIPE_2.0	72			Lbyy						Lateral
9	M38	PIPE_2.0	72			Lbyy						Lateral
10	M39	PIPE_2.0	108			Lbyy						Lateral
11	M42	PIPE_2.0	48			Lbyy						Lateral
12	M49	PIPE_2.0	72			Lbyy						Lateral
13	M50	PIPE_2.0	72			Lbyy						Lateral
14	M51	PIPE_2.0	108			Lbyy						Lateral
15	M54	PIPE_2.0	48			Lbyy						Lateral
16	M7A	LL3x3x4x6	53.385			Lbyy						Lateral
17	M8	LL3x3x4x6	53.385			Lbyy						Lateral
18	M9	LL3x3x4x6	53.385			Lbyy						Lateral
19	M1	L3X3X4	176.4			Lbyy						Lateral
20	M2	L3X3X4	176.467			Lbyy						Lateral
21	M3	L3X3X4	176.535			Lbyy						Lateral
22	M4	L3X3X4	84			Lbyy						Lateral
23	M5	L3X3X4	84.001			Lbyy						Lateral
24	M7	L3X3X4	84.002			Lbyy						Lateral
25	M16	L3X3X4	28.135			Lbyy						Lateral
26	M17	L3X3X4	28.135			Lbyy						Lateral
27	M18	L3X3X4	28.135			Lbyy						Lateral
28	M10	HSS4X4X4	39.6			Lbyy						Lateral
29	M11	HSS4X4X4	39.542			Lbyy						Lateral
30	M12	HSS4X4X4	39.483			Lbyy						Lateral
31	M55	LL2.5x2.5x3x0	85.427			Lbyy						Lateral
32	M56	LL2.5x2.5x3x0	85.427			Lbyy						Lateral
33	M57	LL2.5x2.5x3x0	85.427			Lbyy						Lateral

Nodes

	Label	X [in]	Y [in]	Z [in]	Temp [deg F]	Detach From Diaphragm
1	N1	0	0	0		
2	N2	-88.2	-51	0		
3	N3	88.2	-51	0		
4	N5	0.067296	101.883441	0		
5	N5A	-42	-24.25	0		
6	N6	42	-24.25	0		
7	N8	0.001116	48.498067	0		
8	N8A	0	-51	0		
9	N9	0	-11.4	0		
10	N10	44.116843	25.470871	0		
11	N11	9.87269	5.7	0		
12	N12	-44.066352	25.44172	0		
13	N13	-9.87269	5.7	0		
14	N14	-84	-51	38		

Nodes (Continued)

	Label	X [in]	Y [in]	Z [in]	Temp [deg F]	Detach From Diaphragm
15	N15	84	-51	38		
16	N16	86.167296	-47.246134	38		
17	N17	2.167296	98.246134	38		
18	N18	-2.167296	98.246134	38		
19	N19	-86.167296	-47.246134	38		
20	N20	-60.2	-51	38		
21	N21	60.2	-51	38		
22	N22	74.267296	-26.634729	38		
23	N23	14.067296	77.634729	38		
24	N24	-14.067296	77.634729	38		
25	N25	-74.267296	-26.634729	38		
26	N26	0	-24.25	0		
27	N27	21.000279	12.124517	0		
28	N28	-20.999442	12.124033	0		
29	N29	-81	-51	38		
30	N30	81	-51	38		
31	N31	-81	-54	38		
32	N32	81	-54	38		
33	N33	-1	-51	38		
34	N34	-1	-54	38		
35	N35	-81	-51	0		
36	N36	81	-51	0		
37	N37	-81	-54	0		
38	N38	81	-54	0		
39	N39	-1	-51	0		
40	N40	-1	-54	0		
41	N41	-81	-54	55		
42	N42	81	-54	55		
43	N43	-81	-54	-17		
44	N44	81	-54	-17		
45	N45	-1	-54	67		
46	N46	-1	-54	-41		
47	N47	39	-51	38		
48	N48	39	-54	38		
49	N49	39	-51	0		
50	N50	39	-54	0		
51	N51	39	-54	43		
52	N52	39	-54	-5		
53	N57	81	-54	48.65		
54	N58	81	-54	-10.65		
55	N62	-1	-54	-34.95		
56	N63	-81	-54	48.35		
57	N64	-81	-54	-10.35		
58	N65	-1	-54	60.95		
59	N62A	39	-54	35.55		
60	N63A	39	-54	2.45		
61	N64A	84.667296	-44.648058	38		
62	N65A	3.667296	95.648058	38		
63	N66	87.265372	-43.148058	38		
64	N67	6.265372	97.148058	38		
65	N68	44.667296	24.633975	38		
66	N69	47.265372	26.133975	38		
67	N70	84.570509	-44.703937	0		
68	N71	3.663177	95.64568	0		
69	N72	87.265372	-43.148058	0		
70	N73	6.265372	97.148058	0		
71	N74	44.616271	24.604516	0		
72	N75	47.265372	26.133975	0		
73	N76	87.265372	-43.148058	55		
74	N77	6.265372	97.148058	55		
75	N78	87.265372	-43.148058	-17		
76	N79	6.265372	97.148058	-17		
77	N80	47.265372	26.133975	67		
78	N81	47.265372	26.133975	-41		
79	N82	24.667296	59.274991	38		
80	N83	27.265372	60.774991	38		
81	N84	24.639152	59.258742	0		
82	N85	27.265372	60.774991	0		
83	N86	27.265372	60.774991	43		
84	N87	27.265372	60.774991	-5		
85	N89	6.265372	97.148058	48.65		
86	N90	6.265372	97.148058	-10.65		
87	N91	47.265372	26.133975	-34.95		
88	N92	87.265372	-43.148058	48.35		
89	N93	87.265372	-43.148058	-10.35		
90	N94	47.265372	26.133975	60.95		
91	N95	27.265372	60.774991	35.55		
92	N96	27.265372	60.774991	2.45		
93	N97	-3.667296	95.648058	38		
94	N98	-84.667296	-44.648058	38		
95	N99	-6.265372	97.148058	38		
96	N100	-87.265372	-43.148058	38		
97	N101	-43.667296	26.366025	38		
98	N102	-46.265372	27.866025	38		
99	N103	-3.566352	95.589778	0		
100	N104	-84.566352	-44.706337	0		
101	N105	-6.265372	97.148058	0		
102	N106	-87.265372	-43.148058	0		
103	N107	-43.566352	26.307746	0		
104	N108	-46.265372	27.866025	0		
105	N109	-6.265372	97.148058	55		
106	N110	-87.265372	-43.148058	55		
107	N111	-6.265372	97.148058	-17		
108	N112	-87.265372	-43.148058	-17		
109	N113	-46.265372	27.866025	67		
110	N114	-46.265372	27.866025	-41		
111	N115	-63.667296	-8.274991	38		

Nodes (Continued)

	Label	X [in]	Y [in]	Z [in]	Temp [deg F]	Detach From Diaphragm
112	N116	-66.265372	-6.774991	38		
113	N117	-63.566352	-8.33327	0		
114	N118	-66.265372	-6.774991	0		
115	N119	-66.265372	-6.774991	43		
116	N120	-66.265372	-6.774991	-5		
117	N122	-87.265372	-43.148058	48.65		
118	N123	-87.265372	-43.148058	-10.65		
119	N124	-46.265372	27.866025	-34.95		
120	N125	-6.265372	97.148058	48.35		
121	N126	-6.265372	97.148058	-10.35		
122	N127	-46.265372	27.866025	60.95		
123	N128	-66.265372	-6.774991	35.55		
124	N129	-66.265372	-6.774991	2.45		
125	N133	0.067296	86.883441	0		
126	N134	0.	11.4	-40		
127	N135	-75.276915	-43.383441	0		
128	N136	-9.87269	-5.7	-40		
129	N137	75.209619	-43.5	0		
130	N138	9.87269	-5.7	-40		

Boundary Conditions

	Node Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot [k-ft/rad]	Y Rot [k-ft/rad]	Z Rot [k-ft/rad]
1	N13	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
2	N11	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
3	N9	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
4	N134	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
5	N136	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
6	N138	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Nodal	Point	Distributed	Area(Member)	Surface(Plate/...
1	DEAD LOAD	None			-1	24			3	
2	DEAD LOAD ICE	None				24		33	3	
3	WIND LOAD (...	None				24		33		
4	WIND LOAD (...	None				24		33		
5	WIND LOAD (I...	None				24		33		
6	WIND LOAD (I...	None				24		31		
7	LIVE LOAD1	None				1				
8	LIVE LOAD2	None				1				
9	LIVE LOAD3	None				1				
10	MAINTENANC...	None				1				
11	MAINTENANC...	None				1				
12	MAINTENANC...	None				1				
13	MAINTENANC...	None				1				
14	BLC 1 Transien...	None						36		
15	BLC 2 Transien...	None						36		

Node Loads and Enforced Displacements (BLC 1 : DEAD LOAD)

	Node Label	L, D, M	Direction	Magnitude [(lb, k-ft), (in, rad), (I...	Inactive [(lb, k-ft), (in, rad), (lb*...
1	N57	L	Z	-72	Active
2	N58	L	Z	-72	Active
3	N122	L	Z	-72	Active
4	N123	L	Z	-72	Active
5	N89	L	Z	-72	Active
6	N90	L	Z	-72	Active
7	N62A	L	Z	-52	Active
8	N63A	L	Z	-52	Active
9	N128	L	Z	-52	Active
10	N129	L	Z	-52	Active
11	N95	L	Z	-52	Active
12	N96	L	Z	-52	Active
13	N65	L	Z	-137	Active
14	N62	L	Z	-137	Active
15	N127	L	Z	-137	Active
16	N124	L	Z	-137	Active
17	N94	L	Z	-137	Active
18	N91	L	Z	-137	Active
19	N63	L	Z	-113	Active
20	N64	L	Z	-113	Active
21	N125	L	Z	-113	Active
22	N126	L	Z	-113	Active
23	N92	L	Z	-113	Active
24	N93	L	Z	-113	Active

Node Loads and Enforced Displacements (BLC 2 : DEAD LOAD ICE)

