



August 30, 2022

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

Re: Notice of Exempt Modification – Antenna and RRU Add
Property Address: 231 Kettletown Rd, Southbury, Ct 06488
Applicant: AT&T Mobility, LLC

Dear Ms. Bachman:

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

AT&T currently maintains a wireless telecommunications facility consisting of (9) wireless telecommunication antennas at an antenna center line height of 85-feet on an existing 195 foot – Monopole, owned by Phoenix Tower International and the property by the Town of Southbury.

AT&T now intends INSTALL (3) NEW RRH'S AT GRADE · INSTALL (9) NEW RRH'S, (3) PER SECTOR · REMOVE (6) RRH'S. INSTALL (6) NEW PANEL ANTENNAS, (1) PER GAMMA SECTOR (pos 3), (2) PER ALPHA AND BETA SECTOR (pos 3), and (3) PER SECTOR (pos 4) REMOVE (6) ANTENNAS AT THE CORRESPONDING SECTORS · INSTALL HANDRAIL KIT WITH (6) PIPE MASTS SECURED TO THE EXISTING MOUNT AND NEW HANDRAIL KIT. INSTALL (1) SQUID. INSTALL 930 Y CABLES, (2) DC CABLES AND (1) FIBER.

This facility was approved by the Southbury Zoning Commission on: May 3rd, 2000, for a certificate of Environmental Compatibility and Public Need for the construction, maintenance, and operation of telecommunications antennas, associated equipment, and building to provide Domestic Public Cellular Radio Telecommunication service in the Connecticut- New England area.

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

Please accept this letter pursuant to Regulation of Connecticut State Agencies §16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b) (2). In accordance with R.C.S.A., a copy of this letter is being sent to First Selectman, Jeff Manville and the Planning Director Taianna Kern at: 501 Main Street South (Room 212 and 204) Southbury, CT 06488. A copy is also being sent to PHOENIX TOWER INTERNATIONAL, tower owner at: 1001 YAMATO ROAD, SUITE 105 BOCA RATON, FL 33431.

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

[EM-AT&T-130-181029](#) - AT&T notice of intent to modify an existing telecommunications facility located at 231 Kettletown Road, **Southbury**, Connecticut. **[Decision](#)** The planned modifications to AT&T's facility fall squarely within those activities explicitly provided for in R.C.S.A. §16-50j-72(b) (2).

1. The proposed modifications will not result in an increase in the height of the existing tower. AT&T's replacement antennas will be installed at the 185-foot level of the 195 foot - Monopole.
2. The proposed modifications will not involve any changes to ground-mounted equipment and, therefore, will



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

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

Sincerely,

David Barbagallo

CC w/enclosures:

First Selectman, Jeff Manville
Planning Director Taianna Kern
Tower Owner Phoenix Tower International

PROJECT INFORMATION

SCOPE OF WORK: ITEMS TO BE MOUNTED ON THE EXISTING MONOPOLE:
 *****BIRD SITE*****

- PROPOSED HANDRAIL KIT, SITEPRO-1 PART # HRK14 (OR APPROVED EQUAL).
- PROPOSED 2-1/2" STD. (2.88" O.D.) PIPE MAST BEHIND PROPOSED ANTENNAS SECURED TO THE EXISTING MOUNT AND PROPOSED HANDRAIL (TYP. OF 2 PER SECTOR, TOTAL OF 6).
- PROPOSED AT&T LTE ANTENNA (OPA65R-BU8DA) @ POS. 3 (TOTAL OF 1 PER GAMMA SECTOR).
- PROPOSED AT&T LTE ANTENNAS (OPA65R-BU6DA) @ POS. 3 (TYP. OF 1 PER ALPHA & BETA SECTORS, TOTAL OF 2).
- PROPOSED AT&T LTE ANTENNAS (DMP65R-BU8DA) @ POS. 4 (TYP. OF 1 PER SECTOR, TOTAL OF 3).
- PROPOSED AT&T RRU-4415 B25 (AWS) (TYP. OF 1 PER SECTOR, TOTAL OF 3).
- PROPOSED AT&T RRU 4449 B5/B12 (700/850) (TYP. OF 1 PER SECTOR, TOTAL OF 3).
- PROPOSED AT&T RRU-4478 B14 (700) (TYP. OF 1 PER SECTOR, TOTAL OF 3).
- PROPOSED AT&T DC6-48-60-18-8C-EV RAYCAP SQUID (TOTAL OF 1 FOR GAMMA SECTOR).
- PROPOSED "Y" CABLE (TYP. OF 1 PER SECTOR, TOTAL OF 3).
- PROPOSED (2) DC TRUNKS & (1) FIBER CABLE.

ITEMS TO BE MOUNTED AT EQUIPMENT LOCATION:

- INSTALL (1) IDLe CABLE.
- INSTALL (1) DC12.
- INSTALL SURGE ARRESTOR APTDC-BDFDM-DB (TYP. OF 2 PER SECTOR, TOTAL OF 6).
- PROPOSED AT&T RRU-2012 B29 (700) (TYP. OF 1 PER SECTOR, TOTAL OF 3).
- PROPOSED (4) RECTIFIERS.

ITEMS TO BE REMOVED:

- EXISTING AT&T UMS ANTENNA 7770 @ POS. 1 (TYP. OF 1 PER SECTOR, TOTAL OF 3).
- EXISTING AT&T LTE ANTENNA QS66512-2 @ POS. 2 (TYP. OF 1 PER ALPHA & BETA SECTORS, TOTAL OF 2).
- EXISTING AT&T LTE ANTENNA TPA-65R-LCUUUU-H8 @ POS. 2 (TOTAL OF 1 FOR GAMMA SECTOR).
- EXISTING RRU-11 B12 (700) (TYP. OF 1 PER SECTOR, TOTAL OF 3).
- EXISTING RRU-12 B2 (1900) (TYP. OF 1 PER SECTOR, TOTAL OF 3).
- EXISTING 4478 B5 (850) (TYP. OF 1 PER SECTOR, TOTAL OF 3) (SHELTER).
- EXISTING TMAS: TT19-08BP111-001 (TYP. OF 1 PER SECTOR, TOTAL OF 3)
- EXISTING AT&T DIPLEXERS: LGP21901 (GROUND MOUNTED) (TYP. OF 2 PER SECTOR, TOTAL OF 6)

ITEMS TO REMAIN:

- (3) ANTENNA, (6) RRU'S, (2) DC6 SQUID, (12) 1-1/4" COAX CABLES, (4) DC POWER & (2) FIBER CABLES.

RFDS: FINAL APPROVED V4 RFDS 03/24/22

SITE ADDRESS: 231 KETTLETOWN ROAD
SOUTHURY, CT 06488

LATITUDE: 41.4711861° N, 41° 28' 16.26996" N
 LONGITUDE: -73.2055550° W, 73° 12' 19.998" W

TYPE OF SITE: MONOPOLE / INDOOR EQUIPMENT

STRUCTURE HEIGHT: 195'-0"±
 RAD CENTER: 185'-0"

CURRENT USE: TELECOMMUNICATIONS FACILITY
 PROPOSED USE: TELECOMMUNICATIONS FACILITY



SITE NUMBER: CTL02086

SITE NAME: SOUTHURY KETTLETOWN RD

FA CODE: 10035309

PACE ID: MRCTB0061031, MRCTB052668, MRCTB052672, MRCTB052718, MRCTB052717

PROJECT: 4TXRX, LTE 7C, ANTENNA MODS, LTE 6C, 5G NR 2022 UPGRADE

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 18 FOR I-691 W TOWARD MERIDEN/WATERBURY, CONTINUE ONTO I-691 W, TAKE EXIT 1 ON THE LEFT FOR I-84 W TOWARD WATERBURY/DANBURY, MERGE WITH I-84, TAKE EXIT 15 FOR US-6 E/CT-67 TOWARD SOUTHURY, KEEP LEFT AT THE Y JUNCTION, FOLLOW SIGNS FOR SOUTHURY/KETTLETOWN STATE PK, TURN LEFT ONTO CT-67 S, TURN RIGHT ONTO KETTLETOWN RD, 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.

DRAWING INDEX

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72 HOURS



CALL BEFORE YOU DIG



CALL TOLL FREE 1-800-922-4455
 OR CALL 811



UNDERGROUND SERVICE ALERT

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

smartlink
 SMARTLINK
 1997 ANNAPOLIS EXCHANGE PKWY SUITE 200 ANNAPOLIS, MD 21401

SITE NUMBER: CTL02086
SITE NAME: SOUTHURY KETTLETOWN RD
 231 KETTLETOWN ROAD
 SOUTHURY, CT 06488
 NEW HAVEN COUNTY

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

| NO. | DATE | REVISIONS | BY | CHK | APP'D |
|-----|----------|-------------------------|----|-----|-------|
| 3 | 06/27/22 | ISSUED FOR CONSTRUCTION | MT | MT | OPH |
| 2 | 04/08/22 | ISSUED FOR CONSTRUCTION | MT | MT | OPH |
| 1 | 02/14/22 | ISSUED FOR CONSTRUCTION | SC | MT | OPH |
| 0 | 01/20/22 | ISSUED FOR REVIEW | GD | MT | OPH |

AT&T
 TITLE SHEET
 4TXRX, LTE 7C, ANTENNA MODS, LTE 6C, 5G NR 2022 UPGRADE

| SITE NUMBER | DRAWING NUMBER | REV |
|-------------|----------------|-----|
| CTL02086 | T-1 | 3 |

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 – SMARTLINK
 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 | REF | REFERENCE LINE | VIF | VERIFY IN FIELD |
| EGR | EQUIPMENT GROUND RING | REF | REFERENCE | | |



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



SMARTLINK
 1997 ANNAPOLIS EXCHANGE PKWY SUITE 200
 ANNAPOLIS, MD 21401

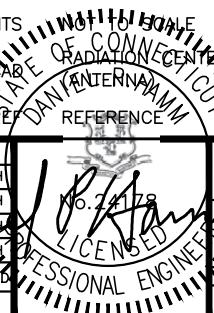
**SITE NUMBER: CTL02086
 SITE NAME: SOUTHBURY KETTLETOWN RD**

231 KETTLETOWN ROAD
 SOUTHBURY, CT 06488
 NEW HAVEN COUNTY



500 ENTERPRISE DRIVE, SUITE 3A
 ROCKY HILL, CT 06067

| | | | | |
|-----------------|----------|-------------------------|--------------|-----------|
| 3 | 06/27/22 | ISSUED FOR CONSTRUCTION | MT | OPH |
| 2 | 04/08/22 | ISSUED FOR CONSTRUCTION | MT | OPH |
| 1 | 02/14/22 | ISSUED FOR CONSTRUCTION | SC | OPH |
| 0 | 01/20/22 | ISSUED FOR REVIEW | GD | OPH |
| NO. | DATE | REVISIONS | BY | CHK APP'D |
| SCALE: AS SHOWN | | DESIGNED BY: AT | DRAWN BY: GD | |



AT&T

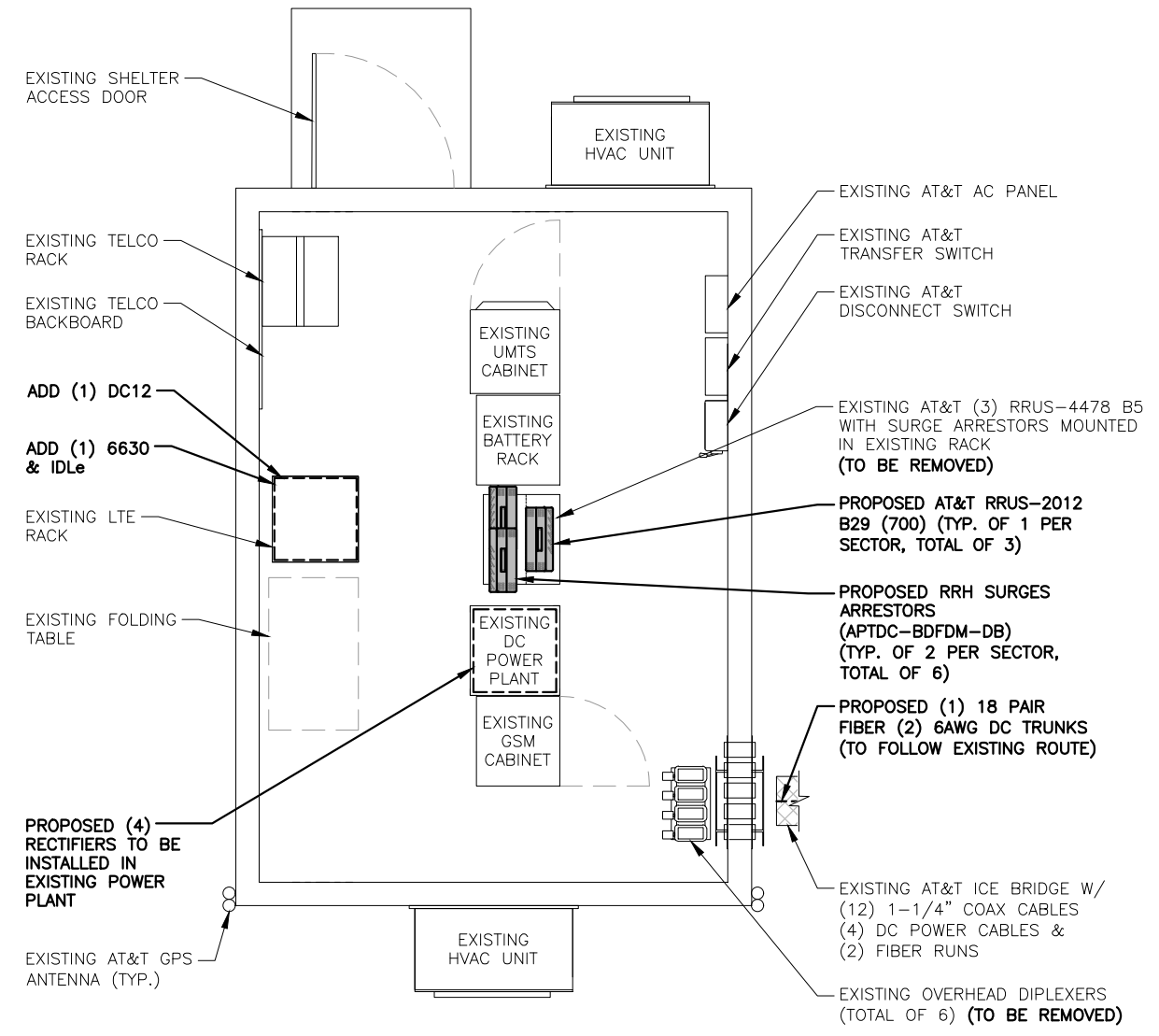
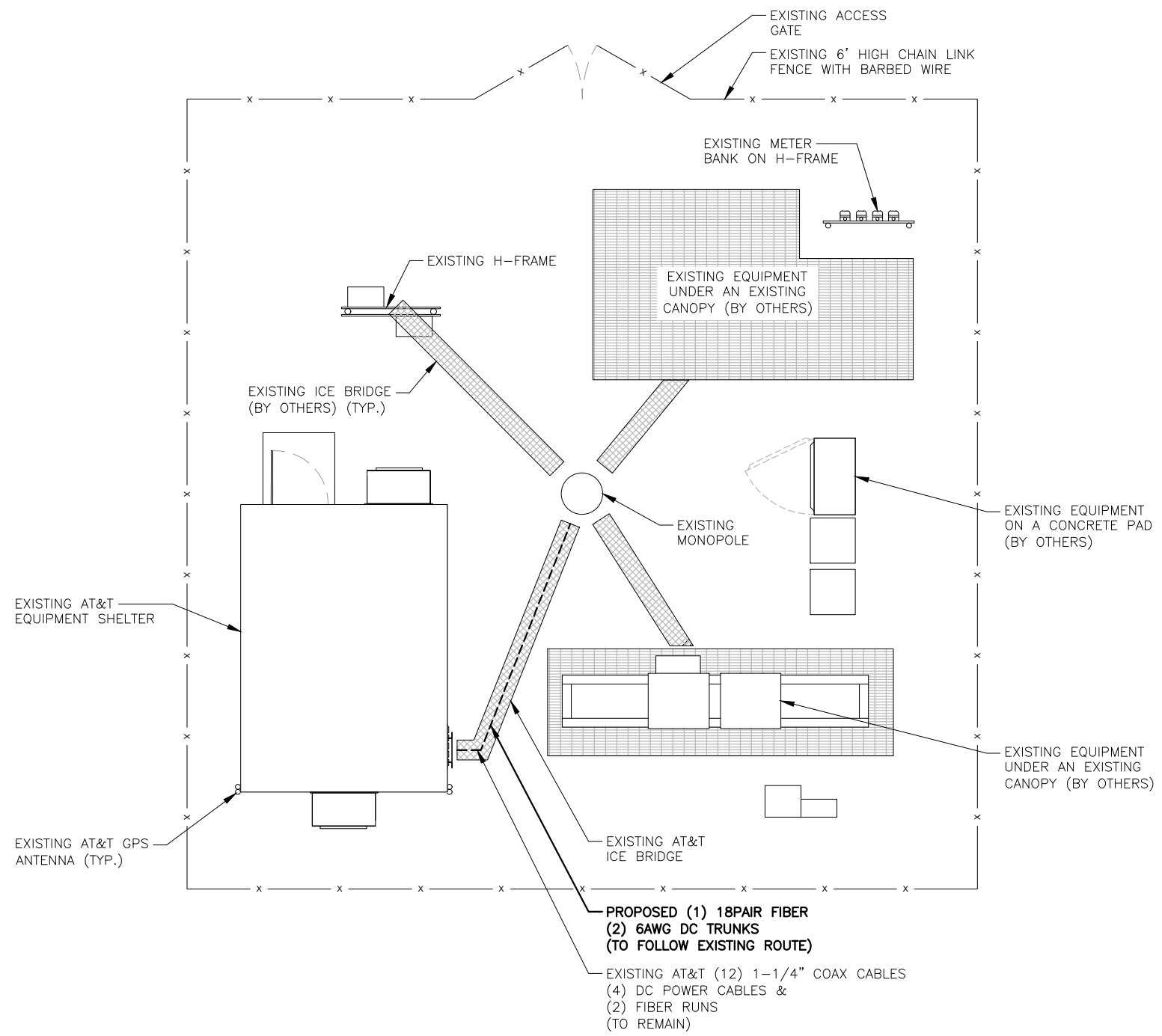
GENERAL NOTES

4TXRX, LTE 7C, ANTENNA MODS, LTE 6C, 5G NR 2022 UPGRADE

| | | |
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| SITE NUMBER | DRAWING NUMBER | REV |
| CTL02086 | GN-1 | 3 |

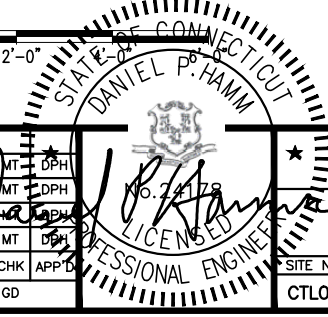
NOTE:
 AN ANALYSIS FOR THE CAPACITY OF THE EXISTING ANTENNA MOUNT TO SUPPORT THE PROPOSED LOADING HAS BEEN COMPLETED BY:
 HUDSON DESIGN GROUP, LLC.
 DATED: APRIL 05, 2022 (REV.1)

NOTE:
 REFER TO FINAL APPROVED V4 RFDS 03/24/22



COMPOUND PLAN 1 A-1
 22x34 SCALE: 1/4"=1'-0"
 11x17 SCALE: 1/8"=1'-0"
 TRUE NORTH
 MAGNETIC NORTH
 0 2'-0" 4'-0" 8'-0" 12'-0"

PROPOSED EQUIPMENT PLAN 2 A-1
 22x34 SCALE: 1/2"=1'-0"
 11x17 SCALE: 1/4"=1'-0"
 TRUE NORTH
 MAGNETIC NORTH
 0 1'-0" 2'-0"



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

smartlink
 SMARTLINK
 1997 ANNAPOLIS EXCHANGE PKWY SUITE 200
 ANNAPOLIS, MD 21401

SITE NUMBER: CTL02086
SITE NAME: SOUTHBURY KETTLETOWN RD
 231 KETTLETOWN ROAD
 SOUTHBURY, CT 06488
 NEW HAVEN COUNTY

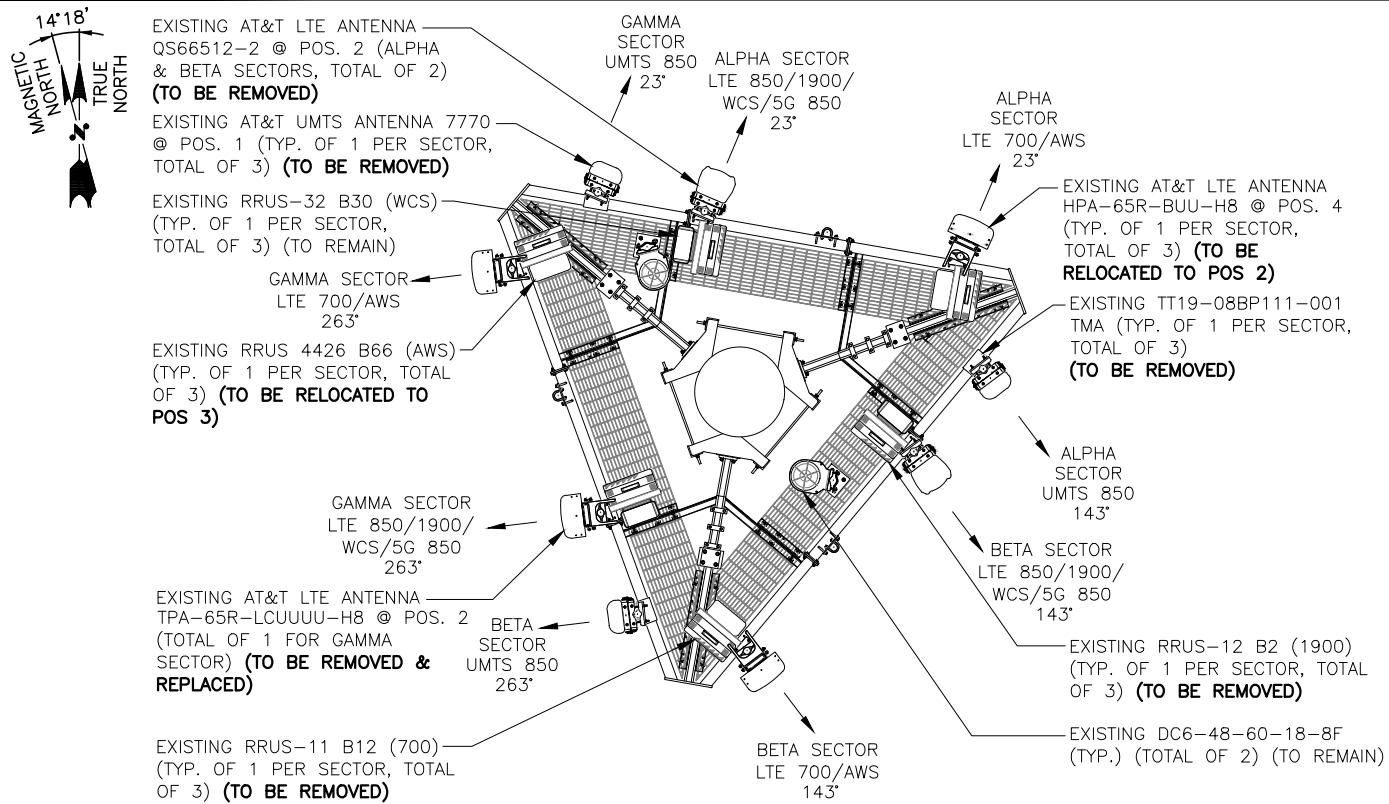
at&t
 500 ENTERPRISE DRIVE, SUITE 3A
 ROCKY HILL, CT 06067

| NO. | DATE | REVISIONS | BY | CHK | APP'D |
|-----|----------|-------------------------|----|-----|-------|
| 3 | 06/27/22 | ISSUED FOR CONSTRUCTION | MT | MT | DPH |
| 2 | 04/08/22 | ISSUED FOR CONSTRUCTION | MT | MT | DPH |
| 1 | 02/14/22 | ISSUED FOR CONSTRUCTION | SG | MT | DPH |
| 0 | 01/20/22 | ISSUED FOR REVIEW | GD | MT | DPH |

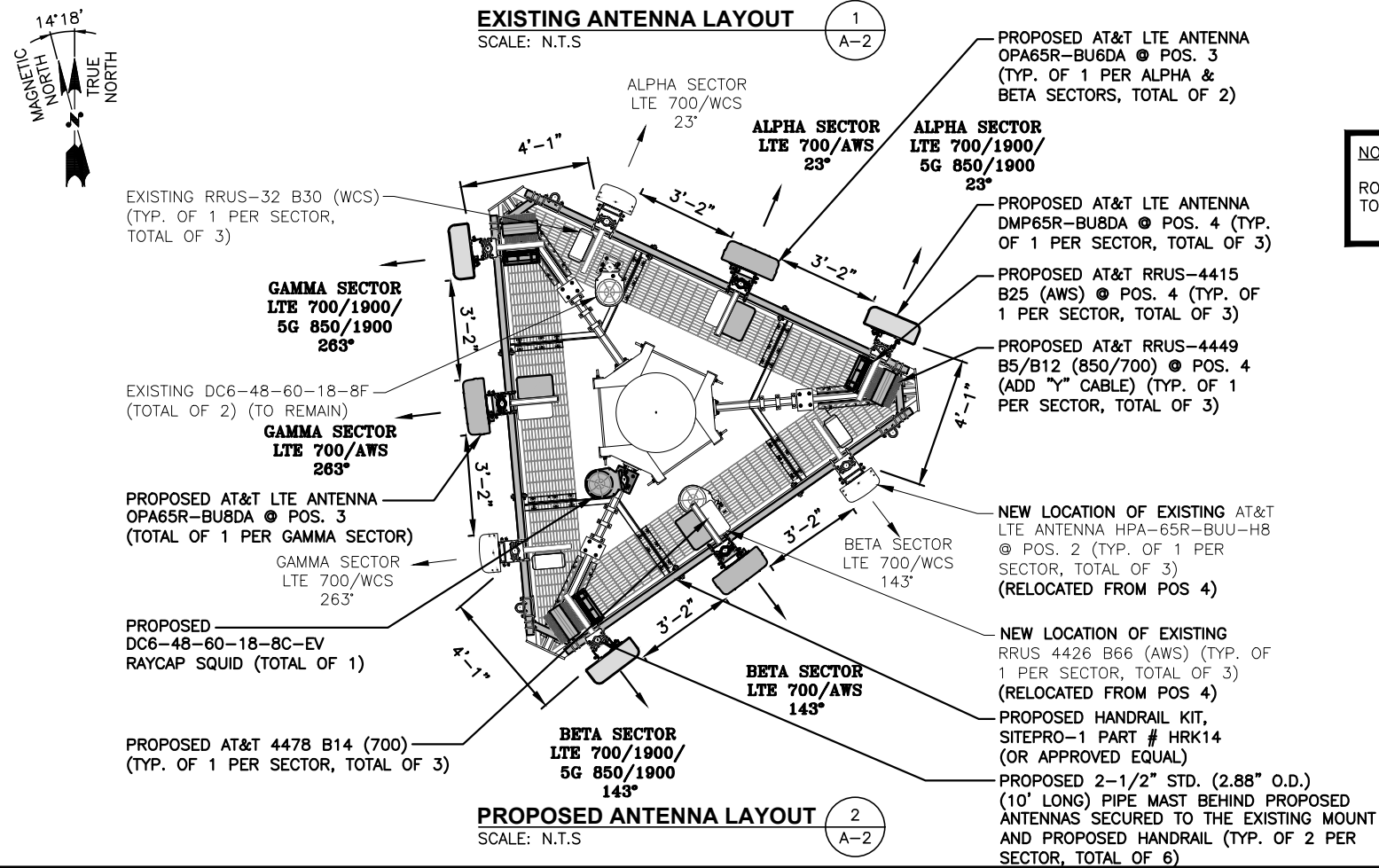
SCALE: AS SHOWN DESIGNED BY: AT DRAWN BY: GD

| SITE NUMBER | DRAWING NUMBER | REV |
|-------------|----------------|-----|
| CTL02086 | A-1 | 3 |

AT&T
 COMPOUND & EQUIPMENT PLANS
 4TXRX, LTE 7C, ANTENNA MODS, LTE 6C, 5G NR 2022 UPGRADE



EXISTING ANTENNA LAYOUT
SCALE: N.T.S

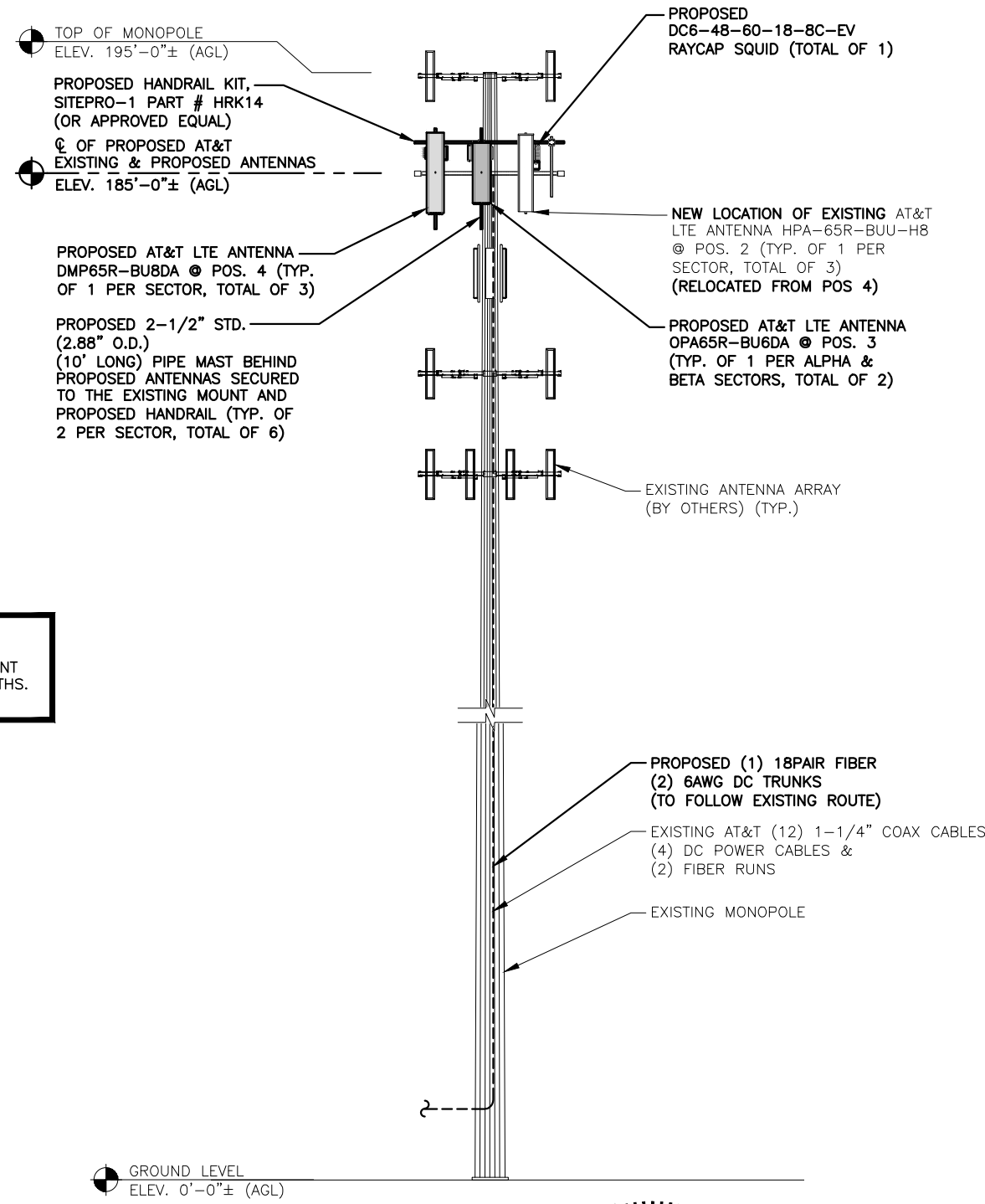


PROPOSED ANTENNA LAYOUT
SCALE: N.T.S



NOTE:
AN ANALYSIS FOR THE CAPACITY OF THE EXISTING ANTENNA MOUNT TO SUPPORT THE PROPOSED LOADING HAS BEEN COMPLETED BY: HUDSON DESIGN GROUP, LLC. DATED: APRIL 05, 2022 (REV.1)

NOTE:
REFER TO FINAL APPROVED V4 RFDS 03/24/22



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



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

smartlink
SMARTLINK
1997 ANNAPOLIS EXCHANGE PKWY SUITE 200
ANNAPOLIS, MD 21401

SITE NUMBER: CTL02086
SITE NAME: SOUTHBURY KETTLETOWN RD
231 KETTLETOWN ROAD
SOUTHBURY, CT 06488
NEW HAVEN COUNTY

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

| | | | | | |
|-----------------|----------|-------------------------|--------------|-----|-------|
| 3 | 06/27/22 | ISSUED FOR CONSTRUCTION | MT | MT | OPH |
| 2 | 04/08/22 | ISSUED FOR CONSTRUCTION | MT | MT | OPH |
| 1 | 02/14/22 | ISSUED FOR CONSTRUCTION | SC | MT | OPH |
| 0 | 01/20/22 | ISSUED FOR REVIEW | GD | MT | OPH |
| NO. | DATE | REVISIONS | BY | CHK | APP'D |
| SCALE: AS SHOWN | | DESIGNED BY: AT | DRAWN BY: GD | | |

STATE OF CONNECTICUT
DANIEL P. HAMM
LICENSED PROFESSIONAL ENGINEER
No. 22118

AT&T
ANTENNA LAYOUTS & ELEVATION
4TXRX, LTE 7C, ANTENNA MODS, LTE
6C, 5G NR 2022 UPGRADE
SITE NUMBER: CTL02086
DRAWING NUMBER: A-2
REV: 3

ANTENNA SCHEDULE

FINAL APPROVED V4 RFDS 03/24/22

| SECTOR | EXISTING/ PROPOSED | BAND | ANTENNA | SIZE (INCHES) (L x W x D) | ANTENNA ϕ HEIGHT | AZIMUTH | TMA/ DIPLEXER | RRU | SIZE (INCHES) (L x W x D) | FEEDER | RAYCAP |
|--------|-----------------------|------------------------------|----------------|------------------------------|--------------------------|---------|------------------|---|---------------------------------------|---------------------------------|-------------------------------------|
| - | - | - | - | - | - | - | - | - | - | (E)(4) 1-1/4" COAX | (E)(1) RAYCAP DC6-48-60-18-8F |
| A2 | EXISTING | LTE 700/WCS | HPA-65R-BUU-H8 | 92.4"x14.8"x7.4" | 185'-0"± | 23° | - | (G)(P)(1)RRUS-2012 B29 (700) (E)(1)RRUS-32 B30 (WCS) | 18"x17"x7" | (E)(1) FIBER (E)(2) DC POWER | |
| A3 | PROPOSED | LTE 700/AWS | OPA65R-BU6DA | 71.2"x21"x7.8" | 185'-0"± | 23° | - | (P)(1) 4478 B14 (700) (E)(1) 4426 B66 (AWS) | 18.1"x13.4"x8.3" | - | |
| A4 | PROPOSED | LTE 700/1900/ 5G 850/1900 | DMP65R-BU8DA | 96"x20.7"x7.7" | 185'-0"± | 23° | - | (P)(1) 4449 B5/B12 (850/700) (P)(1) 4415 B25 (1900) | 17.9"x13.2"x10.4" 18.1"x13.4"x8.3" | (P)(1)(Y-CABLE) | |
| - | - | - | - | - | - | - | - | - | - | (E)(4) 1-1/4" COAX | (E)(1) RAYCAP DC6-48-60-18-8F |
| B2 | EXISTING | LTE 700/WCS | HPA-65R-BUU-H8 | 92.4"x14.8"x7.4" | 185'-0"± | 143° | - | (G)(P)(1)RRUS-2012 B29 (700) (E)(1)RRUS-32 B30 (WCS) | 18"x17"x7" | (E)(1) FIBER (E)(2) DC POWER | |
| B3 | PROPOSED | LTE 700/AWS | OPA65R-BU6DA | 71.2"x21"x7.8" | 185'-0"± | 143° | - | (P)(1) 4478 B14 (700) (E)(1) 4426 B66 (AWS) | 18.1"x13.4"x8.3" | - | |
| B4 | PROPOSED | LTE 700/1900/ 5G 850/1900 | DMP65R-BU8DA | 96"x20.7"x7.7" | 185'-0"± | 143° | - | (P)(1) 4449 B5/B12 (850/700) (P)(1) 4415 B25 (1900) | 17.9"x13.2"x10.4" 18.1"x13.4"x8.3" | (P)(1)(Y-CABLE) | |
| - | - | - | - | - | - | - | - | - | - | (E)(4) 1-1/4" COAX | (P)(1) RAYCAP DC6-48-60-18-8C-EV |
| C2 | EXISTING | LTE 700/WCS | HPA-65R-BUU-H8 | 92.4"x14.8"x7.4" | 185'-0"± | 263° | - | (G)(P)(1)RRUS-2012 B29 (700) (E)(1)RRUS-32 B30 (WCS) | 18"x17"x7" | - | |
| C3 | PROPOSED | LTE 700/AWS | OPA65R-BU8DA | 96"x21"x7.8" | 185'-0"± | 263° | - | (P)(1) 4478 B14 (700) (E)(1) 4426 B66 (AWS) | 18.1"x13.4"x8.3" | (P)(1) FIBER (P)(2) DC POWER | |
| C4 | PROPOSED | LTE 700/1900/ 5G 850/1900 | DMP65R-BU8DA | 96"x20.7"x7.7" | 185'-0"± | 263° | - | (P)(1) 4449 B5/B12 (850/700) (P)(1) 4415 B25 (1900) | 17.9"x13.2"x10.4" 18.1"x13.4"x8.3" | (P)(1)(Y-CABLE) | |

NOTE:

AN ANALYSIS FOR THE CAPACITY OF THE EXISTING ANTENNA MOUNT TO SUPPORT THE PROPOSED LOADING HAS BEEN COMPLETED BY: HUDSON DESIGN GROUP, LLC. DATED: APRIL 05, 2022 (REV.1)

NOTE:

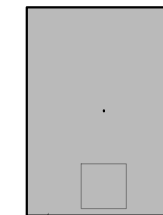
REFER TO FINAL APPROVED V4 RFDS 03/24/22

RRU CHART

| QUANTITY | MODEL | SIZE (L x W x D) |
|----------|----------------------------|-------------------|
| (P)(3) | RRUS 4449 B5/B12 (850/700) | 17.9"x13.2"x10.4" |
| (P)(3) | 4415 B25 (AWS) | 18.1"x13.4"x8.3" |
| (P)(3) | RRUS-4478 B14 (700) | 18.1"x13.4"x8.3" |
| (P)(3) | RRUS-E2 B29 (700) | 18"x17"x7" |
| (E)(3) | RRUS-32 B30 (WCS) | 27.2"x12.1"x7.0" |
| (E)(3) | RRUS-4426 B66 (AWS) | 14.9"x13.2"x5.8" |

NOTE:

SEE RFDS FOR RRH FREQUENCY AND MODEL NUMBER



NOTE: MOUNT PER MANUFACTURER'S SPECIFICATIONS.

NOTE: MOUNT PER MANUFACTURER'S SPECIFICATIONS

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

FINAL ANTENNA SCHEDULE

SCALE: N.T.S.

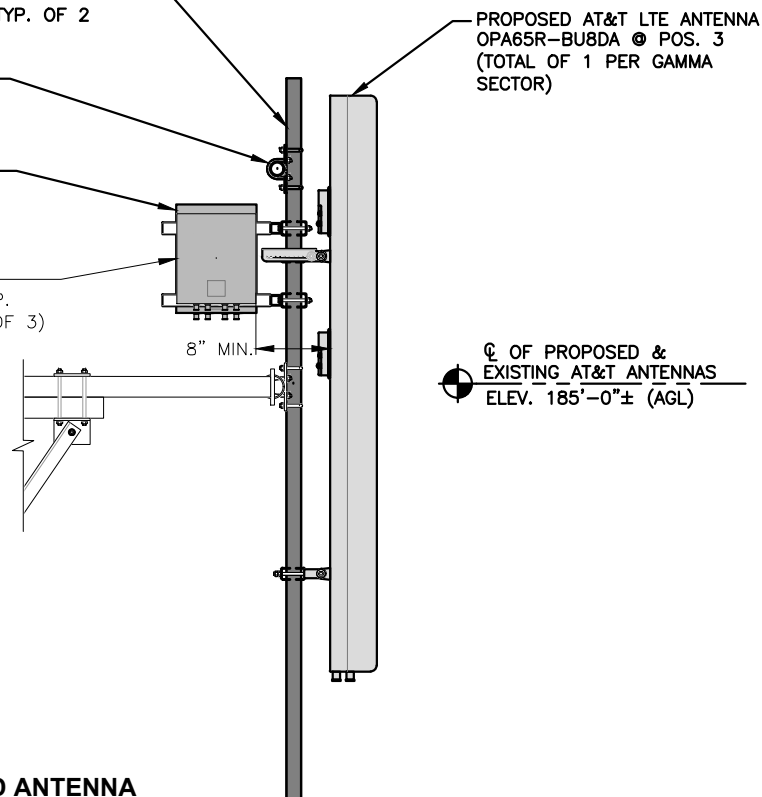
1
A-3

PROPOSED 2-1/2" STD. (2.88" O.D.) (10' LONG) PIPE MAST BEHIND PROPOSED ANTENNAS SECURED TO THE EXISTING MOUNT AND PROPOSED HANDRAIL @ POS. 3 & 4 (TYP. OF 2 PER SECTOR, TOTAL OF 6)

PROPOSED HANDRAIL KIT, SITEPRO-1 PART # HRK14 (OR APPROVED EQUAL)

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

NEW LOCATION OF EXISTING RRU 4426 B66 (AWS) (TYP. OF 1 PER SECTOR, TOTAL OF 3) (RELOCATED FROM POS 4)



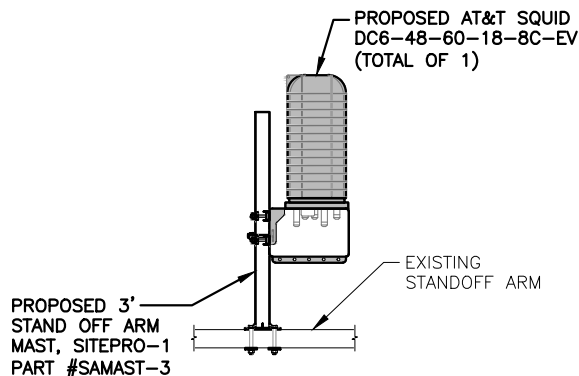
ϕ OF PROPOSED & EXISTING AT&T ANTENNAS
ELEV. 185'-0"± (AGL)



PROPOSED ANTENNA @ POS. 3 GAMMA SECTOR

22x34 SCALE: 3/4"=1'-0"
11x17 SCALE: 3/8"=1'-0"

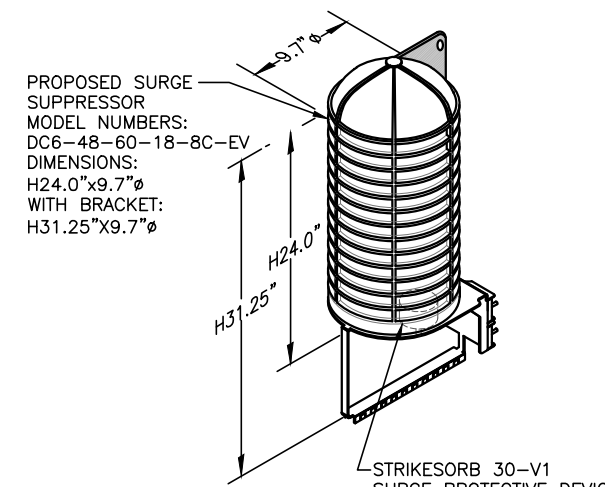
3
A-3



PROPOSED SURGE PROTECTOR MOUNTING DETAIL

SCALE: N.T.S.

4
A-3

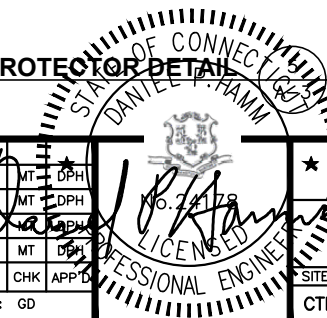


PROPOSED SURGE SUPPRESSOR MODEL NUMBERS: DC6-48-60-18-8C-EV DIMENSIONS: H24.0"x9.7"φ WITH BRACKET: H31.25"x9.7"φ

NOTE: MOUNT PER MANUFACTURER'S SPECIFICATIONS.

PROPOSED SURGE PROTECTOR DETAIL

SCALE: N.T.S.



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SMARTLINK
1997 ANNAPOLIS EXCHANGE PKWY SUITE 200
ANNAPOLIS, MD 21401

SITE NUMBER: CTL02086
SITE NAME: SOUTHBURY KETTLETOWN RD

231 KETTLETOWN ROAD
SOUTHBURY, CT 06488
NEW HAVEN COUNTY



500 ENTERPRISE DRIVE, SUITE 3A
ROCKY HILL, CT 06067

| | | | | | |
|-----------------|----------|-------------------------|--------------|-----|-------|
| 3 | 06/27/22 | ISSUED FOR CONSTRUCTION | MT | MT | DPH |
| 2 | 04/08/22 | ISSUED FOR CONSTRUCTION | MT | MT | DPH |
| 1 | 02/14/22 | ISSUED FOR CONSTRUCTION | SC | MT | DPH |
| 0 | 01/20/22 | ISSUED FOR REVIEW | GD | MT | DPH |
| NO. | DATE | REVISIONS | BY | CHK | APP'D |
| SCALE: AS SHOWN | | DESIGNED BY: AT | DRAWN BY: GD | | |

AT&T

DETAILS

4TXRX, LTE 7C, ANTENNA MODS, LTE 6C, 5G NR 2022 UPGRADE

| SITE NUMBER | DRAWING NUMBER | REV |
|-------------|----------------|-----|
| CTL02086 | A-3 | 3 |

STRUCTURAL NOTES:

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

SPECIAL INSPECTIONS (REFERENCE IBC CHAPTER 17):

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

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

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

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

NOTES:

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

NOTES:

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

SPECIAL INSPECTION CHECKLIST

BEFORE CONSTRUCTION

| CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REQUIRED (COMPLETED BY ENGINEER OF RECORD) | REPORT ITEM |
|--|--|
| N/A | ENGINEER OF RECORD APPROVED SHOP DRAWINGS ¹ |
| N/A | MATERIAL SPECIFICATIONS REPORT ² |
| N/A | FABRICATOR NDE INSPECTION |
| REQUIRED | PACKING SLIPS ³ |

ADDITIONAL TESTING AND INSPECTIONS:

DURING CONSTRUCTION

| CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REQUIRED (COMPLETED BY ENGINEER OF RECORD) | REPORT ITEM |
|--|--|
| REQUIRED | STEEL INSPECTIONS |
| N/A | HIGH STRENGTH BOLT INSPECTIONS |
| N/A | HIGH WIND ZONE INSPECTIONS ⁴ |
| N/A | FOUNDATION INSPECTIONS |
| N/A | CONCRETE COMP. STRENGTH, SLUMP TESTS AND PLACEMENT |
| N/A | POST INSTALLED ANCHOR VERIFICATION ⁵ |
| N/A | GROUT VERIFICATION |
| N/A | CERTIFIED WELD INSPECTION |
| N/A | EARTHWORK: LIFT AND DENSITY |
| N/A | ON SITE COLD GALVANIZING VERIFICATION |
| N/A | GUY WIRE TENSION REPORT |

ADDITIONAL TESTING AND INSPECTIONS:

AFTER CONSTRUCTION

| CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REQUIRED (COMPLETED BY ENGINEER OF RECORD) | REPORT ITEM |
|--|--|
| REQUIRED | MODIFICATION INSPECTOR REDLINE OR RECORD DRAWINGS ⁶ |
| N/A | POST INSTALLED ANCHOR PULL-OUT TESTING |
| REQUIRED | PHOTOGRAPHS |

ADDITIONAL TESTING AND INSPECTIONS:

45 BEECHWOOD DRIVE
NORTH ANDOVER, MA 01845
TEL: (978) 557-5553
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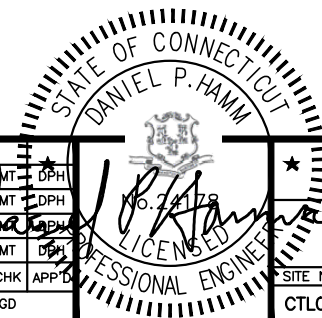
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SITE NUMBER: CTL02086
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NEW HAVEN COUNTY

500 ENTERPRISE DRIVE, SUITE 3A
ROCKY HILL, CT 06067

| 3 | 06/27/22 | ISSUED FOR CONSTRUCTION | MT | OPH | |
|-----------------|----------|-------------------------|--------------|-----|-------|
| 2 | 04/08/22 | ISSUED FOR CONSTRUCTION | MT | OPH | |
| 1 | 02/14/22 | ISSUED FOR CONSTRUCTION | SC | OPH | |
| 0 | 01/20/22 | ISSUED FOR REVIEW | GD | OPH | |
| NO. | DATE | REVISIONS | BY | CHK | APP'D |
| SCALE: AS SHOWN | | DESIGNED BY: AT | DRAWN BY: GD | | |



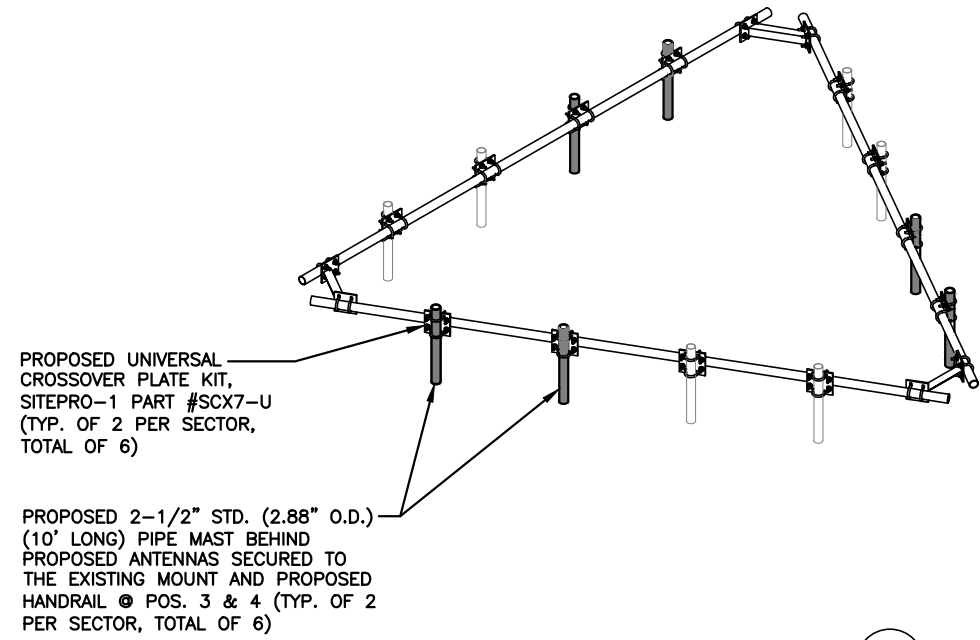
AT&T

STRUCTURAL NOTES
4TXRX, LTE 7C, ANTENNA MODS, LTE
6C, 5G NR 2022 UPGRADE

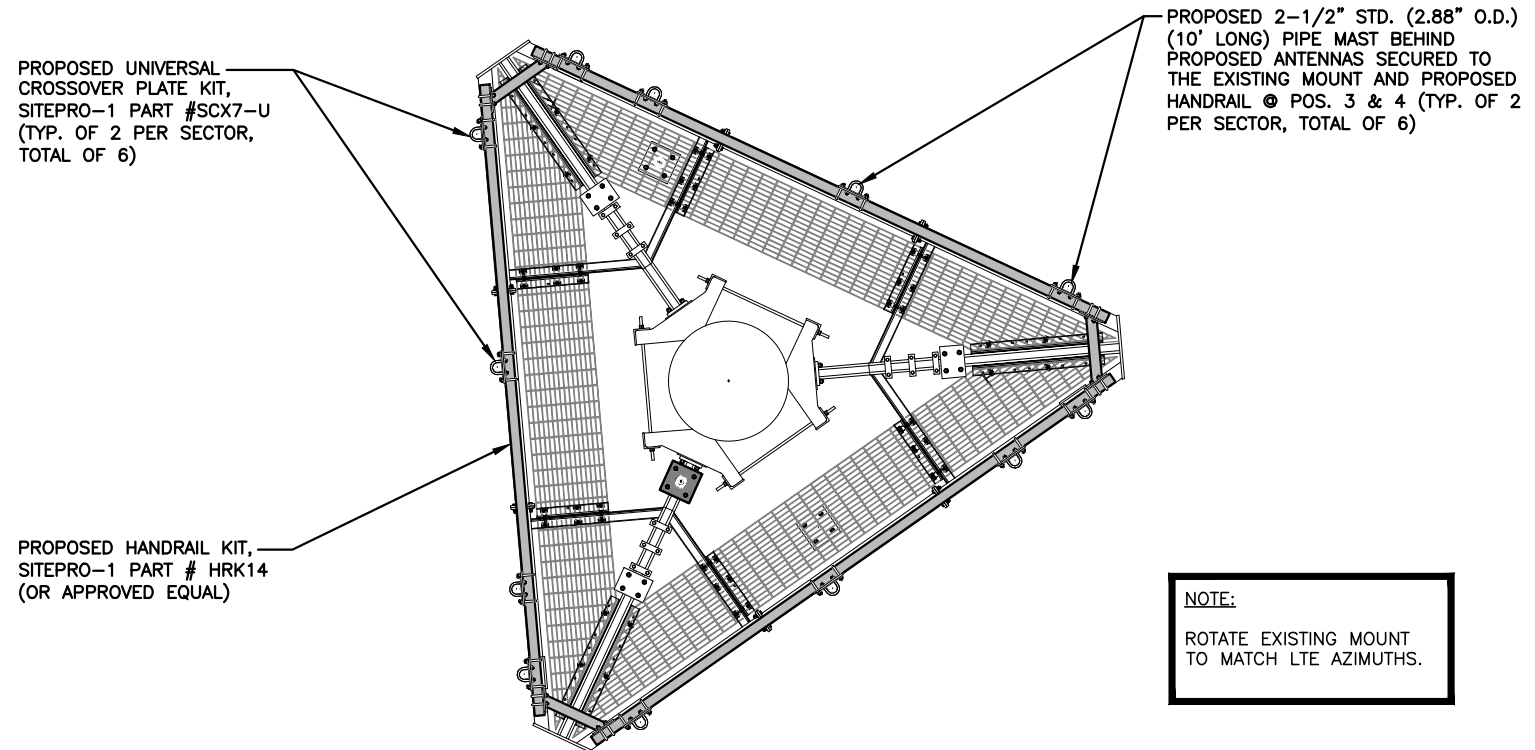
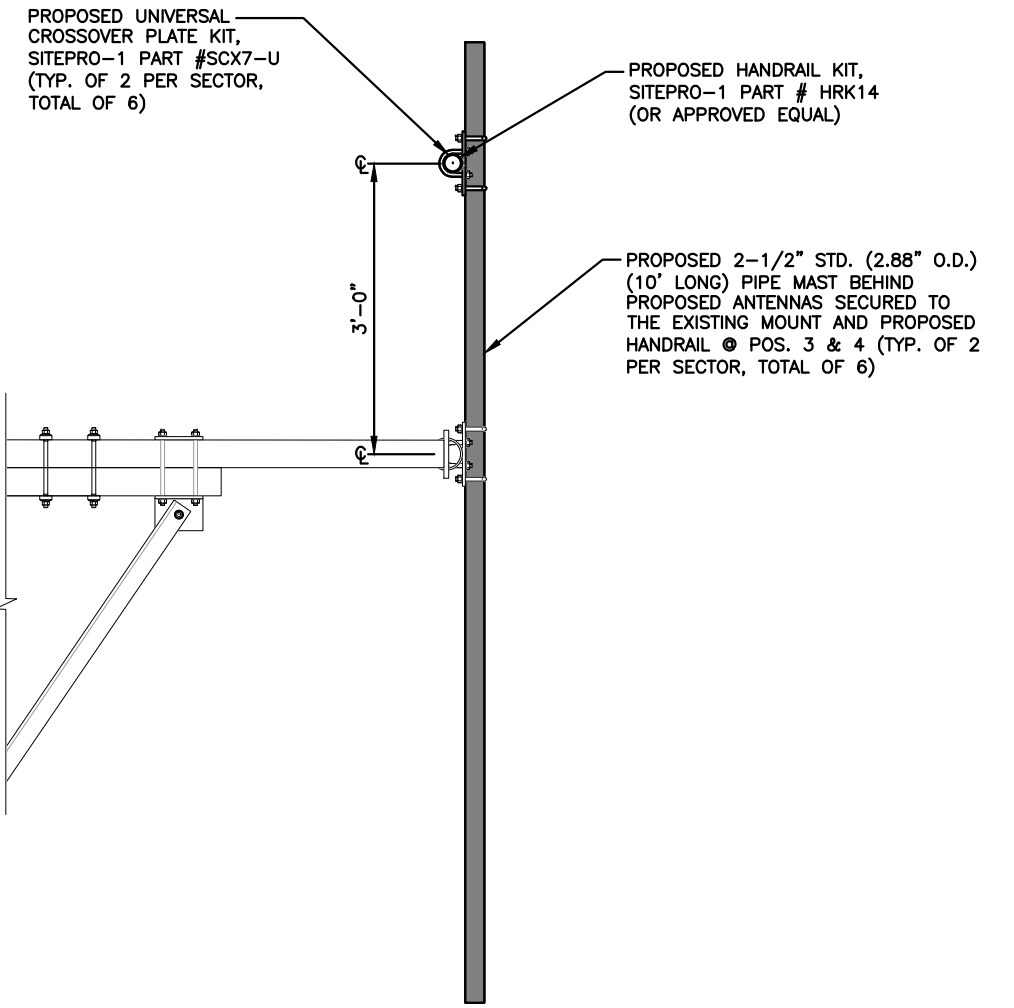
| SITE NUMBER | DRAWING NUMBER | REV |
|-------------|----------------|-----|
| CTL02086 | SN-1 | 3 |

NOTE:
REFER TO FINAL APPROVED V4 RFDS
03/24/22

NOTE:
AN ANALYSIS FOR THE CAPACITY OF
THE EXISTING **ANTENNA MOUNT** TO
SUPPORT THE PROPOSED LOADING
HAS BEEN COMPLETED BY:
HUDSON DESIGN GROUP, LLC.
DATED: APRIL 05, 2022 (REV.1)



HRK14 HANDRAIL KIT DETAIL 1
SCALE: N.T.S. S-1



NOTE:
ROTATE EXISTING MOUNT
TO MATCH LTE AZIMUTHS.

PROPOSED MOUNT MODIFICATIONS PLAN 2
22x34 SCALE: 1/2"=1'-0" S-1
11x17 SCALE: 1/4"=1'-0"
0 1'-0" 2'-0" 4'-0" 6'-0"

PROPOSED MOUNT MODIFICATIONS DETAIL
22x34 SCALE: 1"=1'-0"
11x17 SCALE: 1/2"=1'-0"
0'-6" 1'-0" 2'-0" 3'-0"

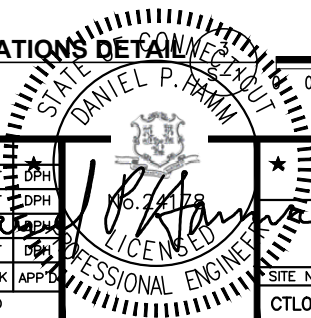
HGD HUDSON Design Group LLC
45 BEECHWOOD DRIVE
NORTH ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

smartlink
1997 ANNAPOLIS EXCHANGE PKWY SUITE 200
ANNAPOLIS, MD 21401

SITE NUMBER: CTL02086
SITE NAME: SOUTHURY KETTLETOWN RD
231 KETTLETOWN ROAD
SOUTHURY, CT 06488
NEW HAVEN COUNTY

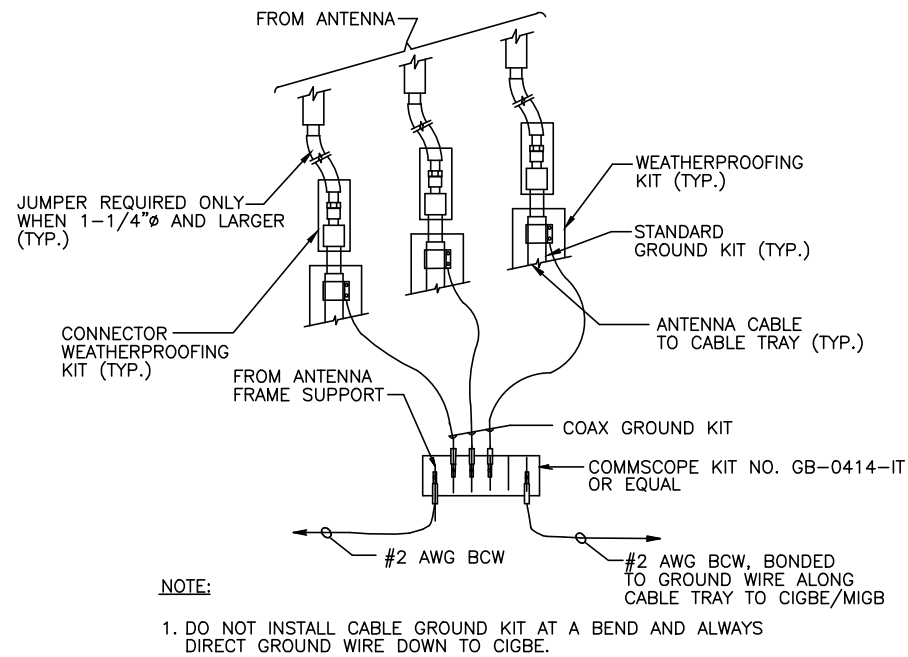
at&t
500 ENTERPRISE DRIVE, SUITE 3A
ROCKY HILL, CT 06067

| 3 | 06/27/22 | ISSUED FOR CONSTRUCTION | MT | MT | DPH |
|-----------------|----------|-------------------------|--------------|-----|-------|
| 2 | 04/08/22 | ISSUED FOR CONSTRUCTION | MT | MT | DPH |
| 1 | 02/14/22 | ISSUED FOR CONSTRUCTION | SG | MT | DPH |
| 0 | 01/20/22 | ISSUED FOR REVIEW | GD | MT | DPH |
| NO. | DATE | REVISIONS | BY | CHK | APP'D |
| SCALE: AS SHOWN | | DESIGNED BY: AT | DRAWN BY: GD | | |

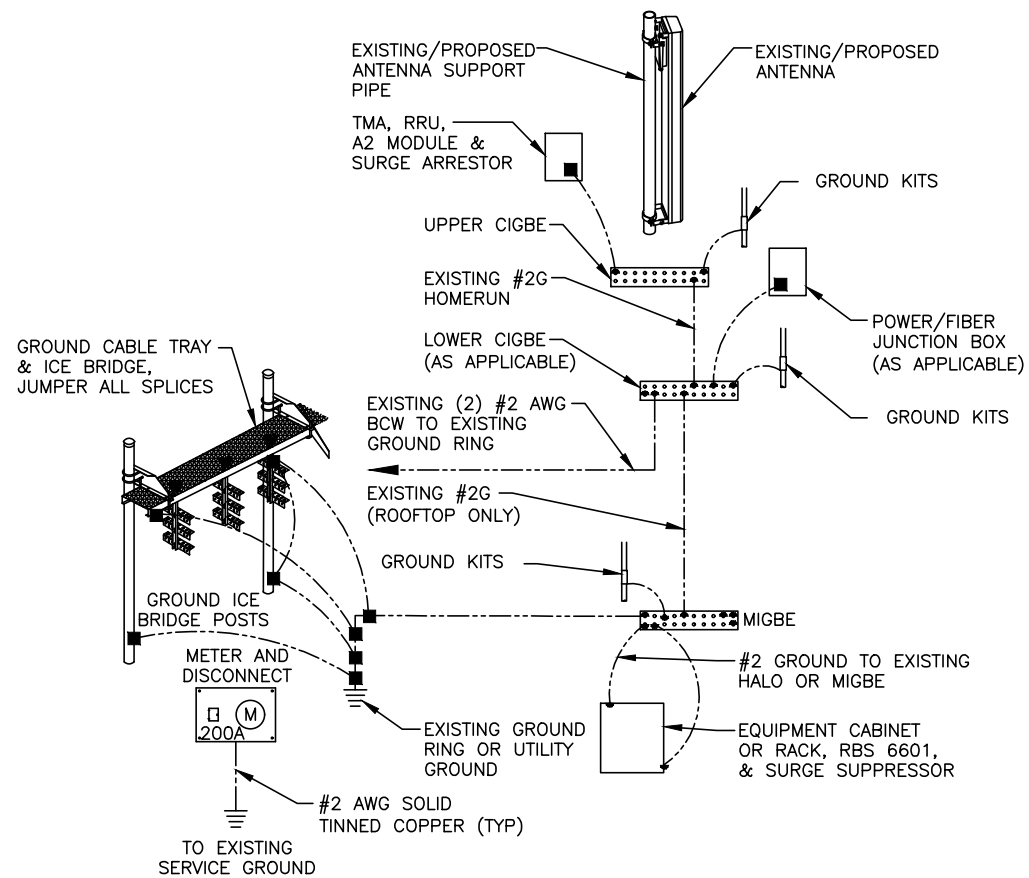


AT&T
STRUCTURAL DETAILS
4TXRX, LTE 7C, ANTENNA MODS, LTE
6C, 5G NR 2022 UPGRADE

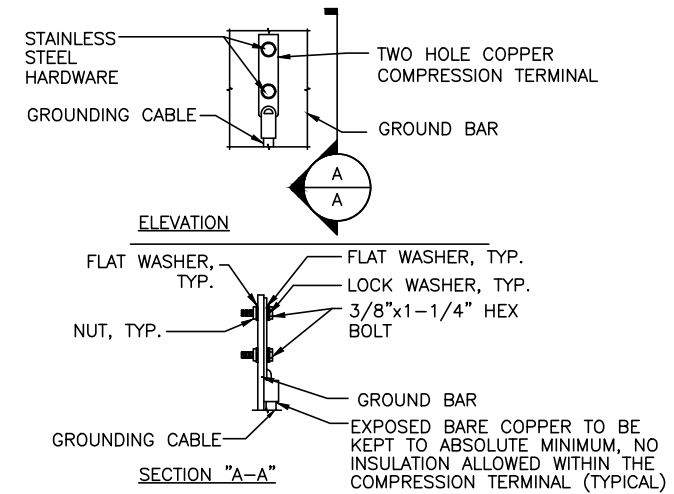
| | | |
|-------------|----------------|-----|
| SITE NUMBER | DRAWING NUMBER | REV |
| CTL02086 | S-1 | 3 |



GROUND WIRE TO GROUND BAR CONNECTION DETAIL 1
SCALE: N.T.S. G-1



GROUNDING RISER DIAGRAM 2
SCALE: N.T.S. G-1



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

TYPICAL GROUND BAR CONNECTION DETAIL 3
SCALE: N.T.S. G-1

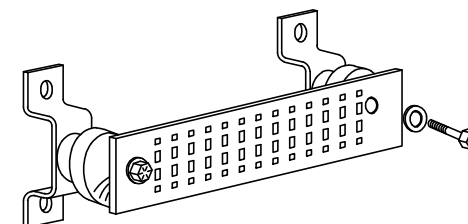
EACH GROUND CONDUCTOR TERMINATING ON ANY GROUND BAR SHALL HAVE AN IDENTIFICATION TAG ATTACHED AT EACH END THAT WILL IDENTIFY ITS ORIGIN AND DESTINATION.

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.

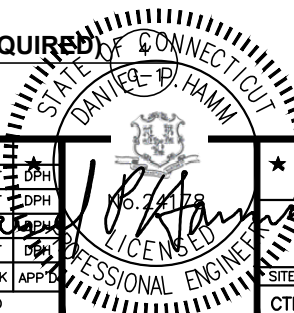
SECTION "A" - SURGE ABSORBERS

- 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)



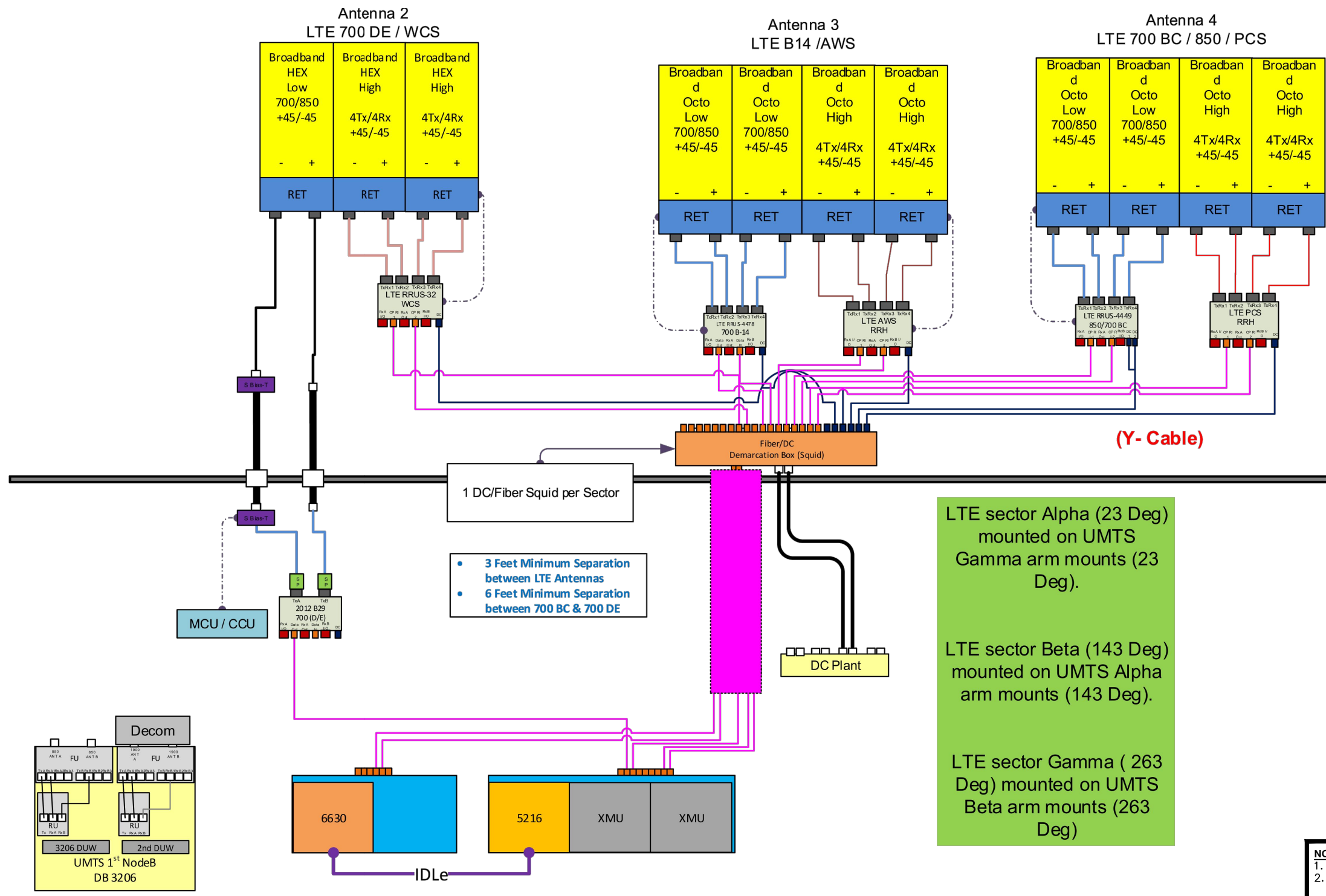
GROUND BAR - DETAIL (AS REQUIRED)
SCALE: N.T.S.

| 3 | 06/27/22 | ISSUED FOR CONSTRUCTION | MT | MT | OPH |
|-----------------|----------|-------------------------|--------------|-----|-------|
| 2 | 04/08/22 | ISSUED FOR CONSTRUCTION | MT | MT | OPH |
| 1 | 02/14/22 | ISSUED FOR CONSTRUCTION | SC | MT | OPH |
| 0 | 01/20/22 | ISSUED FOR REVIEW | GD | MT | OPH |
| NO. | DATE | REVISIONS | BY | CHK | APP'D |
| SCALE: AS SHOWN | | DESIGNED BY: AT | DRAWN BY: GD | | |



| | |
|---|----------------|
| AT&T | |
| GROUNDING DETAILS | |
| 4TXRX, LTE 7C, ANTENNA MODS, LTE 6C, 5G NR 2022 UPGRADE | |
| SITE NUMBER | DRAWING NUMBER |
| CTL02086 | G-1 |
| | 3 |

FINAL APPROVED V4 RFDS 03/24/22



RF PLUMBING DIAGRAM
SCALE: N.T.S.

