September 23, 2022

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

Regarding: Notice of Exempt Modification – AT&T Site CT-1066 / FA# 10035005
Address: 97 High Street, Portland, CT 06480

Dear Ms. Bachman:

New Cingular Wireless, PCS, LLC ("AT&T") currently maintains a wireless telecommunications facility on an existing +/- 80' self-support tower at the above-referenced address, latitude 41.5807139, longitude -72.6238600. Said self-support tower is operated by SRR Towers, LLC.

AT&T desires to modify its existing telecommunications facility by swapping nine (9) antennas, adding three (3) antennas, adding three (3) remote radio units (RRUS), swapping three (3) remote radio units (RRUS), and adding one (1) surge arrestor and accompanying feedlines, as more particularly detailed and described on the enclosed Construction Drawings prepared by Hudson Design Group, LLC, last revised September 21, 2012. The centerline height of the existing antennas is and will remain at 77 feet. This modification may include B2, B5, B17, B14, B29, B30, B66, & n77 hardware that is 4G(LTE) and/or 5GNR capable through remote software configuration and either or both services may be turned off at various times.

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 Ryan Curley, First Selectman of the Town of Portland, John Herring, Zoning Enforcement Officer of the Town of Portland, Mary Dickerson, Town Planner of the Town of Portland, and SRR Towers, LLC, as tower operator and property owner. We have reached out to the Building and Zoning Departments for the Town of Portland who conducted a search and could not locate the original tower approval.

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 calculation 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 dated September 8, 2022, and prepared by Structural Components, LLC, enclosed herewith.*

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,

Evan Renwick

Evan Renwick
Site Acquisition Specialist
Centerline Communications, LLC
750 West Center Street, Suite 301
West Bridgewater, MA 02379
erenwick@clinellc.com

Enclosures:
Exhibit 1 – Construction Drawings
Exhibit 2 – Property Card and GIS
Exhibit 3 – Structural Analysis
Exhibit 4 – Mount Analysis
Exhibit 5 – RF Emissions Analysis Report Evaluation
Exhibit 6 – Notice Delivery Confirmations

cc:
The Honorable Ryan Curley, First Selectman, Town of Portland, elected official
John Herring, Zoning Enforcement Officer, Town of Portland
Mary Dickerson, Town Planner, Town of Portland
SRR Towers LLC, as tower operator and property owner

EXHIBIT 1

PROJECT INFORMATION

SCOPE OF WORK:

ITEMS TO BE MOUNTED ON THE EXISTING SELF SUPPORT TOWER:
- NEW AT&T ANTENNAS: AIR6419 B77G (STACKED) @ POS. 3 (TYP. OF 1 PER SECTOR, TOTAL OF 3)
- NEW AT&T ANTENNAS: AIR6449 B77D (STACKED) @ POS. 3 (TYP. OF 1 PER SECTOR, TOTAL OF 3)
- NEW AT&T ANTENNA: TPA65R-BU6DA-K @ POS. 2 (TYP. OF 1 PER SECTOR, TOTAL OF 3).
- NEW AT&T ANTENNA: DMP65R-BU6DA @ POS. 4 (TYP. OF 1 PER SECTOR, TOTAL OF 3).
- NEW AT&T RRUS: 4449 B5/B12 (TYP. OF 1 PER SECTOR, TOTAL OF 3)
- NEW AT&T RRUS: 4478 B14 (TYP. OF 1 PER SECTOR, TOTAL OF 3)
- NEW AT&T SURGE ARRESTORS DC9-48-60-24-8C-EV (TOTAL OF 1)
- NEW AT&T (3) Y-CABLES
- NEW AT&T (3) #6 AWG DC POWER CABLES & (1) 24 PAIRS OF FIBER RUN.

ITEMS TO BE MOUNTED AT EQUIPMENT LOCATION:
- ADD (1) 6648+IDLe Xcede.

FINAL: 1X6601/1X5216/1XXMU03/XXXX/1X6630 MIXED-MODE/1X6648+IDLe & Xcede CABLE
- ADD (3) -48v RECTIFIERS FOR A TOTAL OF (11) -48v RECTIFIERS TO EXISTING POWER PLANT.
- PROPOSED (1) FIBER BOX ON ICE BRIDGE POST AND (1) FIBER TRAY IN LTE RACK.
- PROPOSED DC12 MOUNTED IN EXISTING LTE RACK & POWER UP LEFT SIDE OF EXISTING DC12.
- INSTALL (1) NEW SPF7 CARD IN EXISTING LTE RACK.

ITEMS TO BE REMOVED:
- EXISTING AT&T ANTENNA: 800-10121 (TYP. OF 1 PER SECTOR, TOTAL OF 3).
- EXISTING AT&T ANTENNA: HPA-65R-BUU-H6 (TYP. OF 1 PER SECTOR, TOTAL OF 3).
- EXISTING AT&T ANTENNA: QS66510-6 (TYP. OF 1 PER SECTOR, TOTAL OF 3).
- EXISTING AT&T RRUS: RRUS-11 B12 (TYP. OF 1 PER SECTOR, TOTAL OF 3)
- EXISTING AT&T TMA'S: DTMABP7819VG12A (TYP. OF 1 PER SECTOR, TOTAL OF 3).
- EXISTING AT&T DIPLEXER: DBC0061F1V51-2 (TYP. OF 2 PER SECTOR, TOTAL OF 6).

ITEMS TO REMAIN:
- (9) RRU'S, (2) SURGE ARRESTOR, (4) DC POWER, (2) FIBER & (6) COAX

SITE ADDRESS:	97 HIGH STREET PORTLAND, CT 06480
LATITUDE:	41.5807139° N 41° 34' 50.570" N
LONGITUDE:	-72.6238600° W 72° 37' 25.896" W
TYPE OF SITE:	SELF SUPPORT TOWER / INDOOR EQUIPMENT
STRUCTURE HEIGHT:	80'-0"±
RAD CENTER:	77'-0"±
CURRENT USE:	TELECOMMUNICATIONS FACILITY
PROPOSED USE:	TELECOMMUNICATIONS FACILITY

DRAWING INDEX

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

at&t

SITE NUMBER: CTL01066

SITE NAME: PORTLAND

FA CODE: 10035005

PACE ID: MRCTB055159, MRCTB054457, MRCTB054602, MRCTB053679, MRCTB056217, MRCTB055774, MRCTB054463, MRCTB055175

PROJECT: 5G NR 1SR, LTE 5C, 4TXRX SOFTWARE, 5G NR 1SR CBAND, 5G NR ACTIVATION, BBU ADD, 5G NR RADIO 2023 UPGRADE

ISSUED FOR PERMITTING

VICINITY MAP

DIRECTIONS TO SITE:

HEAD SOUTHEAST TOWARD CAPITAL BLVD, TURN LEFT ONTO CAPITAL BLVD, USE THE LEFT 2 LANES TO TURN LEFT ONTO STATE HWY 411, TURN LEFT TO MERGE WITH I-91 S, MERGE WITH I-91 S, TAKE EXIT 22S ON THE LEFT TO MERGE WITH CT-9 S TOWARD MIDDLETOWN/OLD SAYBROOK, TAKE EXIT 16 FOR CT-17 N TOWARD CT-66 E/PORTLAND/WILLIMANTIC, CONTINUE ONTO CT-17 N/ST JOHNS SQUARE, TURN RIGHT ONTO MAIN ST, TURN RIGHT ONTO MARLBOROUGH ST PASS BY BURGER KING (ON THE LEFT), TURN LEFT ONTO HIGH ST, TURN RIGHT, DESTINATION WILL BE ON THE LEFT.

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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B	09/21/22	ISSUED FOR PERMITTING	GD	MT	
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SCALE: AS SHOWN | DESIGNED BY: AT | DRAWN BY: GD

STATE OF CONNECTICUT DANIEL T. KAMM LICENSED PROFESSIONAL ENGINEER No. 31428

AT&T

TITLE SHEET
5G NR 1SR, LTE 5C, 4TXRX SOFTWARE, 5G NR 1SR CBAND, 5G NR ACTIVATION, BBU ADD, 5G NR RADIO 2023 UPGRADE

SITE NUMBER	DRAWING NUMBER	REV
CTL01066	T-1	B

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-H, STRUCTURAL STANDARDS FOR STEEL

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

ABBREVIATIONS

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

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

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A	01/14/22	ISSUED FOR REVIEW	GD	MT	

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

STATE OF CONNECTICUT · DANIEL T. HAMM · No. 27328 · LICENSED PROFESSIONAL ENGINEER

AT&T

GENERAL NOTES
5G NR 1SR, LTE 5C, 4TXRX SOFTWARE, 5G NR 1SR CBAND, 5G NR ACTIVATION, BBU ADD, 5G NR RADIO 2023 UPGRADE

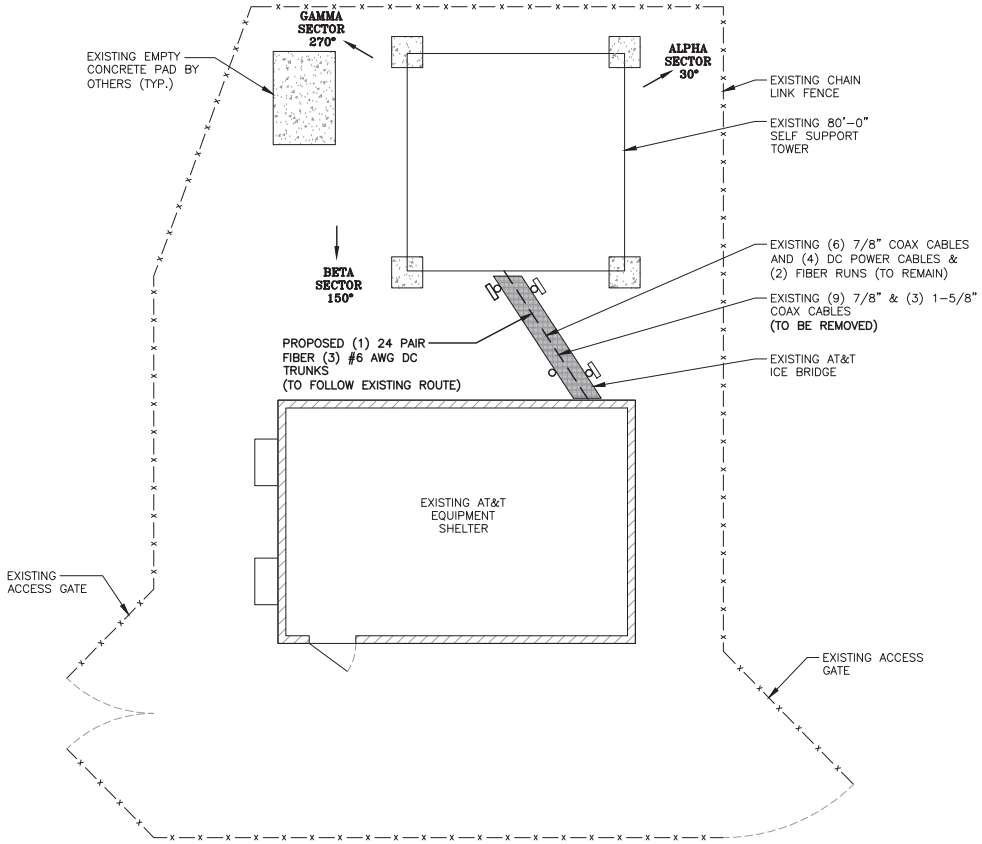
SITE NUMBER	DRAWING NUMBER	REV
CTL01066	GN-1	B

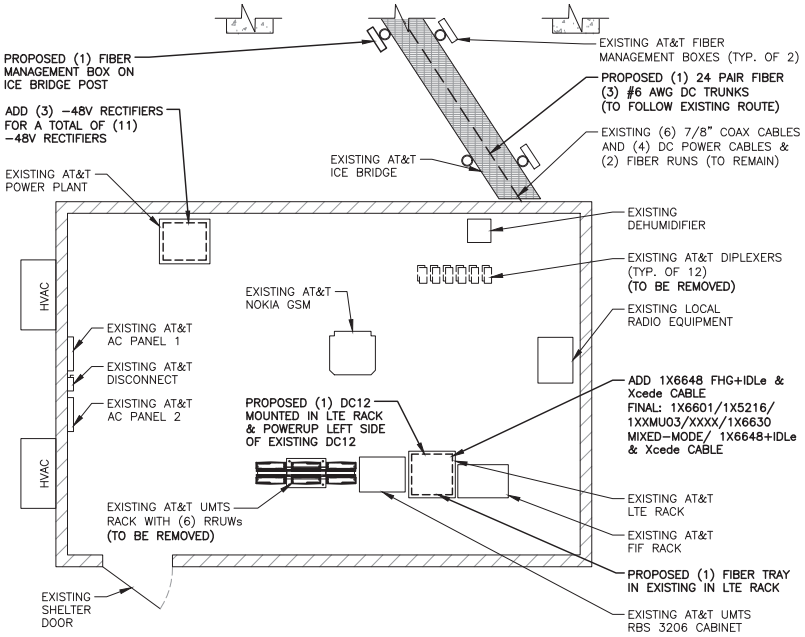
NOTE:

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.





COMPOUND PLAN (1 / A-1)
22x34 SCALE: 1/4"=1'-0"
11x17 SCALE: 1/8"=1'-0"

0 2'-0" 4'-0" 8'-0" 12'-0"

EQUIPMENT PLAN (2 / A-1)
22x34 SCALE: 3/8"=1'-0"
11x17 SCALE: 3/16"=1'-0"

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

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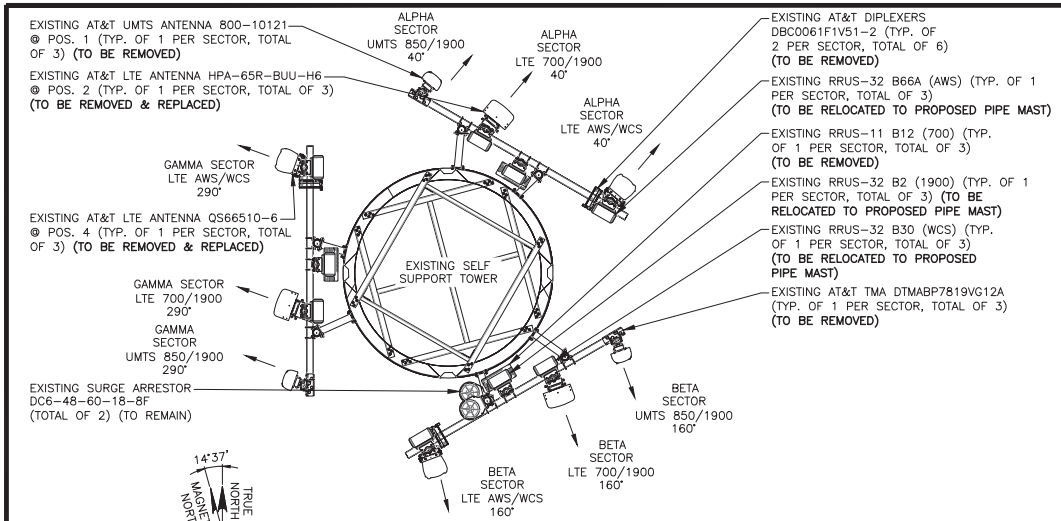
SCALE: AS SHOWN | DESIGNED BY: AT | DRAWN BY: GD

STATE OF CONNECTICUT
DANIEL P. HAMM
No. 27178
LICENSED PROFESSIONAL ENGINEER

AT&T

COMPOUND & EQUIPMENT PLANS
5G NR 1SR, LTE 5C, 4TXRX SOFTWARE, 5G NR 1SR CBAND, 5G NR ACTIVATION, BBU ADD, 5G NR RADIO 2023 UPGRADE

SITE NUMBER	DRAWING NUMBER	REV
CTL01066	A-1	B

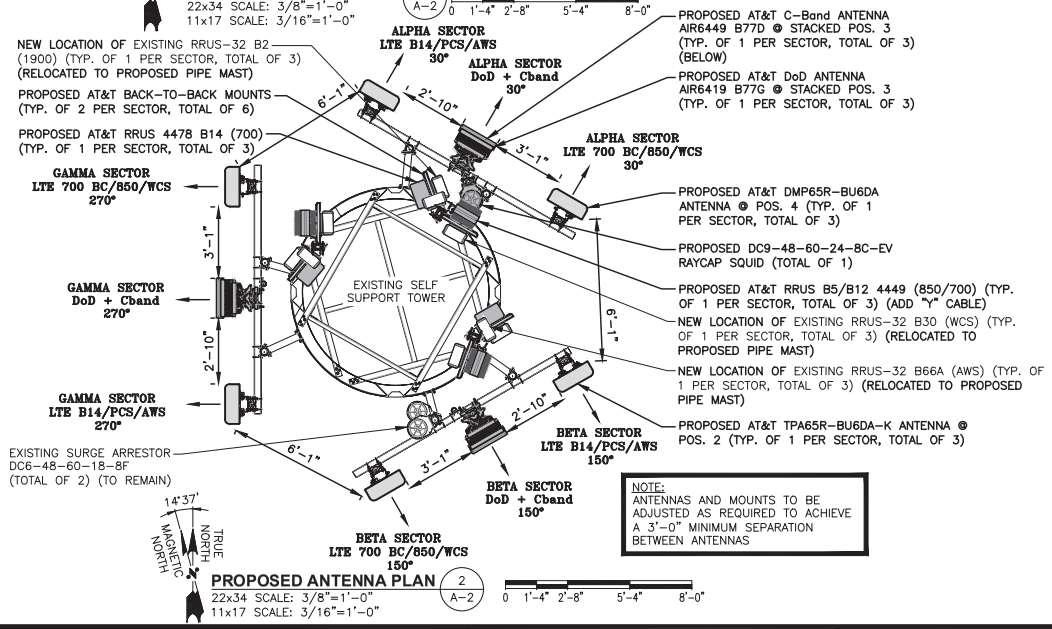


EXISTING ANTENNA PLAN

1 A-2

22x34 SCALE: 3/8"=1'-0"
11x17 SCALE: 3/16"=1'-0"

0 1'-4" 2'-8" 5'-4" 8'-0"



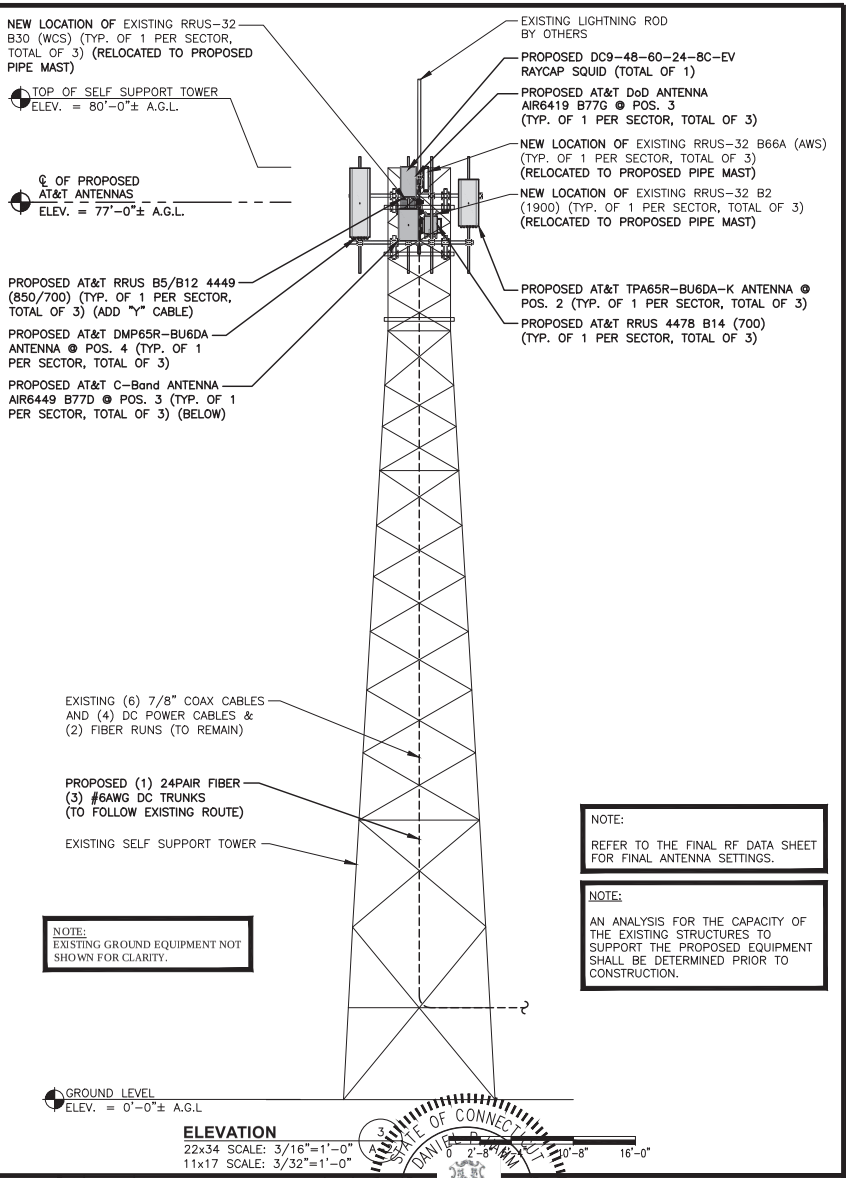
NOTE:
ANTENNAS AND MOUNTS TO BE ADJUSTED AS REQUIRED TO ACHIEVE A 3'-0" MINIMUM SEPARATION BETWEEN ANTENNAS

PROPOSED ANTENNA PLAN

2 A-2

22x34 SCALE: 3/8"=1'-0"
11x17 SCALE: 3/16"=1'-0"

0 1'-4" 2'-8" 5'-4" 8'-0"



NOTE:
EXISTING 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.

ELEVATION

3 A-2

22x34 SCALE: 3/16"=1'-0"
11x17 SCALE: 3/32"=1'-0"

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

SITE NUMBER: CTL01066
SITE NAME: PORTLAND

97 HIGH STREET
PORTLAND, CT 06480
MIDDLESEX COUNTY

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

NO.	DATE	REVISIONS	BY	CHK	APP'D
B	09/21/22	ISSUED FOR PERMITTING	GD	MT	
A	01/14/22	ISSUED FOR REVIEW	GD	MT	

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

STATE OF CONNECTICUT
DANIEL P. LAU
No. 21128
LICENSED PROFESSIONAL ENGINEER

AT&T

ANTENNA LAYOUT PLANS & ELEVATION
5G NR 1SR, LTE 5C, 4TXRX SOFTWARE, 5G NR 1SR CBAND, 5G NR ACTIVATION, BBU ADD, 5G NR RADIO 2023 UPGRADE

SITE NUMBER	DRAWING NUMBER	REV
CTL01066	A-2	B

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	EMPTY	–	–	–	–	–	–	–	–	(E)(2) 7/8" COAX	(E) (1) RAYCAP DC6-48-60-18-8F
A2	PROPOSED	LTE B14/PCS/AWS	TPA65R-BU6DA-K	71.2X20.7X7.7	77'-0"±	30°	–	(P)(1) 4478 B14 (700) (E)(1) RRUS-32 B2 (1900) (E)(1) RRUS-32 B66A (AWS)	18.1x13.4x8.3 – –	(E)(2) DC POWER & (1) FIBER	
A3	PROPOSED	DoD C-BAND	AIR6419 B77G AIR6449 N77D	31.1X16.1X7.3 30.4X15.9X8.1	77'-0"±	30°	–	–	–	–	
A4	PROPOSED	LTE 700 BC/850/WCS	DMP65R-BU6DA	71.2X20.7X7.7	77'-0"±	30°	–	(P)(1) 4449 B5/B12 (850/700) (E)(1) RRUS-32 B30 (WCS)	17.9x13.2x10.4 –	(P)(1) Y CABLE	
B1	EMPTY	–	–	–	–	–	–	–	–	(E)(2) 7/8" COAX	(E) (1) RAYCAP DC6-48-60-18-8F
B2	PROPOSED	LTE B14/PCS/AWS	TPA65R-BU6DA-K	71.2X20.7X7.7	77'-0"±	150°	–	(P)(1) 4478 B14 (700) (E)(1) RRUS-32 B2 (1900) (E)(1) RRUS-32 B66A (AWS)	18.1x13.4x8.3 – –	(E)(2) DC POWER & (1) FIBER	
B3	PROPOSED	DoD C-BAND	AIR6419 B77G AIR6449 N77D	31.1X16.1X7.3 30.4X15.9X8.1	77'-0"±	150°	–	–	–	–	
B4	PROPOSED	LTE 700 BC/850/WCS	DMP65R-BU6DA	71.2X20.7X7.7	77'-0"±	150°	–	(P)(1) 4449 B5/B12 (850/700) (E)(1) RRUS-32 B30 (WCS)	17.9x13.2x10.4 –	(P)(1) Y CABLE	
C1	EMPTY	–	–	–	–	–	–	–	–	(E)(2) 7/8" COAX	(P) (1) RAYCAP DC9-48-60-24-8C-EV
C2	PROPOSED	LTE B14/PCS/AWS	TPA65R-BU6DA-K	71.2X20.7X7.7	77'-0"±	270°	–	(P)(1) 4478 B14 (700) (E)(1) RRUS-32 B2 (1900) (E)(1) RRUS-32 B66A (AWS)	18.1x13.4x8.3 – –	(P)(3) #6AWG DC TRUNK & (P)(1) 24PAIR FIBER (APPROX. LENGTH=90'±)	
C3	PROPOSED	DoD C-BAND	AIR6419 B77G AIR6449 N77D	31.1X16.1X7.3 30.4X15.9X8.1	77'-0"±	270°	–	–	–	–	
C4	PROPOSED	LTE 700 BC/850/WCS	DMP65R-BU6DA	71.2X20.7X7.7	77'-0"±	270°	–	(P)(1) 4449 B5/B12 (850/700) (E)(1) RRUS-32 B30 (WCS)	17.9x13.2x10.4 –	(P)(1) Y CABLE	

RRU CHART

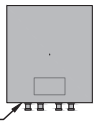
QUANTITY	MODEL	SIZE (L x W x D)
P(3)	4449 B5/B12 (850/700)	17.9"x13.2"x10.4"
P(3)	4478 B14 (700)	18.1"x13.4"x8.3"
E(3)	RRUS-32 B2 (1900)	27.2"x12.1"x7.0"
E(3)	RRUS-32 B66A (AWS)	27.2"x12.1"x7.0"
E(3)	RRUS-32 B30 (WCS)	27.2"x12.1"x7.0"

NOTE:
MOUNT PER MANUFACTURER'S SPECIFICATIONS

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.

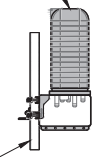
NOTE:
SEE RFDS FOR RRH FREQUENCY AND MODEL NUMBER



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

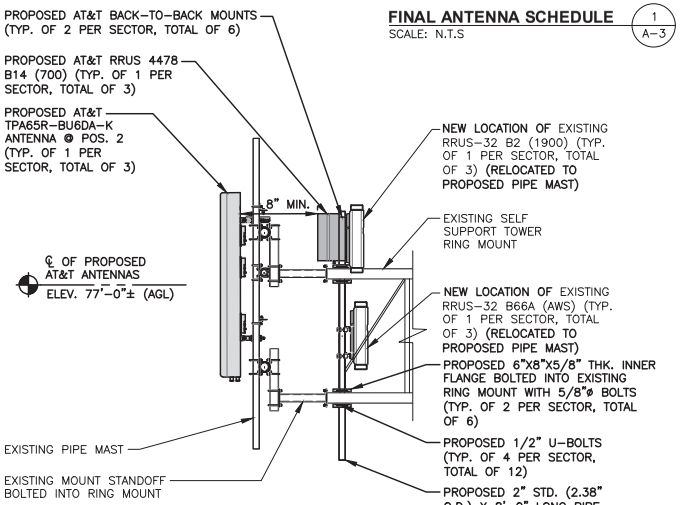
NOTE:
MOUNT PER MANUFACTURER'S SPECIFICATIONS.

PROPOSED RRUS DETAIL
SCALE: N.T.S
(2 / A-3)

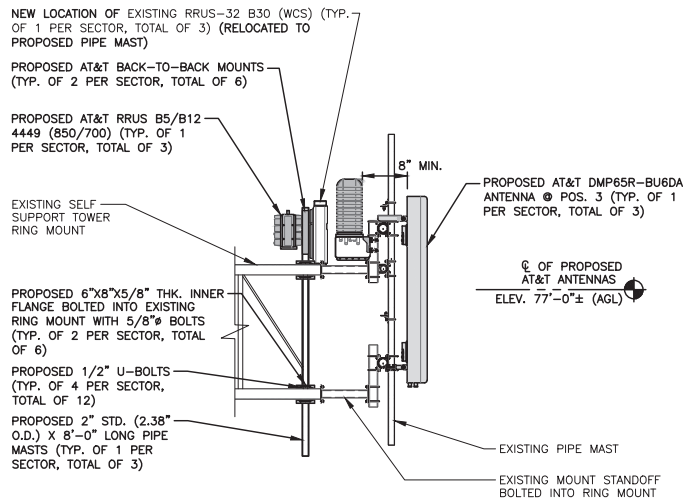


PROPOSED SURGE PROTECTOR MOUNTING DETAIL
22x34 SCALE: 3/4"=1'-0"
11x17 SCALE: 3/8"=1'-0"
0 8" 1'-4" 2'-8" 4'-0"
(3 / A-3)

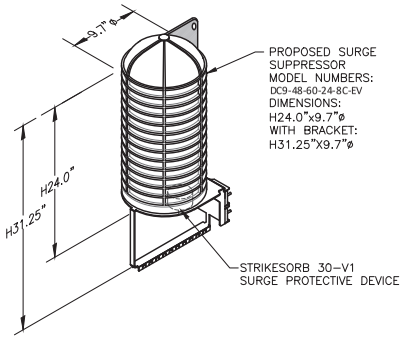
FINAL ANTENNA SCHEDULE
SCALE: N.T.S
(1 / A-3)



PROPOSED ANTENNA @ POS. 2 MOUNTING DETAIL
22x34 SCALE: 3/4"=1'-0"
11x17 SCALE: 3/8"=1'-0"
0 8" 1'-4" 2'-8" 4'-0"
(4 / A-3)



PROPOSED ANTENNA @ POS. 4 MOUNTING DETAIL
22x34 SCALE: 3/4"=1'-0"
11x17 SCALE: 3/8"=1'-0"
0 8" 1'-4" 2'-8" 4'-0"
(5 / A-3)



NOTE:
MOUNT PER MANUFACTURER'S SPECIFICATIONS.

DC SURGE SUPPRESSOR DETAIL
(6 / A-3)

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SITE NUMBER: CTL01066
SITE NAME: PORTLAND

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MIDDLESEX COUNTY

at&t
500 ENTERPRISE DRIVE, SUITE 3A
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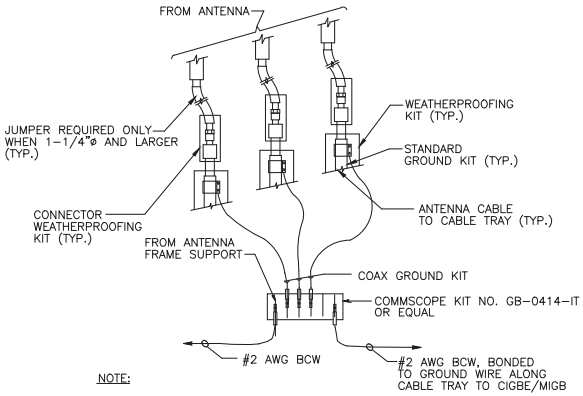
SCALE: AS SHOWN | DESIGNED BY: AT | DRAWN BY: GD

STATE OF CONNECTICUT
DANIEL P. HAMM
No. 27328
LICENSED PROFESSIONAL ENGINEER

AT&T

DETAILS
5G NR 1SR, LTE 5C, 4TXRX SOFTWARE, 5G NR 1SR CBAND, 5G NR ACTIVATION, BBU ADD, 5G NR RADIO 2023 UPGRADE

SITE NUMBER	DRAWING NUMBER	REV
CTL01066	A-3	B

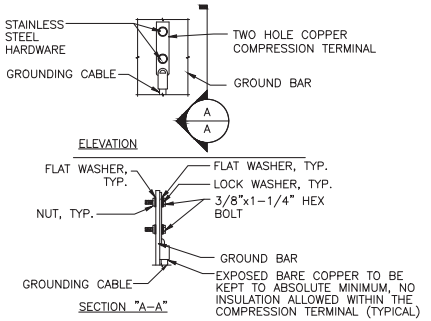


NOTE:

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

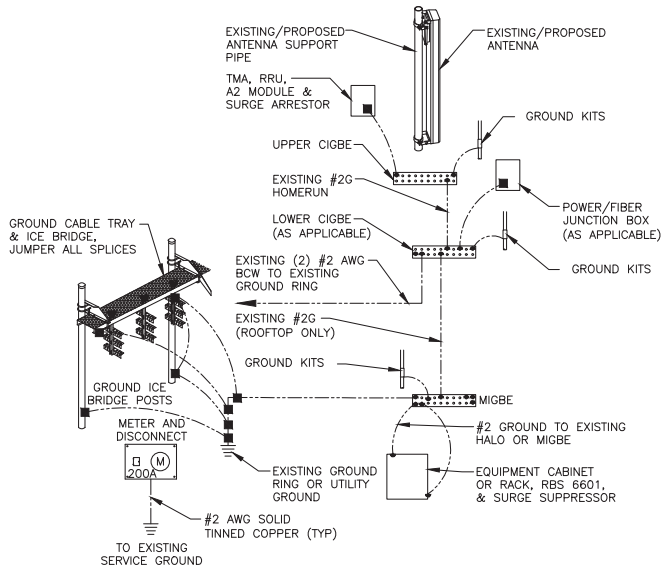


NOTES:

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



GROUNDING RISER DIAGRAM (2 / G-1)

SCALE: N.T.S

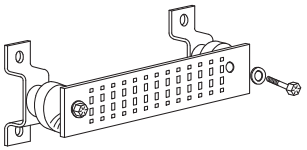
EACH GROUND CONDUCTOR TERMINATING ON ANY GROUND BAR SHALL HAVE AN IDENTIFICATION TAG ATTACHED AT EACH END THAT WILL IDENTIFY ITS ORIGIN AND DESTINATION.

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)

SCALE: N.T.S

HUDSON Design Group LLC
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SITE NUMBER: CTL01066
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A	01/14/22	ISSUED FOR REVIEW	GD	MT	DRH

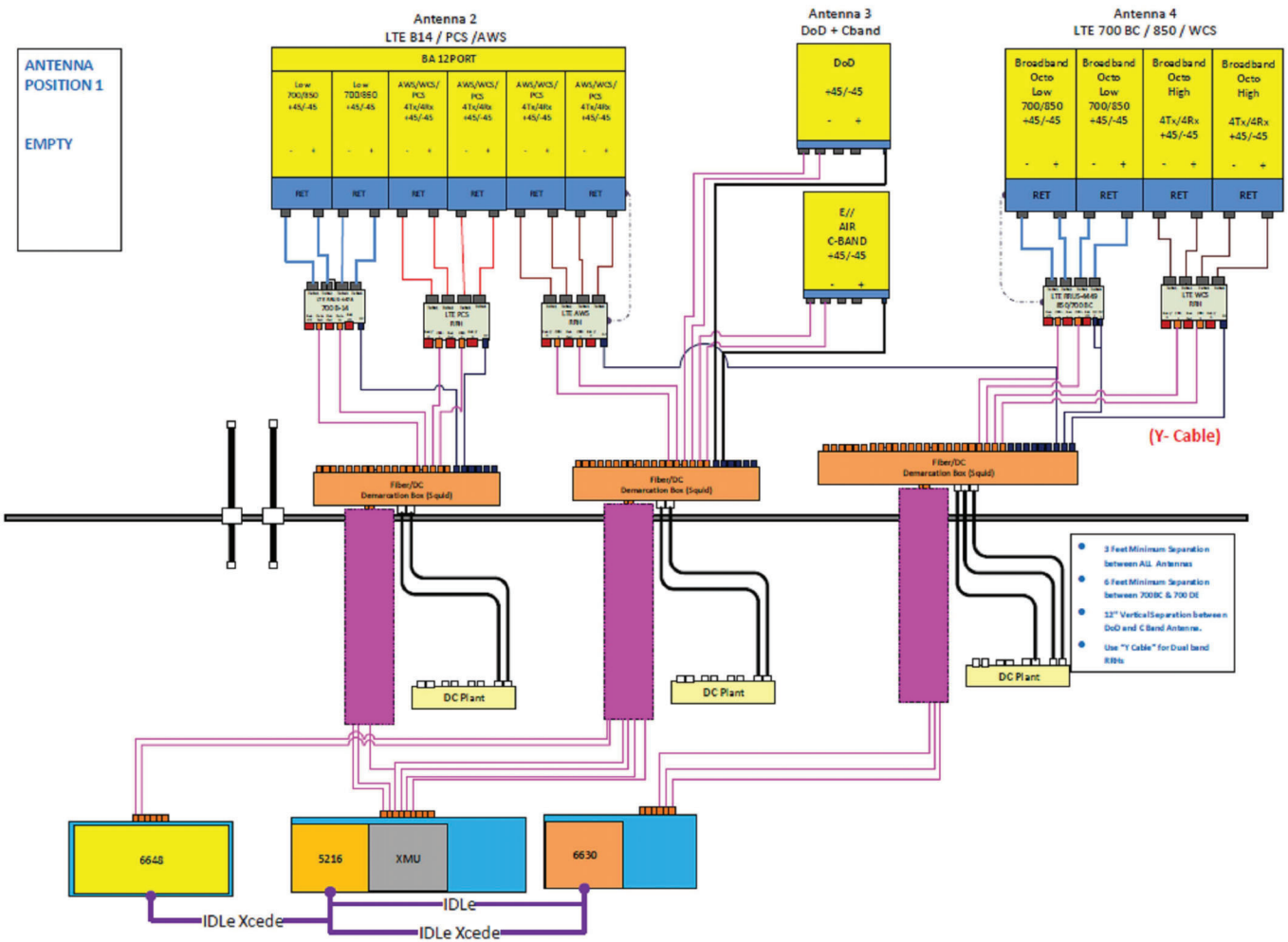
SCALE: AS SHOWN | DESIGNED BY: AT | DRAWN BY: GD

STATE OF CONNECTICUT · DANIEL R. HAMM · No. 27178 · LICENSED PROFESSIONAL ENGINEER

AT&T

GROUNDING DETAILS
5G NR 1SR, LTE 5C, 4TXRX SOFTWARE, 5G NR 1SR CBAND, 5G NR ACTIVATION, BBU ADD, 5G NR RADIO 2023 UPGRADE

SITE NUMBER	DRAWING NUMBER	REV
CTL01066	G-1	B



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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WEST BRIDGEWATER, MA 02379

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

NO.	DATE	REVISIONS	BY	CHK	APP'D
B	09/21/22	ISSUED FOR PERMITTING	JS	MT	DPH
A	01/14/22	ISSUED FOR REVIEW	GD	MT	DPH

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

AT&T

RF PLUMBING DIAGRAM
5G NR 1SR, LTE 5C, 4TXRX SOFTWARE, 5G NR 1SR CBAND, 5G NR ACTIVATION, BBU ADD, 5G NR RADIO 2023 UPGRADE

SITE NUMBER	DRAWING NUMBER	REV
CTL01066	RF–1	B

EXHIBIT 2

qPublic.net™ Town of Portland, CT

Summary

Parcel Number	039-0084
Alternate ID/Map Block Lot	00220000
Location Address	97 HIGH ST
Legal Description	(Note: Not to be used on legal documents.)
Zoning	R15
Land Use	(431) Communication Towers
Acres	0.8
Property Class	300
Neighborhood	200
Tax District	0
Vol/Page	1040/254

Map Not Available

Owner

Owner
SRR TOWERS LLC
57 E WASHINGTON ST
CHAGRIN FALLS OH 44022

Valuation

Effective Date of Current Values: 10/01/2021

	Appraised Values	Assessed Values
Current Land	$81,600	$57,120
Current Building	$93,500	$65,450
Current Total	$175,100	$122,570

2020 Values

	Appraised Values	Assessed Values
Land	$81,600	$57,120
Building	$88,100	$61,670
Total	$169,700	$118,790

Valuation History

Tax Year	Appraised Land Value	Appraised Improvements Value	Appraised Total Value	Assessed Land Value	Assessed Improvements Value	Assessed Total Value
2021	$81,600	$93,500	$175,100	$57,120	$65,450	$122,570
2020	$81,600	$88,100	$169,700	$57,120	$61,670	$118,790
2019	$81,600	$88,100	$169,700	$57,120	$61,670	$118,790
2018	$81,600	$88,100	$169,700	$57,120	$61,670	$118,790
2017	$81,600	$88,100	$169,700	$57,120	$61,670	$118,790
2016	$81,600	$88,100	$169,700	$57,120	$61,670	$118,790

Sales

Date	Book	Page	Grantor	Grantee	Price	Instr Type	Sale Validity	Qualified
6/23/2021	1040	254	NEW CINGULAR WIRELESS PCS LLC	SRR TOWERS LLC	$115,000	04	INTER CORPORATION SALE	Unqualified

Recent Sales In Area

Sale date range:

From:

09/08/2019

To:

09/08/2022

Sales by Neighborhood

Land

Line	Descr	Acres	Base Size	Base Rate	Land Val
1	PRIMARY	0.8000	1.00	85,000	$81,600

Total Acres:
0.8000
Total Land-Value:
$81,600

Commercial

Card	1	**Year Built**	1961
Building No	1	**Effective Year**	0
Structure	TLPHNE EQUIP	**Grade**	C+

Interior/Exterior

Card 1

Line	Sect	From	To	Sec	Occupancy	Occ Descr	Class	Yr Built	Eff Year	Size	Area	Perim	Height	Use Type	Phy Cond	UT	Base RCN	Feat RCN	Base Value	Pct Good	Pct Comp	Adj Value
1	1	01	01		0			1961	0		384	80	10	MULT-USE STO	3	4	26,970	0	26,970	50	0	$18,880

Accessory Information

Card 1

Descr	Full Description	Type	Quantity	Year	Size	Area	Grade	Mods	Cond	F	MD%	Value
FENCE CHAI	FENCE CHAIN	FN1	1	1961	6 x 180	1,080	C -AVERAGE		3	3	0	$1,530
TOWER CELL	TOWER CELLULAR	TT4	1	1990	1 x 80	80	C -AVERAGE		4	4	0	$73,080

Other Features

Card 1

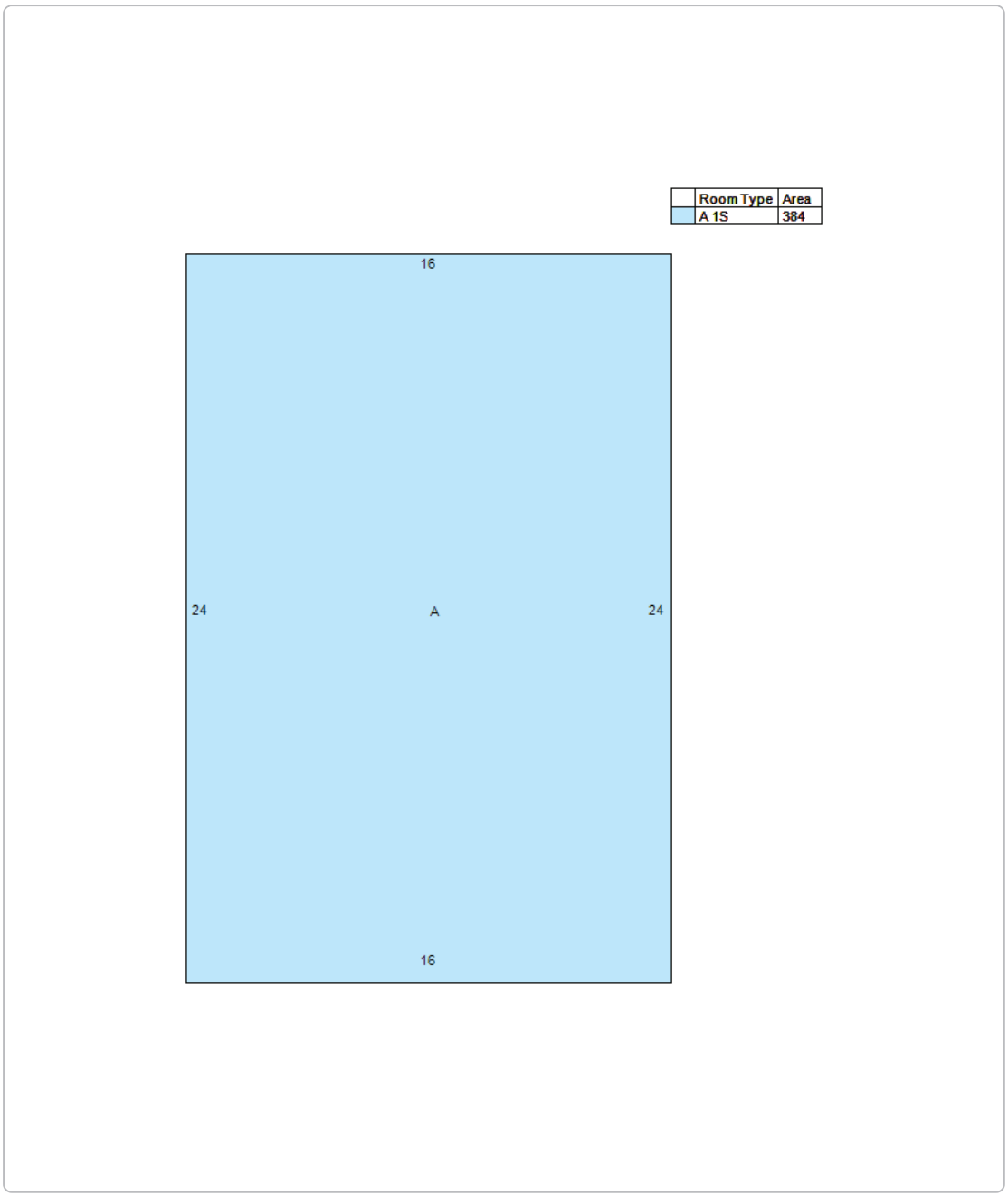
Ln	Code	Descr	Meas 1	Meas 2	Stops	IU	Value
1	VS1	1S	1	384	0	1	$0

Permits

Date	Number	Amount	Purpose
12/13/2017	18-22	$25,000	OTHER
04/19/2017	17-182	$5,000	73 CREP
04/25/2016	16-160	$25,000	BLDG
01/14/2014	14-9	$10,500	BLDG
08/14/2012	12-416	$25,000	BLDG
12/26/2007	9112	$10,000	BLDG

Photos

Sketches



No data available for the following modules: Residential, Other Dwelling Features, Tax History, Additions.

The Town of Portland Assessor makes every effort to produce the most accurate information possible. No warranties, expressed or implied are provided for the data herein, its use or interpretation. The assessment information is from the last certified tax roll. All other data is subject to change.

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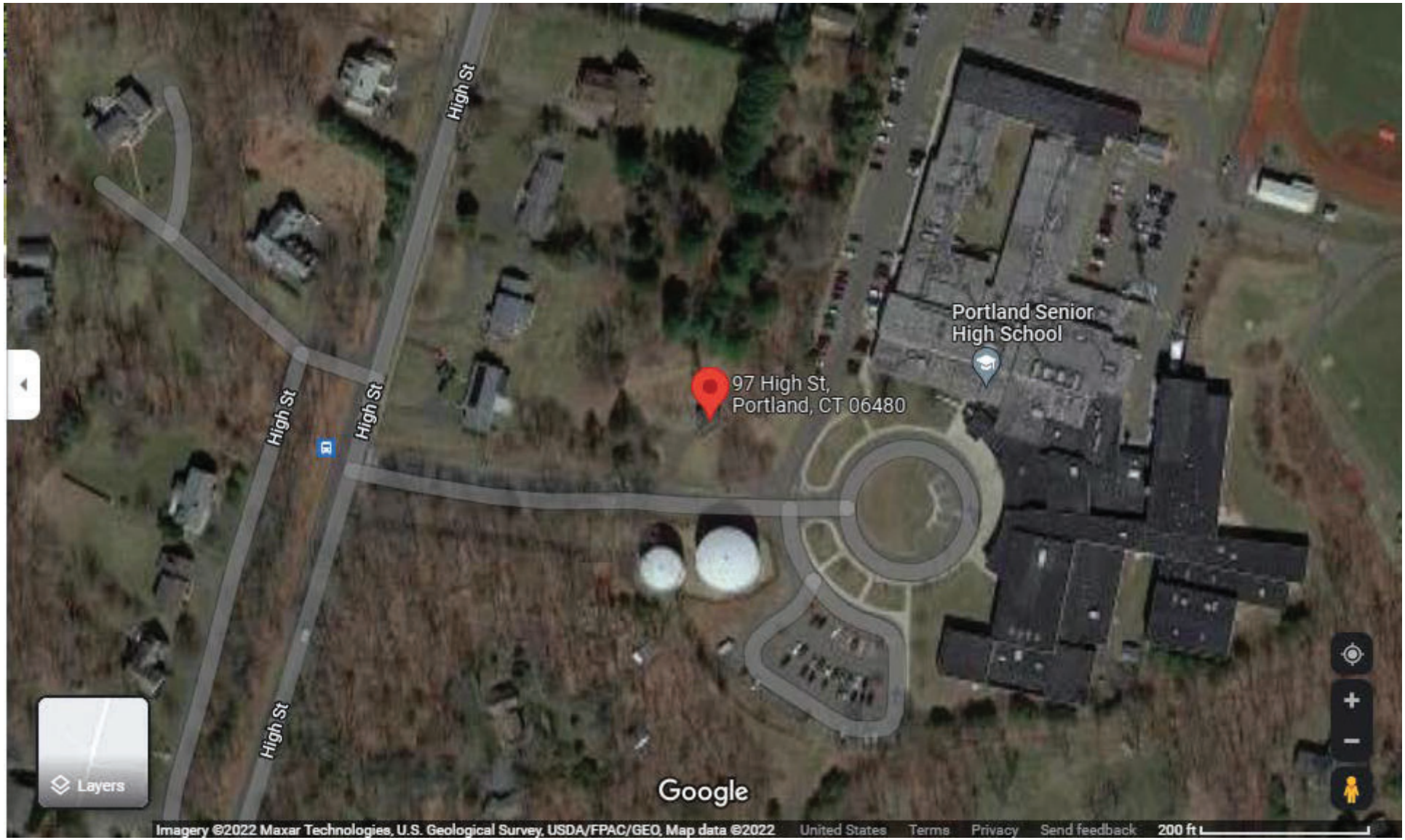
High St
High St
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High St
Portland Senior
High School
97 High St,
Portland, CT 06480
Layers
Google
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200 ft

EXHIBIT 3

Structural Components, LLC
1870 West 64th Lane, Unit A
Denver, CO 80221

Voice: 866-386-7622

September 8, 2022

BST Management, LLC
352 Park Street
Suite 106
North Reading, MA 01864

Re: Rigorous Structural Analysis Report

Structure:	80.4ft Self-Supporting Tower with 10ft Extension
Site Address:	97 High Street, Portland, Connecticut 06480 (Middlesex County) Latitude: 41.5807˚N, Longitude: 72.6238˚W
Site Name:	BST Management, LLC – Portland AT&T – Portland
Site Number:	BST Management, LLC – CT-1680 AT&T – CT1066
SC Number:	220619
Status:	**Structure Passes (98% Capacity)** **Foundation Passes**

Per your request, Structural Components, LLC has completed a structural analysis for the above referenced project to verify the tower's compliance to the following design criteria:

Standard:	TIA-222-G *Structural Standard for Antenna Supporting Structures and Antennas*
Building Code:	2015 International Building Code 2018 Connecticut State Building Code
Design Basic Wind Speed without Ice:	125 mph 3-second gust V_{ULT}
Design Basic Wind Speed with Ice:	50 mph 3-second gust
Ice Thickness:	3/4" radial
Serviceability Basic Wind Speed:	60 mph 3-second gust
Exposure Category:	C
Topographic Category:	1
Risk Category:	II
Seismic Site Class:	D, S_s=0.180, S_1=0.063
Seismic Design Category:	B

Please refer to the following structural analysis report, which gives complete details of the tower loading, results, information provided, and necessary assumptions.

We trust you find this report satisfactory. Please do not hesitate to contact us if you should have any questions or concerns.

Best Regards,
Structural Components LLC

Wesley Culver
Engineering Manager

Michael Deboer, P.E.
Connecticut P.E. # 0018022

09/09/2022

/TR

1 LOADING CONFIGURATION

The following antennas, mounts, transmission lines, and other appurtenances were considered for the structural analysis.

Elevation (ft)		Equipment	Feedlines	Notes
Mount	**Equip**			
90.5	90.5	(1) 5/8" x 6' Lightning Rod	---	Existing
90.0	90.0	(3) CommScope NNH4-65B-R6 Panels (3) Samsung XXDWMM-12.5-65-8TCBRS Panels (3) Samsung MT6407-77A Panels (3) Samsung CBRS RRH - RT4401-48A RRUs (3) Samsung RF4439d-25A RRUs (3) Samsung RF4440d-13A RRUs (1) CommScope FE-16148-OVP-B12 TMA (3) T-Arms	(2) 6x12 Hybrid	Verizon Existing
77.0	77.0	(1) L6" x 6" x 7/16" Ring Mount	---	Existing
76.7[4]	**78.7**	**(3) Ericsson RRUS 32 B2** **(1) Raycap DC6-48-60-18-8F SSD**	**(6) 7/8" TX** **(3) 0.92" OD DC** **(4) 3/4" OD DC** **(1) 3/8" Fiber** **(1) 1/2" Fiber**	**AT&T** **Final**
	77.2	**(3) Ericsson RRUS 32 B30[3]** **(3) Ericsson RRUS 32 B66A[3]** **(1) Raycap DC6-48-60-18-8F SSD**		
	76.7	**(3) CCITPA65R-BU6DA-K Panels** **(3) Ericsson AIR6449 B77D Panels** **(3) Ericsson AIR6419 B77G Panels** **(3) CCIDMP65R-BU6DA Panels** **(3) Ericsson RRUS 4478 B14** **(3) Ericsson RRUS 4449 B5/B12** **(1) Raycap DC9-48-60-24-8C-EV SSDs** **(3) 12' Sector Frame Mounts**		
75.0	75.0	(1) L6" x 6" x 7/16" Ring Mount	---	Existing
73.0	73.0	(1) 2-3/8" x 8' Pipe Mount		
67.7	67.7	(1) L6" x 6" x 7/16" Ring Mount		

1) Elevations reference centerline of panel, yagi, mounts, and dish antennas, and base of whip antennas, in relation to the base of the tower.
2) Refer to the feed line diagram and analysis output in Appendix A for the location and orientation of feedlines and equipment.
3) Secondary appurtenances such as TMAs, Diplexers, and RRUs are considered to be installed directly behind panel antennas for frontal area shielding. See analysis output for magnitude of individual shielding.
4) Elevations adjusted from Structural Components Mapping dated 03/15/2022, Job # 220142.

