**Centek Engineering, Inc.**
3-2 North Branford Road
Branford, Connecticut 06405
Phone: (203) 488-0580
Fax: (203) 488-8587

**Steven L. Levine**
Real Estate Consultant

HAND DELIVERED

May 23, 2017

Attorney Melanie Bachman
Acting Executive Director
Connecticut Siting Council
10 Franklin Square
New Britain, Connecticut 06051

**Notice of Exempt Modification: Existing Telecommunications Facility at 6 Shirley Street, Norwalk**

Dear Ms. Bachman:

In order to accommodate technological changes, implement Uniform Mobile Telecommunications System ("UMTS") and/or Long Term Evolution ("LTE") capabilities, and enhance system performance in the State of Connecticut, New Cingular Wireless PCS, LLC ("AT&T") plans to modify the equipment configurations at many of its existing cell sites. Please accept this letter and attachments as notification, pursuant to R.C.S.A. Section 16-50j-73, of construction which constitutes an exempt modification pursuant to R.C.S.A. Section 16-50j-72(b)(2). In compliance with R.C.S.A. Section 16-50j-73, copies of this letter are being sent to the chief elected official and the Planning & Zoning Department of the municipality in which the affected cell site is located, the property owner of record, and the tower owner or operator.

UMTS technology offers services to mobile computer and phone users anywhere in the world. Based on the Global System for Mobile ("GSM") communication standard, UMTS is the planned worldwide standard for mobile users. UMTS, fully implemented, gives computer and phone users high-speed access to the Internet as they travel. They have the same capabilities even when they roam, through both terrestrial wireless and satellite transmissions.

LTE is a high-performance air interface for cellular mobile communications. It is designed to increase the capacity and speed of mobile telephone networks.

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.

The changes to the facility do not constitute modifications as defined in Connecticut General Statutes ("C.G.S.") Section 16-50i(d) because the general physical and environmental characteristics of the site will not be significantly changed or altered. Rather, the planned changes to the facility fall squarely within those activities explicitly provided for in R.C.S.A. Section 16-50j-72(b)(2).

1. The height of the overall structure will not increase.

2. The proposed changes will not extend the site boundaries.

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

4. The changes will not add radio frequency sending or receiving capability which increases the total radio frequency electromagnetic radiation power density measured at the site boundary to or above the standards adopted by the Federal Communications Commission pursuant to Section 704 of the Telecommunications Act of 1996, as amended, and the State Department of Energy and Environmental Protection, pursuant to Section 22a-162 of the Connecticut General Statutes.

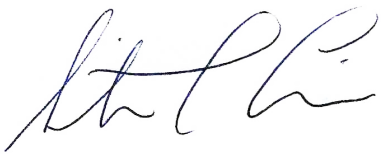
5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.

6. The proposed equipment changes will not impair the structural integrity of the facility, as determined in a certification provided by a professional engineer licensed in Connecticut.

For the foregoing reasons, AT&T respectfully submits that the proposed changes at the referenced site constitute exempt modifications under R.C.S.A. Section 16-50j-72(b)(2).

Please feel free to call me at (860) 830-0380 with questions concerning this matter. Thank you for your consideration.

Sincerely,



Steven L. Levine
Real Estate Consultant

cc: Chief Elected Official, City of Norwalk (by email)
Planning & Zoning Department, City of Norwalk (by email)
Property Owner of Record – CTI Towers Assets II, LLC (by email)
Tower Owner / Operator – CTI Towers Assets II, LLC (by email)

Attachments

**NEW CINGULAR WIRELESS**
**Equipment Modification**

6 Shirley Street, Norwalk
Geographic Coordinates: N 41-06-56 W 73-26-04
Site Number 2138
Ex. Mods. approved 4/98, 9/02, 8/11, and 5/14 (expired)

**Tower Owner/Manager:** CTI Towers Assets II, LLC

**Land Owner of Record:** CTI Towers Assets II, LLC

Please see the attached Norwalk Assessor's card and property map.

**Original Permitting:** According to online FCC tower registration information (Registration #1057290), the subject tower was constructed in or around 1984. Efforts to locate original local zoning documents per the Council's requirement have been unsuccessful. I have personally searched for the original zoning permit in AT&T and Council records, and I have contacted the tower owner CTI Tower Assets asking if they have the permit. Additionally, please refer to the attached email from Jim Bova, Assistant Zoning Officer for the City of Norwalk, stating that no permit for the structure could be located in City records. Accordingly, AT&T respectfully submits that it has performed "due diligence" in this matter and requests that it be relieved of further duty to produce an original zoning approval document.

No condition of approval will be violated by the proposed equipment modifications.

**Lease Area:** Please refer to the attached aerial photograph of the Shirley Street property owned by CTI Tower Assets II, LLC. See also, the attached lease area excerpt from AT&T's 1998 lease and the currently proposed site plan. The CTI Tower Assets property contains three guyed lattice towers used in its radio transmitting operations. The eastern-most tower and several equipment buildings occupy a fenced compound that is wholly-contained within the larger CTI Tower Assets parcel. AT&T's lease area consists of space for one equipment shelter and a

diesel generator within the fenced compound. Since all proposed equipment modifications will take place either on the tower structure or within AT&T's equipment building, the proposed changes will extend neither the existing fenced compound nor the overall site boundaries.

**Equipment Configuration:** 360 ft. Guyed Lattice Tower

**Current and/or Approved:**
Three boom gate antenna mounts @ 75 ft a.g.l.
Nine Celwave APL868013 antennas @ 81 ft c.l.
Six TMA's @ 81 ft
Twelve lines 7/8-inch coax
Equipment Shelter
Diesel Generator on concrete pad

**Planned Modifications:**
Remove all existing antennas and TMA's.
Install six CCI OPA-65R-LCUU-H6 antennas @ 81 ft c.l.
Install three CCI HPA-65R-BUU-H6 antennas @ 81 ft c.l.
Install three CCI TMA's @ 81 ft.
Install three Ericsson RRUS-11 remote radio heads @ 81 ft.
Install three Ericsson RRUS-32 remote radio heads @ 81 ft.
Install three Ericsson RRUS-E2 remote radio heads @ 81 ft.
Install one surge arrestor @ 81 ft.
Install one fiber and two DC power lines to 81 ft.

**Power Density:**

Worst-case calculations with 10 dB reduction for existing wireless operations at the site indicate a radio frequency electromagnetic radiation power density, measured at six feet above ground level beside the tower, of approximately 8.9 % of the standard adopted by the FCC. As depicted in the second table below, the total radio frequency electromagnetic radiation power density following proposed modifications would be approximately 12.4 % of the standard.

**Existing**

| Company | Frequency (MHz) | Antenna (Total for all sectors) | Centerline Ht (feet) | Number of Channels | Power Per Channel (Watts) | Power Density ($mW/cm^2$) | Standard Limits ($mW/cm^2$) | Percent of Limit |
|---|---|---|---|---|---|---|---|---|
| Other Users * | | | | | | | | 6.99 |
| AT&T † | 850 | | 75 | 14 | 100 | 0.1057 | 0.5667 | 1.87 |
| **Total** | | | | | | | | **8.86%** |

* Per CSC records
† Per CSC Records for EM-CING-103-020917 (The approval for EM-CING-103-140415 expired due to non-completion.)

**Proposed**

| Company | Frequency (MHz) | Antenna (Total for all sectors) | Centerline Ht (feet) | Number of Channels | Power Per Channel (Watts) | Power Density ($mW/cm^2$) | Standard Limits ($mW/cm^2$) | Percent of Limit |
|---|---|---|---|---|---|---|---|---|
| Other Users * | | | | | | | | 6.99 |
| AT&T LTE | 740 | CCI - OPA 6 antennas | 81 | 2 | 1476 | 0.1887 | 0.4933 | 3.83 |
| AT&T LTE | 2300 | CCI - OPA 3 antennas | 81 | 1 | 1285 | 0.0822 | 1.0000 | 0.82 |
| AT&T UMTS | 880 | CCI - HPA 3 antennas | 81 | 1 | 325 | 0.0208 | 0.5867 | 0.35 |
| AT&T GSM | 880 | CCI - HPA 3 antennas | 81 | 1 | 325 | 0.0208 | 0.5867 | 0.35 |
| **Total** | | | | | | | | **12.35%** |

* Per CSC records

**Structural information:**

The attached structural analysis demonstrates that the tower will have adequate structural capacity to accommodate the proposed equipment modifications. (Delta Oaks Group, 5/8/17)

# SHIRLEY ST

# Assessor Card

| | | | |
|---|---|---|---|
| **Location** | SHIRLEY ST | **Mblu** | 5/ 58/ 43/ 0/ |
| **Acct#** | 20292 | **Owner** | CTI TOWERS ASSETS II LLC |
| **Assessment** | $1,129,280 | **Appraisal** | $1,613,260 |
| **PID** | 20292 | **Building Count** | 1 |

**Assessing Distr...**

## Current Value

| Appraisal | | | |
|---|---|---|---|
| **Valuation Year** | **Improvements** | **Land** | **Total** |
| 2015 | $673,840 | $939,420 | $1,613,260 |
| **Assessment** | | | |
| **Valuation Year** | **Improvements** | **Land** | **Total** |
| 2015 | $471,690 | $657,590 | $1,129,280 |

## Owner of Record

| | | | |
|---|---|---|---|
| **Owner** | CTI TOWERS ASSETS II LLC | **Sale Price** | $1,062,373 |
| **Co-Owner** | | **Certificate** | |
| **Address** | 38 POND ST SUITE 305 | **Book & Page** | 8425/253 |
| | FRANKLIN, MA 02038 | **Sale Date** | 10/24/2016 |
| | | **Instrument** | |

## Ownership History

| Ownership History | | | | | |
|---|---|---|---|---|---|
| **Owner** | **Sale Price** | **Certificate** | **Book & Page** | **Instrument** | **Sale Date** |
| CTI TOWERS ASSETS II LLC | $1,062,373 | | 8425/253 | | 10/24/2016 |
| CONNOISSEUR MEDIA OF CONNECTICUT LLC | $896,700 | | 7826/111 | | 05/15/2013 |
| COMMODORE MEDIA OF NORWALK INC | $0 | | 3225/304 | 25 | 06/27/1996 |
| C R B OF NORWALK INC | $0 | | 3225/304 | | 06/27/1996 |
| HANSON COMMUNICATIONS INC | $0 | | 0/0 | | |

## Building Information

## Building 1 : Section 1

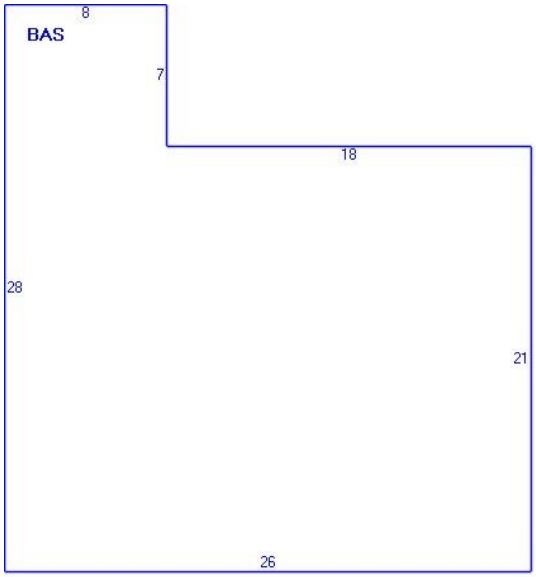
| | |
|---|---|
| **Year Built:** | 1948 |
| **Living Area:** | 602 |
| **Replacement Cost:** | $35,380 |
| **Building Percent Good:** | 61 |
| **Replacement Cost Less Depreciation:** | $21,580 |

| Building Attributes | |
|---|---|
| **Field** | **Description** |
| STYLE | Warehouse |
| MODEL | Industrial |
| Stories: | 1.00 |
| Occupancy | 1.00 |
| Exterior Wall 1 | Concrete |
| Exterior Wall 2 | |
| Roof Structure | Gable |
| Roof Cover | Arch. Shingles |
| Interior Wall 1 | Minimum |
| Interior Wall 2 | |
| Interior Floor 1 | Concrete |
| Interior Floor 2 | |
| Heating Fuel | Gas |
| Heating Type | Forced Air |
| AC Percent | 100 |
| Heat Percent | 100 |
| Bldg Use | Utility |
| Total Rooms | 0 |
| Bedrooms | 0 |
| FBM Area | |
| Heat/AC | Heat/AC Pkg |
| Frame | Masonry |
| Plumbing | Average |
| Foundation | Poured Conc |
| Partitions | Average |
| Wall Height | 7.00 |
| % Sprinkler | 0.00 |

### Building Photo

Building Photo (http://images.vgsi.com/photos/NorwalkCTPhotos//E:\DCIM\100_FUJI/DSCF0300.jpg)

### Building Layout




| Building Sub-Areas (sq ft) | | | Legend |
|---|---|---|---|
| **Code** | **Description** | **Gross Area** | **Living Area** |
| BAS | First Floor | 602 | 602 |
| | | 602 | 602 |

## Extra Features

| Extra Features | Legend |
|---|---|
| No Data for Extra Features | |

## Land

### Land Use

| | |
|---|---|
| **Use Code** | 401 |
| **Description** | Utility |
| **Zone** | B |
| **Neighborhood** | C344 |

### Land Line Valuation

| | |
|---|---|
| **Size (Acres)** | 6.39 |
| **Frontage** | |
| **Depth** | |
| **Assessed Value** | $657,590 |
| **Appraised Value** | $939,420 |

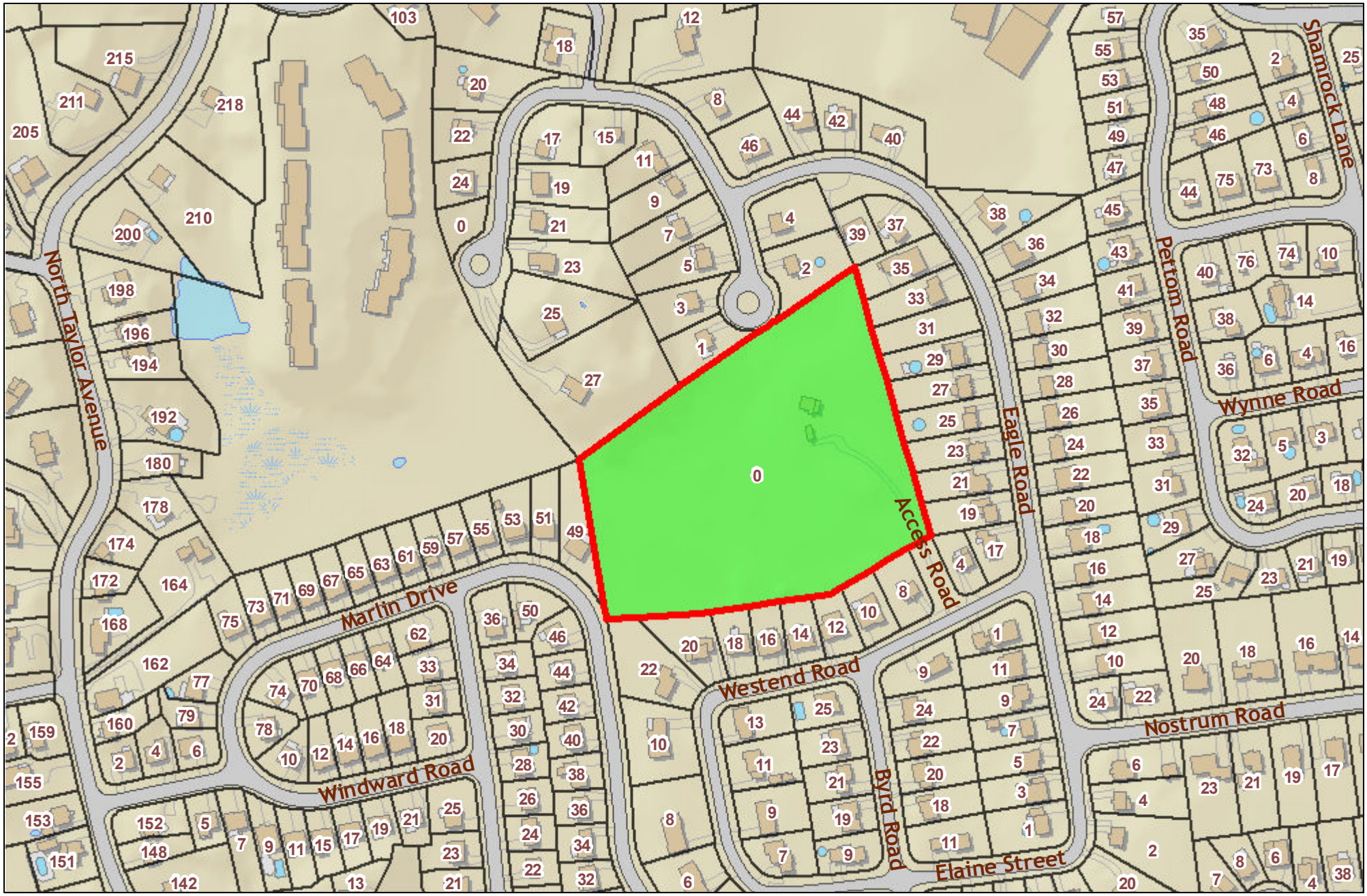
## Outbuildings

| Outbuildings | | | | | | Legend |
|---|---|---|---|---|---|---|
| **Code** | **Description** | **Sub Code** | **Sub Description** | **Size** | **Value** | **Bldg #** |
| FN6 | Fence 6' | | | 2700.00 L.F. | $18,900 | 1 |
| SHD4 | Cell Equip | FR | Frame | 260.00 S.F. | $13,000 | 1 |
| SHD4 | Cell Equip | FR | Frame | 180.00 S.F. | $9,000 | 1 |
| CELL | Cell Site Carrier | | | 3.00 UNITS | $240,000 | 1 |
| CELL | Cell Site Carrier | | | 12.00 UNITS | $45,360 | 1 |
| ANTS | Self Sup Tower | | | 1.00 L.F. | $326,000 | 1 |

## Valuation History

| Appraisal | | | |
|---|---|---|---|
| **Valuation Year** | **Improvements** | **Land** | **Total** |
| 2015 | $673,840 | $939,420 | $1,613,260 |
| 2014 | $302,480 | $939,420 | $1,241,900 |
| 2013 | $302,480 | $939,420 | $1,241,900 |

| Assessment | | | |
|---|---|---|---|
| **Valuation Year** | **Improvements** | **Land** | **Total** |
| 2015 | $471,690 | $657,590 | $1,129,280 |
| 2014 | $211,740 | $657,590 | $869,330 |
| 2013 | $211,740 | $657,590 | $869,330 |




# Assessor Map - 6 Shirley Street, Norwalk

N
W E
S

Feet
0 225 450 900

1 inch = 331 feet

SEAL OF THE CITY OF NORWALK · E PLURIBUS UNUM · INCORPORATED 1913

# Antenna Structure Registration

FCC Registration



ASR Registration Search

## Registration 1057290

HELP

New Search | Return to Results | Printable Page | Reference Copy | Map Registration

### Registration Detail

| | | | |
|---|---|---|---|
| Reg Number | 1057290 | Status | Constructed |
| File Number | A1047810 | Constructed | 01/01/1984 |
| EMI | No | Dismantled | |
| NEPA | No | | |

### Antenna Structure

Structure Type TOWER - Free standing or Guyed Structure used for Commu

**Location** (in NAD83 Coordinates - Convert to NAD27)

| | | | |
|---|---|---|---|
| Lat/Long | 41-06-56.0 N 073-26-04.0 W | Address | 6 SHIRLEY ST |
| City, State | NORWALK , CT | | |
| Zip | 06850 | County | FAIRFIELD |
| Center of AM Array | | Position of Tower in Array | |

### Heights (meters)

| Elevation of Site Above Mean Sea Level | Overall Height Above Ground (AGL) |
|---|---|
| 35.0 | 114.0 |
| **Overall Height Above Mean Sea Level** | **Overall Height Above Ground w/o Appurtenances** |
| 149.0 | 102.0 |

### Painting and Lighting Specifications

FCC Paragraphs 1, 3, 12, 21

### FAA Notification

| | | | |
|---|---|---|---|
| FAA Study | 2004-ANE-508-OE | FAA Issue Date | 06/30/2004 |

### Owner & Contact Information

| | | | |
|---|---|---|---|
| FRN | 0022509178 | Owner Entity Type | Limited Liability Company |
| Assignor FRN | 0022419329 | Assignor ID | L01787809 |

### Owner

CTI Towers Assets II, LLC
Attention To: Loren Stearns
38 Pond Street

P: (508)440-5780
F: (508)440-5765
E: lstearns@ctitowers.com

# E-Mail from the Norwalk Planning & Zoning Department

## Zoning Permit Not Found in Records

**From:** "Bova, Jim" <jbova@norwalkct.org>
**To:** "'sllevine@snet.net'" <sllevine@snet.net>
**Sent:** Thursday, November 10, 2016 3:26 PM
**Subject:** 6 Shirley St

Steve,

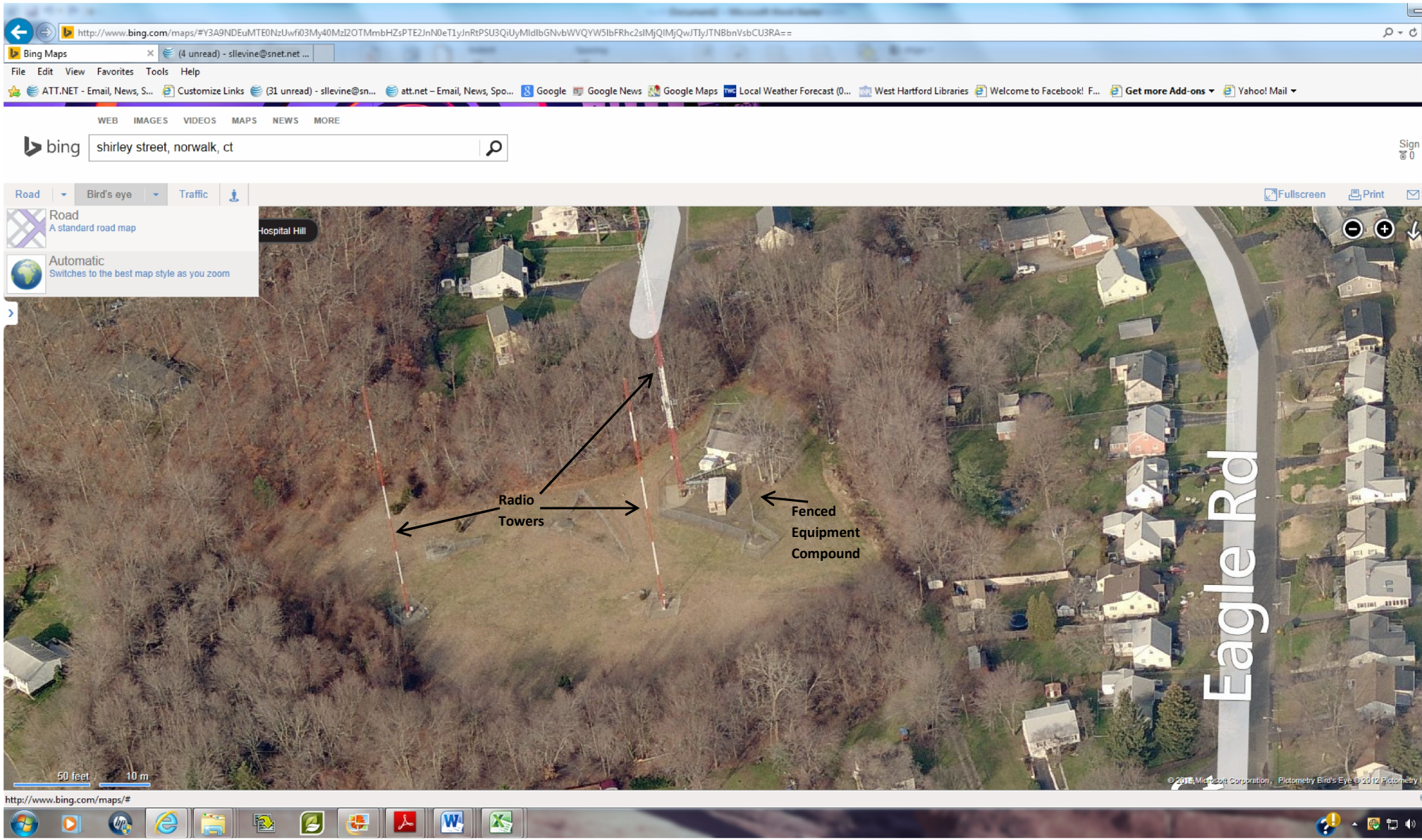
We spoke today concerning permit information for a Telecom Tower located on 6 Shirley St. I was not able to find a permit for this work within the 1959, 1972, 1980s or the present day field card. While there was reference to this tower being located on the parcel, a permit number was not found. If you have any further questions feel free to contact me.

-Jim Bova

Assistant Zoning Officer

City of Norwalk

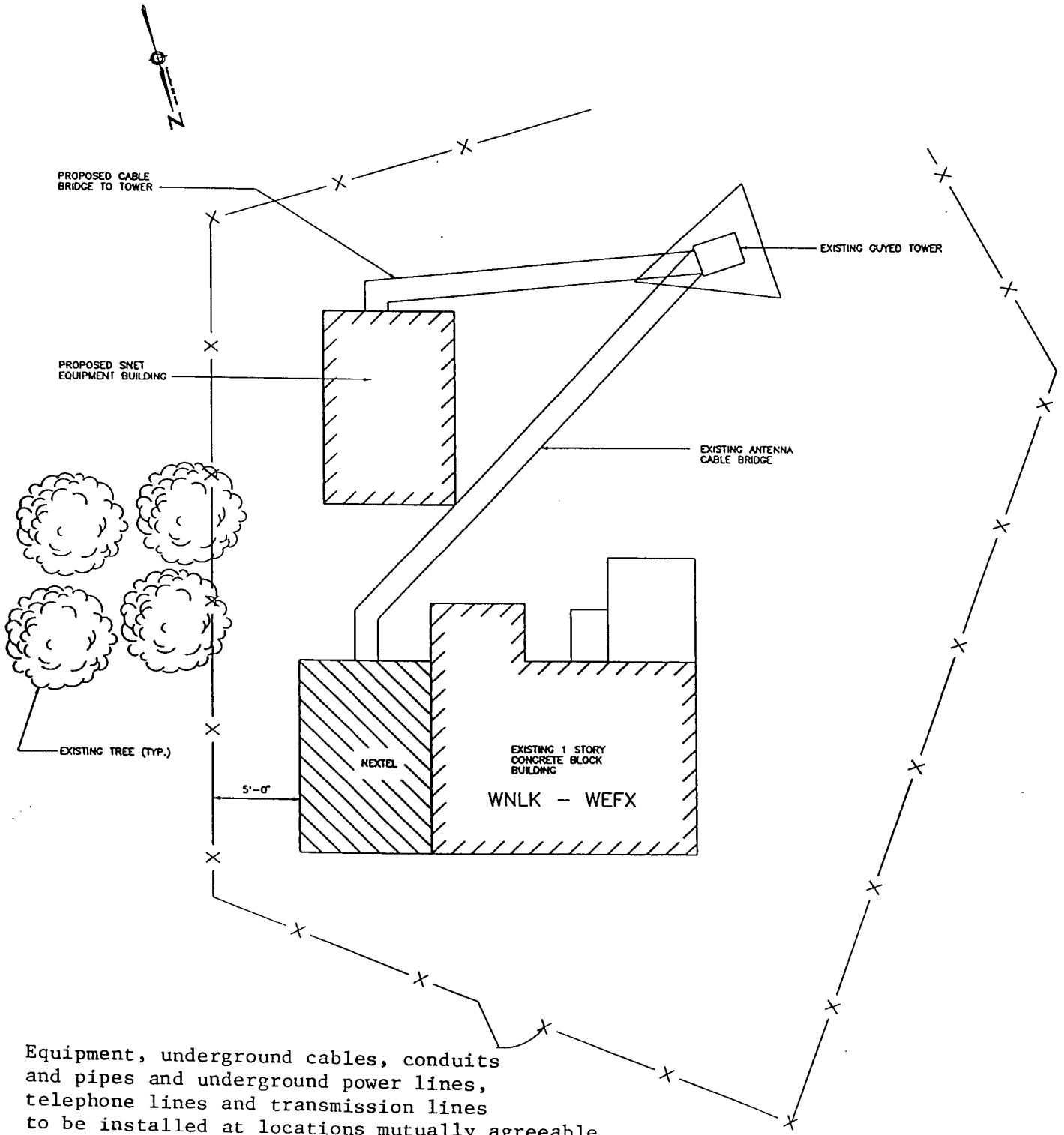
Planning and Zoning




CTI Towers Property
Shirley Street, Norwalk

# Schedule 1.3

To be attached to and become a part of that certain Lease Agreement by and between Commodore Media of Norwalk, Inc., Lessor, and Springwich Limited Partnership, Lessee, Dated: March 20, 1998.




Equipment, underground cables, conduits and pipes and underground power lines, telephone lines and transmission lines to be installed at locations mutually agreeable to Lessor and Lessee.

1 / SK-1 PARTIAL SITE PLAN
SCALE: N.T.S.

## PROJECT INFORMATION

| | |
|---|---|
| SCOPE OF WORK: | TELECOMMUNICATIONS FACILITY UPGRADE (LTE – PROJECT 2017): |
| SITE ADDRESS: | SHIRLEY STREET<br>NORWALK, CT 06850 |
| LATITUDE: | 41.11552° N 41° 6' 55.87" N |
| LONGITUDE: | 73.43436° W 73° 26' 3.7" W |
| TYPE OF SITE: | GUYED TOWER / EQUIPMENT SHELTER |
| OVERALL TOWER HEIGHT: | 360'–0"± |
| RAD CENTER: | 81'–6"± |
| CURRENT USE: | TELECOMMUNICATIONS FACILITY |
| PROPOSED USE: | TELECOMMUNICATIONS FACILITY |
| JURISDICTION: | NATIONAL, STATE & LOCAL CODES OR ORDINANCES |

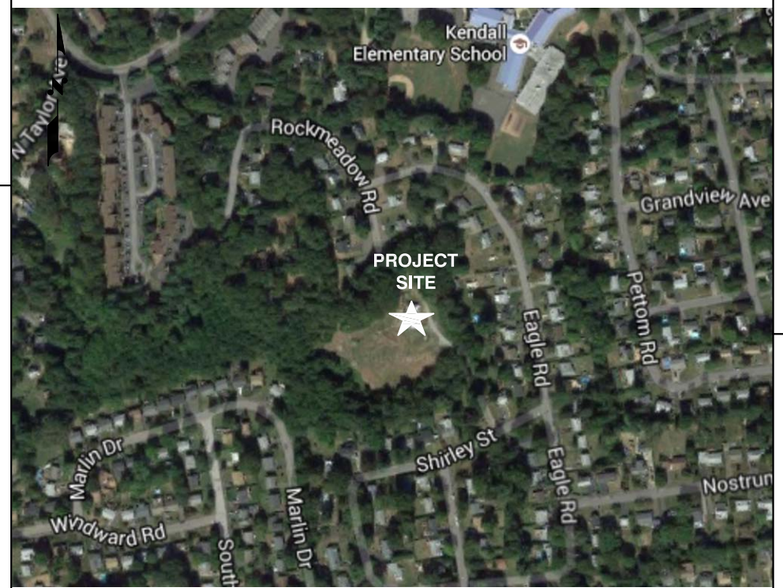
# SITE NUMBER: CT2138
# SITE NAME: NORWALK WNLK
# PROJECT: LTE 2016 UPGRADE

## DRAWING INDEX



## VICINITY MAP

DIRECTION TO SITE:
HEAD NORTHEAST ON ENTERPRISE DR TOWARD CAPITAL BLVD. 0.3 MILES. TURN LEFT AT CAPITAL BLVD. 0.3 MILES. TURN LEFT AT WEST ST. 0.3 MILES. TURN LEFT TO MERGE ONTO I–91 S TOWARD NEW HAVEN. 9.6 MILES. TAKE EXIT 17 FOR CT–15 S/W CROSS PKWY. 0.4 MILES. MERGE ONTO CT–15 S. 29.8 MILES. TAKE EXIT 52 FOR STATE ROUTE 108 S/STATE ROUTE 8 S TOWARD BRIDGEPORT. 0.7 MILES. FOLLOW SIGNS FOR CT–8 S/BRIDGEPORT AND MERGE ONTO CT–8 S/STATE ROUTE 8 S. 5.3 MILES. KEEP RIGHT AT THE FORK, FOLLOW SIGNS FOR I–95 S/N.Y. CITY AND MERGE ONTO I–95 S. 14.2 MILES. TAKE EXIT 14 FOR US–1/CONNECTICUT AVE. 0.2 MILES. TURN RIGHT AT US–1 N/CONNECTICUT AVE. 0.3 MILES. TURN LEFT AT FERRIS AVE. 0.5 MILES. TURN LEFT AT BENEDICT ST. 253 FT. TAKE THE 1ST RIGHT ONTO BYRD RD. 0.2 MILES. TURN RIGHT AT SHIRLEY ST. 194 FT. TAKE THE 1ST LEFT TO STAY ON SHIRLEY ST. 125 FT.




## 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 REPRESENTATIVE IN WRITING OF DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.

CALL

BEFORE YOU DIG

CALL TOLL FREE 800–922–4455

UNDERGROUND SERVICE ALERT


Hudson Design Group LLC
1600 OSGOOD STREET
BUILDING 20 NORTH, SUITE 3090
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

SAI
27 NORTHWESTERN DR.
SALEM, NH 03079


**SITE NUMBER: CT2138**
**SITE NAME: NORWALK WNLK**
SHIRLEY STREET
NORWALK, CT 06850
FAIRFIELD COUNTY


at&t
550 COCHITUATE ROAD
FRAMINGHAM, MA 01701


| NO. | DATE | REVISIONS | BY | CHK | APP'D |
|---|---|---|---|---|---|
| 6 | 02/16/17 | ISSUED FOR CONSTRUCTION | EB | AT | DPH |
| 5 | 01/25/17 | REVISED PER COMMENTS | AN | AT | DPH |
| 4 | 01/11/17 | REVISED PER NEW RFDS | AN | AT | DPH |
| 3 | 02/04/16 | ISSUED FOR CONSTRUCTION | EB | AT | DPH |
| 2 | 11/04/14 | REVISED FOR REVIEW | SG | AT | DPH |

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

STATE OF CONNECTICUT — DEREK J. ASSELIN — No. 27857 — LICENSED PROFESSIONAL ENGINEER

AT&T

TITLE SHEET (LTE)

| JOB NUMBER | DRAWING NUMBER | REV |
|---|---|---|
| CT2138 | T–1 | 6 |

NOTE:

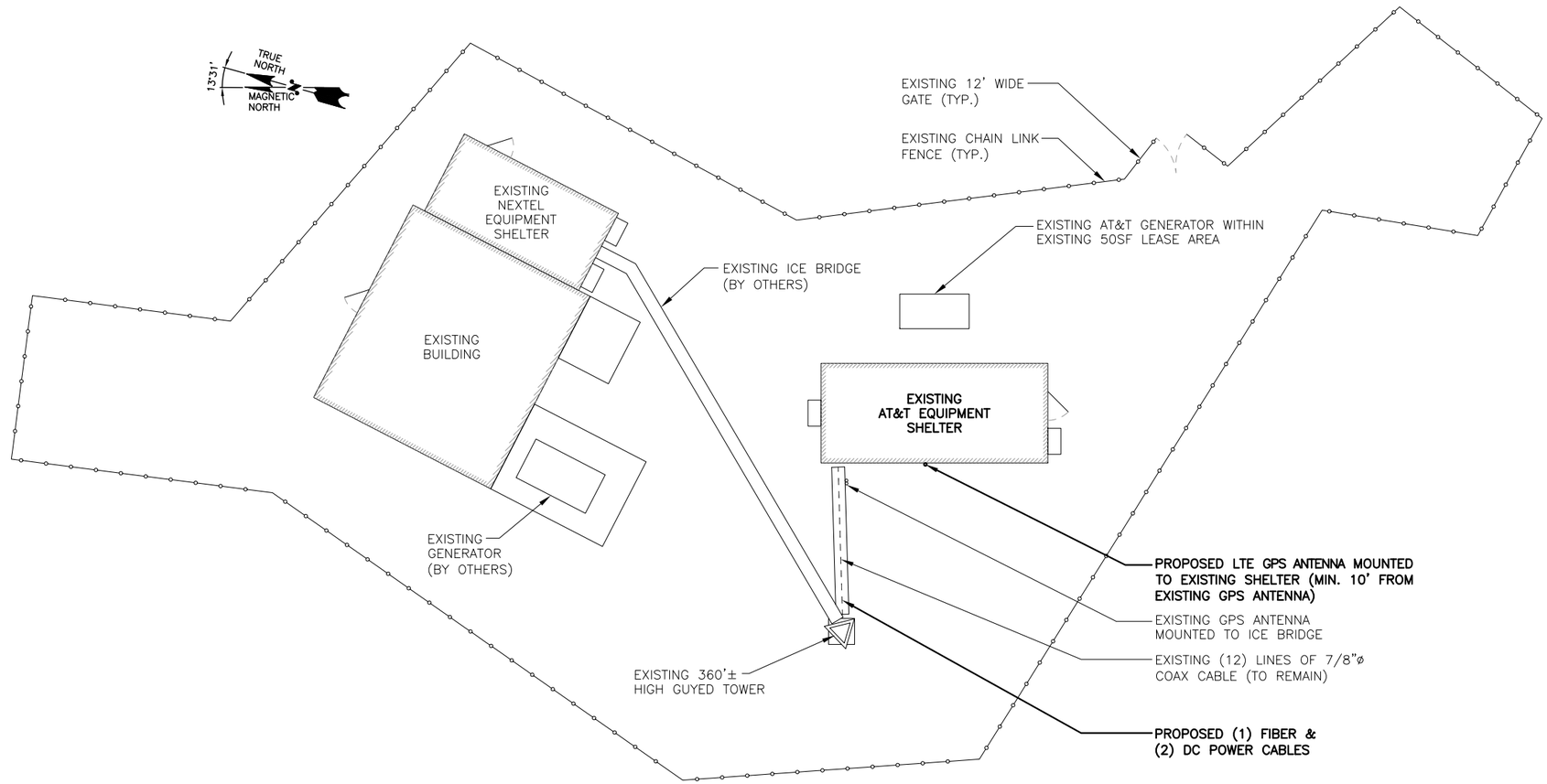
REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.

NOTE:

AN ANALYSIS FOR THE CAPACITY OF THE EXISTING **ANTENNA MOUNT** TO SUPPORT THE PROPOSED LOADING HAS BEEN COMPLETED BY:
HUDSON DESIGN GROUP, LLC.
DATED: APRIL 26, 2016.

NOTE:

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




**COMPOUND PLAN** (1 / A-1)
22x34 SCALE: 1/8"=1'-0"
11x17 SCALE: 1/16"=1'-0"

0 4'-0" 8'-0" 16'-0" 24'-0"


Hudson Design Group LLC
1600 OSGOOD STREET
BUILDING 20 NORTH, SUITE 3090
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

SAI
27 NORTHWESTERN DR.
SALEM, NH 03079


**SITE NUMBER: CT2138**
**SITE NAME: NORWALK WNLK**
SHIRLEY STREET
NORWALK, CT 06850
FAIRFIELD COUNTY


at&t
550 COCHITUATE ROAD
FRAMINGHAM, MA 01701


| NO. | DATE | REVISIONS | BY | CHK | APP'D |
|---|---|---|---|---|---|
| 6 | 02/16/17 | ISSUED FOR CONSTRUCTION | EB | AT | DPH |
| 5 | 01/25/17 | REVISED PER COMMENTS | AN | AT | DPH |
| 4 | 01/11/17 | REVISED PER NEW RFDS | AN | AT | DPH |
| 3 | 02/04/16 | ISSUED FOR CONSTRUCTION | EB | AT | DPH |
| 2 | 11/04/14 | REVISED FOR REVIEW | SG | AT | DPH |

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

STATE OF CONNECTICUT
DEREK J. CREASER
No. 23551
LICENSED PROFESSIONAL ENGINEER

AT&T

COMPOUND PLAN (LTE)

| JOB NUMBER | DRAWING NUMBER | REV |
|---|---|---|
| CT2138 | A-1 | 6 |

NOTE:

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

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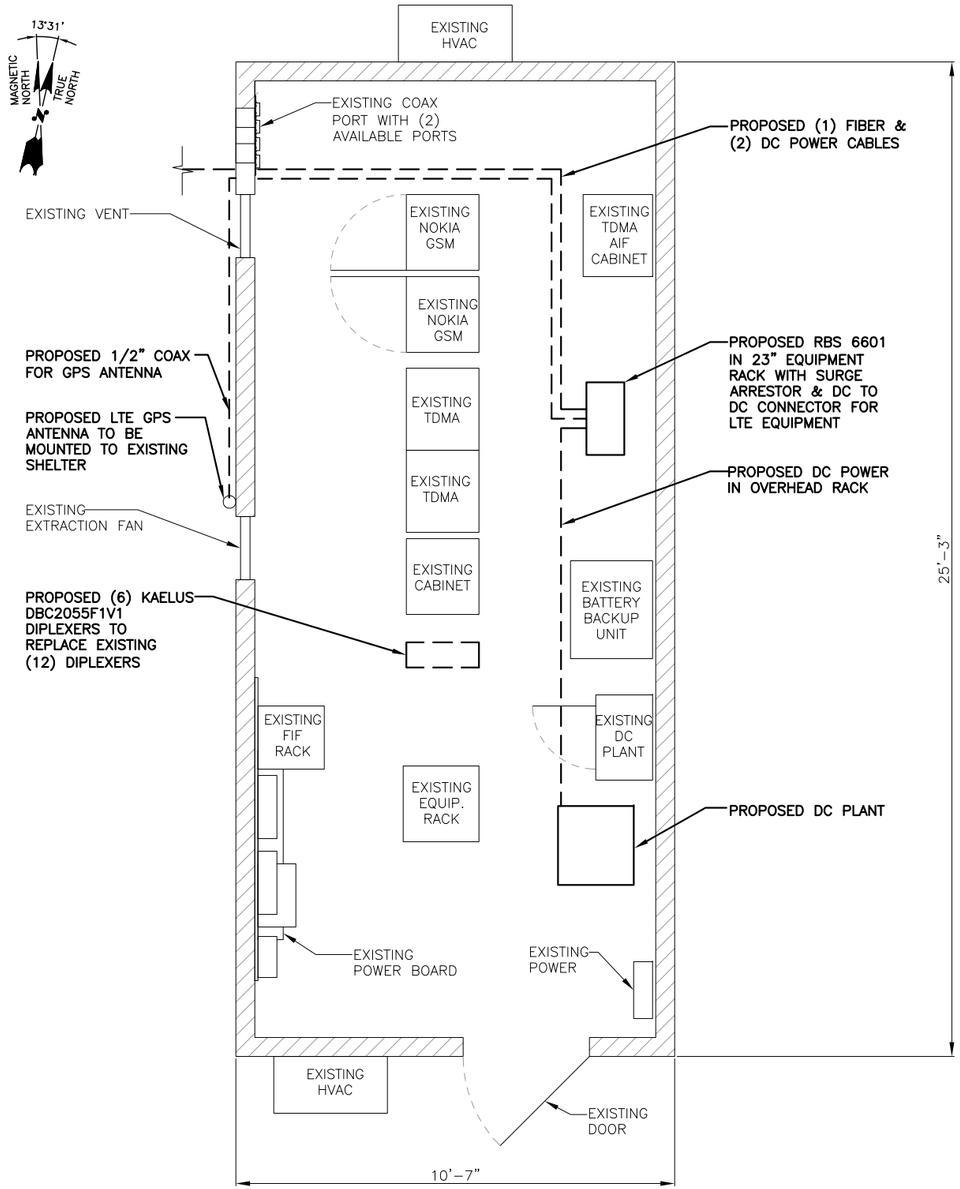
HUDSON DESIGN GROUP, LLC.
DATED: APRIL 26, 2016.




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

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


Hudson Design Group LLC
1600 OSGOOD STREET
BUILDING 20 NORTH, SUITE 3090
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

SAI
27 NORTHWESTERN DR.
SALEM, NH 03079


**SITE NUMBER: CT2138**
**SITE NAME: NORWALK WNLK**
SHIRLEY STREET
NORWALK, CT 06850
FAIRFIELD COUNTY


at&t
550 COCHITUATE ROAD
FRAMINGHAM, MA 01701


| NO. | DATE | REVISIONS | BY | CHK | APP'D |
|---|---|---|---|---|---|
| 6 | 02/16/17 | ISSUED FOR CONSTRUCTION | EB | AT | DPH |
| 5 | 01/25/17 | REVISED PER COMMENTS | AN | AT | DPH |
| 4 | 01/11/17 | REVISED PER NEW RFDS | AN | AT | DPH |
| 3 | 02/04/16 | ISSUED FOR CONSTRUCTION | EB | AT | DPH |
| 2 | 11/04/14 | REVISED FOR REVIEW | SG | AT | DPH |

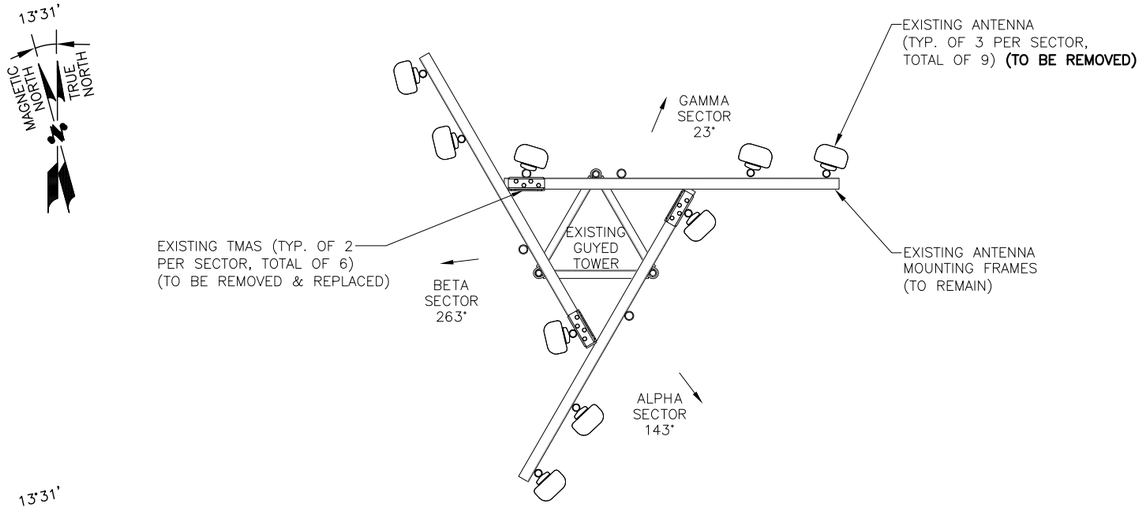
SCALE: AS SHOWN | DESIGNED BY: AT | DRAWN BY: JA

STATE OF CONNECTICUT · DEREK J. CREASER · No. 27858 · LICENSED PROFESSIONAL ENGINEER

AT&T

EQUIPMENT PLAN (LTE)

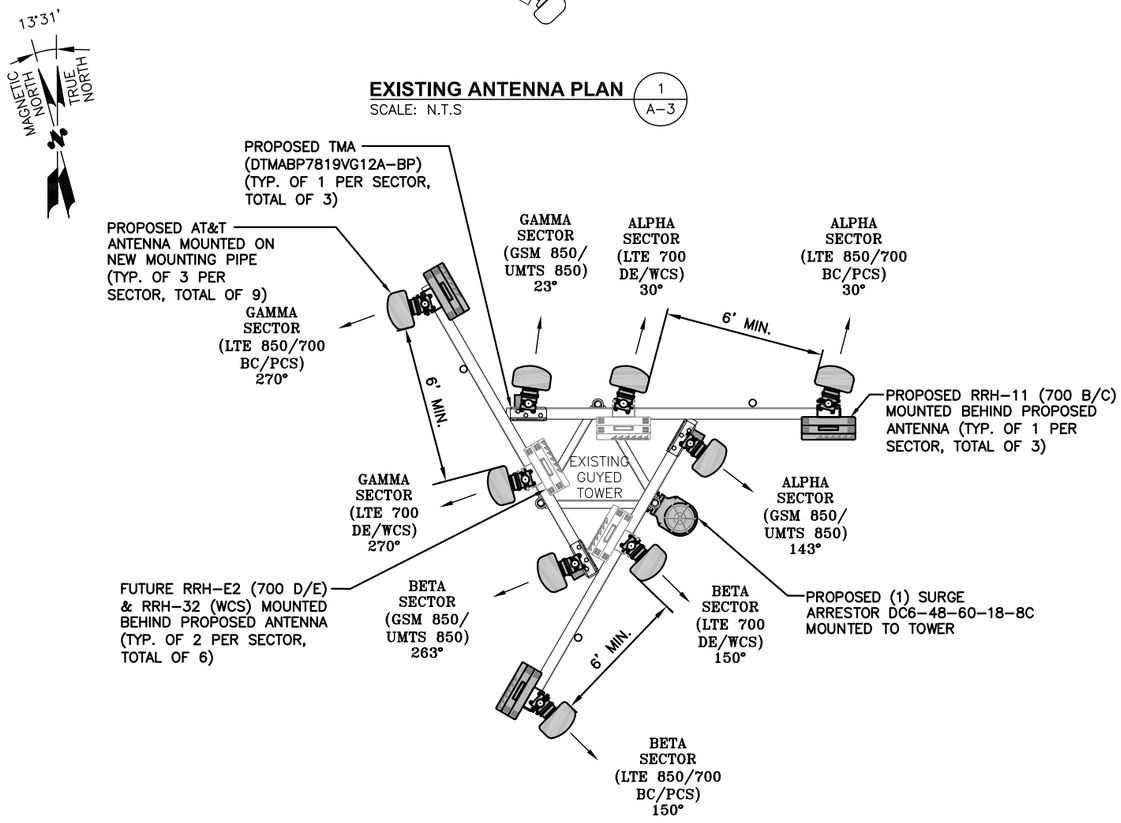
| JOB NUMBER | DRAWING NUMBER | REV |
|---|---|---|
| CT2138 | A-2 | 6 |




## EXISTING ANTENNA PLAN

1 / A-3

SCALE: N.T.S




## PROPOSED ANTENNA PLAN

2 / A-3

SCALE: N.T.S

NOTE:

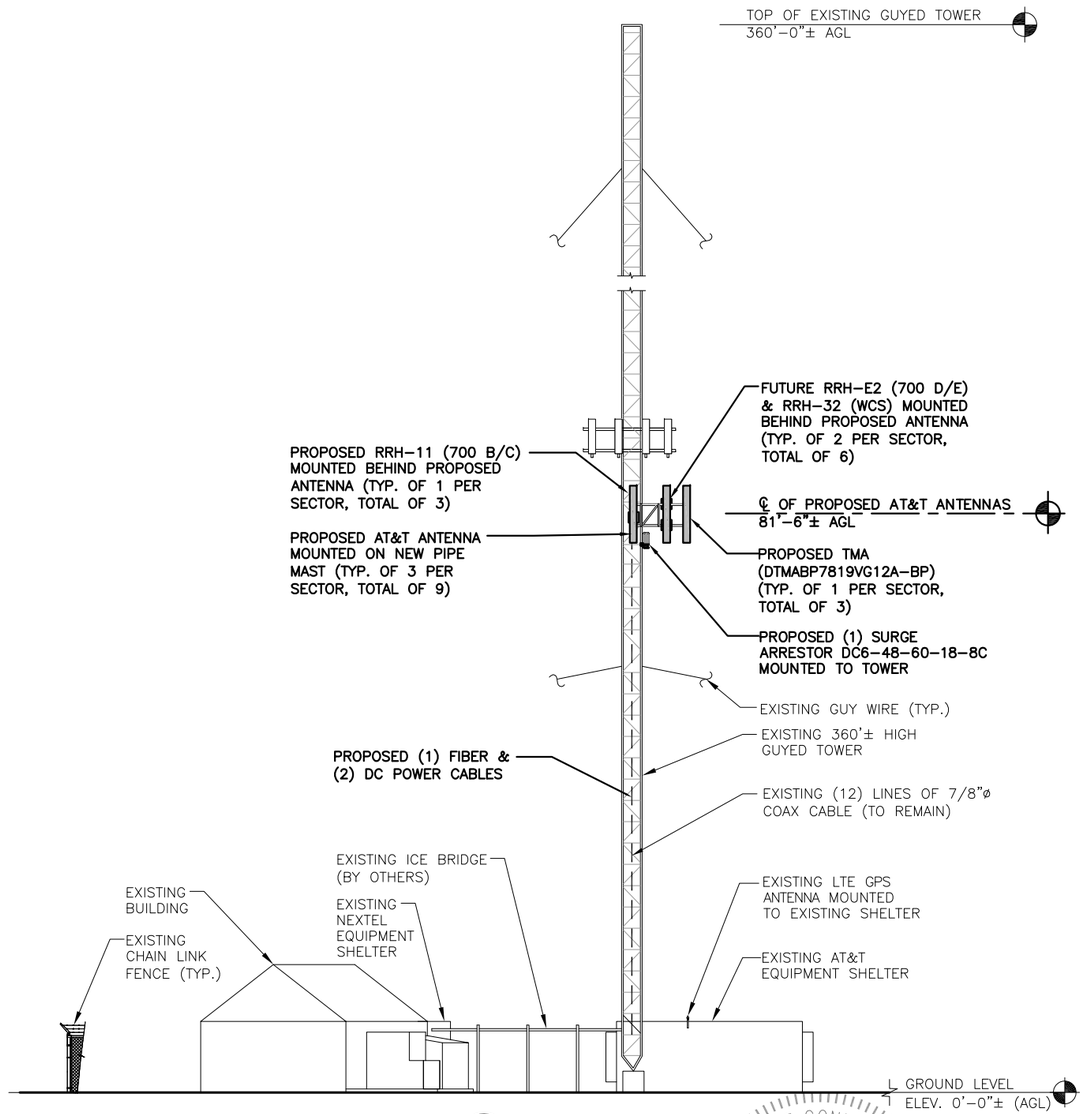
AN ANALYSIS FOR THE CAPACITY OF THE EXISTING STRUCTURES TO SUPPORT THE PROPOSED EQUIPMENT SHALL BE DETERMINED PRIOR TO CONSTRUCTION.