NOTE:
1. CONTRACTOR TO CONFIRM ALL PARTS.
2. INSTALL ALL EQUIPMENT TO MANUFACTURER'S RECOMMENDATIONS

NOTE:
REFER TO FINAL APPROVED V4 RFDS 03/24/22

| | | | | | |
|-----------------|----------|-------------------------|--------------|-----|-------|
| 3 | 06/27/22 | ISSUED FOR CONSTRUCTION | MB | MT | DPH |
| 2 | 04/08/22 | ISSUED FOR CONSTRUCTION | MB | MT | DPH |
| 1 | 02/14/22 | ISSUED FOR CONSTRUCTION | SG | MT | DPH |
| 0 | 01/20/22 | ISSUED FOR REVIEW | GD | MT | DPH |
| NO. | DATE | REVISIONS | BY | CHK | APP'D |
| SCALE: AS SHOWN | | DESIGNED BY: AT | DRAWN BY: GD | | |



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

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

Sincerely,

David Barbagallo

CC w/enclosures:

First Selectman, Jeff Manville
Planning Director Taianna Kern
Tower Owner Phoenix Tower International



PHOENIX TOWER
INTERNATIONAL

Phoenix Tower International
999 Yamato Road Suite 100
Boca Raton, FL 33431



GPD Engineering and Architecture
Professional Corporation

Chad Burton
520 South Main Street, Suite 2531
Akron, OH 44311
(614) 859-1623
cburton@gpdgroup.com

GPD# 2022791.CT1002.17
August 24, 2022

COMPREHENSIVE STRUCTURAL ANALYSIS REPORT

SITE DESIGNATION: PTI Site #: **US-CT-1002**
PTI Site Name: **Kettletown**
AT&T Site #: **CTL02086**

ANALYSIS CRITERIA: Codes: **TIA-222-H**
120 mph (3-second gust) w/ 0" ice
50 mph (3-second gust) w/ 1" ice

SITE DATA: **231 Kettleton Road, Southbury, CT 06488, New Haven County**
Latitude 41° 28' 16.26" N, Longitude 73° 12' 19.99" W
196' Modified PiROD Monopole

To whom it may concern,

GPD is pleased to submit this Comprehensive Structural Analysis Report to determine the structural integrity of the aforementioned tower. The purpose of the analysis is to determine the suitability of the tower with the existing and proposed loading configuration detailed in the analysis report.

Analysis Results

| | | |
|---|-------|------|
| Tower Stress Level with Proposed Equipment: | 87.9% | Pass |
| Foundation Ratio with Proposed Equipment: | 64.4% | Pass |

We at GPD appreciate the opportunity of providing our continuing professional services to you and Phoenix Tower International. If you have any questions or need further assistance on this or any other projects, please do not hesitate to call.

Respectfully submitted,

Christopher J. Scheks, P.E.
Connecticut #: 0030026

8/24/2022

SUMMARY & RESULTS

The purpose of this analysis was to verify whether the existing structure is capable of carrying the proposed loading configuration as specified by AT&T and commissioned by Phoenix Tower International.

This analysis has been performed in accordance with the TIA-222-H Standard based upon a 3-second gust wind speed of 120 mph. Applicable Standard references and design criteria are listed in Appendices A & B.

The proposed feedlines shall be installed as shown in Appendices A & B for the analysis results to be valid.

TOWER SUMMARY AND RESULTS

| Member | Capacity | Results |
|-------------------|----------|---------|
| Monopole | 73.5% | Pass |
| Flange Bolts | 67.1% | Pass |
| Flange Plates | 73.5% | Pass |
| Bridge Stiffeners | 87.9% | Pass |
| Anchor Rods | 72.1% | Pass |
| Base Plate | 87.5% | Pass |
| Foundation | 64.4% | Pass |

RECOMMENDATIONS

The tower and its foundation have sufficient capacity to carry the proposed loading configuration. No modifications are required at this time.

ANALYSIS METHOD

tnxTower (Version 8.1.1.0), a commercially available software program, was used to create a three-dimensional model of the tower and calculate primary member stresses for various load cases. Selected output from the analysis is included in the report appendices. The following table details the information provided to complete this structural analysis. This analysis is based solely on this information.

DOCUMENTS PROVIDED

| Document | Remarks | Source |
|------------------------------|--|--------|
| Collocation Application | PTI AT&T Collocation Application, dated 7/1/2022 | PTI |
| Tower Design | PiROD #: A-115080, dated 3/26/1999 | PTI |
| Foundation Design | PiROD #: A-115080, dated 3/26/1999 | PTI |
| Geotechnical Report | Dr. Clarence Welti, dated 10/7/1998 | PTI |
| Previous Tower Analysis | GPD# 2022791.CT1002.16 , dated 5/17/2022 | PTI |
| Tower Modification Design | GPD #: 2010293.91, dated 9/4/2010 | PTI |
| Tower Modification Design | GPD #: 2013792.15 Rev. A, dated 3/11/2014 | PTI |
| Post Modification Inspection | GPD #: 2010299.50, dated 1/12/2011 | PTI |
| Post Modification Inspection | GPD #: 2014506.06, dated 6/3/2014 | PTI |

ASSUMPTIONS

This structural analysis is based on the theoretical capacity of the members and is not a condition assessment of the tower. This analysis is from information supplied, and therefore, its results are based on and are as accurate as that supplied data. GPD has made no independent determination, nor is it required to, of its accuracy. The following assumptions were made for this structural analysis.

1. The tower member sizes and shapes are considered accurate as supplied. The material grade is as per data supplied and/or as assumed and as stated in the materials section.
2. The appurtenance configuration is as supplied, determined from available photos, and/or as modeled in the analysis. It is assumed to be complete and accurate. All antennas, mounts, coax and waveguides are assumed to be properly installed and supported as per manufacturer requirements.
3. All mounts, if applicable, are considered adequate to support the loading. No actual analysis of the mount(s) is performed. This analysis is limited to analyzing the tower only.
4. The soil parameters are as per data supplied or as assumed and stated in the calculations.
5. Foundations are properly designed and constructed to resist the original design loads indicated in the documents provided.
6. The tower and structures have been properly maintained in accordance with TIA Standards and/or with manufacturer's specifications.
7. All welds and connections are assumed to develop at least the member capacity unless determined otherwise and explicitly stated in this report.
8. All prior structural modifications, if applicable, are assumed to be as per data supplied/available and to have been properly installed.
9. Loading interpreted from photos is accurate to $\pm 5'$ AGL, antenna size accurate to ± 3.3 sf, and coax equal to the number of existing antennas without reserve.
10. All existing and proposed loading has been taken from the available site photos as well as documents supplied to GPD at the time of generating this report. All such documents are listed in the Documents Provided Table and are assumed to be accurate. GPD is not responsible for loading scenarios outside those conveyed in the supplied documentation.

If any of these assumptions are not valid or have been made in error, this analysis may be affected, and GPD should be allowed to review any new information to determine its effect on the structural integrity of the tower.

DISCLAIMER OF WARRANTIES

GPD has not performed a site visit to the tower to verify the member sizes or antenna/coax loading. If the existing conditions are not as represented on the tower elevation contained in this report, we should be contacted immediately to evaluate the significance of the discrepancy. This is not a condition assessment of the tower or foundation. This report does not replace a full tower inspection. The tower and foundations are assumed to have been properly fabricated, erected, maintained, in good condition, twist free, and plumb.

The engineering services rendered by GPD in connection with this Comprehensive Structural Analysis are limited to a computer analysis of the tower structure and theoretical capacity of its main structural members. No allowance was made for any damaged, bent, missing, loose, or rusted members (above and below ground). No allowance was made for loose bolts or cracked welds.

This analysis is limited to the designated maximum wind and seismic conditions per the governing tower standards and code. Wind forces resulting in tower vibrations near the structure's resonant frequencies were not considered in this analysis and are outside the scope of this analysis. Lateral loading from any dynamic response was not evaluated under a time-domain based fatigue analysis.

GPD does not analyze the fabrication of the structure (including welding). It is not possible to have all the very detailed information needed to perform a thorough analysis of every structural sub-component and connection of an existing tower. GPD provides a limited scope of service in that we cannot verify the adequacy of every weld, plate connection detail, etc. The purpose of this report is to assess the capability of adding appurtenances usually accompanied by transmission lines to the structure.

It is the owner's responsibility to determine the amount of ice accumulation in excess of the code specified amount, if any, that should be considered in the structural analysis.

The attached sketches are a schematic representation of the analyzed tower. If any material is fabricated from these sketches, the contractor shall be responsible for field verifying the existing conditions, proper fit, and clearance in the field. Any mentions of structural modifications are reasonable estimates and should not be used as a precise construction document. Precise modification drawings are obtainable from GPD but are beyond the scope of this report.

Miscellaneous items such as antenna mounts, etc., have not been designed or detailed as a part of our work. We recommend that material of adequate size and strength be purchased from a reputable tower manufacturer.

Towers are designed to carry gravity, wind, and ice loads. All members, legs, diagonals, struts, and redundant members provide structural stability to the tower with little redundancy. Absence or removal of a member can trigger catastrophic failure unless a substitute is provided before any removal. Legs carry axial loads and derive their strength from shorter unbraced lengths by the presence of redundant members and their connection to the diagonals with bolts or welds. If the bolts or welds are removed without providing any substitute to the frame, the leg is subjected to a higher unbraced length that immediately reduces its load carrying capacity. If a diagonal is also removed in addition to the connection, the unbraced length of the leg is greatly increased, jeopardizing its load carrying capacity. Failure of one leg can result in a tower collapse because there is no redundancy. Redundant members and diagonals are critical to the stability of the tower.

GPD makes no warranties, expressed and/or implied, in connection with this report and disclaims any liability arising from material, fabrication, and erection of this tower. GPD will not be responsible whatsoever for, or on account of, consequential or incidental damages sustained by any person, firm, or organization as a result of any data or conclusions contained in this report. The maximum liability of GPD pursuant to this report will be limited to the total fee received for preparation of this report.

APPENDIX A

Tower Analysis Summary Form and
Detailed Future Loading Information

Tower Analysis Summary Form

The information contained in this summary report is not to be used independently from the PE stamped tower analysis.

| General Info | |
|-----------------------------|------------|
| Site Name | Kettletown |
| Site Number | US-CT-1002 |
| Date of Analysis | 8/24/2022 |
| Company Performing Analysis | GPD |

| Tower Info | Description | Date |
|---------------------------------|--------------------------|-----------|
| Tower Type (G, SST, MP) | MP | |
| Tower Height (top of steel AGL) | 196' | |
| Tower Manufacturer | n/a | |
| Tower Model | n/a | |
| Tower Design | PIROD #: A-115080 | 3/26/1999 |
| Foundation Design | PIROD #: A-115080 | 3/26/1999 |
| Geotechnical Report | Dr. Clarence Welti | 10/7/1998 |
| Previous Tower Analysis | GPD # 2022791.CT1002.16 | 5/17/2022 |
| Tower Mapping | n/a | |
| Post Modification Inspection | GPD #: 2010299.50 | 1/12/2011 |
| Post Modification Inspection | GPD #: 2014506.06 | 6/3/2014 |
| Modification Design | GPD #: 2010293.91 | 9/4/2010 |
| Modification Design | GPD #: 2013792.15 Rev. A | 3/11/2014 |

| Design Parameters | |
|-----------------------------------|---------------------|
| Design Code Used | TIA-222-H |
| Location of Tower (County, State) | New Haven, CT |
| Wind Speed (mph) | 120 (3-second gust) |
| Ice Thickness (in) | 1 |
| Risk Category (I, II, III) | II |
| Exposure Category (B, C, D) | B |
| Topographic Category (1 to 5) | 1 |

| Analysis Results (% Maximum Usage) | |
|--|-------|
| Existing/Reserved + Future + Proposed Condition | |
| Tower (%) | 87.9% |
| Tower Base (%) | 87.5% |
| Foundation (%) | 64.4% |
| Foundation Adequate? | Yes |

See Next Page for Detailed Future Loading Information

Existing / Reserved Loading

| Antenna Owner | Mount Height (ft) | Antenna CL (ft) | Quantity | Antenna | | | | Azimuth | Quantity | Mount | | Transmission Line | | | |
|------------------|-------------------|-----------------|----------|----------|----------------|-------------------------------|-------------|---------|-----------|---------------------------|-------|-------------------|--------------------|----------|--|
| | | | | Type | Manufacturer | Model | Type | | | Quantity | Model | Size | Attachment Int/Ext | | |
| T-Mobile | 195 | 193 | 3 | Panel | RFS | APXVAARR24 | 50/150/260 | 1 | Unknown | LP Platform | 8 | Unknown | 1-5/8" | Internal | |
| T-Mobile | 195 | 195 | 3 | Panel | RFS | APX16DWV | 50/150/260 | 3 | Commscope | HRK12 | 4 | Fiber | 1-1/4" | Internal | |
| T-Mobile | 195 | 193 | 3 | Panel | Ericsson | AIR6449 | | | | On The Same Mount | | | | | |
| T-Mobile | 195 | 193 | 3 | RRH | Ericsson | 4449 B71+B12 | | | | On The Same Mount | | | | | |
| T-Mobile | 195 | 193 | 3 | RRH | Ericsson | 4415 B66A | | | | On The Same Mount | | | | | |
| T-Mobile | 195 | 195 | 3 | RRH | Ericsson | 4424 B25 | | | | On The Same Mount | | | | | |
| T-Mobile | 195 | 195 | 1 | Surge | Raycap | DC4-48-60-8-20F | | | | On The Same Mount | | | | | |
| AT&T Mobility | 185 | 185 | 3* | Panel | Powerwave | 7770 | 23/143/263 | 1 | Unknown | LP Platform | 12 | Unknown | 1-1/4" | Internal | |
| AT&T Mobility | 185 | 185 | 3 | Panel | CCI | HPA-65R-BUU-H8 | 23/143/263 | 1 | SitePro 1 | PRK-1245L Kicker Supports | 4 | DC Power | 6AWG | Internal | |
| AT&T Mobility | 185 | 185 | 2* | Panel | Quintel | QS66512-2 | 23/143 | | | On The Same Mount | | | | | |
| AT&T Mobility | 185 | 185 | 1* | Panel | CCI | TPA-65R-LCUUUU-H8 | 263 | | | On The Same Mount | | | | | |
| AT&T Mobility | 185 | 185 | 3* | TMA | Powerwave | TT19-48BP111-001 | | | | On The Same Mount | | | | | |
| AT&T Mobility | 185 | 185 | 6* | Diplexer | Powerwave | LGP 21901 | | | | On The Same Mount | | | | | |
| AT&T Mobility | 185 | 185 | 6* | Diplexer | Kathrein | 782-10250 | | | | On The Same Mount | | | | | |
| AT&T Mobility | 185 | 185 | 3* | RRH | Ericsson | RRUS 11 B2 | | | | On The Same Mount | | | | | |
| AT&T Mobility | 185 | 185 | 3* | RRH | Ericsson | RRUS 12 B2 | | | | On The Same Mount | | | | | |
| AT&T Mobility | 185 | 185 | 3 | RRH | Ericsson | RRUS 32 B30 | | | | On The Same Mount | | | | | |
| AT&T Mobility | 185 | 185 | 3 | RRH | Ericsson | RRUS 4426 B66 | | | | On The Same Mount | | | | | |
| AT&T Mobility | 185 | 185 | 2 | Surge | Raycap | DC6-48-60-18-8F | | | | On The Same Mount | | | | | |
| Pocket | 175 | 175 | 3 | Panel | RFS | APXV18-206517S-C | 110/230/350 | | | Flush Mounted | 6 | Unknown | 1-5/8" | External | |
| Sprint | 165 | 165 | 3 | Panel | RFS | APXVTM14-ALU-I20 | 340/70/260 | 1 | Unknown | LP Platform | 4 | Hybriflex | 1-1/4" | External | |
| Sprint | 165 | 165 | 3 | Panel | Commscope | NNV-65B-R4 | 340/70/260 | | | On The Same Mount | | | | | |
| Sprint | 165 | 165 | 3 | RRH | Alcatel Lucent | RRH 1900 4x45 65 MHz | | | | On The Same Mount | | | | | |
| Sprint | 165 | 165 | 3 | RRH | Alcatel Lucent | 800 MHz RRH | | | | On The Same Mount | | | | | |
| Sprint | 165 | 165 | 3 | RRH | Alcatel Lucent | TD-RRH8x20-25 w/ Solar Shield | | | | On The Same Mount | | | | | |
| Sprint | 165 | 165 | 3 | RRH | Alcatel Lucent | RRH2x50-08 (800 MHz) | | | | On The Same Mount | | | | | |
| Verizon Wireless | 155 | 155 | 3 | Panel | Commscope | NNH4-65B-R6 | 0/120/240 | 1 | Unknown | Modified LP Platform | 10 | Unknown | 1-5/8" | External | |
| Verizon Wireless | 155 | 155 | 3 | Panel | Samsung | MT6407-77A | 0/120/240 | | | On The Same Mount | | | | | |
| Verizon Wireless | 155 | 155 | 3 | Panel | Samsung | XXDMMM | 0/120/240 | | | On The Same Mount | | | | | |
| Verizon Wireless | 155 | 155 | 3 | RRU | Samsung | RF4439d-25A | | | | On The Same Mount | | | | | |
| Verizon Wireless | 155 | 155 | 3 | RRU | Samsung | RF4440d-13A | | | | On The Same Mount | | | | | |
| Verizon Wireless | 155 | 155 | 1 | Surge | Raycap | RV2DC-6627-PF-48 | | | | On The Same Mount | | | | | |
| DISH | 140 | 140 | 3 | Panel | JMA | MX08FRO665-20 V0F | 0/120/240 | 1 | SitePro 1 | SNP8HR-396 | 1 | Unknown | 1.60" | Int/Ext | |
| DISH | 140 | 140 | 3 | RRH | Fujitsu | TA08025-B805 | | | | on the same mounts | | | | | |
| DISH | 140 | 140 | 3 | RRH | Fujitsu | TA08025-B804 | | | | on the same mounts | | | | | |
| DISH | 140 | 140 | 1 | Box | Unknown | Junction Box | | | | on the same mounts | | | | | |
| Sprint | 75 | 75 | 1 | GPS | Pctel | TMG-HR-26N GPS | | | | Pipe Mounted | 1 | Unknown | 7/8" | External | |

*Indicates existing loading to be removed

Proposed Loading

| Antenna Owner | Mount Height (ft) | Antenna CL (ft) | Quantity | Antenna | | | | Azimuth | Quantity | Mount | | Transmission Line | | | |
|---------------|-------------------|-----------------|----------|---------|--------------|-----------------|------------|---------|----------|-----------------------|-------|-------------------|--------------------|----------|--|
| | | | | Type | Manufacturer | Model | Type | | | Quantity | Model | Size | Attachment Int/Ext | | |
| AT&T Mobility | 185 | 185 | 3 | Panel | CCI | OPA65R-BU6DA | 23/143/263 | | | on the existing mount | 2 | DC Power | 6AWG | Internal | |
| AT&T Mobility | 185 | 185 | 3 | Panel | CCI | DMP65R-BUSDA | 23/143/263 | | | on the existing mount | 1 | Fiber Cable | 16-PAIR | Internal | |
| AT&T Mobility | 185 | 185 | 3 | RRU | Ericsson | 4449 B5/B12 | | | | on the existing mount | | | | | |
| AT&T Mobility | 185 | 185 | 3 | RRU | Ericsson | 4415 B25 | | | | on the existing mount | | | | | |
| AT&T Mobility | 185 | 185 | 3 | RRU | Ericsson | 4478 B14 | | | | on the existing mount | | | | | |
| AT&T Mobility | 185 | 185 | 1 | Surge | Raycap | DC6-48-60-18-8F | | | | on the existing mount | | | | | |

Note: The proposed loading is in addition to the existing/reserved loading shown above.

Detailed Future Loading Information

Note: Nominal equipment dimensions (Height x Width) have been utilized for the purposes of the below area calculations.

| T-Mobile MLA Information | |
|--|---------------|
| Existing Area (in ²) | 20,898 |
| Proposed Area (in ²) | 0 |
| Final Area (in ²) | 20,898 |
| Future Area (in ²) | 1,102 |
| Total Wind Area (in²) | 22,000 |
| Does T-Mobile's Loading Exceed 22,000 in²? | No |
| If yes, by how much? (in²) | n/a |

| DISH Wireless MLA Information | |
|--|---------------|
| Existing Area (in ²) | 11,233 |
| Proposed Area (in ²) | 0 |
| Final Area (in ²) | 11,233 |
| Future Area (in ²) | 3,767 |
| Total Wind Area (in²) | 15,000 |
| Does DISH's Loading Exceed 15,000 in²? | No |
| If yes, by how much? (in²) | n/a |

| AT&T Area Information | |
|------------------------------------|---------------|
| Existing Area (in ²) | 19,172 |
| Proposed Area (in ²) | 6,347 |
| Final Area (in²) | 25,519 |

| Pocket Area Information | |
|------------------------------------|--------------|
| Existing Area (in ²) | 2,792 |
| Proposed Area (in ²) | 0 |
| Final Area (in²) | 2,792 |

| Sprint Area Information | |
|------------------------------------|---------------|
| Existing Area (in ²) | 13,979 |
| Proposed Area (in ²) | 0 |
| Final Area (in²) | 13,979 |

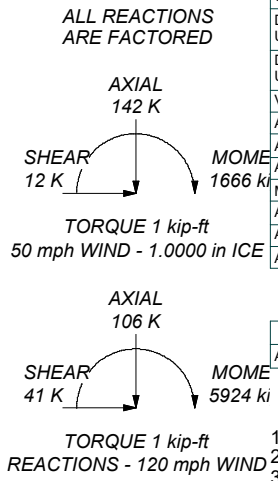
| Verizon Area Information | |
|------------------------------------|---------------|
| Existing Area (in ²) | 15,897 |
| Proposed Area (in ²) | 0 |
| Final Area (in²) | 15,897 |

APPENDIX B

Tower Analysis Output File

DESIGNED APPURTENANCE LOADING

| TYPE | ELEVATION | TYPE | ELEVATION |
|---|-----------|---------------------------------|-----------|
| Pirod 16.5' LP Platform | 195 | NNVV-65B-R4 w/ Mount Pipe | 165 |
| APXVAARR24 w/ Mount Pipe | 195 | NNVV-65B-R4 w/ Mount Pipe | 165 |
| APXVAARR24 w/ Mount Pipe | 195 | NNVV-65B-R4 w/ Mount Pipe | 165 |
| APXVAARR24 w/ Mount Pipe | 195 | RRH 1900 4x45 65 MHz | 165 |
| APX16DWV w/ Mount Pipe | 195 | RRH 1900 4x45 65 MHz | 165 |
| APX16DWV w/ Mount Pipe | 195 | RRH 1900 4x45 65 MHz | 165 |
| APX16DWV w/ Mount Pipe | 195 | 800 MHz RRH | 165 |
| AIR6449 w/ Mount Pipe | 195 | 800 MHz RRH | 165 |
| AIR6449 w/ Mount Pipe | 195 | 800 MHz RRH | 165 |
| AIR6449 w/ Mount Pipe | 195 | TD-RRH8x20-25 w/ Solar Shield | 165 |
| RADIO 4449 B12/B71 | 195 | TD-RRH8x20-25 w/ Solar Shield | 165 |
| RADIO 4449 B12/B71 | 195 | TD-RRH8x20-25 w/ Solar Shield | 165 |
| RADIO 4449 B12/B71 | 195 | RRH2X50-08 (800 MHz) | 165 |
| RADIO 4415 B66A | 195 | RRH2X50-08 (800 MHz) | 165 |
| RADIO 4415 B66A | 195 | RRH2X50-08 (800 MHz) | 165 |
| RADIO 4415 B66A | 195 | Platform Mount (LP 404-1_KCKR) | 155 |
| 4424 B25 | 195 | Additional Mod Components | 155 |
| 4424 B25 | 195 | NNH4-65B-R6 w/ Mount Pipe | 155 |
| 4424 B25 | 195 | NNH4-65B-R6 w/ Mount Pipe | 155 |
| DC4-48-60-8-20F | 195 | NNH4-65B-R6 w/ Mount Pipe | 155 |
| T-Mobile Reserved | 195 | MT6407-77A w/ Mount Pipe | 155 |
| T-Mobile Reserved | 195 | MT6407-77A w/ Mount Pipe | 155 |
| T-Mobile Reserved | 195 | MT6407-77A w/ Mount Pipe | 155 |
| (3) Commscope VSR-MA-B w/ 15.5' Horizontal Pipe | 193 | XXDWMM w/ Mount Pipe | 155 |
| PIROD 13' Low Profile Platform (Monopole) | 185 | XXDWMM w/ Mount Pipe | 155 |
| HPA-65R-BUU-H8 w/ Mount Pipe | 185 | XXDWMM w/ Mount Pipe | 155 |
| HPA-65R-BUU-H8 w/ Mount Pipe | 185 | RF4439D-25A | 155 |
| HPA-65R-BUU-H8 w/ Mount Pipe | 185 | RF4439D-25A | 155 |
| HPA-65R-BUU-H8 w/ Mount Pipe | 185 | RF4439D-25A | 155 |
| OPA65R-BU6DA w/ Mount Pipe | 185 | RF4440D-13A | 155 |
| OPA65R-BU6DA w/ Mount Pipe | 185 | RF4440D-13A | 155 |
| OPA65R-BU6DA w/ Mount Pipe | 185 | RF4440D-13A | 155 |
| DMP65R-BU8DA w/ Mount Pipe | 185 | RVZDC-6627-PF-48 | 155 |
| DMP65R-BU8DA w/ Mount Pipe | 185 | (2) Pipe 2 Std x 6" | 155 |
| DMP65R-BU8DA w/ Mount Pipe | 185 | (2) Pipe 2 Std x 6" | 155 |
| 4449 B5/B12 | 185 | (2) Pipe 2 Std x 6" | 155 |
| 4449 B5/B12 | 185 | SNP8HR-396 | 140 |
| 4449 B5/B12 | 185 | MX08FRO665-20_V0F w/ Mount Pipe | 140 |
| 4415 B25 | 185 | MX08FRO665-20_V0F w/ Mount Pipe | 140 |
| 4415 B25 | 185 | MX08FRO665-20_V0F w/ Mount Pipe | 140 |
| 4415 B25 | 185 | TA8025-B605 | 140 |
| 4478 B14 | 185 | TA8025-B605 | 140 |
| 4478 B14 | 185 | TA8025-B605 | 140 |
| 4478 B14 | 185 | TA8025-B604 | 140 |
| RRUS 32 B30 | 185 | TA8025-B604 | 140 |
| RRUS 32 B30 | 185 | TA8025-B604 | 140 |
| RRUS 32 B30 | 185 | Junction Box | 140 |
| RRUS 4426 B66 | 185 | DISH Reserved | 140 |
| RRUS 4426 B66 | 185 | DISH Reserved | 140 |
| RRUS 4426 B66 | 185 | DISH Reserved | 140 |
| DC6-48-60-18-8F Surge Suppression Unit | 185 | (2) Pipe 2 Std x 8" | 140 |
| DC6-48-60-18-8F Surge Suppression Unit | 185 | (2) Pipe 2 Std x 8" | 140 |
| DC6-48-60-18-8F Surge Suppression Unit | 185 | (2) Pipe 2 Std x 8" | 140 |
| Valmont Light Duty Tri-Bracket (1) | 175 | Bridge Stiffener (3.25 sq ft) | 120 |
| APXV18-206517S-C w/ Mount Pipe | 175 | Bridge Stiffener (3.25 sq ft) | 120 |
| APXV18-206517S-C w/ Mount Pipe | 175 | Bridge Stiffener (3.25 sq ft) | 120 |
| APXV18-206517S-C w/ Mount Pipe | 175 | Bridge Stiffener (3.25 sq ft) | 100 |
| MTS 12.5' LP Platform | 165 | Bridge Stiffener (3.25 sq ft) | 80 |
| APXVTM14-ALU-I20 w/ Mount Pipe | 165 | Bridge Stiffener (3.25 sq ft) | 80 |
| APXVTM14-ALU-I20 w/ Mount Pipe | 165 | GPS-TMG-HR-26N | 75 |
| APXVTM14-ALU-I20 w/ Mount Pipe | 165 | Pipe Mount 3'x4.5" | 75 |




MATERIAL STRENGTH

| GRADE | Fy | Fu | GRADE | Fy | Fu |
|----------|--------|--------|-------|----|----|
| A53-B-42 | 42 ksi | 63 ksi | | | |

TOWER DESIGN NOTES

1. Tower designed for Exposure B to the TIA-222-H Standard.
2. Tower designed for a 120 mph basic wind in accordance with the TIA-222-H Standard.
3. Tower is also designed for a 50 mph basic wind with 1.00 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

| Section | Size | Length (ft) | Grade | Weight (K) |
|---------|------|-------------|-------|------------|
| 1 | | | | 0.1 |
| 2 | | | | 0.5 |
| 3 | | | | 0.5 |
| 4 | | | | 0.5 |
| 5 | | | | 0.5 |
| 6 | | | | 0.6 |
| 7 | | | | 0.6 |
| 8 | | | | 0.6 |
| 9 | | | | 0.7 |
| 10 | | | | 0.7 |
| 11 | | | | 0.7 |
| 12 | | | | 0.7 |
| 13 | | | | 0.6 |
| 14 | | | | 1.30 |
| 15 | | | | 1.3 |
| 16 | | | | 1.3 |
| 17 | | | | 1.3 |
| 18 | | | | 1.3 |
| 19 | | | | 1.5 |
| 20 | | | | 1.5 |
| 21 | | | | 1.5 |
| 22 | | | | 1.5 |
| 23 | | | | 1.5 |
| 24 | | | | 1.6 |
| 25 | | | | 1.6 |
| 26 | | | | 1.6 |
| 27 | | | | 1.6 |
| 28 | | | | 1.7 |
| 29 | | | | 1.7 |
| 30 | | | | 1.7 |
| 31 | | | | 1.7 |
| 32 | | | | 2.1 |
| 33 | | | | 2.1 |
| 34 | | | | 2.1 |
| 35 | | | | 2.1 |
| 36 | | | | 2.5 |
| 37 | | | | 2.5 |
| 38 | | | | 2.5 |
| 39 | | | | 2.5 |
| 40 | | | | 2.5 |
| 41 | | | | 2.5 |
| 42 | | | | 2.5 |
| 58.7 | | | | 58.7 |



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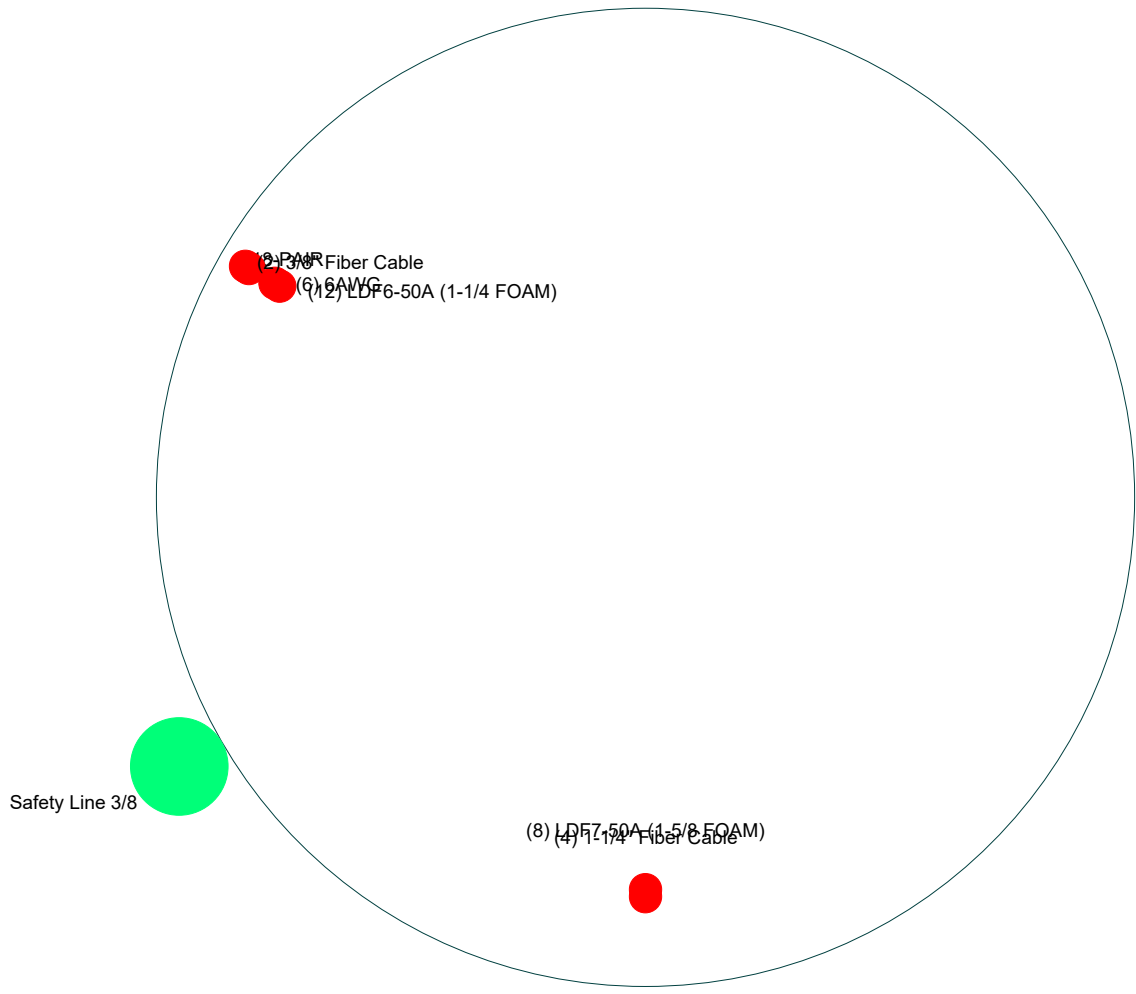
Job: **US-CT-1002**


Project: **2022791.CT1002.17**

| | | |
|-----------------|-------------------|-------------|
| Client: PTI | Drawn by: NMiller | App'd: |
| Code: TIA-222-H | Date: 08/23/22 | Scale: NTS |
| Path: | | Dwg No. E-1 |

Feed Line Plan

— Round
 — Flat
 — App In Face
 — App Out Face

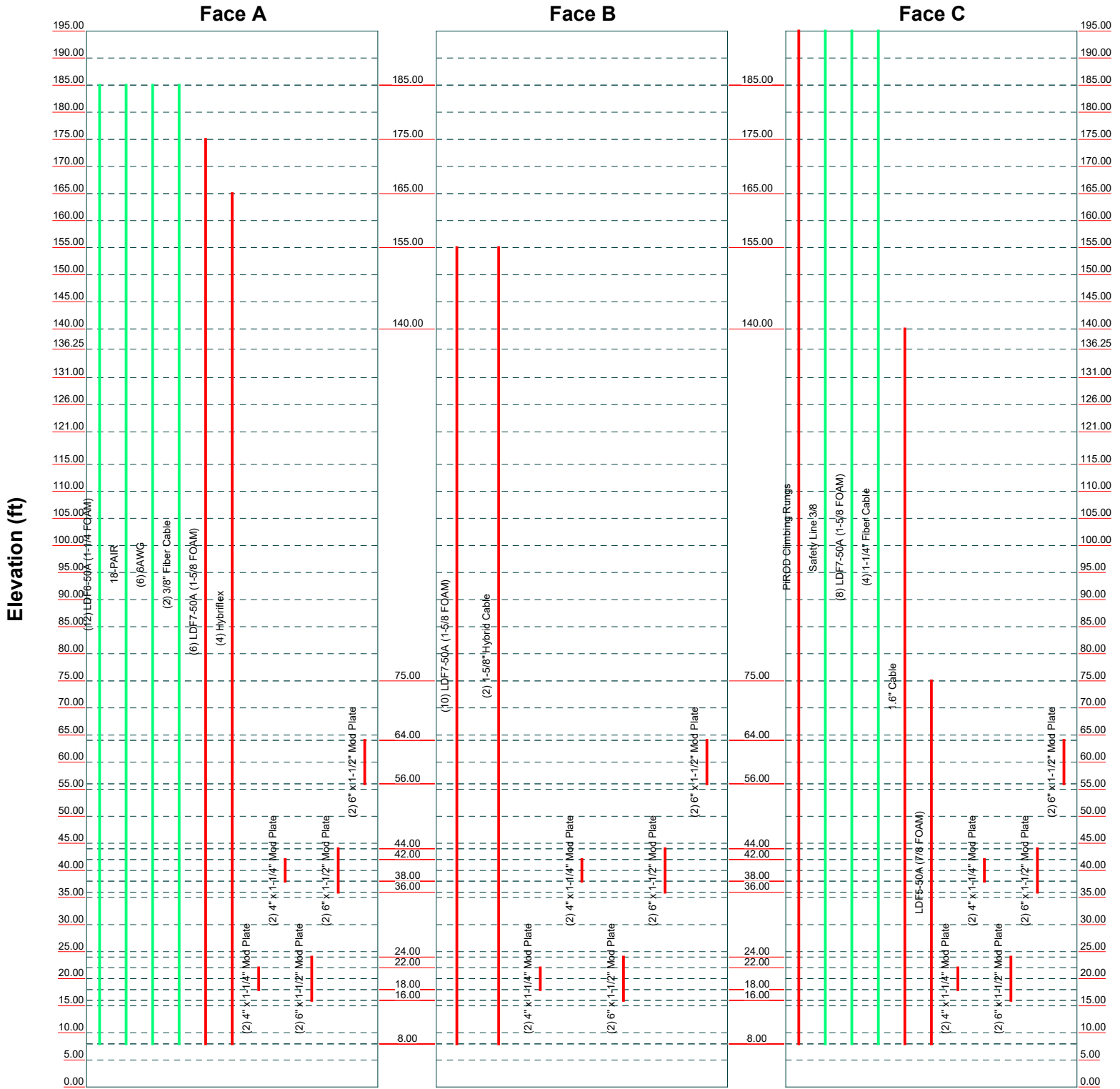



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| | | |
|-----------------------------------|-------------------|-------------|
| Job: US-CT-1002 | | |
| Project: 2022791.CT1002.17 | | |
| Client: PTI | Drawn by: NMiller | App'd: |
| Code: TIA-222-H | Date: 08/23/22 | Scale: NTS |
| Path: | | Dwg No. E-7 |

Feed Line Distribution Chart 0' - 195'

— Round
 — Flat
 — App In Face
 — App Out Face
 — Truss Leg



| | | | |
|--|-----------------------------------|-------------------|-------------|
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| | Project: 2022791.CT1002.17 | | |
| | Client: PTI | Drawn by: NMILLER | App'd: |
| | Code: TIA-222-H | Date: 08/23/22 | Scale: NTS |
| | Path: | | Dwg No. E-7 |

| | | | | |
|--|----------------|-------------------|--------------------|-------------------|
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| | Client | PTI | Designed by | NMiller |

Tower Input Data

The tower is a monopole.

This tower is designed using the TIA-222-H standard.

The following design criteria apply:

- Tower base elevation above sea level: 408.00 ft.
- Basic wind speed of 120 mph.
- Risk Category II.
- Exposure Category B.
- Simplified Topographic Factor Procedure for wind speed-up calculations is used.
- Topographic Category: 1.
- Crest Height: 0.00 ft.
- Nominal ice thickness of 1.0000 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.
- A non-linear (P-delta) analysis was used.
- Pressures are calculated at each section.
- Stress ratio used in pole design is 1.05.
- Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

- | | | |
|--|---|---|
| <ul style="list-style-type: none"> Consider Moments - Legs Consider Moments - Horizontals Consider Moments - Diagonals Use Moment Magnification Use Code Stress Ratios √ Use Code Safety Factors - Guys Escalate Ice Always Use Max Kz Use Special Wind Profile Include Bolts In Member Capacity Leg Bolts Are At Top Of Section Secondary Horizontal Braces Leg Use Diamond Inner Bracing (4 Sided) SR Members Have Cut Ends SR Members Are Concentric | <ul style="list-style-type: none"> Distribute Leg Loads As Uniform Assume Legs Pinned √ Assume Rigid Index Plate √ Use Clear Spans For Wind Area √ Use Clear Spans For KL/r Retention Guys To Initial Tension √ Bypass Mast Stability Checks √ Use Azimuth Dish Coefficients √ Project Wind Area of Appurt. Autocalc Torque Arm Areas Add IBC .6D+W Combination √ Sort Capacity Reports By Component Triangulate Diamond Inner Bracing Treat Feed Line Bundles As Cylinder Ignore KL/ry For 60 Deg. Angle Legs | <ul style="list-style-type: none"> Use ASCE 10 X-Brace Ly Rules Calculate Redundant Bracing Forces Ignore Redundant Members in FEA SR Leg Bolts Resist Compression All Leg Panels Have Same Allowable Offset Girt At Foundation √ Consider Feed Line Torque Include Angle Block Shear Check Use TIA-222-H Bracing Resist. Exemption Use TIA-222-H Tension Splice Exemption <li style="text-align: center;">Poles Include Shear-Torsion Interaction Always Use Sub-Critical Flow Use Top Mounted Sockets Pole Without Linear Attachments Pole With Shroud Or No Appurtenances Outside and Inside Corner Radii Are Known |
|--|---|---|

Pole Section Geometry

| Section | Elevation | Section Length | Pole Size | Pole Grade | Socket Length |
|---------|---------------|----------------|-----------|------------|---------------|
| | ft | ft | | | ft |
| L1 | 196.00-195.00 | 1.00 | P18x0.375 | A53-B-42 | |

| | | | | |
|--|----------------|-------------------|--------------------|-------------------|
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| Section | Elevation ft | Section Length ft | Pole Size | Pole Grade | Socket Length ft |
|---------|-----------------|-------------------------|--------------|----------------------|---------------------|
| L2 | 195.00-190.00 | 5.00 | P24x0.375 | (42 ksi) A53-B-42 | |
| L3 | 190.00-185.00 | 5.00 | P24x0.375 | (42 ksi) A53-B-42 | |
| L4 | 185.00-180.00 | 5.00 | P24x0.375 | (42 ksi) A53-B-42 | |
| L5 | 180.00-175.00 | 5.00 | P30x0.375 | (42 ksi) A53-B-42 | |
| L6 | 175.00-170.00 | 5.00 | P30x0.375 | (42 ksi) A53-B-42 | |
| L7 | 170.00-165.00 | 5.00 | P30x0.375 | (42 ksi) A53-B-42 | |
| L8 | 165.00-160.00 | 5.00 | P30x0.375 | (42 ksi) A53-B-42 | |
| L9 | 160.00-155.00 | 5.00 | P36x0.375 | (42 ksi) A53-B-42 | |
| L10 | 155.00-150.00 | 5.00 | P36x0.375 | (42 ksi) A53-B-42 | |
| L11 | 150.00-145.00 | 5.00 | P36x0.375 | (42 ksi) A53-B-42 | |
| L12 | 145.00-140.00 | 5.00 | P36x0.375 | (42 ksi) A53-B-42 | |
| L13 | 140.00-136.25 | 3.75 | P42x0.375 | (42 ksi) A53-B-42 | |
| L14 | 136.25-136.00 | 0.25 | P42x0.6375 | (42 ksi) A53-B-42 | |
| L15 | 136.00-131.00 | 5.00 | P42x0.6375 | (42 ksi) A53-B-42 | |
| L16 | 131.00-126.00 | 5.00 | P42x0.6375 | (42 ksi) A53-B-42 | |
| L17 | 126.00-121.00 | 5.00 | P42x0.6375 | (42 ksi) A53-B-42 | |
| L18 | 121.00-120.00 | 1.00 | P42x0.6375 | (42 ksi) A53-B-42 | |
| L19 | 120.00-115.00 | 5.00 | P48x0.6 | (42 ksi) A53-B-42 | |
| L20 | 115.00-110.00 | 5.00 | P48x0.6 | (42 ksi) A53-B-42 | |
| L21 | 110.00-105.00 | 5.00 | P48x0.6 | (42 ksi) A53-B-42 | |
| L22 | 105.00-100.00 | 5.00 | P48x0.6 | (42 ksi) A53-B-42 | |
| L23 | 100.00-95.00 | 5.00 | P54x0.5625 | (42 ksi) A53-B-42 | |
| L24 | 95.00-90.00 | 5.00 | P54x0.5625 | (42 ksi) A53-B-42 | |
| L25 | 90.00-85.00 | 5.00 | P54x0.5625 | (42 ksi) A53-B-42 | |
| L26 | 85.00-80.00 | 5.00 | P54x0.5625 | (42 ksi) A53-B-42 | |
| L27 | 80.00-75.00 | 5.00 | P60x0.55 | (42 ksi) A53-B-42 | |
| L28 | 75.00-70.00 | 5.00 | P60x0.55 | (42 ksi) A53-B-42 | |
| L29 | 70.00-65.00 | 5.00 | P60x0.55 | (42 ksi) A53-B-42 | |
| L30 | 65.00-60.00 | 5.00 | P60x0.55 | (42 ksi) A53-B-42 | |
| L31 | 60.00-55.00 | 5.00 | P60x0.675 | (42 ksi) A53-B-42 | |

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| Section | Elevation ft | Section Length ft | Pole Size | Pole Grade | Socket Length ft |
|---------|-----------------|----------------------|-----------|----------------------|---------------------|
| L32 | 55.00-50.00 | 5.00 | P60x0.675 | A53-B-42 (42 ksi) | |
| L33 | 50.00-45.00 | 5.00 | P60x0.675 | A53-B-42 (42 ksi) | |
| L34 | 45.00-40.00 | 5.00 | P60x0.675 | A53-B-42 (42 ksi) | |
| L35 | 40.00-35.00 | 5.00 | P60x0.8 | A53-B-42 (42 ksi) | |
| L36 | 35.00-30.00 | 5.00 | P60x0.8 | A53-B-42 (42 ksi) | |
| L37 | 30.00-25.00 | 5.00 | P60x0.8 | A53-B-42 (42 ksi) | |
| L38 | 25.00-20.00 | 5.00 | P60x0.8 | A53-B-42 (42 ksi) | |
| L39 | 20.00-15.00 | 5.00 | P60x0.8 | A53-B-42 (42 ksi) | |
| L40 | 15.00-10.00 | 5.00 | P60x0.8 | A53-B-42 (42 ksi) | |
| L41 | 10.00-5.00 | 5.00 | P60x0.8 | A53-B-42 (42 ksi) | |
| L42 | 5.00-0.00 | 5.00 | P60x0.8 | A53-B-42 (42 ksi) | |

| Tower Elevation ft | Gusset Area (per face) ft ² | Gusset Thickness in | Gusset Grade | Adjust. Factor A _f | Adjust. Factor A _r | Weight Mult. | Double Angle Stitch Bolt Spacing Diagonals in | Double Angle Stitch Bolt Spacing Horizontals in | Double Angle Stitch Bolt Spacing Redundants in |
|-----------------------|--|------------------------|--------------|----------------------------------|----------------------------------|--------------|---|---|--|
| L1 196.00-195.00 | | | | 1 | 1 | 1 | | | |
| L2 195.00-190.00 | | | | 1 | 1 | 1 | | | |
| L3 190.00-185.00 | | | | 1 | 1 | 1 | | | |
| L4 185.00-180.00 | | | | 1 | 1 | 1 | | | |
| L5 180.00-175.00 | | | | 1 | 1 | 1 | | | |
| L6 175.00-170.00 | | | | 1 | 1 | 1 | | | |
| L7 170.00-165.00 | | | | 1 | 1 | 1 | | | |
| L8 165.00-160.00 | | | | 1 | 1 | 1 | | | |
| L9 160.00-155.00 | | | | 1 | 1 | 1 | | | |
| L10 155.00-150.00 | | | | 1 | 1 | 1 | | | |
| L11 150.00-145.00 | | | | 1 | 1 | 1 | | | |
| L12 145.00-140.00 | | | | 1 | 1 | 1 | | | |
| L13 140.00-136.25 | | | | 1 | 1 | 1 | | | |
| L14 136.25-136.00 | | | | 1 | 1 | 0.945061 | | | |
| L15 136.00-131.00 | | | | 1 | 1 | 0.945061 | | | |

| | | | | |
|---|----------------|-------------------|--------------------|-------------------|
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| Tower Elevation | Gusset Area (per face) | Gusset Thickness | Gusset Grade | Adjust. Factor A_f | Adjust. Factor A_r | Weight Mult. | Double Angle Stitch Bolt Spacing Diagonals in | Double Angle Stitch Bolt Spacing Horizontals in | Double Angle Stitch Bolt Spacing Redundants in |
|-----------------|---------------------------|------------------|--------------|-------------------------|-------------------------|--------------|---|---|--|
| ft | ft ² | in | | | | | | | |
| L16 | | | | 1 | 1 | 0.945061 | | | |
| 131.00-126.00 | | | | | | | | | |
| L17 | | | | 1 | 1 | 0.945061 | | | |
| 126.00-121.00 | | | | | | | | | |
| L18 | | | | 1 | 1 | 0.945061 | | | |
| 121.00-120.00 | | | | | | | | | |
| L19 | | | | 1 | 1 | 0.955342 | | | |
| 120.00-115.00 | | | | | | | | | |
| L20 | | | | 1 | 1 | 0.955342 | | | |
| 115.00-110.00 | | | | | | | | | |
| L21 | | | | 1 | 1 | 0.955342 | | | |
| 110.00-105.00 | | | | | | | | | |
| L22 | | | | 1 | 1 | 0.955342 | | | |
| 105.00-100.00 | | | | | | | | | |
| L23 | | | | 1 | 1 | 0.978753 | | | |
| 100.00-95.00 | | | | | | | | | |
| L24 | | | | 1 | 1 | 0.978753 | | | |
| 95.00-90.00 | | | | | | | | | |
| L25 | | | | 1 | 1 | 0.978753 | | | |
| 90.00-85.00 | | | | | | | | | |
| L26 | | | | 1 | 1 | 0.978753 | | | |
| 85.00-80.00 | | | | | | | | | |
| L27 | | | | 1 | 1 | 0.968574 | | | |
| 80.00-75.00 | | | | | | | | | |
| L28 | | | | 1 | 1 | 0.968574 | | | |
| 75.00-70.00 | | | | | | | | | |
| L29 | | | | 1 | 1 | 0.968574 | | | |
| 70.00-65.00 | | | | | | | | | |
| L30 | | | | 1 | 1 | 0.968574 | | | |
| 65.00-60.00 | | | | | | | | | |
| L31 | | | | 1 | 1 | 0.975432 | | | |
| 60.00-55.00 | | | | | | | | | |
| L32 | | | | 1 | 1 | 0.975432 | | | |
| 55.00-50.00 | | | | | | | | | |
| L33 | | | | 1 | 1 | 0.975432 | | | |
| 50.00-45.00 | | | | | | | | | |
| L34 | | | | 1 | 1 | 0.975432 | | | |
| 45.00-40.00 | | | | | | | | | |
| L35 | | | | 1 | 1 | 0.980151 | | | |
| 40.00-35.00 | | | | | | | | | |
| L36 | | | | 1 | 1 | 0.980151 | | | |
| 35.00-30.00 | | | | | | | | | |
| L37 | | | | 1 | 1 | 0.980151 | | | |
| 30.00-25.00 | | | | | | | | | |
| L38 | | | | 1 | 1 | 0.980151 | | | |
| 25.00-20.00 | | | | | | | | | |
| L39 | | | | 1 | 1 | 0.980151 | | | |
| 20.00-15.00 | | | | | | | | | |
| L40 | | | | 1 | 1 | 0.980151 | | | |
| 15.00-10.00 | | | | | | | | | |
| L41 10.00-5.00 | | | | 1 | 1 | 0.980151 | | | |
| L42 5.00-0.00 | | | | 1 | 1 | 0.980151 | | | |

Feed Line/Linear Appurtenances - Entered As Round Or Flat

| | | | | |
|--|----------------|-------------------|--------------------|-------------------|
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| | Client | PTI | Designed by | NMiller |

| Description | Sector | Exclude From Torque Calculation | Component Type | Placement ft | Total Number | Number Per Row | Start/End Position | Width or Diameter in | Perimeter in | Weight klf |
|-----------------------|--------|---------------------------------|-------------------|---------------|--------------|----------------|--------------------|----------------------|--------------|------------|
| PiROD Climbing Rungs | C | No | Surface Ar (CaAa) | 196.00 - 8.00 | 1 | 1 | 0.000 0.000 | 0.6250 | | 0.00 |
| LDF7-50A (1-5/8 FOAM) | A | No | Surface Ar (CaAa) | 175.00 - 8.00 | 6 | 6 | -0.250 0.000 | 1.9800 | | 0.00 |
| Hybriflex | A | No | Surface Ar (CaAa) | 165.00 - 8.00 | 4 | 4 | 0.000 0.200 | 0.0000 | | 0.00 |
| LDF7-50A (1-5/8 FOAM) | B | No | Surface Ar (CaAa) | 155.00 - 8.00 | 10 | 5 | 0.100 0.500 | 1.9800 | | 0.00 |
| 1-5/8" Hybrid Cable | B | No | Surface Ar (CaAa) | 155.00 - 8.00 | 2 | 1 | 0.000 0.100 | 0.0000 | | 0.00 |
| 1.6" Cable | C | No | Surface Ar (CaAa) | 140.00 - 8.00 | 1 | 1 | 0.000 0.000 | 1.6000 | | 0.00 |
| LDF5-50A (7/8 FOAM) | C | No | Surface Ar (CaAa) | 75.00 - 8.00 | 1 | 1 | 0.100 0.100 | 0.0000 | | 0.00 |
| 4" x 1-1/4" Mod Plate | A | No | Surface Af (CaAa) | 22.00 - 18.00 | 2 | 2 | 0.000 0.000 | 4.0000 | 10.5000 | 0.02 |
| 4" x 1-1/4" Mod Plate | B | No | Surface Af (CaAa) | 22.00 - 18.00 | 2 | 2 | 0.000 0.000 | 4.0000 | 10.5000 | 0.02 |
| 4" x 1-1/4" Mod Plate | C | No | Surface Af (CaAa) | 22.00 - 18.00 | 2 | 2 | 0.000 0.000 | 4.0000 | 10.5000 | 0.02 |
| 4" x 1-1/4" Mod Plate | A | No | Surface Af (CaAa) | 42.00 - 38.00 | 2 | 2 | 0.000 0.000 | 4.0000 | 10.5000 | 0.02 |
| 4" x 1-1/4" Mod Plate | B | No | Surface Af (CaAa) | 42.00 - 38.00 | 2 | 2 | 0.000 0.000 | 4.0000 | 10.5000 | 0.02 |
| 4" x 1-1/4" Mod Plate | C | No | Surface Af (CaAa) | 42.00 - 38.00 | 2 | 2 | 0.000 0.000 | 4.0000 | 10.5000 | 0.02 |
| 6" x 1-1/2" Mod Plate | A | No | Surface Af (CaAa) | 24.00 - 16.00 | 2 | 2 | 0.000 0.000 | 0.0000 | 0.0000 | 0.03 |
| 6" x 1-1/2" Mod Plate | B | No | Surface Af (CaAa) | 24.00 - 16.00 | 2 | 1 | 0.000 0.000 | 0.0000 | 0.0000 | 0.03 |
| 6" x 1-1/2" Mod Plate | C | No | Surface Af (CaAa) | 24.00 - 16.00 | 2 | 1 | 0.000 0.000 | 0.0000 | 0.0000 | 0.03 |
| 6" x 1-1/2" Mod Plate | A | No | Surface Af (CaAa) | 44.00 - 36.00 | 2 | 1 | 0.000 0.000 | 0.0000 | 0.0000 | 0.03 |
| 6" x 1-1/2" Mod Plate | B | No | Surface Af (CaAa) | 44.00 - 36.00 | 2 | 1 | 0.000 0.000 | 0.0000 | 0.0000 | 0.03 |
| 6" x 1-1/2" Mod Plate | C | No | Surface Af (CaAa) | 44.00 - 36.00 | 2 | 1 | 0.000 0.000 | 0.0000 | 0.0000 | 0.03 |
| 6" x 1-1/2" Mod Plate | A | No | Surface Af (CaAa) | 64.00 - 56.00 | 2 | 1 | 0.000 0.000 | 0.0000 | 0.0000 | 0.03 |
| 6" x 1-1/2" Mod Plate | B | No | Surface Af (CaAa) | 64.00 - 56.00 | 2 | 1 | 0.000 0.000 | 0.0000 | 0.0000 | 0.03 |
| 6" x 1-1/2" Mod Plate | C | No | Surface Af (CaAa) | 64.00 - 56.00 | 2 | 1 | 0.000 0.000 | 0.0000 | 0.0000 | 0.03 |

Feed Line/Linear Appurtenances - Entered As Area

| Description | Face or Leg | Allow Shield | Exclude From Torque Calculation | Component Type | Placement ft | Total Number | | C _A A _A ft ² /ft | Weight klf |
|-----------------------|-------------|--------------|---------------------------------|--------------------|---------------|--------------|----------|---|------------|
| Safety Line 3/8 | C | No | No | CaAa (Out Of Face) | 196.00 - 8.00 | 1 | No Ice | 0.04 | 0.00 |
| | | | | | | | 1/2" Ice | 0.14 | 0.00 |
| | | | | | | | 1" Ice | 0.24 | 0.00 |
| LDF7-50A (1-5/8 FOAM) | C | No | No | Inside Pole | 195.00 - 8.00 | 8 | No Ice | 0.00 | 0.00 |
| | | | | | | | 1/2" Ice | 0.00 | 0.00 |
| | | | | | | | 1" Ice | 0.00 | 0.00 |

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|--|----------------|-------------------|--------------------|-------------------|
| tnxTower GPD 520 South Main Street Suite 2531 Akron, Ohio 44311 Phone: (330) 572-2100 FAX: (330) 572-2101 | Job | US-CT-1002 | Page | 6 of 32 |
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| Description | Face or Leg | Allow Shield | Exclude From Torque Calculation | Component Type | Placement ft | Total Number | | C _{AA} ft ² /ft | Weight klf |
|-----------------------|-------------|--------------|---------------------------------|----------------|---------------|--------------|----------|-------------------------------------|------------|
| 1-1/4" Fiber Cable | C | No | No | Inside Pole | 195.00 - 8.00 | 4 | No Ice | 0.00 | 0.00 |
| | | | | | | | 1/2" Ice | 0.00 | 0.00 |
| | | | | | | | 1" Ice | 0.00 | 0.00 |
| LDF6-50A (1-1/4 FOAM) | A | No | No | Inside Pole | 185.00 - 8.00 | 12 | No Ice | 0.00 | 0.00 |
| | | | | | | | 1/2" Ice | 0.00 | 0.00 |
| | | | | | | | 1" Ice | 0.00 | 0.00 |
| 18-PAIR | A | No | No | Inside Pole | 185.00 - 8.00 | 1 | No Ice | 0.00 | 0.00 |
| | | | | | | | 1/2" Ice | 0.00 | 0.00 |
| | | | | | | | 1" Ice | 0.00 | 0.00 |
| 6AWG | A | No | No | Inside Pole | 185.00 - 8.00 | 6 | No Ice | 0.00 | 0.00 |
| | | | | | | | 1/2" Ice | 0.00 | 0.00 |
| | | | | | | | 1" Ice | 0.00 | 0.00 |
| 3/8" Fiber Cable | A | No | No | Inside Pole | 185.00 - 8.00 | 2 | No Ice | 0.00 | 0.00 |
| | | | | | | | 1/2" Ice | 0.00 | 0.00 |
| | | | | | | | 1" Ice | 0.00 | 0.00 |

Feed Line/Linear Appurtenances Section Areas

| Tower Section | Tower Elevation ft | Face | A _R ft ² | A _F ft ² | C _{AA} In Face ft ² | C _{AA} Out Face ft ² | Weight K |
|---------------|--------------------|------|--------------------------------|--------------------------------|---|--|----------|
| L1 | 196.00-195.00 | 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 | 0.063 | 0.037 | 0.00 |
| L2 | 195.00-190.00 | 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 | 0.313 | 0.188 | 0.07 |
| L3 | 190.00-185.00 | 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 | 0.313 | 0.188 | 0.07 |
| L4 | 185.00-180.00 | A | 0.000 | 0.000 | 0.000 | 0.000 | 0.05 |
| | | B | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |
| | | C | 0.000 | 0.000 | 0.313 | 0.188 | 0.07 |
| L5 | 180.00-175.00 | A | 0.000 | 0.000 | 0.000 | 0.000 | 0.05 |
| | | B | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |
| | | C | 0.000 | 0.000 | 0.313 | 0.188 | 0.07 |
| L6 | 175.00-170.00 | A | 0.000 | 0.000 | 5.940 | 0.000 | 0.08 |
| | | B | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |
| | | C | 0.000 | 0.000 | 0.313 | 0.188 | 0.07 |
| L7 | 170.00-165.00 | A | 0.000 | 0.000 | 5.940 | 0.000 | 0.08 |
| | | B | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |
| | | C | 0.000 | 0.000 | 0.313 | 0.188 | 0.07 |
| L8 | 165.00-160.00 | A | 0.000 | 0.000 | 5.940 | 0.000 | 0.10 |
| | | B | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |
| | | C | 0.000 | 0.000 | 0.313 | 0.188 | 0.07 |
| L9 | 160.00-155.00 | A | 0.000 | 0.000 | 5.940 | 0.000 | 0.10 |
| | | B | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |
| | | C | 0.000 | 0.000 | 0.313 | 0.188 | 0.07 |
| L10 | 155.00-150.00 | A | 0.000 | 0.000 | 5.940 | 0.000 | 0.10 |
| | | B | 0.000 | 0.000 | 4.950 | 0.000 | 0.05 |
| | | C | 0.000 | 0.000 | 0.313 | 0.188 | 0.07 |
| L11 | 150.00-145.00 | A | 0.000 | 0.000 | 5.940 | 0.000 | 0.10 |
| | | B | 0.000 | 0.000 | 4.950 | 0.000 | 0.05 |
| | | C | 0.000 | 0.000 | 0.313 | 0.188 | 0.07 |

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|----------------|-------------------|--------------------|-------------------|
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| Tower Section | Tower Elevation ft | Face | A _R ft ² | A _F ft ² | C _{AA} In Face ft ² | C _{AA} Out Face ft ² | Weight K |
|---------------|-----------------------|------|-----------------------------------|-----------------------------------|---|--|-------------|
| L12 | 145.00-140.00 | A | 0.000 | 0.000 | 5.940 | 0.000 | 0.10 |
| | | B | 0.000 | 0.000 | 4.950 | 0.000 | 0.05 |
| | | C | 0.000 | 0.000 | 0.313 | 0.188 | 0.07 |
| L13 | 140.00-136.25 | A | 0.000 | 0.000 | 4.455 | 0.000 | 0.07 |
| | | B | 0.000 | 0.000 | 3.713 | 0.000 | 0.04 |
| | | C | 0.000 | 0.000 | 0.834 | 0.141 | 0.06 |
| L14 | 136.25-136.00 | A | 0.000 | 0.000 | 0.297 | 0.000 | 0.00 |
| | | B | 0.000 | 0.000 | 0.248 | 0.000 | 0.00 |
| | | C | 0.000 | 0.000 | 0.056 | 0.009 | 0.00 |
| L15 | 136.00-131.00 | A | 0.000 | 0.000 | 5.940 | 0.000 | 0.10 |
| | | B | 0.000 | 0.000 | 4.950 | 0.000 | 0.05 |
| | | C | 0.000 | 0.000 | 1.113 | 0.188 | 0.08 |
| L16 | 131.00-126.00 | A | 0.000 | 0.000 | 5.940 | 0.000 | 0.10 |
| | | B | 0.000 | 0.000 | 4.950 | 0.000 | 0.05 |
| | | C | 0.000 | 0.000 | 1.113 | 0.188 | 0.08 |
| L17 | 126.00-121.00 | A | 0.000 | 0.000 | 5.940 | 0.000 | 0.10 |
| | | B | 0.000 | 0.000 | 4.950 | 0.000 | 0.05 |
| | | C | 0.000 | 0.000 | 1.113 | 0.188 | 0.08 |
| L18 | 121.00-120.00 | A | 0.000 | 0.000 | 1.188 | 0.000 | 0.02 |
| | | B | 0.000 | 0.000 | 0.990 | 0.000 | 0.01 |
| | | C | 0.000 | 0.000 | 0.223 | 0.037 | 0.02 |
| L19 | 120.00-115.00 | A | 0.000 | 0.000 | 5.940 | 0.000 | 0.10 |
| | | B | 0.000 | 0.000 | 4.950 | 0.000 | 0.05 |
| | | C | 0.000 | 0.000 | 1.113 | 0.188 | 0.08 |
| L20 | 115.00-110.00 | A | 0.000 | 0.000 | 5.940 | 0.000 | 0.10 |
| | | B | 0.000 | 0.000 | 4.950 | 0.000 | 0.05 |
| | | C | 0.000 | 0.000 | 1.113 | 0.188 | 0.08 |
| L21 | 110.00-105.00 | A | 0.000 | 0.000 | 5.940 | 0.000 | 0.10 |
| | | B | 0.000 | 0.000 | 4.950 | 0.000 | 0.05 |
| | | C | 0.000 | 0.000 | 1.113 | 0.188 | 0.08 |
| L22 | 105.00-100.00 | A | 0.000 | 0.000 | 5.940 | 0.000 | 0.10 |
| | | B | 0.000 | 0.000 | 4.950 | 0.000 | 0.05 |
| | | C | 0.000 | 0.000 | 1.113 | 0.188 | 0.08 |
| L23 | 100.00-95.00 | A | 0.000 | 0.000 | 5.940 | 0.000 | 0.10 |
| | | B | 0.000 | 0.000 | 4.950 | 0.000 | 0.05 |
| | | C | 0.000 | 0.000 | 1.113 | 0.188 | 0.08 |
| L24 | 95.00-90.00 | A | 0.000 | 0.000 | 5.940 | 0.000 | 0.10 |
| | | B | 0.000 | 0.000 | 4.950 | 0.000 | 0.05 |
| | | C | 0.000 | 0.000 | 1.113 | 0.188 | 0.08 |
| L25 | 90.00-85.00 | A | 0.000 | 0.000 | 5.940 | 0.000 | 0.10 |
| | | B | 0.000 | 0.000 | 4.950 | 0.000 | 0.05 |
| | | C | 0.000 | 0.000 | 1.113 | 0.188 | 0.08 |
| L26 | 85.00-80.00 | A | 0.000 | 0.000 | 5.940 | 0.000 | 0.10 |
| | | B | 0.000 | 0.000 | 4.950 | 0.000 | 0.05 |
| | | C | 0.000 | 0.000 | 1.113 | 0.188 | 0.08 |
| L27 | 80.00-75.00 | A | 0.000 | 0.000 | 5.940 | 0.000 | 0.10 |
| | | B | 0.000 | 0.000 | 4.950 | 0.000 | 0.05 |
| | | C | 0.000 | 0.000 | 1.113 | 0.188 | 0.08 |
| L28 | 75.00-70.00 | A | 0.000 | 0.000 | 5.940 | 0.000 | 0.10 |
| | | B | 0.000 | 0.000 | 4.950 | 0.000 | 0.05 |
| | | C | 0.000 | 0.000 | 1.113 | 0.188 | 0.08 |
| L29 | 70.00-65.00 | A | 0.000 | 0.000 | 5.940 | 0.000 | 0.10 |
| | | B | 0.000 | 0.000 | 4.950 | 0.000 | 0.05 |
| | | C | 0.000 | 0.000 | 1.113 | 0.188 | 0.08 |
| L30 | 65.00-60.00 | A | 0.000 | 0.000 | 5.940 | 0.000 | 0.34 |
| | | B | 0.000 | 0.000 | 4.950 | 0.000 | 0.29 |
| | | C | 0.000 | 0.000 | 1.113 | 0.188 | 0.32 |
| L31 | 60.00-55.00 | A | 0.000 | 0.000 | 5.940 | 0.000 | 0.34 |
| | | B | 0.000 | 0.000 | 4.950 | 0.000 | 0.29 |
| | | C | 0.000 | 0.000 | 1.113 | 0.188 | 0.32 |
| L32 | 55.00-50.00 | A | 0.000 | 0.000 | 5.940 | 0.000 | 0.10 |

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|--|----------------|-------------------|--------------------|-------------------|
| tnxTower GPD 520 South Main Street Suite 2531 Akron, Ohio 44311 Phone: (330) 572-2100 FAX: (330) 572-2101 | Job | US-CT-1002 | Page | 8 of 32 |
| | Project | 2022791.CT1002.17 | Date | 15:49:16 08/23/22 |
| | Client | PTI | Designed by | NMiller |

| Tower Section | Tower Elevation ft | Face | A_R ft ² | A_F ft ² | C_{AA} In Face ft ² | C_{AA} Out Face ft ² | Weight K |
|---------------|-----------------------|------|--------------------------|--------------------------|--|---|-------------|
| L33 | 50.00-45.00 | B | 0.000 | 0.000 | 4.950 | 0.000 | 0.05 |
| | | C | 0.000 | 0.000 | 1.113 | 0.188 | 0.08 |
| | | A | 0.000 | 0.000 | 5.940 | 0.000 | 0.10 |
| L34 | 45.00-40.00 | B | 0.000 | 0.000 | 4.950 | 0.000 | 0.05 |
| | | C | 0.000 | 0.000 | 1.113 | 0.188 | 0.08 |
| | | A | 0.000 | 0.000 | 8.005 | 0.000 | 0.41 |
| L35 | 40.00-35.00 | B | 0.000 | 0.000 | 7.015 | 0.000 | 0.36 |
| | | C | 0.000 | 0.000 | 3.177 | 0.188 | 0.39 |
| | | A | 0.000 | 0.000 | 8.005 | 0.000 | 0.41 |
| L36 | 35.00-30.00 | B | 0.000 | 0.000 | 7.015 | 0.000 | 0.36 |
| | | C | 0.000 | 0.000 | 3.177 | 0.188 | 0.39 |
| | | A | 0.000 | 0.000 | 5.940 | 0.000 | 0.10 |
| L37 | 30.00-25.00 | B | 0.000 | 0.000 | 4.950 | 0.000 | 0.05 |
| | | C | 0.000 | 0.000 | 1.113 | 0.188 | 0.08 |
| | | A | 0.000 | 0.000 | 5.940 | 0.000 | 0.10 |
| L38 | 25.00-20.00 | B | 0.000 | 0.000 | 4.950 | 0.000 | 0.05 |
| | | C | 0.000 | 0.000 | 1.113 | 0.188 | 0.08 |
| | | A | 0.000 | 0.000 | 8.005 | 0.000 | 0.41 |
| L39 | 20.00-15.00 | B | 0.000 | 0.000 | 7.015 | 0.000 | 0.36 |
| | | C | 0.000 | 0.000 | 3.177 | 0.188 | 0.39 |
| | | A | 0.000 | 0.000 | 8.005 | 0.000 | 0.41 |
| L40 | 15.00-10.00 | B | 0.000 | 0.000 | 7.015 | 0.000 | 0.36 |
| | | C | 0.000 | 0.000 | 3.177 | 0.188 | 0.39 |
| | | A | 0.000 | 0.000 | 5.940 | 0.000 | 0.10 |
| L41 | 10.00-5.00 | B | 0.000 | 0.000 | 4.950 | 0.000 | 0.05 |
| | | C | 0.000 | 0.000 | 1.113 | 0.188 | 0.08 |
| | | A | 0.000 | 0.000 | 2.376 | 0.000 | 0.04 |
| L42 | 5.00-0.00 | B | 0.000 | 0.000 | 1.980 | 0.000 | 0.02 |
| | | C | 0.000 | 0.000 | 0.445 | 0.075 | 0.03 |
| | | 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 | 0.000 | 0.000 | 0.00 |