2 RESULTS

The analysis was performed using tnxTower v8.1.1.0, a structural analysis program developed by Tower Numerics, Inc. specifically for the communication tower industry.

2.1 TOWER MEMBER STRESS LEVELS

The tower has the following stress ratios in its structural members.

Elev. (ft)	Member	Stress Ratio*
0 – 90.4	Legs	0.98
0 – 90.4	Bracing	0.80
0 – 90.4	Connections	0.89

Stress ratio (SR) criteria:
SR $\leq$ 1.00 is completely within code limits.
SR $\leq$ 1.05 is considered within acceptable tolerance of code limits.
SR > 1.05 is outside acceptable tolerance of code limits and requires structural modifications.
* Seismic analysis for similar structures under similar loading conditions has been shown to produce significantly lower stress ratios than wind and ice. Therefore, seismic analysis has not been included in the current analysis.

2.2 FOUNDATION REACTIONS

The reactions listed below are for the design wind speed listed. Reactions are factored loads.

Reaction Type	Current Wind Reactions	Current Iced Reactions	Foundation Status
Moment (ft-kips)	1,271.3	314.6	Passes*
Shear (kips)	23.4	5.7	
Axial (kips)	21.2	54.2	
Leg Compression (kips)	74.0	51.2	
Leg Uplift (kips)	64.8	40.7	
Leg Shear (kips)	13.0	11.4	

* See Appendix A for foundation calculations.

2.3 TOWER DEFLECTION

The tower deflections have been reviewed and are believed to be acceptable for the proposed equipment. The carrier(s) should review the deflections for the service wind condition included in Appendix A for compatibility with their equipment.

3 PROVIDED INFORMATION AND ASSUMPTIONS

The following information was directly used to generate this report, and can be found in Appendix B.

Document	Author	Date	Reference
Collocation Application	AT&T	08/16/2022	CT-1680
Collocation Application EPA	AT&T	08/17/2022	CT-1680
Mount Analysis	Hudson Design Group, LLC	01/21/2022	MRCTB055774
Structural Analysis Report – Verizon	Structural Components, LLC	05/02/2022	220142
Modification Drawings	Structural Components, LLC	04/29/2022	220142

The following assumptions were made in order to complete the analysis. These assumptions must be checked. If they do not accurately represent the existing or proposed tower, foundation, soil, and loading conditions, we must be notified so that we can make the appropriate changes to our analysis, conclusions, and recommendations.

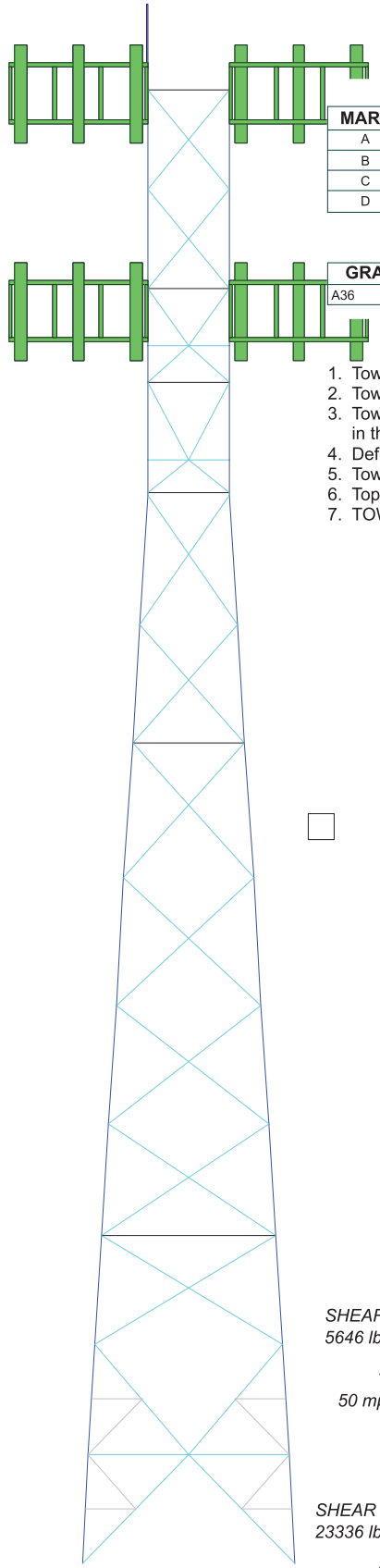
1. The tower and foundation are in good condition with no corrosion, damage or fatiguing issues which could reduce the carrying capacity of the tower.
2. All welds and connections are assumed to develop at least the member capacity, unless determined otherwise and explicitly stated in this report.
3. All prior structural modifications, if any, are assumed to be as per date supplied/ available, to be properly installed and to be fully effective.
4. The following assumptions regarding member minimum material or type apply to this structure, unless otherwise noted in analysis:
   - Angle Legs: A36
   - Angle Bracing: A36
   - Splice Bolts: A307
   - Gusset Plates: A36
   - Brace Bolts: A325N
5. The feedline and appurtenance configuration is as stated in the report. All antennas, coax, cables and waveguide cables are assumed to be properly installed and supported as per manufacturer requirement.
6. The support mounts and/or platforms are not analyzed and are considered adequate to support the loading.
7. All mounting systems connect at tower bracing points. Local stresses are not considered unless noted otherwise in analysis.
8. Some assumptions are made regarding antenna and mount sizes and their projected areas based on a best interpretation of the data supplied and a best knowledge of antenna type and industry practice.
9. The soil parameters are as per data supplied, or as assumed, and stated in the calculations.
10. **The modifications shown in the previous Modification Drawings, SC #220142, dated 04/28/2022 have been considered to be installed for this analysis.**

4 CONCLUSIONS

To the best of our knowledge and belief the tower and foundations satisfy the requirements of the applicable codes and standards having jurisdiction over the work for the loadings and conditions as outlined in this report. **Structural modifications are not required at this time.**

APPENDIX A

Tower Profile and Calculations



Section	T14	T13	T12	T11	T10	T9	T8	T7	T6	T5	T4	T3	T2	T1
Legs		L5x5x5/16				L5x5x3/8			L4x4x3/8					L4x4x1/4
Leg Grade							A36							
Diagonals	L3x3x5/16		C		L2x2 1/2x3/16					B	L2 1/2x2 1/2x3/16		A	L2x2x1/4
Diagonal Grade							A36							
Top Girts	N.A.		L2x2 1/2x1/4		N.A.		L2 1/2x2 1/2x3/16		N.A.		2L4x4x3/8	N.A.	D	L2 1/2x2 1/2x3/16
Bottom Girts					N.A.					E			N.A.	
Horizontals	F				N.A.					D	N.A.	D		N.A.
Red. Horizontals	L1 3/4x1 3/4x3/16						N.A.							
Red. Diagonals	L1 3/4x1 3/4x3/16						N.A.							
Inner Bracing	N.A.		L2x2x3/16		N.A.		L2 1/2x2x3/16		N.A.	G	N.A.	G		N.A.
Face Width (ft)	13.083	12.2597	11.4363	10.6142	9.7793	8.883	7.9252	6.9059	6.0147					5.0416
# Panels @ (ft)		2 @ 6.7075		1 @ 6.688	1 @ 6.792	1 @ 7.292	1 @ 7.792	1 @ 8.292	1 @ 7.25	1 @ 7.917	1 @ 2	1 @ 4.75	H	1 @ 3.5	2 @ 6.08292
Weight (lb)	9055.0	979.7	853.8	819.8	805.0	620.6	636.9	792.8	497.4	522.3	446.5	733.1	309.2	448.4	789.4

SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	L2x2 1/2x3/16	E	L3x3x3/16
B	L2x2x3/16	F	L1 3/4x1 3/4x3/16
C	L2 1/2x2 1/2x3/16	G	L2 1/2x2x3/16
D	L4x3 1/2x1/4	H	1 @ 2.25

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A36	36 ksi	58 ksi			

TOWER DESIGN NOTES

1. Tower designed for Exposure C to the TIA-222-G Standard.
2. Tower designed for a 125 mph basic wind in accordance with the TIA-222-G Standard.
3. Tower is also designed for a 50 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 60 mph wind.
5. Tower Risk Category II.
6. Topographic Category 1 with Crest Height of 0.00 ft
7. TOWER RATING: 97.1%

ALL REACTIONS ARE FACTORED

MAX. CORNER REACTIONS AT BASE:
DOWN: 73986 lb
SHEAR: 12961 lb

UPLIFT: -64739 lb
SHEAR: 11301 lb

AXIAL
54143 lb

SHEAR
5646 lb

MOMENT
314524 lb-ft

TORQUE 2842 lb-ft
50 mph WIND - 0.7500 in ICE

AXIAL
21114 lb

SHEAR
23336 lb

MOMENT
1271270 lb-ft

TORQUE 9597 lb-ft
REACTIONS - 125 mph WIND

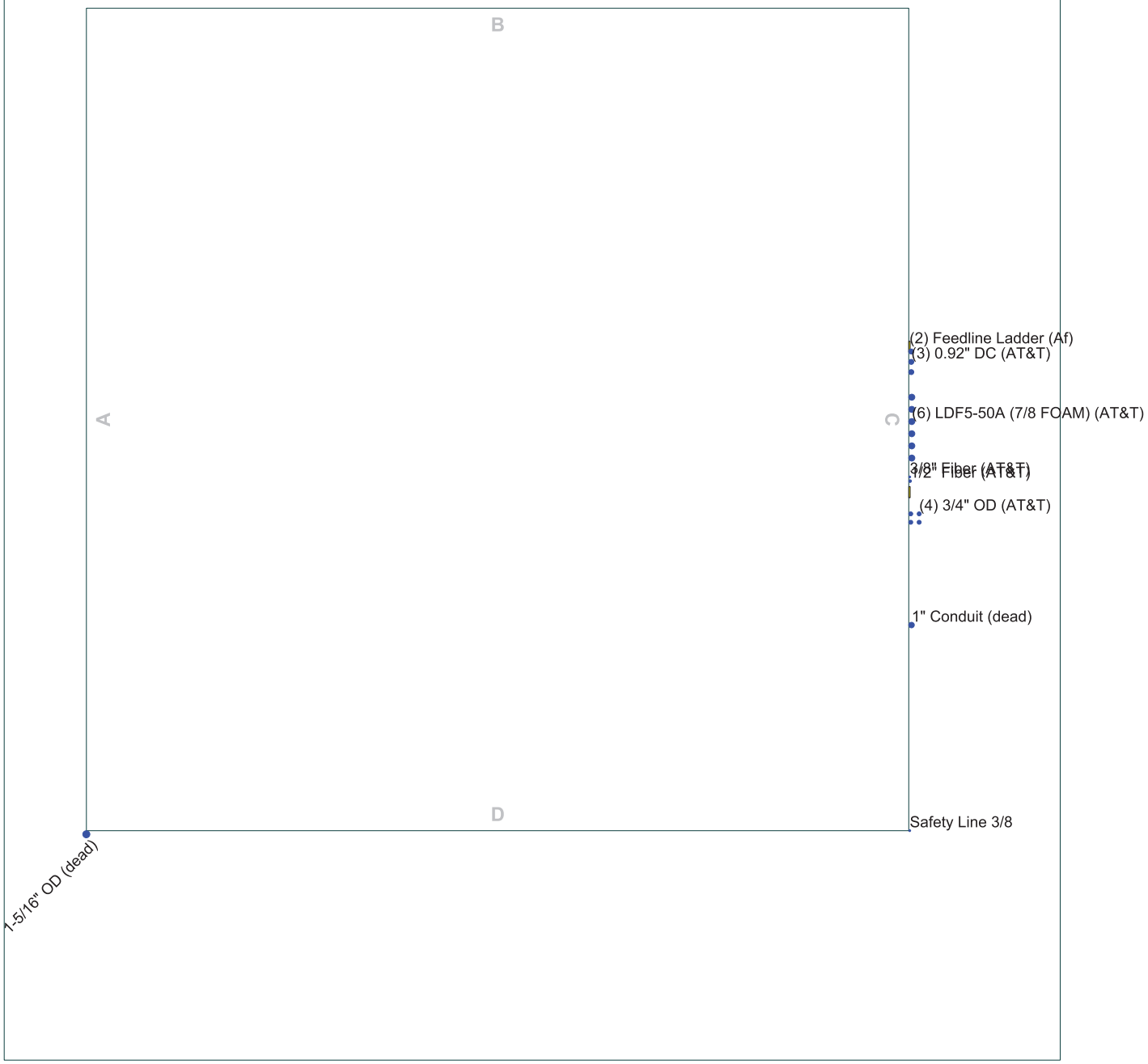
Structural Components, LLC
1870 West 64th Lane, Unit A
Denver, CO 80221
Phone: (866) 386-7622
FAX:

Job: **220619**			
Project: ***Portland (CT-1680)***			
Client: BST Management, LLC	Drawn by: treed		App'd:
Code: TIA-222-G	Date: 09/08/22		Scale: NTS
Path:			Dwg No. E-1

Feed Line Plan
6'8-17/32"

Round Flat App In Face App Out Face

Section @ 6'8-17/32"



Structural Components, LLC
1870 West 64th Lane, Unit A
Denver, CO 80221
Phone: (866) 386-7622
FAX:

Job: ***220619***			
Project: ***Portland (CT-1680)***			
Client: BST Management, LLC	Drawn by: treed	App'd:	
Code: TIA-222-G	Date: 09/07/22	Scale: NTS	
Path:		Dwg No. E-7	

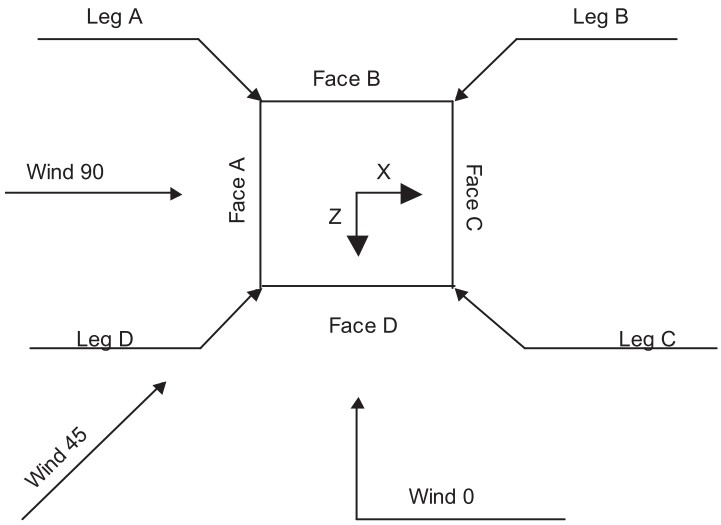
Tower Input Data

The main tower is a 4x free standing tower with an overall height of 90.33 ft above the ground line.
The base of the tower is set at an elevation of 0.00 ft above the ground line.
The face width of the tower is 5.04 ft at the top and 13.08 ft at the base.
This tower is designed using the TIA-222-G standard.
The following design criteria apply:

ASCE 7-10 Wind Data is used.
Basic wind speed of 125 mph.
Risk Category II.
Exposure Category C.
Topographic Category 1.
Crest Height 0.00 ft.
Nominal ice thickness of 0.7500 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 50 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 60 mph.
Pressures are calculated at each section.
Stress ratio used in tower member design is 1.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

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



Square Tower

Tower Section Geometry

Tower Section	Tower Elevation	Assembly Database	Description	Section Width	Number of Sections	Section Length
	ft			ft		ft
T1	90.33-78.06			5.04	1	12.27
T2	78.06-74.56			5.04	1	3.50
T3	74.56-72.31			5.04	1	2.25
T4	72.31-67.56			5.04	1	4.75
T5	67.56-65.44			5.04	1	2.13
T6	65.44-57.52			5.04	1	7.92
T7	57.52-50.27			6.01	1	7.25
T8	50.27-41.98			6.91	1	8.29
T9	41.98-34.19			7.93	1	7.79
T10	34.19-26.90			8.88	1	7.29
T11	26.90-20.10			9.78	1	6.79
T12	20.10-13.42			10.61	1	6.69
T13	13.42-6.71			11.44	1	6.71
T14	6.71-0.00			12.26	1	6.71

Tower Section Geometry *(cont'd)*

Tower Section	Tower Elevation	Diagonal Spacing	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset	Bottom Girt Offset
	ft	ft				in	in
T1	90.33-78.06	6.08	X Brace	No	Yes	1.2500	0.0000
T2	78.06-74.56	3.50	K Brace Up	No	Yes	0.0000	0.0000
T3	74.56-72.31	2.25	K Brace Down	No	Yes	0.0000	0.0000
T4	72.31-67.56	4.75	K Brace Up	No	Yes	0.0000	0.0000
T5	67.56-65.44	2.00	K Brace Down	No	Yes	0.0000	1.5000

Tower Section	Tower Elevation ft	Diagonal Spacing ft	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset in	Bottom Girt Offset in
T6	65.44-57.52	7.92	X Brace	No	No	0.0000	0.0000
T7	57.52-50.27	7.25	X Brace	No	No	0.0000	0.0000
T8	50.27-41.98	8.29	X Brace	No	No	0.0000	0.0000
T9	41.98-34.19	7.79	X Brace	No	No	0.0000	0.0000
T10	34.19-26.90	7.29	X Brace	No	No	0.0000	0.0000
T11	26.90-20.10	6.79	X Brace	No	No	0.0000	0.0000
T12	20.10-13.42	6.69	X Brace	No	No	0.0000	0.0000
T13	13.42-6.71	6.71	K1 Up	No	Yes	0.0000	0.0000
T14	6.71-0.00	6.71	K1 Down	No	Yes	0.0000	0.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 90.33-78.06	Equal Angle	L4x4x1/4	A36 (36 ksi)	Equal Angle	L2x2x1/4	A36 (36 ksi)
T2 78.06-74.56	Equal Angle	L4x4x3/8	A36 (36 ksi)	Single Angle	L2x2 1/2x3/16	A36 (36 ksi)
T3 74.56-72.31	Equal Angle	L4x4x3/8	A36 (36 ksi)	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T4 72.31-67.56	Equal Angle	L4x4x3/8	A36 (36 ksi)	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T5 67.56-65.44	Equal Angle	L4x4x3/8	A36 (36 ksi)	Equal Angle	L2x2x3/16	A36 (36 ksi)
T6 65.44-57.52	Equal Angle	L4x4x3/8	A36 (36 ksi)	Single Angle	L2x2 1/2x3/16	A36 (36 ksi)
T7 57.52-50.27	Equal Angle	L4x4x3/8	A36 (36 ksi)	Single Angle	L2x2 1/2x3/16	A36 (36 ksi)
T8 50.27-41.98	Equal Angle	L5x5x3/8	A36 (36 ksi)	Single Angle	L2x2 1/2x3/16	A36 (36 ksi)
T9 41.98-34.19	Equal Angle	L5x5x3/8	A36 (36 ksi)	Single Angle	L2x2 1/2x3/16	A36 (36 ksi)
T10 34.19-26.90	Equal Angle	L5x5x3/8	A36 (36 ksi)	Single Angle	L2x2 1/2x3/16	A36 (36 ksi)
T11 26.90-20.10	Equal Angle	L5x5x3/8	A36 (36 ksi)	Single Angle	L2x2 1/2x3/16	A36 (36 ksi)
T12 20.10-13.42	Equal Angle	L5x5x5/16	A36 (36 ksi)	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T13 13.42-6.71	Equal Angle	L5x5x5/16	A36 (36 ksi)	Equal Angle	L3x3x5/16	A36 (36 ksi)
T14 6.71-0.00	Equal Angle	L5x5x5/16	A36 (36 ksi)	Equal Angle	L3x3x5/16	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T1 90.33-78.06	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)	Solid Round		A36 (36 ksi)
T2 78.06-74.56	Single Angle	L4x3 1/2x1/4	A36	Solid Round		A36

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T4 72.31-67.56	Double Equal Angle	2L4x4x3/8	(36 ksi) A36 (36 ksi)	Solid Round		(36 ksi) A36 (36 ksi)
T5 67.56-65.44	Single Angle		A36 (36 ksi)	Equal Angle	L3x3x3/16	A36 (36 ksi)
T8 50.27-41.98	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)	Solid Round		A36 (36 ksi)
T12 20.10-13.42	Single Angle	L2x2 1/2x1/4	A36 (36 ksi)	Solid Round		A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
T2 78.06-74.56	None	Flat Bar		A36 (36 ksi)	Single Angle	L4x3 1/2x1/4	A36 (36 ksi)
T3 74.56-72.31	None	Flat Bar		A36 (36 ksi)	Single Angle	L4x3 1/2x1/4	A36 (36 ksi)
T4 72.31-67.56	None	Flat Bar		A36 (36 ksi)	Single Angle	L4x3 1/2x1/4	A36 (36 ksi)
T5 67.56-65.44	None	Flat Bar		A36 (36 ksi)	Single Angle	L4x3 1/2x1/4	A36 (36 ksi)
T13 13.42-6.71	None	Flat Bar		A36 (36 ksi)	Equal Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)
T14 6.71-0.00	None	Flat Bar		A36 (36 ksi)	Equal Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Secondary Horizontal Type	Secondary Horizontal Size	Secondary Horizontal Grade	Inner Bracing Type	Inner Bracing Size	Inner Bracing Grade
T2 78.06-74.56	Solid Round		A36 (36 ksi)	Single Angle	L2 1/2x2x3/16	A36 (36 ksi)
T3 74.56-72.31	Solid Round		A36 (36 ksi)	Single Angle	L2 1/2x2x3/16	A36 (36 ksi)
T5 67.56-65.44	Solid Round		A36 (36 ksi)	Single Angle	L2 1/2x2x3/16	A36 (36 ksi)
T6 65.44-57.52	Solid Round		A36 (36 ksi)	Equal Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)
T8 50.27-41.98	Solid Round		A36 (36 ksi)	Single Angle	L2 1/2x2x3/16	A36 (36 ksi)
T12 20.10-13.42	Solid Round		A36 (36 ksi)	Equal Angle	L2x2x3/16	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Redundant Bracing Grade		Redundant Type	Redundant Size	K Factor
T13	A36	Horizontal (1)	Equal Angle	L1 3/4x1 3/4x3/16	1
13.42-6.71	(36 ksi)	Diagonal (1)	Equal Angle	L1 3/4x1 3/4x3/16	1
T14 6.71-0.00	A36	Horizontal (1)	Equal Angle	L1 3/4x1 3/4x3/16	1
	(36 ksi)	Diagonal (1)	Equal Angle	L1 3/4x1 3/4x3/16	1

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
T1 90.33-78.06	0.00	0.2500	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T2 78.06-74.56	0.35	0.2500	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T3 74.56-72.31	0.35	0.2500	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T4 72.31-67.56	0.58	0.2500	A36 (36 ksi)	1	1	1	36.0000	Third-Pt	36.0000
T5 67.56-65.44	0.58	0.2500	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T6 65.44-57.52	0.00	0.3750	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T7 57.52-50.27	0.00	0.3750	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T8 50.27-41.98	0.00	0.3750	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T9 41.98-34.19	0.00	0.3750	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T10 34.19-26.90	0.00	0.3750	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T11 26.90-20.10	0.00	0.3750	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T12 20.10-13.42	0.00	0.3125	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T13 13.42-6.71	0.43	0.2500	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T14 6.71-0.00	0.43	0.2500	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X Y	K Brace Diags X Y	Single Diags X Y	Girts X Y	Horiz. X Y	Sec. Horiz. X Y	Inner Brace X Y
T1	No	No	1	1	1	1	1	1	1	1

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	Legs	K Factors[1] X Brace Diags X Y	K Brace Diags X Y	Single Diags X Y	Girts X Y	Horiz. X Y	Sec. Horiz. X Y	Inner Brace X Y
90.33-78.06				1	1	1	1	1	1	1
T2	No	No	1	1	1	1	1	1	1	1
78.06-74.56				1	1	1	1	1	1	1
T3	No	No	1	1	1	1	1	1	1	1
74.56-72.31				1	1	1	1	1	1	1
T4	No	No	1	1	1	1	1	1	1	1
72.31-67.56				1	1	1	1	1	1	1
T5	No	No	1	1	1	1	1	1	1	1
67.56-65.44				1	1	1	1	1	1	1
T6	No	No	1	1	1	1	1	1	1	1
65.44-57.52				1	1	1	1	1	1	1
T7	No	No	1	1	1	1	1	1	1	1
57.52-50.27				1	1	1	1	1	1	1
T8	No	No	1	1	1	1	1	1	1	1
50.27-41.98				1	1	1	1	1	1	1
T9	No	No	1	1	1	1	1	1	1	1
41.98-34.19				1	1	1	1	1	1	1
T10	No	No	1	1	1	1	1	1	1	1
34.19-26.90				1	1	1	1	1	1	1
T11	No	No	1	1	1	1	1	1	1	1
26.90-20.10				1	1	1	1	1	1	1
T12	No	No	1	1	1	1	1	1	1	1
20.10-13.42				1	1	1	1	1	1	1
T13	No	No	1	1	1	1	1	1	1	1
13.42-6.71				1	1	1	1	1	1	1
T14 6.71-0.00	No	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1

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

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T1 90.33-78.06	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T2 78.06-74.56	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T3 74.56-72.31	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T4 72.31-67.56	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T5 67.56-65.44	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T6 65.44-57.52	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T7 57.52-50.27	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T8 50.27-41.98	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T9 41.98-34.19	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T10 34.19-26.90	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T11 26.90-20.10	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T12 20.10-13.42	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

Tower Elevation ft	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T13 13.42-6.71	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T14 6.71-0.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

Tower Elevation ft	Redundant Horizontal		Redundant Diagonal		Redundant Sub-Diagonal		Redundant Sub-Horizontal		Redundant Vertical		Redundant Hip		Redundant Hip Diagonal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T1 90.33-78.06	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T2 78.06-74.56	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T3 74.56-72.31	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T4 72.31-67.56	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T5 67.56-65.44	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T6 65.44-57.52	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T7 57.52-50.27	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T8 50.27-41.98	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T9 41.98-34.19	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T10 34.19-26.90	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T11 26.90-20.10	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T12 20.10-13.42	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T13 13.42-6.71	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T14 6.71-0.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

Tower Section Geometry *(cont'd)*

Tower Elevation	Connection Offsets							
	Diagonal				K-Bracing			
	Vert. Top	Horiz. Top	Vert. Bot.	Horiz. Bot.	Vert. Top	Horiz. Top	Vert. Bot.	Horiz. Bot.
ft	in	in	in	in	in	in	in	in
T1 90.33-78.06	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
T2 78.06-74.56	4.2500	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
T3 74.56-72.31	0.0000	0.0000	3.2500	0.0000	0.0000	0.0000	0.0000	0.0000
T4 72.31-67.56	4.2500	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
T5 67.56-65.44	0.0000	0.0000	3.2500	0.0000	0.0000	0.0000	0.0000	0.0000
T6 65.44-57.52	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
T7 57.52-50.27	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
T8 50.27-41.98	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
T9 41.98-34.19	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
T10 34.19-26.90	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
T11 26.90-20.10	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Tower Elevation	Connection Offsets							
	Diagonal				K-Bracing			
	Vert. Top	Horiz. Top	Vert. Bot.	Horiz. Bot.	Vert. Top	Horiz. Top	Vert. Bot.	Horiz. Bot.
ft	in	in	in	in	in	in	in	in
T12 20.10-13.42	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
T13 13.42-6.71	0.0000	0.0000	5.0000	0.0000	0.0000	0.0000	0.0000	0.0000
T14 6.71-0.00	0.0000	0.0000	5.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T1 90.33-78.06	Sleeve DS	0.6250 A307	12	0.6240 A325N	1	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T2 78.06-74.56	Flange	0.7500 A307	0	0.5410 A325N	2	0.6250 A325N	2	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	3	0.6250 A325N	0
T3 74.56-72.31	Flange	0.7500 A307	0	0.5410 A325N	2	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	3	0.6250 A325N	0
T4 72.31-67.56	Flange	0.7500 A307	0	0.5410 A325N	2	0.6250 A325N	3	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	3	0.6250 A325N	0
T5 67.56-65.44	Flange	0.7500 A307	0	0.5410 A325N	2	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	3	0.6250 A325N	0
T6 65.44-57.52	Flange	0.7500 A307	0	0.5410 A325N	2	0.6250 A325N	0	0.6250 A325N	3	0.6250 A325N	0	0.6250 A325N	3	0.6250 A325N	0
T7 57.52-50.27	Flange	0.7500 A307	0	0.5410 A325N	2	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T8 50.27-41.98	Sleeve DS	0.6250 A307	12	0.5410 A325N	2	0.6250 A325N	3	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T9 41.98-34.19	Flange	0.7500 A307	0	0.5410 A325N	2	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T10 34.19-26.90	Flange	0.7500 A307	0	0.5410 A325N	2	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T11 26.90-20.10	Flange	0.7500 A307	0	0.5410 A325N	2	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T12 20.10-13.42	Sleeve DS	0.6250 A307	12	0.5410 A325N	2	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T13 13.42-6.71	Flange	0.7500 A307	0	0.5410 A325N	2	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	1	0.6250 A325N	0
T14 6.71-0.00	Flange	0.7500 A307	0	0.5410 A325N	2	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	1	0.6250 A325N	0

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Redundant Horizontal		Redundant Diagonal		Redundant Sub-Diagonal		Redundant Sub-Horizontal		Redundant Vertical		Redundant Hip		Redundant Hip Diagonal	
	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T1 90.33-78.06	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T2 78.06-74.56	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T3 74.56-72.31	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T4 72.31-67.56	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T5 67.56-65.44	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T6 65.44-57.52	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T7 57.52-50.27	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T8 50.27-41.98	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T9 41.98-34.19	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T10 34.19-26.90	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T11 26.90-20.10	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T12 20.10-13.42	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T13 13.42-6.71	0.5000 A325N	1	0.5000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T14 6.71-0.00	0.5000 A325N	1	0.5000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
Leg A AZ 0 Deg													
Feedline Ladder (Af)	C	No	No	Af (CaAa)	77.00 - 0.00	0.0000	0	2	2	24.0000	2.0000		4.20
LDF5-50A (7/8 FOAM) (AT&T)	C	No	No	Ar (CaAa)	76.70 - 0.00	0.0000	0.01	6	6	1.0900	1.0900		0.33
0.92" DC (AT&T)	C	No	No	Ar (CaAa)	76.70 - 0.00	0.0000	-0.07	3	3	0.9200	0.9200		0.42
3/8" Fiber (AT&T)	C	No	No	Ar (CaAa)	76.70 - 0.00	0.0000	0.07	1	1	0.3750	0.3750		0.10
1/2" Fiber (AT&T)	C	No	No	Ar (CaAa)	76.70 - 0.00	0.0000	0.075	1	1	0.5000	0.5000		0.10
3/4" OD (AT&T)	C	No	No	Ar (CaAa)	76.70 - 0.00	0.0000	0.12	4	2	0.7500	0.7500		0.40
1" Conduit (dead)	C	No	No	Ar (CaAa)	48.00 - 0.00	0.0000	0.25	1	1	1.0000	1.0000		0.75
5/16" OD (dead)	D	No	No	Ar (CaAa)	48.00 - 50.00	-4.0000	0.25	1	1	0.3125	0.3125		2.00

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
1-5/16" OD (dead)	D	No	No	Ar (CaAa)	54.00 - 0.00	0.0000	0.5	1	1	1.3125	1.3125		1.00
Safety Line 3/8	C	No	No	Ar (CaAa)	90.33 - 0.00	0.0000	0.5	1	1	0.3750	0.3750		0.22

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
T1	90.33-78.06	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.460	0.000	2.70
		D	0.000	0.000	0.000	0.000	0.00
T2	78.06-74.56	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	4.571	0.000	31.98
		D	0.000	0.000	0.000	0.000	0.00
T3	74.56-72.31	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	4.549	0.000	30.70
		D	0.000	0.000	0.000	0.000	0.00
T4	72.31-67.56	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	9.603	0.000	64.82
		D	0.000	0.000	0.000	0.000	0.00
T5	67.56-65.44	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	4.296	0.000	29.00
		D	0.000	0.000	0.000	0.000	0.00
T6	65.44-57.52	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	16.006	0.000	108.03
		D	0.000	0.000	0.000	0.000	0.00
T7	57.52-50.27	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	14.657	0.000	98.93
		D	0.000	0.000	0.489	0.000	3.73
T8	50.27-41.98	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	17.366	0.000	117.67
		D	0.000	0.000	1.151	0.000	12.29
T9	41.98-34.19	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	16.532	0.000	112.17
		D	0.000	0.000	1.023	0.000	7.79
T10	34.19-26.90	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	15.471	0.000	104.97
		D	0.000	0.000	0.957	0.000	7.29
T11	26.90-20.10	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	14.410	0.000	97.78
		D	0.000	0.000	0.891	0.000	6.79
T12	20.10-13.42	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
		C	0.000	0.000	14.190	0.000	96.28
		D	0.000	0.000	0.878	0.000	6.69
T13	13.42-6.71	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	14.231	0.000	96.56
		D	0.000	0.000	0.880	0.000	6.71
T14	6.71-0.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	14.231	0.000	96.56
		D	0.000	0.000	0.880	0.000	6.71

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
T1	90.33-78.06	A	1.647	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	4.503	0.000	52.64
		D		0.000	0.000	0.000	0.000	0.00
T2	78.06-74.56	A	1.631	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	14.767	0.000	187.20
		D		0.000	0.000	0.000	0.000	0.00
T3	74.56-72.31	A	1.625	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	14.581	0.000	183.33
		D		0.000	0.000	0.000	0.000	0.00
T4	72.31-67.56	A	1.617	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	30.708	0.000	384.95
		D		0.000	0.000	0.000	0.000	0.00
T5	67.56-65.44	A	1.609	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	13.703	0.000	171.26
		D		0.000	0.000	0.000	0.000	0.00
T6	65.44-57.52	A	1.596	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	50.854	0.000	632.58
		D		0.000	0.000	0.000	0.000	0.00
T7	57.52-50.27	A	1.575	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	46.267	0.000	571.01
		D		0.000	0.000	1.664	0.000	24.46
T8	50.27-41.98	A	1.551	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	54.983	0.000	675.76
		D		0.000	0.000	4.128	0.000	64.35
T9	41.98-34.19	A	1.522	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	52.039	0.000	633.49
		D		0.000	0.000	3.394	0.000	48.85
T10	34.19-26.90	A	1.488	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	48.167	0.000	578.82
		D		0.000	0.000	3.128	0.000	44.43
T11	26.90-20.10	A	1.450	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
		C		0.000	0.000	44.290	0.000	524.20
		D		0.000	0.000	2.861	0.000	40.03
T12	20.10-13.42	A	1.402	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	42.904	0.000	498.10
		D		0.000	0.000	2.753	0.000	37.78
T13	13.42-6.71	A	1.332	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	42.003	0.000	473.96
		D		0.000	0.000	2.667	0.000	35.57
T14	6.71-0.00	A	1.193	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	39.967	0.000	425.32
		D		0.000	0.000	2.481	0.000	31.21

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
T1	90.33-78.06	0.2046	0.2033	1.3555	1.3471
T2	78.06-74.56	1.8569	0.2632	4.5391	0.8574
T3	74.56-72.31	2.4485	0.2784	3.3645	0.4945
T4	72.31-67.56	2.8651	0.3187	7.0114	0.9449
T5	67.56-65.44	1.7781	0.2097	0.2047	0.0326
T6	65.44-57.52	3.8638	0.4161	10.6761	1.3529
T7	57.52-50.27	3.7795	0.8118	10.6323	2.1599
T8	50.27-41.98	3.5085	1.2695	10.3350	3.2736
T9	41.98-34.19	4.2789	1.5105	12.2114	3.7146
T10	34.19-26.90	4.5295	1.6109	12.8382	3.9332
T11	26.90-20.10	4.7204	1.6905	13.2689	4.0920
T12	20.10-13.42	4.1326	1.5189	12.0869	3.8140
T13	13.42-6.71	4.3953	1.6179	12.6641	3.9923
T14	6.71-0.00	4.1829	1.5590	11.5703	3.6924

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T1	14	Safety Line 3/8	78.06 - 90.33	0.6000	0.5523
T2	2	Feedline Ladder (Af)	74.56 - 77.00	0.6000	0.4134
T2	5	LDF5-50A (7/8 FOAM)	74.56 - 76.70	0.6000	0.4134
T2	6	0.92" DC	74.56 - 76.70	0.6000	0.4134
T2	7	3/8" Fiber	74.56 - 76.70	0.6000	0.4134
T2	8	1/2" Fiber	74.56 - 76.70	0.6000	0.4134
T2	10	3/4" OD	74.56 - 76.70	0.6000	0.4134
T2	14	Safety Line 3/8	74.56 - 78.06	0.6000	0.4134
T3	2	Feedline Ladder (Af)	72.31 - 74.56	0.5973	0.2515
T3	5	LDF5-50A (7/8 FOAM)	72.31 - 74.56	0.5973	0.2515
T3	6	0.92" DC	72.31 - 74.56	0.5973	0.2515
T3	7	3/8" Fiber	72.31 - 74.56	0.5973	0.2515

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T3	8	1/2" Fiber	72.31 - 74.56	0.5973	0.2515
T3	10	3/4" OD	72.31 - 74.56	0.5973	0.2515
T3	14	Safety Line 3/8	72.31 - 74.56	0.5973	0.2515
T4	2	Feedline Ladder (Af)	67.56 - 72.31	0.6000	0.4506
T4	5	LDF5-50A (7/8 FOAM)	67.56 - 72.31	0.6000	0.4506
T4	6	0.92" DC	67.56 - 72.31	0.6000	0.4506
T4	7	3/8" Fiber	67.56 - 72.31	0.6000	0.4506
T4	8	1/2" Fiber	67.56 - 72.31	0.6000	0.4506
T4	10	3/4" OD	67.56 - 72.31	0.6000	0.4506
T4	14	Safety Line 3/8	67.56 - 72.31	0.6000	0.4506
T5	2	Feedline Ladder (Af)	65.44 - 67.56	0.4832	0.0219
T5	5	LDF5-50A (7/8 FOAM)	65.44 - 67.56	0.4832	0.0219
T5	6	0.92" DC	65.44 - 67.56	0.4832	0.0219
T5	7	3/8" Fiber	65.44 - 67.56	0.4832	0.0219
T5	8	1/2" Fiber	65.44 - 67.56	0.4832	0.0219
T5	10	3/4" OD	65.44 - 67.56	0.4832	0.0219
T5	14	Safety Line 3/8	65.44 - 67.56	0.4832	0.0219
T6	2	Feedline Ladder (Af)	57.52 - 65.44	0.6000	0.6000
T6	5	LDF5-50A (7/8 FOAM)	57.52 - 65.44	0.6000	0.6000
T6	6	0.92" DC	57.52 - 65.44	0.6000	0.6000
T6	7	3/8" Fiber	57.52 - 65.44	0.6000	0.6000
T6	8	1/2" Fiber	57.52 - 65.44	0.6000	0.6000
T6	10	3/4" OD	57.52 - 65.44	0.6000	0.6000
T6	14	Safety Line 3/8	57.52 - 65.44	0.6000	0.6000
T7	2	Feedline Ladder (Af)	50.27 - 57.52	0.6000	0.6000
T7	5	LDF5-50A (7/8 FOAM)	50.27 - 57.52	0.6000	0.6000
T7	6	0.92" DC	50.27 - 57.52	0.6000	0.6000
T7	7	3/8" Fiber	50.27 - 57.52	0.6000	0.6000
T7	8	1/2" Fiber	50.27 - 57.52	0.6000	0.6000
T7	10	3/4" OD	50.27 - 57.52	0.6000	0.6000
T7	13	1-5/16" OD	50.27 - 54.00	0.6000	0.6000
T7	14	Safety Line 3/8	50.27 - 57.52	0.6000	0.6000
T8	2	Feedline Ladder (Af)	41.98 - 50.27	0.6000	0.6000
T8	5	LDF5-50A (7/8 FOAM)	41.98 - 50.27	0.6000	0.6000
T8	6	0.92" DC	41.98 - 50.27	0.6000	0.6000
T8	7	3/8" Fiber	41.98 - 50.27	0.6000	0.6000
T8	8	1/2" Fiber	41.98 - 50.27	0.6000	0.6000
T8	10	3/4" OD	41.98 - 50.27	0.6000	0.6000
T8	11	1" Conduit	41.98 - 48.00	0.6000	0.6000
T8	12	5/16" OD	48.00 - 50.00	0.6000	0.6000
T8	13	1-5/16" OD	41.98 - 50.27	0.6000	0.6000
T8	14	Safety Line 3/8	41.98 - 50.27	0.6000	0.6000
T9	2	Feedline Ladder (Af)	34.19 - 41.98	0.6000	0.6000
T9	5	LDF5-50A (7/8 FOAM)	34.19 - 41.98	0.6000	0.6000
T9	6	0.92" DC	34.19 - 41.98	0.6000	0.6000
T9	7	3/8" Fiber	34.19 - 41.98	0.6000	0.6000
T9	8	1/2" Fiber	34.19 - 41.98	0.6000	0.6000
T9	10	3/4" OD	34.19 - 41.98	0.6000	0.6000
T9	11	1" Conduit	34.19 - 41.98	0.6000	0.6000
T9	13	1-5/16" OD	34.19 - 41.98	0.6000	0.6000
T9	14	Safety Line 3/8	34.19 - 41.98	0.6000	0.6000
T10	2	Feedline Ladder (Af)	26.90 - 34.19	0.6000	0.6000
T10	5	LDF5-50A (7/8 FOAM)	26.90 - 34.19	0.6000	0.6000
T10	6	0.92" DC	26.90 - 34.19	0.6000	0.6000
T10	7	3/8" Fiber	26.90 - 34.19	0.6000	0.6000
T10	8	1/2" Fiber	26.90 - 34.19	0.6000	0.6000
T10	10	3/4" OD	26.90 - 34.19	0.6000	0.6000
T10	11	1" Conduit	26.90 - 34.19	0.6000	0.6000
T10	13	1-5/16" OD	26.90 - 34.19	0.6000	0.6000
T10	14	Safety Line 3/8	26.90 - 34.19	0.6000	0.6000
T11	2	Feedline Ladder (Af)	20.10 - 26.90	0.6000	0.6000
T11	5	LDF5-50A (7/8 FOAM)	20.10 - 26.90	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T11	6	0.92" DC	20.10 - 26.90	0.6000	0.6000
T11	7	3/8" Fiber	20.10 - 26.90	0.6000	0.6000
T11	8	1/2" Fiber	20.10 - 26.90	0.6000	0.6000
T11	10	3/4" OD	20.10 - 26.90	0.6000	0.6000
T11	11	1" Conduit	20.10 - 26.90	0.6000	0.6000
T11	13	1-5/16" OD	20.10 - 26.90	0.6000	0.6000
T11	14	Safety Line 3/8	20.10 - 26.90	0.6000	0.6000
T12	2	Feedline Ladder (Af)	13.42 - 20.10	0.6000	0.6000
T12	5	LDF5-50A (7/8 FOAM)	13.42 - 20.10	0.6000	0.6000
T12	6	0.92" DC	13.42 - 20.10	0.6000	0.6000
T12	7	3/8" Fiber	13.42 - 20.10	0.6000	0.6000
T12	8	1/2" Fiber	13.42 - 20.10	0.6000	0.6000
T12	10	3/4" OD	13.42 - 20.10	0.6000	0.6000
T12	11	1" Conduit	13.42 - 20.10	0.6000	0.6000
T12	13	1-5/16" OD	13.42 - 20.10	0.6000	0.6000
T12	14	Safety Line 3/8	13.42 - 20.10	0.6000	0.6000
T13	2	Feedline Ladder (Af)	6.71 - 13.42	0.6000	0.6000
T13	5	LDF5-50A (7/8 FOAM)	6.71 - 13.42	0.6000	0.6000
T13	6	0.92" DC	6.71 - 13.42	0.6000	0.6000
T13	7	3/8" Fiber	6.71 - 13.42	0.6000	0.6000
T13	8	1/2" Fiber	6.71 - 13.42	0.6000	0.6000
T13	10	3/4" OD	6.71 - 13.42	0.6000	0.6000
T13	11	1" Conduit	6.71 - 13.42	0.6000	0.6000
T13	13	1-5/16" OD	6.71 - 13.42	0.6000	0.6000
T13	14	Safety Line 3/8	6.71 - 13.42	0.6000	0.6000
T14	2	Feedline Ladder (Af)	0.00 - 6.71	0.6000	0.6000
T14	5	LDF5-50A (7/8 FOAM)	0.00 - 6.71	0.6000	0.6000
T14	6	0.92" DC	0.00 - 6.71	0.6000	0.6000
T14	7	3/8" Fiber	0.00 - 6.71	0.6000	0.6000
T14	8	1/2" Fiber	0.00 - 6.71	0.6000	0.6000
T14	10	3/4" OD	0.00 - 6.71	0.6000	0.6000
T14	11	1" Conduit	0.00 - 6.71	0.6000	0.6000
T14	13	1-5/16" OD	0.00 - 6.71	0.6000	0.6000
T14	14	Safety Line 3/8	0.00 - 6.71	0.6000	0.6000

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 lb
6' x 5/8" Lighting Rod	A	From Leg	0.00	0.0000	90.50	No Ice	0.38	0.38	10.00
			0.00			1/2" Ice	0.99	0.99	14.19
			3.00			1" Ice	1.62	1.62	22.26
***									
NNH4-65B-R6	A	From Leg	3.00	0.0000	90.00	No Ice	12.27	5.75	83.00
(Verizon)			0.00			1/2" Ice	12.77	6.21	155.14
			0.00			1" Ice	13.27	6.67	233.92
NNH4-65B-R6	B	From Leg	3.00	0.0000	90.00	No Ice	12.27	5.75	83.00
(Verizon)			0.00			1/2" Ice	12.77	6.21	155.14
			0.00			1" Ice	13.27	6.67	233.92
NNH4-65B-R6	C	From Leg	3.00	0.0000	90.00	No Ice	12.27	5.75	83.00

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
(Verizon)			0.00				1/2" Ice	12.77	6.21	155.14
			0.00				1" Ice	13.27	6.67	233.92
XXDWMM-12.5-65-8TCBR S	A	From Leg	3.00		0.0000	90.00	No Ice	1.53	0.52	23.14
(Verizon)			0.00				1/2" Ice	1.69	0.61	35.07
			0.00				1" Ice	1.85	0.72	49.34
XXDWMM-12.5-65-8TCBR S	B	From Leg	3.00		0.0000	90.00	No Ice	1.53	0.52	23.14
(Verizon)			0.00				1/2" Ice	1.69	0.61	35.07
			0.00				1" Ice	1.85	0.72	49.34
XXDWMM-12.5-65-8TCBR S	C	From Leg	3.00		0.0000	90.00	No Ice	1.53	0.52	23.14
(Verizon)			0.00				1/2" Ice	1.69	0.61	35.07
			0.00				1" Ice	1.85	0.72	49.34
MT6407-77A	A	From Leg	3.00		0.0000	90.00	No Ice	4.70	1.84	87.10
(Verizon)			0.00				1/2" Ice	4.99	2.07	116.39
			0.00				1" Ice	5.28	2.30	149.54
MT6407-77A	B	From Leg	3.00		0.0000	90.00	No Ice	4.70	1.84	87.10
(Verizon)			0.00				1/2" Ice	4.99	2.07	116.39
			0.00				1" Ice	5.28	2.30	149.54
MT6407-77A	C	From Leg	3.00		0.0000	90.00	No Ice	4.70	1.84	87.10
(Verizon)			0.00				1/2" Ice	4.99	2.07	116.39
			0.00				1" Ice	5.28	2.30	149.54
CBRS RT4401 RRH	A	From Leg	2.50		0.0000	90.00	No Ice	0.99	0.50	19.00
(Verizon)			0.00				1/2" Ice	1.12	0.60	26.77
			0.00				1" Ice	1.26	0.70	36.46
CBRS RT4401 RRH	B	From Leg	2.50		0.0000	90.00	No Ice	0.99	0.50	19.00
(Verizon)			0.00				1/2" Ice	1.12	0.60	26.77
			0.00				1" Ice	1.26	0.70	36.46
CBRS RT4401 RRH	C	From Leg	2.50		0.0000	90.00	No Ice	0.99	0.50	19.00
(Verizon)			0.00				1/2" Ice	1.12	0.60	26.77
			0.00				1" Ice	1.26	0.70	36.46
RF4439d-25A	A	From Leg	2.50		0.0000	90.00	No Ice	0.91	1.47	62.83
(Verizon)			0.00				1/2" Ice	1.03	1.62	77.78
			0.00				1" Ice	1.16	1.78	95.26
RF4439d-25A	B	From Leg	2.50		0.0000	90.00	No Ice	0.91	1.47	62.83
(Verizon)			0.00				1/2" Ice	1.03	1.62	77.78
			0.00				1" Ice	1.16	1.78	95.26
RF4439d-25A	C	From Leg	2.50		0.0000	90.00	No Ice	0.91	1.47	62.83
(Verizon)			0.00				1/2" Ice	1.03	1.62	77.78
			0.00				1" Ice	1.16	1.78	95.26
RF4440d-13A	A	From Leg	2.50		0.0000	90.00	No Ice	1.32	0.62	37.47
(Verizon)			0.00				1/2" Ice	1.46	0.73	48.50
			0.00				1" Ice	1.62	0.85	61.75
RF4440d-13A	B	From Leg	2.50		0.0000	90.00	No Ice	1.32	0.62	37.47
(Verizon)			0.00				1/2" Ice	1.46	0.73	48.50
			0.00				1" Ice	1.62	0.85	61.75
RF4440d-13A	C	From Leg	2.50		0.0000	90.00	No Ice	1.32	0.62	37.47
(Verizon)			0.00				1/2" Ice	1.46	0.73	48.50
			0.00				1" Ice	1.62	0.85	61.75
FE-16148-OVP-B12	A	From Leg	1.00		0.0000	90.00	No Ice	1.87	1.07	15.21
(Verizon)			0.00				1/2" Ice	2.04	1.20	31.51
			0.00				1" Ice	2.21	1.35	50.47
(3) 12' T-Arms	C	None			0.0000	90.00	No Ice	14.00	14.00	1000.00
(Verizon)							1/2" Ice	16.00	16.00	1100.00
							1" Ice	18.00	18.00	1200.00
***										
Ring Mount	C	None			0.0000	77.00	No Ice	6.87	6.87	850.00
							1/2" Ice	8.25	8.25	1020.00
							1" Ice	9.62	9.62	1190.00

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
***									
RRUS-32 (Full Frontal Shielding)	A	From Leg	1.50 -2.00	30.0000	76.70	No Ice 1/2" Ice	0.00 0.00	2.42 2.64	77.00 104.93
(AT&T)			0.50			1" Ice	0.00	2.86	136.47
RRUS-32 (Full Frontal Shielding)	B	From Leg	1.50 -2.00	60.0000	76.70	No Ice 1/2" Ice	0.00 0.00	2.42 2.64	77.00 104.93
(AT&T)			0.50			1" Ice	0.00	2.86	136.47
RRUS-32 (Full Frontal Shielding)	D	From Leg	1.50 -2.00	0.0000	76.70	No Ice 1/2" Ice	0.00 0.00	2.42 2.64	77.00 104.93
(AT&T)			0.50			1" Ice	0.00	2.86	136.47
RRUS-32 (AT&T)	A	From Leg	1.50 2.00	30.0000	76.70	No Ice 1/2" Ice	3.31 3.56	2.42 2.64	77.00 104.93
			2.00			1" Ice	3.81	2.86	136.47
RRUS-32 (AT&T)	B	From Leg	1.50 2.00	60.0000	76.70	No Ice 1/2" Ice	3.31 3.56	2.42 2.64	77.00 104.93
			2.00			1" Ice	3.81	2.86	136.47
RRUS-32 (AT&T)	D	From Leg	1.50 2.00	0.0000	76.70	No Ice 1/2" Ice	3.31 3.56	2.42 2.64	77.00 104.93
			2.00			1" Ice	3.81	2.86	136.47
RRUS-32 (Full Frontal Shielding)	A	From Leg	1.50 5.00	30.0000	76.70	No Ice 1/2" Ice	0.00 0.00	2.42 2.64	77.00 104.93
(AT&T)			0.50			1" Ice	0.00	2.86	136.47
RRUS-32 (Full Frontal Shielding)	B	From Leg	1.50 5.00	60.0000	76.70	No Ice 1/2" Ice	0.00 0.00	2.42 2.64	77.00 104.93
(AT&T)			0.50			1" Ice	0.00	2.86	136.47
RRUS-32 (Full Frontal Shielding)	D	From Leg	1.50 5.00	0.0000	76.70	No Ice 1/2" Ice	0.00 0.00	2.42 2.64	77.00 104.93
(AT&T)			0.50			1" Ice	0.00	2.86	136.47
DC6-48-60-18-8F (AT&T)	B	From Leg	2.00 2.00	60.0000	76.70	No Ice 1/2" Ice	2.20 2.40	2.20 2.40	20.00 42.56
			2.00			1" Ice	2.60	2.60	68.29
DC6-48-60-18-8F (AT&T)	B	From Leg	2.00 2.00	60.0000	76.70	No Ice 1/2" Ice	2.20 2.40	2.20 2.40	20.00 42.56
			0.50			1" Ice	2.60	2.60	68.29
TPA65R-BU6DA-K (AT&T)	A	From Leg	2.00 -5.00	30.0000	76.70	No Ice 1/2" Ice	12.71 13.21	5.62 6.07	69.00 142.96
			0.00			1" Ice	13.71	6.53	223.56
TPA65R-BU6DA-K (AT&T)	B	From Leg	2.00 -5.00	60.0000	76.70	No Ice 1/2" Ice	12.71 13.21	5.62 6.07	69.00 142.96
			0.00			1" Ice	13.71	6.53	223.56
TPA65R-BU6DA-K (AT&T)	D	From Leg	2.00 -5.00	0.0000	76.70	No Ice 1/2" Ice	12.71 13.21	5.62 6.07	69.00 142.96
			0.00			1" Ice	13.71	6.53	223.56
AIR6449 B77D (AT&T)	A	From Leg	2.00 -2.00	30.0000	76.70	No Ice 1/2" Ice	4.05 4.32	2.74 2.97	95.50 129.12
			0.00			1" Ice	4.59	3.20	166.64
AIR6449 B77D (AT&T)	B	From Leg	2.00 -2.00	60.0000	76.70	No Ice 1/2" Ice	4.05 4.32	2.74 2.97	95.50 129.12
			0.00			1" Ice	4.59	3.20	166.64
AIR6449 B77D (AT&T)	D	From Leg	2.00 -2.00	0.0000	76.70	No Ice 1/2" Ice	4.05 4.32	2.74 2.97	95.50 129.12
			0.00			1" Ice	4.59	3.20	166.64
AIR6419 B77G (AT&T)	A	From Leg	2.00 -2.00	30.0000	76.70	No Ice 1/2" Ice	4.17 4.44	2.02 2.23	55.40 84.59
			0.00			1" Ice	4.71	2.44	117.51
AIR6419 B77G (AT&T)	B	From Leg	2.00 -2.00	60.0000	76.70	No Ice 1/2" Ice	4.17 4.44	2.02 2.23	55.40 84.59