NOTE:

AN ANALYSIS FOR THE CAPACITY OF THE EXISTING **ANTENNA MOUNT** TO SUPPORT THE PROPOSED LOADING HAS BEEN COMPLETED BY: HUDSON DESIGN GROUP, LLC. DATED: APRIL 26, 2016.

NOTE:

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




## WEST ELEVATION

3 / A-3

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

0 5'-4" 10'-8" 21'-4" 32'-0"

Hudson Design Group LLC
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N. ANDOVER, MA 01845
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SAI
27 NORTHWESTERN DR.
SALEM, NH 03079

**SITE NUMBER: CT2138**
**SITE NAME: NORWALK WNLK**
SHIRLEY STREET
NORWALK, CT 06850
FAIRFIELD COUNTY

at&t
550 COCHITUATE ROAD
FRAMINGHAM, MA 01701

| NO. | DATE | REVISIONS | BY | CHK | APP'D |
|---|---|---|---|---|---|
| 6 | 02/16/17 | ISSUED FOR CONSTRUCTION | EB | AT | DPH |
| 5 | 01/25/17 | REVISED PER COMMENTS | AN | AT | DPH |
| 4 | 01/11/17 | REVISED PER NEW RFDS | AN | AT | DPH |
| 3 | 02/04/16 | ISSUED FOR CONSTRUCTION | EB | AT | DPH |
| 2 | 11/04/14 | REVISED FOR REVIEW | SG | AT | DPH |

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

STATE OF CONNECTICUT · ROBERT J. CREASER · No. 23557 · LICENSED PROFESSIONAL ENGINEER

AT&T

ANTENNA LAYOUT AND ELEVATION (LTE)

| JOB NUMBER | DRAWING NUMBER | REV |
|---|---|---|
| CT2138 | A-3 | 6 |

**PASS**
(Legs, 97% capacity)

**May 8, 2017**

**Christine Cooper**
CTI Towers
38 Pond Street, Suite 305
Franklin, MA

| | |
|---|---|
| ***Subject*** | **Rigorous Structural Analysis** |
| ***Carrier Designation*** | **AT&T, Reconfiguration**<br>**Site Number: CT2138 / FA 10049148**<br>**Site Name: Norwalk-WNLK** |
| ***CTI Towers Designation*** | **Site Number: 52010**<br>**Site Name: Norwalk 1** |
| ***Engineering Firm Designation*** | **Delta Oaks Group Project Number: STR17-00909-02**<br>**Delta Oaks Group Site Number: 07-00079** |
| ***Site Data*** | **Shirley Street, Norwalk (Fairfield County), CT 06850**<br>**Latitude N 41° 6' 56.001" Longitude W 73° 26' 3.9978"**<br>**Elevation: 117-ft±, Topography Category: 1; Site Class "D"**<br>**Exposure Category: "B"; Structure Class/Risk Category II;**<br>**341.5-ft Guyed Mast** |

Dear Ms. Cooper,

To your request, we present our rigorous structural analysis. Our work indicates that with the proposed appurtenance configuration, the tower and foundation **will** satisfy the structural strength requirements of *ANSI/TIA-222-G-2-2009* / *2012 International Building Code* / *2016 Connecticut State Building Code (CSBC)* for:

- $V_{ult}$ = 119-mph / $V_{asd}$ = 92-mph three-second gust basic wind speed [per Eqn. 16-33 of the 2012 IBC]
- 50-mph three-second gust basic wind speed with 0.75-in radial ice
- Earthquake design parameters and loading, per USGS Ground Motion Parameter Calculator and industry standard, respectively, including:
  - $S_s$ = 0.235g, $S_1$ = 0.068g

We trust you find our work satisfactory. Please do not hesitate to call should you have any questions.

Sincerely,

Michael L. Lassiter, SE, PE
Chief Structural Engineer
CT PE License 25064

STATE OF CONNECTICUT
MICHAEL L. LASSITER
No. 25064
LICENSED PROFESSIONAL ENGINEER
May 8, 2017

**Table 1: Existing, Proposed and Reserved Appurtenance Configuration**

| Elevation (AGL, ft) | Carrier [Status] | Mount [Location] | Equipment | Coax | Location |
|---|---|---|---|---|---|
| 330 | Fox [Existing] | Direct Mount [Mast] | (1) Shively 6810 Broadcast Antenna | (1) 1-5/8" | Leg A |
| 303 | Fox [Existing] | Pipe Mount 2.38" Ø x 5' [Leg B] | (1) Scala 3' x 5.5' Grid Dish | (1) 7/16" | Leg C |
| 290 | Fox [Existing] | Standoff - 5.5' [Leg C] | (1) 10" x 8" x 4.25" Box<br>(1) 7.5" Ø x 3.5' Omni | (1) 3/8"<br>(1) 7/8" | Face B<br>Leg B |
| 290 | Fox | Direct Mount [Leg A] | (1) 2.36" Ø x 20' (4) Element Dipole | (1) 7/8" | Leg B |
| 280 | Fox [Existing] | Standoff - 15" [Leg B] | (1) Andrew DB413-B | (1) 1-5/8" | Leg B |
| 260 | Fox [Existing] | Direct Mount [Leg A] | (1) 25' x 1.62" Ø Broadcast Antenna | (1) 1-5/8" | Leg A |
| 246 | Fox [Existing] | Standoff - 3.5' [Leg A] | (1) 2.3" Ø x 20' Omni | (1) 7/8" | Leg C |
| 245 | Fox [Existing] | Standoff - 3' [Leg B] | (1) 2.3" Ø x 20' Omni | (1) 7/8" | Face C |
| 223 | CTI [Existing] | Direct Mount [Leg A&C] | (2) TWR L-810 Lights | Conduit | Face C |
| 183 | CTI [Existing] | Direct Mount [Leg B] | (1) 26.5" x 15" Conduit Box | (1) 7/16" | Leg C |
| 169 | Fox [Existing] | Direct Mount [Leg B] | (1) 10" x 10" x 1.25" Detuner Box | (1) 7/16" | Leg B |
| 145.5 | Fox [Existing] | Direct Mount [Leg A] | (1) 14.875"x15.125"x0.5" Flat Panel | (1) 1/4" | Leg C |
| 141 | Fox [Existing] | Pipe Mount 2.38" Ø x 3.5' [Leg C] | (1) 4' Grid Dish | (1) 7/8" | Leg B |
| 135 | CTI [Existing] | Direct Mount [Leg A&C] | (2) TWR L-810 Lights | Conduit | Face C |
| 104.5 | Verizon [Existing] | (3) Sector Mounts 3' x 12.5' | (1) RFS 19" x 15" x 10.5" Squid | (2) 1-1/4" | Face C |
| 104 | | | (1) RFS 19" x 15" x 10.5" Squid | | |
| 102.5 | | | (6) CSS X7C-FRO-660-VR0<br>(6) Antel WWX063X19G00<br>(1) RFS 25" x 12" x 8.25" Radio<br>(1) RFS 16.5" x 17" x 10.25" Radio | | |
| 81.5 | ***AT&T [Proposed]*** | (3) 9' Face Mounts | ***(3) CCI HPA-65R-BUU-H6<br>(6) CCI OPA-65R-LCUU-H6<br>(3) CCI DTMABP7819VG12A<br>(3) Ericsson RRUS-11<br>(3) Ericsson RRUS-32<br>(3) Ericsson RRUS-E2<br>(1) Raycap DC6-48-60-18-8C*** | ***(3) 7/8"<br>(1) 10mm Fiber<br>(2) 0.795" DC Power*** | ***Face B*** |
| 80.5 | AT&T [Existing] | | -- | (9) 7/8" | Face B<br>Leg C |
| | AT&T [To Remove] | | (9) RFS APL868013-42T4 | -- | -- |

**Table 1: Existing, Proposed and Reserved Appurtenance Configuration (Continued)**

| Elevation (AGL, ft) | Carrier [Status] | Mount [Location] | Equipment | Coax | Location |
|---|---|---|---|---|---|
| 33 | Fox [Existing] | Direct Mount [Leg B] | (1) 26.5" x 15" Conduit Box | (1) 7/16" | Leg B |
| 8.5 | Fox [Existing] | Direct Mount [Face AB] | (1) 15" x 15" x 6.5" Detuner Box | (1) 7/16" | Leg B |

**Table 2: Serviceability Requirements: Limit State Deformations[1]**

| Elevation (AGL, ft) | Equipment | Twist (deg)[2] | Sway (deg)[2] | Deflection (in) | Deflection Limit (in)[3] | Result |
|---|---|---|---|---|---|---|
| 341.5 | Structure | 0.0682 | 0.3333 | 3.7370 | 122.94 | O. K. |

1. See program output for supporting details.
2. Per TIA-222-G Section 2.8.2.1 rotation about the vertical axis (twist) or any horizontal axis (sway) of the structure shall not exceed 4 degrees.
3. Per TIA-222-G Section 2.8.2.2 horizontal displacement shall not exceed 3% of the height of the structure.

**Table 3: Tower Structure Results Summary, Percent Capacity Utilized[1]**

| Component | Percent Capacity | Result |
|---|---|---|
| Pole | 49 | O. K. |
| **Legs** | **97** | **O. K.** |
| Diagonals | 84 | O. K. |
| Horizontals | 57 | O. K. |
| Secondary-Horizontals | 24 | O. K. |
| Girts | 3 | O. K. |
| Guy Wires | 48 | O. K. |
| Bolt Checks | 84 | O. K. |

1. Detailed results and capacities available in the TNX Tower output attached. Percent utilized less than 105% is considered acceptable.
2. Material properties were assumed:
    a. Leg members: A572-50
    b. Pole Structure: A53 Gr. B
    c. Bracing: Pipes-A500 Gr. B; Angles-A36
    d. Bolts: A325

**Table 4: Foundation Results, Percent Capacity Utilized**

| Component | Percent Utilized | Result |
|---|---|---|
| Mast – Stability | 11 | O. K. |
| Inner Anchors – Stability | 26 | O. K. |
| Outer Anchors – Stability | 28 | O. K. |

1. Foundation rebar information not available at time of analysis.
2. Lower anchor block analyzed as connected to anchor shaft through original upper anchor blocks based on information obtained from tower owner.

**ASSUMPTIONS**

This rigorous 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. Delta Oaks Group ("DOG") 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 based on industry standards.
2. The antenna configuration is as supplied 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. Some assumptions are made regarding antennas and mount sizes and their projected areas based on best interpretation of data supplied and of best knowledge of antenna type and industry practice.
4. 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.
5. The soil parameters are as per data supplied or as assumed and stated in the calculations.
6. Foundations are properly designed and constructed to resist the original design loads indicated in the documents provided.
7. The tower and structures have been properly maintained in accordance with TIA Standards and/or with manufacturer's specifications.
8. All welds and connections are assumed to develop at least the member capacity unless determined otherwise and explicitly stated in this report.
9. All prior structural modifications are assumed to be as per data supplied/available and to have been properly installed.
10. Loading interpreted from photos is accurate to ±5' AGL, antenna size accurate to ±3.3 sf, and coax equal to the number of existing antennas without reserve.
11. Documents reviewed and used in this structural analysis were provided by CLIENT.
12. The proposed coax shall be installed per the attached coax layout plan, Sheet QP-P.
13. Leg A is determined per best industry practice.

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

**DISCLAIMER OF WARRANTIES**

Delta Oaks Group ("DOG") has not performed a detailed 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 DOG in connection with this Rigorous Structural Analysis are limited to a computer analysis of the tower structure and theoretical capacity of its main structural members. All tower components have been assumed to only resist dead loads when no other loads are applied. 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.

DOG 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. DOG 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 rigorous 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 specified code recommended 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 DOG, 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.

DOG makes no warranties, expressed and/or implied, in connection with this report and disclaim any liability arising from material, fabrication, and erection of this tower. DOG 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 DOG pursuant to this report will be limited to the total fee received for preparation of this report.

**Attachments:**

- Document Research Report
- Feed Line Plan
- Program input and output – Wind
- Foundation Calculations
- Tenant application

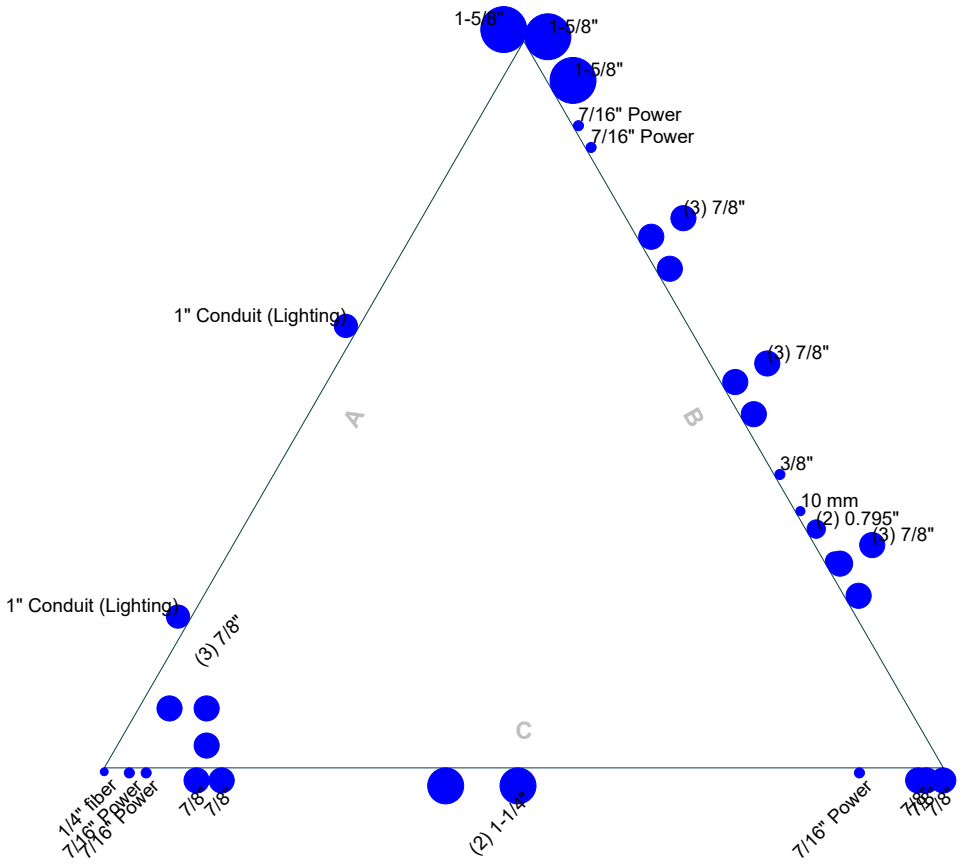
# Document Research Report

**Delta Oaks Group Project #: STR17-00909-02**
**Site Number: 52010**
**Site Name: Norwalk**

| Doc ID | Document Name | Issued By | Issued To | Issue Date | Description |
|---|---|---|---|---|---|
| 17-00909.04 | Copy of CT2138_Revised ATT App_01 10 17 CTI Terms.xlsx | Norwalk-WNLK | CTI Towers | 1/10/2017 | Re-configuration Application |
| 17-00909.03 | Norwalk_52010_Geotechnical Report_May 4, 2017_Rev 0.pdf | Delta Oaks Group | CTI Towers | 5/4/2017 | Geotechnical Investigation |
| 17-00909.02 | Foundation Investigation_Norwalk 52010_5-4-17_Rev 0.pdf | Delta Oaks Group | CTI Towers | 5/4/2017 | Foundation Mapping Report |
| 17-00909.01 | Tower Mapping_Norwalk 52010_5-4-17_Rev 0.pdf | Delta Oaks Group | CTI Towers | 5/4/2017 | Tower Mapping Report |

# Feed Line Plan

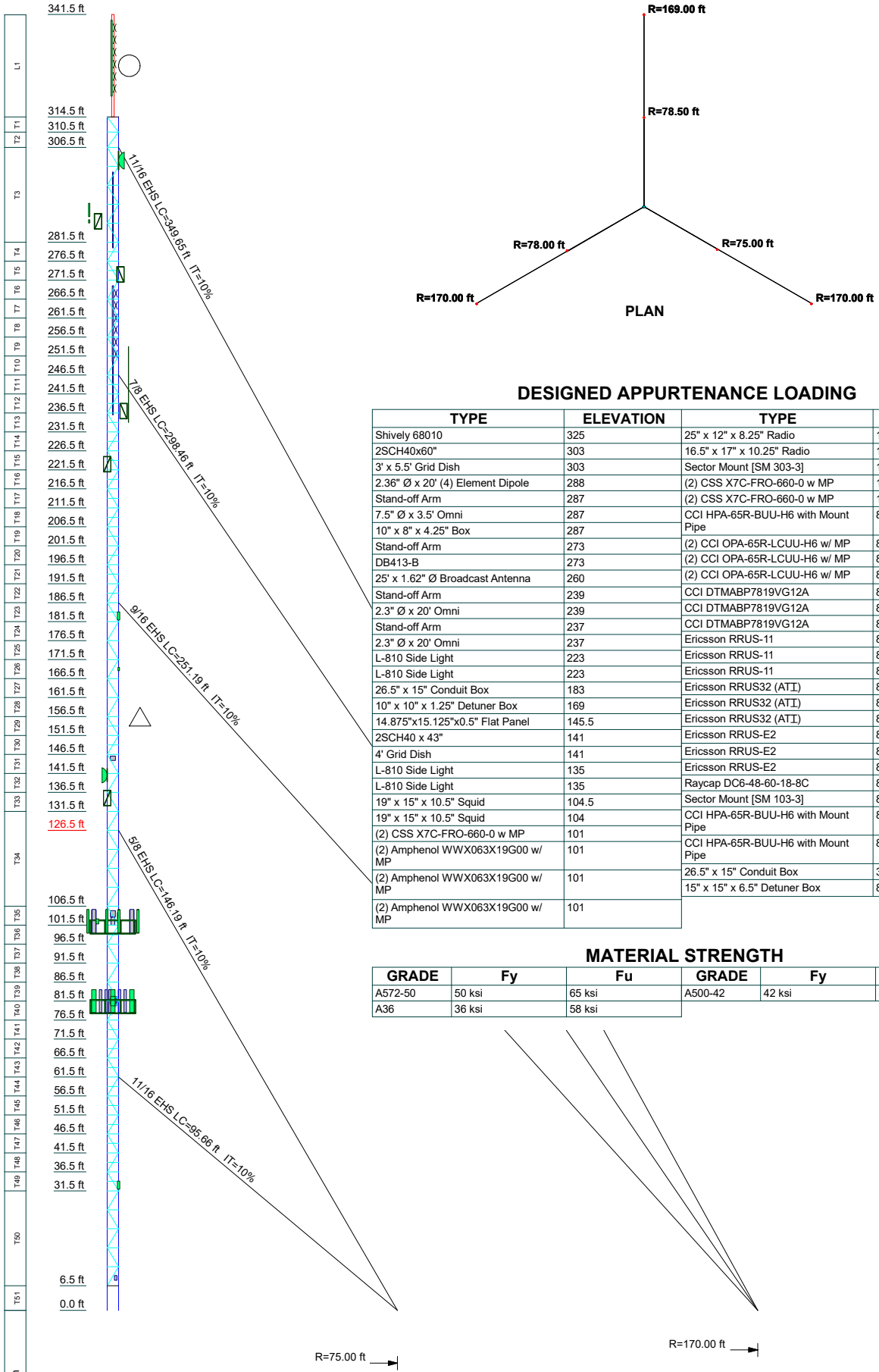
Round Flat App In Face App Out Face





120 Providence Road, Suite 100
Chapel Hill, NC 27514
Phone: 919-342-8247
FAX:


| | | | |
|---|---|---|---|
| Job: ***52010-Norwalk 1*** | | | |
| Project: ***STR17-0090-02*** | | | |
| Client: CTI Towers | Drawn by: BB | App'd: | |
| Code: TIA-222-G | Date: 05/08/17 | Scale: NTS | |
| Path: P:\2017 Projects\17-00909 Norwalk 52010\STR\Models\52010_Norwalk.er | | Dwg No. E-7 | |




## DESIGNED APPURTENANCE LOADING

| TYPE | ELEVATION | TYPE | ELEVATION |
|---|---|---|---|
| Shively 68010 | 325 | 25" x 12" x 8.25" Radio | 101 |
| 2SCH40x60" | 303 | 16.5" x 17" x 10.25" Radio | 101 |
| 3' x 5.5' Grid Dish | 303 | Sector Mount [SM 303-3] | 101 |
| 2.36" Ø x 20' (4) Element Dipole | 288 | (2) CSS X7C-FRO-660-0 w MP | 101 |
| Stand-off Arm | 287 | (2) CSS X7C-FRO-660-0 w MP | 101 |
| 7.5" Ø x 3.5' Omni | 287 | CCI HPA-65R-BUU-H6 with Mount Pipe | 80 |
| 10" x 8" x 4.25" Box | 287 | | |
| Stand-off Arm | 273 | (2) CCI OPA-65R-LCUU-H6 w/ MP | 80 |
| DB413-B | 273 | (2) CCI OPA-65R-LCUU-H6 w/ MP | 80 |
| 25' x 1.62" Ø Broadcast Antenna | 260 | (2) CCI OPA-65R-LCUU-H6 w/ MP | 80 |
| Stand-off Arm | 239 | CCI DTMABP7819VG12A | 80 |
| 2.3" Ø x 20' Omni | 239 | CCI DTMABP7819VG12A | 80 |
| Stand-off Arm | 237 | CCI DTMABP7819VG12A | 80 |
| 2.3" Ø x 20' Omni | 237 | Ericsson RRUS-11 | 80 |
| L-810 Side Light | 223 | Ericsson RRUS-11 | 80 |
| L-810 Side Light | 223 | Ericsson RRUS-11 | 80 |
| 26.5" x 15" Conduit Box | 183 | Ericsson RRUS32 (ATI) | 80 |
| 10" x 10" x 1.25" Detuner Box | 169 | Ericsson RRUS32 (ATI) | 80 |
| 14.875"x15.125"x0.5" Flat Panel | 145.5 | Ericsson RRUS32 (ATI) | 80 |
| 2SCH40 x 43" | 141 | Ericsson RRUS-E2 | 80 |
| 4' Grid Dish | 141 | Ericsson RRUS-E2 | 80 |
| L-810 Side Light | 135 | Ericsson RRUS-E2 | 80 |
| L-810 Side Light | 135 | Raycap DC6-48-60-18-8C | 80 |
| 19" x 15" x 10.5" Squid | 104.5 | Sector Mount [SM 103-3] | 80 |
| 19" x 15" x 10.5" Squid | 104 | CCI HPA-65R-BUU-H6 with Mount Pipe | 80 |
| (2) CSS X7C-FRO-660-0 w MP | 101 | | |
| (2) Amphenol WWX063X19G00 w/ MP | 101 | CCI HPA-65R-BUU-H6 with Mount Pipe | 80 |
| (2) Amphenol WWX063X19G00 w/ MP | 101 | 26.5" x 15" Conduit Box | 33 |
| (2) Amphenol WWX063X19G00 w/ MP | 101 | 15" x 15" x 6.5" Detuner Box | 8.5 |

## MATERIAL STRENGTH

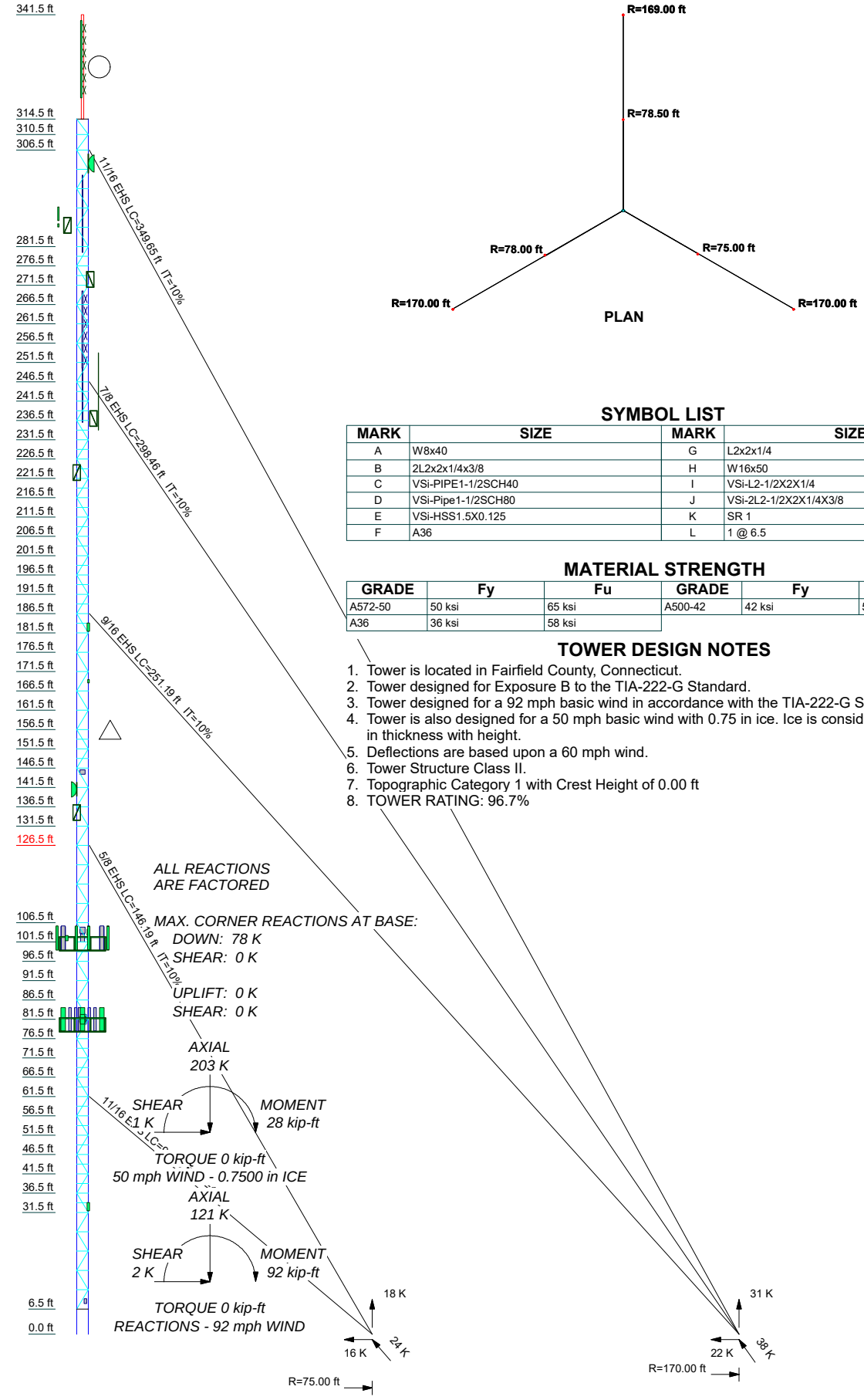
| GRADE | Fy | Fu | GRADE | Fy | Fu |
|---|---|---|---|---|---|
| A572-50 | 50 ksi | 65 ksi | A500-42 | 42 ksi | 58 ksi |
| A36 | 36 ksi | 58 ksi | | | |


DELTA OAKS GROUP

120 Providence Road, Suite 100
Chapel Hill, NC 27514
Phone: 919-342-8247
FAX:


| | | |
|---|---|---|
| Job: ***52010-Norwalk 1*** | | |
| Project: ***STR17-0090-02*** | | |
| Client: CTI Towers | Drawn by: BB | App'd: |
| Code: TIA-222-G | Date: 05/08/17 | Scale: NTS |
| Path: P:\2017 Projects\17-00909 Norwalk 52010\STR\Models\52010_Norwalk.eri | | Dwg No. E-1 |

| Section | T50 | T49 | T48 | T47 | T46 | T45 | T44 | T43 | T42 | T41 | T40 | T39 | T38 | T37 | T36 | T35 | T34 | T33 | T32 | T31 | T30 | T29 | T28 | T27 | T26 | T25 | T24 | T23 | T22 | T21 | T20 | T19 | T18 | T17 | T16 | T15 | T14 | T13 | T12 | T11 | T10 | T9 | T8 | T7 | T6 | T5 | T4 | T3 | T2 | T1 | L1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Legs | SR 2 1/4 | | | | | | | | | | | | | | | | A572-50 | | | | | | | | | | | | | | | | | | | | | | | | SR 2 1/2 | | | | | | | | | | | | P8x.322 (8" std) |
| Leg Grade | A36 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | A53-B-35 |
| Diagonals | N.A. | VSi-PIPE1-1/2SCH40 | | | | | E | | | | C | | | | K | | VSi-HSS1.5X0.125 | | | | | SR 1 | | | B | C | E | | | | | | | | | | | | | | | | | | | | | | | | | | | N.A. |
| Diagonal Grade | N.A. | | | | | | | | | | A500-42 | | | | | | | | | | | | | F | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | N.A. |
| Top Girts | H | | | | | | | | | | | | | | | | N.A. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | N.A. |
| Horizontals | N.A. | | | | | | | | | | | | | | | | VSI-HSS1.5X0.125 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | N.A. |
| Sec. Horizontals | | N.A. | | | | SR 1 | | | | I | | N.A. | | | K | | N.A. | | | | | SR 1 | | | N.A. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | SR 1 | N.A. |
| Face Width (ft) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 0.71875 |
| # Panels @ (ft) | | | | | | | | | | | | | | | | | 60 @ 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 2 @ 4 | N.A. |
| Weight (K) | 20.5 | 1.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 1.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.4 | 0.4 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 1.5 | 0.2 | 0.3 | 0.8 |




## SYMBOL LIST

| MARK | SIZE | MARK | SIZE |
|---|---|---|---|
| A | W8x40 | G | L2x2x1/4 |
| B | 2L2x2x1/4x3/8 | H | W16x50 |
| C | VSi-PIPE1-1/2SCH40 | I | VSi-L2-1/2X2X1/4 |
| D | VSi-Pipe1-1/2SCH80 | J | VSi-2L2-1/2X2X1/4X3/8 |
| E | VSi-HSS1.5X0.125 | K | SR 1 |
| F | A36 | L | 1 @ 6.5 |

## MATERIAL STRENGTH

| GRADE | Fy | Fu | GRADE | Fy | Fu |
|---|---|---|---|---|---|
| A572-50 | 50 ksi | 65 ksi | A500-42 | 42 ksi | 58 ksi |
| A36 | 36 ksi | 58 ksi | | | |

## TOWER DESIGN NOTES

1. Tower is located in Fairfield County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-G Standard.
3. Tower designed for a 92 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TOWER RATING: 96.7%

ALL REACTIONS ARE FACTORED


DELTA OAKS GROUP

120 Providence Road, Suite 100
Chapel Hill, NC 27514
Phone: 919-342-8247
FAX:


| | | | |
|---|---|---|---|
| Job: **52010-Norwalk 1** | | | |
| Project: ***STR17-0090-02*** | | | |
| Client: CTI Towers | Drawn by: BB | App'd: | |
| Code: TIA-222-G | Date: 05/08/17 | Scale: NTS | |
| Path: P:\2017 Projects\17-00909 Norwalk 52010\STR\Models\52010_Norwalk.eri | | Dwg No. E-1 | |

# Text of Notice Email Sent to Town Officials, Property Owner, and Tower Owner

**New Cingular Wireless PCS, LLC notice of intent to modify an existing telecommunications facility located at 6 Shirley Street, Norwalk**

In order to accommodate technological changes, implement Uniform Mobile Telecommunications System ("UMTS") and Long Term Evolution ("LTE") capabilities, and enhance system performance in the State of Connecticut, New Cingular Wireless PCS, LLC ("AT&T") will be changing its equipment configuration at certain cell sites.

As required by Regulations of Connecticut State Agencies ("R.C.S.A.") Section 16-50j-73, the Connecticut Siting Council has been notified of the changes and will review AT&T's proposal. Please accept this letter as notification under Section 16-50j-73 and Siting Council policy of construction which constitutes an exempt modification pursuant to R.C.S.A. Section 16-50j-72(b)(2).

The enclosed Notice fully sets forth the AT&T proposal. However, if you have any questions or require any further information on the plans for the site or the Siting Council's procedures, please contact the undersigned at 860-830-0380 or Ms. Melanie Bachman, Acting Executive Director, Connecticut Siting Council at (860) 827-2935.

Thank you.

-- Steve Levine, for AT&T

**PASS**
(Legs, 97% capacity)

**May 8, 2017**

**Christine Cooper**
CTI Towers
38 Pond Street, Suite 305
Franklin, MA

| | |
|---|---|
| ***Subject*** | **Rigorous Structural Analysis** |
| ***Carrier Designation*** | **AT&T, Reconfiguration**<br>**Site Number: CT2138 / FA 10049148**<br>**Site Name: Norwalk-WNLK** |
| ***CTI Towers Designation*** | **Site Number: 52010**<br>**Site Name: Norwalk 1** |
| ***Engineering Firm Designation*** | **Delta Oaks Group Project Number: STR17-00909-02**<br>**Delta Oaks Group Site Number: 07-00079** |
| ***Site Data*** | **Shirley Street, Norwalk (Fairfield County), CT 06850**<br>**Latitude N 41° 6' 56.001" Longitude W 73° 26' 3.9978"**<br>**Elevation: 117-ft±, Topography Category: 1; Site Class "D"**<br>**Exposure Category: "B"; Structure Class/Risk Category II;**<br>**341.5-ft Guyed Mast** |

Dear Ms. Cooper,

To your request, we present our rigorous structural analysis. Our work indicates that with the proposed appurtenance configuration, the tower and foundation **will** satisfy the structural strength requirements of *ANSI/TIA-222-G-2-2009* / *2012 International Building Code* / *2016 Connecticut State Building Code (CSBC)* for:

- $V_{ult}$ = 119-mph / $V_{asd}$ = 92-mph three-second gust basic wind speed [per Eqn. 16-33 of the 2012 IBC]
- 50-mph three-second gust basic wind speed with 0.75-in radial ice
- Earthquake design parameters and loading, per USGS Ground Motion Parameter Calculator and industry standard, respectively, including:
  - $S_s$ = 0.235g, $S_1$ = 0.068g

We trust you find our work satisfactory. Please do not hesitate to call should you have any questions.

Sincerely,

Michael L. Lassiter, SE, PE
Chief Structural Engineer
CT PE License 25064

STATE OF CONNECTICUT
MICHAEL L. LASSITER
No. 25064
LICENSED PROFESSIONAL ENGINEER
May 8, 2017

**Table 1: Existing, Proposed and Reserved Appurtenance Configuration**

| Elevation (AGL, ft) | Carrier [Status] | Mount [Location] | Equipment | Coax | Location |
|---|---|---|---|---|---|
| 330 | Fox [Existing] | Direct Mount [Mast] | (1) Shively 6810 Broadcast Antenna | (1) 1-5/8" | Leg A |
| 303 | Fox [Existing] | Pipe Mount 2.38" Ø x 5' [Leg B] | (1) Scala 3' x 5.5' Grid Dish | (1) 7/16" | Leg C |
| 290 | Fox [Existing] | Standoff - 5.5' [Leg C] | (1) 10" x 8" x 4.25" Box<br>(1) 7.5" Ø x 3.5' Omni | (1) 3/8"<br>(1) 7/8" | Face B<br>Leg B |
| 290 | Fox | Direct Mount [Leg A] | (1) 2.36" Ø x 20' (4) Element Dipole | (1) 7/8" | Leg B |
| 280 | Fox [Existing] | Standoff - 15" [Leg B] | (1) Andrew DB413-B | (1) 1-5/8" | Leg B |
| 260 | Fox [Existing] | Direct Mount [Leg A] | (1) 25' x 1.62" Ø Broadcast Antenna | (1) 1-5/8" | Leg A |
| 246 | Fox [Existing] | Standoff - 3.5' [Leg A] | (1) 2.3" Ø x 20' Omni | (1) 7/8" | Leg C |
| 245 | Fox [Existing] | Standoff - 3' [Leg B] | (1) 2.3" Ø x 20' Omni | (1) 7/8" | Face C |
| 223 | CTI [Existing] | Direct Mount [Leg A&C] | (2) TWR L-810 Lights | Conduit | Face C |
| 183 | CTI [Existing] | Direct Mount [Leg B] | (1) 26.5" x 15" Conduit Box | (1) 7/16" | Leg C |
| 169 | Fox [Existing] | Direct Mount [Leg B] | (1) 10" x 10" x 1.25" Detuner Box | (1) 7/16" | Leg B |
| 145.5 | Fox [Existing] | Direct Mount [Leg A] | (1) 14.875"x15.125"x0.5" Flat Panel | (1) 1/4" | Leg C |
| 141 | Fox [Existing] | Pipe Mount 2.38" Ø x 3.5' [Leg C] | (1) 4' Grid Dish | (1) 7/8" | Leg B |
| 135 | CTI [Existing] | Direct Mount [Leg A&C] | (2) TWR L-810 Lights | Conduit | Face C |
| 104.5 | Verizon [Existing] | (3) Sector Mounts 3' x 12.5' | (1) RFS 19" x 15" x 10.5" Squid | (2) 1-1/4" | Face C |
| 104 | | | (1) RFS 19" x 15" x 10.5" Squid | | |
| 102.5 | | | (6) CSS X7C-FRO-660-VR0<br>(6) Antel WWX063X19G00<br>(1) RFS 25" x 12" x 8.25" Radio<br>(1) RFS 16.5" x 17" x 10.25" Radio | | |
| 81.5 | ***AT&T [Proposed]*** | (3) 9' Face Mounts | ***(3) CCI HPA-65R-BUU-H6<br>(6) CCI OPA-65R-LCUU-H6<br>(3) CCI DTMABP7819VG12A<br>(3) Ericsson RRUS-11<br>(3) Ericsson RRUS-32<br>(3) Ericsson RRUS-E2<br>(1) Raycap DC6-48-60-18-8C*** | ***(3) 7/8"<br>(1) 10mm Fiber<br>(2) 0.795" DC Power*** | ***Face B*** |
| 80.5 | AT&T [Existing] | | -- | (9) 7/8" | Face B<br>Leg C |
| | AT&T [To Remove] | | (9) RFS APL868013-42T4 | -- | -- |

**Table 1: Existing, Proposed and Reserved Appurtenance Configuration (Continued)**

| Elevation (AGL, ft) | Carrier [Status] | Mount [Location] | Equipment | Coax | Location |
|---|---|---|---|---|---|
| 33 | Fox [Existing] | Direct Mount [Leg B] | (1) 26.5" x 15" Conduit Box | (1) 7/16" | Leg B |
| 8.5 | Fox [Existing] | Direct Mount [Face AB] | (1) 15" x 15" x 6.5" Detuner Box | (1) 7/16" | Leg B |

**Table 2: Serviceability Requirements: Limit State Deformations[1]**

| Elevation (AGL, ft) | Equipment | Twist (deg)[2] | Sway (deg)[2] | Deflection (in) | Deflection Limit (in)[3] | Result |
|---|---|---|---|---|---|---|
| 341.5 | Structure | 0.0682 | 0.3333 | 3.7370 | 122.94 | O. K. |

1. See program output for supporting details.
2. Per TIA-222-G Section 2.8.2.1 rotation about the vertical axis (twist) or any horizontal axis (sway) of the structure shall not exceed 4 degrees.
3. Per TIA-222-G Section 2.8.2.2 horizontal displacement shall not exceed 3% of the height of the structure.

**Table 3: Tower Structure Results Summary, Percent Capacity Utilized[1]**

| Component | Percent Capacity | Result |
|---|---|---|
| Pole | 49 | O. K. |
| **Legs** | **97** | **O. K.** |
| Diagonals | 84 | O. K. |
| Horizontals | 57 | O. K. |
| Secondary-Horizontals | 24 | O. K. |
| Girts | 3 | O. K. |
| Guy Wires | 48 | O. K. |
| Bolt Checks | 84 | O. K. |

1. Detailed results and capacities available in the TNX Tower output attached. Percent utilized less than 105% is considered acceptable.
2. Material properties were assumed:
    a. Leg members: A572-50
    b. Pole Structure: A53 Gr. B
    c. Bracing: Pipes-A500 Gr. B; Angles-A36
    d. Bolts: A325

**Table 4: Foundation Results, Percent Capacity Utilized**

| Component | Percent Utilized | Result |
|---|---|---|
| Mast – Stability | 11 | O. K. |
| Inner Anchors – Stability | 26 | O. K. |
| Outer Anchors – Stability | 28 | O. K. |

1. Foundation rebar information not available at time of analysis.
2. Lower anchor block analyzed as connected to anchor shaft through original upper anchor blocks based on information obtained from tower owner.

**ASSUMPTIONS**

This rigorous 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. Delta Oaks Group ("DOG") 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 based on industry standards.
2. The antenna configuration is as supplied 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. Some assumptions are made regarding antennas and mount sizes and their projected areas based on best interpretation of data supplied and of best knowledge of antenna type and industry practice.
4. 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.
5. The soil parameters are as per data supplied or as assumed and stated in the calculations.
6. Foundations are properly designed and constructed to resist the original design loads indicated in the documents provided.
7. The tower and structures have been properly maintained in accordance with TIA Standards and/or with manufacturer's specifications.
8. All welds and connections are assumed to develop at least the member capacity unless determined otherwise and explicitly stated in this report.
9. All prior structural modifications are assumed to be as per data supplied/available and to have been properly installed.
10. Loading interpreted from photos is accurate to ±5' AGL, antenna size accurate to ±3.3 sf, and coax equal to the number of existing antennas without reserve.
11. Documents reviewed and used in this structural analysis were provided by CLIENT.
12. The proposed coax shall be installed per the attached coax layout plan, Sheet QP-P.
13. Leg A is determined per best industry practice.

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

**DISCLAIMER OF WARRANTIES**

Delta Oaks Group ("DOG") has not performed a detailed 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 DOG in connection with this Rigorous Structural Analysis are limited to a computer analysis of the tower structure and theoretical capacity of its main structural members. All tower components have been assumed to only resist dead loads when no other loads are applied. 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.

DOG 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. DOG 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 rigorous 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 specified code recommended 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 DOG, 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.

DOG makes no warranties, expressed and/or implied, in connection with this report and disclaim any liability arising from material, fabrication, and erection of this tower. DOG 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 DOG pursuant to this report will be limited to the total fee received for preparation of this report.

**Attachments:**

- Document Research Report
- Feed Line Plan
- Program input and output – Wind
- Foundation Calculations
- Tenant application

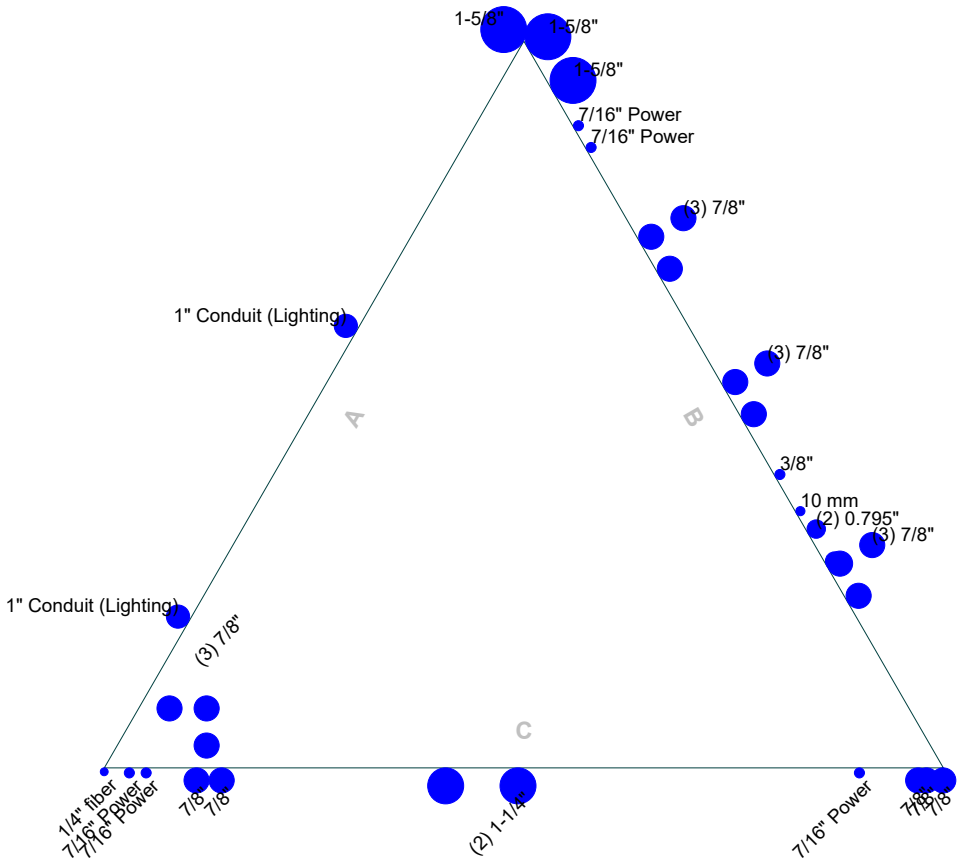
# Document Research Report

**Delta Oaks Group Project #: STR17-00909-02**
**Site Number: 52010**
**Site Name: Norwalk**

| Doc ID | Document Name | Issued By | Issued To | Issue Date | Description |
|---|---|---|---|---|---|
| 17-00909.04 | Copy of CT2138_Revised ATT App_01 10 17 CTI Terms.xlsx | Norwalk-WNLK | CTI Towers | 1/10/2017 | Re-configuration Application |
| 17-00909.03 | Norwalk_52010_Geotechnical Report_May 4, 2017_Rev 0.pdf | Delta Oaks Group | CTI Towers | 5/4/2017 | Geotechnical Investigation |
| 17-00909.02 | Foundation Investigation_Norwalk 52010_5-4-17_Rev 0.pdf | Delta Oaks Group | CTI Towers | 5/4/2017 | Foundation Mapping Report |
| 17-00909.01 | Tower Mapping_Norwalk 52010_5-4-17_Rev 0.pdf | Delta Oaks Group | CTI Towers | 5/4/2017 | Tower Mapping Report |

# Feed Line Plan

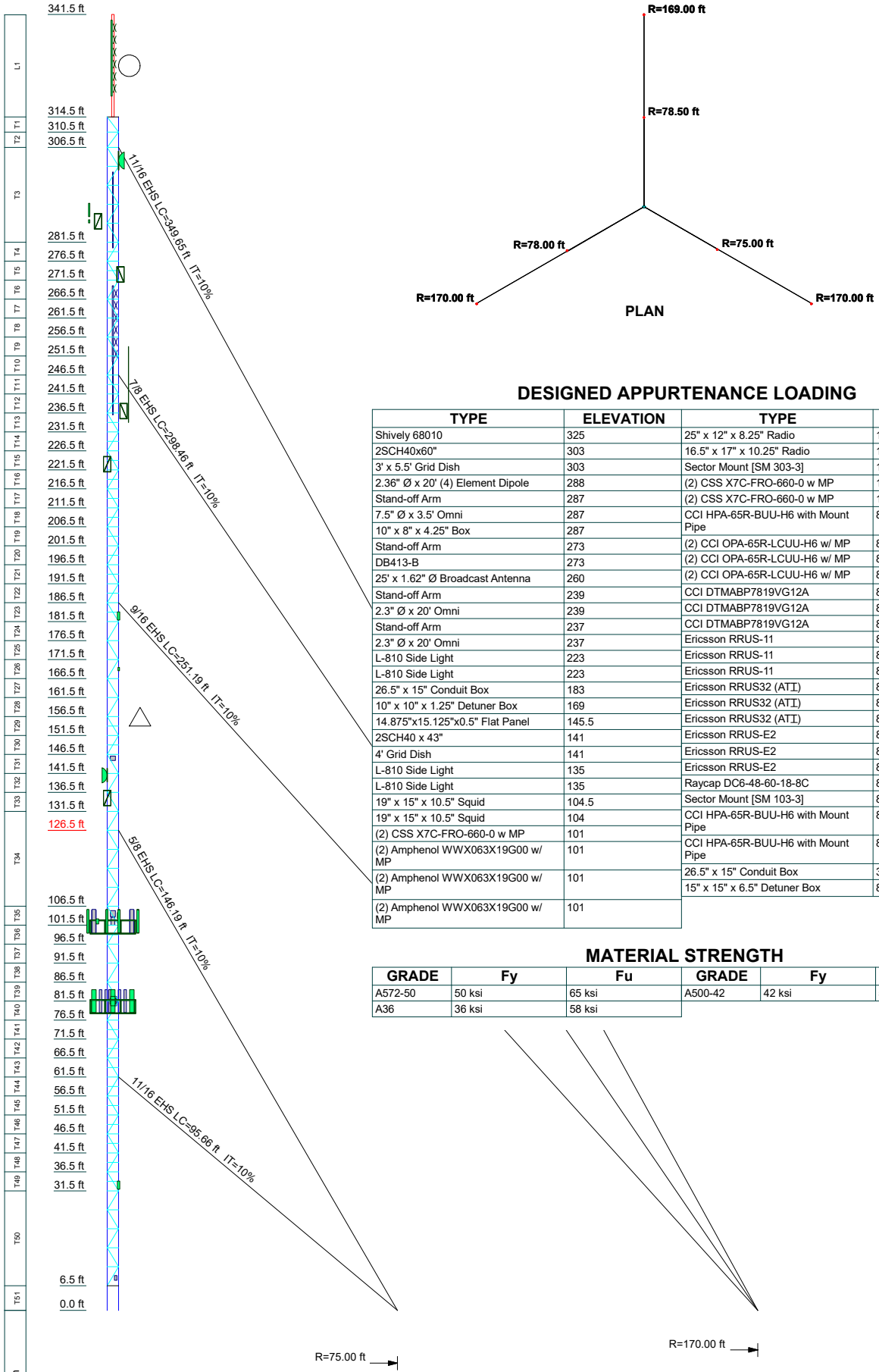
Round Flat App In Face App Out Face





120 Providence Road, Suite 100
Chapel Hill, NC 27514
Phone: 919-342-8247
FAX:


| | | | |
|---|---|---|---|
| Job: ***52010-Norwalk 1*** | | | |
| Project: ***STR17-0090-02*** | | | |
| Client: CTI Towers | Drawn by: BB | App'd: | |
| Code: TIA-222-G | Date: 05/08/17 | Scale: NTS | |
| Path: P:\2017 Projects\17-00909 Norwalk 52010\STR\Models\52010_Norwalk.er | | Dwg No. E-7 | |




## DESIGNED APPURTENANCE LOADING

| TYPE | ELEVATION | TYPE | ELEVATION |
|---|---|---|---|
| Shively 68010 | 325 | 25" x 12" x 8.25" Radio | 101 |
| 2SCH40x60" | 303 | 16.5" x 17" x 10.25" Radio | 101 |
| 3' x 5.5' Grid Dish | 303 | Sector Mount [SM 303-3] | 101 |
| 2.36" Ø x 20' (4) Element Dipole | 288 | (2) CSS X7C-FRO-660-0 w MP | 101 |
| Stand-off Arm | 287 | (2) CSS X7C-FRO-660-0 w MP | 101 |
| 7.5" Ø x 3.5' Omni | 287 | CCI HPA-65R-BUU-H6 with Mount Pipe | 80 |
| 10" x 8" x 4.25" Box | 287 | | |
| Stand-off Arm | 273 | (2) CCI OPA-65R-LCUU-H6 w/ MP | 80 |
| DB413-B | 273 | (2) CCI OPA-65R-LCUU-H6 w/ MP | 80 |
| 25' x 1.62" Ø Broadcast Antenna | 260 | (2) CCI OPA-65R-LCUU-H6 w/ MP | 80 |
| Stand-off Arm | 239 | CCI DTMABP7819VG12A | 80 |
| 2.3" Ø x 20' Omni | 239 | CCI DTMABP7819VG12A | 80 |
| Stand-off Arm | 237 | CCI DTMABP7819VG12A | 80 |
| 2.3" Ø x 20' Omni | 237 | Ericsson RRUS-11 | 80 |
| L-810 Side Light | 223 | Ericsson RRUS-11 | 80 |
| L-810 Side Light | 223 | Ericsson RRUS-11 | 80 |
| 26.5" x 15" Conduit Box | 183 | Ericsson RRUS32 (ATI) | 80 |
| 10" x 10" x 1.25" Detuner Box | 169 | Ericsson RRUS32 (ATI) | 80 |
| 14.875"x15.125"x0.5" Flat Panel | 145.5 | Ericsson RRUS32 (ATI) | 80 |
| 2SCH40 x 43" | 141 | Ericsson RRUS-E2 | 80 |
| 4' Grid Dish | 141 | Ericsson RRUS-E2 | 80 |
| L-810 Side Light | 135 | Ericsson RRUS-E2 | 80 |
| L-810 Side Light | 135 | Raycap DC6-48-60-18-8C | 80 |
| 19" x 15" x 10.5" Squid | 104.5 | Sector Mount [SM 103-3] | 80 |
| 19" x 15" x 10.5" Squid | 104 | CCI HPA-65R-BUU-H6 with Mount Pipe | 80 |
| (2) CSS X7C-FRO-660-0 w MP | 101 | | |
| (2) Amphenol WWX063X19G00 w/ MP | 101 | CCI HPA-65R-BUU-H6 with Mount Pipe | 80 |
| (2) Amphenol WWX063X19G00 w/ MP | 101 | 26.5" x 15" Conduit Box | 33 |
| (2) Amphenol WWX063X19G00 w/ MP | 101 | 15" x 15" x 6.5" Detuner Box | 8.5 |