Feed Line/Linear Appurtenances Section Areas - With Ice

| Tower Section | Tower Elevation ft | Face or Leg | Ice Thickness in | A_R ft ² | A_F ft ² | C_{AA} In Face ft ² | C_{AA} Out Face ft ² | Weight K |
|---------------|-----------------------|-------------|---------------------|--------------------------|--------------------------|--|---|-------------|
| L1 | 196.00-195.00 | A | 1.195 | 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 | 0.301 | 0.276 | 0.01 |
| L2 | 195.00-190.00 | 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 | 1.505 | 1.380 | 0.09 |
| L3 | 190.00-185.00 | A | 1.190 | 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 | 1.502 | 1.377 | 0.09 |
| L4 | 185.00-180.00 | A | 1.187 | 0.000 | 0.000 | 0.000 | 0.000 | 0.05 |
| | | B | | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |
| | | C | | 0.000 | 0.000 | 1.499 | 1.374 | 0.09 |
| L5 | 180.00-175.00 | A | 1.183 | 0.000 | 0.000 | 0.000 | 0.000 | 0.05 |
| | | B | | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |
| | | C | | 0.000 | 0.000 | 1.496 | 1.371 | 0.09 |
| L6 | 175.00-170.00 | A | 1.180 | 0.000 | 0.000 | 8.900 | 0.000 | 0.16 |
| | | B | | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |
| | | C | | 0.000 | 0.000 | 1.492 | 1.367 | 0.09 |
| L7 | 170.00-165.00 | A | 1.176 | 0.000 | 0.000 | 8.895 | 0.000 | 0.16 |
| | | B | | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |

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|---|----------------|-------------------|--------------------|-------------------|
| <p>tnxTower</p> <p>GPD 520 South Main Street Suite 2531 Akron, Ohio 44311 Phone: (330) 572-2100 FAX: (330) 572-2101</p> | Job | US-CT-1002 | Page | 9 of 32 |
| | Project | 2022791.CT1002.17 | Date | 15:49:16 08/23/22 |
| | Client | PTI | Designed by | NMiller |

| <i>Tower Section</i> | <i>Tower Elevation ft</i> | <i>Face or Leg</i> | <i>Ice Thickness in</i> | <i>A_R ft²</i> | <i>A_F ft²</i> | <i>C_{AA} In Face ft²</i> | <i>C_{AA} Out Face ft²</i> | <i>Weight K</i> |
|----------------------|---------------------------|--------------------|-------------------------|-------------------------------------|-------------------------------------|--|---|-----------------|
| L8 | 165.00-160.00 | C | | 0.000 | 0.000 | 1.489 | 1.364 | 0.09 |
| | | A | 1.173 | 0.000 | 0.000 | 10.357 | 0.000 | 0.18 |
| | | B | | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |
| | | C | | 0.000 | 0.000 | 1.485 | 1.360 | 0.09 |
| L9 | 160.00-155.00 | A | 1.169 | 0.000 | 0.000 | 10.348 | 0.000 | 0.18 |
| | | B | | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |
| | | C | | 0.000 | 0.000 | 1.482 | 1.357 | 0.09 |
| L10 | 155.00-150.00 | A | 1.165 | 0.000 | 0.000 | 10.339 | 0.000 | 0.18 |
| | | B | | 0.000 | 0.000 | 8.810 | 0.000 | 0.15 |
| | | C | | 0.000 | 0.000 | 1.478 | 1.353 | 0.09 |
| L11 | 150.00-145.00 | A | 1.162 | 0.000 | 0.000 | 10.329 | 0.000 | 0.18 |
| | | B | | 0.000 | 0.000 | 8.801 | 0.000 | 0.15 |
| | | C | | 0.000 | 0.000 | 1.474 | 1.349 | 0.09 |
| L12 | 145.00-140.00 | A | 1.158 | 0.000 | 0.000 | 10.319 | 0.000 | 0.18 |
| | | B | | 0.000 | 0.000 | 8.792 | 0.000 | 0.15 |
| | | C | | 0.000 | 0.000 | 1.470 | 1.345 | 0.09 |
| L13 | 140.00-136.25 | A | 1.154 | 0.000 | 0.000 | 7.732 | 0.000 | 0.14 |
| | | B | | 0.000 | 0.000 | 6.588 | 0.000 | 0.11 |
| | | C | | 0.000 | 0.000 | 2.565 | 1.006 | 0.09 |
| L14 | 136.25-136.00 | A | 1.152 | 0.000 | 0.000 | 0.515 | 0.000 | 0.01 |
| | | B | | 0.000 | 0.000 | 0.439 | 0.000 | 0.01 |
| | | C | | 0.000 | 0.000 | 0.171 | 0.067 | 0.01 |
| L15 | 136.00-131.00 | A | 1.150 | 0.000 | 0.000 | 10.300 | 0.000 | 0.18 |
| | | B | | 0.000 | 0.000 | 8.775 | 0.000 | 0.15 |
| | | C | | 0.000 | 0.000 | 3.412 | 1.338 | 0.11 |
| L16 | 131.00-126.00 | A | 1.146 | 0.000 | 0.000 | 10.289 | 0.000 | 0.18 |
| | | B | | 0.000 | 0.000 | 8.765 | 0.000 | 0.15 |
| | | C | | 0.000 | 0.000 | 3.404 | 1.333 | 0.11 |
| L17 | 126.00-121.00 | A | 1.141 | 0.000 | 0.000 | 10.278 | 0.000 | 0.18 |
| | | B | | 0.000 | 0.000 | 8.755 | 0.000 | 0.15 |
| | | C | | 0.000 | 0.000 | 3.395 | 1.329 | 0.11 |
| L18 | 121.00-120.00 | A | 1.138 | 0.000 | 0.000 | 2.054 | 0.000 | 0.04 |
| | | B | | 0.000 | 0.000 | 1.750 | 0.000 | 0.03 |
| | | C | | 0.000 | 0.000 | 0.678 | 0.265 | 0.02 |
| L19 | 120.00-115.00 | A | 1.135 | 0.000 | 0.000 | 10.264 | 0.000 | 0.18 |
| | | B | | 0.000 | 0.000 | 8.742 | 0.000 | 0.14 |
| | | C | | 0.000 | 0.000 | 3.383 | 1.323 | 0.11 |
| L20 | 115.00-110.00 | A | 1.130 | 0.000 | 0.000 | 10.251 | 0.000 | 0.18 |
| | | B | | 0.000 | 0.000 | 8.731 | 0.000 | 0.14 |
| | | C | | 0.000 | 0.000 | 3.373 | 1.318 | 0.11 |
| L21 | 110.00-105.00 | A | 1.125 | 0.000 | 0.000 | 10.238 | 0.000 | 0.18 |
| | | B | | 0.000 | 0.000 | 8.720 | 0.000 | 0.14 |
| | | C | | 0.000 | 0.000 | 3.363 | 1.313 | 0.11 |
| L22 | 105.00-100.00 | A | 1.120 | 0.000 | 0.000 | 10.225 | 0.000 | 0.18 |
| | | B | | 0.000 | 0.000 | 8.708 | 0.000 | 0.14 |
| | | C | | 0.000 | 0.000 | 3.353 | 1.308 | 0.11 |
| L23 | 100.00-95.00 | A | 1.114 | 0.000 | 0.000 | 10.211 | 0.000 | 0.18 |
| | | B | | 0.000 | 0.000 | 8.695 | 0.000 | 0.14 |
| | | C | | 0.000 | 0.000 | 3.341 | 1.302 | 0.11 |
| L24 | 95.00-90.00 | A | 1.109 | 0.000 | 0.000 | 10.196 | 0.000 | 0.18 |
| | | B | | 0.000 | 0.000 | 8.682 | 0.000 | 0.14 |
| | | C | | 0.000 | 0.000 | 3.330 | 1.296 | 0.11 |
| L25 | 90.00-85.00 | A | 1.102 | 0.000 | 0.000 | 10.181 | 0.000 | 0.18 |
| | | B | | 0.000 | 0.000 | 8.668 | 0.000 | 0.14 |
| | | C | | 0.000 | 0.000 | 3.317 | 1.290 | 0.11 |
| L26 | 85.00-80.00 | A | 1.096 | 0.000 | 0.000 | 10.165 | 0.000 | 0.18 |
| | | B | | 0.000 | 0.000 | 8.653 | 0.000 | 0.14 |
| | | C | | 0.000 | 0.000 | 3.304 | 1.283 | 0.11 |
| L27 | 80.00-75.00 | A | 1.089 | 0.000 | 0.000 | 10.148 | 0.000 | 0.18 |
| | | B | | 0.000 | 0.000 | 8.638 | 0.000 | 0.14 |
| | | C | | 0.000 | 0.000 | 3.291 | 1.277 | 0.11 |

| | | | | |
|--|----------------|-------------------|--------------------|-------------------|
| tnxTower GPD 520 South Main Street Suite 2531 Akron, Ohio 44311 Phone: (330) 572-2100 FAX: (330) 572-2101 | Job | US-CT-1002 | Page | 10 of 32 |
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| Tower Section | Tower Elevation ft | Face or Leg | Ice Thickness in | A _R ft ² | A _F ft ² | C _{AA} In Face ft ² | C _{AA} Out Face ft ² | Weight K |
|---------------|-----------------------|-------------|---------------------|-----------------------------------|-----------------------------------|---|--|-------------|
| L28 | 75.00-70.00 | A | 1.082 | 0.000 | 0.000 | 10.130 | 0.000 | 0.18 |
| | | B | | 0.000 | 0.000 | 8.622 | 0.000 | 0.14 |
| | | C | | 0.000 | 0.000 | 4.358 | 1.269 | 0.12 |
| L29 | 70.00-65.00 | A | 1.074 | 0.000 | 0.000 | 10.110 | 0.000 | 0.18 |
| | | B | | 0.000 | 0.000 | 8.604 | 0.000 | 0.14 |
| | | C | | 0.000 | 0.000 | 4.335 | 1.262 | 0.12 |
| L30 | 65.00-60.00 | A | 1.066 | 0.000 | 0.000 | 11.597 | 0.000 | 0.43 |
| | | B | | 0.000 | 0.000 | 10.093 | 0.000 | 0.40 |
| | | C | | 0.000 | 0.000 | 5.818 | 1.253 | 0.38 |
| L31 | 60.00-55.00 | A | 1.057 | 0.000 | 0.000 | 11.563 | 0.000 | 0.43 |
| | | B | | 0.000 | 0.000 | 10.061 | 0.000 | 0.40 |
| | | C | | 0.000 | 0.000 | 5.779 | 1.245 | 0.38 |
| L32 | 55.00-50.00 | A | 1.048 | 0.000 | 0.000 | 10.044 | 0.000 | 0.17 |
| | | B | | 0.000 | 0.000 | 8.544 | 0.000 | 0.14 |
| | | C | | 0.000 | 0.000 | 4.255 | 1.235 | 0.12 |
| L33 | 50.00-45.00 | A | 1.037 | 0.000 | 0.000 | 10.018 | 0.000 | 0.17 |
| | | B | | 0.000 | 0.000 | 8.521 | 0.000 | 0.14 |
| | | C | | 0.000 | 0.000 | 4.224 | 1.225 | 0.12 |
| L34 | 45.00-40.00 | A | 1.026 | 0.000 | 0.000 | 11.440 | 0.000 | 0.52 |
| | | B | | 0.000 | 0.000 | 9.946 | 0.000 | 0.48 |
| | | C | | 0.000 | 0.000 | 5.640 | 1.213 | 0.46 |
| L35 | 40.00-35.00 | A | 1.013 | 0.000 | 0.000 | 11.390 | 0.000 | 0.51 |
| | | B | | 0.000 | 0.000 | 9.899 | 0.000 | 0.48 |
| | | C | | 0.000 | 0.000 | 5.584 | 1.200 | 0.46 |
| L36 | 35.00-30.00 | A | 0.998 | 0.000 | 0.000 | 9.921 | 0.000 | 0.17 |
| | | B | | 0.000 | 0.000 | 8.434 | 0.000 | 0.13 |
| | | C | | 0.000 | 0.000 | 4.108 | 1.186 | 0.12 |
| L37 | 30.00-25.00 | A | 0.982 | 0.000 | 0.000 | 9.880 | 0.000 | 0.17 |
| | | B | | 0.000 | 0.000 | 8.397 | 0.000 | 0.13 |
| | | C | | 0.000 | 0.000 | 4.058 | 1.169 | 0.11 |
| L38 | 25.00-20.00 | A | 0.962 | 0.000 | 0.000 | 9.831 | 0.000 | 0.50 |
| | | B | | 0.000 | 0.000 | 9.714 | 0.000 | 0.47 |
| | | C | | 0.000 | 0.000 | 5.361 | 1.150 | 0.45 |
| L39 | 20.00-15.00 | A | 0.939 | 0.000 | 0.000 | 9.771 | 0.000 | 0.50 |
| | | B | | 0.000 | 0.000 | 9.627 | 0.000 | 0.47 |
| | | C | | 0.000 | 0.000 | 5.255 | 1.126 | 0.45 |
| L40 | 15.00-10.00 | A | 0.907 | 0.000 | 0.000 | 9.694 | 0.000 | 0.16 |
| | | B | | 0.000 | 0.000 | 8.229 | 0.000 | 0.12 |
| | | C | | 0.000 | 0.000 | 3.835 | 1.095 | 0.11 |
| L41 | 10.00-5.00 | A | 0.862 | 0.000 | 0.000 | 3.832 | 0.000 | 0.06 |
| | | B | | 0.000 | 0.000 | 3.251 | 0.000 | 0.05 |
| | | C | | 0.000 | 0.000 | 1.480 | 0.420 | 0.04 |
| L42 | 5.00-0.00 | A | 0.773 | 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 | 0.000 | 0.000 | 0.00 |

Feed Line Center of Pressure

| Section | Elevation ft | CP _x in | CP _z in | CP _x Ice in | CP _z Ice in |
|---------|-----------------|-----------------------|-----------------------|------------------------------|------------------------------|
| L1 | 196.00-195.00 | -0.2923 | 0.7508 | -0.8234 | 1.5481 |
| L2 | 195.00-190.00 | -0.2998 | 0.7650 | -0.8922 | 1.6679 |
| L3 | 190.00-185.00 | -0.2998 | 0.7650 | -0.8907 | 1.6653 |
| L4 | 185.00-180.00 | -0.2998 | 0.7650 | -0.8891 | 1.6626 |
| L5 | 180.00-175.00 | -0.3045 | 0.7739 | -0.9347 | 1.7420 |
| L6 | 175.00-170.00 | -6.7561 | -1.3193 | -5.0640 | -0.1215 |

| | | | | |
|--|----------------|-------------------|--------------------|-------------------|
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| | Client | PTI | Designed by | NMiller |

| Section | Elevation | CP _x | CP _z | CP _x | CP _z |
|---------|---------------|-----------------|-----------------|-----------------|-----------------|
| | | | | Ice | Ice |
| | ft | in | in | in | in |
| L7 | 170.00-165.00 | -6.7561 | -1.3193 | -5.0635 | -0.1236 |
| L8 | 165.00-160.00 | -6.7561 | -1.3193 | -5.1077 | -0.5534 |
| L9 | 160.00-155.00 | -7.2461 | -1.4109 | -5.5784 | -0.6007 |
| L10 | 155.00-150.00 | -0.6106 | -0.5169 | -0.6759 | -0.3027 |
| L11 | 150.00-145.00 | -0.6106 | -0.5169 | -0.6754 | -0.3031 |
| L12 | 145.00-140.00 | -0.6106 | -0.5169 | -0.6748 | -0.3035 |
| L13 | 140.00-136.25 | -0.6856 | 0.1730 | -0.7336 | 0.4860 |
| L14 | 136.25-136.00 | -0.6856 | 0.1730 | -0.7334 | 0.4855 |
| L15 | 136.00-131.00 | -0.6856 | 0.1730 | -0.7331 | 0.4848 |
| L16 | 131.00-126.00 | -0.6856 | 0.1730 | -0.7325 | 0.4833 |
| L17 | 126.00-121.00 | -0.6856 | 0.1730 | -0.7318 | 0.4818 |
| L18 | 121.00-120.00 | -0.6856 | 0.1730 | -0.7315 | 0.4809 |
| L19 | 120.00-115.00 | -0.7739 | 0.1881 | -0.8072 | 0.5155 |
| L20 | 115.00-110.00 | -0.7739 | 0.1881 | -0.8064 | 0.5137 |
| L21 | 110.00-105.00 | -0.7739 | 0.1881 | -0.8055 | 0.5119 |
| L22 | 105.00-100.00 | -0.7739 | 0.1881 | -0.8047 | 0.5099 |
| L23 | 100.00-95.00 | -0.8551 | 0.2019 | -0.8716 | 0.5392 |
| L24 | 95.00-90.00 | -0.8551 | 0.2019 | -0.8706 | 0.5369 |
| L25 | 90.00-85.00 | -0.8551 | 0.2019 | -0.8694 | 0.5345 |
| L26 | 85.00-80.00 | -0.8551 | 0.2019 | -0.8682 | 0.5319 |
| L27 | 80.00-75.00 | -0.9285 | 0.2144 | -0.9277 | 0.5568 |
| L28 | 75.00-70.00 | -0.9285 | 0.2144 | -1.0189 | 1.0561 |
| L29 | 70.00-65.00 | -0.9285 | 0.2144 | -1.0169 | 1.0501 |
| L30 | 65.00-60.00 | -0.9285 | 0.2144 | -0.9454 | 0.9725 |
| L31 | 60.00-55.00 | -0.9285 | 0.2144 | -0.9436 | 0.9665 |
| L32 | 55.00-50.00 | -0.9285 | 0.2144 | -1.0097 | 1.0293 |
| L33 | 50.00-45.00 | -0.9285 | 0.2144 | -1.0068 | 1.0211 |
| L34 | 45.00-40.00 | -0.7562 | 0.1746 | -0.8405 | 0.8474 |
| L35 | 40.00-35.00 | -0.7562 | 0.1746 | -0.8380 | 0.8394 |
| L36 | 35.00-30.00 | -0.9285 | 0.2144 | -0.9962 | 0.9903 |
| L37 | 30.00-25.00 | -0.9285 | 0.2144 | -0.9916 | 0.9769 |
| L38 | 25.00-20.00 | -0.7563 | 0.1746 | -0.3381 | 1.0970 |
| L39 | 20.00-15.00 | -0.7563 | 0.1746 | -0.3424 | 1.0759 |
| L40 | 15.00-10.00 | -0.9285 | 0.2144 | -0.9704 | 0.9156 |
| L41 | 10.00-5.00 | -0.5081 | 0.1173 | -0.5365 | 0.4917 |
| L42 | 5.00-0.00 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

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

Shielding Factor Ka

| Tower Section | Feed Line Record No. | Description | Feed Line Segment Elev. | K _a No Ice | K _a Ice |
|---------------|----------------------|----------------------|-------------------------|-----------------------|--------------------|
| L1 | 1 | PiROD Climbing Rungs | 195.00 - 196.00 | 1.0000 | 1.0000 |
| L2 | 1 | PiROD Climbing Rungs | 190.00 - 195.00 | 1.0000 | 1.0000 |
| L3 | 1 | PiROD Climbing Rungs | 185.00 - 190.00 | 1.0000 | 1.0000 |
| L4 | 1 | PiROD Climbing Rungs | 180.00 - 185.00 | 1.0000 | 1.0000 |
| L5 | 1 | PiROD Climbing Rungs | 175.00 - 180.00 | 1.0000 | 1.0000 |
| L6 | 1 | PiROD Climbing Rungs | 170.00 - | 1.0000 | 1.0000 |

| | | | |
|----------------|-------------------|--------------------|-------------------|
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| Tower Section | Feed Line Record No. | Description | Feed Line Segment Elev. | K _a No Ice | K _a Ice |
|---------------|----------------------|-----------------------|-------------------------|-----------------------|--------------------|
| | | | 175.00 | | |
| L6 | 9 | LDF7-50A (1-5/8 FOAM) | 170.00 - 175.00 | 1.0000 | 1.0000 |
| L7 | 1 | PiROD Climbing Rungs | 165.00 - 170.00 | 1.0000 | 1.0000 |
| L7 | 9 | LDF7-50A (1-5/8 FOAM) | 165.00 - 170.00 | 1.0000 | 1.0000 |
| L8 | 1 | PiROD Climbing Rungs | 160.00 - 165.00 | 1.0000 | 1.0000 |
| L8 | 9 | LDF7-50A (1-5/8 FOAM) | 160.00 - 165.00 | 1.0000 | 1.0000 |
| L8 | 10 | Hybriflex | 160.00 - 165.00 | 1.0000 | 1.0000 |
| L9 | 1 | PiROD Climbing Rungs | 155.00 - 160.00 | 1.0000 | 1.0000 |
| L9 | 9 | LDF7-50A (1-5/8 FOAM) | 155.00 - 160.00 | 1.0000 | 1.0000 |
| L9 | 10 | Hybriflex | 155.00 - 160.00 | 1.0000 | 1.0000 |
| L10 | 1 | PiROD Climbing Rungs | 150.00 - 155.00 | 1.0000 | 1.0000 |
| L10 | 9 | LDF7-50A (1-5/8 FOAM) | 150.00 - 155.00 | 1.0000 | 1.0000 |
| L10 | 10 | Hybriflex | 150.00 - 155.00 | 1.0000 | 1.0000 |
| L10 | 11 | LDF7-50A (1-5/8 FOAM) | 150.00 - 155.00 | 1.0000 | 1.0000 |
| L10 | 12 | 1-5/8" Hybrid Cable | 150.00 - 155.00 | 1.0000 | 1.0000 |
| L11 | 1 | PiROD Climbing Rungs | 145.00 - 150.00 | 1.0000 | 1.0000 |
| L11 | 9 | LDF7-50A (1-5/8 FOAM) | 145.00 - 150.00 | 1.0000 | 1.0000 |
| L11 | 10 | Hybriflex | 145.00 - 150.00 | 1.0000 | 1.0000 |
| L11 | 11 | LDF7-50A (1-5/8 FOAM) | 145.00 - 150.00 | 1.0000 | 1.0000 |
| L11 | 12 | 1-5/8" Hybrid Cable | 145.00 - 150.00 | 1.0000 | 1.0000 |
| L12 | 1 | PiROD Climbing Rungs | 140.00 - 145.00 | 1.0000 | 1.0000 |
| L12 | 9 | LDF7-50A (1-5/8 FOAM) | 140.00 - 145.00 | 1.0000 | 1.0000 |
| L12 | 10 | Hybriflex | 140.00 - 145.00 | 1.0000 | 1.0000 |
| L12 | 11 | LDF7-50A (1-5/8 FOAM) | 140.00 - 145.00 | 1.0000 | 1.0000 |
| L12 | 12 | 1-5/8" Hybrid Cable | 140.00 - 145.00 | 1.0000 | 1.0000 |
| L13 | 1 | PiROD Climbing Rungs | 136.25 - 140.00 | 1.0000 | 1.0000 |
| L13 | 9 | LDF7-50A (1-5/8 FOAM) | 136.25 - 140.00 | 1.0000 | 1.0000 |
| L13 | 10 | Hybriflex | 136.25 - 140.00 | 1.0000 | 1.0000 |
| L13 | 11 | LDF7-50A (1-5/8 FOAM) | 136.25 - 140.00 | 1.0000 | 1.0000 |
| L13 | 12 | 1-5/8" Hybrid Cable | 136.25 - 140.00 | 1.0000 | 1.0000 |
| L13 | 13 | 1.6" Cable | 136.25 - 140.00 | 1.0000 | 1.0000 |
| L14 | 1 | PiROD Climbing Rungs | 136.00 - | 1.0000 | 1.0000 |

| | | | |
|----------------|-------------------|--------------------|-------------------|
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| Project | 2022791.CT1002.17 | Date | 15:49:16 08/23/22 |
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| Tower Section | Feed Line Record No. | Description | Feed Line Segment Elev. | K _a No Ice | K _a Ice |
|---------------|----------------------|-----------------------|------------------------------|-----------------------|--------------------|
| L14 | 9 | LDF7-50A (1-5/8 FOAM) | 136.25 136.00 - 136.25 | 1.0000 | 1.0000 |
| L14 | 10 | Hybriflex | 136.00 - 136.25 | 1.0000 | 1.0000 |
| L14 | 11 | LDF7-50A (1-5/8 FOAM) | 136.00 - 136.25 | 1.0000 | 1.0000 |
| L14 | 12 | 1-5/8" Hybrid Cable | 136.00 - 136.25 | 1.0000 | 1.0000 |
| L14 | 13 | 1.6" Cable | 136.00 - 136.25 | 1.0000 | 1.0000 |
| L15 | 1 | PiROD Climbing Rungs | 131.00 - 136.00 | 1.0000 | 1.0000 |
| L15 | 9 | LDF7-50A (1-5/8 FOAM) | 131.00 - 136.00 | 1.0000 | 1.0000 |
| L15 | 10 | Hybriflex | 131.00 - 136.00 | 1.0000 | 1.0000 |
| L15 | 11 | LDF7-50A (1-5/8 FOAM) | 131.00 - 136.00 | 1.0000 | 1.0000 |
| L15 | 12 | 1-5/8" Hybrid Cable | 131.00 - 136.00 | 1.0000 | 1.0000 |
| L15 | 13 | 1.6" Cable | 131.00 - 136.00 | 1.0000 | 1.0000 |
| L16 | 1 | PiROD Climbing Rungs | 126.00 - 131.00 | 1.0000 | 1.0000 |
| L16 | 9 | LDF7-50A (1-5/8 FOAM) | 126.00 - 131.00 | 1.0000 | 1.0000 |
| L16 | 10 | Hybriflex | 126.00 - 131.00 | 1.0000 | 1.0000 |
| L16 | 11 | LDF7-50A (1-5/8 FOAM) | 126.00 - 131.00 | 1.0000 | 1.0000 |
| L16 | 12 | 1-5/8" Hybrid Cable | 126.00 - 131.00 | 1.0000 | 1.0000 |
| L16 | 13 | 1.6" Cable | 126.00 - 131.00 | 1.0000 | 1.0000 |
| L17 | 1 | PiROD Climbing Rungs | 121.00 - 126.00 | 1.0000 | 1.0000 |
| L17 | 9 | LDF7-50A (1-5/8 FOAM) | 121.00 - 126.00 | 1.0000 | 1.0000 |
| L17 | 10 | Hybriflex | 121.00 - 126.00 | 1.0000 | 1.0000 |
| L17 | 11 | LDF7-50A (1-5/8 FOAM) | 121.00 - 126.00 | 1.0000 | 1.0000 |
| L17 | 12 | 1-5/8" Hybrid Cable | 121.00 - 126.00 | 1.0000 | 1.0000 |
| L17 | 13 | 1.6" Cable | 121.00 - 126.00 | 1.0000 | 1.0000 |
| L18 | 1 | PiROD Climbing Rungs | 120.00 - 121.00 | 1.0000 | 1.0000 |
| L18 | 9 | LDF7-50A (1-5/8 FOAM) | 120.00 - 121.00 | 1.0000 | 1.0000 |
| L18 | 10 | Hybriflex | 120.00 - 121.00 | 1.0000 | 1.0000 |
| L18 | 11 | LDF7-50A (1-5/8 FOAM) | 120.00 - 121.00 | 1.0000 | 1.0000 |
| L18 | 12 | 1-5/8" Hybrid Cable | 120.00 - 121.00 | 1.0000 | 1.0000 |
| L18 | 13 | 1.6" Cable | 120.00 - 121.00 | 1.0000 | 1.0000 |
| L19 | 1 | PiROD Climbing Rungs | 115.00 - 120.00 | 1.0000 | 1.0000 |
| L19 | 9 | LDF7-50A (1-5/8 FOAM) | 115.00 - | 1.0000 | 1.0000 |

| | | | |
|----------------|-------------------|--------------------|-------------------|
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| Project | 2022791.CT1002.17 | Date | 15:49:16 08/23/22 |
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| Tower Section | Feed Line Record No. | Description | Feed Line Segment Elev. | K _a No Ice | K _a Ice |
|---------------|----------------------|-----------------------|-------------------------|-----------------------|--------------------|
| L19 | 10 | Hybriflex | 120.00 - 115.00 | 1.0000 | 1.0000 |
| L19 | 11 | LDF7-50A (1-5/8 FOAM) | 120.00 - 115.00 | 1.0000 | 1.0000 |
| L19 | 12 | 1-5/8" Hybrid Cable | 120.00 - 115.00 | 1.0000 | 1.0000 |
| L19 | 13 | 1.6" Cable | 120.00 - 115.00 | 1.0000 | 1.0000 |
| L20 | 1 | PiROD Climbing Rungs | 110.00 - 115.00 | 1.0000 | 1.0000 |
| L20 | 9 | LDF7-50A (1-5/8 FOAM) | 110.00 - 115.00 | 1.0000 | 1.0000 |
| L20 | 10 | Hybriflex | 110.00 - 115.00 | 1.0000 | 1.0000 |
| L20 | 11 | LDF7-50A (1-5/8 FOAM) | 110.00 - 115.00 | 1.0000 | 1.0000 |
| L20 | 12 | 1-5/8" Hybrid Cable | 110.00 - 115.00 | 1.0000 | 1.0000 |
| L20 | 13 | 1.6" Cable | 110.00 - 115.00 | 1.0000 | 1.0000 |
| L21 | 1 | PiROD Climbing Rungs | 105.00 - 110.00 | 1.0000 | 1.0000 |
| L21 | 9 | LDF7-50A (1-5/8 FOAM) | 105.00 - 110.00 | 1.0000 | 1.0000 |
| L21 | 10 | Hybriflex | 105.00 - 110.00 | 1.0000 | 1.0000 |
| L21 | 11 | LDF7-50A (1-5/8 FOAM) | 105.00 - 110.00 | 1.0000 | 1.0000 |
| L21 | 12 | 1-5/8" Hybrid Cable | 105.00 - 110.00 | 1.0000 | 1.0000 |
| L21 | 13 | 1.6" Cable | 105.00 - 110.00 | 1.0000 | 1.0000 |
| L22 | 1 | PiROD Climbing Rungs | 100.00 - 105.00 | 1.0000 | 1.0000 |
| L22 | 9 | LDF7-50A (1-5/8 FOAM) | 100.00 - 105.00 | 1.0000 | 1.0000 |
| L22 | 10 | Hybriflex | 100.00 - 105.00 | 1.0000 | 1.0000 |
| L22 | 11 | LDF7-50A (1-5/8 FOAM) | 100.00 - 105.00 | 1.0000 | 1.0000 |
| L22 | 12 | 1-5/8" Hybrid Cable | 100.00 - 105.00 | 1.0000 | 1.0000 |
| L22 | 13 | 1.6" Cable | 100.00 - 105.00 | 1.0000 | 1.0000 |
| L23 | 1 | PiROD Climbing Rungs | 95.00 - 100.00 | 1.0000 | 1.0000 |
| L23 | 9 | LDF7-50A (1-5/8 FOAM) | 95.00 - 100.00 | 1.0000 | 1.0000 |
| L23 | 10 | Hybriflex | 95.00 - 100.00 | 1.0000 | 1.0000 |
| L23 | 11 | LDF7-50A (1-5/8 FOAM) | 95.00 - 100.00 | 1.0000 | 1.0000 |
| L23 | 12 | 1-5/8" Hybrid Cable | 95.00 - 100.00 | 1.0000 | 1.0000 |
| L23 | 13 | 1.6" Cable | 95.00 - 100.00 | 1.0000 | 1.0000 |
| L24 | 1 | PiROD Climbing Rungs | 90.00 - 95.00 | 1.0000 | 1.0000 |
| L24 | 9 | LDF7-50A (1-5/8 FOAM) | 90.00 - 95.00 | 1.0000 | 1.0000 |
| L24 | 10 | Hybriflex | 90.00 - 95.00 | 1.0000 | 1.0000 |
| L24 | 11 | LDF7-50A (1-5/8 FOAM) | 90.00 - 95.00 | 1.0000 | 1.0000 |
| L24 | 12 | 1-5/8" Hybrid Cable | 90.00 - 95.00 | 1.0000 | 1.0000 |
| L24 | 13 | 1.6" Cable | 90.00 - 95.00 | 1.0000 | 1.0000 |
| L25 | 1 | PiROD Climbing Rungs | 85.00 - 90.00 | 1.0000 | 1.0000 |
| L25 | 9 | LDF7-50A (1-5/8 FOAM) | 85.00 - 90.00 | 1.0000 | 1.0000 |
| L25 | 10 | Hybriflex | 85.00 - 90.00 | 1.0000 | 1.0000 |
| L25 | 11 | LDF7-50A (1-5/8 FOAM) | 85.00 - 90.00 | 1.0000 | 1.0000 |
| L25 | 12 | 1-5/8" Hybrid Cable | 85.00 - 90.00 | 1.0000 | 1.0000 |

| | | | | |
|--|----------------|-------------------|--------------------|-------------------|
| tnxTower GPD 520 South Main Street Suite 2531 Akron, Ohio 44311 Phone: (330) 572-2100 FAX: (330) 572-2101 | Job | US-CT-1002 | Page | 15 of 32 |
| | Project | 2022791.CT1002.17 | Date | 15:49:16 08/23/22 |
| | Client | PTI | Designed by | NMiller |

| Tower Section | Feed Line Record No. | Description | Feed Line Segment Elev. | K_a No Ice | K_a Ice |
|---------------|----------------------|-----------------------|-------------------------|--------------|-----------|
| L25 | 13 | 1.6" Cable | 85.00 - 90.00 | 1.0000 | 1.0000 |
| L26 | 1 | PiROD Climbing Rungs | 80.00 - 85.00 | 1.0000 | 1.0000 |
| L26 | 9 | LDF7-50A (1-5/8 FOAM) | 80.00 - 85.00 | 1.0000 | 1.0000 |
| L26 | 10 | Hybriflex | 80.00 - 85.00 | 1.0000 | 1.0000 |
| L26 | 11 | LDF7-50A (1-5/8 FOAM) | 80.00 - 85.00 | 1.0000 | 1.0000 |
| L26 | 12 | 1-5/8" Hybrid Cable | 80.00 - 85.00 | 1.0000 | 1.0000 |
| L26 | 13 | 1.6" Cable | 80.00 - 85.00 | 1.0000 | 1.0000 |
| L27 | 1 | PiROD Climbing Rungs | 75.00 - 80.00 | 1.0000 | 1.0000 |
| L27 | 9 | LDF7-50A (1-5/8 FOAM) | 75.00 - 80.00 | 1.0000 | 1.0000 |
| L27 | 10 | Hybriflex | 75.00 - 80.00 | 1.0000 | 1.0000 |
| L27 | 11 | LDF7-50A (1-5/8 FOAM) | 75.00 - 80.00 | 1.0000 | 1.0000 |
| L27 | 12 | 1-5/8" Hybrid Cable | 75.00 - 80.00 | 1.0000 | 1.0000 |
| L27 | 13 | 1.6" Cable | 75.00 - 80.00 | 1.0000 | 1.0000 |
| L28 | 1 | PiROD Climbing Rungs | 70.00 - 75.00 | 1.0000 | 1.0000 |
| L28 | 9 | LDF7-50A (1-5/8 FOAM) | 70.00 - 75.00 | 1.0000 | 1.0000 |
| L28 | 10 | Hybriflex | 70.00 - 75.00 | 1.0000 | 1.0000 |
| L28 | 11 | LDF7-50A (1-5/8 FOAM) | 70.00 - 75.00 | 1.0000 | 1.0000 |
| L28 | 12 | 1-5/8" Hybrid Cable | 70.00 - 75.00 | 1.0000 | 1.0000 |
| L28 | 13 | 1.6" Cable | 70.00 - 75.00 | 1.0000 | 1.0000 |
| L28 | 14 | LDF5-50A (7/8 FOAM) | 70.00 - 75.00 | 1.0000 | 1.0000 |
| L29 | 1 | PiROD Climbing Rungs | 65.00 - 70.00 | 1.0000 | 1.0000 |
| L29 | 9 | LDF7-50A (1-5/8 FOAM) | 65.00 - 70.00 | 1.0000 | 1.0000 |
| L29 | 10 | Hybriflex | 65.00 - 70.00 | 1.0000 | 1.0000 |
| L29 | 11 | LDF7-50A (1-5/8 FOAM) | 65.00 - 70.00 | 1.0000 | 1.0000 |
| L29 | 12 | 1-5/8" Hybrid Cable | 65.00 - 70.00 | 1.0000 | 1.0000 |
| L29 | 13 | 1.6" Cable | 65.00 - 70.00 | 1.0000 | 1.0000 |
| L29 | 14 | LDF5-50A (7/8 FOAM) | 65.00 - 70.00 | 1.0000 | 1.0000 |
| L30 | 1 | PiROD Climbing Rungs | 60.00 - 65.00 | 1.0000 | 1.0000 |
| L30 | 9 | LDF7-50A (1-5/8 FOAM) | 60.00 - 65.00 | 1.0000 | 1.0000 |
| L30 | 10 | Hybriflex | 60.00 - 65.00 | 1.0000 | 1.0000 |
| L30 | 11 | LDF7-50A (1-5/8 FOAM) | 60.00 - 65.00 | 1.0000 | 1.0000 |
| L30 | 12 | 1-5/8" Hybrid Cable | 60.00 - 65.00 | 1.0000 | 1.0000 |
| L30 | 13 | 1.6" Cable | 60.00 - 65.00 | 1.0000 | 1.0000 |
| L30 | 14 | LDF5-50A (7/8 FOAM) | 60.00 - 65.00 | 1.0000 | 1.0000 |
| L30 | 27 | 6" x 1-1/2" Mod Plate | 60.00 - 64.00 | 1.0000 | 1.0000 |
| L30 | 28 | 6" x 1-1/2" Mod Plate | 60.00 - 64.00 | 1.0000 | 1.0000 |
| L30 | 29 | 6" x 1-1/2" Mod Plate | 60.00 - 64.00 | 1.0000 | 1.0000 |
| L31 | 1 | PiROD Climbing Rungs | 55.00 - 60.00 | 1.0000 | 1.0000 |
| L31 | 9 | LDF7-50A (1-5/8 FOAM) | 55.00 - 60.00 | 1.0000 | 1.0000 |
| L31 | 10 | Hybriflex | 55.00 - 60.00 | 1.0000 | 1.0000 |
| L31 | 11 | LDF7-50A (1-5/8 FOAM) | 55.00 - 60.00 | 1.0000 | 1.0000 |
| L31 | 12 | 1-5/8" Hybrid Cable | 55.00 - 60.00 | 1.0000 | 1.0000 |
| L31 | 13 | 1.6" Cable | 55.00 - 60.00 | 1.0000 | 1.0000 |
| L31 | 14 | LDF5-50A (7/8 FOAM) | 55.00 - 60.00 | 1.0000 | 1.0000 |
| L31 | 27 | 6" x 1-1/2" Mod Plate | 56.00 - 60.00 | 1.0000 | 1.0000 |
| L31 | 28 | 6" x 1-1/2" Mod Plate | 56.00 - 60.00 | 1.0000 | 1.0000 |
| L31 | 29 | 6" x 1-1/2" Mod Plate | 56.00 - 60.00 | 1.0000 | 1.0000 |
| L32 | 1 | PiROD Climbing Rungs | 50.00 - 55.00 | 1.0000 | 1.0000 |
| L32 | 9 | LDF7-50A (1-5/8 FOAM) | 50.00 - 55.00 | 1.0000 | 1.0000 |
| L32 | 10 | Hybriflex | 50.00 - 55.00 | 1.0000 | 1.0000 |
| L32 | 11 | LDF7-50A (1-5/8 FOAM) | 50.00 - 55.00 | 1.0000 | 1.0000 |
| L32 | 12 | 1-5/8" Hybrid Cable | 50.00 - 55.00 | 1.0000 | 1.0000 |
| L32 | 13 | 1.6" Cable | 50.00 - 55.00 | 1.0000 | 1.0000 |
| L32 | 14 | LDF5-50A (7/8 FOAM) | 50.00 - 55.00 | 1.0000 | 1.0000 |
| L33 | 1 | PiROD Climbing Rungs | 45.00 - 50.00 | 1.0000 | 1.0000 |
| L33 | 9 | LDF7-50A (1-5/8 FOAM) | 45.00 - 50.00 | 1.0000 | 1.0000 |
| L33 | 10 | Hybriflex | 45.00 - 50.00 | 1.0000 | 1.0000 |
| L33 | 11 | LDF7-50A (1-5/8 FOAM) | 45.00 - 50.00 | 1.0000 | 1.0000 |
| L33 | 12 | 1-5/8" Hybrid Cable | 45.00 - 50.00 | 1.0000 | 1.0000 |
| L33 | 13 | 1.6" Cable | 45.00 - 50.00 | 1.0000 | 1.0000 |
| L33 | 14 | LDF5-50A (7/8 FOAM) | 45.00 - 50.00 | 1.0000 | 1.0000 |
| L34 | 1 | PiROD Climbing Rungs | 40.00 - 45.00 | 1.0000 | 1.0000 |

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|----------------|-------------------|--------------------|-------------------|
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| Project | 2022791.CT1002.17 | Date | 15:49:16 08/23/22 |
| Client | PTI | Designed by | NMiller |

| Tower Section | Feed Line Record No. | Description | Feed Line Segment Elev. | K_a No Ice | K_a Ice |
|---------------|----------------------|-----------------------|-------------------------|--------------|-----------|
| L34 | 9 | LDF7-50A (1-5/8 FOAM) | 40.00 - 45.00 | 1.0000 | 1.0000 |
| L34 | 10 | Hybriflex | 40.00 - 45.00 | 1.0000 | 1.0000 |
| L34 | 11 | LDF7-50A (1-5/8 FOAM) | 40.00 - 45.00 | 1.0000 | 1.0000 |
| L34 | 12 | 1-5/8" Hybrid Cable | 40.00 - 45.00 | 1.0000 | 1.0000 |
| L34 | 13 | 1.6" Cable | 40.00 - 45.00 | 1.0000 | 1.0000 |
| L34 | 14 | LDF5-50A (7/8 FOAM) | 40.00 - 45.00 | 1.0000 | 1.0000 |
| L34 | 18 | 4" x 1-1/4" Mod Plate | 40.00 - 42.00 | 1.0000 | 1.0000 |
| L34 | 19 | 4" x 1-1/4" Mod Plate | 40.00 - 42.00 | 1.0000 | 1.0000 |
| L34 | 20 | 4" x 1-1/4" Mod Plate | 40.00 - 42.00 | 1.0000 | 1.0000 |
| L34 | 24 | 6" x 1-1/2" Mod Plate | 40.00 - 44.00 | 1.0000 | 1.0000 |
| L34 | 25 | 6" x 1-1/2" Mod Plate | 40.00 - 44.00 | 1.0000 | 1.0000 |
| L34 | 26 | 6" x 1-1/2" Mod Plate | 40.00 - 44.00 | 1.0000 | 1.0000 |
| L35 | 1 | PiROD Climbing Rungs | 35.00 - 40.00 | 1.0000 | 1.0000 |
| L35 | 9 | LDF7-50A (1-5/8 FOAM) | 35.00 - 40.00 | 1.0000 | 1.0000 |
| L35 | 10 | Hybriflex | 35.00 - 40.00 | 1.0000 | 1.0000 |
| L35 | 11 | LDF7-50A (1-5/8 FOAM) | 35.00 - 40.00 | 1.0000 | 1.0000 |
| L35 | 12 | 1-5/8" Hybrid Cable | 35.00 - 40.00 | 1.0000 | 1.0000 |
| L35 | 13 | 1.6" Cable | 35.00 - 40.00 | 1.0000 | 1.0000 |
| L35 | 14 | LDF5-50A (7/8 FOAM) | 35.00 - 40.00 | 1.0000 | 1.0000 |
| L35 | 18 | 4" x 1-1/4" Mod Plate | 38.00 - 40.00 | 1.0000 | 1.0000 |
| L35 | 19 | 4" x 1-1/4" Mod Plate | 38.00 - 40.00 | 1.0000 | 1.0000 |
| L35 | 20 | 4" x 1-1/4" Mod Plate | 38.00 - 40.00 | 1.0000 | 1.0000 |
| L35 | 24 | 6" x 1-1/2" Mod Plate | 36.00 - 40.00 | 1.0000 | 1.0000 |
| L35 | 25 | 6" x 1-1/2" Mod Plate | 36.00 - 40.00 | 1.0000 | 1.0000 |
| L35 | 26 | 6" x 1-1/2" Mod Plate | 36.00 - 40.00 | 1.0000 | 1.0000 |
| L36 | 1 | PiROD Climbing Rungs | 30.00 - 35.00 | 1.0000 | 1.0000 |
| L36 | 9 | LDF7-50A (1-5/8 FOAM) | 30.00 - 35.00 | 1.0000 | 1.0000 |
| L36 | 10 | Hybriflex | 30.00 - 35.00 | 1.0000 | 1.0000 |
| L36 | 11 | LDF7-50A (1-5/8 FOAM) | 30.00 - 35.00 | 1.0000 | 1.0000 |
| L36 | 12 | 1-5/8" Hybrid Cable | 30.00 - 35.00 | 1.0000 | 1.0000 |
| L36 | 13 | 1.6" Cable | 30.00 - 35.00 | 1.0000 | 1.0000 |
| L36 | 14 | LDF5-50A (7/8 FOAM) | 30.00 - 35.00 | 1.0000 | 1.0000 |
| L37 | 1 | PiROD Climbing Rungs | 25.00 - 30.00 | 1.0000 | 1.0000 |
| L37 | 9 | LDF7-50A (1-5/8 FOAM) | 25.00 - 30.00 | 1.0000 | 1.0000 |
| L37 | 10 | Hybriflex | 25.00 - 30.00 | 1.0000 | 1.0000 |
| L37 | 11 | LDF7-50A (1-5/8 FOAM) | 25.00 - 30.00 | 1.0000 | 1.0000 |
| L37 | 12 | 1-5/8" Hybrid Cable | 25.00 - 30.00 | 1.0000 | 1.0000 |
| L37 | 13 | 1.6" Cable | 25.00 - 30.00 | 1.0000 | 1.0000 |
| L37 | 14 | LDF5-50A (7/8 FOAM) | 25.00 - 30.00 | 1.0000 | 1.0000 |
| L38 | 1 | PiROD Climbing Rungs | 20.00 - 25.00 | 1.0000 | 1.0000 |
| L38 | 9 | LDF7-50A (1-5/8 FOAM) | 20.00 - 25.00 | 1.0000 | 1.0000 |
| L38 | 10 | Hybriflex | 20.00 - 25.00 | 1.0000 | 1.0000 |
| L38 | 11 | LDF7-50A (1-5/8 FOAM) | 20.00 - 25.00 | 1.0000 | 1.0000 |
| L38 | 12 | 1-5/8" Hybrid Cable | 20.00 - 25.00 | 1.0000 | 1.0000 |
| L38 | 13 | 1.6" Cable | 20.00 - 25.00 | 1.0000 | 1.0000 |
| L38 | 14 | LDF5-50A (7/8 FOAM) | 20.00 - 25.00 | 1.0000 | 1.0000 |
| L38 | 15 | 4" x 1-1/4" Mod Plate | 20.00 - 22.00 | 1.0000 | 1.0000 |
| L38 | 16 | 4" x 1-1/4" Mod Plate | 20.00 - 22.00 | 1.0000 | 1.0000 |
| L38 | 17 | 4" x 1-1/4" Mod Plate | 20.00 - 22.00 | 1.0000 | 1.0000 |
| L38 | 21 | 6" x 1-1/2" Mod Plate | 20.00 - 24.00 | 1.0000 | 1.0000 |
| L38 | 22 | 6" x 1-1/2" Mod Plate | 20.00 - 24.00 | 1.0000 | 1.0000 |
| L38 | 23 | 6" x 1-1/2" Mod Plate | 20.00 - 24.00 | 1.0000 | 1.0000 |
| L39 | 1 | PiROD Climbing Rungs | 15.00 - 20.00 | 1.0000 | 1.0000 |
| L39 | 9 | LDF7-50A (1-5/8 FOAM) | 15.00 - 20.00 | 1.0000 | 1.0000 |
| L39 | 10 | Hybriflex | 15.00 - 20.00 | 1.0000 | 1.0000 |
| L39 | 11 | LDF7-50A (1-5/8 FOAM) | 15.00 - 20.00 | 1.0000 | 1.0000 |
| L39 | 12 | 1-5/8" Hybrid Cable | 15.00 - 20.00 | 1.0000 | 1.0000 |
| L39 | 13 | 1.6" Cable | 15.00 - 20.00 | 1.0000 | 1.0000 |
| L39 | 14 | LDF5-50A (7/8 FOAM) | 15.00 - 20.00 | 1.0000 | 1.0000 |
| L39 | 15 | 4" x 1-1/4" Mod Plate | 18.00 - 20.00 | 1.0000 | 1.0000 |
| L39 | 16 | 4" x 1-1/4" Mod Plate | 18.00 - 20.00 | 1.0000 | 1.0000 |
| L39 | 17 | 4" x 1-1/4" Mod Plate | 18.00 - 20.00 | 1.0000 | 1.0000 |

| | | | | |
|--|----------------|-------------------|--------------------|-------------------|
| tnxTower GPD 520 South Main Street Suite 2531 Akron, Ohio 44311 Phone: (330) 572-2100 FAX: (330) 572-2101 | Job | US-CT-1002 | Page | 17 of 32 |
| | Project | 2022791.CT1002.17 | Date | 15:49:16 08/23/22 |
| | Client | PTI | Designed by | NMiller |

| Tower Section | Feed Line Record No. | Description | Feed Line Segment Elev. | K_a No Ice | K_a Ice |
|---------------|----------------------|-----------------------|-------------------------|--------------|-----------|
| L39 | 21 | 6" x 1-1/2" Mod Plate | 16.00 - 20.00 | 1.0000 | 1.0000 |
| L39 | 22 | 6" x 1-1/2" Mod Plate | 16.00 - 20.00 | 1.0000 | 1.0000 |
| L39 | 23 | 6" x 1-1/2" Mod Plate | 16.00 - 20.00 | 1.0000 | 1.0000 |
| L40 | 1 | PiROD Climbing Rungs | 10.00 - 15.00 | 1.0000 | 1.0000 |
| L40 | 9 | LDF7-50A (1-5/8 FOAM) | 10.00 - 15.00 | 1.0000 | 1.0000 |
| L40 | 10 | Hybriflex | 10.00 - 15.00 | 1.0000 | 1.0000 |
| L40 | 11 | LDF7-50A (1-5/8 FOAM) | 10.00 - 15.00 | 1.0000 | 1.0000 |
| L40 | 12 | 1-5/8" Hybrid Cable | 10.00 - 15.00 | 1.0000 | 1.0000 |
| L40 | 13 | 1.6" Cable | 10.00 - 15.00 | 1.0000 | 1.0000 |
| L40 | 14 | LDF5-50A (7/8 FOAM) | 10.00 - 15.00 | 1.0000 | 1.0000 |
| L41 | 1 | PiROD Climbing Rungs | 8.00 - 10.00 | 1.0000 | 1.0000 |
| L41 | 9 | LDF7-50A (1-5/8 FOAM) | 8.00 - 10.00 | 1.0000 | 1.0000 |
| L41 | 10 | Hybriflex | 8.00 - 10.00 | 1.0000 | 1.0000 |
| L41 | 11 | LDF7-50A (1-5/8 FOAM) | 8.00 - 10.00 | 1.0000 | 1.0000 |
| L41 | 12 | 1-5/8" Hybrid Cable | 8.00 - 10.00 | 1.0000 | 1.0000 |
| L41 | 13 | 1.6" Cable | 8.00 - 10.00 | 1.0000 | 1.0000 |
| L41 | 14 | LDF5-50A (7/8 FOAM) | 8.00 - 10.00 | 1.0000 | 1.0000 |

Effective Width of Flat Linear Attachments / Feed Lines

| Tower Section | Attachment Record No. | Description | Attachment Segment Elev. | Ratio Calculation Method | Effective Width Ratio |
|---------------|-----------------------|-----------------------|--------------------------|--------------------------|-----------------------|
| L30 | 27 | 6" x 1-1/2" Mod Plate | 60.00 - 64.00 | Manual | 1.0000 |
| L30 | 28 | 6" x 1-1/2" Mod Plate | 60.00 - 64.00 | Manual | 1.0000 |
| L30 | 29 | 6" x 1-1/2" Mod Plate | 60.00 - 64.00 | Manual | 1.0000 |
| L31 | 27 | 6" x 1-1/2" Mod Plate | 56.00 - 60.00 | Manual | 1.0000 |
| L31 | 28 | 6" x 1-1/2" Mod Plate | 56.00 - 60.00 | Manual | 1.0000 |
| L31 | 29 | 6" x 1-1/2" Mod Plate | 56.00 - 60.00 | Manual | 1.0000 |
| L34 | 18 | 4" x 1-1/4" Mod Plate | 40.00 - 42.00 | Auto | 1.0000 |
| L34 | 19 | 4" x 1-1/4" Mod Plate | 40.00 - 42.00 | Auto | 1.0000 |
| L34 | 20 | 4" x 1-1/4" Mod Plate | 40.00 - 42.00 | Auto | 1.0000 |
| L34 | 24 | 6" x 1-1/2" Mod Plate | 40.00 - 44.00 | Manual | 1.0000 |
| L34 | 25 | 6" x 1-1/2" Mod Plate | 40.00 - 44.00 | Manual | 1.0000 |
| L34 | 26 | 6" x 1-1/2" Mod Plate | 40.00 - 44.00 | Manual | 1.0000 |
| L35 | 18 | 4" x 1-1/4" Mod Plate | 38.00 - 40.00 | Auto | 1.0000 |
| L35 | 19 | 4" x 1-1/4" Mod Plate | 38.00 - 40.00 | Auto | 1.0000 |
| L35 | 20 | 4" x 1-1/4" Mod Plate | 38.00 - 40.00 | Auto | 1.0000 |
| L35 | 24 | 6" x 1-1/2" Mod Plate | 36.00 - 40.00 | Manual | 1.0000 |
| L35 | 25 | 6" x 1-1/2" Mod Plate | 36.00 - 40.00 | Manual | 1.0000 |
| L35 | 26 | 6" x 1-1/2" Mod Plate | 36.00 - 40.00 | Manual | 1.0000 |
| L38 | 15 | 4" x 1-1/4" Mod Plate | 20.00 - 22.00 | Auto | 1.0000 |
| L38 | 16 | 4" x 1-1/4" Mod Plate | 20.00 - 22.00 | Auto | 1.0000 |
| L38 | 17 | 4" x 1-1/4" Mod Plate | 20.00 - 22.00 | Auto | 1.0000 |
| L38 | 21 | 6" x 1-1/2" Mod Plate | 20.00 - 24.00 | Manual | 1.0000 |
| L38 | 22 | 6" x 1-1/2" Mod Plate | 20.00 - 24.00 | Manual | 1.0000 |
| L38 | 23 | 6" x 1-1/2" Mod Plate | 20.00 - 24.00 | Manual | 1.0000 |
| L39 | 15 | 4" x 1-1/4" Mod Plate | 18.00 - 20.00 | Auto | 1.0000 |
| L39 | 16 | 4" x 1-1/4" Mod Plate | 18.00 - 20.00 | Auto | 1.0000 |
| L39 | 17 | 4" x 1-1/4" Mod Plate | 18.00 - 20.00 | Auto | 1.0000 |
| L39 | 21 | 6" x 1-1/2" Mod Plate | 16.00 - 20.00 | Manual | 1.0000 |
| L39 | 22 | 6" x 1-1/2" Mod Plate | 16.00 - 20.00 | Manual | 1.0000 |
| L39 | 23 | 6" x 1-1/2" Mod Plate | 16.00 - 20.00 | Manual | 1.0000 |

| | | | | |
|--|----------------|-------------------|--------------------|-------------------|
| tnxTower GPD 520 South Main Street Suite 2531 Akron, Ohio 44311 Phone: (330) 572-2100 FAX: (330) 572-2101 | Job | US-CT-1002 | Page | 18 of 32 |
| | Project | 2022791.CT1002.17 | Date | 15:49:16 08/23/22 |
| | Client | PTI | Designed by | NMiller |

Discrete Tower Loads

| Description | Face or Leg | Offset Type | Offsets: | | Azimuth Adjustment | Placement | C _A A _{Front} | C _A A _{Side} | Weight |
|---|-------------|--------------------|-----------------------|------|--------------------|-----------|--|----------------------------------|----------------------|
| | | | Horz Lateral | Vert | | | | | |
| | | | ft | ft | ° | ft | ft ² | ft ² | K |
| Pirod 16.5' LP Platform | C | None | | | 0.0000 | 195.00 | No Ice 20.80 1/2" Ice 28.10 1" Ice 35.40 | 20.80 28.10 35.40 | 1.80 2.07 2.33 |
| (3) Commscope VSR-MA-B w/ 15.5' Horizontal Pipe | C | None | | | 0.0000 | 193.00 | No Ice 16.65 1/2" Ice 25.43 1" Ice 34.21 | 16.65 25.43 34.21 | 0.56 0.73 0.89 |
| APXVAARR24 w/ Mount Pipe | A | From Centroid-Le g | 4.00 0.00 -2.00 | | 50.0000 | 195.00 | No Ice 20.24 1/2" Ice 20.89 1" Ice 21.55 | 20.24 12.21 13.49 | 0.16 0.29 0.44 |
| APXVAARR24 w/ Mount Pipe | B | From Centroid-Le g | 4.00 0.00 -2.00 | | 30.0000 | 195.00 | No Ice 20.24 1/2" Ice 20.89 1" Ice 21.55 | 20.24 12.21 13.49 | 0.16 0.29 0.44 |
| APXVAARR24 w/ Mount Pipe | C | From Centroid-Le g | 4.00 0.00 -2.00 | | 20.0000 | 195.00 | No Ice 20.24 1/2" Ice 20.89 1" Ice 21.55 | 20.24 12.21 13.49 | 0.16 0.29 0.44 |
| APX16DWV w/ Mount Pipe | A | From Centroid-Le g | 4.00 0.00 0.00 | | 50.0000 | 195.00 | No Ice 7.14 1/2" Ice 7.76 1" Ice 8.29 | 3.81 4.88 5.66 | 0.07 0.12 0.18 |
| APX16DWV w/ Mount Pipe | B | From Centroid-Le g | 4.00 0.00 0.00 | | 30.0000 | 195.00 | No Ice 7.14 1/2" Ice 7.76 1" Ice 8.29 | 3.81 4.88 5.66 | 0.07 0.12 0.18 |
| APX16DWV w/ Mount Pipe | C | From Centroid-Le g | 4.00 0.00 0.00 | | 20.0000 | 195.00 | No Ice 7.14 1/2" Ice 7.76 1" Ice 8.29 | 3.81 4.88 5.66 | 0.07 0.12 0.18 |
| AIR6449 w/ Mount Pipe | A | From Centroid-Le g | 4.00 0.00 0.00 | | 0.0000 | 195.00 | No Ice 6.45 1/2" Ice 7.02 1" Ice 7.53 | 3.92 4.64 5.25 | 0.13 0.18 0.24 |
| AIR6449 w/ Mount Pipe | B | From Centroid-Le g | 4.00 0.00 0.00 | | 0.0000 | 195.00 | No Ice 6.45 1/2" Ice 7.02 1" Ice 7.53 | 3.92 4.64 5.25 | 0.13 0.18 0.24 |
| AIR6449 w/ Mount Pipe | C | From Centroid-Le g | 4.00 0.00 0.00 | | 0.0000 | 195.00 | No Ice 6.45 1/2" Ice 7.02 1" Ice 7.53 | 3.92 4.64 5.25 | 0.13 0.18 0.24 |
| RADIO 4449 B12/B71 | A | From Centroid-Le g | 4.00 0.00 -2.00 | | 0.0000 | 195.00 | No Ice 1.65 1/2" Ice 1.81 1" Ice 1.98 | 1.16 1.30 1.45 | 0.07 0.09 0.11 |
| RADIO 4449 B12/B71 | B | From Centroid-Le g | 4.00 0.00 -2.00 | | 0.0000 | 195.00 | No Ice 1.65 1/2" Ice 1.81 1" Ice 1.98 | 1.16 1.30 1.45 | 0.07 0.09 0.11 |
| RADIO 4449 B12/B71 | C | From Centroid-Le g | 4.00 0.00 -2.00 | | 0.0000 | 195.00 | No Ice 1.65 1/2" Ice 1.81 1" Ice 1.98 | 1.16 1.30 1.45 | 0.07 0.09 0.11 |
| RADIO 4415 B66A | A | From Centroid-Le g | 4.00 0.00 0.00 | | 0.0000 | 195.00 | No Ice 1.86 1/2" Ice 2.03 1" Ice 2.20 | 0.87 1.00 1.13 | 0.05 0.06 0.08 |
| RADIO 4415 B66A | B | From Centroid-Le g | 4.00 0.00 0.00 | | 0.0000 | 195.00 | No Ice 1.86 1/2" Ice 2.03 | 0.87 1.00 | 0.05 0.06 |

| | | | | |
|--|----------------|-------------------|--------------------|-------------------|
| tnxTower GPD 520 South Main Street Suite 2531 Akron, Ohio 44311 Phone: (330) 572-2100 FAX: (330) 572-2101 | Job | US-CT-1002 | Page | 19 of 32 |
| | Project | 2022791.CT1002.17 | Date | 15:49:16 08/23/22 |
| | Client | PTI | Designed by | NMiller |

| Description | Face or Leg | Offset Type | Offsets: | | Azimuth Adjustment | Placement | C _{AA} Front | C _{AA} Side | Weight |
|---|-------------|-------------|----------|---------|--------------------|-----------|-----------------------|----------------------|--------|
| | | | Horz | Vert | | | | | |
| | | | ft | ft | ° | ft | ft ² | ft ² | K |
| RADIO 4415 B66A | C | g | 0.00 | | | 1" Ice | 2.20 | 1.13 | 0.08 |
| | | From | 4.00 | 0.0000 | 195.00 | No Ice | 1.86 | 0.87 | 0.05 |
| | | Centroid-Le | 0.00 | | | 1/2" Ice | 2.03 | 1.00 | 0.06 |
| 4424 B25 | A | g | 0.00 | | | 1" Ice | 2.20 | 1.13 | 0.08 |
| | | From | 4.00 | 0.0000 | 195.00 | No Ice | 1.86 | 1.32 | 0.09 |
| | | Centroid-Le | 0.00 | | | 1/2" Ice | 2.03 | 1.47 | 0.11 |
| 4424 B25 | B | g | -2.00 | | | 1" Ice | 2.20 | 1.62 | 0.13 |
| | | From | 4.00 | 0.0000 | 195.00 | No Ice | 1.86 | 1.32 | 0.09 |
| | | Centroid-Le | 0.00 | | | 1/2" Ice | 2.03 | 1.47 | 0.11 |
| 4424 B25 | C | g | -2.00 | | | 1" Ice | 2.20 | 1.62 | 0.13 |
| | | From | 4.00 | 0.0000 | 195.00 | No Ice | 1.86 | 1.32 | 0.09 |
| | | Centroid-Le | 0.00 | | | 1/2" Ice | 2.03 | 1.47 | 0.11 |
| DC4-48-60-8-20F | A | g | -2.00 | | | 1" Ice | 2.20 | 1.62 | 0.13 |
| | | From | 4.00 | 0.0000 | 195.00 | No Ice | 1.43 | 0.59 | 0.01 |
| | | Centroid-Le | 0.00 | | | 1/2" Ice | 1.58 | 0.70 | 0.02 |
| T-Mobile Reserved | A | g | 0.00 | | | 1" Ice | 1.74 | 0.81 | 0.03 |
| | | From | 4.00 | 50.0000 | 195.00 | No Ice | 5.10 | 6.78 | 0.05 |
| | | Centroid-Le | 0.00 | | | 1/2" Ice | 5.86 | 7.46 | 0.08 |
| T-Mobile Reserved | B | g | 0.00 | | | 1" Ice | 6.54 | 8.10 | 0.13 |
| | | From | 4.00 | 30.0000 | 195.00 | No Ice | 5.10 | 6.78 | 0.05 |
| | | Centroid-Le | 0.00 | | | 1/2" Ice | 5.10 | 7.46 | 0.08 |
| T-Mobile Reserved | C | g | 0.00 | | | 1" Ice | 6.54 | 8.10 | 0.13 |
| | | From | 4.00 | 20.0000 | 195.00 | No Ice | 5.10 | 6.78 | 0.05 |
| | | Centroid-Le | 0.00 | | | 1/2" Ice | 5.10 | 7.46 | 0.08 |
| PiROD 13' Low Profile Platform (Monopole) | C | g | 0.00 | | | 1" Ice | 6.54 | 8.10 | 0.13 |
| | | None | | 0.0000 | 185.00 | No Ice | 15.70 | 15.70 | 1.30 |
| | | | | | | 1/2" Ice | 20.10 | 20.10 | 1.76 |
| HPA-65R-BUU-H8 w/ Mount Pipe | A | From | 4.00 | 23.0000 | 185.00 | No Ice | 13.05 | 9.42 | 0.09 |
| | | Centroid-Le | 0.00 | | | 1/2" Ice | 13.66 | 10.82 | 0.19 |
| | | g | 0.00 | | | 1" Ice | 14.27 | 12.07 | 0.29 |
| HPA-65R-BUU-H8 w/ Mount Pipe | B | From | 4.00 | 23.0000 | 185.00 | No Ice | 13.05 | 9.42 | 0.09 |
| | | Centroid-Le | 0.00 | | | 1/2" Ice | 13.66 | 10.82 | 0.19 |
| | | g | 0.00 | | | 1" Ice | 14.27 | 12.07 | 0.29 |
| HPA-65R-BUU-H8 w/ Mount Pipe | C | From | 4.00 | 23.0000 | 185.00 | No Ice | 13.05 | 9.42 | 0.09 |
| | | Centroid-Le | 0.00 | | | 1/2" Ice | 13.66 | 10.82 | 0.19 |
| | | g | 0.00 | | | 1" Ice | 14.27 | 12.07 | 0.29 |
| OPA65R-BU6DA w/ Mount Pipe | A | From | 4.00 | 23.0000 | 185.00 | No Ice | 12.89 | 7.10 | 0.08 |
| | | Centroid-Le | 0.00 | | | 1/2" Ice | 13.39 | 8.05 | 0.17 |
| | | g | 0.00 | | | 1" Ice | 13.90 | 8.88 | 0.27 |
| OPA65R-BU6DA w/ Mount Pipe | B | From | 4.00 | 23.0000 | 185.00 | No Ice | 12.89 | 7.10 | 0.08 |
| | | Centroid-Le | 0.00 | | | 1/2" Ice | 13.39 | 8.05 | 0.17 |
| | | g | 0.00 | | | 1" Ice | 13.90 | 8.88 | 0.27 |
| OPA65R-BU6DA w/ Mount Pipe | C | From | 4.00 | 23.0000 | 185.00 | No Ice | 12.89 | 7.10 | 0.08 |
| | | Centroid-Le | 0.00 | | | 1/2" Ice | 13.39 | 8.05 | 0.17 |
| | | g | 0.00 | | | 1" Ice | 13.90 | 8.88 | 0.27 |
| DMP65R-BU8DA w/ Mount Pipe | A | From | 4.00 | 23.0000 | 185.00 | No Ice | 17.87 | 10.02 | 0.03 |
| | | Centroid-Le | 0.00 | | | 1/2" Ice | 18.50 | 11.44 | 0.15 |
| | | g | 0.00 | | | 1" Ice | 19.14 | 12.72 | 0.28 |
| DMP65R-BU8DA w/ Mount Pipe | B | From | 4.00 | 23.0000 | 185.00 | No Ice | 17.87 | 10.02 | 0.03 |
| | | Centroid-Le | 0.00 | | | 1/2" Ice | 18.50 | 11.44 | 0.15 |
| | | g | 0.00 | | | 1" Ice | 19.14 | 12.72 | 0.28 |
| DMP65R-BU8DA w/ Mount Pipe | C | From | 4.00 | 23.0000 | 185.00 | No Ice | 17.87 | 10.02 | 0.03 |
| | | Centroid-Le | 0.00 | | | 1/2" Ice | 18.50 | 11.44 | 0.15 |
| | | g | 0.00 | | | 1" Ice | 19.14 | 12.72 | 0.28 |
| 4449 B5/B12 | A | From | 4.00 | 23.0000 | 185.00 | No Ice | 1.97 | 1.41 | 0.07 |
| | | Centroid-Le | 0.00 | | | 1/2" Ice | 2.14 | 1.56 | 0.09 |

| | | | | |
|--|----------------|-------------------|--------------------|-------------------|
| tnxTower GPD 520 South Main Street Suite 2531 Akron, Ohio 44311 Phone: (330) 572-2100 FAX: (330) 572-2101 | Job | US-CT-1002 | Page | 20 of 32 |
| | Project | 2022791.CT1002.17 | Date | 15:49:16 08/23/22 |
| | Client | PTI | Designed by | NMiller |

| Description | Face or Leg | Offset Type | Offsets: | | Azimuth Adjustment ° | Placement ft | C _{AA} Front ft ² | C _{AA} Side ft ² | Weight K | |
|---|-------------------|----------------|-----------------------|------------|----------------------------|-----------------|---|--|-------------|------|
| | | | Horz Lateral ft | Vert ft | | | | | | |
| 4449 B5/B12 | B | g | 0.00 | | 23.0000 | 185.00 | 1" Ice | 2.33 | 1.73 | 0.11 |
| | | From | 4.00 | | | | No Ice | 1.97 | 1.41 | 0.07 |
| | | Centroid-Le | 0.00 | | | | 1/2" Ice | 2.14 | 1.56 | 0.09 |
| 4449 B5/B12 | C | g | 0.00 | | 23.0000 | 185.00 | 1" Ice | 2.33 | 1.73 | 0.11 |
| | | From | 4.00 | | | | No Ice | 1.97 | 1.41 | 0.07 |
| | | Centroid-Le | 0.00 | | | | 1/2" Ice | 2.14 | 1.56 | 0.09 |
| 4415 B25 | A | g | 0.00 | | 23.0000 | 185.00 | 1" Ice | 2.33 | 1.73 | 0.11 |
| | | From | 4.00 | | | | No Ice | 1.65 | 0.68 | 0.05 |
| | | Centroid-Le | 0.00 | | | | 1/2" Ice | 1.81 | 0.79 | 0.06 |
| 4415 B25 | B | g | 0.00 | | 23.0000 | 185.00 | 1" Ice | 1.98 | 0.92 | 0.07 |
| | | From | 4.00 | | | | No Ice | 1.65 | 0.68 | 0.05 |
| | | Centroid-Le | 0.00 | | | | 1/2" Ice | 1.81 | 0.79 | 0.06 |
| 4415 B25 | C | g | 0.00 | | 23.0000 | 185.00 | 1" Ice | 1.98 | 0.92 | 0.07 |
| | | From | 4.00 | | | | No Ice | 1.65 | 0.68 | 0.05 |
| | | Centroid-Le | 0.00 | | | | 1/2" Ice | 1.81 | 0.79 | 0.06 |
| 4478 B14 | A | g | 0.00 | | 23.0000 | 185.00 | 1" Ice | 1.98 | 0.92 | 0.07 |
| | | From | 4.00 | | | | No Ice | 1.96 | 1.25 | 0.06 |
| | | Centroid-Le | 0.00 | | | | 1/2" Ice | 2.14 | 1.40 | 0.08 |
| 4478 B14 | B | g | 0.00 | | 23.0000 | 185.00 | 1" Ice | 2.32 | 1.55 | 0.10 |
| | | From | 4.00 | | | | No Ice | 1.96 | 1.25 | 0.06 |
| | | Centroid-Le | 0.00 | | | | 1/2" Ice | 2.14 | 1.40 | 0.08 |
| 4478 B14 | C | g | 0.00 | | 23.0000 | 185.00 | 1" Ice | 2.32 | 1.55 | 0.10 |
| | | From | 4.00 | | | | No Ice | 1.96 | 1.25 | 0.06 |
| | | Centroid-Le | 0.00 | | | | 1/2" Ice | 2.14 | 1.40 | 0.08 |
| RRUS 32 B30 | A | g | 0.00 | | 23.0000 | 185.00 | 1" Ice | 2.32 | 1.55 | 0.10 |
| | | From | 4.00 | | | | No Ice | 2.69 | 1.57 | 0.06 |
| | | Centroid-Le | 0.00 | | | | 1/2" Ice | 2.91 | 1.76 | 0.08 |
| RRUS 32 B30 | B | g | 0.00 | | 23.0000 | 185.00 | 1" Ice | 3.14 | 1.95 | 0.10 |
| | | From | 4.00 | | | | No Ice | 2.69 | 1.57 | 0.06 |
| | | Centroid-Le | 0.00 | | | | 1/2" Ice | 2.91 | 1.76 | 0.08 |
| RRUS 32 B30 | C | g | 0.00 | | 23.0000 | 185.00 | 1" Ice | 3.14 | 1.95 | 0.10 |
| | | From | 4.00 | | | | No Ice | 2.69 | 1.57 | 0.06 |
| | | Centroid-Le | 0.00 | | | | 1/2" Ice | 2.91 | 1.76 | 0.08 |
| RRUS 4426 B66 | A | g | 0.00 | | 23.0000 | 185.00 | 1" Ice | 3.14 | 1.95 | 0.10 |
| | | From | 4.00 | | | | No Ice | 1.64 | 0.73 | 0.05 |
| | | Centroid-Le | 0.00 | | | | 1/2" Ice | 1.80 | 0.84 | 0.06 |
| RRUS 4426 B66 | B | g | 0.00 | | 23.0000 | 185.00 | 1" Ice | 1.97 | 0.97 | 0.08 |
| | | From | 4.00 | | | | No Ice | 1.64 | 0.73 | 0.05 |
| | | Centroid-Le | 0.00 | | | | 1/2" Ice | 1.80 | 0.84 | 0.06 |
| RRUS 4426 B66 | C | g | 0.00 | | 23.0000 | 185.00 | 1" Ice | 1.97 | 0.97 | 0.08 |
| | | From | 4.00 | | | | No Ice | 1.64 | 0.73 | 0.05 |
| | | Centroid-Le | 0.00 | | | | 1/2" Ice | 1.80 | 0.84 | 0.06 |
| DC6-48-60-18-8F Surge Suppression Unit | A | g | 0.00 | | 23.0000 | 185.00 | 1" Ice | 1.97 | 0.97 | 0.08 |
| | | From | 4.00 | | | | No Ice | 0.92 | 0.92 | 0.02 |
| | | Centroid-Le | 0.00 | | | | 1/2" Ice | 1.46 | 1.46 | 0.04 |
| DC6-48-60-18-8F Surge Suppression Unit | B | g | 0.00 | | 23.0000 | 185.00 | 1" Ice | 1.64 | 1.64 | 0.06 |
| | | From | 4.00 | | | | No Ice | 0.92 | 0.92 | 0.02 |
| | | Centroid-Le | 0.00 | | | | 1/2" Ice | 1.46 | 1.46 | 0.04 |
| DC6-48-60-18-8F Surge Suppression Unit | C | g | 0.00 | | 23.0000 | 185.00 | 1" Ice | 1.64 | 1.64 | 0.06 |
| | | From | 4.00 | | | | No Ice | 0.92 | 0.92 | 0.02 |
| | | Centroid-Le | 0.00 | | | | 1/2" Ice | 1.46 | 1.46 | 0.04 |
| Valmont Light Duty Tri-Bracket (1) | C | g | 0.00 | | 0.0000 | 175.00 | 1" Ice | 1.64 | 1.64 | 0.06 |
| | | None | | | | | No Ice | 1.76 | 1.76 | 0.05 |
| | | | | | | | 1/2" Ice | 2.08 | 2.08 | 0.07 |
| APXV18-206517S-C w/ Mount Pipe | A | From Leg | 0.50 | | -10.0000 | 175.00 | 1" Ice | 2.40 | 2.40 | 0.09 |
| | | | 0.00 | | | | No Ice | 5.17 | 4.46 | 0.05 |
| | | | | | | | 1/2" Ice | 5.62 | 5.39 | 0.09 |