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 lb
			0.00			1" Ice	4.71	2.44	117.51
AIR6419 B77G	D	From Leg	2.00	0.0000	76.70	No Ice	4.17	2.02	55.40
(AT&T)			-2.00			1/2" Ice	4.44	2.23	84.59
			0.00			1" Ice	4.71	2.44	117.51
DMP65R-BU6DA	A	From Leg	2.00	30.0000	76.70	No Ice	12.71	5.62	80.00
(AT&T)			5.00			1/2" Ice	13.21	6.07	153.96
			0.00			1" Ice	13.71	6.53	234.56
DMP65R-BU6DA	B	From Leg	2.00	60.0000	76.70	No Ice	12.71	5.62	80.00
(AT&T)			5.00			1/2" Ice	13.21	6.07	153.96
			0.00			1" Ice	13.71	6.53	234.56
DMP65R-BU6DA	C	From Leg	2.00	0.0000	76.70	No Ice	12.71	5.62	80.00
(AT&T)			5.00			1/2" Ice	13.21	6.07	153.96
			0.00			1" Ice	13.71	6.53	234.56
4478 RRU	A	From Leg	1.50	30.0000	76.70	No Ice	1.64	0.91	60.00
(AT&T)			2.00			1/2" Ice	1.80	1.03	74.20
			0.00			1" Ice	1.97	1.17	90.89
4478 RRU	B	From Leg	1.50	60.0000	76.70	No Ice	1.64	0.91	60.00
(AT&T)			2.00			1/2" Ice	1.80	1.03	74.20
			0.00			1" Ice	1.97	1.17	90.89
4478 RRU	D	From Leg	1.50	0.0000	76.70	No Ice	1.64	0.91	60.00
(AT&T)			2.00			1/2" Ice	1.80	1.03	74.20
			0.00			1" Ice	1.97	1.17	90.89
4449 RRU	A	From Leg	1.50	30.0000	76.70	No Ice	1.64	1.02	74.00
(AT&T)			2.00			1/2" Ice	1.80	1.15	90.04
			0.00			1" Ice	1.97	1.28	108.70
4449 RRU	B	From Leg	1.50	60.0000	76.70	No Ice	1.64	1.02	74.00
(AT&T)			2.00			1/2" Ice	1.80	1.15	90.04
			0.00			1" Ice	1.97	1.28	108.70
4449 RRU	D	From Leg	1.50	0.0000	76.70	No Ice	1.64	1.02	74.00
(AT&T)			2.00			1/2" Ice	1.80	1.15	90.04
			0.00			1" Ice	1.97	1.28	108.70
DC9-48-60-24-8C-EV	A	From Leg	2.00	30.0000	76.70	No Ice	2.74	4.78	16.00
(AT&T)			0.00			1/2" Ice	2.96	5.06	53.06
			0.00			1" Ice	3.20	5.35	94.20
(3) 12' Sector Frames	C	None		0.0000	76.70	No Ice	25.00	25.00	800.00
(AT&T)						1/2" Ice	37.00	37.00	1100.00
						1" Ice	47.00	47.00	1500.00
***									
Ring Mount	C	None		0.0000	75.00	No Ice	6.87	6.87	850.00
						1/2" Ice	8.25	8.25	1020.00
						1" Ice	9.62	9.62	1190.00
***									
2-3/8" x 8' Pipe Mount	A	From Leg	0.00	0.0000	73.00	No Ice	1.90	1.90	30.00
			0.00			1/2" Ice	2.73	2.73	44.37
			0.00			1" Ice	3.40	3.40	64.01
***									
Ring Mount	C	None		0.0000	67.70	No Ice	6.87	6.87	850.00
						1/2" Ice	8.25	8.25	1020.00
						1" Ice	9.62	9.62	1190.00

Force Totals

Load Case	Vertical Forces lb	Sum of Forces X lb	Sum of Forces Z lb	Sum of Overturning Moments, M_x lb-ft	Sum of Overturning Moments, M_z lb-ft	Sum of Torques lb-ft
Leg Weight	3728.23					
Bracing Weight	5215.45					
Total Member Self-Weight	8943.69			-3391.25	-4229.62	
Gusset Weight	111.27					
Total Weight	17594.64			-3391.25	-4229.62	
Wind 0 deg - No Ice		-354.19	-19534.04	-1089686.06	25225.38	3150.88
Wind 45 deg - No Ice		16017.64	-15982.94	-858182.69	-861682.34	5187.00
Wind 90 deg - No Ice		21354.96	354.19	26063.76	-1166657.90	-3118.17
Wind 135 deg - No Ice		16518.54	16483.85	893055.86	-903338.02	-9596.76
Wind 180 deg - No Ice		354.19	19534.04	1082903.56	-33684.63	-3150.88
Wind 225 deg - No Ice		-16017.64	15982.94	851400.19	853223.10	-5187.00
Wind 270 deg - No Ice		-21354.96	-354.19	-32846.26	1158198.65	3118.17
Wind 315 deg - No Ice		-16518.54	-16483.85	-899838.36	894878.77	9596.76
Member Ice	18641.32					
Gusset Ice	182.03					
Total Weight Ice	50895.90			-6722.32	-23624.78	
Wind 0 deg - Ice		-58.91	-4750.06	-268156.08	-18715.92	2444.68
Wind 45 deg - Ice		3912.08	-3906.05	-212613.97	-229978.81	2730.09
Wind 90 deg - Ice		5294.55	58.91	-1813.46	-306403.82	-94.61
Wind 135 deg - Ice		3995.40	3989.37	206111.50	-236920.99	-2842.24
Wind 180 deg - Ice		58.91	4750.06	254711.44	-28533.64	-2444.68
Wind 225 deg - Ice		-3912.08	3906.05	199169.32	182729.25	-2730.09
Wind 270 deg - Ice		-5294.55	-58.91	-11631.18	259154.26	94.61
Wind 315 deg - Ice		-3995.40	-3989.37	-219556.14	189671.43	2842.24
Total Weight	17594.64			-3391.25	-4229.62	
Wind 0 deg - Service		-81.61	-4500.64	-254213.60	6947.20	725.96
Wind 45 deg - Service		3690.46	-3682.47	-200875.22	-197396.34	1195.08
Wind 90 deg - Service		4920.18	81.61	2855.16	-267662.71	-718.43
Wind 135 deg - Service		3805.87	3797.88	202610.14	-206993.81	-2211.09
Wind 180 deg - Service		81.61	4500.64	246351.05	-6625.67	-725.96
Wind 225 deg - Service		-3690.46	3682.47	193012.67	197717.87	-1195.08
Wind 270 deg - Service		-4920.18	-81.61	-10717.71	267984.24	718.43
Wind 315 deg - Service		-3805.87	-3797.88	-210472.69	207315.34	2211.09

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.0 Wind 0 deg - No Ice
3	0.9 Dead+1.0 Wind 0 deg - No Ice
4	1.2 Dead+1.0 Wind 45 deg - No Ice
5	0.9 Dead+1.0 Wind 45 deg - No Ice
6	1.2 Dead+1.0 Wind 90 deg - No Ice
7	0.9 Dead+1.0 Wind 90 deg - No Ice
8	1.2 Dead+1.0 Wind 135 deg - No Ice
9	0.9 Dead+1.0 Wind 135 deg - No Ice
10	1.2 Dead+1.0 Wind 180 deg - No Ice
11	0.9 Dead+1.0 Wind 180 deg - No Ice
12	1.2 Dead+1.0 Wind 225 deg - No Ice
13	0.9 Dead+1.0 Wind 225 deg - No Ice
14	1.2 Dead+1.0 Wind 270 deg - No Ice
15	0.9 Dead+1.0 Wind 270 deg - No Ice
16	1.2 Dead+1.0 Wind 315 deg - No Ice
17	0.9 Dead+1.0 Wind 315 deg - No Ice

Comb. No.	Description
18	1.2 Dead+1.0 Ice+1.0 Temp
19	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
20	1.2 Dead+1.0 Wind 45 deg+1.0 Ice+1.0 Temp
21	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
22	1.2 Dead+1.0 Wind 135 deg+1.0 Ice+1.0 Temp
23	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
24	1.2 Dead+1.0 Wind 225 deg+1.0 Ice+1.0 Temp
25	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
26	1.2 Dead+1.0 Wind 315 deg+1.0 Ice+1.0 Temp
27	Dead+Wind 0 deg - Service
28	Dead+Wind 45 deg - Service
29	Dead+Wind 90 deg - Service
30	Dead+Wind 135 deg - Service
31	Dead+Wind 180 deg - Service
32	Dead+Wind 225 deg - Service
33	Dead+Wind 270 deg - Service
34	Dead+Wind 315 deg - Service

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Leg D	Max. Vert	12	70414.31	8907.61	-8709.44
	Max. H_x	12	70414.31	8907.61	-8709.44
	Max. H_z	5	-61788.75	-7770.22	7579.59
	Min. Vert	5	-61788.75	-7770.22	7579.59
	Min. H_x	5	-61788.75	-7770.22	7579.59
	Min. H_z	12	70414.31	8907.61	-8709.44
Leg C	Max. Vert	8	73986.22	-8954.64	-9370.66
	Max. H_x	17	-64681.74	7817.24	8154.65
	Max. H_z	17	-64681.74	7817.24	8154.65
	Min. Vert	17	-64681.74	7817.24	8154.65
	Min. H_x	8	73986.22	-8954.64	-9370.66
	Min. H_z	8	73986.22	-8954.64	-9370.66
Leg B	Max. Vert	4	71113.31	-8750.00	8956.89
	Max. H_x	13	-61264.50	7541.54	-7740.89
	Max. H_z	4	71113.31	-8750.00	8956.89
	Min. Vert	13	-61264.50	7541.54	-7740.89
	Min. H_x	4	71113.31	-8750.00	8956.89
	Min. H_z	13	-61264.50	7541.54	-7740.89
Leg A	Max. Vert	16	73909.32	9361.98	8954.69
	Max. H_x	16	73909.32	9361.98	8954.69
	Max. H_z	16	73909.32	9361.98	8954.69
	Min. Vert	9	-64739.42	-8153.53	-7824.84
	Min. H_x	9	-64739.42	-8153.53	-7824.84
	Min. H_z	9	-64739.42	-8153.53	-7824.84

Tower Mast Reaction Summary

Load Combination	Vertical lb	$Shear_x$ lb	$Shear_z$ lb	Overturning Moment, M_x lb-ft	Overturning Moment, M_z lb-ft	Torque lb-ft
Dead Only	17594.64	0.00	0.00	-3391.23	-4229.60	0.00
1.2 Dead+1.0 Wind 0 deg - No	21113.57	-354.19	-19534.04	-1090858.84	24379.48	3150.88

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	lb	lb	lb	lb-ft	lb-ft	lb-ft
Ice						
0.9 Dead+1.0 Wind 0 deg - No Ice	15835.18	-354.19	-19534.04	-1089841.48	25648.36	3150.88
1.2 Dead+1.0 Wind 45 deg - No Ice	21113.57	16017.64	-15982.94	-859484.59	-863151.93	5187.00
0.9 Dead+1.0 Wind 45 deg - No Ice	15835.18	16017.64	-15982.94	-858467.22	-861883.05	5187.00
1.2 Dead+1.0 Wind 90 deg - No Ice	21113.57	21354.96	354.19	25385.54	-1168298.37	-3118.17
0.9 Dead+1.0 Wind 90 deg - No Ice	15835.18	21354.96	354.19	26402.90	-1167029.49	-3118.17
1.2 Dead+1.0 Wind 135 deg - No Ice	21113.57	16518.55	16483.85	893001.32	-904807.60	-9596.65
0.9 Dead+1.0 Wind 135 deg - No Ice	15835.18	16518.55	16483.85	894018.69	-903538.72	-9596.65
1.2 Dead+1.0 Wind 180 deg - No Ice	21113.57	354.19	19534.04	1082719.90	-34530.53	-3150.88
0.9 Dead+1.0 Wind 180 deg - No Ice	15835.18	354.19	19534.04	1083737.27	-33261.65	-3150.88
1.2 Dead+1.0 Wind 225 deg - No Ice	21113.57	-16017.64	15982.94	851345.65	853000.88	-5187.00
0.9 Dead+1.0 Wind 225 deg - No Ice	15835.18	-16017.64	15982.94	852363.02	854269.76	-5187.00
1.2 Dead+1.0 Wind 270 deg - No Ice	21113.57	-21354.96	-354.19	-33524.48	1158147.32	3118.17
0.9 Dead+1.0 Wind 270 deg - No Ice	15835.18	-21354.96	-354.19	-32507.11	1159416.20	3118.17
1.2 Dead+1.0 Wind 315 deg - No Ice	21113.57	-16518.55	-16483.85	-901140.26	894656.55	9596.65
0.9 Dead+1.0 Wind 315 deg - No Ice	15835.18	-16518.55	-16483.85	-900122.89	895925.43	9596.65
1.2 Dead+1.0 Ice+1.0 Temp	54142.66	0.00	0.00	-7400.54	-24470.68	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	54142.66	-58.91	-4750.07	-268995.96	-19561.82	2444.68
1.2 Dead+1.0 Wind 45 deg+1.0 Ice+1.0 Temp	54142.66	3912.08	-3906.06	-213462.70	-230995.22	2730.09
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	54142.66	5294.55	58.91	-2491.68	-307501.07	-94.61
1.2 Dead+1.0 Wind 135 deg+1.0 Ice+1.0 Temp	54142.66	3995.40	3989.37	205603.79	-237937.40	-2842.24
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	54142.66	58.91	4750.07	254194.88	-29379.54	-2444.68
1.2 Dead+1.0 Wind 225 deg+1.0 Ice+1.0 Temp	54142.66	-3912.08	3906.06	198661.62	182053.87	-2730.09
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	54142.66	-5294.55	-58.91	-12309.40	258559.72	94.61
1.2 Dead+1.0 Wind 315 deg+1.0 Ice+1.0 Temp	54142.66	-3995.40	-3989.37	-220404.88	188996.04	2842.24
Dead+Wind 0 deg - Service	17594.64	-81.61	-4500.64	-253787.50	2556.83	725.96
Dead+Wind 45 deg - Service	17594.64	3690.46	-3682.47	-200478.87	-201930.41	1195.08
Dead+Wind 90 deg - Service	17594.64	4920.18	81.61	3395.21	-272236.15	-718.43
Dead+Wind 135 deg - Service	17594.64	3805.87	3797.88	203293.88	-211527.87	-2211.07
Dead+Wind 180 deg - Service	17594.64	81.61	4500.64	247005.05	-11016.04	-725.96
Dead+Wind 225 deg - Service	17594.64	-3690.46	3682.47	193696.42	193471.20	-1195.08
Dead+Wind 270 deg - Service	17594.64	-4920.18	-81.61	-10177.66	263776.94	718.43
Dead+Wind 315 deg - Service	17594.64	-3805.87	-3797.88	-210076.34	203068.67	2211.07

Solution Summary

Load Comb.	Sum of Applied Forces PX lb	PY lb	PZ lb	Sum of Reactions PX lb	PY lb	PZ lb	% Error
1	0.00	-17594.64	0.00	-0.00	17594.64	-0.00	0.000%
2	-354.19	-21113.57	-19534.04	354.19	21113.57	19534.04	0.000%
3	-354.19	-15835.18	-19534.04	354.19	15835.18	19534.04	0.000%
4	16017.64	-21113.57	-15982.94	-16017.64	21113.57	15982.94	0.000%
5	16017.64	-15835.18	-15982.94	-16017.64	15835.18	15982.94	0.000%
6	21354.96	-21113.57	354.19	-21354.96	21113.57	-354.19	0.000%
7	21354.96	-15835.18	354.19	-21354.96	15835.18	-354.19	0.000%
8	16518.54	-21113.57	16483.85	-16518.55	21113.57	-16483.85	0.000%
9	16518.54	-15835.18	16483.85	-16518.55	15835.18	-16483.85	0.000%
10	354.19	-21113.57	19534.04	-354.19	21113.57	-19534.04	0.000%
11	354.19	-15835.18	19534.04	-354.19	15835.18	-19534.04	0.000%
12	-16017.64	-21113.57	15982.94	16017.64	21113.57	-15982.94	0.000%
13	-16017.64	-15835.18	15982.94	16017.64	15835.18	-15982.94	0.000%
14	-21354.96	-21113.57	-354.19	21354.96	21113.57	354.19	0.000%
15	-21354.96	-15835.18	-354.19	21354.96	15835.18	354.19	0.000%
16	-16518.54	-21113.57	-16483.85	16518.55	21113.57	16483.85	0.000%
17	-16518.54	-15835.18	-16483.85	16518.55	15835.18	16483.85	0.000%
18	0.00	-54142.66	0.00	-0.00	54142.66	-0.00	0.000%
19	-58.91	-54142.66	-4750.06	58.91	54142.66	4750.07	0.000%
20	3912.08	-54142.66	-3906.05	-3912.08	54142.66	3906.06	0.000%
21	5294.55	-54142.66	58.91	-5294.55	54142.66	-58.91	0.000%
22	3995.40	-54142.66	3989.37	-3995.40	54142.66	-3989.37	0.000%
23	58.91	-54142.66	4750.06	-58.91	54142.66	-4750.07	0.000%
24	-3912.08	-54142.66	3906.05	3912.08	54142.66	-3906.06	0.000%
25	-5294.55	-54142.66	-58.91	5294.55	54142.66	58.91	0.000%
26	-3995.40	-54142.66	-3989.37	3995.40	54142.66	3989.37	0.000%
27	-81.61	-17594.64	-4500.64	81.61	17594.64	4500.64	0.000%
28	3690.46	-17594.64	-3682.47	-3690.46	17594.64	3682.47	0.000%
29	4920.18	-17594.64	81.61	-4920.18	17594.64	-81.61	0.000%
30	3805.87	-17594.64	3797.88	-3805.87	17594.64	-3797.88	0.000%
31	81.61	-17594.64	4500.64	-81.61	17594.64	-4500.64	0.000%
32	-3690.46	-17594.64	3682.47	3690.46	17594.64	-3682.47	0.000%
33	-4920.18	-17594.64	-81.61	4920.18	17594.64	81.61	0.000%
34	-3805.87	-17594.64	-3797.88	3805.87	17594.64	3797.88	0.000%

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	90.333 - 78.063	0.878	34	0.0745	0.0064
T2	78.063 - 74.563	0.685	34	0.0726	0.0057
T3	74.563 - 72.313	0.630	34	0.0713	0.0054
T4	72.313 - 67.563	0.595	34	0.0704	0.0052
T5	67.563 - 65.438	0.518	34	0.0666	0.0044
T6	65.438 - 57.521	0.487	34	0.0649	0.0042
T7	57.521 - 50.271	0.380	34	0.0564	0.0031
T8	50.271 - 41.979	0.296	34	0.0488	0.0025
T9	41.979 - 34.187	0.212	34	0.0411	0.0018
T10	34.187 - 26.895	0.145	34	0.0343	0.0013
T11	26.895 - 20.103	0.093	34	0.0273	0.0009
T12	20.103 - 13.415	0.054	30	0.0214	0.0006
T13	13.415 - 6.7075	0.025	30	0.0130	0.0003
T14	6.7075 - 0	0.003	32	0.0068	0.0002

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
90.50	6' x 5/8" Lighting Rod	34	0.878	0.0745	0.0064	334539
90.00	NNH4-65B-R6	34	0.872	0.0745	0.0064	334539
77.00	Ring Mount	34	0.668	0.0722	0.0056	283719
76.70	RRUS-32 (Full Frontal Shielding)	34	0.664	0.0721	0.0056	270095
75.00	Ring Mount	34	0.637	0.0715	0.0054	554365
73.00	2-3/8" x 8' Pipe Mount	34	0.606	0.0707	0.0053	148906
67.70	Ring Mount	34	0.521	0.0667	0.0045	35122

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	90.333 - 78.063	3.770	16	0.3169	0.0279
T2	78.063 - 74.563	2.952	16	0.3090	0.0248
T3	74.563 - 72.313	2.716	16	0.3038	0.0234
T4	72.313 - 67.563	2.566	16	0.3003	0.0225
T5	67.563 - 65.438	2.240	16	0.2849	0.0193
T6	65.438 - 57.521	2.106	16	0.2778	0.0180
T7	57.521 - 50.271	1.647	16	0.2425	0.0136
T8	50.271 - 41.979	1.281	16	0.2106	0.0107
T9	41.979 - 34.187	0.919	16	0.1775	0.0079
T10	34.187 - 26.895	0.630	16	0.1484	0.0058
T11	26.895 - 20.103	0.405	16	0.1183	0.0040
T12	20.103 - 13.415	0.233	8	0.0930	0.0026
T13	13.415 - 6.7075	0.109	8	0.0565	0.0013
T14	6.7075 - 0	0.013	16	0.0297	0.0007

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
90.50	6' x 5/8" Lighting Rod	16	3.770	0.3169	0.0279	88427
90.00	NNH4-65B-R6	16	3.748	0.3168	0.0278	88427
77.00	Ring Mount	16	2.880	0.3075	0.0244	97323
76.70	RRUS-32 (Full Frontal Shielding)	16	2.860	0.3070	0.0242	91070
75.00	Ring Mount	16	2.745	0.3044	0.0235	187196
73.00	2-3/8" x 8' Pipe Mount	16	2.612	0.3016	0.0228	36888
67.70	Ring Mount	16	2.249	0.2853	0.0193	8530

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt lb	Allowable Load per Bolt lb	Ratio Load / Allowable	Allowable Ratio	Criteria
T1	90.333	Leg	A307	0.6250	12	682.70	12425.20	0.055 ✔	1	Bolt DS
		Diagonal	A325N	0.6240	1	1307.89	9492.94	0.138 ✔	1	Member Block Shear
		Top Girt	A325N	0.6250	1	80.78	8482.50	0.010 ✔	1	Member Bearing
T2	78.063	Diagonal	A325N	0.5410	2	1364.37	5577.24	0.245 ✔	1	Member Block Shear
		Top Girt	A325N	0.6250	2	316.69	11010.90	0.029 ✔	1	Member Block Shear
T3	74.563	Diagonal	A325N	0.5410	2	1641.53	7208.49	0.228 ✔	1	Member Block Shear
		Horizontal	A325N	0.6250	3	309.23	10059.40	0.031 ✔	1	Member Block Shear
T4	72.313	Diagonal	A325N	0.5410	2	2571.31	7208.49	0.357 ✔	1	Member Block Shear
		Top Girt	A325N	0.6250	3	559.38	15080.00	0.037 ✔	1	Gusset Bearing
T5	67.563	Diagonal	A325N	0.5410	2	2007.27	5577.24	0.360 ✔	1	Member Block Shear
		Horizontal	A325N	0.6250	3	164.58	10059.40	0.016 ✔	1	Member Block Shear
T6	65.438	Diagonal	A325N	0.5410	2	1634.46	6188.96	0.264 ✔	1	Member Block Shear
T7	57.521	Diagonal	A325N	0.5410	2	1501.25	6188.96	0.243 ✔	1	Member Block Shear
T8	50.271	Leg	A307	0.6250	12	6925.24	12425.20	0.557 ✔	1	Bolt DS
		Diagonal	A325N	0.5410	2	1415.25	6188.96	0.229 ✔	1	Member Block Shear
		Top Girt	A325N	0.6250	3	208.15	6728.91	0.031 ✔	1	Member Block Shear
T9	41.979	Diagonal	A325N	0.5410	2	1462.33	6188.96	0.236 ✔	1	Member Block Shear
T10	34.187	Diagonal	A325N	0.5410	2	1314.76	6188.96	0.212 ✔	1	Member Block Shear
T11	26.895	Diagonal	A325N	0.5410	2	1388.56	6188.96	0.224 ✔	1	Member Block Shear
T12	20.103	Leg	A307	0.6250	12	10991.70	12425.20	0.885 ✔	1	Bolt DS
		Diagonal	A325N	0.5410	2	2463.47	7208.49	0.342 ✔	1	Member Block Shear
		Top Girt	A325N	0.6250	1	1963.23	9487.50	0.207 ✔	1	Member Block Shear
T13	13.415	Diagonal	A325N	0.5410	2	3530.85	9309.78	0.379 ✔	1	Bolt Shear
		Redund Horz 1 Bracing	A325N	0.5000	1	955.23	5709.38	0.167 ✔	1	Member Block Shear
		Redund Diag 1 Bracing	A325N	0.5000	1	736.82	5709.38	0.129 ✔	1	Member Block Shear
T14	6.7075	Diagonal	A325N	0.5410	2	3660.96	9309.78	0.393 ✔	1	Bolt Shear
		Horizontal	A325N	0.6250	1	963.21	6096.09	0.158 ✔	1	Member Block Shear
		Redund Horz 1 Bracing	A325N	0.5000	1	963.21	5709.38	0.169 ✔	1	Member Block Shear
		Redund Diag 1 Bracing	A325N	0.5000	1	693.25	5709.38	0.121 ✔	1	Member Block Shear

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	90.333 - 78.063	L4x4x1/4	12.27	6.08	91.8 K=1.00	1.9400	-4096.19	39552.00	0.104 [1] ✔
T2	78.063 - 74.563	L4x4x3/8	3.50	3.50	53.3 K=1.00	2.8600	-9917.36	79792.20	0.124 [1] ✔
T3	74.563 - 72.313	L4x4x3/8	2.25	2.25	34.3 K=1.00	2.8600	-9983.48	87110.20	0.115 [1] ✔
T4	72.313 - 67.563	L4x4x3/8	4.75	4.75	72.3 K=1.00	2.8600	-19225.00	70353.00	0.273 [1] ✔
T5	67.563 - 65.438	L4x4x3/8	2.13	0.13	1.9 K=1.00	2.8600	-25033.50	92646.30	0.270 [1] ✔
T6	65.438 - 57.521	L4x4x3/8	7.95	7.95	121.0 K=1.00	2.8600	-28240.70	42861.90	0.659 [1] ✔
T7	57.521 - 50.271	L4x4x3/8	7.28	7.28	110.8 K=1.00	2.8600	-36260.90	48541.60	0.747 [1] ✔
T8	50.271 - 41.979	L5x5x3/8	8.32	8.32	100.9 K=1.00	3.6100	-41551.40	68445.00	0.607 [1] ✔
T9	41.979 - 34.187	L5x5x3/8	7.82	7.82	94.8 K=1.00	3.6100	-48700.20	72871.90	0.668 [1] ✔
T10	34.187 - 26.895	L5x5x3/8	7.32	7.32	88.7 K=1.00	3.6100	-53732.30	77283.40	0.695 [1] ✔
T11	26.895 - 20.103	L5x5x3/8	6.82	6.82	82.6 K=1.00	3.6100	-58348.40	81643.20	0.715 [1] ✔
T12	20.103 - 13.415	L5x5x5/16	6.71	6.71	81.0 K=1.00	3.0300	-65950.50	67911.60	0.971 [1] ✔
T13	13.415 - 6.7075	L5x5x5/16	6.73	3.37	40.6 K=1.00	3.0300	-63562.70	87206.50	0.729 [1] ✔
T14	6.7075 - 0	L5x5x5/16	6.73	3.37	40.6 K=1.00	3.0300	-64093.80	87206.50	0.735 [1] ✔

[1] $P_u / \phi P_n$ controls

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	90.333 - 78.063	L2x2x1/4	7.90	3.69	113.2 K=1.00	0.9380	-1329.05	15476.20	0.086 [1] ✔
T2	78.063 - 74.563	L2x2 1/2x3/16	4.31	4.03	113.2 K=1.00	0.8090	-3165.44	13350.80	0.237 [1] ✔
T3	74.563 - 72.313	L2 1/2x2 1/2x3/16	3.38	3.16	76.5 K=1.00	0.9020	-3891.73	21476.40	0.181 [1] ✔
T4	72.313 -	L2 1/2x2 1/2x3/16	5.38	5.02	121.7	0.9020	-5704.94	13393.30	0.426 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
	67.563				K=1.00				✔
T5	67.563 - 65.438	L2x2x3/16	3.22	3.01	91.5 K=1.00	0.7150	-4833.28	14904.90	0.324 [1] ✔
T6	65.438 - 57.521	L2x2 1/2x3/16	9.67	4.97	139.7 K=1.00	0.8090	-3525.09	9371.28	0.376 [1] ✔
T7	57.521 - 50.271	L2x2 1/2x3/16	9.72	4.95	139.0 K=1.00	0.8090	-2876.06	9461.43	0.304 [1] ✔
T8	50.271 - 41.979	L2x2 1/2x3/16	11.14	5.64	158.5 K=1.00	0.8090	-3012.83	7278.76	0.414 [1] ✔
T9	41.979 - 34.187	L2x2 1/2x3/16	11.47	5.78	162.4 K=1.00	0.8090	-2841.34	6931.00	0.410 [1] ✔
T10	34.187 - 26.895	L2x2 1/2x3/16	11.85	5.95	167.1 K=1.00	0.8090	-2709.28	6545.86	0.414 [1] ✔
T11	26.895 - 20.103	L2x2 1/2x3/16	12.26	6.13	172.3 K=1.00	0.8090	-2804.94	6158.09	0.455 [1] ✔
T12	20.103 - 13.415	L2 1/2x2 1/2x3/16	12.90	6.45	156.3 K=1.00	0.9020	-4322.63	8340.24	0.518 [1] ✔
T13	13.415 - 6.7075	L3x3x5/16	8.82	8.50	110.7 K=1.00	1.7800	-7061.70	30265.50	0.233 [1] ✔
T14	6.7075 - 0	L3x3x5/16	9.38	9.08	118.2 K=1.00	1.7800	-7321.92	27647.00	0.265 [1] ✔

[1] P_u / ϕP_n controls

Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T3	74.563 - 72.313	L4x3 1/2x1/4	5.04	3.53	39.4 K=1.00	1.8100	-930.47	52350.20	0.018 [1] ✔
T5	67.563 - 65.438	L4x3 1/2x1/4	5.04	3.53	39.4 K=1.00	1.8100	-485.91	52350.20	0.009 [1] ✔
T14	6.7075 - 0	L1 3/4x1 3/4x3/16	12.26	5.92	206.9 K=1.00	0.6211	-963.21	3277.90	0.294 [1] ✔
		KL/R > 200 (C) - 205							

[1] P_u / ϕP_n controls

Top Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	90.333 - 78.063	L2 1/2x2 1/2x3/16	5.04	4.71	114.1 K=1.00	0.9020	-101.82	14719.50	0.007 [1] ✔
T2	78.063 -	L4x3 1/2x1/4	5.04	3.53	57.7	1.8100	-449.80	47824.20	0.009 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
	74.563				K=1.00				✔
T4	72.313 - 67.563	2L4x4x3/8	5.04	4.71	45.9 K=1.00	5.7200	-1065.13	165844.00	0.006 [1] ✔
T8	50.271 - 41.979	L2 1/2x2 1/2x3/16	6.91	6.49	157.3 K=1.00	0.9020	-624.44	8233.94	0.076 [1] ✔
T12	20.103 - 13.415	L2x2 1/2x1/4	10.61	10.20	288.6 K=1.00	1.0600	-2297.22	2874.91	0.799 [1] ✔
		KL/R > 200 (C) - 190							

[1] P_u / ϕP_n controls

Bottom Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T5	67.563 - 65.438	L3x3x3/16	5.04	3.53	71.1 K=1.00	1.0900	-878.27	26385.00	0.033 [1] ✔

[1] P_u / ϕP_n controls

Redundant Horizontal (1) Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T13	13.415 - 6.7075	L1 3/4x1 3/4x3/16	3.06	2.86	99.8 K=1.00	0.6211	-955.23	11911.00	0.080 [1] ✔
T14	6.7075 - 0	L1 3/4x1 3/4x3/16	3.06	2.86	99.8 K=1.00	0.6211	-963.21	11911.00	0.081 [1] ✔

[1] P_u / ϕP_n controls

Redundant Diagonal (1) Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T13	13.415 - 6.7075	L1 3/4x1 3/4x3/16	4.69	4.39	153.4 K=1.00	0.6211	-736.82	5961.09	0.124 [1] ✔
T14	6.7075 - 0	L1 3/4x1 3/4x3/16	4.41	4.09	142.9 K=1.00	0.6211	-693.25	6866.88	0.101 [1] ✔

[1] P_u / ϕP_n controls

Inner Bracing Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T2	78.063 - 74.563	L2 1/2x2x3/16	3.56	3.23	90.8 K=1.00	0.8090	-6.52	16979.30	0.000 [1] ✔
T5	67.563 - 65.438	L2 1/2x2x3/16	3.56	3.23	90.8 K=1.00	0.8090	-3.67	16979.30	0.000 [1] ✔
T12	20.103 - 13.415	L2x2x3/16	15.01	14.59	444.5 K=1.00	0.7150	-127.85	817.57	0.156 [1] ✔
		KL/R > 250 (C) - 187							

[1] P_u / ϕP_n controls

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	90.333 - 78.063	L4x4x1/4	12.27	6.08	58.4	1.9400	2762.93	62856.00	0.044 [1] ✔
T2	78.063 - 74.563	L4x4x3/8	3.50	3.50	34.1	2.8600	6991.13	92664.00	0.075 [1] ✔
T3	74.563 - 72.313	L4x4x3/8	2.25	2.25	22.0	2.8600	6334.59	92664.00	0.068 [1] ✔
T4	72.313 - 67.563	L4x4x3/8	4.75	4.75	46.3	2.8600	15092.20	92664.00	0.163 [1] ✔
T5	67.563 - 65.438	L4x4x3/8	2.13	0.13	1.2	2.8600	19529.50	92664.00	0.211 [1] ✔
T6	65.438 - 57.521	L4x4x3/8	7.95	7.95	77.5	2.8600	22905.00	92664.00	0.247 [1] ✔
T7	57.521 - 50.271	L4x4x3/8	7.28	7.28	71.0	2.8600	30141.30	92664.00	0.325 [1] ✔
T8	50.271 - 41.979	L5x5x3/8	8.32	8.32	64.0	3.6100	35367.70	116964.00	0.302 [1] ✔
T9	41.979 - 34.187	L5x5x3/8	7.82	7.82	60.2	3.6100	41835.30	116964.00	0.358 [1] ✔
T10	34.187 - 26.895	L5x5x3/8	7.32	7.32	56.3	3.6100	46637.10	116964.00	0.399 [1] ✔
T11	26.895 - 20.103	L5x5x3/8	6.82	6.82	52.4	3.6100	50822.70	116964.00	0.435 [1] ✔
T12	20.103 - 13.415	L5x5x5/16	6.71	6.71	51.3	3.0300	57351.10	98172.00	0.584 [1] ✔

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T13	13.415 - 6.7075	L5x5x5/16	6.73	3.37	25.7	3.0300	56356.60	98172.00	0.574 [1] ✔
T14	6.7075 - 0	L5x5x5/16	6.73	3.37	25.7	3.0300	56396.40	98172.00	0.574 [1] ✔

[1] P_u / ϕP_n controls

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	90.333 - 78.063	L2x2x1/4	7.90	3.69	72.7	0.5631	1307.89	24493.20	0.053 [1] ✔
T2	78.063 - 74.563	L2x2 1/2x3/16	4.31	4.03	80.6	0.5131	2728.74	22319.60	0.122 [1] ✔
T3	74.563 - 72.313	L2 1/2x2 1/2x3/16	3.38	3.16	48.7	0.5828	3283.05	25353.70	0.129 [1] ✔
T4	72.313 - 67.563	L2 1/2x2 1/2x3/16	5.38	5.02	77.5	0.5828	5142.61	25353.70	0.203 [1] ✔
T5	67.563 - 65.438	L2x2x3/16	3.22	3.01	58.4	0.4426	4014.54	19252.80	0.209 [1] ✔
T6	65.438 - 57.521	L2x2 1/2x3/16	9.67	4.97	99.4	0.5131	3268.92	22319.60	0.146 [1] ✔
T7	57.521 - 50.271	L2x2 1/2x3/16	9.72	4.95	99.0	0.5131	3002.51	22319.60	0.135 [1] ✔
T8	50.271 - 41.979	L2x2 1/2x3/16	11.14	5.64	112.8	0.5131	2830.51	22319.60	0.127 [1] ✔
T9	41.979 - 34.187	L2x2 1/2x3/16	11.47	5.78	115.6	0.5131	2924.65	22319.60	0.131 [1] ✔
T10	34.187 - 26.895	L2x2 1/2x3/16	11.85	5.95	119.0	0.5131	2629.52	22319.60	0.118 [1] ✔
T11	26.895 - 20.103	L2x2 1/2x3/16	12.26	6.13	122.7	0.5131	2777.13	22319.60	0.124 [1] ✔
T12	20.103 - 13.415	L2 1/2x2 1/2x3/16	12.90	6.45	99.5	0.5828	4926.93	25353.70	0.194 [1] ✔
T13	13.415 - 6.7075	L3x3x5/16	8.82	8.50	110.7	1.1789	6244.79	51282.40	0.122 [1] ✔
T14	6.7075 - 0	L3x3x5/16	9.38	9.08	118.2	1.1789	6293.68	51282.40	0.123 [1] ✔

[1] P_u / ϕP_n controls

Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T3	74.563 - 72.313	L4x3 1/2x1/4	5.04	3.53	39.4	1.2169	927.70	52934.10	0.018 [1] ✔
T5	67.563 - 65.438	L4x3 1/2x1/4	5.04	3.53	39.4	1.2169	493.73	52934.10	0.009 [1] ✔
T14	6.7075 - 0	L1 3/4x1 3/4x3/16	12.26	5.92	198.5	0.3604	963.21	15675.30	0.061 [1] ✔

[1] P_u / ϕP_n controls

Top Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	90.333 - 78.063	L2 1/2x2 1/2x3/16	5.04	4.71	72.6	0.5710	80.78	24839.90	0.003 [1] ✔
T2	78.063 - 74.563	L4x3 1/2x1/4	5.04	3.53	44.6	1.2169	633.39	52934.10	0.012 [1] ✔
T4	72.313 - 67.563	2L4x4x3/8	5.04	4.71	45.9	3.8681	1678.13	168263.00	0.010 [1] ✔
T8	50.271 - 41.979	L2 1/2x2 1/2x3/16	6.91	6.49	100.1	0.5710	624.44	24839.90	0.025 [1] ✔
T12	20.103 - 13.415	L2x2 1/2x1/4	10.61	10.20	206.6	0.6544	1963.23	28465.30	0.069 [1] ✔

[1] P_u / ϕP_n controls

Bottom Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T5	67.563 - 65.438	L3x3x3/16	5.04	3.53	60.2	1.0900	1118.19	35316.00	0.032 [1] ✔

[1] P_u / ϕP_n controls

Redundant Horizontal (1) Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T13	13.415 - 6.7075	L1 3/4x1 3/4x3/16	3.06	2.86	63.8	0.3779	955.23	16439.90	0.058 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T14	6.7075 - 0	L1 3/4x1 3/4x3/16	3.06	2.86	63.8	0.3779	963.21	16439.90	0.059 [1]

[1] P_u / ϕP_n controls

Redundant Diagonal (1) Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T13	13.415 - 6.7075	L1 3/4x1 3/4x3/16	4.69	4.39	98.1	0.3779	736.82	16439.90	0.045 [1]
T14	6.7075 - 0	L1 3/4x1 3/4x3/16	4.41	4.09	91.4	0.3779	693.25	16439.90	0.042 [1]

[1] P_u / ϕP_n controls

Inner Bracing Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T2	78.063 - 74.563	L2 1/2x2x3/16	7.13	6.80	136.0	0.8090	103.91	26211.60	0.004 [*1]
T5	67.563 - 65.438	L2 1/2x2x3/16	7.13	6.80	136.0	0.8090	228.04	26211.60	0.009 [*1]
T8	50.271 - 41.979	L2 1/2x2x3/16	9.77	9.35	187.1	0.8090	33.32	26211.60	0.001 [*1]
T12	20.103 - 13.415	L2x2x3/16	15.01	14.59	283.8	0.7150	137.26	23166.00	0.006 [*1]

[*] DL controls
[1] P_u / ϕP_n controls

Section Capacity Table

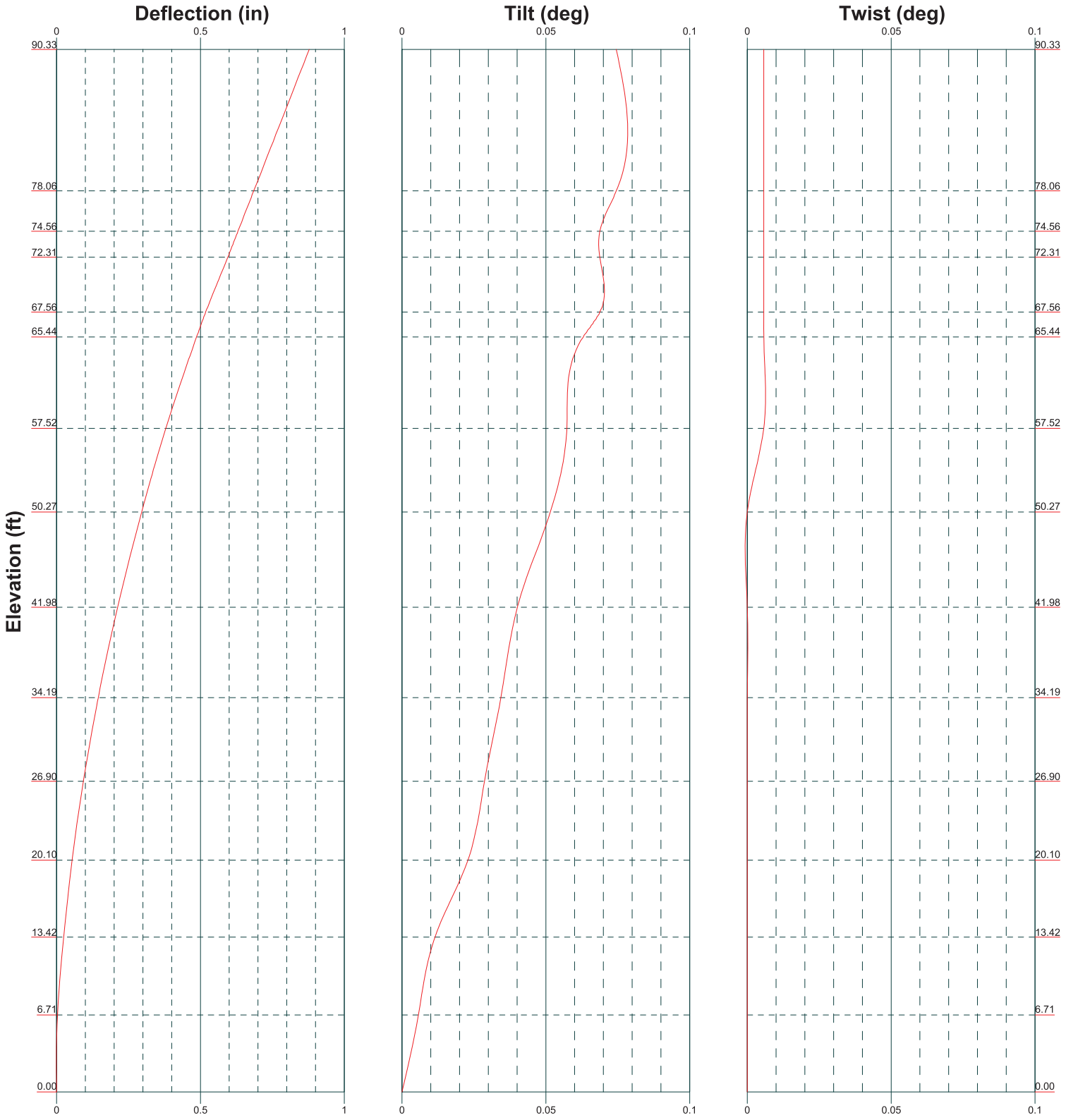
Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
T1	90.333 - 78.063	Leg	L4x4x1/4	4	-4096.19	39552.00	10.4	Pass
T2	78.063 - 74.563	Leg	L4x4x3/8	28	-9917.36	79792.20	12.4	Pass
T3	74.563 - 72.313	Leg	L4x4x3/8	54	-9983.48	87110.20	11.5	Pass
T4	72.313 - 67.563	Leg	L4x4x3/8	66	-19225.00	70353.00	27.3	Pass
T5	67.563 - 65.438	Leg	L4x4x3/8	86	-25033.50	92646.30	27.0	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
T6	65.438 - 57.521	Leg	L4x4x3/8	108	-28240.70	42861.90	65.9	Pass
T7	57.521 - 50.271	Leg	L4x4x3/8	120	-36260.90	48541.60	74.7	Pass
T8	50.271 - 41.979	Leg	L5x5x3/8	132	-41551.40	68445.00	60.7	Pass
T9	41.979 - 34.187	Leg	L5x5x3/8	150	-48700.20	72871.90	66.8	Pass
T10	34.187 - 26.895	Leg	L5x5x3/8	162	-53732.30	77283.40	69.5	Pass
T11	26.895 - 20.103	Leg	L5x5x3/8	174	-58348.40	81643.20	71.5	Pass
T12	20.103 - 13.415	Leg	L5x5x5/16	186	-65950.50	67911.60	97.1	Pass
T13	13.415 - 6.7075	Leg	L5x5x5/16	204	-63562.70	87206.50	72.9	Pass
T14	6.7075 - 0	Leg	L5x5x5/16	234	-64093.80	87206.50	73.5	Pass
T1	90.333 - 78.063	Diagonal	L2x2x1/4	14	-1329.05	15476.20	8.6	Pass
T2	78.063 - 74.563	Diagonal	L2x2 1/2x3/16	42	-3165.44	13350.80	23.7	Pass
T3	74.563 - 72.313	Diagonal	L2 1/2x2 1/2x3/16	60	-3891.73	21476.40	18.1	Pass
T4	72.313 - 67.563	Diagonal	L2 1/2x2 1/2x3/16	78	-5704.94	13393.30	42.6	Pass
T5	67.563 - 65.438	Diagonal	L2x2x3/16	98	-4833.28	14904.90	32.4	Pass
T6	65.438 - 57.521	Diagonal	L2x2 1/2x3/16	114	-3525.09	9371.28	37.6	Pass
T7	57.521 - 50.271	Diagonal	L2x2 1/2x3/16	125	-2876.06	9461.43	30.4	Pass
T8	50.271 - 41.979	Diagonal	L2x2 1/2x3/16	144	-3012.83	7278.76	41.4	Pass
T9	41.979 - 34.187	Diagonal	L2x2 1/2x3/16	155	-2841.34	6931.00	41.0	Pass
T10	34.187 - 26.895	Diagonal	L2x2 1/2x3/16	168	-2709.28	6545.86	41.4	Pass
T11	26.895 - 20.103	Diagonal	L2x2 1/2x3/16	180	-2804.94	6158.09	45.5	Pass
T12	20.103 - 13.415	Diagonal	L2 1/2x2 1/2x3/16	196	-4322.63	8340.24	51.8	Pass
T13	13.415 - 6.7075	Diagonal	L3x3x5/16	216	-7061.70	30265.50	23.3	Pass
T14	6.7075 - 0	Diagonal	L3x3x5/16	243	-7321.92	27647.00	26.5	Pass
T3	74.563 - 72.313	Horizontal	L4x3 1/2x1/4	41	-930.47	52350.20	1.8	Pass
T5	67.563 - 65.438	Horizontal	L4x3 1/2x1/4	77	493.73	52934.10	0.9	Pass
T14	6.7075 - 0	Horizontal	L1 3/4x1 3/4x3/16	205	-963.21	3277.90	29.4	Pass
T1	90.333 - 78.063	Top Girt	L2 1/2x2 1/2x3/16	5	-101.82	14719.50	0.7	Pass
T2	78.063 - 74.563	Top Girt	L4x3 1/2x1/4	33	633.39	52934.10	1.2	Pass
T4	72.313 - 67.563	Top Girt	2L4x4x3/8	69	1678.13	168263.00	1.0	Pass
T8	50.271 - 41.979	Top Girt	L2 1/2x2 1/2x3/16	137	-624.44	8233.94	7.6	Pass
T12	20.103 - 13.415	Top Girt	L2x2 1/2x1/4	190	-2297.22	2874.91	79.9	Pass
T5	67.563 - 65.438	Bottom Girt	L3x3x3/16	89	-878.27	26385.00	3.3	Pass
T13	13.415 - 6.7075	Redund Horz 1 Bracing	L1 3/4x1 3/4x3/16	224	-955.23	11911.00	8.0	Pass
T14	6.7075 - 0	Redund Horz 1 Bracing	L1 3/4x1 3/4x3/16	241	-963.21	11911.00	8.1	Pass
T13	13.415 - 6.7075	Redund Diag 1 Bracing	L1 3/4x1 3/4x3/16	211	-736.82	5961.09	12.4	Pass
T14	6.7075 - 0	Redund Diag 1 Bracing	L1 3/4x1 3/4x3/16	245	-693.25	6866.88	10.1	Pass
T2	78.063 - 74.563	Inner Bracing	L2 1/2x2x3/16	29	103.91	26211.60	0.4	Pass
T5	67.563 - 65.438	Inner Bracing	L2 1/2x2x3/16	87	228.04	26211.60	0.9	Pass
T8	50.271 - 41.979	Inner Bracing	L2 1/2x2x3/16	133	33.32	26211.60	0.7	Pass
T12	20.103 - 13.415	Inner Bracing	L2x2x3/16	187	-127.85	817.57	15.6	Pass
						Summary		
						Leg (T12)	97.1	Pass
						Diagonal (T12)	51.8	Pass
						Horizontal (T14)	29.4	Pass
						Top Girt (T12)	79.9	Pass
						Bottom Girt (T5)	3.3	Pass
						Redund Horz 1 Bracing (T14)	8.1	Pass
						Redund Diag 1 Bracing	12.4	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
						(T13) Inner Bracing (T12)	15.6	Pass
						Bolt Checks	88.5	Pass
						RATING =	**97.1**	**Pass**

TIA-222-G - Service - 60 mph

Maximum Values

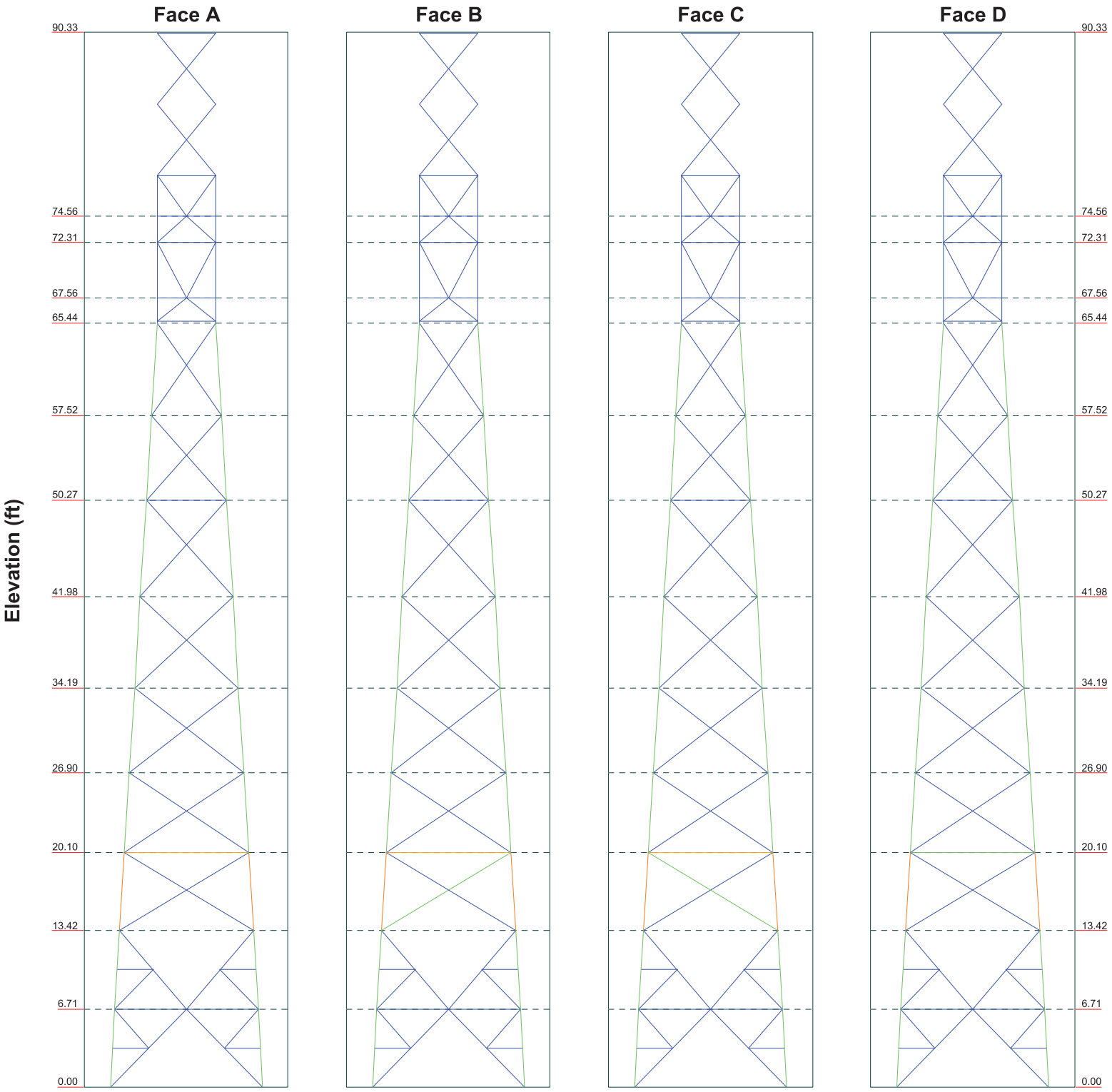


Structural Components, LLC
1870 West 64th Lane, Unit A
Denver, CO 80221
Phone: (866) 386-7622
FAX:

Job: ***220619***			
Project: ***Portland (CT-1680)***			
Client: BST Management, LLC	Drawn by: treed		App'd:
Code: TIA-222-G	Date: 09/08/22		Scale: NTS
Path:			Dwg No. E-5

Stress Distribution Chart
0' - 90'3-31/32"

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



Structural Components, LLC
1870 West 64th Lane, Unit A
Denver, CO 80221
Phone: (866) 386-7622
FAX:

Job: ***220619***			
Project: ***Portland (CT-1680)***			
Client: BST Management, LLC	Drawn by: treed		App'd:
Code: TIA-222-G	Date: 09/08/22		Scale: NTS
Path:			Dwg No. E-8

PIER/PAD & MAT FOUNDATION

Template = "SquareCombPierPadMat.xmcd"
Version = 4.02

Structural Components
Bringing It All Together.

1870 West 64th Lane, UnitA
Denver, CO 80221
866-386-7622

PROJECT DATA

Job = 220619
Client = "BST Management, LLC"
Site = "Portland (CT-1680)"
Model = "90ft SST"

DESIGN CODES AND STANDARDS

Code = ("TIA-222-G, "Structural Standard for Antenna Supporting Structures and Antennas" 2005."
"ACI 318-08, "Building Code Requirements for Structural Concrete and Commentary," 2008.")