## MATERIAL STRENGTH

| GRADE | Fy | Fu | GRADE | Fy | Fu |
|---|---|---|---|---|---|
| A572-50 | 50 ksi | 65 ksi | A500-42 | 42 ksi | 58 ksi |
| A36 | 36 ksi | 58 ksi | | | |


DELTA OAKS GROUP

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|---|---|---|
| Job: ***52010-Norwalk 1*** | | |
| Project: ***STR17-0090-02*** | | |
| Client: CTI Towers | Drawn by: BB | App'd: |
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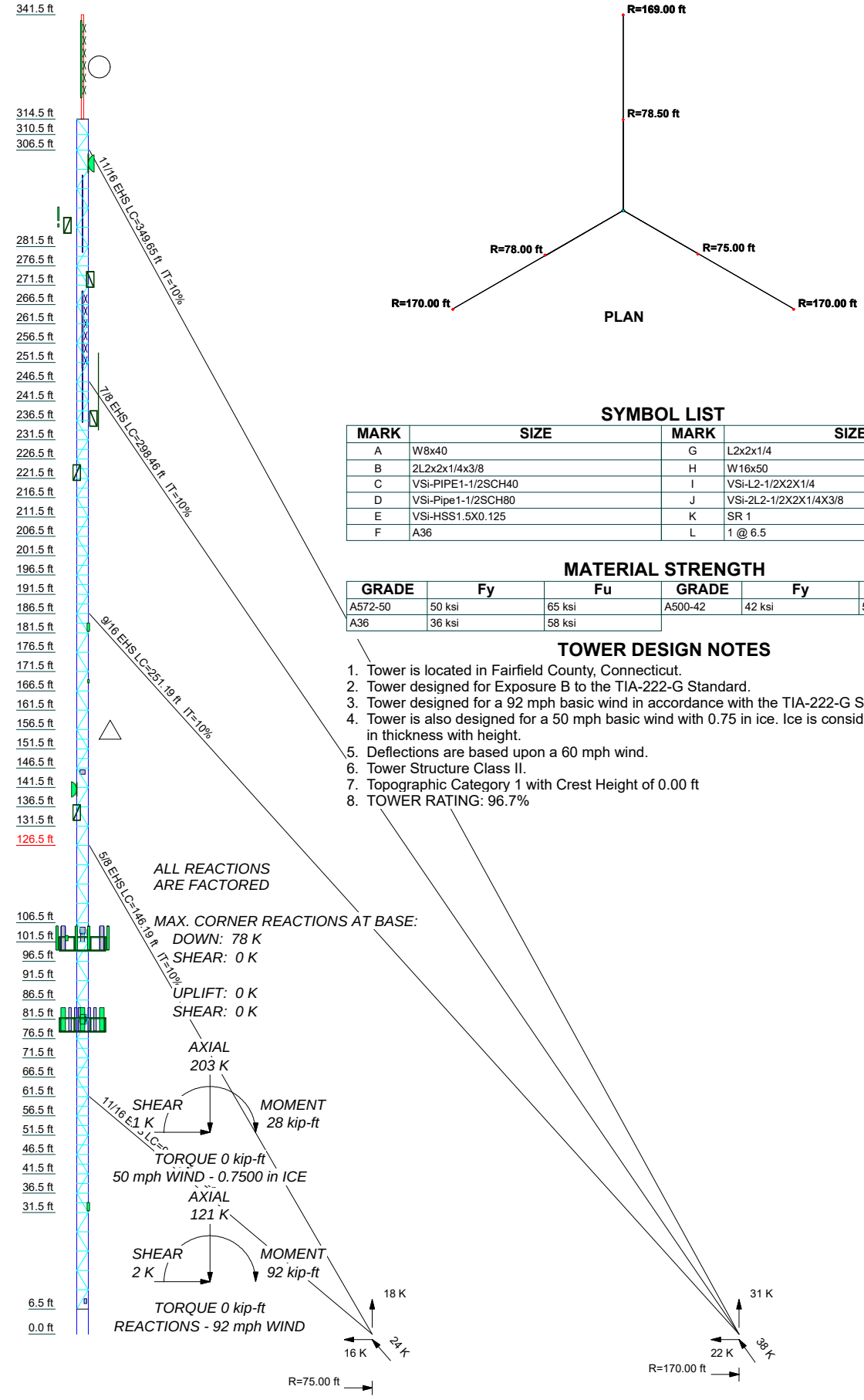
| Path: P:\2017 Projects\17-00909 Norwalk 52010\STR\Models\52010_Norwalk.eri | | Dwg No. E-1 |

| Section | T50 | T49 | T48 | T47 | T46 | T45 | T44 | T43 | T42 | T41 | T40 | T39 | T38 | T37 | T36 | T35 | T34 | T33 | T32 | T31 | T30 | T29 | T28 | T27 | T26 | T25 | T24 | T23 | T22 | T21 | T20 | T19 | T18 | T17 | T16 | T15 | T14 | T13 | T12 | T11 | T10 | T9 | T8 | T7 | T6 | T5 | T4 | T3 | T2 | T1 | L1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Legs | SR 2 1/4 | | | | | | | | | | | | | | | | A572-50 | | | | | | | | | | | | | | | | | | | | | | | | SR 2 1/2 | | | | | | | | | | | | P8x.322 (8" std) |
| Leg Grade | A36 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | A53-B-35 |
| Diagonals | N.A. | VSi-PIPE1-1/2SCH40 | | | | | E | | | | C | | | | K | | VSi-HSS1.5X0.125 | | | | | SR 1 | | | B | C | E | | | | | | | | | | | | | | | | | | | | | | | | | | | N.A. |
| Diagonal Grade | N.A. | | | | | | | | | | A500-42 | | | | | | | | | | | | | F | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | N.A. |
| Top Girts | H | | | | | | | | | | | | | | | | N.A. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | N.A. |
| Horizontals | N.A. | | | | | | | | | | | | | | | | VSI-HSS1.5X0.125 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | N.A. |
| Sec. Horizontals | | N.A. | | | | SR 1 | | | | I | | N.A. | | | K | | N.A. | | | | | SR 1 | | | N.A. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | SR 1 | N.A. |
| Face Width (ft) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 0.71875 |
| # Panels @ (ft) | | | | | | | | | | | | | | | | | 60 @ 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 2 @ 4 | N.A. |
| Weight (K) | 20.5 | 1.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 1.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.4 | 0.4 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 1.5 | 0.2 | 0.3 | 0.8 |




## SYMBOL LIST

| MARK | SIZE | MARK | SIZE |
|---|---|---|---|
| A | W8x40 | G | L2x2x1/4 |
| B | 2L2x2x1/4x3/8 | H | W16x50 |
| C | VSi-PIPE1-1/2SCH40 | I | VSi-L2-1/2X2X1/4 |
| D | VSi-Pipe1-1/2SCH80 | J | VSi-2L2-1/2X2X1/4X3/8 |
| E | VSi-HSS1.5X0.125 | K | SR 1 |
| F | A36 | L | 1 @ 6.5 |

## MATERIAL STRENGTH

| GRADE | Fy | Fu | GRADE | Fy | Fu |
|---|---|---|---|---|---|
| A572-50 | 50 ksi | 65 ksi | A500-42 | 42 ksi | 58 ksi |
| A36 | 36 ksi | 58 ksi | | | |

## TOWER DESIGN NOTES

1. Tower is located in Fairfield County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-G Standard.
3. Tower designed for a 92 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TOWER RATING: 96.7%

ALL REACTIONS ARE FACTORED


DELTA OAKS GROUP

120 Providence Road, Suite 100
Chapel Hill, NC 27514
Phone: 919-342-8247
FAX:


| | | | |
|---|---|---|---|
| Job: **52010-Norwalk 1** | | | |
| Project: ***STR17-0090-02*** | | | |
| Client: CTI Towers | Drawn by: BB | App'd: | |
| Code: TIA-222-G | Date: 05/08/17 | Scale: NTS | |
| Path: P:\2017 Projects\17-00909 Norwalk 52010\STR\Models\52010_Norwalk.eri | | Dwg No. E-1 | |

## Tower Input Data

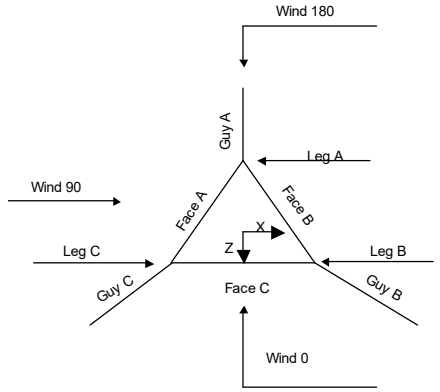
The main tower is a 3x guyed tower with an overall height of 341.50 ft above the ground line.
The base of the tower is set at an elevation of 0.00 ft above the ground line.
The face width of the tower is 3.00 ft at the top and 3.00 ft at the base.
An index plate is provided at the 3x guyed -tower connection.
There is a pole section.
This tower is designed using the TIA-222-G standard.
The following design criteria apply:

Tower is located in Fairfield County, Connecticut.
ASCE 7-10 Wind Data is used (wind speeds converted to nominal values).
Basic wind speed of 92 mph.
Structure Class II.
Exposure Category B.
Topographic Category 1.
Crest Height 0.00 ft.
Nominal ice thickness of 0.7500 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 50 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 60 mph.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.
Safety factor used in guy design is 1.
Stress ratio used in tower member design is 1.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

## Options

| | | |
|---|---|---|
| Consider Moments - Legs | Distribute Leg Loads As Uniform | Use ASCE 10 X-Brace Ly Rules |
| Consider Moments - Horizontals | Assume Legs Pinned | √ Calculate Redundant Bracing Forces |
| Consider Moments - Diagonals | √ Assume Rigid Index Plate | Ignore Redundant Members in FEA |
| Use Moment Magnification | √ Use Clear Spans For Wind Area | √ SR Leg Bolts Resist Compression |
| √ Use Code Stress Ratios | √ Use Clear Spans For KL/r | √ All Leg Panels Have Same Allowable |
| √ Use Code Safety Factors - Guys | √ Retension Guys To Initial Tension | Offset Girt At Foundation |
| Escalate Ice | √ Bypass Mast Stability Checks | √ Consider Feed Line Torque |
| Always Use Max Kz | √ Use Azimuth Dish Coefficients | √ Include Angle Block Shear Check |
| Use Special Wind Profile | √ Project Wind Area of Appurt. | Use TIA-222-G Bracing Resist. Exemption |
| √ Include Bolts In Member Capacity | √ Autocalc Torque Arm Areas | Use TIA-222-G Tension Splice Exemption |
| Leg Bolts Are At Top Of Section | Add IBC .6D+W Combination | Poles |
| √ Secondary Horizontal Braces Leg | √ Sort Capacity Reports By Component | √ Include Shear-Torsion Interaction |
| Use Diamond Inner Bracing (4 Sided) | Triangulate Diamond Inner Bracing | Always Use Sub-Critical Flow |
| √ SR Members Have Cut Ends | Treat Feed Line Bundles As Cylinder | Use Top Mounted Sockets |
| SR Members Are Concentric | | |






***Corner & Starmount Guyed Tower***

## Pole Section Geometry

| Section | Elevation<br>ft | Section Length<br>ft | Pole Size | Pole Grade | Socket Length<br>ft |
|---|---|---|---|---|---|
| L1 | 341.50-314.50 | 27.00 | P8x.322 (8" std) | A53-B-35 (35 ksi) | |

| Tower Elevation<br>ft | Gusset Area (per face)<br>ft² | Gusset Thickness<br>in | Gusset Grade | Adjust. Factor $A_f$ | Adjust. Factor $A_r$ | Weight Mult. | Double Angle Stitch Bolt Spacing Diagonals<br>in | Double Angle Stitch Bolt Spacing Horizontals<br>in | Double Angle Stitch Bolt Spacing Redundants<br>in |
|---|---|---|---|---|---|---|---|---|---|
| L1<br>341.50-314.50 | | | | 1 | 1 | 1 | | | |

## Tower Section Geometry

| Tower Section | Tower Elevation<br>ft | Assembly Database | Description | Section Width<br>ft | Number of Sections | Section Length<br>ft |
|---|---|---|---|---|---|---|

| Tower Section | Tower Elevation ft | Assembly Database | Description | Section Width ft | Number of Sections | Section Length ft |
|---|---|---|---|---|---|---|
| T1 | 314.50-310.50 | | | 3.00 | 1 | 4.00 |
| T2 | 310.50-306.50 | | | 3.00 | 1 | 4.00 |
| T3 | 306.50-281.50 | | | 3.00 | 1 | 25.00 |
| T4 | 281.50-276.50 | | | 3.00 | 1 | 5.00 |
| T5 | 276.50-271.50 | | | 3.00 | 1 | 5.00 |
| T6 | 271.50-266.50 | | | 3.00 | 1 | 5.00 |
| T7 | 266.50-261.50 | | | 3.00 | 1 | 5.00 |
| T8 | 261.50-256.50 | | | 3.00 | 1 | 5.00 |
| T9 | 256.50-251.50 | | | 3.00 | 1 | 5.00 |
| T10 | 251.50-246.50 | | | 3.00 | 1 | 5.00 |
| T11 | 246.50-241.50 | | | 3.00 | 1 | 5.00 |
| T12 | 241.50-236.50 | | | 3.00 | 1 | 5.00 |
| T13 | 236.50-231.50 | | | 3.00 | 1 | 5.00 |
| T14 | 231.50-226.50 | | | 3.00 | 1 | 5.00 |
| T15 | 226.50-221.50 | | | 3.00 | 1 | 5.00 |
| T16 | 221.50-216.50 | | | 3.00 | 1 | 5.00 |
| T17 | 216.50-211.50 | | | 3.00 | 1 | 5.00 |
| T18 | 211.50-206.50 | | | 3.00 | 1 | 5.00 |
| T19 | 206.50-201.50 | | | 3.00 | 1 | 5.00 |
| T20 | 201.50-196.50 | | | 3.00 | 1 | 5.00 |
| T21 | 196.50-191.50 | | | 3.00 | 1 | 5.00 |
| T22 | 191.50-186.50 | | | 3.00 | 1 | 5.00 |
| T23 | 186.50-181.50 | | | 3.00 | 1 | 5.00 |
| T24 | 181.50-176.50 | | | 3.00 | 1 | 5.00 |
| T25 | 176.50-171.50 | | | 3.00 | 1 | 5.00 |
| T26 | 171.50-166.50 | | | 3.00 | 1 | 5.00 |
| T27 | 166.50-161.50 | | | 3.00 | 1 | 5.00 |
| T28 | 161.50-156.50 | | | 3.00 | 1 | 5.00 |
| T29 | 156.50-151.50 | | | 3.00 | 1 | 5.00 |
| T30 | 151.50-146.50 | | | 3.00 | 1 | 5.00 |
| T31 | 146.50-141.50 | | | 3.00 | 1 | 5.00 |
| T32 | 141.50-136.50 | | | 3.00 | 1 | 5.00 |
| T33 | 136.50-131.50 | | | 3.00 | 1 | 5.00 |
| T34 | 131.50-106.50 | | | 3.00 | 1 | 25.00 |
| T35 | 106.50-101.50 | | | 3.00 | 1 | 5.00 |
| T36 | 101.50-96.50 | | | 3.00 | 1 | 5.00 |
| T37 | 96.50-91.50 | | | 3.00 | 1 | 5.00 |
| T38 | 91.50-86.50 | | | 3.00 | 1 | 5.00 |
| T39 | 86.50-81.50 | | | 3.00 | 1 | 5.00 |
| T40 | 81.50-76.50 | | | 3.00 | 1 | 5.00 |
| T41 | 76.50-71.50 | | | 3.00 | 1 | 5.00 |
| T42 | 71.50-66.50 | | | 3.00 | 1 | 5.00 |
| T43 | 66.50-61.50 | | | 3.00 | 1 | 5.00 |
| T44 | 61.50-56.50 | | | 3.00 | 1 | 5.00 |
| T45 | 56.50-51.50 | | | 3.00 | 1 | 5.00 |
| T46 | 51.50-46.50 | | | 3.00 | 1 | 5.00 |
| T47 | 46.50-41.50 | | | 3.00 | 1 | 5.00 |
| T48 | 41.50-36.50 | | | 3.00 | 1 | 5.00 |
| T49 | 36.50-31.50 | | | 3.00 | 1 | 5.00 |
| T50 | 31.50-6.50 | | | 3.00 | 1 | 25.00 |
| T51 | 6.50-0.00 | | | 3.00 | 1 | 6.50 |

## Tower Section Geometry *(cont'd)*



| Tower Section | Tower Elevation ft | Diagonal Spacing ft | Bracing Type | Has K Brace End Panels | Has Horizontals | Top Girt Offset in | Bottom Girt Offset in |
|---|---|---|---|---|---|---|---|
| T1 | 314.50-310.50 | 4.00 | Diag Down | No | Yes | 0.0000 | 0.0000 |
| T2 | 310.50-306.50 | 4.00 | Diag Up | No | Yes | 0.0000 | 0.0000 |
| T3 | 306.50-281.50 | 5.00 | K Brace Right | No | Yes | 0.0000 | 0.0000 |
| T4 | 281.50-276.50 | 5.00 | Diag Up | No | Yes | 0.0000 | 0.0000 |
| T5 | 276.50-271.50 | 5.00 | Diag Down | No | Yes | 0.0000 | 0.0000 |
| T6 | 271.50-266.50 | 5.00 | Diag Up | No | Yes | 0.0000 | 0.0000 |
| T7 | 266.50-261.50 | 5.00 | Diag Down | No | Yes | 0.0000 | 0.0000 |
| T8 | 261.50-256.50 | 5.00 | Diag Up | No | Yes | 0.0000 | 0.0000 |
| T9 | 256.50-251.50 | 5.00 | Diag Down | No | Yes | 0.0000 | 0.0000 |
| T10 | 251.50-246.50 | 5.00 | Diag Up | No | Yes | 0.0000 | 0.0000 |
| T11 | 246.50-241.50 | 5.00 | Diag Down | No | Yes | 0.0000 | 0.0000 |
| T12 | 241.50-236.50 | 5.00 | Diag Up | No | Yes | 0.0000 | 0.0000 |
| T13 | 236.50-231.50 | 5.00 | Diag Down | No | Yes | 0.0000 | 0.0000 |
| T14 | 231.50-226.50 | 5.00 | Diag Up | No | Yes | 0.0000 | 0.0000 |
| T15 | 226.50-221.50 | 5.00 | Diag Down | No | Yes | 0.0000 | 0.0000 |
| T16 | 221.50-216.50 | 5.00 | Diag Up | No | Yes | 0.0000 | 0.0000 |
| T17 | 216.50-211.50 | 5.00 | Diag Down | No | Yes | 0.0000 | 0.0000 |
| T18 | 211.50-206.50 | 5.00 | Diag Up | No | Yes | 0.0000 | 0.0000 |
| T19 | 206.50-201.50 | 5.00 | Diag Down | No | Yes | 0.0000 | 0.0000 |
| T20 | 201.50-196.50 | 5.00 | Diag Up | No | Yes | 0.0000 | 0.0000 |
| T21 | 196.50-191.50 | 5.00 | Diag Down | No | Yes | 0.0000 | 0.0000 |
| T22 | 191.50-186.50 | 5.00 | Diag Up | No | Yes | 0.0000 | 0.0000 |
| T23 | 186.50-181.50 | 5.00 | Diag Down | No | Yes | 0.0000 | 0.0000 |
| T24 | 181.50-176.50 | 5.00 | Diag Up | No | Yes | 0.0000 | 0.0000 |
| T25 | 176.50-171.50 | 5.00 | Diag Down | No | Yes | 0.0000 | 0.0000 |
| T26 | 171.50-166.50 | 5.00 | Diag Up | No | Yes | 0.0000 | 0.0000 |
| T27 | 166.50-161.50 | 5.00 | Diag Down | No | Yes | 0.0000 | 0.0000 |
| T28 | 161.50-156.50 | 5.00 | Diag Up | No | Yes | 0.0000 | 0.0000 |
| T29 | 156.50-151.50 | 5.00 | Diag Down | No | Yes | 0.0000 | 0.0000 |
| T30 | 151.50-146.50 | 5.00 | Diag Up | No | Yes | 0.0000 | 0.0000 |
| T31 | 146.50-141.50 | 5.00 | Diag Down | No | Yes | 0.0000 | 0.0000 |
| T32 | 141.50-136.50 | 5.00 | Diag Up | No | Yes | 0.0000 | 0.0000 |
| T33 | 136.50-131.50 | 5.00 | Diag Down | No | Yes | 0.0000 | 0.0000 |
| T34 | 131.50-106.50 | 5.00 | K Brace Left | No | Yes | 0.0000 | 0.0000 |
| T35 | 106.50-101.50 | 5.00 | Diag Down | No | Yes | 0.0000 | 0.0000 |
| T36 | 101.50-96.50 | 5.00 | Diag Up | No | Yes | 0.0000 | 0.0000 |
| T37 | 96.50-91.50 | 5.00 | Diag Down | No | Yes | 0.0000 | 0.0000 |
| T38 | 91.50-86.50 | 5.00 | Diag Up | No | Yes | 0.0000 | 0.0000 |
| T39 | 86.50-81.50 | 5.00 | Diag Down | No | Yes | 0.0000 | 0.0000 |
| T40 | 81.50-76.50 | 5.00 | Diag Up | No | Yes | 0.0000 | 0.0000 |
| T41 | 76.50-71.50 | 5.00 | Diag Down | No | Yes | 0.0000 | 0.0000 |
| T42 | 71.50-66.50 | 5.00 | Diag Up | No | Yes | 0.0000 | 0.0000 |
| T43 | 66.50-61.50 | 5.00 | Diag Down | No | Yes | 0.0000 | 0.0000 |
| T44 | 61.50-56.50 | 5.00 | Diag Up | No | Yes | 0.0000 | 0.0000 |
| T45 | 56.50-51.50 | 5.00 | Diag Down | No | Yes | 0.0000 | 0.0000 |
| T46 | 51.50-46.50 | 5.00 | Diag Up | No | Yes | 0.0000 | 0.0000 |
| T47 | 46.50-41.50 | 5.00 | Diag Down | No | Yes | 0.0000 | 0.0000 |
| T48 | 41.50-36.50 | 5.00 | Diag Up | No | Yes | 0.0000 | 0.0000 |
| T49 | 36.50-31.50 | 5.00 | Diag Down | No | Yes | 0.0000 | 0.0000 |
| T50 | 31.50-6.50 | 5.00 | K Brace Left | No | Yes | 0.0000 | 0.0000 |
| T51 | 6.50-0.00 | 6.50 | X Brace | No | Yes | 0.0000 | 0.0000 |

## Tower Section Geometry *(cont'd)*

| Tower Elevation ft | Leg Type | Leg Size | Leg Grade | Diagonal Type | Diagonal Size | Diagonal Grade |
|---|---|---|---|---|---|---|

| Tower Elevation ft | Leg Type | Leg Size | Leg Grade | Diagonal Type | Diagonal Size | Diagonal Grade |
|---|---|---|---|---|---|---|
| T1 314.50-310.50 | Solid Round | 2 1/2 | A572-50 (50 ksi) | Double Equal Angle | 2L2x2x1/4x3/8 | A36 (36 ksi) |
| T2 310.50-306.50 | Solid Round | 2 1/2 | A572-50 (50 ksi) | Pipe | VSi-HSS1.5X0.125 | A500-42 (42 ksi) |
| T3 306.50-281.50 | Solid Round | 2 1/2 | A572-50 (50 ksi) | Pipe | VSi-HSS1.5X0.125 | A500-42 (42 ksi) |
| T4 281.50-276.50 | Solid Round | 2 1/2 | A572-50 (50 ksi) | Pipe | VSi-HSS1.5X0.125 | A500-42 (42 ksi) |
| T5 276.50-271.50 | Solid Round | 2 1/2 | A572-50 (50 ksi) | Pipe | VSi-HSS1.5X0.125 | A500-42 (42 ksi) |
| T6 271.50-266.50 | Solid Round | 2 1/2 | A572-50 (50 ksi) | Pipe | VSi-PIPE1-1/2SCH40 | A500-42 (42 ksi) |
| T7 266.50-261.50 | Solid Round | 2 1/2 | A572-50 (50 ksi) | Pipe | VSi-PIPE1-1/2SCH40 | A500-42 (42 ksi) |
| T8 261.50-256.50 | Solid Round | 2 1/2 | A572-50 (50 ksi) | Pipe | VSi-PIPE1-1/2SCH40 | A500-42 (42 ksi) |
| T9 256.50-251.50 | Solid Round | 2 1/2 | A572-50 (50 ksi) | Pipe | VSi-Pipe1-1/2SCH80 | A500-42 (42 ksi) |
| T10 251.50-246.50 | Solid Round | 2 1/2 | A572-50 (50 ksi) | Pipe | VSi-Pipe1-1/2SCH80 | A500-42 (42 ksi) |
| T11 246.50-241.50 | Solid Round | 2 1/2 | A572-50 (50 ksi) | Double Equal Angle | 2L2x2x1/4x3/8 | A36 (36 ksi) |
| T12 241.50-236.50 | Solid Round | 2 1/2 | A572-50 (50 ksi) | Double Equal Angle | 2L2x2x1/4x3/8 | A36 (36 ksi) |
| T13 236.50-231.50 | Solid Round | 2 1/2 | A572-50 (50 ksi) | Double Equal Angle | 2L2x2x1/4x3/8 | A36 (36 ksi) |
| T14 231.50-226.50 | Solid Round | 2 1/2 | A572-50 (50 ksi) | Double Equal Angle | 2L2x2x1/4x3/8 | A36 (36 ksi) |
| T15 226.50-221.50 | Solid Round | 2 1/2 | A572-50 (50 ksi) | Pipe | VSi-PIPE1-1/2SCH40 | A500-42 (42 ksi) |
| T16 221.50-216.50 | Solid Round | 2 1/2 | A572-50 (50 ksi) | Pipe | VSi-PIPE1-1/2SCH40 | A500-42 (42 ksi) |
| T17 216.50-211.50 | Solid Round | 2 1/2 | A572-50 (50 ksi) | Pipe | VSi-PIPE1-1/2SCH40 | A500-42 (42 ksi) |
| T18 211.50-206.50 | Solid Round | 2 1/2 | A572-50 (50 ksi) | Pipe | VSi-PIPE1-1/2SCH40 | A500-42 (42 ksi) |
| T19 206.50-201.50 | Solid Round | 2 1/2 | A572-50 (50 ksi) | Pipe | VSi-PIPE1-1/2SCH40 | A500-42 (42 ksi) |
| T20 201.50-196.50 | Solid Round | 2 1/2 | A572-50 (50 ksi) | Pipe | VSi-PIPE1-1/2SCH40 | A500-42 (42 ksi) |
| T21 196.50-191.50 | Solid Round | 2 1/2 | A572-50 (50 ksi) | Pipe | VSi-PIPE1-1/2SCH40 | A500-42 (42 ksi) |
| T22 191.50-186.50 | Solid Round | 2 1/2 | A572-50 (50 ksi) | Pipe | VSi-PIPE1-1/2SCH40 | A500-42 (42 ksi) |
| T23 186.50-181.50 | Solid Round | 2 1/2 | A572-50 (50 ksi) | Pipe | VSi-PIPE1-1/2SCH40 | A500-42 (42 ksi) |
| T24 181.50-176.50 | Solid Round | 2 1/4 | A572-50 (50 ksi) | Pipe | VSi-HSS1.5X0.125 | A500-42 (42 ksi) |
| T25 176.50-171.50 | Solid Round | 2 1/4 | A572-50 (50 ksi) | Pipe | VSi-PIPE1-1/2SCH40 | A500-42 (42 ksi) |
| T26 171.50-166.50 | Solid Round | 2 1/4 | A572-50 (50 ksi) | Pipe | VSi-PIPE1-1/2SCH40 | A500-42 (42 ksi) |
| T27 166.50-161.50 | Solid Round | 2 1/4 | A572-50 (50 ksi) | Double Equal Angle | 2L2x2x1/4x3/8 | A36 (36 ksi) |
| T28 161.50-156.50 | Solid Round | 2 1/4 | A572-50 (50 ksi) | Pipe | VSi-HSS1.5X0.125 | A500-42 (42 ksi) |
| T29 156.50-151.50 | Solid Round | 2 1/4 | A572-50 (50 ksi) | Pipe | VSi-HSS1.5X0.125 | A500-42 (42 ksi) |
| T30 151.50-146.50 | Solid Round | 2 1/4 | A572-50 (50 ksi) | Pipe | VSi-HSS1.5X0.125 | A500-42 (42 ksi) |
| T31 | Solid Round | 2 1/4 | A572-50 | Pipe | VSi-HSS1.5X0.125 | A500-42 |



| Tower Elevation ft | Leg Type | Leg Size | Leg Grade | Diagonal Type | Diagonal Size | Diagonal Grade |
|---|---|---|---|---|---|---|
| 146.50-141.50 | | | (50 ksi) | | | (42 ksi) |
| T32 141.50-136.50 | Solid Round | 2 1/4 | A572-50 (50 ksi) | Pipe | VSi-HSS1.5X0.125 | A500-42 (42 ksi) |
| T33 136.50-131.50 | Solid Round | 2 1/4 | A572-50 (50 ksi) | Pipe | VSi-HSS1.5X0.125 | A500-42 (42 ksi) |
| T34 131.50-106.50 | Solid Round | 2 1/4 | A572-50 (50 ksi) | Pipe | VSi-HSS1.5X0.125 | A500-42 (42 ksi) |
| T35 106.50-101.50 | Solid Round | 2 1/4 | A572-50 (50 ksi) | Pipe | VSi-HSS1.5X0.125 | A500-42 (42 ksi) |
| T36 101.50-96.50 | Solid Round | 2 1/4 | A572-50 (50 ksi) | Pipe | VSi-HSS1.5X0.125 | A500-42 (42 ksi) |
| T37 96.50-91.50 | Solid Round | 2 1/4 | A572-50 (50 ksi) | Pipe | VSi-HSS1.5X0.125 | A500-42 (42 ksi) |
| T38 91.50-86.50 | Solid Round | 2 1/4 | A572-50 (50 ksi) | Pipe | VSi-HSS1.5X0.125 | A500-42 (42 ksi) |
| T39 86.50-81.50 | Solid Round | 2 1/4 | A572-50 (50 ksi) | Pipe | VSi-HSS1.5X0.125 | A500-42 (42 ksi) |
| T40 81.50-76.50 | Solid Round | 2 1/4 | A572-50 (50 ksi) | Pipe | VSi-PIPE1-1/2SCH40 | A500-42 (42 ksi) |
| T41 76.50-71.50 | Solid Round | 2 1/4 | A572-50 (50 ksi) | Pipe | VSi-PIPE1-1/2SCH40 | A500-42 (42 ksi) |
| T42 71.50-66.50 | Solid Round | 2 1/4 | A572-50 (50 ksi) | Pipe | VSi-HSS1.5X0.125 | A500-42 (42 ksi) |
| T43 66.50-61.50 | Solid Round | 2 1/4 | A572-50 (50 ksi) | Pipe | VSi-HSS1.5X0.125 | A500-42 (42 ksi) |
| T44 61.50-56.50 | Solid Round | 2 1/4 | A572-50 (50 ksi) | Pipe | VSi-HSS1.5X0.125 | A500-42 (42 ksi) |
| T45 56.50-51.50 | Solid Round | 2 1/4 | A572-50 (50 ksi) | Pipe | VSi-HSS1.5X0.125 | A500-42 (42 ksi) |
| T46 51.50-46.50 | Solid Round | 2 1/4 | A572-50 (50 ksi) | Pipe | VSi-HSS1.5X0.125 | A500-42 (42 ksi) |
| T47 46.50-41.50 | Solid Round | 2 1/4 | A572-50 (50 ksi) | Pipe | VSi-PIPE1-1/2SCH40 | A500-42 (42 ksi) |
| T48 41.50-36.50 | Solid Round | 2 1/4 | A572-50 (50 ksi) | Pipe | VSi-PIPE1-1/2SCH40 | A500-42 (42 ksi) |
| T49 36.50-31.50 | Solid Round | 2 1/4 | A572-50 (50 ksi) | Pipe | VSi-PIPE1-1/2SCH40 | A500-42 (42 ksi) |
| T50 31.50-6.50 | Solid Round | 2 1/4 | A572-50 (50 ksi) | Pipe | VSi-PIPE1-1/2SCH40 | A500-42 (42 ksi) |
| T51 6.50-0.00 | Wide Flange | W8x40 | A36 (36 ksi) | Tube | | A500-42 (42 ksi) |

## Tower Section Geometry *(cont'd)*

| Tower Elevation ft | Top Girt Type | Top Girt Size | Top Girt Grade | Bottom Girt Type | Bottom Girt Size | Bottom Girt Grade |
|---|---|---|---|---|---|---|
| T1 314.50-310.50 | Equal Angle | L2x2x1/4 | A36 (36 ksi) | Tube | | A500-42 (42 ksi) |
| T51 6.50-0.00 | Wide Flange | W16x50 | A36 (36 ksi) | Solid Round | | A36 (36 ksi) |

## Tower Section Geometry *(cont'd)*

| Tower Elevation ft | No. of Mid Girts | Mid Girt Type | Mid Girt Size | Mid Girt Grade | Horizontal Type | Horizontal Size | Horizontal Grade |
|---|---|---|---|---|---|---|---|
| T1 314.50-310.50 | None | Flat Bar | | A36 (36 ksi) | Pipe | VSi-HSS1.5X0.125 | A500-42 (42 ksi) |
| T2 310.50-306.50 | None | Flat Bar | | A36 (36 ksi) | Pipe | VSi-HSS1.5X0.125 | A500-42 (42 ksi) |
| T3 306.50-281.50 | None | Flat Bar | | A36 (36 ksi) | Pipe | VSi-HSS1.5X0.125 | A500-42 (42 ksi) |
| T4 281.50-276.50 | None | Flat Bar | | A36 (36 ksi) | Pipe | VSi-HSS1.5X0.125 | A500-42 (42 ksi) |
| T5 276.50-271.50 | None | Flat Bar | | A36 (36 ksi) | Pipe | VSi-HSS1.5X0.125 | A500-42 (42 ksi) |
| T6 271.50-266.50 | None | Flat Bar | | A36 (36 ksi) | Pipe | VSi-HSS1.5X0.125 | A500-42 (42 ksi) |
| T7 266.50-261.50 | None | Flat Bar | | A36 (36 ksi) | Pipe | VSi-HSS1.5X0.125 | A500-42 (42 ksi) |
| T8 261.50-256.50 | None | Flat Bar | | A36 (36 ksi) | Pipe | VSi-HSS1.5X0.125 | A500-42 (42 ksi) |
| T9 256.50-251.50 | None | Flat Bar | | A36 (36 ksi) | Pipe | VSi-HSS1.5X0.125 | A500-42 (42 ksi) |
| T10 251.50-246.50 | None | Flat Bar | | A36 (36 ksi) | Pipe | VSi-HSS1.5X0.125 | A500-42 (42 ksi) |
| T11 246.50-241.50 | None | Flat Bar | | A36 (36 ksi) | Pipe | VSi-HSS1.5X0.125 | A500-42 (42 ksi) |
| T12 241.50-236.50 | None | Flat Bar | | A36 (36 ksi) | Pipe | VSi-HSS1.5X0.125 | A500-42 (42 ksi) |
| T13 236.50-231.50 | None | Flat Bar | | A36 (36 ksi) | Pipe | VSi-HSS1.5X0.125 | A500-42 (42 ksi) |
| T14 231.50-226.50 | None | Flat Bar | | A36 (36 ksi) | Pipe | VSi-HSS1.5X0.125 | A500-42 (42 ksi) |
| T15 226.50-221.50 | None | Flat Bar | | A36 (36 ksi) | Pipe | VSi-HSS1.5X0.125 | A500-42 (42 ksi) |
| T16 221.50-216.50 | None | Flat Bar | | A36 (36 ksi) | Pipe | VSi-HSS1.5X0.125 | A500-42 (42 ksi) |
| T17 216.50-211.50 | None | Flat Bar | | A36 (36 ksi) | Pipe | VSi-HSS1.5X0.125 | A500-42 (42 ksi) |
| T18 211.50-206.50 | None | Flat Bar | | A36 (36 ksi) | Pipe | VSi-HSS1.5X0.125 | A500-42 (42 ksi) |
| T19 206.50-201.50 | None | Flat Bar | | A36 (36 ksi) | Pipe | VSi-HSS1.5X0.125 | A500-42 (42 ksi) |
| T20 201.50-196.50 | None | Flat Bar | | A36 (36 ksi) | Pipe | VSi-HSS1.5X0.125 | A500-42 (42 ksi) |
| T21 196.50-191.50 | None | Flat Bar | | A36 (36 ksi) | Pipe | VSi-HSS1.5X0.125 | A500-42 (42 ksi) |
| T22 191.50-186.50 | None | Flat Bar | | A36 (36 ksi) | Pipe | VSi-HSS1.5X0.125 | A500-42 (42 ksi) |
| T23 186.50-181.50 | None | Flat Bar | | A36 (36 ksi) | Pipe | VSi-HSS1.5X0.125 | A500-42 (42 ksi) |
| T24 181.50-176.50 | None | Flat Bar | | A36 (36 ksi) | Pipe | VSi-HSS1.5X0.125 | A500-42 (42 ksi) |
| T25 176.50-171.50 | None | Flat Bar | | A36 (36 ksi) | Pipe | VSi-HSS1.5X0.125 | A500-42 (42 ksi) |
| T26 171.50-166.50 | None | Flat Bar | | A36 (36 ksi) | Pipe | VSi-HSS1.5X0.125 | A500-42 (42 ksi) |
| T27 166.50-161.50 | None | Flat Bar | | A36 (36 ksi) | Pipe | VSi-HSS1.5X0.125 | A500-42 (42 ksi) |
| T28 161.50-156.50 | None | Flat Bar | | A36 (36 ksi) | Pipe | VSi-HSS1.5X0.125 | A500-42 (42 ksi) |
| T29 | None | Flat Bar | | A36 | Pipe | VSi-HSS1.5X0.125 | A500-42 |



| Tower Elevation ft | No. of Mid Girts | Mid Girt Type | Mid Girt Size | Mid Girt Grade | Horizontal Type | Horizontal Size | Horizontal Grade |
|---|---|---|---|---|---|---|---|
| 156.50-151.50 | | | | (36 ksi) | | | (42 ksi) |
| T30 151.50-146.50 | None | Flat Bar | | A36 (36 ksi) | Pipe | VSi-HSS1.5X0.125 | A500-42 (42 ksi) |
| T31 146.50-141.50 | None | Flat Bar | | A36 (36 ksi) | Pipe | VSi-HSS1.5X0.125 | A500-42 (42 ksi) |
| T32 141.50-136.50 | None | Flat Bar | | A36 (36 ksi) | Pipe | VSi-HSS1.5X0.125 | A500-42 (42 ksi) |
| T33 136.50-131.50 | None | Flat Bar | | A36 (36 ksi) | Pipe | VSi-HSS1.5X0.125 | A500-42 (42 ksi) |
| T34 131.50-106.50 | None | Flat Bar | | A36 (36 ksi) | Pipe | VSi-HSS1.5X0.125 | A500-42 (42 ksi) |
| T35 106.50-101.50 | None | Flat Bar | | A36 (36 ksi) | Pipe | VSi-HSS1.5X0.125 | A500-42 (42 ksi) |
| T36 101.50-96.50 | None | Flat Bar | | A36 (36 ksi) | Pipe | VSi-HSS1.5X0.125 | A500-42 (42 ksi) |
| T37 96.50-91.50 | None | Flat Bar | | A36 (36 ksi) | Pipe | VSi-HSS1.5X0.125 | A500-42 (42 ksi) |
| T38 91.50-86.50 | None | Flat Bar | | A36 (36 ksi) | Pipe | VSi-HSS1.5X0.125 | A500-42 (42 ksi) |
| T39 86.50-81.50 | None | Flat Bar | | A36 (36 ksi) | Pipe | VSi-HSS1.5X0.125 | A500-42 (42 ksi) |
| T40 81.50-76.50 | None | Flat Bar | | A36 (36 ksi) | Pipe | VSi-HSS1.5X0.125 | A500-42 (42 ksi) |
| T41 76.50-71.50 | None | Flat Bar | | A36 (36 ksi) | Pipe | VSi-HSS1.5X0.125 | A500-42 (42 ksi) |
| T42 71.50-66.50 | None | Flat Bar | | A36 (36 ksi) | Pipe | VSi-HSS1.5X0.125 | A500-42 (42 ksi) |
| T43 66.50-61.50 | None | Flat Bar | | A36 (36 ksi) | Pipe | VSi-HSS1.5X0.125 | A500-42 (42 ksi) |
| T44 61.50-56.50 | None | Flat Bar | | A36 (36 ksi) | Pipe | VSi-HSS1.5X0.125 | A500-42 (42 ksi) |
| T45 56.50-51.50 | None | Flat Bar | | A36 (36 ksi) | Pipe | VSi-HSS1.5X0.125 | A500-42 (42 ksi) |
| T46 51.50-46.50 | None | Flat Bar | | A36 (36 ksi) | Pipe | VSi-HSS1.5X0.125 | A500-42 (42 ksi) |
| T47 46.50-41.50 | None | Flat Bar | | A36 (36 ksi) | Pipe | VSi-HSS1.5X0.125 | A500-42 (42 ksi) |
| T48 41.50-36.50 | None | Flat Bar | | A36 (36 ksi) | Pipe | VSi-HSS1.5X0.125 | A500-42 (42 ksi) |
| T49 36.50-31.50 | None | Flat Bar | | A36 (36 ksi) | Pipe | VSi-HSS1.5X0.125 | A500-42 (42 ksi) |
| T50 31.50-6.50 | None | Flat Bar | | A36 (36 ksi) | Pipe | VSi-HSS1.5X0.125 | A500-42 (42 ksi) |

## Tower Section Geometry *(cont'd)*

| Tower Elevation ft | Secondary Horizontal Type | Secondary Horizontal Size | Secondary Horizontal Grade | Inner Bracing Type | Inner Bracing Size | Inner Bracing Grade |
|---|---|---|---|---|---|---|
| T4 281.50-276.50 | Solid Round | 1 | A36 (36 ksi) | Solid Round | | A572-50 (50 ksi) |
| T5 276.50-271.50 | Solid Round | 1 | A36 (36 ksi) | Solid Round | | A572-50 (50 ksi) |
| T11 | Single Angle | VSi-L2-1/2X2X1/4 | A36 | Solid Round | | A572-50 |

| Tower Elevation | Secondary Horizontal Type | Secondary Horizontal Size | Secondary Horizontal Grade | Inner Bracing Type | Inner Bracing Size | Inner Bracing Grade |
|---|---|---|---|---|---|---|
| ft | | | | | | |
| 246.50-241.50 | | | (36 ksi) | | | (50 ksi) |
| T12 | Double Angle | VSi-2L2-1/2X2X1/4X3/8 | A36 | Solid Round | | A572-50 |
| 241.50-236.50 | | | (36 ksi) | | | (50 ksi) |
| T13 | Double Angle | VSi-2L2-1/2X2X1/4X3/8 | A36 | Solid Round | | A572-50 |
| 236.50-231.50 | | | (36 ksi) | | | (50 ksi) |
| T14 | Single Angle | VSi-L2-1/2X2X1/4 | A36 | Solid Round | | A572-50 |
| 231.50-226.50 | | | (36 ksi) | | | (50 ksi) |
| T15 | Single Angle | VSi-L2-1/2X2X1/4 | A36 | Solid Round | | A572-50 |
| 226.50-221.50 | | | (36 ksi) | | | (50 ksi) |
| T16 | Single Angle | VSi-L2-1/2X2X1/4 | A36 | Solid Round | | A572-50 |
| 221.50-216.50 | | | (36 ksi) | | | (50 ksi) |
| T17 | Single Angle | VSi-L2-1/2X2X1/4 | A36 | Solid Round | | A572-50 |
| 216.50-211.50 | | | (36 ksi) | | | (50 ksi) |
| T18 | Single Angle | VSi-L2-1/2X2X1/4 | A36 | Solid Round | | A572-50 |
| 211.50-206.50 | | | (36 ksi) | | | (50 ksi) |
| T19 | Single Angle | VSi-L2-1/2X2X1/4 | A36 | Solid Round | | A572-50 |
| 206.50-201.50 | | | (36 ksi) | | | (50 ksi) |
| T20 | Single Angle | VSi-L2-1/2X2X1/4 | A36 | Solid Round | | A572-50 |
| 201.50-196.50 | | | (36 ksi) | | | (50 ksi) |
| T21 | Single Angle | VSi-L2-1/2X2X1/4 | A36 | Solid Round | | A572-50 |
| 196.50-191.50 | | | (36 ksi) | | | (50 ksi) |
| T22 | Single Angle | VSi-L2-1/2X2X1/4 | A36 | Solid Round | | A572-50 |
| 191.50-186.50 | | | (36 ksi) | | | (50 ksi) |
| T23 | Single Angle | VSi-L2-1/2X2X1/4 | A36 | Solid Round | | A572-50 |
| 186.50-181.50 | | | (36 ksi) | | | (50 ksi) |
| T29 | Solid Round | 1 | A36 | Solid Round | | A572-50 |
| 156.50-151.50 | | | (36 ksi) | | | (50 ksi) |
| T30 | Solid Round | 1 | A36 | Solid Round | | A572-50 |
| 151.50-146.50 | | | (36 ksi) | | | (50 ksi) |
| T36 101.50-96.50 | Solid Round | 1 | A36 | Solid Round | | A572-50 |
| | | | (36 ksi) | | | (50 ksi) |
| T41 76.50-71.50 | Single Angle | VSi-L2-1/2X2X1/4 | A36 | Solid Round | | A572-50 |
| | | | (36 ksi) | | | (50 ksi) |
| T42 71.50-66.50 | Single Angle | VSi-L2-1/2X2X1/4 | A36 | Solid Round | | A572-50 |
| | | | (36 ksi) | | | (50 ksi) |
| T43 66.50-61.50 | Single Angle | VSi-L2-1/2X2X1/4 | A36 | Solid Round | | A572-50 |
| | | | (36 ksi) | | | (50 ksi) |
| T44 61.50-56.50 | Solid Round | 1 | A36 | Solid Round | | A572-50 |
| | | | (36 ksi) | | | (50 ksi) |
| T45 56.50-51.50 | Solid Round | 1 | A36 | Solid Round | | A572-50 |
| | | | (36 ksi) | | | (50 ksi) |
| T46 51.50-46.50 | Solid Round | 1 | A36 | Solid Round | | A572-50 |
| | | | (36 ksi) | | | (50 ksi) |
| T47 46.50-41.50 | Solid Round | 1 | A36 | Solid Round | | A572-50 |
| | | | (36 ksi) | | | (50 ksi) |
| T48 41.50-36.50 | Solid Round | 1 | A36 | Solid Round | | A572-50 |
| | | | (36 ksi) | | | (50 ksi) |
| T49 36.50-31.50 | Solid Round | 1 | A36 | Solid Round | | A572-50 |
| | | | (36 ksi) | | | (50 ksi) |

## Tower Section Geometry *(cont'd)*



| 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 | Double Angle Stitch Bolt Spacing Horizontals | Double Angle Stitch Bolt Spacing Redundants |
|---|---|---|---|---|---|---|---|---|---|
| ft | $ft^2$ | in | | | | | in | in | in |
| T1 | 0.00 | 0.0000 | A36 | 1 | 1 | 1 | 36.0000 | 36.0000 | 36.0000 |
| 314.50-310.50 | | | (36 ksi) | | | | | | |
| T2 | 0.00 | 0.0000 | A36 | 1 | 1 | 1 | 36.0000 | 36.0000 | 36.0000 |
| 310.50-306.50 | | | (36 ksi) | | | | | | |
| T3 | 0.00 | 0.0000 | A36 | 1 | 1 | 1 | 36.0000 | 36.0000 | 36.0000 |
| 306.50-281.50 | | | (36 ksi) | | | | | | |
| T4 | 0.00 | 0.0000 | A36 | 1 | 1 | 1 | 36.0000 | 36.0000 | 36.0000 |
| 281.50-276.50 | | | (36 ksi) | | | | | | |
| T5 | 0.00 | 0.0000 | A36 | 1 | 1 | 1 | 36.0000 | 36.0000 | 36.0000 |
| 276.50-271.50 | | | (36 ksi) | | | | | | |
| T6 | 0.00 | 0.0000 | A36 | 1 | 1 | 1 | 36.0000 | 36.0000 | 36.0000 |
| 271.50-266.50 | | | (36 ksi) | | | | | | |
| T7 | 0.00 | 0.0000 | A36 | 1 | 1 | 1 | 36.0000 | 36.0000 | 36.0000 |
| 266.50-261.50 | | | (36 ksi) | | | | | | |
| T8 | 0.00 | 0.0000 | A36 | 1 | 1 | 1 | 36.0000 | 36.0000 | 36.0000 |
| 261.50-256.50 | | | (36 ksi) | | | | | | |
| T9 | 0.00 | 0.0000 | A36 | 1 | 1 | 1 | 36.0000 | 36.0000 | 36.0000 |
| 256.50-251.50 | | | (36 ksi) | | | | | | |
| T10 | 0.00 | 0.0000 | A36 | 1 | 1 | 1 | 36.0000 | 36.0000 | 36.0000 |
| 251.50-246.50 | | | (36 ksi) | | | | | | |
| T11 | 0.00 | 0.0000 | A36 | 1 | 1 | 1 | 36.0000 | 36.0000 | 36.0000 |
| 246.50-241.50 | | | (36 ksi) | | | | | | |
| T12 | 0.00 | 0.0000 | A36 | 1 | 1 | 1 | 36.0000 | 36.0000 | 36.0000 |
| 241.50-236.50 | | | (36 ksi) | | | | | | |
| T13 | 0.00 | 0.0000 | A36 | 1 | 1 | 1 | 36.0000 | 36.0000 | 36.0000 |
| 236.50-231.50 | | | (36 ksi) | | | | | | |
| T14 | 0.00 | 0.0000 | A36 | 1 | 1 | 1 | 36.0000 | 36.0000 | 36.0000 |
| 231.50-226.50 | | | (36 ksi) | | | | | | |
| T15 | 0.00 | 0.0000 | A36 | 1 | 1 | 1 | 36.0000 | 36.0000 | 36.0000 |
| 226.50-221.50 | | | (36 ksi) | | | | | | |
| T16 | 0.00 | 0.0000 | A36 | 1 | 1 | 1 | 36.0000 | 36.0000 | 36.0000 |
| 221.50-216.50 | | | (36 ksi) | | | | | | |
| T17 | 0.00 | 0.0000 | A36 | 1 | 1 | 1 | 36.0000 | 36.0000 | 36.0000 |
| 216.50-211.50 | | | (36 ksi) | | | | | | |
| T18 | 0.00 | 0.0000 | A36 | 1 | 1 | 1 | 36.0000 | 36.0000 | 36.0000 |
| 211.50-206.50 | | | (36 ksi) | | | | | | |
| T19 | 0.00 | 0.0000 | A36 | 1 | 1 | 1 | 36.0000 | 36.0000 | 36.0000 |
| 206.50-201.50 | | | (36 ksi) | | | | | | |
| T20 | 0.00 | 0.0000 | A36 | 1 | 1 | 1 | 36.0000 | 36.0000 | 36.0000 |
| 201.50-196.50 | | | (36 ksi) | | | | | | |
| T21 | 0.00 | 0.0000 | A36 | 1 | 1 | 1 | 36.0000 | 36.0000 | 36.0000 |
| 196.50-191.50 | | | (36 ksi) | | | | | | |
| T22 | 0.00 | 0.0000 | A36 | 1 | 1 | 1 | 36.0000 | 36.0000 | 36.0000 |
| 191.50-186.50 | | | (36 ksi) | | | | | | |
| T23 | 0.00 | 0.0000 | A36 | 1 | 1 | 1 | 36.0000 | 36.0000 | 36.0000 |
| 186.50-181.50 | | | (36 ksi) | | | | | | |
| T24 | 0.00 | 0.0000 | A36 | 1 | 1 | 1 | 36.0000 | 36.0000 | 36.0000 |
| 181.50-176.50 | | | (36 ksi) | | | | | | |
| T25 | 0.00 | 0.0000 | A36 | 1 | 1 | 1 | 36.0000 | 36.0000 | 36.0000 |
| 176.50-171.50 | | | (36 ksi) | | | | | | |
| T26 | 0.00 | 0.0000 | A36 | 1 | 1 | 1 | 36.0000 | 36.0000 | 36.0000 |
| 171.50-166.50 | | | (36 ksi) | | | | | | |
| T27 | 0.00 | 0.0000 | A36 | 1 | 1 | 1 | 36.0000 | 36.0000 | 36.0000 |
| 166.50-161.50 | | | (36 ksi) | | | | | | |
| T28 | 0.00 | 0.0000 | A36 | 1 | 1 | 1 | 36.0000 | 36.0000 | 36.0000 |
| 161.50-156.50 | | | (36 ksi) | | | | | | |
| T29 | 0.00 | 0.0000 | A36 | 1 | 1 | 1 | 36.0000 | 36.0000 | 36.0000 |
| 156.50-151.50 | | | (36 ksi) | | | | | | |
| T30 | 0.00 | 0.0000 | A36 | 1 | 1 | 1 | 36.0000 | 36.0000 | 36.0000 |

| 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 | Double Angle Stitch Bolt Spacing Horizontals | Double Angle Stitch Bolt Spacing Redundants |
|---|---|---|---|---|---|---|---|---|---|
| ft | $ft^2$ | in | | | | | in | in | in |
| 151.50-146.50 | | | (36 ksi) | | | | | | |
| T31 | 0.00 | 0.0000 | A36 | 1 | 1 | 1 | 36.0000 | 36.0000 | 36.0000 |
| 146.50-141.50 | | | (36 ksi) | | | | | | |
| T32 | 0.00 | 0.0000 | A36 | 1 | 1 | 1 | 36.0000 | 36.0000 | 36.0000 |
| 141.50-136.50 | | | (36 ksi) | | | | | | |
| T33 | 0.00 | 0.0000 | A36 | 1 | 1 | 1 | 36.0000 | 36.0000 | 36.0000 |
| 136.50-131.50 | | | (36 ksi) | | | | | | |
| T34 | 0.00 | 0.0000 | A36 | 1 | 1 | 1 | 36.0000 | 36.0000 | 36.0000 |
| 131.50-106.50 | | | (36 ksi) | | | | | | |
| T35 | 0.00 | 0.0000 | A36 | 1 | 1 | 1 | 36.0000 | 36.0000 | 36.0000 |
| 106.50-101.50 | | | (36 ksi) | | | | | | |
| T36 | 0.00 | 0.0000 | A36 | 1 | 1 | 1 | 36.0000 | 36.0000 | 36.0000 |
| 101.50-96.50 | | | (36 ksi) | | | | | | |
| T37 | 0.00 | 0.0000 | A36 | 1 | 1 | 1 | 36.0000 | 36.0000 | 36.0000 |
| 96.50-91.50 | | | (36 ksi) | | | | | | |
| T38 | 0.00 | 0.0000 | A36 | 1 | 1 | 1 | 36.0000 | 36.0000 | 36.0000 |
| 91.50-86.50 | | | (36 ksi) | | | | | | |
| T39 | 0.00 | 0.0000 | A36 | 1 | 1 | 1 | 36.0000 | 36.0000 | 36.0000 |
| 86.50-81.50 | | | (36 ksi) | | | | | | |
| T40 | 0.00 | 0.0000 | A36 | 1 | 1 | 1 | 36.0000 | 36.0000 | 36.0000 |
| 81.50-76.50 | | | (36 ksi) | | | | | | |
| T41 | 0.00 | 0.0000 | A36 | 1 | 1 | 1 | 36.0000 | 36.0000 | 36.0000 |
| 76.50-71.50 | | | (36 ksi) | | | | | | |
| T42 | 0.00 | 0.0000 | A36 | 1 | 1 | 1 | 36.0000 | 36.0000 | 36.0000 |
| 71.50-66.50 | | | (36 ksi) | | | | | | |
| T43 | 0.00 | 0.0000 | A36 | 1 | 1 | 1 | 36.0000 | 36.0000 | 36.0000 |
| 66.50-61.50 | | | (36 ksi) | | | | | | |
| T44 | 0.00 | 0.0000 | A36 | 1 | 1 | 1 | 36.0000 | 36.0000 | 36.0000 |
| 61.50-56.50 | | | (36 ksi) | | | | | | |
| T45 | 0.00 | 0.0000 | A36 | 1 | 1 | 1 | 36.0000 | 36.0000 | 36.0000 |
| 56.50-51.50 | | | (36 ksi) | | | | | | |
| T46 | 0.00 | 0.0000 | A36 | 1 | 1 | 1 | 36.0000 | 36.0000 | 36.0000 |
| 51.50-46.50 | | | (36 ksi) | | | | | | |
| T47 | 0.00 | 0.0000 | A36 | 1 | 1 | 1 | 36.0000 | 36.0000 | 36.0000 |
| 46.50-41.50 | | | (36 ksi) | | | | | | |
| T48 | 0.00 | 0.0000 | A36 | 1 | 1 | 1 | 36.0000 | 36.0000 | 36.0000 |
| 41.50-36.50 | | | (36 ksi) | | | | | | |
| T49 | 0.00 | 0.0000 | A36 | 1 | 1 | 1 | 36.0000 | 36.0000 | 36.0000 |
| 36.50-31.50 | | | (36 ksi) | | | | | | |
| T50 31.50-6.50 | 0.00 | 0.0000 | A36 | 1 | 1 | 1 | 36.0000 | 36.0000 | 36.0000 |
| | | | (36 ksi) | | | | | | |
| T51 6.50-0.00 | 0.00 | 0.0000 | A36 | 1 | 1 | 1 | 36.0000 | 36.0000 | 36.0000 |
| | | | (36 ksi) | | | | | | |