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|--|----------------|-------------------|--------------------|-------------------|
| tnxTower GPD 520 South Main Street Suite 2531 Akron, Ohio 44311 Phone: (330) 572-2100 FAX: (330) 572-2101 | Job | US-CT-1002 | Page | 21 of 32 |
| | Project | 2022791.CT1002.17 | Date | 15:49:16 08/23/22 |
| | Client | PTI | Designed by | NMiller |

| Description | Face or Leg | Offset Type | Offsets: | | Azimuth Adjustment | Placement | C _{AA} Front | C _{AA} Side | Weight | |
|--------------------------------|-------------|------------------|----------|------|--------------------|-----------|-----------------------|----------------------|--------|------|
| | | | Horz | Vert | | | | | | |
| | | | ft | ft | ° | ft | ft ² | ft ² | K | |
| APXV18-206517S-C w/ Mount Pipe | B | From Leg | 0.00 | | -10.0000 | 175.00 | 1" Ice | 6.08 | 6.20 | 0.14 |
| | | | 0.50 | | | | No Ice | 5.17 | 4.46 | 0.05 |
| | | | 0.00 | | | | 1/2" Ice | 5.62 | 5.39 | 0.09 |
| | | | 0.00 | | | | 1" Ice | 6.08 | 6.20 | 0.14 |
| APXV18-206517S-C w/ Mount Pipe | C | From Leg | 0.50 | | -10.0000 | 175.00 | No Ice | 5.17 | 4.46 | 0.05 |
| | | | 0.00 | | | | 1/2" Ice | 5.62 | 5.39 | 0.09 |
| | | | 0.00 | | | | 1" Ice | 6.08 | 6.20 | 0.14 |
| | | | 0.00 | | | | No Ice | 14.66 | 14.66 | 1.25 |
| MTS 12.5' LP Platform | C | None | | | 0.0000 | 165.00 | 1/2" Ice | 18.87 | 18.87 | 1.48 |
| | | | | | | | 1" Ice | 23.08 | 23.08 | 1.71 |
| | | | | | | | No Ice | 6.58 | 4.96 | 0.08 |
| APXVTM14-ALU-I20 w/ Mount Pipe | A | From Centroid-Fa | 4.00 | | 40.0000 | 165.00 | 1/2" Ice | 7.03 | 5.75 | 0.13 |
| | | | 0.00 | | | | 1" Ice | 7.47 | 6.47 | 0.19 |
| | | | 0.00 | | | | No Ice | 6.58 | 4.96 | 0.08 |
| APXVTM14-ALU-I20 w/ Mount Pipe | B | From Centroid-Fa | 4.00 | | 10.0000 | 165.00 | 1/2" Ice | 7.03 | 5.75 | 0.13 |
| | | | 0.00 | | | | 1" Ice | 7.47 | 6.47 | 0.19 |
| | | | 0.00 | | | | No Ice | 6.58 | 4.96 | 0.08 |
| APXVTM14-ALU-I20 w/ Mount Pipe | C | From Centroid-Fa | 4.00 | | 80.0000 | 165.00 | 1/2" Ice | 7.03 | 5.75 | 0.13 |
| | | | 0.00 | | | | 1" Ice | 7.47 | 6.47 | 0.19 |
| | | | 0.00 | | | | No Ice | 6.58 | 4.96 | 0.08 |
| NNVV-65B-R4 w/ Mount Pipe | A | From Centroid-Fa | 4.00 | | 40.0000 | 165.00 | 1/2" Ice | 12.77 | 8.13 | 0.19 |
| | | | 0.00 | | | | 1" Ice | 13.27 | 8.97 | 0.28 |
| | | | 0.00 | | | | No Ice | 12.27 | 7.17 | 0.10 |
| NNVV-65B-R4 w/ Mount Pipe | B | From Centroid-Fa | 4.00 | | 10.0000 | 165.00 | 1/2" Ice | 12.77 | 8.13 | 0.19 |
| | | | 0.00 | | | | 1" Ice | 13.27 | 8.97 | 0.28 |
| | | | 0.00 | | | | No Ice | 12.27 | 7.17 | 0.10 |
| NNVV-65B-R4 w/ Mount Pipe | C | From Centroid-Fa | 4.00 | | 80.0000 | 165.00 | 1/2" Ice | 12.77 | 8.13 | 0.19 |
| | | | 0.00 | | | | 1" Ice | 13.27 | 8.97 | 0.28 |
| | | | 0.00 | | | | No Ice | 2.29 | 2.29 | 0.06 |
| RRH 1900 4x45 65 MHz | A | From Centroid-Fa | 4.00 | | 40.0000 | 165.00 | 1/2" Ice | 2.50 | 2.50 | 0.08 |
| | | | 0.00 | | | | 1" Ice | 2.71 | 2.71 | 0.11 |
| | | | 0.00 | | | | No Ice | 2.29 | 2.29 | 0.06 |
| RRH 1900 4x45 65 MHz | B | From Centroid-Fa | 4.00 | | 10.0000 | 165.00 | 1/2" Ice | 2.50 | 2.50 | 0.08 |
| | | | 0.00 | | | | 1" Ice | 2.71 | 2.71 | 0.11 |
| | | | 0.00 | | | | No Ice | 2.29 | 2.29 | 0.06 |
| RRH 1900 4x45 65 MHz | C | From Centroid-Fa | 4.00 | | 80.0000 | 165.00 | 1/2" Ice | 2.50 | 2.50 | 0.08 |
| | | | 0.00 | | | | 1" Ice | 2.71 | 2.71 | 0.11 |
| | | | 0.00 | | | | No Ice | 1.70 | 1.28 | 0.05 |
| 800 MHz RRH | A | From Centroid-Fa | 4.00 | | 40.0000 | 165.00 | 1/2" Ice | 1.86 | 1.43 | 0.07 |
| | | | 0.00 | | | | 1" Ice | 2.03 | 1.58 | 0.09 |
| | | | 0.00 | | | | No Ice | 1.70 | 1.28 | 0.05 |
| 800 MHz RRH | B | From Centroid-Fa | 4.00 | | 10.0000 | 165.00 | 1/2" Ice | 1.86 | 1.43 | 0.07 |
| | | | 0.00 | | | | 1" Ice | 2.03 | 1.58 | 0.09 |
| | | | 0.00 | | | | No Ice | 1.70 | 1.28 | 0.05 |
| 800 MHz RRH | C | From Centroid-Fa | 4.00 | | 80.0000 | 165.00 | 1/2" Ice | 1.86 | 1.43 | 0.07 |
| | | | 0.00 | | | | 1" Ice | 2.03 | 1.58 | 0.09 |
| | | | 0.00 | | | | No Ice | 3.70 | 1.29 | 0.07 |
| TD-RRH8x20-25 w/ Solar Shield | A | From Centroid-Fa | 4.00 | | 40.0000 | 165.00 | 1/2" Ice | 3.95 | 1.46 | 0.09 |
| | | | 0.00 | | | | 1" Ice | 4.20 | 1.64 | 0.12 |
| | | | 0.00 | | | | No Ice | 3.70 | 1.29 | 0.07 |
| TD-RRH8x20-25 w/ Solar Shield | B | From Centroid-Fa | 4.00 | | 10.0000 | 165.00 | 1/2" Ice | 3.95 | 1.46 | 0.09 |
| | | | 0.00 | | | | 1" Ice | 4.20 | 1.64 | 0.12 |
| | | | 0.00 | | | | No Ice | 3.70 | 1.29 | 0.07 |
| TD-RRH8x20-25 w/ Solar Shield | C | From Centroid-Fa | 4.00 | | 80.0000 | 165.00 | 1/2" Ice | 3.95 | 1.46 | 0.09 |
| | | | 0.00 | | | | 1" Ice | 4.20 | 1.64 | 0.12 |
| | | | 0.00 | | | | No Ice | 1.70 | 1.28 | 0.05 |
| RRH2X50-08 (800 MHz) | A | From Centroid-Fa | 4.00 | | 40.0000 | 165.00 | 1/2" Ice | 1.86 | 1.43 | 0.07 |
| | | | 0.00 | | | | No Ice | 1.70 | 1.28 | 0.05 |

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|--|----------------|-------------------|--------------------|-------------------|
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| | Project | 2022791.CT1002.17 | Date | 15:49:16 08/23/22 |
| | Client | PTI | Designed by | NMiller |

| Description | Face or Leg | Offset Type | Offsets: | | Azimuth Adjustment | Placement | C _{AA} Front | C _{AA} Side | Weight |
|--------------------------------|-------------|-------------|----------|------|--------------------|-----------|-----------------------|----------------------|--------|
| | | | Horz | Vert | | | | | |
| | | | ft | ft | ° | ft | ft ² | ft ² | K |
| RRH2X50-08 (800 MHz) | B | ce | 0.00 | | | 1" Ice | 2.03 | 1.58 | 0.09 |
| | | From | 4.00 | | 10.0000 | No Ice | 1.70 | 1.28 | 0.05 |
| | | Centroid-Fa | 0.00 | | | 1/2" Ice | 1.86 | 1.43 | 0.07 |
| RRH2X50-08 (800 MHz) | C | ce | 0.00 | | | 1" Ice | 2.03 | 1.58 | 0.09 |
| | | From | 4.00 | | 80.0000 | No Ice | 1.70 | 1.28 | 0.05 |
| | | Centroid-Fa | 0.00 | | | 1/2" Ice | 1.86 | 1.43 | 0.07 |
| Platform Mount [LP 404-1_KCKR] | C | ce | 0.00 | | | 1" Ice | 2.03 | 1.58 | 0.09 |
| | | None | | | 0.0000 | No Ice | 35.82 | 35.82 | 2.32 |
| | | | | | | 1/2" Ice | 45.85 | 45.85 | 3.02 |
| Additional Mod Components | C | ce | 0.00 | | | 1" Ice | 55.76 | 55.76 | 3.89 |
| | | None | | | 0.0000 | No Ice | 6.20 | 6.20 | 0.20 |
| | | | | | | 1/2" Ice | 7.19 | 7.19 | 0.26 |
| NNH4-65B-R6 w/ Mount Pipe | A | ce | 0.00 | | | 1" Ice | 8.18 | 8.18 | 0.32 |
| | | From | 4.00 | | 0.0000 | No Ice | 12.27 | 7.17 | 0.11 |
| | | Centroid-Fa | 0.00 | | | 1/2" Ice | 12.77 | 8.13 | 0.20 |
| NNH4-65B-R6 w/ Mount Pipe | B | ce | 0.00 | | | 1" Ice | 13.27 | 8.97 | 0.29 |
| | | From | 4.00 | | 0.0000 | No Ice | 12.27 | 7.17 | 0.11 |
| | | Centroid-Fa | 0.00 | | | 1/2" Ice | 12.77 | 8.13 | 0.20 |
| NNH4-65B-R6 w/ Mount Pipe | C | ce | 0.00 | | | 1" Ice | 13.27 | 8.97 | 0.29 |
| | | From | 4.00 | | 0.0000 | No Ice | 12.27 | 7.17 | 0.11 |
| | | Centroid-Fa | 0.00 | | | 1/2" Ice | 12.77 | 8.13 | 0.20 |
| MT6407-77A w/ Mount Pipe | A | ce | 0.00 | | | 1" Ice | 13.27 | 8.97 | 0.29 |
| | | From | 4.00 | | 0.0000 | No Ice | 4.91 | 2.68 | 0.10 |
| | | Centroid-Fa | 0.00 | | | 1/2" Ice | 5.26 | 3.14 | 0.14 |
| MT6407-77A w/ Mount Pipe | B | ce | 0.00 | | | 1" Ice | 5.61 | 3.62 | 0.18 |
| | | From | 4.00 | | 0.0000 | No Ice | 4.91 | 2.68 | 0.10 |
| | | Centroid-Fa | 0.00 | | | 1/2" Ice | 5.26 | 3.14 | 0.14 |
| MT6407-77A w/ Mount Pipe | C | ce | 0.00 | | | 1" Ice | 5.61 | 3.62 | 0.18 |
| | | From | 4.00 | | 0.0000 | No Ice | 4.91 | 2.68 | 0.10 |
| | | Centroid-Fa | 0.00 | | | 1/2" Ice | 5.26 | 3.14 | 0.14 |
| XXDWMM w/ Mount Pipe | A | ce | 0.00 | | | 1" Ice | 5.61 | 3.62 | 0.18 |
| | | From | 4.00 | | 0.0000 | No Ice | 2.64 | 2.18 | 0.05 |
| | | Centroid-Fa | 0.00 | | | 1/2" Ice | 3.19 | 2.80 | 0.08 |
| XXDWMM w/ Mount Pipe | B | ce | 0.00 | | | 1" Ice | 3.64 | 3.29 | 0.11 |
| | | From | 4.00 | | 0.0000 | No Ice | 2.64 | 2.18 | 0.05 |
| | | Centroid-Fa | 0.00 | | | 1/2" Ice | 3.19 | 2.80 | 0.08 |
| XXDWMM w/ Mount Pipe | C | ce | 0.00 | | | 1" Ice | 3.64 | 3.29 | 0.11 |
| | | From | 4.00 | | 0.0000 | No Ice | 2.64 | 2.18 | 0.05 |
| | | Centroid-Fa | 0.00 | | | 1/2" Ice | 3.19 | 2.80 | 0.08 |
| RF4439D-25A | A | ce | 0.00 | | | 1" Ice | 3.64 | 3.29 | 0.11 |
| | | From | 4.00 | | 0.0000 | No Ice | 1.87 | 1.25 | 0.07 |
| | | Centroid-Fa | 0.00 | | | 1/2" Ice | 2.03 | 1.39 | 0.09 |
| RF4439D-25A | B | ce | 0.00 | | | 1" Ice | 2.21 | 1.54 | 0.11 |
| | | From | 4.00 | | 0.0000 | No Ice | 1.87 | 1.25 | 0.07 |
| | | Centroid-Fa | 0.00 | | | 1/2" Ice | 2.03 | 1.39 | 0.09 |
| RF4439D-25A | C | ce | 0.00 | | | 1" Ice | 2.21 | 1.54 | 0.11 |
| | | From | 4.00 | | 0.0000 | No Ice | 1.87 | 1.25 | 0.07 |
| | | Centroid-Fa | 0.00 | | | 1/2" Ice | 2.03 | 1.39 | 0.09 |
| RF4440D-13A | A | ce | 0.00 | | | 1" Ice | 2.21 | 1.54 | 0.11 |
| | | From | 4.00 | | 0.0000 | No Ice | 1.87 | 1.13 | 0.07 |
| | | Centroid-Fa | 0.00 | | | 1/2" Ice | 2.03 | 1.27 | 0.09 |
| RF4440D-13A | B | ce | 0.00 | | | 1" Ice | 2.21 | 1.41 | 0.11 |
| | | From | 4.00 | | 0.0000 | No Ice | 1.87 | 1.13 | 0.07 |
| | | Centroid-Fa | 0.00 | | | 1/2" Ice | 2.03 | 1.27 | 0.09 |
| RF4440D-13A | C | ce | 0.00 | | | 1" Ice | 2.21 | 1.41 | 0.11 |
| | | From | 4.00 | | 0.0000 | No Ice | 1.87 | 1.13 | 0.07 |
| | | Centroid-Fa | 0.00 | | | 1/2" Ice | 2.03 | 1.27 | 0.09 |

| | | | | |
|--|----------------|-------------------|--------------------|-------------------|
| tnxTower GPD 520 South Main Street Suite 2531 Akron, Ohio 44311 Phone: (330) 572-2100 FAX: (330) 572-2101 | Job | US-CT-1002 | Page | 23 of 32 |
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| | Client | PTI | Designed by | NMiller |

| Description | Face or Leg | Offset Type | Offsets: | | Azimuth Adjustment | Placement | C _{AA} Front | C _{AA} Side | Weight | |
|---------------------------------|-------------|-------------|----------|------|--------------------|-----------|-----------------------|----------------------|--------|------|
| | | | Horz | Vert | | | | | | |
| | | | ft | ft | ° | ft | ft ² | ft ² | K | |
| RVZDC-6627-PF-48 | A | ce | 0.00 | | 0.0000 | 155.00 | 1" Ice | 2.21 | 1.41 | 0.11 |
| | | From | 4.00 | | | | No Ice | 3.79 | 2.51 | 0.03 |
| | | Centroid-Fa | 0.00 | | | | 1/2" Ice | 4.04 | 2.73 | 0.06 |
| (2) Pipe 2 Std x 6' | A | ce | 0.00 | | 0.0000 | 155.00 | 1" Ice | 4.30 | 2.95 | 0.10 |
| | | From | 4.00 | | | | No Ice | 1.43 | 1.43 | 0.02 |
| | | Centroid-Fa | 0.00 | | | | 1/2" Ice | 1.93 | 1.93 | 0.03 |
| (2) Pipe 2 Std x 6' | B | ce | 0.00 | | 0.0000 | 155.00 | 1" Ice | 2.30 | 2.30 | 0.05 |
| | | From | 4.00 | | | | No Ice | 1.43 | 1.43 | 0.02 |
| | | Centroid-Fa | 0.00 | | | | 1/2" Ice | 1.93 | 1.93 | 0.03 |
| (2) Pipe 2 Std x 6' | C | ce | 0.00 | | 0.0000 | 155.00 | 1" Ice | 2.30 | 2.30 | 0.05 |
| | | From | 4.00 | | | | No Ice | 1.43 | 1.43 | 0.02 |
| | | Centroid-Fa | 0.00 | | | | 1/2" Ice | 1.93 | 1.93 | 0.03 |
| SNP8HR-396 | C | ce | 0.00 | | 0.0000 | 140.00 | 1" Ice | 2.30 | 2.30 | 0.05 |
| | | From | 4.00 | | | | No Ice | 26.80 | 26.80 | 1.51 |
| | | Centroid-Fa | 0.00 | | | | 1/2" Ice | 32.20 | 32.20 | 1.81 |
| MX08FRO665-20_V0F w/ Mount Pipe | A | From Leg | 3.00 | | 0.0000 | 140.00 | 1" Ice | 37.60 | 37.60 | 2.11 |
| | | | 0.00 | | | | No Ice | 12.96 | 7.77 | 0.08 |
| | | | 0.00 | | | | 1/2" Ice | 13.67 | 9.05 | 0.18 |
| MX08FRO665-20_V0F w/ Mount Pipe | B | From Leg | 3.00 | | 0.0000 | 140.00 | 1" Ice | 14.34 | 10.19 | 0.28 |
| | | | 0.00 | | | | No Ice | 12.96 | 7.77 | 0.08 |
| | | | 0.00 | | | | 1/2" Ice | 13.67 | 9.05 | 0.18 |
| MX08FRO665-20_V0F w/ Mount Pipe | C | From Leg | 3.00 | | 0.0000 | 140.00 | 1" Ice | 14.34 | 10.19 | 0.28 |
| | | | 0.00 | | | | No Ice | 12.96 | 7.77 | 0.08 |
| | | | 0.00 | | | | 1/2" Ice | 13.67 | 9.05 | 0.18 |
| TA8025-B605 | A | From Leg | 3.00 | | 0.0000 | 140.00 | 1" Ice | 14.34 | 10.19 | 0.28 |
| | | | 0.00 | | | | No Ice | 1.96 | 1.05 | 0.06 |
| | | | 0.00 | | | | 1/2" Ice | 2.14 | 1.18 | 0.08 |
| TA8025-B605 | B | From Leg | 3.00 | | 0.0000 | 140.00 | 1" Ice | 2.32 | 1.32 | 0.10 |
| | | | 0.00 | | | | No Ice | 1.96 | 1.05 | 0.06 |
| | | | 0.00 | | | | 1/2" Ice | 2.14 | 1.18 | 0.08 |
| TA8025-B605 | C | From Leg | 3.00 | | 0.0000 | 140.00 | 1" Ice | 2.32 | 1.32 | 0.10 |
| | | | 0.00 | | | | No Ice | 1.96 | 1.05 | 0.06 |
| | | | 0.00 | | | | 1/2" Ice | 2.14 | 1.18 | 0.08 |
| TA8025-B604 | A | From Leg | 3.00 | | 0.0000 | 140.00 | 1" Ice | 2.32 | 1.32 | 0.10 |
| | | | 0.00 | | | | No Ice | 1.96 | 1.05 | 0.06 |
| | | | 0.00 | | | | 1/2" Ice | 2.14 | 1.18 | 0.08 |
| TA8025-B604 | B | From Leg | 3.00 | | 0.0000 | 140.00 | 1" Ice | 2.32 | 1.32 | 0.10 |
| | | | 0.00 | | | | No Ice | 1.96 | 1.05 | 0.06 |
| | | | 0.00 | | | | 1/2" Ice | 2.14 | 1.18 | 0.08 |
| TA8025-B604 | C | From Leg | 3.00 | | 0.0000 | 140.00 | 1" Ice | 2.32 | 1.32 | 0.10 |
| | | | 0.00 | | | | No Ice | 1.96 | 1.05 | 0.06 |
| | | | 0.00 | | | | 1/2" Ice | 2.14 | 1.18 | 0.08 |
| Junction Box | A | From Leg | 3.00 | | 0.0000 | 140.00 | 1" Ice | 2.32 | 1.32 | 0.10 |
| | | | 0.00 | | | | No Ice | 1.03 | 2.31 | 0.03 |
| | | | 0.00 | | | | 1/2" Ice | 1.17 | 2.50 | 0.05 |
| DISH Reserved | A | From Leg | 3.00 | | 0.0000 | 140.00 | 1" Ice | 1.31 | 2.70 | 0.07 |
| | | | 0.00 | | | | No Ice | 17.44 | 14.76 | 0.16 |
| | | | 0.00 | | | | 1/2" Ice | 18.90 | 16.30 | 0.24 |
| DISH Reserved | B | From Leg | 3.00 | | 0.0000 | 140.00 | 1" Ice | 20.24 | 17.70 | 0.34 |
| | | | 0.00 | | | | No Ice | 17.44 | 14.76 | 0.16 |
| | | | 0.00 | | | | 1/2" Ice | 18.90 | 16.30 | 0.24 |
| DISH Reserved | C | From Leg | 3.00 | | 0.0000 | 140.00 | 1" Ice | 20.24 | 17.70 | 0.34 |
| | | | 0.00 | | | | No Ice | 17.44 | 14.76 | 0.16 |
| | | | 0.00 | | | | 1/2" Ice | 18.90 | 16.30 | 0.24 |
| (2) Pipe 2 Std x 8' | A | From Leg | 3.00 | | 0.0000 | 140.00 | 1" Ice | 20.24 | 17.70 | 0.34 |
| | | | 0.00 | | | | No Ice | 1.90 | 1.90 | 0.03 |
| | | | 0.00 | | | | 1/2" Ice | 2.73 | 2.73 | 0.04 |

| | | | | |
|--|----------------|-------------------|--------------------|-------------------|
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| | Client | PTI | Designed by | NMiller |

| Description | Face or Leg | Offset Type | Offsets: | | Azimuth Adjustment | Placement | C _{AA} Front | C _{AA} Side | Weight | |
|-------------------------------|-------------|-------------|----------|---------|--------------------|-----------|-----------------------|----------------------|--------|------|
| | | | Horz | Lateral | | | | | | Vert |
| (2) Pipe 2 Std x 8' | B | From Leg | 0.00 | | 0.0000 | 140.00 | 1" Ice | 3.40 | 3.40 | 0.06 |
| | | | 3.00 | | | | No Ice | 1.90 | 1.90 | 0.03 |
| | | | 0.00 | | | | 1/2" Ice | 2.73 | 2.73 | 0.04 |
| (2) Pipe 2 Std x 8' | C | From Leg | 0.00 | | 0.0000 | 140.00 | 1" Ice | 3.40 | 3.40 | 0.06 |
| | | | 3.00 | | | | No Ice | 1.90 | 1.90 | 0.03 |
| | | | 0.00 | | | | 1/2" Ice | 2.73 | 2.73 | 0.04 |
| Pipe Mount 3'x4.5" | C | From Leg | 0.00 | | 0.0000 | 75.00 | 1" Ice | 3.40 | 3.40 | 0.06 |
| | | | 0.50 | | | | No Ice | 0.89 | 0.89 | 0.03 |
| | | | 0.00 | | | | 1/2" Ice | 1.12 | 1.12 | 0.04 |
| GPS-TMG-HR-26N | C | From Leg | 0.00 | | 0.0000 | 75.00 | 1" Ice | 1.33 | 1.33 | 0.05 |
| | | | 0.50 | | | | No Ice | 0.13 | 0.13 | 0.00 |
| | | | 0.00 | | | | 1/2" Ice | 0.18 | 0.18 | 0.00 |
| Bridge Stiffener (3.25 sq ft) | A | From Leg | 0.00 | | 90.0000 | 120.00 | 1" Ice | 0.24 | 0.24 | 0.01 |
| | | | 0.50 | | | | No Ice | 3.25 | 0.74 | 0.00 |
| | | | 0.00 | | | | 1/2" Ice | 3.60 | 1.25 | 0.00 |
| Bridge Stiffener (3.25 sq ft) | B | From Leg | 0.00 | | 90.0000 | 120.00 | 1" Ice | 3.94 | 1.73 | 0.00 |
| | | | 0.50 | | | | No Ice | 3.25 | 0.74 | 0.00 |
| | | | 0.00 | | | | 1/2" Ice | 3.60 | 1.25 | 0.00 |
| Bridge Stiffener (3.25 sq ft) | C | From Leg | 0.00 | | 90.0000 | 120.00 | 1" Ice | 3.94 | 1.73 | 0.00 |
| | | | 0.50 | | | | No Ice | 3.25 | 0.74 | 0.00 |
| | | | 0.00 | | | | 1/2" Ice | 3.60 | 1.25 | 0.00 |
| Bridge Stiffener (3.25 sq ft) | A | From Leg | 0.00 | | 90.0000 | 100.00 | 1" Ice | 3.94 | 1.73 | 0.00 |
| | | | 0.50 | | | | No Ice | 3.25 | 0.74 | 0.00 |
| | | | 0.00 | | | | 1/2" Ice | 3.60 | 1.25 | 0.00 |
| Bridge Stiffener (3.25 sq ft) | B | From Leg | 0.00 | | 90.0000 | 100.00 | 1" Ice | 3.94 | 1.73 | 0.00 |
| | | | 0.50 | | | | No Ice | 3.25 | 0.74 | 0.00 |
| | | | 0.00 | | | | 1/2" Ice | 3.60 | 1.25 | 0.00 |
| Bridge Stiffener (3.25 sq ft) | C | From Leg | 0.00 | | 90.0000 | 100.00 | 1" Ice | 3.94 | 1.73 | 0.00 |
| | | | 0.50 | | | | No Ice | 3.25 | 0.74 | 0.00 |
| | | | 0.00 | | | | 1/2" Ice | 3.60 | 1.25 | 0.00 |
| Bridge Stiffener (3.25 sq ft) | A | From Leg | 0.00 | | 90.0000 | 80.00 | 1" Ice | 3.94 | 1.73 | 0.00 |
| | | | 0.50 | | | | No Ice | 3.25 | 0.74 | 0.00 |
| | | | 0.00 | | | | 1/2" Ice | 3.60 | 1.25 | 0.00 |
| Bridge Stiffener (3.25 sq ft) | B | From Leg | 0.00 | | 90.0000 | 80.00 | 1" Ice | 3.94 | 1.73 | 0.00 |
| | | | 0.50 | | | | No Ice | 3.25 | 0.74 | 0.00 |
| | | | 0.00 | | | | 1/2" Ice | 3.60 | 1.25 | 0.00 |
| Bridge Stiffener (3.25 sq ft) | C | From Leg | 0.00 | | 90.0000 | 80.00 | 1" Ice | 3.94 | 1.73 | 0.00 |
| | | | 0.50 | | | | No Ice | 3.25 | 0.74 | 0.00 |
| | | | 0.00 | | | | 1/2" Ice | 3.60 | 1.25 | 0.00 |
| | | | 0.00 | | | | 1" Ice | 3.94 | 1.73 | 0.00 |

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 30 deg - No Ice |
| 5 | 0.9 Dead+1.0 Wind 30 deg - No Ice |
| 6 | 1.2 Dead+1.0 Wind 60 deg - No Ice |

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| | Client PTI | Designed by NMiller |

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

Maximum Tower Deflections - Service Wind

| Section No. | Elevation ft | Horz. Deflection in | Gov. Load Comb. | Tilt ° | Twist ° |
|-------------|-----------------|------------------------|--------------------|-----------|------------|
| L1 | 196 - 195 | 19.276 | 40 | 0.8936 | 0.0011 |
| L2 | 195 - 190 | 19.089 | 40 | 0.8936 | 0.0011 |
| L3 | 190 - 185 | 18.157 | 40 | 0.8918 | 0.0009 |
| L4 | 185 - 180 | 17.229 | 40 | 0.8844 | 0.0008 |
| L5 | 180 - 175 | 16.313 | 40 | 0.8688 | 0.0007 |
| L6 | 175 - 170 | 15.413 | 40 | 0.8554 | 0.0007 |
| L7 | 170 - 165 | 14.529 | 40 | 0.8362 | 0.0007 |
| L8 | 165 - 160 | 13.668 | 40 | 0.8110 | 0.0007 |
| L9 | 160 - 155 | 12.837 | 40 | 0.7788 | 0.0006 |

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| | Project | 2022791.CT1002.17 | Date | 15:49:16 08/23/22 |
| | Client | PTI | Designed by | NMiller |

| Section No. | Elevation ft | Horz. Deflection in | Gov. Load Comb. | Tilt ° | Twist ° |
|-------------|-----------------|------------------------|-----------------|-----------|------------|
| L10 | 155 - 150 | 12.034 | 40 | 0.7559 | 0.0006 |
| L11 | 150 - 145 | 11.258 | 40 | 0.7278 | 0.0005 |
| L12 | 145 - 140 | 10.514 | 40 | 0.6941 | 0.0005 |
| L13 | 140 - 136.25 | 9.808 | 40 | 0.6545 | 0.0004 |
| L14 | 136.25 - 136 | 9.302 | 40 | 0.6335 | 0.0004 |
| L15 | 136 - 131 | 9.269 | 40 | 0.6327 | 0.0004 |
| L16 | 131 - 126 | 8.616 | 40 | 0.6134 | 0.0004 |
| L17 | 126 - 121 | 7.985 | 40 | 0.5915 | 0.0003 |
| L18 | 121 - 120 | 7.378 | 40 | 0.5669 | 0.0003 |
| L19 | 120 - 115 | 7.260 | 40 | 0.5616 | 0.0003 |
| L20 | 115 - 110 | 6.682 | 40 | 0.5418 | 0.0003 |
| L21 | 110 - 105 | 6.126 | 40 | 0.5200 | 0.0003 |
| L22 | 105 - 100 | 5.594 | 40 | 0.4962 | 0.0002 |
| L23 | 100 - 95 | 5.087 | 40 | 0.4703 | 0.0002 |
| L24 | 95 - 90 | 4.606 | 40 | 0.4495 | 0.0002 |
| L25 | 90 - 85 | 4.147 | 40 | 0.4270 | 0.0002 |
| L26 | 85 - 80 | 3.712 | 40 | 0.4030 | 0.0002 |
| L27 | 80 - 75 | 3.303 | 40 | 0.3773 | 0.0002 |
| L28 | 75 - 70 | 2.919 | 40 | 0.3570 | 0.0002 |
| L29 | 70 - 65 | 2.556 | 40 | 0.3354 | 0.0001 |
| L30 | 65 - 60 | 2.217 | 40 | 0.3126 | 0.0001 |
| L31 | 60 - 55 | 1.902 | 40 | 0.2885 | 0.0001 |
| L32 | 55 - 50 | 1.610 | 40 | 0.2676 | 0.0001 |
| L33 | 50 - 45 | 1.342 | 40 | 0.2457 | 0.0001 |
| L34 | 45 - 40 | 1.096 | 40 | 0.2227 | 0.0001 |
| L35 | 40 - 35 | 0.876 | 40 | 0.1986 | 0.0001 |
| L36 | 35 - 30 | 0.679 | 40 | 0.1772 | 0.0001 |
| L37 | 30 - 25 | 0.505 | 40 | 0.1548 | 0.0001 |
| L38 | 25 - 20 | 0.355 | 40 | 0.1314 | 0.0000 |
| L39 | 20 - 15 | 0.230 | 40 | 0.1071 | 0.0000 |
| L40 | 15 - 10 | 0.131 | 40 | 0.0818 | 0.0000 |
| L41 | 10 - 5 | 0.059 | 40 | 0.0555 | 0.0000 |
| L42 | 5 - 0 | 0.015 | 40 | 0.0283 | 0.0000 |

Critical Deflections and Radius of Curvature - Service Wind

| Elevation ft | Appurtenance | Gov. Load Comb. | Deflection in | Tilt ° | Twist ° | Radius of Curvature ft |
|-----------------|--|-----------------|------------------|-----------|------------|---------------------------|
| 195.00 | Pirod 16.5' LP Platform | 40 | 19.089 | 0.8936 | 0.0011 | 84164 |
| 193.00 | (3) Commscope VSR-MA-B w/ 15.5' Horizontal Pipe | 40 | 18.716 | 0.8933 | 0.0010 | 84164 |
| 185.00 | PiROD 13' Low Profile Platform (Monopole) | 40 | 17.229 | 0.8844 | 0.0009 | 25703 |
| 175.00 | Valmont Light Duty Tri-Bracket (1) | 40 | 15.413 | 0.8554 | 0.0008 | 17588 |
| 165.00 | MTS 12.5' LP Platform | 40 | 13.668 | 0.8110 | 0.0007 | 10009 |
| 155.00 | Platform Mount [LP 404-1_KCKR] | 40 | 12.034 | 0.7559 | 0.0006 | 11260 |
| 140.00 | SNP8HR-396 | 40 | 9.808 | 0.6545 | 0.0004 | 8449 |
| 120.00 | Bridge Stiffener (3.25 sq ft) | 40 | 7.260 | 0.5616 | 0.0003 | 12632 |
| 100.00 | Bridge Stiffener (3.25 sq ft) | 40 | 5.087 | 0.4703 | 0.0002 | 12210 |
| 80.00 | Bridge Stiffener (3.25 sq ft) | 40 | 3.303 | 0.3773 | 0.0002 | 12440 |
| 75.00 | Pipe Mount 3'x4.5" | 40 | 2.919 | 0.3570 | 0.0002 | 13686 |

| | | | | |
|--|----------------|-------------------|--------------------|-------------------|
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| | Client | PTI | Designed by | NMiller |

Maximum Tower Deflections - Design Wind

| Section No. | Elevation ft | Horz. Deflection in | Gov. Load Comb. | Tilt ° | Twist ° |
|-------------|-----------------|------------------------|-----------------|-----------|------------|
| L1 | 196 - 195 | 86.710 | 20 | 4.0217 | 0.0047 |
| L2 | 195 - 190 | 85.869 | 20 | 4.0217 | 0.0047 |
| L3 | 190 - 185 | 81.663 | 20 | 4.0137 | 0.0039 |
| L4 | 185 - 180 | 77.478 | 20 | 3.9803 | 0.0034 |
| L5 | 180 - 175 | 73.346 | 20 | 3.9100 | 0.0030 |
| L6 | 175 - 170 | 69.291 | 4 | 3.8496 | 0.0031 |
| L7 | 170 - 165 | 65.318 | 4 | 3.7634 | 0.0031 |
| L8 | 165 - 160 | 61.449 | 4 | 3.6499 | 0.0032 |
| L9 | 160 - 155 | 57.712 | 4 | 3.5053 | 0.0028 |
| L10 | 155 - 150 | 54.105 | 4 | 3.4020 | 0.0026 |
| L11 | 150 - 145 | 50.616 | 4 | 3.2759 | 0.0023 |
| L12 | 145 - 140 | 47.270 | 4 | 3.1241 | 0.0020 |
| L13 | 140 - 136.25 | 44.095 | 4 | 2.9462 | 0.0018 |
| L14 | 136.25 - 136 | 41.820 | 4 | 2.8508 | 0.0016 |
| L15 | 136 - 131 | 41.671 | 4 | 2.8468 | 0.0016 |
| L16 | 131 - 126 | 38.737 | 4 | 2.7597 | 0.0015 |
| L17 | 126 - 121 | 35.900 | 4 | 2.6611 | 0.0014 |
| L18 | 121 - 120 | 33.172 | 4 | 2.5500 | 0.0013 |
| L19 | 120 - 115 | 32.640 | 4 | 2.5263 | 0.0013 |
| L20 | 115 - 110 | 30.042 | 4 | 2.4373 | 0.0012 |
| L21 | 110 - 105 | 27.542 | 4 | 2.3393 | 0.0011 |
| L22 | 105 - 100 | 25.148 | 4 | 2.2321 | 0.0010 |
| L23 | 100 - 95 | 22.872 | 4 | 2.1155 | 0.0010 |
| L24 | 95 - 90 | 20.706 | 4 | 2.0217 | 0.0009 |
| L25 | 90 - 85 | 18.642 | 4 | 1.9207 | 0.0008 |
| L26 | 85 - 80 | 16.687 | 4 | 1.8125 | 0.0008 |
| L27 | 80 - 75 | 14.850 | 4 | 1.6969 | 0.0007 |
| L28 | 75 - 70 | 13.121 | 4 | 1.6055 | 0.0007 |
| L29 | 70 - 65 | 11.490 | 4 | 1.5084 | 0.0006 |
| L30 | 65 - 60 | 9.964 | 4 | 1.4057 | 0.0006 |
| L31 | 60 - 55 | 8.549 | 4 | 1.2972 | 0.0005 |
| L32 | 55 - 50 | 7.239 | 4 | 1.2034 | 0.0005 |
| L33 | 50 - 45 | 6.030 | 4 | 1.1048 | 0.0004 |
| L34 | 45 - 40 | 4.927 | 4 | 1.0013 | 0.0004 |
| L35 | 40 - 35 | 3.935 | 4 | 0.8928 | 0.0003 |
| L36 | 35 - 30 | 3.050 | 4 | 0.7964 | 0.0003 |
| L37 | 30 - 25 | 2.269 | 4 | 0.6958 | 0.0002 |
| L38 | 25 - 20 | 1.595 | 4 | 0.5908 | 0.0002 |
| L39 | 20 - 15 | 1.033 | 4 | 0.4815 | 0.0002 |
| L40 | 15 - 10 | 0.588 | 4 | 0.3677 | 0.0001 |
| L41 | 10 - 5 | 0.264 | 4 | 0.2496 | 0.0001 |
| L42 | 5 - 0 | 0.067 | 4 | 0.1270 | 0.0000 |

Critical Deflections and Radius of Curvature - Design Wind

| Elevation ft | Appurtenance | Gov. Load Comb. | Deflection in | Tilt ° | Twist ° | Radius of Curvature ft |
|-----------------|--|-----------------|------------------|-----------|------------|---------------------------|
| 195.00 | PiROD 16.5' LP Platform | 20 | 85.869 | 4.0217 | 0.0051 | 18882 |
| 193.00 | (3) Commscope VSR-MA-B w/ 15.5' Horizontal Pipe | 20 | 84.186 | 4.0204 | 0.0050 | 18882 |
| 185.00 | PiROD 13' Low Profile Platform (Monopole) | 20 | 77.478 | 3.9803 | 0.0041 | 5767 |
| 175.00 | Valmont Light Duty Tri-Bracket (1) | 4 | 69.291 | 3.8496 | 0.0036 | 3949 |

| | | | | |
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| | Client | PTI | Designed by | NMiller |

| Elevation | Appurtenance | Gov. Load Comb. | Deflection in | Tilt ° | Twist ° | Radius of Curvature ft |
|-----------|--------------------------------|-----------------|---------------|--------|---------|------------------------|
| 165.00 | MTS 12.5' LP Platform | 4 | 61.449 | 3.6499 | 0.0035 | 2246 |
| 155.00 | Platform Mount [LP 404-1_KCKR] | 4 | 54.105 | 3.4020 | 0.0029 | 2524 |
| 140.00 | SNP8HR-396 | 4 | 44.095 | 2.9462 | 0.0019 | 1887 |
| 120.00 | Bridge Stiffener (3.25 sq ft) | 4 | 32.640 | 2.5263 | 0.0014 | 2816 |
| 100.00 | Bridge Stiffener (3.25 sq ft) | 4 | 22.872 | 2.1155 | 0.0010 | 2719 |
| 80.00 | Bridge Stiffener (3.25 sq ft) | 4 | 14.850 | 1.6969 | 0.0007 | 2768 |
| 75.00 | Pipe Mount 3'x4.5" | 4 | 13.121 | 1.6055 | 0.0007 | 3046 |

Compression Checks

Pole Design Data

| Section No. | Elevation ft | Size | L ft | L _u ft | Kl/r | A in ² | P _u K |
|-------------|-------------------|------------|------|-------------------|------|-------------------|------------------|
| L1 | 196 - 195 (1) | P18x0.375 | 1.00 | 0.00 | 0.0 | 20.7640 | -0.12 |
| L2 | 195 - 190 (2) | P24x0.375 | 5.00 | 0.00 | 0.0 | 27.8325 | -5.33 |
| L3 | 190 - 185 (3) | P24x0.375 | 5.00 | 0.00 | 0.0 | 27.8325 | -5.97 |
| L4 | 185 - 180 (4) | P24x0.375 | 5.00 | 0.00 | 0.0 | 27.8325 | -9.70 |
| L5 | 180 - 175 (5) | P30x0.375 | 5.00 | 0.00 | 0.0 | 34.9011 | -10.55 |
| L6 | 175 - 170 (6) | P30x0.375 | 5.00 | 0.00 | 0.0 | 34.9011 | -11.64 |
| L7 | 170 - 165 (7) | P30x0.375 | 5.00 | 0.00 | 0.0 | 34.9011 | -12.54 |
| L8 | 165 - 160 (8) | P30x0.375 | 5.00 | 0.00 | 0.0 | 34.9011 | -16.25 |
| L9 | 160 - 155 (9) | P36x0.375 | 5.00 | 0.00 | 0.0 | 41.9697 | -17.32 |
| L10 | 155 - 150 (10) | P36x0.375 | 5.00 | 0.00 | 0.0 | 41.9697 | -22.86 |
| L11 | 150 - 145 (11) | P36x0.375 | 5.00 | 0.00 | 0.0 | 41.9697 | -24.02 |
| L12 | 145 - 140 (12) | P36x0.375 | 5.00 | 0.00 | 0.0 | 41.9697 | -25.19 |
| L13 | 140 - 136.25 (13) | P42x0.375 | 3.75 | 0.00 | 0.0 | 49.0383 | -29.30 |
| L14 | 136.25 - 136 (14) | P42x0.6375 | 0.25 | 0.00 | 0.0 | 82.8394 | -29.40 |
| L15 | 136 - 131 (15) | P42x0.6375 | 5.00 | 0.00 | 0.0 | 82.8394 | -31.29 |
| L16 | 131 - 126 (16) | P42x0.6375 | 5.00 | 0.00 | 0.0 | 82.8394 | -33.19 |
| L17 | 126 - 121 (17) | P42x0.6375 | 5.00 | 0.00 | 0.0 | 82.8394 | -35.09 |
| L18 | 121 - 120 (18) | P42x0.6375 | 1.00 | 0.00 | 0.0 | 82.8394 | -35.47 |
| L19 | 120 - 115 (19) | P48x0.6 | 5.00 | 0.00 | 0.0 | 89.3469 | -37.52 |
| L20 | 115 - 110 (20) | P48x0.6 | 5.00 | 0.00 | 0.0 | 89.3469 | -39.56 |
| L21 | 110 - 105 (21) | P48x0.6 | 5.00 | 0.00 | 0.0 | 89.3469 | -41.61 |
| L22 | 105 - 100 (22) | P48x0.6 | 5.00 | 0.00 | 0.0 | 89.3469 | -43.67 |
| L23 | 100 - 95 (23) | P54x0.5625 | 5.00 | 0.00 | 0.0 | 94.4319 | -45.87 |
| L24 | 95 - 90 (24) | P54x0.5625 | 5.00 | 0.00 | 0.0 | 94.4319 | -48.07 |
| L25 | 90 - 85 (25) | P54x0.5625 | 5.00 | 0.00 | 0.0 | 94.4319 | -50.27 |
| L26 | 85 - 80 (26) | P54x0.5625 | 5.00 | 0.00 | 0.0 | 94.4319 | -52.48 |
| L27 | 80 - 75 (27) | P60x0.55 | 5.00 | 0.00 | 0.0 | 102.722 | -54.82 |
| L28 | 75 - 70 (28) | P60x0.55 | 5.00 | 0.00 | 0.0 | 102.722 | -57.20 |
| L29 | 70 - 65 (29) | P60x0.55 | 5.00 | 0.00 | 0.0 | 102.722 | -59.56 |
| L30 | 65 - 60 (30) | P60x0.55 | 5.00 | 0.00 | 0.0 | 102.722 | -62.80 |
| L31 | 60 - 55 (31) | P60x0.675 | 5.00 | 0.00 | 0.0 | 125.803 | -66.51 |
| L32 | 55 - 50 (32) | P60x0.675 | 5.00 | 0.00 | 0.0 | 125.803 | -69.34 |

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| Section No. | Elevation ft | Size | L ft | L _u ft | Kl/r | A in ² | P _u K |
|-------------|-----------------|-----------|---------|----------------------|------|----------------------|---------------------|
| L33 | 50 - 45 (33) | P60x0.675 | 5.00 | 0.00 | 0.0 | 125.803 | -72.18 |
| L34 | 45 - 40 (34) | P60x0.675 | 5.00 | 0.00 | 0.0 | 125.803 | -76.15 |
| L35 | 40 - 35 (35) | P60x0.8 | 5.00 | 0.00 | 0.0 | 148.786 | -80.58 |
| L36 | 35 - 30 (36) | P60x0.8 | 5.00 | 0.00 | 0.0 | 148.786 | -83.90 |
| L37 | 30 - 25 (37) | P60x0.8 | 5.00 | 0.00 | 0.0 | 148.786 | -87.21 |
| L38 | 25 - 20 (38) | P60x0.8 | 5.00 | 0.00 | 0.0 | 148.786 | -91.66 |
| L39 | 20 - 15 (39) | P60x0.8 | 5.00 | 0.00 | 0.0 | 148.786 | -96.11 |
| L40 | 15 - 10 (40) | P60x0.8 | 5.00 | 0.00 | 0.0 | 148.786 | -99.44 |
| L41 | 10 - 5 (41) | P60x0.8 | 5.00 | 0.00 | 0.0 | 148.786 | -102.62 |
| L42 | 5 - 0 (42) | P60x0.8 | 5.00 | 0.00 | 0.0 | 148.786 | -105.68 |

¹ P_u / φP_n controls

Pole Bending Design Data

| Section No. | Elevation ft | Size | M _{ux} kip-ft | φM _{ux} kip-ft |
|-------------|----------------------|------------|---------------------------|----------------------------|
| L1 | 196 - 195 (1) | P18x0.375 | 0.02 | 367.00 |
| L2 | 195 - 190 (2) | P24x0.375 | 27.93 | 623.72 |
| L3 | 190 - 185 (3) | P24x0.375 | 63.75 | 623.72 |
| L4 | 185 - 180 (4) | P24x0.375 | 129.34 | 623.72 |
| L5 | 180 - 175 (5) | P30x0.375 | 196.67 | 947.86 |
| L6 | 175 - 170 (6) | P30x0.375 | 269.26 | 947.86 |
| L7 | 170 - 165 (7) | P30x0.375 | 343.71 | 947.86 |
| L8 | 165 - 160 (8) | P30x0.375 | 436.81 | 947.86 |
| L9 | 160 - 155 (9) | P36x0.375 | 531.85 | 1338.81 |
| L10 | 155 - 150 (10) | P36x0.375 | 650.83 | 1338.81 |
| L11 | 150 - 145 (11) | P36x0.375 | 771.72 | 1338.81 |
| L12 | 145 - 140 (12) | P36x0.375 | 894.48 | 1338.81 |
| L13 | 140 - 136.25 (13) | P42x0.375 | 1005.16 | 1796.56 |
| L14 | 136.25 - 136 (14) | P42x0.6375 | 1012.58 | 3234.64 |
| L15 | 136 - 131 (15) | P42x0.6375 | 1162.53 | 3234.64 |
| L16 | 131 - 126 (16) | P42x0.6375 | 1314.90 | 3234.64 |
| L17 | 126 - 121 (17) | P42x0.6375 | 1469.55 | 3234.64 |
| L18 | 121 - 120 (18) | P42x0.6375 | 1500.74 | 3234.64 |
| L19 | 120 - 115 (19) | P48x0.6 | 1658.19 | 3882.43 |
| L20 | 115 - 110 (20) | P48x0.6 | 1818.14 | 3882.43 |
| L21 | 110 - 105 (21) | P48x0.6 | 1980.49 | 3882.43 |
| L22 | 105 - 100 (22) | P48x0.6 | 2145.14 | 3882.43 |
| L23 | 100 - 95 (23) | P54x0.5625 | 2312.20 | 4518.48 |
| L24 | 95 - 90 (24) | P54x0.5625 | 2481.77 | 4518.48 |
| L25 | 90 - 85 (25) | P54x0.5625 | 2653.75 | 4518.48 |

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| | Client | PTI | Designed by | NMiller |

| Section No. | Elevation ft | Size | M_{ux} kip-ft | ϕM_{ux} kip-ft |
|-------------|-----------------|------------|--------------------|-------------------------|
| L26 | 85 - 80 (26) | P54x0.5625 | 2828.03 | 4518.48 |
| L27 | 80 - 75 (27) | P60x0.55 | 3005.66 | 5389.82 |
| L28 | 75 - 70 (28) | P60x0.55 | 3186.35 | 5389.82 |
| L29 | 70 - 65 (29) | P60x0.55 | 3369.52 | 5389.82 |
| L30 | 65 - 60 (30) | P60x0.55 | 3554.98 | 5389.82 |
| L31 | 60 - 55 (31) | P60x0.675 | 3742.74 | 6746.49 |
| L32 | 55 - 50 (32) | P60x0.675 | 3932.68 | 6746.49 |
| L33 | 50 - 45 (33) | P60x0.675 | 4124.61 | 6746.49 |
| L34 | 45 - 40 (34) | P60x0.675 | 4318.45 | 6746.49 |
| L35 | 40 - 35 (35) | P60x0.8 | 4514.18 | 8149.65 |
| L36 | 35 - 30 (36) | P60x0.8 | 4711.61 | 8149.65 |
| L37 | 30 - 25 (37) | P60x0.8 | 4910.52 | 8149.65 |
| L38 | 25 - 20 (38) | P60x0.8 | 5110.86 | 8149.65 |
| L39 | 20 - 15 (39) | P60x0.8 | 5312.54 | 8149.65 |
| L40 | 15 - 10 (40) | P60x0.8 | 5515.42 | 8149.65 |
| L41 | 10 - 5 (41) | P60x0.8 | 5719.29 | 8149.65 |
| L42 | 5 - 0 (42) | P60x0.8 | 5924.05 | 8149.65 |

Pole Shear Design Data

| Section No. | Elevation ft | Size | Actual V_u K | ϕV_n K | Ratio V_u ϕV_n | Actual T_u kip-ft | ϕT_n kip-ft | Ratio T_u ϕT_n |
|-------------|----------------------|------------|-------------------|-----------------|---------------------------|------------------------|----------------------|---------------------------|
| L1 | 196 - 195 (1) | P18x0.375 | 0.02 | 235.46 | 0.000 | 0.00 | 364.87 | 0.000 |
| L2 | 195 - 190 (2) | P24x0.375 | 7.00 | 315.62 | 0.022 | 0.87 | 655.57 | 0.001 |
| L3 | 190 - 185 (3) | P24x0.375 | 7.32 | 315.62 | 0.023 | 0.85 | 655.57 | 0.001 |
| L4 | 185 - 180 (4) | P24x0.375 | 13.27 | 315.62 | 0.042 | 0.85 | 655.57 | 0.001 |
| L5 | 180 - 175 (5) | P30x0.375 | 13.66 | 395.78 | 0.035 | 0.85 | 994.73 | 0.001 |
| L6 | 175 - 170 (6) | P30x0.375 | 14.70 | 395.78 | 0.037 | 0.85 | 994.73 | 0.001 |
| L7 | 170 - 165 (7) | P30x0.375 | 15.07 | 395.78 | 0.038 | 0.85 | 994.73 | 0.001 |
| L8 | 165 - 160 (8) | P30x0.375 | 18.79 | 395.78 | 0.047 | 0.03 | 994.73 | 0.000 |
| L9 | 160 - 155 (9) | P36x0.375 | 19.21 | 454.19 | 0.042 | 0.03 | 1094.28 | 0.000 |
| L10 | 155 - 150 (10) | P36x0.375 | 24.00 | 454.19 | 0.053 | 0.27 | 1094.28 | 0.000 |
| L11 | 150 - 145 (11) | P36x0.375 | 24.38 | 454.19 | 0.054 | 0.27 | 1094.28 | 0.000 |
| L12 | 145 - 140 (12) | P36x0.375 | 24.75 | 454.19 | 0.054 | 0.27 | 1094.28 | 0.000 |
| L13 | 140 - 136.25 (13) | P42x0.375 | 29.72 | 421.13 | 0.071 | 0.57 | 1185.51 | 0.000 |
| L14 | 136.25 - 136 (14) | P42x0.6375 | 29.74 | 939.40 | 0.032 | 0.57 | 3416.14 | 0.000 |
| L15 | 136 - 131 (15) | P42x0.6375 | 30.25 | 939.40 | 0.032 | 0.05 | 3416.14 | 0.000 |
| L16 | 131 - 126 (16) | P42x0.6375 | 30.71 | 939.40 | 0.033 | 0.04 | 3416.14 | 0.000 |
| L17 | 126 - 121 (17) | P42x0.6375 | 31.16 | 939.40 | 0.033 | 0.03 | 3416.14 | 0.000 |
| L18 | 121 - 120 (18) | P42x0.6375 | 31.25 | 939.40 | 0.033 | 0.03 | 3416.14 | 0.000 |
| L19 | 120 - 115 (19) | P48x0.6 | 31.75 | 1013.19 | 0.031 | 0.03 | 4074.41 | 0.000 |
| L20 | 115 - 110 (20) | P48x0.6 | 32.24 | 1013.19 | 0.032 | 0.02 | 4074.41 | 0.000 |
| L21 | 110 - 105 (21) | P48x0.6 | 32.71 | 1013.19 | 0.032 | 0.01 | 4074.41 | 0.000 |
| L22 | 105 - 100 (22) | P48x0.6 | 33.17 | 1013.19 | 0.033 | 0.00 | 4074.41 | 0.000 |
| L23 | 100 - 95 (23) | P54x0.5625 | 33.68 | 1021.92 | 0.033 | 0.01 | 3693.17 | 0.000 |
| L24 | 95 - 90 (24) | P54x0.5625 | 34.17 | 1021.92 | 0.033 | 0.01 | 3693.17 | 0.000 |
| L25 | 90 - 85 (25) | P54x0.5625 | 34.64 | 1021.92 | 0.034 | 0.02 | 3693.17 | 0.000 |
| L26 | 85 - 80 (26) | P54x0.5625 | 35.09 | 1021.92 | 0.034 | 0.03 | 3693.17 | 0.000 |
| L27 | 80 - 75 (27) | P60x0.55 | 35.88 | 974.15 | 0.037 | 1.07 | 3914.21 | 0.000 |
| L28 | 75 - 70 (28) | P60x0.55 | 36.40 | 974.15 | 0.037 | 1.12 | 3914.21 | 0.000 |
| L29 | 70 - 65 (29) | P60x0.55 | 36.86 | 974.15 | 0.038 | 1.13 | 3914.21 | 0.000 |
| L30 | 65 - 60 (30) | P60x0.55 | 37.32 | 974.15 | 0.038 | 1.14 | 3914.21 | 0.000 |
| L31 | 60 - 55 (31) | P60x0.675 | 37.78 | 1426.61 | 0.026 | 1.15 | 6179.21 | 0.000 |

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| | Client | PTI | Designed by | NMiller |

| Section No. | Elevation ft | Size | Actual V_u K | ϕV_n K | Ratio $\frac{V_u}{\phi V_n}$ | Actual T_u kip-ft | ϕT_n kip-ft | Ratio $\frac{T_u}{\phi T_n}$ |
|-------------|-----------------|-----------|----------------------|-----------------|---------------------------------|---------------------------|----------------------|---------------------------------|
| L32 | 55 - 50 (32) | P60x0.675 | 38.19 | 1426.61 | 0.027 | 1.15 | 6179.21 | 0.000 |
| L33 | 50 - 45 (33) | P60x0.675 | 38.58 | 1426.61 | 0.027 | 1.16 | 6179.21 | 0.000 |
| L34 | 45 - 40 (34) | P60x0.675 | 38.96 | 1426.61 | 0.027 | 1.17 | 6179.21 | 0.000 |
| L35 | 40 - 35 (35) | P60x0.8 | 39.33 | 1687.23 | 0.023 | 1.17 | 8781.67 | 0.000 |
| L36 | 35 - 30 (36) | P60x0.8 | 39.64 | 1687.23 | 0.023 | 1.18 | 8781.67 | 0.000 |
| L37 | 30 - 25 (37) | P60x0.8 | 39.93 | 1687.23 | 0.024 | 1.19 | 8781.67 | 0.000 |
| L38 | 25 - 20 (38) | P60x0.8 | 40.21 | 1687.23 | 0.024 | 1.19 | 8781.67 | 0.000 |
| L39 | 20 - 15 (39) | P60x0.8 | 40.47 | 1687.23 | 0.024 | 1.20 | 8781.67 | 0.000 |
| L40 | 15 - 10 (40) | P60x0.8 | 40.69 | 1687.23 | 0.024 | 1.20 | 8781.67 | 0.000 |
| L41 | 10 - 5 (41) | P60x0.8 | 40.89 | 1687.23 | 0.024 | 1.21 | 8781.67 | 0.000 |
| L42 | 5 - 0 (42) | P60x0.8 | 41.06 | 1687.23 | 0.024 | 1.21 | 8781.67 | 0.000 |

TNX Geometry Input

Increment (ft): [Export to TNX](#)

| | Section Height (ft) | Section Length (ft) | Lap Splice Length (ft) | Number of Sides | Top Diameter (in) | Bottom Diameter (in) | Wall Thickness (in) | Tapered Pole Grade | Weight Multiplier |
|----|---------------------|---------------------|------------------------|-----------------|-------------------|----------------------|---------------------|--------------------|-------------------|
| 1 | 196 - 195 | 1 | 0 | 0 | 18.000 | 18.000 | 0.375 | A53-B-42 | 1.000 |
| 2 | 195 - 190 | 5 | | 0 | 24.000 | 24.000 | 0.375 | A53-B-42 | 1.000 |
| 3 | 190 - 185 | 5 | | 0 | 24.000 | 24.000 | 0.375 | A53-B-42 | 1.000 |
| 4 | 185 - 180 | 5 | 0 | 0 | 24.000 | 24.000 | 0.375 | A53-B-42 | 1.000 |
| 5 | 180 - 175 | 5 | | 0 | 30.000 | 30.000 | 0.375 | A53-B-42 | 1.000 |
| 6 | 175 - 170 | 5 | | 0 | 30.000 | 30.000 | 0.375 | A53-B-42 | 1.000 |
| 7 | 170 - 165 | 5 | | 0 | 30.000 | 30.000 | 0.375 | A53-B-42 | 1.000 |
| 8 | 165 - 160 | 5 | 0 | 0 | 30.000 | 30.000 | 0.375 | A53-B-42 | 1.000 |
| 9 | 160 - 155 | 5 | | 0 | 36.000 | 36.000 | 0.375 | A53-B-42 | 1.000 |
| 10 | 155 - 150 | 5 | | 0 | 36.000 | 36.000 | 0.375 | A53-B-42 | 1.000 |
| 11 | 150 - 145 | 5 | | 0 | 36.000 | 36.000 | 0.375 | A53-B-42 | 1.000 |
| 12 | 145 - 140 | 5 | 0 | 0 | 36.000 | 36.000 | 0.375 | A53-B-42 | 1.000 |
| 13 | 140 - 136.25 | 3.75 | | 0 | 42.000 | 42.000 | 0.375 | A53-B-42 | 1.000 |
| 14 | 136.25 - 136 | 0.25 | | 0 | 42.000 | 42.000 | 0.6375 | A53-B-42 | 0.945 |
| 15 | 136 - 131 | 5 | | 0 | 42.000 | 42.000 | 0.6375 | A53-B-42 | 0.945 |
| 16 | 131 - 126 | 5 | | 0 | 42.000 | 42.000 | 0.6375 | A53-B-42 | 0.945 |
| 17 | 126 - 121 | 5 | | 0 | 42.000 | 42.000 | 0.6375 | A53-B-42 | 0.945 |
| 18 | 121 - 120 | 1 | 0 | 0 | 42.000 | 42.000 | 0.6375 | A53-B-42 | 0.945 |
| 19 | 120 - 115 | 5 | | 0 | 48.000 | 48.000 | 0.6 | A53-B-42 | 0.955 |
| 20 | 115 - 110 | 5 | | 0 | 48.000 | 48.000 | 0.6 | A53-B-42 | 0.955 |
| 21 | 110 - 105 | 5 | | 0 | 48.000 | 48.000 | 0.6 | A53-B-42 | 0.955 |
| 22 | 105 - 100 | 5 | 0 | 0 | 48.000 | 48.000 | 0.6 | A53-B-42 | 0.955 |
| 23 | 100 - 95 | 5 | | 0 | 54.000 | 54.000 | 0.5625 | A53-B-42 | 0.979 |
| 24 | 95 - 90 | 5 | | 0 | 54.000 | 54.000 | 0.5625 | A53-B-42 | 0.979 |
| 25 | 90 - 85 | 5 | | 0 | 54.000 | 54.000 | 0.5625 | A53-B-42 | 0.979 |
| 26 | 85 - 80 | 5 | 0 | 0 | 54.000 | 54.000 | 0.5625 | A53-B-42 | 0.979 |
| 27 | 80 - 75 | 5 | | 0 | 60.000 | 60.000 | 0.55 | A53-B-42 | 0.969 |
| 28 | 75 - 70 | 5 | | 0 | 60.000 | 60.000 | 0.55 | A53-B-42 | 0.969 |
| 29 | 70 - 65 | 5 | | 0 | 60.000 | 60.000 | 0.55 | A53-B-42 | 0.969 |
| 30 | 65 - 60 | 5 | 0 | 0 | 60.000 | 60.000 | 0.55 | A53-B-42 | 0.969 |
| 31 | 60 - 55 | 5 | | 0 | 60.000 | 60.000 | 0.675 | A53-B-42 | 0.975 |
| 32 | 55 - 50 | 5 | | 0 | 60.000 | 60.000 | 0.675 | A53-B-42 | 0.975 |
| 33 | 50 - 45 | 5 | | 0 | 60.000 | 60.000 | 0.675 | A53-B-42 | 0.975 |
| 34 | 45 - 40 | 5 | 0 | 0 | 60.000 | 60.000 | 0.675 | A53-B-42 | 0.975 |
| 35 | 40 - 35 | 5 | | 0 | 60.000 | 60.000 | 0.8 | A53-B-42 | 0.980 |
| 36 | 35 - 30 | 5 | | 0 | 60.000 | 60.000 | 0.8 | A53-B-42 | 0.980 |
| 37 | 30 - 25 | 5 | | 0 | 60.000 | 60.000 | 0.8 | A53-B-42 | 0.980 |
| 38 | 25 - 20 | 5 | | 0 | 60.000 | 60.000 | 0.8 | A53-B-42 | 0.980 |
| 39 | 20 - 15 | 5 | | 0 | 60.000 | 60.000 | 0.8 | A53-B-42 | 0.980 |
| 40 | 15 - 10 | 5 | | 0 | 60.000 | 60.000 | 0.8 | A53-B-42 | 0.980 |
| 41 | 10 - 5 | 5 | | 0 | 60.000 | 60.000 | 0.8 | A53-B-42 | 0.980 |
| 42 | 5 - 0 | 5 | | 0 | 60.000 | 60.000 | 0.8 | A53-B-42 | 0.980 |

TNX Section Forces

| Increment (ft): | | TNX Output | | |
|-----------------|---------------------|------------|-------------------|-------|
| 5 | | P_u | M_{ux} (kip-ft) | V_u |
| | Section Height (ft) | (K) | | (K) |
| 1 | 196 - 195 | 0.09 | 0.03 | 0.05 |
| 2 | 195 - 190 | 5.33 | 27.93 | 7.00 |
| 3 | 190 - 185 | 5.97 | 63.75 | 7.32 |
| 4 | 185 - 180 | 9.70 | 129.34 | 13.27 |
| 5 | 180 - 175 | 10.55 | 196.67 | 13.66 |
| 6 | 175 - 170 | 11.64 | 269.26 | 14.70 |
| 7 | 170 - 165 | 12.54 | 343.71 | 15.07 |
| 8 | 165 - 160 | 16.25 | 436.81 | 18.79 |
| 9 | 160 - 155 | 17.32 | 531.85 | 19.21 |
| 10 | 155 - 150 | 22.86 | 650.83 | 24.00 |
| 11 | 150 - 145 | 24.02 | 771.72 | 24.38 |
| 12 | 145 - 140 | 25.19 | 894.48 | 24.75 |
| 13 | 140 - 136.25 | 29.30 | 1005.16 | 29.72 |
| 14 | 136.25 - 136 | 29.40 | 1012.59 | 29.74 |
| 15 | 136 - 131 | 31.29 | 1162.52 | 30.25 |
| 16 | 131 - 126 | 33.18 | 1314.90 | 30.71 |
| 17 | 126 - 121 | 35.09 | 1469.55 | 31.16 |
| 18 | 121 - 120 | 35.47 | 1500.74 | 31.25 |
| 19 | 120 - 115 | 37.52 | 1658.19 | 31.75 |
| 20 | 115 - 110 | 39.56 | 1818.14 | 32.24 |
| 21 | 110 - 105 | 41.61 | 1980.49 | 32.71 |
| 22 | 105 - 100 | 43.67 | 2145.14 | 33.17 |
| 23 | 100 - 95 | 45.87 | 2312.20 | 33.68 |
| 24 | 95 - 90 | 48.07 | 2481.77 | 34.17 |
| 25 | 90 - 85 | 50.27 | 2653.75 | 34.64 |
| 26 | 85 - 80 | 52.48 | 2828.03 | 35.09 |
| 27 | 80 - 75 | 54.82 | 3005.66 | 35.88 |
| 28 | 75 - 70 | 57.20 | 3186.35 | 36.40 |
| 29 | 70 - 65 | 59.56 | 3369.52 | 36.86 |
| 30 | 65 - 60 | 62.80 | 3554.98 | 37.32 |
| 31 | 60 - 55 | 66.51 | 3742.74 | 37.78 |
| 32 | 55 - 50 | 69.34 | 3932.68 | 38.19 |
| 33 | 50 - 45 | 72.18 | 4124.61 | 38.58 |
| 34 | 45 - 40 | 76.15 | 4318.45 | 38.96 |
| 35 | 40 - 35 | 80.58 | 4514.18 | 39.33 |
| 36 | 35 - 30 | 83.90 | 4711.61 | 39.64 |
| 37 | 30 - 25 | 87.21 | 4910.52 | 39.93 |
| 38 | 25 - 20 | 91.66 | 5110.86 | 40.21 |
| 39 | 20 - 15 | 96.11 | 5312.54 | 40.47 |
| 40 | 15 - 10 | 99.45 | 5515.42 | 40.69 |
| 41 | 10 - 5 | 102.62 | 5719.29 | 40.89 |
| 42 | 5 - 0 | 105.68 | 5924.05 | 41.06 |