	Node Label	L, D, M	Direction	Magnitude [(lb, k-ft), (in, rad), (I...	Inactive [(lb, k-ft), (in, rad), (lb*...
1	N57	L	Z	-136	Active
2	N58	L	Z	-136	Active
3	N122	L	Z	-136	Active
4	N123	L	Z	-136	Active
5	N89	L	Z	-136	Active
6	N90	L	Z	-136	Active
7	N62A	L	Z	-110	Active
8	N63A	L	Z	-110	Active
9	N128	L	Z	-110	Active
10	N129	L	Z	-110	Active
11	N95	L	Z	-110	Active
12	N96	L	Z	-110	Active
13	N65	L	Z	-402	Active
14	N62	L	Z	-402	Active
15	N127	L	Z	-402	Active
16	N124	L	Z	-402	Active
17	N94	L	Z	-402	Active
18	N91	L	Z	-402	Active
19	N63	L	Z	-155	Active

Node Loads and Enforced Displacements (BLC 2 : DEAD LOAD ICE) (Continued)

	Node Label	L, D, M	Direction	Magnitude [(lb, k-ft), (in, rad), (l...	Inactive [(lb, k-ft), (in, rad), (lb*...
20	N64	L	Z	-155	Active
21	N125	L	Z	-155	Active
22	N126	L	Z	-155	Active
23	N92	L	Z	-155	Active
24	N93	L	Z	-155	Active

Node Loads and Enforced Displacements (BLC 6 : WIND LOAD (ICE) SIDE)

	Node Label	L, D, M	Direction	Magnitude [(lb, k-ft), (in, rad), (l...	Inactive [(lb, k-ft), (in, rad), (lb*...
7	N62A	L	X	11	Active
8	N63A	L	X	11	Active
9	N128	L	X	22	Active
10	N129	L	X	22	Active
11	N95	L	X	22	Active
12	N96	L	X	22	Active
13	N65	L	X	48	Active
14	N62	L	X	48	Active
15	N127	L	X	73	Active
16	N124	L	X	73	Active
17	N94	L	X	73	Active
18	N91	L	X	73	Active
19	N63	L	X	22	Active
20	N64	L	X	22	Active
21	N125	L	X	31	Active
22	N126	L	X	31	Active
23	N92	L	X	31	Active
24	N93	L	X	31	Active

Member Distributed Loads (BLC 2 : DEAD LOAD ICE)

	Member Label	Direction	Start Magnitude [lb/ft,...	End Magnitude [lb/ft,...	Start Location [(in, %)]	End Location [(in, %)]	Inactive [(lb, k-ft), (in, r...
1	M13	Z	-14	-14	0	%100	Active
2	M14	Z	-14	-14	0	%100	Active
3	M15	Z	-14	-14	0	%100	Active
4	M25	Z	-14	-14	0	%100	Active
5	M26	Z	-14	-14	0	%100	Active
6	M27	Z	-14	-14	0	%100	Active
7	M30	Z	-14	-14	0	%100	Active
8	M37	Z	-14	-14	0	%100	Active
9	M38	Z	-14	-14	0	%100	Active
10	M39	Z	-14	-14	0	%100	Active
11	M42	Z	-14	-14	0	%100	Active
12	M49	Z	-14	-14	0	%100	Active
13	M50	Z	-14	-14	0	%100	Active
14	M51	Z	-14	-14	0	%100	Active
15	M54	Z	-14	-14	0	%100	Active
16	M7A	Z	-16	-16	0	%100	Active
17	M8	Z	-16	-16	0	%100	Active
18	M9	Z	-16	-16	0	%100	Active
19	M1	Z	-11	-11	0	%100	Active
20	M2	Z	-11	-11	0	%100	Active
21	M3	Z	-11	-11	0	%100	Active
22	M4	Z	-11	-11	0	%100	Active
23	M5	Z	-11	-11	0	%100	Active
24	M7	Z	-11	-11	0	%100	Active
25	M16	Z	-11	-11	0	%100	Active
26	M17	Z	-11	-11	0	%100	Active
27	M18	Z	-11	-11	0	%100	Active
28	M10	Z	-35	-35	0	%100	Active
29	M11	Z	-35	-35	0	%100	Active
30	M12	Z	-35	-35	0	%100	Active
31	M57	Z	-14	-14	0	%100	Active
32	M55	Z	-14	-14	0	%100	Active
33	M56	Z	-14	-14	0	%100	Active

Member Distributed Loads (BLC 3 : WIND LOAD (NO ICE) FRONT)

	Member Label	Direction	Start Magnitude [lb/ft,...	End Magnitude [lb/ft,...	Start Location [(in, %)]	End Location [(in, %)]	Inactive [(lb, k-ft), (in, r...
1	M13	PY	6	6	0	%100	Active
2	M14	PY	6	6	0	%100	Active
3	M15	PY	6	6	0	%100	Active
4	M25	PY	6	6	0	%100	Active
5	M26	PY	6	6	0	%100	Active
6	M27	PY	6	6	0	%100	Active
7	M30	PY	6	6	0	%100	Active
8	M37	PY	6	6	0	%100	Active
9	M38	PY	6	6	0	%100	Active
10	M39	PY	6	6	0	%100	Active
11	M42	PY	6	6	0	%100	Active
12	M49	PY	6	6	0	%100	Active
13	M50	PY	6	6	0	%100	Active
14	M51	PY	6	6	0	%100	Active
15	M54	PY	6	6	0	%100	Active
16	M7A	PY	12	12	0	%100	Active
17	M8	PY	12	12	0	%100	Active
18	M9	PY	12	12	0	%100	Active
19	M1	PY	12	12	0	%100	Active
20	M2	PY	12	12	0	%100	Active
21	M3	PY	12	12	0	%100	Active
22	M4	PY	12	12	0	%100	Active
23	M5	PY	12	12	0	%100	Active
24	M7	PY	12	12	0	%100	Active
25	M16	PY	12	12	0	%100	Active
26	M17	PY	12	12	0	%100	Active
27	M18	PY	12	12	0	%100	Active
28	M10	PY	16	16	0	%100	Active
29	M11	PY	16	16	0	%100	Active
30	M12	PY	16	16	0	%100	Active
31	M57	PY	10	10	0	%100	Active
32	M56	PY	10	10	0	%100	Active
33	M55	PY	10	10	0	%100	Active

Member Distributed Loads (BLC 3 : WIND LOAD (NO ICE) FRONT) (Continued)

	Member Label	Direction	Start Magnitude [lb/ft,...	End Magnitude [lb/ft,...	Start Location [(in, %)]	End Location [(in, %)]	Inactive [(lb, k-ft), (in, r...
8	M37	PY	6	6	0	%100	Active
9	M38	PY	6	6	0	%100	Active
10	M39	PY	6	6	0	%100	Active
11	M42	PY	6	6	0	%100	Active
12	M49	PY	6	6	0	%100	Active
13	M50	PY	6	6	0	%100	Active
14	M51	PY	6	6	0	%100	Active
15	M54	PY	6	6	0	%100	Active
16	M7A	PY	12	12	0	%100	Active
17	M8	PY	12	12	0	%100	Active
18	M9	PY	12	12	0	%100	Active
19	M1	PY	12	12	0	%100	Active
20	M2	PY	12	12	0	%100	Active
21	M3	PY	12	12	0	%100	Active
22	M4	PY	12	12	0	%100	Active
23	M5	PY	12	12	0	%100	Active
24	M7	PY	12	12	0	%100	Active
25	M16	PY	12	12	0	%100	Active
26	M17	PY	12	12	0	%100	Active
27	M18	PY	12	12	0	%100	Active
28	M10	PY	16	16	0	%100	Active
29	M11	PY	16	16	0	%100	Active
30	M12	PY	16	16	0	%100	Active
31	M57	PY	10	10	0	%100	Active
32	M56	PY	10	10	0	%100	Active
33	M55	PY	10	10	0	%100	Active

Member Distributed Loads (BLC 5 : WIND LOAD (ICE) FRONT)

	Member Label	Direction	Start Magnitude [lb/ft,...	End Magnitude [lb/ft,...	Start Location [(in, %)]	End Location [(in, %)]	Inactive [(lb, k-ft), (in, r...
32	M56	PY	7.3	7.3	0	%100	Active
33	M55	PY	7.3	7.3	0	%100	Active

Member Distributed Loads (BLC 15 : BLC 2 Transient Area Loads)

	Member Label	Direction	Start Magnitude [lb/ft,...	End Magnitude [lb/ft,...	Start Location [(in, %)]	End Location [(in, %)]	Inactive [(lb, k-ft), (in, r...
18	M1	Z	-6.724	-9.014	29.4	58.8	Active
19	M1	Z	-9.014	-9.342	58.8	88.2	Active
20	M1	Z	-9.342	-9.014	88.2	117.6	Active
21	M1	Z	-9.014	-6.724	117.6	147	Active
22	M1	Z	-6.724	-2.799	147	176.4	Active
23	M4	Z	-17.633	-4.409	0	28	Active
24	M4	Z	-4.409	-4.407	28	56	Active
25	M4	Z	-4.407	-17.628	56	84	Active
26	M10	Z	-19.641	-19.641	0	26.75	Active
27	M2	Z	-2.793	-6.706	0	29.411	Active
28	M2	Z	-6.706	-8.991	29.411	58.822	Active
29	M2	Z	-8.991	-9.321	58.822	88.234	Active
30	M2	Z	-9.321	-8.997	88.234	117.645	Active
31	M2	Z	-8.997	-6.713	117.645	147.056	Active
32	M2	Z	-6.713	-2.795	147.056	176.467	Active
33	M5	Z	-17.57	-4.391	0	28	Active
34	M5	Z	-4.391	-4.402	28	56.001	Active
35	M5	Z	-4.402	-17.604	56.001	84.001	Active
36	M11	Z	-19.648	-19.648	0.004	26.693	Active

Member Area Loads (BLC 1 : DEAD LOAD)

	Node A	Node B	Node C	Node D	Direction	Load Direction	Magnitude [psf]	Inactive [(lb, k-ft), (i...
1	N5	N2	N5A	N8	Z	Two Way	-5	Active
2	N5A	N2	N3	N6	Z	Two Way	-5	Active
3	N5	N8	N6	N3	Z	Two Way	-5	Active

Member Area Loads (BLC 2 : DEAD LOAD ICE)