## Tower Section Geometry *(cont'd)*

| Tower Elevation | Calc K Single Angles | Calc K Solid Rounds | K Factors[1] Legs | X Brace Diags X | X Brace Diags Y | Single Diags X | Single Diags Y | Girts X | Girts Y | Horiz. X | Horiz. Y | Sec. Horiz. X | Sec. Horiz. Y | Inner Brace X | Inner Brace Y |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ft | | | | | | | | | | | | | | | |
| T1 | No | No | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 314.50-310.50 | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| T2 | No | No | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |



| Tower Elevation | Calc K Single Angles | Calc K Solid Rounds | K Factors[1] Legs | X Brace Diags X | X Brace Diags Y | Single Diags X | Single Diags Y | Girts X | Girts Y | Horiz. X | Horiz. Y | Sec. Horiz. X | Sec. Horiz. Y | Inner Brace X | Inner Brace Y |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ft | | | | | | | | | | | | | | | |
| 310.50-306.50 | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| T3 | No | No | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 306.50-281.50 | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| T4 | No | No | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 281.50-276.50 | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| T5 | No | No | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 276.50-271.50 | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| T6 | No | No | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 271.50-266.50 | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| T7 | No | No | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 266.50-261.50 | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| T8 | No | No | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 261.50-256.50 | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| T9 | No | No | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 256.50-251.50 | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| T10 | No | No | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 251.50-246.50 | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| T11 | No | No | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 246.50-241.50 | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| T12 | No | No | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 241.50-236.50 | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| T13 | No | No | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 236.50-231.50 | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| T14 | No | No | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 231.50-226.50 | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| T15 | No | No | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 226.50-221.50 | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| T16 | No | No | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 221.50-216.50 | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| T17 | No | No | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 216.50-211.50 | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| T18 | No | No | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 211.50-206.50 | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| T19 | No | No | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 206.50-201.50 | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| T20 | No | No | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 201.50-196.50 | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| T21 | No | No | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 196.50-191.50 | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| T22 | No | No | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 191.50-186.50 | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| T23 | No | No | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 186.50-181.50 | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| T24 | No | No | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 181.50-176.50 | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| T25 | No | No | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 176.50-171.50 | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| T26 | No | No | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 171.50-166.50 | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| T27 | No | No | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 166.50-161.50 | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| T28 | No | No | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 161.50-156.50 | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| T29 | No | No | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 156.50-151.50 | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| T30 | No | No | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 151.50-146.50 | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| T31 | No | No | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |

| Tower Elevation ft | Calc K Single Angles | Calc K Solid Rounds | K Factors[1] Legs | X Brace Diags X Y | K Brace Diags X Y | Single Diags X Y | Girts X Y | Horiz. X Y | Sec. Horiz. X Y | Inner Brace X Y |
|---|---|---|---|---|---|---|---|---|---|---|
| 146.50-141.50 | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| T32 | No | No | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 141.50-136.50 | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| T33 | No | No | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 136.50-131.50 | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| T34 | No | No | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 131.50-106.50 | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| T35 | No | No | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 106.50-101.50 | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| T36 | No | No | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 101.50-96.50 | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| T37 | No | No | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 96.50-91.50 | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| T38 | No | No | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 91.50-86.50 | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| T39 | No | No | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 86.50-81.50 | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| T40 | No | No | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 81.50-76.50 | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| T41 | No | No | 1 | 1 | 1 | 0.5 | 1 | 1 | 1 | 1 |
| 76.50-71.50 | | | | 1 | 1 | 0.5 | 1 | 1 | 1 | 1 |
| T42 | No | No | 1 | 1 | 1 | 0.5 | 1 | 1 | 1 | 1 |
| 71.50-66.50 | | | | 1 | 1 | 0.5 | 1 | 1 | 1 | 1 |
| T43 | No | No | 1 | 1 | 1 | 0.5 | 1 | 1 | 1 | 1 |
| 66.50-61.50 | | | | 1 | 1 | 0.5 | 1 | 1 | 1 | 1 |
| T44 | No | No | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 61.50-56.50 | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| T45 | No | No | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 56.50-51.50 | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| T46 | No | No | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 51.50-46.50 | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| T47 | No | No | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 46.50-41.50 | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| T48 | No | No | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 41.50-36.50 | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| T49 | No | No | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 36.50-31.50 | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| T50 | No | No | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 31.50-6.50 | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| T51 6.50-0.00 | No | No | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 |

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

## Tower Section Geometry *(cont'd)*



| Tower Elevation ft | Leg Net Width Deduct in | U | Diagonal Net Width Deduct in | U | Top Girt Net Width Deduct in | U | Bottom Girt Net Width Deduct in | U | Mid Girt Net Width Deduct in | U | Long Horizontal Net Width Deduct in | U | Short Horizontal Net Width Deduct in | U |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| T1 | 0.0000 | 1 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 |
| 314.50-310.50 | | | | | | | | | | | | | | |
| T2 | 0.0000 | 1 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 |
| 310.50-306.50 | | | | | | | | | | | | | | |
| T3 | 0.0000 | 1 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 |
| 306.50-281.50 | | | | | | | | | | | | | | |
| T4 | 0.0000 | 1 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 |
| 281.50-276.50 | | | | | | | | | | | | | | |
| T5 | 0.0000 | 1 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 |
| 276.50-271.50 | | | | | | | | | | | | | | |
| T6 | 0.0000 | 1 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 |
| 271.50-266.50 | | | | | | | | | | | | | | |
| T7 | 0.0000 | 1 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 |
| 266.50-261.50 | | | | | | | | | | | | | | |
| T8 | 0.0000 | 1 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 |
| 261.50-256.50 | | | | | | | | | | | | | | |
| T9 | 0.0000 | 1 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 |
| 256.50-251.50 | | | | | | | | | | | | | | |
| T10 | 0.0000 | 1 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 |
| 251.50-246.50 | | | | | | | | | | | | | | |
| T11 | 0.0000 | 1 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 |
| 246.50-241.50 | | | | | | | | | | | | | | |
| T12 | 0.0000 | 1 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 |
| 241.50-236.50 | | | | | | | | | | | | | | |
| T13 | 0.0000 | 1 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 |
| 236.50-231.50 | | | | | | | | | | | | | | |
| T14 | 0.0000 | 1 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 |
| 231.50-226.50 | | | | | | | | | | | | | | |
| T15 | 0.0000 | 1 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 |
| 226.50-221.50 | | | | | | | | | | | | | | |
| T16 | 0.0000 | 1 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 |
| 221.50-216.50 | | | | | | | | | | | | | | |
| T17 | 0.0000 | 1 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 |
| 216.50-211.50 | | | | | | | | | | | | | | |
| T18 | 0.0000 | 1 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 |
| 211.50-206.50 | | | | | | | | | | | | | | |
| T19 | 0.0000 | 1 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 |
| 206.50-201.50 | | | | | | | | | | | | | | |
| T20 | 0.0000 | 1 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 |
| 201.50-196.50 | | | | | | | | | | | | | | |
| T21 | 0.0000 | 1 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 |
| 196.50-191.50 | | | | | | | | | | | | | | |
| T22 | 0.0000 | 1 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 |
| 191.50-186.50 | | | | | | | | | | | | | | |
| T23 | 0.0000 | 1 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 |
| 186.50-181.50 | | | | | | | | | | | | | | |
| T24 | 0.0000 | 1 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 |
| 181.50-176.50 | | | | | | | | | | | | | | |
| T25 | 0.0000 | 1 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 |
| 176.50-171.50 | | | | | | | | | | | | | | |
| T26 | 0.0000 | 1 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 |
| 171.50-166.50 | | | | | | | | | | | | | | |
| T27 | 0.0000 | 1 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 |
| 166.50-161.50 | | | | | | | | | | | | | | |
| T28 | 0.0000 | 1 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 |
| 161.50-156.50 | | | | | | | | | | | | | | |

| Tower Elevation ft | Leg | | Diagonal | | Top Girt | | Bottom Girt | | Mid Girt | | Long Horizontal | | Short Horizontal | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Net Width Deduct in | U | Net Width Deduct in | U | Net Width Deduct in | U | Net Width Deduct in | U | Net Width Deduct in | U | Net Width Deduct in | U | Net Width Deduct in | U |
| T29 | 0.0000 | 1 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 |
| 156.50-151.50 | | | | | | | | | | | | | | |
| T30 | 0.0000 | 1 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 |
| 151.50-146.50 | | | | | | | | | | | | | | |
| T31 | 0.0000 | 1 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 |
| 146.50-141.50 | | | | | | | | | | | | | | |
| T32 | 0.0000 | 1 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 |
| 141.50-136.50 | | | | | | | | | | | | | | |
| T33 | 0.0000 | 1 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 |
| 136.50-131.50 | | | | | | | | | | | | | | |
| T34 | 0.0000 | 1 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 |
| 131.50-106.50 | | | | | | | | | | | | | | |
| T35 | 0.0000 | 1 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 |
| 106.50-101.50 | | | | | | | | | | | | | | |
| T36 | 0.0000 | 1 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 |
| 101.50-96.50 | | | | | | | | | | | | | | |
| T37 | 0.0000 | 1 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 |
| 96.50-91.50 | | | | | | | | | | | | | | |
| T38 | 0.0000 | 1 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 |
| 91.50-86.50 | | | | | | | | | | | | | | |
| T39 | 0.0000 | 1 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 |
| 86.50-81.50 | | | | | | | | | | | | | | |
| T40 | 0.0000 | 1 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 |
| 81.50-76.50 | | | | | | | | | | | | | | |
| T41 | 0.0000 | 1 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 |
| 76.50-71.50 | | | | | | | | | | | | | | |
| T42 | 0.0000 | 1 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 |
| 71.50-66.50 | | | | | | | | | | | | | | |
| T43 | 0.0000 | 1 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 |
| 66.50-61.50 | | | | | | | | | | | | | | |
| T44 | 0.0000 | 1 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 |
| 61.50-56.50 | | | | | | | | | | | | | | |
| T45 | 0.0000 | 1 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 |
| 56.50-51.50 | | | | | | | | | | | | | | |
| T46 | 0.0000 | 1 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 |
| 51.50-46.50 | | | | | | | | | | | | | | |
| T47 | 0.0000 | 1 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 |
| 46.50-41.50 | | | | | | | | | | | | | | |
| T48 | 0.0000 | 1 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 |
| 41.50-36.50 | | | | | | | | | | | | | | |
| T49 | 0.0000 | 1 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 |
| 36.50-31.50 | | | | | | | | | | | | | | |
| T50 31.50-6.50 | 0.0000 | 1 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 |
| T51 6.50-0.00 | 0.0000 | 1 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 | 0.0000 | 0.75 |

## Tower Section Geometry *(cont'd)*



| Tower Elevation ft | Leg Connection Type | Leg | | Diagonal | | Top Girt | | Bottom Girt | | Mid Girt | | Long Horizontal | | Short Horizontal | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Bolt Size in | No. | Bolt Size in | No. | Bolt Size in | No. | Bolt Size in | No. | Bolt Size in | No. | Bolt Size in | No. | Bolt Size in | No. |
| T1 | Flange | 0.5000 | 0 | 0.6250 | 1 | 0.6250 | 0 | 0.0000 | 0 | 0.6250 | 0 | 0.6250 | 1 | 0.5000 | 0 |
| 314.50-310.50 | | A325N | | A325N | | A325N | | A325N | | A325N | | A325N | | A325N | |
| T2 | Flange | 0.5000 | 3 | 0.6250 | 1 | 0.6250 | 0 | 0.6250 | 0 | 0.6250 | 0 | 0.6250 | 1 | 0.5000 | 0 |
| 310.50-306.50 | | A325N | | A325N | | A325N | | A325N | | A325N | | A325N | | A325N | |
| T3 | Flange | 0.5000 | 3 | 0.6250 | 1 | 0.6250 | 0 | 0.6250 | 0 | 0.6250 | 0 | 0.6250 | 1 | 0.5000 | 1 |
| 306.50-281.50 | | A325N | | A325N | | A325N | | A325N | | A325N | | A325N | | A325N | |
| T4 | Flange | 0.5000 | 0 | 0.6250 | 1 | 0.6250 | 0 | 0.0000 | 0 | 0.6250 | 0 | 0.6250 | 1 | 0.5000 | 1 |
| 281.50-276.50 | | A325N | | A325N | | A325N | | A325N | | A325N | | A325N | | A325N | |
| T5 | Flange | 0.5000 | 0 | 0.6250 | 1 | 0.6250 | 0 | 0.0000 | 0 | 0.6250 | 0 | 0.6250 | 1 | 0.5000 | 0 |
| 276.50-271.50 | | A325N | | A325N | | A325N | | A325N | | A325N | | A325N | | A325N | |
| T6 | Flange | 0.5000 | 0 | 0.6250 | 1 | 0.6250 | 0 | 0.0000 | 0 | 0.6250 | 0 | 0.6250 | 1 | 0.5000 | 0 |
| 271.50-266.50 | | A325N | | A325N | | A325N | | A325N | | A325N | | A325N | | A325N | |
| T7 | Flange | 0.5000 | 0 | 0.6250 | 1 | 0.6250 | 0 | 0.0000 | 0 | 0.6250 | 0 | 0.6250 | 1 | 0.5000 | 0 |
| 266.50-261.50 | | A325N | | A325N | | A325N | | A325N | | A325N | | A325N | | A325N | |
| T8 | Flange | 0.5000 | 3 | 0.6250 | 1 | 0.6250 | 0 | 0.6250 | 0 | 0.6250 | 0 | 0.6250 | 1 | 0.5000 | 0 |
| 261.50-256.50 | | A325N | | A325N | | A325N | | A325N | | A325N | | A325N | | A325N | |
| T9 | Flange | 0.5000 | 0 | 0.6250 | 1 | 0.6250 | 0 | 0.0000 | 0 | 0.6250 | 0 | 0.6250 | 1 | 0.5000 | 0 |
| 256.50-251.50 | | A325N | | A325N | | A325N | | A325N | | A325N | | A325N | | A325N | |
| T10 | Flange | 0.5000 | 0 | 0.6250 | 1 | 0.6250 | 0 | 0.0000 | 0 | 0.6250 | 0 | 0.6250 | 1 | 0.5000 | 1 |
| 251.50-246.50 | | A325N | | A325N | | A325N | | A325N | | A325N | | A325N | | A325N | |
| T11 | Flange | 0.5000 | 0 | 0.6250 | 1 | 0.6250 | 0 | 0.0000 | 0 | 0.6250 | 0 | 0.6250 | 1 | 0.5000 | 1 |
| 246.50-241.50 | | A325N | | A325N | | A325N | | A325N | | A325N | | A325N | | A325N | |
| T12 | Flange | 0.5000 | 0 | 0.6250 | 1 | 0.6250 | 0 | 0.0000 | 0 | 0.6250 | 0 | 0.6250 | 1 | 0.5000 | 1 |
| 241.50-236.50 | | A325N | | A325N | | A325N | | A325N | | A325N | | A325N | | A325N | |
| T13 | Flange | 0.5000 | 3 | 0.6250 | 1 | 0.6250 | 0 | 0.6250 | 0 | 0.6250 | 0 | 0.6250 | 1 | 0.5000 | 1 |
| 236.50-231.50 | | A325N | | A325N | | A325N | | A325N | | A325N | | A325N | | A325N | |
| T14 | Flange | 0.5000 | 0 | 0.6250 | 1 | 0.6250 | 0 | 0.0000 | 0 | 0.6250 | 0 | 0.6250 | 1 | 0.5000 | 1 |
| 231.50-226.50 | | A325N | | A325N | | A325N | | A325N | | A325N | | A325N | | A325N | |
| T15 | Flange | 0.5000 | 0 | 0.6250 | 1 | 0.6250 | 0 | 0.0000 | 0 | 0.6250 | 0 | 0.6250 | 1 | 0.5000 | 1 |
| 226.50-221.50 | | A325N | | A325N | | A325N | | A325N | | A325N | | A325N | | A325N | |
| T16 | Flange | 0.5000 | 0 | 0.6250 | 1 | 0.6250 | 0 | 0.0000 | 0 | 0.6250 | 0 | 0.6250 | 1 | 0.5000 | 1 |
| 221.50-216.50 | | A325N | | A325N | | A325N | | A325N | | A325N | | A325N | | A325N | |
| T17 | Flange | 0.5000 | 0 | 0.6250 | 1 | 0.6250 | 0 | 0.0000 | 0 | 0.6250 | 0 | 0.6250 | 1 | 0.5000 | 1 |
| 216.50-211.50 | | A325N | | A325N | | A325N | | A325N | | A325N | | A325N | | A325N | |
| T18 | Flange | 0.5000 | 3 | 0.6250 | 1 | 0.6250 | 0 | 0.6250 | 0 | 0.6250 | 0 | 0.6250 | 1 | 0.5000 | 1 |
| 211.50-206.50 | | A325N | | A325N | | A325N | | A325N | | A325N | | A325N | | A325N | |
| T19 | Flange | 0.5000 | 0 | 0.6250 | 1 | 0.6250 | 0 | 0.0000 | 0 | 0.6250 | 0 | 0.6250 | 1 | 0.5000 | 1 |
| 206.50-201.50 | | A325N | | A325N | | A325N | | A325N | | A325N | | A325N | | A325N | |
| T20 | Flange | 0.5000 | 0 | 0.6250 | 1 | 0.6250 | 0 | 0.0000 | 0 | 0.6250 | 0 | 0.6250 | 1 | 0.5000 | 1 |
| 201.50-196.50 | | A325N | | A325N | | A325N | | A325N | | A325N | | A325N | | A325N | |
| T21 | Flange | 0.5000 | 0 | 0.6250 | 1 | 0.6250 | 0 | 0.0000 | 0 | 0.6250 | 0 | 0.6250 | 1 | 0.5000 | 1 |
| 196.50-191.50 | | A325N | | A325N | | A325N | | A325N | | A325N | | A325N | | A325N | |
| T22 | Flange | 0.5000 | 0 | 0.6250 | 1 | 0.6250 | 0 | 0.0000 | 0 | 0.6250 | 0 | 0.6250 | 1 | 0.5000 | 1 |
| 191.50-186.50 | | A325N | | A325N | | A325N | | A325N | | A325N | | A325N | | A325N | |
| T23 | Flange | 0.5000 | 3 | 0.6250 | 1 | 0.6250 | 0 | 0.6250 | 0 | 0.6250 | 0 | 0.6250 | 1 | 0.5000 | 0 |
| 186.50-181.50 | | A325N | | A325N | | A325N | | A325N | | A325N | | A325N | | A325N | |
| T24 | Flange | 0.5000 | 0 | 0.6250 | 1 | 0.6250 | 0 | 0.0000 | 0 | 0.6250 | 0 | 0.6250 | 1 | 0.5000 | 0 |
| 181.50-176.50 | | A325N | | A325N | | A325N | | A325N | | A325N | | A325N | | A325N | |
| T25 | Flange | 0.5000 | 0 | 0.6250 | 1 | 0.6250 | 0 | 0.0000 | 0 | 0.6250 | 0 | 0.6250 | 1 | 0.5000 | 0 |
| 176.50-171.50 | | A325N | | A325N | | A325N | | A325N | | A325N | | A325N | | A325N | |
| T26 | Flange | 0.5000 | 0 | 0.6250 | 1 | 0.6250 | 0 | 0.0000 | 0 | 0.6250 | 0 | 0.6250 | 1 | 0.5000 | 0 |
| 171.50-166.50 | | A325N | | A325N | | A325N | | A325N | | A325N | | A325N | | A325N | |
| T27 | Flange | 0.5000 | 0 | 0.6250 | 1 | 0.6250 | 0 | 0.0000 | 0 | 0.6250 | 0 | 0.6250 | 1 | 0.5000 | 0 |
| 166.50-161.50 | | A325N | | A325N | | A325N | | A325N | | A325N | | A325N | | A325N | |
| T28 | Flange | 0.5000 | 3 | 0.6250 | 1 | 0.6250 | 0 | 0.6250 | 0 | 0.6250 | 0 | 0.6250 | 1 | 0.5000 | 1 |
| 161.50-156.50 | | A325N | | A325N | | A325N | | A325N | | A325N | | A325N | | A325N | |
| T29 | Flange | 0.5000 | 0 | 0.6250 | 1 | 0.6250 | 0 | 0.0000 | 0 | 0.6250 | 0 | 0.6250 | 1 | 0.5000 | 1 |
| 156.50-151.50 | | A325N | | A325N | | A325N | | A325N | | A325N | | A325N | | A325N | |

| Tower Elevation ft | Leg Connection Type | Leg Bolt Size in | Leg No. | Diagonal Bolt Size in | Diagonal No. | Top Girt Bolt Size in | Top Girt No. | Bottom Girt Bolt Size in | Bottom Girt No. | Mid Girt Bolt Size in | Mid Girt No. | Long Horizontal Bolt Size in | Long Horizontal No. | Short Horizontal Bolt Size in | Short Horizontal No. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| T30 | Flange | 0.5000 | 0 | 0.6250 | 1 | 0.6250 | 0 | 0.0000 | 0 | 0.6250 | 0 | 0.6250 | 1 | 0.5000 | 0 |
| 151.50-146.50 | | A325N | | A325N | | A325N | | A325N | | A325N | | A325N | | A325N | |
| T31 | Flange | 0.5000 | 0 | 0.6250 | 1 | 0.6250 | 0 | 0.0000 | 0 | 0.6250 | 0 | 0.6250 | 1 | 0.5000 | 0 |
| 146.50-141.50 | | A325N | | A325N | | A325N | | A325N | | A325N | | A325N | | A325N | |
| T32 | Flange | 0.5000 | 0 | 0.6250 | 1 | 0.6250 | 0 | 0.0000 | 0 | 0.6250 | 0 | 0.6250 | 1 | 0.5000 | 0 |
| 141.50-136.50 | | A325N | | A325N | | A325N | | A325N | | A325N | | A325N | | A325N | |
| T33 | Flange | 0.5000 | 3 | 0.6250 | 1 | 0.6250 | 0 | 0.6250 | 0 | 0.6250 | 0 | 0.6250 | 1 | 0.5000 | 0 |
| 136.50-131.50 | | A325N | | A325N | | A325N | | A325N | | A325N | | A325N | | A325N | |
| T34 | Flange | 0.5000 | 3 | 0.6250 | 1 | 0.6250 | 0 | 0.6250 | 0 | 0.6250 | 0 | 0.6250 | 1 | 0.5000 | 0 |
| 131.50-106.50 | | A325N | | A325N | | A325N | | A325N | | A325N | | A325N | | A325N | |
| T35 | Flange | 0.5000 | 0 | 0.6250 | 1 | 0.6250 | 0 | 0.0000 | 0 | 0.6250 | 0 | 0.6250 | 1 | 0.5000 | 1 |
| 106.50-101.50 | | A325N | | A325N | | A325N | | A325N | | A325N | | A325N | | A325N | |
| T36 | Flange | 0.5000 | 0 | 0.6250 | 1 | 0.6250 | 0 | 0.0000 | 0 | 0.6250 | 0 | 0.6250 | 1 | 0.5000 | 0 |
| 101.50-96.50 | | A325N | | A325N | | A325N | | A325N | | A325N | | A325N | | A325N | |
| T37 | Flange | 0.5000 | 0 | 0.6250 | 1 | 0.6250 | 0 | 0.0000 | 0 | 0.6250 | 0 | 0.6250 | 1 | 0.5000 | 0 |
| 96.50-91.50 | | A325N | | A325N | | A325N | | A325N | | A325N | | A325N | | A325N | |
| T38 | Flange | 0.5000 | 0 | 0.6250 | 1 | 0.6250 | 0 | 0.0000 | 0 | 0.6250 | 0 | 0.6250 | 1 | 0.5000 | 0 |
| 91.50-86.50 | | A325N | | A325N | | A325N | | A325N | | A325N | | A325N | | A325N | |
| T39 | Flange | 0.5000 | 3 | 0.6250 | 1 | 0.6250 | 0 | 0.6250 | 0 | 0.6250 | 0 | 0.6250 | 1 | 0.5000 | 0 |
| 86.50-81.50 | | A325N | | A325N | | A325N | | A325N | | A325N | | A325N | | A325N | |
| T40 | Flange | 0.5000 | 0 | 0.6250 | 1 | 0.6250 | 0 | 0.0000 | 0 | 0.6250 | 0 | 0.6250 | 1 | 0.5000 | 0 |
| 81.50-76.50 | | A325N | | A325N | | A325N | | A325N | | A325N | | A325N | | A325N | |
| T41 | Flange | 0.5000 | 0 | 0.6250 | 1 | 0.6250 | 0 | 0.0000 | 0 | 0.6250 | 0 | 0.6250 | 1 | 0.5000 | 0 |
| 76.50-71.50 | | A325N | | A325N | | A325N | | A325N | | A325N | | A325N | | A325N | |
| T42 | Flange | 0.5000 | 0 | 0.6250 | 1 | 0.6250 | 0 | 0.0000 | 0 | 0.6250 | 0 | 0.6250 | 1 | 0.5000 | 0 |
| 71.50-66.50 | | A325N | | A325N | | A325N | | A325N | | A325N | | A325N | | A325N | |
| T43 | Flange | 0.5000 | 0 | 0.6250 | 1 | 0.6250 | 0 | 0.0000 | 0 | 0.6250 | 0 | 0.6250 | 1 | 0.5000 | 1 |
| 66.50-61.50 | | A325N | | A325N | | A325N | | A325N | | A325N | | A325N | | A325N | |
| T44 | Flange | 0.5000 | 3 | 0.6250 | 1 | 0.6250 | 0 | 0.6250 | 0 | 0.6250 | 0 | 0.6250 | 1 | 0.5000 | 1 |
| 61.50-56.50 | | A325N | | A325N | | A325N | | A325N | | A325N | | A325N | | A325N | |
| T45 | Flange | 0.5000 | 0 | 0.6250 | 1 | 0.6250 | 0 | 0.0000 | 0 | 0.6250 | 0 | 0.6250 | 1 | 0.5000 | 1 |
| 56.50-51.50 | | A325N | | A325N | | A325N | | A325N | | A325N | | A325N | | A325N | |
| T46 | Flange | 0.5000 | 0 | 0.6250 | 1 | 0.6250 | 0 | 0.0000 | 0 | 0.6250 | 0 | 0.6250 | 1 | 0.5000 | 1 |
| 51.50-46.50 | | A325N | | A325N | | A325N | | A325N | | A325N | | A325N | | A325N | |
| T47 | Flange | 0.5000 | 0 | 0.6250 | 1 | 0.6250 | 0 | 0.0000 | 0 | 0.6250 | 0 | 0.6250 | 1 | 0.5000 | 1 |
| 46.50-41.50 | | A325N | | A325N | | A325N | | A325N | | A325N | | A325N | | A325N | |
| T48 | Flange | 0.5000 | 0 | 0.6250 | 1 | 0.6250 | 0 | 0.0000 | 0 | 0.6250 | 0 | 0.6250 | 1 | 0.5000 | 1 |
| 41.50-36.50 | | A325N | | A325N | | A325N | | A325N | | A325N | | A325N | | A325N | |
| T49 | Flange | 0.5000 | 3 | 0.6250 | 1 | 0.6250 | 0 | 0.6250 | 0 | 0.6250 | 0 | 0.6250 | 1 | 0.5000 | 0 |
| 36.50-31.50 | | A325N | | A325N | | A325N | | A325N | | A325N | | A325N | | A325N | |
| T50 31.50-6.50 | Flange | 0.5000 | 4 | 0.6250 | 1 | 0.6250 | 0 | 0.6250 | 0 | 0.6250 | 0 | 0.6250 | 1 | 0.5000 | 0 |
| | | A325N | | A325N | | A325N | | A325N | | A325N | | A325N | | A325N | |
| T51 6.50-0.00 | Flange | 0.5000 | 0 | 0.5000 | 0 | 0.6250 | 0 | 0.6250 | 0 | 0.6250 | 0 | 0.6250 | 0 | 0.5000 | 0 |
| | | A325N | | A325N | | A325N | | A325N | | A325N | | A325N | | A325N | |

## Guy Data

| Guy Elevation ft | Guy Grade | Guy Size | Initial Tension K | % | Guy Modulus ksi | Guy Weight plf | $L_u$ ft | Anchor Radius ft | Anchor Azimuth Adj. ° | Anchor Elevation ft | End Fitting Efficiency % |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 306.5 | EHS A | 11/16 | 5.00 | 10% | 24200 | 0.994 | 348.93 | 169.00 | 0.0000 | 0.00 | 100% |
| | B | 11/16 | 5.00 | 10% | 24200 | 0.994 | 349.41 | 170.00 | 0.0000 | 0.00 | 100% |
| | C | 11/16 | 5.00 | 10% | 24200 | 0.994 | 349.41 | 170.00 | 0.0000 | 0.00 | 100% |



| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 246.5 | EHS | A | 7/8 | 7.97 | 10% | 19000 | 1.581 | 297.63 | 169.00 | 0.0000 | 0.00 | 100% |
| | | B | 7/8 | 7.97 | 10% | 19000 | 1.581 | 298.19 | 170.00 | 0.0000 | 0.00 | 100% |
| | | C | 7/8 | 7.97 | 10% | 19000 | 1.581 | 298.19 | 170.00 | 0.0000 | 0.00 | 100% |
| 186.5 | EHS | A | 9/16 | 3.50 | 10% | 21000 | 0.671 | 250.31 | 169.00 | 0.0000 | 0.00 | 100% |
| | | B | 9/16 | 3.50 | 10% | 21000 | 0.671 | 250.98 | 170.00 | 0.0000 | 0.00 | 100% |
| | | C | 9/16 | 3.50 | 10% | 21000 | 0.671 | 250.98 | 170.00 | 0.0000 | 0.00 | 100% |
| 126.5 | EHS | A | 5/8 | 4.24 | 10% | 21000 | 0.813 | 147.84 | 78.50 | 0.0000 | 0.00 | 100% |
| | | B | 5/8 | 4.24 | 10% | 21000 | 0.813 | 146.06 | 75.00 | 0.0000 | 0.00 | 100% |
| | | C | 5/8 | 4.24 | 10% | 21000 | 0.813 | 147.59 | 78.00 | 0.0000 | 0.00 | 100% |
| 61.5 | EHS | A | 11/16 | 5.00 | 10% | 24200 | 0.994 | 98.29 | 78.50 | 0.0000 | 0.00 | 100% |
| | | B | 11/16 | 5.00 | 10% | 24200 | 0.994 | 95.59 | 75.00 | 0.0000 | 0.00 | 100% |
| | | C | 11/16 | 5.00 | 10% | 24200 | 0.994 | 97.90 | 78.00 | 0.0000 | 0.00 | 100% |

## Guy Data*(cont'd)*

| Guy Elevation ft | Mount Type | Torque-Arm Spread ft | Torque-Arm Leg Angle ° | Torque-Arm Style | Torque-Arm Grade | Torque-Arm Type | Torque-Arm Size |
|---|---|---|---|---|---|---|---|
| 306.5 | Corner | | | | | | |
| 246.5 | Corner | | | | | | |
| 186.5 | Corner | | | | | | |
| 126.5 | Corner | | | | | | |
| 61.5 | Corner | | | | | | |

## Guy Data *(cont'd)*

| Guy Elevation ft | Diagonal Grade | Diagonal Type | Upper Diagonal Size | Lower Diagonal Size | Is Strap. | Pull-Off Grade | Pull-Off Type | Pull-Off Size |
|---|---|---|---|---|---|---|---|---|
| 306.50 | A572-50 (50 ksi) | Solid Round | | | | A572-50 (50 ksi) | Solid Round | |
| 246.50 | A572-50 (50 ksi) | Solid Round | | | | A572-50 (50 ksi) | Solid Round | |
| 186.50 | A572-50 (50 ksi) | Solid Round | | | | A572-50 (50 ksi) | Solid Round | |
| 126.50 | A572-50 (50 ksi) | Solid Round | | | | A572-50 (50 ksi) | Solid Round | |
| 61.50 | A572-50 (50 ksi) | Solid Round | | | | A572-50 (50 ksi) | Solid Round | |

## Guy Data *(cont'd)*

| Guy Elevation ft | Cable Weight A K | Cable Weight B K | Cable Weight C K | Cable Weight D K | Tower Intercept A ft | Tower Intercept B ft | Tower Intercept C ft | Tower Intercept D ft |
|---|---|---|---|---|---|---|---|---|
| 306.5 | 0.35 | 0.35 | 0.35 | | 11.75<br>5.9 sec/pulse | 11.79<br>5.9 sec/pulse | 11.79<br>5.9 sec/pulse | |
| 246.5 | 0.47 | 0.47 | 0.47 | | 8.59 | 8.62 | 8.62 | |

| Guy Elevation ft | Cable Weight A K | Cable Weight B K | Cable Weight C K | Cable Weight D K | Tower Intercept A ft | Tower Intercept B ft | Tower Intercept C ft | Tower Intercept D ft |
|---|---|---|---|---|---|---|---|---|
| | | | | | 5.1 sec/pulse | 5.1 sec/pulse | 5.1 sec/pulse | |
| 186.5 | 0.17 | 0.17 | 0.17 | | 5.91 | 5.94 | 5.94 | |
| | | | | | 4.2 sec/pulse | 4.2 sec/pulse | 4.2 sec/pulse | |
| 126.5 | 0.12 | 0.12 | 0.12 | | 2.07 | 2.02 | 2.07 | |
| | | | | | 2.5 sec/pulse | 2.5 sec/pulse | 2.5 sec/pulse | |
| 61.5 | 0.10 | 0.10 | 0.10 | | 0.96 | 0.90 | 0.95 | |
| | | | | | 1.7 sec/pulse | 1.6 sec/pulse | 1.7 sec/pulse | |

## Guy Data *(cont'd)*

| Guy Elevation ft | Calc K Single Angles | Calc K Solid Rounds | Torque Arm $K_x$ | Torque Arm $K_y$ | Pull Off $K_x$ | Pull Off $K_y$ | Diagonal $K_x$ | Diagonal $K_y$ |
|---|---|---|---|---|---|---|---|---|
| 306.5 | No | No | | | 1 | 1 | 1 | 1 |
| 246.5 | No | No | | | 1 | 1 | 1 | 1 |
| 186.5 | No | No | | | 1 | 1 | 1 | 1 |
| 126.5 | No | No | | | 1 | 1 | 1 | 1 |
| 61.5 | No | No | | | 1 | 1 | 1 | 1 |

## Guy Data *(cont'd)*

| Guy Elevation ft | Torque-Arm Bolt Size in | Torque-Arm Number | Torque-Arm Net Width Deduct in | Torque-Arm U | Pull Off Bolt Size in | Pull Off Number | Pull Off Net Width Deduct in | Pull Off U | Diagonal Bolt Size in | Diagonal Number | Diagonal Net Width Deduct in | Diagonal U |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 306.5 | 0.6250 A325N | 0 | 0.0000 | 0.75 | 0.6250 A325N | 0 | 0.0000 | 0.75 | 0.6250 A325N | 0 | 0.0000 | 0.75 |
| 246.5 | 0.6250 A325N | 0 | 0.0000 | 0.75 | 0.6250 A325N | 0 | 0.0000 | 0.75 | 0.6250 A325N | 0 | 0.0000 | 0.75 |
| 186.5 | 0.6250 A325N | 0 | 0.0000 | 0.75 | 0.6250 A325N | 0 | 0.0000 | 0.75 | 0.6250 A325N | 0 | 0.0000 | 0.75 |
| 126.5 | 0.6250 A325N | 0 | 0.0000 | 0.75 | 0.6250 A325N | 0 | 0.0000 | 0.75 | 0.6250 A325N | 0 | 0.0000 | 0.75 |
| 61.5 | 0.6250 A325N | 0 | 0.0000 | 0.75 | 0.6250 A325N | 0 | 0.0000 | 0.75 | 0.6250 A325N | 0 | 0.0000 | 0.75 |

## Guy Pressures

| Guy Elevation ft | Guy Location | z ft | $q_z$ psf | $q_z$ Ice psf | Ice Thickness in |
|---|---|---|---|---|---|
| 306.5 | A | 153.25 | 21 | 6 | 1.7490 |
| | B | 153.25 | 21 | 6 | 1.7490 |
| | C | 153.25 | 21 | 6 | 1.7490 |
| 246.5 | A | 123.25 | 19 | 6 | 1.7113 |
| | B | 123.25 | 19 | 6 | 1.7113 |
| | C | 123.25 | 19 | 6 | 1.7113 |



| Guy Elevation ft | Guy Location | z ft | $q_z$ psf | $q_z$ Ice psf | Ice Thickness in |
|---|---|---|---|---|---|
| 186.5 | A | 93.25 | 18 | 5 | 1.6642 |
| | B | 93.25 | 18 | 5 | 1.6642 |
| | C | 93.25 | 18 | 5 | 1.6642 |
| 126.5 | A | 63.25 | 16 | 5 | 1.6008 |
| | B | 63.25 | 16 | 5 | 1.6008 |
| | C | 63.25 | 16 | 5 | 1.6008 |
| 61.5 | A | 30.75 | 13 | 4 | 1.4894 |
| | B | 30.75 | 13 | 4 | 1.4894 |
| | C | 30.75 | 13 | 4 | 1.4894 |

## Feed Line/Linear Appurtenances - Entered As Round Or Flat

| Description | Sector | Component Type | Placement ft | Total Number | Number Per Row | Start/End Position | Width or Diameter in | Perimeter in | Weight plf |
|---|---|---|---|---|---|---|---|---|---|
| 1-5/8" | A | Ar (CaAa) | 314.50 - 0.00 | 1 | 1 | 0.000<br>0.000 | 1.9800 | | 0.82 |
| 1-5/8" | A | Surface Ar (CaAa) | 325.00 - 314.50 | 1 | 1 | 0.000<br>0.000 | 1.9800 | | 0.82 |
| *** | | | | | | | | | |
| 7/16" Power | C | Ar (CaAa) | 303.00 - 0.00 | 1 | 1 | 0.000<br>0.000 | 0.4375 | | 0.05 |
| *** | | | | | | | | | |
| 3/8" | B | Ar (CaAa) | 287.00 - 0.00 | 1 | 1 | 0.000<br>0.000 | 0.4400 | | 0.08 |
| 7/8" | C | Ar (CaAa) | 287.00 - 0.00 | 1 | 1 | 0.000<br>0.000 | 1.0900 | | 0.33 |
| *** | | | | | | | | | |
| 7/8" | C | Ar (CaAa) | 288.00 - 0.00 | 1 | 1 | 0.000<br>0.000 | 1.0900 | | 0.33 |
| *** | | | | | | | | | |
| 1-5/8" | B | Ar (CaAa) | 273.00 - 0.00 | 1 | 1 | 0.000<br>0.000 | 1.9800 | | 0.82 |
| *** | | | | | | | | | |
| 1-5/8" | B | Ar (CaAa) | 260.00 - 0.00 | 1 | 1 | 0.000<br>0.000 | 1.9800 | | 0.82 |
| *** | | | | | | | | | |
| 7/8" | C | Ar (CaAa) | 239.00 - 0.00 | 1 | 1 | 0.000<br>0.000 | 1.0900 | | 0.33 |
| *** | | | | | | | | | |
| 7/8" | C | Ar (CaAa) | 237.00 - 0.00 | 1 | 1 | 0.000<br>0.000 | 1.0900 | | 0.33 |
| *** | | | | | | | | | |
| 1" Conduit (Lighting) | A | Ar (CaAa) | 223.00 - 0.00 | 1 | 1 | 0.000<br>0.000 | 1.0000 | | 1.13 |
| *** | | | | | | | | | |
| 7/16" Power | C | Ar (CaAa) | 183.00 - 0.00 | 1 | 1 | 0.000<br>0.000 | 0.4375 | | 0.05 |
| *** | | | | | | | | | |
| 7/16" Power | C | Ar (CaAa) | 169.00 - 0.00 | 1 | 1 | 0.000<br>0.000 | 0.4375 | | 0.05 |
| *** | | | | | | | | | |
| 1/4" fiber | C | Ar (CaAa) | 145.50 - 0.00 | 1 | 1 | 0.000<br>0.000 | 0.3450 | | 0.06 |
| *** | | | | | | | | | |
| 7/8" | C | Ar (CaAa) | 141.00 - 0.00 | 1 | 1 | 0.000<br>0.000 | 1.0900 | | 0.33 |
| *** | | | | | | | | | |

| Description | Sector | Component Type | Placement ft | Total Number | Number Per Row | Start/End Position | Width or Diameter in | Perimeter in | Weight plf |
|---|---|---|---|---|---|---|---|---|---|
| 1" Conduit (Lighting) | A | Ar (CaAa) | 135.00 - 0.00 | 1 | 1 | 0.000<br>0.000 | 1.0000 | | 1.13 |
| *** | | | | | | | | | |
| 1-1/4" | C | Ar (CaAa) | 101.00 - 0.00 | 2 | 2 | 0.000<br>0.000 | 1.5500 | | 0.66 |
| *** | | | | | | | | | |
| 7/8" | B | Ar (CaAa) | 80.00 - 0.00 | 3 | 2 | 0.000<br>0.000 | 1.0900 | | 0.33 |
| 7/8" | B | Ar (CaAa) | 80.00 - 0.00 | 3 | 2 | 0.000<br>0.000 | 1.0900 | | 0.33 |
| 7/8" | C | Ar (CaAa) | 80.00 - 0.00 | 3 | 2 | 0.000<br>0.000 | 1.0900 | | 0.33 |
| 10 mm | B | Ar (CaAa) | 80.00 - 0.00 | 1 | 1 | 0.000<br>0.000 | 0.3937 | | 0.01 |
| 0.795" | B | Ar (CaAa) | 80.00 - 0.00 | 2 | 2 | 0.000<br>0.000 | 0.7950 | | 0.33 |
| 7/8" | B | Ar (CaAa) | 80.00 - 0.00 | 3 | 2 | 0.000<br>0.000 | 1.0900 | | 0.33 |
| *** | | | | | | | | | |
| 7/16" Power | B | Ar (CaAa) | 33.00 - 0.00 | 1 | 1 | 0.000<br>0.000 | 0.4375 | | 0.05 |
| *** | | | | | | | | | |
| 7/16" Power | B | Ar (CaAa) | 8.50 - 0.00 | 1 | 1 | 0.000<br>0.000 | 0.4375 | | 0.05 |
| *** | | | | | | | | | |

## Feed Line/Linear Appurtenances - Entered As Area

| Description | Face or Leg | Allow Shield | Component Type | Placement ft | Total Number | $C_AA_A$ $ft^2/ft$ | Weight plf |
|---|---|---|---|---|---|---|---|
| *** | | | | | | | |