FACTORED FOUNDATION DESIGN LOADS

Overdesign Factor: $\alpha = 1.00$
Percentage for Passing: $PP = 100 \cdot \%$
Calculation Mode: calc = "Analysis (no seismic provision check)" reinf' = "Reinforcing Details Available"

	Load Comb. #1	Load Comb. #2	Load Comb. #3
Load Combination:	$Comb_1$ = "1.2D + 1.0W"	$Comb'_2$ = "0.9D + 1.6W"	$Comb_3$ = "1.2D + 1.0Di + 1.0W"
Overall Moment:	$M_{u_1} = 1271.3 \cdot kip \cdot ft$	$M_{u_2} = 1271.1 \cdot kip \cdot ft$	$M_{u_3} = 314.6 \cdot kip \cdot ft$
Overall Shear:	$V_{u_1} = 23.4 \cdot kip$	$V_{u_2} = 23.4 \cdot kip$	$V_{u_3} = 5.7 \cdot kip$
Overall Axial:	$P_{u_1} = 21.2 \cdot kip$	$P_{u_2} = 15.9 \cdot kip$	$P_{u_3} = 54.2 \cdot kip$
Leg Moment:	$LM_{u_1} = 0.0 \cdot kip \cdot ft$	$LM_{u_2} = 0.0 \cdot kip \cdot ft$	$LM_{u_3} = 0.0 \cdot kip \cdot ft$
Leg Shear:	$S_{u_1} = 13.0 \cdot kip$	$S_{u_2} = 13.0 \cdot kip$	$S_{u_3} = 11.4 \cdot kip$
Leg Axial:	$Pmax_{u_1} = 74.0 \cdot kip$	$Pmax_{u_2} = 73.1 \cdot kip$	$Pmax_{u_3} = 51.2 \cdot kip$
	$Pmin_{u_1} = -64.8 \cdot kip$	$Pmin_{u_2} = -63.9 \cdot kip$	$Pmin_{u_3} = -40.7 \cdot kip$

DIMENSIONS

Depth:	$D = 6.5 \cdot ft$	(from grade to bottom of pad)
Pad Width:	$W = 18.0 \cdot ft$	(each way)
Pad Thickness:	$T = 2.0 \cdot ft$	
Pier Separation:	$Wt = 13.0 \cdot ft$	
Pier (or mat) Extension:	$E = 0.5 \cdot ft$	(above-grade portion)
Pier: Pier = "Square"	$D_p = 2.0 \cdot ft$	
Base Plate Geometry:	BPG = "None"	$BP = 0.0 \cdot in$
Tower Offset:	$ecc1 = 0.0 \cdot ft$	(center of tower to center of pad)
Tower Leg Offset:	$ecc2 = 0.0 \cdot ft$	(center of tower leg to center of pier)
Concrete Volume:	$V_{pad} = 24.0 \cdot yd^3$	
	$V_{pier} = 0.7 \cdot yd^3$	
	$V_{conc} = 27.0 \cdot yd^3$	

SITE & GEOTECHNICAL DATA

Soil Parameters: Geo = "GDP, 03/06/2017, Job # 2017702.58"

Soil Unit Weight: $\gamma_{soil} = 136.5385 \cdot pcf$

Soil Cone Override: soilcone = "N" $\phi_{cone} = 0.0 \cdot deg$

Constant Lateral Pressure: costpres = "N" $CP_p = 0 \cdot psf$ (for pier) $CP_P = 0 \cdot psf$ (for pad)

Equivalent Fluid Pressure: EFpres = "N" $EFP = 0.0 \cdot pcf$

Angle of Internal Friction: $\phi_1 = 15.0 \cdot deg$ (above water table)

$\phi_2 =$ "N/A" $\cdot deg$ (below water table)

Ultimate Bearing Pressure: $B'_c = 30.0 \cdot ksf$ Bearing = "Capacity at Depth"

Cohesion: $c = 10000 \cdot psf$

Adhesion: $c_A = 0 \cdot psf$

Passive Pressure Coefficient (Rankine): $K_{p1} = 1.70$ (above water table) $K_{p2} =$ "N/A" (below water table)

Active Pressure Coefficient: $K_{a1} = 0.59$ (above water table) $K_{a2} =$ "N/A" (below water table)

Ultimate Friction Coefficient: $\mu = 0.60$ (base) $\mu_s = 0.60$ (sides)

Ultimate Sliding Friction: $f_s = 0 \cdot psf$ (base) $f_{s.s} = 0.0000 \cdot psf$ (sides)

Depth Neglected: $D_n = 2.5\,ft$

Depth of Water Table: $D_w =$ "Below Footing"

Seismic Design Category: SDCT = "Seismic Design Category B" $Note_{SDC} =$ "N/A"

MATERIAL SPECIFICATIONS

Concrete:	Compressive Strength:	$f'_c = 3000 \cdot psi$
	Clear Cover:	$cc = 3.0 \cdot in$
	Lightweight Aggregate Factor:	$\lambda = 1.00$
	Unit Weight:	$\gamma_{conc} = 150 \cdot pcf$
Rebar:	Yield Strength:	$F_y = 60 \cdot ksi$

LATERAL CAPACITY

Design Resist.	Lat. Load	Check	Ratio
$\min(\phi V_n) = 1111 \cdot kip$	$\max(V_u) = 23 \cdot kip$	$Check'_{lateral} =$ "OK"	$Ratio'_{lateral} = 0.02$

OVERTURNING

Design Resist.	O.T. Moment	Check	Ratio
$\min(MR1, MR2) = 6768\,ft \cdot kip$	$\max(M_{u.ot}) = 1435 \cdot ft \cdot kip$	$Check'_{over} =$ "OK"	$Ratio'_{over} = 0.21$

SOIL BEARING

Design Bearing Capacity	Max. Bearing	Check	Ratio
$\phi B_c = 22500 \cdot psf$	$P_{pos} = 2693 \cdot psf$	$Check'_{comp} =$ "OK"	$Ratio'_{comp} = 0.12$

PAD REINFORCEMENT/STRENGTH

*Pad reinforcement is assumed

Number of Reinforcing Layers:	$Mats = \text{"Top \& Bottom Mats"}$
Pad has Hoops or Ties?	$Tie_P = \text{"No"}$
Bar Quantity:	$n_p = 21$ (per layer per direction)
Bar Size:	$s_p = 6$
Bar Spacing (center to center):	$sp_{p.ctr} = 10.5 \cdot in$
Bar Spacing (clear):	$sp_{p.cl} = 9.7 \cdot in$
Total Weight (per mat):	$Wt_{tp} = 1104\,lbf$
Check of Reinforcing Spacing and Minimum Reinforcing:	$Check_{spp.cl} = \text{"OK"}$ $Check_{spp.cl2} = \text{"OK"}$ $Check_{minp} = \text{"No Good"}$

REINFORCING FLEXURAL STRENGTH

Case	Design Strength	Calculated Max Moment	Check	Ratio
A	$\phi M_{nA} = 805 \cdot ft \cdot kip$	$\max(M_{u.TA}) = 87\,ft \cdot kip$	$Check'_{flex} = \text{"OK"}$	$Ratio_{flex} = 0.98$
B	$\phi M_{nB} = 805 \cdot ft \cdot kip$	$\max(M_{u.TB}) = 790\,ft \cdot kip$		

(Case A = Bottom of Pad in Tension at Toe, Case B = Top of Pad in Tension at Heel)

PAD ONE-WAY SHEAR

Case	Design Strength	Calculated Max Shear	Check	Ratio
1	$\phi V_{n1} = 353 \cdot kip$	$\lvert\max(V_{umax.C1T}, V_{umin.C1T})\rvert = 279 \cdot kip$	$Check'_{shear.1} = \text{"OK"}$	$Ratio'_{shear.1} = 0.79$
2		$\lvert\max(V_{umax.C2T}, V_{umin.C2T})\rvert = 181 \cdot kip$		

(Case 1 = Hinging about Pad Edge Adjacent to Pier 1, Case 2 = Hinging about Pad Edge Adjacent to Piers 2/3.)

Shear Reinforcing Check: $Check'_{shrrnf} = \text{"OK"}$

TWO-WAY PAD SHEAR

Design Strength	Calculated Max Shear	Check	Ratio
$\phi V_{n2} = 573 \cdot kip$	$\max(V_{u2}) = 134 \cdot kip$	$Check'_{shear.2} = \text{"OK"}$	$Ratio'_{shear.2} = 0.23$

PIER REINFORCEMENT

Gross Area: $A_{pier} = 4.0 \cdot ft^2$

Design Pier Area Factor: $P_{Ag} = 50 \cdot \%$

Effective Gross Area: $A'_{pier} = 2.0 \cdot ft^2$

Check of Area Factor: $Check_{PAg} = "OK"$

LONGITUDINAL PIER REINFORCING

Bar Quantity: $n_c = 12$

Bar Size: $s_c = 6$

Hook Length: $hook_{ca} = 0.0 \cdot in$ (actual/0 for none)

Bend Dia: $bend_c = 4.5 \cdot in$ (inside)

Hook Length: $hook_c = 9.0 \cdot in$ (required per ACI 7.1.2)

Bar Weight: $Wt_{tc} = 133\ lbf$ (per pier)

Check of Hook Length: $Check_{hookc} = "N/A"$

TIES

Tie Size: $s_t = 4.0000$

Tie Weight: $Wt_{tc} = 133 \cdot lbf$ (per pier)

Check of Tie Size: $Check_{st} = "OK"$

Maximum Crosstie Spacing (hx): (0 for none) $h_x = 0.0 \cdot in$

$Note_{SDCt1} = "N/A"$

Tie Levels: (0 if none)	Qty. Spaces	Spacing	
	$qsp_{t1} = 7.0000$	$sp_{t1} = 8.0 \cdot in$	(top)
	$qsp_{t2} = 0.0000$	$sp_{t2} = 0.0 \cdot in$	(mid.)
	$qsp_{t3} = 0.0000$	$sp_{t3} = 0.0 \cdot in$	(bot.)

Tie Quantity: $n_t = 8$

Maximum Required Tie Spacing (top, mid., bot.): $sp_{t.max} = 12.0 \cdot in$

$Check_{tie} = "OK"$

$Note_{SDCt3} = "N/A"$

$Check_{sp.cl} = "OK"$

TIE SPLICE

Required Lap Splice Length: $Lap = 24.0000 \cdot in$

$Note_{SDCt2} = "N/A"$

MINIMUM LONGITUDINAL REINFORCEMENT

Pier Area of Steel: $A_{tc} = 5.3 \cdot in^2$ $Ratio_{min.c} = 1.8 \cdot \%$ (based on effective pier gross area)

Minimum Steel Area Required: $A_{min.c} = 2.9 \cdot in^2$

Maximum Steel Area Allowed: $A_{max.c} = 23.0 \cdot in^2$

Check of Steel Area: $Check_{min.c} = "OK"$

BASE PLATE BEARING ON CONCRETE

Design Strength	Calculated Max Compression	Check	Ratio
$\phi B_n = 0 \cdot kip$	$\max(Pmax_u) = 74 \cdot kip$	$Check'_{bear} = "N/A"$	$Ratio'_{bear} = 0.00$

COMPRESSIVE STRENGTH OF PIER CONCRETE

Design Strength	Calculated Max Compression	Check	Ratio
$\phi P_n = 382 \cdot kip$	$\max(P_{upier}) = 78 \cdot kip$	$Check'_{comp2} = "OK"$	$Ratio'_{comp2} = 0.20$

SHEAR STRENGTH OF PIER CONCRETE

Design Strength	Calculated Max Shear	Check	Ratio
$\phi V_{npM} = 72 \cdot kip$	$\max(S_u) = 13 \cdot kip$	$Check'_{shear.p} = "OK"$	$Ratio'_{shear.p} = 0.20$

Shear Reinforcing Check: $Check'_{shrrnfp} = "OK"$

PIER MOMENT CAPACITY

Design Strength	Calculated Max Moment	Check	Ratio
$\phi Mn_{cm} = 109\ ft \cdot kip$	$\max(M_{u1.c}, M_{u2.c}) = 65\ ft \cdot kip$	$Check'_{pier} = "OK"$	$Ratio'_{pier} = 0.60$

DEVELOPMENT LENGTH IN TENSION

Case	Required Length	Length Available	Check	Ratio
w/o Hook	$l_{dc} = 12.0 \cdot in$	$l_{ac} = 21.0 \cdot in$	$Check_{dev.ch} = "Hook\ not\ Required"$	$Ratio_{dev} = 0.57$
w/ Hook	$l_{dch} = 6.9 \cdot in$	$hook_{ca} = 0.0 \cdot in$		

Controlling Foundation: $CFP = 98.1 \cdot \%$

APPENDIX B

Data Provided for Analysis

SRR Towers Collocation Application

Installation Type: Anchor ☐ Collocation ☑ Add to Existing ☐

Contact:	James Burgess	Site Number:	
Email	jamesb@blueskytower.com	Site Name:	
Office:	617-549-2800	Submittal Date	
Fax:		Revision Date(s)	

PLEASE SUBMIT THIS APPLICATION VIA E-MAIL. Include Drawings, Specification Sheets, RFDS, Antenna Data Sheets

Applicant Information

Applicant Name:	AT&T	Primary Contact/Agent Name:	Allison Conwell
Applicant Site Name:	Portland	Contact/Agent Company Name:	Centerline Communications
Applicant Site Number:	CT1066	Contact/Agent Number:	215-588-7035
Proposed ON AIR Date:		Contact Email:	aconwell@clinellc.com

Applicant Contact Information

Leasing Contact Name:	Allison Conwell	Email:	aconwell@clinellc.com	Number:	215-588-7035
RF Contact Name:		Email:		Number:	
Construction Contact Name:		Email:		Number:	
Emergency Contact Name:		Email:		Number:	
Account Payable Contact Name:		Email:		Number:	

Tower Information

Latitude:	41.5807139	N	Structure Type:	Self -Support	
Longitude:	-72.62386	W	Structure Height:	80	
AMSL:		FT	Site Address:	97 High Street Portland, CT 06480	

EQUIPMENT SPECIFICATIONS

Summary of Work to be Completed:	Replacing (6) antennas, adding (3) antennas (new antennas stacked, no additional space required, replacing (3) RRUs, adding (3) RRUs, removing (3) TMAs, adding (1) surge arrestor, adding (1) fiber cable and adding (3) DC cables.

EXISTING CONDITIONS - List all installed equipment prior to proposed modification. If this is a new installation, proceed to FINAL CONFIGURATION.

	SECTOR 1	SECTOR 2	SECTOR 3	SECTOR 4 (if necessary)
Current RAD Center (Ft AGL)	77	77	77	
Tower Mount Height (if different than RAD ctr)				
Mount Type (Label "Existing" if no change)	Existing	Existing	Existing	
Mount Model #				
Antenna Manufacturer	Kathrein / CCI / Quintel	Kathrein / CCI / Quintel	Kathrein / CCI / Quintel	
Antenna Model# (Attach Specs)	800 10121 / HPA-65R-BUU-H6 / QS66510-6	800 10121 / HPA-65R-BUU-H6 / QS66510-6	800 10121 / HPA-65R-BUU-H6 / QS66510-6	
Antenna Dimensions (WxHxD in inches)	54.5 x 10.3 x 5.9 / 72 x 14.8 x 9 / 72 x 12 x 9.6	54.5 x 10.3 x 5.9 / 72 x 14.8 x 9 / 72 x 12 x 9.6	54.5 x 10.3 x 5.9 / 72 x 14.8 x 9 / 72 x 12 x 9.6	
Antenna Weight (Lbs.)	44.1 / 50.7 / 98	44.1 / 50.7 / 98	44.1 / 50.7 / 98	
Antenna Quantity	(1) / (1) / (1)	(1) / (1) / (1)	(1) / (1) / (1)	
Dish Manufacturer				
Dish Model# (attach Specs)				
Dish Diameter (Ft)				
Dish Weight (Lbs.)				
Dish Mount Height				
Azimuths	30	150	270	
Total # of Coax Lines per Sector	2	2	2	
Diameter Of Coax Cables (In)	7/8"	7/8"	7/8"	
Total # of Hybrid Cables per Sector				
Diameter Of Hybrid Cables (In)				
Total # of other Cables per Sector	4 DC / 2 Fiber			
Diameter Of Other Cables (In)	3/4" / 3/8"			
Quantity of RRUs per Sector	4	4	4	
Manufacturer	Ericsson	Ericsson	Ericsson	
Model	RRUS 11 B12 / RRUS 32 B2 / RRUS 32 B66A / RRUS 32 B30	RRUS 11 B12 / RRUS 32 B2 / RRUS 32 B66A / RRUS 32 B30	RRUS 11 B12 / RRUS 32 B2 / RRUS 32 B66A / RRUS 32 B30	
Dimensions	17.8 x 17 x 7.2 / 27.2 x 12.1 x 7 / 27.2 x 12.1 x 7 / 27.2 x 12.1 x 7	17.8 x 17 x 7.2 / 27.2 x 12.1 x 7 / 27.2 x 12.1 x 7 / 27.2 x 12.1 x 7	17.8 x 17 x 7.2 / 27.2 x 12.1 x 7 / 27.2 x 12.1 x 7 / 27.2 x 12.1 x 7	
Weight (Lbs.)	55 / 60 / 60 / 60	55 / 60 / 60 / 60	55 / 60 / 60 / 60	
Quantity of TMAs per Sector	1	1	1	
Manufacturer	CCI	CCI	CCI	
Model	DTMABP7819VG12A	DTMABP7819VG12A	DTMABP7819VG12A	
Dimensions	10.63x 11.02 x 3.78	10.63x 11.02 x 3.78	10.63x 11.02 x 3.78	
Weight (Lbs.)	19	19	19	
Quantity of Surge Arrestors per Sector	2	0	0	
Manufacturer	Raycap			
Model	DC6-48-60-18-8F			
Antenna Model & Quantity to be Removed per Sector (If Applicable)	3	3	3	
RRU Model & Quantity to be Removed per Sector (If Applicable)	3	3	3	
Line/Cable Type, Size & Quantity to be Removed (If Applicable)				
List Any Other Equipment to be Removed (If Applicable)	3 TMA	3 TMA	3 TMA	

FINAL CONFIGURATION - List all installed equipment after proposed modification or initial installation.

	SECTOR 1	SECTOR 2	SECTOR 3	SECTOR 4 (if necessary)
Current/Proposed RAD Center (Ft AGL)	77	77	77	
Tower Mount Height (if different than RAD ctr)				
Mount Type (Label "Existing" if no change)	Existing	Existing	Existing	
Mount Model #				
Antenna Manufacturer	CCI / Ericsson / CCI	CCI / Ericsson / CCI	CCI / Ericsson / CCI	
Antenna Model# (Attach Specs)	TPA65R-BU6DA-K / AIR6449 B77D + AIR6419 B77G / DMP65R-BU6DA	TPA65R-BU6DA-K / AIR6449 B77D + AIR6419 B77G / DMP65R-BU6DA	TPA65R-BU6DA-K / AIR6449 B77D + AIR6419 B77G / DMP65R-BU6DA	
Antenna Dimensions (WxHxD in inches)	71.2 x 20.7 x 7.7 / (2) 30.4 x 15.9 x 8.1 / 71.2 x 20.7 x 7.7	71.2 x 20.7 x 7.7 / (2) 30.4 x 15.9 x 8.1 / 71.2 x 20.7 x 7.7	71.2 x 20.7 x 7.7 / (2) 30.4 x 15.9 x 8.1 / 71.2 x 20.7 x 7.7	
Antenna Weight (Lbs.)	69 / (2) 82 / 80	69 / (2) 82 / 80	69 / (2) 82 / 80	

Antenna Quantity	4 (AIR's are stacked)	4 (AIR's are stacked)	4 (AIR's are stacked)	
Dish Manufacturer				
Dish Model# (attach Specs)				
Dish Diameter (Ft)				
Dish Weight (Lbs.)				
Dish Mount Height				
Azimuths	30	150	270	

Total # of Coax Lines per Sector	2	2	2	
Diameter Of Coax Cables (In)	7/8"	7/8"	7/8"	
Total # of Hybrid Cables per Sector				
Diameter Of Hybrid Cables (In)				
Total # of other Cables per Sector	4 DC / 1 Fiber	3 DC / 1 Fiber		
Diameter Of Other Cables (In)	3/4" / 3/8"	.92"/ 1/2"		
Quantity of RRUs per Sector	5	5	5	
Manufacturer	Ericsson	Ericsson	Ericsson	
Model	RRUS 32 B2 / RRUS 32 B30 / RRUS 32 B66A / RRUs 4478 B14 / RRUS 4449 B5/B12	RRUS 32 B2 / RRUS 32 B30 / RRUS 32 B66A / RRUs 4478 B14 / RRUS 4449 B5/B12	RRUS 32 B2 / RRUS 32 B30 / RRUS 32 B66A / RRUs 4478 B14 / RRUS 4449 B5/B12	
Quantity of TMAs per Sector				
Manufacturer				
Model				
Quantity of Surge Arrestors per Sector	2	1		
Manufacturer	Raycap	Raycap		
Model	DC6-48-60-18-8F	DC9-48-60-24-8C-EV		
Transmit Frequency (MHz)	734-746, 788-799880-890, 891.5-894, 1930-1945, 1965-1970, 1975-1990, 2170-2180, 2345-2360, 3450-3550, 3700-3980	734-746, 788-799880-890, 891.5-894, 1930-1945, 1965-1970, 1975-1990, 2170-2180, 2345-2360, 3450-3550, 3700-3980	734-746, 788-799880-890, 891.5-894, 1930-1945, 1965-1970, 1975-1990, 2170-2180, 2345-2360, 3450-3550, 3700-3980	
Receive Frequency (MHz)	704-728, 758-769, 835-845,846.5-849, 1770-1780, 1850-1865,1885-1890,1895-1910, 2305-2320, 3450-3550, 3700-3980	704-728, 758-769, 835-845,846.5-849, 1770-1780, 1850-1865,1885-1890,1895-1910, 2305-2320, 3450-3550, 3700-3980	704-728, 758-769, 835-845,846.5-849, 1770-1780, 1850-1865,1885-1890,1895-1910, 2305-2320, 3450-3550, 3700-3980	
Antenna Gain (Db)				
Type of Technology	CBAND DoD	CBAND DoD	CBAND DoD	
TX Power Output				
ERP (Watts)				
Electric Service Required (Amps/Volts)				

GROUND SPACE REQUIREMENTS

Existing Lease Area: DIMS: L(ft) 22 W(ft) 14' 7" OR 319 Square footage

New/Add 'l Lease Area being requested: DIMS: L(ft) _____ W(ft) _____ OR _____ Square footage

Shelter: DIMS: L(ft) _____ W(ft) _____ H(ft) _____

Concrete Pad for Shelter/Cabinets: DIMS: L(ft) _____ W(ft) _____

POWER REQUIREMENTS

Power Provided by: _____ Electrical Service Provider: _____ Electrical Service Telephone Number: _____

Average Monthly Power Consumption: _____ KWH units

Is a multi-tenant meter rack present: Yes How many, if any, empty meter banks are present: _____

Telco/Interconnect Requirements: POTS ☐ T1 ☐ MICROWAVE ☐ FIBER OPTICS ☑

Fiber Provider: _____

BACK-UP POWER INFORMATION

Generator Required: _____ Generation Location: _____

Generator Ground Space Requirement: DIMS: L(ft) _____ W(ft) _____ H(ft) _____ **Fuel Type:** _____

BST Generator: _____ Generator Owner: _____ Shared Generator Peak Usage: _____ KW

Generator Capacity: _____ KW Generator Make: _____ Generator Model: _____

Fuel Tank Location: _____ Fuel Tank Size: DIMS: L(f _____ W(ft) _____ Fuel Tank S _____ Gallons

Pad for Fuel Tank (if required) DIMS: L(ft _____ W(ft) _____

Comments: _____

Comments: List any pertinent information that was not included above.

AT&T

EPA - Tower Summary

Totals:

Tower Top EPA SQIN (with Drag & Shielding)	19,172.9
Tower Top Weight lbs	1,819.5
Cabling SQ IN	8.1
TOTAL Tower Top + Cabling	19,181.0

Sub-Totals:

Antenna SQIN	11,521.4
RRH SQIN	3,721.7
Squid SQIN	929.9
TMA SQIN	-
WCS Filter SQIN	-
Combiner SQIN	-
RET SQIN	-
Microwave SQIN	-
ODU SQIN	-
Ice Bridge SQIN	-
Mount SQIN	3,000.0

January 21, 2022

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

RE:		
	Site Number:	CT1066
	FA Number:	10035005
	PACE Number:	MRCTB055774
	PT Number:	2051A11LZZ
	Site Name:	PORTLAND
	Site Address:	213 High Street Portland, CT 06480

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 mounts to determine their capability of supporting the following additional loading:

- (3) RRUS-32 B2 RRH's (27.2"x12.1"x7.0" – Wt. = 60 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)
- (2) Squid Surge Arrestors (24.0"x9.7" Ø – Wt. = 33 lbs. /each)
- **(3) TPA65R-BU6DA-K Antennas (71.2"x20.7"x7.7" – Wt. = 69 lbs. /each)**
- **(3) AIR6449 Antennas (30.6"x15.9"x10.6" – 82 lbs. /each)**
- **(3) AIR6419 Antennas (31.0"x16.1"x7.3" – Wt. = 66 lbs. /each)**
- **(3) DMP65R-BU6DA Antennas (71.2"x20.7"x7.7" – Wt. = 80 lbs. /each)**
- **(3) 4478 B14 RRH's (18.1"x13.4"x8.3" – Wt. = 60 lbs. /each)**
- **(3) 4449 B5/B12 RRH's (17.9"x13.2"x9.4" – Wt. = 73 lbs. /each)**
- **(1) Squid Surge Arrestor (24.0"x9.7" Ø – Wt. = 33 lbs.)**

**Proposed equipment shown in bold*

No original structural design documents or fabrication drawings were available for the existing mounts. HDG's subconsultant, ProVertic LLC, performed a survey climb and mapping of the existing AT&T antenna mounts on January 5, 2022. HDG conducted a ground audit of the existing AT&T antenna mounts on October 20, 2021.

Mount Analysis Methods:

- This analysis was conducted in accordance with EIA/TIA-222-H, Structural Standards for Steel Antenna Towers and Antenna Supporting Structures, the International Building Code 2015 with 2018 Connecticut State Building Code, and AT&T Mount Technical Directive – R16.
- HDG considers this mount to be asymmetrical and has applied wind loads in 30-degree increments all around the mount. Per TIA-222-H and Appendix N of the Connecticut State Building Code, the max basic wind speed for this site is equal to 130 mph with a max basic wind speed with ice of 50 mph and a max ice thickness of 1.0 in. An escalated ice thickness of 1.09 in was used for this analysis.
- HDG considers this site to be exposure category C; tower is located near large, flat, open, terrain/grasslands.
- HDG considers this site to be topographic category 1; tower is located on flat terrain or the bottom of a hill or ridge.
- HDG considers this site to have a spectral response acceleration parameter at short periods, S_S, of 0.180 and a spectral response acceleration parameter at a period of 1 second, S_1, of 0.063.
- The mount has been analyzed with load combinations consisting of 500 lbs live load using a service wind speed of 30 mph wind on the worst-case antenna. Analysis performed on each antenna pipe to determine worst case location; worst case location was antenna position 4.
- 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 self-supporting tower with threaded rods and steel plates and/or clamps tightened around the tower leg. HDG considers the threaded rods as the governing connection members.

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

	Component	Controlling Load Case	Stress Ratio	Pass/Fail
Existing Mount Rating	18	LC7	94%	**PASS**

Reference Documents:

- Mount mapping report prepared by ProVertic LLC.

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.

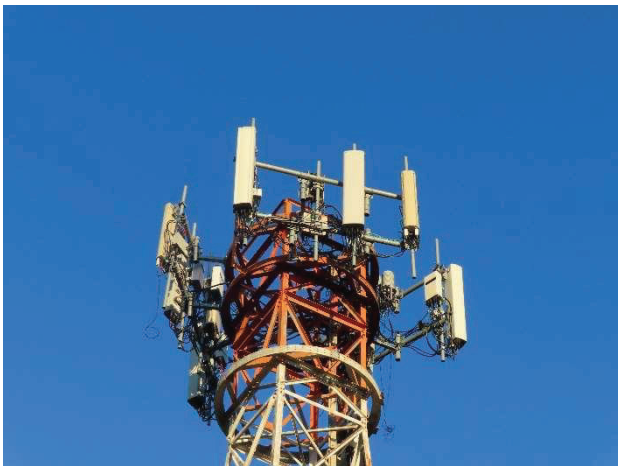
Please feel free to contact our office should you have any questions.

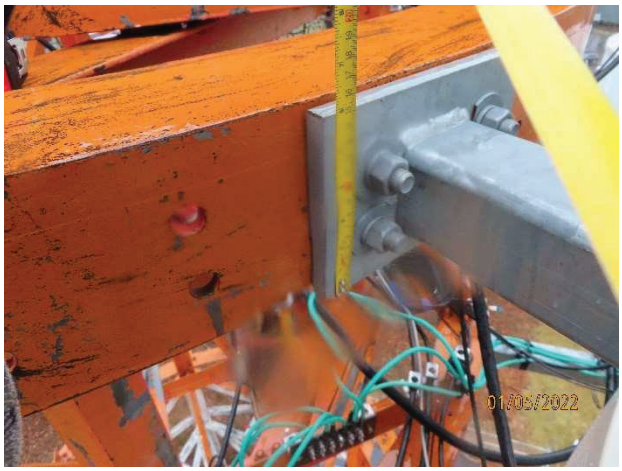
Respectfully Submitted,
Hudson Design Group LLC

Michael Cabral
Vice President

Daniel P. Hamm, PE
Principal

FIELD PHOTOS:





HUDSON
Design Group LLC

Wind & Ice
Calculations

Date: 1/21/2022
Project Name: PORTLAND
Project No.: CT1066
Designed By: CL **Checked By:** MSC

HUDSON Design Group LLC

2.6.5.2 Velocity Pressure Coeff:

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

z=	77	(ft)
z_g=	900	(ft)
α=	9.5	
K_z=	**1.198**	

$K_{zmin} \le K_z \le 2.01$

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

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

K_{zt}= 1

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

Category= **1**

K_h=	1	
K_c=	1	(from Table 2-4)
K_t=	0	(from Table 2-5)
f=	0	(from Table 2-5)
z=	77	
z_s=	350	(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 = 1.00 in
Importance Factor = I= 1.0 (from Table 2-3)
K_{iz} = 1.09 (from Sec. 2.6.10)

$t_{iz} = t_i * I * K_{iz} * (K_{zt})^{0.35}$ $\quad t_{iz}$ = 1.09 in

Date: 1/21/2022
Project Name: PORTLAND
Project No.: CT1066
Designed By: CL Checked By: MSC

HUDSON Design Group LLC

2.6.9 Gust Effect Factor

2.6.9.1 Self Supporting Lattice Structures

G_h = 1.0 Latticed Structures > 600 ft

G_h = 0.85 Latticed Structures 450 ft or less

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

h=	80	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=	1.198	(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=	**43.50**	K_e=	0.99	(from 2.6.8)
$q_{z\ (ice)}$=	**6.43**	K_d=	0.85	(from Table 2-2)
$q_{z\ (30)}$=	**2.32**	V_{max}=	130	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: 1/21/2022
Project Name: PORTLAND
Project No.: CT1066
Designed By: CL Checked By: MSC

HUDSON Design Group LLC

Determine Ca:

Table 2-9

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

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

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

Ice Thickness = 1.09 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)
TPA65R-BU6DA-K Antenna	71.2	20.7	7.7	10.24	3.44	1.24	553	93	29
AIR6449 Antenna	30.6	15.9	10.6	3.38	1.92	1.20	176	32	9
AIR6419 Antenna	31.0	16.1	7.3	3.47	1.93	1.20	181	33	10
DMP65R-BU6DA Antenna	71.2	20.7	7.7	10.24	3.44	1.24	553	93	29
RRUS-32 B66A RRH	27.2	12.1	7.0	2.29	2.25	1.20	119	22	6
RRUS-32 B66A RRH (Shielded)	27.2	6.1	7.0	1.14	4.50	1.29	64	14	3
RRUS-32 B2 RRH	27.2	7.0	12.1	1.32	3.89	1.26	73	15	4
RRUS-32 B2 RRH (Shielded)	27.2	3.5	12.1	0.66	7.77	1.43	41	11	2
4478 B14 RRH	18.1	8.3	13.4	1.04	2.18	1.20	54	11	3
4478 B14 RRH (Shielded)	18.1	4.2	13.4	0.52	4.36	1.28	29	7	2
RRUS-32 B30 RRH	27.2	7.0	12.1	1.32	3.89	1.26	73	15	4
RRUS-32 B30 RRH (Shielded)	27.2	3.5	12.1	0.66	7.77	1.43	41	11	2
4449 B5/B12 RRH	17.9	9.4	13.2	1.17	1.90	1.20	61	12	3
4449 B5/B12 RRH (Shielded)	17.9	4.7	13.2	0.58	3.81	1.26	32	8	2
Squid Surge Arrestor	24.0	9.7	9.7	1.62	2.47	0.70	49	10	3
2" Pipe	2.4	12.0		0.20	0.20	0.70	6		
3" Pipe	3.5	12.0		0.29	0.29	0.70	9		
HSS 3x3	3.0	12.0		0.25	0.25	1.20	13		

Date: 1/21/2022
Project Name: PORTLAND
Project No.: CT1066
Designed By: CL Checked By: MSC

HUDSON Design Group LLC

WIND LOADS

Angle =	30	(deg)	Ice Thickness =	1.09	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)	Force (lbs)	Force (lbs)
TPA65R-BU6DA-K Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	553	244	476
AIR6449 Antenna	30.6	15.9	10.6	3.38	2.25	1.92	2.89	1.20	1.22	176	119	162
AIR6419 Antenna	31.0	16.1	7.3	3.47	1.57	1.93	4.25	1.20	1.28	181	87	158
DMP65R-BU6DA Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	553	244	476
RRUS-32 B66A RRH	27.2	12.1	7.0	2.29	1.32	2.25	3.89	1.20	1.26	119	73	108
RRUS-32 B66A RRH (Shielded)	27.2	6.1	7.0	1.14	1.32	4.50	3.89	1.29	1.26	64	73	66
RRUS-32 B2 RRH	27.2	7.0	12.1	1.32	2.29	3.89	2.25	1.26	1.20	73	119	84
RRUS-32 B2 RRH (Shielded)	27.2	3.5	12.1	0.66	2.29	7.77	2.25	1.43	1.20	41	119	61
4478 B14 RRH	18.1	8.3	13.4	1.04	1.68	2.18	1.35	1.20	1.20	54	88	63
4478 B14 RRH (Shielded)	18.1	4.2	13.4	0.52	1.68	4.36	1.35	1.28	1.20	29	88	44
RRUS-32 B30 RRH	27.2	7.0	12.1	1.32	2.29	3.89	2.25	1.26	1.20	73	119	84
RRUS-32 B30 RRH (Shielded)	27.2	3.5	12.1	0.66	2.29	7.77	2.25	1.43	1.20	41	119	61
4449 B5/B12 RRH	17.9	9.4	13.2	1.17	1.64	1.90	1.36	1.20	1.20	61	86	67
4449 B5/B12 RRH (Shielded)	17.9	4.7	13.2	0.58	1.64	3.81	1.36	1.26	1.20	32	86	45

WIND LOADS WITH ICE:

TPA65R-BU6DA-K Antenna	73.4	22.9	9.9	11.66	5.03	3.21	7.43	1.23	1.41	92	46	81
AIR6449 Antenna	32.8	18.1	12.8	4.11	2.91	1.81	2.57	1.20	1.20	32	23	29
AIR6419 Antenna	33.2	18.3	9.5	4.21	2.18	1.82	3.50	1.20	1.24	33	17	29
DMP65R-BU6DA Antenna	73.4	22.9	9.9	11.66	5.03	3.21	7.43	1.23	1.41	92	46	81
RRUS-32 B66A RRH	29.4	14.3	9.2	2.91	1.87	2.06	3.20	1.20	1.23	22	15	21
RRUS-32 B66A RRH (Shielded)	29.4	7.1	9.2	1.46	1.87	4.12	3.20	1.27	1.23	12	15	13
RRUS-32 B2 RRH	29.4	9.2	14.3	1.87	2.91	3.20	2.06	1.23	1.20	15	22	17
RRUS-32 B2 RRH (Shielded)	29.4	4.6	14.3	0.94	2.91	6.40	2.06	1.37	1.20	8	22	12
4478 B14 RRH	20.3	10.5	15.6	1.48	2.19	1.94	1.30	1.20	1.20	11	17	13
4478 B14 RRH (Shielded)	20.3	5.2	15.6	0.74	2.19	3.87	1.30	1.26	1.20	6	17	9
RRUS-32 B30 RRH	29.4	9.2	14.3	1.87	2.91	3.20	2.06	1.23	1.20	15	22	17
RRUS-32 B30 RRH (Shielded)	29.4	4.6	14.3	0.94	2.91	6.40	2.06	1.37	1.20	8	22	12
4449 B5/B12 RRH	20.1	11.6	15.4	1.61	2.14	1.73	1.31	1.20	1.20	12	17	13
4449 B5/B12 RRH (Shielded)	20.1	5.8	15.4	0.81	2.14	3.47	1.31	1.24	1.20	6	17	9

WIND LOADS AT 30 MPH:

TPA65R-BU6DA-K Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	29	13	25
AIR6449 Antenna	30.6	15.9	10.6	3.38	2.25	1.92	2.89	1.20	1.22	9	6	9
AIR6419 Antenna	31.0	16.1	7.3	3.47	1.57	1.93	4.25	1.20	1.28	10	5	8
DMP65R-BU6DA Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	29	13	25
RRUS-32 B66A RRH	27.2	12.1	7.0	2.29	1.32	2.25	3.89	1.20	1.26	6	4	6
RRUS-32 B66A RRH (Shielded)	27.2	6.1	7.0	1.14	1.32	4.50	3.89	1.29	1.26	3	4	4
RRUS-32 B2 RRH	27.2	7.0	12.1	1.32	2.29	3.89	2.25	1.26	1.20	4	6	4
RRUS-32 B2 RRH (Shielded)	27.2	3.5	12.1	0.66	2.29	7.77	2.25	1.43	1.20	2	6	3
4478 B14 RRH	18.1	8.3	13.4	1.04	1.68	2.18	1.35	1.20	1.20	3	5	3
4478 B14 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 B30 RRH	27.2	7.0	12.1	1.32	2.29	3.89	2.25	1.26	1.20	4	6	4
RRUS-32 B30 RRH (Shielded)	27.2	3.5	12.1	0.66	2.29	7.77	2.25	1.43	1.20	2	6	3
4449 B5/B12 RRH	17.9	9.4	13.2	1.17	1.64	1.90	1.36	1.20	1.20	3	5	4
4449 B5/B12 RRH (Shielded)	17.9	4.7	13.2	0.58	1.64	3.81	1.36	1.26	1.20	2	5	2

Date: 1/21/2022
Project Name: PORTLAND
Project No.: CT1066
Designed By: CL Checked By: MSC

HUDSON Design Group LLC

WIND LOADS

Angle =	60	(deg)	Ice Thickness =	1.09	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)	Force (lbs)	Force (lbs)
TPA65R-BU6DA-K Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	553	244	321
AIR6449 Antenna	30.6	15.9	10.6	3.38	2.25	1.92	2.89	1.20	1.22	176	119	134
AIR6419 Antenna	31.0	16.1	7.3	3.47	1.57	1.93	4.25	1.20	1.28	181	87	111
DMP65R-BU6DA Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	553	244	321
RRUS-32 B66A RRH	27.2	12.1	7.0	2.29	1.32	2.25	3.89	1.20	1.26	119	73	84
RRUS-32 B66A RRH (Shielded)	27.2	9.1	7.0	1.71	1.32	3.00	3.89	1.22	1.26	91	73	77
RRUS-32 B2 RRH	27.2	7.0	12.1	1.32	2.29	3.89	2.25	1.26	1.20	73	119	108
RRUS-32 B2 RRH (Shielded)	27.2	5.3	12.1	0.99	2.29	5.18	2.25	1.32	1.20	57	119	104
4478 B14 RRH	18.1	8.3	13.4	1.04	1.68	2.18	1.35	1.20	1.20	54	88	80
4478 B14 RRH (Shielded)	18.1	6.2	13.4	0.78	1.68	2.91	1.35	1.22	1.20	41	88	76
RRUS-32 B30 RRH	27.2	7.0	12.1	1.32	2.29	3.89	2.25	1.26	1.20	73	119	108
RRUS-32 B30 RRH (Shielded)	27.2	5.3	12.1	0.99	2.29	5.18	2.25	1.32	1.20	57	119	104
4449 B5/B12 RRH	17.9	9.4	13.2	1.17	1.64	1.90	1.36	1.20	1.20	61	86	79
4449 B5/B12 RRH (Shielded)	17.9	7.1	13.2	0.88	1.64	2.54	1.36	1.20	1.20	46	86	76

WIND LOADS WITH ICE:

TPA65R-BU6DA-K Antenna	73.4	22.9	9.9	11.66	5.03	3.21	7.43	1.23	1.41	92	46	57
AIR6449 Antenna	32.8	18.1	12.8	4.11	2.91	1.81	2.57	1.20	1.20	32	23	25
AIR6419 Antenna	33.2	18.3	9.5	4.21	2.18	1.82	3.50	1.20	1.24	33	17	21
DMP65R-BU6DA Antenna	73.4	22.9	9.9	11.66	5.03	3.21	7.43	1.23	1.41	92	46	57
RRUS-32 B66A RRH	29.4	14.3	9.2	2.91	1.87	2.06	3.20	1.20	1.23	22	15	17
RRUS-32 B66A RRH (Shielded)	29.4	10.7	9.2	2.18	1.87	2.74	3.20	1.21	1.23	17	15	15
RRUS-32 B2 RRH	29.4	9.2	14.3	1.87	2.91	3.20	2.06	1.23	1.20	15	22	21
RRUS-32 B2 RRH (Shielded)	29.4	6.9	14.3	1.40	2.91	4.27	2.06	1.28	1.20	12	22	20
4478 B14 RRH	20.3	10.5	15.6	1.48	2.19	1.94	1.30	1.20	1.20	11	17	16
4478 B14 RRH (Shielded)	20.3	7.9	15.6	1.11	2.19	2.58	1.30	1.20	1.20	9	17	15
RRUS-32 B30 RRH	29.4	9.2	14.3	1.87	2.91	3.20	2.06	1.23	1.20	15	22	21
RRUS-32 B30 RRH (Shielded)	29.4	6.9	14.3	1.40	2.91	4.27	2.06	1.28	1.20	12	22	20
4449 B5/B12 RRH	20.1	11.6	15.4	1.61	2.14	1.73	1.31	1.20	1.20	12	17	16
4449 B5/B12 RRH (Shielded)	20.1	8.7	15.4	1.21	2.14	2.31	1.31	1.20	1.20	9	17	15

WIND LOADS AT 30 MPH:

TPA65R-BU6DA-K Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	29	13	17
AIR6449 Antenna	30.6	15.9	10.6	3.38	2.25	1.92	2.89	1.20	1.22	9	6	7
AIR6419 Antenna	31.0	16.1	7.3	3.47	1.57	1.93	4.25	1.20	1.28	10	5	6
DMP65R-BU6DA Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	29	13	17
RRUS-32 B66A RRH	27.2	12.1	7.0	2.29	1.32	2.25	3.89	1.20	1.26	6	4	4
RRUS-32 B66A RRH (Shielded)	27.2	9.1	7.0	1.71	1.32	3.00	3.89	1.22	1.26	5	4	4
RRUS-32 B2 RRH	27.2	7.0	12.1	1.32	2.29	3.89	2.25	1.26	1.20	4	6	6
RRUS-32 B2 RRH (Shielded)	27.2	5.3	12.1	0.99	2.29	5.18	2.25	1.32	1.20	3	6	6
4478 B14 RRH	18.1	8.3	13.4	1.04	1.68	2.18	1.35	1.20	1.20	3	5	4
4478 B14 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 B30 RRH	27.2	7.0	12.1	1.32	2.29	3.89	2.25	1.26	1.20	4	6	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	6	6
4449 B5/B12 RRH	17.9	9.4	13.2	1.17	1.64	1.90	1.36	1.20	1.20	3	5	4
4449 B5/B12 RRH (Shielded)	17.9	7.1	13.2	0.88	1.64	2.54	1.36	1.20	1.20	2	5	4

Date: 1/21/2022
Project Name: PORTLAND
Project No.: CT1066
Designed By: CL Checked By: MSC

HUDSON Design Group LLC

WIND LOADS

Angle =	90	(deg)	Ice Thickness =	1.09	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)	Force (lbs)	Force (lbs)
TPA65R-BU6DA-K Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	553	244	244
AIR6449 Antenna	30.6	15.9	10.6	3.38	2.25	1.92	2.89	1.20	1.22	176	119	119
AIR6419 Antenna	31.0	16.1	7.3	3.47	1.57	1.93	4.25	1.20	1.28	181	87	87
DMP65R-BU6DA Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	553	244	244
RRUS-32 B66A RRH	27.2	12.1	7.0	2.29	1.32	2.25	3.89	1.20	1.26	119	73	73
RRUS-32 B66A RRH (Shielded)	27.2	6.1	7.0	1.14	1.32	4.50	3.89	1.29	1.26	64	73	73
RRUS-32 B2 RRH	27.2	7.0	12.1	1.32	2.29	3.89	2.25	1.26	1.20	73	119	119
RRUS-32 B2 RRH (Shielded)	27.2	3.5	12.1	0.66	2.29	7.77	2.25	1.43	1.20	41	119	119
4478 B14 RRH	18.1	8.3	13.4	1.04	1.68	2.18	1.35	1.20	1.20	54	88	88
4478 B14 RRH (Shielded)	18.1	4.2	13.4	0.52	1.68	4.36	1.35	1.28	1.20	29	88	88
RRUS-32 B30 RRH	27.2	7.0	12.1	1.32	2.29	3.89	2.25	1.26	1.20	73	119	119
RRUS-32 B30 RRH (Shielded)	27.2	3.5	12.1	0.66	2.29	7.77	2.25	1.43	1.20	41	119	119
4449 B5/B12 RRH	17.9	9.4	13.2	1.17	1.64	1.90	1.36	1.20	1.20	61	86	86
4449 B5/B12 RRH (Shielded)	17.9	4.7	13.2	0.58	1.64	3.81	1.36	1.26	1.20	32	86	86

WIND LOADS WITH ICE:

TPA65R-BU6DA-K Antenna	73.4	22.9	9.9	11.66	5.03	3.21	7.43	1.23	1.41	92	46	46
AIR6449 Antenna	32.8	18.1	12.8	4.11	2.91	1.81	2.57	1.20	1.20	32	23	23
AIR6419 Antenna	33.2	18.3	9.5	4.21	2.18	1.82	3.50	1.20	1.24	33	17	17
DMP65R-BU6DA Antenna	73.4	22.9	9.9	11.66	5.03	3.21	7.43	1.23	1.41	92	46	46
RRUS-32 B66A RRH	29.4	14.3	9.2	2.91	1.87	2.06	3.20	1.20	1.23	22	15	15
RRUS-32 B66A RRH (Shielded)	29.4	8.2	9.2	1.68	1.87	3.57	3.20	1.25	1.23	13	15	15
RRUS-32 B2 RRH	29.4	9.2	14.3	1.87	2.91	3.20	2.06	1.23	1.20	15	22	22
RRUS-32 B2 RRH (Shielded)	29.4	5.7	14.3	1.16	2.91	5.17	2.06	1.32	1.20	10	22	22
4478 B14 RRH	20.3	10.5	15.6	1.48	2.19	1.94	1.30	1.20	1.20	11	17	17
4478 B14 RRH (Shielded)	20.3	6.3	15.6	0.89	2.19	3.20	1.30	1.23	1.20	7	17	17
RRUS-32 B30 RRH	29.4	9.2	14.3	1.87	2.91	3.20	2.06	1.23	1.20	15	22	22
RRUS-32 B30 RRH (Shielded)	29.4	5.7	14.3	1.16	2.91	5.17	2.06	1.32	1.20	10	22	22
4449 B5/B12 RRH	20.1	11.6	15.4	1.61	2.14	1.73	1.31	1.20	1.20	12	17	17
4449 B5/B12 RRH (Shielded)	20.1	6.9	15.4	0.96	2.14	2.92	1.31	1.22	1.20	8	17	17

WIND LOADS AT 30 MPH:

TPA65R-BU6DA-K Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	29	13	13
AIR6449 Antenna	30.6	15.9	10.6	3.38	2.25	1.92	2.89	1.20	1.22	9	6	6
AIR6419 Antenna	31.0	16.1	7.3	3.47	1.57	1.93	4.25	1.20	1.28	10	5	5
DMP65R-BU6DA Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	29	13	13
RRUS-32 B66A RRH	27.2	12.1	7.0	2.29	1.32	2.25	3.89	1.20	1.26	6	4	4
RRUS-32 B66A RRH (Shielded)	27.2	6.1	7.0	1.14	1.32	4.50	3.89	1.29	1.26	3	4	4
RRUS-32 B2 RRH	27.2	7.0	12.1	1.32	2.29	3.89	2.25	1.26	1.20	4	6	6
RRUS-32 B2 RRH (Shielded)	27.2	3.5	12.1	0.66	2.29	7.77	2.25	1.43	1.20	2	6	6
4478 B14 RRH	18.1	8.3	13.4	1.04	1.68	2.18	1.35	1.20	1.20	3	5	5
4478 B14 RRH (Shielded)	18.1	4.2	13.4	0.52	1.68	4.36	1.35	1.28	1.20	2	5	5
RRUS-32 B30 RRH	27.2	7.0	12.1	1.32	2.29	3.89	2.25	1.26	1.20	4	6	6
RRUS-32 B30 RRH (Shielded)	27.2	3.5	12.1	0.66	2.29	7.77	2.25	1.43	1.20	2	6	6
4449 B5/B12 RRH	17.9	9.4	13.2	1.17	1.64	1.90	1.36	1.20	1.20	3	5	5
4449 B5/B12 RRH (Shielded)	17.9	4.7	13.2	0.58	1.64	3.81	1.36	1.26	1.20	2	5	5

Date: 1/21/2022
Project Name: PORTLAND
Project No.: CT1066
Designed By: CL Checked By: MSC

HUDSON Design Group LLC

WIND LOADS

Angle =	120	(deg)	Ice Thickness =	1.09	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)	Force (lbs)	Force (lbs)
TPA65R-BU6DA-K Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	553	244	321
AIR6449 Antenna	30.6	15.9	10.6	3.38	2.25	1.92	2.89	1.20	1.22	176	119	134
AIR6419 Antenna	31.0	16.1	7.3	3.47	1.57	1.93	4.25	1.20	1.28	181	87	111
DMP65R-BU6DA Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	553	244	321
RRUS-32 B66A RRH	27.2	12.1	7.0	2.29	1.32	2.25	3.89	1.20	1.26	119	73	84
RRUS-32 B66A RRH (Shielded)	27.2	9.1	7.0	1.71	1.32	3.00	3.89	1.22	1.26	91	73	77
RRUS-32 B2 RRH	27.2	7.0	12.1	1.32	2.29	3.89	2.25	1.26	1.20	73	119	108
RRUS-32 B2 RRH (Shielded)	27.2	5.3	12.1	0.99	2.29	5.18	2.25	1.32	1.20	57	119	104
4478 B14 RRH	18.1	8.3	13.4	1.04	1.68	2.18	1.35	1.20	1.20	54	88	80
4478 B14 RRH (Shielded)	18.1	6.2	13.4	0.78	1.68	2.91	1.35	1.22	1.20	41	88	76
RRUS-32 B30 RRH	27.2	7.0	12.1	1.32	2.29	3.89	2.25	1.26	1.20	73	119	108
RRUS-32 B30 RRH (Shielded)	27.2	5.3	12.1	0.99	2.29	5.18	2.25	1.32	1.20	57	119	104
4449 B5/B12 RRH	17.9	9.4	13.2	1.17	1.64	1.90	1.36	1.20	1.20	61	86	79
4449 B5/B12 RRH (Shielded)	17.9	7.1	13.2	0.88	1.64	2.54	1.36	1.20	1.20	46	86	76

WIND LOADS WITH ICE:

TPA65R-BU6DA-K Antenna	73.4	22.9	9.9	11.66	5.03	3.21	7.43	1.23	1.41	92	46	57
AIR6449 Antenna	32.8	18.1	12.8	4.11	2.91	1.81	2.57	1.20	1.20	32	23	25
AIR6419 Antenna	33.2	18.3	9.5	4.21	2.18	1.82	3.50	1.20	1.24	33	17	21
DMP65R-BU6DA Antenna	73.4	22.9	9.9	11.66	5.03	3.21	7.43	1.23	1.41	92	46	57
RRUS-32 B66A RRH	29.4	14.3	9.2	2.91	1.87	2.06	3.20	1.20	1.23	22	15	17
RRUS-32 B66A RRH (Shielded)	29.4	10.7	9.2	2.18	1.87	2.74	3.20	1.21	1.23	17	15	15
RRUS-32 B2 RRH	29.4	9.2	14.3	1.87	2.91	3.20	2.06	1.23	1.20	15	22	21
RRUS-32 B2 RRH (Shielded)	29.4	6.9	14.3	1.40	2.91	4.27	2.06	1.28	1.20	12	22	20
4478 B14 RRH	20.3	10.5	15.6	1.48	2.19	1.94	1.30	1.20	1.20	11	17	16
4478 B14 RRH (Shielded)	20.3	7.9	15.6	1.11	2.19	2.58	1.30	1.20	1.20	9	17	15
RRUS-32 B30 RRH	29.4	9.2	14.3	1.87	2.91	3.20	2.06	1.23	1.20	15	22	21
RRUS-32 B30 RRH (Shielded)	29.4	6.9	14.3	1.40	2.91	4.27	2.06	1.28	1.20	12	22	20
4449 B5/B12 RRH	20.1	11.6	15.4	1.61	2.14	1.73	1.31	1.20	1.20	12	17	16
4449 B5/B12 RRH (Shielded)	20.1	8.7	15.4	1.21	2.14	2.31	1.31	1.20	1.20	9	17	15

WIND LOADS AT 30 MPH:

TPA65R-BU6DA-K Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	29	13	17
AIR6449 Antenna	30.6	15.9	10.6	3.38	2.25	1.92	2.89	1.20	1.22	9	6	7
AIR6419 Antenna	31.0	16.1	7.3	3.47	1.57	1.93	4.25	1.20	1.28	10	5	6
DMP65R-BU6DA Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	29	13	17
RRUS-32 B66A RRH	27.2	12.1	7.0	2.29	1.32	2.25	3.89	1.20	1.26	6	4	4
RRUS-32 B66A RRH (Shielded)	27.2	9.1	7.0	1.71	1.32	3.00	3.89	1.22	1.26	5	4	4
RRUS-32 B2 RRH	27.2	7.0	12.1	1.32	2.29	3.89	2.25	1.26	1.20	4	6	6
RRUS-32 B2 RRH (Shielded)	27.2	5.3	12.1	0.99	2.29	5.18	2.25	1.32	1.20	3	6	6
4478 B14 RRH	18.1	8.3	13.4	1.04	1.68	2.18	1.35	1.20	1.20	3	5	4
4478 B14 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 B30 RRH	27.2	7.0	12.1	1.32	2.29	3.89	2.25	1.26	1.20	4	6	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	6	6
4449 B5/B12 RRH	17.9	9.4	13.2	1.17	1.64	1.90	1.36	1.20	1.20	3	5	4
4449 B5/B12 RRH (Shielded)	17.9	7.1	13.2	0.88	1.64	2.54	1.36	1.20	1.20	2	5	4

Date: 1/21/2022
Project Name: PORTLAND
Project No.: CT1066
Designed By: CL Checked By: MSC

HUDSON Design Group LLC

WIND LOADS

Angle = 150 (deg)

Ice Thickness = 1.09 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)	Force (lbs)	Force (lbs)
TPA65R-BU6DA-K Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	553	244	476
AIR6449 Antenna	30.6	15.9	10.6	3.38	2.25	1.92	2.89	1.20	1.22	176	119	162
AIR6419 Antenna	31.0	16.1	7.3	3.47	1.57	1.93	4.25	1.20	1.28	181	87	158
DMP65R-BU6DA Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	553	244	476
RRUS-32 B66A RRH	27.2	12.1	7.0	2.29	1.32	2.25	3.89	1.20	1.26	119	73	108
RRUS-32 B66A RRH (Shielded)	27.2	6.1	7.0	1.14	1.32	4.50	3.89	1.29	1.26	64	73	66
RRUS-32 B2 RRH	27.2	7.0	12.1	1.32	2.29	3.89	2.25	1.26	1.20	73	119	84
RRUS-32 B2 RRH (Shielded)	27.2	3.5	12.1	0.66	2.29	7.77	2.25	1.43	1.20	41	119	61
4478 B14 RRH	18.1	8.3	13.4	1.04	1.68	2.18	1.35	1.20	1.20	54	88	63
4478 B14 RRH (Shielded)	18.1	4.2	13.4	0.52	1.68	4.36	1.35	1.28	1.20	29	88	44
RRUS-32 B30 RRH	27.2	7.0	12.1	1.32	2.29	3.89	2.25	1.26	1.20	73	119	84
RRUS-32 B30 RRH (Shielded)	27.2	3.5	12.1	0.66	2.29	7.77	2.25	1.43	1.20	41	119	61
4449 B5/B12 RRH	17.9	9.4	13.2	1.17	1.64	1.90	1.36	1.20	1.20	61	86	67
4449 B5/B12 RRH (Shielded)	17.9	4.7	13.2	0.58	1.64	3.81	1.36	1.26	1.20	32	86	45

WIND LOADS WITH ICE:

TPA65R-BU6DA-K Antenna	73.4	22.9	9.9	11.66	5.03	3.21	7.43	1.23	1.41	92	46	81
AIR6449 Antenna	32.8	18.1	12.8	4.11	2.91	1.81	2.57	1.20	1.20	32	23	29
AIR6419 Antenna	33.2	18.3	9.5	4.21	2.18	1.82	3.50	1.20	1.24	33	17	29
DMP65R-BU6DA Antenna	73.4	22.9	9.9	11.66	5.03	3.21	7.43	1.23	1.41	92	46	81
RRUS-32 B66A RRH	29.4	14.3	9.2	2.91	1.87	2.06	3.20	1.20	1.23	22	15	21
RRUS-32 B66A RRH (Shielded)	29.4	7.1	9.2	1.46	1.87	4.12	3.20	1.27	1.23	12	15	13
RRUS-32 B2 RRH	29.4	9.2	14.3	1.87	2.91	3.20	2.06	1.23	1.20	15	22	17
RRUS-32 B2 RRH (Shielded)	29.4	4.6	14.3	0.94	2.91	6.40	2.06	1.37	1.20	8	22	12
4478 B14 RRH	20.3	10.5	15.6	1.48	2.19	1.94	1.30	1.20	1.20	11	17	13
4478 B14 RRH (Shielded)	20.3	5.2	15.6	0.74	2.19	3.87	1.30	1.26	1.20	6	17	9
RRUS-32 B30 RRH	29.4	9.2	14.3	1.87	2.91	3.20	2.06	1.23	1.20	15	22	17
RRUS-32 B30 RRH (Shielded)	29.4	4.6	14.3	0.94	2.91	6.40	2.06	1.37	1.20	8	22	12
4449 B5/B12 RRH	20.1	11.6	15.4	1.61	2.14	1.73	1.31	1.20	1.20	12	17	13
4449 B5/B12 RRH (Shielded)	20.1	5.8	15.4	0.81	2.14	3.47	1.31	1.24	1.20	6	17	9

WIND LOADS AT 30 MPH:

TPA65R-BU6DA-K Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	29	13	25
AIR6449 Antenna	30.6	15.9	10.6	3.38	2.25	1.92	2.89	1.20	1.22	9	6	9
AIR6419 Antenna	31.0	16.1	7.3	3.47	1.57	1.93	4.25	1.20	1.28	10	5	8
DMP65R-BU6DA Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	29	13	25
RRUS-32 B66A RRH	27.2	12.1	7.0	2.29	1.32	2.25	3.89	1.20	1.26	6	4	6
RRUS-32 B66A RRH (Shielded)	27.2	6.1	7.0	1.14	1.32	4.50	3.89	1.29	1.26	3	4	4
RRUS-32 B2 RRH	27.2	7.0	12.1	1.32	2.29	3.89	2.25	1.26	1.20	4	6	4
RRUS-32 B2 RRH (Shielded)	27.2	3.5	12.1	0.66	2.29	7.77	2.25	1.43	1.20	2	6	3
4478 B14 RRH	18.1	8.3	13.4	1.04	1.68	2.18	1.35	1.20	1.20	3	5	3
4478 B14 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 B30 RRH	27.2	7.0	12.1	1.32	2.29	3.89	2.25	1.26	1.20	4	6	4
RRUS-32 B30 RRH (Shielded)	27.2	3.5	12.1	0.66	2.29	7.77	2.25	1.43	1.20	2	6	3
4449 B5/B12 RRH	17.9	9.4	13.2	1.17	1.64	1.90	1.36	1.20	1.20	3	5	4
4449 B5/B12 RRH (Shielded)	17.9	4.7	13.2	0.58	1.64	3.81	1.36	1.26	1.20	2	5	2

Date: 1/21/2022
Project Name: PORTLAND
Project No.: CT1066
Designed By: CL **Checked By:** MSC

HUDSON Design Group LLC

ICE WEIGHT CALCULATIONS

Thickness of ice: 1.09 in.
Density of ice: 56 pcf

TPA65R-BU6DA-K Antenna

Weight of ice based on total radial SF area:

Height (in):	71.2	
Width (in):	20.7	
Depth (in):	7.7	
Total weight of ice on object:		183 lbs
Weight of object:	69.0 lbs	
Combined weight of ice and object:		252 lbs

AIR6449 Antenna

Weight of ice based on total radial SF area:

Height (in):	30.6	
Width (in):	15.9	
Depth (in):	10.6	
Total weight of ice on object:		69 lbs
Weight of object:	82.0 lbs	
Combined weight of ice and object:		151 lbs

AIR6419 Antenna

Weight of ice based on total radial SF area:

Height (in):	31.0	
Width (in):	16.1	
Depth (in):	7.3	
Total weight of ice on object:		65 lbs
Weight of object:	66.0 lbs	
Combined weight of ice and object:		131 lbs

DMP65R-BU6DA Antenna

Weight of ice based on total radial SF area:

Height (in):	71.2	
Width (in):	20.7	
Depth (in):	7.7	
Total weight of ice on object:		183 lbs
Weight of object:	80.0 lbs	
Combined weight of ice and object:		263 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:		45 lbs
Weight of object:	60.0 lbs	
Combined weight of ice and object:		105 lbs

RRUS-32 B2 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:		45 lbs
Weight of object:	60.0 lbs	
Combined weight of ice and object:		105 lbs

4478 B14 RRH

Weight of ice based on total radial SF area:

Height (in):	18.1	
Width (in):	13.4	
Depth (in):	8.3	
Total weight of ice on object:		34 lbs
Weight of object:	60.0 lbs	
Combined weight of ice and object:		94 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:		45 lbs
Weight of object:	60.0 lbs	
Combined weight of ice and object:		105 lbs

4449 B5/B12 RRH

Weight of ice based on total radial SF area:

Height (in):	17.9	
Width (in):	13.2	
Depth (in):	9.4	
Total weight of ice on object:		34 lbs
Weight of object:	73.0 lbs	
Combined weight of ice and object:		107 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:		29 lbs
Weight of object:	33 lbs	
Combined weight of ice and object:		62 lbs

2" Pipe

Per foot weight of ice:

diameter (in):	2.38	
Per foot weight of ice on object:		5 plf

3" Pipe

Per foot weight of ice:

diameter (in):	3.5	
Per foot weight of ice on object:		6 plf

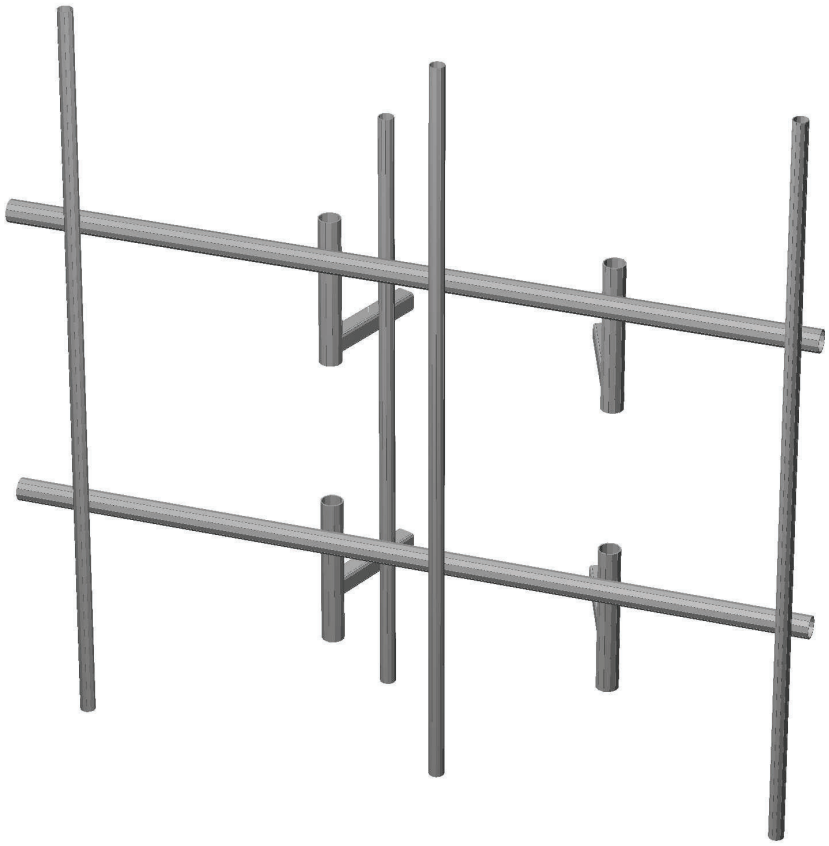
HSS 3x3

Weight of ice based on total radial SF area:

Height (in):	3	
Width (in):	3	
Per foot weight of ice on object:		7 plf

HUDSON
Design Group LLC

Mount Calculations
(Existing Conditions)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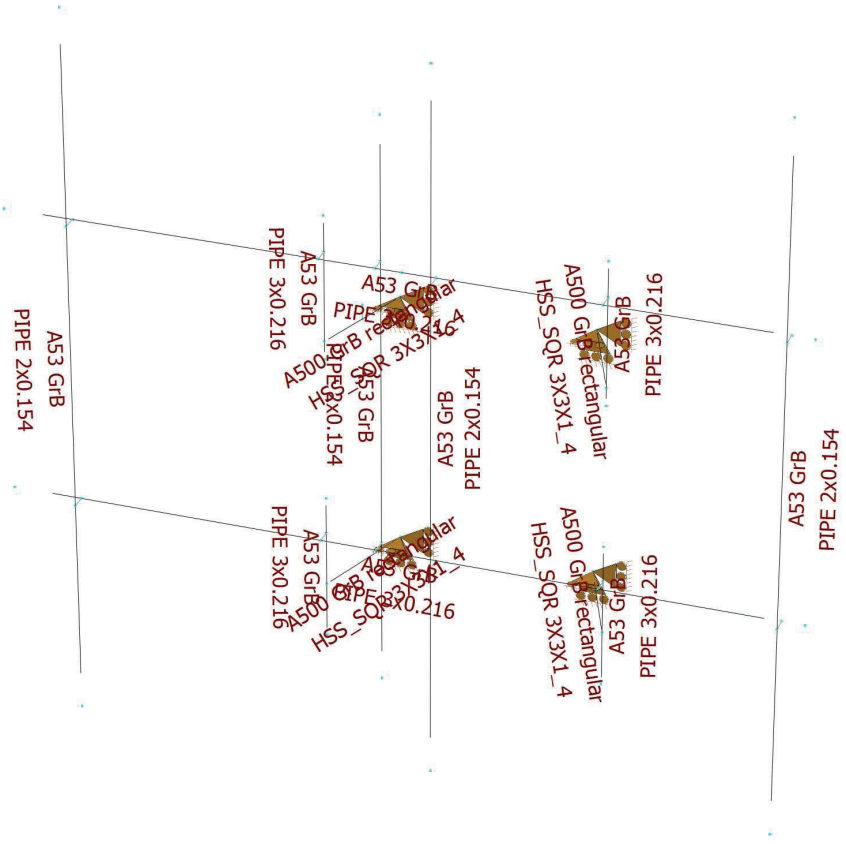
X
Z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PIPE 2x0.154
A53 GrB
PIPE 3x0.216
A500 GrB Rectangular
HSS_SQR 3X3X1_4
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PIPE 3x0.216
A53 GrB
PIPE 2x0.154
A53 GrB
PIPE 2x0.154
A53 GrB
PIPE 3x0.216
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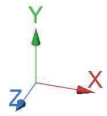
PIPE 2x0.154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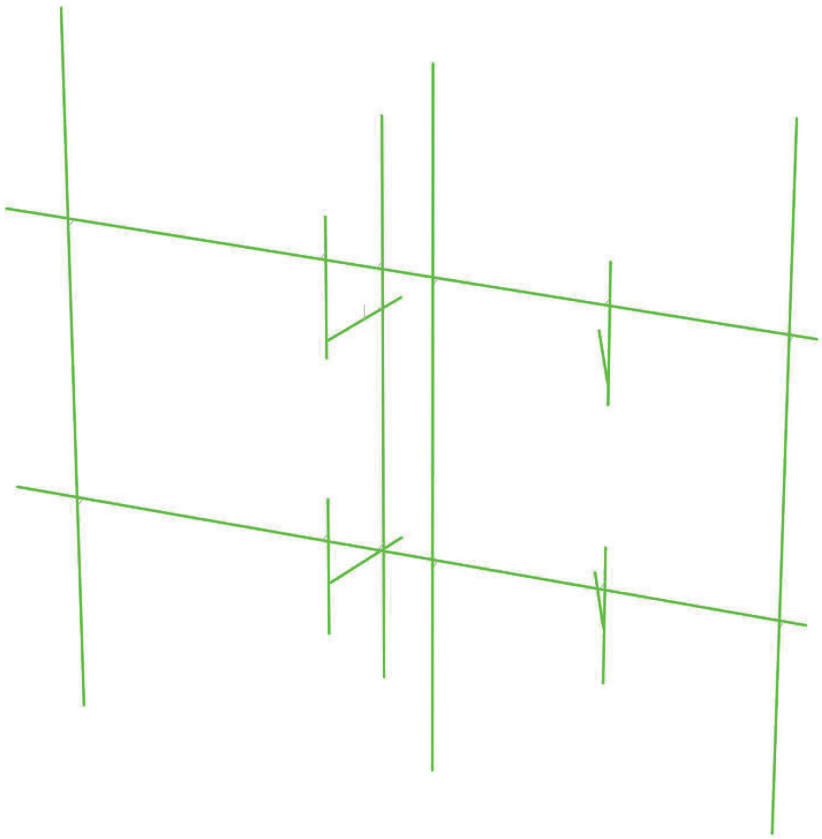
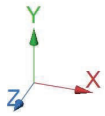
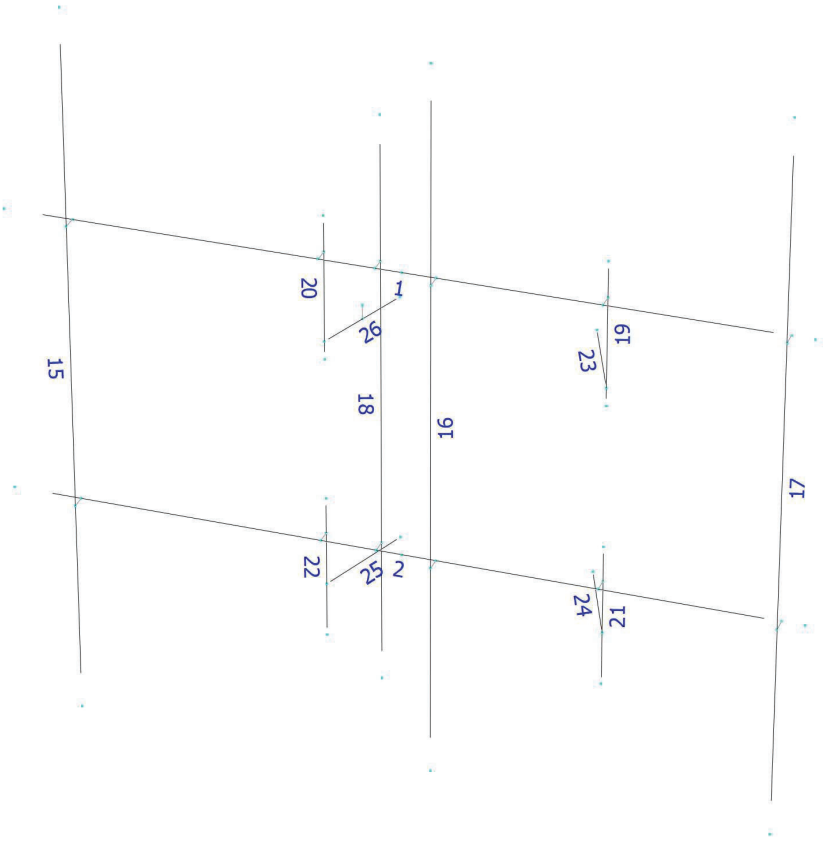
Design status
- Not designed
- Error on design
- Design O.K.
- With warnings



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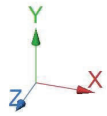

Y
X
Z

Current Date: 1/21/2022 1:21 PM
Units system: English

Load data

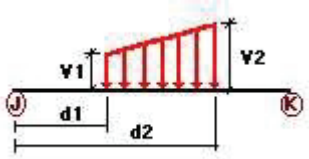
GLOSSARY

Comb : Indicates if load condition is a load combination

Load Conditions

Condition	Description	Comb.	Category
D	Dead Load	No	DL
Wo	Wind Load (NO ICE)	No	WIND
W30	WL 30deg	No	WIND
W60	WL 60deg	No	WIND
W90	WL 90deg	No	WIND
W120	WL 120deg	No	WIND
W150	WL 150deg	No	WIND
Di	Ice Load	No	LL
WI0	WL ICE 0deg	No	WIND
WI30	WL ICE 30deg	No	WIND
WI60	WL ICE 60deg	No	WIND
WI90	WL ICE 90deg	No	WIND
WI120	WL ICE 120deg	No	WIND
WI150	WL ICE 150deg	No	WIND
WL0	WL 30 mph 0deg	No	WIND
WL30	WL 30 mph 30deg	No	WIND
WL60	WL 30 mph 60deg	No	WIND
WL90	WL 30 mph 90deg	No	WIND
WL120	WL 30 mph 120deg	No	WIND
WL150	WL 30 mph 150deg	No	WIND
LL1	250 lb Live Load Center of Mount	No	LL
LL2	250 lb Live Load Right End of Mount	No	LL
LL3	250 lb Live Load Left End of Mount	No	LL
LLa1	500 lb Live Load Antenna 1	No	LL
LLa2	500 lb Live Load Antenna 2	No	LL
LLa3	500 lb Live Load Antenna 3	No	LL
LLa4	500 lb Live Load Antenna 4	No	LL

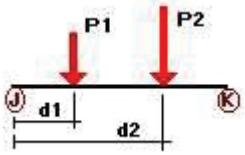
Distributed force on members



Condition	Member	Dir1	Val1 [Kip/ft]	Val2 [Kip/ft]	Dist1 [ft]	%	Dist2 [ft]	%
Wo	1	z	-0.009	-0.009	0.00	No	100.00	Yes
	2	z	-0.009	-0.009	0.00	No	100.00	Yes
	18	z	-0.006	-0.006	0.00	No	100.00	Yes
	19	z	-0.009	-0.009	0.00	No	100.00	Yes
	20	z	-0.009	-0.009	0.00	No	100.00	Yes
	21	z	-0.009	-0.009	0.00	No	100.00	Yes
	22	z	-0.009	-0.009	0.00	No	100.00	Yes
	23	z	-0.013	-0.013	0.00	No	100.00	Yes
	24	z	-0.013	-0.013	0.00	No	100.00	Yes
	25	z	-0.013	-0.013	0.00	No	100.00	Yes
	26	z	-0.013	-0.013	0.00	No	100.00	Yes
W30	1	z	-0.009	-0.009	0.00	No	100.00	Yes
	2	z	-0.009	-0.009	0.00	No	100.00	Yes
	18	z	-0.006	-0.006	0.00	No	100.00	Yes
	19	z	-0.009	-0.009	0.00	No	100.00	Yes
	20	z	-0.009	-0.009	0.00	No	100.00	Yes
	21	z	-0.009	-0.009	0.00	No	100.00	Yes
	22	z	-0.009	-0.009	0.00	No	100.00	Yes
	23	z	-0.013	-0.013	0.00	No	100.00	Yes
	24	z	-0.013	-0.013	0.00	No	100.00	Yes
	25	z	-0.013	-0.013	0.00	No	100.00	Yes
	26	z	-0.013	-0.013	0.00	No	100.00	Yes
W60	15	x	-0.006	-0.006	0.00	No	100.00	Yes
	16	x	-0.006	-0.006	0.00	No	100.00	Yes
	17	x	-0.006	-0.006	0.00	No	100.00	Yes
	18	x	-0.006	-0.006	0.00	No	100.00	Yes
	19	x	-0.009	-0.009	0.00	No	100.00	Yes
	20	x	-0.009	-0.009	0.00	No	100.00	Yes
	21	x	-0.009	-0.009	0.00	No	100.00	Yes
	22	x	-0.009	-0.009	0.00	No	100.00	Yes
	23	x	-0.013	-0.013	0.00	No	100.00	Yes
	24	x	-0.013	-0.013	0.00	No	100.00	Yes
	25	x	-0.013	-0.013	0.00	No	100.00	Yes
	26	x	-0.013	-0.013	0.00	No	100.00	Yes
W90	15	x	-0.006	-0.006	0.00	No	100.00	Yes
	16	x	-0.006	-0.006	0.00	No	100.00	Yes
	17	x	-0.006	-0.006	0.00	No	100.00	Yes
	18	x	-0.006	-0.006	0.00	No	100.00	Yes
	19	x	-0.009	-0.009	0.00	No	100.00	Yes
	20	x	-0.009	-0.009	0.00	No	100.00	Yes
	21	x	-0.009	-0.009	0.00	No	100.00	Yes
	22	x	-0.009	-0.009	0.00	No	100.00	Yes
	23	x	-0.013	-0.013	0.00	No	100.00	Yes
	24	x	-0.013	-0.013	0.00	No	100.00	Yes
	25	x	-0.013	-0.013	0.00	No	100.00	Yes
	26	x	-0.013	-0.013	0.00	No	100.00	Yes
W120	15	x	-0.006	-0.006	0.00	No	100.00	Yes
	16	x	-0.006	-0.006	0.00	No	100.00	Yes
	17	x	-0.006	-0.006	0.00	No	100.00	Yes
	18	x	-0.006	-0.006	0.00	No	100.00	Yes
	19	x	-0.009	-0.009	0.00	No	100.00	Yes
	20	x	-0.009	-0.009	0.00	No	100.00	Yes
	21	x	-0.009	-0.009	0.00	No	100.00	Yes
	22	x	-0.009	-0.009	0.00	No	100.00	Yes
	23	x	-0.013	-0.013	0.00	No	100.00	Yes
	24	x	-0.013	-0.013	0.00	No	100.00	Yes
	25	x	-0.013	-0.013	0.00	No	100.00	Yes
	26	x	-0.013	-0.013	0.00	No	100.00	Yes
W150	1	z	0.009	0.009	0.00	No	100.00	Yes
	2	z	0.009	0.009	0.00	No	100.00	Yes

	15	z	0.006	0.006	0.00	No	100.00	Yes
	16	z	0.006	0.006	0.00	No	100.00	Yes
	17	z	0.006	0.006	0.00	No	100.00	Yes
	18	z	0.006	0.006	0.00	No	100.00	Yes
	19	z	0.009	0.009	0.00	No	100.00	Yes
	20	z	0.009	0.009	0.00	No	100.00	Yes
	21	z	0.009	0.009	0.00	No	100.00	Yes
	22	z	0.009	0.009	0.00	No	100.00	Yes
	23	z	0.013	0.013	0.00	No	100.00	Yes
	24	z	0.013	0.013	0.00	No	100.00	Yes
	25	z	0.013	0.013	0.00	No	100.00	Yes
	26	z	0.013	0.013	0.00	No	100.00	Yes
Di	1	y	-0.006	-0.006	0.00	No	100.00	Yes
	2	y	-0.006	-0.006	0.00	No	100.00	Yes
	15	y	-0.005	-0.005	0.00	No	100.00	Yes
	16	y	-0.005	-0.005	0.00	No	100.00	Yes
	17	y	-0.005	-0.005	0.00	No	100.00	Yes
	18	y	-0.005	-0.005	0.00	No	100.00	Yes
	19	y	-0.006	-0.006	0.00	No	100.00	Yes
	20	y	-0.006	-0.006	0.00	No	100.00	Yes
	21	y	-0.006	-0.006	0.00	No	100.00	Yes
	22	y	-0.006	-0.006	0.00	No	100.00	Yes
	23	y	-0.007	-0.007	0.00	No	100.00	Yes
	24	y	-0.007	-0.007	0.00	No	100.00	Yes
	25	y	-0.007	-0.007	0.00	No	100.00	Yes
	26	y	-0.007	-0.007	0.00	No	100.00	Yes

Concentrated forces on members



Condition	Member	Dir1	Value1 [Kip]	Dist1 [ft]	%
D	15	y	-0.04	2.50	No
		y	-0.04	7.50	No
		y	-0.073	5.00	No
		y	-0.06	5.00	No
	16	y	-0.041	2.00	No
		y	-0.041	4.50	No
		y	-0.033	5.50	No
		y	-0.033	8.00	No
	17	y	-0.035	2.50	No
		y	-0.035	7.50	No
		y	-0.06	4.00	No
		y	-0.06	6.00	No
		y	-0.06	6.00	No
	18	y	-0.033	1.50	No
	27	y	-0.033	0.20	No
Wo	15	z	-0.267	2.50	No
		z	-0.267	7.50	No
		z	-0.032	5.00	No
		z	-0.041	5.00	No

	16	z	-0.088	2.00	No
		z	-0.088	4.50	No
		z	-0.091	5.50	No
		z	-0.091	8.00	No
	17	z	-0.267	2.50	No
		z	-0.267	7.50	No
		z	-0.064	4.00	No
		z	-0.029	6.00	No
		z	-0.041	6.00	No
	18	z	-0.049	1.50	No
	27	z	-0.049	0.20	No
W30	15	3	-0.238	2.50	No
		3	-0.238	7.50	No
		3	-0.084	5.00	No
	16	3	-0.081	2.00	No
		3	-0.081	4.50	No
		3	-0.079	5.50	No
		3	-0.079	8.00	No
	17	3	-0.238	2.50	No
		3	-0.238	7.50	No
		3	-0.108	4.00	No
		3	-0.084	6.00	No
	18	3	-0.049	1.50	No
	27	3	-0.049	0.20	No
W60	15	3	-0.161	2.50	No
		3	-0.161	7.50	No
		3	-0.108	5.00	No
	16	3	-0.067	2.00	No
		3	-0.067	4.50	No
		3	-0.056	5.50	No
		3	-0.056	8.00	No
	17	3	-0.161	2.50	No
		3	-0.161	7.50	No
		3	-0.084	4.00	No
		3	-0.108	6.00	No
	18	3	-0.049	1.50	No
	27	3	-0.049	0.20	No
W90	15	x	-0.122	2.50	No
		x	-0.122	7.50	No
		x	-0.119	5.00	No
	16	x	-0.06	2.00	No
		x	-0.06	4.50	No
		x	-0.044	5.50	No
		x	-0.044	8.00	No
	17	x	-0.122	2.50	No
		x	-0.122	7.50	No
		x	-0.073	4.00	No
		x	-0.119	6.00	No
	18	x	-0.049	1.50	No
	27	x	-0.049	0.20	No
W120	15	2	-0.161	2.50	No
		2	-0.161	7.50	No
		2	-0.108	5.00	No
	16	2	-0.067	2.00	No
		2	-0.067	4.50	No
		2	-0.056	5.50	No
		2	-0.056	8.00	No
	17	2	-0.161	2.50	No
		2	-0.161	7.50	No
		2	-0.084	4.00	No

		2	-0.108	6.00	No
	18	2	-0.049	1.50	No
	27	2	-0.049	0.20	No
W150	15	2	-0.238	2.50	No
		2	-0.238	7.50	No
		2	-0.084	5.00	No
	16	2	-0.081	2.00	No
		2	-0.081	4.50	No
		2	-0.079	5.50	No
		2	-0.079	8.00	No
	17	2	-0.238	2.50	No
		2	-0.238	7.50	No
		2	-0.108	4.00	No
		2	-0.084	6.00	No
	18	2	-0.049	1.50	No
	27	2	-0.049	0.20	No
Di	15	y	-0.092	2.50	No
		y	-0.092	7.50	No
		y	-0.034	5.00	No
		y	-0.045	5.00	No
	16	y	-0.035	2.00	No
		y	-0.035	4.50	No
		y	-0.033	5.50	No
		y	-0.033	8.00	No
	17	y	-0.092	2.50	No
		y	-0.092	7.50	No
		y	-0.045	4.00	No
		y	-0.034	6.00	No
		y	-0.045	6.00	No
	18	y	-0.029	1.50	No
	27	y	-0.029	0.20	No
WI0	15	z	-0.047	2.50	No
		z	-0.047	7.50	No
		z	-0.008	5.00	No
		z	-0.011	5.00	No
	16	z	-0.016	2.00	No
		z	-0.016	4.50	No
		z	-0.017	5.50	No
		z	-0.017	8.00	No
	17	z	-0.047	2.50	No
		z	-0.047	7.50	No
		z	-0.014	4.00	No
		z	-0.007	6.00	No
		z	-0.011	6.00	No
	18	z	-0.01	1.50	No
	27	z	-0.01	0.20	No
WI30	15	3	-0.041	2.50	No
		3	-0.041	7.50	No
		3	-0.017	5.00	No
	16	3	-0.015	2.00	No
		3	-0.015	4.50	No
		3	-0.015	5.50	No
		3	-0.015	8.00	No
	17	3	-0.041	2.50	No
		3	-0.041	7.50	No
		3	-0.021	4.00	No
		3	-0.017	6.00	No
	18	3	-0.01	1.50	No
	27	3	-0.01	0.20	No
WI60	15	3	-0.029	2.50	No

		3	-0.029	7.50	No
		3	-0.021	5.00	No
	16	3	-0.013	2.00	No
		3	-0.013	4.50	No
		3	-0.011	5.50	No
		3	-0.011	8.00	No
	17	3	-0.029	2.50	No
		3	-0.029	7.50	No
		3	-0.017	4.00	No
		3	-0.021	6.00	No
	18	3	-0.01	1.50	No
	27	3	-0.01	0.20	No
WI90	15	x	-0.023	2.50	No
		x	-0.023	7.50	No
		x	-0.022	5.00	No
	16	x	-0.012	2.00	No
		x	-0.012	4.50	No
		x	-0.009	5.50	No
		x	-0.009	8.00	No
	17	x	-0.023	2.50	No
		x	-0.023	7.50	No
		x	-0.015	4.00	No
		x	-0.022	6.00	No
	18	x	-0.01	1.50	No
	27	x	-0.01	0.20	No
WI120	15	2	-0.029	2.50	No
		2	-0.029	7.50	No
		2	-0.021	5.00	No
	16	2	-0.013	2.00	No
		2	-0.013	4.50	No
		2	-0.011	5.50	No
		2	-0.011	8.00	No
	17	2	-0.029	2.50	No
		2	-0.029	7.50	No
		2	-0.017	4.00	No
		2	-0.021	6.00	No
	18	2	-0.01	1.50	No
	27	2	-0.01	0.20	No
WI150	15	2	-0.041	2.50	No
		2	-0.041	7.50	No
		2	-0.017	5.00	No
	16	2	-0.015	2.00	No
		2	-0.015	4.50	No
		2	-0.015	5.50	No
		2	-0.015	8.00	No
	17	2	-0.041	2.50	No
		2	-0.041	7.50	No
		2	-0.021	4.00	No
		2	-0.017	6.00	No
	18	2	-0.01	1.50	No
	27	2	-0.01	0.20	No
WL0	15	z	-0.015	2.50	No
		z	-0.015	7.50	No
		z	-0.002	5.00	No
		z	-0.002	5.00	No
	16	z	-0.005	2.00	No
		z	-0.005	4.50	No
		z	-0.005	5.50	No
		z	-0.005	8.00	No
	17	z	-0.015	2.50	No

		z	-0.015	7.50	No
		z	-0.003	4.00	No
		z	-0.002	6.00	No
		z	-0.002	6.00	No
	18	z	-0.003	1.50	No
	27	z	-0.003	0.20	No
WL30	15	3	-0.013	2.50	No
		3	-0.013	7.50	No
		3	-0.004	5.00	No
	16	3	-0.005	2.00	No
		3	-0.005	4.50	No
		3	-0.004	5.50	No
		3	-0.004	8.00	No
	17	3	-0.013	2.50	No
		3	-0.013	7.50	No
		3	-0.006	4.00	No
		3	-0.004	6.00	No
	18	3	-0.003	1.50	No
	27	3	-0.003	0.20	No
WL60	15	3	-0.009	2.50	No
		3	-0.009	7.50	No
		3	-0.006	5.00	No
	16	3	-0.004	2.00	No
		3	-0.004	4.50	No
		3	-0.003	5.50	No
		3	-0.003	8.00	No
	17	3	-0.009	2.50	No
		3	-0.009	7.50	No
		3	-0.004	4.00	No
		3	-0.006	6.00	No
	18	3	-0.003	1.50	No
	27	3	-0.003	0.20	No
WL90	15	x	-0.007	2.50	No
		x	-0.007	7.50	No
		x	-0.006	5.00	No
	16	x	-0.003	2.00	No
		x	-0.003	4.50	No
		x	-0.003	5.50	No
		x	-0.003	8.00	No
	17	x	-0.007	2.50	No
		x	-0.007	7.50	No
		x	-0.004	4.00	No
		x	-0.006	6.00	No
	18	x	-0.003	1.50	No
	27	x	-0.003	0.20	No
WL120	15	2	-0.009	2.50	No
		2	-0.009	7.50	No
		2	-0.006	5.00	No
	16	2	-0.004	2.00	No
		2	-0.004	4.50	No
		2	-0.003	5.50	No
		2	-0.003	8.00	No
	17	2	-0.009	2.50	No
		2	-0.009	7.50	No
		2	-0.004	4.00	No
		2	-0.006	6.00	No
	18	2	-0.003	1.50	No
	27	2	-0.003	0.20	No
WL150	15	2	-0.013	2.50	No
		2	-0.013	7.50	No

		2	-0.004	5.00	No
	16	2	-0.005	2.00	No
		2	-0.005	4.50	No
		2	-0.004	5.50	No
		2	-0.004	8.00	No
	17	2	-0.013	2.50	No
		2	-0.013	7.50	No
		2	-0.006	4.00	No
		2	-0.004	6.00	No
	18	2	-0.003	1.50	No
	27	2	-0.003	0.20	No
LL1	1	y	-0.25	50.00	Yes
LL2	1	y	-0.25	100.00	Yes
LL3	1	y	-0.25	0.00	Yes
LLa2	17	y	-0.50	50.00	Yes
LLa3	16	y	-0.50	50.00	Yes
LLa4	15	y	-0.50	50.00	Yes

Self weight multipliers for load conditions

Condition	Description	Self weight multiplier			
		Comb.	MultX	MultY	MultZ
D	Dead Load	No	0.00	-1.00	0.00
Wo	Wind Load (NO ICE)	No	0.00	0.00	0.00
W30	WL 30deg	No	0.00	0.00	0.00
W60	WL 60deg	No	0.00	0.00	0.00
W90	WL 90deg	No	0.00	0.00	0.00
W120	WL 120deg	No	0.00	0.00	0.00
W150	WL 150deg	No	0.00	0.00	0.00
Di	Ice Load	No	0.00	0.00	0.00
WI0	WL ICE 0deg	No	0.00	0.00	0.00
WI30	WL ICE 30deg	No	0.00	0.00	0.00
WI60	WL ICE 60deg	No	0.00	0.00	0.00
WI90	WL ICE 90deg	No	0.00	0.00	0.00
WI120	WL ICE 120deg	No	0.00	0.00	0.00
WI150	WL ICE 150deg	No	0.00	0.00	0.00
WL0	WL 30 mph 0deg	No	0.00	0.00	0.00
WL30	WL 30 mph 30deg	No	0.00	0.00	0.00
WL60	WL 30 mph 60deg	No	0.00	0.00	0.00
WL90	WL 30 mph 90deg	No	0.00	0.00	0.00
WL120	WL 30 mph 120deg	No	0.00	0.00	0.00
WL150	WL 30 mph 150deg	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 Right End of Mount	No	0.00	0.00	0.00
LL3	250 lb Live Load Left End of Mount	No	0.00	0.00	0.00
LLa1	500 lb Live Load Antenna 1	No	0.00	0.00	0.00
LLa2	500 lb Live Load Antenna 2	No	0.00	0.00	0.00
LLa3	500 lb Live Load Antenna 3	No	0.00	0.00	0.00
LLa4	500 lb Live Load Antenna 4	No	0.00	0.00	0.00

Earthquake (Dynamic analysis only)

Condition	a/g	Ang. [Deg]	Damp. [%]
D	0.00	0.00	0.00
Wo	0.00	0.00	0.00
W30	0.00	0.00	0.00
W60	0.00	0.00	0.00
W90	0.00	0.00	0.00
W120	0.00	0.00	0.00
W150	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
WI60	0.00	0.00	0.00
WI90	0.00	0.00	0.00
WI120	0.00	0.00	0.00
WI150	0.00	0.00	0.00
WL0	0.00	0.00	0.00
WL30	0.00	0.00	0.00
WL60	0.00	0.00	0.00
WL90	0.00	0.00	0.00
WL120	0.00	0.00	0.00
WL150	0.00	0.00	0.00
LL1	0.00	0.00	0.00
LL2	0.00	0.00	0.00
LL3	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

Current Date: 1/21/2022 1:22 PM
Units system: English

Steel Code Check

Report: Summary - Group by member

Load conditions to be included in design :

LC1=1.2D+Wo
LC2=1.2D+W30
LC3=1.2D+W60
LC4=1.2D+W90
LC5=1.2D+W120
LC6=1.2D+W150
LC7=1.2D-Wo
LC8=1.2D-W30
LC9=1.2D-W60
LC10=1.2D-W90
LC11=1.2D-W120
LC12=1.2D-W150
LC13=0.9D+Wo
LC14=0.9D+W30
LC15=0.9D+W60
LC16=0.9D+W90
LC17=0.9D+W120
LC18=0.9D+W150
LC19=0.9D-Wo
LC20=0.9D-W30
LC21=0.9D-W60
LC22=0.9D-W90
LC23=0.9D-W120
LC24=0.9D-W150
LC25=1.2D+Di+WI0
LC26=1.2D+Di+WI30
LC27=1.2D+Di+WI60
LC28=1.2D+Di+WI90
LC29=1.2D+Di+WI120
LC30=1.2D+Di+WI150
LC31=1.2D+Di-WI0
LC32=1.2D+Di-WI30
LC33=1.2D+Di-WI60
LC34=1.2D+Di-WI90
LC35=1.2D+Di-WI120
LC36=1.2D+Di-WI150
LC37=1.2D+1.6LL1
LC38=1.2D+1.6LL2
LC39=1.2D+1.6LL3
LC40=1.2D+WL0+1.6LLa1
LC41=1.2D+WL30+1.6LLa1
LC42=1.2D+WL60+1.6LLa1
LC43=1.2D+WL90+1.6LLa1
LC44=1.2D+WL120+1.6LLa1
LC45=1.2D+WL150+1.6LLa1
LC46=1.2D-WL0+1.6LLa1
LC47=1.2D-WL30+1.6LLa1
LC48=1.2D-WL60+1.6LLa1
LC49=1.2D-WL90+1.6LLa1
LC50=1.2D-WL120+1.6LLa1
LC51=1.2D-WL150+1.6LLa1
LC52=1.2D+WL0+1.6LLa2
LC53=1.2D+WL30+1.6LLa2
LC54=1.2D+WL60+1.6LLa2

LC55=1.2D+WL90+1.6LLa2
LC56=1.2D+WL120+1.6LLa2
LC57=1.2D+WL150+1.6LLa2
LC58=1.2D-WL0+1.6LLa2
LC59=1.2D-WL30+1.6LLa2
LC60=1.2D-WL60+1.6LLa2
LC61=1.2D-WL90+1.6LLa2
LC62=1.2D-WL120+1.6LLa2
LC63=1.2D-WL150+1.6LLa2
LC64=1.2D+WL0+1.6LLa3
LC65=1.2D+WL30+1.6LLa3
LC66=1.2D+WL60+1.6LLa3
LC67=1.2D+WL90+1.6LLa3
LC68=1.2D+WL120+1.6LLa3
LC69=1.2D+WL150+1.6LLa3
LC70=1.2D-WL0+1.6LLa3
LC71=1.2D-WL30+1.6LLa3
LC72=1.2D-WL60+1.6LLa3
LC73=1.2D-WL90+1.6LLa3
LC74=1.2D-WL120+1.6LLa3
LC75=1.2D-WL150+1.6LLa3
LC76=1.2D+WL0+1.6LLa4
LC77=1.2D+WL30+1.6LLa4
LC78=1.2D+WL60+1.6LLa4
LC79=1.2D+WL90+1.6LLa4
LC80=1.2D+WL120+1.6LLa4
LC81=1.2D+WL150+1.6LLa4
LC82=1.2D-WL0+1.6LLa4
LC83=1.2D-WL30+1.6LLa4
LC84=1.2D-WL60+1.6LLa4
LC85=1.2D-WL90+1.6LLa4
LC86=1.2D-WL120+1.6LLa4
LC87=1.2D-WL150+1.6LLa4

Description	Section	Member	Ctrl Eq.	Ratio	Status	Reference
	HSS_SQR 3X3X1_4	**23**	LC10 at 100.00%	0.22	OK	Eq. H1-1b
		24	LC57 at 100.00%	0.39	OK	Eq. H1-1b
		25	LC83 at 100.00%	**0.47**	**OK**	Eq. H1-1b
		26	LC2 at 0.00%	0.24	OK	Eq. H1-1b
	PIPE 2x0.154	**15**	LC82 at 68.75%	0.90	OK	Eq. H1-1b
		16	LC7 at 31.25%	0.92	OK	Eq. H1-1b
		17	LC58 at 68.75%	0.83	OK	Eq. H1-1b
		18	LC7 at 25.00%	**0.94**	**OK**	Eq. H1-1b
	PIPE 3x0.216	**1**	LC8 at 39.84%	0.58	OK	Eq. H3-6
		2	LC81 at 39.84%	0.60	OK	Eq. H3-6
		19	LC59 at 72.92%	0.51	OK	Eq. H1-1b
		20	LC81 at 72.92%	0.60	OK	Eq. H1-1b
		21	LC59 at 37.50%	0.57	OK	Eq. H1-1b
		22	LC81 at 37.50%	**0.69**	**OK**	Eq. H1-1b

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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	6.01	0
2	-5.25	0.00	6.01	0
3	5.25	0.00	6.01	0
4	0.00	-4.00	6.01	0
5	-5.25	-4.00	6.01	0
6	5.25	-4.00	6.01	0
7	4.95	0.00	6.01	0
8	4.95	-4.00	6.01	0
9	0.45	0.00	6.01	0
10	0.45	-4.00	6.01	0
11	-0.34	0.00	6.01	0
12	-0.34	-4.00	6.01	0
13	-4.33	0.00	6.01	0
14	-4.33	-4.00	6.01	0
15	4.95	0.00	6.21	0
16	4.95	-4.00	6.21	0
17	0.45	0.00	6.21	0
18	0.45	-4.00	6.21	0
19	-4.33	0.00	6.21	0
20	-4.33	-4.00	6.21	0
21	-0.34	0.00	5.81	0
22	-0.34	-4.00	5.81	0
23	2.583	0.00	6.01	0

24	2.583	-4.00	6.01	0
25	-1.08	0.00	6.01	0
26	-1.08	-4.00	6.01	0
27	2.583	0.00	5.81	0
28	2.583	-4.00	5.81	0
29	-1.08	0.00	5.81	0
30	-1.08	-4.00	5.81	0
31	4.95	3.00	6.21	0
32	0.45	3.00	6.21	0
33	-4.33	3.00	6.21	0
34	-4.33	-7.00	6.21	0
35	0.45	-7.00	6.21	0
36	4.95	-7.00	6.21	0
37	-0.34	2.00	5.81	0
38	-0.34	-6.00	5.81	0
39	2.583	0.50	5.81	0
40	-1.08	0.50	5.81	0
41	2.583	-1.50	5.81	0
42	-1.08	-1.50	5.81	0
43	2.583	-3.50	5.81	0
44	-1.08	-3.50	5.81	0
45	2.583	-5.50	5.81	0
46	-1.08	-5.50	5.81	0
47	2.583	-4.75	5.81	0
48	-1.08	-4.75	5.81	0
49	2.583	-1.25	5.81	0
50	-1.08	-1.25	5.81	0
71	2.023	-4.75	4.42	0
72	-0.58	-4.75	4.40	0
73	2.023	-1.25	4.42	0
74	-0.58	-1.25	4.40	0
75	-0.83	-1.25	5.105	0
76	-0.83	-1.05	5.105	0

Restraints

Node	TX	TY	TZ	RX	RY	RZ
71	1	1	1	0	0	0
72	1	1	1	0	0	0
73	1	1	1	0	0	0
74	1	1	1	0	0	0

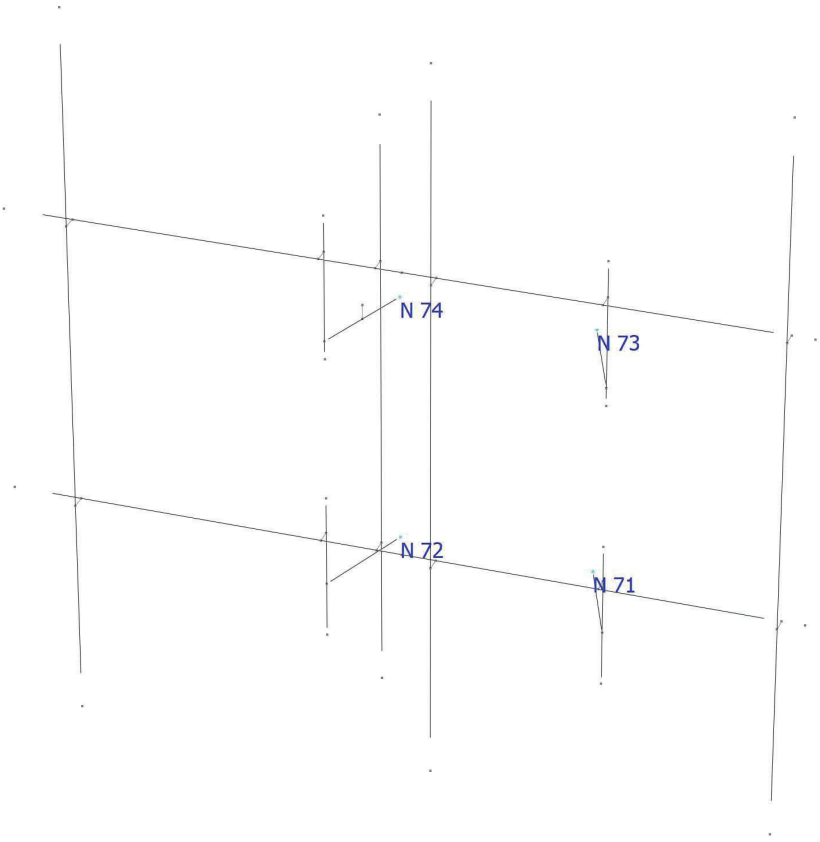
Members

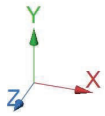
Member	NJ	NK	Description	Section	Material	d0 [in]	dL [in]	lg factor
1	2	3		PIPE 3x0.216	A53 GrB	0.00	0.00	0.00
2	5	6		PIPE 3x0.216	A53 GrB	0.00	0.00	0.00
15	33	34		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
16	32	35		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
17	31	36		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00

18	37	38	PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
19	41	39	PIPE 3x0.216	A53 GrB	0.00	0.00	0.00
20	42	40	PIPE 3x0.216	A53 GrB	0.00	0.00	0.00
21	45	43	PIPE 3x0.216	A53 GrB	0.00	0.00	0.00
22	46	44	PIPE 3x0.216	A53 GrB	0.00	0.00	0.00
23	73	49	HSS_SQR 3X3X1_4	A500 GrB rectangular	0.00	0.00	0.00
24	71	47	HSS_SQR 3X3X1_4	A500 GrB rectangular	0.00	0.00	0.00
25	72	48	HSS_SQR 3X3X1_4	A500 GrB rectangular	0.00	0.00	0.00
26	50	74	HSS_SQR 3X3X1_4	A500 GrB rectangular	0.00	0.00	0.00

Orientation of local axes

Member	Rotation [Deg]	Axes23	NX	NY	NZ
15	315.00	0	0.00	0.00	0.00
16	315.00	0	0.00	0.00	0.00
17	315.00	0	0.00	0.00	0.00
18	315.00	0	0.00	0.00	0.00


N 74
N 73
N 72
N 71


Y
X
Z

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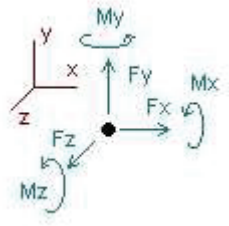
Units system: English

Analysis result

Reactions



Direction of positive forces and moments

	Forces [Kip]			Moments [Kip*ft]		
Node	**FX**	**FY**	**FZ**	**MX**	**MY**	**MZ**
Condition **LC1=1.2D+Wo**						
71	0.44112	0.18391	0.40654	0.00000	0.00000	0.00000
72	-0.45327	0.29186	0.62614	0.00000	0.00000	0.00000
73	0.38038	0.33351	0.38342	0.00000	0.00000	0.00000
74	-0.36823	0.49476	0.65146	0.00000	0.00000	0.00000
SUM	0.00000	1.30404	2.06756	0.00000	0.00000	0.00000
Condition **LC2=1.2D+W30**						
71	0.62229	0.05129	-0.05242	0.00000	0.00000	0.00000
72	-0.11796	0.57634	0.97048	0.00000	0.00000	0.00000
73	0.57077	0.05493	-0.10954	0.00000	0.00000	0.00000
74	0.08880	0.62149	0.69194	0.00000	0.00000	0.00000
SUM	1.16390	1.30404	1.50046	0.00000	0.00000	0.00000
Condition **LC3=1.2D+W60**						
71	0.60131	0.11732	-0.10612	0.00000	0.00000	0.00000
72	-0.03803	0.65287	0.88368	0.00000	0.00000	0.00000
73	0.49772	-0.01025	-0.30699	0.00000	0.00000	0.00000
74	0.22255	0.54410	0.44018	0.00000	0.00000	0.00000
SUM	1.28355	1.30404	0.91075	0.00000	0.00000	0.00000
Condition **LC4=1.2D+W90**						
71	0.51673	0.17945	-0.26873	0.00000	0.00000	0.00000
72	0.12164	0.81059	0.88586	0.00000	0.00000	0.00000
73	0.35874	-0.13648	-0.67329	0.00000	0.00000	0.00000
74	0.48070	0.45048	0.05616	0.00000	0.00000	0.00000
SUM	1.47780	1.30404	0.00000	0.00000	0.00000	0.00000
Condition **LC5=1.2D+W120**						
71	0.34901	0.30695	-0.29429	0.00000	0.00000	0.00000
72	0.19802	0.89404	0.74729	0.00000	0.00000	0.00000
73	0.11967	-0.17991	-0.92510	0.00000	0.00000	0.00000
74	0.61685	0.28296	-0.43865	0.00000	0.00000	0.00000
SUM	1.28355	1.30404	-0.91075	0.00000	0.00000	0.00000

Condition **LC6=1.2D+W150**

71	0.23712	0.40171	-0.32467	0.00000	0.00000	0.00000
72	0.22988	0.98310	0.59332	0.00000	0.00000	0.00000
73	-0.03847	-0.24800	-1.14458	0.00000	0.00000	0.00000
74	0.73537	0.16723	-0.80453	0.00000	0.00000	0.00000
SUM	1.16390	1.30404	-1.68046	0.00000	0.00000	0.00000

Condition **LC7=1.2D-Wo**

71	-0.09266	0.65403	0.09649	0.00000	0.00000	0.00000
72	0.01166	0.82177	0.08550	0.00000	0.00000	0.00000
73	-0.41110	-0.04353	-0.88588	0.00000	0.00000	0.00000
74	0.49210	-0.12823	-1.36367	0.00000	0.00000	0.00000
SUM	0.00000	1.30404	-2.06756	0.00000	0.00000	0.00000

Condition **LC8=1.2D-W30**

71	-0.26775	0.78783	0.55537	0.00000	0.00000	0.00000
72	-0.32518	0.54467	-0.25195	0.00000	0.00000	0.00000
73	-0.60330	0.23009	-0.39764	0.00000	0.00000	0.00000
74	0.03234	-0.25855	-1.40624	0.00000	0.00000	0.00000
SUM	-1.16390	1.30404	-1.50046	0.00000	0.00000	0.00000