	Node A	Node B	Node C	Node D	Direction	Load Direction	Magnitude [psf]	Inactive [(lb, k-ft), (i...
1	N5	N2	N5A	N8	Z	Two Way	-10.95	Active
2	N5A	N2	N3	N6	Z	Two Way	-10.95	Active
3	N5	N8	N6	N3	Z	Two Way	-10.95	Active

Load Combinations

	Desc...	Solve	PDelta	SRSS	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
1	DL +...	Yes	Y		1	1.2			3	1.6														
2	DL +...	Yes	Y		1	1.2			3	1.386	4	0.8												
3	DL +...	Yes	Y		1	1.2			3	0.8	4	1.386												
4	DL +...	Yes	Y		1	1.2					4	1.6												
5	DL +...	Yes	Y		1	1.2			3	-0.8	4	1.386												
6	DL +...	Yes	Y		1	1.2			3	-1.386	4	0.8												
7	DL +...	Yes	Y		1	1.2			3	-1.6														
8	DL +...	Yes	Y		1	1.2			3	-1.386	4	-0.8												
9	DL +...	Yes	Y		1	1.2			3	-0.8	4	-1.386												
10	DL +...	Yes	Y		1	1.2					4	-1.6												
11	DL +...	Yes	Y		1	1.2			3	0.8	4	-1.386												
12	DL +...	Yes	Y		1	1.2			3	1.386	4	-0.8												
13	DL +...	Yes	Y		1	1.2	2	1	5	1														
14	DL +...	Yes	Y		1	1.2	2	1	5	0.866	6	0.5												
15	DL +...	Yes	Y		1	1.2	2	1	5	0.5	6	0.866												
16	DL +...	Yes	Y		1	1.2	2	1			6	1												
17	DL +...	Yes	Y		1	1.2	2	1	5	-0.5	6	0.866												
18	DL +...	Yes	Y		1	1.2	2	1	5	-0.866	6	0.5												
19	DL +...	Yes	Y		1	1.2	2	1	5	-1														
20	DL +...	Yes	Y		1	1.2	2	1	5	-0.866	6	-0.5												
21	DL +...	Yes	Y		1	1.2	2	1	5	-0.5	6	-0.866												
22	DL +...	Yes	Y		1	1.2	2	1			6	-1												
23	DL +...	Yes	Y		1	1.2	2	1	5	0.5	6	-0.866												
24	DL +...	Yes	Y		1	1.2	2	1	5	0.866	6	-0.5												
25	DEA...	Yes	Y		1	1.2					7	1.5												
26	DEA...	Yes	Y		1	1.2					8	1.5												
27	DEA...	Yes	Y		1	1.2					9	1.5												
28	DL +...	Yes	Y		1	1.2	10	1.5	3	0.082														
29	DL +...	Yes	Y		1	1.2	11	1.5	3	0.082														
30	DL +...	Yes	Y		1	1.2	12	1.5	3	0.082														
31	DL +...	Yes	Y		1	1.2	13	1.5	3	0.082														
32	DL +...	Yes	Y		1	1.2	10	1.5	4	0.082														
33	DL +...	Yes	Y		1	1.2	11	1.5	4	0.082														
34	DL +...	Yes	Y		1	1.2	12	1.5	4	0.082														
35	DL +...	Yes	Y		1	1.2	13	1.5	4	0.082														
36	DL +...	Yes	Y		1	1.2	10	1.5	3	-0.082														
37	DL +...	Yes	Y		1	1.2	11	1.5	3	-0.082														
38	DL +...	Yes	Y		1	1.2	12	1.5	3	-0.082														
39	DL +...	Yes	Y		1	1.2	13	1.5	3	-0.082														
40	DL +...	Yes	Y		1	1.2	10	1.5	4	-0.082														
41	DL +...	Yes	Y		1	1.2	11	1.5	4	-0.082														
42	DL +...	Yes	Y		1	1.2	12	1.5	4	-0.082														
43	DL +...	Yes	Y		1	1.2	13	1.5	4	-0.082														
44	DL+...		Y		1	1	2	0.7	5	-0.7														

Node Reactions

No Data to Print...

Node Reactions (Continued)

	Node Label		X [lbs]	LC	Y [lbs]	LC	Z [lbs]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N13	max	2432.825	9	3515.497	8	2012.4	14	3.351	13	5.825	13	3.474	2
2		min	-2618.236	3	-3418.001	2	367.327	8	0.584	7	0.96	7	-3.461	8
3	N11	max	2681.774	11	3604.846	6	2012.215	17	3.375	17	-0.93	11	3.612	5
4		min	-2499.898	5	-3501.174	12	342.791	11	0.49	11	-5.823	17	-3.612	11
5	N9	max	3469.639	10	1061.886	7	2003.54	22	-1.155	3	0.051	5	2.241	10
6		min	-3464	4	-1269.989	1	375.829	3	-6.703	21	-0.154	41	-2.229	4
7	N134	max	56.933	10	4962.543	13	2708.988	13	0	8	0	8	0	8
8		min	-54.45	4	657.612	6	362.656	6	0	14	-0.003	14	-0.002	14
9	N136	max	-485.739	3	-286.865	3	2718.515	21	0.003	22	0.002	22	0	4
10		min	-4325.789	21	-2481.28	21	304.014	3	0	4	0	4	-0.002	22

Node Reactions (Continued)

	Node Label		X [lbs]	LC	Y [lbs]	LC	Z [lbs]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
11	N138	max	4291.784	17	-295.473	10	2709.37	17	0	12	0.002	18	0	12
12		min	525.629	11	-2486.379	16	328.703	11	-0.003	18	0	12	-0.002	18
13	Totals:	max	6317.925	10	5794.924	7	13389.997	24						
14		min	-6317.92	4	-5794.931	1	4488.824	5						