## Feed Line/Linear Appurtenances Section Areas

| Tower Section | Tower Elevation ft | Face | $A_R$ $ft^2$ | $A_F$ $ft^2$ | $C_AA_A$ In Face $ft^2$ | $C_AA_A$ Out Face $ft^2$ | Weight K |
|---|---|---|---|---|---|---|---|
| L1 | 341.50-314.50 | A | 0.000 | 0.000 | 2.079 | 0.000 | 0.01 |
| | | B | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |
| | | C | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |
| T1 | 314.50-310.50 | A | 0.000 | 0.000 | 0.792 | 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 |
| T2 | 310.50-306.50 | A | 0.000 | 0.000 | 0.792 | 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 |
| T3 | 306.50-281.50 | A | 0.000 | 0.000 | 4.950 | 0.000 | 0.02 |
| | | B | 0.000 | 0.000 | 0.242 | 0.000 | 0.00 |
| | | C | 0.000 | 0.000 | 2.249 | 0.000 | 0.01 |
| T4 | 281.50-276.50 | A | 0.000 | 0.000 | 0.990 | 0.000 | 0.00 |
| | | B | 0.000 | 0.000 | 0.220 | 0.000 | 0.00 |
| | | C | 0.000 | 0.000 | 1.309 | 0.000 | 0.00 |
| T5 | 276.50-271.50 | A | 0.000 | 0.000 | 0.990 | 0.000 | 0.00 |
| | | B | 0.000 | 0.000 | 0.517 | 0.000 | 0.00 |



| Tower Section | Tower Elevation ft | Face | $A_R$ $ft^2$ | $A_F$ $ft^2$ | $C_AA_A$ In Face $ft^2$ | $C_AA_A$ Out Face $ft^2$ | Weight K |
|---|---|---|---|---|---|---|---|
| | | C | 0.000 | 0.000 | 1.309 | 0.000 | 0.00 |
| T6 | 271.50-266.50 | A | 0.000 | 0.000 | 0.990 | 0.000 | 0.00 |
| | | B | 0.000 | 0.000 | 1.210 | 0.000 | 0.00 |
| | | C | 0.000 | 0.000 | 1.309 | 0.000 | 0.00 |
| T7 | 266.50-261.50 | A | 0.000 | 0.000 | 0.990 | 0.000 | 0.00 |
| | | B | 0.000 | 0.000 | 1.210 | 0.000 | 0.00 |
| | | C | 0.000 | 0.000 | 1.309 | 0.000 | 0.00 |
| T8 | 261.50-256.50 | A | 0.000 | 0.000 | 0.990 | 0.000 | 0.00 |
| | | B | 0.000 | 0.000 | 1.903 | 0.000 | 0.01 |
| | | C | 0.000 | 0.000 | 1.309 | 0.000 | 0.00 |
| T9 | 256.50-251.50 | A | 0.000 | 0.000 | 0.990 | 0.000 | 0.00 |
| | | B | 0.000 | 0.000 | 2.200 | 0.000 | 0.01 |
| | | C | 0.000 | 0.000 | 1.309 | 0.000 | 0.00 |
| T10 | 251.50-246.50 | A | 0.000 | 0.000 | 0.990 | 0.000 | 0.00 |
| | | B | 0.000 | 0.000 | 2.200 | 0.000 | 0.01 |
| | | C | 0.000 | 0.000 | 1.309 | 0.000 | 0.00 |
| T11 | 246.50-241.50 | A | 0.000 | 0.000 | 0.990 | 0.000 | 0.00 |
| | | B | 0.000 | 0.000 | 2.200 | 0.000 | 0.01 |
| | | C | 0.000 | 0.000 | 1.309 | 0.000 | 0.00 |
| T12 | 241.50-236.50 | A | 0.000 | 0.000 | 0.990 | 0.000 | 0.00 |
| | | B | 0.000 | 0.000 | 2.200 | 0.000 | 0.01 |
| | | C | 0.000 | 0.000 | 1.636 | 0.000 | 0.00 |
| T13 | 236.50-231.50 | A | 0.000 | 0.000 | 0.990 | 0.000 | 0.00 |
| | | B | 0.000 | 0.000 | 2.200 | 0.000 | 0.01 |
| | | C | 0.000 | 0.000 | 2.399 | 0.000 | 0.01 |
| T14 | 231.50-226.50 | A | 0.000 | 0.000 | 0.990 | 0.000 | 0.00 |
| | | B | 0.000 | 0.000 | 2.200 | 0.000 | 0.01 |
| | | C | 0.000 | 0.000 | 2.399 | 0.000 | 0.01 |
| T15 | 226.50-221.50 | A | 0.000 | 0.000 | 1.140 | 0.000 | 0.01 |
| | | B | 0.000 | 0.000 | 2.200 | 0.000 | 0.01 |
| | | C | 0.000 | 0.000 | 2.399 | 0.000 | 0.01 |
| T16 | 221.50-216.50 | A | 0.000 | 0.000 | 1.490 | 0.000 | 0.01 |
| | | B | 0.000 | 0.000 | 2.200 | 0.000 | 0.01 |
| | | C | 0.000 | 0.000 | 2.399 | 0.000 | 0.01 |
| T17 | 216.50-211.50 | A | 0.000 | 0.000 | 1.490 | 0.000 | 0.01 |
| | | B | 0.000 | 0.000 | 2.200 | 0.000 | 0.01 |
| | | C | 0.000 | 0.000 | 2.399 | 0.000 | 0.01 |
| T18 | 211.50-206.50 | A | 0.000 | 0.000 | 1.490 | 0.000 | 0.01 |
| | | B | 0.000 | 0.000 | 2.200 | 0.000 | 0.01 |
| | | C | 0.000 | 0.000 | 2.399 | 0.000 | 0.01 |
| T19 | 206.50-201.50 | A | 0.000 | 0.000 | 1.490 | 0.000 | 0.01 |
| | | B | 0.000 | 0.000 | 2.200 | 0.000 | 0.01 |
| | | C | 0.000 | 0.000 | 2.399 | 0.000 | 0.01 |
| T20 | 201.50-196.50 | A | 0.000 | 0.000 | 1.490 | 0.000 | 0.01 |
| | | B | 0.000 | 0.000 | 2.200 | 0.000 | 0.01 |
| | | C | 0.000 | 0.000 | 2.399 | 0.000 | 0.01 |
| T21 | 196.50-191.50 | A | 0.000 | 0.000 | 1.490 | 0.000 | 0.01 |
| | | B | 0.000 | 0.000 | 2.200 | 0.000 | 0.01 |
| | | C | 0.000 | 0.000 | 2.399 | 0.000 | 0.01 |
| T22 | 191.50-186.50 | A | 0.000 | 0.000 | 1.490 | 0.000 | 0.01 |
| | | B | 0.000 | 0.000 | 2.200 | 0.000 | 0.01 |
| | | C | 0.000 | 0.000 | 2.399 | 0.000 | 0.01 |
| T23 | 186.50-181.50 | A | 0.000 | 0.000 | 1.490 | 0.000 | 0.01 |
| | | B | 0.000 | 0.000 | 2.200 | 0.000 | 0.01 |
| | | C | 0.000 | 0.000 | 2.464 | 0.000 | 0.01 |
| T24 | 181.50-176.50 | A | 0.000 | 0.000 | 1.490 | 0.000 | 0.01 |
| | | B | 0.000 | 0.000 | 2.200 | 0.000 | 0.01 |
| | | C | 0.000 | 0.000 | 2.618 | 0.000 | 0.01 |
| T25 | 176.50-171.50 | A | 0.000 | 0.000 | 1.490 | 0.000 | 0.01 |
| | | B | 0.000 | 0.000 | 2.200 | 0.000 | 0.01 |
| | | C | 0.000 | 0.000 | 2.618 | 0.000 | 0.01 |

| Tower Section | Tower Elevation ft | Face | $A_R$ $ft^2$ | $A_F$ $ft^2$ | $C_AA_A$ In Face $ft^2$ | $C_AA_A$ Out Face $ft^2$ | Weight K |
|---|---|---|---|---|---|---|---|
| T26 | 171.50-166.50 | A | 0.000 | 0.000 | 1.490 | 0.000 | 0.01 |
| | | B | 0.000 | 0.000 | 2.200 | 0.000 | 0.01 |
| | | C | 0.000 | 0.000 | 2.727 | 0.000 | 0.01 |
| T27 | 166.50-161.50 | A | 0.000 | 0.000 | 1.490 | 0.000 | 0.01 |
| | | B | 0.000 | 0.000 | 2.200 | 0.000 | 0.01 |
| | | C | 0.000 | 0.000 | 2.836 | 0.000 | 0.01 |
| T28 | 161.50-156.50 | A | 0.000 | 0.000 | 1.490 | 0.000 | 0.01 |
| | | B | 0.000 | 0.000 | 2.200 | 0.000 | 0.01 |
| | | C | 0.000 | 0.000 | 2.836 | 0.000 | 0.01 |
| T29 | 156.50-151.50 | A | 0.000 | 0.000 | 1.490 | 0.000 | 0.01 |
| | | B | 0.000 | 0.000 | 2.200 | 0.000 | 0.01 |
| | | C | 0.000 | 0.000 | 2.836 | 0.000 | 0.01 |
| T30 | 151.50-146.50 | A | 0.000 | 0.000 | 1.490 | 0.000 | 0.01 |
| | | B | 0.000 | 0.000 | 2.200 | 0.000 | 0.01 |
| | | C | 0.000 | 0.000 | 2.836 | 0.000 | 0.01 |
| T31 | 146.50-141.50 | A | 0.000 | 0.000 | 1.490 | 0.000 | 0.01 |
| | | B | 0.000 | 0.000 | 2.200 | 0.000 | 0.01 |
| | | C | 0.000 | 0.000 | 2.974 | 0.000 | 0.01 |
| T32 | 141.50-136.50 | A | 0.000 | 0.000 | 1.490 | 0.000 | 0.01 |
| | | B | 0.000 | 0.000 | 2.200 | 0.000 | 0.01 |
| | | C | 0.000 | 0.000 | 3.499 | 0.000 | 0.01 |
| T33 | 136.50-131.50 | A | 0.000 | 0.000 | 1.840 | 0.000 | 0.01 |
| | | B | 0.000 | 0.000 | 2.200 | 0.000 | 0.01 |
| | | C | 0.000 | 0.000 | 3.554 | 0.000 | 0.01 |
| T34 | 131.50-106.50 | A | 0.000 | 0.000 | 9.950 | 0.000 | 0.08 |
| | | B | 0.000 | 0.000 | 11.000 | 0.000 | 0.04 |
| | | C | 0.000 | 0.000 | 17.769 | 0.000 | 0.05 |
| T35 | 106.50-101.50 | A | 0.000 | 0.000 | 1.990 | 0.000 | 0.02 |
| | | B | 0.000 | 0.000 | 2.200 | 0.000 | 0.01 |
| | | C | 0.000 | 0.000 | 3.554 | 0.000 | 0.01 |
| T36 | 101.50-96.50 | A | 0.000 | 0.000 | 1.990 | 0.000 | 0.02 |
| | | B | 0.000 | 0.000 | 2.200 | 0.000 | 0.01 |
| | | C | 0.000 | 0.000 | 4.949 | 0.000 | 0.02 |
| T37 | 96.50-91.50 | A | 0.000 | 0.000 | 1.990 | 0.000 | 0.02 |
| | | B | 0.000 | 0.000 | 2.200 | 0.000 | 0.01 |
| | | C | 0.000 | 0.000 | 5.104 | 0.000 | 0.02 |
| T38 | 91.50-86.50 | A | 0.000 | 0.000 | 1.990 | 0.000 | 0.02 |
| | | B | 0.000 | 0.000 | 2.200 | 0.000 | 0.01 |
| | | C | 0.000 | 0.000 | 5.104 | 0.000 | 0.02 |
| T39 | 86.50-81.50 | A | 0.000 | 0.000 | 1.990 | 0.000 | 0.02 |
| | | B | 0.000 | 0.000 | 2.200 | 0.000 | 0.01 |
| | | C | 0.000 | 0.000 | 5.104 | 0.000 | 0.02 |
| T40 | 81.50-76.50 | A | 0.000 | 0.000 | 1.990 | 0.000 | 0.02 |
| | | B | 0.000 | 0.000 | 6.328 | 0.000 | 0.02 |
| | | C | 0.000 | 0.000 | 6.248 | 0.000 | 0.02 |
| T41 | 76.50-71.50 | A | 0.000 | 0.000 | 1.990 | 0.000 | 0.02 |
| | | B | 0.000 | 0.000 | 8.097 | 0.000 | 0.03 |
| | | C | 0.000 | 0.000 | 6.739 | 0.000 | 0.02 |
| T42 | 71.50-66.50 | A | 0.000 | 0.000 | 1.990 | 0.000 | 0.02 |
| | | B | 0.000 | 0.000 | 8.097 | 0.000 | 0.03 |
| | | C | 0.000 | 0.000 | 6.739 | 0.000 | 0.02 |
| T43 | 66.50-61.50 | A | 0.000 | 0.000 | 1.990 | 0.000 | 0.02 |
| | | B | 0.000 | 0.000 | 8.097 | 0.000 | 0.03 |
| | | C | 0.000 | 0.000 | 6.739 | 0.000 | 0.02 |
| T44 | 61.50-56.50 | A | 0.000 | 0.000 | 1.990 | 0.000 | 0.02 |
| | | B | 0.000 | 0.000 | 8.097 | 0.000 | 0.03 |
| | | C | 0.000 | 0.000 | 6.739 | 0.000 | 0.02 |
| T45 | 56.50-51.50 | A | 0.000 | 0.000 | 1.990 | 0.000 | 0.02 |
| | | B | 0.000 | 0.000 | 8.097 | 0.000 | 0.03 |
| | | C | 0.000 | 0.000 | 6.739 | 0.000 | 0.02 |
| T46 | 51.50-46.50 | A | 0.000 | 0.000 | 1.990 | 0.000 | 0.02 |



| Tower Section | Tower Elevation ft | Face | $A_R$ $ft^2$ | $A_F$ $ft^2$ | $C_AA_A$ In Face $ft^2$ | $C_AA_A$ Out Face $ft^2$ | Weight K |
|---|---|---|---|---|---|---|---|
| | | B | 0.000 | 0.000 | 8.097 | 0.000 | 0.03 |
| | | C | 0.000 | 0.000 | 6.739 | 0.000 | 0.02 |
| T47 | 46.50-41.50 | A | 0.000 | 0.000 | 1.990 | 0.000 | 0.02 |
| | | B | 0.000 | 0.000 | 8.097 | 0.000 | 0.03 |
| | | C | 0.000 | 0.000 | 6.739 | 0.000 | 0.02 |
| T48 | 41.50-36.50 | A | 0.000 | 0.000 | 1.990 | 0.000 | 0.02 |
| | | B | 0.000 | 0.000 | 8.097 | 0.000 | 0.03 |
| | | C | 0.000 | 0.000 | 6.739 | 0.000 | 0.02 |
| T49 | 36.50-31.50 | A | 0.000 | 0.000 | 1.990 | 0.000 | 0.02 |
| | | B | 0.000 | 0.000 | 8.162 | 0.000 | 0.03 |
| | | C | 0.000 | 0.000 | 6.739 | 0.000 | 0.02 |
| T50 | 31.50-6.50 | A | 0.000 | 0.000 | 9.950 | 0.000 | 0.08 |
| | | B | 0.000 | 0.000 | 41.666 | 0.000 | 0.14 |
| | | C | 0.000 | 0.000 | 33.694 | 0.000 | 0.10 |
| T51 | 6.50-0.00 | A | 0.000 | 0.000 | 2.587 | 0.000 | 0.02 |
| | | B | 0.000 | 0.000 | 11.095 | 0.000 | 0.04 |
| | | C | 0.000 | 0.000 | 8.760 | 0.000 | 0.03 |

## Feed Line/Linear Appurtenances Section Areas - With Ice

| Tower Section | Tower Elevation ft | Face or Leg | Ice Thickness in | $A_R$ $ft^2$ | $A_F$ $ft^2$ | $C_AA_A$ In Face $ft^2$ | $C_AA_A$ Out Face $ft^2$ | Weight K |
|---|---|---|---|---|---|---|---|---|
| L1 | 341.50-314.50 | A | 1.887 | 0.000 | 0.000 | 5.768 | 0.000 | 0.10 |
| | | B | | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |
| | | C | | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |
| T1 | 314.50-310.50 | A | 1.878 | 0.000 | 0.000 | 2.295 | 0.000 | 0.04 |
| | | B | | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |
| | | C | | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |
| T2 | 310.50-306.50 | A | 1.876 | 0.000 | 0.000 | 2.293 | 0.000 | 0.04 |
| | | B | | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |
| | | C | | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |
| T3 | 306.50-281.50 | A | 1.867 | 0.000 | 0.000 | 14.284 | 0.000 | 0.24 |
| | | B | | 0.000 | 0.000 | 2.295 | 0.000 | 0.03 |
| | | C | | 0.000 | 0.000 | 14.756 | 0.000 | 0.20 |
| T4 | 281.50-276.50 | A | 1.857 | 0.000 | 0.000 | 2.847 | 0.000 | 0.05 |
| | | B | | 0.000 | 0.000 | 2.077 | 0.000 | 0.03 |
| | | C | | 0.000 | 0.000 | 6.880 | 0.000 | 0.10 |
| T5 | 276.50-271.50 | A | 1.854 | 0.000 | 0.000 | 2.844 | 0.000 | 0.05 |
| | | B | | 0.000 | 0.000 | 2.927 | 0.000 | 0.04 |
| | | C | | 0.000 | 0.000 | 6.870 | 0.000 | 0.10 |
| T6 | 271.50-266.50 | A | 1.850 | 0.000 | 0.000 | 2.840 | 0.000 | 0.05 |
| | | B | | 0.000 | 0.000 | 4.910 | 0.000 | 0.07 |
| | | C | | 0.000 | 0.000 | 6.859 | 0.000 | 0.10 |
| T7 | 266.50-261.50 | A | 1.847 | 0.000 | 0.000 | 2.837 | 0.000 | 0.05 |
| | | B | | 0.000 | 0.000 | 4.903 | 0.000 | 0.07 |
| | | C | | 0.000 | 0.000 | 6.849 | 0.000 | 0.10 |
| T8 | 261.50-256.50 | A | 1.843 | 0.000 | 0.000 | 2.833 | 0.000 | 0.05 |
| | | B | | 0.000 | 0.000 | 6.880 | 0.000 | 0.11 |
| | | C | | 0.000 | 0.000 | 6.838 | 0.000 | 0.10 |
| T9 | 256.50-251.50 | A | 1.840 | 0.000 | 0.000 | 2.830 | 0.000 | 0.05 |
| | | B | | 0.000 | 0.000 | 7.719 | 0.000 | 0.12 |
| | | C | | 0.000 | 0.000 | 6.828 | 0.000 | 0.09 |
| T10 | 251.50-246.50 | A | 1.836 | 0.000 | 0.000 | 2.826 | 0.000 | 0.05 |
| | | B | | 0.000 | 0.000 | 7.708 | 0.000 | 0.12 |
| | | C | | 0.000 | 0.000 | 6.817 | 0.000 | 0.09 |
| T11 | 246.50-241.50 | A | 1.832 | 0.000 | 0.000 | 2.822 | 0.000 | 0.05 |
| | | B | | 0.000 | 0.000 | 7.697 | 0.000 | 0.12 |

| Tower Section | Tower Elevation ft | Face or Leg | Ice Thickness in | $A_R$ $ft^2$ | $A_F$ $ft^2$ | $C_AA_A$ In Face $ft^2$ | $C_AA_A$ Out Face $ft^2$ | Weight K |
|---|---|---|---|---|---|---|---|---|
| | | C | | 0.000 | 0.000 | 6.805 | 0.000 | 0.09 |
| T12 | 241.50-236.50 | A | 1.828 | 0.000 | 0.000 | 2.818 | 0.000 | 0.05 |
| | | B | | 0.000 | 0.000 | 7.685 | 0.000 | 0.12 |
| | | C | | 0.000 | 0.000 | 8.218 | 0.000 | 0.11 |
| T13 | 236.50-231.50 | A | 1.825 | 0.000 | 0.000 | 2.815 | 0.000 | 0.05 |
| | | B | | 0.000 | 0.000 | 7.674 | 0.000 | 0.12 |
| | | C | | 0.000 | 0.000 | 11.522 | 0.000 | 0.16 |
| T14 | 231.50-226.50 | A | 1.821 | 0.000 | 0.000 | 2.811 | 0.000 | 0.05 |
| | | B | | 0.000 | 0.000 | 7.662 | 0.000 | 0.12 |
| | | C | | 0.000 | 0.000 | 11.502 | 0.000 | 0.16 |
| T15 | 226.50-221.50 | A | 1.817 | 0.000 | 0.000 | 3.502 | 0.000 | 0.06 |
| | | B | | 0.000 | 0.000 | 7.650 | 0.000 | 0.12 |
| | | C | | 0.000 | 0.000 | 11.482 | 0.000 | 0.16 |
| T16 | 221.50-216.50 | A | 1.813 | 0.000 | 0.000 | 5.115 | 0.000 | 0.08 |
| | | B | | 0.000 | 0.000 | 7.638 | 0.000 | 0.12 |
| | | C | | 0.000 | 0.000 | 11.461 | 0.000 | 0.16 |
| T17 | 216.50-211.50 | A | 1.808 | 0.000 | 0.000 | 5.107 | 0.000 | 0.08 |
| | | B | | 0.000 | 0.000 | 7.625 | 0.000 | 0.12 |
| | | C | | 0.000 | 0.000 | 11.440 | 0.000 | 0.16 |
| T18 | 211.50-206.50 | A | 1.804 | 0.000 | 0.000 | 5.098 | 0.000 | 0.08 |
| | | B | | 0.000 | 0.000 | 7.612 | 0.000 | 0.12 |
| | | C | | 0.000 | 0.000 | 11.419 | 0.000 | 0.16 |
| T19 | 206.50-201.50 | A | 1.800 | 0.000 | 0.000 | 5.089 | 0.000 | 0.08 |
| | | B | | 0.000 | 0.000 | 7.599 | 0.000 | 0.12 |
| | | C | | 0.000 | 0.000 | 11.397 | 0.000 | 0.16 |
| T20 | 201.50-196.50 | A | 1.795 | 0.000 | 0.000 | 5.081 | 0.000 | 0.08 |
| | | B | | 0.000 | 0.000 | 7.586 | 0.000 | 0.12 |
| | | C | | 0.000 | 0.000 | 11.375 | 0.000 | 0.16 |
| T21 | 196.50-191.50 | A | 1.791 | 0.000 | 0.000 | 5.071 | 0.000 | 0.08 |
| | | B | | 0.000 | 0.000 | 7.572 | 0.000 | 0.12 |
| | | C | | 0.000 | 0.000 | 11.352 | 0.000 | 0.16 |
| T22 | 191.50-186.50 | A | 1.786 | 0.000 | 0.000 | 5.062 | 0.000 | 0.08 |
| | | B | | 0.000 | 0.000 | 7.558 | 0.000 | 0.12 |
| | | C | | 0.000 | 0.000 | 11.329 | 0.000 | 0.16 |
| T23 | 186.50-181.50 | A | 1.781 | 0.000 | 0.000 | 5.052 | 0.000 | 0.08 |
| | | B | | 0.000 | 0.000 | 7.544 | 0.000 | 0.11 |
| | | C | | 0.000 | 0.000 | 11.905 | 0.000 | 0.16 |
| T24 | 181.50-176.50 | A | 1.776 | 0.000 | 0.000 | 5.043 | 0.000 | 0.08 |
| | | B | | 0.000 | 0.000 | 7.529 | 0.000 | 0.11 |
| | | C | | 0.000 | 0.000 | 13.276 | 0.000 | 0.18 |
| T25 | 176.50-171.50 | A | 1.771 | 0.000 | 0.000 | 5.033 | 0.000 | 0.08 |
| | | B | | 0.000 | 0.000 | 7.514 | 0.000 | 0.11 |
| | | C | | 0.000 | 0.000 | 13.245 | 0.000 | 0.18 |
| T26 | 171.50-166.50 | A | 1.766 | 0.000 | 0.000 | 5.022 | 0.000 | 0.08 |
| | | B | | 0.000 | 0.000 | 7.498 | 0.000 | 0.11 |
| | | C | | 0.000 | 0.000 | 14.207 | 0.000 | 0.19 |
| T27 | 166.50-161.50 | A | 1.761 | 0.000 | 0.000 | 5.012 | 0.000 | 0.08 |
| | | B | | 0.000 | 0.000 | 7.483 | 0.000 | 0.11 |
| | | C | | 0.000 | 0.000 | 15.162 | 0.000 | 0.20 |
| T28 | 161.50-156.50 | A | 1.755 | 0.000 | 0.000 | 5.001 | 0.000 | 0.08 |
| | | B | | 0.000 | 0.000 | 7.466 | 0.000 | 0.11 |
| | | C | | 0.000 | 0.000 | 15.124 | 0.000 | 0.20 |
| T29 | 156.50-151.50 | A | 1.750 | 0.000 | 0.000 | 4.990 | 0.000 | 0.08 |
| | | B | | 0.000 | 0.000 | 7.449 | 0.000 | 0.11 |
| | | C | | 0.000 | 0.000 | 15.085 | 0.000 | 0.20 |
| T30 | 151.50-146.50 | A | 1.744 | 0.000 | 0.000 | 4.978 | 0.000 | 0.08 |
| | | B | | 0.000 | 0.000 | 7.432 | 0.000 | 0.11 |
| | | C | | 0.000 | 0.000 | 15.045 | 0.000 | 0.20 |
| T31 | 146.50-141.50 | A | 1.738 | 0.000 | 0.000 | 4.966 | 0.000 | 0.08 |
| | | B | | 0.000 | 0.000 | 7.414 | 0.000 | 0.11 |
| | | C | | 0.000 | 0.000 | 16.531 | 0.000 | 0.21 |



| Tower Section | Tower Elevation ft | Face or Leg | Ice Thickness in | $A_R$ $ft^2$ | $A_F$ $ft^2$ | $C_AA_A$ In Face $ft^2$ | $C_AA_A$ Out Face $ft^2$ | Weight K |
|---|---|---|---|---|---|---|---|---|
| T32 | 141.50-136.50 | A | 1.732 | 0.000 | 0.000 | 4.954 | 0.000 | 0.08 |
| | | B | | 0.000 | 0.000 | 7.396 | 0.000 | 0.11 |
| | | C | | 0.000 | 0.000 | 18.914 | 0.000 | 0.25 |
| T33 | 136.50-131.50 | A | 1.726 | 0.000 | 0.000 | 6.499 | 0.000 | 0.10 |
| | | B | | 0.000 | 0.000 | 7.377 | 0.000 | 0.11 |
| | | C | | 0.000 | 0.000 | 19.085 | 0.000 | 0.25 |
| T34 | 131.50-106.50 | A | 1.705 | 0.000 | 0.000 | 35.529 | 0.000 | 0.55 |
| | | B | | 0.000 | 0.000 | 36.579 | 0.000 | 0.54 |
| | | C | | 0.000 | 0.000 | 94.506 | 0.000 | 1.22 |
| T35 | 106.50-101.50 | A | 1.682 | 0.000 | 0.000 | 7.037 | 0.000 | 0.11 |
| | | B | | 0.000 | 0.000 | 7.247 | 0.000 | 0.11 |
| | | C | | 0.000 | 0.000 | 18.696 | 0.000 | 0.24 |
| T36 | 101.50-96.50 | A | 1.674 | 0.000 | 0.000 | 7.013 | 0.000 | 0.11 |
| | | B | | 0.000 | 0.000 | 7.223 | 0.000 | 0.10 |
| | | C | | 0.000 | 0.000 | 23.897 | 0.000 | 0.29 |
| T37 | 96.50-91.50 | A | 1.666 | 0.000 | 0.000 | 6.987 | 0.000 | 0.11 |
| | | B | | 0.000 | 0.000 | 7.197 | 0.000 | 0.10 |
| | | C | | 0.000 | 0.000 | 24.391 | 0.000 | 0.30 |
| T38 | 91.50-86.50 | A | 1.656 | 0.000 | 0.000 | 6.959 | 0.000 | 0.11 |
| | | B | | 0.000 | 0.000 | 7.169 | 0.000 | 0.10 |
| | | C | | 0.000 | 0.000 | 24.293 | 0.000 | 0.30 |
| T39 | 86.50-81.50 | A | 1.647 | 0.000 | 0.000 | 6.931 | 0.000 | 0.11 |
| | | B | | 0.000 | 0.000 | 7.141 | 0.000 | 0.10 |
| | | C | | 0.000 | 0.000 | 24.191 | 0.000 | 0.29 |
| T40 | 81.50-76.50 | A | 1.637 | 0.000 | 0.000 | 6.900 | 0.000 | 0.10 |
| | | B | | 0.000 | 0.000 | 22.494 | 0.000 | 0.26 |
| | | C | | 0.000 | 0.000 | 27.767 | 0.000 | 0.33 |
| T41 | 76.50-71.50 | A | 1.626 | 0.000 | 0.000 | 6.868 | 0.000 | 0.10 |
| | | B | | 0.000 | 0.000 | 28.969 | 0.000 | 0.32 |
| | | C | | 0.000 | 0.000 | 29.212 | 0.000 | 0.34 |
| T42 | 71.50-66.50 | A | 1.615 | 0.000 | 0.000 | 6.834 | 0.000 | 0.10 |
| | | B | | 0.000 | 0.000 | 28.844 | 0.000 | 0.32 |
| | | C | | 0.000 | 0.000 | 29.071 | 0.000 | 0.34 |
| T43 | 66.50-61.50 | A | 1.603 | 0.000 | 0.000 | 6.798 | 0.000 | 0.10 |
| | | B | | 0.000 | 0.000 | 28.710 | 0.000 | 0.31 |
| | | C | | 0.000 | 0.000 | 28.919 | 0.000 | 0.33 |
| T44 | 61.50-56.50 | A | 1.590 | 0.000 | 0.000 | 6.759 | 0.000 | 0.10 |
| | | B | | 0.000 | 0.000 | 28.567 | 0.000 | 0.31 |
| | | C | | 0.000 | 0.000 | 28.757 | 0.000 | 0.33 |
| T45 | 56.50-51.50 | A | 1.576 | 0.000 | 0.000 | 6.717 | 0.000 | 0.10 |
| | | B | | 0.000 | 0.000 | 28.412 | 0.000 | 0.31 |
| | | C | | 0.000 | 0.000 | 28.582 | 0.000 | 0.33 |
| T46 | 51.50-46.50 | A | 1.560 | 0.000 | 0.000 | 6.671 | 0.000 | 0.10 |
| | | B | | 0.000 | 0.000 | 28.244 | 0.000 | 0.30 |
| | | C | | 0.000 | 0.000 | 28.392 | 0.000 | 0.32 |
| T47 | 46.50-41.50 | A | 1.544 | 0.000 | 0.000 | 6.621 | 0.000 | 0.10 |
| | | B | | 0.000 | 0.000 | 28.059 | 0.000 | 0.30 |
| | | C | | 0.000 | 0.000 | 28.184 | 0.000 | 0.32 |
| T48 | 41.50-36.50 | A | 1.525 | 0.000 | 0.000 | 6.566 | 0.000 | 0.10 |
| | | B | | 0.000 | 0.000 | 27.855 | 0.000 | 0.29 |
| | | C | | 0.000 | 0.000 | 27.953 | 0.000 | 0.31 |
| T49 | 36.50-31.50 | A | 1.504 | 0.000 | 0.000 | 6.503 | 0.000 | 0.09 |
| | | B | | 0.000 | 0.000 | 28.142 | 0.000 | 0.30 |
| | | C | | 0.000 | 0.000 | 27.693 | 0.000 | 0.31 |
| T50 | 31.50-6.50 | A | 1.419 | 0.000 | 0.000 | 31.242 | 0.000 | 0.43 |
| | | B | | 0.000 | 0.000 | 142.276 | 0.000 | 1.44 |
| | | C | | 0.000 | 0.000 | 133.159 | 0.000 | 1.41 |
| T51 | 6.50-0.00 | A | 1.190 | 0.000 | 0.000 | 7.227 | 0.000 | 0.09 |
| | | B | | 0.000 | 0.000 | 35.056 | 0.000 | 0.32 |
| | | C | | 0.000 | 0.000 | 30.896 | 0.000 | 0.29 |

## Feed Line Center of Pressure

| Section | Elevation | $CP_X$ | $CP_Z$ | $CP_X$ Ice | $CP_Z$ Ice |
|---|---|---|---|---|---|
| | ft | in | in | in | in |
| L1 | 341.50-314.50 | -0.1111 | -0.0641 | -0.1967 | -0.1136 |
| T1 | 314.50-310.50 | -0.0384 | -0.9519 | -0.0324 | -0.8037 |
| T2 | 310.50-306.50 | -0.0420 | -1.0433 | -0.0349 | -0.8667 |
| T3 | 306.50-281.50 | 0.0578 | -0.7587 | -0.0782 | -0.3878 |
| T4 | 281.50-276.50 | 0.6440 | -0.2727 | 0.6255 | 0.0826 |
| T5 | 276.50-271.50 | 0.6391 | -0.4638 | 0.6232 | -0.0586 |
| T6 | 271.50-266.50 | 0.6346 | -0.8596 | 0.6865 | -0.3983 |
| T7 | 266.50-261.50 | 0.6346 | -0.8596 | 0.6868 | -0.3988 |
| T8 | 261.50-256.50 | 0.6033 | -1.2248 | 0.6589 | -0.7190 |
| T9 | 256.50-251.50 | 0.5914 | -1.3633 | 0.6481 | -0.8441 |
| T10 | 251.50-246.50 | 0.5914 | -1.3633 | 0.6483 | -0.8447 |
| T11 | 246.50-241.50 | 0.5421 | -1.2497 | 0.5511 | -0.7183 |
| T12 | 241.50-236.50 | 0.4074 | -1.1157 | 0.3989 | -0.5879 |
| T13 | 236.50-231.50 | 0.1350 | -0.8356 | 0.0949 | -0.3179 |
| T14 | 231.50-226.50 | 0.1350 | -0.8356 | 0.0950 | -0.3184 |
| T15 | 226.50-221.50 | 0.1067 | -0.8585 | 0.0616 | -0.3513 |
| T16 | 221.50-216.50 | 0.0422 | -0.8996 | -0.0133 | -0.4199 |
| T17 | 216.50-211.50 | 0.0422 | -0.8996 | -0.0133 | -0.4204 |
| T18 | 211.50-206.50 | 0.0422 | -0.8996 | -0.0132 | -0.4210 |
| T19 | 206.50-201.50 | 0.0422 | -0.8996 | -0.0132 | -0.4215 |
| T20 | 201.50-196.50 | 0.0422 | -0.8996 | -0.0132 | -0.4221 |
| T21 | 196.50-191.50 | 0.0422 | -0.8996 | -0.0131 | -0.4227 |
| T22 | 191.50-186.50 | 0.0422 | -0.8996 | -0.0131 | -0.4233 |
| T23 | 186.50-181.50 | 0.0167 | -0.8784 | -0.0727 | -0.3805 |
| T24 | 181.50-176.50 | -0.0467 | -0.9310 | -0.2380 | -0.3289 |
| T25 | 176.50-171.50 | -0.0456 | -0.9095 | -0.2345 | -0.3247 |
| T26 | 171.50-166.50 | -0.0068 | -0.8716 | -0.1371 | -0.2497 |
| T27 | 166.50-161.50 | 0.0309 | -0.8300 | -0.0444 | -0.1779 |
| T28 | 161.50-156.50 | 0.0318 | -0.8532 | -0.0451 | -0.1814 |
| T29 | 156.50-151.50 | 0.0309 | -0.8293 | -0.0416 | -0.1682 |
| T30 | 151.50-146.50 | 0.0309 | -0.8293 | -0.0416 | -0.1688 |
| T31 | 146.50-141.50 | -0.0289 | -0.8064 | -0.2128 | -0.0769 |
| T32 | 141.50-136.50 | 0.1498 | -0.6350 | -0.0385 | 0.0810 |
| T33 | 136.50-131.50 | 0.0494 | -0.5684 | -0.1450 | 0.1252 |
| T34 | 131.50-106.50 | -0.0001 | -0.5481 | -0.1973 | 0.1359 |
| T35 | 106.50-101.50 | -0.0001 | -0.5481 | -0.1970 | 0.1338 |
| T36 | 101.50-96.50 | -0.0482 | -0.1793 | -0.1835 | 0.2083 |
| T37 | 96.50-91.50 | -0.0541 | -0.1477 | -0.1944 | 0.2295 |
| T38 | 91.50-86.50 | -0.0541 | -0.1477 | -0.1943 | 0.2291 |
| T39 | 86.50-81.50 | -0.0541 | -0.1477 | -0.1942 | 0.2288 |
| T40 | 81.50-76.50 | 0.3456 | -0.2133 | 0.0140 | 0.1427 |
| T41 | 76.50-71.50 | 0.4387 | -0.2239 | 0.0714 | 0.1109 |
| T42 | 71.50-66.50 | 0.4434 | -0.2263 | 0.0727 | 0.1114 |
| T43 | 66.50-61.50 | 0.4434 | -0.2263 | 0.0735 | 0.1109 |
| T44 | 61.50-56.50 | 0.4528 | -0.2311 | 0.0755 | 0.1120 |
| T45 | 56.50-51.50 | 0.4528 | -0.2311 | 0.0765 | 0.1114 |
| T46 | 51.50-46.50 | 0.4528 | -0.2311 | 0.0775 | 0.1107 |
| T47 | 46.50-41.50 | 0.4479 | -0.2286 | 0.0780 | 0.1090 |
| T48 | 41.50-36.50 | 0.4479 | -0.2286 | 0.0793 | 0.1081 |
| T49 | 36.50-31.50 | 0.4488 | -0.2406 | 0.0855 | 0.0761 |
| T50 | 31.50-6.50 | 0.4572 | -0.2752 | 0.1070 | -0.0064 |
| T51 | 6.50-0.00 | 0.2936 | -0.2008 | 0.1065 | -0.0865 |



## Shielding Factor Ka

| Tower Section | Feed Line Record No. | Description | Feed Line Segment Elev. | $K_a$ No Ice | $K_a$ Ice |
|---|---|---|---|---|---|
| L1 | 2 | 1-5/8" | 314.50 - 325.00 | 1.0000 | 1.0000 |
| T1 | 1 | 1-5/8" | 310.50 - 314.50 | 0.6000 | 0.4504 |
| T2 | 1 | 1-5/8" | 306.50 - 310.50 | 0.6000 | 0.4728 |
| T3 | 1 | 1-5/8" | 281.50 - 306.50 | 0.6000 | 0.5012 |
| T3 | 4 | 7/16" Power | 281.50 - 303.00 | 0.6000 | 0.5012 |
| T3 | 6 | 3/8" | 281.50 - 287.00 | 0.6000 | 0.5012 |
| T3 | 7 | 7/8" | 281.50 - 287.00 | 0.6000 | 0.5012 |
| T3 | 9 | 7/8" | 281.50 - 288.00 | 0.6000 | 0.5012 |
| T4 | 1 | 1-5/8" | 276.50 - 281.50 | 0.6000 | 0.4403 |
| T4 | 4 | 7/16" Power | 276.50 - 281.50 | 0.6000 | 0.4403 |
| T4 | 6 | 3/8" | 276.50 - 281.50 | 0.6000 | 0.4403 |
| T4 | 7 | 7/8" | 276.50 - 281.50 | 0.6000 | 0.4403 |
| T4 | 9 | 7/8" | 276.50 - 281.50 | 0.6000 | 0.4403 |
| T5 | 1 | 1-5/8" | 271.50 - 276.50 | 0.6000 | 0.4408 |
| T5 | 4 | 7/16" Power | 271.50 - 276.50 | 0.6000 | 0.4408 |
| T5 | 6 | 3/8" | 271.50 - 276.50 | 0.6000 | 0.4408 |
| T5 | 7 | 7/8" | 271.50 - 276.50 | 0.6000 | 0.4408 |
| T5 | 9 | 7/8" | 271.50 - 276.50 | 0.6000 | 0.4408 |
| T5 | 11 | 1-5/8" | 271.50 - 273.00 | 0.6000 | 0.4408 |
| T6 | 1 | 1-5/8" | 266.50 - 271.50 | 0.6000 | 0.4933 |
| T6 | 4 | 7/16" Power | 266.50 - 271.50 | 0.6000 | 0.4933 |
| T6 | 6 | 3/8" | 266.50 - 271.50 | 0.6000 | 0.4933 |
| T6 | 7 | 7/8" | 266.50 - 271.50 | 0.6000 | 0.4933 |
| T6 | 9 | 7/8" | 266.50 - 271.50 | 0.6000 | 0.4933 |
| T6 | 11 | 1-5/8" | 266.50 - 271.50 | 0.6000 | 0.4933 |
| T7 | 1 | 1-5/8" | 261.50 - 266.50 | 0.6000 | 0.4938 |
| T7 | 4 | 7/16" Power | 261.50 - 266.50 | 0.6000 | 0.4938 |
| T7 | 6 | 3/8" | 261.50 - | 0.6000 | 0.4938 |

| Tower Section | Feed Line Record No. | Description | Feed Line Segment Elev. | $K_a$ No Ice | $K_a$ Ice |
|---|---|---|---|---|---|
| T7 | 7 | 7/8" | 266.50<br>261.50 - 266.50 | 0.6000 | 0.4938 |
| T7 | 9 | 7/8" | 261.50 - 266.50 | 0.6000 | 0.4938 |
| T7 | 11 | 1-5/8" | 261.50 - 266.50 | 0.6000 | 0.4938 |
| T8 | 1 | 1-5/8" | 256.50 - 261.50 | 0.6000 | 0.4944 |
| T8 | 4 | 7/16" Power | 256.50 - 261.50 | 0.6000 | 0.4944 |
| T8 | 6 | 3/8" | 256.50 - 261.50 | 0.6000 | 0.4944 |
| T8 | 7 | 7/8" | 256.50 - 261.50 | 0.6000 | 0.4944 |
| T8 | 9 | 7/8" | 256.50 - 261.50 | 0.6000 | 0.4944 |
| T8 | 11 | 1-5/8" | 256.50 - 261.50 | 0.6000 | 0.4944 |
| T8 | 13 | 1-5/8" | 256.50 - 260.00 | 0.6000 | 0.4944 |
| T9 | 1 | 1-5/8" | 251.50 - 256.50 | 0.6000 | 0.4949 |
| T9 | 4 | 7/16" Power | 251.50 - 256.50 | 0.6000 | 0.4949 |
| T9 | 6 | 3/8" | 251.50 - 256.50 | 0.6000 | 0.4949 |
| T9 | 7 | 7/8" | 251.50 - 256.50 | 0.6000 | 0.4949 |
| T9 | 9 | 7/8" | 251.50 - 256.50 | 0.6000 | 0.4949 |
| T9 | 11 | 1-5/8" | 251.50 - 256.50 | 0.6000 | 0.4949 |
| T9 | 13 | 1-5/8" | 251.50 - 256.50 | 0.6000 | 0.4949 |
| T10 | 1 | 1-5/8" | 246.50 - 251.50 | 0.6000 | 0.4954 |
| T10 | 4 | 7/16" Power | 246.50 - 251.50 | 0.6000 | 0.4954 |
| T10 | 6 | 3/8" | 246.50 - 251.50 | 0.6000 | 0.4954 |
| T10 | 7 | 7/8" | 246.50 - 251.50 | 0.6000 | 0.4954 |
| T10 | 9 | 7/8" | 246.50 - 251.50 | 0.6000 | 0.4954 |
| T10 | 11 | 1-5/8" | 246.50 - 251.50 | 0.6000 | 0.4954 |
| T10 | 13 | 1-5/8" | 246.50 - 251.50 | 0.6000 | 0.4954 |
| T11 | 1 | 1-5/8" | 241.50 - 246.50 | 0.6000 | 0.4118 |
| T11 | 4 | 7/16" Power | 241.50 - 246.50 | 0.6000 | 0.4118 |
| T11 | 6 | 3/8" | 241.50 - 246.50 | 0.6000 | 0.4118 |
| T11 | 7 | 7/8" | 241.50 - 246.50 | 0.6000 | 0.4118 |
| T11 | 9 | 7/8" | 241.50 - 246.50 | 0.6000 | 0.4118 |
| T11 | 11 | 1-5/8" | 241.50 - 246.50 | 0.6000 | 0.4118 |
| T11 | 13 | 1-5/8" | 241.50 - | 0.6000 | 0.4118 |



| Tower Section | Feed Line Record No. | Description | Feed Line Segment Elev. | $K_a$ No Ice | $K_a$ Ice |
|---|---|---|---|---|---|
| T12 | 1 | 1-5/8" | 246.50<br>236.50 - 241.50 | 0.6000 | 0.4124 |
| T12 | 4 | 7/16" Power | 236.50 - 241.50 | 0.6000 | 0.4124 |
| T12 | 6 | 3/8" | 236.50 - 241.50 | 0.6000 | 0.4124 |
| T12 | 7 | 7/8" | 236.50 - 241.50 | 0.6000 | 0.4124 |
| T12 | 9 | 7/8" | 236.50 - 241.50 | 0.6000 | 0.4124 |
| T12 | 11 | 1-5/8" | 236.50 - 241.50 | 0.6000 | 0.4124 |
| T12 | 13 | 1-5/8" | 236.50 - 241.50 | 0.6000 | 0.4124 |
| T12 | 15 | 7/8" | 236.50 - 239.00 | 0.6000 | 0.4124 |
| T12 | 17 | 7/8" | 236.50 - 237.00 | 0.6000 | 0.4124 |
| T13 | 1 | 1-5/8" | 231.50 - 236.50 | 0.6000 | 0.4131 |
| T13 | 4 | 7/16" Power | 231.50 - 236.50 | 0.6000 | 0.4131 |
| T13 | 6 | 3/8" | 231.50 - 236.50 | 0.6000 | 0.4131 |
| T13 | 7 | 7/8" | 231.50 - 236.50 | 0.6000 | 0.4131 |
| T13 | 9 | 7/8" | 231.50 - 236.50 | 0.6000 | 0.4131 |
| T13 | 11 | 1-5/8" | 231.50 - 236.50 | 0.6000 | 0.4131 |
| T13 | 13 | 1-5/8" | 231.50 - 236.50 | 0.6000 | 0.4131 |
| T13 | 15 | 7/8" | 231.50 - 236.50 | 0.6000 | 0.4131 |
| T13 | 17 | 7/8" | 231.50 - 236.50 | 0.6000 | 0.4131 |
| T14 | 1 | 1-5/8" | 226.50 - 231.50 | 0.6000 | 0.4138 |
| T14 | 4 | 7/16" Power | 226.50 - 231.50 | 0.6000 | 0.4138 |
| T14 | 6 | 3/8" | 226.50 - 231.50 | 0.6000 | 0.4138 |
| T14 | 7 | 7/8" | 226.50 - 231.50 | 0.6000 | 0.4138 |
| T14 | 9 | 7/8" | 226.50 - 231.50 | 0.6000 | 0.4138 |
| T14 | 11 | 1-5/8" | 226.50 - 231.50 | 0.6000 | 0.4138 |
| T14 | 13 | 1-5/8" | 226.50 - 231.50 | 0.6000 | 0.4138 |
| T14 | 15 | 7/8" | 226.50 - 231.50 | 0.6000 | 0.4138 |
| T14 | 17 | 7/8" | 226.50 - 231.50 | 0.6000 | 0.4138 |
| T15 | 1 | 1-5/8" | 221.50 - 226.50 | 0.6000 | 0.4170 |
| T15 | 4 | 7/16" Power | 221.50 - 226.50 | 0.6000 | 0.4170 |
| T15 | 6 | 3/8" | 221.50 - 226.50 | 0.6000 | 0.4170 |
| T15 | 7 | 7/8" | 221.50 - | 0.6000 | 0.4170 |

| Tower Section | Feed Line Record No. | Description | Feed Line Segment Elev. | $K_a$ No Ice | $K_a$ Ice |
|---|---|---|---|---|---|
| T15 | 9 | 7/8" | 226.50<br>221.50 - 226.50 | 0.6000 | 0.4170 |
| T15 | 11 | 1-5/8" | 221.50 - 226.50 | 0.6000 | 0.4170 |
| T15 | 13 | 1-5/8" | 221.50 - 226.50 | 0.6000 | 0.4170 |
| T15 | 15 | 7/8" | 221.50 - 226.50 | 0.6000 | 0.4170 |
| T15 | 17 | 7/8" | 221.50 - 226.50 | 0.6000 | 0.4170 |
| T15 | 19 | 1" Conduit (Lighting) | 221.50 - 223.00 | 0.6000 | 0.4170 |
| T16 | 1 | 1-5/8" | 216.50 - 221.50 | 0.6000 | 0.4178 |
| T16 | 4 | 7/16" Power | 216.50 - 221.50 | 0.6000 | 0.4178 |
| T16 | 6 | 3/8" | 216.50 - 221.50 | 0.6000 | 0.4178 |
| T16 | 7 | 7/8" | 216.50 - 221.50 | 0.6000 | 0.4178 |
| T16 | 9 | 7/8" | 216.50 - 221.50 | 0.6000 | 0.4178 |
| T16 | 11 | 1-5/8" | 216.50 - 221.50 | 0.6000 | 0.4178 |
| T16 | 13 | 1-5/8" | 216.50 - 221.50 | 0.6000 | 0.4178 |
| T16 | 15 | 7/8" | 216.50 - 221.50 | 0.6000 | 0.4178 |
| T16 | 17 | 7/8" | 216.50 - 221.50 | 0.6000 | 0.4178 |
| T16 | 19 | 1" Conduit (Lighting) | 216.50 - 221.50 | 0.6000 | 0.4178 |
| T17 | 1 | 1-5/8" | 211.50 - 216.50 | 0.6000 | 0.4185 |
| T17 | 4 | 7/16" Power | 211.50 - 216.50 | 0.6000 | 0.4185 |
| T17 | 6 | 3/8" | 211.50 - 216.50 | 0.6000 | 0.4185 |
| T17 | 7 | 7/8" | 211.50 - 216.50 | 0.6000 | 0.4185 |
| T17 | 9 | 7/8" | 211.50 - 216.50 | 0.6000 | 0.4185 |
| T17 | 11 | 1-5/8" | 211.50 - 216.50 | 0.6000 | 0.4185 |
| T17 | 13 | 1-5/8" | 211.50 - 216.50 | 0.6000 | 0.4185 |
| T17 | 15 | 7/8" | 211.50 - 216.50 | 0.6000 | 0.4185 |
| T17 | 17 | 7/8" | 211.50 - 216.50 | 0.6000 | 0.4185 |
| T17 | 19 | 1" Conduit (Lighting) | 211.50 - 216.50 | 0.6000 | 0.4185 |
| T18 | 1 | 1-5/8" | 206.50 - 211.50 | 0.6000 | 0.4192 |
| T18 | 4 | 7/16" Power | 206.50 - 211.50 | 0.6000 | 0.4192 |
| T18 | 6 | 3/8" | 206.50 - 211.50 | 0.6000 | 0.4192 |
| T18 | 7 | 7/8" | 206.50 - 211.50 | 0.6000 | 0.4192 |
| T18 | 9 | 7/8" | 206.50 - | 0.6000 | 0.4192 |



| Tower Section | Feed Line Record No. | Description | Feed Line Segment Elev. | $K_a$ No Ice | $K_a$ Ice |
|---|---|---|---|---|---|
| T18 | 11 | 1-5/8" | 211.50<br>206.50 - 211.50 | 0.6000 | 0.4192 |
| T18 | 13 | 1-5/8" | 206.50 - 211.50 | 0.6000 | 0.4192 |
| T18 | 15 | 7/8" | 206.50 - 211.50 | 0.6000 | 0.4192 |
| T18 | 17 | 7/8" | 206.50 - 211.50 | 0.6000 | 0.4192 |
| T18 | 19 | 1" Conduit (Lighting) | 206.50 - 211.50 | 0.6000 | 0.4192 |
| T19 | 1 | 1-5/8" | 201.50 - 206.50 | 0.6000 | 0.4200 |
| T19 | 4 | 7/16" Power | 201.50 - 206.50 | 0.6000 | 0.4200 |
| T19 | 6 | 3/8" | 201.50 - 206.50 | 0.6000 | 0.4200 |
| T19 | 7 | 7/8" | 201.50 - 206.50 | 0.6000 | 0.4200 |
| T19 | 9 | 7/8" | 201.50 - 206.50 | 0.6000 | 0.4200 |
| T19 | 11 | 1-5/8" | 201.50 - 206.50 | 0.6000 | 0.4200 |
| T19 | 13 | 1-5/8" | 201.50 - 206.50 | 0.6000 | 0.4200 |
| T19 | 15 | 7/8" | 201.50 - 206.50 | 0.6000 | 0.4200 |
| T19 | 17 | 7/8" | 201.50 - 206.50 | 0.6000 | 0.4200 |
| T19 | 19 | 1" Conduit (Lighting) | 201.50 - 206.50 | 0.6000 | 0.4200 |
| T20 | 1 | 1-5/8" | 196.50 - 201.50 | 0.6000 | 0.4207 |
| T20 | 4 | 7/16" Power | 196.50 - 201.50 | 0.6000 | 0.4207 |
| T20 | 6 | 3/8" | 196.50 - 201.50 | 0.6000 | 0.4207 |
| T20 | 7 | 7/8" | 196.50 - 201.50 | 0.6000 | 0.4207 |
| T20 | 9 | 7/8" | 196.50 - 201.50 | 0.6000 | 0.4207 |
| T20 | 11 | 1-5/8" | 196.50 - 201.50 | 0.6000 | 0.4207 |
| T20 | 13 | 1-5/8" | 196.50 - 201.50 | 0.6000 | 0.4207 |
| T20 | 15 | 7/8" | 196.50 - 201.50 | 0.6000 | 0.4207 |
| T20 | 17 | 7/8" | 196.50 - 201.50 | 0.6000 | 0.4207 |
| T20 | 19 | 1" Conduit (Lighting) | 196.50 - 201.50 | 0.6000 | 0.4207 |
| T21 | 1 | 1-5/8" | 191.50 - 196.50 | 0.6000 | 0.4215 |
| T21 | 4 | 7/16" Power | 191.50 - 196.50 | 0.6000 | 0.4215 |
| T21 | 6 | 3/8" | 191.50 - 196.50 | 0.6000 | 0.4215 |
| T21 | 7 | 7/8" | 191.50 - 196.50 | 0.6000 | 0.4215 |
| T21 | 9 | 7/8" | 191.50 - 196.50 | 0.6000 | 0.4215 |
| T21 | 11 | 1-5/8" | 191.50 - | 0.6000 | 0.4215 |

| Tower Section | Feed Line Record No. | Description | Feed Line Segment Elev. | $K_a$ No Ice | $K_a$ Ice |
|---|---|---|---|---|---|
| T21 | 13 | 1-5/8" | 191.50 - 196.50 | 0.6000 | 0.4215 |
| T21 | 15 | 7/8" | 191.50 - 196.50 | 0.6000 | 0.4215 |
| T21 | 17 | 7/8" | 191.50 - 196.50 | 0.6000 | 0.4215 |
| T21 | 19 | 1" Conduit (Lighting) | 191.50 - 196.50 | 0.6000 | 0.4215 |
| T22 | 1 | 1-5/8" | 186.50 - 191.50 | 0.6000 | 0.4223 |
| T22 | 4 | 7/16" Power | 186.50 - 191.50 | 0.6000 | 0.4223 |
| T22 | 6 | 3/8" | 186.50 - 191.50 | 0.6000 | 0.4223 |
| T22 | 7 | 7/8" | 186.50 - 191.50 | 0.6000 | 0.4223 |
| T22 | 9 | 7/8" | 186.50 - 191.50 | 0.6000 | 0.4223 |
| T22 | 11 | 1-5/8" | 186.50 - 191.50 | 0.6000 | 0.4223 |
| T22 | 13 | 1-5/8" | 186.50 - 191.50 | 0.6000 | 0.4223 |
| T22 | 15 | 7/8" | 186.50 - 191.50 | 0.6000 | 0.4223 |
| T22 | 17 | 7/8" | 186.50 - 191.50 | 0.6000 | 0.4223 |
| T22 | 19 | 1" Conduit (Lighting) | 186.50 - 191.50 | 0.6000 | 0.4223 |
| T23 | 1 | 1-5/8" | 181.50 - 186.50 | 0.6000 | 0.4231 |
| T23 | 4 | 7/16" Power | 181.50 - 186.50 | 0.6000 | 0.4231 |
| T23 | 6 | 3/8" | 181.50 - 186.50 | 0.6000 | 0.4231 |
| T23 | 7 | 7/8" | 181.50 - 186.50 | 0.6000 | 0.4231 |
| T23 | 9 | 7/8" | 181.50 - 186.50 | 0.6000 | 0.4231 |
| T23 | 11 | 1-5/8" | 181.50 - 186.50 | 0.6000 | 0.4231 |
| T23 | 13 | 1-5/8" | 181.50 - 186.50 | 0.6000 | 0.4231 |
| T23 | 15 | 7/8" | 181.50 - 186.50 | 0.6000 | 0.4231 |
| T23 | 17 | 7/8" | 181.50 - 186.50 | 0.6000 | 0.4231 |
| T23 | 19 | 1" Conduit (Lighting) | 181.50 - 186.50 | 0.6000 | 0.4231 |
| T23 | 21 | 7/16" Power | 181.50 - 183.00 | 0.6000 | 0.4231 |
| T24 | 1 | 1-5/8" | 176.50 - 181.50 | 0.6000 | 0.5232 |
| T24 | 4 | 7/16" Power | 176.50 - 181.50 | 0.6000 | 0.5232 |
| T24 | 6 | 3/8" | 176.50 - 181.50 | 0.6000 | 0.5232 |
| T24 | 7 | 7/8" | 176.50 - 181.50 | 0.6000 | 0.5232 |
| T24 | 9 | 7/8" | 176.50 - 181.50 | 0.6000 | 0.5232 |
| T24 | 11 | 1-5/8" | 176.50 - | 0.6000 | 0.5232 |