Condition **LC9=1.2D-W60**

71	-0.24695	0.72506	0.61221	0.00000	0.00000	0.00000
72	-0.40723	0.47022	-0.16442	0.00000	0.00000	0.00000
73	-0.53026	0.29407	-0.20062	0.00000	0.00000	0.00000
74	-0.09912	-0.18531	-1.15792	0.00000	0.00000	0.00000
SUM	-1.28355	1.30404	-0.91075	0.00000	0.00000	0.00000

Condition **LC10=1.2D-W90**

71	-0.16273	0.66602	0.77852	0.00000	0.00000	0.00000
72	-0.57042	0.31293	-0.16759	0.00000	0.00000	0.00000
73	-0.38997	0.42055	0.16651	0.00000	0.00000	0.00000
74	-0.35467	-0.09545	-0.77744	0.00000	0.00000	0.00000
SUM	-1.47780	1.30404	0.00000	0.00000	0.00000	0.00000

Condition **LC11=1.2D-W120**

71	0.00180	0.53865	0.80525	0.00000	0.00000	0.00000
72	-0.64735	0.22559	-0.03314	0.00000	0.00000	0.00000
73	-0.14933	0.46705	0.42119	0.00000	0.00000	0.00000
74	-0.48867	0.07276	-0.28254	0.00000	0.00000	0.00000
SUM	-1.28355	1.30404	0.91075	0.00000	0.00000	0.00000

Condition **LC12=1.2D-W150**

71	0.11055	0.44165	0.83465	0.00000	0.00000	0.00000
72	-0.67798	0.13099	0.11622	0.00000	0.00000	0.00000
73	0.01056	0.53896	0.64361	0.00000	0.00000	0.00000
74	-0.60703	0.19244	0.08598	0.00000	0.00000	0.00000
SUM	-1.16390	1.30404	1.68046	0.00000	0.00000	0.00000

Condition **LC13=0.9D+Wo**

71	0.39690	0.07718	0.34219	0.00000	0.00000	0.00000
72	-0.39701	0.14995	0.53546	0.00000	0.00000	0.00000
73	0.38493	0.29893	0.44737	0.00000	0.00000	0.00000
74	-0.38482	0.45197	0.74254	0.00000	0.00000	0.00000
SUM	0.00000	0.97803	2.06756	0.00000	0.00000	0.00000

Condition **LC14=0.9D+W30**

71	0.57855	-0.05548	-0.11669	0.00000	0.00000	0.00000
72	-0.06138	0.43536	0.88003	0.00000	0.00000	0.00000
73	0.57487	0.01971	-0.04584	0.00000	0.00000	0.00000
74	0.07186	0.57844	0.78296	0.00000	0.00000	0.00000
SUM	1.16390	0.97803	1.50046	0.00000	0.00000	0.00000

Condition **LC15=0.9D+W60**

71	0.55767	0.01092	-0.17026	0.00000	0.00000	0.00000
72	0.01845	0.51237	0.79343	0.00000	0.00000	0.00000
73	0.50171	-0.04580	-0.24343	0.00000	0.00000	0.00000
74	0.20572	0.50054	0.53102	0.00000	0.00000	0.00000
SUM	1.28355	0.97803	0.91075	0.00000	0.00000	0.00000

Condition **LC16=0.9D+W90**

71	0.47331	0.07355	-0.33267	0.00000	0.00000	0.00000
72	0.17802	0.67101	0.79594	0.00000	0.00000	0.00000
73	0.36247	-0.17261	-0.60996	0.00000	0.00000	0.00000
74	0.46401	0.40609	0.14669	0.00000	0.00000	0.00000
SUM	1.47780	0.97803	0.00000	0.00000	0.00000	0.00000

Condition **LC17=0.9D+W120**

71	0.30567	0.20167	-0.35799	0.00000	0.00000	0.00000
72	0.25414	0.75523	0.65766	0.00000	0.00000	0.00000
73	0.12328	-0.21652	-0.86194	0.00000	0.00000	0.00000
74	0.60047	0.23765	-0.34848	0.00000	0.00000	0.00000
SUM	1.28355	0.97803	-0.91075	0.00000	0.00000	0.00000

Condition **LC18=0.9D+W150**

71	0.19385	0.29688	-0.38820	0.00000	0.00000	0.00000
72	0.28581	0.84490	0.50394	0.00000	0.00000	0.00000
73	-0.03496	-0.28497	-1.08157	0.00000	0.00000	0.00000
74	0.71920	0.12123	-0.71463	0.00000	0.00000	0.00000
SUM	1.16390	0.97803	-1.68046	0.00000	0.00000	0.00000

Condition **LC19=0.9D-Wo**

71	-0.13630	0.54981	0.03312	0.00000	0.00000	0.00000
72	0.06702	0.68351	-0.00378	0.00000	0.00000	0.00000
73	-0.40727	-0.08032	-0.82281	0.00000	0.00000	0.00000
74	0.47656	-0.17497	-1.27409	0.00000	0.00000	0.00000
SUM	0.00000	0.97803	-2.06756	0.00000	0.00000	0.00000

Condition **LC20=0.9D-W30**

71	-0.31186	0.68367	0.49192	0.00000	0.00000	0.00000
72	-0.27013	0.40552	-0.34146	0.00000	0.00000	0.00000
73	-0.59903	0.19389	-0.33432	0.00000	0.00000	0.00000
74	0.01713	-0.30505	-1.31660	0.00000	0.00000	0.00000
SUM	-1.16390	0.97803	-1.50046	0.00000	0.00000	0.00000

Condition **LC21=0.9D-W60**

71	-0.29115	0.62056	0.54864	0.00000	0.00000	0.00000
72	-0.35209	0.33062	-0.25413	0.00000	0.00000	0.00000
73	-0.52588	0.25819	-0.13717	0.00000	0.00000	0.00000
74	-0.11444	-0.23133	-1.06809	0.00000	0.00000	0.00000
SUM	-1.28355	0.97803	-0.91075	0.00000	0.00000	0.00000

Condition **LC22=0.9D-W90**

71	-0.20717	0.56103	0.71475	0.00000	0.00000	0.00000
72	-0.51520	0.17243	-0.25763	0.00000	0.00000	0.00000
73	-0.38533	0.38526	0.23020	0.00000	0.00000	0.00000
74	-0.37011	-0.14068	-0.68731	0.00000	0.00000	0.00000
SUM	-1.47780	0.97803	0.00000	0.00000	0.00000	0.00000

Condition **LC23=0.9D-W120**

71	-0.04273	0.43303	0.74124	0.00000	0.00000	0.00000
72	-0.59188	0.08429	-0.12349	0.00000	0.00000	0.00000
73	-0.14455	0.43225	0.48506	0.00000	0.00000	0.00000
74	-0.50439	0.02846	-0.19206	0.00000	0.00000	0.00000
SUM	-1.28355	0.97803	0.91075	0.00000	0.00000	0.00000

Condition **LC24=0.9D-W150**

71	0.06595	0.33556	0.77047	0.00000	0.00000	0.00000
72	-0.62233	-0.01095	0.02562	0.00000	0.00000	0.00000
73	0.01544	0.50457	0.70763	0.00000	0.00000	0.00000
74	-0.62296	0.14886	0.17674	0.00000	0.00000	0.00000
SUM	-1.16390	0.97803	1.68046	0.00000	0.00000	0.00000

Condition **LC25=1.2D+Di+WI0**

71	0.35933	0.69684	0.47112	0.00000	0.00000	0.00000
72	-0.43163	0.91449	0.65802	0.00000	0.00000	0.00000
73	0.04178	0.27939	-0.33678	0.00000	0.00000	0.00000
74	0.03052	0.34625	-0.46736	0.00000	0.00000	0.00000
SUM	0.00000	2.23697	0.32500	0.00000	0.00000	0.00000

Condition **LC26=1.2D+Di+WI30**

71	0.38870	0.67296	0.38572	0.00000	0.00000	0.00000
72	-0.36865	0.96577	0.71893	0.00000	0.00000	0.00000
73	0.07450	0.22964	-0.42846	0.00000	0.00000	0.00000
74	0.11686	0.36860	-0.46476	0.00000	0.00000	0.00000
SUM	0.21142	2.23697	0.21142	0.00000	0.00000	0.00000

Condition **LC27=1.2D+Di+WI60**

71	0.37428	0.68535	0.39749	0.00000	0.00000	0.00000
72	-0.37264	0.96492	0.69864	0.00000	0.00000	0.00000
73	0.05492	0.23095	-0.43200	0.00000	0.00000	0.00000
74	0.11527	0.35575	-0.49230	0.00000	0.00000	0.00000
SUM	0.17183	2.23697	0.17183	0.00000	0.00000	0.00000

Condition **LC28=1.2D+Di+WI90**

71	0.35985	0.69531	0.36428	0.00000	0.00000	0.00000
72	-0.34183	0.99502	0.70165	0.00000	0.00000	0.00000
73	0.03029	0.20650	-0.50306	0.00000	0.00000	0.00000
74	0.16470	0.34014	-0.56287	0.00000	0.00000	0.00000
SUM	0.21300	2.23697	0.00000	0.00000	0.00000	0.00000

Condition **LC29=1.2D+Di+WI120**

71	0.32829	0.71964	0.36046	0.00000	0.00000	0.00000
72	-0.32859	1.00975	0.67498	0.00000	0.00000	0.00000
73	-0.01595	0.19921	-0.55007	0.00000	0.00000	0.00000
74	0.18807	0.30836	-0.65719	0.00000	0.00000	0.00000
SUM	0.17183	2.23697	-0.17183	0.00000	0.00000	0.00000

Condition **LC30=1.2D+Di+WI150**

71	0.33290	0.71770	0.34150	0.00000	0.00000	0.00000
72	-0.31360	1.02239	0.68556	0.00000	0.00000	0.00000
73	-0.01529	0.18581	-0.57756	0.00000	0.00000	0.00000
74	0.20742	0.31106	-0.66093	0.00000	0.00000	0.00000
SUM	0.21142	2.23697	-0.21142	0.00000	0.00000	0.00000

Condition **LC31=1.2D+Di-WI0**

71	0.26665	0.76845	0.41391	0.00000	0.00000	0.00000
72	-0.34736	0.99855	0.58751	0.00000	0.00000	0.00000
73	-0.09135	0.21920	-0.54334	0.00000	0.00000	0.00000
74	0.17206	0.25077	-0.78307	0.00000	0.00000	0.00000
SUM	0.00000	2.23697	-0.32500	0.00000	0.00000	0.00000

Condition **LC32=1.2D+Di-WI30**

71	0.23745	0.79237	0.49932	0.00000	0.00000	0.00000
72	-0.41039	0.94748	0.52680	0.00000	0.00000	0.00000
73	-0.12413	0.26881	-0.45180	0.00000	0.00000	0.00000
74	0.08565	0.22831	-0.78575	0.00000	0.00000	0.00000
SUM	-0.21142	2.23697	-0.21142	0.00000	0.00000	0.00000

Condition **LC33=1.2D+Di-WI60**

71	0.25184	0.78003	0.48759	0.00000	0.00000	0.00000
72	-0.40641	0.94835	0.54708	0.00000	0.00000	0.00000
73	-0.10456	0.26749	-0.44825	0.00000	0.00000	0.00000
74	0.08730	0.24110	-0.75825	0.00000	0.00000	0.00000
SUM	-0.17183	2.23697	-0.17183	0.00000	0.00000	0.00000

Condition **LC34=1.2D+Di-WI90**

71	0.26627	0.77016	0.52092	0.00000	0.00000	0.00000
72	-0.43733	0.91827	0.54406	0.00000	0.00000	0.00000
73	-0.07989	0.29193	-0.37718	0.00000	0.00000	0.00000
74	0.03795	0.25660	-0.68779	0.00000	0.00000	0.00000
SUM	-0.21300	2.23697	0.00000	0.00000	0.00000	0.00000

Condition **LC35=1.2D+Di-WI120**

71	0.29774	0.74582	0.52475	0.00000	0.00000	0.00000
72	-0.45057	0.90342	0.57061	0.00000	0.00000	0.00000
73	-0.03361	0.29931	-0.33009	0.00000	0.00000	0.00000
74	0.01462	0.28842	-0.59345	0.00000	0.00000	0.00000
SUM	-0.17183	2.23697	0.17183	0.00000	0.00000	0.00000

Condition **LC36=1.2D+Di-WI150**

71	0.29312	0.74775	0.54372	0.00000	0.00000	0.00000
72	-0.46560	0.89072	0.55997	0.00000	0.00000	0.00000
73	-0.03422	0.31276	-0.30256	0.00000	0.00000	0.00000
74	-0.00473	0.28574	-0.58970	0.00000	0.00000	0.00000
SUM	-0.21142	2.23697	0.21142	0.00000	0.00000	0.00000

Condition **LC37=1.2D+1.6LL1**

71	0.20289	0.52933	0.33159	0.00000	0.00000	0.00000
72	-0.28209	0.76053	0.46713	0.00000	0.00000	0.00000
73	-0.03419	0.16676	-0.33014	0.00000	0.00000	0.00000
74	0.11339	0.24743	-0.46859	0.00000	0.00000	0.00000
SUM	0.00000	1.70404	0.00000	0.00000	0.00000	0.00000

Condition **LC38=1.2D+1.6LL2**

71	0.38368	0.74369	0.33556	0.00000	0.00000	0.00000
72	-0.17015	0.52168	0.46153	0.00000	0.00000	0.00000
73	-0.13946	0.36861	-0.33429	0.00000	0.00000	0.00000
74	-0.07406	0.07006	-0.46279	0.00000	0.00000	0.00000
SUM	0.00000	1.70404	0.00000	0.00000	0.00000	0.00000

Condition **LC39=1.2D+1.6LL3**

71	0.06594	0.32088	0.32694	0.00000	0.00000	0.00000
72	-0.47267	0.95676	0.47441	0.00000	0.00000	0.00000
73	0.17182	0.00567	-0.32381	0.00000	0.00000	0.00000
74	0.23491	0.42073	-0.47754	0.00000	0.00000	0.00000
SUM	0.00000	1.70404	0.00000	0.00000	0.00000	0.00000

Condition **LC40=1.2D+WL0+1.6LLa1**

71	0.18918	0.41121	0.26211	0.00000	0.00000	0.00000
72	-0.23507	0.54862	0.37002	0.00000	0.00000	0.00000
73	0.00313	0.15139	-0.22301	0.00000	0.00000	0.00000
74	0.04276	0.19282	-0.31212	0.00000	0.00000	0.00000
SUM	0.00000	1.30404	0.09700	0.00000	0.00000	0.00000

Condition **LC41=1.2D+WL30+1.6LLa1**

71	0.19782	0.40386	0.23682	0.00000	0.00000	0.00000
72	-0.21657	0.56425	0.38764	0.00000	0.00000	0.00000
73	0.01360	0.13637	-0.24955	0.00000	0.00000	0.00000
74	0.06879	0.19956	-0.31128	0.00000	0.00000	0.00000
SUM	0.06364	1.30404	0.06364	0.00000	0.00000	0.00000

Condition **LC42=1.2D+WL60+1.6LLa1**

71	0.19377	0.40822	0.24064	0.00000	0.00000	0.00000
72	-0.21772	0.56411	0.38185	0.00000	0.00000	0.00000
73	0.00681	0.13644	-0.25163	0.00000	0.00000	0.00000
74	0.06806	0.19528	-0.31995	0.00000	0.00000	0.00000
SUM	0.05091	1.30404	0.05091	0.00000	0.00000	0.00000

Condition **LC43=1.2D+WL90+1.6LLa1**

71	0.18934	0.41193	0.23182	0.00000	0.00000	0.00000
72	-0.20864	0.57273	0.38194	0.00000	0.00000	0.00000
73	-0.00100	0.12973	-0.27162	0.00000	0.00000	0.00000
74	0.08230	0.18965	-0.34214	0.00000	0.00000	0.00000
SUM	0.06200	1.30404	0.00000	0.00000	0.00000	0.00000

Condition **LC44=1.2D+WL120+1.6LLa1**

71	0.17974	0.41904	0.23096	0.00000	0.00000	0.00000
72	-0.20485	0.57774	0.37401	0.00000	0.00000	0.00000
73	-0.01400	0.12717	-0.28526	0.00000	0.00000	0.00000
74	0.09001	0.18010	-0.37062	0.00000	0.00000	0.00000
SUM	0.05091	1.30404	-0.05091	0.00000	0.00000	0.00000

Condition **LC45=1.2D+WL150+1.6LLa1**

71	0.18135	0.41839	0.22495	0.00000	0.00000	0.00000
72	-0.20036	0.58234	0.37810	0.00000	0.00000	0.00000
73	-0.01382	0.12217	-0.29510	0.00000	0.00000	0.00000
74	0.09647	0.18114	-0.37160	0.00000	0.00000	0.00000
SUM	0.06364	1.30404	-0.06364	0.00000	0.00000	0.00000

Condition **LC46=1.2D-WL0+1.6LLa1**

71	0.16164	0.43418	0.24718	0.00000	0.00000	0.00000
72	-0.21059	0.57482	0.34790	0.00000	0.00000	0.00000
73	-0.03655	0.13257	-0.28367	0.00000	0.00000	0.00000
74	0.08551	0.16247	-0.40841	0.00000	0.00000	0.00000
SUM	0.00000	1.30404	-0.09700	0.00000	0.00000	0.00000

Condition **LC47=1.2D-WL30+1.6LLa1**

71	0.15302	0.44153	0.27247	0.00000	0.00000	0.00000
72	-0.22909	0.55921	0.33029	0.00000	0.00000	0.00000
73	-0.04704	0.14758	-0.25715	0.00000	0.00000	0.00000
74	0.05947	0.15572	-0.40926	0.00000	0.00000	0.00000
SUM	-0.06364	1.30404	-0.06364	0.00000	0.00000	0.00000

Condition **LC48=1.2D-WL60+1.6LLa1**

71	0.15707	0.43718	0.26866	0.00000	0.00000	0.00000
72	-0.22794	0.55936	0.33609	0.00000	0.00000	0.00000
73	-0.04024	0.14751	-0.25507	0.00000	0.00000	0.00000
74	0.06021	0.15999	-0.40059	0.00000	0.00000	0.00000
SUM	-0.05091	1.30404	-0.05091	0.00000	0.00000	0.00000

Condition **LC49=1.2D-WL90+1.6LLa1**

71	0.16149	0.43348	0.27749	0.00000	0.00000	0.00000
72	-0.23703	0.55074	0.33600	0.00000	0.00000	0.00000
73	-0.03243	0.15422	-0.23508	0.00000	0.00000	0.00000
74	0.04597	0.16561	-0.37841	0.00000	0.00000	0.00000
SUM	-0.06200	1.30404	0.00000	0.00000	0.00000	0.00000

Condition **LC50=1.2D-WL120+1.6LLa1**

71	0.17108	0.42637	0.27835	0.00000	0.00000	0.00000
72	-0.24083	0.54572	0.34391	0.00000	0.00000	0.00000
73	-0.01943	0.15679	-0.22143	0.00000	0.00000	0.00000
74	0.03826	0.17517	-0.34992	0.00000	0.00000	0.00000
SUM	-0.05091	1.30404	0.05091	0.00000	0.00000	0.00000

Condition **LC51=1.2D-WL150+1.6LLa1**

71	0.16947	0.42702	0.28436	0.00000	0.00000	0.00000
72	-0.24532	0.54112	0.33982	0.00000	0.00000	0.00000
73	-0.01960	0.16179	-0.21159	0.00000	0.00000	0.00000
74	0.03180	0.17412	-0.34895	0.00000	0.00000	0.00000
SUM	-0.06364	1.30404	0.06364	0.00000	0.00000	0.00000

Condition **LC52=1.2D+WL0+1.6LLa2**

71	0.60435	1.05116	0.45304	0.00000	0.00000	0.00000
72	-0.15262	0.51158	0.59234	0.00000	0.00000	0.00000
73	-0.24712	0.54697	-0.41413	0.00000	0.00000	0.00000
74	-0.20461	-0.00568	-0.53426	0.00000	0.00000	0.00000
SUM	0.00000	2.10404	0.09700	0.00000	0.00000	0.00000

Condition **LC53=1.2D+WL30+1.6LLa2**

71	0.61288	1.04381	0.42768	0.00000	0.00000	0.00000
72	-0.13414	0.52705	0.60985	0.00000	0.00000	0.00000
73	-0.23655	0.53212	-0.44055	0.00000	0.00000	0.00000
74	-0.17855	0.00105	-0.53334	0.00000	0.00000	0.00000
SUM	0.06364	2.10404	0.06364	0.00000	0.00000	0.00000

Condition **LC54=1.2D+WL60+1.6LLa2**

71	0.60884	1.04812	0.43150	0.00000	0.00000	0.00000
72	-0.13528	0.52690	0.60406	0.00000	0.00000	0.00000
73	-0.24334	0.53224	-0.44264	0.00000	0.00000	0.00000
74	-0.17931	-0.00322	-0.54201	0.00000	0.00000	0.00000
SUM	0.05091	2.10404	0.05091	0.00000	0.00000	0.00000

Condition **LC55=1.2D+WL90+1.6LLa2**

71	0.60439	1.05175	0.42263	0.00000	0.00000	0.00000
72	-0.12617	0.53542	0.60410	0.00000	0.00000	0.00000
73	-0.25111	0.52571	-0.46259	0.00000	0.00000	0.00000
74	-0.16510	-0.00884	-0.56415	0.00000	0.00000	0.00000
SUM	0.06200	2.10404	0.00000	0.00000	0.00000	0.00000

Condition **LC56=1.2D+WL120+1.6LLa2**

71	0.59479	1.05876	0.42174	0.00000	0.00000	0.00000
72	-0.12234	0.54035	0.59615	0.00000	0.00000	0.00000
73	-0.26409	0.52330	-0.47621	0.00000	0.00000	0.00000
74	-0.15745	-0.01838	-0.59260	0.00000	0.00000	0.00000
SUM	0.05091	2.10404	-0.05091	0.00000	0.00000	0.00000

Condition **LC57=1.2D+WL150+1.6LLa2**

71	0.59637	1.05809	0.41571	0.00000	0.00000	0.00000
72	-0.11786	0.54489	0.60021	0.00000	0.00000	0.00000
73	-0.26389	0.51839	-0.48602	0.00000	0.00000	0.00000
74	-0.15099	-0.01733	-0.59354	0.00000	0.00000	0.00000
SUM	0.06364	2.10404	-0.06364	0.00000	0.00000	0.00000

Condition **LC58=1.2D-WL0+1.6LLa2**

71	0.57676	1.07379	0.43797	0.00000	0.00000	0.00000
72	-0.12801	0.53743	0.57010	0.00000	0.00000	0.00000
73	-0.28669	0.52879	-0.47468	0.00000	0.00000	0.00000
74	-0.16205	-0.03597	-0.63039	0.00000	0.00000	0.00000
SUM	0.00000	2.10404	-0.09700	0.00000	0.00000	0.00000

Condition **LC59=1.2D-WL30+1.6LLa2**

71	0.56824	1.08114	0.46334	0.00000	0.00000	0.00000
72	-0.14649	0.52198	0.55260	0.00000	0.00000	0.00000
73	-0.29727	0.54363	-0.44826	0.00000	0.00000	0.00000
74	-0.18812	-0.04271	-0.63132	0.00000	0.00000	0.00000
SUM	-0.06364	2.10404	-0.06364	0.00000	0.00000	0.00000

Condition **LC60=1.2D-WL60+1.6LLa2**

71	0.57228	1.07684	0.45952	0.00000	0.00000	0.00000
72	-0.14536	0.52213	0.55839	0.00000	0.00000	0.00000
73	-0.29047	0.54352	-0.44617	0.00000	0.00000	0.00000
74	-0.18736	-0.03844	-0.62265	0.00000	0.00000	0.00000
SUM	-0.05091	2.10404	-0.05091	0.00000	0.00000	0.00000

Condition **LC61=1.2D-WL90+1.6LLa2**

71	0.57673	1.07322	0.46840	0.00000	0.00000	0.00000
72	-0.15448	0.51362	0.55835	0.00000	0.00000	0.00000
73	-0.28270	0.55004	-0.42623	0.00000	0.00000	0.00000
74	-0.20156	-0.03284	-0.60053	0.00000	0.00000	0.00000
SUM	-0.06200	2.10404	0.00000	0.00000	0.00000	0.00000

Condition **LC62=1.2D-WL120+1.6LLa2**

71	0.58632	1.06621	0.46929	0.00000	0.00000	0.00000
72	-0.15831	0.50868	0.56629	0.00000	0.00000	0.00000
73	-0.26972	0.55245	-0.41259	0.00000	0.00000	0.00000
74	-0.20921	-0.02329	-0.57208	0.00000	0.00000	0.00000
SUM	-0.05091	2.10404	0.05091	0.00000	0.00000	0.00000

Condition **LC63=1.2D-WL150+1.6LLa2**

71	0.58474	1.06687	0.47532	0.00000	0.00000	0.00000
72	-0.16279	0.50413	0.56223	0.00000	0.00000	0.00000
73	-0.26991	0.55738	-0.40279	0.00000	0.00000	0.00000
74	-0.21567	-0.02434	-0.57113	0.00000	0.00000	0.00000
SUM	-0.06364	2.10404	0.06364	0.00000	0.00000	0.00000

Condition **LC64=1.2D+WL0+1.6LLa3**

71	0.27623	0.67239	0.43294	0.00000	0.00000	0.00000
72	-0.33631	0.91644	0.61489	0.00000	0.00000	0.00000
73	-0.06536	0.22557	-0.39370	0.00000	0.00000	0.00000
74	0.12544	0.28965	-0.55713	0.00000	0.00000	0.00000
SUM	0.00000	2.10404	0.09700	0.00000	0.00000	0.00000

Condition **LC65=1.2D+WL30+1.6LLa3**

71	0.28480	0.66503	0.40764	0.00000	0.00000	0.00000
72	-0.31787	0.93194	0.63248	0.00000	0.00000	0.00000
73	-0.05483	0.21061	-0.42022	0.00000	0.00000	0.00000
74	0.15153	0.29645	-0.55626	0.00000	0.00000	0.00000
SUM	0.06364	2.10404	0.06364	0.00000	0.00000	0.00000

Condition **LC66=1.2D+WL60+1.6LLa3**

71	0.28075	0.66936	0.41146	0.00000	0.00000	0.00000
72	-0.31900	0.93178	0.62667	0.00000	0.00000	0.00000
73	-0.06162	0.21070	-0.42229	0.00000	0.00000	0.00000
74	0.15078	0.29221	-0.56492	0.00000	0.00000	0.00000
SUM	0.05091	2.10404	0.05091	0.00000	0.00000	0.00000

Condition **LC67=1.2D+WL90+1.6LLa3**

71	0.27630	0.67299	0.40260	0.00000	0.00000	0.00000
72	-0.30990	0.94027	0.62671	0.00000	0.00000	0.00000
73	-0.06941	0.20407	-0.44225	0.00000	0.00000	0.00000
74	0.16501	0.28671	-0.58706	0.00000	0.00000	0.00000
SUM	0.06200	2.10404	0.00000	0.00000	0.00000	0.00000

Condition **LC68=1.2D+WL120+1.6LLa3**

71	0.26669	0.68001	0.40171	0.00000	0.00000	0.00000
72	-0.30607	0.94517	0.61874	0.00000	0.00000	0.00000
73	-0.08240	0.20158	-0.45587	0.00000	0.00000	0.00000
74	0.17269	0.27729	-0.61550	0.00000	0.00000	0.00000
SUM	0.05091	2.10404	-0.05091	0.00000	0.00000	0.00000

Condition **LC69=1.2D+WL150+1.6LLa3**

71	0.26828	0.67935	0.39570	0.00000	0.00000	0.00000
72	-0.30159	0.94972	0.62282	0.00000	0.00000	0.00000
73	-0.08221	0.19661	-0.46569	0.00000	0.00000	0.00000
74	0.17916	0.27836	-0.61646	0.00000	0.00000	0.00000
SUM	0.06364	2.10404	-0.06364	0.00000	0.00000	0.00000

Condition **LC70=1.2D-WL0+1.6LLa3**

71	0.24861	0.69504	0.41789	0.00000	0.00000	0.00000
72	-0.31173	0.94218	0.59259	0.00000	0.00000	0.00000
73	-0.10499	0.20702	-0.45425	0.00000	0.00000	0.00000
74	0.16810	0.25980	-0.65323	0.00000	0.00000	0.00000
SUM	0.00000	2.10404	-0.09700	0.00000	0.00000	0.00000

Condition **LC71=1.2D-WL30+1.6LLa3**

71	0.24006	0.70240	0.44319	0.00000	0.00000	0.00000
72	-0.33018	0.92670	0.57502	0.00000	0.00000	0.00000
73	-0.11553	0.22196	-0.42775	0.00000	0.00000	0.00000
74	0.14200	0.25299	-0.65410	0.00000	0.00000	0.00000
SUM	-0.06364	2.10404	-0.06364	0.00000	0.00000	0.00000

Condition **LC72=1.2D-WL60+1.6LLa3**

71	0.24411	0.69808	0.43938	0.00000	0.00000	0.00000
72	-0.32905	0.92686	0.58083	0.00000	0.00000	0.00000
73	-0.10873	0.22187	-0.42567	0.00000	0.00000	0.00000
74	0.14276	0.25723	-0.64545	0.00000	0.00000	0.00000
SUM	-0.05091	2.10404	-0.05091	0.00000	0.00000	0.00000

Condition **LC73=1.2D-WL90+1.6LLa3**

71	0.24856	0.69445	0.44824	0.00000	0.00000	0.00000
72	-0.33815	0.91837	0.58078	0.00000	0.00000	0.00000
73	-0.10094	0.22850	-0.40571	0.00000	0.00000	0.00000
74	0.12853	0.26272	-0.62332	0.00000	0.00000	0.00000
SUM	-0.06200	2.10404	0.00000	0.00000	0.00000	0.00000

Condition **LC74=1.2D-WL120+1.6LLa3**

71	0.25816	0.68743	0.44914	0.00000	0.00000	0.00000
72	-0.34198	0.91346	0.58874	0.00000	0.00000	0.00000
73	-0.08795	0.23101	-0.39209	0.00000	0.00000	0.00000
74	0.12086	0.27214	-0.59488	0.00000	0.00000	0.00000
SUM	-0.05091	2.10404	0.05091	0.00000	0.00000	0.00000

Condition **LC75=1.2D-WL150+1.6LLa3**

71	0.25657	0.68809	0.45515	0.00000	0.00000	0.00000
72	-0.34647	0.90890	0.58466	0.00000	0.00000	0.00000
73	-0.08813	0.23598	-0.38226	0.00000	0.00000	0.00000
74	0.11439	0.27107	-0.59391	0.00000	0.00000	0.00000
SUM	-0.06364	2.10404	0.06364	0.00000	0.00000	0.00000

Condition **LC76=1.2D+WL0+1.6LLa4**

71	0.03026	0.29954	0.41693	0.00000	0.00000	0.00000
72	-0.68216	1.30861	0.63587	0.00000	0.00000	0.00000
73	0.30342	-0.08083	-0.37457	0.00000	0.00000	0.00000
74	0.34847	0.57673	-0.58122	0.00000	0.00000	0.00000
SUM	0.00000	2.10404	0.09700	0.00000	0.00000	0.00000

Condition **LC77=1.2D+WL30+1.6LLa4**

71	0.03886	0.29221	0.39167	0.00000	0.00000	0.00000
72	-0.66373	1.32410	0.65353	0.00000	0.00000	0.00000
73	0.31394	-0.09582	-0.40112	0.00000	0.00000	0.00000
74	0.37456	0.58355	-0.58045	0.00000	0.00000	0.00000
SUM	0.06364	2.10404	0.06364	0.00000	0.00000	0.00000

Condition **LC78=1.2D+WL60+1.6LLa4**

71	0.03481	0.29654	0.39548	0.00000	0.00000	0.00000
72	-0.66486	1.32392	0.64770	0.00000	0.00000	0.00000
73	0.30716	-0.09577	-0.40319	0.00000	0.00000	0.00000
74	0.37380	0.57935	-0.58909	0.00000	0.00000	0.00000
SUM	0.05091	2.10404	0.05091	0.00000	0.00000	0.00000

Condition **LC79=1.2D+WL90+1.6LLa4**

71	0.03034	0.30018	0.38665	0.00000	0.00000	0.00000
72	-0.65577	1.33238	0.64775	0.00000	0.00000	0.00000
73	0.29939	-0.10249	-0.42315	0.00000	0.00000	0.00000
74	0.38804	0.57396	-0.61124	0.00000	0.00000	0.00000
SUM	0.06200	2.10404	0.00000	0.00000	0.00000	0.00000

Condition **LC80=1.2D+WL120+1.6LLa4**

71	0.02072	0.30720	0.38575	0.00000	0.00000	0.00000
72	-0.65194	1.33723	0.63974	0.00000	0.00000	0.00000
73	0.28643	-0.10507	-0.43676	0.00000	0.00000	0.00000
74	0.39570	0.56468	-0.63965	0.00000	0.00000	0.00000
SUM	0.05091	2.10404	-0.05091	0.00000	0.00000	0.00000

Condition **LC81=1.2D+WL150+1.6LLa4**

71	0.02231	0.30655	0.37976	0.00000	0.00000	0.00000
72	-0.64747	1.34178	0.64384	0.00000	0.00000	0.00000
73	0.28663	-0.11006	-0.44659	0.00000	0.00000	0.00000
74	0.40217	0.56577	-0.64064	0.00000	0.00000	0.00000
SUM	0.06364	2.10404	-0.06364	0.00000	0.00000	0.00000

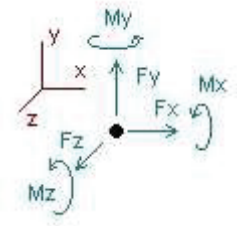
Condition **LC82=1.2D-WL0+1.6LLa4**

71	0.00260	0.32219	0.40189	0.00000	0.00000	0.00000
72	-0.65759	1.33419	0.61349	0.00000	0.00000	0.00000
73	0.26389	-0.09972	-0.43512	0.00000	0.00000	0.00000
74	0.39109	0.54738	-0.67726	0.00000	0.00000	0.00000
SUM	0.00000	2.10404	-0.09700	0.00000	0.00000	0.00000

Condition **LC83=1.2D-WL30+1.6LLa4**						
71	-0.00598	0.32952	0.42715	0.00000	0.00000	0.00000
72	-0.67602	1.31872	0.59584	0.00000	0.00000	0.00000
73	0.25337	-0.08474	-0.40860	0.00000	0.00000	0.00000
74	0.36500	0.54054	-0.67803	0.00000	0.00000	0.00000
SUM	-0.06364	2.10404	-0.06364	0.00000	0.00000	0.00000
Condition **LC84=1.2D-WL60+1.6LLa4**						
71	-0.00193	0.32520	0.42334	0.00000	0.00000	0.00000
72	-0.67489	1.31890	0.60167	0.00000	0.00000	0.00000
73	0.26015	-0.08480	-0.40652	0.00000	0.00000	0.00000
74	0.36576	0.54474	-0.66940	0.00000	0.00000	0.00000
SUM	-0.05091	2.10404	-0.05091	0.00000	0.00000	0.00000
Condition **LC85=1.2D-WL90+1.6LLa4**						
71	0.00253	0.32157	0.43219	0.00000	0.00000	0.00000
72	-0.68399	1.31044	0.60163	0.00000	0.00000	0.00000
73	0.26792	-0.07808	-0.38656	0.00000	0.00000	0.00000
74	0.35154	0.55011	-0.64725	0.00000	0.00000	0.00000
SUM	-0.06200	2.10404	0.00000	0.00000	0.00000	0.00000
Condition **LC86=1.2D-WL120+1.6LLa4**						
71	0.01215	0.31455	0.43308	0.00000	0.00000	0.00000
72	-0.68782	1.30559	0.60962	0.00000	0.00000	0.00000
73	0.28088	-0.07549	-0.37294	0.00000	0.00000	0.00000
74	0.34388	0.55940	-0.61885	0.00000	0.00000	0.00000
SUM	-0.05091	2.10404	0.05091	0.00000	0.00000	0.00000
Condition **LC87=1.2D-WL150+1.6LLa4**						
71	0.01056	0.31519	0.43908	0.00000	0.00000	0.00000
72	-0.69230	1.30102	0.60552	0.00000	0.00000	0.00000
73	0.28069	-0.07049	-0.36310	0.00000	0.00000	0.00000
74	0.33740	0.55832	-0.61785	0.00000	0.00000	0.00000
SUM	-0.06364	2.10404	0.06364	0.00000	0.00000	0.00000

Envelope for nodal reactions

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



Direction of positive forces and moments

Envelope of nodal reactions for :

LC1=1.2D+Wo
LC2=1.2D+W30
LC3=1.2D+W60
LC4=1.2D+W90
LC5=1.2D+W120
LC6=1.2D+W150
LC7=1.2D-Wo
LC8=1.2D-W30
LC9=1.2D-W60
LC10=1.2D-W90
LC11=1.2D-W120
LC12=1.2D-W150
LC13=0.9D+Wo
LC14=0.9D+W30
LC15=0.9D+W60
LC16=0.9D+W90
LC17=0.9D+W120
LC18=0.9D+W150
LC19=0.9D-Wo
LC20=0.9D-W30
LC21=0.9D-W60
LC22=0.9D-W90
LC23=0.9D-W120
LC24=0.9D-W150
LC25=1.2D+Di+WI0
LC26=1.2D+Di+WI30
LC27=1.2D+Di+WI60
LC28=1.2D+Di+WI90
LC29=1.2D+Di+WI120
LC30=1.2D+Di+WI150
LC31=1.2D+Di-WI0
LC32=1.2D+Di-WI30
LC33=1.2D+Di-WI60
LC34=1.2D+Di-WI90
LC35=1.2D+Di-WI120
LC36=1.2D+Di-WI150
LC37=1.2D+1.6LL1
LC38=1.2D+1.6LL2
LC39=1.2D+1.6LL3
LC40=1.2D+WL0+1.6LLa1
LC41=1.2D+WL30+1.6LLa1
LC42=1.2D+WL60+1.6LLa1
LC43=1.2D+WL90+1.6LLa1
LC44=1.2D+WL120+1.6LLa1
LC45=1.2D+WL150+1.6LLa1
LC46=1.2D-WL0+1.6LLa1
LC47=1.2D-WL30+1.6LLa1
LC48=1.2D-WL60+1.6LLa1
LC49=1.2D-WL90+1.6LLa1
LC50=1.2D-WL120+1.6LLa1
LC51=1.2D-WL150+1.6LLa1
LC52=1.2D+WL0+1.6LLa2
LC53=1.2D+WL30+1.6LLa2
LC54=1.2D+WL60+1.6LLa2
LC55=1.2D+WL90+1.6LLa2
LC56=1.2D+WL120+1.6LLa2
LC57=1.2D+WL150+1.6LLa2
LC58=1.2D-WL0+1.6LLa2
LC59=1.2D-WL30+1.6LLa2
LC60=1.2D-WL60+1.6LLa2
LC61=1.2D-WL90+1.6LLa2
LC62=1.2D-WL120+1.6LLa2
LC63=1.2D-WL150+1.6LLa2

LC64=1.2D+WL0+1.6LLa3
LC65=1.2D+WL30+1.6LLa3
LC66=1.2D+WL60+1.6LLa3
LC67=1.2D+WL90+1.6LLa3
LC68=1.2D+WL120+1.6LLa3
LC69=1.2D+WL150+1.6LLa3
LC70=1.2D-WL0+1.6LLa3
LC71=1.2D-WL30+1.6LLa3
LC72=1.2D-WL60+1.6LLa3
LC73=1.2D-WL90+1.6LLa3
LC74=1.2D-WL120+1.6LLa3
LC75=1.2D-WL150+1.6LLa3
LC76=1.2D+WL0+1.6LLa4
LC77=1.2D+WL30+1.6LLa4
LC78=1.2D+WL60+1.6LLa4
LC79=1.2D+WL90+1.6LLa4
LC80=1.2D+WL120+1.6LLa4
LC81=1.2D+WL150+1.6LLa4
LC82=1.2D-WL0+1.6LLa4
LC83=1.2D-WL30+1.6LLa4
LC84=1.2D-WL60+1.6LLa4
LC85=1.2D-WL90+1.6LLa4
LC86=1.2D-WL120+1.6LLa4
LC87=1.2D-WL150+1.6LLa4

		Forces						Moments					
Node		**Fx** [Kip]	**lc**	**Fy** [Kip]	**lc**	**Fz** [Kip]	**lc**	**Mx** [Kip*ft]	**lc**	**My** [Kip*ft]	**lc**	**Mz** [Kip*ft]	**lc**
71	Max	0.622	LC2	1.081	LC59	0.835	LC12	0.00000	LC1	0.00000	LC1	0.00000	LC1
	Min	-0.312	LC20	-0.055	LC14	-0.388	LC18	0.00000	LC1	0.00000	LC1	0.00000	LC1
72	Max	0.286	LC18	1.342	LC81	0.970	LC2	0.00000	LC1	0.00000	LC1	0.00000	LC1
	Min	-0.692	LC87	-0.011	LC24	-0.341	LC20	0.00000	LC1	0.00000	LC1	0.00000	LC1
73	Max	0.575	LC14	0.557	LC63	0.708	LC24	0.00000	LC1	0.00000	LC1	0.00000	LC1
	Min	-0.603	LC8	-0.285	LC18	-1.145	LC6	0.00000	LC1	0.00000	LC1	0.00000	LC1
74	Max	0.735	LC6	0.621	LC2	0.783	LC14	0.00000	LC1	0.00000	LC1	0.00000	LC1
	Min	-0.623	LC24	-0.305	LC20	-1.406	LC8	0.00000	LC1	0.00000	LC1	0.00000	LC1

Date: 1/21/2022
Project Name: PORTLAND
Project No.: CT1066
Designed By: CL **Checked By:** MSC

HUDSON Design Group LLC

CHECK CONNECTION CAPACITY (Worst Case)

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

Bolt Type = A36 1/2" Threaded Rod

Allowable Tensile Load =

F_{Tall} = 4271 lbs.

Allowable Shear Load =

F_{Vall}= 2562 lbs.

TENSILE FORCES

Reaction **F =** 970 lbs. (See Bentley Output)

SHEAR FORCES

Reactions in X direction: 692 lbs. (See Bentley Output)
Reactions in Y direction: 1342 lbs. (See Bentley Output)

Resultant: 1510 lbs.

No. of Supports = 1
No. of Bolts / Support = 4

Tension Design Load /Bolts =

f_t= 242.50 lbs. < 4271 lbs. **Therefore, OK !**

Shear Design Load / Bolts=

f_v= 377.48 lbs. < 2562 lbs. **Therefore, OK !**

CHECK COMBINED TENSION AND SHEAR

f_t / F_T	+	f_v / F_V	≤	1.0			
0.057	+	0.147	=	0.204	<	1.0	**Therefore, OK !**

Structural Components, LLC
1870 West 64th Lane, Unit A
Denver, CO 80221

Voice: 866-386-7622

April 21, 2022

BST Management, LLC
352 Park Street
Suite 106
North Reading, MA 01864

Re: Rigorous Structural Analysis Report

Structure:	80.4ft Self-Supporting Tower with 10ft Extension
Site Address:	97 High Street, Portland, Connecticut 06480 (Middlesex County) Latitude: 41.5807°N, Longitude: 72.6238°W
Site Name:	BST Management, LLC – Portland Verizon – Portland
Site Number:	BST Management, LLC – CT-1680 Verizon – 469381
SC Number:	220142
Status:	**Structure Passes with Modifications (99% Capacity)** **Foundation Passes**

Per your request, Structural Components, LLC has completed a structural analysis for the above referenced project to verify the tower's compliance to the following design criteria:

Standard:	TIA-222-G *Structural Standard for Antenna Supporting Structures and Antennas*
Building Code:	2015 International Building Code Connecticut State Building Code
Design Basic Wind Speed without Ice:	125 mph 3-second gust V_{ULT}
Design Basic Wind Speed with Ice:	50 mph 3-second gust
Ice Thickness:	3/4" radial
Serviceability Basic Wind Speed:	60 mph 3-second gust
Exposure Category:	C
Topographic Category:	1
Risk Category:	II
Seismic Site Class:	D, S_s=0.180, S_1=0.063
Seismic Design Category:	B

Please refer to the following structural analysis report, which gives complete details of the tower loading, results, information provided, and necessary assumptions.

We trust you find this report satisfactory. Please do not hesitate to contact us if you should have any questions or concerns.

Best Regards,
Structural Components LLC

Wesley Culver
Engineering Manager

/TR

Michael Deboer, P.E.
Connecticut P.E. # 0018022

05/02/2022

1 LOADING CONFIGURATION

The following antennas, mounts, transmission lines, and other appurtenances were considered for the structural analysis.

Elevation (ft)		Equipment	Feedlines	Notes
Mount	Equip			
90.5	90.5	(1) 5/8" x 6' Lightning Rod	---	Existing
90.0	**90.0**	**(3) CommScope NNH4-65B-R6 Panels** **(3) Samsung XXDWMM-12.5-65-8TCBRS Panels** **(3) Samsung MT6407-77A Panels** **(3) Samsung CBRS RRH - RT4401-48A RRUs** **(3) Samsung RF4439d-25A RRUs** **(3) Samsung RF4440d-13A RRUs** **(1) CommScope FE-16148-OVP-B12 TMA** **(3) T-Arms**	**(2) 6x12 Hybrid**	**Verizon Proposed**
77.0	77.0	(1) L6" x 6" x 7/16" Ring Mount	---	Existing
76.7	78.7	(3) Ericsson RRUS 32 (1) Raycap DC6-48-60-18-F SSD	(3) 1-5/8" TX (15) 7/8" TX (2) 3/4" OD (2) 3/4" Fiber (2) 1/2" TX	AT&T Existing / Reserved
	78.2	(3) Kathrein 800 10121 Panels		
	77.7	(3) Quintel QS66510-6 Panels		
	77.2	(3) CCI HPA-65R-BUU-H6 Panels (6) Ericsson RRUS 32 (1) Raycap DC6-48-60-18-F SSD		
	76.7	(3) CCI DTMABP7819VG12A TMAs (3) 12' Sector Frame Mounts		
	75.7	(6) Kathrein 782 11054 RETs (6) Kaelus DBC0061F1V51-2 Combiners		
	75.5	(3) Ericsson RRUS 11 B12		
75.0	75.0	(1) L6" x 6" x 7/16" Ring Mount	---	Existing
73.0	73.0	(1) 2-3/8" x 8' Pipe Mount		
67.7	67.7	(1) L6" x 6" x 7/16" Ring Mount		

1) Elevations reference centerline of panel, yagi, mounts, and dish antennas, and base of whip antennas, in relation to the base of the tower.
2) Refer to the feed line diagram and analysis output in Appendix A for the location and orientation of feedlines and equipment.

2 RESULTS

The analysis was performed using tnxTower v8.1.1.0, a structural analysis program developed by Tower Numerics, Inc. specifically for the communication tower industry.

2.1 TOWER MEMBER STRESS LEVELS

The tower has the following stress ratios in its structural members.

Elev. (ft)	Member	Stress Ratio After Modifications*
0 – 90.4	Legs	0.99
0 – 90.4	Bracing	0.84
0 – 90.4	Connections	0.90

Stress ratio (SR) criteria:
SR $\leq$ 1.00 is completely within code limits.
SR $\leq$ 1.05 is considered within acceptable tolerance of code limits.
SR > 1.05 is outside acceptable tolerance of code limits and requires structural modifications.
* Seismic analysis for similar analysis scenario has been previously shown to produce significantly lower stress ratios than wind and ice. Therefore seismic analysis has not been included in the current analysis.

2.2 FOUNDATION REACTIONS

The reactions listed below are for the design wind speed listed. Reactions are factored loads.

Reaction Type	Current Wind Reactions	Current Iced Reactions	Foundation Status
Moment (ft-kips)	1,296.0	1,296.6	Passes*
Shear (kips)	24.3	24.3	
Axial (kips)	21.0	55.4	
Leg Compression (kips)	74.5	75.8	
Leg Uplift (kips)	66.6	65.3	
Leg Shear (kips)	11.7	13.3	

* See Appendix A for foundation calculations.

2.3 TOWER DEFLECTION

The tower deflections have been reviewed and are believed to be acceptable for the proposed equipment. The carrier(s) should review the deflections for the service wind condition included in Appendix A for compatibility with their equipment.

3 PROVIDED INFORMATION AND ASSUMPTIONS

The following information was directly used to generate this report, and can be found in Appendix B.

Document	Author	Date	Reference
Collocation Application	Verizon	11/08/2021	CT-1680
Structural Analysis Report – AT&T	GDP	12/12/2017	2018701.10
Tower Design Drawings	Empire Telecom	12/13/2017	10035005
Construction Drawings	Centek	10/19/2017	17004.51
Construction Drawings	Centek	05/02/2018	17004.51
Self Supporting Tower Mapping Report	Structural Components, LLC	03/15/2022	220142
TIA Inspection + L&A Mapping Report	Structural Components, LLC	03/15/2022	220142
Foundation NDT Mapping Report	GDP	03/06/2017	217702.58
Geotechnical Report	GDP	03/06/2017	2017702.58

The following assumptions were made in order to complete the analysis. These assumptions must be checked. If they do not accurately represent the existing or proposed tower, foundation, soil, and loading conditions, we must be notified so that we can make the appropriate changes to our analysis, conclusions, and recommendations.

1. The tower and foundation are in good condition with no corrosion, damage or fatiguing issues which could reduce the carrying capacity of the tower.
2. All welds and connections are assumed to develop at least the member capacity, unless determined otherwise and explicitly stated in this report.
3. All prior structural modifications, if any, are assumed to be as per date supplied/ available, to be properly installed and to be fully effective.
4. The following assumptions regarding member minimum material or type apply to this structure, unless otherwise noted in analysis:
   - Angle Legs: A36
   - Angle Bracing: A36
   - Splice Bolts: A307
   - Gusset Plates: A36
   - Brace Bolts: A325N
5. The feedline and appurtenance configuration is as stated in the report. All antennas, coax, cables and waveguide cables are assumed to be properly installed and supported as per manufacturer requirement.
6. The support mounts and/or platforms are not analyzed and are considered adequate to support the loading.
7. All mounting systems connect at tower bracing points. Local stresses are not considered unless noted otherwise in analysis.
8. Some assumptions are made regarding antenna and mount sizes and their projected areas based on a best interpretation of the data supplied and a best knowledge of antenna type and industry practice.
9. The soil parameters are as per data supplied, or as assumed, and stated in the calculations.

4 REQUIRED STRUCTURAL MODIFICATIONS

Provided the assumptions outlined are accurate, we recommend the following modifications:

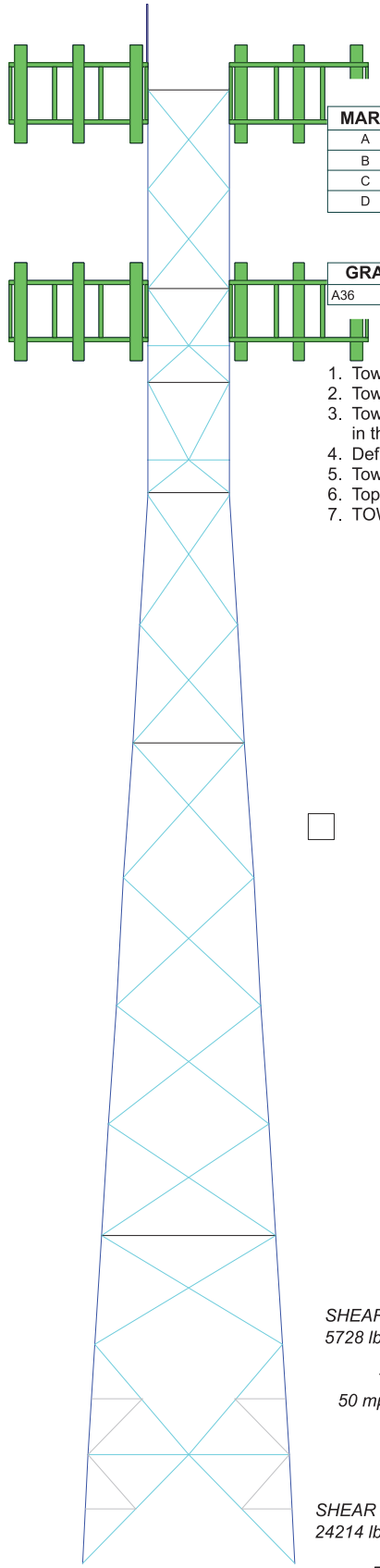
1. Install new L1-3/4" x 1-3/4" x 3/16" sub diagonals and sub horizontals from 0-13.5ft.
2. Upgrade top girt at 20.0ft from an L2" x 2-1/2" x 3/16" to a L2" x 2-1/2" x 1/4"
3. Install new 10ft tower extension.
4. Install new safety climb up climbing leg to rest platform and up inside of face to top.

Once the above upgrades are completed, the tower will be in structural compliance with the proposed antenna installation.

5 CONCLUSIONS

With the loadings listed and the installed structural modifications as outlined, the tower and foundations satisfy the structural strength requirements of the standards and codes listed.