Analysis Results

| Elevation (ft) | Component Type | Size | Critical Element | % Capacity | Pass / Fail |
|----------------|----------------|----------------|------------------|------------|-------------|
| 196 - 195 | Pole | TP18x18x0.375 | Pole | 0.0% | Pass |
| 195 - 190 | Pole | TP24x24x0.375 | Pole | 4.8% | Pass |
| 190 - 185 | Pole | TP24x24x0.375 | Pole | 10.3% | Pass |
| 185 - 180 | Pole | TP24x24x0.375 | Pole | 20.8% | Pass |
| 180 - 175 | Pole | TP30x30x0.375 | Pole | 20.6% | Pass |
| 175 - 170 | Pole | TP30x30x0.375 | Pole | 28.0% | Pass |
| 170 - 165 | Pole | TP30x30x0.375 | Pole | 35.6% | Pass |
| 165 - 160 | Pole | TP30x30x0.375 | Pole | 45.3% | Pass |
| 160 - 155 | Pole | TP36x36x0.375 | Pole | 39.1% | Pass |
| 155 - 150 | Pole | TP36x36x0.375 | Pole | 48.0% | Pass |
| 150 - 145 | Pole | TP36x36x0.375 | Pole | 56.7% | Pass |
| 145 - 140 | Pole | TP36x36x0.375 | Pole | 65.5% | Pass |
| 140 - 136.25 | Pole | TP42x42x0.375 | Pole | 55.4% | Pass |
| 136.25 - 136 | Pole + Reinf. | TP42x42x0.6375 | Pole | 33.3% | Pass |
| 136 - 131 | Pole + Reinf. | TP42x42x0.6375 | Pole | 38.2% | Pass |
| 131 - 126 | Pole + Reinf. | TP42x42x0.6375 | Pole | 43.1% | Pass |
| 126 - 121 | Pole + Reinf. | TP42x42x0.6375 | Pole | 48.1% | Pass |
| 121 - 120 | Pole + Reinf. | TP42x42x0.6375 | Pole | 49.1% | Pass |
| 120 - 115 | Pole + Reinf. | TP48x48x0.6 | Pole | 44.5% | Pass |
| 115 - 110 | Pole + Reinf. | TP48x48x0.6 | Pole | 48.8% | Pass |
| 110 - 105 | Pole + Reinf. | TP48x48x0.6 | Pole | 53.1% | Pass |
| 105 - 100 | Pole + Reinf. | TP48x48x0.6 | Pole | 57.5% | Pass |
| 100 - 95 | Pole + Reinf. | TP54x54x0.5625 | Pole | 51.7% | Pass |
| 95 - 90 | Pole + Reinf. | TP54x54x0.5625 | Pole | 55.5% | Pass |
| 90 - 85 | Pole + Reinf. | TP54x54x0.5625 | Pole | 59.3% | Pass |
| 85 - 80 | Pole + Reinf. | TP54x54x0.5625 | Pole | 63.2% | Pass |
| 80 - 75 | Pole + Reinf. | TP60x60x0.55 | Pole | 56.9% | Pass |
| 75 - 70 | Pole + Reinf. | TP60x60x0.55 | Pole | 60.3% | Pass |
| 70 - 65 | Pole + Reinf. | TP60x60x0.55 | Pole | 63.8% | Pass |
| 65 - 60 | Pole + Reinf. | TP60x60x0.55 | Pole | 67.3% | Pass |
| 60 - 55 | Pole + Reinf. | TP60x60x0.675 | Pole | 56.3% | Pass |
| 55 - 50 | Pole + Reinf. | TP60x60x0.675 | Pole | 59.1% | Pass |
| 50 - 45 | Pole + Reinf. | TP60x60x0.675 | Pole | 62.0% | Pass |
| 45 - 40 | Pole + Reinf. | TP60x60x0.675 | Pole | 64.9% | Pass |
| 40 - 35 | Pole + Reinf. | TP60x60x0.8 | Pole | 56.0% | Pass |
| 35 - 30 | Pole + Reinf. | TP60x60x0.8 | Pole | 58.4% | Pass |
| 30 - 25 | Pole + Reinf. | TP60x60x0.8 | Pole | 60.9% | Pass |
| 25 - 20 | Pole + Reinf. | TP60x60x0.8 | Pole | 63.4% | Pass |
| 20 - 15 | Pole + Reinf. | TP60x60x0.8 | Pole | 65.9% | Pass |
| 15 - 10 | Pole + Reinf. | TP60x60x0.8 | Pole | 68.4% | Pass |
| 10 - 5 | Pole + Reinf. | TP60x60x0.8 | Pole | 70.9% | Pass |
| 5 - 0 | Pole + Reinf. | TP60x60x0.8 | Pole | 73.5% | Pass |
| | | | | Summary | |
| | | | Pole | 73.5% | Pass |
| | | | Reinforcement | 69.5% | Pass |
| | | | Overall | 73.5% | Pass |

Additional Calculations

| Section Elevation (ft) | Moment of Inertia (in ⁴) | | | Area (in ²) | | | % Capacity* (100% Max. Allowable) | |
|---------------------------|--------------------------------------|--------|-------|-------------------------|--------|--------|--------------------------------------|-------|
| | Pole | Reinf. | Total | Pole | Reinf. | Total | Pole | R1 |
| 196 - 195 | 807 | n/a | 807 | 20.76 | n/a | 20.76 | 0.0% | |
| 195 - 190 | 1942 | n/a | 1942 | 27.83 | n/a | 27.83 | 4.8% | |
| 190 - 185 | 1942 | n/a | 1942 | 27.83 | n/a | 27.83 | 10.3% | |
| 185 - 180 | 1942 | n/a | 1942 | 27.83 | n/a | 27.83 | 20.8% | |
| 180 - 175 | 3829 | n/a | 3829 | 34.90 | n/a | 34.90 | 20.6% | |
| 175 - 170 | 3829 | n/a | 3829 | 34.90 | n/a | 34.90 | 28.0% | |
| 170 - 165 | 3829 | n/a | 3829 | 34.90 | n/a | 34.90 | 35.6% | |
| 165 - 160 | 3829 | n/a | 3829 | 34.90 | n/a | 34.90 | 45.3% | |
| 160 - 155 | 6659 | n/a | 6659 | 41.97 | n/a | 41.97 | 39.1% | |
| 155 - 150 | 6659 | n/a | 6659 | 41.97 | n/a | 41.97 | 48.0% | |
| 150 - 145 | 6659 | n/a | 6659 | 41.97 | n/a | 41.97 | 56.7% | |
| 145 - 140 | 6659 | n/a | 6659 | 41.97 | n/a | 41.97 | 65.5% | |
| 140 - 136.25 | 10622 | n/a | 10622 | 49.04 | n/a | 49.04 | 55.4% | |
| 136.25 - 136 | 10622 | 6973 | 17594 | 49.04 | 29.25 | 78.29 | 33.3% | 31.3% |
| 136 - 131 | 10622 | 6973 | 17594 | 49.04 | 29.25 | 78.29 | 38.2% | 34.9% |
| 131 - 126 | 10622 | 6973 | 17594 | 49.04 | 29.25 | 78.29 | 43.1% | 39.4% |
| 126 - 121 | 10622 | 6973 | 17594 | 49.04 | 29.25 | 78.29 | 48.1% | 43.9% |
| 121 - 120 | 10622 | 6973 | 17594 | 49.04 | 29.25 | 78.29 | 49.1% | 44.9% |
| 120 - 115 | 15908 | 9013 | 24921 | 56.11 | 29.25 | 85.36 | 44.5% | 39.9% |
| 115 - 110 | 15908 | 9013 | 24921 | 56.11 | 29.25 | 85.36 | 48.8% | 43.7% |
| 110 - 105 | 15908 | 9013 | 24921 | 56.11 | 29.25 | 85.36 | 53.1% | 47.6% |
| 105 - 100 | 15908 | 9013 | 24921 | 56.11 | 29.25 | 85.36 | 57.5% | 51.5% |
| 100 - 95 | 22710 | 11316 | 34026 | 63.18 | 29.25 | 92.43 | 51.7% | 45.7% |
| 95 - 90 | 22710 | 11316 | 34026 | 63.18 | 29.25 | 92.43 | 55.5% | 49.1% |
| 90 - 85 | 22710 | 11316 | 34026 | 63.18 | 29.25 | 92.43 | 59.3% | 52.4% |
| 85 - 80 | 22710 | 11316 | 34026 | 63.18 | 29.25 | 92.43 | 63.2% | 55.8% |
| 80 - 75 | 31217 | 13883 | 45100 | 70.24 | 29.25 | 99.49 | 56.9% | 49.8% |
| 75 - 70 | 31217 | 13883 | 45100 | 70.24 | 29.25 | 99.49 | 60.3% | 52.7% |
| 70 - 65 | 31217 | 13883 | 45100 | 70.24 | 29.25 | 99.49 | 63.8% | 55.7% |
| 65 - 60 | 31217 | 13883 | 45100 | 70.24 | 29.25 | 99.49 | 67.3% | 58.8% |
| 60 - 55 | 41363 | 13883 | 55246 | 93.46 | 29.25 | 122.71 | 56.3% | 50.5% |
| 55 - 50 | 41363 | 13883 | 55246 | 93.46 | 29.25 | 122.71 | 59.1% | 53.1% |
| 50 - 45 | 41363 | 13883 | 55246 | 93.46 | 29.25 | 122.71 | 62.0% | 55.7% |
| 45 - 40 | 41363 | 13883 | 55246 | 93.46 | 29.25 | 122.71 | 64.9% | 58.3% |
| 40 - 35 | 51381 | 13883 | 65264 | 116.58 | 29.25 | 145.83 | 56.0% | 51.5% |
| 35 - 30 | 51381 | 13883 | 65264 | 116.58 | 29.25 | 145.83 | 58.4% | 53.8% |
| 30 - 25 | 51381 | 13883 | 65264 | 116.58 | 29.25 | 145.83 | 60.9% | 56.1% |
| 25 - 20 | 51381 | 13883 | 65264 | 116.58 | 29.25 | 145.83 | 63.4% | 58.4% |
| 20 - 15 | 51381 | 13883 | 65264 | 116.58 | 29.25 | 145.83 | 65.9% | 60.7% |
| 15 - 10 | 51381 | 13883 | 65264 | 116.58 | 29.25 | 145.83 | 68.4% | 63.0% |
| 10 - 5 | 51381 | 13883 | 65264 | 116.58 | 29.25 | 145.83 | 70.9% | 65.3% |
| 5 - 0 | 51381 | 13883 | 65264 | 116.58 | 29.25 | 145.83 | 73.5% | 69.5% |

Note: Section capacity checked using 5 degree increments.

*Rating per TIA-222-H Section 15.5.

APPENDIX C

Additional Calculations



**Existing Flange Connection @
US-CT-1002 Kettletown
2022791.CT1002.17**

180'

| | | |
|----------|--------|------|
| Moment = | 129.34 | k-ft |
| Axial = | 9.70 | k |
| Shear = | 13.27 | k |

| | |
|-------------------------------|------|
| Maximum Capacity | 100% |
| Apply TIA-222-H Section 15.5? | Yes |

| Flange Bolts | |
|--------------------------------|-----------------------|
| # Bolts = | 20 |
| Bolt Type = | A325 |
| Threads Included? = | Yes |
| Bolt Diameter = | 1 in |
| Bolt Circle = | 27 in |
| ϕ_t = | 0.75 |
| ϕ_v = | 0.75 |
| F_{ub} = | 120 ksi |
| A_b = | 0.785 in ² |
| A_n = | 0.606 in ² |
| ϕR_{nv} = | 35.34 k |
| ϕR_{nt} = | 54.54 k |
| ϕR_{nt} (adjusted) = | 54.53 k |
| V_{ub} = | 0.66 k |
| T_{ub} = | 11.00 k |
| Max Comp. on Bolt = | 11.97 k |
| <i>Prying Action Check</i> | |
| N/A, top flange thickness > tc | |
| Shear Capacity = | 1.8% |
| Tensile Capacity = | 19.2% |
| Interaction Capacity = | 3.9% |
| Bolt Capacity = | 19.2% OK |

| Upper Flange Plate | |
|-------------------------------|----------------------|
| Location = | External |
| Plate Strength (F_y) = | 36 ksi |
| Plate Tensile (F_u) = | 58 ksi |
| Plate Thickness = | 1.25 in |
| Outer Diameter = | 30.375 in |
| ϕ_t = | 0.9 |
| wcalc = | 12.37 in |
| wmax = | 20.84 in |
| w = | 12.37 in |
| Z = | 4.83 in ³ |
| M_u = | 37.11 k-in |
| ϕM_n = | 156.55 k-in |
| Upper Plate Capacity = | 22.6% OK |

| Upper Stiffeners | |
|------------------|------|
| Configuration = | None |

| Pole Information | |
|-----------------------|----------|
| Shaft Diam. (Upper) = | 24 in |
| Thickness (Upper) = | 0.375 in |
| # of Sides (Upper) = | Round |
| F_y (Upper) = | 42 ksi |
| Shaft Diam. (Lower) = | 30 in |
| Thickness (Lower) = | 0.375 in |
| # of Sides (Lower) = | Round |
| F_y (Lower) = | 42 ksi |

| Lower Flange Plate | |
|-------------------------------|----------------------|
| Location = | Internal |
| Plate Strength (F_y) = | 36 ksi |
| Plate Thickness = | 1.25 in |
| Hole Diameter = | 24.25 in |
| Pole Inner Diameter = | 29.25 in |
| e = | 1.13 in |
| w = | 4.59 in |
| Z = | 1.79 in ³ |
| M_u = | 13.47 k-in |
| ϕM_n = | 58.15 k-in |
| Lower Plate Capacity = | 22.1% OK |

| Lower Stiffeners | |
|------------------|------|
| Configuration = | None |



Existing Flange Connection @
US-CT-1002 Kettletown
 2022791.CT1002.17

160'

| | | |
|----------|--------|------|
| Moment = | 436.81 | k-ft |
| Axial = | 16.25 | k |
| Shear = | 18.79 | k |

| | |
|-------------------------------|------|
| Maximum Capacity | 100% |
| Apply TIA-222-H Section 15.5? | Yes |

| Flange Bolts | |
|--------------------------------|-----------------------|
| # Bolts = | 24 |
| Bolt Type = | A325 |
| Threads Included? = | Yes |
| Bolt Diameter = | 1 in |
| Bolt Circle = | 33 in |
| ϕ_t = | 0.75 |
| ϕ_v = | 0.75 |
| F_{ub} = | 120 ksi |
| A_b = | 0.785 in ² |
| A_n = | 0.606 in ² |
| ϕR_{nv} = | 35.34 k |
| ϕR_{nt} = | 54.54 k |
| ϕR_{nt} (adjusted) = | 54.53 k |
| V_{ub} = | 0.78 k |
| T_{ub} = | 25.78 k |
| Max Comp. on Bolt = | 27.14 k |
| <i>Prying Action Check</i> | |
| N/A, top flange thickness > tc | |
| Shear Capacity = | 2.1% |
| Tensile Capacity = | 45.0% |
| Interaction Capacity = | 21.3% |
| Bolt Capacity = | 45.0% OK |

| Upper Flange Plate | |
|-------------------------------|----------------------|
| Location = | External |
| Plate Strength (F_y) = | 36 ksi |
| Plate Tensile (F_u) = | 58 ksi |
| Plate Thickness = | 1.25 in |
| Outer Diameter = | 36.375 in |
| ϕ_t = | 0.9 |
| wcalc = | 13.75 in |
| wmax = | 21.04 in |
| w = | 13.75 in |
| Z = | 5.37 in ³ |
| M_u = | 89.92 k-in |
| ϕM_n = | 173.99 k-in |
| Upper Plate Capacity = | 49.2% OK |

| Upper Stiffeners | |
|------------------|------|
| Configuration = | None |

| Pole Information | |
|-----------------------|----------|
| Shaft Diam. (Upper) = | 30 in |
| Thickness (Upper) = | 0.375 in |
| # of Sides (Upper) = | Round |
| F_y (Upper) = | 42 ksi |
| Shaft Diam. (Lower) = | 36 in |
| Thickness (Lower) = | 0.375 in |
| # of Sides (Lower) = | Round |
| F_y (Lower) = | 42 ksi |

| Lower Flange Plate | |
|-------------------------------|----------------------|
| Location = | Internal |
| Plate Strength (F_y) = | 36 ksi |
| Plate Thickness = | 1.25 in |
| Hole Diameter = | 27.375 in |
| Pole Inner Diameter = | 35.25 in |
| e = | 1.13 in |
| w = | 4.61 in |
| Z = | 1.80 in ³ |
| M_u = | 30.53 k-in |
| ϕM_n = | 58.40 k-in |
| Lower Plate Capacity = | 49.8% OK |

| Lower Stiffeners | |
|------------------|------|
| Configuration = | None |



Existing Flange Connection @
US-CT-1002 Kettletown
 2022791.CT1002.17

140'

| | | |
|----------|--------|------|
| Moment = | 894.48 | k-ft |
| Axial = | 25.20 | k |
| Shear = | 24.75 | k |

| | |
|-------------------------------|------|
| Maximum Capacity | 100% |
| Apply TIA-222-H Section 15.5? | Yes |

| Flange Bolts | |
|--------------------------------|-----------------------|
| # Bolts = | 28 |
| Bolt Type = | A325 |
| Threads Included? = | Yes |
| Bolt Diameter = | 1 in |
| Bolt Circle = | 39 in |
| ϕ_t = | 0.75 |
| ϕ_v = | 0.75 |
| F_{ub} = | 120 ksi |
| A_b = | 0.785 in ² |
| A_n = | 0.606 in ² |
| ϕR_{nv} = | 35.34 k |
| ϕR_{nt} = | 54.54 k |
| ϕR_{nt} (adjusted) = | 54.52 k |
| V_{ub} = | 0.88 k |
| T_{ub} = | 38.41 k |
| Max Comp. on Bolt = | 40.20 k |
| <i>Prying Action Check</i> | |
| N/A, top flange thickness > tc | |
| Shear Capacity = | 2.4% |
| Tensile Capacity = | 67.1% |
| Interaction Capacity = | 47.3% |
| Bolt Capacity = | 67.1% OK |

| Upper Flange Plate | |
|-------------------------------|----------------------|
| Location = | External |
| Plate Strength (F_y) = | 36 ksi |
| Plate Tensile (F_u) = | 58 ksi |
| Plate Thickness = | 1.25 in |
| Outer Diameter = | 42.375 in |
| ϕ_t = | 0.9 |
| wcalc = | 15.00 in |
| wmax = | 25.38 in |
| w = | 15.00 in |
| Z = | 5.86 in ³ |
| M_u = | 140.91 k-in |
| ϕM_n = | 189.84 k-in |
| Upper Plate Capacity = | 70.7% OK |

| Upper Stiffeners | |
|------------------|------|
| Configuration = | None |

| Pole Information | |
|-----------------------|----------|
| Shaft Diam. (Upper) = | 36 in |
| Thickness (Upper) = | 0.375 in |
| # of Sides (Upper) = | Round |
| F_y (Upper) = | 42 ksi |
| Shaft Diam. (Lower) = | 42 in |
| Thickness (Lower) = | 0.375 in |
| # of Sides (Lower) = | Round |
| F_y (Lower) = | 42 ksi |

| Lower Flange Plate | |
|-------------------------------|----------------------|
| Location = | Internal |
| Plate Strength (F_y) = | 36 ksi |
| Plate Thickness = | 1.25 in |
| Hole Diameter = | 33.375 in |
| Pole Inner Diameter = | 41.25 in |
| e = | 1.13 in |
| w = | 4.63 in |
| Z = | 1.81 in ³ |
| M_u = | 45.23 k-in |
| ϕM_n = | 58.58 k-in |
| Lower Plate Capacity = | 73.5% OK |

| Lower Stiffeners | |
|------------------|------|
| Configuration = | None |



BOLT AND BRIDGE STIFFENER CALCULATIONS

@ 120'

Moment from TNX (M) = 1500.74 kip-ft
Axial from TNX (P) = 35.47 kip

ASIF = 1.00

Inner Bolt Diameter = 1 in
Inner Bolt Area (A_{inner}) = 0.79 in²
Inner Bolt MOI ($I_{o,inner}$) = 0.05 in⁴
Number Inner Bolts (N_{inner}) = 32

Inner Bolt Circle (BC_{inner}) = 45 in
Total Area ($A_{tot.in}$) = 25.13 in²
Percent Total Area (η_{in}) = 48.2%

Axial, Inner Bolts ($P*\eta_{in}$) = 17.10 kips

Bridge Stiffener Width = 6.00 in
Bridge Stiffener Thickness = 1.50 in
Bridge Stiffener Unbraced Length = 12.00 in
Bridge Stiffener Area (A_{pl}) = 9.00 in²
Bridge Stiffener MOI (I_o) = 27.00 in⁴
Number Bridge Stiffeners (N_{pl}) = 3

Connection Bolt Hole Size = 0 in
Net Bridge Stiffener Area ($A_{e,pl}$) = 9 in²
Bridge Stiffener Circle (BC_{pl}) = 51 in
Total Area ($A_{tot.pl}$) = 27.00 in²
Percent Total Area (η_{pl}) = 51.8%

Axial, Bridge Stiffener ($P*\eta_{pl}$) = 18.37 kips

$$I_{inner} = 6363.30 \text{ in.}^4 \quad (N_{inner} * A_{inner} * BC_{inner}^2 / 8 + N_{inner} * I_{o,inner})$$

$$I_{pl} = 8859.38 \text{ in.}^4 \quad (N_{pl} * A_{pl} * BC_{pl}^2 / 8 + N_{pl} * I_{o,pl})$$

$$I_{tot} = 15222.67 \text{ in.}^4 \quad (I_{inner} + I_{outer} + I_{pl})$$

$$P_{u.t,inner} = 20.4 \text{ kips} \quad (M * (BC_{inner} / 2) * A_{inner} / I_{total} - P * \eta_{in} / N_{inner})$$

$$P_{u.t,pl} = 265.4 \text{ kips} \quad (M * (BC_{pl} / 2) * A_{pl} / I_{total} - P * \eta_{pl} / N_{pl})$$

$$P_{u.c,pl} = 277.6 \text{ kips} \quad (M * (BC_{pl} / 2) * A_{pl} / I_{total} + P * \eta_{pl} / N_{pl})$$

$$\phi P_{nt,bolt} = 61.85 \text{ kips}$$

Bolt Rating = 31.4% **OK**

Bridge Stiffener Check

f_y = 50 ksi
 f_u = 65 ksi
E = 29000 ksi
K = 0.85

KL/r = 23.556
 F_e = 515.82 ksi
 F_{cr} = 48.01 ksi
 ϕP_{nc} = 388.90 kips
 ϕP_{nt} = 438.75 kips

Bridge Stiffener Rating = 68.0% **OK**



**Existing Flange Connection @
US-CT-1002 Kettletown
2022791.CT1002.17**

120'

| | | |
|-----------|-------------|------|
| *Moment = | 645.4161977 | k-ft |
| Axial = | 35.47 | k |
| Shear = | 31.25 | k |

| | |
|-------------------------------|------|
| Maximum Capacity | 100% |
| Apply TIA-222-H Section 15.5? | Yes |

*Above reactions have been adjusted due to consideration of modifications. See attached hand calculations for determination of flange bolt forces used in the analysis.

| Flange Bolts | |
|--------------------------------|-----------------------|
| # Bolts = | 32 |
| Bolt Type = | A325 |
| Threads Included? = | Yes |
| Bolt Diameter = | 1 in |
| Bolt Circle = | 45 in |
| ϕ_t = | 0.75 |
| ϕ_v = | 0.75 |
| F_{ub} = | 120 ksi |
| A_b = | 0.785 in ² |
| A_n = | 0.606 in ² |
| ϕR_{nv} = | 35.34 k |
| ϕR_{nt} = | 54.54 k |
| ϕR_{nt} (adjusted) = | 54.52 k |
| V_{ub} = | 0.98 k |
| T_{ub} = | 20.40 k |
| Max Comp. on Bolt = | 22.62 k |
| <i>Prying Action Check</i> | |
| N/A, top flange thickness > tc | |
| Shear Capacity = | 2.6% |
| Tensile Capacity = | 35.6% |
| Interaction Capacity = | 13.4% |
| Bolt Capacity = | 35.6% OK |

| Upper Flange Plate | |
|-------------------------------|----------------------|
| Location = | External |
| Plate Strength (F_y) = | 36 ksi |
| Plate Tensile (F_u) = | 58 ksi |
| Plate Thickness = | 1.25 in |
| Outer Diameter = | 48.375 in |
| ϕ_t = | 0.9 |
| wcalc = | 16.16 in |
| wmax = | 25.56 in |
| w = | 16.16 in |
| Z = | 6.31 in ³ |
| M_u = | 85.70 k-in |
| ϕM_n = | 204.47 k-in |
| Upper Plate Capacity = | 39.9% OK |

| Upper Stiffeners | |
|------------------|------|
| Configuration = | None |

| Pole Information | |
|-----------------------|----------|
| Shaft Diam. (Upper) = | 42 in |
| Thickness (Upper) = | 0.375 in |
| # of Sides (Upper) = | Round |
| F_y (Upper) = | 42 ksi |
| Shaft Diam. (Lower) = | 48 in |
| Thickness (Lower) = | 0.375 in |
| # of Sides (Lower) = | Round |
| F_y (Lower) = | 42 ksi |

| Lower Flange Plate | |
|-------------------------------|----------------------|
| Location = | Internal |
| Plate Strength (F_y) = | 36 ksi |
| Plate Thickness = | 1.25 in |
| Hole Diameter = | 39.375 in |
| Pole Inner Diameter = | 47.25 in |
| e = | 1.13 in |
| w = | 4.64 in |
| Z = | 1.81 in ³ |
| M_u = | 25.44 k-in |
| ϕM_n = | 58.71 k-in |
| Lower Plate Capacity = | 41.3% OK |

| Lower Stiffeners | |
|------------------|------|
| Configuration = | None |



BOLT AND BRIDGE STIFFENER CALCULATIONS

@ 100'

Moment from TNX (M) = 2145.14 kip-ft
Axial from TNX (P) = 43.68 kip

ASIF = 1.00

Inner Bolt Diameter = 1 in
Inner Bolt Area (A_{inner}) = 0.79 in²
Inner Bolt MOI ($I_{o,inner}$) = 0.05 in⁴
Number Inner Bolts (N_{inner}) = 33

Inner Bolt Circle (BC_{inner}) = 51 in
Total Area ($A_{tot.in}$) = 25.92 in²
Percent Total Area (η_{in}) = 49.0%

Axial, Inner Bolts ($P*\eta_{in}$) = 21.39 kips

Bridge Stiffener Width = 6.00 in
Bridge Stiffener Thickness = 1.50 in
Bridge Stiffener Unbraced Length = 12.00 in
Bridge Stiffener Area (A_{pl}) = 9.00 in²
Bridge Stiffener MOI (I_o) = 27.00 in⁴
Number Bridge Stiffeners (N_{pl}) = 3

Connection Bolt Hole Size = 0 in
Net Bridge Stiffener Area ($A_{e,pl}$) = 9 in²
Bridge Stiffener Circle (BC_{pl}) = 57 in
Total Area ($A_{tot,pl}$) = 27.00 in²
Percent Total Area (η_{pl}) = 51.0%

Axial, Bridge Stiffener ($P*\eta_{pl}$) = 22.28 kips

$$I_{inner} = 8428.25 \text{ in.}^4 \quad (N_{inner} * A_{inner} * BC_{inner}^2 / 8 + N_{inner} * I_{o,inner})$$

$$I_{pl} = 11046.38 \text{ in.}^4 \quad (N_{pl} * A_{pl} * BC_{pl}^2 / 8 + N_{pl} * I_{o,pl})$$

$$I_{tot} = 19474.63 \text{ in.}^4 \quad (I_{inner} + I_{outer} + I_{pl})$$

$$P_{u.t,inner} = 25.8 \text{ kips} \quad (M * (BC_{inner} / 2) * A_{inner} / I_{total} - P * \eta_{in} / N_{inner})$$

$$P_{u.t,pl} = 331.6 \text{ kips} \quad (M * (BC_{pl} / 2) * A_{pl} / I_{total} - P * \eta_{pl} / N_{pl})$$

$$P_{u.c,pl} = 346.5 \text{ kips} \quad (M * (BC_{pl} / 2) * A_{pl} / I_{total} + P * \eta_{pl} / N_{pl})$$

$$\phi P_{nt,bolt} = 61.85 \text{ kips}$$

Bolt Rating = 39.8% **OK**

Bridge Stiffener Check

$f_y = 50 \text{ ksi}$
 $f_u = 65 \text{ ksi}$
 $E = 29000 \text{ ksi}$
 $K = 0.85$
 $KL/r = 23.556$
 $F_e = 515.82 \text{ ksi}$
 $F_{cr} = 48.01 \text{ ksi}$
 $\phi P_{nc} = 388.90 \text{ kips}$
 $\phi P_{nt} = 438.75 \text{ kips}$

Bridge Stiffener Rating = 84.8% **OK**



Existing Flange Connection @
US-CT-1002 Kettletown
2022791.CT1002.17

100'

| | | |
|-----------|-------------|------|
| *Moment = | 1033.453314 | k-ft |
| Axial = | 43.68 | k |
| Shear = | 33.17 | k |

| | |
|-------------------------------|------|
| Maximum Capacity | 100% |
| Apply TIA-222-H Section 15.5? | Yes |

*Above reactions have been adjusted due to consideration of modifications. See attached hand calculations for determination of flange bolt forces used in the analysis.

| Flange Bolts | |
|--------------------------------|-----------------------|
| # Bolts = | 36 |
| Bolt Type = | A325 |
| Threads Included? = | Yes |
| Bolt Diameter = | 1 in |
| Bolt Circle = | 51 in |
| ϕ_t = | 0.75 |
| ϕ_v = | 0.75 |
| F_{ub} = | 120 ksi |
| A_b = | 0.785 in ² |
| A_n = | 0.606 in ² |
| ϕR_{nv} = | 35.34 k |
| ϕR_{nt} = | 54.54 k |
| ϕR_{nt} (adjusted) = | 54.52 k |
| V_{ub} = | 0.92 k |
| T_{ub} = | 25.80 k |
| Max Comp. on Bolt = | 28.23 k |
| <i>Prying Action Check</i> | |
| N/A, top flange thickness > tc | |
| Shear Capacity = | 2.5% |
| Tensile Capacity = | 45.1% |
| Interaction Capacity = | 21.4% |
| Bolt Capacity = | 45.1% OK |

| Upper Flange Plate | |
|-------------------------------|----------------------|
| Location = | External |
| Plate Strength (F_y) = | 36 ksi |
| Plate Tensile (F_u) = | 58 ksi |
| Plate Thickness = | 1.25 in |
| Outer Diameter = | 54.375 in |
| ϕ_t = | 0.9 |
| wcalc = | 17.23 in |
| wmax = | 25.70 in |
| w = | 17.23 in |
| Z = | 6.73 in ³ |
| M_{Uy} = | 113.38 k-in |
| ϕM_{Uy} = | 218.11 k-in |
| Upper Plate Capacity = | 49.5% OK |

| Upper Stiffeners | |
|------------------|------|
| Configuration = | None |

| Pole Information | |
|-----------------------|----------|
| Shaft Diam. (Upper) = | 48 in |
| Thickness (Upper) = | 0.375 in |
| # of Sides (Upper) = | Round |
| F_y (Upper) = | 42 ksi |
| Shaft Diam. (Lower) = | 54 in |
| Thickness (Lower) = | 0.375 in |
| # of Sides (Lower) = | Round |
| F_y (Lower) = | 42 ksi |

| Lower Flange Plate | |
|-------------------------------|----------------------|
| Location = | Internal |
| Plate Strength (F_y) = | 36 ksi |
| Plate Thickness = | 1.25 in |
| Hole Diameter = | 45.375 in |
| Pole Inner Diameter = | 53.25 in |
| e = | 1.13 in |
| w = | 4.65 in |
| Z = | 1.82 in ³ |
| M_{Uy} = | 31.75 k-in |
| ϕM_{Uy} = | 58.81 k-in |
| Lower Plate Capacity = | 51.4% OK |

| Lower Stiffeners | |
|------------------|------|
| Configuration = | None |



BOLT AND BRIDGE STIFFENER CALCULATIONS

@ 80'

Moment from TNX (M) = **2828.03** kip-ft
Axial from TNX (P) = **52.48** kip

ASIF = **1.00**

Inner Bolt Diameter = **1** in
Inner Bolt Area (A_{inner}) = **0.79** in²
Inner Bolt MOI ($I_{o,inner}$) = **0.05** in⁴
Number Inner Bolts (N_{inner}) = **48**

Inner Bolt Circle (BC_{inner}) = **57** in
Total Area ($A_{tot.in}$) = **37.70** in²
Percent Total Area (η_{in}) = **58.3%**

Axial, Inner Bolts ($P*\eta_{in}$) = **30.58** kips

Bridge Stiffener Width = **6.00** in
Bridge Stiffener Thickness = **1.50** in
Bridge Stiffener Unbraced Length = **12.00** in
Bridge Stiffener Area (A_{pl}) = **9.00** in²
Bridge Stiffener MOI (I_o) = **27.00** in⁴
Number Bridge Stiffeners (N_{pl}) = **3**

Connection Bolt Hole Size = **0** in
Net Bridge Stiffener Area ($A_{e,pl}$) = **9** in
Bridge Stiffener Circle (BC_{pl}) = **63** in
Total Area ($A_{tot,pl}$) = **27.00** in²
Percent Total Area (η_{pl}) = **41.7%**

Axial, Bridge Stiffener ($P*\eta_{pl}$) = **21.90** kips

$$I_{inner} = 15312.91 \text{ in.}^4 \quad (N_{inner} * A_{inner} * BC_{inner}^2 / 8 + N_{inner} * I_{o,inner})$$

$$I_{pl} = 13476.38 \text{ in.}^4 \quad (N_{pl} * A_{pl} * BC_{pl}^2 / 8 + N_{pl} * I_{o,pl})$$

$$I_{tot} = 28789.28 \text{ in.}^4 \quad (I_{inner} + I_{outer} + I_{pl})$$

$$P_{u.t,inner} = 25.7 \text{ kips} \quad (M * (BC_{inner} / 2) * A_{inner} / I_{total} - P * \eta_{in} / N_{inner})$$

$$P_{u.t,pl} = 326.9 \text{ kips} \quad (M * (BC_{pl} / 2) * A_{pl} / I_{total} - P * \eta_{pl} / N_{pl})$$

$$P_{u.c,pl} = 341.5 \text{ kips} \quad (M * (BC_{pl} / 2) * A_{pl} / I_{total} + P * \eta_{pl} / N_{pl})$$

$\phi P_{nt,bolt} = 61.85$ kips
Bolt Rating = **39.6%** **OK**

Bridge Stiffener Check

$f_y = 50$ ksi
 $f_u = 65$ ksi
E = 29000 ksi
K = 0.85

KL/r = 23.556
 $F_e = 515.82$ ksi
 $F_{cr} = 48.01$ ksi
 $\phi P_{nc} = 388.90$ kips
 $\phi P_{nt} = 438.75$ kips

Bridge Stiffener Rating = **83.6%** **OK**



**Existing Flange Connection @
US-CT-1002 Kettletown
2022791.CT1002.17**

80'

| | | |
|-----------|-------------|------|
| *Moment = | 1527.457405 | k-ft |
| Axial = | 52.48 | k |
| Shear = | 35.09 | k |

| | |
|-------------------------------|------|
| Maximum Capacity | 100% |
| Apply TIA-222-H Section 15.5? | Yes |

*Above reactions have been adjusted due to consideration of modifications. See attached hand calculations for determination of flange bolt forces used in the analysis.

| Flange Bolts | |
|--|-----------------------|
| # Bolts = | 48 |
| Bolt Type = | A325 |
| Threads Included? = | Yes |
| Bolt Diameter = | 1 in |
| Bolt Circle = | 57 in |
| ϕ_t = | 0.75 |
| ϕ_v = | 0.75 |
| F_{ub} = | 120 ksi |
| A_b = | 0.785 in ² |
| A_n = | 0.606 in ² |
| ϕR_{nv} = | 35.34 k |
| ϕR_{nt} = | 54.54 k |
| ϕR_{nt} (adjusted) = | 54.53 k |
| V_{ub} = | 0.73 k |
| T_{ub} = | 25.70 k |
| Max Comp. on Bolt = | 27.89 k |
| <i>Prying Action Check</i> | |
| N/A, top flange thickness > t _c | |
| Shear Capacity = | 2.0% |
| Tensile Capacity = | 44.9% |
| Interaction Capacity = | 21.2% |
| Bolt Capacity = | 44.9% OK |

| Upper Flange Plate | |
|-------------------------------|----------------------|
| Location = | External |
| Plate Strength (F_y) = | 36 ksi |
| Plate Tensile (F_u) = | 58 ksi |
| Plate Thickness = | 1.25 in |
| Outer Diameter = | 60.375 in |
| ϕ_t = | 0.9 |
| b = | 3.11 in |
| Le = | 3.00 in |
| Z = | 2.34 in ³ |
| M_{u_y} = | 35.43 k-in |
| ϕM_{n_y} = | 75.94 k-in |
| Upper Plate Capacity = | 44.4% OK |

| Upper Stiffeners | |
|--------------------------------|-----------------|
| Configuration = | Every Bolt |
| Thickness = | 0.625 in |
| Width = | 3 in |
| Notch = | 0.5 in |
| Height = | 5 in |
| Stiffener Strength (F_y) = | 36 ksi |
| Weld Info. Known? = | Yes |
| Vertical Weld Size = | 0.3125 in |
| Horiz. Weld Type = | Fillet |
| Fillet Size = | 0.3125 in |
| Weld Strength = | 70 ksi |
| Stiffener Vertical Force = | 15.92 k |
| Vert. Weld Capacity = | 33.3% |
| Horiz. Weld Capacity = | 47.5% |
| Stiffener Capacity = | 52.7% |
| Controlling Capacity = | 52.7% OK |

| Pole Information | |
|-----------------------|----------|
| Shaft Diam. (Upper) = | 54 in |
| Thickness (Upper) = | 0.375 in |
| # of Sides (Upper) = | Round |
| F_y (Upper) = | 42 ksi |
| Shaft Diam. (Lower) = | 60 in |
| Thickness (Lower) = | 0.375 in |
| # of Sides (Lower) = | Round |
| F_y (Lower) = | 42 ksi |

| Lower Flange Plate | |
|-------------------------------|----------------------|
| Location = | Internal |
| Plate Strength (F_y) = | 36 ksi |
| Plate Thickness = | 1.25 in |
| Hole Diameter = | 51.375 in |
| b = | 3.11 in |
| Le = | 2.00 in |
| Z = | 2.34 in ³ |
| M_{u_y} = | 42.30 k-in |
| ϕM_{n_y} = | 75.94 k-in |
| Lower Plate Capacity = | 53.1% OK |

| Lower Stiffeners | |
|--------------------------------|-----------------|
| Configuration = | Every Bolt |
| Thickness = | 0.625 in |
| Width = | 2 in |
| Notch = | 0.5 in |
| Height = | 3.5 in |
| Stiffener Strength (F_y) = | 36 ksi |
| Weld Info. Known? = | Yes |
| Vertical Weld Size = | 0.3125 in |
| Horiz. Weld Type = | Fillet |
| Fillet Size = | 0.3125 in |
| Weld Strength = | 70 ksi |
| Stiffener Vertical Force = | 10.31 k |
| Vert. Weld Capacity = | 32.0% |
| Horiz. Weld Capacity = | 51.4% |
| Stiffener Capacity = | 48.4% |
| Controlling Capacity = | 51.4% OK |



BOLT AND BRIDGE STIFFENER CALCULATIONS

@ 60'

| | | | | | |
|---|-----------------------|--|-----------------------|--|------------|
| Moment from TNX (M) = | 3554.98 kip-ft | ASIF = | 1.00 | | |
| Axial from TNX (P) = | 62.80 kip | | | | |
| Inner Bolt Diameter = | 1.25 in | Inner Bolt Circle (BC _{inner}) = | 47 in | | |
| Inner Bolt Area (A _{inner}) = | 1.23 in ² | Total Area (A _{tot.in}) = | 39.27 in ² | | |
| Inner Bolt MOI (I _{o,inner}) = | 0.12 in ⁴ | Percent Total Area (η _{in}) = | 29.6% | Axial, Inner Bolts (P*η _{in}) = | 18.61 kips |
| Number Inner Bolts (N _{inner}) = | 32 | | | | |
| Outer Bolt Diameter = | 1.25 in | Outer Bolt Circle (BC _{outer}) = | 53 in | | |
| Outer Bolt Area (A _{outer}) = | 1.23 in ² | Total Area (A _{tot.out}) = | 39.27 in ² | | |
| Outer Bolt MOI (I _{o,outer}) = | 0.12 in ⁴ | Percent Total Area (η _{out}) = | 29.6% | Axial, Outer Bolts (P*η _{out}) = | 18.61 kips |
| Number Outer Bolts (N _{outer}) = | 32 | | | | |
| Bridge Stiffener Width = | 6.00 in | Connection Bolt Hole Size = | 1.21875 in | | |
| Bridge Stiffener Thickness = | 1.50 in | Net Bridge Stiffener Area (A _{e,pl}) = | 7.17188 in | | |
| Bridge Stiffener Unbraced Length = | 30.00 in | Bridge Stiffener Circle (BC _{pl}) = | 63 in | | |
| Bridge Stiffener Area (A _{pl}) = | 9.00 in ² | Total Area (A _{tot.pl}) = | 54.00 in ² | | |
| Bridge Stiffener MOI (I _o) = | 27.00 in ⁴ | Percent Total Area (η _{pl}) = | 40.7% | Axial, Bridge Stiffener (P*η _{pl}) = | 25.59 kips |
| Number Bridge Stiffeners (N _{pl}) = | 6 | | | | |

| | | |
|----------------------|---------------------------|---|
| I _{inner} = | 10847.24 in. ⁴ | (N _{inner} * A _{inner} * BC _{inner} ² / 8 + N _{inner} * I _{o,inner}) |
| I _{outer} = | 13792.48 in. ⁴ | (N _{outer} * A _{outer} * BC _{outer} ² / 8 + N _{outer} * I _{o,outer}) |
| I _{pl} = | 26952.75 in. ⁴ | (N _{pl} * A _{pl} * BC _{pl} ² / 8 + N _{pl} * I _{o,pl}) |
| I _{tot} = | 51592.47 in. ⁴ | (I _{inner} + I _{outer} + I _{pl}) |

| | | |
|--------------------------|-----------------|--|
| P _{u.t.inner} = | 23.3 kips | (M * (BC _{inner} / 2) * A _{inner}) / I _{total} - P * η _{in} / N _{inner} |
| P _{u.t.outer} = | 26.3 kips | (M * (BC _{outer} / 2) * A _{outer}) / I _{total} - P * η _{out} / N _{outer} |
| P _{u.t.pl} = | 230.2 kips | (M * (BC _{pl} / 2) * A _{pl}) / I _{total} - P * η _{pl} / N _{pl} |
| P _{u.c.pl} = | 238.7 kips | (M * (BC _{pl} / 2) * A _{pl}) / I _{total} + P * η _{pl} / N _{pl} |
| ØP _{nt.bolt} = | 96.64 kips | |
| Bolt Rating = | 25.9% OK | |

Bridge Stiffener Check

| | | |
|--------------------|--------|------|
| f _y = | 50 | ksi |
| f _u = | 65 | ksi |
| E = | 29000 | ksi |
| K = | 0.85 | |
| KL/r = | 58.890 | |
| F _e = | 82.53 | ksi |
| F _{cr} = | 38.80 | ksi |
| ØP _{nc} = | 314.29 | kips |
| ØP _{nt} = | 349.63 | kips |

Bridge Stiffener Rating = 72.3% **OK**



Existing Flange Connection @
US-CT-1002 Kettletown
 2022791.CT1002.17

60'

| | | |
|-----------|-------------|------|
| *Moment = | 1513.694454 | k-ft |
| Axial = | 62.80 | k |
| Shear = | 37.32 | k |

| | |
|-------------------------------|------|
| Maximum Capacity | 100% |
| Apply TIA-222-H Section 15.5? | Yes |

*Above reactions have been adjusted due to consideration of modifications. See attached hand calculations for determination of flange bolt forces used in the analysis.

| Flange Bolts | |
|----------------------------|-----------------------|
| # Bolts = | 32 |
| Bolt Type = | A325 |
| Threads Included? = | Yes |
| Bolt Diameter = | 1.75 in |
| Bolt Circle = | 44 in |
| ϕ_t = | 0.75 |
| ϕ_v = | 0.75 |
| F_{ub} = | 105 ksi |
| A_b = | 2.405 in ² |
| A_n = | 1.9 in ² |
| ϕR_{nv} = | 94.71 k |
| ϕR_{nt} = | 149.63 k |
| ϕR_{nt} (adjusted) = | 149.61 k |
| V_{ub} = | 1.17 k |
| T_{ub} = | 49.60 k |
| Max Comp. on Bolt = | 53.52 k |
| <i>Prying Action Check</i> | |
| N/A for stiffened flange | |
| Shear Capacity = | 1.2% |
| Tensile Capacity = | 31.6% |
| Interaction Capacity = | 10.5% |
| Bolt Capacity = | 31.6% OK |

| Upper Flange Plate | |
|-------------------------------|----------------------|
| Location = | Internal |
| Plate Strength (F_y) = | 36 ksi |
| Plate Tensile (F_u) = | 58 ksi |
| Plate Thickness = | 1.25 in |
| Hole Diameter = | 43 in |
| ϕ_t = | 0.9 |
| b = | 3.69 in |
| Le = | 7.00 in |
| Z = | 2.34 in ³ |
| M_{uy} = | 31.59 k-in |
| ϕM_n = | 75.94 k-in |
| Upper Plate Capacity = | 39.6% OK |

| Upper Stiffeners | |
|--------------------------------|-----------------|
| Configuration = | Every Bolt |
| Thickness = | 0.625 in |
| Width = | 7 in |
| Notch = | 0.5 in |
| Height = | 10 in |
| Stiffener Strength (F_y) = | 36 ksi |
| Weld Info. Known? = | No |
| Stiffener Vertical Force = | 26.75 k |
| Vert. Weld Capacity = | Not Verified |
| Horiz. Weld Capacity = | Not Verified |
| Stiffener Capacity = | 46.5% |
| Controlling Capacity = | 46.5% OK |

| Pole Information | |
|-----------------------|----------|
| Shaft Diam. (Upper) = | 60 in |
| Thickness (Upper) = | 0.375 in |
| # of Sides (Upper) = | Round |
| F_y (Upper) = | 42 ksi |
| Shaft Diam. (Lower) = | 60 in |
| Thickness (Lower) = | 0.5 in |
| # of Sides (Lower) = | Round |
| F_y (Lower) = | 42 ksi |

| Lower Flange Plate | |
|-------------------------------|----------------------|
| Location = | Internal |
| Plate Strength (F_y) = | 36 ksi |
| Plate Thickness = | 1.25 in |
| Hole Diameter = | 43 in |
| b = | 3.69 in |
| Le = | 7.00 in |
| Z = | 2.34 in ³ |
| M_{uy} = | 31.59 k-in |
| ϕM_n = | 75.94 k-in |
| Lower Plate Capacity = | 39.6% OK |

| Lower Stiffeners | |
|--------------------------------|-----------------|
| Configuration = | Every Bolt |
| Thickness = | 0.625 in |
| Width = | 7 in |
| Notch = | 0.5 in |
| Height = | 10 in |
| Stiffener Strength (F_y) = | 36 ksi |
| Weld Info. Known? = | No |
| Stiffener Vertical Force = | 23.58 k |
| Vert. Weld Capacity = | Not Verified |
| Horiz. Weld Capacity = | Not Verified |
| Stiffener Capacity = | 41.0% |
| Controlling Capacity = | 41.0% OK |



BOLT AND BRIDGE STIFFENER CALCULATIONS

@ 40'

| | | | | |
|---|-----------------------|--|-----------------------|---|
| Moment from TNX (M) = | 4318.45 kip-ft | ASIF = | 1.00 | |
| Axial from TNX (P) = | 76.15 kip | | | |
| Inner Bolt Diameter = | 1.25 in | Inner Bolt Circle (BC _{inner}) = | 47 in | |
| Inner Bolt Area (A _{inner}) = | 1.23 in ² | Total Area (A _{tot.in}) = | 39.27 in ² | |
| Inner Bolt MOI (I _{o.inner}) = | 0.12 in ⁴ | Percent Total Area (η _{in}) = | 29.6% | Axial, Inner Bolts (P*η _{in}) = 22.56 kips |
| Number Inner Bolts (N _{inner}) = | 32 | | | |
| Outer Bolt Diameter = | 1.25 in | Outer Bolt Circle (BC _{outer}) = | 53 in | |
| Outer Bolt Area (A _{outer}) = | 1.23 in ² | Total Area (A _{tot.out}) = | 39.27 in ² | |
| Outer Bolt MOI (I _{o.outer}) = | 0.12 in ⁴ | Percent Total Area (η _{out}) = | 29.6% | Axial, Outer Bolts (P*η _{out}) = 22.56 kips |
| Number Outer Bolts (N _{outer}) = | 32 | | | |
| Bridge Stiffener Width = | 6.00 in | Connection Bolt Hole Size = | 1.18 in | |
| Bridge Stiffener Thickness = | 1.50 in | Net Bridge Stiffener Area (A _{e.pl}) = | 7.23 in | |
| Bridge Stiffener Unbraced Length = | 30.00 in | Bridge Stiffener Circle (BC _{pl}) = | 63 in | |
| Bridge Stiffener Area (A _{pl}) = | 9.00 in ² | Total Area (A _{tot.pl}) = | 54.00 in ² | |
| Bridge Stiffener MOI (I _o) = | 27.00 in ⁴ | Percent Total Area (η _{pl}) = | 40.7% | Axial, Bridge Stiffener (P*η _{pl}) = 31.02 kips |
| Number Bridge Stiffeners (N _{pl}) = | 6 | | | |

| | | |
|----------------------|---------------------------|---|
| I _{inner} = | 10847.24 in. ⁴ | (N _{inner} * A _{inner} * BC _{inner} ² / 8 + N _{inner} * I _{o.inner}) |
| I _{outer} = | 13792.48 in. ⁴ | (N _{outer} * A _{outer} * BC _{outer} ² / 8 + N _{outer} * I _{o.outer}) |
| I _{pl} = | 26952.75 in. ⁴ | (N _{pl} * A _{pl} * BC _{pl} ² / 8 + N _{pl} * I _{o.pl}) |
| I _{tot} = | 51592.47 in. ⁴ | (I _{inner} + I _{outer} + I _{pl}) |

| | | |
|--------------------------|-----------------|--|
| P _{u.t.inner} = | 28.3 kips | (M * (BC _{inner} / 2) * A _{inner}) / I _{total} - P * η _{in} / N _{inner} |
| P _{u.t.outer} = | 32.0 kips | (M * (BC _{outer} / 2) * A _{outer}) / I _{total} - P * η _{out} / N _{outer} |
| P _{u.t.pl} = | 279.6 kips | (M * (BC _{pl} / 2) * A _{pl}) / I _{total} - P * η _{pl} / N _{pl} |
| P _{u.c.pl} = | 289.9 kips | (M * (BC _{pl} / 2) * A _{pl}) / I _{total} + P * η _{pl} / N _{pl} |
| ØP _{nt.bolt} = | 96.64 kips | |
| Bolt Rating = | 31.5% OK | |

Bridge Stiffener Check

| | | |
|--------------------|--------|------|
| f _y = | 50 | ksi |
| f _u = | 65 | ksi |
| E = | 29000 | ksi |
| K = | 0.85 | |
| KL/r = | 58.890 | |
| F _e = | 82.53 | ksi |
| F _{cr} = | 38.80 | ksi |
| ØP _{nc} = | 314.29 | kips |
| ØP _{nt} = | 352.46 | kips |

Bridge Stiffener Rating = 87.9% **OK**



Existing Flange Connection @
US-CT-1002 Kettletown
 2022791.CT1002.17

40'

| | | |
|-----------|-----------|------|
| *Moment = | 2090.5995 | k-ft |
| Axial = | 76.147 | k |
| Shear = | 38.958 | k |

| | |
|-------------------------------|------|
| Maximum Capacity | 100% |
| Apply TIA-222-H Section 15.5? | Yes |

*Above reactions have been adjusted due to consideration of modifications. See attached hand calculations for determination of flange bolt forces used in the analysis.

| Flange Bolts | |
|----------------------------|-----------------------|
| # Bolts = | 32 |
| Bolt Type = | A325 |
| Threads Included? = | Yes |
| Bolt Diameter = | 1.75 in |
| Bolt Circle = | 50 in |
| ϕ_t = | 0.75 |
| ϕ_v = | 0.75 |
| F_{ub} = | 105 ksi |
| A_b = | 2.405 in ² |
| A_n = | 1.9 in ² |
| ϕR_{nv} = | 94.71 k |
| ϕR_{nt} = | 149.63 k |
| ϕR_{nt} (adjusted) = | 149.61 k |
| V_{ub} = | 1.22 k |
| T_{ub} = | 60.30 k |
| Max Comp. on Bolt = | 65.06 k |
| <i>Prying Action Check</i> | |
| N/A for stiffened flange | |
| Shear Capacity = | 1.2% |
| Tensile Capacity = | 38.4% |
| Interaction Capacity = | 15.5% |
| Bolt Capacity = | 38.4% OK |

| Upper Flange Plate | |
|-------------------------------|----------------------|
| Location = | Internal |
| Plate Strength (F_y) = | 36 ksi |
| Plate Tensile (F_u) = | 58 ksi |
| Plate Thickness = | 1.25 in |
| Hole Diameter = | 43 in |
| ϕ_t = | 0.9 |
| b = | 4.28 in |
| Le = | 7.00 in |
| Z = | 2.34 in ³ |
| M_{uy} = | 41.40 k-in |
| ϕM_n = | 75.94 k-in |
| Upper Plate Capacity = | 51.9% OK |

| Upper Stiffeners | |
|--------------------------------|-----------------|
| Configuration = | Every Bolt |
| Thickness = | 0.625 in |
| Width = | 7 in |
| Notch = | 0.5 in |
| Height = | 10 in |
| Stiffener Strength (F_y) = | 36 ksi |
| Weld Info. Known? = | No |
| Stiffener Vertical Force = | 32.38 k |
| Vert. Weld Capacity = | Not Verified |
| Horiz. Weld Capacity = | Not Verified |
| Stiffener Capacity = | 56.3% |
| Controlling Capacity = | 56.3% OK |

| Pole Information | |
|-----------------------|----------|
| Shaft Diam. (Upper) = | 60 in |
| Thickness (Upper) = | 0.5 in |
| # of Sides (Upper) = | Round |
| F_y (Upper) = | 42 ksi |
| Shaft Diam. (Lower) = | 60 in |
| Thickness (Lower) = | 0.625 in |
| # of Sides (Lower) = | Round |
| F_y (Lower) = | 42 ksi |

| Lower Flange Plate | |
|-------------------------------|----------------------|
| Location = | Internal |
| Plate Strength (F_y) = | 36 ksi |
| Plate Thickness = | 1.25 in |
| Hole Diameter = | 43 in |
| b = | 4.28 in |
| Le = | 7.00 in |
| Z = | 2.34 in ³ |
| M_{uy} = | 41.40 k-in |
| ϕM_n = | 75.94 k-in |
| Lower Plate Capacity = | 51.9% OK |

| Lower Stiffeners | |
|--------------------------------|-----------------|
| Configuration = | Every Bolt |
| Thickness = | 0.625 in |
| Width = | 7 in |
| Notch = | 0.5 in |
| Height = | 10 in |
| Stiffener Strength (F_y) = | 36 ksi |
| Weld Info. Known? = | No |
| Stiffener Vertical Force = | 28.96 k |
| Vert. Weld Capacity = | Not Verified |
| Horiz. Weld Capacity = | Not Verified |
| Stiffener Capacity = | 50.3% |
| Controlling Capacity = | 50.3% OK |

BOLT AND BRIDGE STIFFENER CALCULATIONS

@ 20'

| | | | | | |
|---|-----------------------|--|-----------------------|--|------------|
| Moment from TNX (M) = | 5110.86 kip-ft | ASIF = | 1.00 | | |
| Axial from TNX (P) = | 91.66 kip | | | | |
| Inner Bolt Diameter = | 1.25 in | Inner Bolt Circle (BC _{inner}) = | 47 in | | |
| Inner Bolt Area (A _{inner}) = | 1.23 in ² | Total Area (A _{tot.in}) = | 39.27 in ² | | |
| Inner Bolt MOI (I _{o.inner}) = | 0.12 in ⁴ | Percent Total Area (η _{in}) = | 24.2% | Axial, Inner Bolts (P*η _{in}) = | 22.15 kips |
| Number Inner Bolts (N _{inner}) = | 32 | | | | |
| Outer Bolt Diameter = | 1.25 in | Outer Bolt Circle (BC _{outer}) = | 53 in | | |
| Outer Bolt Area (A _{outer}) = | 1.23 in ² | Total Area (A _{tot.out}) = | 39.27 in ² | | |
| Outer Bolt MOI (I _{o.outer}) = | 0.12 in ⁴ | Percent Total Area (η _{out}) = | 24.2% | Axial, Outer Bolts (P*η _{out}) = | 22.15 kips |
| Number Outer Bolts (N _{outer}) = | 32 | | | | |
| Bridge Stiffener Width = | 6.00 in | Connection Bolt Hole Size = | 1.21875 in | | |
| Bridge Stiffener Thickness = | 1.50 in | Net Bridge Stiffener Area (A _{e.pl}) = | 7.17188 in | | |
| Bridge Stiffener Unbraced Length = | 30.00 in | Bridge Stiffener Circle (BC _{pl}) = | 60.75 in | | |
| Bridge Stiffener Area (A _{pl}) = | 9.00 in ² | Total Area (A _{tot.pl}) = | 54.00 in ² | | |
| Bridge Stiffener MOI (I _o) = | 27.00 in ⁴ | Percent Total Area (η _{pl}) = | 33.2% | Axial, Bridge Stiffener (P*η _{pl}) = | 30.45 kips |
| Number Bridge Stiffeners (N _{pl}) = | 6 | | | | |
| Bridge Stiffener Width = | 4.00 in | Connection Bolt Hole Size = | 1.21875 in | | |
| Bridge Stiffener Thickness = | 1.25 in | Net Bridge Stiffener Area (A _{e.pl}) = | 3.47656 in | | |
| Bridge Stiffener Unbraced Length = | 12.00 in | Bridge Stiffener Circle (BC _{pl}) = | 60.625 in | | |
| Bridge Stiffener Area (A _{pl}) = | 5.00 in ² | Total Area (A _{tot.pl}) = | 30.00 in ² | | |
| Bridge Stiffener MOI (I _o) = | 6.67 in ⁴ | Percent Total Area (η _{pl}) = | 18.5% | Axial, Bridge Stiffener (P*η _{pl}) = | 16.92 kips |
| Number Bridge Stiffeners (N _{pl}) = | 6 | | | | |

| | | |
|----------------------|---------------------------|---|
| I _{inner} = | 10847.24 in. ⁴ | (N _{inner} * A _{inner} * BC _{inner} ² / 8 + N _{inner} * I _{o.inner}) |
| I _{outer} = | 13792.48 in. ⁴ | (N _{outer} * A _{outer} * BC _{outer} ² / 8 + N _{outer} * I _{o.outer}) |
| I _{pl} = | 25073.30 in. ⁴ | (N _{pl} * A _{pl} * BC _{pl} ² / 8 + N _{pl} * I _{o.pl}) |
| I _{pl} = | 13822.71 in. ⁴ | (N _{pl} * A _{pl} * BC _{pl} ² / 8 + N _{pl} * I _{o.pl}) |
| I _{tot} = | 63535.73 in. ⁴ | (I _{inner} + I _{outer} + I _{pl}) |

| | | |
|--------------------------|------------|--|
| P _{u.t.inner} = | 27.1 kips | (M * (BC _{inner} / 2) * A _{inner}) / I _{total} - P * η _{in} / N _{inner} |
| P _{u.t.outer} = | 30.7 kips | (M * (BC _{outer} / 2) * A _{outer}) / I _{total} - P * η _{out} / N _{outer} |
| P _{u.t.pl} = | 258.8 kips | (M * (BC _{pl} / 2) * A _{pl}) / I _{total} - P * η _{pl} / N _{pl} |
| P _{u.c.pl} = | 269.0 kips | (M * (BC _{pl} / 2) * A _{pl}) / I _{total} + P * η _{pl} / N _{pl} |
| P _{u.t.pl} = | 143.5 kips | (M * (BC _{pl} / 2) * A _{pl}) / I _{total} - P * η _{pl} / N _{pl} |
| P _{u.c.pl} = | 149.1 kips | (M * (BC _{pl} / 2) * A _{pl}) / I _{total} + P * η _{pl} / N _{pl} |
| ØP _{nt.bolt} = | 96.64 kips | |
| Bolt Rating = | 30.3% OK | |

Bridge Stiffener Check

| | | |
|--------------------|--------|------|
| f _y = | 50 | ksi |
| f _u = | 65 | ksi |
| E = | 29000 | ksi |
| K = | 0.85 | |
| KL/r = | 58.890 | |
| F _e = | 82.53 | ksi |
| F _{cr} = | 38.80 | ksi |
| ØP _{nc} = | 314.29 | kips |
| ØP _{nt} = | 349.63 | kips |

Bridge Stiffener Rating = 81.5% OK



Existing Flange Connection @
US-CT-1002 Kettletown
 2022791.CT1002.17

20'

| | | |
|-----------|-------------|------|
| *Moment = | 2023.386482 | k-ft |
| Axial = | 91.662 | k |
| Shear = | 40.21 | k |

| | |
|-------------------------------|------|
| Maximum Capacity | 100% |
| Apply TIA-222-H Section 15.5? | Yes |

*Above reactions have been adjusted due to consideration of modifications. See attached hand calculations for determination of flange bolt forces used in the analysis.

| Flange Bolts | |
|----------------------------|-----------------------|
| # Bolts = | 32 |
| Bolt Type = | A325 |
| Threads Included? = | Yes |
| Bolt Diameter = | 1.75 in |
| Bolt Circle = | 50 in |
| ϕ_t = | 0.75 |
| ϕ_v = | 0.75 |
| F_{ub} = | 105 ksi |
| A_b = | 2.405 in ² |
| A_n = | 1.9 in ² |
| ϕR_{nv} = | 94.71 k |
| ϕR_{nt} = | 149.63 k |
| ϕR_{nt} (adjusted) = | 149.61 k |
| V_{ub} = | 1.26 k |
| T_{ub} = | 57.80 k |
| Max Comp. on Bolt = | 63.53 k |
| <i>Prying Action Check</i> | |
| N/A for stiffened flange | |
| Shear Capacity = | 1.3% |
| Tensile Capacity = | 36.8% |
| Interaction Capacity = | 14.2% |
| Bolt Capacity = | 36.8% OK |

| Upper Flange Plate | |
|-------------------------------|----------------------|
| Location = | Internal |
| Plate Strength (F_y) = | 36 ksi |
| Plate Tensile (F_u) = | 58 ksi |
| Plate Thickness = | 1.25 in |
| Hole Diameter = | 43 in |
| ϕ_t = | 0.9 |
| b = | 4.28 in |
| Le = | 7.00 in |
| Z = | 2.34 in ³ |
| M_{Iy} = | 40.43 k-in |
| ϕM_n = | 75.94 k-in |
| Upper Plate Capacity = | 50.7% OK |

| Upper Stiffeners | |
|--------------------------------|-----------------|
| Configuration = | Every Bolt |
| Thickness = | 0.625 in |
| Width = | 7 in |
| Notch = | 0.5 in |
| Height = | 10 in |
| Stiffener Strength (F_y) = | 36 ksi |
| Weld Info. Known? = | No |
| Stiffener Vertical Force = | 28.32 k |
| Vert. Weld Capacity = | Not Verified |
| Horiz. Weld Capacity = | Not Verified |
| Stiffener Capacity = | 49.2% |
| Controlling Capacity = | 49.2% OK |

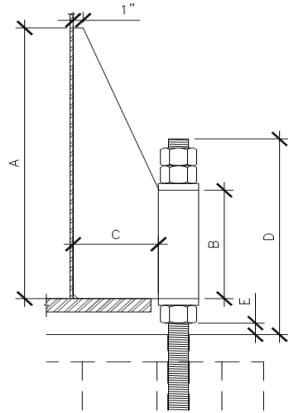
| Pole Information | |
|-----------------------|----------|
| Shaft Diam. (Upper) = | 60 in |
| Thickness (Upper) = | 0.625 in |
| # of Sides (Upper) = | Round |
| F_y (Upper) = | 42 ksi |
| Shaft Diam. (Lower) = | 60 in |
| Thickness (Lower) = | 0.625 in |
| # of Sides (Lower) = | Round |
| F_y (Lower) = | 42 ksi |

| Lower Flange Plate | |
|-------------------------------|----------------------|
| Location = | Internal |
| Plate Strength (F_y) = | 36 ksi |
| Plate Thickness = | 1.25 in |
| Hole Diameter = | 43 in |
| b = | 4.28 in |
| Le = | 7.00 in |
| Z = | 2.34 in ³ |
| M_{Iy} = | 40.43 k-in |
| ϕM_n = | 75.94 k-in |
| Lower Plate Capacity = | 50.7% OK |

| Lower Stiffeners | |
|--------------------------------|-----------------|
| Configuration = | Every Bolt |
| Thickness = | 0.625 in |
| Width = | 7 in |
| Notch = | 0.5 in |
| Height = | 10 in |
| Stiffener Strength (F_y) = | 36 ksi |
| Weld Info. Known? = | No |
| Stiffener Vertical Force = | 28.32 k |
| Vert. Weld Capacity = | Not Verified |
| Horiz. Weld Capacity = | Not Verified |
| Stiffener Capacity = | 49.2% |
| Controlling Capacity = | 49.2% OK |

ANCHOR ROD BRACKET CALCULATIONS - TIA-222-H

Site Name: US-CT-1002 Kettletown
 GPD Project No: 2022791.CT1002.15
 Sheet Application: Analysis
 Max Capacity: 100%
 Apply TIA-222-H Section 15.5? Yes



| Anchor Rod Properties | | |
|-------------------------|------|------|
| F_u = | 125 | ksi |
| F_y = | 105 | ksi |
| Diameter = | 1.25 | in |
| Rod Tension Force = | 68.8 | kips |
| Rod Compression Force = | 68.8 | kips |

| Bracket Plate Properties | | |
|------------------------------------|------|-----|
| A = | 36 | in |
| B = | 9 | in |
| C = | 5.25 | in |
| Unbraced Length of Anchor Rod, E = | 1.25 | in |
| Bracket Thickness = | 1.25 | in |
| F_y = | 50 | ksi |
| F_u = | 65 | ksi |
| ARB connected to flat plate? | No | |

| Anchor Rod Buckling | | |
|-------------------------|-----------|-----------------|
| Buckling K Factor = | 1.2 | |
| Nominal Diameter, d = | 1.25 | in |
| Gross Area, A_g = | 1.227 | in ² |
| Moment of Inertia, I = | 0.120 | in ⁴ |
| Radius of Gyration, r = | 0.313 | in |
| KL/r = | 4.80 | |
| F_e = | 12422.7 | ksi |
| F_{cr} = | 104.6 | ksi |
| $\phi_{buckling}$ = | 0.9 | |
| Capacity = | lar <= 4d | OK |

| Pipe Yielding | | |
|--------------------------|------------|-----------------|
| Pipe Size = | P 3 XX-STR | |
| Outer Diameter = | 3.5 | in |
| Inner Diameter = | 2.3 | in |
| Area = | 5.47 | in ² |
| Yield Stress, F_y = | 35 | ksi |
| Ultimate Stress, F_u = | 60 | ksi |
| ϕ = | 0.97 | |
| ϕP_n = | 172.19 | kips |
| Capacity = | 38.1% | OK |

| Flexure and Combined Flexure & Shear (Pipe-to-Bracket) | | |
|--|--------|-----------------|
| Plastic Modulus, Z = | 25.31 | in ³ |
| Elastic Modulus, S = | 16.88 | in ³ |
| ϕM = | 0.9 | |
| ϕV = | 1.0 | |
| $\phi M_{n, yield, LTB}$ = | 1139.1 | kip-in |
| ϕV_n = | 337.5 | kips |
| M_u = | 120.4 | kip-in |
| V_u = | 68.8 | kips |
| Capacity = | 10.1% | OK |

| Shear Strength (Pipe-to-Bracket) | | |
|----------------------------------|-------|-----------------|
| A_w = | 11.25 | in ² |
| F_y = | 50 | ksi |
| F_u = | 65 | ksi |
| ϕ_{yield} = | 1.0 | |
| $\phi_{rupture}$ = | 0.75 | |
| $\phi V_{n, yield}$ = | 337.5 | kips |
| $\phi V_{n, rupture}$ = | 329.1 | kips |
| V_u = | 68.8 | kips |
| Capacity = | 19.9% | OK |

| Rupture Strength at Welds (Bracket-to-Tower) | | |
|--|--------|------|
| Pole Thickness = | 0.625 | in |
| Pole F_y = | 42 | ksi |
| Pole F_u = | 63 | ksi |
| Applied Force = | 1.28 | k/in |
| Rupture Strength of Pole = | 23.625 | k/in |
| Capacity = | 5.4% | OK |

| Pipe Punching Shear | | |
|--------------------------|--------|------|
| Eccentricity, e = | 1.75 | in |
| Induced Moment, M = | 120.40 | k-in |
| ϕ = | 0.75 | |
| $\phi M_{n, punching}$ = | 437.4 | k-in |
| Capacity = | 26.2% | OK |

| Flexure and Combined Flexure & Shear (Bracket-to-Tower) | | |
|---|---------|-----------------|
| Plastic Modulus, Z = | 405.00 | in ³ |
| Elastic Modulus, S = | 270.00 | in ³ |
| ϕM = | 0.9 | |
| ϕV = | 1.0 | |
| $\phi M_{n, yield, LTB}$ = | 17773.7 | kip-in |
| ϕV_n = | 1350 | kips |
| M_u = | 481.6 | kip-in |
| V_u = | 68.8 | kips |
| Capacity = | 2.6% | OK |

| Shear Strength (Bracket-to-Tower) | | |
|-----------------------------------|--------|-----------------|
| A_w = | 45 | in ² |
| F_y = | 50 | ksi |
| F_u = | 65 | ksi |
| ϕ_{yield} = | 1.0 | |
| $\phi_{rupture}$ = | 0.75 | |
| $\phi V_{n, yield}$ = | 1350.0 | kips |
| $\phi V_{n, rupture}$ = | 1316.3 | kips |
| V_u = | 68.8 | kips |
| Capacity = | 5.0% | OK |

| Pole Punching Shear (max per unit length) | | |
|---|---------|-----------------|
| Eccentricity, e = | 7 | in |
| Induced Moment, M = | 481.60 | k-in |
| Elastic Modulus, S = | 270.00 | in ³ |
| Shear Force, f_v = | 2.23 | kips |
| ϕ_{yield} = | 1.0 | |
| $\phi_{rupture}$ = | 0.75 | |
| $\phi F_v, yield$ = | 31.50 | kips |
| $\phi F_v, rupture$ = | 35.4375 | kips |
| Capacity = | 6.7% | OK |

| Weld Check (Pipe-to-Bracket) | | | | | |
|------------------------------|-------|-----|--------------|--------|------|
| Weld Length = | 9 | in | D = | 6 | |
| Fillet Weld Size = | 0.375 | in | C1 = | 1 | |
| Weld Strength = | 70 | ksi | C = | 3.53 | |
| e = | 1.75 | in | ϕ = | 0.75 | |
| a = | 0.194 | | ϕR_n = | 142.88 | kips |
| | | | Capacity = | 45.9% | OK |

| Weld Check (Bracket-to-Tower) | | | | | |
|-------------------------------|--------|-----|--------------|--------|------|
| Weld Length = | 36 | in | D = | 5 | |
| Fillet Weld Size = | 0.3125 | in | C1 = | 1 | |
| Weld Strength = | 70 | ksi | C = | 3.53 | |
| e = | 7 | in | ϕ = | 0.75 | |
| a = | 0.194 | | ϕR_n = | 476.25 | kips |
| | | | Capacity = | 13.8% | OK |