| Tower Section | Feed Line Record No. | Description | Feed Line Segment Elev. | $K_a$ No Ice | $K_a$ Ice |
|---|---|---|---|---|---|
| T24 | 13 | 1-5/8" | 176.50 - 181.50 | 0.6000 | 0.5232 |
| T24 | 15 | 7/8" | 176.50 - 181.50 | 0.6000 | 0.5232 |
| T24 | 17 | 7/8" | 176.50 - 181.50 | 0.6000 | 0.5232 |
| T24 | 19 | 1" Conduit (Lighting) | 176.50 - 181.50 | 0.6000 | 0.5232 |
| T24 | 21 | 7/16" Power | 176.50 - 181.50 | 0.6000 | 0.5232 |
| T25 | 1 | 1-5/8" | 171.50 - 176.50 | 0.6000 | 0.5125 |
| T25 | 4 | 7/16" Power | 171.50 - 176.50 | 0.6000 | 0.5125 |
| T25 | 6 | 3/8" | 171.50 - 176.50 | 0.6000 | 0.5125 |
| T25 | 7 | 7/8" | 171.50 - 176.50 | 0.6000 | 0.5125 |
| T25 | 9 | 7/8" | 171.50 - 176.50 | 0.6000 | 0.5125 |
| T25 | 11 | 1-5/8" | 171.50 - 176.50 | 0.6000 | 0.5125 |
| T25 | 13 | 1-5/8" | 171.50 - 176.50 | 0.6000 | 0.5125 |
| T25 | 15 | 7/8" | 171.50 - 176.50 | 0.6000 | 0.5125 |
| T25 | 17 | 7/8" | 171.50 - 176.50 | 0.6000 | 0.5125 |
| T25 | 19 | 1" Conduit (Lighting) | 171.50 - 176.50 | 0.6000 | 0.5125 |
| T25 | 21 | 7/16" Power | 171.50 - 176.50 | 0.6000 | 0.5125 |
| T26 | 1 | 1-5/8" | 166.50 - 171.50 | 0.6000 | 0.5133 |
| T26 | 4 | 7/16" Power | 166.50 - 171.50 | 0.6000 | 0.5133 |
| T26 | 6 | 3/8" | 166.50 - 171.50 | 0.6000 | 0.5133 |
| T26 | 7 | 7/8" | 166.50 - 171.50 | 0.6000 | 0.5133 |
| T26 | 9 | 7/8" | 166.50 - 171.50 | 0.6000 | 0.5133 |
| T26 | 11 | 1-5/8" | 166.50 - 171.50 | 0.6000 | 0.5133 |
| T26 | 13 | 1-5/8" | 166.50 - 171.50 | 0.6000 | 0.5133 |
| T26 | 15 | 7/8" | 166.50 - 171.50 | 0.6000 | 0.5133 |
| T26 | 17 | 7/8" | 166.50 - 171.50 | 0.6000 | 0.5133 |
| T26 | 19 | 1" Conduit (Lighting) | 166.50 - 171.50 | 0.6000 | 0.5133 |
| T26 | 21 | 7/16" Power | 166.50 - 171.50 | 0.6000 | 0.5133 |
| T26 | 23 | 7/16" Power | 166.50 - 169.00 | 0.6000 | 0.5133 |
| T27 | 1 | 1-5/8" | 161.50 - 166.50 | 0.6000 | 0.5115 |
| T27 | 4 | 7/16" Power | 161.50 - 166.50 | 0.6000 | 0.5115 |
| T27 | 6 | 3/8" | 161.50 - | 0.6000 | 0.5115 |

| Tower Section | Feed Line Record No. | Description | Feed Line Segment Elev. | $K_a$ No Ice | $K_a$ Ice |
|---|---|---|---|---|---|
| T27 | 7 | 7/8" | 161.50 - 166.50 | 0.6000 | 0.5115 |
| T27 | 9 | 7/8" | 161.50 - 166.50 | 0.6000 | 0.5115 |
| T27 | 11 | 1-5/8" | 161.50 - 166.50 | 0.6000 | 0.5115 |
| T27 | 13 | 1-5/8" | 161.50 - 166.50 | 0.6000 | 0.5115 |
| T27 | 15 | 7/8" | 161.50 - 166.50 | 0.6000 | 0.5115 |
| T27 | 17 | 7/8" | 161.50 - 166.50 | 0.6000 | 0.5115 |
| T27 | 19 | 1" Conduit (Lighting) | 161.50 - 166.50 | 0.6000 | 0.5115 |
| T27 | 21 | 7/16" Power | 161.50 - 166.50 | 0.6000 | 0.5115 |
| T27 | 23 | 7/16" Power | 161.50 - 166.50 | 0.6000 | 0.5115 |
| T28 | 1 | 1-5/8" | 156.50 - 161.50 | 0.6000 | 0.5254 |
| T28 | 4 | 7/16" Power | 156.50 - 161.50 | 0.6000 | 0.5254 |
| T28 | 6 | 3/8" | 156.50 - 161.50 | 0.6000 | 0.5254 |
| T28 | 7 | 7/8" | 156.50 - 161.50 | 0.6000 | 0.5254 |
| T28 | 9 | 7/8" | 156.50 - 161.50 | 0.6000 | 0.5254 |
| T28 | 11 | 1-5/8" | 156.50 - 161.50 | 0.6000 | 0.5254 |
| T28 | 13 | 1-5/8" | 156.50 - 161.50 | 0.6000 | 0.5254 |
| T28 | 15 | 7/8" | 156.50 - 161.50 | 0.6000 | 0.5254 |
| T28 | 17 | 7/8" | 156.50 - 161.50 | 0.6000 | 0.5254 |
| T28 | 19 | 1" Conduit (Lighting) | 156.50 - 161.50 | 0.6000 | 0.5254 |
| T28 | 21 | 7/16" Power | 156.50 - 161.50 | 0.6000 | 0.5254 |
| T28 | 23 | 7/16" Power | 156.50 - 161.50 | 0.6000 | 0.5254 |
| T29 | 1 | 1-5/8" | 151.50 - 156.50 | 0.6000 | 0.4657 |
| T29 | 4 | 7/16" Power | 151.50 - 156.50 | 0.6000 | 0.4657 |
| T29 | 6 | 3/8" | 151.50 - 156.50 | 0.6000 | 0.4657 |
| T29 | 7 | 7/8" | 151.50 - 156.50 | 0.6000 | 0.4657 |
| T29 | 9 | 7/8" | 151.50 - 156.50 | 0.6000 | 0.4657 |
| T29 | 11 | 1-5/8" | 151.50 - 156.50 | 0.6000 | 0.4657 |
| T29 | 13 | 1-5/8" | 151.50 - 156.50 | 0.6000 | 0.4657 |
| T29 | 15 | 7/8" | 151.50 - 156.50 | 0.6000 | 0.4657 |
| T29 | 17 | 7/8" | 151.50 - 156.50 | 0.6000 | 0.4657 |
| T29 | 19 | 1" Conduit (Lighting) | 151.50 - | 0.6000 | 0.4657 |



| Tower Section | Feed Line Record No. | Description | Feed Line Segment Elev. | $K_a$ No Ice | $K_a$ Ice |
|---|---|---|---|---|---|
| T29 | 21 | 7/16" Power | 151.50 - 156.50 | 0.6000 | 0.4657 |
| T29 | 23 | 7/16" Power | 151.50 - 156.50 | 0.6000 | 0.4657 |
| T30 | 1 | 1-5/8" | 146.50 - 151.50 | 0.6000 | 0.4667 |
| T30 | 4 | 7/16" Power | 146.50 - 151.50 | 0.6000 | 0.4667 |
| T30 | 6 | 3/8" | 146.50 - 151.50 | 0.6000 | 0.4667 |
| T30 | 7 | 7/8" | 146.50 - 151.50 | 0.6000 | 0.4667 |
| T30 | 9 | 7/8" | 146.50 - 151.50 | 0.6000 | 0.4667 |
| T30 | 11 | 1-5/8" | 146.50 - 151.50 | 0.6000 | 0.4667 |
| T30 | 13 | 1-5/8" | 146.50 - 151.50 | 0.6000 | 0.4667 |
| T30 | 15 | 7/8" | 146.50 - 151.50 | 0.6000 | 0.4667 |
| T30 | 17 | 7/8" | 146.50 - 151.50 | 0.6000 | 0.4667 |
| T30 | 19 | 1" Conduit (Lighting) | 146.50 - 151.50 | 0.6000 | 0.4667 |
| T30 | 21 | 7/16" Power | 146.50 - 151.50 | 0.6000 | 0.4667 |
| T30 | 23 | 7/16" Power | 146.50 - 151.50 | 0.6000 | 0.4667 |
| T31 | 1 | 1-5/8" | 141.50 - 146.50 | 0.6000 | 0.5281 |
| T31 | 4 | 7/16" Power | 141.50 - 146.50 | 0.6000 | 0.5281 |
| T31 | 6 | 3/8" | 141.50 - 146.50 | 0.6000 | 0.5281 |
| T31 | 7 | 7/8" | 141.50 - 146.50 | 0.6000 | 0.5281 |
| T31 | 9 | 7/8" | 141.50 - 146.50 | 0.6000 | 0.5281 |
| T31 | 11 | 1-5/8" | 141.50 - 146.50 | 0.6000 | 0.5281 |
| T31 | 13 | 1-5/8" | 141.50 - 146.50 | 0.6000 | 0.5281 |
| T31 | 15 | 7/8" | 141.50 - 146.50 | 0.6000 | 0.5281 |
| T31 | 17 | 7/8" | 141.50 - 146.50 | 0.6000 | 0.5281 |
| T31 | 19 | 1" Conduit (Lighting) | 141.50 - 146.50 | 0.6000 | 0.5281 |
| T31 | 21 | 7/16" Power | 141.50 - 146.50 | 0.6000 | 0.5281 |
| T31 | 23 | 7/16" Power | 141.50 - 146.50 | 0.6000 | 0.5281 |
| T31 | 25 | 1/4" fiber | 141.50 - 145.50 | 0.6000 | 0.5281 |
| T32 | 1 | 1-5/8" | 136.50 - 141.50 | 0.6000 | 0.5290 |
| T32 | 4 | 7/16" Power | 136.50 - 141.50 | 0.6000 | 0.5290 |
| T32 | 6 | 3/8" | 136.50 - 141.50 | 0.6000 | 0.5290 |
| T32 | 7 | 7/8" | 136.50 - | 0.6000 | 0.5290 |

| Tower Section | Feed Line Record No. | Description | Feed Line Segment Elev. | $K_a$ No Ice | $K_a$ Ice |
|---|---|---|---|---|---|
| T32 | 9 | 7/8" | 136.50 - 141.50 | 0.6000 | 0.5290 |
| T32 | 11 | 1-5/8" | 136.50 - 141.50 | 0.6000 | 0.5290 |
| T32 | 13 | 1-5/8" | 136.50 - 141.50 | 0.6000 | 0.5290 |
| T32 | 15 | 7/8" | 136.50 - 141.50 | 0.6000 | 0.5290 |
| T32 | 17 | 7/8" | 136.50 - 141.50 | 0.6000 | 0.5290 |
| T32 | 19 | 1" Conduit (Lighting) | 136.50 - 141.50 | 0.6000 | 0.5290 |
| T32 | 21 | 7/16" Power | 136.50 - 141.50 | 0.6000 | 0.5290 |
| T32 | 23 | 7/16" Power | 136.50 - 141.50 | 0.6000 | 0.5290 |
| T32 | 25 | 1/4" fiber | 136.50 - 141.50 | 0.6000 | 0.5290 |
| T32 | 27 | 7/8" | 136.50 - 141.00 | 0.6000 | 0.5290 |
| T33 | 1 | 1-5/8" | 131.50 - 136.50 | 0.6000 | 0.5300 |
| T33 | 4 | 7/16" Power | 131.50 - 136.50 | 0.6000 | 0.5300 |
| T33 | 6 | 3/8" | 131.50 - 136.50 | 0.6000 | 0.5300 |
| T33 | 7 | 7/8" | 131.50 - 136.50 | 0.6000 | 0.5300 |
| T33 | 9 | 7/8" | 131.50 - 136.50 | 0.6000 | 0.5300 |
| T33 | 11 | 1-5/8" | 131.50 - 136.50 | 0.6000 | 0.5300 |
| T33 | 13 | 1-5/8" | 131.50 - 136.50 | 0.6000 | 0.5300 |
| T33 | 15 | 7/8" | 131.50 - 136.50 | 0.6000 | 0.5300 |
| T33 | 17 | 7/8" | 131.50 - 136.50 | 0.6000 | 0.5300 |
| T33 | 19 | 1" Conduit (Lighting) | 131.50 - 136.50 | 0.6000 | 0.5300 |
| T33 | 21 | 7/16" Power | 131.50 - 136.50 | 0.6000 | 0.5300 |
| T33 | 23 | 7/16" Power | 131.50 - 136.50 | 0.6000 | 0.5300 |
| T33 | 25 | 1/4" fiber | 131.50 - 136.50 | 0.6000 | 0.5300 |
| T33 | 27 | 7/8" | 131.50 - 136.50 | 0.6000 | 0.5300 |
| T33 | 29 | 1" Conduit (Lighting) | 131.50 - 135.00 | 0.6000 | 0.5300 |
| T34 | 1 | 1-5/8" | 106.50 - 131.50 | 0.6000 | 0.5331 |
| T34 | 4 | 7/16" Power | 106.50 - 131.50 | 0.6000 | 0.5331 |
| T34 | 6 | 3/8" | 106.50 - 131.50 | 0.6000 | 0.5331 |
| T34 | 7 | 7/8" | 106.50 - 131.50 | 0.6000 | 0.5331 |
| T34 | 9 | 7/8" | 106.50 - 131.50 | 0.6000 | 0.5331 |
| T34 | 11 | 1-5/8" | 106.50 - | 0.6000 | 0.5331 |



| Tower Section | Feed Line Record No. | Description | Feed Line Segment Elev. | $K_a$ No Ice | $K_a$ Ice |
|---|---|---|---|---|---|
| T34 | 13 | 1-5/8" | 106.50 - 131.50 | 0.6000 | 0.5331 |
| T34 | 15 | 7/8" | 106.50 - 131.50 | 0.6000 | 0.5331 |
| T34 | 17 | 7/8" | 106.50 - 131.50 | 0.6000 | 0.5331 |
| T34 | 19 | 1" Conduit (Lighting) | 106.50 - 131.50 | 0.6000 | 0.5331 |
| T34 | 21 | 7/16" Power | 106.50 - 131.50 | 0.6000 | 0.5331 |
| T34 | 23 | 7/16" Power | 106.50 - 131.50 | 0.6000 | 0.5331 |
| T34 | 25 | 1/4" fiber | 106.50 - 131.50 | 0.6000 | 0.5331 |
| T34 | 27 | 7/8" | 106.50 - 131.50 | 0.6000 | 0.5331 |
| T34 | 29 | 1" Conduit (Lighting) | 106.50 - 131.50 | 0.6000 | 0.5331 |
| T35 | 1 | 1-5/8" | 101.50 - 106.50 | 0.6000 | 0.5366 |
| T35 | 4 | 7/16" Power | 101.50 - 106.50 | 0.6000 | 0.5366 |
| T35 | 6 | 3/8" | 101.50 - 106.50 | 0.6000 | 0.5366 |
| T35 | 7 | 7/8" | 101.50 - 106.50 | 0.6000 | 0.5366 |
| T35 | 9 | 7/8" | 101.50 - 106.50 | 0.6000 | 0.5366 |
| T35 | 11 | 1-5/8" | 101.50 - 106.50 | 0.6000 | 0.5366 |
| T35 | 13 | 1-5/8" | 101.50 - 106.50 | 0.6000 | 0.5366 |
| T35 | 15 | 7/8" | 101.50 - 106.50 | 0.6000 | 0.5366 |
| T35 | 17 | 7/8" | 101.50 - 106.50 | 0.6000 | 0.5366 |
| T35 | 19 | 1" Conduit (Lighting) | 101.50 - 106.50 | 0.6000 | 0.5366 |
| T35 | 21 | 7/16" Power | 101.50 - 106.50 | 0.6000 | 0.5366 |
| T35 | 23 | 7/16" Power | 101.50 - 106.50 | 0.6000 | 0.5366 |
| T35 | 25 | 1/4" fiber | 101.50 - 106.50 | 0.6000 | 0.5366 |
| T35 | 27 | 7/8" | 101.50 - 106.50 | 0.6000 | 0.5366 |
| T35 | 29 | 1" Conduit (Lighting) | 101.50 - 106.50 | 0.6000 | 0.5366 |
| T36 | 1 | 1-5/8" | 96.50 - 101.50 | 0.6000 | 0.4791 |
| T36 | 4 | 7/16" Power | 96.50 - 101.50 | 0.6000 | 0.4791 |
| T36 | 6 | 3/8" | 96.50 - 101.50 | 0.6000 | 0.4791 |
| T36 | 7 | 7/8" | 96.50 - 101.50 | 0.6000 | 0.4791 |
| T36 | 9 | 7/8" | 96.50 - 101.50 | 0.6000 | 0.4791 |
| T36 | 11 | 1-5/8" | 96.50 - 101.50 | 0.6000 | 0.4791 |
| T36 | 13 | 1-5/8" | 96.50 - 101.50 | 0.6000 | 0.4791 |
| T36 | 15 | 7/8" | 96.50 - 101.50 | 0.6000 | 0.4791 |
| T36 | 17 | 7/8" | 96.50 - 101.50 | 0.6000 | 0.4791 |
| T36 | 19 | 1" Conduit (Lighting) | 96.50 - 101.50 | 0.6000 | 0.4791 |
| T36 | 21 | 7/16" Power | 96.50 - 101.50 | 0.6000 | 0.4791 |
| T36 | 23 | 7/16" Power | 96.50 - 101.50 | 0.6000 | 0.4791 |
| T36 | 25 | 1/4" fiber | 96.50 - 101.50 | 0.6000 | 0.4791 |

| Tower Section | Feed Line Record No. | Description | Feed Line Segment Elev. | $K_a$ No Ice | $K_a$ Ice |
|---|---|---|---|---|---|
| T36 | 27 | 7/8" | 96.50 - 101.50 | 0.6000 | 0.4791 |
| T36 | 29 | 1" Conduit (Lighting) | 96.50 - 101.50 | 0.6000 | 0.4791 |
| T36 | 31 | 1-1/4" | 96.50 - 101.00 | 0.6000 | 0.4791 |
| T37 | 1 | 1-5/8" | 91.50 - 96.50 | 0.6000 | 0.5392 |
| T37 | 4 | 7/16" Power | 91.50 - 96.50 | 0.6000 | 0.5392 |
| T37 | 6 | 3/8" | 91.50 - 96.50 | 0.6000 | 0.5392 |
| T37 | 7 | 7/8" | 91.50 - 96.50 | 0.6000 | 0.5392 |
| T37 | 9 | 7/8" | 91.50 - 96.50 | 0.6000 | 0.5392 |
| T37 | 11 | 1-5/8" | 91.50 - 96.50 | 0.6000 | 0.5392 |
| T37 | 13 | 1-5/8" | 91.50 - 96.50 | 0.6000 | 0.5392 |
| T37 | 15 | 7/8" | 91.50 - 96.50 | 0.6000 | 0.5392 |
| T37 | 17 | 7/8" | 91.50 - 96.50 | 0.6000 | 0.5392 |
| T37 | 19 | 1" Conduit (Lighting) | 91.50 - 96.50 | 0.6000 | 0.5392 |
| T37 | 21 | 7/16" Power | 91.50 - 96.50 | 0.6000 | 0.5392 |
| T37 | 23 | 7/16" Power | 91.50 - 96.50 | 0.6000 | 0.5392 |
| T37 | 25 | 1/4" fiber | 91.50 - 96.50 | 0.6000 | 0.5392 |
| T37 | 27 | 7/8" | 91.50 - 96.50 | 0.6000 | 0.5392 |
| T37 | 29 | 1" Conduit (Lighting) | 91.50 - 96.50 | 0.6000 | 0.5392 |
| T37 | 31 | 1-1/4" | 91.50 - 96.50 | 0.6000 | 0.5392 |
| T38 | 1 | 1-5/8" | 86.50 - 91.50 | 0.6000 | 0.5406 |
| T38 | 4 | 7/16" Power | 86.50 - 91.50 | 0.6000 | 0.5406 |
| T38 | 6 | 3/8" | 86.50 - 91.50 | 0.6000 | 0.5406 |
| T38 | 7 | 7/8" | 86.50 - 91.50 | 0.6000 | 0.5406 |
| T38 | 9 | 7/8" | 86.50 - 91.50 | 0.6000 | 0.5406 |
| T38 | 11 | 1-5/8" | 86.50 - 91.50 | 0.6000 | 0.5406 |
| T38 | 13 | 1-5/8" | 86.50 - 91.50 | 0.6000 | 0.5406 |
| T38 | 15 | 7/8" | 86.50 - 91.50 | 0.6000 | 0.5406 |
| T38 | 17 | 7/8" | 86.50 - 91.50 | 0.6000 | 0.5406 |
| T38 | 19 | 1" Conduit (Lighting) | 86.50 - 91.50 | 0.6000 | 0.5406 |
| T38 | 21 | 7/16" Power | 86.50 - 91.50 | 0.6000 | 0.5406 |
| T38 | 23 | 7/16" Power | 86.50 - 91.50 | 0.6000 | 0.5406 |
| T38 | 25 | 1/4" fiber | 86.50 - 91.50 | 0.6000 | 0.5406 |
| T38 | 27 | 7/8" | 86.50 - 91.50 | 0.6000 | 0.5406 |
| T38 | 29 | 1" Conduit (Lighting) | 86.50 - 91.50 | 0.6000 | 0.5406 |
| T38 | 31 | 1-1/4" | 86.50 - 91.50 | 0.6000 | 0.5406 |
| T39 | 1 | 1-5/8" | 81.50 - 86.50 | 0.6000 | 0.5420 |
| T39 | 4 | 7/16" Power | 81.50 - 86.50 | 0.6000 | 0.5420 |
| T39 | 6 | 3/8" | 81.50 - 86.50 | 0.6000 | 0.5420 |
| T39 | 7 | 7/8" | 81.50 - 86.50 | 0.6000 | 0.5420 |
| T39 | 9 | 7/8" | 81.50 - 86.50 | 0.6000 | 0.5420 |
| T39 | 11 | 1-5/8" | 81.50 - 86.50 | 0.6000 | 0.5420 |
| T39 | 13 | 1-5/8" | 81.50 - 86.50 | 0.6000 | 0.5420 |
| T39 | 15 | 7/8" | 81.50 - 86.50 | 0.6000 | 0.5420 |
| T39 | 17 | 7/8" | 81.50 - 86.50 | 0.6000 | 0.5420 |
| T39 | 19 | 1" Conduit (Lighting) | 81.50 - 86.50 | 0.6000 | 0.5420 |
| T39 | 21 | 7/16" Power | 81.50 - 86.50 | 0.6000 | 0.5420 |
| T39 | 23 | 7/16" Power | 81.50 - 86.50 | 0.6000 | 0.5420 |
| T39 | 25 | 1/4" fiber | 81.50 - 86.50 | 0.6000 | 0.5420 |
| T39 | 27 | 7/8" | 81.50 - 86.50 | 0.6000 | 0.5420 |
| T39 | 29 | 1" Conduit (Lighting) | 81.50 - 86.50 | 0.6000 | 0.5420 |
| T39 | 31 | 1-1/4" | 81.50 - 86.50 | 0.6000 | 0.5420 |
| T40 | 1 | 1-5/8" | 76.50 - 81.50 | 0.6000 | 0.5331 |
| T40 | 4 | 7/16" Power | 76.50 - 81.50 | 0.6000 | 0.5331 |
| T40 | 6 | 3/8" | 76.50 - 81.50 | 0.6000 | 0.5331 |
| T40 | 7 | 7/8" | 76.50 - 81.50 | 0.6000 | 0.5331 |
| T40 | 9 | 7/8" | 76.50 - 81.50 | 0.6000 | 0.5331 |
| T40 | 11 | 1-5/8" | 76.50 - 81.50 | 0.6000 | 0.5331 |
| T40 | 13 | 1-5/8" | 76.50 - 81.50 | 0.6000 | 0.5331 |
| T40 | 15 | 7/8" | 76.50 - 81.50 | 0.6000 | 0.5331 |
| T40 | 17 | 7/8" | 76.50 - 81.50 | 0.6000 | 0.5331 |
| T40 | 19 | 1" Conduit (Lighting) | 76.50 - 81.50 | 0.6000 | 0.5331 |
| T40 | 21 | 7/16" Power | 76.50 - 81.50 | 0.6000 | 0.5331 |



| Tower Section | Feed Line Record No. | Description | Feed Line Segment Elev. | $K_a$ No Ice | $K_a$ Ice |
|---|---|---|---|---|---|
| T40 | 23 | 7/16" Power | 76.50 - 81.50 | 0.6000 | 0.5331 |
| T40 | 25 | 1/4" fiber | 76.50 - 81.50 | 0.6000 | 0.5331 |
| T40 | 27 | 7/8" | 76.50 - 81.50 | 0.6000 | 0.5331 |
| T40 | 29 | 1" Conduit (Lighting) | 76.50 - 81.50 | 0.6000 | 0.5331 |
| T40 | 31 | 1-1/4" | 76.50 - 81.50 | 0.6000 | 0.5331 |
| T40 | 33 | 7/8" | 76.50 - 80.00 | 0.6000 | 0.5331 |
| T40 | 34 | 7/8" | 76.50 - 80.00 | 0.6000 | 0.5331 |
| T40 | 35 | 7/8" | 76.50 - 80.00 | 0.6000 | 0.5331 |
| T40 | 36 | 10 mm | 76.50 - 80.00 | 0.6000 | 0.5331 |
| T40 | 37 | 0.795" | 76.50 - 80.00 | 0.6000 | 0.5331 |
| T40 | 38 | 7/8" | 76.50 - 80.00 | 0.6000 | 0.5331 |
| T41 | 1 | 1-5/8" | 71.50 - 76.50 | 0.6000 | 0.4567 |
| T41 | 4 | 7/16" Power | 71.50 - 76.50 | 0.6000 | 0.4567 |
| T41 | 6 | 3/8" | 71.50 - 76.50 | 0.6000 | 0.4567 |
| T41 | 7 | 7/8" | 71.50 - 76.50 | 0.6000 | 0.4567 |
| T41 | 9 | 7/8" | 71.50 - 76.50 | 0.6000 | 0.4567 |
| T41 | 11 | 1-5/8" | 71.50 - 76.50 | 0.6000 | 0.4567 |
| T41 | 13 | 1-5/8" | 71.50 - 76.50 | 0.6000 | 0.4567 |
| T41 | 15 | 7/8" | 71.50 - 76.50 | 0.6000 | 0.4567 |
| T41 | 17 | 7/8" | 71.50 - 76.50 | 0.6000 | 0.4567 |
| T41 | 19 | 1" Conduit (Lighting) | 71.50 - 76.50 | 0.6000 | 0.4567 |
| T41 | 21 | 7/16" Power | 71.50 - 76.50 | 0.6000 | 0.4567 |
| T41 | 23 | 7/16" Power | 71.50 - 76.50 | 0.6000 | 0.4567 |
| T41 | 25 | 1/4" fiber | 71.50 - 76.50 | 0.6000 | 0.4567 |
| T41 | 27 | 7/8" | 71.50 - 76.50 | 0.6000 | 0.4567 |
| T41 | 29 | 1" Conduit (Lighting) | 71.50 - 76.50 | 0.6000 | 0.4567 |
| T41 | 31 | 1-1/4" | 71.50 - 76.50 | 0.6000 | 0.4567 |
| T41 | 33 | 7/8" | 71.50 - 76.50 | 0.6000 | 0.4567 |
| T41 | 34 | 7/8" | 71.50 - 76.50 | 0.6000 | 0.4567 |
| T41 | 35 | 7/8" | 71.50 - 76.50 | 0.6000 | 0.4567 |
| T41 | 36 | 10 mm | 71.50 - 76.50 | 0.6000 | 0.4567 |
| T41 | 37 | 0.795" | 71.50 - 76.50 | 0.6000 | 0.4567 |
| T41 | 38 | 7/8" | 71.50 - 76.50 | 0.6000 | 0.4567 |
| T42 | 1 | 1-5/8" | 66.50 - 71.50 | 0.6000 | 0.4693 |
| T42 | 4 | 7/16" Power | 66.50 - 71.50 | 0.6000 | 0.4693 |
| T42 | 6 | 3/8" | 66.50 - 71.50 | 0.6000 | 0.4693 |
| T42 | 7 | 7/8" | 66.50 - 71.50 | 0.6000 | 0.4693 |
| T42 | 9 | 7/8" | 66.50 - 71.50 | 0.6000 | 0.4693 |
| T42 | 11 | 1-5/8" | 66.50 - 71.50 | 0.6000 | 0.4693 |
| T42 | 13 | 1-5/8" | 66.50 - 71.50 | 0.6000 | 0.4693 |
| T42 | 15 | 7/8" | 66.50 - 71.50 | 0.6000 | 0.4693 |
| T42 | 17 | 7/8" | 66.50 - 71.50 | 0.6000 | 0.4693 |
| T42 | 19 | 1" Conduit (Lighting) | 66.50 - 71.50 | 0.6000 | 0.4693 |
| T42 | 21 | 7/16" Power | 66.50 - 71.50 | 0.6000 | 0.4693 |
| T42 | 23 | 7/16" Power | 66.50 - 71.50 | 0.6000 | 0.4693 |
| T42 | 25 | 1/4" fiber | 66.50 - 71.50 | 0.6000 | 0.4693 |
| T42 | 27 | 7/8" | 66.50 - 71.50 | 0.6000 | 0.4693 |
| T42 | 29 | 1" Conduit (Lighting) | 66.50 - 71.50 | 0.6000 | 0.4693 |
| T42 | 31 | 1-1/4" | 66.50 - 71.50 | 0.6000 | 0.4693 |
| T42 | 33 | 7/8" | 66.50 - 71.50 | 0.6000 | 0.4693 |
| T42 | 34 | 7/8" | 66.50 - 71.50 | 0.6000 | 0.4693 |
| T42 | 35 | 7/8" | 66.50 - 71.50 | 0.6000 | 0.4693 |
| T42 | 36 | 10 mm | 66.50 - 71.50 | 0.6000 | 0.4693 |
| T42 | 37 | 0.795" | 66.50 - 71.50 | 0.6000 | 0.4693 |
| T42 | 38 | 7/8" | 66.50 - 71.50 | 0.6000 | 0.4693 |
| T43 | 1 | 1-5/8" | 61.50 - 66.50 | 0.6000 | 0.4714 |
| T43 | 4 | 7/16" Power | 61.50 - 66.50 | 0.6000 | 0.4714 |
| T43 | 6 | 3/8" | 61.50 - 66.50 | 0.6000 | 0.4714 |
| T43 | 7 | 7/8" | 61.50 - 66.50 | 0.6000 | 0.4714 |
| T43 | 9 | 7/8" | 61.50 - 66.50 | 0.6000 | 0.4714 |
| T43 | 11 | 1-5/8" | 61.50 - 66.50 | 0.6000 | 0.4714 |
| T43 | 13 | 1-5/8" | 61.50 - 66.50 | 0.6000 | 0.4714 |

| Tower Section | Feed Line Record No. | Description | Feed Line Segment Elev. | $K_a$ No Ice | $K_a$ Ice |
|---|---|---|---|---|---|
| T43 | 15 | 7/8" | 61.50 - 66.50 | 0.6000 | 0.4714 |
| T43 | 17 | 7/8" | 61.50 - 66.50 | 0.6000 | 0.4714 |
| T43 | 19 | 1" Conduit (Lighting) | 61.50 - 66.50 | 0.6000 | 0.4714 |
| T43 | 21 | 7/16" Power | 61.50 - 66.50 | 0.6000 | 0.4714 |
| T43 | 23 | 7/16" Power | 61.50 - 66.50 | 0.6000 | 0.4714 |
| T43 | 25 | 1/4" fiber | 61.50 - 66.50 | 0.6000 | 0.4714 |
| T43 | 27 | 7/8" | 61.50 - 66.50 | 0.6000 | 0.4714 |
| T43 | 29 | 1" Conduit (Lighting) | 61.50 - 66.50 | 0.6000 | 0.4714 |
| T43 | 31 | 1-1/4" | 61.50 - 66.50 | 0.6000 | 0.4714 |
| T43 | 33 | 7/8" | 61.50 - 66.50 | 0.6000 | 0.4714 |
| T43 | 34 | 7/8" | 61.50 - 66.50 | 0.6000 | 0.4714 |
| T43 | 35 | 7/8" | 61.50 - 66.50 | 0.6000 | 0.4714 |
| T43 | 36 | 10 mm | 61.50 - 66.50 | 0.6000 | 0.4714 |
| T43 | 37 | 0.795" | 61.50 - 66.50 | 0.6000 | 0.4714 |
| T43 | 38 | 7/8" | 61.50 - 66.50 | 0.6000 | 0.4714 |
| T44 | 1 | 1-5/8" | 56.50 - 61.50 | 0.6000 | 0.4941 |
| T44 | 4 | 7/16" Power | 56.50 - 61.50 | 0.6000 | 0.4941 |
| T44 | 6 | 3/8" | 56.50 - 61.50 | 0.6000 | 0.4941 |
| T44 | 7 | 7/8" | 56.50 - 61.50 | 0.6000 | 0.4941 |
| T44 | 9 | 7/8" | 56.50 - 61.50 | 0.6000 | 0.4941 |
| T44 | 11 | 1-5/8" | 56.50 - 61.50 | 0.6000 | 0.4941 |
| T44 | 13 | 1-5/8" | 56.50 - 61.50 | 0.6000 | 0.4941 |
| T44 | 15 | 7/8" | 56.50 - 61.50 | 0.6000 | 0.4941 |
| T44 | 17 | 7/8" | 56.50 - 61.50 | 0.6000 | 0.4941 |
| T44 | 19 | 1" Conduit (Lighting) | 56.50 - 61.50 | 0.6000 | 0.4941 |
| T44 | 21 | 7/16" Power | 56.50 - 61.50 | 0.6000 | 0.4941 |
| T44 | 23 | 7/16" Power | 56.50 - 61.50 | 0.6000 | 0.4941 |
| T44 | 25 | 1/4" fiber | 56.50 - 61.50 | 0.6000 | 0.4941 |
| T44 | 27 | 7/8" | 56.50 - 61.50 | 0.6000 | 0.4941 |
| T44 | 29 | 1" Conduit (Lighting) | 56.50 - 61.50 | 0.6000 | 0.4941 |
| T44 | 31 | 1-1/4" | 56.50 - 61.50 | 0.6000 | 0.4941 |
| T44 | 33 | 7/8" | 56.50 - 61.50 | 0.6000 | 0.4941 |
| T44 | 34 | 7/8" | 56.50 - 61.50 | 0.6000 | 0.4941 |
| T44 | 35 | 7/8" | 56.50 - 61.50 | 0.6000 | 0.4941 |
| T44 | 36 | 10 mm | 56.50 - 61.50 | 0.6000 | 0.4941 |
| T44 | 37 | 0.795" | 56.50 - 61.50 | 0.6000 | 0.4941 |
| T44 | 38 | 7/8" | 56.50 - 61.50 | 0.6000 | 0.4941 |
| T45 | 1 | 1-5/8" | 51.50 - 56.50 | 0.6000 | 0.4966 |
| T45 | 4 | 7/16" Power | 51.50 - 56.50 | 0.6000 | 0.4966 |
| T45 | 6 | 3/8" | 51.50 - 56.50 | 0.6000 | 0.4966 |
| T45 | 7 | 7/8" | 51.50 - 56.50 | 0.6000 | 0.4966 |
| T45 | 9 | 7/8" | 51.50 - 56.50 | 0.6000 | 0.4966 |
| T45 | 11 | 1-5/8" | 51.50 - 56.50 | 0.6000 | 0.4966 |
| T45 | 13 | 1-5/8" | 51.50 - 56.50 | 0.6000 | 0.4966 |
| T45 | 15 | 7/8" | 51.50 - 56.50 | 0.6000 | 0.4966 |
| T45 | 17 | 7/8" | 51.50 - 56.50 | 0.6000 | 0.4966 |
| T45 | 19 | 1" Conduit (Lighting) | 51.50 - 56.50 | 0.6000 | 0.4966 |
| T45 | 21 | 7/16" Power | 51.50 - 56.50 | 0.6000 | 0.4966 |
| T45 | 23 | 7/16" Power | 51.50 - 56.50 | 0.6000 | 0.4966 |
| T45 | 25 | 1/4" fiber | 51.50 - 56.50 | 0.6000 | 0.4966 |
| T45 | 27 | 7/8" | 51.50 - 56.50 | 0.6000 | 0.4966 |
| T45 | 29 | 1" Conduit (Lighting) | 51.50 - 56.50 | 0.6000 | 0.4966 |
| T45 | 31 | 1-1/4" | 51.50 - 56.50 | 0.6000 | 0.4966 |
| T45 | 33 | 7/8" | 51.50 - 56.50 | 0.6000 | 0.4966 |
| T45 | 34 | 7/8" | 51.50 - 56.50 | 0.6000 | 0.4966 |
| T45 | 35 | 7/8" | 51.50 - 56.50 | 0.6000 | 0.4966 |
| T45 | 36 | 10 mm | 51.50 - 56.50 | 0.6000 | 0.4966 |
| T45 | 37 | 0.795" | 51.50 - 56.50 | 0.6000 | 0.4966 |
| T45 | 38 | 7/8" | 51.50 - 56.50 | 0.6000 | 0.4966 |
| T46 | 1 | 1-5/8" | 46.50 - 51.50 | 0.6000 | 0.4994 |
| T46 | 4 | 7/16" Power | 46.50 - 51.50 | 0.6000 | 0.4994 |
| T46 | 6 | 3/8" | 46.50 - 51.50 | 0.6000 | 0.4994 |



| Tower Section | Feed Line Record No. | Description | Feed Line Segment Elev. | $K_a$ No Ice | $K_a$ Ice |
|---|---|---|---|---|---|
| T46 | 7 | 7/8" | 46.50 - 51.50 | 0.6000 | 0.4994 |
| T46 | 9 | 7/8" | 46.50 - 51.50 | 0.6000 | 0.4994 |
| T46 | 11 | 1-5/8" | 46.50 - 51.50 | 0.6000 | 0.4994 |
| T46 | 13 | 1-5/8" | 46.50 - 51.50 | 0.6000 | 0.4994 |
| T46 | 15 | 7/8" | 46.50 - 51.50 | 0.6000 | 0.4994 |
| T46 | 17 | 7/8" | 46.50 - 51.50 | 0.6000 | 0.4994 |
| T46 | 19 | 1" Conduit (Lighting) | 46.50 - 51.50 | 0.6000 | 0.4994 |
| T46 | 21 | 7/16" Power | 46.50 - 51.50 | 0.6000 | 0.4994 |
| T46 | 23 | 7/16" Power | 46.50 - 51.50 | 0.6000 | 0.4994 |
| T46 | 25 | 1/4" fiber | 46.50 - 51.50 | 0.6000 | 0.4994 |
| T46 | 27 | 7/8" | 46.50 - 51.50 | 0.6000 | 0.4994 |
| T46 | 29 | 1" Conduit (Lighting) | 46.50 - 51.50 | 0.6000 | 0.4994 |
| T46 | 31 | 1-1/4" | 46.50 - 51.50 | 0.6000 | 0.4994 |
| T46 | 33 | 7/8" | 46.50 - 51.50 | 0.6000 | 0.4994 |
| T46 | 34 | 7/8" | 46.50 - 51.50 | 0.6000 | 0.4994 |
| T46 | 35 | 7/8" | 46.50 - 51.50 | 0.6000 | 0.4994 |
| T46 | 36 | 10 mm | 46.50 - 51.50 | 0.6000 | 0.4994 |
| T46 | 37 | 0.795" | 46.50 - 51.50 | 0.6000 | 0.4994 |
| T46 | 38 | 7/8" | 46.50 - 51.50 | 0.6000 | 0.4994 |
| T47 | 1 | 1-5/8" | 41.50 - 46.50 | 0.6000 | 0.4918 |
| T47 | 4 | 7/16" Power | 41.50 - 46.50 | 0.6000 | 0.4918 |
| T47 | 6 | 3/8" | 41.50 - 46.50 | 0.6000 | 0.4918 |
| T47 | 7 | 7/8" | 41.50 - 46.50 | 0.6000 | 0.4918 |
| T47 | 9 | 7/8" | 41.50 - 46.50 | 0.6000 | 0.4918 |
| T47 | 11 | 1-5/8" | 41.50 - 46.50 | 0.6000 | 0.4918 |
| T47 | 13 | 1-5/8" | 41.50 - 46.50 | 0.6000 | 0.4918 |
| T47 | 15 | 7/8" | 41.50 - 46.50 | 0.6000 | 0.4918 |
| T47 | 17 | 7/8" | 41.50 - 46.50 | 0.6000 | 0.4918 |
| T47 | 19 | 1" Conduit (Lighting) | 41.50 - 46.50 | 0.6000 | 0.4918 |
| T47 | 21 | 7/16" Power | 41.50 - 46.50 | 0.6000 | 0.4918 |
| T47 | 23 | 7/16" Power | 41.50 - 46.50 | 0.6000 | 0.4918 |
| T47 | 25 | 1/4" fiber | 41.50 - 46.50 | 0.6000 | 0.4918 |
| T47 | 27 | 7/8" | 41.50 - 46.50 | 0.6000 | 0.4918 |
| T47 | 29 | 1" Conduit (Lighting) | 41.50 - 46.50 | 0.6000 | 0.4918 |
| T47 | 31 | 1-1/4" | 41.50 - 46.50 | 0.6000 | 0.4918 |
| T47 | 33 | 7/8" | 41.50 - 46.50 | 0.6000 | 0.4918 |
| T47 | 34 | 7/8" | 41.50 - 46.50 | 0.6000 | 0.4918 |
| T47 | 35 | 7/8" | 41.50 - 46.50 | 0.6000 | 0.4918 |
| T47 | 36 | 10 mm | 41.50 - 46.50 | 0.6000 | 0.4918 |
| T47 | 37 | 0.795" | 41.50 - 46.50 | 0.6000 | 0.4918 |
| T47 | 38 | 7/8" | 41.50 - 46.50 | 0.6000 | 0.4918 |
| T48 | 1 | 1-5/8" | 36.50 - 41.50 | 0.6000 | 0.4951 |
| T48 | 4 | 7/16" Power | 36.50 - 41.50 | 0.6000 | 0.4951 |
| T48 | 6 | 3/8" | 36.50 - 41.50 | 0.6000 | 0.4951 |
| T48 | 7 | 7/8" | 36.50 - 41.50 | 0.6000 | 0.4951 |
| T48 | 9 | 7/8" | 36.50 - 41.50 | 0.6000 | 0.4951 |
| T48 | 11 | 1-5/8" | 36.50 - 41.50 | 0.6000 | 0.4951 |
| T48 | 13 | 1-5/8" | 36.50 - 41.50 | 0.6000 | 0.4951 |
| T48 | 15 | 7/8" | 36.50 - 41.50 | 0.6000 | 0.4951 |
| T48 | 17 | 7/8" | 36.50 - 41.50 | 0.6000 | 0.4951 |
| T48 | 19 | 1" Conduit (Lighting) | 36.50 - 41.50 | 0.6000 | 0.4951 |
| T48 | 21 | 7/16" Power | 36.50 - 41.50 | 0.6000 | 0.4951 |
| T48 | 23 | 7/16" Power | 36.50 - 41.50 | 0.6000 | 0.4951 |
| T48 | 25 | 1/4" fiber | 36.50 - 41.50 | 0.6000 | 0.4951 |
| T48 | 27 | 7/8" | 36.50 - 41.50 | 0.6000 | 0.4951 |
| T48 | 29 | 1" Conduit (Lighting) | 36.50 - 41.50 | 0.6000 | 0.4951 |
| T48 | 31 | 1-1/4" | 36.50 - 41.50 | 0.6000 | 0.4951 |
| T48 | 33 | 7/8" | 36.50 - 41.50 | 0.6000 | 0.4951 |
| T48 | 34 | 7/8" | 36.50 - 41.50 | 0.6000 | 0.4951 |
| T48 | 35 | 7/8" | 36.50 - 41.50 | 0.6000 | 0.4951 |
| T48 | 36 | 10 mm | 36.50 - 41.50 | 0.6000 | 0.4951 |
| T48 | 37 | 0.795" | 36.50 - 41.50 | 0.6000 | 0.4951 |

| Tower Section | Feed Line Record No. | Description | Feed Line Segment Elev. | $K_a$ No Ice | $K_a$ Ice |
|---|---|---|---|---|---|
| T48 | 38 | 7/8" | 36.50 - 41.50 | 0.6000 | 0.4951 |
| T49 | 1 | 1-5/8" | 31.50 - 36.50 | 0.6000 | 0.4989 |
| T49 | 4 | 7/16" Power | 31.50 - 36.50 | 0.6000 | 0.4989 |
| T49 | 6 | 3/8" | 31.50 - 36.50 | 0.6000 | 0.4989 |
| T49 | 7 | 7/8" | 31.50 - 36.50 | 0.6000 | 0.4989 |
| T49 | 9 | 7/8" | 31.50 - 36.50 | 0.6000 | 0.4989 |
| T49 | 11 | 1-5/8" | 31.50 - 36.50 | 0.6000 | 0.4989 |
| T49 | 13 | 1-5/8" | 31.50 - 36.50 | 0.6000 | 0.4989 |
| T49 | 15 | 7/8" | 31.50 - 36.50 | 0.6000 | 0.4989 |
| T49 | 17 | 7/8" | 31.50 - 36.50 | 0.6000 | 0.4989 |
| T49 | 19 | 1" Conduit (Lighting) | 31.50 - 36.50 | 0.6000 | 0.4989 |
| T49 | 21 | 7/16" Power | 31.50 - 36.50 | 0.6000 | 0.4989 |
| T49 | 23 | 7/16" Power | 31.50 - 36.50 | 0.6000 | 0.4989 |
| T49 | 25 | 1/4" fiber | 31.50 - 36.50 | 0.6000 | 0.4989 |
| T49 | 27 | 7/8" | 31.50 - 36.50 | 0.6000 | 0.4989 |
| T49 | 29 | 1" Conduit (Lighting) | 31.50 - 36.50 | 0.6000 | 0.4989 |
| T49 | 31 | 1-1/4" | 31.50 - 36.50 | 0.6000 | 0.4989 |
| T49 | 33 | 7/8" | 31.50 - 36.50 | 0.6000 | 0.4989 |
| T49 | 34 | 7/8" | 31.50 - 36.50 | 0.6000 | 0.4989 |
| T49 | 35 | 7/8" | 31.50 - 36.50 | 0.6000 | 0.4989 |
| T49 | 36 | 10 mm | 31.50 - 36.50 | 0.6000 | 0.4989 |
| T49 | 37 | 0.795" | 31.50 - 36.50 | 0.6000 | 0.4989 |
| T49 | 38 | 7/8" | 31.50 - 36.50 | 0.6000 | 0.4989 |
| T49 | 40 | 7/16" Power | 31.50 - 33.00 | 0.6000 | 0.4989 |
| T50 | 1 | 1-5/8" | 6.50 - 31.50 | 0.6000 | 0.5668 |
| T50 | 4 | 7/16" Power | 6.50 - 31.50 | 0.6000 | 0.5668 |
| T50 | 6 | 3/8" | 6.50 - 31.50 | 0.6000 | 0.5668 |
| T50 | 7 | 7/8" | 6.50 - 31.50 | 0.6000 | 0.5668 |
| T50 | 9 | 7/8" | 6.50 - 31.50 | 0.6000 | 0.5668 |
| T50 | 11 | 1-5/8" | 6.50 - 31.50 | 0.6000 | 0.5668 |
| T50 | 13 | 1-5/8" | 6.50 - 31.50 | 0.6000 | 0.5668 |
| T50 | 15 | 7/8" | 6.50 - 31.50 | 0.6000 | 0.5668 |
| T50 | 17 | 7/8" | 6.50 - 31.50 | 0.6000 | 0.5668 |
| T50 | 19 | 1" Conduit (Lighting) | 6.50 - 31.50 | 0.6000 | 0.5668 |
| T50 | 21 | 7/16" Power | 6.50 - 31.50 | 0.6000 | 0.5668 |
| T50 | 23 | 7/16" Power | 6.50 - 31.50 | 0.6000 | 0.5668 |
| T50 | 25 | 1/4" fiber | 6.50 - 31.50 | 0.6000 | 0.5668 |
| T50 | 27 | 7/8" | 6.50 - 31.50 | 0.6000 | 0.5668 |
| T50 | 29 | 1" Conduit (Lighting) | 6.50 - 31.50 | 0.6000 | 0.5668 |
| T50 | 31 | 1-1/4" | 6.50 - 31.50 | 0.6000 | 0.5668 |
| T50 | 33 | 7/8" | 6.50 - 31.50 | 0.6000 | 0.5668 |
| T50 | 34 | 7/8" | 6.50 - 31.50 | 0.6000 | 0.5668 |
| T50 | 35 | 7/8" | 6.50 - 31.50 | 0.6000 | 0.5668 |
| T50 | 36 | 10 mm | 6.50 - 31.50 | 0.6000 | 0.5668 |
| T50 | 37 | 0.795" | 6.50 - 31.50 | 0.6000 | 0.5668 |
| T50 | 38 | 7/8" | 6.50 - 31.50 | 0.6000 | 0.5668 |
| T50 | 40 | 7/16" Power | 6.50 - 31.50 | 0.6000 | 0.5668 |
| T50 | 42 | 7/16" Power | 6.50 - 8.50 | 0.6000 | 0.5668 |
| T51 | 1 | 1-5/8" | 0.00 - 6.50 | 0.4678 | 0.3708 |
| T51 | 4 | 7/16" Power | 0.00 - 6.50 | 0.4678 | 0.3708 |
| T51 | 6 | 3/8" | 0.00 - 6.50 | 0.4678 | 0.3708 |
| T51 | 7 | 7/8" | 0.00 - 6.50 | 0.4678 | 0.3708 |
| T51 | 9 | 7/8" | 0.00 - 6.50 | 0.4678 | 0.3708 |
| T51 | 11 | 1-5/8" | 0.00 - 6.50 | 0.4678 | 0.3708 |
| T51 | 13 | 1-5/8" | 0.00 - 6.50 | 0.4678 | 0.3708 |
| T51 | 15 | 7/8" | 0.00 - 6.50 | 0.4678 | 0.3708 |
| T51 | 17 | 7/8" | 0.00 - 6.50 | 0.4678 | 0.3708 |
| T51 | 19 | 1" Conduit (Lighting) | 0.00 - 6.50 | 0.4678 | 0.3708 |
| T51 | 21 | 7/16" Power | 0.00 - 6.50 | 0.4678 | 0.3708 |
| T51 | 23 | 7/16" Power | 0.00 - 6.50 | 0.4678 | 0.3708 |
| T51 | 25 | 1/4" fiber | 0.00 - 6.50 | 0.4678 | 0.3708 |
| T51 | 27 | 7/8" | 0.00 - 6.50 | 0.4678 | 0.3708 |



| Tower Section | Feed Line Record No. | Description | Feed Line Segment Elev. | $K_a$ No Ice | $K_a$ Ice |
|---|---|---|---|---|---|
| T51 | 29 | 1" Conduit (Lighting) | 0.00 - 6.50 | 0.4678 | 0.3708 |
| T51 | 31 | 1-1/4" | 0.00 - 6.50 | 0.4678 | 0.3708 |
| T51 | 33 | 7/8" | 0.00 - 6.50 | 0.4678 | 0.3708 |
| T51 | 34 | 7/8" | 0.00 - 6.50 | 0.4678 | 0.3708 |
| T51 | 35 | 7/8" | 0.00 - 6.50 | 0.4678 | 0.3708 |
| T51 | 36 | 10 mm | 0.00 - 6.50 | 0.4678 | 0.3708 |
| T51 | 37 | 0.795" | 0.00 - 6.50 | 0.4678 | 0.3708 |
| T51 | 38 | 7/8" | 0.00 - 6.50 | 0.4678 | 0.3708 |
| T51 | 40 | 7/16" Power | 0.00 - 6.50 | 0.4678 | 0.3708 |
| T51 | 42 | 7/16" Power | 0.00 - 6.50 | 0.4678 | 0.3708 |