Node Displacements

	Node Label		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation...	LC	Y Rotation...	LC	Z Rotation...	LC
1	N1	max	0	43	0	43	0	43	0	43	0	43	0	43
2		min	0	1	0	1	0	1	0	1	0	1	0	1
3	N2	max	0.006	10	0.049	3	0.041	3	-2.424e-03	5	-1.297e-03	3	1.09e-03	10
4		min	-0.008	4	-0.05	9	-0.203	21	-1.5e-02	23	-2.138e-02	21	-1.067e-03	4
5	N3	max	0.008	11	0.05	11	0.04	11	2.562e-02	18	1.936e-03	4	9.238e-04	10
6		min	-0.007	5	-0.052	5	-0.202	17	3.489e-03	12	-3.303e-03	10	-9.088e-04	4
7	N5	max	0.082	4	0.019	1	0.032	7	3.877e-04	7	2.33e-02	14	6.816e-04	10
8		min	-0.081	10	-0.016	7	-0.202	13	-1.117e-02	13	3.894e-03	8	-6.65e-04	4
9	N5A	max	0.01	4	0.015	2	0.041	43	4.289e-04	9	1.396e-03	20	4.882e-04	9
10		min	-0.011	10	-0.016	8	-0.01	3	-1.329e-03	15	2.526e-04	3	-5.219e-04	3
11	N6	max	0.011	4	0.016	12	0.04	32	2.951e-04	5	-4.903e-04	1	5.779e-04	11
12		min	-0.01	10	-0.017	6	-0.009	11	-7.428e-04	24	-1.669e-03	21	-6.052e-04	5
13	N8	max	0.023	4	0.016	1	0.037	13	1.801e-03	19	1.321e-03	4	1.044e-03	10
14		min	-0.023	10	-0.014	7	-0.007	7	3.591e-04	1	-1.122e-03	10	-1.074e-03	4
15	N8A	max	0.005	40	0	1	-0.04	3	8.814e-03	20	6.939e-04	29	6.12e-04	10
16		min	-0.005	35	0	7	-0.238	21	1.42e-03	3	-2.852e-04	39	-6.17e-04	4
17	N9	max	0	4	0	1	0	3	0	21	0	41	0	4
18		min	0	10	0	7	0	22	0	3	0	5	0	10
19	N10	max	0.022	5	0.038	11	-0.036	10	-4.902e-04	10	7.65e-03	16	1.143e-03	10
20		min	-0.022	11	-0.038	5	-0.238	16	-4.447e-03	16	1.141e-03	10	-1.15e-03	4
21	N11	max	0	5	0	12	0	11	0	11	0	17	0	11
22		min	0	11	0	6	0	17	0	17	0	11	0	5
23	N12	max	0.022	3	0.036	3	-0.038	7	-4.6e-04	6	-1.165e-03	7	1.122e-03	10
24		min	-0.021	9	-0.036	9	-0.237	13	-4.449e-03	24	-7.617e-03	13	-1.132e-03	4
25	N13	max	0	3	0	2	0	8	0	7	0	7	0	8
26		min	0	9	0	8	0	14	0	13	0	13	0	2
27	N14	max	0.212	4	0.339	1	0.024	3	7.802e-03	7	5.15e-03	4	4.395e-03	11
28		min	-0.215	10	-0.334	7	-0.243	21	-8.951e-03	1	-5.657e-03	10	-4.139e-03	5
29	N15	max	0.211	4	0.349	1	0.029	11	8.569e-03	7	5.106e-03	4	3.452e-03	9
30		min	-0.215	10	-0.367	7	-0.234	17	-9.174e-03	1	-5.622e-03	10	-4.079e-03	3
31	N16	max	0.287	3	0.288	1	0.023	11	7.405e-03	7	6.926e-03	3	4.098e-03	8
32		min	-0.29	9	-0.292	7	-0.243	17	-6.402e-03	1	-7.636e-03	9	-3.869e-03	2
33	N17	max	0.428	4	0.235	1	0.023	7	5.302e-03	7	9.166e-03	4	2.823e-03	4
34		min	-0.41	10	-0.228	7	-0.234	13	-4.57e-03	1	-9.393e-03	10	-3.518e-03	10
35	N18	max	0.425	4	0.222	1	0.014	7	4.988e-03	7	9.445e-03	4	3.425e-03	4
36		min	-0.422	10	-0.221	7	-0.241	13	-4.923e-03	1	-8.31e-03	10	-3.112e-03	10
37	N19	max	0.294	5	0.284	1	0.032	3	6.846e-03	7	7.786e-03	5	3.277e-03	12
38		min	-0.31	11	-0.273	7	-0.236	21	-6.977e-03	1	-7.056e-03	11	-3.866e-03	6
39	N20	max	0.212	4	0.417	1	-0.012	1	6.505e-03	7	1.794e-03	2	6.652e-03	12
40		min	-0.215	10	-0.408	7	-0.24	19	-7.537e-03	1	-1.749e-03	8	-6.729e-03	6
41	N21	max	0.211	4	0.445	1	-0.029	1	7.203e-03	7	5.11e-04	5	7.029e-03	8
42		min	-0.215	10	-0.453	7	-0.272	19	-7.432e-03	1	-3.48e-03	41	-6.805e-03	2
43	N22	max	0.371	3	0.339	1	-0.006	9	3.115e-03	8	6.222e-03	3	6.615e-03	8
44		min	-0.376	9	-0.346	7	-0.241	15	-2.641e-03	2	-7.075e-03	9	-6.752e-03	2
45	N23	max	0.513	4	0.258	2	-0.019	9	4.552e-03	9	6.157e-03	3	6.521e-03	4
46		min	-0.504	10	-0.255	8	-0.274	15	-3.219e-03	3	-5.571e-03	9	-6.381e-03	10
47	N24	max	0.513	4	0.237	12	0.005	5	4.873e-03	5	5.416e-03	5	5.884e-03	4
48		min	-0.504	10	-0.238	6	-0.244	23	-4.459e-03	11	-4.783e-03	11	-5.942e-03	10
49	N25	max	0.39	5	0.325	1	-0.023	5	2.876e-03	6	6.909e-03	5	6.863e-03	11
50		min	-0.399	11	-0.317	7	-0.273	23	-4.016e-03	12	-6.064e-03	11	-6.569e-03	5
51	N26	max	0.008	4	0	1	-0.006	3	4.807e-03	21	1.66e-04	41	3.232e-04	4
52		min	-0.008	10	0	7	-0.034	21	8.146e-04	3	-5.494e-05	5	-3.309e-04	10
53	N27	max	0.007	5	0.013	11	-0.005	11	-3.325e-04	11	4.172e-03	17	1.233e-03	11
54		min	-0.008	11	-0.013	5	-0.034	17	-2.424e-03	16	6.631e-04	11	-1.235e-03	5
55	N28	max	0.007	3	0.012	3	-0.006	7	-4.114e-04	6	-6.676e-04	7	1.167e-03	9
56		min	-0.007	9	-0.012	8	-0.034	13	-2.399e-03	13	-4.178e-03	13	-1.178e-03	3
57	N29	max	0.212	4	0.347	1	0.011	3	7.802e-03	7	5.151e-03	4	4.395e-03	11
58		min	-0.215	10	-0.341	7	-0.238	20	-8.951e-03	1	-5.657e-03	10	-4.139e-03	5
59	N30	max	0.211	4	0.358	1	0.015	11	8.569e-03	7	5.106e-03	4	3.452e-03	9
60		min	-0.215	10	-0.374	7	-0.233	17	-9.174e-03	1	-5.622e-03	10	-4.079e-03	3
61	N31	max	0.202	4	0.347	1	0.031	2	7.802e-03	7	5.151e-03	4	4.395e-03	11
62		min	-0.204	10	-0.341	7	-0.238	20	-8.951e-03	1	-5.657e-03	10	-4.139e-03	5
63	N32	max	0.202	4	0.358	1	0.027	11	8.569e-03	7	5.106e-03	4	3.452e-03	9
64		min	-0.207	10	-0.374	7	-0.235	18	-9.174e-03	1	-5.622e-03	10	-4.079e-03	3
65	N33	max	0.211	4	0.637	1	-0.028	6	2.416e-02	7	4.648e-03	4	2.937e-03	4
66		min	-0.215	10	-0.687	7	-0.261	23	-2.449e-02	1	-4.193e-03	10	-3.103e-03	10
67	N34	max	0.22	4	0.637	1	-0.036	2	2.416e-02	7	4.648e-03	4	2.937e-03	4
68		min	-0.224	10	-0.687	7	-0.266	20	-2.449e-02	1	-4.193e-03	10	-3.103e-03	10
69	N35	max	0.005	10	0.046	2	0.015	2	7.448e-03	7	4.547e-03	5	2.324e-03	12
70		min	-0.008	4	-0.057	8	-0.229	20	-6.618e-03	1	-2.125e-03	11	-3.391e-03	6
71	N36	max	0.008	11	0.046	11	0.019	11	9.461e-03	7	1.908e-03	4	1.466e-03	9
72		min	-0.006	5	-0.049	5	-0.219	17	-7.249e-03	1	-3.621e-03	22	-1.226e-03	3
73	N37	max	0.01	11	0.046	2	0.031	2	7.448e-03	7	4.547e-03	5	2.324e-03	12
74		min	-0.016	5	-0.057	8	-0.237	20	-6.618e-03	1	-2.125e-03	11	-3.391e-03	6
75	N38	max	0.01	10	0.046	11	0.027	11	9.461e-03	7	1.908e-03	4	1.466e-03	9
76		min	-0.008	4	-0.049	5	-0.234	18	-7.249e-03	1	-3.621e-03	22	-1.226e-03	3
77	N39	max	0.005	40	0	2	-0.039	3	9.281e-03	19	5.247e-04	29	5.046e-04	10
78		min	-0.005	35	0	8	-0.238	21	-2.338e-03	1	-4.409e-04	39	-4.301e-04	4
79	N40	max	0.005	10	0	2	-0.036	2	9.281e-03	19	5.247e-04	29	5.046e-04	10
80		min	-0.006	4	0	8	-0.265	20	-2.338e-03	1	-4.409e-04	39	-4.301e-04	4
81	N41	max	0.295	4	0.507	1	0.031	2	8.405e-03	7	5.564e-03	4	4.395e-03	11
82		min	-0.306	10	-0.482	7	-0.238	20	-9.555e-03	1	-6.071e-03	10	-4.139e-03	5
83	N42	max	0.294	4	0.522	1	0.027	11	9.123e-03	7	5.521e-03	4	3.452e-03	9
84		min	-0.308	10	-0.527	7	-0.235	18	-9.728e-03	1	-6.037e-03	10	-4.079e-03	3
85	N43	max	0.042	11	0.087	6	0.031	2	6.845e-03	7	4.2e-03	17	2.324e-03	12
86		min	-0.088	5	-0.084	12	-0.237	20	-6.016e-03	1	-1.768e-03	11	-3.391e-03	6
87	N44	max	0.065	22	0.132	8	0.027	11	8.907e-03	7	1.494e-03	4	1.466e-03	9
88		min	-0.035	4	-0.097	2	-0.234	18	-6.696e-03	1	-3.507e-03	22	-1.226e-03	3
89	N45	max	0.442	4	1.503	1	-0.036	2	3.133e-02	7	8.69e-03	4	2.937e-03	4

Node Displacements (Continued)