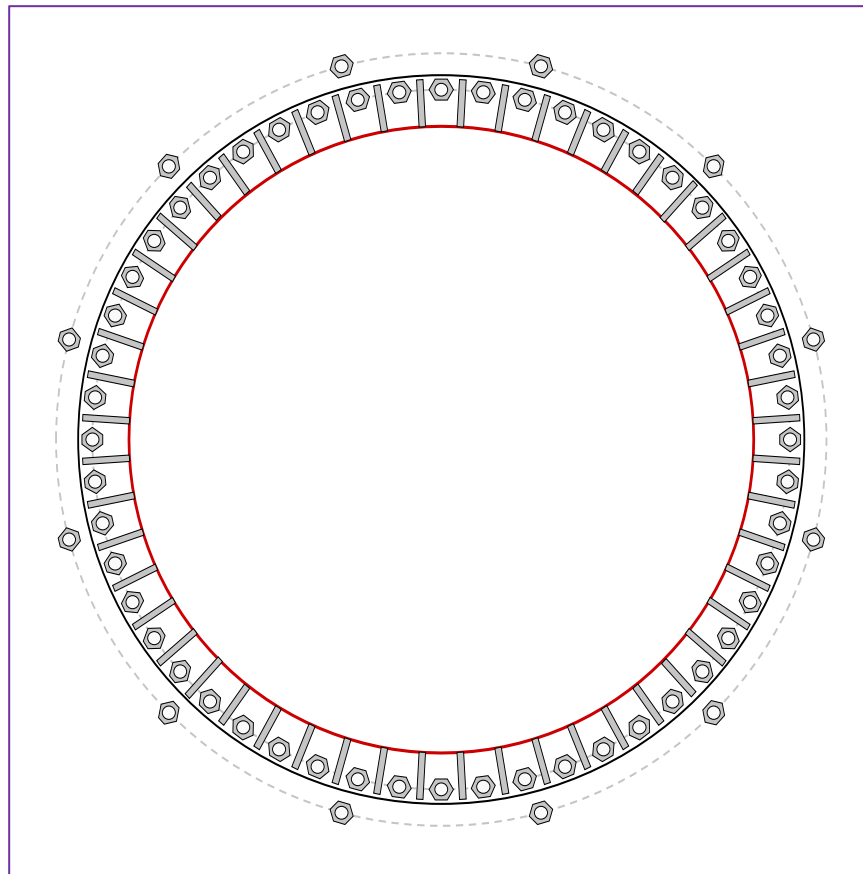
Monopole Base Plate Connection

| Analysis Considerations | |
|-------------------------|------------------|
| TIA-222 Revision | H |
| Grout Considered: | See Custom Sheet |
| l_{ar} (in) | See Custom Sheet |

*BARB CL = 1.875 ft

| Applied Loads | |
|--------------------|---------|
| Moment (kip-ft) | 5924.00 |
| Axial Force (kips) | 106.00 |
| Shear Force (kips) | 41.00 |

*TIA-222-H Section 15.5 Applied



| Connection Properties | Analysis Results |
|-----------------------|------------------|
|-----------------------|------------------|

Anchor Rod Data
 GROUP 1: (52) 1-1/4" ϕ bolts (A687 N; $F_y=105$ ksi, $F_u=125$ ksi) on 67" BC
 GROUP 2: (12) 1-1/4" ϕ bolts (F1554-105 N; $F_y=105$ ksi, $F_u=125$ ksi) on 74" BC

Base Plate Data
 69.75" OD x 1.25" Plate (A36; $F_y=36$ ksi, $F_u=58$ ksi)

Stiffener Data
 (52) 8"H x 4.5"W x 0.625"T, Notch: 0.5"
 plate: $F_y=36$ ksi ; weld: $F_y=70$ ksi
 horiz. weld: 0.3125" fillet
 vert. weld: 0.3125" fillet

Pole Data
 60" x 0.625" round pole (A53-B-42; $F_y=42$ ksi, $F_u=63$ ksi)

Anchor Rod Summary (units of kips, kip-in)
 GROUP 1:
 $Pu_t = 68.8$ $\phi Pn_t = 90.84$ **Stress Rating**
 $Vu = 0.79$ $\phi Vn = 57.52$ **72.1%**
 $Mu = n/a$ $\phi Mn = n/a$ **Pass**

GROUP 2: (BARB)
 $Pu_t = 68.68$ $\phi Pn_t = 90.84$ **Stress Rating**
 $Vu = 0$ $\phi Vn = 57.52$ **72.0%**
 $Mu = n/a$ $\phi Mn = n/a$ **Pass**

Base Plate Summary
 Max Stress (ksi): 6.45 (Shear)
 Allowable Stress (ksi): 21.6
 Stress Rating: **28.4%** **Pass**

Stiffener Summary
 Horizontal Weld: **80.6%** **Pass**
 Vertical Weld: **51.9%** **Pass**
 Plate Flexure+Shear: **40.5%** **Pass**
 Plate Tension+Shear: **63.2%** **Pass**
 Plate Compression: **87.5%** **Pass**

Pole Summary
 Punching Shear: **15.1%** **Pass**

Elevation (ft) 0 (Base)

note: Bending interaction not considered when Grout Considered = "Yes"

| Bolt Group | Resist Axial | Resist Shear | Induce Plate Bending | Grout Considered | Apply at BARB Elevation | BARB CL Elevation (ft) |
|------------|--------------|--------------|----------------------|------------------|-------------------------|------------------------|
| 1 | Yes | Yes | Yes | No | No | 1.875 |
| 2 | Yes | No | No | No | Yes | |

Include Pole Reactions in Report

Custom Bolt Connection

| Bolt | Bolt Group ID | Location (deg) | Diameter (in) | Material | Bolt Circle (in) | Eta Factor, n: | l _w (in): | Thread Type | Area Override, in ² | Tension Only |
|------|---------------|----------------|---------------|-----------|------------------|----------------|----------------------|-------------|--------------------------------|--------------|
| 1 | 1 | 0 | 1.25 | A687 | 67 | 0.5 | 1.25 | N-Included | | No |
| 2 | 1 | 6.92307692 | 1.25 | A687 | 67 | 0.5 | 1.25 | N-Included | | No |
| 3 | 1 | 13.8461538 | 1.25 | A687 | 67 | 0.5 | 1.25 | N-Included | | No |
| 4 | 1 | 20.7692308 | 1.25 | A687 | 67 | 0.5 | 1.25 | N-Included | | No |
| 5 | 1 | 27.6923077 | 1.25 | A687 | 67 | 0.5 | 1.25 | N-Included | | No |
| 6 | 1 | 34.6153846 | 1.25 | A687 | 67 | 0.5 | 1.25 | N-Included | | No |
| 7 | 1 | 41.5384615 | 1.25 | A687 | 67 | 0.5 | 1.25 | N-Included | | No |
| 8 | 1 | 48.4615385 | 1.25 | A687 | 67 | 0.5 | 1.25 | N-Included | | No |
| 9 | 1 | 55.3846154 | 1.25 | A687 | 67 | 0.5 | 1.25 | N-Included | | No |
| 10 | 1 | 62.3076923 | 1.25 | A687 | 67 | 0.5 | 1.25 | N-Included | | No |
| 11 | 1 | 69.2307692 | 1.25 | A687 | 67 | 0.5 | 1.25 | N-Included | | No |
| 12 | 1 | 76.1538462 | 1.25 | A687 | 67 | 0.5 | 1.25 | N-Included | | No |
| 13 | 1 | 83.0769231 | 1.25 | A687 | 67 | 0.5 | 1.25 | N-Included | | No |
| 14 | 1 | 90 | 1.25 | A687 | 67 | 0.5 | 1.25 | N-Included | | No |
| 15 | 1 | 96.9230769 | 1.25 | A687 | 67 | 0.5 | 1.25 | N-Included | | No |
| 16 | 1 | 103.846154 | 1.25 | A687 | 67 | 0.5 | 1.25 | N-Included | | No |
| 17 | 1 | 110.769231 | 1.25 | A687 | 67 | 0.5 | 1.25 | N-Included | | No |
| 18 | 1 | 117.692308 | 1.25 | A687 | 67 | 0.5 | 1.25 | N-Included | | No |
| 19 | 1 | 124.615385 | 1.25 | A687 | 67 | 0.5 | 1.25 | N-Included | | No |
| 20 | 1 | 131.538462 | 1.25 | A687 | 67 | 0.5 | 1.25 | N-Included | | No |
| 21 | 1 | 138.461538 | 1.25 | A687 | 67 | 0.5 | 1.25 | N-Included | | No |
| 22 | 1 | 145.384615 | 1.25 | A687 | 67 | 0.5 | 1.25 | N-Included | | No |
| 23 | 1 | 152.307692 | 1.25 | A687 | 67 | 0.5 | 1.25 | N-Included | | No |
| 24 | 1 | 159.230769 | 1.25 | A687 | 67 | 0.5 | 1.25 | N-Included | | No |
| 25 | 1 | 166.153846 | 1.25 | A687 | 67 | 0.5 | 1.25 | N-Included | | No |
| 26 | 1 | 173.076923 | 1.25 | A687 | 67 | 0.5 | 1.25 | N-Included | | No |
| 27 | 1 | 180 | 1.25 | A687 | 67 | 0.5 | 1.25 | N-Included | | No |
| 28 | 1 | 186.923077 | 1.25 | A687 | 67 | 0.5 | 1.25 | N-Included | | No |
| 29 | 1 | 193.846154 | 1.25 | A687 | 67 | 0.5 | 1.25 | N-Included | | No |
| 30 | 1 | 200.769231 | 1.25 | A687 | 67 | 0.5 | 1.25 | N-Included | | No |
| 31 | 1 | 207.692308 | 1.25 | A687 | 67 | 0.5 | 1.25 | N-Included | | No |
| 32 | 1 | 214.615385 | 1.25 | A687 | 67 | 0.5 | 1.25 | N-Included | | No |
| 33 | 1 | 221.538462 | 1.25 | A687 | 67 | 0.5 | 1.25 | N-Included | | No |
| 34 | 1 | 228.461538 | 1.25 | A687 | 67 | 0.5 | 1.25 | N-Included | | No |
| 35 | 1 | 235.384615 | 1.25 | A687 | 67 | 0.5 | 1.25 | N-Included | | No |
| 36 | 1 | 242.307692 | 1.25 | A687 | 67 | 0.5 | 1.25 | N-Included | | No |
| 37 | 1 | 249.230769 | 1.25 | A687 | 67 | 0.5 | 1.25 | N-Included | | No |
| 38 | 1 | 256.153846 | 1.25 | A687 | 67 | 0.5 | 1.25 | N-Included | | No |
| 39 | 1 | 263.076923 | 1.25 | A687 | 67 | 0.5 | 1.25 | N-Included | | No |
| 40 | 1 | 270 | 1.25 | A687 | 67 | 0.5 | 1.25 | N-Included | | No |
| 41 | 1 | 276.923077 | 1.25 | A687 | 67 | 0.5 | 1.25 | N-Included | | No |
| 42 | 1 | 283.846154 | 1.25 | A687 | 67 | 0.5 | 1.25 | N-Included | | No |
| 43 | 1 | 290.769231 | 1.25 | A687 | 67 | 0.5 | 1.25 | N-Included | | No |
| 44 | 1 | 297.692308 | 1.25 | A687 | 67 | 0.5 | 1.25 | N-Included | | No |
| 45 | 1 | 304.615385 | 1.25 | A687 | 67 | 0.5 | 1.25 | N-Included | | No |
| 46 | 1 | 311.538462 | 1.25 | A687 | 67 | 0.5 | 1.25 | N-Included | | No |
| 47 | 1 | 318.461538 | 1.25 | A687 | 67 | 0.5 | 1.25 | N-Included | | No |
| 48 | 1 | 325.384615 | 1.25 | A687 | 67 | 0.5 | 1.25 | N-Included | | No |
| 49 | 1 | 332.307692 | 1.25 | A687 | 67 | 0.5 | 1.25 | N-Included | | No |
| 50 | 1 | 339.230769 | 1.25 | A687 | 67 | 0.5 | 1.25 | N-Included | | No |
| 51 | 1 | 346.153846 | 1.25 | A687 | 67 | 0.5 | 1.25 | N-Included | | No |
| 52 | 1 | 353.076923 | 1.25 | A687 | 67 | 0.5 | 1.25 | N-Included | | No |
| 53 | 2 | 15 | 1.25 | F1554-105 | 74 | | 1.25 | N-Included | | No |
| 54 | 2 | 45 | 1.25 | F1554-105 | 74 | | 1.25 | N-Included | | No |
| 55 | 2 | 75 | 1.25 | F1554-105 | 74 | | 1.25 | N-Included | | No |
| 56 | 2 | 105 | 1.25 | F1554-105 | 74 | | 1.25 | N-Included | | No |
| 57 | 2 | 135 | 1.25 | F1554-105 | 74 | | 1.25 | N-Included | | No |
| 58 | 2 | 165 | 1.25 | F1554-105 | 74 | | 1.25 | N-Included | | No |
| 59 | 2 | 195 | 1.25 | F1554-105 | 74 | | 1.25 | N-Included | | No |
| 60 | 2 | 225 | 1.25 | F1554-105 | 74 | | 1.25 | N-Included | | No |
| 61 | 2 | 255 | 1.25 | F1554-105 | 74 | | 1.25 | N-Included | | No |
| 62 | 2 | 285 | 1.25 | F1554-105 | 74 | | 1.25 | N-Included | | No |
| 63 | 2 | 315 | 1.25 | F1554-105 | 74 | | 1.25 | N-Included | | No |
| 64 | 2 | 345 | 1.25 | F1554-105 | 74 | | 1.25 | N-Included | | No |

Custom Stiffener Connection

| Stiffener | Stiffener Group ID | Location (deg) | Width (in) | Height (in) | Thickness (in) | H. Notch (in) | V. Notch (in) | Grade (ksi) | Weld Type | Groove Depth (in) | Groove Angle (deg.) | H. Fillet Weld Size (in) | V. Fillet Weld Size (in) | Weld Strength (ksi) |
|-----------|--------------------|----------------|------------|-------------|----------------|---------------|---------------|-------------|-----------|-------------------|---------------------|--------------------------|--------------------------|---------------------|
| 1 | 1 | 3.46153846 | 4.5 | 8 | 0.625 | 0.5 | 0.5 | 36 | Fillet | | | 0.3125 | 0.3125 | 70 |
| 2 | 1 | 10.3846154 | 4.5 | 8 | 0.625 | 0.5 | 0.5 | 36 | Fillet | | | 0.3125 | 0.3125 | 70 |
| 3 | 1 | 17.3076923 | 4.5 | 8 | 0.625 | 0.5 | 0.5 | 36 | Fillet | | | 0.3125 | 0.3125 | 70 |
| 4 | 1 | 24.2307692 | 4.5 | 8 | 0.625 | 0.5 | 0.5 | 36 | Fillet | | | 0.3125 | 0.3125 | 70 |
| 5 | 1 | 31.1538462 | 4.5 | 8 | 0.625 | 0.5 | 0.5 | 36 | Fillet | | | 0.3125 | 0.3125 | 70 |
| 6 | 1 | 38.0769231 | 4.5 | 8 | 0.625 | 0.5 | 0.5 | 36 | Fillet | | | 0.3125 | 0.3125 | 70 |
| 7 | 1 | 45 | 4.5 | 8 | 0.625 | 0.5 | 0.5 | 36 | Fillet | | | 0.3125 | 0.3125 | 70 |
| 8 | 1 | 51.9230769 | 4.5 | 8 | 0.625 | 0.5 | 0.5 | 36 | Fillet | | | 0.3125 | 0.3125 | 70 |
| 9 | 1 | 58.8461538 | 4.5 | 8 | 0.625 | 0.5 | 0.5 | 36 | Fillet | | | 0.3125 | 0.3125 | 70 |
| 10 | 1 | 65.7692308 | 4.5 | 8 | 0.625 | 0.5 | 0.5 | 36 | Fillet | | | 0.3125 | 0.3125 | 70 |
| 11 | 1 | 72.6923077 | 4.5 | 8 | 0.625 | 0.5 | 0.5 | 36 | Fillet | | | 0.3125 | 0.3125 | 70 |
| 12 | 1 | 79.6153846 | 4.5 | 8 | 0.625 | 0.5 | 0.5 | 36 | Fillet | | | 0.3125 | 0.3125 | 70 |
| 13 | 1 | 86.5384615 | 4.5 | 8 | 0.625 | 0.5 | 0.5 | 36 | Fillet | | | 0.3125 | 0.3125 | 70 |
| 14 | 1 | 93.4615385 | 4.5 | 8 | 0.625 | 0.5 | 0.5 | 36 | Fillet | | | 0.3125 | 0.3125 | 70 |
| 15 | 1 | 100.384615 | 4.5 | 8 | 0.625 | 0.5 | 0.5 | 36 | Fillet | | | 0.3125 | 0.3125 | 70 |
| 16 | 1 | 107.307692 | 4.5 | 8 | 0.625 | 0.5 | 0.5 | 36 | Fillet | | | 0.3125 | 0.3125 | 70 |
| 17 | 1 | 114.230769 | 4.5 | 8 | 0.625 | 0.5 | 0.5 | 36 | Fillet | | | 0.3125 | 0.3125 | 70 |
| 18 | 1 | 121.153846 | 4.5 | 8 | 0.625 | 0.5 | 0.5 | 36 | Fillet | | | 0.3125 | 0.3125 | 70 |
| 19 | 1 | 128.076923 | 4.5 | 8 | 0.625 | 0.5 | 0.5 | 36 | Fillet | | | 0.3125 | 0.3125 | 70 |
| 20 | 1 | 135 | 4.5 | 8 | 0.625 | 0.5 | 0.5 | 36 | Fillet | | | 0.3125 | 0.3125 | 70 |
| 21 | 1 | 141.923077 | 4.5 | 8 | 0.625 | 0.5 | 0.5 | 36 | Fillet | | | 0.3125 | 0.3125 | 70 |
| 22 | 1 | 148.846154 | 4.5 | 8 | 0.625 | 0.5 | 0.5 | 36 | Fillet | | | 0.3125 | 0.3125 | 70 |
| 23 | 1 | 155.769231 | 4.5 | 8 | 0.625 | 0.5 | 0.5 | 36 | Fillet | | | 0.3125 | 0.3125 | 70 |
| 24 | 1 | 162.692308 | 4.5 | 8 | 0.625 | 0.5 | 0.5 | 36 | Fillet | | | 0.3125 | 0.3125 | 70 |
| 25 | 1 | 169.615385 | 4.5 | 8 | 0.625 | 0.5 | 0.5 | 36 | Fillet | | | 0.3125 | 0.3125 | 70 |
| 26 | 1 | 176.538462 | 4.5 | 8 | 0.625 | 0.5 | 0.5 | 36 | Fillet | | | 0.3125 | 0.3125 | 70 |
| 27 | 1 | 183.461538 | 4.5 | 8 | 0.625 | 0.5 | 0.5 | 36 | Fillet | | | 0.3125 | 0.3125 | 70 |
| 28 | 1 | 190.384615 | 4.5 | 8 | 0.625 | 0.5 | 0.5 | 36 | Fillet | | | 0.3125 | 0.3125 | 70 |
| 29 | 1 | 197.307692 | 4.5 | 8 | 0.625 | 0.5 | 0.5 | 36 | Fillet | | | 0.3125 | 0.3125 | 70 |
| 30 | 1 | 204.230769 | 4.5 | 8 | 0.625 | 0.5 | 0.5 | 36 | Fillet | | | 0.3125 | 0.3125 | 70 |
| 31 | 1 | 211.153846 | 4.5 | 8 | 0.625 | 0.5 | 0.5 | 36 | Fillet | | | 0.3125 | 0.3125 | 70 |
| 32 | 1 | 218.076923 | 4.5 | 8 | 0.625 | 0.5 | 0.5 | 36 | Fillet | | | 0.3125 | 0.3125 | 70 |
| 33 | 1 | 225 | 4.5 | 8 | 0.625 | 0.5 | 0.5 | 36 | Fillet | | | 0.3125 | 0.3125 | 70 |
| 34 | 1 | 231.923077 | 4.5 | 8 | 0.625 | 0.5 | 0.5 | 36 | Fillet | | | 0.3125 | 0.3125 | 70 |
| 35 | 1 | 238.846154 | 4.5 | 8 | 0.625 | 0.5 | 0.5 | 36 | Fillet | | | 0.3125 | 0.3125 | 70 |
| 36 | 1 | 245.769231 | 4.5 | 8 | 0.625 | 0.5 | 0.5 | 36 | Fillet | | | 0.3125 | 0.3125 | 70 |
| 37 | 1 | 252.692308 | 4.5 | 8 | 0.625 | 0.5 | 0.5 | 36 | Fillet | | | 0.3125 | 0.3125 | 70 |
| 38 | 1 | 259.615385 | 4.5 | 8 | 0.625 | 0.5 | 0.5 | 36 | Fillet | | | 0.3125 | 0.3125 | 70 |
| 39 | 1 | 266.538462 | 4.5 | 8 | 0.625 | 0.5 | 0.5 | 36 | Fillet | | | 0.3125 | 0.3125 | 70 |
| 40 | 1 | 273.461538 | 4.5 | 8 | 0.625 | 0.5 | 0.5 | 36 | Fillet | | | 0.3125 | 0.3125 | 70 |
| 41 | 1 | 280.384615 | 4.5 | 8 | 0.625 | 0.5 | 0.5 | 36 | Fillet | | | 0.3125 | 0.3125 | 70 |
| 42 | 1 | 287.307692 | 4.5 | 8 | 0.625 | 0.5 | 0.5 | 36 | Fillet | | | 0.3125 | 0.3125 | 70 |
| 43 | 1 | 294.230769 | 4.5 | 8 | 0.625 | 0.5 | 0.5 | 36 | Fillet | | | 0.3125 | 0.3125 | 70 |
| 44 | 1 | 301.153846 | 4.5 | 8 | 0.625 | 0.5 | 0.5 | 36 | Fillet | | | 0.3125 | 0.3125 | 70 |
| 45 | 1 | 308.076923 | 4.5 | 8 | 0.625 | 0.5 | 0.5 | 36 | Fillet | | | 0.3125 | 0.3125 | 70 |
| 46 | 1 | 315 | 4.5 | 8 | 0.625 | 0.5 | 0.5 | 36 | Fillet | | | 0.3125 | 0.3125 | 70 |
| 47 | 1 | 321.923077 | 4.5 | 8 | 0.625 | 0.5 | 0.5 | 36 | Fillet | | | 0.3125 | 0.3125 | 70 |
| 48 | 1 | 328.846154 | 4.5 | 8 | 0.625 | 0.5 | 0.5 | 36 | Fillet | | | 0 | | |

Pile Analysis

US-CT-1002 Kettletown

2022791.CT1002.17

| | |
|----------|-----------------------|
| M | 5924.00 k-ft |
| P | 106.00 k |
| V | 41.00 k |
| M tot | 6149.5 k-ft |
| M tot 45 | 4348.353 k-ft |
| d | 5.5 ft |
| h | 46 ft |
| Vconc | 11638 ft ³ |
| wconc | 1745.7 k |

Pile Ultimate Capacities

Existing

| | |
|-------------|-------|
| Compression | 150 k |
| Tension | 100 k |

Modification

| | |
|-------------|-------|
| Compression | 100 k |
| Tension | 100 k |

Wequip 75 k (weight of the equipment above the pad)

| | |
|------------|----|
| n existing | 24 |
| n mod | 48 |

Total force on piles

| | n | x (ft) | y (ft) | X | | | 45 | |
|----------|----|--------|--------|--------|--------|-----------|--------|--------|
| | | | | Pc (k) | Pt (k) | Mu (k-ft) | Pc (k) | Pt (k) |
| Existing | 4 | 0 | 0 | 25.72 | 25.72 | 0.00 | 25.72 | 25.72 |
| | 10 | 6 | 6 | 28.03 | 23.41 | 840.89 | 28.99 | 22.45 |
| | 10 | 12 | 12 | 30.34 | 21.09 | 1820.49 | 32.26 | 19.18 |
| | 24 | | | | | | | |
| Mod | 2 | 0 | 0 | 25.72 | 25.72 | 0.00 | 25.72 | 25.72 |
| | 4 | 3.5 | 3.5 | 27.07 | 24.37 | 189.47 | 27.63 | 23.81 |
| | 4 | 7 | 7 | 28.42 | 23.02 | 397.81 | 29.53 | 21.90 |
| | 4 | 10.5 | 10.5 | 29.76 | 21.67 | 625.03 | 31.44 | 20.00 |
| | 4 | 14 | 14 | 31.11 | 20.32 | 871.14 | 33.35 | 18.09 |
| | 4 | 17.5 | 17.5 | 32.46 | 18.98 | 1136.12 | 35.25 | 16.18 |
| | 26 | 21 | 21 | 33.81 | 17.63 | 9229.86 | 37.16 | 14.28 |
| | 48 | | | | | | | |

Pile Capacities

Existing

| | |
|-------------|-------|
| Compression | 38.5% |
| Tension | 49.0% |

Modification

| | |
|-------------|-------|
| Compression | 64.4% |
| Tension | 49.0% |

Reinforcement Capacity

| | |
|--------|---------------|
| Mu | 15110.80 k-ft |
| a | 4.262575 in |
| d | 60.885 in |
| Phi Mn | 22473.3 k-ft |

Capacity 64.0%

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 120 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 1.19 in was used for this analysis.
- HDG considers this site to be exposure category B; tower is located in an urban/suburban or wooded area with numerous closely spaced obstructions.
- HDG considers this site to be topographic category 1; tower is located on flat terrain or the bottom of a hill or ridge.
- HDG considers this site to have a spectral response acceleration parameter at short periods, S_s , of 0.198 and a spectral response acceleration parameter at a period of 1 second, S_1 , of 0.065.
- 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 3.
- The mount has been analyzed with load combinations consisting of a 250 lbs live load in a worst case location on the mount.
- The existing mounts are secured to the existing monopole with HSS members secured to ring mounts. The ring mounts are secured around the monopole using threaded rods. HDG considers the threaded rods to be the governing connection member.

Based on our evaluation, we have determined that the existing mounts **ARE NOT CAPABLE** of supporting the proposed installation. HDG recommends the following modifications:

- **Install new 2-1/2" std. (2.88" O.D.) pipe mast behind proposed antennas secured to the existing mount and proposed handrail (typ. of 2 per sector, total of 6).**
- **Install new handrail kit, SitePro1 P/N HRK14 (or approved equal).**

| | Component | Controlling Load Case | Stress Ratio | Pass/Fail |
|------------------------------|-----------|-----------------------|--------------|-------------|
| Existing Mount Rating | 20 | LC1 | 110% | FAIL |
| Modified Mount Rating | 21 | LC1 | 83% | 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: 1/20/2022
 Project Name: SOUTHBURY KETTLETOWN RD
 Project No.: CT2086
 Designed By: ID Checked By: MSC



2.6.5.2 Velocity Pressure Coeff:

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

$K_z =$ **1.178**

$z =$ 185 (ft)
 $z_g =$ 1200 (ft)
 $\alpha =$ 7.0

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

Table 2-4

| Exposure | Z _g | α | K _{zmin} | K _c |
|----------|----------------|------|-------------------|----------------|
| B | 1200 ft | 7.0 | 0.70 | 0.9 |
| C | 900 ft | 9.5 | 0.85 | 1.0 |
| D | 700 ft | 11.5 | 1.03 | 1.1 |

2.6.6.2 Topographic Factor:

Table 2-5

| Topo. Category | K _t | f |
|----------------|----------------|------|
| 2 | 0.43 | 1.25 |
| 3 | 0.53 | 2.0 |
| 4 | 0.72 | 1.5 |

$$K_{zt} = [1 + (K_c K_t / K_h)]^2$$

$K_{zt} =$ **1**

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

Category = **1**

$$K_h = e^{(fz/H)}$$

$K_h =$ 1
 $K_c =$ 0.9 (from Table 2-4)
 $K_t =$ 0 (from Table 2-5)
 $f =$ 0 (from Table 2-5)
 $z =$ 185
 $z_s =$ 395 (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 =
 Importance Factor =

$t_i =$ 1.00 in
 $I =$ 1.0 (from Table 2-3)
 $K_{iz} =$ 1.19 (from Sec. 2.6.10)

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

$t_{iz} =$ 1.19 in

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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

$h =$ 195

$G_h =$ 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

$G_h =$ 1.00

2.6.11.2 Design Wind Force on Appurtenances

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

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

| | |
|---------------|-------|
| $q_z =$ | 40.67 |
| $q_z (ice) =$ | 7.06 |
| $q_z (30) =$ | 2.54 |

| | |
|-------------------|-------------------------------|
| $K_z =$ | 1.178 (from 2.6.5.2) |
| $K_{zt} =$ | 1.0 (from 2.6.6.2.1) |
| $K_s =$ | 1.0 (from 2.6.7) |
| $K_e =$ | 0.99 (from 2.6.8) |
| $K_d =$ | 0.95 (from Table 2-2) |
| $V_{max} =$ | 120 mph (Ultimate Wind Speed) |
| $V_{max (ice)} =$ | 50 mph |
| $V_{30} =$ | 30 mph |

Table 2-2

| Structure Type | Wind Direction Probability Factor, K_d |
|---|--|
| 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 |

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Determine Ca:

Table 2-9

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

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

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

Ice Thickness = **1.19 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) |
|----------------------------|--------|-------|-------|-----------|--------------|------|-------------|----------------------|----------------------|
| 7770 Antenna | 55.0 | 11.0 | 5.0 | 4.20 | 5.00 | 1.31 | 224 | 49 | 14 |
| HPA-65R-BUU-H8 Antenna | 92.4 | 14.8 | 7.4 | 9.50 | 6.24 | 1.37 | 528 | 109 | 33 |
| OPA65R-BU8DA Antenna | 96.0 | 21.0 | 7.8 | 14.00 | 4.57 | 1.29 | 736 | 146 | 46 |
| OPA65R-BU6DA Antenna | 71.2 | 21.0 | 7.8 | 10.38 | 3.39 | 1.24 | 524 | 105 | 33 |
| DMP65R-BU8DA Antenna | 96.0 | 20.7 | 7.7 | 13.80 | 4.64 | 1.30 | 727 | 144 | 45 |
| RRUS-32 B30 RRH | 27.2 | 12.1 | 7.0 | 2.29 | 2.25 | 1.20 | 112 | 25 | 7 |
| RRUS-32 B30 RRH (Shielded) | 27.2 | 3.5 | 12.1 | 0.66 | 7.77 | 1.43 | 38 | 12 | 2 |
| 4426 B66 RRH | 14.9 | 13.2 | 5.8 | 1.37 | 1.13 | 1.20 | 67 | 16 | 4 |
| 4426 B66 RRH (Shielded) | 14.9 | 2.9 | 13.2 | 0.30 | 5.14 | 1.32 | 16 | 6 | 1 |
| B14 4478 RRH | 18.1 | 13.4 | 8.3 | 1.68 | 1.35 | 1.20 | 82 | 19 | 5 |
| B14 4478 RRH (Shielded) | 18.1 | 4.2 | 13.4 | 0.52 | 4.36 | 1.28 | 27 | 8 | 2 |
| B5/B12 4449 RRH | 17.9 | 13.2 | 9.4 | 1.64 | 1.36 | 1.20 | 80 | 19 | 5 |
| B5/B12 4449 RRH (Shielded) | 17.9 | 4.7 | 13.2 | 0.58 | 3.81 | 1.26 | 30 | 9 | 2 |
| 4415 B25 RRH | 16.5 | 13.5 | 6.3 | 1.55 | 1.22 | 1.20 | 75 | 18 | 5 |
| 4415 B25 RRH (Shielded) | 16.5 | 3.2 | 13.5 | 0.36 | 5.24 | 1.32 | 19 | 7 | 1 |
| TT19-08BP111-001 TMA | 9.9 | 5.4 | 6.7 | 0.37 | 1.83 | 1.20 | 18 | 6 | 1 |
| Surge Arrestor | 24.0 | 9.7 | 9.7 | 1.62 | 2.47 | 0.70 | 46 | 11 | 3 |

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| <u>Appurtenances</u> | <u>Height</u> | <u>Width</u> | <u>Depth</u> | <u>Flat Area</u> | <u>Aspect Ratio</u> | <u>Ca</u> | <u>Force (lbs)</u> | <u>Force (lbs) (w/ Ice)</u> | <u>Force (lbs) (30 mph)</u> |
|----------------------|---------------|--------------|--------------|------------------|---------------------|-----------|--------------------|-----------------------------|-----------------------------|
| 2" Pipe | 2.4 | 12.0 | | 0.20 | 0.20 | 1.20 | 10 | 4 | 1 |
| 2-1/2" Pipe | 2.9 | 12.0 | | 0.24 | 0.24 | 1.20 | 12 | 4 | 1 |
| 3" Pipe | 3.5 | 12.0 | | 0.29 | 0.29 | 1.20 | 14 | 5 | 1 |
| L 2-1/2x2-1/2 Angles | 2.5 | 12.0 | | 0.21 | 0.21 | 2.00 | 17 | 7 | 1 |
| L 2-1/2x1-1/2 Angles | 2.5 | 12.0 | | 0.21 | 0.21 | 2.00 | 17 | 7 | 1 |
| PL 6x5/8 | 6.0 | 12.0 | | 0.50 | 0.50 | 1.20 | 24 | 7 | 2 |
| HSS 3x3 | 3.0 | 12.0 | | 0.25 | 0.25 | 1.25 | 13 | 5 | 1 |

WIND LOADS

Angle = 30 (deg) Ice Thickness = 1.19 in. Equivalent Angle = 210 (deg)

WIND LOADS WITH NO ICE:

| Appurtenances | Height | Width | Depth | Flat Area (normal) | Flat Area (side) | Aspect Ratio | Aspect Ratio | Ca (normal) | Ca (side) | Force (lbs) (normal) | Force (lbs) (side) | Force (lbs) (angle) |
|----------------------------|--------|-------|-------|--------------------|------------------|--------------|--------------|-------------|-----------|----------------------|--------------------|---------------------|
| 7770 Antenna | 55.0 | 11.0 | 5.0 | 4.20 | 1.91 | 5.00 | 11.00 | 1.31 | 1.53 | 224 | 119 | 198 |
| HPA-65R-BUU-H8 Antenna | 92.4 | 14.8 | 7.4 | 9.50 | 4.75 | 6.24 | 12.49 | 1.37 | 1.58 | 528 | 306 | 472 |
| OPA65R-BU8DA Antenna | 96.0 | 21.0 | 7.8 | 14.00 | 5.20 | 4.57 | 12.31 | 1.29 | 1.58 | 736 | 334 | 635 |
| OPA65R-BU6DA Antenna | 71.2 | 21.0 | 7.8 | 10.38 | 3.86 | 3.39 | 9.13 | 1.24 | 1.47 | 524 | 231 | 450 |
| DMP65R-BU8DA Antenna | 96.0 | 20.7 | 7.7 | 13.80 | 5.13 | 4.64 | 12.47 | 1.30 | 1.58 | 727 | 330 | 628 |
| RRUS-32 B30 RRH | 27.2 | 12.1 | 7.0 | 2.29 | 1.32 | 2.25 | 3.89 | 1.20 | 1.26 | 112 | 68 | 101 |
| RRUS-32 B30 RRH (Shielded) | 27.2 | 6.1 | 12.1 | 1.14 | 2.29 | 4.50 | 2.25 | 1.29 | 1.20 | 60 | 112 | 73 |
| 4426 B66 RRH | 14.9 | 13.2 | 5.8 | 1.37 | 0.60 | 1.13 | 2.57 | 1.20 | 1.20 | 67 | 29 | 57 |
| 4426 B66 RRH (Shielded) | 14.9 | 6.6 | 13.2 | 0.68 | 1.37 | 2.26 | 1.13 | 1.20 | 1.20 | 33 | 67 | 42 |
| B14 4478 RRH | 18.1 | 13.4 | 8.3 | 1.68 | 1.04 | 1.35 | 2.18 | 1.20 | 1.20 | 82 | 51 | 74 |
| B14 4478 RRH (Shielded) | 18.1 | 6.7 | 13.4 | 0.84 | 1.68 | 2.70 | 1.35 | 1.21 | 1.20 | 41 | 82 | 52 |
| B5/B12 4449 RRH | 17.9 | 13.2 | 9.4 | 1.64 | 1.17 | 1.36 | 1.90 | 1.20 | 1.20 | 80 | 57 | 74 |
| B5/B12 4449 RRH (Shielded) | 17.9 | 6.6 | 13.2 | 0.82 | 1.64 | 2.71 | 1.36 | 1.21 | 1.20 | 40 | 80 | 50 |
| 4415 B25 RRH | 16.5 | 13.5 | 6.3 | 1.55 | 0.72 | 1.22 | 2.62 | 1.20 | 1.21 | 75 | 35 | 65 |
| 4415 B25 RRH (Shielded) | 16.5 | 6.8 | 13.5 | 0.77 | 1.55 | 2.44 | 1.22 | 1.20 | 1.20 | 38 | 75 | 47 |
| TT19-08BP111-001 TMA | 9.9 | 5.4 | 6.7 | 0.37 | 0.46 | 1.83 | 1.48 | 1.20 | 1.20 | 18 | 22 | 19 |

WIND LOADS WITH ICE:

| | | | | | | | | | | | | |
|----------------------------|------|------|------|-------|------|------|------|------|------|-----|----|-----|
| 7770 Antenna | 57.4 | 13.4 | 7.4 | 5.33 | 2.94 | 4.29 | 7.78 | 1.28 | 1.43 | 48 | 30 | 44 |
| HPA-65R-BUU-H8 Antenna | 94.8 | 17.2 | 9.8 | 11.30 | 6.43 | 5.52 | 9.69 | 1.33 | 1.49 | 107 | 68 | 97 |
| OPA65R-BU8DA Antenna | 98.4 | 23.4 | 10.2 | 15.97 | 6.95 | 4.21 | 9.67 | 1.28 | 1.49 | 144 | 73 | 126 |
| OPA65R-BU6DA Antenna | 73.6 | 23.4 | 10.2 | 11.94 | 5.20 | 3.15 | 7.23 | 1.23 | 1.41 | 104 | 52 | 91 |
| DMP65R-BU8DA Antenna | 98.4 | 23.1 | 10.1 | 15.76 | 6.88 | 4.26 | 9.76 | 1.28 | 1.49 | 142 | 73 | 125 |
| RRUS-32 B30 RRH | 29.6 | 14.5 | 9.4 | 2.97 | 1.93 | 2.04 | 3.15 | 1.20 | 1.23 | 25 | 17 | 23 |
| RRUS-32 B30 RRH (Shielded) | 29.6 | 7.2 | 14.5 | 1.49 | 2.97 | 4.09 | 2.04 | 1.27 | 1.20 | 13 | 25 | 16 |
| 4426 B66 RRH | 17.3 | 15.6 | 8.2 | 1.87 | 0.98 | 1.11 | 2.11 | 1.20 | 1.20 | 16 | 8 | 14 |
| 4426 B66 RRH (Shielded) | 17.3 | 7.8 | 15.6 | 0.93 | 1.87 | 2.22 | 1.11 | 1.20 | 1.20 | 8 | 16 | 10 |
| B14 4478 RRH | 20.5 | 15.8 | 10.7 | 2.24 | 1.52 | 1.30 | 1.92 | 1.20 | 1.20 | 19 | 13 | 17 |
| B14 4478 RRH (Shielded) | 20.5 | 7.9 | 15.8 | 1.12 | 2.24 | 2.60 | 1.30 | 1.20 | 1.20 | 10 | 19 | 12 |
| B5/B12 4449 RRH | 20.3 | 15.6 | 11.8 | 2.19 | 1.66 | 1.30 | 1.72 | 1.20 | 1.20 | 19 | 14 | 17 |
| B5/B12 4449 RRH (Shielded) | 20.3 | 7.8 | 15.6 | 1.10 | 2.19 | 2.60 | 1.30 | 1.20 | 1.20 | 9 | 19 | 12 |
| 4415 B25 RRH | 18.9 | 15.9 | 8.7 | 2.08 | 1.14 | 1.19 | 2.18 | 1.20 | 1.20 | 18 | 10 | 16 |
| 4415 B25 RRH (Shielded) | 18.9 | 7.9 | 15.9 | 1.04 | 2.08 | 2.38 | 1.19 | 1.20 | 1.20 | 9 | 18 | 11 |
| TT19-08BP111-001 TMA | 12.3 | 7.8 | 9.1 | 0.66 | 0.77 | 1.58 | 1.35 | 1.20 | 1.20 | 6 | 7 | 6 |

WIND LOADS AT 30 MPH:

| | | | | | | | | | | | | |
|----------------------------|------|------|------|-------|------|------|-------|------|------|----|----|----|
| 7770 Antenna | 55.0 | 11.0 | 5.0 | 4.20 | 1.91 | 5.00 | 11.00 | 1.31 | 1.53 | 14 | 7 | 12 |
| HPA-65R-BUU-H8 Antenna | 92.4 | 14.8 | 7.4 | 9.50 | 4.75 | 6.24 | 12.49 | 1.37 | 1.58 | 33 | 19 | 30 |
| OPA65R-BU8DA Antenna | 96.0 | 21.0 | 7.8 | 14.00 | 5.20 | 4.57 | 12.31 | 1.29 | 1.58 | 46 | 21 | 40 |
| OPA65R-BU6DA Antenna | 71.2 | 21.0 | 7.8 | 10.38 | 3.86 | 3.39 | 9.13 | 1.24 | 1.47 | 33 | 14 | 28 |
| DMP65R-BU8DA Antenna | 96.0 | 20.7 | 7.7 | 13.80 | 5.13 | 4.64 | 12.47 | 1.30 | 1.58 | 45 | 21 | 39 |
| RRUS-32 B30 RRH | 27.2 | 12.1 | 7.0 | 2.29 | 1.32 | 2.25 | 3.89 | 1.20 | 1.26 | 7 | 4 | 6 |
| RRUS-32 B30 RRH (Shielded) | 27.2 | 6.1 | 12.1 | 1.14 | 2.29 | 4.50 | 2.25 | 1.29 | 1.20 | 4 | 7 | 5 |
| 4426 B66 RRH | 14.9 | 13.2 | 5.8 | 1.37 | 0.60 | 1.13 | 2.57 | 1.20 | 1.20 | 4 | 2 | 4 |
| 4426 B66 RRH (Shielded) | 14.9 | 6.6 | 13.2 | 0.68 | 1.37 | 2.26 | 1.13 | 1.20 | 1.20 | 2 | 4 | 3 |
| B14 4478 RRH | 18.1 | 13.4 | 8.3 | 1.68 | 1.04 | 1.35 | 2.18 | 1.20 | 1.20 | 5 | 3 | 5 |
| B14 4478 RRH (Shielded) | 18.1 | 6.7 | 13.4 | 0.84 | 1.68 | 2.70 | 1.35 | 1.21 | 1.20 | 3 | 5 | 3 |
| B5/B12 4449 RRH | 17.9 | 13.2 | 9.4 | 1.64 | 1.17 | 1.36 | 1.90 | 1.20 | 1.20 | 5 | 4 | 5 |
| B5/B12 4449 RRH (Shielded) | 17.9 | 6.6 | 13.2 | 0.82 | 1.64 | 2.71 | 1.36 | 1.21 | 1.20 | 3 | 5 | 3 |
| 4415 B25 RRH | 16.5 | 13.5 | 6.3 | 1.55 | 0.72 | 1.22 | 2.62 | 1.20 | 1.21 | 5 | 2 | 4 |
| 4415 B25 RRH (Shielded) | 16.5 | 6.8 | 13.5 | 0.77 | 1.55 | 2.44 | 1.22 | 1.20 | 1.20 | 2 | 5 | 3 |
| TT19-08BP111-001 TMA | 9.9 | 5.4 | 6.7 | 0.37 | 0.46 | 1.83 | 1.48 | 1.20 | 1.20 | 1 | 1 | 1 |

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WIND LOADS

Angle = 60 (deg) Ice Thickness = 1.19 in. Equivalent Angle = 240 (deg)

WIND LOADS WITH NO ICE:

| Appurtenances | Height | Width | Depth | Flat Area (normal) | Flat Area (side) | Ratio (normal) | Ratio (side) | Ca (normal) | Ca (side) | Force (lbs) (normal) | Force (lbs) (side) | Force (lbs) (angle) |
|----------------------------|--------|-------|-------|--------------------|------------------|----------------|--------------|-------------|-----------|----------------------|--------------------|---------------------|
| 7770 Antenna | 55.0 | 11.0 | 5.0 | 4.20 | 1.91 | 5.00 | 11.00 | 1.31 | 1.53 | 224 | 119 | 145 |
| HPA-65R-BUU-H8 Antenna | 92.4 | 14.8 | 7.4 | 9.50 | 4.75 | 6.24 | 12.49 | 1.37 | 1.58 | 528 | 306 | 361 |
| OPA65R-BU8DA Antenna | 96.0 | 21.0 | 7.8 | 14.00 | 5.20 | 4.57 | 12.31 | 1.29 | 1.58 | 736 | 334 | 434 |
| OPA65R-BU6DA Antenna | 71.2 | 21.0 | 7.8 | 10.38 | 3.86 | 3.39 | 9.13 | 1.24 | 1.47 | 524 | 231 | 304 |
| DMP65R-BU8DA Antenna | 96.0 | 20.7 | 7.7 | 13.80 | 5.13 | 4.64 | 12.47 | 1.30 | 1.58 | 727 | 330 | 429 |
| RRUS-32 B30 RRH | 27.2 | 12.1 | 7.0 | 2.29 | 1.32 | 2.25 | 3.89 | 1.20 | 1.26 | 112 | 68 | 79 |
| RRUS-32 B30 RRH (Shielded) | 27.2 | 9.1 | 12.1 | 1.71 | 2.29 | 3.00 | 2.25 | 1.22 | 1.20 | 85 | 112 | 105 |
| 4426 B66 RRH | 14.9 | 13.2 | 5.8 | 1.37 | 0.60 | 1.13 | 2.57 | 1.20 | 1.20 | 67 | 29 | 39 |
| 4426 B66 RRH (Shielded) | 14.9 | 9.9 | 13.2 | 1.02 | 1.37 | 1.51 | 1.13 | 1.20 | 1.20 | 50 | 67 | 62 |
| B14 4478 RRH | 18.1 | 13.4 | 8.3 | 1.68 | 1.04 | 1.35 | 2.18 | 1.20 | 1.20 | 82 | 51 | 59 |
| B14 4478 RRH (Shielded) | 18.1 | 10.1 | 13.4 | 1.26 | 1.68 | 1.80 | 1.35 | 1.20 | 1.20 | 62 | 82 | 77 |
| B5/B12 4449 RRH | 17.9 | 13.2 | 9.4 | 1.64 | 1.17 | 1.36 | 1.90 | 1.20 | 1.20 | 80 | 57 | 63 |
| B5/B12 4449 RRH (Shielded) | 17.9 | 9.9 | 13.2 | 1.23 | 1.64 | 1.81 | 1.36 | 1.20 | 1.20 | 60 | 80 | 75 |
| 4415 B25 RRH | 16.5 | 13.5 | 6.3 | 1.55 | 0.72 | 1.22 | 2.62 | 1.20 | 1.21 | 75 | 35 | 45 |
| 4415 B25 RRH (Shielded) | 16.5 | 10.1 | 13.5 | 1.16 | 1.55 | 1.63 | 1.22 | 1.20 | 1.20 | 57 | 75 | 71 |
| TT19-08BP111-001 TMA | 9.9 | 5.4 | 6.7 | 0.37 | 0.46 | 1.83 | 1.48 | 1.20 | 1.20 | 18 | 22 | 21 |

WIND LOADS WITH ICE:

| | | | | | | | | | | | | |
|----------------------------|------|------|------|-------|------|------|------|------|------|-----|----|----|
| 7770 Antenna | 57.4 | 13.4 | 7.4 | 5.33 | 2.94 | 4.29 | 7.78 | 1.28 | 1.43 | 48 | 30 | 34 |
| HPA-65R-BUU-H8 Antenna | 94.8 | 17.2 | 9.8 | 11.30 | 6.43 | 5.52 | 9.69 | 1.33 | 1.49 | 107 | 68 | 77 |
| OPA65R-BU8DA Antenna | 98.4 | 23.4 | 10.2 | 15.97 | 6.95 | 4.21 | 9.67 | 1.28 | 1.49 | 144 | 73 | 91 |
| OPA65R-BU6DA Antenna | 73.6 | 23.4 | 10.2 | 11.94 | 5.20 | 3.15 | 7.23 | 1.23 | 1.41 | 104 | 52 | 65 |
| DMP65R-BU8DA Antenna | 98.4 | 23.1 | 10.1 | 15.76 | 6.88 | 4.26 | 9.76 | 1.28 | 1.49 | 142 | 73 | 90 |
| RRUS-32 B30 RRH | 29.6 | 14.5 | 9.4 | 2.97 | 1.93 | 2.04 | 3.15 | 1.20 | 1.23 | 25 | 17 | 19 |
| RRUS-32 B30 RRH (Shielded) | 29.6 | 10.9 | 14.5 | 2.23 | 2.97 | 2.72 | 2.04 | 1.21 | 1.20 | 19 | 25 | 24 |
| 4426 B66 RRH | 17.3 | 15.6 | 8.2 | 1.87 | 0.98 | 1.11 | 2.11 | 1.20 | 1.20 | 16 | 8 | 10 |
| 4426 B66 RRH (Shielded) | 17.3 | 11.7 | 15.6 | 1.40 | 1.87 | 1.48 | 1.11 | 1.20 | 1.20 | 12 | 16 | 15 |
| B14 4478 RRH | 20.5 | 15.8 | 10.7 | 2.24 | 1.52 | 1.30 | 1.92 | 1.20 | 1.20 | 19 | 13 | 14 |
| B14 4478 RRH (Shielded) | 20.5 | 11.8 | 15.8 | 1.68 | 2.24 | 1.73 | 1.30 | 1.20 | 1.20 | 14 | 19 | 18 |
| B5/B12 4449 RRH | 20.3 | 15.6 | 11.8 | 2.19 | 1.66 | 1.30 | 1.72 | 1.20 | 1.20 | 19 | 14 | 15 |
| B5/B12 4449 RRH (Shielded) | 20.3 | 11.7 | 15.6 | 1.64 | 2.19 | 1.74 | 1.30 | 1.20 | 1.20 | 14 | 19 | 17 |
| 4415 B25 RRH | 18.9 | 15.9 | 8.7 | 2.08 | 1.14 | 1.19 | 2.18 | 1.20 | 1.20 | 18 | 10 | 12 |
| 4415 B25 RRH (Shielded) | 18.9 | 11.9 | 15.9 | 1.56 | 2.08 | 1.59 | 1.19 | 1.20 | 1.20 | 13 | 18 | 17 |
| TT19-08BP111-001 TMA | 12.3 | 7.8 | 9.1 | 0.66 | 0.77 | 1.58 | 1.35 | 1.20 | 1.20 | 6 | 7 | 6 |

WIND LOADS AT 30 MPH:

| | | | | | | | | | | | | |
|----------------------------|------|------|------|-------|------|------|-------|------|------|----|----|----|
| 7770 Antenna | 55.0 | 11.0 | 5.0 | 4.20 | 1.91 | 5.00 | 11.00 | 1.31 | 1.53 | 14 | 7 | 9 |
| HPA-65R-BUU-H8 Antenna | 92.4 | 14.8 | 7.4 | 9.50 | 4.75 | 6.24 | 12.49 | 1.37 | 1.58 | 33 | 19 | 23 |
| OPA65R-BU8DA Antenna | 96.0 | 21.0 | 7.8 | 14.00 | 5.20 | 4.57 | 12.31 | 1.29 | 1.58 | 46 | 21 | 27 |
| OPA65R-BU6DA Antenna | 71.2 | 21.0 | 7.8 | 10.38 | 3.86 | 3.39 | 9.13 | 1.24 | 1.47 | 33 | 14 | 19 |
| DMP65R-BU8DA Antenna | 96.0 | 20.7 | 7.7 | 13.80 | 5.13 | 4.64 | 12.47 | 1.30 | 1.58 | 45 | 21 | 27 |
| RRUS-32 B30 RRH | 27.2 | 12.1 | 7.0 | 2.29 | 1.32 | 2.25 | 3.89 | 1.20 | 1.26 | 7 | 4 | 5 |
| RRUS-32 B30 RRH (Shielded) | 27.2 | 9.1 | 12.1 | 1.71 | 2.29 | 3.00 | 2.25 | 1.22 | 1.20 | 5 | 7 | 7 |
| 4426 B66 RRH | 14.9 | 13.2 | 5.8 | 1.37 | 0.60 | 1.13 | 2.57 | 1.20 | 1.20 | 4 | 2 | 2 |
| 4426 B66 RRH (Shielded) | 14.9 | 9.9 | 13.2 | 1.02 | 1.37 | 1.51 | 1.13 | 1.20 | 1.20 | 3 | 4 | 4 |
| B14 4478 RRH | 18.1 | 13.4 | 8.3 | 1.68 | 1.04 | 1.35 | 2.18 | 1.20 | 1.20 | 5 | 3 | 4 |
| B14 4478 RRH (Shielded) | 18.1 | 10.1 | 13.4 | 1.26 | 1.68 | 1.80 | 1.35 | 1.20 | 1.20 | 4 | 5 | 5 |
| B5/B12 4449 RRH | 17.9 | 13.2 | 9.4 | 1.64 | 1.17 | 1.36 | 1.90 | 1.20 | 1.20 | 5 | 4 | 4 |
| B5/B12 4449 RRH (Shielded) | 17.9 | 9.9 | 13.2 | 1.23 | 1.64 | 1.81 | 1.36 | 1.20 | 1.20 | 4 | 5 | 5 |
| 4415 B25 RRH | 16.5 | 13.5 | 6.3 | 1.55 | 0.72 | 1.22 | 2.62 | 1.20 | 1.21 | 5 | 2 | 3 |
| 4415 B25 RRH (Shielded) | 16.5 | 10.1 | 13.5 | 1.16 | 1.55 | 1.63 | 1.22 | 1.20 | 1.20 | 4 | 5 | 4 |
| TT19-08BP111-001 TMA | 9.9 | 5.4 | 6.7 | 0.37 | 0.46 | 1.83 | 1.48 | 1.20 | 1.20 | 1 | 1 | 1 |

Date: 1/20/2022
 Project Name: SOUTHBURY KETTLETOWN RD
 Project No.: CT2086
 Designed By: ID Checked By: MSC



WIND LOADS

Angle = **90** (deg) Ice Thickness = **1.19** in. Equivalent Angle = **270** (deg)

WIND LOADS WITH NO ICE:

| Appurtenances | Height | Width | Depth | Flat Area (normal) | Flat Area (side) | Ratio (normal) | Ratio (side) | Ca (normal) | Ca (side) | Force (lbs) (normal) | Force (lbs) (side) | Force (lbs) (angle) |
|----------------------------|--------|-------|-------|--------------------|------------------|----------------|--------------|-------------|-----------|----------------------|--------------------|---------------------|
| 7770 Antenna | 55.0 | 11.0 | 5.0 | 4.20 | 1.91 | 5.00 | 11.00 | 1.31 | 1.53 | 224 | 119 | 119 |
| HPA-65R-BUU-H8 Antenna | 92.4 | 14.8 | 7.4 | 9.50 | 4.75 | 6.24 | 12.49 | 1.37 | 1.58 | 528 | 306 | 306 |
| OPA65R-BU8DA Antenna | 96.0 | 21.0 | 7.8 | 14.00 | 5.20 | 4.57 | 12.31 | 1.29 | 1.58 | 736 | 334 | 334 |
| OPA65R-BU6DA Antenna | 71.2 | 21.0 | 7.8 | 10.38 | 3.86 | 3.39 | 9.13 | 1.24 | 1.47 | 524 | 231 | 231 |
| DMP65R-BU8DA Antenna | 96.0 | 20.7 | 7.7 | 13.80 | 5.13 | 4.64 | 12.47 | 1.30 | 1.58 | 727 | 330 | 330 |
| RRUS-32 B30 RRH | 27.2 | 12.1 | 7.0 | 2.29 | 1.32 | 2.25 | 3.89 | 1.20 | 1.26 | 112 | 68 | 68 |
| RRUS-32 B30 RRH (Shielded) | 27.2 | 3.5 | 12.1 | 0.66 | 2.29 | 7.77 | 2.25 | 1.43 | 1.20 | 38 | 112 | 112 |
| 4426 B66 RRH | 14.9 | 13.2 | 5.8 | 1.37 | 0.60 | 1.13 | 2.57 | 1.20 | 1.20 | 67 | 29 | 29 |
| 4426 B66 RRH (Shielded) | 14.9 | 2.9 | 13.2 | 0.30 | 1.37 | 5.14 | 1.13 | 1.32 | 1.20 | 16 | 67 | 67 |
| B14 4478 RRH | 18.1 | 13.4 | 8.3 | 1.68 | 1.04 | 1.35 | 2.18 | 1.20 | 1.20 | 82 | 51 | 51 |
| B14 4478 RRH (Shielded) | 18.1 | 4.2 | 13.4 | 0.52 | 1.68 | 4.36 | 1.35 | 1.28 | 1.20 | 27 | 82 | 82 |
| B5/B12 4449 RRH | 17.9 | 13.2 | 9.4 | 1.64 | 1.17 | 1.36 | 1.90 | 1.20 | 1.20 | 80 | 57 | 57 |
| B5/B12 4449 RRH (Shielded) | 17.9 | 4.7 | 13.2 | 0.58 | 1.64 | 3.81 | 1.36 | 1.26 | 1.20 | 30 | 80 | 80 |
| 4415 B25 RRH | 16.5 | 13.5 | 6.3 | 1.55 | 0.72 | 1.22 | 2.62 | 1.20 | 1.21 | 75 | 35 | 35 |
| 4415 B25 RRH (Shielded) | 16.5 | 3.2 | 13.5 | 0.36 | 1.55 | 5.24 | 1.22 | 1.32 | 1.20 | 19 | 75 | 75 |
| TT19-08BP111-001 TMA | 9.9 | 5.4 | 6.7 | 0.37 | 0.46 | 1.83 | 1.48 | 1.20 | 1.20 | 18 | 22 | 22 |

WIND LOADS WITH ICE:

| | | | | | | | | | | | | |
|----------------------------|------|------|------|-------|------|------|------|------|------|-----|----|----|
| 7770 Antenna | 57.4 | 13.4 | 7.4 | 5.33 | 2.94 | 4.29 | 7.78 | 1.28 | 1.43 | 48 | 30 | 30 |
| HPA-65R-BUU-H8 Antenna | 94.8 | 17.2 | 9.8 | 11.30 | 6.43 | 5.52 | 9.69 | 1.33 | 1.49 | 107 | 68 | 68 |
| OPA65R-BU8DA Antenna | 98.4 | 23.4 | 10.2 | 15.97 | 6.95 | 4.21 | 9.67 | 1.28 | 1.49 | 144 | 73 | 73 |
| OPA65R-BU6DA Antenna | 73.6 | 23.4 | 10.2 | 11.94 | 5.20 | 3.15 | 7.23 | 1.23 | 1.41 | 104 | 52 | 52 |
| DMP65R-BU8DA Antenna | 98.4 | 23.1 | 10.1 | 15.76 | 6.88 | 4.26 | 9.76 | 1.28 | 1.49 | 142 | 73 | 73 |
| RRUS-32 B30 RRH | 29.6 | 14.5 | 9.4 | 2.97 | 1.93 | 2.04 | 3.15 | 1.20 | 1.23 | 25 | 17 | 17 |
| RRUS-32 B30 RRH (Shielded) | 29.6 | 5.9 | 14.5 | 1.21 | 2.97 | 5.03 | 2.04 | 1.31 | 1.20 | 11 | 25 | 25 |
| 4426 B66 RRH | 17.3 | 15.6 | 8.2 | 1.87 | 0.98 | 1.11 | 2.11 | 1.20 | 1.20 | 16 | 8 | 8 |
| 4426 B66 RRH (Shielded) | 17.3 | 5.3 | 15.6 | 0.63 | 1.87 | 3.27 | 1.11 | 1.23 | 1.20 | 6 | 16 | 16 |
| B14 4478 RRH | 20.5 | 15.8 | 10.7 | 2.24 | 1.52 | 1.30 | 1.92 | 1.20 | 1.20 | 19 | 13 | 13 |
| B14 4478 RRH (Shielded) | 20.5 | 6.5 | 15.8 | 0.93 | 2.24 | 3.14 | 1.30 | 1.23 | 1.20 | 8 | 19 | 19 |
| B5/B12 4449 RRH | 20.3 | 15.6 | 11.8 | 2.19 | 1.66 | 1.30 | 1.72 | 1.20 | 1.20 | 19 | 14 | 14 |
| B5/B12 4449 RRH (Shielded) | 20.3 | 7.1 | 15.6 | 1.00 | 2.19 | 2.87 | 1.30 | 1.22 | 1.20 | 9 | 19 | 19 |
| 4415 B25 RRH | 18.9 | 15.9 | 8.7 | 2.08 | 1.14 | 1.19 | 2.18 | 1.20 | 1.20 | 18 | 10 | 10 |
| 4415 B25 RRH (Shielded) | 18.9 | 5.5 | 15.9 | 0.72 | 2.08 | 3.42 | 1.19 | 1.24 | 1.20 | 6 | 18 | 18 |
| TT19-08BP111-001 TMA | 12.3 | 7.8 | 9.1 | 0.66 | 0.77 | 1.58 | 1.35 | 1.20 | 1.20 | 6 | 7 | 7 |

WIND LOADS AT 30 MPH:

| | | | | | | | | | | | | |
|----------------------------|------|------|------|-------|------|------|-------|------|------|----|----|----|
| 7770 Antenna | 55.0 | 11.0 | 5.0 | 4.20 | 1.91 | 5.00 | 11.00 | 1.31 | 1.53 | 14 | 7 | 7 |
| HPA-65R-BUU-H8 Antenna | 92.4 | 14.8 | 7.4 | 9.50 | 4.75 | 6.24 | 12.49 | 1.37 | 1.58 | 33 | 19 | 19 |
| OPA65R-BU8DA Antenna | 96.0 | 21.0 | 7.8 | 14.00 | 5.20 | 4.57 | 12.31 | 1.29 | 1.58 | 46 | 21 | 21 |
| OPA65R-BU6DA Antenna | 71.2 | 21.0 | 7.8 | 10.38 | 3.86 | 3.39 | 9.13 | 1.24 | 1.47 | 33 | 14 | 14 |
| DMP65R-BU8DA Antenna | 96.0 | 20.7 | 7.7 | 13.80 | 5.13 | 4.64 | 12.47 | 1.30 | 1.58 | 45 | 21 | 21 |
| RRUS-32 B30 RRH | 27.2 | 12.1 | 7.0 | 2.29 | 1.32 | 2.25 | 3.89 | 1.20 | 1.26 | 7 | 4 | 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 | 7 | 7 |
| 4426 B66 RRH | 14.9 | 13.2 | 5.8 | 1.37 | 0.60 | 1.13 | 2.57 | 1.20 | 1.20 | 4 | 2 | 2 |
| 4426 B66 RRH (Shielded) | 14.9 | 2.9 | 13.2 | 0.30 | 1.37 | 5.14 | 1.13 | 1.32 | 1.20 | 1 | 4 | 4 |
| B14 4478 RRH | 18.1 | 13.4 | 8.3 | 1.68 | 1.04 | 1.35 | 2.18 | 1.20 | 1.20 | 5 | 3 | 3 |
| B14 4478 RRH (Shielded) | 18.1 | 4.2 | 13.4 | 0.52 | 1.68 | 4.36 | 1.35 | 1.28 | 1.20 | 2 | 5 | 5 |
| B5/B12 4449 RRH | 17.9 | 13.2 | 9.4 | 1.64 | 1.17 | 1.36 | 1.90 | 1.20 | 1.20 | 5 | 4 | 4 |
| B5/B12 4449 RRH (Shielded) | 17.9 | 4.7 | 13.2 | 0.58 | 1.64 | 3.81 | 1.36 | 1.26 | 1.20 | 2 | 5 | 5 |
| 4415 B25 RRH | 16.5 | 13.5 | 6.3 | 1.55 | 0.72 | 1.22 | 2.62 | 1.20 | 1.21 | 5 | 2 | 2 |
| 4415 B25 RRH (Shielded) | 16.5 | 3.2 | 13.5 | 0.36 | 1.55 | 5.24 | 1.22 | 1.32 | 1.20 | 1 | 5 | 5 |
| TT19-08BP111-001 TMA | 9.9 | 5.4 | 6.7 | 0.37 | 0.46 | 1.83 | 1.48 | 1.20 | 1.20 | 1 | 1 | 1 |

Date: 1/20/2022

Project Name: SOUTHURBY KETTLETOWN RD

Project No.: CT2086

Designed By: ID Checked By: MSC



ICE WEIGHT CALCULATIONS

Thickness of ice: 1.19 in.
Density of ice: 56 pcf

7770 Antenna

Weight of ice based on total radial SF area:
Height (in): 55.0
Width (in): 11.0
Depth (in): 5.0
Total weight of ice on object: 88 lbs
Weight of object: 35.0 lbs
Combined weight of ice and object: 123 lbs

HPA-65R-BUU-H8 Antenna

Weight of ice based on total radial SF area:
Height (in): 92.4
Width (in): 14.8
Depth (in): 7.4
Total weight of ice on object: 199 lbs
Weight of object: 68.0 lbs
Combined weight of ice and object: 267 lbs

OPA65R-BU8DA Antenna

Weight of ice based on total radial SF area:
Height (in): 96.0
Width (in): 21.0
Depth (in): 7.8
Total weight of ice on object: 274 lbs
Weight of object: 77.0 lbs
Combined weight of ice and object: 351 lbs

OPA65R-BU6DA Antenna

Weight of ice based on total radial SF area:
Height (in): 71.2
Width (in): 21.0
Depth (in): 7.8
Total weight of ice on object: 204 lbs
Weight of object: 64.0 lbs
Combined weight of ice and object: 268 lbs

DMP65R-BU8DA Antenna

Weight of ice based on total radial SF area:
Height (in): 96.0
Width (in): 20.7
Depth (in): 7.7
Total weight of ice on object: 271 lbs
Weight of object: 96.0 lbs
Combined weight of ice and object: 367 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: 50 lbs
Weight of object: 60.0 lbs
Combined weight of ice and object: 110 lbs

4426 B66 RRH

Weight of ice based on total radial SF area:
Height (in): 14.9
Width (in): 13.2
Depth (in): 5.8
Total weight of ice on object: 28 lbs
Weight of object: 49.0 lbs
Combined weight of ice and object: 77 lbs

B14 4478 RRH

Weight of ice based on total radial SF area:
Height (in): 18.1
Width (in): 13.4
Depth (in): 8.3
Total weight of ice on object: 37 lbs
Weight of object: 60.0 lbs
Combined weight of ice and object: 97 lbs

B5/B12 4449 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: 38 lbs
Weight of object: 73.0 lbs
Combined weight of ice and object: 111 lbs

4415 B25 RRH

Weight of ice based on total radial SF area:
Height (in): 16.5
Width (in): 13.5
Depth (in): 6.3
Total weight of ice on object: 32 lbs
Weight of object: 50.0 lbs
Combined weight of ice and object: 82 lbs

TT19-08BP111-001 TMA

Weight of ice based on total radial SF area:
Height (in): 9.9
Width (in): 5.4
Depth (in): 6.7
Total weight of ice on object: 12 lbs
Weight of object: 16.0 lbs
Combined weight of ice and object: 28 lbs

3/4" Round Bar

Per foot weight of ice:
diameter (in): 0.75
Per foot weight of ice on object: 3 plf

2" Pipe

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

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: 32 lbs
Weight of object: 33 lbs
Combined weight of ice and object: 65 lbs

2-1/2" Pipe

Per foot weight of ice:
diameter (in): 2.88
Per foot weight of ice on object: 6 plf

L 2-1/2x2-1/2 Angles

Weight of ice based on total radial SF area:
Height (in): 2.5
Width (in): 2.5
Per foot weight of ice on object: 7 plf

3" Pipe

Per foot weight of ice:
diameter (in): 3.5
Per foot weight of ice on object: 7 plf

L 2-1/2x1-1/2 Angles

Weight of ice based on total radial SF area:
Height (in): 2.5
Width (in): 1.5
Per foot weight of ice on object: 6 plf

PL 6x5/8

Weight of ice based on total radial SF area:
Height (in): 6
Width (in): 0.625
Per foot weight of ice on object: 11 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: 8 plf

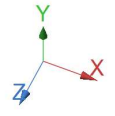
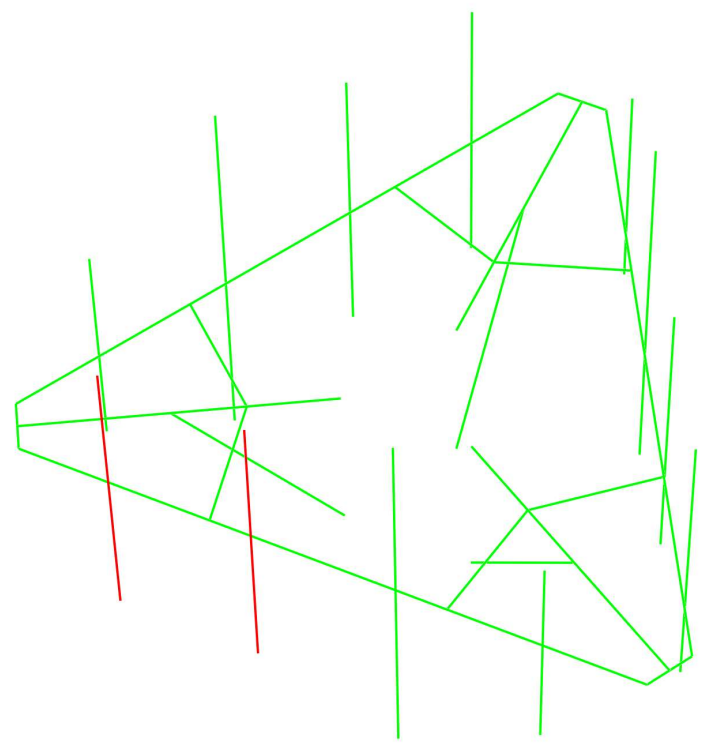