## Discrete Tower Loads

| Description | Face or Leg | Offset Type | Offsets: Horz Lateral ft | Vert ft | Azimuth Adjustment ° | Placement ft | | $C_AA_A$ Front $ft^2$ | $C_AA_A$ Side $ft^2$ | Weight K |
|---|---|---|---|---|---|---|---|---|---|---|
| Shively 68010 | C | From Leg | 0.00 | | 0.0000 | 325.00 | No Ice | 22.30 | 22.30 | 0.35 |
| | | | 0.00 | | | | 1/2" Ice | 40.14 | 40.14 | 0.46 |
| | | | 5.00 | | | | 1" Ice | 57.98 | 57.98 | 0.57 |
| *** | | | | | | | | | | |
| 2SCH40x60" | B | From Leg | 0.00 | | 0.0000 | 303.00 | No Ice | 1.19 | 1.19 | 0.02 |
| | | | 0.00 | | | | 1/2" Ice | 1.50 | 1.50 | 0.03 |
| | | | 0.00 | | | | 1" Ice | 1.81 | 1.81 | 0.04 |
| *** | | | | | | | | | | |
| 10" x 8" x 4.25" Box | C | From Leg | 5.50 | | 0.0000 | 287.00 | No Ice | 0.67 | 0.35 | 0.01 |
| | | | 0.00 | | | | 1/2" Ice | 0.77 | 0.44 | 0.02 |
| | | | 0.00 | | | | 1" Ice | 0.88 | 0.53 | 0.02 |
| 7.5" Ø x 3.5' Omni | C | From Leg | 5.50 | | 0.0000 | 287.00 | No Ice | 1.24 | 1.24 | 0.03 |
| | | | 0.00 | | | | 1/2" Ice | 1.92 | 1.92 | 0.04 |
| | | | 3.00 | | | | 1" Ice | 2.17 | 2.17 | 0.07 |
| Stand-off Arm | C | From Leg | 2.75 | | 0.0000 | 287.00 | No Ice | 3.50 | 3.50 | 0.10 |
| | | | 0.00 | | | | 1/2" Ice | 4.20 | 4.20 | 0.13 |
| | | | 0.00 | | | | 1" Ice | 5.00 | 5.00 | 0.15 |
| *** | | | | | | | | | | |
| 2.36" Ø x 20' (4) Element Dipole | A | From Leg | 0.00 | | 0.0000 | 288.00 | No Ice | 4.72 | 4.72 | 0.04 |
| | | | 0.00 | | | | 1/2" Ice | 6.75 | 6.75 | 0.07 |
| | | | 2.00 | | | | 1" Ice | 8.79 | 8.79 | 0.12 |
| *** | | | | | | | | | | |
| DB413-B | B | From Leg | 1.25 | | 0.0000 | 273.00 | No Ice | 2.55 | 2.55 | 0.03 |
| | | | 0.00 | | | | 1/2" Ice | 4.59 | 4.59 | 0.04 |
| | | | 7.00 | | | | 1" Ice | 6.63 | 6.63 | 0.05 |
| Stand-off Arm | B | From Leg | 0.63 | | 0.0000 | 273.00 | No Ice | 3.50 | 3.50 | 0.10 |
| | | | 0.00 | | | | 1/2" Ice | 4.20 | 4.20 | 0.13 |
| | | | 0.00 | | | | 1" Ice | 5.00 | 5.00 | 0.15 |
| *** | | | | | | | | | | |
| 25' x 1.62" Ø Broadcast Antenna | A | From Leg | 0.00 | | 0.0000 | 260.00 | No Ice | 4.05 | 4.05 | 0.07 |
| | | | 0.00 | | | | 1/2" Ice | 6.57 | 6.57 | 0.10 |
| | | | 0.00 | | | | 1" Ice | 9.11 | 9.11 | 0.15 |
| *** | | | | | | | | | | |
| 2.3" Ø x 20' Omni | A | From Leg | 3.50 | | 0.0000 | 239.00 | No Ice | 4.60 | 4.60 | 0.04 |
| | | | 0.00 | | | | 1/2" Ice | 6.63 | 6.63 | 0.07 |

| Description | Face or Leg | Offset Type | Offsets: Horz Lateral ft | Offsets: Vert ft | Azimuth Adjustment ° | Placement ft | | $C_AA_A$ Front $ft^2$ | $C_AA_A$ Side $ft^2$ | Weight K |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 7.00 | | | 1" Ice | 8.67 | 8.67 | 0.12 |
| Stand-off Arm | A | From Leg | 1.75 | 0.00 | 0.0000 | 239.00 | No Ice | 3.50 | 3.50 | 0.10 |
| | | | | 0.00 | | | 1/2" Ice | 4.20 | 4.20 | 0.13 |
| | | | | 0.00 | | | 1" Ice | 5.00 | 5.00 | 0.15 |
| *** | | | | | | | | | | |
| 2.3" Ø x 20' Omni | B | From Leg | 3.00 | 0.00 | 0.0000 | 237.00 | No Ice | 4.60 | 4.60 | 0.04 |
| | | | | 0.00 | | | 1/2" Ice | 6.63 | 6.63 | 0.07 |
| | | | | 7.00 | | | 1" Ice | 8.67 | 8.67 | 0.12 |
| Stand-off Arm | B | From Leg | 1.50 | 0.00 | 0.0000 | 237.00 | No Ice | 3.50 | 3.50 | 0.10 |
| | | | | 0.00 | | | 1/2" Ice | 4.20 | 4.20 | 0.13 |
| | | | | 0.00 | | | 1" Ice | 5.00 | 5.00 | 0.15 |
| *** | | | | | | | | | | |
| L-810 Side Light | A | From Leg | 0.00 | 0.00 | 0.0000 | 223.00 | No Ice | 0.20 | 0.20 | 0.00 |
| | | | | 0.00 | | | 1/2" Ice | 0.28 | 0.28 | 0.01 |
| | | | | 0.00 | | | 1" Ice | 0.36 | 0.36 | 0.01 |
| L-810 Side Light | C | From Leg | 0.00 | 0.00 | 0.0000 | 223.00 | No Ice | 0.20 | 0.20 | 0.00 |
| | | | | 0.00 | | | 1/2" Ice | 0.28 | 0.28 | 0.01 |
| | | | | 0.00 | | | 1" Ice | 0.36 | 0.36 | 0.01 |
| *** | | | | | | | | | | |
| 26.5" x 15" Conduit Box | B | From Leg | 0.00 | 0.00 | 0.0000 | 183.00 | No Ice | 3.31 | 1.42 | 0.01 |
| | | | | 0.00 | | | 1/2" Ice | 3.55 | 1.60 | 0.03 |
| | | | | 0.00 | | | 1" Ice | 3.79 | 1.78 | 0.06 |
| *** | | | | | | | | | | |
| 10" x 10" x 1.25" Detuner Box | B | From Leg | 0.00 | 0.00 | 0.0000 | 169.00 | No Ice | 0.83 | 0.12 | 0.01 |
| | | | | 0.00 | | | 1/2" Ice | 0.95 | 0.19 | 0.01 |
| | | | | 0.00 | | | 1" Ice | 1.07 | 0.26 | 0.02 |
| *** | | | | | | | | | | |
| 14.875"x15.125"x0.5" Flat Panel | A | From Leg | 0.00 | 0.00 | 0.0000 | 145.50 | No Ice | 1.87 | 0.10 | 0.01 |
| | | | | 0.00 | | | 1/2" Ice | 2.05 | 0.20 | 0.02 |
| | | | | 0.00 | | | 1" Ice | 2.22 | 0.30 | 0.03 |
| *** | | | | | | | | | | |
| 2SCH40 x 43" | C | From Leg | 0.00 | 0.00 | 0.0000 | 141.00 | No Ice | 0.74 | 0.74 | 0.02 |
| | | | | 0.00 | | | 1/2" Ice | 0.96 | 0.96 | 0.03 |
| | | | | 0.00 | | | 1" Ice | 1.19 | 1.19 | 0.04 |
| *** | | | | | | | | | | |
| L-810 Side Light | A | From Leg | 0.00 | 0.00 | 0.0000 | 135.00 | No Ice | 0.20 | 0.20 | 0.00 |
| | | | | 0.00 | | | 1/2" Ice | 0.28 | 0.28 | 0.01 |
| | | | | 0.00 | | | 1" Ice | 0.36 | 0.36 | 0.01 |
| L-810 Side Light | C | From Leg | 0.00 | 0.00 | 0.0000 | 135.00 | No Ice | 0.20 | 0.20 | 0.00 |
| | | | | 0.00 | | | 1/2" Ice | 0.28 | 0.28 | 0.01 |
| | | | | 0.00 | | | 1" Ice | 0.36 | 0.36 | 0.01 |
| *** | | | | | | | | | | |
| 19" x 15" x 10.5" Squid | A | From Leg | 0.00 | 0.00 | 0.0000 | 104.50 | No Ice | 2.38 | 1.66 | 0.01 |
| | | | | 0.00 | | | 1/2" Ice | 2.57 | 1.83 | 0.03 |
| | | | | 0.00 | | | 1" Ice | 2.77 | 2.01 | 0.06 |
| 19" x 15" x 10.5" Squid | B | From Leg | 0.00 | 0.00 | 0.0000 | 104.00 | No Ice | 2.38 | 1.66 | 0.01 |
| | | | | 0.00 | | | 1/2" Ice | 2.57 | 1.83 | 0.03 |
| | | | | 0.00 | | | 1" Ice | 2.77 | 2.01 | 0.06 |
| (2) CSS X7C-FRO-660-0 w MP | A | From Leg | 3.00 | 0.00 | 0.0000 | 101.00 | No Ice | 9.67 | 7.99 | 0.05 |
| | | | | 0.00 | | | 1/2" Ice | 10.18 | 9.07 | 0.13 |
| | | | | 1.50 | | | 1" Ice | 10.69 | 9.94 | 0.22 |
| (2) CSS X7C-FRO-660-0 w MP | B | From Leg | 3.00 | 0.00 | 0.0000 | 101.00 | No Ice | 9.67 | 7.99 | 0.05 |
| | | | | 0.00 | | | 1/2" Ice | 10.18 | 9.07 | 0.13 |
| | | | | 1.50 | | | 1" Ice | 10.69 | 9.94 | 0.22 |
| (2) CSS X7C-FRO-660-0 w MP | C | From Leg | 3.00 | 0.00 | 0.0000 | 101.00 | No Ice | 9.67 | 7.99 | 0.05 |
| | | | | 0.00 | | | 1/2" Ice | 10.18 | 9.07 | 0.13 |
| | | | | 1.50 | | | 1" Ice | 10.69 | 9.94 | 0.22 |



| Description | Face or Leg | Offset Type | Offsets: Horz Lateral ft | Offsets: Vert ft | Azimuth Adjustment ° | Placement ft | | $C_AA_A$ Front $ft^2$ | $C_AA_A$ Side $ft^2$ | Weight K |
|---|---|---|---|---|---|---|---|---|---|---|
| (2) Amphenol WWX063X19G00 w/ MP | A | From Leg | 3.00 | 0.00 | 0.0000 | 101.00 | No Ice | 8.81 | 7.57 | 0.07 |
| | | | | 1.50 | | | 1/2" Ice | 9.35 | 8.61 | 0.15 |
| | | | | | | | 1" Ice | 9.88 | 9.52 | 0.23 |
| (2) Amphenol WWX063X19G00 w/ MP | B | From Leg | 3.00 | 0.00 | 0.0000 | 101.00 | No Ice | 8.81 | 7.57 | 0.07 |
| | | | | 1.50 | | | 1/2" Ice | 9.35 | 8.61 | 0.15 |
| | | | | | | | 1" Ice | 9.88 | 9.52 | 0.23 |
| (2) Amphenol WWX063X19G00 w/ MP | C | From Leg | 3.00 | 0.00 | 0.0000 | 101.00 | No Ice | 8.81 | 7.57 | 0.07 |
| | | | | 1.50 | | | 1/2" Ice | 9.35 | 8.61 | 0.15 |
| | | | | | | | 1" Ice | 9.88 | 9.52 | 0.23 |
| 25" x 12" x 8.25" Radio | A | From Leg | 3.00 | 0.00 | 0.0000 | 101.00 | No Ice | 2.50 | 1.75 | 0.02 |
| | | | | 1.50 | | | 1/2" Ice | 2.71 | 1.93 | 0.04 |
| | | | | | | | 1" Ice | 2.93 | 2.12 | 0.07 |
| 16.5" x 17" x 10.25" Radio | C | From Leg | 3.00 | 0.00 | 0.0000 | 101.00 | No Ice | 2.34 | 1.41 | 0.02 |
| | | | | 1.50 | | | 1/2" Ice | 2.53 | 1.56 | 0.04 |
| | | | | | | | 1" Ice | 2.72 | 1.72 | 0.07 |
| Sector Mount [SM 303-3] | C | None | | | 0.0000 | 101.00 | No Ice | 43.57 | 43.57 | 1.88 |
| | | | | | | | 1/2" Ice | 61.82 | 61.82 | 2.70 |
| | | | | | | | 1" Ice | 80.07 | 80.07 | 3.53 |
| *** | | | | | | | | | | |
| CCI HPA-65R-BUU-H6 with Mount Pipe | A | From Face | 0.00 | 0.00 | 0.0000 | 80.00 | No Ice | 9.90 | 8.11 | 0.08 |
| | | | | 0.00 | | | 1/2" Ice | 10.47 | 9.30 | 0.16 |
| | | | | 1.50 | | | 1" Ice | 11.01 | 10.21 | 0.25 |
| CCI HPA-65R-BUU-H6 with Mount Pipe | A | From Face | 0.00 | 0.00 | 0.0000 | 80.00 | No Ice | 9.90 | 8.11 | 0.08 |
| | | | | 0.00 | | | 1/2" Ice | 10.47 | 9.30 | 0.16 |
| | | | | 1.50 | | | 1" Ice | 11.01 | 10.21 | 0.25 |
| CCI HPA-65R-BUU-H6 with Mount Pipe | C | From Face | 0.00 | 0.00 | 0.0000 | 80.00 | No Ice | 9.90 | 8.11 | 0.08 |
| | | | | 0.00 | | | 1/2" Ice | 10.47 | 9.30 | 0.16 |
| | | | | 1.50 | | | 1" Ice | 11.01 | 10.21 | 0.25 |
| (2) CCI OPA-65R-LCUU-H6 w/ MP | A | From Face | 0.00 | 0.00 | 0.0000 | 80.00 | No Ice | 9.95 | 7.53 | 0.11 |
| | | | | 0.00 | | | 1/2" Ice | 10.50 | 8.56 | 0.19 |
| | | | | 1.50 | | | 1" Ice | 11.04 | 9.45 | 0.28 |
| (2) CCI OPA-65R-LCUU-H6 w/ MP | B | From Face | 0.00 | 0.00 | 0.0000 | 80.00 | No Ice | 9.95 | 7.53 | 0.11 |
| | | | | 0.00 | | | 1/2" Ice | 10.50 | 8.56 | 0.19 |
| | | | | 1.50 | | | 1" Ice | 11.04 | 9.45 | 0.28 |
| (2) CCI OPA-65R-LCUU-H6 w/ MP | C | From Face | 0.00 | 0.00 | 0.0000 | 80.00 | No Ice | 9.95 | 7.53 | 0.11 |
| | | | | 0.00 | | | 1/2" Ice | 10.50 | 8.56 | 0.19 |
| | | | | 1.50 | | | 1" Ice | 11.04 | 9.45 | 0.28 |
| CCI DTMABP7819VG12A | A | From Face | 0.00 | 0.00 | 0.0000 | 80.00 | No Ice | 0.98 | 0.34 | 0.02 |
| | | | | 0.00 | | | 1/2" Ice | 1.10 | 0.42 | 0.03 |
| | | | | 1.50 | | | 1" Ice | 1.23 | 0.51 | 0.04 |
| CCI DTMABP7819VG12A | B | From Face | 0.00 | 0.00 | 0.0000 | 80.00 | No Ice | 0.98 | 0.34 | 0.02 |
| | | | | 0.00 | | | 1/2" Ice | 1.10 | 0.42 | 0.03 |
| | | | | 1.50 | | | 1" Ice | 1.23 | 0.51 | 0.04 |
| CCI DTMABP7819VG12A | C | From Face | 0.00 | 0.00 | 0.0000 | 80.00 | No Ice | 0.98 | 0.34 | 0.02 |
| | | | | 0.00 | | | 1/2" Ice | 1.10 | 0.42 | 0.03 |
| | | | | 1.50 | | | 1" Ice | 1.23 | 0.51 | 0.04 |
| Ericsson RRUS-11 | A | From Face | 0.00 | 0.00 | 0.0000 | 80.00 | No Ice | 2.52 | 1.07 | 0.05 |
| | | | | 0.00 | | | 1/2" Ice | 2.72 | 1.21 | 0.07 |
| | | | | 1.50 | | | 1" Ice | 2.92 | 1.36 | 0.09 |
| Ericsson RRUS-11 | B | From Face | 0.00 | 0.00 | 0.0000 | 80.00 | No Ice | 2.52 | 1.07 | 0.05 |
| | | | | 0.00 | | | 1/2" Ice | 2.72 | 1.21 | 0.07 |
| | | | | 1.50 | | | 1" Ice | 2.92 | 1.36 | 0.09 |
| Ericsson RRUS-11 | C | From Face | 0.00 | 0.00 | 0.0000 | 80.00 | No Ice | 2.52 | 1.07 | 0.05 |
| | | | | 0.00 | | | 1/2" Ice | 2.72 | 1.21 | 0.07 |
| | | | | 1.50 | | | 1" Ice | 2.92 | 1.36 | 0.09 |
| Ericsson RRUS32 (AT&T) | A | From Face | 0.00 | 0.00 | 0.0000 | 80.00 | No Ice | 3.31 | 2.42 | 0.08 |
| | | | | 0.00 | | | 1/2" Ice | 3.56 | 2.64 | 0.10 |

| Description | Face or Leg | Offset Type | Offsets: Horz Lateral ft / Vert ft / ft | Azimuth Adjustment ° | Placement ft | | $C_AA_A$ Front $ft^2$ | $C_AA_A$ Side $ft^2$ | Weight K |
|---|---|---|---|---|---|---|---|---|---|
| | | | 1.50 | | | 1" Ice | 3.81 | 2.86 | 0.14 |
| Ericsson RRUS32 (AT&T) | B | From Face | 0.00 | 0.0000 | 80.00 | No Ice | 3.31 | 2.42 | 0.08 |
| | | | 0.00 | | | 1/2" Ice | 3.56 | 2.64 | 0.10 |
| | | | 1.50 | | | 1" Ice | 3.81 | 2.86 | 0.14 |
| Ericsson RRUS32 (AT&T) | C | From Face | 0.00 | 0.0000 | 80.00 | No Ice | 3.31 | 2.42 | 0.08 |
| | | | 0.00 | | | 1/2" Ice | 3.56 | 2.64 | 0.10 |
| | | | 1.50 | | | 1" Ice | 3.81 | 2.86 | 0.14 |
| Ericsson RRUS-E2 | A | From Face | 0.00 | 0.0000 | 80.00 | No Ice | 3.15 | 1.29 | 0.06 |
| | | | 0.00 | | | 1/2" Ice | 3.36 | 1.44 | 0.08 |
| | | | 1.50 | | | 1" Ice | 3.59 | 1.60 | 0.11 |
| Ericsson RRUS-E2 | B | From Face | 0.00 | 0.0000 | 80.00 | No Ice | 3.15 | 1.29 | 0.06 |
| | | | 0.00 | | | 1/2" Ice | 3.36 | 1.44 | 0.08 |
| | | | 1.50 | | | 1" Ice | 3.59 | 1.60 | 0.11 |
| Ericsson RRUS-E2 | C | From Face | 0.00 | 0.0000 | 80.00 | No Ice | 3.15 | 1.29 | 0.06 |
| | | | 0.00 | | | 1/2" Ice | 3.36 | 1.44 | 0.08 |
| | | | 1.50 | | | 1" Ice | 3.59 | 1.60 | 0.11 |
| Raycap DC6-48-60-18-8C | C | From Face | 0.00 | 0.0000 | 80.00 | No Ice | 0.92 | 0.92 | 0.02 |
| | | | 0.00 | | | 1/2" Ice | 1.46 | 1.46 | 0.04 |
| | | | 1.50 | | | 1" Ice | 1.64 | 1.64 | 0.06 |
| Sector Mount [SM 103-3] | B | None | | 0.0000 | 80.00 | No Ice | 46.08 | 46.08 | 1.54 |
| | | | | | | 1/2" Ice | 54.63 | 54.63 | 2.16 |
| | | | | | | 1" Ice | 63.18 | 63.18 | 2.78 |
| *** | | | | | | | | | |
| 26.5" x 15" Conduit Box | B | From Leg | 0.00 | 0.0000 | 33.00 | No Ice | 3.31 | 1.42 | 0.01 |
| | | | 0.00 | | | 1/2" Ice | 3.55 | 1.60 | 0.03 |
| | | | 0.00 | | | 1" Ice | 3.79 | 1.78 | 0.06 |
| *** | | | | | | | | | |
| 15" x 15" x 6.5" Detuner Box | B | From Face | 0.00 | 0.0000 | 8.50 | No Ice | 1.88 | 0.81 | 0.01 |
| | | | 0.00 | | | 1/2" Ice | 2.05 | 0.94 | 0.02 |
| | | | 0.00 | | | 1" Ice | 2.22 | 1.07 | 0.04 |
| *** | | | | | | | | | |

## Dishes

| Description | Face or Leg | Dish Type | Offset Type | Offsets: Horz Lateral ft / Vert ft | Azimuth Adjustment ° | 3 dB Beam Width ° | Elevation ft | Outside Diameter ft | | Aperture Area $ft^2$ | Weight K |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 3' x 5.5' Grid Dish | B | Grid | From Leg | 0.00 | 0.0000 | | 303.00 | 4.58 | No Ice | 16.47 | 0.04 |
| | | | | 0.00 | | | | | 1/2" Ice | 17.08 | 0.12 |
| | | | | 0.00 | | | | | 1" Ice | 17.68 | 0.21 |
| *** | | | | | | | | | | | |
| 4' Grid Dish | C | Grid | From Leg | 0.00 | 0.0000 | | 141.00 | 4.00 | No Ice | 12.57 | 0.10 |
| | | | | 0.00 | | | | | 1/2" Ice | 13.10 | 0.15 |
| | | | | 0.00 | | | | | 1" Ice | 13.62 | 0.20 |
| *** | | | | | | | | | | | |



## Load Combinations

| Comb. No. | Description |
|---|---|
| 1 | Dead Only |
| 2 | 1.2 Dead+1.6 Wind 0 deg - No Ice+1.0 Guy |
| 3 | 1.2 Dead+1.6 Wind 30 deg - No Ice+1.0 Guy |
| 4 | 1.2 Dead+1.6 Wind 60 deg - No Ice+1.0 Guy |
| 5 | 1.2 Dead+1.6 Wind 90 deg - No Ice+1.0 Guy |
| 6 | 1.2 Dead+1.6 Wind 120 deg - No Ice+1.0 Guy |
| 7 | 1.2 Dead+1.6 Wind 150 deg - No Ice+1.0 Guy |
| 8 | 1.2 Dead+1.6 Wind 180 deg - No Ice+1.0 Guy |
| 9 | 1.2 Dead+1.6 Wind 210 deg - No Ice+1.0 Guy |
| 10 | 1.2 Dead+1.6 Wind 240 deg - No Ice+1.0 Guy |
| 11 | 1.2 Dead+1.6 Wind 270 deg - No Ice+1.0 Guy |
| 12 | 1.2 Dead+1.6 Wind 300 deg - No Ice+1.0 Guy |
| 13 | 1.2 Dead+1.6 Wind 330 deg - No Ice+1.0 Guy |
| 14 | 1.2 Dead+1.0 Ice+1.0 Temp+Guy |
| 15 | 1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp+1.0 Guy |
| 16 | 1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp+1.0 Guy |
| 17 | 1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp+1.0 Guy |
| 18 | 1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp+1.0 Guy |
| 19 | 1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp+1.0 Guy |
| 20 | 1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp+1.0 Guy |
| 21 | 1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp+1.0 Guy |
| 22 | 1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp+1.0 Guy |
| 23 | 1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp+1.0 Guy |
| 24 | 1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp+1.0 Guy |
| 25 | 1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp+1.0 Guy |
| 26 | 1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp+1.0 Guy |
| 27 | Dead+Wind 0 deg - Service+Guy |
| 28 | Dead+Wind 30 deg - Service+Guy |
| 29 | Dead+Wind 60 deg - Service+Guy |
| 30 | Dead+Wind 90 deg - Service+Guy |
| 31 | Dead+Wind 120 deg - Service+Guy |
| 32 | Dead+Wind 150 deg - Service+Guy |
| 33 | Dead+Wind 180 deg - Service+Guy |
| 34 | Dead+Wind 210 deg - Service+Guy |
| 35 | Dead+Wind 240 deg - Service+Guy |
| 36 | Dead+Wind 270 deg - Service+Guy |
| 37 | Dead+Wind 300 deg - Service+Guy |
| 38 | Dead+Wind 330 deg - Service+Guy |

## Maximum Tower Deflections - Service Wind

| Section No. | Elevation ft | Horz. Deflection in | Gov. Load Comb. | Tilt ° | Twist ° |
|---|---|---|---|---|---|
| L1 | 341.5 - 314.5 | 3.737 | 33 | 0.3333 | 0.0682 |
| T1 | 314.5 - 310.5 | 2.130 | 33 | 0.0875 | 0.0737 |
| T2 | 310.5 - 306.5 | 2.057 | 33 | 0.0842 | 0.0756 |
| T3 | 306.5 - 281.5 | 1.984 | 33 | 0.0800 | 0.0864 |
| T4 | 281.5 - 276.5 | 1.613 | 33 | 0.0650 | 0.1164 |
| T5 | 276.5 - 271.5 | 1.545 | 33 | 0.0620 | 0.1076 |
| T6 | 271.5 - 266.5 | 1.480 | 33 | 0.0587 | 0.1355 |
| T7 | 266.5 - 261.5 | 1.418 | 33 | 0.0547 | 0.1196 |
| T8 | 261.5 - 256.5 | 1.361 | 33 | 0.0501 | 0.1472 |
| T9 | 256.5 - 251.5 | 1.308 | 33 | 0.0446 | 0.1307 |
| T10 | 251.5 - 246.5 | 1.262 | 33 | 0.0381 | 0.1571 |
| T11 | 246.5 - 241.5 | 1.222 | 33 | 0.0305 | 0.1540 |

| Section No. | Elevation ft | Horz. Deflection in | Gov. Load Comb. | Tilt ° | Twist ° |
|---|---|---|---|---|---|
| T12 | 241.5 - 236.5 | 1.196 | 33 | 0.0248 | 0.1917 |
| T13 | 236.5 - 231.5 | 1.174 | 33 | 0.0204 | 0.1419 |
| T14 | 231.5 - 226.5 | 1.156 | 33 | 0.0169 | 0.1915 |
| T15 | 226.5 - 221.5 | 1.141 | 33 | 0.0140 | 0.1393 |
| T16 | 221.5 - 216.5 | 1.129 | 37 | 0.0118 | 0.1856 |
| T17 | 216.5 - 211.5 | 1.122 | 37 | 0.0099 | 0.1346 |
| T18 | 211.5 - 206.5 | 1.117 | 37 | 0.0082 | 0.1816 |
| T19 | 206.5 - 201.5 | 1.113 | 37 | 0.0065 | 0.1295 |
| T20 | 201.5 - 196.5 | 1.111 | 37 | 0.0056 | 0.1771 |
| T21 | 196.5 - 191.5 | 1.110 | 37 | 0.0062 | 0.1238 |
| T22 | 191.5 - 186.5 | 1.111 | 37 | 0.0086 | 0.1723 |
| T23 | 186.5 - 181.5 | 1.116 | 37 | 0.0118 | 0.1262 |
| T24 | 181.5 - 176.5 | 1.130 | 37 | 0.0140 | 0.1781 |
| T25 | 176.5 - 171.5 | 1.147 | 37 | 0.0154 | 0.1188 |
| T26 | 171.5 - 166.5 | 1.163 | 37 | 0.0157 | 0.1752 |
| T27 | 166.5 - 161.5 | 1.178 | 37 | 0.0152 | 0.1121 |
| T28 | 161.5 - 156.5 | 1.191 | 37 | 0.0138 | 0.1753 |
| T29 | 156.5 - 151.5 | 1.203 | 37 | 0.0120 | 0.0987 |
| T30 | 151.5 - 146.5 | 1.212 | 37 | 0.0097 | 0.1673 |
| T31 | 146.5 - 141.5 | 1.218 | 37 | 0.0073 | 0.0876 |
| T32 | 141.5 - 136.5 | 1.221 | 37 | 0.0050 | 0.1596 |
| T33 | 136.5 - 131.5 | 1.221 | 37 | 0.0034 | 0.0801 |
| T34 | 131.5 - 106.5 | 1.217 | 37 | 0.0034 | 0.1577 |
| T35 | 106.5 - 101.5 | 1.183 | 37 | 0.0321 | 0.0701 |
| T36 | 101.5 - 96.5 | 1.151 | 37 | 0.0440 | 0.1684 |
| T37 | 96.5 - 91.5 | 1.094 | 37 | 0.0559 | 0.0625 |
| T38 | 91.5 - 86.5 | 1.024 | 37 | 0.0665 | 0.1631 |
| T39 | 86.5 - 81.5 | 0.943 | 37 | 0.0757 | 0.0550 |
| T40 | 81.5 - 76.5 | 0.854 | 37 | 0.0833 | 0.1573 |
| T41 | 76.5 - 71.5 | 0.754 | 37 | 0.0881 | 0.0547 |
| T42 | 71.5 - 66.5 | 0.648 | 37 | 0.0886 | 0.1551 |
| T43 | 66.5 - 61.5 | 0.538 | 37 | 0.0844 | 0.0443 |
| T44 | 61.5 - 56.5 | 0.434 | 37 | 0.0754 | 0.1350 |
| T45 | 56.5 - 51.5 | 0.364 | 37 | 0.0665 | 0.0504 |
| T46 | 51.5 - 46.5 | 0.303 | 37 | 0.0586 | 0.1459 |
| T47 | 46.5 - 41.5 | 0.249 | 37 | 0.0515 | 0.0386 |
| T48 | 41.5 - 36.5 | 0.200 | 37 | 0.0452 | 0.1476 |
| T49 | 36.5 - 31.5 | 0.157 | 38 | 0.0393 | 0.0309 |
| T50 | 31.5 - 6.5 | 0.119 | 38 | 0.0338 | 0.1456 |
| T51 | 6.5 - 0 | 0.012 | 27 | 0.0038 | 0.0090 |

## Critical Deflections and Radius of Curvature - Service Wind

| Elevation ft | Appurtenance | Gov. Load Comb. | Deflection in | Tilt ° | Twist ° | Radius of Curvature ft |
|---|---|---|---|---|---|---|
| 325.00 | Shively 68010 | 33 | 2.566 | 0.1449 | 0.0729 | 4778 |
| 306.50 | Guy | 33 | 1.984 | 0.0800 | 0.0864 | 88902 |
| 303.00 | 3' x 5.5' Grid Dish | 33 | 1.922 | 0.0765 | 0.0978 | 30739 |
| 288.00 | 2.36" Ø x 20' (4) Element Dipole | 33 | 1.700 | 0.0680 | 0.1286 | 173095 |
| 287.00 | 10" x 8" x 4.25" Box | 33 | 1.687 | 0.0676 | 0.1281 | 248835 |
| 273.00 | DB413-B | 33 | 1.499 | 0.0597 | 0.1302 | 81915 |
| 260.00 | 25' x 1.62" Ø Broadcast Antenna | 33 | 1.345 | 0.0485 | 0.1442 | 54979 |
| 246.50 | Guy | 33 | 1.222 | 0.0305 | 0.1540 | 22602 |
| 239.00 | 2.3" Ø x 20' Omni | 33 | 1.185 | 0.0225 | 0.1640 | 85576 |
| 237.00 | 2.3" Ø x 20' Omni | 33 | 1.176 | 0.0208 | 0.1427 | 80925 |
| 223.00 | L-810 Side Light | 33 | 1.132 | 0.0124 | 0.1757 | 127279 |



| Elevation ft | Appurtenance | Gov. Load Comb. | Deflection in | Tilt ° | Twist ° | Radius of Curvature ft |
|---|---|---|---|---|---|---|
| 186.50 | Guy | 37 | 1.116 | 0.0118 | 0.1262 | 29812 |
| 183.00 | 26.5" x 15" Conduit Box | 37 | 1.125 | 0.0134 | 0.1714 | 53083 |
| 169.00 | 10" x 10" x 1.25" Detuner Box | 37 | 1.170 | 0.0155 | 0.1325 | 155312 |
| 145.50 | 14.875"x15.125"x0.5" Flat Panel | 37 | 1.219 | 0.0069 | 0.0896 | 84623 |
| 141.00 | 4' Grid Dish | 37 | 1.221 | 0.0048 | 0.1579 | 77288 |
| 135.00 | L-810 Side Light | 37 | 1.220 | 0.0032 | 0.0847 | 190659 |
| 126.50 | Guy | 37 | 1.215 | 0.0051 | 0.1900 | 159858 |
| 104.50 | 19" x 15" x 10.5" Squid | 37 | 1.173 | 0.0367 | 0.1269 | 15336 |
| 104.00 | 19" x 15" x 10.5" Squid | 37 | 1.170 | 0.0379 | 0.1402 | 14424 |
| 101.00 | (2) CSS X7C-FRO-660-0 w MP | 37 | 1.146 | 0.0452 | 0.1620 | 12700 |
| 80.00 | CCI HPA-65R-BUU-H6 with Mount Pipe | 37 | 0.825 | 0.0852 | 0.1310 | 29184 |
| 61.50 | Guy | 37 | 0.434 | 0.0754 | 0.1350 | 8447 |
| 33.00 | 26.5" x 15" Conduit Box | 38 | 0.130 | 0.0355 | 0.0873 | 51226 |
| 8.50 | 15" x 15" x 6.5" Detuner Box | 27 | 0.017 | 0.0054 | 0.0239 | 88663 |

## Maximum Tower Deflections - Design Wind

| Section No. | Elevation ft | Horz. Deflection in | Gov. Load Comb. | Tilt ° | Twist ° |
|---|---|---|---|---|---|
| L1 | 341.5 - 314.5 | 18.716 | 6 | 1.3130 | 0.1962 |
| T1 | 314.5 - 310.5 | 12.211 | 6 | 0.4783 | 0.2167 |
| T2 | 310.5 - 306.5 | 11.811 | 6 | 0.4669 | 0.2210 |
| T3 | 306.5 - 281.5 | 11.411 | 6 | 0.4526 | 0.2434 |
| T4 | 281.5 - 276.5 | 9.207 | 6 | 0.3867 | 0.3306 |
| T5 | 276.5 - 271.5 | 8.800 | 6 | 0.3705 | 0.3419 |
| T6 | 271.5 - 266.5 | 8.408 | 6 | 0.3519 | 0.4019 |
| T7 | 266.5 - 261.5 | 8.038 | 6 | 0.3298 | 0.3953 |
| T8 | 261.5 - 256.5 | 7.693 | 6 | 0.3039 | 0.4412 |
| T9 | 256.5 - 251.5 | 7.374 | 6 | 0.2736 | 0.4392 |
| T10 | 251.5 - 246.5 | 7.091 | 6 | 0.2384 | 0.4752 |
| T11 | 246.5 - 241.5 | 6.847 | 6 | 0.1975 | 0.4750 |
| T12 | 241.5 - 236.5 | 6.668 | 6 | 0.1644 | 0.5330 |
| T13 | 236.5 - 231.5 | 6.519 | 6 | 0.1367 | 0.4792 |
| T14 | 231.5 - 226.5 | 6.393 | 6 | 0.1165 | 0.5316 |
| T15 | 226.5 - 221.5 | 6.291 | 6 | 0.1025 | 0.4706 |
| T16 | 221.5 - 216.5 | 6.212 | 6 | 0.0909 | 0.5170 |
| T17 | 216.5 - 211.5 | 6.149 | 6 | 0.0810 | 0.4530 |
| T18 | 211.5 - 206.5 | 6.106 | 10 | 0.0720 | 0.5006 |
| T19 | 206.5 - 201.5 | 6.085 | 10 | 0.0634 | 0.4332 |
| T20 | 201.5 - 196.5 | 6.075 | 10 | 0.0545 | 0.4821 |
| T21 | 196.5 - 191.5 | 6.077 | 10 | 0.0448 | 0.4114 |
| T22 | 191.5 - 186.5 | 6.092 | 10 | 0.0393 | 0.4618 |
| T23 | 186.5 - 181.5 | 6.120 | 10 | 0.0445 | 0.3958 |
| T24 | 181.5 - 176.5 | 6.191 | 10 | 0.0551 | 0.4556 |
| T25 | 176.5 - 171.5 | 6.277 | 10 | 0.0629 | 0.3796 |
| T26 | 171.5 - 166.5 | 6.359 | 10 | 0.0655 | 0.4361 |
| T27 | 166.5 - 161.5 | 6.438 | 10 | 0.0633 | 0.3568 |
| T28 | 161.5 - 156.5 | 6.505 | 10 | 0.0569 | 0.4256 |
| T29 | 156.5 - 151.5 | 6.571 | 10 | 0.0473 | 0.3251 |
| T30 | 151.5 - 146.5 | 6.623 | 10 | 0.0348 | 0.3936 |
| T31 | 146.5 - 141.5 | 6.657 | 10 | 0.0264 | 0.2884 |
| T32 | 141.5 - 136.5 | 6.671 | 10 | 0.0340 | 0.3646 |
| T33 | 136.5 - 131.5 | 6.664 | 10 | 0.0406 | 0.2686 |
| T34 | 131.5 - 106.5 | 6.636 | 10 | 0.0451 | 0.3555 |

| Section No. | Elevation ft | Horz. Deflection in | Gov. Load Comb. | Tilt ° | Twist ° |
|---|---|---|---|---|---|
| T35 | 106.5 - 101.5 | 6.276 | 10 | 0.1859 | 0.2303 |
| T36 | 101.5 - 96.5 | 6.080 | 10 | 0.2383 | 0.3506 |
| T37 | 96.5 - 91.5 | 5.786 | 2 | 0.2901 | 0.2148 |
| T38 | 91.5 - 86.5 | 5.435 | 2 | 0.3367 | 0.3279 |
| T39 | 86.5 - 81.5 | 5.036 | 2 | 0.3771 | 0.1881 |
| T40 | 81.5 - 76.5 | 4.599 | 2 | 0.4107 | 0.3045 |
| T41 | 76.5 - 71.5 | 4.117 | 2 | 0.4327 | 0.1744 |
| T42 | 71.5 - 66.5 | 3.609 | 2 | 0.4380 | 0.2906 |
| T43 | 66.5 - 61.5 | 3.080 | 2 | 0.4248 | 0.1478 |
| T44 | 61.5 - 56.5 | 2.569 | 2 | 0.3926 | 0.2530 |
| T45 | 56.5 - 51.5 | 2.187 | 2 | 0.3585 | 0.1402 |
| T46 | 51.5 - 46.5 | 1.836 | 2 | 0.3264 | 0.2772 |
| T47 | 46.5 - 41.5 | 1.514 | 2 | 0.2957 | 0.1090 |
| T48 | 41.5 - 36.5 | 1.221 | 2 | 0.2657 | 0.2879 |
| T49 | 36.5 - 31.5 | 0.958 | 2 | 0.2357 | 0.0876 |
| T50 | 31.5 - 6.5 | 0.725 | 2 | 0.2051 | 0.2923 |
| T51 | 6.5 - 0 | 0.065 | 2 | 0.0223 | 0.0251 |

## Critical Deflections and Radius of Curvature - Design Wind

| Elevation ft | Appurtenance | Gov. Load Comb. | Deflection in | Tilt ° | Twist ° | Radius of Curvature ft |
|---|---|---|---|---|---|---|
| 325.00 | Shively 68010 | 6 | 14.095 | 0.6735 | 0.2589 | 1399 |
| 306.50 | Guy | 6 | 11.411 | 0.4526 | 0.2434 | 28071 |
| 303.00 | 3' x 5.5' Grid Dish | 6 | 11.068 | 0.4400 | 0.2641 | 9232 |
| 288.00 | 2.36" Ø x 20' (4) Element Dipole | 6 | 9.743 | 0.4031 | 0.3272 | 30539 |
| 287.00 | 10" x 8" x 4.25" Box | 6 | 9.660 | 0.4008 | 0.3289 | 36123 |
| 273.00 | DB413-B | 6 | 8.523 | 0.3578 | 0.3893 | 14282 |
| 260.00 | 25' x 1.62" Ø Broadcast Antenna | 6 | 7.594 | 0.2953 | 0.4412 | 9941 |
| 246.50 | Guy | 6 | 6.847 | 0.1975 | 0.4750 | 4565 |
| 239.00 | 2.3" Ø x 20' Omni | 6 | 6.591 | 0.1501 | 0.5003 | 13325 |
| 237.00 | 2.3" Ø x 20' Omni | 6 | 6.533 | 0.1393 | 0.4784 | 12685 |
| 223.00 | L-810 Side Light | 6 | 6.234 | 0.0942 | 0.5062 | 16573 |
| 186.50 | Guy | 10 | 6.120 | 0.0445 | 0.3958 | 7124 |
| 183.00 | 26.5" x 15" Conduit Box | 10 | 6.166 | 0.0521 | 0.4491 | 11283 |
| 169.00 | 10" x 10" x 1.25" Detuner Box | 10 | 6.400 | 0.0650 | 0.3785 | 35018 |
| 145.50 | 14.875"x15.125"x0.5" Flat Panel | 10 | 6.661 | 0.0280 | 0.2819 | 15079 |
| 141.00 | 4' Grid Dish | 10 | 6.672 | 0.0348 | 0.3618 | 13397 |
| 135.00 | L-810 Side Light | 10 | 6.657 | 0.0420 | 0.2654 | 18985 |
| 126.50 | Guy | 10 | 6.604 | 0.0529 | 0.3925 | 32727 |
| 104.50 | 19" x 15" x 10.5" Squid | 10 | 6.208 | 0.2064 | 0.2999 | 3670 |
| 104.00 | 19" x 15" x 10.5" Squid | 10 | 6.189 | 0.2117 | 0.3167 | 3475 |
| 101.00 | (2) CSS X7C-FRO-660-0 w MP | 10 | 6.054 | 0.2436 | 0.3418 | 3092 |
| 80.00 | CCI HPA-65R-BUU-H6 with Mount Pipe | 2 | 4.458 | 0.4188 | 0.2693 | 7180 |
| 61.50 | Guy | 2 | 2.569 | 0.3926 | 0.2530 | 2181 |
| 33.00 | 26.5" x 15" Conduit Box | 2 | 0.791 | 0.2147 | 0.1649 | 8713 |
| 8.50 | 15" x 15" x 6.5" Detuner Box | 2 | 0.091 | 0.0323 | 0.0475 | 12293 |

## Section Capacity Table



| Section No. | Elevation ft | Component Type | Size | Critical Element | P K | $\phi P_{allow}$ K | % Capacity | Pass Fail |
|---|---|---|---|---|---|---|---|---|
| L1 | 341.5 - 314.5 | Pole | P8x.322 (8" std) | 1 | -1.34 | 264.58 | 48.9 | Pass |
| T1 | 314.5 - 310.5 | Leg | 2 1/2 | 4 | -13.05 | 143.51 | 9.1 | Pass |
| T2 | 310.5 - 306.5 | Leg | 2 1/2 | 12 | -16.28 | 143.51 | 11.3 | Pass |
| | | | | | | | 37.8 (b) | |
| T3 | 306.5 - 281.5 | Leg | 2 1/2 | 20 | -20.89 | 112.60 | 18.6 | Pass |
| T4 | 281.5 - 276.5 | Leg | 2 1/2 | 54 | -22.89 | 186.65 | 12.3 | Pass |
| T5 | 276.5 - 271.5 | Leg | 2 1/2 | 65 | -24.99 | 186.65 | 13.4 | Pass |
| T6 | 271.5 - 266.5 | Leg | 2 1/2 | 78 | -28.35 | 112.60 | 25.2 | Pass |
| T7 | 266.5 - 261.5 | Leg | 2 1/2 | 86 | -31.25 | 112.60 | 27.8 | Pass |
| T8 | 261.5 - 256.5 | Leg | 2 1/2 | 96 | -35.50 | 112.60 | 31.5 | Pass |
| T9 | 256.5 - 251.5 | Leg | 2 1/2 | 104 | -39.29 | 112.60 | 34.9 | Pass |
| T10 | 251.5 - 246.5 | Leg | 2 1/2 | 114 | -44.83 | 112.60 | 39.8 | Pass |
| T11 | 246.5 - 241.5 | Leg | 2 1/2 | 122 | -45.82 | 186.65 | 24.5 | Pass |
| T12 | 241.5 - 236.5 | Leg | 2 1/2 | 135 | -42.49 | 186.65 | 22.8 | Pass |
| T13 | 236.5 - 231.5 | Leg | 2 1/2 | 147 | -38.94 | 186.65 | 20.9 | Pass |
| | | | | | | | 32.6 (b) | |
| T14 | 231.5 - 226.5 | Leg | 2 1/2 | 159 | -35.78 | 186.65 | 19.2 | Pass |
| T15 | 226.5 - 221.5 | Leg | 2 1/2 | 171 | -34.02 | 186.65 | 18.2 | Pass |
| T16 | 221.5 - 216.5 | Leg | 2 1/2 | 184 | -32.11 | 186.65 | 17.2 | Pass |
| T17 | 216.5 - 211.5 | Leg | 2 1/2 | 196 | -32.14 | 186.65 | 17.2 | Pass |
| T18 | 211.5 - 206.5 | Leg | 2 1/2 | 208 | -32.26 | 186.65 | 17.3 | Pass |
| | | | | | | | 27.0 (b) | |
| T19 | 206.5 - 201.5 | Leg | 2 1/2 | 220 | -32.58 | 186.65 | 17.5 | Pass |
| T20 | 201.5 - 196.5 | Leg | 2 1/2 | 232 | -33.26 | 186.65 | 17.8 | Pass |
| T21 | 196.5 - 191.5 | Leg | 2 1/2 | 244 | -33.87 | 186.65 | 18.1 | Pass |
| T22 | 191.5 - 186.5 | Leg | 2 1/2 | 256 | -35.08 | 186.65 | 18.8 | Pass |
| T23 | 186.5 - 181.5 | Leg | 2 1/2 | 268 | -39.34 | 186.65 | 21.1 | Pass |
| | | | | | | | 33.0 (b) | |
| T24 | 181.5 - 176.5 | Leg | 2 1/4 | 280 | -38.33 | 77.87 | 49.2 | Pass |
| T25 | 176.5 - 171.5 | Leg | 2 1/4 | 289 | -38.78 | 77.87 | 49.8 | Pass |
| T26 | 171.5 - 166.5 | Leg | 2 1/4 | 296 | -39.46 | 77.87 | 50.7 | Pass |
| T27 | 166.5 - 161.5 | Leg | 2 1/4 | 307 | -40.68 | 77.87 | 52.2 | Pass |
| T28 | 161.5 - 156.5 | Leg | 2 1/4 | 315 | -41.92 | 77.87 | 53.8 | Pass |
| T29 | 156.5 - 151.5 | Leg | 2 1/4 | 324 | -42.80 | 145.33 | 29.5 | Pass |
| T30 | 151.5 - 146.5 | Leg | 2 1/4 | 336 | -43.69 | 145.33 | 30.1 | Pass |
| T31 | 146.5 - 141.5 | Leg | 2 1/4 | 348 | -43.96 | 77.87 | 56.5 | Pass |
| T32 | 141.5 - 136.5 | Leg | 2 1/4 | 357 | -44.15 | 77.87 | 56.7 | Pass |
| T33 | 136.5 - 131.5 | Leg | 2 1/4 | 366 | -43.92 | 77.87 | 56.4 | Pass |
| T34 | 131.5 - 106.5 | Leg | 2 1/4 | 375 | -58.32 | 77.87 | 74.9 | Pass |
| T35 | 106.5 - 101.5 | Leg | 2 1/4 | 408 | -60.03 | 77.87 | 77.1 | Pass |
| T36 | 101.5 - 96.5 | Leg | 2 1/4 | 417 | -62.98 | 145.33 | 43.3 | Pass |
| T37 | 96.5 - 91.5 | Leg | 2 1/4 | 429 | -61.79 | 77.87 | 79.3 | Pass |
| T38 | 91.5 - 86.5 | Leg | 2 1/4 | 438 | -60.17 | 77.87 | 77.3 | Pass |
| T39 | 86.5 - 81.5 | Leg | 2 1/4 | 447 | -58.30 | 77.87 | 74.9 | Pass |
| T40 | 81.5 - 76.5 | Leg | 2 1/4 | 455 | -58.77 | 77.87 | 75.5 | Pass |
| T41 | 76.5 - 71.5 | Leg | 2 1/4 | 464 | -58.33 | 145.33 | 40.1 | Pass |
| T42 | 71.5 - 66.5 | Leg | 2 1/4 | 476 | -61.93 | 145.33 | 42.6 | Pass |
| T43 | 66.5 - 61.5 | Leg | 2 1/4 | 488 | -67.38 | 145.33 | 46.4 | Pass |
| T44 | 61.5 - 56.5 | Leg | 2 1/4 | 500 | -72.48 | 145.33 | 49.9 | Pass |
| | | | | | | | 60.8 (b) | |
| T45 | 56.5 - 51.5 | Leg | 2 1/4 | 512 | -72.11 | 145.33 | 49.6 | Pass |
| T46 | 51.5 - 46.5 | Leg | 2 1/4 | 524 | -71.58 | 145.33 | 49.3 | Pass |
| T47 | 46.5 - 41.5 | Leg | 2 1/4 | 536 | -71.58 | 145.33 | 49.3 | Pass |
| T48 | 41.5 - 36.5 | Leg | 2 1/4 | 548 | -71.44 | 145.33 | 49.2 | Pass |
| T49 | 36.5 - 31.5 | Leg | 2 1/4 | 560 | -71.80 | 145.33 | 49.4 | Pass |
| | | | | | | | 60.2 (b) | |
| T50 | 31.5 - 6.5 | Leg | 2 1/4 | 574 | -75.26 | 77.87 | 96.7 | Pass |
| T51 | 6.5 - 0 | Leg | W8x40 | 606 | -74.92 | 351.00 | 25.3 | Pass |
| T1 | 314.5 - 310.5 | Diagonal | 2L2x2x1/4x3/8 | 8 | -2.40 | 32.96 | 7.3 | Pass |
| | | | | | | | 13.3 (b) | |
| T2 | 310.5 - 306.5 | Diagonal | VSi-HSS1.5X0.125 | 19 | -2.44 | 9.14 | 26.7 | Pass |

| Section No. | Elevation ft | Component Type | Size | Critical Element | P K | $\phi P_{allow}$ K | % Capacity | Pass Fail |
|---|---|---|---|---|---|---|---|---|
| T3 | 306.5 - 281.5 | Diagonal | VSi-HSS1.5X0.125 | 26 | -1.72 | 6.86 | 25.1 | Pass |
| T4 | 281.5 - 276.5 | Diagonal | VSi-HSS1.5X0.125 | 61 | -1.75 | 6.86 | 25.5 | Pass |
| T5 | 276.5 - 271.5 | Diagonal | VSi-HSS1.5X0.125 | 71 | -2.20 | 6.86 | 32.2 | Pass |
| T6 | 271.5 - 266.5 | Diagonal | VSi-PIPE1-1/2SCH40 | 83 | -2.74 | 15.44 | 17.7 | Pass |
| | | | | | | | 22.0 (b) | |
| T7 | 266.5 - 261.5 | Diagonal | VSi-PIPE1-1/2SCH40 | 92 | -2.92 | 15.44 | 18.9 | Pass |
| | | | | | | | 23.5 (b) | |
| T8 | 261.5 - 256.5 | Diagonal | VSi-PIPE1-1/2SCH40 | 101 | -3.23 | 15.44 | 20.9 | Pass |
| | | | | | | | 26.0 (b) | |
| T9 | 256.5 - 251.5 | Diagonal | VSi-Pipe1-1/2SCH80 | 110 | -3.51 | 19.83 | 17.7 | Pass |
| | | | | | | | 28.2 (b) | |
| T10 | 251.5 - 246.5 | Diagonal | VSi-Pipe1-1/2SCH80 | 119 | -3.72 | 19.83 | 18.8 | Pass |
| | | | | | | | 30.0 (b) | |
| T11 | 246.5 - 241.5 | Diagonal | 2L2x2x1/4x3/8 | 129 | -4.16 | 31.03 | 13.4 | Pass |
| | | | | | | | 21.2 (b) | |
| T12 | 241.5 - 236.5 | Diagonal | 2L2x2x1/4x3/8 | 141 | -3.41 | 31.03 | 11.0 | Pass |
| | | | | | | | 16.2 (b) | |
| T13 | 236.5 - 231.5 | Diagonal | 2L2x2x1/4x3/8 | 154 | -2.49 | 31.03 | 8.0 | Pass |
| | | | | | | | 11.0 (b) | |
| T14 | 231.5 - 226.5 | Diagonal | 2L2x2x1/4x3/8 | 166 | -2.22 | 31.03 | 7.2 | Pass |
| | | | | | | | 9.4 (b) | |
| T15 | 226.5 - 221.5 | Diagonal | VSi-PIPE1-1/2SCH40 | 178 | -1.81 | 15.44 | 11.7 | Pass |
| | | | | | | | 14.6 (b) | |
| T16 | 221.5 - 216.5 | Diagonal | VSi-PIPE1-1/2SCH40 | 190 | -1.40 | 15.44 | 9.1 | Pass |
| | | | | | | | 11.3 (b) | |
| T17 | 216.5 - 211.5 | Diagonal | VSi-PIPE1-1/2SCH40 | 202 | -1.15 | 15.44 | 7.5 | Pass |
| | | | | | | | 9.3 (b) | |
| T18 | 211.5 - 206.5 | Diagonal | VSi-PIPE1-1/2SCH40 | 212 | -0.83 | 15.44 | 5.4 | Pass |
| | | | | | | | 6.7 (b) | |
| T19 | 206.5 - 201.5 | Diagonal | VSi-PIPE1-1/2SCH40 | 225 | -0.85 | 15.44 | 5.5 | Pass |
| | | | | | | | 6.9 (b) | |
| T20 | 201.5 - 196.5 | Diagonal | VSi-PIPE1-1/2SCH40 | 237 | -1.25 | 15.44 | 8.1 | Pass |
| | | | | | | | 10.0 (b) | |
| T21 | 196.5 - 191.5 | Diagonal | VSi-PIPE1-1/2SCH40 | 249 | -1.60 | 15.44 | 10.4 | Pass |
| | | | | | | | 12.9 (b) | |
| T22 | 191.5 - 186.5 | Diagonal | VSi-PIPE1-1/2SCH40 | 261 | -1.91 | 15.44 | 12.4 | Pass |
| | | | | | | | 15.4 (b) | |
| T23 | 186.5 - 181.5 | Diagonal | VSi-PIPE1-1/2SCH40 | 274 | -3.29 | 15.44 | 21.3 | Pass |
| | | | | | | | 26.5 (b) | |
| T24 | 181.5 - 176.5 | Diagonal | VSi-HSS1.5X0.125 | 286 | -2.98 | 6.81 | 43.8 | Pass |
| T25 | 176.5 - 171.5 | Diagonal | VSi-PIPE1-1/2SCH40 | 295 | -2.73 | 15.28 | 17.9 | Pass |
| | | | | | | | 22.0 (b) | |
| T26 | 171.5 - 166.5 | Diagonal | VSi-PIPE1-1/2SCH40 | 302 | -2.35 | 15.28 | 15.4 | Pass |
| | | | | | | | 18.9 (b) | |
| T27 | 166.5 - 161.5 | Diagonal | 2L2x2x1/4x3/8 | 313 | -2.17 | 30.92 | 7.0 | Pass |
| | | | | | | | 8.9 (b) | |
| T28 | 161.5 - 156.5 | Diagonal | VSi-HSS1.5X0.125 | 320 | -1.76 | 6.75 | 26.0 | Pass |
| T29 | 156.5 - 151.5 | Diagonal | VSi-HSS1.5X0.125 | 331 | -1.56 | 6.75 | 23.0 | Pass |
| T30 | 151.5 - 146.5 | Diagonal | VSi-HSS1.5X0.125 | 341 | -1.21 | 6.75 | 18.0 | Pass |
| T31 | 146.5 - 141.5 | Diagonal | VSi-HSS1.5X0.125 | 355 | -0.93 | 6.75 | 13.8 | Pass |
| T32 | 141.5 - 136.5 | Diagonal | VSi-HSS1.5X0.125 | 363 | -1.10 | 6.75 | 16.3 | Pass |
| T33 | 136.5 - 131.5 | Diagonal | VSi-HSS1.5X0.125 | 372 | -1.27 | 6.75 | 18.8 | Pass |
| T34 | 131.5 - 106.5 | Diagonal | VSi-HSS1.5X0.125 | 400 | -4.44 | 6.75 | 65.7 | Pass |
| T35 | 106.5 - 101.5 | Diagonal | VSi-HSS1.5X0.125 | 415 | -3.14 | 6.75 | 46.5 | Pass |
| T36 | 101.5 - 96.5 | Diagonal | VSi-HSS1.5X0.125 | 423 | -2.16 | 6.75 | 31.9 | Pass |
| T37 | 96.5 - 91.5 | Diagonal | VSi-HSS1.5X0.125 | 435 | -3.08 | 6.75 | 45.6 | Pass |
| T38 | 91.5 - 86.5 | Diagonal | VSi-HSS1.5X0.125 | 444 | -3.41 | 6.75 | 50.5 | Pass |
| T39 | 86.5 - 81.5 | Diagonal | VSi-HSS1.5X0.125 | 453 | -3.43 | 6.75 | 50.8 | Pass |
| T40 | 81.5 - 76.5 | Diagonal | VSi-PIPE1-1/2SCH40 | 463 | -7.01 | 15.28 | 45.9 | Pass |
| | | | | | | | 56.4 (b) | |
| T41 | 76.5 - 71.5 | Diagonal | VSi-PIPE1-1/2SCH40 | 472 | -8.78 | 25.48 | 34.5 | Pass |