05/02/2022



Section	T14	T13	T12	T11	T10	T9	T8	T7	T6	T5	T4	T3	T2	T1
Legs	L5x5x5/16					L5x5x3/8			L4x4x3/8					L4x4x1/4
Leg Grade	A36													
Diagonals	L3x3x5/16		C			L2x2 1/2x3/16				B	L2 1/2x2 1/2x3/16		A	L2x2x1/4
Diagonal Grade	A36													
Top Girts	N.A.		L2x2 1/2x1/4		N.A.		L2 1/2x2 1/2x3/16		N.A.		2L4x4x3/8	N.A.	D	L2 1/2x2 1/2x3/16
Bottom Girts					N.A.					E		N.A.		
Horizontals	F	L1 3/4x1 3/4x3/16				N.A.				D	N.A.	D	N.A.	
Red. Horizontals								N.A.						
Red. Diagonals		L1 3/4x1 3/4x3/16						N.A.						
Inner Bracing	N.A.		L2x2x3/16		N.A.		L2 1/2x2x3/16		N.A.	G	N.A.	G	N.A.	
Face Width (ft)	13.083	12.2597	11.4363	10.6142	9.7793	8.883	7.9252	6.9059	6.0147					5.0416
# Panels @ (ft)		2 @ 6.7075		1 @ 6.688	1 @ 6.792	1 @ 7.292	1 @ 7.792	1 @ 8.292	1 @ 7.25	1 @ 7.917	1 @ 2	1 @ 4.75	H	1 @ 3.5	2 @ 6.08292
Weight (lb)	9055.0	979.7	853.8	819.8	805.0	620.6	636.9	792.8	497.4	522.3	446.5	733.1	309.2	448.4	789.4

SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	L2x2 1/2x3/16	E	L3x3x3/16
B	L2x2x3/16	F	L1 3/4x1 3/4x3/16
C	L2 1/2x2 1/2x3/16	G	L2 1/2x2x3/16
D	L4x3 1/2x1/4	H	1 @ 2.25

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A36	36 ksi	58 ksi			

TOWER DESIGN NOTES

1. Tower designed for Exposure C to the TIA-222-G Standard.
2. Tower designed for a 125 mph basic wind in accordance with the TIA-222-G Standard.
3. Tower is also designed for a 50 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 60 mph wind.
5. Tower Risk Category II.
6. Topographic Category 1 with Crest Height of 0.00 ft
7. TOWER RATING: 98.2%

ALL REACTIONS ARE FACTORED

MAX. CORNER REACTIONS AT BASE:
DOWN: 75312 lb
SHEAR: 13297 lb

UPLIFT: -66114 lb
SHEAR: 11647 lb

AXIAL
55302 lb

SHEAR
5728 lb

MOMENT
329683 lb-ft

TORQUE 3590 lb-ft
50 mph WIND - 0.7500 in ICE

AXIAL
20963 lb

SHEAR
24214 lb

MOMENT
1296504 lb-ft

TORQUE 14525 lb-ft
REACTIONS - 125 mph WIND

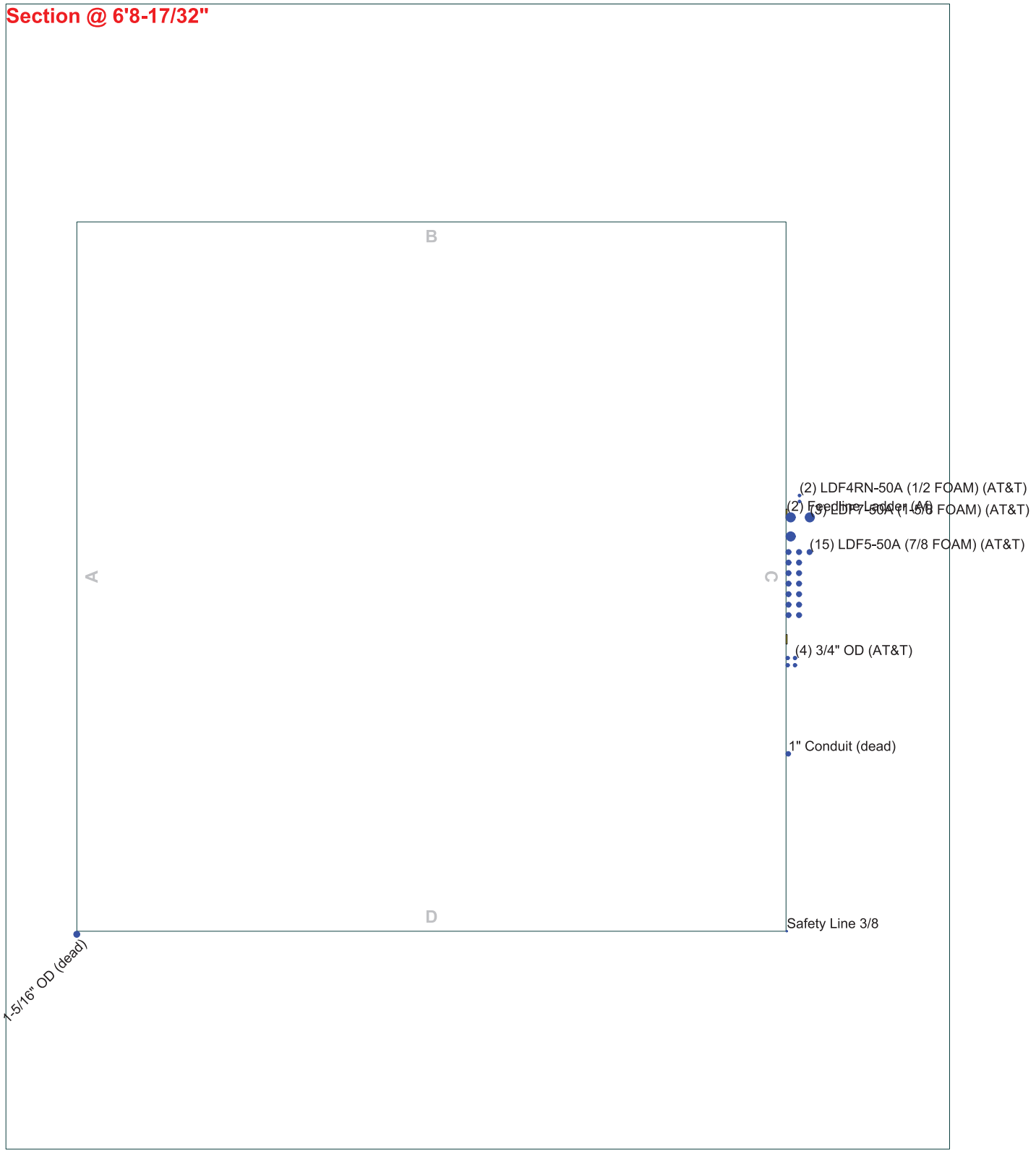
Structural Components, LLC
1870 West 64th Lane, Unit A
Denver, CO 80221
Phone: (866) 386-7622
FAX:

Job: **220142**			
Project: ***Portland (CT-1680)***			
Client: BST Management, LLC	Drawn by: treed	App'd:	
Code: TIA-222-G	Date: 04/21/22	Scale: NTS	
Path:		Dwg No. E-1	

Feed Line Plan
6'8-17/32"

Round Flat App In Face App Out Face

Section @ 6'8-17/32"



Structural Components, LLC
1870 West 64th Lane, Unit A
Denver, CO 80221
Phone: (866) 386-7622
FAX:

Job: 220142			
Project: Portland (CT-1680)			
Client: BST Management, LLC	Drawn by: treed		App'd:
Code: TIA-222-G	Date: 04/21/22		Scale: NTS
Path:			Dwg No. E-7

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MODIFICATION DRAWINGS FOR PORTLAND, CT

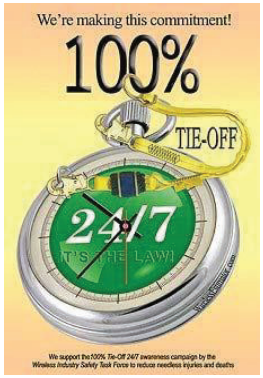
verizonwireless

SITE NAME:

BST MANAGEMENT, LLC - PORTLAND
VERIZON - PORTLAND

SITE NUMBER:

BST MANAGEMENT, LLC - CT-1680
VERIZON - 469381



SITE INFORMATION

SITE ADDRESS:
97 HIGH STREET
PORTLAND CT 06480

SITE COORDINATES:
LATITUDE: 41.5807° N
LONGITUDE: 72.6238° W

SITE ACCESS ISSUES:
NO SITE ACCESS ISSUES NOTED.

CODE COMPLIANCE

ALL WORK AND MATERIALS SHALL BE PERFORMED AND INSTALLED IN ACCORDANCE WITH THE CURRENT EDITIONS OF ALL GOVERNING CODES AS ADOPTED BY THE LOCAL GOVERNING AUTHORITIES. NOTHING IN THESE PLANS IS TO BE CONSTRUCTED TO PERMIT WORK NOT CONFORMING TO THESE CODES.

DESIGN DATA

STANDARD:
TIA-222-G
BUILDING CODE:
2015 INTERNATIONAL BUILDING CODE
CONNECTICUT STATE BUILDING CODE
DESIGN BASIC WIND SPEED WITHOUT ICE:
125 MPH 3-SEC. GUST ULTIMATE
DESIGN BASIC WIND SPEED WITH ICE:
50 MPH 3-SEC. GUST
ICE THICKNESS:
3/4" RADIAL
SERVICEABILITY BASIC WIND SPEED:
60 MPH 3-SEC. GUST
EXPOSURE CATEGORY:
C
TOPOGRAPHIC CATEGORY:
1
RISK CATEGORY:
II
SEISMIC SITE CLASS:
D, Ss= 0.180, S1=0.063
SEISMIC DESIGN CATEGORY:
B

PROJECT SUMMARY

APPLICANT/LESSEE:
VERIZON
CONTRACTORS:
CONSTRUCTION:
TBD.
CONSULTANTS:
STRUCTURAL COMPONENTS, LLC
1-866-386-7622
FOR ENGINEERING QUESTIONS CONTACT: WESLEY CULVER
FOR CONSTRUCTION AND FIELD SERVICES QUESTIONS CONTACT: HOWARD ROTCHFORD
TOWER OWNER:
BST MANAGEMENT, LLC
352 PARK STREET
SUITE 106
NORTH READING, MA 01864

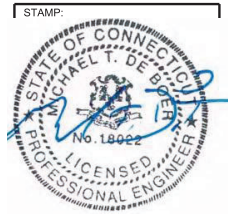
SHEET INDEX

ARCHITECTURAL:
T-1 TITLE SHEET
GN-1 GENERAL CONSTRUCTION NOTES
GN-2 SPECIAL INSPECTIONS
STRUCTURAL:
BOM BILL OF MATERIALS
S-1 SPECIFICATIONS
DETAILS:
D-1 SUB-DIAG. & SUB-HORZ. INSTALL DETAILS
D-2 TOP GIRT INSTALL DETAILS
D-3 TOWER EXTENSION DETAILS
D-4 SAFETY CLIMB INSTALL DETAILS
D-5 SAFETY CLIMB INSTALL DETAILS (CONT'D)

BLUE SKY TOWERS LLC

Structural Components
Bringing It All Together.
1870 W 64TH LANE
DENVER, CO 80221
(866) 386 - 7622
JOB #: 220142

STAMP:



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REVISIONS:

NO.	DATE	DESCRIPTION	BY	CHK	APD
0	4/29/22	MODIFICATION DRAWINGS	RM	TR	WC
1					
2					
3					
4					
5					

SITE INFORMATION:
97 HIGH STREET
PORTLAND CT 06480

DESIGN TYPE:
SELF SUPPORT
TOWER
MODIFICATION

SHEET TITLE:
TITLE SHEET

SHEET TITLE: T-1
REVISION: 0

GENERAL NOTES:

1. THE MODIFICATIONS OUTLINED IN THESE DOCUMENTS WERE DESIGNED IN ACCORDANCE WITH THE TIA-222-G TOWER CODE.
2. PLANS, SECTIONS, AND DETAILS ARE NOT TO BE SCALED FOR DETERMINATION OF QUANTITIES, LENGTHS, OR FIT OF MATERIALS.
3. UNLESS NOTED OTHERWISE = U.N.O.
4. ALL WORK ON THESE DRAWINGS SHALL BE PERFORMED BY A QUALIFIED CONTRACTOR WITH A MINIMUM OF 5 YEARS OF PAST TOWER EXPERIENCE AND SHALL FOLLOW THE DICTATES OF GOOD CONSTRUCTION PRACTICE WITH WORKING KNOWLEDGE OF THE TIA CODE "STRUCTURAL STANDARD FOR ANTENNA SUPPORTING STRUCTURES AND ANTENNAS".
5. CONTRACTOR AND/OR SUB-CONTRACTOR SHALL BE RESPONSIBLE FOR ANY PERMITTING REQUIRED OR PROVIDE PROOF THAT THE LOCAL JURISDICTION DOES NOT REQUIRE A PERMIT FOR THE WORK COMPLETED.
6. ALL WORK SHALL BE DONE IN ACCORDANCE WITH ALL FEDERAL, STATE AND LOCAL CODES AND OSHA SAFETY REGULATIONS AND PERFORMED UNDER NORMAL WEATHER CONDITIONS WITH WINDS NOT IN EXCESS OF 20 MPH.
7. CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO PROTECT ALL EXISTING EQUIPMENT, ANTENNAS, TX AND STRUCTURES. THE CONTRACTOR IS ALSO RESPONSIBLE FOR THE PROTECTION OF WORKERS, PUBLIC AND PRIVATE PROPERTY DURING CONSTRUCTION UP UNTIL COMPLETION OF WORK.
8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFICATION OF ALL MEASUREMENTS AT THE SITE BEFORE ORDERING ANY MATERIALS OR DOING ANY WORK. NO EXTRA CHARGE FOR COMPENSATIONS SHALL BE ALLOWED DUE TO DIFFERENCE BETWEEN ACTUAL DIMENSIONS AND DIMENSIONS INDICATED ON THE CONSTRUCTION DRAWINGS. ANY SUCH DISCREPANCY IN THE DIMENSION WHICH MAY BE FOUND SHALL BE SUBMITTED TO THE OWNER/CLIENT FOR CONSIDERATIONS BEFORE THE CONTRACTOR PROCEEDS WITH THE WORK IN THE AFFECTED AREA.
9. ANY SUBSTITUTIONS MUST CONFORM TO THE REQUIREMENTS OF THESE NOTES AND SPECIFICATIONS, AND SHOULD BE SIMILAR TO THOSE SHOWN. ALL SUBSTITUTIONS SHALL BE SUBMITTED TO THE ENGINEER OF RECORD FOR REVIEW AND APPROVAL PRIOR TO FABRICATION OR INSTALLATION.
10. CONTRACTOR'S PROPOSED INSTALLATION SHALL NOT INTERFERE, NOR DENY ACCESS TO ANY EXISTING OPERATIONAL AND SAFETY EQUIPMENT.
11. CONTRACTOR SHALL PROMPTLY REMOVE ANY AND ALL DEBRIS FROM SITE AND RESTORE AS BEST AS POSSIBLE TO PRECONSTRUCTION CONDITION INCLUDING BUT NOT LIMITED TO ANY DIVOTS ON ROADWAY OR SURROUNDING AREA.
12. DIGITAL PHOTOGRAPHS SHALL BE TAKEN OF SITE ACCESS, COMPOUND AND TOWER PRIOR TO CONSTRUCTION, DURING CONSTRUCTION AND POST CONSTRUCTION INCLUDING BUT NOT LIMITED TO ALL REINFORCED AREAS. CLOSE-OUT REPORT SHALL FOLLOW WITHIN 3 BUSINESS DAYS.

PARTS / FABRICATION / SHOP DRAWINGS:

1. ALL PARTS INCLUDED IN THESE DRAWINGS ARE MANUFACTURED AND OR SUPPLIED BY STRUCTURAL COMPONENTS, LLC. PARTS FROM OTHER MANUFACTURER'S ARE NOT TO BE USED UNLESS OTHERWISE AUTHORIZED BY THE STRUCTURAL ENGINEER OF RECORD.
2. ALL FABRICATION / SHOP DRAWINGS ARE TO BE REVIEWED FOR COMPLIANCE TO THE STRUCTURAL DRAWINGS AND SIGNED OFF BY THE STRUCTURAL ENGINEER PRIOR TO FABRICATION.

EARTHWORK:

1. THE STRUCTURAL DRAWINGS ILLUSTRATE THE COMPLETED FOUNDATION WITH ALL ELEMENTS IN THEIR FINAL POSITIONS, PROPERLY SUPPORTED AND BRACED.
2. THE CONTRACTOR, IN THE PROPER SEQUENCE, SHALL PROVIDE SHORING AND BRACING AS MAY BE REQUIRED DURING CONSTRUCTION TO ACHIEVE THE FINAL COMPLETED STRUCTURE.
3. OBSERVATION VISITS TO THE SITE BY THE STRUCTURAL ENGINEER SHALL NOT INCLUDE INSPECTION OF THE SHORING AND BRACING ELEMENTS.
4. THE CONTRACTOR IS RESPONSIBLE FOR THE DESIGN AND EXECUTION OF ALL MISCELLANEOUS SHORING, BRACING, ETC. NECESSARY TO PROVIDE A COMPLETE AND STABLE STRUCTURE AS SHOWN ON THESE DRAWINGS.
5. CONTRACTOR'S PROPOSED INSTALLATION SHALL NOT INTERFERE, NOR DENY ACCESS TO ANY EXISTING OPERATIONAL AND SAFETY EQUIPMENT.

FOUNDATION DESIGN:

1. REFER TO GEOTECHNICAL REPORT REFERENCED IN PASSING WITH MODIFICATIONS STRUCTURAL FOR SOILS INFORMATION.
2. CONTRACTOR SHALL VERIFY THAT THE SOILS ENCOUNTERED CORRESPOND TO THE GEOTECHNICAL REPORT WHILE EXCAVATING. THE CONTRACTOR SHALL CONTACT THE ENGINEER OF RECORD IF ANY UNEXPECTED SOILS ARE ENCOUNTERED.
3. ALL FILL SHALL BE CLEAN AND FREE OF ORGANIC OR FROZEN SOILS AND FOREIGN MATERIALS. STRUCTURAL BACKFILL SHALL BE COMPACTED IN 12 INCH LOOSE LIFTS TO 97% OF MAXIMUM DRY DENSITY WITHIN 3% OF OPTIMUM MOISTURE CONTENT IN ACCORDANCE WITH ASTM D698.
4. LOOSE MATERIAL SHALL BE REMOVED FROM BOTTOM OF EXCAVATION PRIOR TO PLACING CONCRETE.
5. CONCRETE SHALL BE PLACED AS SOON AS PRACTICAL AFTER EXCAVATION TO AVOID DISTURBANCE OF BEARING AND SIDE WALL SURFACES.
6. FOLLOW ALL RECOMMENDATIONS IN GEOTECHNICAL REPORT FOR SUB-GRADE PREPARATION UNDER FOUNDATION ELEMENTS.

CAST-IN-PLACE CONCRETE:

1. ALL CONCRETE DESIGN IS BASED ON THE "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE" (ACI 318-14/318R-14).
2. ALL STRUCTURAL CONCRETE SHALL HAVE A MINIMUM 28-DAY COMPRESSIVE STRENGTH OF 4,000 PSI. U.N.O.
3. CONCRETE SHALL BE PROPORTIONED UTILIZING TYPE II CEMENT. CONCRETE SUSCEPTIBLE TO FREEZING SHALL BE FORMULATED FOR MAXIMUM FROST RESISTANCE IN ACCORDANCE WITH THE ACI MANUAL OF CONCRETE PRACTICE.
4. COLD WEATHER AND/OR HOT WEATHER CONCRETING PROCEDURES SHALL BE PROVIDED, IF CONDITIONS WARRANT, AS RECOMMENDED IN THE ACI MANUAL OF CONCRETE PRACTICE.
5. ALL ANCHOR BOLTS IN NEW FOUNDATIONS SHALL BE PLACED WITH SETTING TEMPLATES.

REINFORCING STEEL:

1. ALL DETAILING, FABRICATION, AND PLACEMENT OF REINFORCING STEEL SHALL BE IN ACCORDANCE WITH THE ACI MANUAL OF CONCRETE PRACTICE.
2. REINFORCING BARS SHALL BE DEFORMED AND CONFORM TO ASTM A615-79 AND SHALL BE GRADE 60, EXCEPT TIES WHICH MAY BE GRADE 40.
3. AT REINFORCING STEEL SPLICES IN CONCRETE, LAP BARS 40 DIAMETERS FOR SIZES UNDER #7 AND 48 DIAMETERS FOR SIZES #7 AND LARGER U.N.O.
4. EXCEPT AS NOTED ON THE DRAWINGS, MINIMUM CONCRETE PROTECTION FOR REINFORCEMENT SHALL BE IN ACCORDANCE WITH ACI 318-14/318R-14.
5. NO.5 OR LARGER REINFORCING BARS SHALL NOT BE RE-BENT WITHOUT APPROVAL BY THE STRUCTURAL ENGINEER.
6. WELDING OF REBAR IS STRICTLY PROHIBITED.

BACKFILLING:

1. BACKFILLING OF SOILS AROUND FOUNDATION BASES / ANCHORS SHALL BE COMPLETED BEFORE ERECTION OF TOWER BEGINS.
2. BACKFILL SHALL BE COMPACTED IN LIFTS TO 90% COMPACTION.
3. BACKFILL SHALL BE NATIVE SOILS; IMPORTED FILL SHALL BE VERIFIED WITH THE GEOTECHNICAL ENGINEER AND STRUCTURAL ENGINEER PRIOR TO BACKFILLING.

STRUCTURAL STEEL:

1. STRUCTURAL STEEL SHALL BE DETAILED, FABRICATED, AND ERECTED IN ACCORDANCE WITH 2010 AISC SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS, 2010 AISC CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES AND CHAPTER 4 OF THE TIA CODE.
2. PRE-QUALIFIED STRUCTURAL STEEL SHALL CONFORM TO THE FOLLOWING MINIMUM GRADES (SEE FABRICATION DRAWINGS FOR SPECIFIC GRADES FOR SPECIFIC PARTS):
   - CHANNELS, SOLID ROUND, & ANGLES ------ ASTM A36, (FY = 36 KSI)
   - PLATES ---------- A572 GR. 50, (FY = 50 KSI)
   - HSS ---------- ASTM A500 GR. B, (FY = 46 KSI)
   - STEEL PIPE ---------- ASTM A53 GR. B, (FY = 36 KSI)
   - U-BOLTS ---------- ASTM A307, (FY = 36 KSI) w/ LOCKING DEVICE U.N.O.
   - SEE TABLE 5-1 OF THE TIA CODE FOR ADDITIONAL SHAPES AND STANDARDS THAT ARE NOT LISTED ABOVE.
3. NON PRE QUALIFIED STRUCTURAL STEEL SHALL CONFORM TO THE FOLLOWING STANDARDS AS PER THE TIA CODE:
   - THE CARBON EQUIVALENT OF STEEL SHALL NOT EXCEED 0.65 PER SECTION 5.4.2 OF THE TIA CODE
   - ELONGATION OF STEEL SHALL NOT BE LESS THAN 18%
   - TEST REPORTS SHALL BE IN ACCORDANCE WITH ASTM A6 OR A568
   - TOLERANCES SHALL BE IN ACCORDANCE WITH ASTM A6
4. FIELD CUT EDGES, EXCEPT DRILLED HOLES, SHALL BE GROUND SMOOTH.

CORROSION CONTROL:

1. ALL STEEL MEMBERS SHALL HAVE CORROSION CONTROL AS OUTLINED IN THE TIA CODE AND STATED BELOW:
   - STEEL MEMBERS SHALL BE HOT DIPPED GALVANIZED PER ASTM A123.
   - FASTENERS AND HARDWARE SHALL BE HOT DIPPED GALVANIZED PER ASTM A153 OR ASTM B695 CLASS 50 (A490 BOLTS SHALL NOT BE HOT DIPPED GALVANIZED).
   - GUYS STANDS SHALL BE PROTECTED IN ACCORDANCE WITH ASTM A475 OR A586 MINIMUM CLASS A COATING.
   - GUY ANCHORAGE IN DIRECT CONTACT OF GROUND SHALL BE HOT DIPPED GALVANIZED PER ASTM A123.
   - ALL REPAIRS SHALL BE PROTECTED IN ACCORDANCE WITH ASTM A780.
2. ALL FIELD CUT SURFACES SHALL BE REPAIRED WITH (2) COATS OF A 95% ZINC RICH PAINT PER ASTM A780 (ZRC PREFERRED).
3. ALL DAMAGED SURFACES, WELDED AREAS AND AUTHORIZED NON-GALVANIZED MEMBERS OR PARTS (EXISTING OR NEW) SHALL BE PAINTED WITH (2) COATS OF ZINC RICH PAINT (ZRC PREFERRED).
4. GUY ANCHOR GALVANIZATION SHALL EXTEND A MIN OF 6" INTO CONCRETE.

BOLTS:

1. ALL CONNECTIONS OF STRUCTURAL STEEL MEMBERS SHALL BE MADE USING SPECIFIED HIGH STRENGTH ASTM A325 OR A490 BOLTS WITH THREADS EXCLUDED IN SHEAR PLANE.
2. FASTENERS SHALL BE INSTALLED IN PROPERLY ALIGNED HOLES.
3. ALL BOLTS WITHOUT DTI WASHERS SHALL BE INSTALLED SNUG FIT UNTIL THE SECTION IS FULLY COMPACTED, AND THEN TIGHTENED FURTHER BY AISC - "TURN OF THE NUT", TIGHTENING SHALL PROGRESS SYSTEMATICALLY.
4. BOLT LENGTHS UP TO AND INCLUDING FOUR DIAMETERS SHALL BE TENSIONED $^{1}/_{3}$ TURN BEYOND SNUG FIT. BOLT LENGTHS OVER 4 DIAMETERS SHALL BE $^{1}/_{2}$ TURN BEYOND SNUG FIT.
5. FOR SITES WITH DTI WASHERS, REFER TO MANUFACTURER'S RECOMMENDED CALIBRATION PROCEDURE. HTTP://WWW.APPLIEDBOLTING.COM/PDF/SQUIRT_INSTALL.PDF
   - CHECK THE FIRST SET OF BOLTS WITH THE RECOMMENDED FEELER GAUGE TO VERIFY THE PROPER AMOUNT OF "SQUIRT".
   - FOR THE REMAINING BOLTS WITH DTI WASHERS, TIGHTEN UNTIL THE VOLUME AND APPEARANCE OF THE SQUIRT MATCHES THE FIRST "CALIBRATION" SET. THE NUMBER OF SQUIRTS MUST BE AT LEAST THE NUMBER OF BUMPS MINUS ONE. (FOR INSTANCE A FIVE BUMP DTI SHOULD SQUIRT IN AT LEAST FOUR PLACES).
   - PHOTOS OF THE FULLY ENGAGED SQUIRTER DTI WASHERS MUST BE TAKEN WITHIN 24 HOURS OF INSTALLATION BY THE CONTRACTOR.
6. FOR SETS OF BOLT, TIGHTEN GROUP INCREMENTALLY. COMPRESS ALL UNTIL MEMBERS ARE IN FIRM CONTACT. THEN COMPLETE FINAL BOLT TENSIONING.

WELDS:

1. ALL WELDING TO BE PERFORMED BY AWS CERTIFIED WELDERS AND CONDUCTED IN ACCORDANCE WITH AISC AND AWS WELDING CODE - STEEL AWS D1.1/D1.1M:2006 SPECIFICATIONS AND RECOMMENDATIONS.
2. ALL FIELD WELDS SHALL BE PERFORMED BY SMAW OR FCAW PROCESSES ONLY AND USE THE FOLLOWING ELECTRODE SPECIFICATIONS:
   - FILLER METAL YIELD <= 55 KSI
     - SMAC - 7015-X, 7016-X, 7018-X, OR 7028-X
     - FCAW - E7XT-X, OR E7XT-XM
   - FILLER METAL YIELD > 55 KSI
     - SMAC - 8015-X, 8016-X OR 8018-X
     - FCAW - E8XTX-X, OR E8XTX-XM
   - ALL FILLER METAL IS ASSUMED TO BE <= 55 KSI UNLESS WELD CALLOUT SPECIFIES OTHERWISE
   - ALL FCAW WIRE MUST BE SELF-SHIELDED
3. REFER TO STRUCTURAL DRAWINGS FOR ALL FIELD WELD SIZES AND TYPES.
4. PRIOR TO FIELD WELDING GALVANIZED MATERIAL, CONTRACTOR SHALL GRIND OFF GALVANIZING 1/2" BEYOND ALL FIELD WELD SURFACES.
5. REFER TO A DETAILED WELDING SPECIFICATION AND GUIDELINE BY STRUCTURAL COMPONENTS PRIOR TO COMMENCEMENT OF WORK.
6. CONTRACTOR RESPONSIBLE FOR PROTECTING NEARBY COMBUSTIBLE MATERIALS FROM HEAT, FLAME, SPARKS, AND SLAG BY MOVING OR COVERING THEM.
7. FIRE WATCH MUST REMAIN IN THE WORK AREA 30 MINUTES MINIMUM AFTER WELDING OR CUTTING OPERATIONS HAVE ENDED.

GUY ASSEMBLIES:

1. ALL GUY ASSEMBLIES AND COMPONENTS SHALL HAVE THE MINIMUM DESIGN STRENGTHS AS SHOWN ON THE STRUCTURAL DRAWINGS.
2. GUY STRANDS SHALL BE EXTRA HIGH STRENGTH (EHS) OR EQUAL AND SHALL BE IN ACCORDANCE WITH ASTM A475.
3. STRUCTURAL STRANDS SHALL BE IN ACCORDANCE WITH ASTM A586 OR EQUAL.
4. GUY GRIPS SHALL BE DESIGNED SPECIFICALLY FOR THE FULL STRENGTH OF THE GUY WIRES THEY ARE BEING USED FOR.
5. SOCKETS SHALL BE IN ACCORDANCE WITH ASTM A27 AND A148.
6. ZINC POURED ATTACHMENTS SHALL BE IN ACCORDANCE WITH ASTM B6.
7. SHACKLES AND TURNBUCKLES SHALL BE FORGED FROM AISI GRADE 1035 OR 1045 STEEL OR EQUIVALENT.
8. INITIAL TENSION OF GUYS SHALL BE AS STATED ON THE STRUCTURAL DRAWINGS.
9. TURNBUCKLE LOCKS SHALL BE INSTALLED AND SECURELY FIXED THROUGH ALL TURNBUCKLES.
10. FACTORY INSTALLED COMPONENTS SHALL BE PROOF LOADED, PRE-STRESSED AND HAVE LENGTH MEASUREMENTS CHECKED IN ACCORDANCE WITH CHAPTER 9 OF THE TIA CODE.
11. THE MAXIMUM DEVIATION FOR THE DESIGN INITIAL TENSION SHALL BE 10% FOR GUYS UP TO AND INCLUDING 1" DIAMETER OF THE SPECIFIED DESIGN INITIAL TENSION AT AN ANCHORAGE, CORRECTED FOR AMBIENT TEMPERATURE.
12. THE MAXIMUM DEVIATION FOR THE DESIGN INITIAL TENSION SHALL BE 5% FOR GUYS GREATER THAN 1" DIAMETER OF THE SPECIFIED DESIGN INITIAL TENSION AT AN ANCHORAGE, CORRECTED FOR AMBIENT TEMPERATURE.
13. FOR NEWLY INSTALLED GUY WIRES FINAL TURNBUCKLE GAPS MUST ALLOW FOR 3" OF ADJUSTMENT IN EITHER DIRECTION. FOR EXAMPLE, A 12" TURNBUCKLE SHALL HAVE A RANGE BETWEEN 3" AND 9".

TOLERANCES:

1. CONSTRUCTION OF TOWERS SHALL MEET ALL OF THE TOLERANCE REQUIREMENTS AS OUTLINED IN CHAPTER 6.1.2 OF THE TIA CODE.

GROUT:

1. ALL GROUT BENEATH BASE PLATES SHALL BE NON-SHRINK, "EMBECO","FIVE-STAR" OR EQUAL.
2. ALL GROUT SHALL HAVE A MINIMUM 28-DAY COMPRESSIVE STRENGTH OF 5,000 PSI. U.N.O.

STRUCTURAL ERECTION AND BRACING REQUIREMENTS:

1. THE STRUCTURAL DRAWINGS ILLUSTRATE THE COMPLETED STRUCTURE WITH ALL ELEMENTS IN THEIR FINAL POSITIONS, PROPERLY SUPPORTED AND BRACED.
2. THE CONTRACTOR, IN THE PROPER SEQUENCE, SHALL PROVIDE TEMPORARY BRACING AS MAY BE REQUIRED DURING CONSTRUCTION TO ACHIEVE THE FINAL COMPLETED STRUCTURE.
3. OBSERVATION VISITS TO THE SITE BY THE STRUCTURAL ENGINEER SHALL NOT INCLUDE INSPECTION OF THE BRACING ELEMENTS.
4. THE CONTRACTOR IS RESPONSIBLE FOR THE DESIGN AND EXECUTION OF ALL TEMPORARY SUPPORTS, GUYING, ETC. NECESSARY TO PROVIDE A COMPLETE AND STABLE STRUCTURE AS SHOWN ON THESE DRAWINGS.
5. CONTRACTOR'S PROPOSED INSTALLATION SHALL NOT INTERFERE, NOR DENY ACCESS TO ANY EXISTING OPERATIONAL AND SAFETY EQUIPMENT.

PAINT:

1. AS NOTED IN DRAWINGS, CLEAN AND PAINT PROPOSED STEEL ACCORDING TO FAA ADVISORY CIRCULAR AC 70/7460-IK.

PROTECTIVE GROUNDING:

1. GROUNDING OF THE TOWER SHALL BE IN ACCORDANCE WITH SECTION 10 OF THE TIA-222-G CODE WITH THE FOLLOWING EXCEPTIONS:
   - NO TESTING TO VERIFY FINAL RESISTANCE WILL BE COMPLETED UNLESS SPECIFICALLY REQUESTED BY CLIENT AND NOTED IN THE DRAWINGS.
   - ALTERNATIVE GROUNDING METHODS FOR SITE SPECIFIC CONDITIONS DESIGNED IN ACCORDANCE WITH MOTOROLA R56 "STANDARDS AND GUIDELINES FOR COMMUNICATION SITES" MAY BE APPROVED BY THE ENGINEER OF RECORD AND PRESENTED IN THE DRAWINGS.

MAPPING:

1. FIELD MAPPING SHALL BE IN ACCORDANCE WITH CHAPTER 14 OF THE TIA CODE.
2. CONTRACTOR SHALL THOROUGHLY INSPECT AND SURVEY EXISTING STRUCTURE TO VERIFY DIMENSIONS, ELEVATIONS, FRAMING, ETC. WHICH AFFECT THE WORK SHOWN ON THE DRAWINGS.
3. REPORT ANY VARIATIONS OR DISCREPANCIES TO THE STRUCTURAL ENGINEER BEFORE PROCEEDING.

MAINTENANCE:

1. A CONTINUOUS INSPECTION OF THE STRUCTURE SHALL BE COMPLETED PER TIA RECOMMENDATIONS AS OUTLINED IN CHAPTER 14 OF THE TIA CODE. ANY DEFECTS SHALL BE REPORTED TO ENSURE THE STRUCTURAL INTEGRITY FOR THE LIFE OF THE STRUCTURE.

AJAX BOLTS:

1. AJAX BOLTS USED FOR STRUCTURAL CONNECTIONS SHALL BE AJAX 'ONESIDE' PC8.8 W/ SLEEVE AND SHALL BE THE SIZE AS SPECIFIED ON THE STRUCTURAL DRAWINGS.
2. ALL AJAX BOLTS SHALL BE INSTALLED AS PER THE MANUFACTURER'S SPECIFICATIONS AND DETAILS SHOWN IN DRAWINGS.
3. ALL AJAX BOLTS SHALL RUST PROOF GALVANIZED.
4. AJAX BOLTS SHALL BE INSTALLED IN PROPERLY ALIGNED HOLES.

THREADED REBAR:

1. ALL DETAILING, FABRICATION, AND PLACEMENT OF THREADED REBAR REINFORCING STEEL SHALL BE IN ACCORDANCE WITH THE MANUFACTURERS SPECIFICATIONS.
2. THREADED REBAR SHALL BE DEFORMED AND CONFORM TO THE FOLLOWING MINIMUM GRADES:
   - GRADE 75 ---------- ASTM A615, (FY = 75 KSI, Fu = 100 KSI)
   - GRADE 90 ---------- ASTM A615, (FY = 90 KSI, Fu = 100 KSI)
   - 150 KSI ---------- ASTM A722, (FY = 127.5 KSI, Fu = 150 KSI)
3. THREADED REBAR SHALL HAVE A MINIMUM SIZE EQUAL TO THE SIZE AS INDICATED ON THE STRUCTURAL DRAWINGS.
4. ALL COUPLERS, NUTS AND LOCK NUTS USED WITH ALL-THREAD REINFORCING BARS SHALL BE OF THE APPROPRIATE SIZE AND PITCH TO MATCH THE CORRESPONDING BAR SIZE AND SHALL BE MANUFACTURED BY THE SAME MANUFACTURER AS THE REINFORCING BARS. (SEE BELOW)
5. ALL BARS AND PARTS ARE TO BE HOT DIPPED GALVANIZED.
6. WELDING OFALL-THREAD BARS IS STRICTLY PROHIBITED.

DYWIDAG THREADBAR REINFORCING BAR ATTACHMENTS:

1. ALL COUPLERS, NUTS AND LOCK NUTS USED WITH DYWIDAG REINFORCING BARS SHALL BE OF THE APPROPRIATE SIZE AND PITCH TO MATCH THE CORRESPONDING BAR SIZE AND SHALL BE MANUFACTURED BY DYWIDAG-SYSTEMS INTERNATIONAL.
2. ANCHOR BOLTS ARE TO BE ASTM A615 FOR ALL ALL-THREAD REINFORCING BAR GRADES EXCEPT FOR 150 KSI WHICH SHALL BE ASTM A722.
3. HEX NUTS AND JAM NUTS ARE TO BE ASTM A108 FOR ALL ALL-THREAD REINFORCING BAR GRADES.
4. HARDENED WASHERS ARE TO BE ASTM F436 FOR ALL ALL-THREAD REINFORCING BAR GRADES.
5. COUPLERS SHALL BE 'STOP-TYPE COUPLING AND ARE TO BE ASTM A108 FOR ALL ALL-THREAD REINFORCING BAR GRADES.

WILLIAMS FORM ALL-THREAD REINFORCING BAR ATTACHMENTS:

1. ALL COUPLERS, NUTS AND LOCK NUTS USED WITH WILLIAMS FORM ALL-THREAD REINFORCING BARS SHALL BE OF THE APPROPRIATE SIZE AND PITCH TO MATCH THE CORRESPONDING BAR SIZE AND SHALL BE MANUFACTURED BY WILLIAMS FORM ENGINEERING CORP.
2. ANCHOR BOLTS ARE TO BE ASTM A615 FOR ALL ALL-THREAD REINFORCING BAR GRADES EXCEPT FOR 150 KSI WHICH SHALL BE ASTM A722.
3. HEX NUTS AND JAM NUTS ARE TO BE ASTM A108 FOR ALL ALL-THREAD REINFORCING BAR GRADES.
4. HARDENER WASHERS ARE TO BE ASTM F436 FOR ALL ALL-THREAD REINFORCING BAR GRADES.
5. COUPLERS SHALL BE 'STOP-TYPE COUPLING AND ARE TO BE ASTM A108 FOR ALL ALL-THREAD REINFORCING BAR GRADES.

THREADED REBAR (VGX REINFORCING RODS):

1. ALL DETAILING, FABRICATION, AND PLACEMENT OF THREADED REBAR REINFORCING STEEL SHALL BE IN ACCORDANCE WITH THE MANUFACTURERS SPECIFICATIONS.
2. THREADED REBAR SHALL BE DEFORMED AND CONFORM TO THE FOLLOWING MINIMUM GRADES:
   - GRADE 75 ---------- ASTM A615, (FY = 75 KSI, Fu = 100 KSI)
   - GRADE 90 ---------- ASTM A615, (FY = 90 KSI, Fu = 100 KSI)
   - GRADE 150 ---------- ASTM A722, (FY = 127.5 KSI, Fu = 150 KSI)
3. THREADED REBAR SHALL HAVE A MINIMUM SIZE EQUAL TO THE SIZE AS INDICATED ON THE STRUCTURAL DRAWINGS.
4. ALL COUPLERS, NUTS AND LOCK NUTS USED WITH ALL-THREAD REINFORCING BARS SHALL BE OF THE APPROPRIATE SIZE AND PITCH TO MATCH THE CORRESPONDING BAR SIZE AND SHALL BE MANUFACTURED BY THE SAME MANUFACTURER AS THE REINFORCING BARS. (SEE BELOW)
5. ALL BARS AND PARTS ARE TO BE HOT DIPPED GALVANIZED.
6. WELDING OF ALL-THREAD BARS IS STRICTLY PROHIBITED.
7. ALL VGX REINFORCING RODS AND HELICAL ANCHORS SHALL BE PROOF LOADED TO THE LOADS AS SHOWN BELOW. INCREASE LOADS ON EACH ANCHOR AROUND THE POLE IN INCREMENTS OF 10 KIPS UNTIL PROOF LOAD ON ALL ANCHORS IS MET.
   - #14 GRADE 75 ---------- 70 KIPS
   - #11 GRADE 75 ---------- 50 KIPS
   - #11 GRADE 90 ---------- 60 KIPS
   - #11 150 KSI ---------- 70 KIPS
8. PRE-TENSIONING OF VGX REINFORCING RODS SHALL BE PROVIDED AFTER ALL PROOF LOADS HAVE BEEN APPLIED. PRE-TENSION LOADS ARE AS FOLLOWS:
   - #14 GRADE 75 ---------- 11.2 KIPS
   - #11 GRADE 75 ---------- 7.8 KIPS
   - #11 GRADE 90 ---------- 9.4 KIPS
   - #11 150 KSI ---------- 11.2 KIPS

HELICAL PIERS (BY OTHERS):

1. HELICAL PIERS SHALL BE DESIGNED FOR A VERTICAL LOAD AND A HORIZONTAL LOAD AS DETAILED IN THE PASSING WITH MODIFICATIONS STRUCTURAL ANALYSIS.
2. HELICAL PIERS SHALL BE INSTALLED TO HAVE A MINIMUM FACTOR OF SAFETY OF 1.5.
3. ALL HELICAL PIERS AND CONNECTIONS TO RVG BASE TERMINATION SHALL BE DESIGNED BY THE HELICAL PIER SUPPLIER, SUCH THAT THEY PROVIDE THE MINIMUM ALLOWABLE CAPACITIES AS INDICATED ON THE DRAWINGS. DESIGN SHALL BE SEALED BY A LICENSED PROFESSIONAL ENGINEER.
4. REFER TO GEOTECHNICAL REPORT REFERENCED IN PASSING WITH MODIFICATIONS STRUCTURAL FOR SOILS INFORMATION.
5. ALL STEEL FOR HELICAL PIERS SHALL BE HOT-DIP GALVANIZED.
6. HELICAL PIERS SHALL BE INSTALLED TO THE MANUFACTURERS SPECIFICATIONS. DOCUMENTATION OF THE INSTALLED CAPACITIES SHALL BE FURNISHED TO THE STRUCTURAL ENGINEER AFTER INSTALLATION IS COMPLETE.

REINFORCEMENT REQUIREMENTS OF EXISTING STRUCTURES:

1. ALL MODIFICATIONS AND REINFORCEMENTS TO THE STRUCTURE ARE BASED ON A RIGOROUS STRUCTURAL ANALYSIS.
2. ALL ADDED STRUCTURAL COMPONENTS HAVE BEEN DESIGN IN ACCORDANCE WITH THE CODES AS STATED ABOVE.
3. ALL ASSUMPTIONS MADE SHALL BE VERIFIED WITH THE STRUCTURAL ENGINEER PRIOR TO CONSTRUCTION.

ANCHOR REINFORCEMENT INSTALLATION:

1. CONTRACTOR SHALL VERIFY THAT DRILLING CLEARANCE AT POLE AND ACCESS IS SATISFACTORY PRIOR TO CONSTRUCTION. ANY OBSTACLES SHALL BE REPORTED IMMEDIATELY TO ENGINEER.
2. DRILL HOLES SHALL BE LOCATED FAR ENOUGH INSIDE THE EDGE OF CAISSON OR PIER TO AVOID REBAR CAGE. DISTANCE SHOWN IN DRAWINGS.
3. COMPRESSED AIR SHALL BE USED TO BLOW DEBRIS OUT OF THE NEWLY DRILLED HOLES.
4. HOLES IN BASEPLATE ARE PREFERABLY DRILLED. IF HOLES IN BASEPLATE ARE TORCHED, EDGES SHALL BE GROUND SMOOTH AND REPAIRED ACCORDING TO "CORROSION CONTROL" SECTION.
5. PHOTOS SHALL BE TAKEN OF EACH HOLE WITH A TAPE MEASURE INSERTED TO SHOW ACTUAL DEPTH OF HOLE. HOLES SHALL BE NUMBERED WITH A MARKER PER DRAWINGS FOR REFERENCE.
6. HILTI RE 150 EPOXY SHALL BE USED TO SET ANCHORS. ALTERNATIVE EPOXY MAY BE APPROVED BY ENGINEER OF RECORD IF REQUESTED. FOLLOW MANUFACTURERS INSTRUCTIONS.
7. AFTER EPOXY HAS CURED FOR A MINIMUM OF 24 HOURS, TOP OFF HOLE WITH ADDITIONAL EPOXY TO CROWN OVER CONCRETE AND ENSURE THAT THERE WILL BE NO WATER RETENTION AROUND ANCHOR ROD.

BLUE SKY TOWERS LLC

Structural Components
Bringing It All Together.

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DENVER, CO 80221
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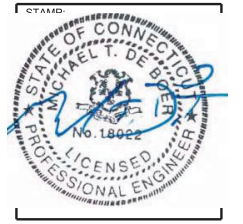

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REVISIONS:

NO.	DATE	DESCRIPTION	BY	CHK	APD
5					
4					
3				TR	WC
2			RM		
1					
0	4/29/22	MODIFICATION DRAWINGS			

SITE INFORMATION:

97 HIGH STREET
PORTLAND CT 06480

DESIGN TYPE:

SELF SUPPORT
TOWER
MODIFICATION

SHEET TITLE:

GENERAL
CONSTRUCTION NOTES

SHEET TITLE:	REVISION:
GN-1	0

1. **GENERAL INSPECTION NOTES:**
   a. THE CONSTRUCTION OF THE PROPOSED STRUCTURAL ELEMENTS SHOWN IN THESE DRAWINGS SHALL NOT BE CONSIDERED AS COMPLETE UNTIL THE SPECIAL INSPECTIONS AND STRUCTURAL OBSERVATIONS MARKED IN THE FOLLOWING TABLES HAVE BEEN REVIEWED AND APPROVED BY THE ENGINEER OF RECORD (EOR) AND SUBMITTED TO THE BUILDING OFFICIAL.
   b. THIS SPECIAL INSPECTION PROGRAM DOES NOT RELIEVE THE CONTRACTOR OF HIS OR HER RESPONSIBILITIES.
   c. THE QUALIFICATIONS OF ALL SPECIAL INSPECTORS MUST BE SUBMITTED TO THE EOR FOR REVIEW AND APPROVAL.
   d. THE GENERAL CONTRACTOR IS RESPONSIBLE FOR COORDINATING WITH ALL INSPECTORS SUCH THAT WORK MAY BE INSPECTED AT APPROPRIATE TIMES.
   e. THE EOR OR PERSONNEL WORKING UNDER THE DIRECTION OF THE EOR MAY BE CONTRACTED TO COMPLETE THE SPECIAL INSPECTIONS.
   f. ANY CHANGES NOTED DURING THE INSPECTIONS MUST BE REVIEWED AND APPROVED BY THE EOR.
   g. THE GENERAL CONTRACTOR SHALL PROVIDE AN AS-BUILT SET OF PLANS TO THE EOR DOCUMENTING ALL CHANGES THAT OCCURRED DURING CONSTRUCTION.
   h. REFER TO THE NOTES THAT ACCOMPANY EACH TABLE FOR SPECIFICS ON REQUIRED INSPECTIONS.

2. **DUTIES OF THE SPECIAL INSPECTOR:**
   a. ANY CHANGES NOTED DURING THE INSPECTION MUST BE REVIEWED AND APPROVED BY THE EOR.
   b. THE INSPECTOR SHALL OBSERVE THE WORK FOR COMPLIANCE WITH THE JURISDICTION APPROVED PLANS, SPECIFICATIONS AND APPLICABLE PROVISIONS OF THE IBC. SHOP DRAWINGS MAY BE USED ONLY AS AN AID TO INSPECTIONS.
   c. CONTINUOUS SPECIAL INSPECTIONS REQUIRE FULL-TIME OBSERVATION OF WORK REQUIRING SPECIAL INSPECTION BY AN APPROVED SPECIAL INSPECTOR WHO IS PRESENT IN THE AREA WHERE THE WORK IS BEING PERFORMED.
   d. PERIODIC SPECIAL INSPECTIONS REQUIRE PART-TIME OR INTERMITTENT OBSERVATION OF WORK REQUIRING SPECIAL INSPECTION BY AN APPROVED SPECIAL INSPECTOR WHO IS PRESENT IN THE AREA WHERE THE WORK IS BEING PERFORMED AND AT THE COMPLETION OF THE WORK.
   e. THE INSPECTOR SHALL BRING NON-CONFORMING ITEMS TO THE IMMEDIATE ATTENTION OF THE GENERAL CONTRACTOR. THE GENERAL CONTRACTOR SHALL BRING ALL NON-CONFORMING ITEMS TO THE IMMEDIATE ATTENTION OF THE EOR. IF ANY ITEM IS NOT RESOLVED IN A TIMELY MANNER AND IS ABOUT TO BE INCORPORATED IN THE WORK, THE SPECIAL INSPECTOR SHALL IMMEDIATELY NOTIFY THE EOR.
   f. ALL NON-CONFORMING ITEMS, EVEN IF CORRECTED, SHALL BE DESCRIBED ON AN ASCE DAILY REPORT FORM AND ON AN ASCE DISCREPANCY NOTICE FORM.
   g. THE SPECIAL INSPECTOR SHALL COMPLETE AN ASCE DAILY REPORT FORM, AN INTERIM REPORT FORM AND/OR A DISCREPANCY NOTICE FORM FOR EACH DAY'S INSPECTIONS. FORMS CAN BE OBTAINED UPON REQUEST FROM THE EOR.
   h. THE SPECIAL INSPECTOR OR INSPECTION AGENCY SHALL SUBMIT FINAL SIGNED REPORTS TO THE EOR.

3. **REQUIREMENTS FOR STRUCTURAL OBSERVATION:**

   STRUCTURES MEETING THE FOLLOWING CRITERIA ARE REQUIRED TO HAVE SPECIAL INSPECTIONS CONDUCTED BY REGISTERED PROFESSIONAL ENGINEERS:
   - EXPOSURE CATEGORY B AND VASD ≥ 120 MPH AND AT LEAST ONE OF THE FOLLOWING CRITERIA:
     - RISK CATEGORY III OR IV AND/OR
     - HEIGHT OF THE STRUCTURE IS GREATER THAN 75 FT
   - EXPOSURE CATEGORY C OR D AND VASD ≥ 110 MPH AND AT LEAST ONE OF THE FOLLOWING CRITERIA:
     - RISK CATEGORY III OR IV AND/OR
     - HEIGHT OF THE STRUCTURE IS GREATER THAN 75 FT
   - SEISMIC DESIGN CATEGORY C, D, E OR F AND AT LEAST ONE OF THE FOLLOWING CRITERIA:
     - RISK CATEGORY III OR IV AND/OR
     - HEIGHT OF THE STRUCTURE IS GREATER THAN 75 FT

   THE FOLLOWING ARE EXCEPTIONS TO THESE REQUIREMENTS:
   - STRUCTURAL STEEL (CONCRETE NOT EXCEPTED) DESIGNED FOR SEISMIC DESIGN CATEGORY C THAT WAS NOT SPECIFICALLY DESIGNED FOR SEISMIC RESISTANCE AND HAS A RESPONSE MODIFICATION FACTOR OF 3 OR LESS (EXCLUDING CANTILEVERED COLUMNS SYSTEMS).
   - FOUNDATION MODIFICATIONS OR TOWER MODIFICATIONS DESIGNED FOR SEISMIC CATEGORY C, D, E OR F WHERE THE ORIGINAL TOWER OR FOUNDATION IS CAPABLE OF WITHSTANDING SEISMIC LOADS WITHOUT CONSIDERING REINFORCEMENTS.

4. **REFERENCED STANDARDS:**
   a. ACI 318-11
   b. AISC 360-10 AND AISC 303-10 IN ACCORDANCE WITH AISC FOURTEENTH EDITION
   c. AWS D1.1 – 04, D1.3 – 98, D1.4 – 98
   d. ASTM C 31/C 31M-08B, ASTM C 172-08

5. **SOILS AND EARTHWORK INSPECTION NOTES:**
   a. THE FINAL DEPTH AND SOIL CONDITION SHALL BE INSPECTED PRIOR TO PLACEMENT OF REINFORCING STEEL AND CONCRETE. THIS SHALL INCLUDE VERIFYING THAT THE SOIL TYPE AND MATERIAL MATCHES THE GEOTECHNICAL REPORT REFERENCED IN THE PASSING WITH MODIFICATIONS ANALYSIS. IF THERE IS ANY DOUBT TO SOIL CONDITION/TYPE THEN ADDITIONAL TESTING MAY BE REQUIRED TO VERIFY DESIGN BEARING CAPACITY. CONTACT THE EOR WITH ANY OBSERVED ISSUES.
   b. THE BOTTOM OF EXCAVATION SHALL BE INSPECTED TO ENSURE THAT NO EXCESS LOOSE OR FOREIGN MATERIALS ARE PRESENT.
   c. THE DENSITY AND LIFT THICKNESS SHALL BE CONTINUOUSLY MONITORED DURING BACKFILL TO MATCH RECOMMENDATIONS IN GEOTECHNICAL REPORT. IF NO RECOMMENDATIONS ARE LISTED, THE BACKFILL SHALL BE PERFORMED IN 9-12" HORIZONTAL LIFTS TO NOT LESS THAN 90% OF THE MAXIMUM DRY DENSITY AT OPTIMUM MOISTURE CONTENT DETERMINED IN ACCORDANCE WITH ASTM 1557. THE FILL SHALL BE FREE FROM LARGE ROCKS, WASTE AND DEBRIS.

6. **REBAR INSPECTION NOTES:**
   a. ALL REBAR PARTS LISTS, INCLUDING MATERIAL SPECIFICATIONS, MUST BE MAINTAINED AND PROVIDED TO THE EOR.
   b. ALL REBAR MUST BE INSPECTED BEFORE CONCRETE IS POURED INCLUDING BUT NOT LIMITED TO PLACEMENT, SIZES, BEND DIAMETERS, SPACING, LAP DISTANCES, CLEAR COVER AND TIES.
   c. ANY EMBEDDED DOWELS SET WITH EPOXY OR GROUT MUST BE INSPECTED BEFORE CONCRETE IS POURED. THIS INCLUDES FINAL DEPTH AND HOLE DIAMETER, HOLE DRILLING AND CLEANING PROCEDURES. THE EPOXY OR GROUT APPLICATION MUST BE INSPECTED AND VERIFIED TO FOLLOW MANUFACTURER'S RECOMMENDATIONS. HORIZONTAL OR UPWARD SLOPING PLACEMENT OF DOWELS WITH EPOXY MUST BE CONTINUOUSLY MONITORED.
   d. ANY CONDUITS OR OTHER ITEMS TO BE EMBEDDED IN CONCRETE SHALL BE INSPECTED TO CONFORM WITH ACI 318: 6.3.

7. **CONCRETE INSPECTION NOTES:**
   a. BATCH DESIGN MIX RECORDS MUST BE RETAINED AND PROVIDED TO THE EOR.
   b. AT LEAST 5 TEST CYLINDERS MUST BE TAKEN PER TRUCK IN ACCORDANCE WITH ASTM D3665.
   c. SLUMP, AIR CONTENT AND TEMPERATURE TESTS MUST BE COMPLETED AT THE TIME THAT TEST CYLINDERS ARE TAKEN. THIS INFORMATION SHALL BE DOCUMENTED WITH THE STRENGTH TESTS.
   d. ALL TEST CYLINDERS MUST BE CURED ON SITE AT IDENTICAL CONDITIONS AS TESTED CONCRETE.
   e. IF ANY COLD WEATHER, HOT WEATHER OR ACCELERATE CURING METHODS ARE USED, THESE PROCEDURES AND MATERIALS MUST BE DOCUMENTED.
   f. FINAL BREAK TESTS MUST BE COMPLETED AND PASS REQUIREMENTS IN ACI 318: 5.6.3.3 BEFORE NEW CONCRETE CAN BE LOADED.