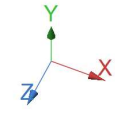
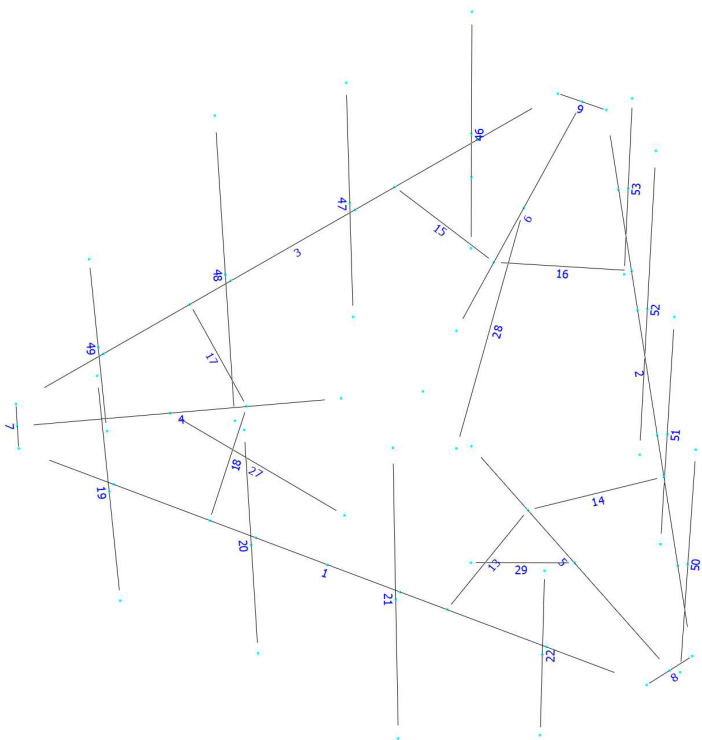
HUDSON
Design Group LLC

**Mount Calculations
(Existing Conditions)**

Design status

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





Load data

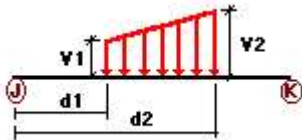
GLOSSARY

Comb : Indicates if load condition is a load combination

Load Conditions

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

Distributed force on members

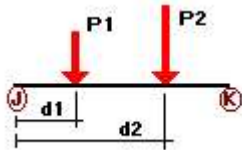


| Condition | Member | Dir1 | Val1 [Kip/ft] | Val2 [Kip/ft] | Dist1 [ft] | % | Dist2 [ft] | % |
|-----------|--------|--------|------------------|------------------|---------------|------|---------------|----|
| DL | 4 | y | -0.01 | 0.00 | 0.00 | No | 0.00 | No |
| | 5 | y | -0.01 | 0.00 | 0.00 | No | 0.00 | No |
| | 6 | y | -0.01 | 0.00 | 0.00 | No | 0.00 | No |
| | 13 | y | -0.01 | 0.00 | 0.00 | No | 0.00 | No |
| | 14 | y | -0.01 | 0.00 | 0.00 | No | 0.00 | No |
| | 15 | y | -0.01 | 0.00 | 0.00 | No | 0.00 | No |
| | 16 | y | -0.01 | 0.00 | 0.00 | No | 0.00 | No |
| | 17 | y | -0.01 | 0.00 | 0.00 | No | 0.00 | No |
| W0 | 18 | y | -0.01 | 0.00 | 0.00 | No | 0.00 | No |
| | 1 | z | -0.014 | 0.00 | 0.00 | No | 0.00 | No |
| | 2 | z | -0.014 | 0.00 | 0.00 | No | 0.00 | No |
| | 3 | z | -0.014 | 0.00 | 0.00 | No | 0.00 | No |
| | 4 | z | -0.013 | 0.00 | 0.00 | No | 0.00 | No |
| | 5 | z | -0.013 | 0.00 | 0.00 | No | 0.00 | No |
| | 6 | z | -0.013 | 0.00 | 0.00 | No | 0.00 | No |
| 7 | z | -0.024 | 0.00 | 0.00 | No | 0.00 | No | |

| | | | | | | | | |
|-----|----|---|--------|------|------|----|------|----|
| | 8 | z | -0.024 | 0.00 | 0.00 | No | 0.00 | No |
| | 9 | z | -0.024 | 0.00 | 0.00 | No | 0.00 | No |
| | 13 | z | -0.017 | 0.00 | 0.00 | No | 0.00 | No |
| | 14 | z | -0.017 | 0.00 | 0.00 | No | 0.00 | No |
| | 15 | z | -0.017 | 0.00 | 0.00 | No | 0.00 | No |
| | 16 | z | -0.017 | 0.00 | 0.00 | No | 0.00 | No |
| | 17 | z | -0.017 | 0.00 | 0.00 | No | 0.00 | No |
| | 18 | z | -0.017 | 0.00 | 0.00 | No | 0.00 | No |
| | 19 | z | -0.01 | 0.00 | 0.00 | No | 0.00 | No |
| | 20 | z | -0.01 | 0.00 | 0.00 | No | 0.00 | No |
| | 21 | z | -0.01 | 0.00 | 0.00 | No | 0.00 | No |
| | 22 | z | -0.01 | 0.00 | 0.00 | No | 0.00 | No |
| | 27 | z | -0.017 | 0.00 | 0.00 | No | 0.00 | No |
| | 28 | z | -0.017 | 0.00 | 0.00 | No | 0.00 | No |
| | 29 | z | -0.017 | 0.00 | 0.00 | No | 0.00 | No |
| | 46 | z | -0.01 | 0.00 | 0.00 | No | 0.00 | No |
| | 47 | z | -0.01 | 0.00 | 0.00 | No | 0.00 | No |
| | 48 | z | -0.01 | 0.00 | 0.00 | No | 0.00 | No |
| | 49 | z | -0.01 | 0.00 | 0.00 | No | 0.00 | No |
| | 50 | z | -0.01 | 0.00 | 0.00 | No | 0.00 | No |
| | 51 | z | -0.01 | 0.00 | 0.00 | No | 0.00 | No |
| | 52 | z | -0.01 | 0.00 | 0.00 | No | 0.00 | No |
| | 53 | z | -0.01 | 0.00 | 0.00 | No | 0.00 | No |
| W30 | 1 | x | -0.014 | 0.00 | 0.00 | No | 0.00 | No |
| | 2 | x | -0.014 | 0.00 | 0.00 | No | 0.00 | No |
| | 3 | x | -0.014 | 0.00 | 0.00 | No | 0.00 | No |
| | 4 | x | -0.013 | 0.00 | 0.00 | No | 0.00 | No |
| | 5 | x | -0.013 | 0.00 | 0.00 | No | 0.00 | No |
| | 6 | x | -0.013 | 0.00 | 0.00 | No | 0.00 | No |
| | 7 | x | -0.024 | 0.00 | 0.00 | No | 0.00 | No |
| | 8 | x | -0.024 | 0.00 | 0.00 | No | 0.00 | No |
| | 9 | x | -0.024 | 0.00 | 0.00 | No | 0.00 | No |
| | 13 | x | -0.017 | 0.00 | 0.00 | No | 0.00 | No |
| | 14 | x | -0.017 | 0.00 | 0.00 | No | 0.00 | No |
| | 15 | x | -0.017 | 0.00 | 0.00 | No | 0.00 | No |
| | 16 | x | -0.017 | 0.00 | 0.00 | No | 0.00 | No |
| | 17 | x | -0.017 | 0.00 | 0.00 | No | 0.00 | No |
| | 18 | x | -0.017 | 0.00 | 0.00 | No | 0.00 | No |
| | 19 | x | -0.01 | 0.00 | 0.00 | No | 0.00 | No |
| | 20 | x | -0.01 | 0.00 | 0.00 | No | 0.00 | No |
| | 21 | x | -0.01 | 0.00 | 0.00 | No | 0.00 | No |
| | 22 | x | -0.01 | 0.00 | 0.00 | No | 0.00 | No |
| | 27 | x | -0.017 | 0.00 | 0.00 | No | 0.00 | No |
| | 28 | x | -0.017 | 0.00 | 0.00 | No | 0.00 | No |
| | 29 | x | -0.017 | 0.00 | 0.00 | No | 0.00 | No |
| | 46 | x | -0.01 | 0.00 | 0.00 | No | 0.00 | No |
| | 47 | x | -0.01 | 0.00 | 0.00 | No | 0.00 | No |
| | 48 | x | -0.01 | 0.00 | 0.00 | No | 0.00 | No |
| | 49 | x | -0.01 | 0.00 | 0.00 | No | 0.00 | No |
| | 50 | x | -0.01 | 0.00 | 0.00 | No | 0.00 | No |
| | 51 | x | -0.01 | 0.00 | 0.00 | No | 0.00 | No |
| | 52 | x | -0.01 | 0.00 | 0.00 | No | 0.00 | No |
| | 53 | x | -0.01 | 0.00 | 0.00 | No | 0.00 | No |
| Di | 1 | y | -0.007 | 0.00 | 0.00 | No | 0.00 | No |
| | 2 | y | -0.007 | 0.00 | 0.00 | No | 0.00 | No |
| | 3 | y | -0.007 | 0.00 | 0.00 | No | 0.00 | No |
| | 4 | y | -0.008 | 0.00 | 0.00 | No | 0.00 | No |
| | 5 | y | -0.008 | 0.00 | 0.00 | No | 0.00 | No |
| | 6 | y | -0.008 | 0.00 | 0.00 | No | 0.00 | No |
| | 7 | y | -0.011 | 0.00 | 0.00 | No | 0.00 | No |

| | | | | | | | |
|----|---|--------|------|------|----|------|----|
| 8 | y | -0.011 | 0.00 | 0.00 | No | 0.00 | No |
| 9 | y | -0.011 | 0.00 | 0.00 | No | 0.00 | No |
| 13 | y | -0.006 | 0.00 | 0.00 | No | 0.00 | No |
| 14 | y | -0.006 | 0.00 | 0.00 | No | 0.00 | No |
| 15 | y | -0.006 | 0.00 | 0.00 | No | 0.00 | No |
| 16 | y | -0.006 | 0.00 | 0.00 | No | 0.00 | No |
| 17 | y | -0.006 | 0.00 | 0.00 | No | 0.00 | No |
| 18 | y | -0.006 | 0.00 | 0.00 | No | 0.00 | No |
| 19 | y | -0.005 | 0.00 | 0.00 | No | 0.00 | No |
| 20 | y | -0.005 | 0.00 | 0.00 | No | 0.00 | No |
| 21 | y | -0.005 | 0.00 | 0.00 | No | 0.00 | No |
| 22 | y | -0.005 | 0.00 | 0.00 | No | 0.00 | No |
| 27 | y | -0.007 | 0.00 | 0.00 | No | 0.00 | No |
| 28 | y | -0.007 | 0.00 | 0.00 | No | 0.00 | No |
| 29 | y | -0.007 | 0.00 | 0.00 | No | 0.00 | No |
| 46 | y | -0.005 | 0.00 | 0.00 | No | 0.00 | No |
| 47 | y | -0.005 | 0.00 | 0.00 | No | 0.00 | No |
| 48 | y | -0.005 | 0.00 | 0.00 | No | 0.00 | No |
| 49 | y | -0.005 | 0.00 | 0.00 | No | 0.00 | No |
| 50 | y | -0.005 | 0.00 | 0.00 | No | 0.00 | No |
| 51 | y | -0.005 | 0.00 | 0.00 | No | 0.00 | No |
| 52 | y | -0.005 | 0.00 | 0.00 | No | 0.00 | No |
| 53 | y | -0.005 | 0.00 | 0.00 | No | 0.00 | No |

Concentrated forces on members



| Condition | Member | Dir1 | Value1 [Kip] | Dist1 [ft] | % |
|-----------|--------|--------|-----------------|---------------|----|
| DL | 19 | y | -0.048 | 0.50 | No |
| | | y | -0.048 | 7.50 | No |
| | | y | -0.073 | 2.00 | No |
| | | y | -0.05 | 2.00 | No |
| | 20 | y | -0.039 | 0.50 | No |
| | | y | -0.039 | 7.50 | No |
| | | y | -0.049 | 2.00 | No |
| | | y | -0.06 | 2.00 | No |
| | 21 | y | -0.034 | 1.50 | No |
| | | y | -0.034 | 8.50 | No |
| | | y | -0.06 | 2.00 | No |
| | 22 | y | -0.018 | 1.00 | No |
| y | | -0.018 | 5.00 | No | |
| 46 | y | -0.016 | 2.00 | No | |
| | y | -0.048 | 0.50 | No | |
| | y | -0.048 | 7.50 | No | |
| | y | -0.073 | 2.00 | No | |
| 47 | y | -0.05 | 2.00 | No | |
| | y | -0.032 | 0.50 | No | |
| | y | -0.032 | 7.50 | No | |
| | y | -0.049 | 2.00 | No | |
| | | y | -0.06 | 2.00 | No |

| | | | | | |
|-----|----|---|--------|------|----|
| | 48 | y | -0.034 | 1.50 | No |
| | | y | -0.034 | 8.50 | No |
| | | y | -0.06 | 2.00 | No |
| | 49 | y | -0.018 | 1.00 | No |
| | | y | -0.018 | 5.00 | No |
| | | y | -0.016 | 2.00 | No |
| | 50 | y | -0.048 | 0.50 | No |
| | | y | -0.048 | 7.50 | No |
| | | y | -0.073 | 2.00 | No |
| | | y | -0.05 | 2.00 | No |
| | 51 | y | -0.032 | 0.50 | No |
| | | y | -0.032 | 7.50 | No |
| | | y | -0.049 | 2.00 | No |
| | | y | -0.06 | 2.00 | No |
| | 52 | y | -0.034 | 1.50 | No |
| | | y | -0.034 | 8.50 | No |
| | | y | -0.06 | 2.00 | No |
| | 53 | y | -0.018 | 1.00 | No |
| | | y | -0.018 | 5.00 | No |
| | | y | -0.016 | 2.00 | No |
| W0 | 19 | z | -0.364 | 0.50 | No |
| | | z | -0.364 | 7.50 | No |
| | | z | -0.03 | 2.00 | No |
| | | z | -0.019 | 2.00 | No |
| | 20 | z | -0.368 | 0.50 | No |
| | | z | -0.368 | 7.50 | No |
| | | z | -0.016 | 2.00 | No |
| | | z | -0.027 | 2.00 | No |
| | 21 | z | -0.264 | 1.50 | No |
| | | z | -0.264 | 8.50 | No |
| | | z | -0.038 | 2.00 | No |
| | 22 | z | -0.113 | 1.00 | No |
| | | z | -0.113 | 5.00 | No |
| | | z | -0.018 | 2.00 | No |
| | 46 | z | -0.215 | 0.50 | No |
| | | z | -0.215 | 7.50 | No |
| | | z | -0.075 | 2.00 | No |
| | 47 | z | -0.152 | 1.50 | No |
| | | z | -0.152 | 6.50 | No |
| | | z | -0.077 | 2.00 | No |
| | 48 | z | -0.181 | 1.50 | No |
| | | z | -0.181 | 8.50 | No |
| | | z | -0.105 | 2.00 | No |
| | 49 | z | -0.073 | 1.00 | No |
| | | z | -0.073 | 5.00 | No |
| | | z | -0.021 | 2.00 | No |
| | 50 | z | -0.215 | 0.50 | No |
| | | z | -0.215 | 7.50 | No |
| | | z | -0.075 | 2.00 | No |
| | 51 | z | -0.152 | 1.50 | No |
| | | z | -0.152 | 6.50 | No |
| | | z | -0.077 | 2.00 | No |
| | 52 | z | -0.181 | 1.50 | No |
| | | z | -0.181 | 8.50 | No |
| | | z | -0.105 | 2.00 | No |
| | 53 | z | -0.073 | 1.00 | No |
| | | z | -0.073 | 5.00 | No |
| | | z | -0.021 | 2.00 | No |
| W30 | 19 | x | -0.166 | 0.50 | No |
| | | x | -0.166 | 7.50 | No |

| | | | | | |
|----|----|---|--------|------|----|
| | | x | -0.08 | 2.00 | No |
| | 20 | x | -0.167 | 0.50 | No |
| | | x | -0.167 | 7.50 | No |
| | | x | -0.082 | 2.00 | No |
| | 21 | x | -0.153 | 1.50 | No |
| | | x | -0.153 | 8.50 | No |
| | | x | -0.112 | 2.00 | No |
| | 22 | x | -0.06 | 1.00 | No |
| | | x | -0.06 | 5.00 | No |
| | | x | -0.022 | 2.00 | No |
| | 46 | x | -0.314 | 0.50 | No |
| | | x | -0.314 | 7.50 | No |
| | | x | -0.05 | 2.00 | No |
| | 47 | x | -0.226 | 1.50 | No |
| | | x | -0.226 | 6.50 | No |
| | | x | -0.052 | 2.00 | No |
| | 48 | x | -0.237 | 1.50 | No |
| | | x | -0.237 | 8.50 | No |
| | | x | -0.073 | 2.00 | No |
| | 49 | x | -0.099 | 1.00 | No |
| | | x | -0.099 | 5.00 | No |
| | | x | -0.019 | 2.00 | No |
| | 50 | x | -0.314 | 0.50 | No |
| | | x | -0.314 | 7.50 | No |
| | | x | -0.05 | 2.00 | No |
| | 51 | x | -0.226 | 1.50 | No |
| | | x | -0.226 | 6.50 | No |
| | | x | -0.052 | 2.00 | No |
| | 52 | x | -0.237 | 1.50 | No |
| | | x | -0.237 | 8.50 | No |
| | | x | -0.073 | 2.00 | No |
| | 53 | x | -0.099 | 1.00 | No |
| | | x | -0.099 | 5.00 | No |
| | | x | -0.019 | 2.00 | No |
| Di | 19 | y | -0.136 | 0.50 | No |
| | | y | -0.136 | 7.50 | No |
| | | y | -0.038 | 2.00 | No |
| | | y | -0.032 | 2.00 | No |
| | 20 | y | -0.137 | 0.50 | No |
| | | y | -0.137 | 7.50 | No |
| | | y | -0.028 | 2.00 | No |
| | | y | -0.037 | 2.00 | No |
| | 21 | y | -0.10 | 1.50 | No |
| | | y | -0.10 | 8.50 | No |
| | | y | -0.05 | 2.00 | No |
| | 22 | y | -0.044 | 1.00 | No |
| | | y | -0.044 | 5.00 | No |
| | | y | -0.012 | 2.00 | No |
| | 46 | y | -0.136 | 0.50 | No |
| | | y | -0.136 | 7.50 | No |
| | | y | -0.038 | 2.00 | No |
| | | y | -0.032 | 2.00 | No |
| | 47 | y | -0.102 | 0.50 | No |
| | | y | -0.102 | 7.50 | No |
| | | y | -0.028 | 2.00 | No |
| | | y | -0.037 | 2.00 | No |
| | 48 | y | -0.10 | 1.50 | No |
| | | y | -0.10 | 8.50 | No |
| | | y | -0.05 | 2.00 | No |
| | 49 | y | -0.044 | 1.00 | No |

| | | | | | |
|------|----|---|--------|------|----|
| | | y | -0.044 | 5.00 | No |
| | | y | -0.012 | 2.00 | No |
| | 50 | y | -0.136 | 0.50 | No |
| | | y | -0.136 | 7.50 | No |
| | | y | -0.038 | 2.00 | No |
| | | y | -0.032 | 2.00 | No |
| | 51 | y | -0.102 | 0.50 | No |
| | | y | -0.102 | 7.50 | No |
| | | y | -0.028 | 2.00 | No |
| | | y | -0.037 | 2.00 | No |
| | 52 | y | -0.10 | 1.50 | No |
| | | y | -0.10 | 8.50 | No |
| | | y | -0.05 | 2.00 | No |
| | 53 | y | -0.044 | 1.00 | No |
| | | y | -0.044 | 5.00 | No |
| | | y | -0.012 | 2.00 | No |
| Wi0 | 19 | z | -0.073 | 0.50 | No |
| | | z | -0.073 | 7.50 | No |
| | | z | -0.009 | 2.00 | No |
| | | z | -0.007 | 2.00 | No |
| | 20 | z | -0.073 | 0.50 | No |
| | | z | -0.073 | 7.50 | No |
| | | z | -0.006 | 2.00 | No |
| | | z | -0.008 | 2.00 | No |
| | 21 | z | -0.055 | 1.50 | No |
| | | z | -0.055 | 8.50 | No |
| | | z | -0.012 | 2.00 | No |
| | 22 | z | -0.025 | 1.00 | No |
| | | z | -0.025 | 5.00 | No |
| | | z | -0.006 | 2.00 | No |
| | 46 | z | -0.045 | 0.50 | No |
| | | z | -0.045 | 7.50 | No |
| | | z | -0.017 | 2.00 | No |
| | 47 | z | -0.033 | 1.50 | No |
| | | z | -0.033 | 6.50 | No |
| | | z | -0.018 | 2.00 | No |
| | 48 | z | -0.039 | 1.50 | No |
| | | z | -0.039 | 8.50 | No |
| | | z | -0.024 | 2.00 | No |
| | 49 | z | -0.018 | 1.00 | No |
| | | z | -0.018 | 5.00 | No |
| | | z | -0.006 | 2.00 | No |
| | 50 | z | -0.045 | 0.50 | No |
| | | z | -0.045 | 7.50 | No |
| | | z | -0.017 | 2.00 | No |
| | 51 | z | -0.033 | 1.50 | No |
| | | z | -0.033 | 6.50 | No |
| | | z | -0.018 | 2.00 | No |
| | 52 | z | -0.039 | 1.50 | No |
| | | z | -0.039 | 8.50 | No |
| | | z | -0.024 | 2.00 | No |
| | 53 | z | -0.018 | 1.00 | No |
| | | z | -0.018 | 5.00 | No |
| | | z | -0.006 | 2.00 | No |
| Wi30 | 19 | x | -0.037 | 0.50 | No |
| | | x | -0.037 | 7.50 | No |
| | | x | -0.019 | 2.00 | No |
| | 20 | x | -0.037 | 0.50 | No |
| | | x | -0.037 | 7.50 | No |
| | | x | -0.019 | 2.00 | No |

| | | | | | |
|-----|----|---|--------|------|----|
| | 21 | x | -0.034 | 1.50 | No |
| | | x | -0.034 | 8.50 | No |
| | | x | -0.025 | 2.00 | No |
| | 22 | x | -0.015 | 1.00 | No |
| | | x | -0.015 | 5.00 | No |
| | | x | -0.007 | 2.00 | No |
| | 46 | x | -0.063 | 0.50 | No |
| | | x | -0.063 | 7.50 | No |
| | | x | -0.012 | 2.00 | No |
| | 47 | x | -0.046 | 1.50 | No |
| | | x | -0.046 | 6.50 | No |
| | | x | -0.012 | 2.00 | No |
| | 48 | x | -0.049 | 1.50 | No |
| | | x | -0.049 | 8.50 | No |
| | | x | -0.016 | 2.00 | No |
| | 49 | x | -0.022 | 1.00 | No |
| | | x | -0.022 | 5.00 | No |
| | | x | -0.006 | 2.00 | No |
| | 50 | x | -0.063 | 0.50 | No |
| | | x | -0.063 | 7.50 | No |
| | | x | -0.012 | 2.00 | No |
| | 51 | x | -0.046 | 1.50 | No |
| | | x | -0.046 | 6.50 | No |
| | | x | -0.012 | 2.00 | No |
| | 52 | x | -0.049 | 1.50 | No |
| | | x | -0.049 | 8.50 | No |
| | | x | -0.016 | 2.00 | No |
| | 53 | x | -0.022 | 1.00 | No |
| | | x | -0.022 | 5.00 | No |
| | | x | -0.006 | 2.00 | No |
| WLO | 19 | z | -0.023 | 0.50 | No |
| | | z | -0.023 | 7.50 | No |
| | | z | -0.002 | 2.00 | No |
| | | z | -0.001 | 2.00 | No |
| | 20 | z | -0.023 | 0.50 | No |
| | | z | -0.023 | 7.50 | No |
| | | z | -0.001 | 2.00 | No |
| | | z | -0.002 | 2.00 | No |
| | 21 | z | -0.017 | 1.50 | No |
| | | z | -0.017 | 8.50 | No |
| | | z | -0.002 | 2.00 | No |
| | 22 | z | -0.008 | 1.00 | No |
| | | z | -0.008 | 5.00 | No |
| | | z | -0.001 | 2.00 | No |
| | 46 | z | -0.014 | 0.50 | No |
| | | z | -0.014 | 7.50 | No |
| | | z | -0.005 | 2.00 | No |
| | 47 | z | -0.01 | 1.50 | No |
| | | z | -0.01 | 6.50 | No |
| | | z | -0.005 | 2.00 | No |
| | 48 | z | -0.012 | 1.50 | No |
| | | z | -0.012 | 8.50 | No |
| | | z | -0.007 | 2.00 | No |
| | 49 | z | -0.005 | 1.00 | No |
| | | z | -0.005 | 5.00 | No |
| | | z | -0.001 | 2.00 | No |
| | 50 | z | -0.014 | 0.50 | No |
| | | z | -0.014 | 7.50 | No |
| | | z | -0.005 | 2.00 | No |
| | 51 | z | -0.01 | 1.50 | No |

| | | | | | |
|------|----|---|--------|--------|-----|
| | | z | -0.01 | 6.50 | No |
| | | z | -0.005 | 2.00 | No |
| | 52 | z | -0.012 | 1.50 | No |
| | | z | -0.012 | 8.50 | No |
| | | z | -0.007 | 2.00 | No |
| | 53 | z | -0.005 | 1.00 | No |
| | | z | -0.005 | 5.00 | No |
| | | z | -0.001 | 2.00 | No |
| WL30 | 19 | x | -0.011 | 0.50 | No |
| | | x | -0.011 | 7.50 | No |
| | | x | -0.005 | 2.00 | No |
| | 20 | x | -0.011 | 0.50 | No |
| | | x | -0.011 | 7.50 | No |
| | | x | -0.005 | 2.00 | No |
| | 21 | x | -0.01 | 1.50 | No |
| | | x | -0.01 | 8.50 | No |
| | | x | -0.007 | 2.00 | No |
| | 22 | x | -0.004 | 1.00 | No |
| | | x | -0.004 | 5.00 | No |
| | | x | -0.001 | 2.00 | No |
| | 46 | x | -0.02 | 0.50 | No |
| | | x | -0.02 | 7.50 | No |
| | | x | -0.003 | 2.00 | No |
| | 47 | x | -0.015 | 1.50 | No |
| | | x | -0.015 | 6.50 | No |
| | | x | -0.003 | 2.00 | No |
| | 48 | x | -0.015 | 1.50 | No |
| | | x | -0.015 | 8.50 | No |
| | | x | -0.005 | 2.00 | No |
| | 49 | x | -0.007 | 1.00 | No |
| | | x | -0.007 | 5.00 | No |
| | | x | -0.001 | 2.00 | No |
| | 50 | x | -0.02 | 0.50 | No |
| | | x | -0.02 | 7.50 | No |
| | | x | -0.003 | 2.00 | No |
| | 51 | x | -0.015 | 1.50 | No |
| | | x | -0.015 | 6.50 | No |
| | | x | -0.003 | 2.00 | No |
| | 52 | x | -0.015 | 1.50 | No |
| | | x | -0.015 | 8.50 | No |
| | | x | -0.005 | 2.00 | No |
| | 53 | x | -0.007 | 1.00 | No |
| | | x | -0.007 | 5.00 | No |
| | | x | -0.001 | 2.00 | No |
| LL1 | 1 | y | -0.25 | 50.00 | Yes |
| LL2 | 1 | y | -0.25 | 100.00 | Yes |
| LLa1 | 22 | y | -0.50 | 50.00 | Yes |
| LLa2 | 21 | y | -0.50 | 50.00 | Yes |
| LLa3 | 20 | y | -0.50 | 50.00 | Yes |
| LLa4 | 19 | y | -0.50 | 50.00 | Yes |

Self weight multipliers for load conditions

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

Earthquake (Dynamic analysis only)

| Condition | a/g | Ang. [Deg] | Damp. [%] |
|-----------|------|---------------|--------------|
| DL | 0.00 | 0.00 | 0.00 |
| W0 | 0.00 | 0.00 | 0.00 |
| W30 | 0.00 | 0.00 | 0.00 |
| Di | 0.00 | 0.00 | 0.00 |
| Wi0 | 0.00 | 0.00 | 0.00 |
| Wi30 | 0.00 | 0.00 | 0.00 |
| WL0 | 0.00 | 0.00 | 0.00 |
| WL30 | 0.00 | 0.00 | 0.00 |
| LL1 | 0.00 | 0.00 | 0.00 |
| LL2 | 0.00 | 0.00 | 0.00 |
| LLa1 | 0.00 | 0.00 | 0.00 |
| LLa2 | 0.00 | 0.00 | 0.00 |
| LLa3 | 0.00 | 0.00 | 0.00 |
| LLa4 | 0.00 | 0.00 | 0.00 |

Steel Code Check

Report: Summary - Group by member

Load conditions to be included in design :

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

| Description | Section | Member | Ctrl Eq. | Ratio | Status | Reference |
|----------------------------|---------|--------|----------------|-------|--------|-----------|
| <i>HSS_SQR 3X3X3_8</i> | | 4 | LC11 at 47.92% | 0.56 | OK | Eq. H1-1b |
| | | 5 | LC12 at 52.08% | 0.55 | OK | Eq. H1-1b |
| | | 6 | LC9 at 52.08% | 0.54 | OK | Eq. H1-1b |
| <i>LU 2-1_2X1-1_2X3_16</i> | | 13 | LC1 at 43.75% | 0.23 | OK | Eq. H2-1 |
| | | 14 | LC2 at 50.00% | 0.24 | OK | Eq. H2-1 |
| | | 15 | LC4 at 50.00% | 0.25 | OK | Eq. H2-1 |
| | | 16 | LC2 at 43.75% | 0.21 | OK | Eq. H2-1 |
| | | 17 | LC4 at 50.00% | 0.20 | OK | Eq. H2-1 |
| | | 18 | LC1 at 50.00% | 0.32 | OK | Eq. H2-1 |
| <i>PIPE 2x0.154</i> | | 19 | LC1 at 50.00% | 1.09 | N.G. | Eq. H1-1b |
| | | 20 | LC1 at 50.00% | 1.10 | N.G. | Eq. H1-1b |
| | | 21 | LC3 at 46.88% | 0.92 | OK | Eq. H1-1b |
| | | 22 | LC1 at 50.00% | 0.22 | OK | Eq. H1-1b |
| | | 46 | LC2 at 47.92% | 0.98 | OK | Eq. H1-1b |
| | | 47 | LC2 at 46.88% | 0.55 | OK | Eq. H1-1b |
| | | 48 | LC2 at 46.88% | 0.93 | OK | Eq. H1-1b |
| | | 49 | LC2 at 50.00% | 0.20 | OK | Eq. H1-1b |

| | | | | | |
|-----------------------------|-----------|----------------|-------------|-----------|-----------|
| | 50 | LC2 at 46.88% | 0.96 | OK | Eq. H1-1b |
| | 51 | LC2 at 46.88% | 0.55 | OK | Eq. H1-1b |
| | 52 | LC2 at 46.88% | 0.93 | OK | Eq. H1-1b |
| | 53 | LC2 at 50.00% | 0.20 | OK | Eq. H1-1b |
| <hr/> | | | | | |
| PIPE 3x0.216 | 1 | LC25 at 38.28% | 0.82 | OK | Eq. H1-1b |
| | 2 | LC11 at 38.39% | 0.63 | OK | Eq. H1-1b |
| | 3 | LC11 at 39.29% | 0.62 | OK | Eq. H1-1b |
| <hr/> | | | | | |
| PL 6x5/8 | 7 | LC2 at 46.88% | 0.40 | OK | Eq. H1-1b |
| | 8 | LC4 at 50.00% | 0.51 | OK | Eq. H1-1b |
| | 9 | LC1 at 50.00% | 0.47 | OK | Eq. H1-1b |
| <hr/> | | | | | |
| T2L 2-1_2X2-1_2X3_16 | 27 | LC11 at 0.00% | 0.50 | OK | Eq. H2-1 |
| | 28 | LC10 at 0.00% | 0.48 | OK | Eq. H2-1 |
| | 29 | LC11 at 0.00% | 0.48 | OK | Eq. H2-1 |

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 | -2.5833 | 0.00 | 0.00 | 0 |
| 2 | -6.8333 | 0.00 | 0.00 | 0 |
| 3 | -1.4434 | 0.00 | -3.75 | 0 |
| 4 | -7.386 | 0.00 | -0.9572 | 0 |
| 5 | -5.261 | 0.00 | -4.6378 | 0 |
| 6 | -2.6776 | 0.00 | -9.1122 | 0 |
| 7 | -0.5526 | 0.00 | -12.7928 | 0 |
| 8 | 2.5833 | 0.00 | 0.00 | 0 |
| 9 | 6.8333 | 0.00 | 0.00 | 0 |
| 10 | 1.4434 | 0.00 | -3.75 | 0 |
| 11 | 7.386 | 0.00 | -0.9572 | 0 |
| 12 | 5.261 | 0.00 | -4.6378 | 0 |
| 13 | 2.6776 | 0.00 | -9.1122 | 0 |
| 14 | 0.00 | 0.00 | -6.25 | 0 |
| 15 | 0.5526 | 0.00 | -12.7928 | 0 |
| 16 | -7.1096 | 0.00 | -0.4786 | 0 |
| 17 | 7.1096 | 0.00 | -0.4786 | 0 |
| 18 | 0.00 | 0.00 | -12.7928 | 0 |
| 23 | 3.0959 | 0.00 | -2.7959 | 0 |
| 28 | 0.00 | 0.00 | -8.1582 | 0 |
| 33 | -3.0959 | 0.00 | -2.7959 | 0 |
| 34 | -4.7083 | 4.00 | 0.20 | 0 |
| 35 | 4.7083 | 3.00 | 0.20 | 0 |

| | | | | |
|-----|----------|-------|----------|---|
| 40 | -1.5694 | 4.00 | 0.20 | 0 |
| 41 | 1.5694 | 5.25 | 0.20 | 0 |
| 50 | -4.7083 | -4.00 | 0.20 | 0 |
| 51 | -1.5694 | -4.00 | 0.20 | 0 |
| 52 | 1.5694 | -5.25 | 0.20 | 0 |
| 53 | 4.7083 | -3.00 | 0.20 | 0 |
| 54 | -4.7083 | 0.00 | 0.20 | 0 |
| 55 | 4.7083 | 0.00 | 0.20 | 0 |
| 56 | -1.5694 | 0.00 | 0.20 | 0 |
| 57 | 1.5694 | 0.00 | 0.20 | 0 |
| 58 | -4.7083 | 0.00 | 0.00 | 0 |
| 59 | 4.7083 | 0.00 | 0.00 | 0 |
| 60 | -1.5694 | 0.00 | 0.00 | 0 |
| 61 | 1.5694 | 0.00 | 0.00 | 0 |
| 62 | -1.4434 | -4.25 | -3.75 | 0 |
| 63 | 1.4434 | -4.25 | -3.75 | 0 |
| 64 | 0.00 | -4.25 | -6.25 | 0 |
| 65 | -4.4338 | 0.00 | -2.0235 | 0 |
| 66 | 0.00 | 0.00 | 0.00 | 0 |
| 70 | 0.00 | 0.00 | -4.5833 | 0 |
| 71 | 2.95E-06 | 0.00 | -9.703 | 0 |
| 72 | 4.4338 | 0.00 | -2.0235 | 0 |
| 77 | -1.7883 | 0.00 | -11.0525 | 0 |
| 78 | 6.4967 | 0.00 | -2.8975 | 0 |
| 79 | -1.6151 | 0.00 | -10.9525 | 0 |
| 80 | 6.3234 | 0.00 | -2.7975 | 0 |
| 85 | -3.3578 | 0.00 | -8.3342 | 0 |
| 86 | 4.9272 | 0.00 | -5.6158 | 0 |
| 87 | -3.1846 | 0.00 | -8.2342 | 0 |
| 88 | 4.754 | 0.00 | -5.5158 | 0 |
| 93 | -4.9272 | 0.00 | -5.6158 | 0 |
| 94 | 3.3578 | 0.00 | -8.3342 | 0 |
| 95 | -4.754 | 0.00 | -5.5158 | 0 |
| 96 | 3.1846 | 0.00 | -8.2342 | 0 |
| 101 | -6.4967 | 0.00 | -2.8975 | 0 |
| 102 | 1.7883 | 0.00 | -11.0525 | 0 |
| 103 | -6.3234 | 0.00 | -2.7975 | 0 |
| 104 | 1.6151 | 0.00 | -10.9525 | 0 |
| 105 | -1.7883 | 4.00 | -11.0525 | 0 |
| 106 | 6.4967 | 4.00 | -2.8975 | 0 |
| 107 | -6.4967 | 3.00 | -2.8975 | 0 |
| 108 | 1.7883 | 3.00 | -11.0525 | 0 |
| 109 | -3.3578 | 4.00 | -8.3342 | 0 |
| 110 | 4.9272 | 4.00 | -5.6158 | 0 |
| 111 | -4.9272 | 5.25 | -5.6158 | 0 |
| 112 | 3.3578 | 5.25 | -8.3342 | 0 |
| 113 | -1.7883 | -4.00 | -11.0525 | 0 |
| 114 | -3.3578 | -4.00 | -8.3342 | 0 |
| 115 | -4.9272 | -5.25 | -5.6158 | 0 |
| 116 | -6.4967 | -3.00 | -2.8975 | 0 |
| 117 | 6.4967 | -4.00 | -2.8975 | 0 |
| 118 | 4.9272 | -4.00 | -5.6158 | 0 |
| 119 | 3.3578 | -5.25 | -8.3342 | 0 |
| 120 | 1.7883 | -3.00 | -11.0525 | 0 |
| 123 | -1.7883 | -1.50 | -11.0525 | 0 |

Restraints

| Node | TX | TY | TZ | RX | RY | RZ |
|------|----|----|----|----|----|----|
| 3 | 1 | 1 | 1 | 1 | 1 | 1 |
| 10 | 1 | 1 | 1 | 1 | 1 | 1 |
| 14 | 1 | 1 | 1 | 1 | 1 | 1 |
| 62 | 1 | 1 | 1 | 1 | 1 | 1 |
| 63 | 1 | 1 | 1 | 1 | 1 | 1 |
| 64 | 1 | 1 | 1 | 1 | 1 | 1 |

Members

| Member | NJ | NK | Description | Section | Material | d0 [in] | dL [in] | Ig factor |
|--------|-----|-----|-------------|----------------------|----------------------|------------|------------|-----------|
| 1 | 2 | 9 | | PIPE 3x0.216 | A53 GrB | 0.00 | 0.00 | 0.00 |
| 2 | 11 | 15 | | PIPE 3x0.216 | A53 GrB | 0.00 | 0.00 | 0.00 |
| 3 | 7 | 4 | | PIPE 3x0.216 | A53 GrB | 0.00 | 0.00 | 0.00 |
| 4 | 16 | 3 | | HSS_SQR 3X3X3_8 | A500 GrB rectangular | 0.00 | 0.00 | 0.00 |
| 5 | 10 | 17 | | HSS_SQR 3X3X3_8 | A500 GrB rectangular | 0.00 | 0.00 | 0.00 |
| 6 | 14 | 18 | | HSS_SQR 3X3X3_8 | A500 GrB rectangular | 0.00 | 0.00 | 0.00 |
| 7 | 4 | 2 | | PL 6x5/8 | A36 | 0.00 | 0.00 | 0.00 |
| 8 | 9 | 11 | | PL 6x5/8 | A36 | 0.00 | 0.00 | 0.00 |
| 9 | 15 | 7 | | PL 6x5/8 | A36 | 0.00 | 0.00 | 0.00 |
| 13 | 23 | 8 | | LU 2-1_2X1-1_2X3_16 | A36 | 0.00 | 0.00 | 0.00 |
| 14 | 12 | 23 | | LU 2-1_2X1-1_2X3_16 | A36 | 0.00 | 0.00 | 0.00 |
| 15 | 6 | 28 | | LU 2-1_2X1-1_2X3_16 | A36 | 0.00 | 0.00 | 0.00 |
| 16 | 28 | 13 | | LU 2-1_2X1-1_2X3_16 | A36 | 0.00 | 0.00 | 0.00 |
| 17 | 33 | 5 | | LU 2-1_2X1-1_2X3_16 | A36 | 0.00 | 0.00 | 0.00 |
| 18 | 1 | 33 | | LU 2-1_2X1-1_2X3_16 | A36 | 0.00 | 0.00 | 0.00 |
| 19 | 34 | 50 | | PIPE 2x0.154 | A53 GrB | 0.00 | 0.00 | 0.00 |
| 20 | 40 | 51 | | PIPE 2x0.154 | A53 GrB | 0.00 | 0.00 | 0.00 |
| 21 | 41 | 52 | | PIPE 2x0.154 | A53 GrB | 0.00 | 0.00 | 0.00 |
| 22 | 35 | 53 | | PIPE 2x0.154 | A53 GrB | 0.00 | 0.00 | 0.00 |
| 27 | 62 | 65 | | T2L 2-1_2X2-1_2X3_16 | A36 | 0.00 | 0.00 | 0.00 |
| 28 | 64 | 71 | | T2L 2-1_2X2-1_2X3_16 | A36 | 0.00 | 0.00 | 0.00 |
| 29 | 63 | 72 | | T2L 2-1_2X2-1_2X3_16 | A36 | 0.00 | 0.00 | 0.00 |
| 46 | 105 | 113 | | PIPE 2x0.154 | A53 GrB | 0.00 | 0.00 | 0.00 |
| 47 | 109 | 114 | | PIPE 2x0.154 | A53 GrB | 0.00 | 0.00 | 0.00 |
| 48 | 111 | 115 | | PIPE 2x0.154 | A53 GrB | 0.00 | 0.00 | 0.00 |
| 49 | 107 | 116 | | PIPE 2x0.154 | A53 GrB | 0.00 | 0.00 | 0.00 |
| 50 | 106 | 117 | | PIPE 2x0.154 | A53 GrB | 0.00 | 0.00 | 0.00 |
| 51 | 110 | 118 | | PIPE 2x0.154 | A53 GrB | 0.00 | 0.00 | 0.00 |
| 52 | 112 | 119 | | PIPE 2x0.154 | A53 GrB | 0.00 | 0.00 | 0.00 |
| 53 | 108 | 120 | | PIPE 2x0.154 | A53 GrB | 0.00 | 0.00 | 0.00 |

Orientation of local axes

| Member | Rotation [Deg] | Axes23 | NX | NY | NZ |
|--------|-------------------|--------|------|------|------|
| 13 | 270.00 | 0 | 0.00 | 0.00 | 0.00 |
| 14 | 270.00 | 0 | 0.00 | 0.00 | 0.00 |
| 15 | 270.00 | 0 | 0.00 | 0.00 | 0.00 |
| 16 | 270.00 | 0 | 0.00 | 0.00 | 0.00 |
| 17 | 270.00 | 0 | 0.00 | 0.00 | 0.00 |
| 18 | 270.00 | 0 | 0.00 | 0.00 | 0.00 |

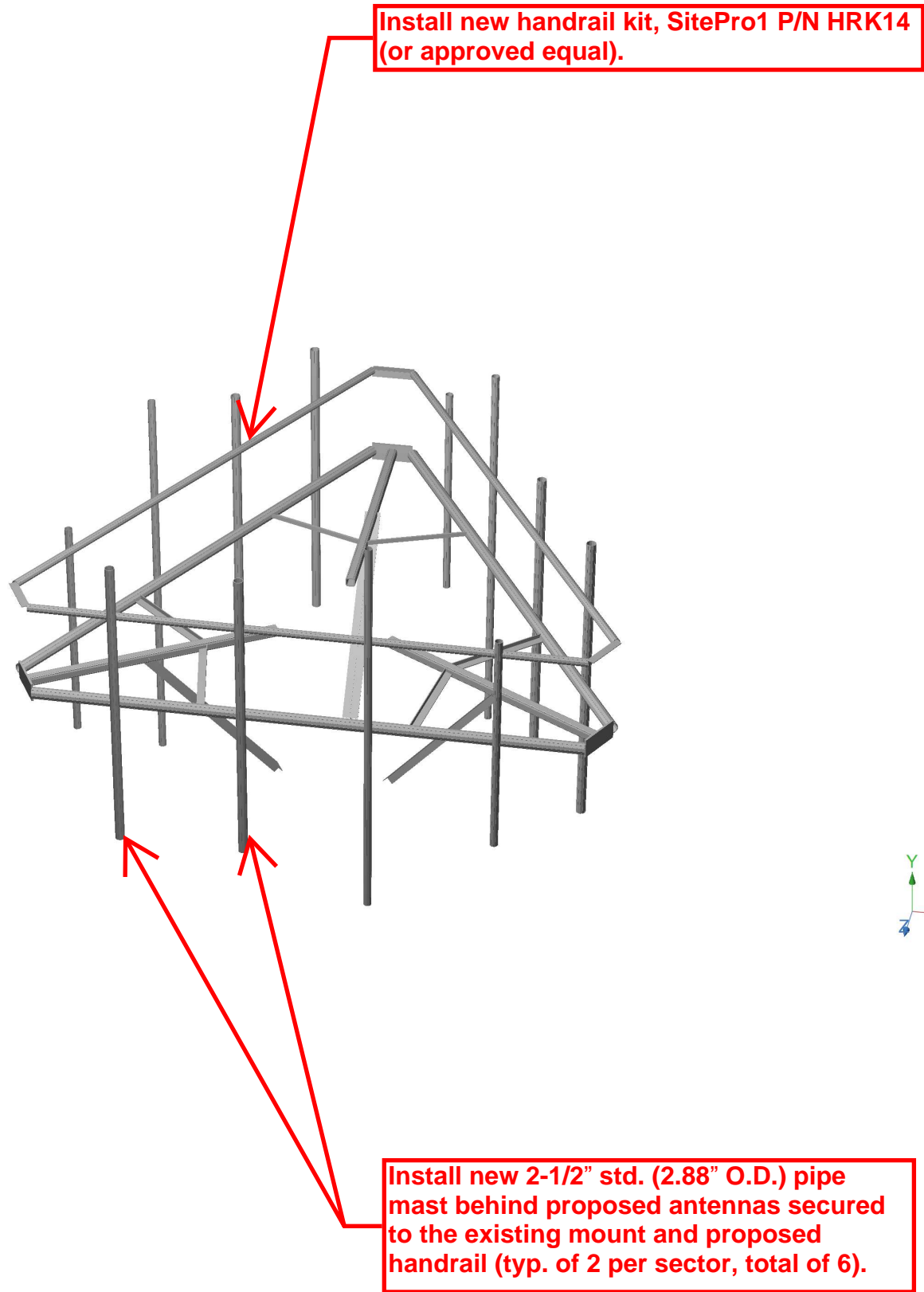
Hinges

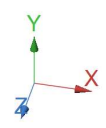
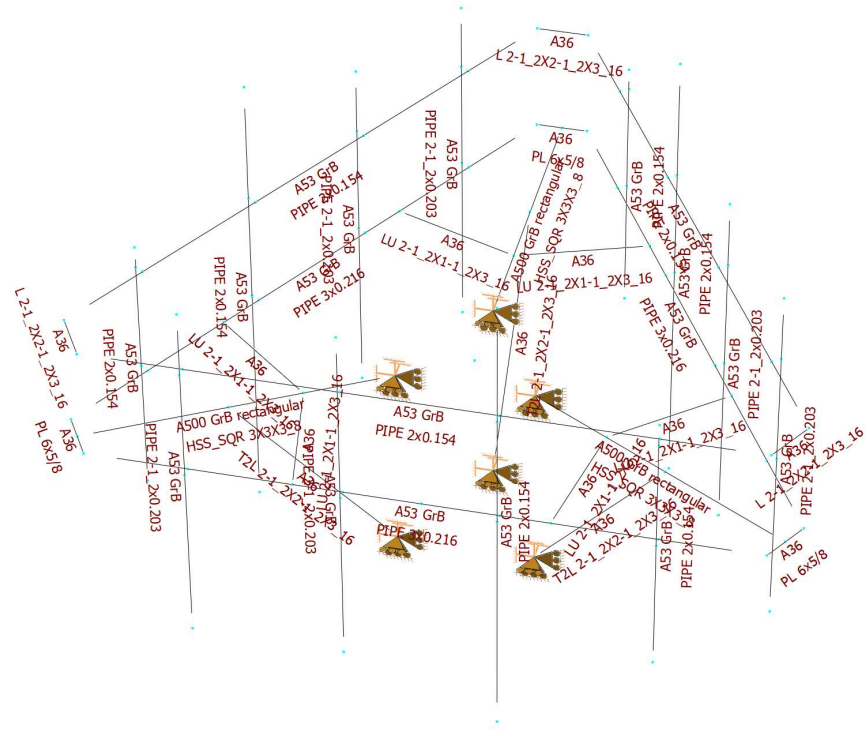
| Member | Node-J | | | | Node-K | | | | TOR | AXL | Axial rigidity |
|--------|--------|-----|----|----|--------|-----|----|----|-----|-----|----------------|
| | M33 | M22 | V3 | V2 | M33 | M22 | V3 | V2 | | | |
| 13 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | Full |
| 14 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | Full |
| 15 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | Full |
| 16 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | Full |
| 17 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | Full |
| 18 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | Full |
| 27 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | Full |
| 28 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | Full |
| 29 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | Full |



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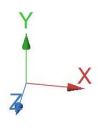
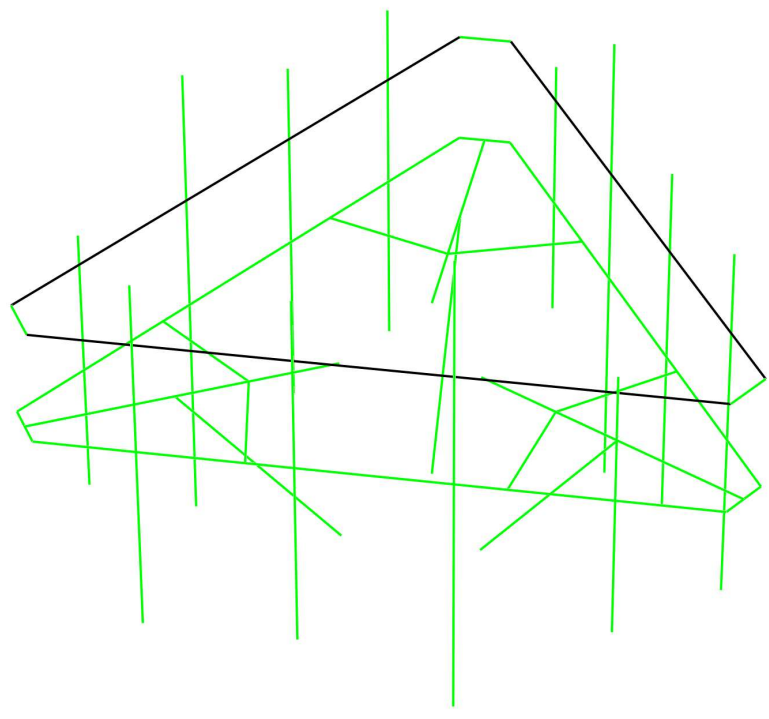
**Mount Calculations
(Modified Conditions)**

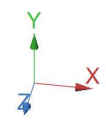
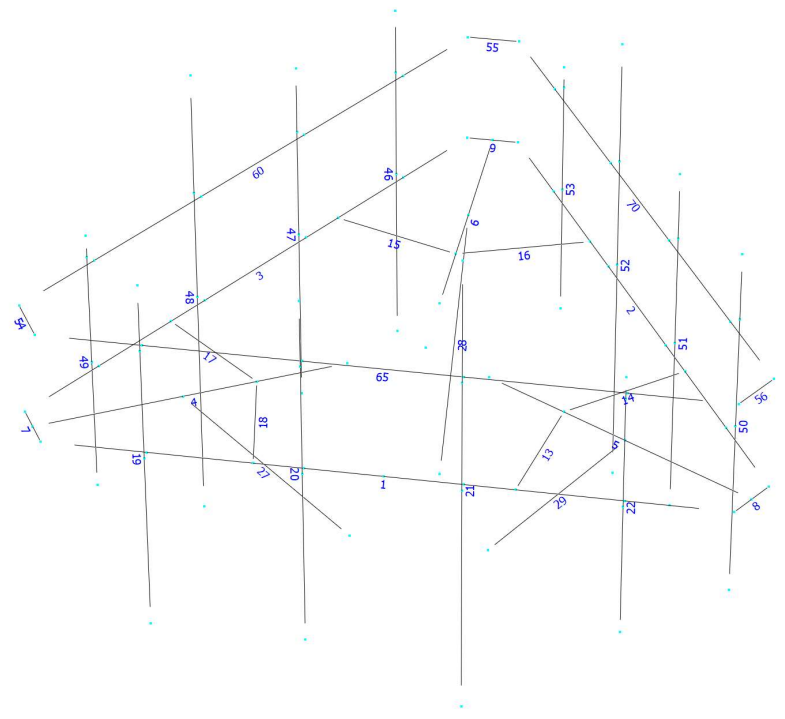




Design status

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





Load data

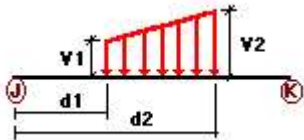
GLOSSARY

Comb : Indicates if load condition is a load combination

Load Conditions

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

Distributed force on members

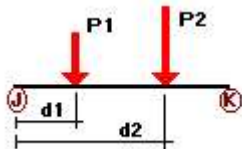


| Condition | Member | Dir1 | Val1 [Kip/ft] | Val2 [Kip/ft] | Dist1 [ft] | % | Dist2 [ft] | % |
|-----------|--------|--------|------------------|------------------|---------------|------|---------------|----|
| DL | 4 | y | -0.01 | 0.00 | 0.00 | No | 0.00 | No |
| | 5 | y | -0.01 | 0.00 | 0.00 | No | 0.00 | No |
| | 6 | y | -0.01 | 0.00 | 0.00 | No | 0.00 | No |
| | 13 | y | -0.01 | 0.00 | 0.00 | No | 0.00 | No |
| | 14 | y | -0.01 | 0.00 | 0.00 | No | 0.00 | No |
| | 15 | y | -0.01 | 0.00 | 0.00 | No | 0.00 | No |
| | 16 | y | -0.01 | 0.00 | 0.00 | No | 0.00 | No |
| | 17 | y | -0.01 | 0.00 | 0.00 | No | 0.00 | No |
| W0 | 18 | y | -0.01 | 0.00 | 0.00 | No | 0.00 | No |
| | 1 | z | -0.014 | 0.00 | 0.00 | No | 0.00 | No |
| | 2 | z | -0.014 | 0.00 | 0.00 | No | 0.00 | No |
| | 3 | z | -0.014 | 0.00 | 0.00 | No | 0.00 | No |
| | 4 | z | -0.013 | 0.00 | 0.00 | No | 0.00 | No |
| | 5 | z | -0.013 | 0.00 | 0.00 | No | 0.00 | No |
| | 6 | z | -0.013 | 0.00 | 0.00 | No | 0.00 | No |
| 7 | z | -0.024 | 0.00 | 0.00 | No | 0.00 | No | |

| | | | | | | | | |
|-----|----|---|--------|------|------|----|------|----|
| | 8 | z | -0.024 | 0.00 | 0.00 | No | 0.00 | No |
| | 9 | z | -0.024 | 0.00 | 0.00 | No | 0.00 | No |
| | 13 | z | -0.017 | 0.00 | 0.00 | No | 0.00 | No |
| | 14 | z | -0.017 | 0.00 | 0.00 | No | 0.00 | No |
| | 15 | z | -0.017 | 0.00 | 0.00 | No | 0.00 | No |
| | 16 | z | -0.017 | 0.00 | 0.00 | No | 0.00 | No |
| | 17 | z | -0.017 | 0.00 | 0.00 | No | 0.00 | No |
| | 18 | z | -0.017 | 0.00 | 0.00 | No | 0.00 | No |
| | 19 | z | -0.012 | 0.00 | 0.00 | No | 0.00 | No |
| | 20 | z | -0.012 | 0.00 | 0.00 | No | 0.00 | No |
| | 21 | z | -0.01 | 0.00 | 0.00 | No | 0.00 | No |
| | 22 | z | -0.01 | 0.00 | 0.00 | No | 0.00 | No |
| | 27 | z | -0.017 | 0.00 | 0.00 | No | 0.00 | No |
| | 28 | z | -0.017 | 0.00 | 0.00 | No | 0.00 | No |
| | 29 | z | -0.017 | 0.00 | 0.00 | No | 0.00 | No |
| | 46 | z | -0.012 | 0.00 | 0.00 | No | 0.00 | No |
| | 47 | z | -0.012 | 0.00 | 0.00 | No | 0.00 | No |
| | 48 | z | -0.01 | 0.00 | 0.00 | No | 0.00 | No |
| | 49 | z | -0.01 | 0.00 | 0.00 | No | 0.00 | No |
| | 50 | z | -0.012 | 0.00 | 0.00 | No | 0.00 | No |
| | 51 | z | -0.012 | 0.00 | 0.00 | No | 0.00 | No |
| | 52 | z | -0.01 | 0.00 | 0.00 | No | 0.00 | No |
| | 53 | z | -0.01 | 0.00 | 0.00 | No | 0.00 | No |
| | 54 | z | -0.017 | 0.00 | 0.00 | No | 0.00 | No |
| | 55 | z | -0.017 | 0.00 | 0.00 | No | 0.00 | No |
| | 56 | z | -0.017 | 0.00 | 0.00 | No | 0.00 | No |
| | 60 | z | -0.01 | 0.00 | 0.00 | No | 0.00 | No |
| | 65 | z | -0.01 | 0.00 | 0.00 | No | 0.00 | No |
| | 70 | z | -0.01 | 0.00 | 0.00 | No | 0.00 | No |
| W30 | 1 | x | -0.014 | 0.00 | 0.00 | No | 0.00 | No |
| | 2 | x | -0.014 | 0.00 | 0.00 | No | 0.00 | No |
| | 3 | x | -0.014 | 0.00 | 0.00 | No | 0.00 | No |
| | 4 | x | -0.013 | 0.00 | 0.00 | No | 0.00 | No |
| | 5 | x | -0.013 | 0.00 | 0.00 | No | 0.00 | No |
| | 6 | x | -0.013 | 0.00 | 0.00 | No | 0.00 | No |
| | 7 | x | -0.024 | 0.00 | 0.00 | No | 0.00 | No |
| | 8 | x | -0.024 | 0.00 | 0.00 | No | 0.00 | No |
| | 9 | x | -0.024 | 0.00 | 0.00 | No | 0.00 | No |
| | 13 | x | -0.017 | 0.00 | 0.00 | No | 0.00 | No |
| | 14 | x | -0.017 | 0.00 | 0.00 | No | 0.00 | No |
| | 15 | x | -0.017 | 0.00 | 0.00 | No | 0.00 | No |
| | 16 | x | -0.017 | 0.00 | 0.00 | No | 0.00 | No |
| | 17 | x | -0.017 | 0.00 | 0.00 | No | 0.00 | No |
| | 18 | x | -0.017 | 0.00 | 0.00 | No | 0.00 | No |
| | 19 | x | -0.012 | 0.00 | 0.00 | No | 0.00 | No |
| | 20 | x | -0.012 | 0.00 | 0.00 | No | 0.00 | No |
| | 21 | x | -0.01 | 0.00 | 0.00 | No | 0.00 | No |
| | 22 | x | -0.01 | 0.00 | 0.00 | No | 0.00 | No |
| | 27 | x | -0.017 | 0.00 | 0.00 | No | 0.00 | No |
| | 28 | x | -0.017 | 0.00 | 0.00 | No | 0.00 | No |
| | 29 | x | -0.017 | 0.00 | 0.00 | No | 0.00 | No |
| | 46 | x | -0.012 | 0.00 | 0.00 | No | 0.00 | No |
| | 47 | x | -0.012 | 0.00 | 0.00 | No | 0.00 | No |
| | 48 | x | -0.01 | 0.00 | 0.00 | No | 0.00 | No |
| | 49 | x | -0.01 | 0.00 | 0.00 | No | 0.00 | No |
| | 50 | x | -0.012 | 0.00 | 0.00 | No | 0.00 | No |
| | 51 | x | -0.012 | 0.00 | 0.00 | No | 0.00 | No |
| | 52 | x | -0.01 | 0.00 | 0.00 | No | 0.00 | No |
| | 53 | x | -0.01 | 0.00 | 0.00 | No | 0.00 | No |
| | 54 | x | -0.017 | 0.00 | 0.00 | No | 0.00 | No |

| | | | | | | | | |
|----|----|---|--------|------|------|----|------|----|
| | 55 | x | -0.017 | 0.00 | 0.00 | No | 0.00 | No |
| | 56 | x | -0.017 | 0.00 | 0.00 | No | 0.00 | No |
| | 60 | x | -0.01 | 0.00 | 0.00 | No | 0.00 | No |
| | 65 | x | -0.01 | 0.00 | 0.00 | No | 0.00 | No |
| | 70 | x | -0.01 | 0.00 | 0.00 | No | 0.00 | No |
| Di | 1 | y | -0.007 | 0.00 | 0.00 | No | 0.00 | No |
| | 2 | y | -0.007 | 0.00 | 0.00 | No | 0.00 | No |
| | 3 | y | -0.007 | 0.00 | 0.00 | No | 0.00 | No |
| | 4 | y | -0.008 | 0.00 | 0.00 | No | 0.00 | No |
| | 5 | y | -0.008 | 0.00 | 0.00 | No | 0.00 | No |
| | 6 | y | -0.008 | 0.00 | 0.00 | No | 0.00 | No |
| | 7 | y | -0.011 | 0.00 | 0.00 | No | 0.00 | No |
| | 8 | y | -0.011 | 0.00 | 0.00 | No | 0.00 | No |
| | 9 | y | -0.011 | 0.00 | 0.00 | No | 0.00 | No |
| | 13 | y | -0.006 | 0.00 | 0.00 | No | 0.00 | No |
| | 14 | y | -0.006 | 0.00 | 0.00 | No | 0.00 | No |
| | 15 | y | -0.006 | 0.00 | 0.00 | No | 0.00 | No |
| | 16 | y | -0.006 | 0.00 | 0.00 | No | 0.00 | No |
| | 17 | y | -0.006 | 0.00 | 0.00 | No | 0.00 | No |
| | 18 | y | -0.006 | 0.00 | 0.00 | No | 0.00 | No |
| | 19 | y | -0.006 | 0.00 | 0.00 | No | 0.00 | No |
| | 20 | y | -0.006 | 0.00 | 0.00 | No | 0.00 | No |
| | 21 | y | -0.005 | 0.00 | 0.00 | No | 0.00 | No |
| | 22 | y | -0.005 | 0.00 | 0.00 | No | 0.00 | No |
| | 27 | y | -0.007 | 0.00 | 0.00 | No | 0.00 | No |
| | 28 | y | -0.007 | 0.00 | 0.00 | No | 0.00 | No |
| | 29 | y | -0.007 | 0.00 | 0.00 | No | 0.00 | No |
| | 46 | y | -0.006 | 0.00 | 0.00 | No | 0.00 | No |
| | 47 | y | -0.006 | 0.00 | 0.00 | No | 0.00 | No |
| | 48 | y | -0.005 | 0.00 | 0.00 | No | 0.00 | No |
| | 49 | y | -0.005 | 0.00 | 0.00 | No | 0.00 | No |
| | 50 | y | -0.006 | 0.00 | 0.00 | No | 0.00 | No |
| | 51 | y | -0.006 | 0.00 | 0.00 | No | 0.00 | No |
| | 52 | y | -0.005 | 0.00 | 0.00 | No | 0.00 | No |
| | 53 | y | -0.005 | 0.00 | 0.00 | No | 0.00 | No |
| | 54 | y | -0.007 | 0.00 | 0.00 | No | 0.00 | No |
| | 55 | y | -0.007 | 0.00 | 0.00 | No | 0.00 | No |
| | 56 | y | -0.007 | 0.00 | 0.00 | No | 0.00 | No |
| | 60 | y | -0.005 | 0.00 | 0.00 | No | 0.00 | No |
| | 65 | y | -0.005 | 0.00 | 0.00 | No | 0.00 | No |
| | 70 | y | -0.005 | 0.00 | 0.00 | No | 0.00 | No |