	Node Label		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation...	LC	Y Rotation...	LC	Z Rotation...	LC
90		min	-0.433	10	-1.542	7	-0.267	20	-3.167e-02	1	-8.232e-03	10	-3.103e-03	10
91	N46	max	0.271	4	0.392	1	-0.036	2	1.415e-02	1	9.253e-03	10	5.046e-04	10
92		min	-0.267	10	-0.228	7	-0.266	20	-1.016e-02	7	-9.364e-03	4	-4.301e-04	4
93	N47	max	0.211	4	0.56	1	-0.061	1	1.351e-02	7	2.292e-03	5	5.017e-03	7
94		min	-0.214	10	-0.583	7	-0.306	19	-1.36e-02	1	-2.414e-03	11	-4.119e-03	1
95	N48	max	0.213	4	0.56	1	-0.02	1	1.351e-02	7	2.292e-03	5	5.017e-03	7
96		min	-0.214	10	-0.583	7	-0.319	19	-1.36e-02	1	-2.414e-03	11	-4.119e-03	1
97	N49	max	0.006	11	0.034	12	-0.061	1	1.416e-02	7	3.015e-03	4	9.952e-04	11
98		min	-0.005	5	-0.056	7	-0.302	19	-1.375e-02	1	-2.754e-03	10	-1.025e-03	5
99	N50	max	0.009	11	0.034	12	-0.02	1	1.416e-02	7	3.015e-03	4	9.952e-04	11
100		min	-0.008	5	-0.056	7	-0.319	19	-1.375e-02	1	-2.754e-03	10	-1.025e-03	5
101	N51	max	0.222	4	0.628	1	-0.02	1	1.351e-02	7	2.293e-03	5	5.017e-03	7
102		min	-0.223	10	-0.651	7	-0.319	19	-1.36e-02	1	-2.415e-03	11	-4.119e-03	1
103	N52	max	0.022	10	0.025	9	-0.02	1	1.416e-02	7	3.014e-03	4	9.952e-04	11
104		min	-0.022	4	-0.046	3	-0.319	19	-1.375e-02	1	-2.753e-03	10	-1.025e-03	5
105	N57	max	0.259	4	0.46	1	0.027	11	9.121e-03	7	5.519e-03	4	3.452e-03	9
106		min	-0.27	10	-0.469	7	-0.235	18	-9.725e-03	1	-6.035e-03	10	-4.079e-03	3
107	N58	max	0.045	10	0.08	8	0.027	11	8.91e-03	7	1.497e-03	4	1.466e-03	9
108		min	-0.025	4	-0.06	2	-0.234	18	-6.699e-03	1	-3.508e-03	22	-1.226e-03	3
109	N62	max	0.215	4	0.306	1	-0.036	2	1.415e-02	1	9.251e-03	10	5.046e-04	10
110		min	-0.211	10	-0.167	7	-0.266	20	-1.016e-02	7	-9.362e-03	4	-4.301e-04	4
111	N63	max	0.258	4	0.444	1	0.031	2	8.403e-03	7	5.561e-03	4	4.395e-03	11
112		min	-0.266	10	-0.426	7	-0.238	20	-9.552e-03	1	-6.068e-03	10	-4.139e-03	5
113	N64	max	0.03	11	0.049	5	0.031	2	6.848e-03	7	4.202e-03	17	2.324e-03	12
114		min	-0.06	5	-0.051	11	-0.237	20	-6.019e-03	1	-1.77e-03	11	-3.391e-03	6
115	N65	max	0.39	4	1.311	1	-0.036	2	3.133e-02	7	8.688e-03	4	2.937e-03	4
116		min	-0.383	10	-1.352	7	-0.267	20	-3.167e-02	1	-8.23e-03	10	-3.103e-03	10
117	N62A	max	0.207	4	0.527	1	-0.02	1	1.353e-02	7	3.281e-03	5	4.674e-03	7
118		min	-0.207	10	-0.55	7	-0.319	19	-1.364e-02	1	-3.419e-03	11	-3.836e-03	1
119	N63A	max	0.008	28	0.067	1	-0.02	1	1.416e-02	7	4.159e-03	4	9.352e-04	10
120		min	-0.005	39	-0.091	7	-0.319	19	-1.384e-02	1	-3.961e-03	10	-9.085e-04	4
121	N64A	max	0.295	3	0.294	1	0.012	10	7.405e-03	7	6.926e-03	3	4.098e-03	8
122		min	-0.298	9	-0.298	7	-0.238	16	-6.403e-03	1	-7.636e-03	9	-3.869e-03	2
123	N65A	max	0.435	4	0.235	1	0.01	7	5.302e-03	7	9.166e-03	4	2.823e-03	4
124		min	-0.419	10	-0.229	7	-0.233	13	-4.57e-03	1	-9.393e-03	10	-3.518e-03	10
125	N66	max	0.3	3	0.284	1	0.033	10	7.405e-03	7	6.926e-03	3	4.098e-03	8
126		min	-0.303	9	-0.288	7	-0.238	16	-6.403e-03	1	-7.636e-03	9	-3.869e-03	2
127	N67	max	0.431	4	0.234	1	0.018	7	5.302e-03	7	9.166e-03	4	2.823e-03	4
128		min	-0.414	10	-0.23	7	-0.234	14	-4.57e-03	1	-9.393e-03	10	-3.518e-03	10
129	N68	max	0.626	3	0.374	2	-0.044	2	1.127e-02	8	2.042e-02	3	4.057e-03	11
130		min	-0.579	9	-0.352	8	-0.26	19	-1.151e-02	2	-2.089e-02	9	-4.178e-03	5
131	N69	max	0.628	3	0.377	2	-0.028	10	1.127e-02	8	2.042e-02	3	4.057e-03	11
132		min	-0.581	9	-0.354	8	-0.268	16	-1.151e-02	2	-2.089e-02	9	-4.178e-03	5
133	N70	max	0.024	2	0.05	11	0.017	10	4.277e-03	8	5.996e-03	3	1.991e-03	8
134		min	-0.013	8	-0.047	5	-0.229	16	-6.886e-03	2	-6.432e-03	9	-3.08e-03	2
135	N71	max	0.082	4	0.02	1	0.013	7	4.207e-03	8	9.209e-03	4	4.666e-04	16
136		min	-0.08	10	-0.017	7	-0.219	13	-3.972e-03	2	-6.455e-03	10	-1.202e-04	10
137	N72	max	0.029	2	0.05	11	0.033	10	4.277e-03	8	5.996e-03	3	1.991e-03	8
138		min	-0.016	8	-0.049	5	-0.237	16	-6.886e-03	2	-6.432e-03	9	-3.08e-03	2
139	N73	max	0.081	4	0.02	1	0.018	7	4.207e-03	8	9.209e-03	4	4.666e-04	16
140		min	-0.08	10	-0.017	7	-0.233	14	-3.972e-03	2	-6.455e-03	10	-1.202e-04	10
141	N74	max	0.021	5	0.038	11	-0.036	10	2.034e-03	9	8.342e-03	15	1.253e-03	11
142		min	-0.021	11	-0.039	5	-0.238	17	-4.629e-03	15	-3.162e-03	9	-1.177e-03	5
143	N75	max	0.023	5	0.042	11	-0.028	10	2.034e-03	9	8.342e-03	15	1.253e-03	11
144		min	-0.023	11	-0.042	5	-0.266	16	-4.629e-03	15	-3.162e-03	9	-1.177e-03	5
145	N76	max	0.425	3	0.399	1	0.033	10	7.819e-03	7	7.449e-03	3	4.098e-03	8
146		min	-0.44	9	-0.42	7	-0.238	16	-6.816e-03	1	-8.159e-03	9	-3.869e-03	2
147	N77	max	0.595	4	0.318	1	0.018	7	5.717e-03	7	9.719e-03	4	2.823e-03	4
148		min	-0.581	10	-0.326	7	-0.234	14	-4.985e-03	1	-9.947e-03	10	-3.518e-03	10
149	N78	max	0.09	9	0.074	9	0.033	10	3.919e-03	8	5.475e-03	3	1.991e-03	8
150		min	-0.07	3	-0.118	3	-0.237	16	-6.527e-03	2	-5.91e-03	9	-3.08e-03	2
151	N79	max	0.029	9	0.059	9	0.018	7	3.848e-03	8	8.655e-03	4	4.666e-04	16
152		min	-0.097	15	-0.052	3	-0.233	14	-3.613e-03	2	-5.903e-03	10	-1.202e-04	10
153	N80	max	1.354	3	0.786	2	-0.028	10	1.48e-02	8	2.678e-02	4	4.057e-03	11
154		min	-1.321	9	-0.757	8	-0.268	16	-1.504e-02	2	-2.729e-02	10	-4.178e-03	5
155	N81	max	0.3	5	0.226	12	-0.028	10	6.945e-03	12	1.438e-02	10	1.253e-03	11
156		min	-0.443	11	-0.303	6	-0.267	16	-8.803e-03	6	-1.081e-02	4	-1.177e-03	5
157	N82	max	0.611	4	0.31	2	-0.052	9	8.026e-03	9	1.108e-02	3	4.491e-03	3
158		min	-0.59	10	-0.301	8	-0.308	15	-7.941e-03	3	-1.107e-02	9	-3.572e-03	9
159	N83	max	0.606	4	0.321	2	-0.011	9	8.026e-03	9	1.108e-02	3	4.491e-03	3
160		min	-0.586	10	-0.31	8	-0.321	15	-7.941e-03	3	-1.107e-02	9	-3.572e-03	9
161	N84	max	0.088	4	0.025	1	-0.054	9	6.882e-03	9	1.332e-02	4	6.636e-04	8
162		min	-0.069	10	-0.014	7	-0.303	15	-7.364e-03	3	-1.311e-02	10	-6.942e-04	2
163	N85	max	0.089	4	0.024	1	-0.011	9	6.882e-03	9	1.332e-02	4	6.636e-04	8
164		min	-0.069	10	-0.012	7	-0.321	15	-7.364e-03	3	-1.311e-02	10	-6.942e-04	2
165	N86	max	0.661	4	0.356	2	-0.011	9	8.026e-03	9	1.108e-02	3	4.491e-03	3
166		min	-0.642	10	-0.345	8	-0.321	15	-7.942e-03	3	-1.108e-02	9	-3.572e-03	9
167	N87	max	0.029	18	0.036	10	-0.011	9	6.881e-03	9	1.332e-02	4	6.636e-04	8
168		min	-0.01	12	-0.026	4	-0.321	15	-7.363e-03	3	-1.311e-02	10	-6.942e-04	2
169	N89	max	0.533	4	0.286	1	0.018	7	5.715e-03	7	9.717e-03	4	2.823e-03	4
170		min	-0.518	10	-0.29	7	-0.234	14	-4.983e-03	1	-9.945e-03	10	-3.518e-03	10
171	N90	max	0.003	7	0.035	9	0.018	7	3.85e-03	8	8.658e-03	4	4.666e-04	16
172		min	-0.054	14	-0.029	3	-0.233	14	-3.615e-03	2	-5.905e-03	10	-1.202e-04	10
173	N91	max	0.235	5	0.184	12	-0.028	10	6.943e-03	12	1.438e-02	10	1.253e-03	11
174		min	-0.357	11	-0.249	6	-0.267	16	-8.801e-03	6	-1.08e-02	4	-1.177e-03	5
175	N92	max	0.376	3	0.353	1	0.033	10	7.817e-03	7	7.446e-03	3	4.098e-03	8
176		min	-0.386	9	-0.368	7	-0.238	16	-6.814e-03	1	-8.157e-03	9	-3.869e-03	2
177	N93	max	0.051	10	0.055	9	0.033	10	3.922e-03	8	5.477e-03	3	1.991e-03	8
178		min	-0.034	4	-0.081	3	-0.237	16	-6.529e-03	2	-5.912e-03	9	-3.08e-03	2
179	N94	max	1.193	3	0.696	2	-0.028	10	1.48e-02	8	2.678e-02	4	4.057e-03	11
180		min	-1.157	9	-0.668	8	-0.268	16	-1.503e-02	2	-2.729e-02	10	-4.178e-03	5
181	N95	max	0.578	4	0.304	2	-0.011	9	7.789e-03	9	1.163e-02	4	4.166e-03	3
182		min	-0.559	10	-0.292	8	-0.321	15	-7.68e-03	3	-1.167e-02	10	-3.308e-03	9
183	N96	max	0.122	4	0.037	2	-0.011	9	6.88e-03	8	1.372e-02	4	4.413e-04	7
184		min	-0.102	10	-0.025	8	-0.321	15	-7.239e-03	2	-1.356e-02	10	-4.175e-04	1
185	N97	max	0.434	4	0.221	1	0.008	6	4.988e-03	7	9.445e-03	4	3.425e-03	4
186		min	-0.43	10	-0.221	7	-0.238	24	-4.923e-03	1	-8.31e-03	10	-3.112e-03	10

Node Displacements (Continued)