| Section No. | Elevation ft | Component Type | Size | Critical Element | P K | $\phi P_{allow}$ K | % Capacity | Pass Fail |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | 70.7 (b) | |
| T42 | 71.5 - 66.5 | Diagonal | VSi-HSS1.5X0.125 | 484 | -9.00 | 15.47 | 58.2 | Pass |
| | | | | | | | 80.5 (b) | |
| T43 | 66.5 - 61.5 | Diagonal | VSi-HSS1.5X0.125 | 495 | -9.36 | 15.47 | 60.5 | Pass |
| | | | | | | | 84.3 (b) | |
| T44 | 61.5 - 56.5 | Diagonal | VSi-HSS1.5X0.125 | 506 | -2.20 | 6.75 | 32.6 | Pass |
| T45 | 56.5 - 51.5 | Diagonal | VSi-HSS1.5X0.125 | 518 | -1.95 | 6.75 | 28.9 | Pass |
| T46 | 51.5 - 46.5 | Diagonal | VSi-HSS1.5X0.125 | 530 | -1.77 | 6.75 | 26.1 | Pass |
| T47 | 46.5 - 41.5 | Diagonal | VSi-PIPE1-1/2SCH40 | 542 | -1.40 | 15.28 | 9.1 | Pass |
| | | | | | | | 11.3 (b) | |
| T48 | 41.5 - 36.5 | Diagonal | VSi-PIPE1-1/2SCH40 | 554 | -1.23 | 15.28 | 8.1 | Pass |
| | | | | | | | 9.9 (b) | |
| T49 | 36.5 - 31.5 | Diagonal | VSi-PIPE1-1/2SCH40 | 566 | -0.86 | 15.28 | 5.6 | Pass |
| | | | | | | | 6.9 (b) | |
| T50 | 31.5 - 6.5 | Diagonal | VSi-PIPE1-1/2SCH40 | 579 | -2.09 | 15.28 | 13.7 | Pass |
| | | | | | | | 16.8 (b) | |
| T2 | 310.5 - 306.5 | Horizontal | VSi-HSS1.5X0.125 | 14 | -0.33 | 15.28 | 2.2 | Pass |
| | | | | | | | 3.2 (b) | |
| T3 | 306.5 - 281.5 | Horizontal | VSi-HSS1.5X0.125 | 25 | 3.54 | 20.41 | 17.4 | Pass |
| | | | | | | | 33.9 (b) | |
| T4 | 281.5 - 276.5 | Horizontal | VSi-HSS1.5X0.125 | 56 | -0.55 | 15.28 | 3.6 | Pass |
| | | | | | | | 5.3 (b) | |
| T5 | 276.5 - 271.5 | Horizontal | VSi-HSS1.5X0.125 | 68 | -0.61 | 15.28 | 4.0 | Pass |
| | | | | | | | 5.8 (b) | |
| T6 | 271.5 - 266.5 | Horizontal | VSi-HSS1.5X0.125 | 80 | -0.69 | 15.28 | 4.5 | Pass |
| | | | | | | | 6.6 (b) | |
| T7 | 266.5 - 261.5 | Horizontal | VSi-HSS1.5X0.125 | 89 | -0.76 | 15.28 | 5.0 | Pass |
| | | | | | | | 7.3 (b) | |
| T8 | 261.5 - 256.5 | Horizontal | VSi-HSS1.5X0.125 | 98 | -0.86 | 15.28 | 5.6 | Pass |
| | | | | | | | 8.2 (b) | |
| T9 | 256.5 - 251.5 | Horizontal | VSi-HSS1.5X0.125 | 107 | -0.95 | 15.28 | 6.2 | Pass |
| | | | | | | | 9.1 (b) | |
| T10 | 251.5 - 246.5 | Horizontal | VSi-HSS1.5X0.125 | 116 | -1.09 | 15.28 | 7.1 | Pass |
| | | | | | | | 10.4 (b) | |
| T11 | 246.5 - 241.5 | Horizontal | VSi-HSS1.5X0.125 | 126 | 5.27 | 20.41 | 25.8 | Pass |
| | | | | | | | 50.4 (b) | |
| T12 | 241.5 - 236.5 | Horizontal | VSi-HSS1.5X0.125 | 137 | -1.11 | 15.28 | 7.3 | Pass |
| | | | | | | | 10.6 (b) | |
| T13 | 236.5 - 231.5 | Horizontal | VSi-HSS1.5X0.125 | 149 | -1.03 | 15.28 | 6.7 | Pass |
| | | | | | | | 9.9 (b) | |
| T14 | 231.5 - 226.5 | Horizontal | VSi-HSS1.5X0.125 | 161 | -0.94 | 15.28 | 6.2 | Pass |
| | | | | | | | 9.0 (b) | |
| T15 | 226.5 - 221.5 | Horizontal | VSi-HSS1.5X0.125 | 173 | -0.87 | 15.28 | 5.7 | Pass |
| | | | | | | | 8.3 (b) | |
| T16 | 221.5 - 216.5 | Horizontal | VSi-HSS1.5X0.125 | 185 | -0.82 | 15.28 | 5.4 | Pass |
| | | | | | | | 7.9 (b) | |
| T17 | 216.5 - 211.5 | Horizontal | VSi-HSS1.5X0.125 | 198 | -0.78 | 15.28 | 5.1 | Pass |
| | | | | | | | 7.5 (b) | |
| T18 | 211.5 - 206.5 | Horizontal | VSi-HSS1.5X0.125 | 210 | -0.78 | 15.28 | 5.1 | Pass |
| | | | | | | | 7.5 (b) | |
| T19 | 206.5 - 201.5 | Horizontal | VSi-HSS1.5X0.125 | 222 | -0.79 | 15.28 | 5.2 | Pass |
| | | | | | | | 7.6 (b) | |
| T20 | 201.5 - 196.5 | Horizontal | VSi-HSS1.5X0.125 | 234 | -0.81 | 15.28 | 5.3 | Pass |
| | | | | | | | 7.7 (b) | |
| T21 | 196.5 - 191.5 | Horizontal | VSi-HSS1.5X0.125 | 246 | -0.82 | 15.28 | 5.4 | Pass |
| | | | | | | | 7.9 (b) | |
| T22 | 191.5 - 186.5 | Horizontal | VSi-HSS1.5X0.125 | 258 | -0.85 | 15.28 | 5.6 | Pass |
| | | | | | | | 8.1 (b) | |
| T23 | 186.5 - 181.5 | Horizontal | VSi-HSS1.5X0.125 | 269 | 3.39 | 20.41 | 16.6 | Pass |
| | | | | | | | 32.4 (b) | |
| T24 | 181.5 - 176.5 | Horizontal | VSi-HSS1.5X0.125 | 282 | -1.01 | 15.28 | 6.6 | Pass |

| Section No. | Elevation ft | Component Type | Size | Critical Element | P K | $\phi P_{allow}$ K | % Capacity | Pass Fail |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | 9.7 (b) | |
| T25 | 176.5 - 171.5 | Horizontal | VSi-HSS1.5X0.125 | 292 | -1.02 | 15.22 | 6.7 | Pass |
| | | | | | | | 9.8 (b) | |
| T26 | 171.5 - 166.5 | Horizontal | VSi-HSS1.5X0.125 | 299 | -1.04 | 15.22 | 6.8 | Pass |
| | | | | | | | 9.9 (b) | |
| T27 | 166.5 - 161.5 | Horizontal | VSi-HSS1.5X0.125 | 309 | -1.07 | 15.22 | 7.0 | Pass |
| | | | | | | | 10.2 (b) | |
| T28 | 161.5 - 156.5 | Horizontal | VSi-HSS1.5X0.125 | 317 | -1.10 | 15.22 | 7.2 | Pass |
| | | | | | | | 10.6 (b) | |
| T29 | 156.5 - 151.5 | Horizontal | VSi-HSS1.5X0.125 | 326 | -1.13 | 15.22 | 7.4 | Pass |
| | | | | | | | 10.8 (b) | |
| T30 | 151.5 - 146.5 | Horizontal | VSi-HSS1.5X0.125 | 338 | -1.15 | 15.22 | 7.6 | Pass |
| | | | | | | | 11.0 (b) | |
| T31 | 146.5 - 141.5 | Horizontal | VSi-HSS1.5X0.125 | 350 | -1.16 | 15.22 | 7.6 | Pass |
| | | | | | | | 11.1 (b) | |
| T32 | 141.5 - 136.5 | Horizontal | VSi-HSS1.5X0.125 | 359 | -1.16 | 15.22 | 7.6 | Pass |
| | | | | | | | 11.1 (b) | |
| T33 | 136.5 - 131.5 | Horizontal | VSi-HSS1.5X0.125 | 368 | -1.16 | 15.22 | 7.6 | Pass |
| | | | | | | | 11.1 (b) | |
| T34 | 131.5 - 106.5 | Horizontal | VSi-HSS1.5X0.125 | 402 | 3.41 | 20.41 | 16.7 | Pass |
| | | | | | | | 32.7 (b) | |
| T35 | 106.5 - 101.5 | Horizontal | VSi-HSS1.5X0.125 | 410 | -1.58 | 15.22 | 10.4 | Pass |
| | | | | | | | 15.1 (b) | |
| T36 | 101.5 - 96.5 | Horizontal | VSi-HSS1.5X0.125 | 420 | -1.66 | 15.22 | 10.9 | Pass |
| | | | | | | | 15.9 (b) | |
| T37 | 96.5 - 91.5 | Horizontal | VSi-HSS1.5X0.125 | 432 | -1.66 | 15.22 | 10.9 | Pass |
| | | | | | | | 15.9 (b) | |
| T38 | 91.5 - 86.5 | Horizontal | VSi-HSS1.5X0.125 | 440 | -1.63 | 15.22 | 10.7 | Pass |
| | | | | | | | 15.6 (b) | |
| T39 | 86.5 - 81.5 | Horizontal | VSi-HSS1.5X0.125 | 449 | -1.58 | 15.22 | 10.4 | Pass |
| | | | | | | | 15.2 (b) | |
| T40 | 81.5 - 76.5 | Horizontal | VSi-HSS1.5X0.125 | 458 | -1.55 | 15.22 | 10.2 | Pass |
| | | | | | | | 14.8 (b) | |
| T41 | 76.5 - 71.5 | Horizontal | VSi-HSS1.5X0.125 | 467 | -1.55 | 15.22 | 10.2 | Pass |
| | | | | | | | 14.8 (b) | |
| T42 | 71.5 - 66.5 | Horizontal | VSi-HSS1.5X0.125 | 479 | -1.63 | 15.22 | 10.7 | Pass |
| | | | | | | | 15.6 (b) | |
| T43 | 66.5 - 61.5 | Horizontal | VSi-HSS1.5X0.125 | 491 | -1.77 | 15.22 | 11.6 | Pass |
| | | | | | | | 17.0 (b) | |
| T44 | 61.5 - 56.5 | Horizontal | VSi-HSS1.5X0.125 | 504 | 5.90 | 20.41 | 28.9 | Pass |
| | | | | | | | 56.5 (b) | |
| T45 | 56.5 - 51.5 | Horizontal | VSi-HSS1.5X0.125 | 515 | -1.91 | 15.22 | 12.5 | Pass |
| | | | | | | | 18.3 (b) | |
| T46 | 51.5 - 46.5 | Horizontal | VSi-HSS1.5X0.125 | 527 | -1.90 | 15.22 | 12.5 | Pass |
| | | | | | | | 18.2 (b) | |
| T47 | 46.5 - 41.5 | Horizontal | VSi-HSS1.5X0.125 | 541 | -1.88 | 15.22 | 12.4 | Pass |
| | | | | | | | 18.0 (b) | |
| T48 | 41.5 - 36.5 | Horizontal | VSi-HSS1.5X0.125 | 553 | -1.88 | 15.22 | 12.4 | Pass |
| | | | | | | | 18.0 (b) | |
| T49 | 36.5 - 31.5 | Horizontal | VSi-HSS1.5X0.125 | 563 | -1.89 | 15.22 | 12.4 | Pass |
| | | | | | | | 18.1 (b) | |
| T50 | 31.5 - 6.5 | Horizontal | VSi-HSS1.5X0.125 | 575 | -1.89 | 15.22 | 12.4 | Pass |
| | | | | | | | 18.1 (b) | |
| T4 | 281.5 - 276.5 | Secondary Horizontal | 1 | 62 | -0.55 | 9.88 | 5.6 | Pass |
| | | | | | | | 7.0 (b) | |
| T5 | 276.5 - 271.5 | Secondary Horizontal | 1 | 74 | -0.61 | 9.88 | 6.1 | Pass |
| T11 | 246.5 - 241.5 | Secondary Horizontal | VSi-L2-1/2X2X1/4 | 131 | -1.11 | 24.78 | 4.5 | Pass |
| | | | | | | | 14.0 (b) | |
| T12 | 241.5 - 236.5 | Secondary Horizontal | VSi-2L2-1/2X2X1/4X3/8 | 143 | -1.03 | 46.33 | 2.2 | Pass |
| | | | | | | | 6.5 (b) | |
| T13 | 236.5 - 231.5 | Secondary Horizontal | VSi-2L2-1/2X2X1/4X3/8 | 156 | -0.94 | 46.33 | 2.0 | Pass |



| Section No. | Elevation ft | Component Type | Size | Critical Element | P K | $\phi P_{allow}$ K | % Capacity | Pass Fail |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | 5.9 (b) | |
| T14 | 231.5 - 226.5 | Secondary Horizontal | VSi-L2-1/2X2X1/4 | 168 | -0.87 | 24.78 | 3.5 | Pass |
| | | | | | | | 10.9 (b) | |
| T15 | 226.5 - 221.5 | Secondary Horizontal | VSi-L2-1/2X2X1/4 | 179 | -0.82 | 24.78 | 3.3 | Pass |
| | | | | | | | 10.4 (b) | |
| T16 | 221.5 - 216.5 | Secondary Horizontal | VSi-L2-1/2X2X1/4 | 192 | -0.78 | 24.78 | 3.1 | Pass |
| | | | | | | | 9.8 (b) | |
| T17 | 216.5 - 211.5 | Secondary Horizontal | VSi-L2-1/2X2X1/4 | 204 | -0.78 | 24.78 | 3.1 | Pass |
| | | | | | | | 9.8 (b) | |
| T18 | 211.5 - 206.5 | Secondary Horizontal | VSi-L2-1/2X2X1/4 | 217 | -0.78 | 24.78 | 3.2 | Pass |
| | | | | | | | 9.8 (b) | |
| T19 | 206.5 - 201.5 | Secondary Horizontal | VSi-L2-1/2X2X1/4 | 228 | -0.79 | 24.78 | 3.2 | Pass |
| | | | | | | | 9.9 (b) | |
| T20 | 201.5 - 196.5 | Secondary Horizontal | VSi-L2-1/2X2X1/4 | 240 | -0.81 | 24.78 | 3.3 | Pass |
| | | | | | | | 10.1 (b) | |
| T21 | 196.5 - 191.5 | Secondary Horizontal | VSi-L2-1/2X2X1/4 | 252 | -0.82 | 24.78 | 3.3 | Pass |
| | | | | | | | 10.3 (b) | |
| T22 | 191.5 - 186.5 | Secondary Horizontal | VSi-L2-1/2X2X1/4 | 265 | -0.85 | 24.78 | 3.4 | Pass |
| | | | | | | | 10.7 (b) | |
| T23 | 186.5 - 181.5 | Secondary Horizontal | VSi-L2-1/2X2X1/4 | 276 | -0.95 | 24.78 | 3.8 | Pass |
| T29 | 156.5 - 151.5 | Secondary Horizontal | 1 | 332 | -1.13 | 9.74 | 11.6 | Pass |
| | | | | | | | 14.2 (b) | |
| T30 | 151.5 - 146.5 | Secondary Horizontal | 1 | 344 | -1.15 | 9.74 | 11.8 | Pass |
| T36 | 101.5 - 96.5 | Secondary Horizontal | 1 | 425 | -1.66 | 9.74 | 17.0 | Pass |
| T41 | 76.5 - 71.5 | Secondary Horizontal | VSi-L2-1/2X2X1/4 | 473 | -1.53 | 24.66 | 6.2 | Pass |
| T42 | 71.5 - 66.5 | Secondary Horizontal | VSi-L2-1/2X2X1/4 | 485 | -1.63 | 24.66 | 6.6 | Pass |
| T43 | 66.5 - 61.5 | Secondary Horizontal | VSi-L2-1/2X2X1/4 | 497 | -1.77 | 24.66 | 7.2 | Pass |
| | | | | | | | 22.3 (b) | |
| T44 | 61.5 - 56.5 | Secondary Horizontal | 1 | 511 | -1.91 | 9.74 | 19.6 | Pass |
| | | | | | | | 24.0 (b) | |
| T45 | 56.5 - 51.5 | Secondary Horizontal | 1 | 521 | -1.90 | 9.74 | 19.5 | Pass |
| | | | | | | | 23.9 (b) | |
| T46 | 51.5 - 46.5 | Secondary Horizontal | 1 | 533 | -1.88 | 9.74 | 19.3 | Pass |
| | | | | | | | 23.7 (b) | |
| T47 | 46.5 - 41.5 | Secondary Horizontal | 1 | 545 | -1.88 | 9.74 | 19.3 | Pass |
| | | | | | | | 23.7 (b) | |
| T48 | 41.5 - 36.5 | Secondary Horizontal | 1 | 557 | -1.88 | 9.74 | 19.3 | Pass |
| | | | | | | | 23.6 (b) | |
| T49 | 36.5 - 31.5 | Secondary Horizontal | 1 | 571 | -1.89 | 9.74 | 19.4 | Pass |
| T1 | 314.5 - 310.5 | Top Girt | L2x2x1/4 | 6 | -0.00 | 20.65 | 0.2 | Pass |
| T51 | 6.5 - 0 | Top Girt | W16x50 | 609 | 0.50 | 476.28 | 3.1 | Pass |
| T3 | 306.5 - 281.5 | Guy A@306.5 | 11/16 | 613 | 14.23 | 30.00 | 47.4 | Pass |
| T11 | 246.5 - 241.5 | Guy A@246.5 | 7/8 | 616 | 17.00 | 47.82 | 35.5 | Pass |
| T23 | 186.5 - 181.5 | Guy A@186.5 | 9/16 | 619 | 9.09 | 21.00 | 43.3 | Pass |
| T34 | 131.5 - 106.5 | Guy A@126.5 | 5/8 | 622 | 11.30 | 25.44 | 44.4 | Pass |
| T44 | 61.5 - 56.5 | Guy A@61.5 | 11/16 | 625 | 12.87 | 30.00 | 42.9 | Pass |
| T3 | 306.5 - 281.5 | Guy B@306.5 | 11/16 | 612 | 14.28 | 30.00 | 47.6 | Pass |
| T11 | 246.5 - 241.5 | Guy B@246.5 | 7/8 | 615 | 17.02 | 47.82 | 35.6 | Pass |
| T23 | 186.5 - 181.5 | Guy B@186.5 | 9/16 | 618 | 9.13 | 21.00 | 43.5 | Pass |
| T34 | 131.5 - 106.5 | Guy B@126.5 | 5/8 | 621 | 11.38 | 25.44 | 44.7 | Pass |
| T44 | 61.5 - 56.5 | Guy B@61.5 | 11/16 | 624 | 13.22 | 30.00 | 44.1 | Pass |
| T3 | 306.5 - 281.5 | Guy C@306.5 | 11/16 | 611 | 14.21 | 30.00 | 47.4 | Pass |
| T11 | 246.5 - 241.5 | Guy C@246.5 | 7/8 | 614 | 16.96 | 47.82 | 35.5 | Pass |
| T23 | 186.5 - 181.5 | Guy C@186.5 | 9/16 | 617 | 9.07 | 21.00 | 43.2 | Pass |
| T34 | 131.5 - 106.5 | Guy C@126.5 | 5/8 | 620 | 11.30 | 25.44 | 44.4 | Pass |
| T44 | 61.5 - 56.5 | Guy C@61.5 | 11/16 | 623 | 12.92 | 30.00 | 43.1 | Pass |
| | | | | | | | Summary | |
| | | | | | | Pole (L1) | 48.9 | Pass |
| | | | | | | Leg (T50) | 96.7 | Pass |
| | | | | | | Diagonal (T43) | 84.3 | Pass |

| Section No. | Elevation ft | Component Type | Size | Critical Element | P K | $\phi P_{allow}$ K | % Capacity | Pass Fail |
|---|---|---|---|---|---|---|---|---|
| | | | | | | Horizontal (T44) | 56.5 | Pass |
| | | | | | | Secondary Horizontal (T44) | 24.0 | Pass |
| | | | | | | Top Girt (T51) | 3.1 | Pass |
| | | | | | | Guy A (T3) | 47.4 | Pass |
| | | | | | | Guy B (T3) | 47.6 | Pass |
| | | | | | | Guy C (T3) | 47.4 | Pass |
| | | | | | | Bolt Checks | 84.3 | Pass |
| | | | | | | **RATING =** | **96.7** | **Pass** |

# PAD AND PIER FOUNDATION DESIGN
# SELF-SUPPORTING POLE STRUCTURE
**ANSI/TIA-222-G-2-2009 & ACI 318-05**

Job No.: 17-00909
Date: 08 MAY 2017
Calculated by: MLL

## INPUT

- Reactions:

$M_{\square} :=$ □□.□ip·□t = overturning moment at top of pier, factored

$\square_{\square} :=$ □□□.□ip = axial load at top of pier

$\square_{\square} :=$ □.□ip = shear load at top of pier

- Concrete:

$\square_{p\square d} :=$ □□□□.□t = pad width (and length)

$\square_{pier} :=$ □□□.□t = existing pier diameter

$\square ier\square\square\square pe :=$ Circular / Square

$\square :=$ □□□.□t = distance from top of pier to top of grade

$\square_{p\square d} :=$ □□ + □□□ − □□□□.□t = pad depth

$t_{p\square d} :=$ □□□.□t = pad thickness

$\gamma_{\square} :=$ □□□.□p□□ = density of concrete

$\square\square_{\square} :=$ □□□□.□psi = design compressive strength of concrete

- Rebar: (unknown, assumed temperature and shrinkage steel)

$\square_{\square} :=$ □□.□si = specified minimum yield strength of rebar

Tie := "□□" = size of tie rebar in pier

$s_{tie} :=$ □□.□i□ = spacing of tie rebar in pier

□ert := "□□" = size of vertical rebar in pier

$\square_{\square ert} :=$ □□ = number of vertical rebar in pier

$L_{\square ert\square e\square t} :=$ □□.□i□ = length of vertical rebar exension in pad (assumed)

$\square o\square er_{top} :=$ □□□.□i□ = cover from top edge of vertical to top of concrete in pier

$\square o\square er_{side} :=$ □□□.□i□ = cover from outside edge of tie to edge of concrete in pier

Top□□ori□ := #6 / #7 / #8 / #9 / #10

$s_{\square\square top} :=$ □□□□□.□i□ = size / max spacing of horizontal rebar in top of pad

□ot□□ori□ := #6 / #7 / #8 / #9 / #10

$s_{\square\square\square ot} :=$ □□□□□.□i□ = size / max spacing of horizontal rebar in bottom of pad

$\square o\square er_{t\square\square p\square d} :=$ □□□.□i□ = cover from outside edge of outside top/bottom horizontal to edge of concrete in pad

$\square o\square er_{e\square d\square p\square d} :=$ □□□.□i□ = cover from outside end of horizontal to edge of concrete in pad

- Anchor Rods:

$d_{A\square} := 2.25\ i\square$ = diameter of anchor rod

$\square C := 60.0\ i\square$ = bolt-circle diameter for anchor rods

$d_{te\square p\square te} := 6.\ \square i\square$ = anchor rod template width

$L_{A\square} := 84.\ \square i\square$ = total length of anchor rod

$pro\square_{A\square} := 12.0\ i\square$ = projection of anchor rod above top of concrete

- Pier Strength:

$\phi M_{\square\square pier} := 0.\ \square(1\cdot\square ip\cdot i\square)$ = design flexural strength of pier (w/ applied axial comp. rxn) [Pier.lpd]

$\phi M_{\square\square pier} = 0\cdot\square ip\cdot\square t$

- Soil:

$\gamma_s := 120\cdot pcf$ = density of soil

$q'_{all} := 1000\ \square ps\square$ = net allowable bearing pressure

$\psi_{i\square p\square t} := 0.35$ = coefficient of friction per GEO (-or- for clay: assumed per TBL 8.3; for sand: = 0 if to be calc'd

$\phi := 0\cdot de\square$ = friction angle of soil ( = 0 if $\psi$ is input or if soil is clay)

$GW := 10.\ \square t$ = ground water depth

- Constants:

$\gamma_w \equiv 62.\ \square pcf$ = unit weight of water

$E \equiv 29000\cdot\square si$ = modulus of elasticity of rebar steel

$\varepsilon_{cu} \equiv 0.00\ \square\cdot\frac{i\square}{i\square}$ = max usable strain at extreme conc. comp. fiber

$\phi_s \equiv 0.75$ = resistance factor for soil strength

$\phi_{\square} \equiv 0.75$ = strength reduction factor for shear

$\phi_t \equiv 0.90$ = strength reduction factor for tension

## OUTPUT

GEOMETRY, DEAD LOADS & REBAR

SOIL RESISTANCE - SIDE

SOIL RESISTANCE - DIAGONAL

PAD STRUCTURE FORCES

PAD FLEXURAL STRENGTH - DESIGN

### Pad Rebar

- Top:

$\square_{\_ op} = 16$

$s_{\square\_ op\_ e\square d} = -133.27\ i\square$

$Top\_\square ori\square\_\square e\square d = "\#\square"$

- Bottom:

$n_{h\_b\,ot} = 16$ = number of pad horizontal rebar at input spacing

$s_{\square\_\square ot\_ e\square d} = -239.43\ i\square$ = spacing required for input rebar size

$\square ot\_\square ori\square\_\square e\square d = "\#\square"$ = size of rebar required for current #/spacing

PAD FLEXURAL STRENGTH - ANALYSIS

PAD SHEAR STRENGTH

PIER STRUCTURE STRENGTH

PAD & PIER STRUCTURE DETAILING

## Results Summary

- Soil:

$$res\_t_{\_oi\_} := \begin{pmatrix} r_{\_\_} \\ r_{\_TM} \\ r_{\_} \end{pmatrix} \qquad res\_t_{\_oi\_} = \begin{pmatrix} \_\_ \\ \_ \\ \_ \end{pmatrix} \cdot \_$$

$$res\_t_{\_oi\_A\_o\_t\_\_i\_\_} := \begin{pmatrix} r_{\_\_\_di\_\_} \\ r_{\_TM\_di\_\_} \end{pmatrix} \qquad res\_t_{\_oi\_A\_o\_t\_\_i\_\_} = \begin{pmatrix} \_\_ \\ \_ \end{pmatrix} \cdot \_$$

- Structure - Pad:

$$res\_t_{\_\_d\_Top\_\_tr} := \begin{pmatrix} r_{\_\_top} \\ r_{\_\_top} \end{pmatrix} \qquad res\_t_{\_\_d\_Top\_\_tr} = \begin{pmatrix} -\_ \\ \_ \end{pmatrix} \cdot \_$$

$$res\_t_{As\_M\_\_\_Top} := C\_e\_\__{As\_\_\_\_top} \qquad res\_t_{As\_M\_\_\_Top} = "\_\_"$$

$$res\_t_{\_\_d\_\_ot\_\_tr} := \begin{pmatrix} r_{\_\_\_ot} \\ r_{\_\_\_ot\_\_r} \\ r_{\_\_\_ot\_\_w\_\_} \\ r_{\_\_\_ot\_\_w\_\_} \end{pmatrix} \qquad res\_t_{\_\_d\_\_ot\_\_tr} = \begin{pmatrix} \_ \\ \_ \\ -\_ \\ \_ \end{pmatrix} \cdot \_$$

$$res\_t_{As\_M\_\_\_\_ot} := C\_e\_\__{As\_\_\_\_\_ot} \qquad res\_t_{As\_M\_\_\_\_ot} = "\_\_"$$

$$res\_t_{As\_\_i\_\_p\_d} := C\_e\_\__{As\_\_i\_\_p\_d} \qquad res\_t_{As\_\_i\_\_p\_d} = "\_\_"$$

- Structure - Pier:

$$res\_t_{\_ier\_\_tr\_\_tre\_\_t\_} := \begin{pmatrix} r_{\_\_pier} \\ r_{\_\_pier} \end{pmatrix} \qquad res\_t_{\_ier\_\_tr\_\_tre\_\_t\_} = \begin{pmatrix} \_\_\_\_\_ \\ \_ \end{pmatrix} \cdot \_$$

$$res\_t_{As\_Mi\_\_\_ier} := r_{As\_pier} \qquad res\_t_{As\_Mi\_\_\_ier} = "\_\_"$$

- Detailing - Pad & Pier:

$$res\_t_{\_i\_e} := res\_t_{\_\_p\_d\_MI\_} \qquad res\_t_{\_i\_e} = "\_\_"$$

$$res\_t_{\_et\_i\_i\_\_\_A\_\_\_\_\_\_\_t} := \begin{cases} \begin{pmatrix} res\_t_{\_d\_A\_} \\ res\_t_{\_d\_\_A\_} \end{pmatrix} & i\_\_\_e\_r\_\_\_\_e\_\_\_ = "I\_\_\_ier" \\ res\_t_{\_d\_\_ori\_\_A\_} & i\_\_\_e\_r\_\_\_\_e\_\_\_ = "I\_\_\_d" \end{cases} \qquad res\_t_{\_et\_i\_i\_\_\_A\_\_\_\_\_\_\_t} = "\_\_"$$

$$res\_t_{\_ori\_\_\_d} := \begin{pmatrix} res\_t_{\_d\_\_ori\_\_top} \\ res\_t_{\_d\_\_ori\_\_\_ot} \end{pmatrix} \qquad res\_t_{\_ori\_\_\_d} = \begin{pmatrix} "\_\_" \\ "\_\_" \end{pmatrix}$$

$$res\_t_{\_ert} := \begin{pmatrix} res\_t_{L\_ert\_e\_t} \\ res\_t_{\_d\_} \end{pmatrix} \qquad res\_t_{\_ert} = \begin{pmatrix} "\_\_" \\ "\_\_" \end{pmatrix}$$

$$res\_t_{\_ow\_\_e\_Co\_\_rete} := r_{\_o\_\_\_pier} \qquad res\_t_{\_ow\_\_e\_Co\_\_rete} = "\_\_"$$

$$res\_t_{As\_T\_\_sp\_\_i\_\_} := \begin{pmatrix} C\_e\_\__{As\_T\_\_sp\_\_i\_\_\_top} \\ C\_e\_\__{As\_T\_\_sp\_\_i\_\_\_\_ot} \end{pmatrix} \qquad res\_t_{As\_T\_\_sp\_\_i\_\_} = \begin{pmatrix} "\_\_" \\ "\_\_" \end{pmatrix}$$

$M\_\_\_\_ti\_i\_\_tio\_\_\_oi\_ = \_\_.\_$ **IGNORE STRUCTURE AND DETAILING OUTPUT, REINFORCEMENT UNKNOWN**

**Project:** STR17-090-02 **Ref:** ANSI/TIA-222-G-2009

**Date:** 5/8/2017

**Description:** Inner Anchors-Lower Block

# Anchor Block Design

***Design For:***

| | | |
|---|---|---|
| *Uplift =* | *18* | *k* |
| *Lateral Load =* | *16* | |

***Soil Properties:***

| | | |
|---|---|---|
| $g_s$ = | *120* | *pcf* |
| f = | *35* | $^o$ |
| $q_L$ = | *2039* | *psf* |

***Concrete Properties:***

| | | |
|---|---|---|
| $r_c$= | *150* | *pcf* |
| $f'_c$ = | *3000* | *psi* |

***Dimension:***

| | | |
|---|---|---|
| *Width (W) =* | *16* | *ft* |
| *Length (L) =* | *6* | |
| *Height (H) =* | *2.5* | |
| *Depth (D) =* | *3.25* | |

***Resistance of Concrete:***

| | | |
|---|---|---|
| *Wc=* | *36* | *k* |

***Soil Resistance:***

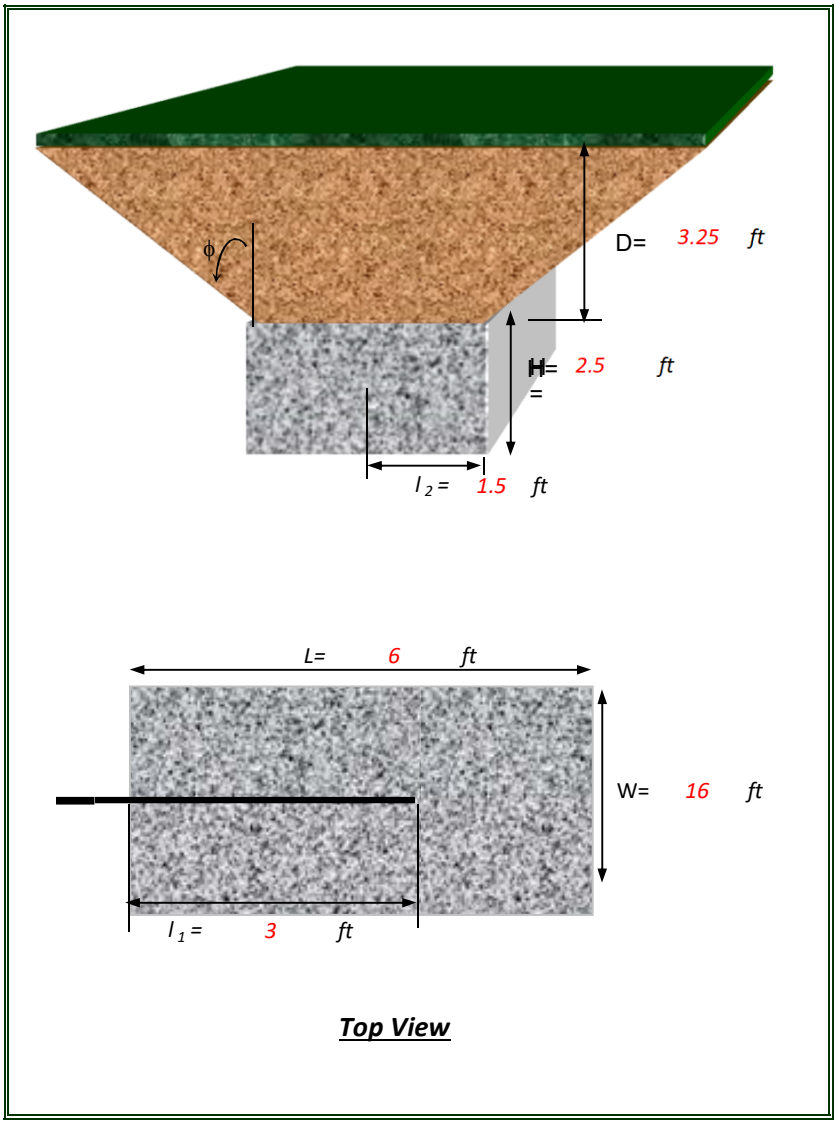
| | | |
|---|---|---|
| $A_1$ = | *96* | $ft^2$ |
| $A_2$ = | *216.8* | |
| $V_s$ = | *495.2* | $ft^3$ |
| $W_s$ = | *59.4* | *k* |

***Total Uplift Resitance:***

| | | |
|---|---|---|
| $U_{res}$ = | *71.6* | k |

***Total Lateral Resistance:***

| | | |
|---|---|---|
| *Lat. Res.($P_{res}$)=* | *61.17* | *k* |




***Summary:***

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| *Uplift (U) =* | *18* | *k* | $U_{res}$ = | *71.6* | *k* | $U/U_{res}$ = | *25%* |
| *Lateral Load (P) =* | *16* | *k* | *Lat. Res.($P_{res}$)=* | *61.17* | *k* | $P/P_{res}$ = | *26%* |

***Design okay***

**Project:** STR17-090-02 **Ref:** ANSI/TIA-222-G-2009

**Date:** 5/8/2017

**Description:** Outer Anchors-Lower Block

# Anchor Block Design

***Design For:***

| | | |
|---|---|---|
| *Uplift =* | *31* | *k* |
| *Lateral Load =* | *22* | |

***Soil Properties:***

| | | |
|---|---|---|
| $g_s$ = | *120* | *pcf* |
| f = | *35* | $^o$ |
| $q_L$ = | *2666* | *psf* |

***Concrete Properties:***

| | | |
|---|---|---|
| $r_c$= | *150* | *pcf* |
| $f'_c$ = | *3000* | *psi* |

***Dimension:***

| | | |
|---|---|---|
| *Width (W) =* | *16* | *ft* |
| *Length (L) =* | *6* | |
| *Height (H) =* | *2.5* | |
| *Depth (D) =* | *5* | |

***Resistance of Concrete:***

| | | |
|---|---|---|
| *Wc=* | *36* | *k* |

***Soil Resistance:***

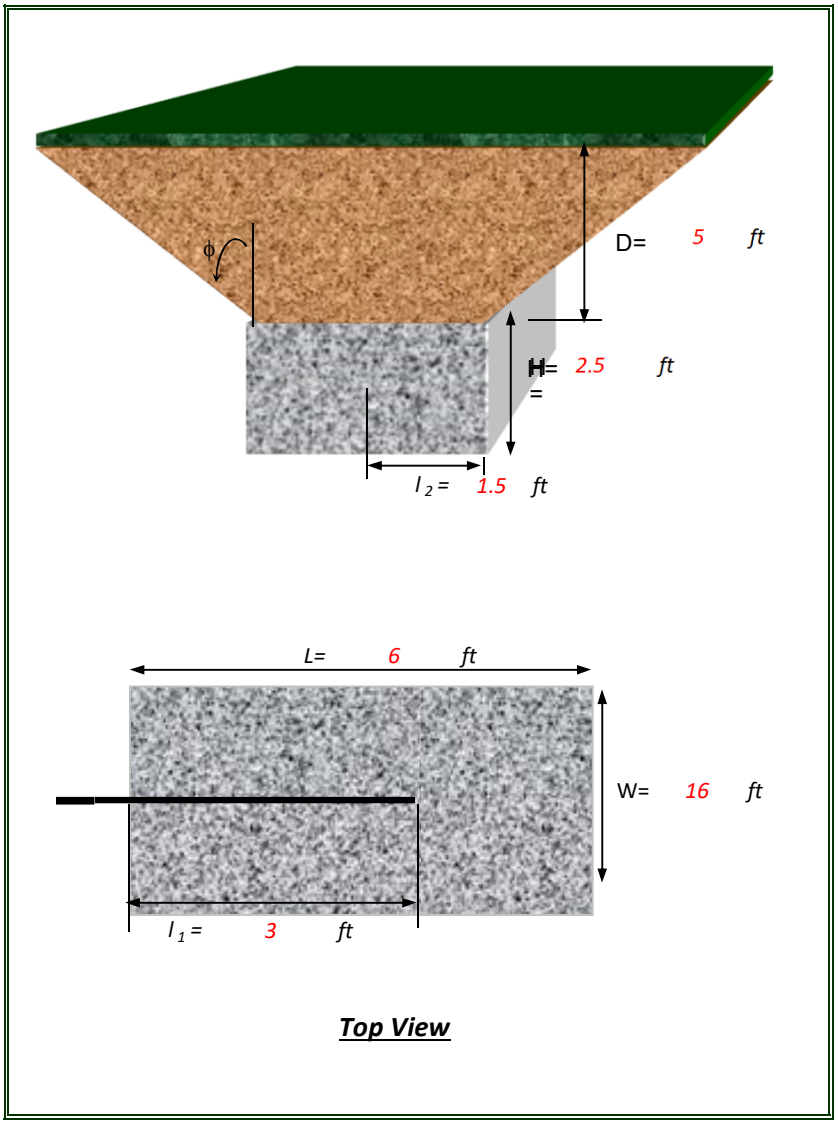
| | | |
|---|---|---|
| $A_1$ = | *96* | $ft^2$ |
| $A_2$ = | *299.1* | |
| $V_s$ = | *940.9* | $ft^3$ |
| $W_s$ = | *112.9* | *k* |

***Total Uplift Resitance:***

| | | |
|---|---|---|
| $U_{res}$ = | *111.7* | k |

***Total Lateral Resistance:***

| | | |
|---|---|---|
| *Lat. Res.($P_{res}$)=* | *79.98* | *k* |




***Summary:***

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| *Uplift (U) =* | *31* | *k* | $U_{res}$ = | *111.7* | *k* | $U/U_{res}$ = | *28%* |
| *Lateral Load (P) =* | *22* | *k* | *Lat. Res.($P_{res}$)=* | *79.98* | *k* | $P/P_{res}$ = | *28%* |

***Design okay***

CTI TOWERS

# Site License Application - ver. 3/16

**The application determines the loading for the corresponding structural analysis. Any discrepancies between the application and construction drawings will result in a $1500 administrative fee. All re-runs of structural analyses due to discrepancies or changes in loading will be the responsibility of the company submitting the application. In the event of any discrepancies in the lease documentation, the equipment listed in the application as lease exhibit will be the agreed upon equipment.**

| Site Information | | | |
|---|---|---|---|
| CTI Site Name/Number | Norwalk 1 | 52010 | Application Submission Date: 1/10/2017 |
| Customer Site Name/Number | Norwalk-WNLK | CT2138 / FA 10049148 | |
| Street Address, City, State, Zip | Shirley Street, Norwalk CT | | Proposed On Air/Change Out Date: 8/11/2017 |
| Latitude/Longitude | 41.11555555 | -73.43444444 | |

| | Existing/Leased Antenna Configuration | | | Proposed Final Antenna Configuration | | |
|---|---|---|---|---|---|---|
| Antenna Space and Equipment | Sector 1 | Sector 2 | Sector 3 | Sector 1 | Sector 2 | Sector 3 |
| Status (Leased/Existing/Proposed/) | Leased/Removing | Leased/Removing | Leased/Removing | Proposed | Proposed | Proposed |
| RAD Center AGL | 81'-6" | 81'-6" | 81'-6" | 81'-6" | 81'-6" | 81'-6" |
| Antenna Mount Height | 78' | 78' | 78' | 78' | 78' | 78' |
| Antenna Quantity | 3 | 3 | 3 | 3 | 3 | 3 |
| Antenna Manufacturer | Celwave | Celwave | Celwave | CCI | CCI | CCI |
| Antenna Type (Panel, Omni, etc.) | Panel | Panel | Panel | Panel | Panel | Panel |
| Antenna Model # | ALP868013 | ALP868013 | ALP868013 | (1) HPA-65R-BUU-H6 / (2) OPA-65R-LCUU-H6 | (1) HPA-65R-BUU-H6 / (2) OPA-65R-LCUU-H6 | (1) HPA-65R-BUU-H6 / (2) OPA-65R-LCUU-H6 |
| Antenna Dimensions (indicate inches-H" x W" x D") | 51" x 12" x 6" | 51" x 12" x 6" | 51" x 12" x 6" | (1) 72" x 14.8" x 9" (2) 72.3" x 14.4" x 7.3" | (1) 72" x 14.8" x 9" (2) 72.3" x 14.4" x 7.3" | (1) 72" x 14.8" x 9" (2) 72.3" x 14.4" x 7.3" |
| Antenna Weight (per antenna in LB's) | 41 lbs | 41 lbs | 41 lbs | (1) 51lbs (2) 56.9 lbs | (1) 51lbs (2) 56.9 lbs | (1) 51lbs (2) 56.9 lbs |
| Direction of Radiation (Azimuth) | 23 | 143 | 263 | (1) @ 143 / (2) @ 30 | (1) @ 263 / (2) @ 150 | (1) @ 23 / (2) @ 270 |
| TX Frequency | 880-893, 1930-1940, 1965-1975 MHz | 880-893, 1930-1940, 1965-1975 MHz | 880-893, 1930-1940, 1965-1975 MHz | 880-893, 1930-1940, 1965-1975, 716-728, 734-746, 2345-2360 MHz | 880-893, 1930-1940, 1965-1975, 716-728, 734-746, 2345-2360 MHz | 880-893, 1930-1940, 1965-1975, 716-728, 734-746, 2345-2360 MHz |
| RX Frequency | 835-845, 1850-1860, 1885-1895 MHz | 835-845, 1850-1860, 1885-1895 MHz | 835-845, 1850-1860, 1885-1895 MHz | 835-845, 1850-1860, 1885-1895, 704-716, 2305-2320 MHz | 835-845, 1850-1860, 1885-1895, 704-716, 2305-2320 MHz | 835-845, 1850-1860, 1885-1895, 704-716, 2305-2320 MHz |
| TMA Quantity | 2 | 2 | 2 | 1 | 1 | 1 |
| TMA Manufacturer & Model | Powerwave TT19-08BP111-001 | Powerwave TT19-08BP111-001 | Powerwave TT19-08BP111-001 | CCI DTMABP7819VG12A | CCI DTMABP7819VG12A | CCI DTMABP7819VG12A |
| TMA Dimensions | 9.9" x 6.7" x 5.4" | 9.9" x 6.7" x 5.4" | 9.9" x 6.7" x 5.4" | 10.63" x 11.02" x 3.78" | 10.63" x 11.02" x 3.78" | 10.63" x 11.02" x 3.78" |
| TMA Weight | 16 lbs | 16 lbs | 16 lbs | 19.18 lbs | 19.18 lbs | 19.18 lbs |
| Diplexer Quantity | | | | | | |
| Diplexer Manufacturer & Model | | | | | | |
| Diplexer Dimensions | | | | | | |
| Diplexer Weight | | | | | | |
| RRU Quantity | | | | 3 | 3 | 3 |
| RRU Manufacturer & Model | | | | (1) RRUS-11 (1) RRUS-32 (1) RRUS-E2 | (1) RRUS-11 (1) RRUS-32 (1) RRUS-E2 | (1) RRUS-11 (1) RRUS-32 (1) RRUS-E2 |
| RRU Dimensions | | | | 19.7" x 17" x 7.2" 26.7" x 12.1" x 6.7" 20.4" x 18.5" x 7.5" | 19.7" x 17" x 7.2" 26.7" x 12.1" x 6.7" 20.4" x 18.5" x 7.5" | 19.7" x 17" x 7.2" 26.7" x 12.1" x 6.7" 20.4" x 18.5" x 7.5" |

| | | | | | | |
|---|---|---|---|---|---|---|
| **RRU Weight** | | | | 50 lbs / 60 lbs / 60 lbs | 50 lbs / 60 lbs / 60 lbs | 50 lbs / 60 lbs / 60 lbs |
| **Other Equipment Quantity** | | | | 1 | | |
| **Other Equipment Manufacturer & Model** | | | | Raycap DC6-48-60-18-8C | | |
| **Other Equipment Dimensions** | | | | 18.17" x 20.06" x 6.37" | | |
| **Other Equipment Weight** | | | | 16 lbs | | |
| **# of Coax Cables Per Sector** | 4 | 4 | 4 | 4 | 4 | 4 |
| **Diameter of Coax Cables** | 7/8" | 7/8" | 7/8" | 7/8" | 7/8" | 7/8" |
| **# of Fiber Cables Per Sector** | | | | 1 | | |
| **Diameter of Fiber Cables** | | | | 10mm | | |
| **# of Hybrid Cables Per Sector** | | | | 2 | | |
| **Diameter of Hybrid Cables** | | | | 0.795" | | |
| **# of RET Cables Per Sector** | | | | | | |
| **Diameter of RET Cables** | | | | | | |
| **Receive or Transmit** | | | | | | |
| **TX Frequency** | | | | | | |
| **RX Frequency** | | | | | | |
| **Type of Service (LTE, CDMA, GSM, Broadcast, etc.)** | UMTS/GSM | UMTS/GSM | UMTS/GSM | UMTS/GSM, LTE | UMTS/GSM, LTE | UMTS/GSM, LTE |
| | **Existing/Leased Microwave Configuration** | | | **Proposed Microwave Configuration** | | |
| **Microwave Space and Equipment** | **Sector 1** | **Sector 2** | **Sector 3** | **Sector 1** | **Sector 2** | **Sector 3** |
| **Status (Leased/Existing/Proposed/)** | | | | | | |
| **MW RAD Center AGL** | | | | | | |
| **MW Mount Height** | | | | | | |
| **MW Quantity** | | | | | | |
| **MW Manufacturer** | | | | | | |
| **MW Model #** | | | | | | |
| **MW Dimensions (indicate inches-H" x W" x D")** | | | | | | |
| **MW Weight (per unit in LB's)** | | | | | | |
| **MW Direction of Radiation (Azimuth)** | | | | | | |
| **ODU Quantity** | | | | | | |
| **ODU Manufacturer & Model** | | | | | | |
| **ODU Dimensions** | | | | | | |
| **ODU Weight** | | | | | | |
| **# of Coax Cables Per MW** | | | | | | |
| **Diameter of Coax Cables** | | | | | | |
| **# of Fiber Cables Per MW** | | | | | | |
| **Diameter of Fiber Cables** | | | | | | |
| **TX Frequency** | | | | | | |
| **RX Frequency** | | | | | | |
| **Brief Desription of Work to be Performed** | | | | | | |

Removing (9) Antennas, replacing w/ (3) HPA-65R-BUU-H6 antennas (1 per sector) & (6) OPA-65R-LCUU-H6 antennas (2 per sector). Removing 6 TMA and replacing w/ (3) TMA. Adding (1) Raycap Surge Arrestors, (9) RRUs, (1) Fiber lines & (2) DC power lines.
Final Configuration: 9 antennas, 3 TMA, (1) Surge Arrestor, (9) RRUs, (12) coax, (1) Fiber lines, (2) DC power lines.

| Building/Shelter Space and Equipment | Existing/Leased Space and Equipment | Proposed Space and Equipment |
|---|---|---|
| Status (existing/proposed) | Existing | |
| Type of Enclosure (shelter, cabinets, etc.) | shelter | |
| Leased Ground Space Dimensions (W'x L'x H') | 12' x 26' x 10' | |
| Concrete Pad Dimensions (W'x L'x H') | | |
| Shelter/Cabinet Dimensions (W'x L'x H') | 12' x 26' x 10' | |
| Shelter/Cabinet Manufacturer/Model/Quantity | | |
| Generator Leased Ground Dimensions (W'x L'x H') | 50 square feet | |
| Generator Make & Model | Generac SD050 | |
| Generator Fuel Type | Diesel | |
| Generator Fuel Tank Ground Dimensions (W'x L'x H') | | |
| Fuel Tank Type (above ground, underground, integrated w/ generator) | above ground | |
| Fuel Tank Location | | |
| Fuel Tank Capacity (gallons) | 210 gallons | |
| Telco/Interconnect Requirements | | |
| Base Station Equipment Manufacturer | | |
| Type and Model | | |
| Type of Service | | |
| Average Monthly Power Consumption (kw) | | |
| Electric Service Required (Amps/Volts) | | |
| Batteries to be Installed within Ground Lease Area | | |
| Quantity & Type Batteries (lead acid, dry cell) | | |