Concentrated forces on members



| Condition | Member | Dir1 | Value1 [Kip] | Dist1 [ft] | % |
|-----------|--------|--------|-----------------|---------------|------|
| DL | 19 | y | -0.048 | 0.50 | No |
| | | y | -0.048 | 7.50 | No |
| | | y | -0.073 | 2.00 | No |
| | 20 | y | -0.05 | 2.00 | No |
| | | y | -0.039 | 0.50 | No |
| | | y | -0.039 | 7.50 | No |
| | | y | -0.049 | 2.00 | No |
| | | y | -0.06 | 2.00 | No |
| | 21 | y | -0.034 | 1.50 | No |
| | | y | -0.034 | 8.50 | No |
| | | y | -0.06 | 2.00 | No |
| | 22 | y | -0.018 | 1.00 | No |
| | | y | -0.018 | 5.00 | No |
| | | y | -0.016 | 2.00 | No |
| | 46 | y | -0.048 | 0.50 | No |
| | | y | -0.048 | 7.50 | No |
| | | y | -0.073 | 2.00 | No |
| | 47 | y | -0.05 | 2.00 | No |
| | | y | -0.032 | 0.50 | No |
| | | y | -0.032 | 7.50 | No |
| | 48 | y | -0.049 | 2.00 | No |
| | | y | -0.06 | 2.00 | No |
| | | y | -0.034 | 1.50 | No |
| | 49 | y | -0.034 | 8.50 | No |
| | | y | -0.06 | 2.00 | No |
| | | y | -0.018 | 1.00 | No |
| | 50 | y | -0.018 | 5.00 | No |
| | | y | -0.016 | 2.00 | No |
| | | y | -0.048 | 0.50 | No |
| | 51 | y | -0.048 | 7.50 | No |
| | | y | -0.073 | 2.00 | No |
| | | y | -0.05 | 2.00 | No |
| | 52 | y | -0.032 | 0.50 | No |
| | | y | -0.032 | 7.50 | No |
| | | y | -0.049 | 2.00 | No |
| | 53 | y | -0.06 | 2.00 | No |
| | | y | -0.034 | 1.50 | No |
| | | y | -0.034 | 8.50 | No |
| | 54 | y | -0.06 | 2.00 | No |
| | | y | -0.018 | 1.00 | No |
| | | y | -0.018 | 5.00 | No |
| | W0 | 19 | z | -0.016 | 2.00 |
| z | | | -0.364 | 0.50 | No |
| z | | | -0.364 | 7.50 | No |
| 20 | | z | -0.03 | 2.00 | No |
| | | z | -0.019 | 2.00 | No |
| | | z | -0.368 | 0.50 | No |
| 21 | | z | -0.368 | 7.50 | No |
| | | z | -0.016 | 2.00 | No |
| | | z | -0.027 | 2.00 | No |
| 22 | | z | -0.264 | 1.50 | No |
| | | z | -0.264 | 8.50 | No |
| | | z | -0.038 | 2.00 | No |
| 46 | | z | -0.113 | 1.00 | No |
| | | z | -0.113 | 5.00 | No |
| | | z | -0.018 | 2.00 | No |
| 47 | z | -0.215 | 0.50 | No | |
| | z | -0.215 | 7.50 | No | |
| | z | -0.075 | 2.00 | No | |
| 47 | z | -0.152 | 1.50 | No | |

| | | | | | |
|-----|----|---|--------|------|----|
| | | z | -0.152 | 6.50 | No |
| | | z | -0.077 | 2.00 | No |
| | 48 | z | -0.181 | 1.50 | No |
| | | z | -0.181 | 8.50 | No |
| | | z | -0.105 | 2.00 | No |
| | 49 | z | -0.073 | 1.00 | No |
| | | z | -0.073 | 5.00 | No |
| | | z | -0.021 | 2.00 | No |
| | 50 | z | -0.215 | 0.50 | No |
| | | z | -0.215 | 7.50 | No |
| | | z | -0.075 | 2.00 | No |
| | 51 | z | -0.152 | 1.50 | No |
| | | z | -0.152 | 6.50 | No |
| | | z | -0.077 | 2.00 | No |
| | 52 | z | -0.181 | 1.50 | No |
| | | z | -0.181 | 8.50 | No |
| | | z | -0.105 | 2.00 | No |
| | 53 | z | -0.073 | 1.00 | No |
| | | z | -0.073 | 5.00 | No |
| | | z | -0.021 | 2.00 | No |
| W30 | 19 | x | -0.166 | 0.50 | No |
| | | x | -0.166 | 7.50 | No |
| | | x | -0.08 | 2.00 | No |
| | 20 | x | -0.167 | 0.50 | No |
| | | x | -0.167 | 7.50 | No |
| | | x | -0.082 | 2.00 | No |
| | 21 | x | -0.153 | 1.50 | No |
| | | x | -0.153 | 8.50 | No |
| | | x | -0.112 | 2.00 | No |
| | 22 | x | -0.06 | 1.00 | No |
| | | x | -0.06 | 5.00 | No |
| | | x | -0.022 | 2.00 | No |
| | 46 | x | -0.314 | 0.50 | No |
| | | x | -0.314 | 7.50 | No |
| | | x | -0.05 | 2.00 | No |
| | 47 | x | -0.226 | 1.50 | No |
| | | x | -0.226 | 6.50 | No |
| | | x | -0.052 | 2.00 | No |
| | 48 | x | -0.237 | 1.50 | No |
| | | x | -0.237 | 8.50 | No |
| | | x | -0.073 | 2.00 | No |
| | 49 | x | -0.099 | 1.00 | No |
| | | x | -0.099 | 5.00 | No |
| | | x | -0.019 | 2.00 | No |
| | 50 | x | -0.314 | 0.50 | No |
| | | x | -0.314 | 7.50 | No |
| | | x | -0.05 | 2.00 | No |
| | 51 | x | -0.226 | 1.50 | No |
| | | x | -0.226 | 6.50 | No |
| | | x | -0.052 | 2.00 | No |
| | 52 | x | -0.237 | 1.50 | No |
| | | x | -0.237 | 8.50 | No |
| | | x | -0.073 | 2.00 | No |
| | 53 | x | -0.099 | 1.00 | No |
| | | x | -0.099 | 5.00 | No |
| | | x | -0.019 | 2.00 | No |
| Di | 19 | y | -0.136 | 0.50 | No |
| | | y | -0.136 | 7.50 | No |
| | | y | -0.038 | 2.00 | No |
| | | y | -0.032 | 2.00 | No |

| | | | | | |
|-----|----|---|--------|------|----|
| | 20 | y | -0.137 | 0.50 | No |
| | | y | -0.137 | 7.50 | No |
| | | y | -0.028 | 2.00 | No |
| | | y | -0.037 | 2.00 | No |
| | 21 | y | -0.10 | 1.50 | No |
| | | y | -0.10 | 8.50 | No |
| | | y | -0.05 | 2.00 | No |
| | 22 | y | -0.044 | 1.00 | No |
| | | y | -0.044 | 5.00 | No |
| | | y | -0.012 | 2.00 | No |
| | 46 | y | -0.136 | 0.50 | No |
| | | y | -0.136 | 7.50 | No |
| | | y | -0.038 | 2.00 | No |
| | | y | -0.032 | 2.00 | No |
| | 47 | y | -0.102 | 0.50 | No |
| | | y | -0.102 | 7.50 | No |
| | | y | -0.028 | 2.00 | No |
| | | y | -0.037 | 2.00 | No |
| | 48 | y | -0.10 | 1.50 | No |
| | | y | -0.10 | 8.50 | No |
| | | y | -0.05 | 2.00 | No |
| | 49 | y | -0.044 | 1.00 | No |
| | | y | -0.044 | 5.00 | No |
| | | y | -0.012 | 2.00 | No |
| | 50 | y | -0.136 | 0.50 | No |
| | | y | -0.136 | 7.50 | No |
| | | y | -0.038 | 2.00 | No |
| | | y | -0.032 | 2.00 | No |
| | 51 | y | -0.102 | 0.50 | No |
| | | y | -0.102 | 7.50 | No |
| | | y | -0.028 | 2.00 | No |
| | | y | -0.037 | 2.00 | No |
| | 52 | y | -0.10 | 1.50 | No |
| | | y | -0.10 | 8.50 | No |
| | | y | -0.05 | 2.00 | No |
| | 53 | y | -0.044 | 1.00 | No |
| | | y | -0.044 | 5.00 | No |
| | | y | -0.012 | 2.00 | No |
| Wi0 | 19 | z | -0.073 | 0.50 | No |
| | | z | -0.073 | 7.50 | No |
| | | z | -0.009 | 2.00 | No |
| | | z | -0.007 | 2.00 | No |
| | 20 | z | -0.073 | 0.50 | No |
| | | z | -0.073 | 7.50 | No |
| | | z | -0.006 | 2.00 | No |
| | | z | -0.008 | 2.00 | No |
| | 21 | z | -0.055 | 1.50 | No |
| | | z | -0.055 | 8.50 | No |
| | | z | -0.012 | 2.00 | No |
| | 22 | z | -0.025 | 1.00 | No |
| | | z | -0.025 | 5.00 | No |
| | | z | -0.006 | 2.00 | No |
| | 46 | z | -0.045 | 0.50 | No |
| | | z | -0.045 | 7.50 | No |
| | | z | -0.017 | 2.00 | No |
| | 47 | z | -0.033 | 1.50 | No |
| | | z | -0.033 | 6.50 | No |
| | | z | -0.018 | 2.00 | No |
| | 48 | z | -0.039 | 1.50 | No |
| | | z | -0.039 | 8.50 | No |

| | | | | | |
|------|----|---|--------|------|----|
| | | z | -0.024 | 2.00 | No |
| | 49 | z | -0.018 | 1.00 | No |
| | | z | -0.018 | 5.00 | No |
| | | z | -0.006 | 2.00 | No |
| | 50 | z | -0.045 | 0.50 | No |
| | | z | -0.045 | 7.50 | No |
| | | z | -0.017 | 2.00 | No |
| | 51 | z | -0.033 | 1.50 | No |
| | | z | -0.033 | 6.50 | No |
| | | z | -0.018 | 2.00 | No |
| | 52 | z | -0.039 | 1.50 | No |
| | | z | -0.039 | 8.50 | No |
| | | z | -0.024 | 2.00 | No |
| | 53 | z | -0.018 | 1.00 | No |
| | | z | -0.018 | 5.00 | No |
| | | z | -0.006 | 2.00 | No |
| Wi30 | 19 | x | -0.037 | 0.50 | No |
| | | x | -0.037 | 7.50 | No |
| | | x | -0.019 | 2.00 | No |
| | 20 | x | -0.037 | 0.50 | No |
| | | x | -0.037 | 7.50 | No |
| | | x | -0.019 | 2.00 | No |
| | 21 | x | -0.034 | 1.50 | No |
| | | x | -0.034 | 8.50 | No |
| | | x | -0.025 | 2.00 | No |
| | 22 | x | -0.015 | 1.00 | No |
| | | x | -0.015 | 5.00 | No |
| | | x | -0.007 | 2.00 | No |
| | 46 | x | -0.063 | 0.50 | No |
| | | x | -0.063 | 7.50 | No |
| | | x | -0.012 | 2.00 | No |
| | 47 | x | -0.046 | 1.50 | No |
| | | x | -0.046 | 6.50 | No |
| | | x | -0.012 | 2.00 | No |
| | 48 | x | -0.049 | 1.50 | No |
| | | x | -0.049 | 8.50 | No |
| | | x | -0.016 | 2.00 | No |
| | 49 | x | -0.022 | 1.00 | No |
| | | x | -0.022 | 5.00 | No |
| | | x | -0.006 | 2.00 | No |
| | 50 | x | -0.063 | 0.50 | No |
| | | x | -0.063 | 7.50 | No |
| | | x | -0.012 | 2.00 | No |
| | 51 | x | -0.046 | 1.50 | No |
| | | x | -0.046 | 6.50 | No |
| | | x | -0.012 | 2.00 | No |
| | 52 | x | -0.049 | 1.50 | No |
| | | x | -0.049 | 8.50 | No |
| | | x | -0.016 | 2.00 | No |
| | 53 | x | -0.022 | 1.00 | No |
| | | x | -0.022 | 5.00 | No |
| | | x | -0.006 | 2.00 | No |
| WLO | 19 | z | -0.023 | 0.50 | No |
| | | z | -0.023 | 7.50 | No |
| | | z | -0.002 | 2.00 | No |
| | | z | -0.001 | 2.00 | No |
| | 20 | z | -0.023 | 0.50 | No |
| | | z | -0.023 | 7.50 | No |
| | | z | -0.001 | 2.00 | No |
| | | z | -0.002 | 2.00 | No |

| | | | | | |
|------|----|---|--------|------|----|
| | 21 | z | -0.017 | 1.50 | No |
| | | z | -0.017 | 8.50 | No |
| | | z | -0.002 | 2.00 | No |
| | 22 | z | -0.008 | 1.00 | No |
| | | z | -0.008 | 5.00 | No |
| | | z | -0.001 | 2.00 | No |
| | 46 | z | -0.014 | 0.50 | No |
| | | z | -0.014 | 7.50 | No |
| | | z | -0.005 | 2.00 | No |
| | 47 | z | -0.01 | 1.50 | No |
| | | z | -0.01 | 6.50 | No |
| | | z | -0.005 | 2.00 | No |
| | 48 | z | -0.012 | 1.50 | No |
| | | z | -0.012 | 8.50 | No |
| | | z | -0.007 | 2.00 | No |
| | 49 | z | -0.005 | 1.00 | No |
| | | z | -0.005 | 5.00 | No |
| | | z | -0.001 | 2.00 | No |
| | 50 | z | -0.014 | 0.50 | No |
| | | z | -0.014 | 7.50 | No |
| | | z | -0.005 | 2.00 | No |
| | 51 | z | -0.01 | 1.50 | No |
| | | z | -0.01 | 6.50 | No |
| | | z | -0.005 | 2.00 | No |
| | 52 | z | -0.012 | 1.50 | No |
| | | z | -0.012 | 8.50 | No |
| | | z | -0.007 | 2.00 | No |
| | 53 | z | -0.005 | 1.00 | No |
| | | z | -0.005 | 5.00 | No |
| | | z | -0.001 | 2.00 | No |
| WL30 | 19 | x | -0.011 | 0.50 | No |
| | | x | -0.011 | 7.50 | No |
| | | x | -0.005 | 2.00 | No |
| | 20 | x | -0.011 | 0.50 | No |
| | | x | -0.011 | 7.50 | No |
| | | x | -0.005 | 2.00 | No |
| | 21 | x | -0.01 | 1.50 | No |
| | | x | -0.01 | 8.50 | No |
| | | x | -0.007 | 2.00 | No |
| | 22 | x | -0.004 | 1.00 | No |
| | | x | -0.004 | 5.00 | No |
| | | x | -0.001 | 2.00 | No |
| | 46 | x | -0.02 | 0.50 | No |
| | | x | -0.02 | 7.50 | No |
| | | x | -0.003 | 2.00 | No |
| | 47 | x | -0.015 | 1.50 | No |
| | | x | -0.015 | 6.50 | No |
| | | x | -0.003 | 2.00 | No |
| | 48 | x | -0.015 | 1.50 | No |
| | | x | -0.015 | 8.50 | No |
| | | x | -0.005 | 2.00 | No |
| | 49 | x | -0.007 | 1.00 | No |
| | | x | -0.007 | 5.00 | No |
| | | x | -0.001 | 2.00 | No |
| | 50 | x | -0.02 | 0.50 | No |
| | | x | -0.02 | 7.50 | No |
| | | x | -0.003 | 2.00 | No |
| | 51 | x | -0.015 | 1.50 | No |
| | | x | -0.015 | 6.50 | No |
| | | x | -0.003 | 2.00 | No |

| | | | | | |
|------|----|---|--------|--------|-----|
| | 52 | x | -0.015 | 1.50 | No |
| | | x | -0.015 | 8.50 | No |
| | | x | -0.005 | 2.00 | No |
| | 53 | x | -0.007 | 1.00 | No |
| | | x | -0.007 | 5.00 | No |
| | | x | -0.001 | 2.00 | No |
| LL1 | 1 | y | -0.25 | 50.00 | Yes |
| LL2 | 1 | y | -0.25 | 100.00 | Yes |
| LLa1 | 22 | y | -0.50 | 50.00 | Yes |
| LLa2 | 21 | y | -0.50 | 50.00 | Yes |
| LLa3 | 20 | y | -0.50 | 50.00 | Yes |
| LLa4 | 19 | y | -0.50 | 50.00 | Yes |

Self weight multipliers for load conditions

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

Earthquake (Dynamic analysis only)

| Condition | a/g | Ang. [Deg] | Damp. [%] |
|-----------|------|---------------|--------------|
| DL | 0.00 | 0.00 | 0.00 |
| W0 | 0.00 | 0.00 | 0.00 |
| W30 | 0.00 | 0.00 | 0.00 |
| Di | 0.00 | 0.00 | 0.00 |
| Wi0 | 0.00 | 0.00 | 0.00 |
| Wi30 | 0.00 | 0.00 | 0.00 |
| WL0 | 0.00 | 0.00 | 0.00 |
| WL30 | 0.00 | 0.00 | 0.00 |
| LL1 | 0.00 | 0.00 | 0.00 |
| LL2 | 0.00 | 0.00 | 0.00 |
| LLa1 | 0.00 | 0.00 | 0.00 |
| LLa2 | 0.00 | 0.00 | 0.00 |
| LLa3 | 0.00 | 0.00 | 0.00 |
| LLa4 | 0.00 | 0.00 | 0.00 |



Current Date: 1/21/2022 11:12 AM
 Units system: English

Steel Code Check

Report: Summary - Group by member

Load conditions to be included in design :

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

| Description | Section | Member | Ctrl Eq. | Ratio | Status | Reference |
|-------------|----------------------------|-----------|----------------|-------------|-----------|-----------|
| | HSS_SQR 3X3X3_8 | 4 | LC11 at 47.92% | 0.69 | OK | Eq. H1-1b |
| | | 5 | LC12 at 52.08% | 0.68 | OK | Eq. H1-1b |
| | | 6 | LC9 at 52.08% | 0.67 | OK | Eq. H1-1b |
| | L 2-1_2X2-1_2X3_16 | 54 | LC4 at 100.00% | 0.26 | OK | Eq. H2-1 |
| | | 55 | LC3 at 0.00% | 0.23 | OK | Eq. H2-1 |
| | | 56 | LC2 at 0.00% | 0.28 | OK | Eq. H2-1 |
| | LU 2-1_2X1-1_2X3_16 | 13 | LC1 at 43.75% | 0.24 | OK | Eq. H2-1 |
| | | 14 | LC2 at 50.00% | 0.25 | OK | Eq. H2-1 |
| | | 15 | LC4 at 50.00% | 0.26 | OK | Eq. H2-1 |
| | | 16 | LC2 at 43.75% | 0.22 | OK | Eq. H2-1 |
| | | 17 | LC4 at 50.00% | 0.19 | OK | Eq. H2-1 |
| | | 18 | LC1 at 50.00% | 0.33 | OK | Eq. H2-1 |
| | PIPE 2-1_2x0.203 | 19 | LC3 at 47.92% | 0.69 | OK | Eq. H1-1b |
| | | 20 | LC1 at 47.92% | 0.67 | OK | Eq. H1-1b |
| | | 46 | LC4 at 47.92% | 0.63 | OK | Eq. H1-1b |
| | | 47 | LC2 at 47.92% | 0.44 | OK | Eq. H1-1b |

| | | | | | |
|-----------------------------|-----------|-----------------|-------------|---------------|-----------|
| | 50 | LC4 at 47.92% | 0.63 | OK | Eq. H1-1b |
| | 51 | LC2 at 47.92% | 0.43 | OK | Eq. H1-1b |
| <hr/> | | | | | |
| PIPE 2x0.154 | 21 | LC1 at 47.92% | 0.83 | OK | Eq. H1-1b |
| | 22 | LC22 at 47.92% | 0.62 | OK | Eq. H1-1b |
| | 48 | LC4 at 50.00% | 0.73 | OK | Eq. H1-1b |
| | 49 | LC10 at 47.92% | 0.71 | OK | Eq. H1-1b |
| | 52 | LC2 at 50.00% | 0.73 | OK | Eq. H1-1b |
| | 53 | LC10 at 47.92% | 0.67 | OK | Eq. H1-1b |
| | 60 | LC11 at 83.75% | 0.54 | With warnings | Eq. H1-1b |
| | 65 | LC12 at 83.75% | 0.56 | With warnings | Eq. H1-1b |
| | 70 | LC9 at 83.75% | 0.54 | With warnings | Eq. H1-1b |
| <hr/> | | | | | |
| PIPE 3x0.216 | 1 | LC25 at 38.28% | 0.43 | OK | Eq. H1-1b |
| | 2 | LC10 at 0.00% | 0.40 | OK | Eq. H1-1b |
| | 3 | LC12 at 100.00% | 0.40 | OK | Eq. H1-1b |
| <hr/> | | | | | |
| PL 6x5/8 | 7 | LC2 at 46.88% | 0.41 | OK | Eq. H1-1b |
| | 8 | LC4 at 50.00% | 0.51 | OK | Eq. H1-1b |
| | 9 | LC1 at 50.00% | 0.49 | OK | Eq. H1-1b |
| <hr/> | | | | | |
| T2L 2-1_2X2-1_2X3_16 | 27 | LC11 at 0.00% | 0.56 | OK | Eq. H2-1 |
| | 28 | LC10 at 0.00% | 0.55 | OK | Eq. H2-1 |
| | 29 | LC11 at 0.00% | 0.55 | OK | Eq. H2-1 |

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 | -2.5833 | 0.00 | 0.00 | 0 |
| 2 | -6.8333 | 0.00 | 0.00 | 0 |
| 3 | -1.4434 | 0.00 | -3.75 | 0 |
| 4 | -7.386 | 0.00 | -0.9572 | 0 |
| 5 | -5.261 | 0.00 | -4.6378 | 0 |
| 6 | -2.6776 | 0.00 | -9.1122 | 0 |
| 7 | -0.5526 | 0.00 | -12.7928 | 0 |
| 8 | 2.5833 | 0.00 | 0.00 | 0 |
| 9 | 6.8333 | 0.00 | 0.00 | 0 |
| 10 | 1.4434 | 0.00 | -3.75 | 0 |
| 11 | 7.386 | 0.00 | -0.9572 | 0 |
| 12 | 5.261 | 0.00 | -4.6378 | 0 |
| 13 | 2.6776 | 0.00 | -9.1122 | 0 |
| 14 | 0.00 | 0.00 | -6.25 | 0 |
| 15 | 0.5526 | 0.00 | -12.7928 | 0 |
| 16 | -7.1096 | 0.00 | -0.4786 | 0 |
| 17 | 7.1096 | 0.00 | -0.4786 | 0 |
| 18 | 0.00 | 0.00 | -12.7928 | 0 |
| 23 | 3.0959 | 0.00 | -2.7959 | 0 |
| 28 | 0.00 | 0.00 | -8.1582 | 0 |
| 33 | -3.0959 | 0.00 | -2.7959 | 0 |
| 34 | -4.7083 | 4.00 | 0.20 | 0 |
| 35 | 4.7083 | 3.00 | 0.20 | 0 |

| | | | | |
|-----|----------|-------|----------|---|
| 40 | -1.5694 | 4.00 | 0.20 | 0 |
| 41 | 1.5694 | 5.25 | 0.20 | 0 |
| 50 | -4.7083 | -4.00 | 0.20 | 0 |
| 51 | -1.5694 | -4.00 | 0.20 | 0 |
| 52 | 1.5694 | -5.25 | 0.20 | 0 |
| 53 | 4.7083 | -3.00 | 0.20 | 0 |
| 54 | -4.7083 | 0.00 | 0.20 | 0 |
| 55 | 4.7083 | 0.00 | 0.20 | 0 |
| 56 | -1.5694 | 0.00 | 0.20 | 0 |
| 57 | 1.5694 | 0.00 | 0.20 | 0 |
| 58 | -4.7083 | 0.00 | 0.00 | 0 |
| 59 | 4.7083 | 0.00 | 0.00 | 0 |
| 60 | -1.5694 | 0.00 | 0.00 | 0 |
| 61 | 1.5694 | 0.00 | 0.00 | 0 |
| 62 | -1.4434 | -4.25 | -3.75 | 0 |
| 63 | 1.4434 | -4.25 | -3.75 | 0 |
| 64 | 0.00 | -4.25 | -6.25 | 0 |
| 65 | -4.4338 | 0.00 | -2.0235 | 0 |
| 66 | 0.00 | 0.00 | 0.00 | 0 |
| 70 | 0.00 | 0.00 | -4.5833 | 0 |
| 71 | 2.95E-06 | 0.00 | -9.703 | 0 |
| 72 | 4.4338 | 0.00 | -2.0235 | 0 |
| 77 | -1.7883 | 0.00 | -11.0525 | 0 |
| 78 | 6.4967 | 0.00 | -2.8975 | 0 |
| 79 | -1.6151 | 0.00 | -10.9525 | 0 |
| 80 | 6.3234 | 0.00 | -2.7975 | 0 |
| 85 | -3.3578 | 0.00 | -8.3342 | 0 |
| 86 | 4.9272 | 0.00 | -5.6158 | 0 |
| 87 | -3.1846 | 0.00 | -8.2342 | 0 |
| 88 | 4.754 | 0.00 | -5.5158 | 0 |
| 93 | -4.9272 | 0.00 | -5.6158 | 0 |
| 94 | 3.3578 | 0.00 | -8.3342 | 0 |
| 95 | -4.754 | 0.00 | -5.5158 | 0 |
| 96 | 3.1846 | 0.00 | -8.2342 | 0 |
| 101 | -6.4967 | 0.00 | -2.8975 | 0 |
| 102 | 1.7883 | 0.00 | -11.0525 | 0 |
| 103 | -6.3234 | 0.00 | -2.7975 | 0 |
| 104 | 1.6151 | 0.00 | -10.9525 | 0 |
| 105 | -1.7883 | 4.00 | -11.0525 | 0 |
| 106 | 6.4967 | 4.00 | -2.8975 | 0 |
| 107 | -6.4967 | 3.00 | -2.8975 | 0 |
| 108 | 1.7883 | 3.00 | -11.0525 | 0 |
| 109 | -3.3578 | 4.00 | -8.3342 | 0 |
| 110 | 4.9272 | 4.00 | -5.6158 | 0 |
| 111 | -4.9272 | 5.25 | -5.6158 | 0 |
| 112 | 3.3578 | 5.25 | -8.3342 | 0 |
| 113 | -1.7883 | -4.00 | -11.0525 | 0 |
| 114 | -3.3578 | -4.00 | -8.3342 | 0 |
| 115 | -4.9272 | -5.25 | -5.6158 | 0 |
| 116 | -6.4967 | -3.00 | -2.8975 | 0 |
| 117 | 6.4967 | -4.00 | -2.8975 | 0 |
| 118 | 4.9272 | -4.00 | -5.6158 | 0 |
| 119 | 3.3578 | -5.25 | -8.3342 | 0 |
| 120 | 1.7883 | -3.00 | -11.0525 | 0 |
| 121 | -1.7883 | 2.50 | -11.0525 | 0 |
| 122 | -1.6151 | 2.50 | -10.9525 | 0 |
| 124 | -3.3578 | 2.50 | -8.3342 | 0 |
| 125 | -3.1846 | 2.50 | -8.2342 | 0 |
| 126 | -4.9272 | 2.50 | -5.6158 | 0 |
| 127 | -4.754 | 2.50 | -5.5158 | 0 |

| | | | | |
|-----|---------|------|----------|---|
| 128 | -6.4967 | 2.50 | -2.8975 | 0 |
| 129 | -6.3234 | 2.50 | -2.7975 | 0 |
| 130 | -4.7083 | 2.50 | 0.20 | 0 |
| 131 | -4.7083 | 2.50 | 0.00 | 0 |
| 132 | -1.5694 | 2.50 | 0.20 | 0 |
| 133 | -1.5694 | 2.50 | 0.00 | 0 |
| 134 | 1.5694 | 2.50 | 0.20 | 0 |
| 135 | 1.5694 | 2.50 | 0.00 | 0 |
| 136 | 4.7083 | 2.50 | 0.20 | 0 |
| 137 | 4.7083 | 2.50 | 0.00 | 0 |
| 138 | 6.4967 | 2.50 | -2.8975 | 0 |
| 139 | 6.3234 | 2.50 | -2.7975 | 0 |
| 140 | 4.9272 | 2.50 | -5.6158 | 0 |
| 141 | 4.754 | 2.50 | -5.5158 | 0 |
| 142 | 3.3578 | 2.50 | -8.3342 | 0 |
| 143 | 3.1846 | 2.50 | -8.2342 | 0 |
| 144 | 1.7883 | 2.50 | -11.0525 | 0 |
| 145 | 1.6151 | 2.50 | -10.9525 | 0 |
| 146 | -7.386 | 2.50 | -0.9572 | 0 |
| 147 | -6.8333 | 2.50 | 0.00 | 0 |
| 148 | 0.5526 | 2.50 | -12.7928 | 0 |
| 149 | -0.5526 | 2.50 | -12.7928 | 0 |
| 150 | 6.8333 | 2.50 | 0.00 | 0 |
| 151 | 7.386 | 2.50 | -0.9572 | 0 |

Restraints

| Node | TX | TY | TZ | RX | RY | RZ |
|------|----|----|----|----|----|----|
| 3 | 1 | 1 | 1 | 1 | 1 | 1 |
| 10 | 1 | 1 | 1 | 1 | 1 | 1 |
| 14 | 1 | 1 | 1 | 1 | 1 | 1 |
| 62 | 1 | 1 | 1 | 1 | 1 | 1 |
| 63 | 1 | 1 | 1 | 1 | 1 | 1 |
| 64 | 1 | 1 | 1 | 1 | 1 | 1 |

Members

| Member | NJ | NK | Description | Section | Material | d0 [in] | dL [in] | Ig factor |
|--------|----|----|-------------|---------------------|----------------------|------------|------------|-----------|
| 1 | 2 | 9 | | PIPE 3x0.216 | A53 GrB | 0.00 | 0.00 | 0.00 |
| 2 | 11 | 15 | | PIPE 3x0.216 | A53 GrB | 0.00 | 0.00 | 0.00 |
| 3 | 7 | 4 | | PIPE 3x0.216 | A53 GrB | 0.00 | 0.00 | 0.00 |
| 4 | 16 | 3 | | HSS_SQR 3X3X3_8 | A500 GrB rectangular | 0.00 | 0.00 | 0.00 |
| 5 | 10 | 17 | | HSS_SQR 3X3X3_8 | A500 GrB rectangular | 0.00 | 0.00 | 0.00 |
| 6 | 14 | 18 | | HSS_SQR 3X3X3_8 | A500 GrB rectangular | 0.00 | 0.00 | 0.00 |
| 7 | 4 | 2 | | PL 6x5/8 | A36 | 0.00 | 0.00 | 0.00 |
| 8 | 9 | 11 | | PL 6x5/8 | A36 | 0.00 | 0.00 | 0.00 |
| 9 | 15 | 7 | | PL 6x5/8 | A36 | 0.00 | 0.00 | 0.00 |
| 13 | 23 | 8 | | LU 2-1_2X1-1_2X3_16 | A36 | 0.00 | 0.00 | 0.00 |
| 14 | 12 | 23 | | LU 2-1_2X1-1_2X3_16 | A36 | 0.00 | 0.00 | 0.00 |
| 15 | 6 | 28 | | LU 2-1_2X1-1_2X3_16 | A36 | 0.00 | 0.00 | 0.00 |

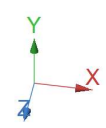
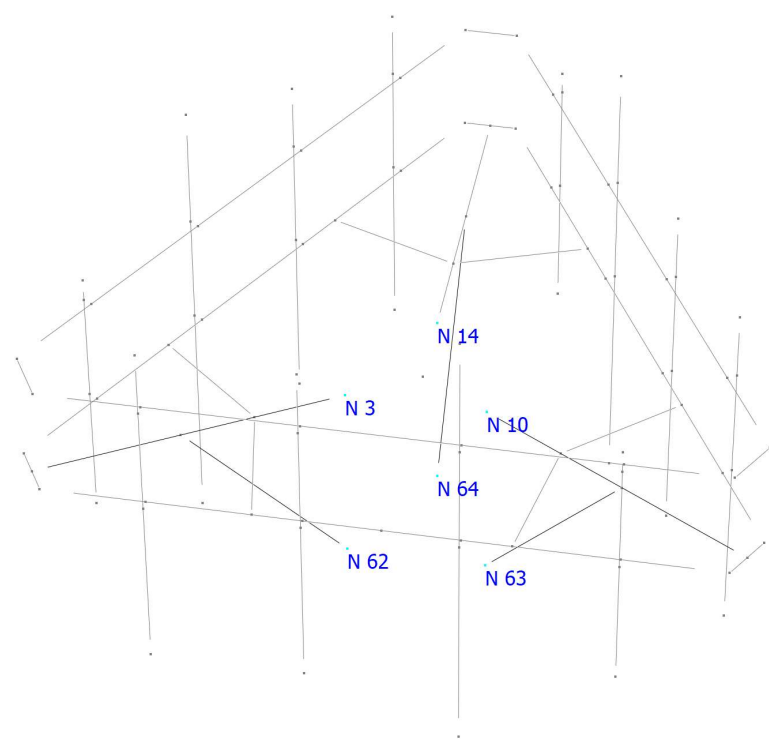
| | | | | | | | |
|----|-----|-----|----------------------|---------|------|------|------|
| 16 | 28 | 13 | LU 2-1_2X1-1_2X3_16 | A36 | 0.00 | 0.00 | 0.00 |
| 17 | 33 | 5 | LU 2-1_2X1-1_2X3_16 | A36 | 0.00 | 0.00 | 0.00 |
| 18 | 1 | 33 | LU 2-1_2X1-1_2X3_16 | A36 | 0.00 | 0.00 | 0.00 |
| 19 | 34 | 50 | PIPE 2-1_2x0.203 | A53 GrB | 0.00 | 0.00 | 0.00 |
| 20 | 40 | 51 | PIPE 2-1_2x0.203 | A53 GrB | 0.00 | 0.00 | 0.00 |
| 21 | 41 | 52 | PIPE 2x0.154 | A53 GrB | 0.00 | 0.00 | 0.00 |
| 22 | 35 | 53 | PIPE 2x0.154 | A53 GrB | 0.00 | 0.00 | 0.00 |
| 27 | 62 | 65 | T2L 2-1_2X2-1_2X3_16 | A36 | 0.00 | 0.00 | 0.00 |
| 28 | 64 | 71 | T2L 2-1_2X2-1_2X3_16 | A36 | 0.00 | 0.00 | 0.00 |
| 29 | 63 | 72 | T2L 2-1_2X2-1_2X3_16 | A36 | 0.00 | 0.00 | 0.00 |
| 46 | 105 | 113 | PIPE 2-1_2x0.203 | A53 GrB | 0.00 | 0.00 | 0.00 |
| 47 | 109 | 114 | PIPE 2-1_2x0.203 | A53 GrB | 0.00 | 0.00 | 0.00 |
| 48 | 111 | 115 | PIPE 2x0.154 | A53 GrB | 0.00 | 0.00 | 0.00 |
| 49 | 107 | 116 | PIPE 2x0.154 | A53 GrB | 0.00 | 0.00 | 0.00 |
| 50 | 106 | 117 | PIPE 2-1_2x0.203 | A53 GrB | 0.00 | 0.00 | 0.00 |
| 51 | 110 | 118 | PIPE 2-1_2x0.203 | A53 GrB | 0.00 | 0.00 | 0.00 |
| 52 | 112 | 119 | PIPE 2x0.154 | A53 GrB | 0.00 | 0.00 | 0.00 |
| 53 | 108 | 120 | PIPE 2x0.154 | A53 GrB | 0.00 | 0.00 | 0.00 |
| 54 | 146 | 147 | L 2-1_2X2-1_2X3_16 | A36 | 0.00 | 0.00 | 0.00 |
| 55 | 148 | 149 | L 2-1_2X2-1_2X3_16 | A36 | 0.00 | 0.00 | 0.00 |
| 56 | 150 | 151 | L 2-1_2X2-1_2X3_16 | A36 | 0.00 | 0.00 | 0.00 |
| 60 | 149 | 146 | PIPE 2x0.154 | A53 GrB | 0.00 | 0.00 | 0.00 |
| 65 | 147 | 150 | PIPE 2x0.154 | A53 GrB | 0.00 | 0.00 | 0.00 |
| 70 | 151 | 148 | PIPE 2x0.154 | A53 GrB | 0.00 | 0.00 | 0.00 |

Orientation of local axes

| Member | Rotation [Deg] | Axes23 | NX | NY | NZ |
|--------|-------------------|--------|------|------|------|
| 13 | 270.00 | 0 | 0.00 | 0.00 | 0.00 |
| 14 | 270.00 | 0 | 0.00 | 0.00 | 0.00 |
| 15 | 270.00 | 0 | 0.00 | 0.00 | 0.00 |
| 16 | 270.00 | 0 | 0.00 | 0.00 | 0.00 |
| 17 | 270.00 | 0 | 0.00 | 0.00 | 0.00 |
| 18 | 270.00 | 0 | 0.00 | 0.00 | 0.00 |
| 54 | 90.00 | 0 | 0.00 | 0.00 | 0.00 |
| 55 | 90.00 | 0 | 0.00 | 0.00 | 0.00 |
| 56 | 90.00 | 0 | 0.00 | 0.00 | 0.00 |

Hinges

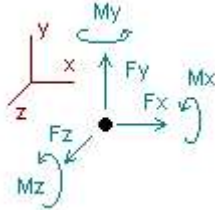
| Member | Node-J | | | | Node-K | | | | TOR | AXL | Axial rigidity |
|--------|--------|-----|----|----|--------|-----|----|----|-----|-----|----------------|
| | M33 | M22 | V3 | V2 | M33 | M22 | V3 | V2 | | | |
| 13 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | Full |
| 14 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | Full |
| 15 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | Full |
| 16 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | Full |
| 17 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | Full |
| 18 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | Full |
| 27 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | Full |
| 28 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | Full |



Analysis result

Envelope for nodal reactions

Note.- I_c is the controlling load condition



Direction of positive forces and moments

Envelope of nodal reactions for :

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

| Node | | Forces | | | | | | Moments | | | | | |
|------|-----|--------|-------|--------|-------|--------|-------|----------|-------|----------|-------|----------|-------|
| | | Fx | I_c | Fy | I_c | Fz | I_c | Mx | I_c | My | I_c | Mz | I_c |
| | | [Kip] | | [Kip] | | [Kip] | | [Kip*ft] | | [Kip*ft] | | [Kip*ft] | |
| 3 | Max | 4.281 | LC2 | -0.553 | LC8 | 1.946 | LC5 | 1.02818 | LC10 | 2.55488 | LC5 | 1.97710 | LC11 |
| | Min | -1.608 | LC8 | -2.034 | LC10 | -3.490 | LC3 | 0.19036 | LC8 | -2.54694 | LC3 | 0.54840 | LC5 |
| 10 | Max | 1.951 | LC6 | -0.558 | LC6 | 1.320 | LC5 | 1.16431 | LC9 | 1.79635 | LC7 | -0.49234 | LC5 |
| | Min | -4.612 | LC4 | -2.010 | LC12 | -2.860 | LC3 | 0.26923 | LC6 | -1.80590 | LC1 | -1.87616 | LC11 |

| | | | | | | | | | | | | | |
|----|-----|--------|------|--------|------|--------|------|----------|-----|----------|-----|----------|-----|
| 14 | Max | 2.013 | LC2 | -0.504 | LC7 | 5.237 | LC1 | -0.57116 | LC7 | 3.02269 | LC8 | 0.18099 | LC8 |
| | Min | -2.013 | LC4 | -1.983 | LC9 | -2.184 | LC7 | -2.16242 | LC9 | -3.02575 | LC2 | -0.25268 | LC2 |
| 62 | Max | -1.024 | LC8 | 4.734 | LC10 | 1.906 | LC10 | 0.17646 | LC5 | 0.16206 | LC5 | 0.06149 | LC7 |
| | Min | -3.301 | LC10 | 1.408 | LC8 | 0.568 | LC8 | -0.19721 | LC3 | -0.16159 | LC7 | -0.09848 | LC1 |
| 63 | Max | 3.269 | LC12 | 4.690 | LC12 | 1.888 | LC12 | 0.12901 | LC5 | 0.11620 | LC7 | 0.07155 | LC1 |
| | Min | 1.029 | LC6 | 1.411 | LC6 | 0.564 | LC6 | -0.14861 | LC3 | -0.11740 | LC5 | -0.03381 | LC7 |
| 64 | Max | 0.107 | LC6 | 4.628 | LC9 | -1.095 | LC7 | 0.06669 | LC1 | 0.22003 | LC8 | 0.27066 | LC8 |
| | Min | -0.107 | LC8 | 1.311 | LC7 | -3.725 | LC9 | -0.02416 | LC7 | -0.22058 | LC6 | -0.27146 | LC6 |

Date: 1/21/2022
Project Name: SOUTHURY KETTLETOWN RD
Project No.: CT2086
Designed By: ID Checked By: MSC



CHECK CONNECTION CAPACITY (Worst Case)

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

Bolt Type = A36 5/8" Threaded Rod

Allowable Tensile Load =

$F_{Tall} = 6673$ lbs.

Allowable Shear Load =

$F_{Vall} = 4004$ lbs.

TENSILE FORCES

Reaction $F = 1906$ lbs. (See Bentley Output)

SHEAR FORCES

Reactions in X direction: 4734 lbs. (See Bentley Output)

Reactions in Y direction: 3301 lbs. (See Bentley Output)

Resultant: 5771 lbs.

No. of Supports = 1

No. of Bolts / Support = 3

Tension Design Load /Bolts =

$f_t = 635.33$ lbs. < 6673 lbs. **Therefore, OK !**

Shear Design Load / Bolts=

$f_v = 1923.75$ lbs. < 4004 lbs. **Therefore, OK !**

CHECK COMBINED TENSION AND SHEAR

$f_t / F_T + f_v / F_V \leq 1.0$
0.095 + 0.480 = 0.576 < 1.0 **Therefore, OK !**



**Smartlink on behalf of AT&T
Mobility, LCC**

Site FA – 10035309

Site ID – CTL02086

USID – 61174

Site Name – SOUTHBURY

KETTLETOWN RD

MRCTB052672-MRCTB052668-

MRCTB052718-MRCTB052717

231 KETTLETOWN ROAD

SOUTHBURY, CT 06488

Latitude: N41-28-16.27

Longitude: W73-12-20.00

Structure Type: Monopole

Report generated date: March 1, 2022

Report by: Sophie Thein

Customer Contact: Kristina Cottone

**AT&T Mobility, LCC will be compliant when the
remediation recommended in Section 4.2 or
other appropriate remediation is implemented.**

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1 General Site Summary

1.1 Report Summary

| AT&T Mobility, LCC | Summary |
|--|--------------------------|
| Max Cumulative Simulated RFE Level on the Ground | <1% General Public Limit |
| Compliant per AT&T Mobility, LLC's Policy? | No |

1.2 Fall Arrest Anchor Point Summary

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

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

RFDS: NEW-ENGLAND_CONNECTICUT_CTL02086_2022-LTE-Next-Carrier_5G-NR-1DR-1_mm093q_2051A13PJ5_10035309_61174_09-21-2021_Final-Approved_v3.00

CD's: 10035309_AE201_220214_CTL02086_Rev1_4TX4RX_LTE 7C_ANTENNA MODS_LTE 6C_5G NR (1)

RF Powers Used: Max RRH Powers

AT&T Mobility, LLC Duty Cycle: MPE Calculations are modeled with "75% Downlink Duty Cycle" for LTE and 5G.

1.3 Signage Summary

a. Pre-Site Visit AT&T Signage (Existing Signage)

| AT&T Signage Locations | | | | | | | | | | | | | | | | | | | | |
|------------------------|---------------|-----|---------------|-----|----------|-----|----------|-----|----------|-----|-----------|-----|----------|-----|-----------|-----|----------|-----|----------|-----|
| | Information 1 | | Information 2 | | Notice | | Notice 2 | | Caution | | Caution 2 | | Warning | | Warning 2 | | Barriers | | | |
| Access Point(s) | | | | | | | | | | | | | | | | | | | | |
| Alpha | | | | | | | | | | | | | | | | | | | | |
| Beta | | | | | | | | | | | | | | | | | | | | |
| Gamma | | | | | | | | | | | | | | | | | | | | |
| Delta | | | | | | | | | | | | | | | | | | | | |
| Epsilon | | | | | | | | | | | | | | | | | | | | |
| Zeta | | | | | | | | | | | | | | | | | | | | |
| Status | Existing | N/A | Existing | N/A | Existing | N/A | Existing | N/A | Existing | N/A | Existing | N/A | Existing | N/A | Existing | N/A | Existing | N/A | Existing | N/A |

b. Proposed AT&T Signage

| AT&T Signage Locations | | | | | | | | | | | | | | | | | | | | |
|------------------------|---------------|--------|---------------|--------|--------|--------|----------|--------|---------|--------|-----------|--------|---------|--------|-----------|--------|----------|--------|---------|--------|
| | Information 1 | | Information 2 | | Notice | | Notice 2 | | Caution | | Caution 2 | | Warning | | Warning 2 | | Barriers | | | |
| Access Point(s) | | | | | | | | | | | 1 | | | | | | | | | |
| Alpha | | | | | | | | | | | | | | | | | | | | |
| Beta | | | | | | | | | | | | | | | | | | | | |
| Gamma | | | | | | | | | | | | | | | | | | | | |
| Delta | | | | | | | | | | | | | | | | | | | | |
| Epsilon | | | | | | | | | | | | | | | | | | | | |
| Zeta | | | | | | | | | | | | | | | | | | | | |
| Status | N/A | Remove | N/A | Remove | N/A | Remove | Install | Remove | N/A | Remove | Install | Remove | N/A | Remove | Install | Remove | Install | Remove | Install | Remove |

Note: The Caution sign proposed at the Monopole Base is a Caution 2B sign.

c. Final Compliance Configuration Signage Summary (Required)

| AT&T Signage Locations | | | | | | | | | | | | | | | | | | | | |
|------------------------|---------------|-----|---------------|-----|--------|-----|----------|----------|---------|-----|-----------|----------|---------|-----|-----------|----------|----------|----------|----------|----------|
| | Information 1 | | Information 2 | | Notice | | Notice 2 | | Caution | | Caution 2 | | Warning | | Warning 2 | | Barriers | | | |
| Access Point(s) | | | | | | | | | | | 1 | | | | | | | | | |
| Alpha | | | | | | | | | | | | | | | | | | | | |
| Beta | | | | | | | | | | | | | | | | | | | | |
| Gamma | | | | | | | | | | | | | | | | | | | | |
| Delta | | | | | | | | | | | | | | | | | | | | |
| Epsilon | | | | | | | | | | | | | | | | | | | | |
| Zeta | | | | | | | | | | | | | | | | | | | | |
| Status | N/A | N/A | N/A | N/A | N/A | N/A | Existing | Proposed | N/A | N/A | Existing | Proposed | N/A | N/A | Existing | Proposed | Existing | Proposed | Existing | Proposed |

Note: The Caution sign required at the Monopole Base is a Caution 2B sign.

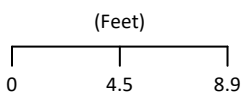
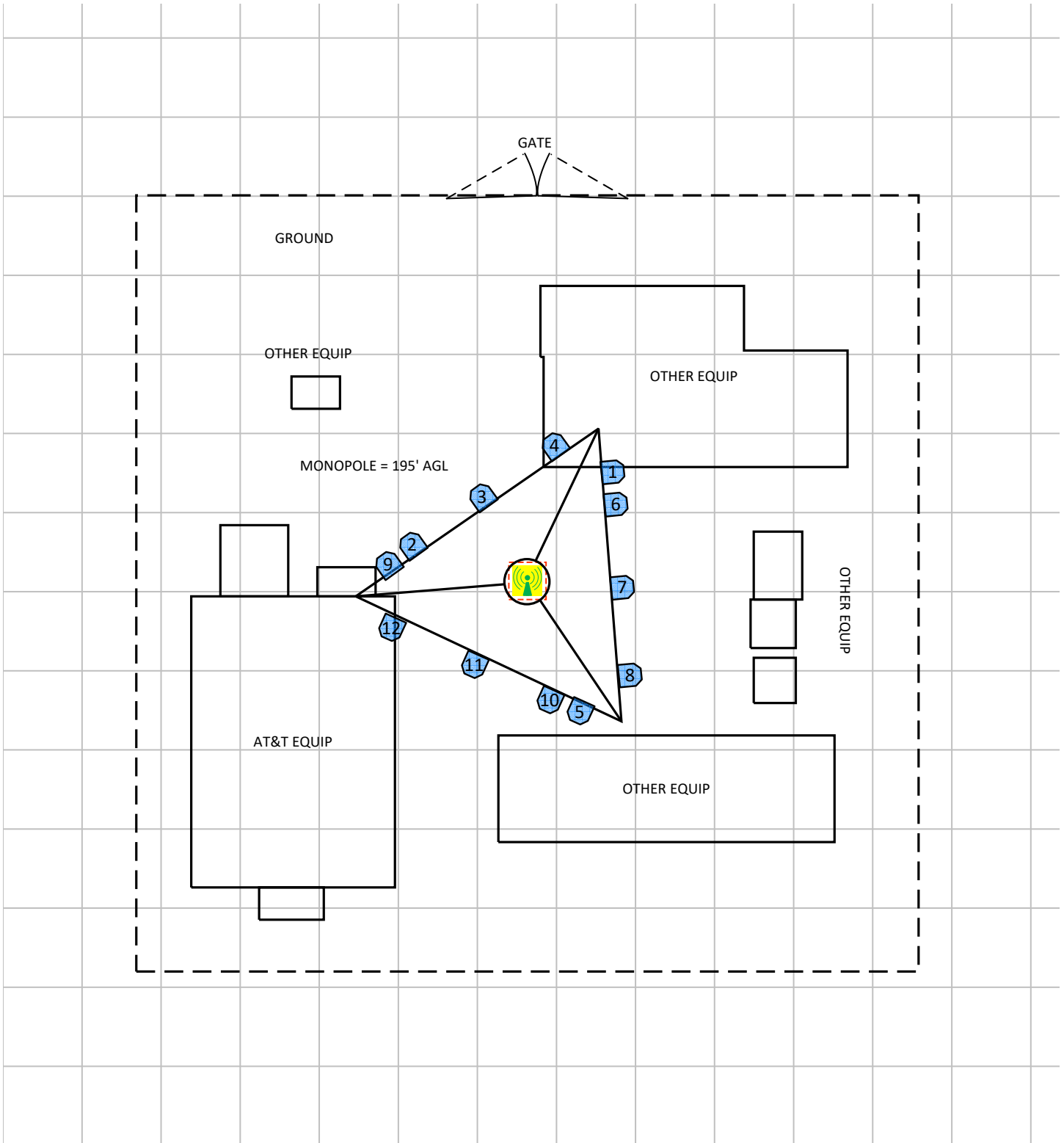
Note: The table above represents EVERY compliance item that MUST be implemented at this location.

2 Scale Maps of Site

The following diagrams are included:

- Site Scale Map
- RF Exposure Diagram
- RF Exposure Diagram – Elevation View

Site Scale Map For: SOUTHBURY KETTLETOWN RD



| | | | | | |
|-------------------------------|-----------------------|----------------------|-----------|---------|-----------------|
| AT&T MOBILITY LLC | VERIZON WIRELESS | T-MOBILE | SPRINT | DISH | UNKNOWN CARRIER |
| Sign Legend | | | | | |
| Notice | Notice 2 | Caution | Caution 2 | Warning | Warning 2 |
| Info | Info 2 | RF Emissions Diagram | | | |
| Barrier Signage Legend | | | | | |
| No-sign | Notice 2 | Caution 2 | Warning 2 | Notice | Caution |
| Existing Barrier | Proposed Barrier/Sign | Remove Barrier/Sign | X | | |

3 Antenna Inventory

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

| Ant ID | Operator | Antenna Make & Model | Type | TX Freq (MHz) | Technology | Az (Deg) | Hor BW (Deg) | Ant Len (ft) | Power | Power Type | Power Unit | TX Count | Total ERP (Watts) | Ant Gain (dBd) | Z (ft) | AGL (ft) |
|--------|------------------------------|-----------------------------|-------|---------------|------------|----------|--------------|--------------|-------|------------|------------|----------|-------------------|----------------|--------|----------|
| 1 | AT&T MOBILITY LLC | Powerwave 7770 | Panel | 850 | UMTS | 143 | 82.0 | 4.6 | 80 | TPO | Watt | 1 | 849.36 | 11.51 | 181.6 | 181.61 |
| 2 | AT&T MOBILITY LLC | CCI Antennas HPA-65R-BUU-H8 | Panel | 722 | LTE | 23 | 64.9 | 7.7 | 80 | TPO | Watt | 1 | 1270.84 | 13.26 | 180.1 | 180.05 |
| 2 | AT&T MOBILITY LLC | CCI Antennas HPA-65R-BUU-H8 | Panel | 2300 | LTE | 23 | 63.3 | 7.7 | 100 | TPO | Watt | 1 | 2517.68 | 15.26 | 180.1 | 180.05 |
| 3 | AT&T MOBILITY LLC (Proposed) | CCI Antennas OPA65R-BU6D | Panel | 763 | LTE | 23 | 61.1 | 5.9 | 160 | TPO | Watt | 1 | 1841.28 | 11.86 | 180.9 | 180.94 |
| 3 | AT&T MOBILITY LLC (Proposed) | CCI Antennas OPA65R-BU6D | Panel | 2100 | LTE/AWS1 | 23 | 69.0 | 5.9 | 240 | TPO | Watt | 1 | 9230.2 | 17.10 | 180.9 | 180.94 |
| 4 | AT&T MOBILITY LLC (Proposed) | Cci DMP65R-BU8D | Panel | 737 | LTE | 23 | 70.6 | 8 | 160 | TPO | Watt | 1 | 2018.92 | 12.26 | 179.9 | 179.9 |
| 4 | AT&T MOBILITY LLC (Proposed) | Cci DMP65R-BU8D | Panel | 850 | 5G | 23 | 71.4 | 8 | 160 | TPO | Watt | 1 | 2163.32 | 12.56 | 179.9 | 179.9 |
| 4 | AT&T MOBILITY LLC (Proposed) | Cci DMP65R-BU8D | Panel | 1900 | LTE | 23 | 67.0 | 8 | 80 | TPO | Watt | 1 | 1563.47 | 14.16 | 179.9 | 179.9 |
| 4 | AT&T MOBILITY LLC (Proposed) | Cci DMP65R-BU8D | Panel | 1900 | 5G | 23 | 67.0 | 8 | 80 | TPO | Watt | 1 | 1563.47 | 14.16 | 179.9 | 179.9 |
| 5 | AT&T MOBILITY LLC | Powerwave 7770 | Panel | 850 | UMTS | 263 | 82.0 | 4.6 | 80 | TPO | Watt | 1 | 849.36 | 11.51 | 181.6 | 181.61 |
| 6 | AT&T MOBILITY LLC | CCI Antennas HPA-65R-BUU-H8 | Panel | 722 | LTE | 143 | 64.9 | 7.7 | 80 | TPO | Watt | 1 | 1270.84 | 13.26 | 180.1 | 180.05 |
| 6 | AT&T MOBILITY LLC | CCI Antennas HPA-65R-BUU-H8 | Panel | 2300 | LTE | 143 | 63.3 | 7.7 | 100 | TPO | Watt | 1 | 2517.68 | 15.26 | 180.1 | 180.05 |
| 7 | AT&T MOBILITY LLC (Proposed) | CCI Antennas OPA65R-BU6D | Panel | 763 | LTE | 143 | 61.1 | 5.9 | 160 | TPO | Watt | 1 | 1841.28 | 11.86 | 180.9 | 180.94 |
| 7 | AT&T MOBILITY LLC (Proposed) | CCI Antennas OPA65R-BU6D | Panel | 2100 | LTE/AWS1 | 143 | 69.0 | 5.9 | 240 | TPO | Watt | 1 | 9230.2 | 17.10 | 180.9 | 180.94 |
| 8 | AT&T MOBILITY LLC (Proposed) | Cci DMP65R-BU8D | Panel | 737 | LTE | 143 | 70.6 | 8 | 160 | TPO | Watt | 1 | 2018.92 | 12.26 | 179.9 | 179.9 |
| 8 | AT&T MOBILITY LLC (Proposed) | Cci DMP65R-BU8D | Panel | 850 | 5G | 143 | 71.4 | 8 | 160 | TPO | Watt | 1 | 2163.32 | 12.56 | 179.9 | 179.9 |
| 8 | AT&T MOBILITY LLC (Proposed) | Cci DMP65R-BU8D | Panel | 1900 | LTE | 143 | 67.0 | 8 | 80 | TPO | Watt | 1 | 1563.47 | 14.16 | 179.9 | 179.9 |
| 8 | AT&T MOBILITY LLC (Proposed) | Cci DMP65R-BU8D | Panel | 1900 | 5G | 143 | 67.0 | 8 | 80 | TPO | Watt | 1 | 1563.47 | 14.16 | 179.9 | 179.9 |
| 9 | AT&T MOBILITY LLC | Powerwave 7770 | Panel | 850 | UMTS | 23 | 82.0 | 4.6 | 80 | TPO | Watt | 1 | 849.36 | 11.51 | 181.6 | 181.61 |
| 10 | AT&T MOBILITY LLC | CCI Antennas HPA-65R-BUU-H8 | Panel | 722 | LTE | 263 | 64.9 | 7.7 | 80 | TPO | Watt | 1 | 1270.84 | 13.26 | 180.1 | 180.05 |
| 10 | AT&T MOBILITY LLC | CCI Antennas HPA-65R-BUU-H8 | Panel | 2300 | LTE | 263 | 63.3 | 7.7 | 100 | TPO | Watt | 1 | 2517.68 | 15.26 | 180.1 | 180.05 |
| 11 | AT&T MOBILITY LLC (Proposed) | CCI Antennas OPA65R-BU6D | Panel | 763 | LTE | 263 | 61.1 | 5.9 | 160 | TPO | Watt | 1 | 1841.28 | 11.86 | 180.9 | 180.94 |
| 11 | AT&T MOBILITY LLC (Proposed) | CCI Antennas OPA65R-BU6D | Panel | 2100 | LTE/AWS1 | 263 | 69.0 | 5.9 | 240 | TPO | Watt | 1 | 9230.2 | 17.10 | 180.9 | 180.94 |
| 12 | AT&T MOBILITY LLC (Proposed) | Cci DMP65R-BU8D | Panel | 737 | LTE | 263 | 70.6 | 8 | 160 | TPO | Watt | 1 | 2018.92 | 12.26 | 179.9 | 179.9 |
| 12 | AT&T MOBILITY LLC (Proposed) | Cci DMP65R-BU8D | Panel | 850 | 5G | 263 | 71.4 | 8 | 160 | TPO | Watt | 1 | 2163.32 | 12.56 | 179.9 | 179.9 |
| 12 | AT&T MOBILITY LLC (Proposed) | Cci DMP65R-BU8D | Panel | 1900 | LTE | 263 | 67.0 | 8 | 80 | TPO | Watt | 1 | 1563.47 | 14.16 | 179.9 | 179.9 |
| 12 | AT&T MOBILITY LLC (Proposed) | Cci DMP65R-BU8D | Panel | 1900 | 5G | 263 | 67.0 | 8 | 80 | TPO | Watt | 1 | 1563.47 | 14.16 | 179.9 | 179.9 |

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

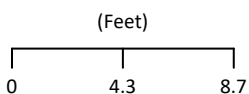
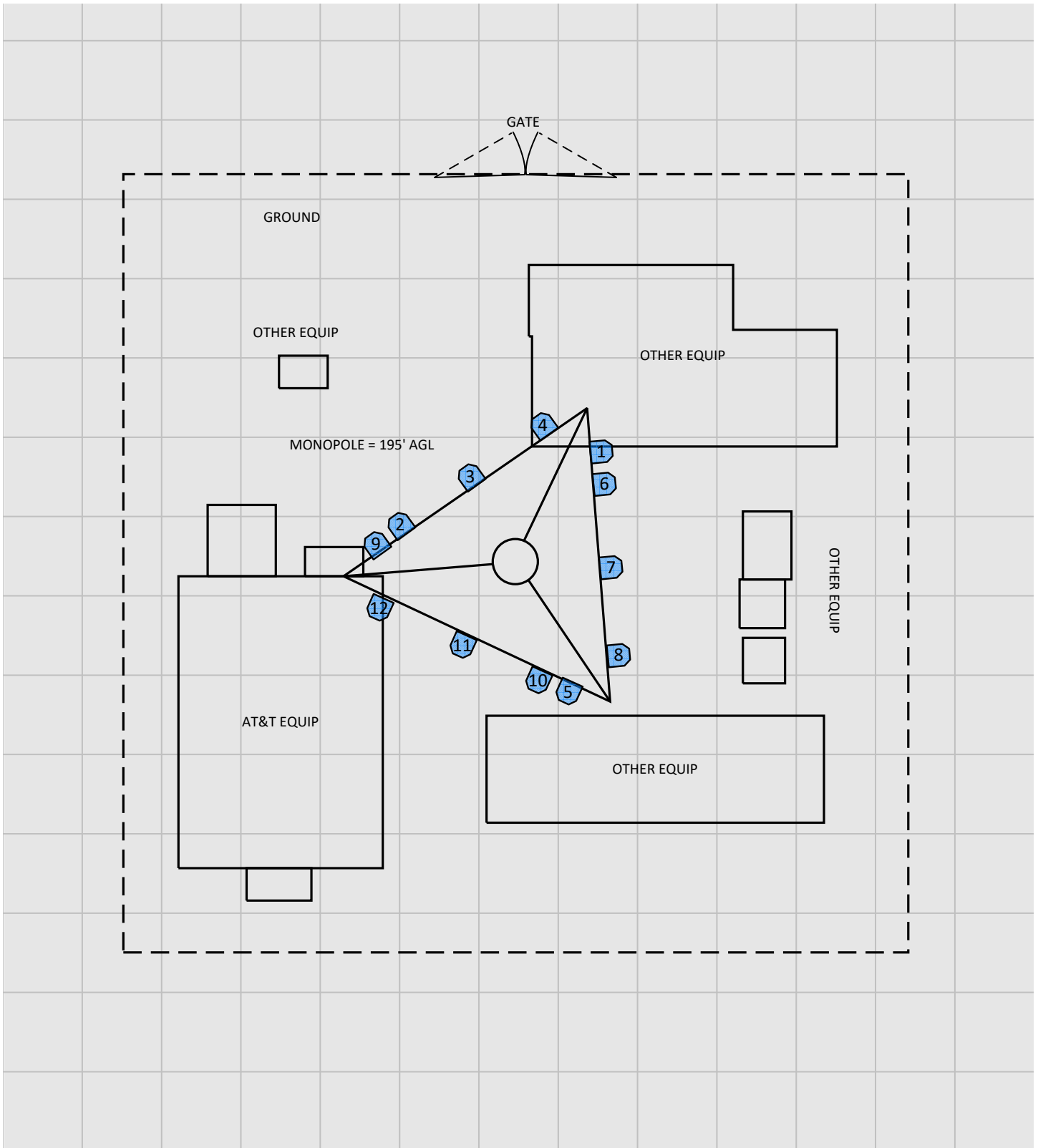
4 Emission Predictions

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

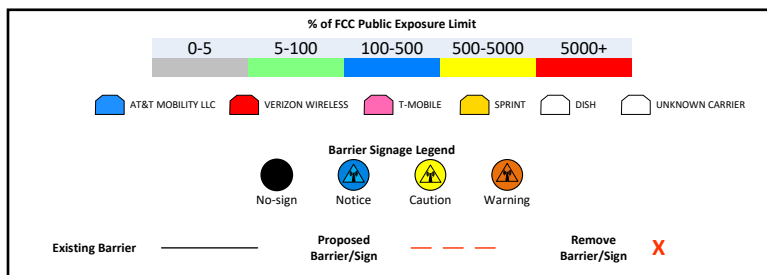
- GROUND LEVEL = 0'
- MONOPOLE = 195'

The Antenna Inventory heights are referenced to the same level.

RF Exposure Simulation For: SOUTHBURY KETTLETOWN RD Composite View

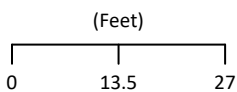
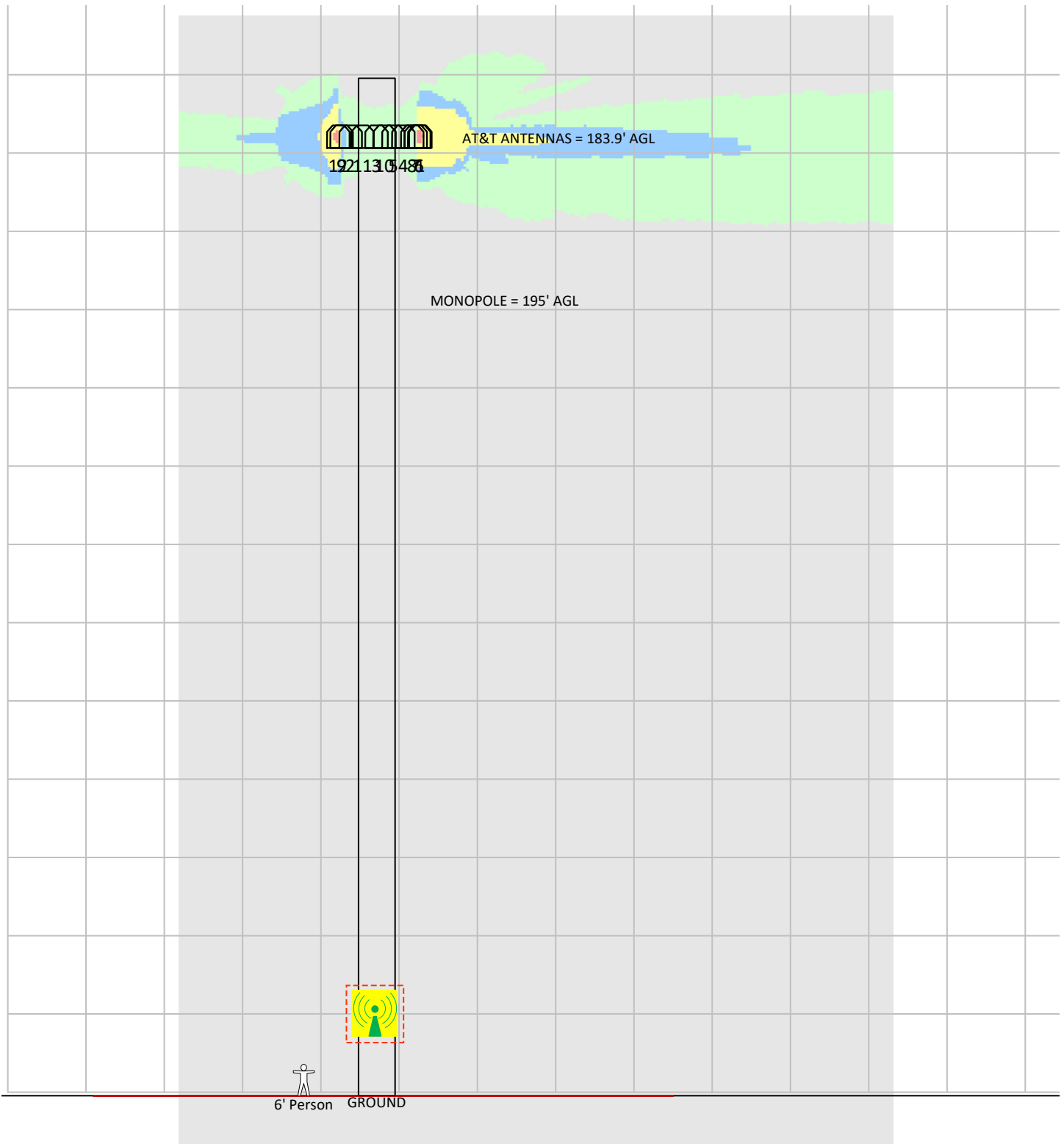


www.sitesafe.com
3/1/2022 12:52:07 PM



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

RF Exposure Simulation For: SOUTHBURY KETTLETOWN RD Elevation View



www.sitesafe.com
3/1/2022 12:59:36 PM

| % of FCC Public Exposure Limit | | | | | | | | | | | | | | | | | |
|--------------------------------|-------------------|-------|-----------------------|---------|-----------|---------------------|-----------|-------|---------|--|-----------------|--|---------|--|--------|--|----------------------|
| 0-5 | | 5-100 | | 100-500 | | 500-5000 | | 5000+ | | | | | | | | | |
| | AT&T MOBILITY LLC | | VERIZON WIRELESS | | T-MOBILE | | SPRINT | | DISH | | UNKNOWN CARRIER | | | | | | |
| Sign Legend | | | | | | | | | | | | | | | | | |
| | Notice | | Notice 2 | | Caution | | Caution 2 | | Warning | | Warning 2 | | Info | | Info 2 | | RF Emissions Diagram |
| Barrier Signage Legend | | | | | | | | | | | | | | | | | |
| | No-sign | | Notice 2 | | Caution 2 | | Warning 2 | | Notice | | Caution | | Warning | | | | |
| Existing Barrier | | | Proposed Barrier/Sign | | | Remove Barrier/Sign | | | | | | | | | | | |

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

5 Site Compliance

5.1 Site Compliance Statement

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

AT&T Mobility, LLC will be compliant when the remediation recommended in Section 4.2 or other appropriate remediation is implemented.

The compliance determination is based on General Public RFE levels derived from theoretical modeling, RF signage placement, and the level of restricted access to the antennas at the site.

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

5.2 Actions for Site Compliance

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

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

Site Access Location

(1) Caution 2 sign(s) required on the base of the pole.

6 Reviewer Certification

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

That I am registered as a Professional Engineer in the jurisdiction indicated in the professional engineering stamp on the cover of this document; and

The reviewer whose signature appears below hereby certifies and affirms:

That I am an employee of Site Safe, LLC, in Vienna, Virginia, at which place the staff and I provide RF compliance services to clients in the wireless communications industry; and

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

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

March 1, 2022

Appendix A – Statement of Limiting Conditions

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

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

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

Appendix B – Regulatory Background Information

AT&T Mobility, LLC policies

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

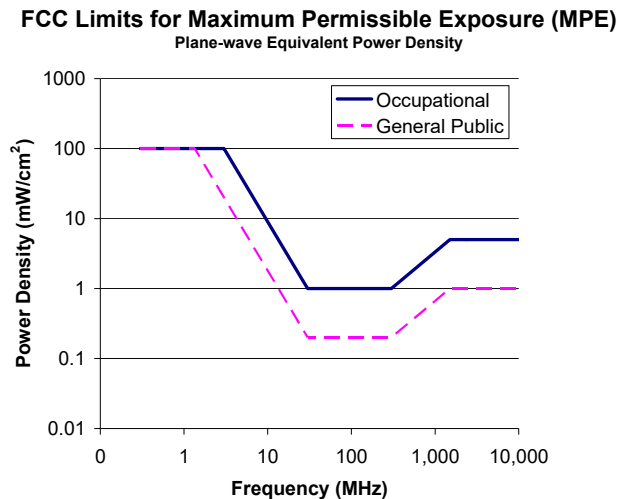
FCC regulations define two separate tiers of exposure limits: Occupational or “Controlled environment” and General Public or “Uncontrolled environment”. The General Public limits are generally five times more conservative or restrictive than the Occupational limit. These limits apply to *accessible*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

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

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

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

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



Limits for Occupational/Controlled Exposure (MPE)

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

Limits for General Population/Uncontrolled Exposure (MPE)

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

f = frequency in MHz

*Plane-wave equivalent power density

OSHA Statement

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

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

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

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

Appendix C – Safety Plan and Procedures

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

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

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

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

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

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

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

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

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

Appendix D – RF Emissions

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

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

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

If trained occupational personnel require access to areas that are delineated as above 100% of the limit, Sitesafe recommends that they utilize the proper personal protection equipment (RF monitors), coordinate with the carriers to reduce or shutdown power, or make real-time power density measurements with the appropriate power density meter to determine real-time MPE levels. This will allow the personnel to ensure that their work area is within exposure limits.

Appendix E – Assumptions and Definitions

General Model Assumptions

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

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

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

Use of Generic Antennas

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

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

Appendix F – Definitions

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

Compliance – The determination of whether a site complies with FCC standards with regards to Human Exposure to Radio Frequency Electromagnetic Fields from transmitting antennas.

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

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

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

Effective Radiated Power (ERP) – The product of the power supplied to the antenna and the antenna gain in a given direction relative to a half-wave dipole antenna.

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

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

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

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

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

Maximum Permissible Exposure (MPE) – The rms and peak electric and magnetic field strength, their squares, or the plane-wave equivalent power densities associated with these fields to which a person may be exposed without harmful effect and with acceptable safety factor.

Occupational/Controlled Environment – Defined by the FCC as an area where RF exposure may occur to persons who are **aware** of the potential for exposure as a condition of employment or specific activity and can exercise control over their exposure.

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

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

Radio Frequency Exposure or Electromagnetic Fields – Electromagnetic waves that are propagated from antennas through space.

Spatial Average Measurement – A technique used to average a minimum of ten (10) measurements taken in a ten (10) second interval from zero (0) to six (6) feet. This measurement is intended to model the average energy a 6-foot tall human body will absorb while present in an electromagnetic field of energy.

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

Appendix G – References

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

Site Safe, LLC

<http://www.sitesafe.com>

FCC Radio Frequency Safety

<http://www.fcc.gov/encyclopedia/radio-frequency-safety>

National Council on Radiation Protection and Measurements (NCRP)

<http://www.ncrponline.org>

Institute of Electrical and Electronics Engineers, Inc., (IEEE)

<http://www.ieee.org>

American National Standards Institute (ANSI)

<http://www.ansi.org>

Environmental Protection Agency (EPA)

<http://www.epa.gov/radtown/wireless-tech.html>

National Institutes of Health (NIH)

<http://www.niehs.nih.gov/health/topics/agents/emf/>

Occupational Safety and Health Agency (OSHA)

<http://www.osha.gov/SLTC/radiofrequencyradiation/>

International Commission on Non-Ionizing Radiation Protection (ICNIRP)

<http://www.icnirp.org>

World Health Organization (WHO)

<http://www.who.int/peh-emf/en/>

National Cancer Institute

<http://www.cancer.gov/cancertopics/factsheet/Risk/cellphones>

American Cancer Society (ACS)

http://www.cancer.org/docroot/PED/content/PED_1_3X_Cellular_Phone_Towers.asp?sitearea=PED

European Commission Scientific Committee on Emerging and Newly Identified Health Risks

http://ec.europa.eu/health/ph_risk/committees/04_scenihp/docs/scenihp_o_022.pdf

Fairfax County, Virginia Public School Survey

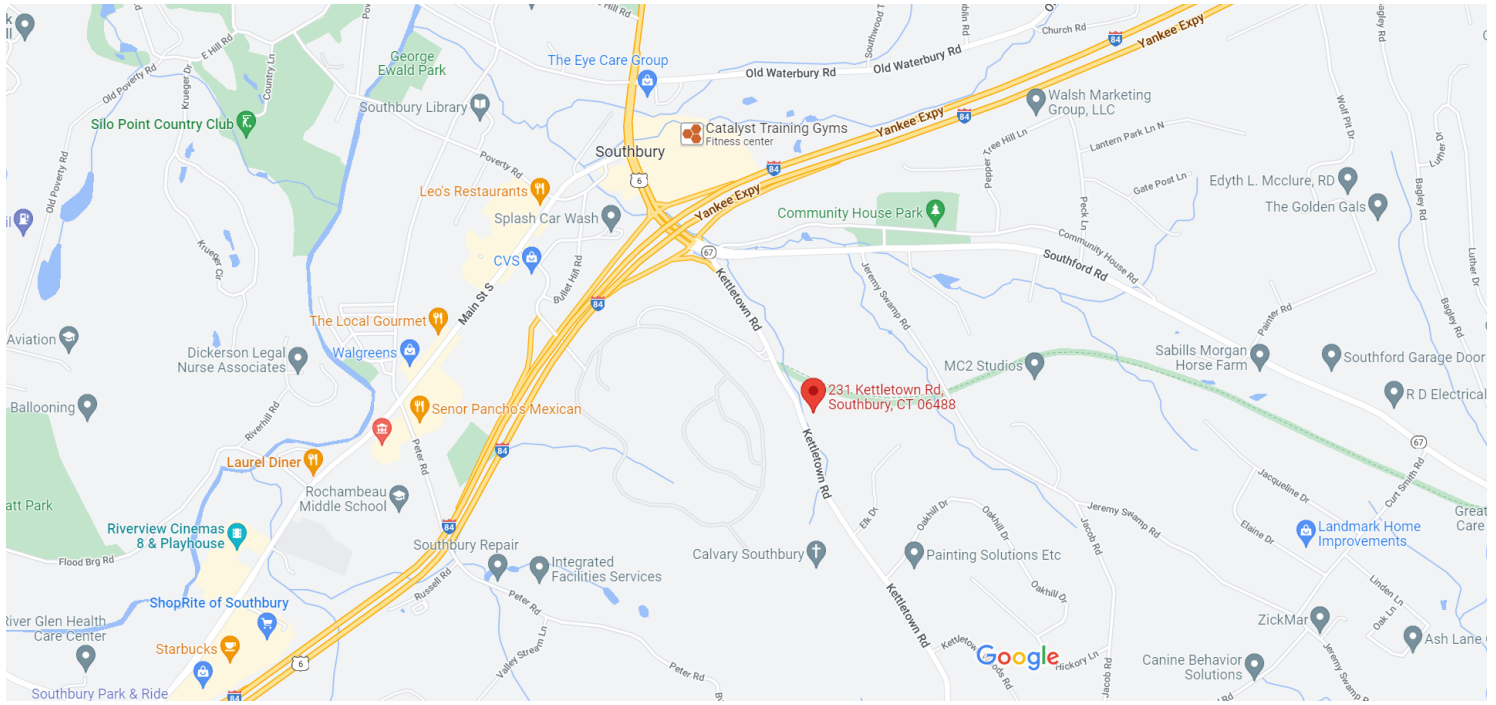
<http://www.fcps.edu/fts/safety-security/RFEESurvey/>

UK Health Protection Agency Advisory Group on Non-Ionizing Radiation

http://www.hpa.org.uk/webw/HPAweb&HPAwebStandard/HPAweb_C/1317133826368

Norwegian Institute of Public Health

<http://www.fhi.no/dokumenter/545eea7147.pdf>



231 Kettletown Rd

Southbury, CT 06488
Building



Directions



Save



Nearby



Send to phone



Share

Photos

At this location

Southbury Dump

5.0 (1)

City government office · 231 Kettletown Rd

Open · Closes 3PM

Southbury Town Recycling

City government office · 231 Kettletown Rd



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BOCA RATON, FL
9/1/2022 8:45 AM

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WINDSOR LOCKS, CT
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WATERTOWN, CT
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WATERTOWN, CT
8/31/2022 9:02 AM

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Taianna Kern
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501 Main St Planning Director
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Town of Southbury

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2032620600

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