	Node Label		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation...	LC	Y Rotation...	LC	Z Rotation...	LC
187	N98	max	0.303	5	0.288	1	0.017	3	6.846e-03	7	7.786e-03	5	3.277e-03	12
188		min	-0.317	11	-0.278	7	-0.235	21	-6.977e-03	1	-7.056e-03	11	-3.866e-03	6
189	N99	max	0.429	4	0.22	1	0.029	6	4.988e-03	7	9.445e-03	4	3.425e-03	4
190		min	-0.425	10	-0.22	7	-0.238	24	-4.923e-03	1	-8.31e-03	10	-3.112e-03	10
191	N100	max	0.308	5	0.282	1	0.03	4	6.846e-03	7	7.786e-03	5	3.277e-03	12
192		min	-0.322	11	-0.269	7	-0.236	22	-6.977e-03	1	-7.056e-03	11	-3.866e-03	6
193	N101	max	0.584	4	0.364	12	-0.026	9	1.101e-02	6	2.09e-02	5	3.389e-03	8
194		min	-0.627	11	-0.335	6	-0.263	15	-1.049e-02	11	-2.097e-02	11	-3.582e-03	2
195	N102	max	0.588	4	0.368	12	-0.029	6	1.101e-02	6	2.09e-02	5	3.389e-03	8
196		min	-0.63	10	-0.338	6	-0.268	24	-1.049e-02	11	-2.097e-02	11	-3.582e-03	2
197	N103	max	0.094	4	0.025	12	0.013	6	4.052e-03	6	6.882e-03	4	1.847e-03	4
198		min	-0.103	10	-0.017	6	-0.229	24	-2.383e-03	12	-8.916e-03	10	-2.903e-03	10
199	N104	max	0.003	36	0.046	3	0.021	3	3.884e-03	6	6.798e-03	5	1.516e-03	11
200		min	-0.007	23	-0.046	9	-0.22	21	-6.398e-03	12	-8.007e-03	11	-1.255e-03	5
201	N105	max	0.091	4	0.029	12	0.028	6	4.052e-03	6	6.882e-03	4	1.847e-03	4
202		min	-0.098	10	-0.019	6	-0.237	24	-2.383e-03	12	-8.916e-03	10	-2.903e-03	10
203	N106	max	0.004	6	0.048	3	0.029	4	3.884e-03	6	6.798e-03	5	1.516e-03	11
204		min	-0.009	23	-0.049	9	-0.235	22	-6.398e-03	12	-8.007e-03	11	-1.255e-03	5
205	N107	max	0.023	3	0.036	3	-0.038	7	2.162e-03	5	2.886e-03	6	1.396e-03	10
206		min	-0.022	9	-0.036	9	-0.238	13	-5.042e-03	23	-8.186e-03	23	-1.327e-03	4
207	N108	max	0.025	3	0.039	3	-0.029	6	2.162e-03	5	2.886e-03	6	1.396e-03	10
208		min	-0.025	9	-0.039	9	-0.266	24	-5.042e-03	23	-8.186e-03	23	-1.327e-03	4
209	N109	max	0.598	4	0.31	1	0.028	6	5.401e-03	7	1.005e-02	4	3.425e-03	4
210		min	-0.575	10	-0.311	7	-0.238	24	-5.336e-03	1	-8.913e-03	10	-3.112e-03	10
211	N110	max	0.447	5	0.406	1	0.03	4	7.261e-03	7	8.266e-03	5	3.277e-03	12
212		min	-0.448	11	-0.392	7	-0.236	22	-7.393e-03	1	-7.535e-03	11	-3.866e-03	6
213	N111	max	0.046	11	0.065	19	0.028	6	3.694e-03	6	6.28e-03	4	1.847e-03	4
214		min	-0.018	5	-0.008	1	-0.237	24	-2.026e-03	12	-8.313e-03	10	-2.903e-03	10
215	N112	max	0.122	11	0.076	5	0.029	4	3.525e-03	6	6.319e-03	5	1.516e-03	11
216		min	-0.106	5	-0.12	11	-0.236	22	-6.038e-03	12	-7.527e-03	11	-1.255e-03	5
217	N113	max	1.336	4	0.748	12	-0.029	6	1.453e-02	6	2.764e-02	4	3.389e-03	8
218		min	-1.378	10	-0.733	6	-0.268	24	-1.401e-02	12	-2.762e-02	10	-3.582e-03	2
219	N114	max	0.475	3	0.209	2	-0.029	6	6.584e-03	2	1.158e-02	9	1.396e-03	10
220		min	-0.335	9	-0.295	8	-0.267	24	-8.668e-03	8	-1.503e-02	4	-1.327e-03	4
221	N115	max	0.495	5	0.356	1	-0.054	5	5.727e-03	6	1.24e-02	5	5.385e-03	10
222		min	-0.518	11	-0.341	7	-0.307	23	-5.805e-03	12	-1.238e-02	11	-4.488e-03	4
223	N116	max	0.502	5	0.352	1	-0.014	5	5.727e-03	6	1.24e-02	5	5.385e-03	10
224		min	-0.526	11	-0.34	7	-0.32	23	-5.805e-03	12	-1.238e-02	11	-4.488e-03	4
225	N117	max	0.021	5	0.042	2	-0.057	5	7.627e-03	6	1.231e-02	5	4.366e-04	2
226		min	-0.041	11	-0.032	8	-0.301	23	-7.647e-03	12	-1.294e-02	11	-4.672e-04	8
227	N118	max	0.021	5	0.041	2	-0.014	5	7.627e-03	6	1.231e-02	5	4.366e-04	2
228		min	-0.041	11	-0.031	8	-0.319	23	-7.647e-03	12	-1.294e-02	11	-4.672e-04	8
229	N119	max	0.564	5	0.376	1	-0.014	5	5.728e-03	6	1.24e-02	5	5.385e-03	10
230		min	-0.588	11	-0.363	7	-0.32	23	-5.806e-03	12	-1.238e-02	11	-4.488e-03	4
231	N120	max	0.024	11	0.05	4	-0.014	5	7.626e-03	6	1.23e-02	5	4.366e-04	2
232		min	-0.041	5	-0.039	10	-0.319	23	-7.646e-03	12	-1.294e-02	11	-4.672e-04	8
233	N122	max	0.395	5	0.359	1	0.03	4	7.259e-03	7	8.264e-03	5	3.277e-03	12
234		min	-0.401	11	-0.345	7	-0.236	22	-7.391e-03	1	-7.533e-03	11	-3.866e-03	6
235	N123	max	0.074	11	0.058	5	0.029	4	3.527e-03	6	6.321e-03	5	1.516e-03	11
236		min	-0.066	5	-0.085	11	-0.236	22	-6.04e-03	12	-7.529e-03	11	-1.255e-03	5
237	N124	max	0.384	3	0.169	2	-0.029	6	6.582e-03	2	1.158e-02	9	1.396e-03	10
238		min	-0.265	9	-0.242	8	-0.267	24	-8.666e-03	8	-1.503e-02	4	-1.327e-03	4
239	N125	max	0.531	4	0.274	1	0.028	6	5.398e-03	7	1.005e-02	4	3.425e-03	4
240		min	-0.516	10	-0.275	7	-0.238	24	-5.333e-03	1	-8.911e-03	10	-3.112e-03	10
241	N126	max	0.025	3	0.042	19	0.028	6	3.696e-03	6	6.283e-03	4	1.847e-03	4
242		min	-0.011	9	0.002	2	-0.237	24	-2.029e-03	12	-8.316e-03	10	-2.903e-03	10
243	N127	max	1.169	4	0.663	12	-0.029	6	1.453e-02	6	2.764e-02	4	3.389e-03	8
244		min	-1.211	10	-0.646	6	-0.268	24	-1.401e-02	12	-2.762e-02	10	-3.582e-03	2
245	N128	max	0.471	5	0.34	1	-0.014	5	6.39e-03	6	1.248e-02	5	5.02e-03	10
246		min	-0.496	11	-0.327	7	-0.32	23	-6.474e-03	12	-1.242e-02	11	-4.183e-03	4
247	N129	max	0.051	5	0.052	2	-0.014	5	8.083e-03	6	1.245e-02	5	4.27e-04	1
248		min	-0.073	11	-0.042	8	-0.32	23	-8.116e-03	12	-1.297e-02	11	-3.963e-04	7
249	N133	max	0.069	4	0.018	1	0.026	7	5.674e-04	7	1.628e-02	14	1.03e-03	10
250		min	-0.068	10	-0.016	7	-0.048	1	-8.262e-03	13	2.6e-03	8	-1.029e-03	4
251	N134	max	0	4	0	6	0	6	0	14	0	14	0	14
252		min	0	10	0	13	0	13	0	8	0	8	0	8
253	N135	max	0.003	36	0.037	3	0.029	3	-1.687e-03	6	-7.305e-04	3	8.903e-04	10
254		min	-0.006	31	-0.038	9	-0.051	9	-1.031e-02	24	-1.529e-02	21	-8.865e-04	4
255	N136	max	0	21	0	21	0	3	0	4	0	4	0	22
256		min	0	3	0	3	0	21	0	22	0	22	0	4
257	N137	max	0.006	1	0.04	11	0.029	11	1.812e-02	18	1.782e-03	4	8.318e-04	10
258		min	-0.004	7	-0.042	5	-0.051	5	2.19e-03	11	-2.533e-03	10	-8.295e-04	4
259	N138	max	0	11	0	16	0	11	0	18	0	12	0	18
260		min	0	17	0	10	0	17	0	12	0	18	0	12