8. **ANCHOR ROD AND EMBEDMENT INSPECTION NOTES:**
   a. FOR EMBEDMENTS SET IN UNCURED CONCRETE, THE SPECIAL INSPECTOR SHALL VERIFY THAT THE EMBEDMENT MATCHES THE DRAWINGS FOR GEOMETRY, ELEVATION AND LOCATION.
   b. FOR EMBEDMENTS SET IN HARDENED CONCRETE, THE HOLE DIAMETER(S) AND DEPTH(S) MUST BE INSPECTED BY THE SPECIAL INSPECTOR PRIOR TO SETTING THE EMBEDMENT. THE TECHNIQUE FOR DRILLING OR CORING AND CLEANING MUST BE DOCUMENTED BY THE SPECIAL INSPECTOR AND CONFIRMED TO MATCH DRAWINGS. GROUT OR EPOXY PRODUCTS AND VOLUMES MUST BE RECORDED BY THE SPECIAL INSPECTOR ON A PER HOLE BASIS.
   c. VERTICALLY ORIENTATED EMBEDMENTS MUST BE PERIODICALLY MONITORED DURING INSTALLATION FOR ELEVATION AND TO VERIFY THE PROCEDURES MATCH MANUFACTURER'S RECOMMENDATIONS.
   d. HORIZONTAL AND UPWARDLY SLOPING EMBEDMENTS MUST BE CONTINUOUSLY INSPECTED DURING ALL INSTALLATION ACTIVITIES TO VERIFY THE PROCEDURES MATCH MANUFACTURER'S RECOMMENDATIONS.

9. **STRUCTURAL STEEL SHOP FABRICATION INSPECTION NOTES:**
   a. SHOP DRAWINGS SHALL BE REVIEWED AND APPROVED BY EOR PRIOR TO FABRICATION OF PARTS.
   b. ALL BOLT MATERIAL SPECIFICATIONS MUST BE MAINTAINED FROM MANUFACTURER PROVIDED TO THE EOR.
   c. ALL SHOP WELDING SHALL BE INSPECTED AND APPROVED BY A CERTIFIED WELDING INSPECTOR IN ACCORDANCE WITH AWS D1.1.
   d. ALL WELDING MATERIAL SPECIFICATIONS MUST BE MAINTAINED FROM MANUFACTURER PROVIDED TO THE EOR.

10. **STRUCTURAL STEEL FIELD FABRICATION INSPECTION NOTES:**
   a. FOR DTI WASHERS "LOT" CALIBRATION DETAILS MUST BE PROVIDED TO THE EOR. ALL DTI WASHERS INSTALLED MUST BE INSPECTED TO DETERMINE THEY HAVE MET THE TENSIONING SPECIFIED BY THE "LOT" CALIBRATION DETAILS.
   b. FOR ANY OTHER DIRECT TENSION INDICATORS USED, THE CALIBRATION AND INSTALLATION TECHNIQUES MUST BE INSPECTED FOR CONFORMANCE WITH MANUFACTURER'S RECOMMENDATIONS.
   c. FOR SNUG TIGHT CONNECTIONS ALL PARTS MUST BE INSPECTED TO VERIFY THAT THE CONNECTED MATERIALS HAVE BEEN DRAWN TOGETHER AND PROPERLY SNUGGED. ANY LOCK WASHERS USED MUST BE VERIFIED TO BE FULLY COMPRESSED.
   d. FOR ANY FIELD FABRICATION INCLUDING CUTTING, PUNCHING OR DRILLING, THE FINAL DIMENSIONS MUST BE VERIFIED TO MATCH THE DRAWINGS.
   e. ALL COLD-GALVANIZED SURFACES MUST BE INSPECTED TO HAVE BEEN COATED PROPERLY. A PHOTOGRAPH OF THE COLD-GALVANIZING PRODUCT WITH THE SITE SIGN IS REQUIRED AS PART OF THE INSPECTION RECORDS.

11. **FIELD WELDING INSPECTION NOTES:**

   ALL FIELD WELDS SHALL BE INSPECTED BY A CERTIFIED WELDING INSPECTOR IN ACCORDANCE WITH AWS D1.1. THIS INCLUDES, BUT IS NOT LIMITED TO, FIELD PREPARATION OF AREAS TO BE WELDED, WELDING MATERIALS TO BE USED, WELDING PROCEDURES AND TECHNIQUES, FINAL SIZE AND QUALITY OF WELD AND SURFACE FINISH OF WELDED AREAS.

12. **GUY WIRE TENSION INSPECTION NOTES:**
   a. FINAL GUY WIRE TENSIONS MEASUREMENTS AND TOWER ALIGNMENT MEASUREMENTS MUST BE MADE FOLLOWING ALL GUY WIRE TENSION ADJUSTMENTS.
   b. FINAL GUY WIRE TENSIONS MUST BE DOCUMENTED FOR EACH LEVEL BY CONTRACTOR. THIS SHALL INCLUDE PHOTOS TAKEN WITH TENSION METER OR DIRECT TENSION DEVICE AND WHITE BOARD SHOWING SITE, ANCHOR, GUY LEVEL, TEMPERATURE AND TENSION READING.
   c. CALIBRATION CERTIFICATION OF TENSION METERS SHALL BE PROVIDED TO THE EOR.
   d. FINAL ALIGNMENT OF TOWER SHALL BE MEASURED AND DOCUMENTED BY CONTRACTOR AS SHOWN ON A-1 SHEET. THIS ALIGNMENT SHALL ALSO BE MEASURED AND VERIFIED WITH CLOSEOUT INSPECTION.

SPECIAL INSPECTION CHECKLIST

INSPECTION	DESCRIPTION (SEE ABOVE NOTES)	REQUIRED	RESPONSIBILITY	FREQUENCY
STRUCTURAL OBSERVATION	IBC: 1704.5	NO	SI (RPE)	---
VERIFY MATERIALS BELOW SHALLOW FOUNDATIONS ARE ADEQUATE TO ACHIEVE THE DESIGN BEARING CAPACITY	REFER TO GEOTECHNICAL REPORT IF AVAILABLE	NO	SI	PERIODIC
VERIFY EXCAVATIONS ARE EXTENDED TO PROPER DEPTH AND HAVE REACHED PROPER MATERIAL	REFER TO GEOTECHNICAL REPORT IF AVAILABLE	NO	SI	PERIODIC
PERFORM CLASSIFICATION OF COMPACTED FILL MATERIALS	REFER TO GEOTECHNICAL REPORT IF AVAILABLE	NO	SI	CONTINUOUS
PERFORM TESTING OF COMPACTED FILL MATERIALS	REFER TO GEOTECHNICAL REPORT IF AVAILABLE	NO	TA	CONTINUOUS
VERIFY USE OF PROPER MATERIALS, DENSITIES AND LIFT THICKNESSES DURING PLACEMENT AND COMPACTION OF COMPACTED FILL	REFER TO GEOTECHNICAL REPORT IF AVAILABLE	NO	SI	CONTINUOUS
PRIOR TO PLACEMENT OF COMPACTED FILL, OBSERVE SUBGRADE AND VERIFY THAT SITE HAS BEEN PREPARED PROPERLY	REFER TO GEOTECHNICAL REPORT IF AVAILABLE	NO	SI	PERIODIC
INSPECTION OF REINFORCING STEEL, INCLUDING PRE-STRESSING TENDONS, AND PLACEMENT.	ACI 318: 3.5, 7.1-7.7, IBC: 1910.4	NO	SI	PERIODIC
INSPECTION OF REINFORCING STEEL WELDING IN ACCORDANCE WITH TABLE 1705.2.2, ITEM 2B	AWS D1.4, ACI 318: 3.5.2	NO	CWI	PERIODIC
INSPECTION OF EMBEDMENTS TO BE INSTALLED IN CONCRETE PRIOR TO AND DURING PLACEMENT OF CONCRETE	ACI 318: 8.1.3, 21.1.8, IBC: 1908.5, 1909.1	NO	SI	CONTINUOUS
INSPECTION OF ANCHORS POST-INSTALLED IN HARDENED CONCRETE MEMBERS THAT ARE NOT UNDER SUSTAINED TENSION LOADS.	ACI 318: 3.8.6, 8.1.3, 21.1.8, IBC: 1909.1	NO	SI	PERIODIC
VERIFY MIX DESIGN: A. GC TO PROVIDE MIX DESIGN TO EOR PRIOR TO CONCRETE ORDER FOR REVIEW AND APPROVAL B. EOR TO APPROVE OR REJECT MIX DESIGN	ACI 318: CH 4, 5.2-5.4, IBC: 1904.2, 1910.2, 1910.3	NO	GC EOR	PERIODIC
SAMPLING AND TESTING OF FRESH CONCRETE IMMEDIATELY PRIOR TO PLACEMENT FOR SLUMP, AIR AND TEMPERATURE	ASTM C 172, ASTM C 31, ACI 318: 5.6, 5.8, IBC: 1910.10	NO	TA	CONTINUOUS
INSPECTION FOR MAINTENANCE OF SPECIFIED CURING TEMPERATURES AND TECHNIQUES	ACI 318: 5.11-5.13, IBC: 1910.9	NO	SI	PERIODIC
INSPECTION OF PRE-STRESSED CONCRETE FOR APPLICATION OF PRE-STRESSING FORCES AND GROUTING OF BONDED PRE-STRESSING TENDONS	ACI 318: 18.20, ACI 318: 18.18.4	NO	SI	CONTINUOUS
ERECTION OF PRECAST CONCRETE MEMBERS	ACI 318: CH 16	NO	SI	PERIODIC
VERIFICATION OF IN-SITU CONCRETE STRENGTH PRIOR TO LOADING, STRESSING OF TENDONS AND/OR REMOVAL OF FORMS: A. TA TO PROVIDE CONCRETE BREAK TEST(S) TO GC WHEN REQUESTED B. GC TO PROVIDE CONCRETE BREAK TEST(S) TO EOR FOR APPROVAL C. EOR TO APPROVE OR REJECT REQUESTED ACTIONS BASED ON TESTED STRENGTH(S)	ACI 318: 6.2	NO	TA GC EOR	PERIODIC
INSPECTION OF FORMWORK FOR SHAPE, LOCATION AND DIMENSIONS OF THE CONCRETE MEMBER BEING FORMED	ACI 318: 6.1.1	NO	SI	PERIODIC
PULL-TESTING OF INSTALLED FOUNDATION SYSTEMS OR EMBEDMENTS: A. SI SHALL CONDUCT TESTING OR OBSERVE TESTING BY OTHERS FOR CONFORMANCE WITH DRAWINGS B. SI SHALL DOCUMENT TEST RESULTS IN A REPORT	REFER TO DRAWINGS	NO	SI	CONTINUOUS
BASE PLATE GROUTING	REFER TO DRAWINGS	NO	SI	PERIODIC
IDENTIFICATION OF HARDWARE MARKINGS TO CONFORM TO ASTM STANDARDS SPECIFIED IN THE APPROVED CONSTRUCTION DOCUMENTS	APPLICABLE ASTM MATERIAL STANDARDS	YES	SI	PERIODIC
HARDWARE MANUFACTURER CERTIFICATE OF COMPLIANCE	---	YES	FAB	PERIODIC
FIELD INSPECTION OF STRUCTURAL STEEL MEMBERS	REFER TO DRAWINGS	NO	SI	PERIODIC
SNUG TIGHT JOINTS	AISC 360, SECTION N6, IBC: 1705.2	YES	SI	PERIODIC
PRE-TENSIONED AND SLIP-CRITICAL JOINTS USING TURN-OF-NUT WITH MATCH-MARKING, TWIST OFF BOLT OR DIRECT TENSION INDICATOR METHODS OF INSTALLATION	AISC 360, SECTION N6, IBC: 1705.2	NO	SI	PERIODIC
PRE-TENSIONED AND SLIP-CRITICAL JOINTS USING TURN-OF-NUT WITHOUT MATCH-MARKING, OR CALIBRATED WRENCH METHODS OF INSTALLATION	AISC 360, SECTION N6, IBC: 1705.2	NO	SI	CONTINUOUS
IDENTIFICATION OF STRUCTURAL STEEL MARKINGS TO CONFORM TO AISC 303	AISC 303, SECTION 6.1	YES	FAB	PERIODIC
IDENTIFICATION OF OTHER STEEL MARKINGS TO CONFORM TO ASTM STANDARDS SPECIFIED IN THE APPROVED CONSTRUCTION DOCUMENTS	APPLICABLE ASTM MATERIAL STANDARDS	NO	FAB	PERIODIC
STRUCTURAL STEEL MANUFACTURER CERTIFIED TEST REPORTS	---	YES	FAB	PERIODIC
WELD FILLER IDENTIFICATION AND MARKING TO CONFORM TO AWS SPECIFICATION IN THE APPROVED CONSTRUCTION DOCUMENTS	APPLICABLE AWS STANDARDS	NO	CWI	PERIODIC
WELD FILLER MATERIAL MANUFACTURER CERTIFICATION OF COMPLIANCE	---	NO	FAB	PERIODIC
COMPLETE AND PARTIAL JOINT PENETRATION GROOVE WELDS	AWS D1.1, IBC 1705.2.2.1	NO	CWI	CONTINUOUS
MULTI-PASS FILLET WELDS	AWS D1.1, IBC 1705.2.2.1	NO	CWI	CONTINUOUS
SINGLE-PASS FILLET WELDS >5/16"	AWS D1.1, IBC 1705.2.2.1	NO	CWI	CONTINUOUS
PLUG AND SLOT WELDS	AWS D1.1, IBC 1705.2.2.1	NO	CWI	CONTINUOUS
SINGLE-PASS FILLET WELDS <5/16"	AWS D1.1, IBC 1705.2.2.1	NO	CWI	PERIODIC

TABLE KEY: EOR – ENGINEER OF RECORD; SI – SPECIAL INSPECTOR UNDER CONTRACT WITH GC AND APPROVED BY EOR; RPE – REGISTERED PROFESSIONAL ENGINEER UNDER CONTRACT WITH GC AND APPROVED BY EOR; TA – 3RD PARTY TESTING AGENCY UNDER CONTRACT WITH GC; GC – GENERAL CONTRACTOR; CWI – CERTIFIED WELDING INSPECTOR UNDER CONTRACT WITH GC; FAB – FABRICATOR QA/QC REPRESENTATIVE

BLUE SKY TOWERS LLC

Structural Components
Bringing It All Together.
1870 W 64TH LANE
DENVER, CO 80221
(866) 386 - 7622
JOB #: 220142

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REVISIONS:

NO.	DATE	DESCRIPTION	BY	CHK	APD
5					WC
4				TR	
3			RM		
2					
1					
0	4/29/22	MODIFICATION DRAWINGS			

SITE INFORMATION:
97 HIGH STREET
PORTLAND CT 06480

DESIGN TYPE:
SELF SUPPORT
TOWER
MODIFICATION

SHEET TITLE:
SPECIAL INSPECTIONS

SHEET TITLE: GN-2 | REVISION: 0

PORTLAND_CT-1680 (SC Job #220142) BOM

Quantity Required	Quantity Supplied	Elevations	Part Number	Revision	Description	Piece Weight	Total Weight
					SUB-DIAGONAL, SUB-HORIZONTAL, TOP GIRT, & HW		
16	16	0'-0" TO 13'-4"	CP-03102-07	0	3/8" THICK GUSSET PLATE	3.73	59.68
16	16		CP-03102-08	0	1-3/4"x1-3/4"x3/16" LONG SUB-HORIZONTAL	8.01	128.16
16	16		CP-03102-09	0	1-3/4"x1-3/4"x3/16" LONG SUB-DIAGONAL	11.85	189.60
32	35		HK1-0815-10	0	1/2" x 1-1/2" A325 BOLT HW KIT	0.24	8.40
64	70		HK1-0817-10	0	1/2" x 1-3/4" A325 BOLT HW KIT	0.26	18.20
4	4	20'-0"	CP-03102-10	0	2-1/2"x2"x1/4" LONG REPLACEMENT TOP GIRT	41.20	164.80
8	9		H01-1015-12	0	5/8" x 1-1/2" A325 BOLT	0.33	2.97
16	18		H01-1017-12	0	5/8" x 1-3/4" A325 BOLT	0.35	6.30
24	27		H04-0010-01	0	5/8" HEAVY LOCK WASHER	0.03	0.81
24	27		H02-0010-11	0	5/8"-11 A563DH NUT	0.13	3.51
					BOLT ON TOWER EXTENSION & HW		
16	16	80'-0"	CP-03102-01	0	EXTENSION - INNER & OUTER LEG SPLICE PLATE	1.97	31.52
8	8	80'-0"	CP-03102-02	0	EXTENSION - LEG SPLICE SHIM PLATE	0.44	3.52
4	4	80'-0" TO 90'-0"	CP-03102-03	0	EXTENSION - LEG	66.00	264.00
16	16	80'-0" TO 90'-0"	CP-03102-04	0	EXTENSION - DIAGONAL	23.92	382.72
4	4	90'-0"	CP-03102-05	0	EXTENSION - TOP GIRT	15.64	62.56
54	60	80'-0" TO 90'-0"	H01-1020-12	0	5/8" x 2" x 1-1/4" A325 BOLT	0.29	17.40
40	45		H01-1017-12	0	5/8" x 1-3/4" x 1-1/4" A325 BOLT	0.26	11.70
94	105		H04-0010-01	0	5/8" HEAVY LOCK WASHER	0.03	3.15
94	105		H02-0010-11	0	5/8"-11 A563DH NUT	0.13	13.65
8	10		H82-0010-02	0	RINGFILL - 5/8" BOLT - 1/4" THICK	0.19	1.90
1	1	90'-0"	H41-0010-06	0	5/8" x 6' LIGHTNING ROD KIT	5.50	5.50
					SAFETY CLIMB & HW		
2	2	90'-0"	CP-03102-06	0	LADDER TOP CONNECTION ANGLE	2.33	4.66
4	5	90'-0"	H01-1017-12	0	5/8" x 1-3/4" x 1-1/4" A325 BOLT	0.26	1.30
4	5		H04-0010-01	0	5/8" HEAVY LOCK WASHER	0.03	0.15
4	5		H02-0010-11	0	5/8"-11 A563DH NUT	0.13	0.65
1	1	79'-0" TO 91'-0"	CW-01133-01	0	12 FT LADDER WELDMENT	76.52	76.52
4	4	79'-0" TO 91'-0"	P597-018-06	0	CLIMBING LADDER BACKING PLATE	0.74	2.96
8	9	79'-0" TO 91'-0"	H26-1085-60	0	3/8" x 3/4" x 8-1/2" x 6" ROUND J-BOLT	0.32	2.88
8	9		H03-0006-02	0	3/8" F436 FLAT WASHER	0.01	0.09
8	9		H04-0006-01	0	3/8" SPRING LOCK WASHER	0.01	0.09
8	9		H02-0006-16	0	3/8"-16 HEAVY HEX NUT	0.04	0.36
1	1	7'-0" TO 57'-0"	H42-130-50	0	AF - 50' SAFETY CLIMB - ROUND & ANGLE LEG - SS - 14RCL50SS	115.00	115.00
1	1	54'-0" TO 91'-0"	H42-130-50	0	AF - 50' SAFETY CLIMB - ROUND & ANGLE LEG - SS - 14RCL50SS	115.00	115.00
1	1	54'-0"	CP-03102-07	0	AF - 2IN TO 4IN ROUND AND ANGLE LEG TERM. BRACKET - 14AFVB1	8.00	8.00
1	1	54'-0"	CP-03102-08	0	AF - SAFETY CLIMB BOTTOM TENSIONER BRACKET - 14AFPMJHB01	4.00	4.00
						TOTAL WEIGHT	1711.71

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DENVER, CO 80221
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JOB #: 220142

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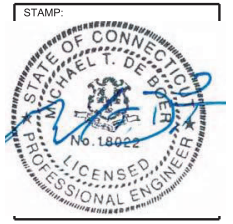

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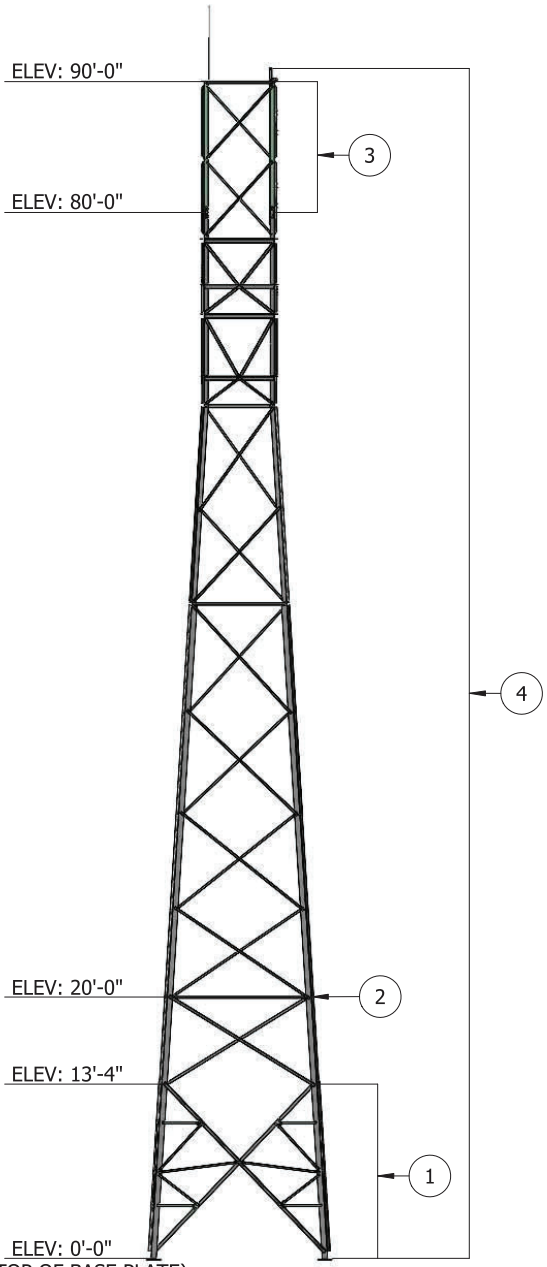
NO.	DATE	DESCRIPTION	BY	CHK	APD
5					
4					
3			RM	TR	WC
2					
1		MODIFICATION DRAWINGS			
0	4/29/22				

SITE INFORMATION:
97 HIGH STREET
PORTLAND CT 06480

DESIGN TYPE:
SELF SUPPORT
TOWER
MODIFICATION

SHEET TITLE:
BILL OF MATERIALS

SHEET TITLE: BOM
REVISION: 0



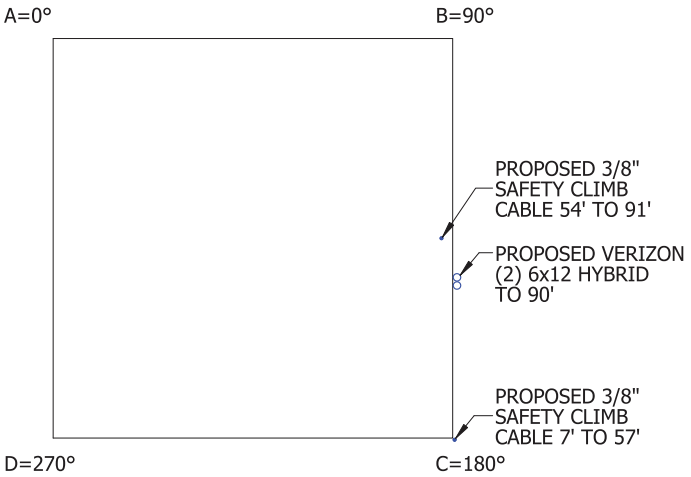
NOTE: ELEVATIONS ARE ROUNDED TO THE NEAREST INCH.

TOWER SPECIFICATIONS	
MANUFACTURER	UNKNOWN
TOWER TYPE / HEIGHT	(4) LEG SELF SUPPORT / 80' TOWER EXTENDED TO 90'

CURRENT STRUCTURAL ANALYSIS	
COMPANY	STRUCTURAL COMPONENTS, LLC
AUTHOR / FILE # / DATE	MICHAEL DEBOER, P.E. / 220142 / 4-21-2022

TOWER MODIFICATION SCHEDULE

ITEM	DESCRIPTION	ELEVATION		DWG. NO.
		BOTTOM	TOP	
1	INSTALL SUB-DIAGONALS AND SUB-HORIZONTALS.	0' - 0"	13' - 4"	D-1
2	UPGRADE TOP GIRT.	20' - 0"	20' - 0"	D-2
3	INSTALL NEW 10 FT TOWER EXTENSION.	80' - 0"	90' - 0"	D-3
4	INSTALL NEW SAFETY CLIMBS.	0' - 0"	91' - 0"	D-4 & D-5



NOTE: ONLY PROPOSED COAX LINES ARE SHOWN.

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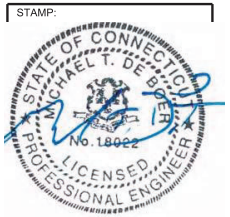

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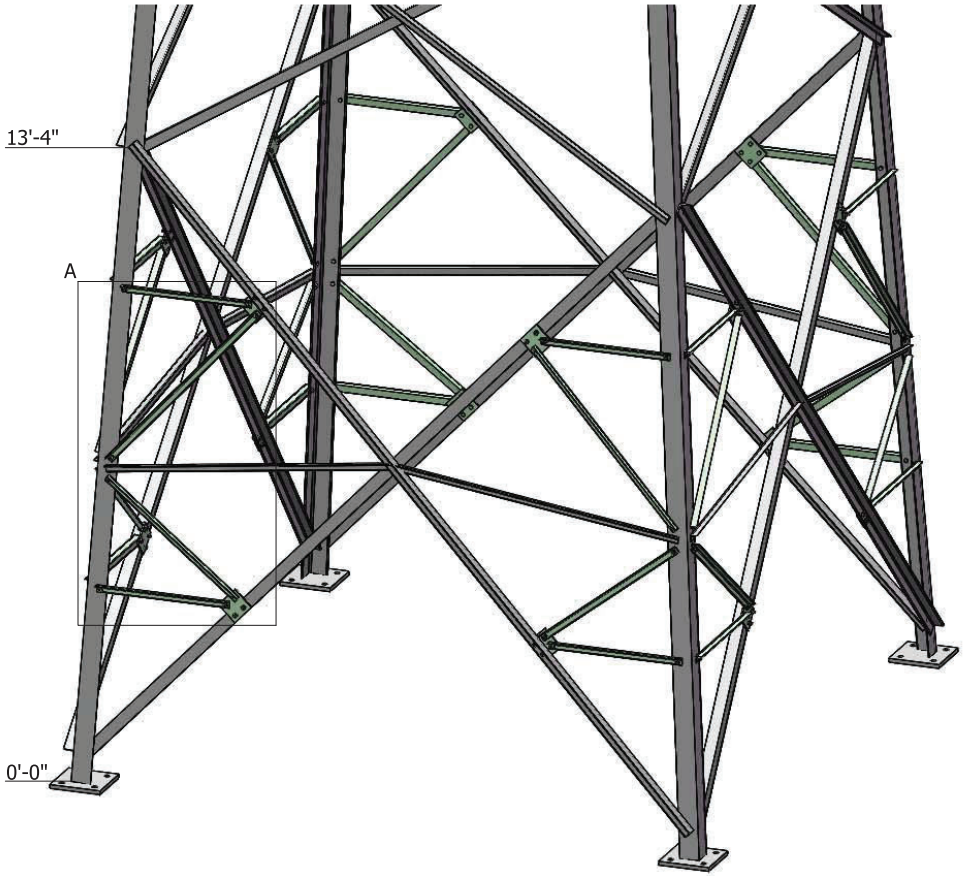
3					
4					
5					

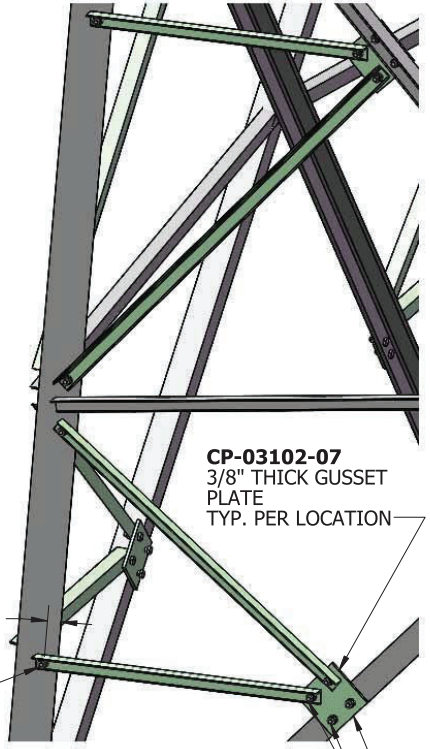
SITE INFORMATION:
97 HIGH STREET
PORTLAND CT 06480

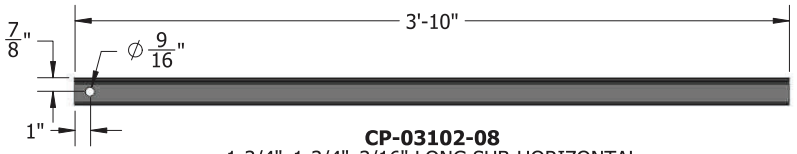
DESIGN TYPE:
SELF SUPPORT
TOWER
MODIFICATION

SHEET TITLE:
SPECIFICATIONS

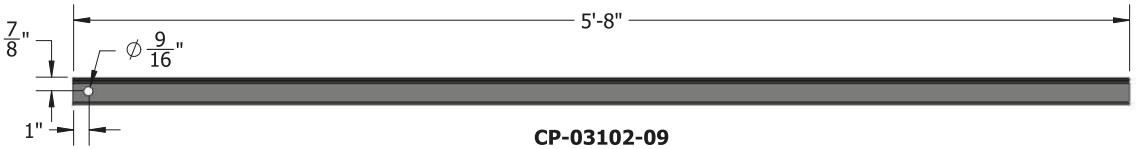
SHEET TITLE:	REVISION:
S-1	0







CP-03102-08
1-3/4"x1-3/4"x3/16" LONG SUB-HORIZONTAL



CP-03102-09
1-3/4"x1-3/4"x3/16" LONG SUB-DIAGONAL

NOTES:
1. 9/16" HOLES WILL NEED TO BE FIELD DRILLED THROUGH THE TOWER LEGS AND MAIN DIAGONALS TO ACCOMMODATE FIT UP. ENSURE THE LEG HOLES HAVE A 1-1/2" C-E TEAR OUT AND USE THE GUSSET PLATE AS A TEMPLATE TO LOCATE THE DIAGONAL HOLES.
2. SUB-HORIZONTALS AND SUB-DIAGONALS ARE SENT LONG WITH ONE END BOLT HOLE SHOP FABRICATED. ANGLES WILL NEED TO BE FIELD FABRICATED FOR FIT UP.
3. TRIM ANGLES TO LENGTH AND MATCH THE SHOWN SHOP FABRICATED END BOLT DIMENSIONS.
4. COAT ALL EXPOSED STEEL WITH TWO COATS OF BRUSH ON GALVALITE ZRC PAINT.

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1					
2					
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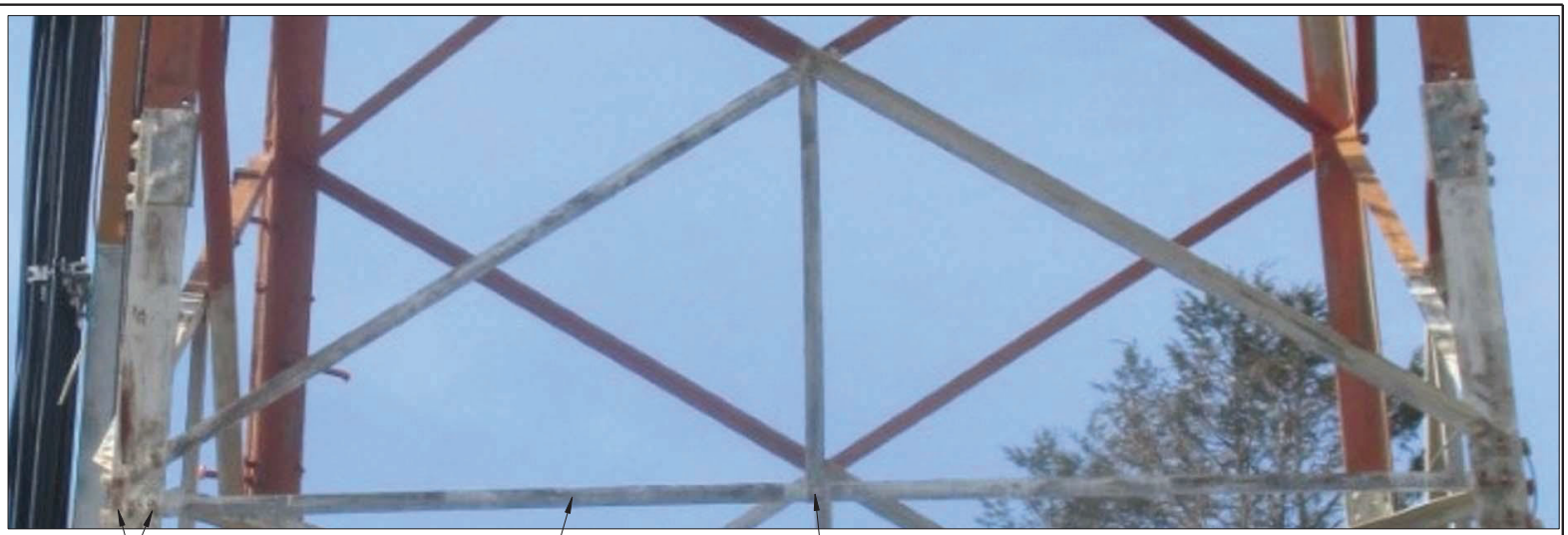
4					
5					

SITE INFORMATION:
97 HIGH STREET
PORTLAND CT 06480

DESIGN TYPE:
SELF SUPPORT TOWER MODIFICATION

SHEET TITLE:
SUB-DIAG. & SUB-HORZ. INSTALL DETAILS

SHEET TITLE: D-1
REVISION: 0



TYPICAL GIRT END BOLTS:
(2) 5/8" x 1-3/4" A325 BOLTS
(2) 5/8" LOCK WASHERS
(2) 5/8" NUTS

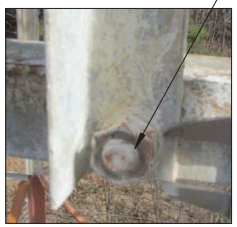
REPLACE EXISTING TOP GIRTS WITH NEW 2-1/2"x2"x1/4" ANGLE.
TYP. PER TOWER FACE

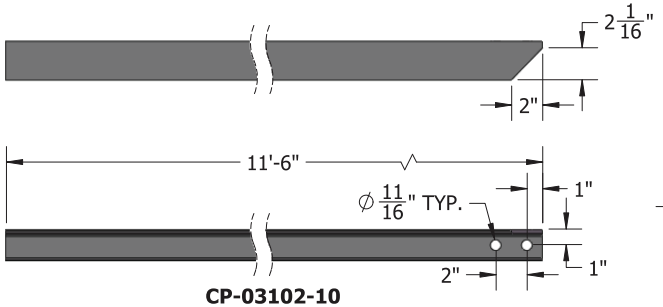
RE-ATTACH THE VERTICAL ANGLE TO THE REPLACEMENT TOP GIRT WITH:
(1) 5/8" x 1-1/2" A325 BOLT
(1) 5//8" LOCK WASHER
(1) 5/8" NUT
TYP. PER LOCATION

RE-ATTACH THE INTERNAL MEMBERS TO THE REPLACEMENT TOP GIRT WITH:
(1) 5/8" x 1-1/2" BOLT
(1) 5/8" LOCK WASHER
(1) 5/8" NUT
TYP. PER LOCATION

NOTES:
1. REPLACEMENT TOP GIRT ANGLES ARE SENT LONG WITH ONE END SHOP FABRICATED. ANGLES WILL NEED TO BE FIELD FABRICATED FOR FIT UP.
2. TRIM ANGLES TO LENGTH AND MATCH THE SHOWN SHOP FABRICATED END BOLT DIMENSIONS.
3. THE SHOP FABRICATED COPE IS ESTIMATED, COPE ANGLES AS NEEDED TO ACCOMMODATE FIT UP.
4. COAT ALL EXPOSED STEEL WITH TWO COATS OF BRUSH ON GALVALITE ZRC PAINT.
5. DO NOT REMOVE ANY TOWER HARDWARE OR MEMBERS IF WIND SPEEDS ARE FORECAST TO BE 20 MPH OR HIGHER.
6. ALL NEW TOP GIRT REPLACEMENT HARDWARE PROVIDED.

NOTE:
MATCH THE EXISTING TOP GIRT COPE TO ACCOMMODATE FIT UP. THE SHOP FABRICATED COPE IS ESTIMATED AND MAY NEED TO BE MODIFIED.





CP-03102-10
2-1/2"x2"x1/4" LONG REPLACEMENT TOP GIRT

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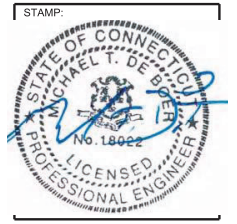

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1					
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3					
4					
5					

SITE INFORMATION:
97 HIGH STREET
PORTLAND CT 06480

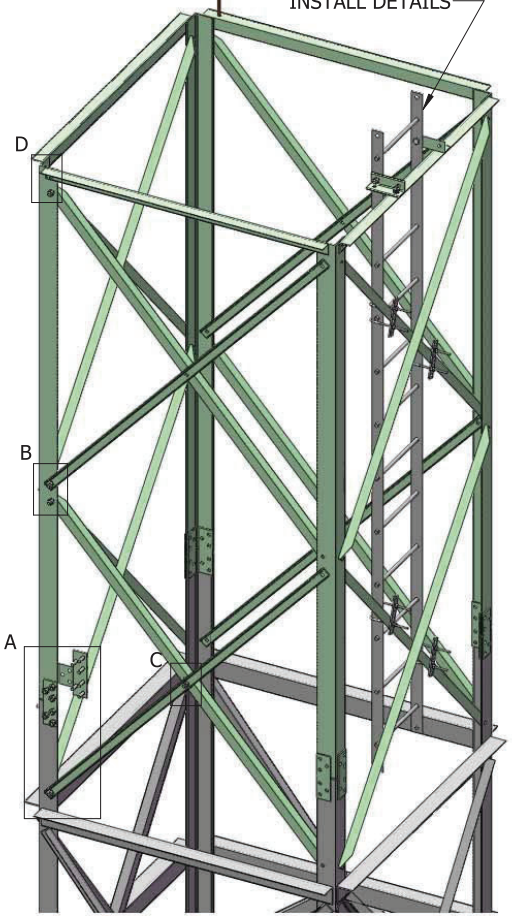
DESIGN TYPE:
SELF SUPPORT TOWER MODIFICATION

SHEET TITLE:
TOP GIRT INSTALL DETAILS

SHEET TITLE: D-2
REVISION: 0

INSTALL THE PROVIDED 5/8" x 6' LIGHTNING ROD TO THE EXTENSION TOP GIRT AT THE DESIRED LOCATION.
FIELD DRILL A 11/16" HOLE IN THE TOP GIRT TO ACCOMMODATE FIT UP.

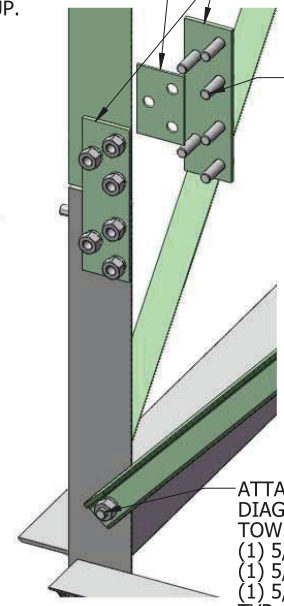
NOTE: REFERENCE THE FOLLOWING SHEET FOR LADDER INSTALL DETAILS



REMOVE THE (4) EXISTING TOWER TOP GIRTS PRIOR TO INSTALLING THE TOWER EXTENSION.

1/8" THICK SHIM PLATE

TYPICAL 1/4" THICK SPLICE PLATE

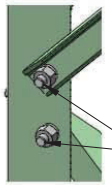


BOLT THE EXTENSION TO THE TOWER LEG WITH:
(6) 5/8" x 2" A325 BOLTS
(6) 5/8" LOCK WASHERS
(6) 5/8" NUTS
TYP. PER LOCATION
(6) BOLTS PER ANGLE FACE
(12) TOTAL BOLTS PER LEG
11/16" HOLES WILL NEED TO BE FIELD DRILLED INTO THE EXISTING TOWER LEGS TO ACCOMMODATE FIT UP.
USE THE SPLICE PLATES TO LOCATE THE FIELD DRILLED HOLES.

ATTACH THE EXTENSION DIAGONAL TO THE EXISTING TOWER LEG WITH:
(1) 5/8" x 1-3/4" A325 BOLT
(1) 5/8" LOCK WASHER
(1) 5/8" NUT
TYP. PER LOCATION
NOTE: FIELD DRILL 11/16" HOLE TO ACCOMMODATE FIT UP. ENSURE THERE IS A MINIMUM 1-1/4" C-E TEAR OUT ON THE LEG.

DETAIL A

THE 1-5/16" OD SAFETY CLIMB RAIL MAY BE REMOVED PRIOR TO INSTALLING THE TOWER EXTENSION.

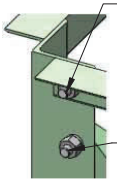


BOLT THE SINGLE DIAGONAL TO THE TOWER LEG WITH:
(1) 5/8" x 1-3/4" A325 BOLT
(1) 5/8" LOCK WASHER
(1) 5/8" NUT
TYP. PER LOCATION

DETAIL B

STITCH BOLT THE DIAGONALS TOGETHER WITH:
(1) 5/8" x 2" A325 BOLT
(1) 1/4" THICK RINGFILL
(1) 5/8" LOCK WASHER
(1) 5/8" NUT
TYP. PER LOCATION

DETAIL C



BOLT THE TOP GIRT TO THE LEG WITH
(1) 5/8" x 1-3/4" A325 BOLT
(1) 5/8" LOCK WASHER
(1) 5/8" NUT
TYP. PER LOCATION

BOLT THE SINGLE DIAGONAL TO THE TOWER LEG WITH:
(1) 5/8" x 1-3/4" A325 BOLT
(1) 5/8" LOCK WASHER
(1) 5/8" NUT
TYP. PER LOCATION

DETAIL D

NOTES:
1. NOT ALL HARDWARE IS SHOWN IN MODEL.
2. TOWER EXTENSION WILL BE SENT FULLY SHOP FABRICATED.
3. COAT ALL FIELD DRILLED HOLES WITH TWO COATS OF BRUSH ON GALVALITE ZRC PAINT.

BLUE SKY TOWERS LLC

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1870 W 64TH LANE
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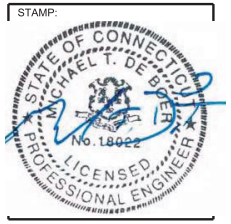

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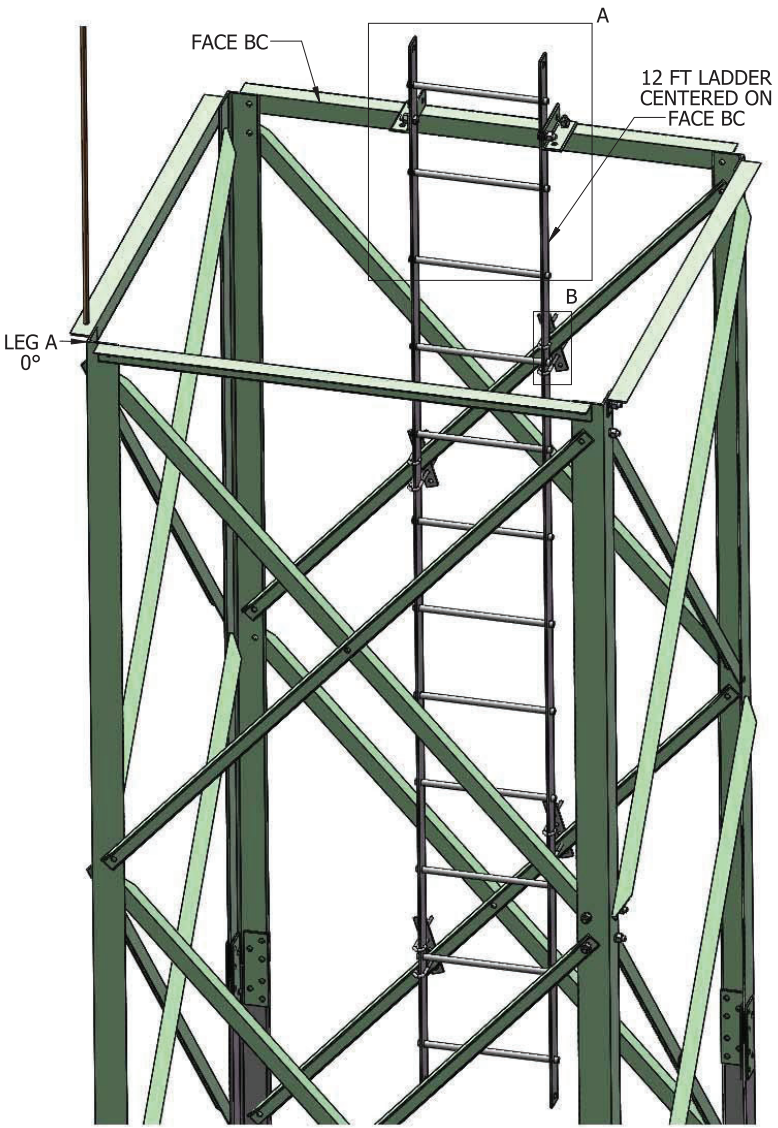
0	4/29/22	MODIFICATION DRAWINGS			

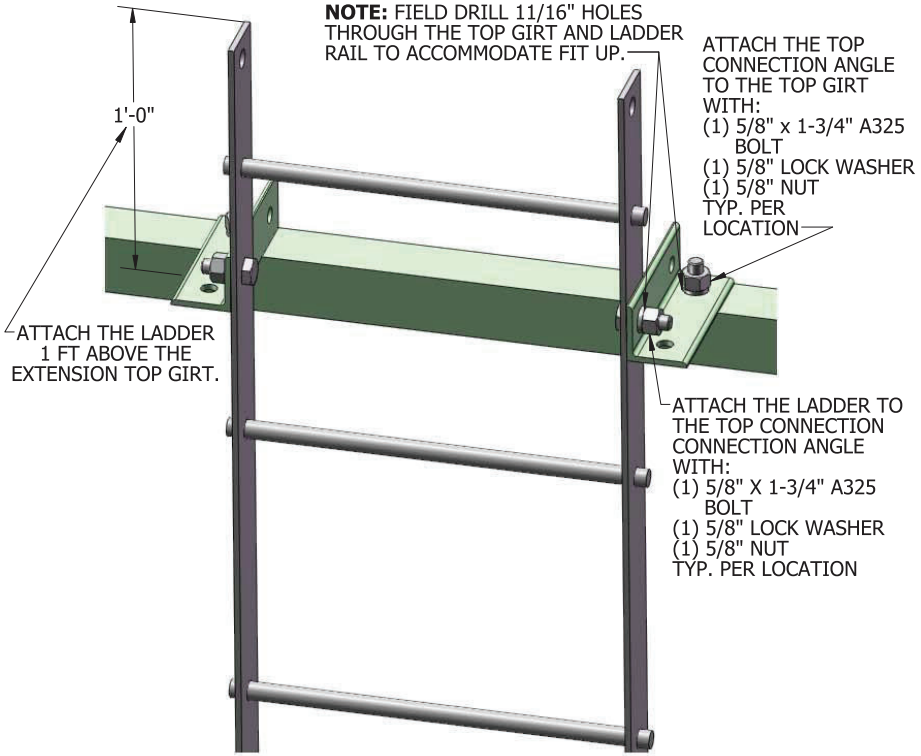
SITE INFORMATION:
97 HIGH STREET
PORTLAND CT 06480

DESIGN TYPE:
SELF SUPPORT TOWER MODIFICATION

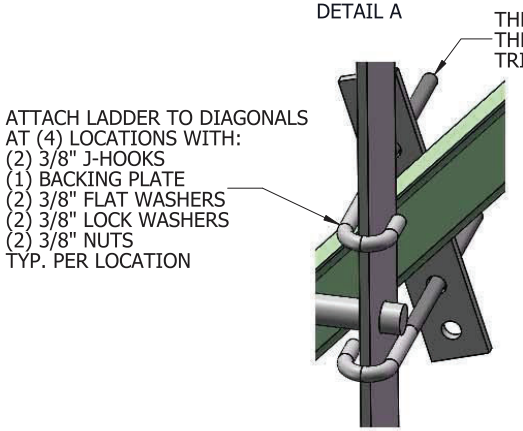
SHEET TITLE:
TOWER EXTENSION DETAILS

SHEET TITLE:	REVISION:
D-3	0





DETAIL A



DETAIL B

NOTE: COAT EXPOSED STEEL WITH TWO COATS OF BRUSH ON GALVALITE ZRC PAINT.

BLUE SKY TOWERS LLC

Structural Components
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1870 W 64TH LANE
DENVER, CO 80221
(866) 386 - 7622
JOB #: 220142

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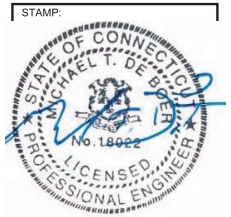

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REVISIONS:

NO.	DATE	DESCRIPTION	BY	CHK	APD
5					
4					
3					
2					
1			RM	TR	WC
0	4/29/22	MODIFICATION DRAWINGS			

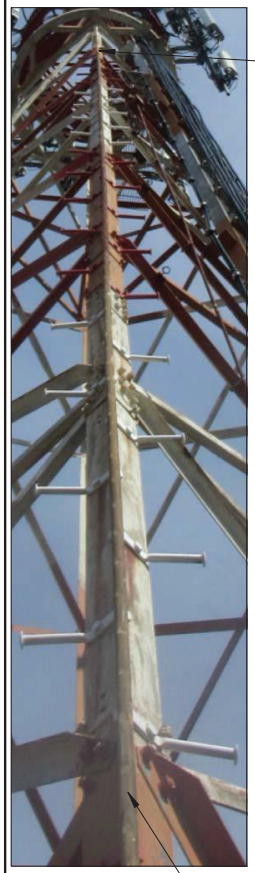
SITE INFORMATION:
97 HIGH STREET
PORTLAND CT 06480

DESIGN TYPE:
SELF SUPPORT
TOWER
MODIFICATION

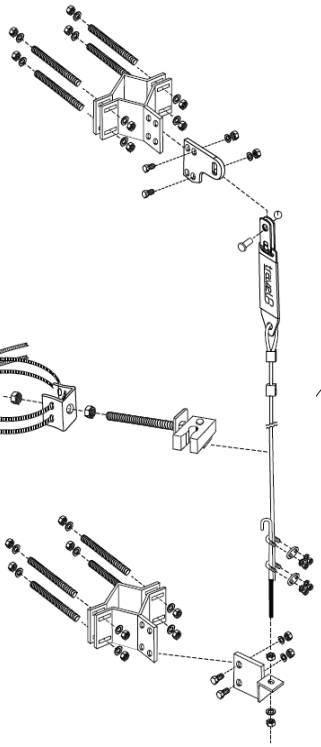
SHEET TITLE:
SAFETY CLIMB
INSTALL DETAILS

SHEET TITLE:	REVISION:
D-4	0

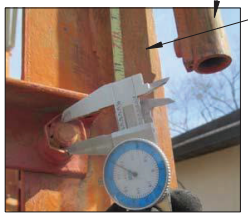
SAFETY CLIMB INSTALL (7' TO 57')



INSTALL THE TOP SAFETY CLIMB LEG BRACKET TO LEG C AT APPROXIMATELY 57 FT.



REMOVE THE LOWER 1-5/16" OD SAFETY CLIMB RAIL ON LEG C PRIOR TO INSTALLING THE NEW SAFETY CLIMB.



INSTALL THE BOTTOM SAFETY CLIMB LEG BRACKET TO LEG C AT APPROXIMATELY 7 FT.

SAFETY CLIMB INSTALL (54' TO 91')

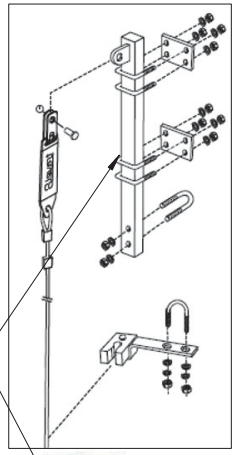
REMOVE THE UPPER 1-5/16" OD SAFETY CLIMB RAIL ON FACE BC PRIOR TO INSTALLING THE NEW SAFETY CLIMB.

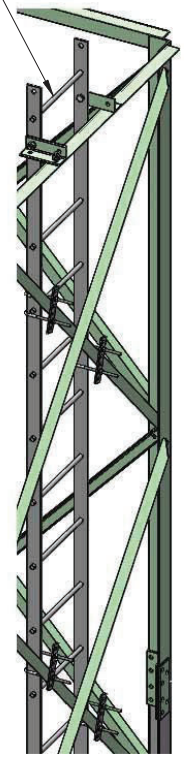
INSTALL THE BOTTOM SAFETY CLIMB LEG BRACKET TO THE INTERNAL CLIMBING ANGLE ON FACE BC APPROXIMATELY 4' ABOVE THE PLATFORM.

NOTE: FOLLOW ALL SAFETY CLIMB MANUFACTURES INSTALLATION INSTRUCTIONS.

NOTE: SAFETY CLIMB TRANSITION PLATFORM SITS AT APPROXIMATELY 50'-3".

INSTALL THE TOP LADDER MOUNT SAFETY CLIMB BRACKET TO THE CLIMBING LADDER. ENSURE THE BRACKET IS ATTACHED TO THE TOP (3) LADDER RUNGS.





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(866) 386 - 7622
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STAMP:

STATE OF CONNECTICUT
MICHAEL T. DE BOER
No. 18022
LICENSED PROFESSIONAL ENGINEER

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REVISIONS:

NO.	DATE	DESCRIPTION	BY	CHK	APD
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4					
3					
2					
1			RM	TR	WC
0	4/29/22	MODIFICATION DRAWINGS			

SITE INFORMATION:
97 HIGH STREET
PORTLAND CT 06480

DESIGN TYPE:
SELF SUPPORT TOWER MODIFICATION

SHEET TITLE:
SAFETY CLIMB INSTALL DETAILS (CONT'D)

SHEET TITLE: D-5

REVISION: 0