LRFD

	Member	Shape	Code Ch...	Loc [in]	LC	Shear Ch...	Loc [in]	Dir	LC	phi*Pnc [lb]	phi*Pnt [lb]	phi*Mnyy...	phi*Mnzz...	Cb	Eqn
1	M13	PIPE_2.0	0.326	84	9	0.229	143.5		7	5018.672	32130	1.872	1.872	1.972	H1-1b
2	M14	PIPE_2.0	0.383	84	5	0.235	143.5		3	5018.672	32130	1.872	1.872	1.892	H1-1b
3	M15	PIPE_2.0	0.359	82.25	9	0.226	143.5		11	5018.672	32130	1.872	1.872	1.78	H1-1b
4	M25	PIPE_2.0	0.298	17.25	21	0.069	17.25		10	20866.733	32130	1.872	1.872	1.345	H1-1b
5	M26	PIPE_2.0	0.286	17.25	16	0.072	17.25		3	20866.733	32130	1.872	1.872	1.571	H1-1b
6	M27	PIPE_2.0	0.709	66.375	1	0.116	66.375		10	12143.947	32130	1.872	1.872	1.494	H1-1b
7	M30	PIPE_2.0	0.358	43	10	0.119	5		6	26521.424	32130	1.872	1.872	1.466	H1-1b
8	M37	PIPE_2.0	0.307	17.25	17	0.067	17.25		6	20866.733	32130	1.872	1.872	1.632	H1-1b
9	M38	PIPE_2.0	0.298	17.25	24	0.077	17.25		11	20866.733	32130	1.872	1.872	1.532	H1-1b
10	M39	PIPE_2.0	0.665	66.375	10	0.110	66.375		6	12143.947	32130	1.872	1.872	2.4	H1-1b
11	M42	PIPE_2.0	0.383	43	6	0.112	5		4	26521.424	32130	1.872	1.872	1.963	H1-1b
12	M49	PIPE_2.0	0.300	17.25	13	0.055	17.25		15	20866.733	32130	1.872	1.872	1.606	H1-1b
13	M50	PIPE_2.0	0.313	17.25	9	0.069	17.25		7	20866.733	32130	1.872	1.872	1.595	H1-1b
14	M51	PIPE_2.0	0.716	66.375	4	0.101	66.375		2	12143.947	32130	1.872	1.872	2.597	H1-1b
15	M54	PIPE_2.0	0.371	43	2	0.135	5		10	26521.424	32130	1.872	1.872	1.948	H1-1b
16	M7A	LL3x3x4x6	0.464	15.015	21	0.124	14.459	y	21	78280.295	93312	8.512	4.911	1.216	H1-1b
17	M8	LL3x3x4x6	0.462	15.015	17	0.122	14.459	y	17	78280.295	93312	8.512	4.911	2.07	H1-1b
18	M9	LL3x3x4x6	0.460	15.015	13	0.123	14.459	y	13	78280.295	93312	8.512	4.911	1.243	H1-1b
19	M1	L3X3X4	0.547	5.513	8	0.611	88.2	z	13	3577.807	46656	1.688	2.688	1.5	H2-1

LRFD (Continued)

	Member	Shape	Code Ch...	Loc [in]	LC	Shear Ch...	Loc [in]	Dir	LC	phi*Pnc [lb]	phi*Pnt [lb]	phi*Mnyy...	phi*Mnzz...	Cb	Eqn
20	M2	L3X3X4	0.590	5.515	4	0.708	88.234	y	8	3575.077	46656	1.688	2.688	1.5	H2-1
21	M3	L3X3X4	0.539	5.517	12	0.685	88.267	y	5	3572.354	46656	1.688	2.688	1.5	H2-1
22	M4	L3X3X4	0.231	42	21	0.032	0	y	21	15778.129	46656	1.688	3.345	1.5	H2-1
23	M5	L3X3X4	0.282	41.126	11	0.033	0	y	17	15777.71	46656	1.688	3.345	1.5	H2-1
24	M7	L3X3X4	0.288	42.001	3	0.032	0	y	13	15777.29	46656	1.688	3.345	1.5	H2-1
25	M16	L3X3X4	0.374	0	8	0.057	28.135	y	2	41307.194	46656	1.688	3.756	1.391	H2-1
26	M17	L3X3X4	0.238	0	9	0.063	28.135	z	10	41307.194	46656	1.688	3.756	1.5	H2-1
27	M18	L3X3X4	0.375	0	11	0.058	0	z	6	41307.194	46656	1.688	3.756	1.317	H2-1
28	M10	HSS4X4X4	0.461	39.6	22	0.096	39.6	y	10	133302.091	139518	16.181	16.181	2.565	H1-1b
29	M11	HSS4X4X4	0.487	39.542	17	0.113	39.542	y	6	133319.954	139518	16.181	16.181	3	H1-1b
30	M12	HSS4X4X4	0.485	39.483	14	0.113	39.483	y	2	133337.808	139518	16.181	16.181	3	H1-1b
31	M55	LL2.5x2.5...	0.185	85.427	13	0.019	85.427	y	14	30558.737	58320	3.3	2.55	1.136	H1-1b*
32	M56	LL2.5x2.5...	0.186	85.427	21	0.019	85.427	z	22	30558.737	58320	3.3	2.55	1.136	H1-1b*
33	M57	LL2.5x2.5...	0.185	85.427	17	0.019	85.427	z	18	30558.737	58320	3.3	2.55	1.136	H1-1b*

1.0 DESIGN INFORMATION AND GENERAL REQUIREMENTS

1.0 GENERAL
ALL DIMENSIONS ARE APPROXIMATE, CONTRACTOR SHOULD VERIFY ALL DIMENSIONS BEFORE FABRICATION OF STEEL AND COMMENCEMENT OF WORK.

1.1 CODES
a. 2018 CONNECTICUT STATE BUILDING CODE (2015 IBC)
b. MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES, ASCE/SEI 7–10, AMERICAN SOCIETY OF CIVIL ENGINEERS
c. STEEL CONSTRUCTION MANUAL, 14TH EDITION, AMERICAN INSTITUTE OF STEEL CONSTRUCTION
d. STRUCTURAL STANDARDS FOR ANTENNA SUPPORTING STRUCTURES, ANSI/TIA–222–G, TELECOMMUNICATIONS INDUSTRY ASSOCIATION

1.2 LOADS AND DESIGN CRITERIA
a. BASIC WIND SPEED (3–SECOND GUST): V: 97 MPH (ASD), EXPOSURE B, RISK CATEGORY II
b. EQUIPMENT AS LISTED IN MOUNT STRUCTURAL ANALYSIS REPORT – UPGRADE PREPARED BY EFI GLOBAL, INC, DATED 06/19/2020.

1.3 NOTES
a. PRIOR TO PURCHASE OR FABRICATION OF MATERIAL, THE CONTRACTOR SHALL PERFORM AN INSPECTION VERIFYING MEMBER AND BOLT SIZES. SHOULD THE CONTRACTOR DISCOVER ANY DAMAGED OR MISSING MEMBERS OR THE MEMBER OR BOLT SIZES DO NOT MATCH THOSE LISTED, EFI GLOBAL, INC, SHALL BE NOTIFIED IMMEDIATELY.
b. CONTRACTOR TO REPLACE ALL BOLTS REMOVED WITH NEW BOLTS OF SAME TYPE, UNLESS NOTED OTHERWISE.

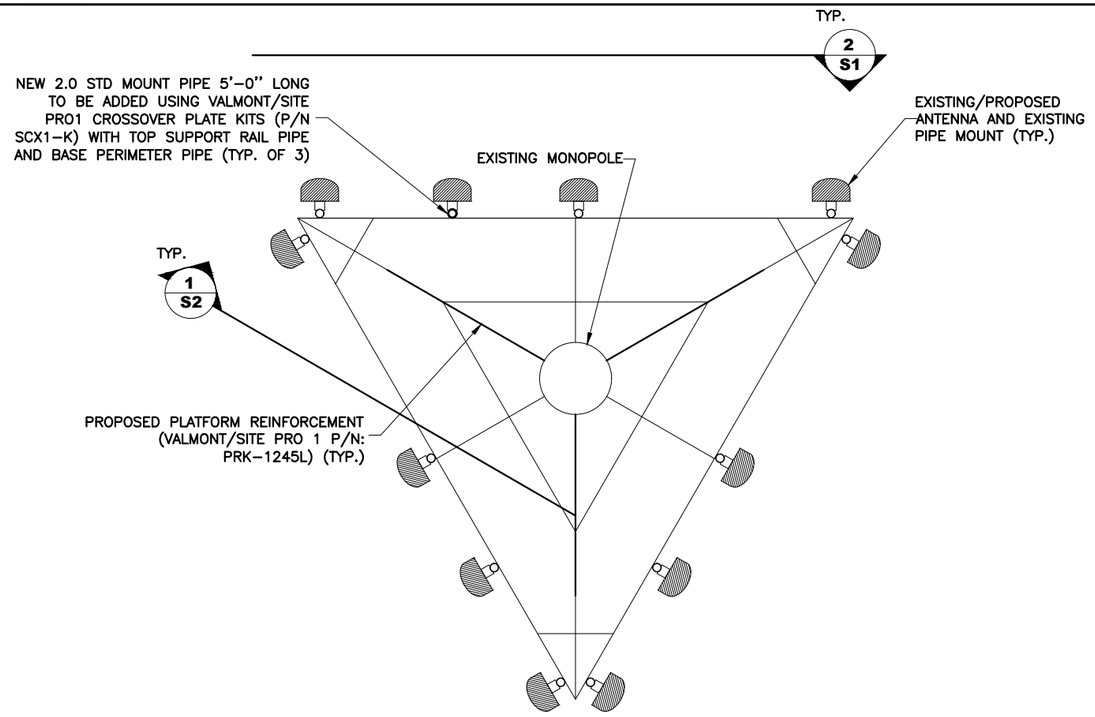
2.0 STRUCTURAL STEEL

2.1 MATERIALS
a. STRUCTURAL STEEL . . . . . ASTM A992
MISC ANGLE & PLATE . . . . ASTM A36
PIPE . . . . . ASTM A53 GR. B
RODS . . . . . ASTM A572–50 (MINIMUM)
HSS. . . . . ASTM A500, GR. B, Fy=46 KSI
b. BOLTS . . . . . ASTM A325 U.N.O.
c. WELDING ELECTRODES . . . . . AWS A5.1 (E70XX)
d. STEEL CONSTRUCTION SHALL CONFORM TO "SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS, ANSI/AISC 360–16"
e. WELDING SHALL CONFORM TO AWS D1.1/D1.3/D1.7 AS APPLICABLE.
f. THE FABRICATOR SHALL FURNISH CHECKED SHOP AND ERECTION DRAWINGS TO THE ENGINEER, AND OBTAIN APPROVAL PRIOR TO FABRICATING ANY STRUCTURAL STEEL. SHOP DRAWINGS SHALL CONFORM TO "DETAILING FOR STEEL CONSTRUCTION, 2ND EDITION"
g. POOR MATCHING OF HOLES SHALL BE CORRECTED BY DRILLING TO THE NEXT LARGER SIZE. WELDING FOR REDRILLING WILL NOT BE PERMITTED.

2.2 CONNECTIONS
a. SHOP CONNECTIONS MAY BE BOLTED OR WELDED
b. CONNECTIONS WHERE THE BEAM SHEAR (V) IS NOT NOTED ON THE DRAWINGS, SIMPLE SHEAR CONNECTIONS SHALL BE DESIGNED TO DEVELOP 1/2 OF THE MAXIMUM TOTAL UNIFORM LOAD CAPACITY OF THE BEAM.
c. FIELD CONNECTIONS SHALL BE MADE WITH A325 BOLTS AND HARDENED WASHERS EXCEPT AS INDICATED ON THE DESIGN DRAWINGS
d. CONNECTIONS NOT SHOWN ON DRAWINGS SHALL BE DESIGNED BY THE STEEL FABRICATOR. CONNECTIONS SHALL BE DESIGNED IN ACCORDANCE WITH AISC "SPECIFICATIONS FOR STRUCTURAL JOINTS USING ASTM A325 OR A490 BOLTS" AND "AISC CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES".
e. DO NOT FIELD CUT OR ALTER STRUCTURAL MEMBERS WITHOUT PRIOR WRITTEN APPROVAL OF ENGINEER.
f. BOLT HOLES SHALL BE CUT, DRILLED OR PUNCHED AT RIGHT ANGLES TO THE SURFACE OF THE METAL AND SHALL NOT BE MADE OR ENLARGED BY BURNING. HOLES SHALL BE CLEAN CUT WITHOUT TORN OR RAGGED EDGES. OUTSIDE BURRS RESULTING FROM DRILLING OR REAMING OPERATION SHALL BE REMOVED WITH A TOOL MAKING A 1/16 INCH BEVEL. BOLT HOLES SHALL BE 1/16 INCH OVERSIZE.

2.3 FINISHES
a. STRUCTURAL STEEL SHALL BE HOT DIP GALVANIZED AFTER FABRICATION PER ASTM A123
b. BOLTS AND NUTS SHALL BE HOT DIP GALVANIZED PER ASTM A153.
c. ALL SURFACES DAMAGED BY FIELD WELDING OR CUTTING SHALL BE PAINTED WITH COLD GALVANIZING COMPOUND TWICE. THE PAINT SHOULD BE AT LEAST 93% PURE ZINC. RUST–OLEUM PROFESSIONAL, (MODEL# 7585838) OR SIMILAR.

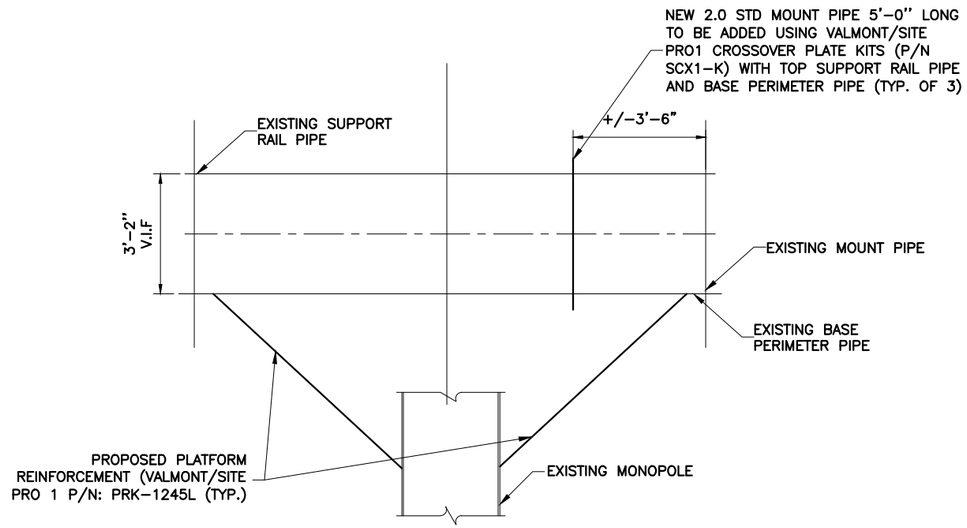
2.4 WELDING
a. CONTRACTOR TO TAKE ALL NECESSARY PRECAUTIONS FOR FIRE PREVENTION DURING WELDING, SUCH AS; INSTALLING 3000 (NFPA 701) FIRE BLANKET AROUND COAX. MORE SPLATTER AND SPARKS SHOULD BE ANTICIPATED WHILE WELDING ON GALVANIZED SURFACE. COAX IS FLAMMABLE AND SHALL CATCH FIRE IF NOT PROTECTED. WATER SHALL BE ON SITE OF ADEQUATE AMOUNT AND AVAILABLE AT SHORT NOTICE AT ALL TIMES DURING WELDING ACTIVITY. CONTRACTOR SHOULD BE ABLE TO TRANSPORT THE WATER TO THE HEIGHT WELDING BEING PERFORMED.
b. WELDING ON GALVANIZED SURFACE SHOULD BE DONE WITH EXTREME CAUTION. IF THE WELD MATERIAL IS CONTAMINATED WITH ZINC, IT DOES NOT PROVIDE A STRUCTURAL WELD. GROUND GALVANIZING BEFORE WELDING.
c. WELDING CERTIFICATE MUST BE PROVIDED PRIOR TO WELDING. ALL WELDING SHALL BE PERFORMED BY AWS QUALIFIED WELDER WHO HAS EXPERIENCE WITH GALVANIZED SURFACES.



PROPOSED MODIFICATION TO BE INSTALLED AT ALL CORNERS.

1/S1 PLATFORM MOUNT @ 163' PLAN
1/4" = 1'-0"

NOTE:
– ADDITIONAL EQUIPMENT AND MOUNTING HARDWARE NOT SHOWN FOR CLARITY



2/S1 PLATFORM MOUNT @ 163' ELEVATION
N.T.S

NOTE:
– ADDITIONAL EQUIPMENT AND MOUNTING HARDWARE NOT SHOWN FOR CLARITY

STATE OF CONNECTICUT
AHMET COLAKOGLU
PEN. 27057
LICENSED PROFESSIONAL ENGINEER
06-19-2020

Ahmet Colakoglu, PE
CT License No: 27057

efi global
EFI GLOBAL, INC.
1117 PERIMETER CENTER WEST
SUITE E500
ATLANTA, GA 30338
TEL NO: 770–693–0835
TELCOM@EFIGLOBAL.COM
FIRM LICENSE: PEC0001245

PREPARED FOR:
T-Mobile Northeast, LLC
35 Griffin Road South
Bloomfield, CT 06002

NUM	DATE	DESCRIPTION:
A	06/19/20	ISSUED FOR CONSTRUCTION

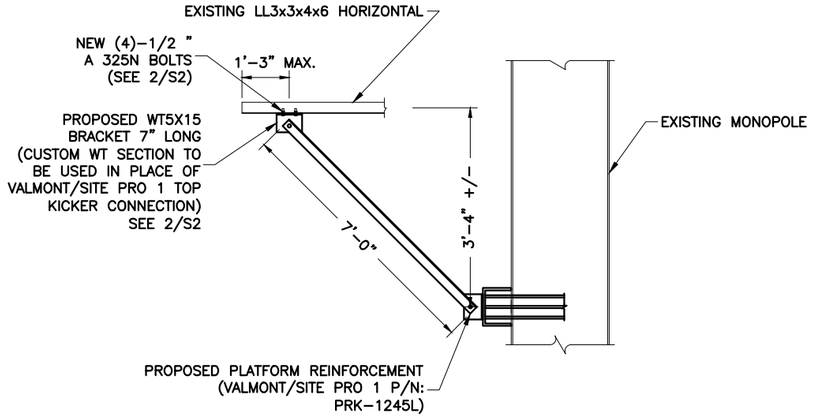
CT11365D

ADDRESS:
239E.MIDDLE TPK,
MANCHESTER, CT 06040

DESIGNED: SK
DRAWN: SK
CHECKED: AC

JOB #: 049.00421
2075019

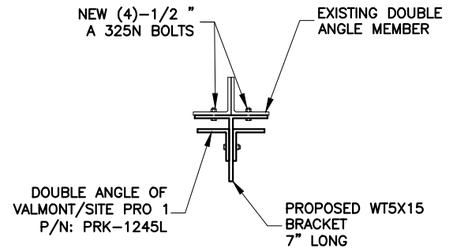
S1
UPGRADE DRAWINGS

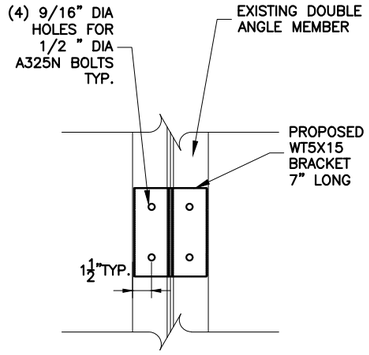


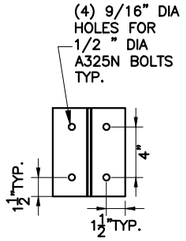
1/S2 PLATFORM MOUNT KICKER CONNECTION

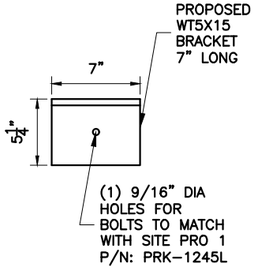
1/4" = 1'-0"

NOTE:
– ADDITIONAL EQUIPMENT AND MOUNTING HARDWARE NOT SHOWN FOR CLARITY









2/S2 CONNECTION DETAIL

1" = 1'-0"

NOTE:
– MODIFICATIONS SHOULD BE DONE AT ALL SECTORS

PROPOSED MODIFICATION TO BE INSTALLED AT ALL CORNERS.

efi global
EFI GLOBAL, INC.
1117 PERIMETER CENTER WEST
SUITE E500
ATLANTA, GA 30338
TEL NO: 770-693-0835
TELECOM@EFIGLOBAL.COM
FIRM LICENSE: PEC0001245

PREPARED FOR:
T-Mobile Northeast, LLC
35 Griffin Road South
Bloomfield, CT 06002

NUM	DATE	DESCRIPTION:
A	06/19/20	ISSUED FOR CONSTRUCTION

CT11365D

ADDRESS:
239E.MIDDLE TPK,
MANCHESTER, CT 06040

STATE OF CONNECTICUT
AHMET COLAKOGLU
PEN. 27057
LICENSED PROFESSIONAL ENGINEER
06-19-2020

Ahmet Colakoglu, PE
CT License No: 27057

DESIGNED: SK
DRAWN: SK
CHECKED: AC

JOB #: 049.00421
2075019

S2 UPGRADE DRAWINGS