NORTHEAST SITE SOLUTIONS
*Turnkey Wireless Development*

Northeast Site Solutions
Denise Sabo
199 Brickyard Rd Farmington, CT 06032
860-209-4690
denise@northeastsitesolutions.com

October 24, 2016

Members of the Siting Council
Connecticut Siting Council
Ten Franklin Square
New Britain, CT 06051

RE: Notice of Exempt Modification
52 LIBRARY STREET, SALISBURY, CT 06068
Latitude: 41.980852
Longitude: -73.418426
T-Mobile Site#: CTNH547A-NSD-ROB

Dear Ms. Bachman:

T-Mobile is proposing to collocate onto an existing tower located at 52 Library Street, Salisbury, CT 06068. The tower is owned by American Tower Company. The property is owned by The Town of Salisbury. T-Mobile now intends to install three (3) new 700 MHz antennas, three (3) new 1900/2100 MHz antennas, add (2) hybrid cables and add (9) RRUs to the tower loading at the 123' RAD.

**Planned Modifications:**

Install New: (3) APX16DWV-16DWV-S-E-A20
(3) LNX-6515DS-A1M
(2) 1-5/8" Hybrid Cable (1 installed now, 1 for future)
(3) RRUS11 B2
(3) RRUS11 B4
(3) RRUS11 B12
(1) GPS at equipment
(1) ½" coax at equipment for the GPS

This facility was approved by The Connecticut Siting Council on 11/17/2005. Please see attached.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies§ 16- SOj-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.SA. § 16-SOj-73, a copy of this letter is being sent to Curtis Rand-First Selectman, highest elected official for the Town of Salisbury, as well as the property owner and the tower owner.

NORTHEAST SITE SOLUTIONS
*Turnkey Wireless Development*

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

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

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

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

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

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

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

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

Sincerely,

**Denise Sabo**
Mobile: 860-209-4690
Fax: 413-521-0558
Office: 199 Brickyard Rd, Farmington, CT 06032
Email: denise@northeastsitesolutions.com

Attachments

cc: Curtis Rand-First Selectman, as elected official
American Tower Company - as tower owner
Town of Salisbury - as property owner

# Exhibit A

| | | |
|---|---|---|
| **DOCKET NO. 306** – Wireless *EDGE* Fairfield Group LLC application for a Certificate of Environmental Compatibility and Public Need for the construction, maintenance, and operation of a cellular telecommunications facility located at 52 Library Street, Salisbury, Connecticut. | } | Connecticut |
| | } | Siting |
| | } | Council |

November 17, 2005

## Decision and Order

Pursuant to the foregoing Findings of Fact and Opinion, the Connecticut Siting Council (Council) finds that the effects associated with the construction, operation, and maintenance of a telecommunications facility including effects on the natural environment; ecological integrity and balance; public health and safety; scenic, historic, and recreational values; forests and parks; air and water purity; and fish and wildlife are not disproportionate either alone or cumulatively with other effects when compared to need, are not in conflict with the policies of the State concerning such effects, and are not sufficient reason to deny the application and therefore directs that a Certificate of Environmental Compatibility and Pubic Need, as provided by General Statutes § 16-50k, be issued to Wireless *EDGE* Fairfield Group LLC for the construction, maintenance and operation of a wireless telecommunications facility to be located at 52 Library Street in Salisbury, Connecticut.

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

1. The tower shall be designed as a monopole and shall be constructed no taller than 150 feet above ground level to provide telecommunications services to both public and private entities. Cingular's antennas to be mounted on the monopole shall be installed using a T-arm configuration.

2. The tower shall be designed and constructed in such a manner as to be able to accommodate a future extension. Any such extension must be approved by the Council as a petition for declaratory ruling, or other administrative procedure as deemed appropriate by the Council.

3. The Certificate Holder shall prepare a Development and Management (D&M) Plan for this site in compliance with Sections 16-50j-75 through 16-50j-77 of the Regulations of Connecticut State Agencies. The D&M Plan shall be served on the Town of Salisbury and all parties and intervenors, as listed in the service list, and submitted to and approved by the Council prior to the commencement of facility construction and shall include:

    a) a final site plan(s) of site development to include specifications for the tower, tower foundation, antennas mountings, equipment building, access road, utility line, and landscaping; and

b) construction plans for site clearing, water drainage, and erosion and sedimentation control consistent with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control, as amended.

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

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

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

7. The Certificate Holder shall provide reasonable space on the tower for no compensation for any municipal antennas, provided such antennas are compatible with the structural integrity of the tower.

8. If the facility authorized herein is not fully constructed and providing wireless services within eighteen months from the date of the mailing of the Council's Findings of Fact, Opinion, and Decision and Order (collectively called "Final Decision"), this Decision and Order shall be void, and the Certificate Holder shall dismantle the tower and remove all associated equipment or reapply for any continued or new use to the Council before any such use is made. The time between the filing and resolution of any appeals of the Council's Final Decision shall not be counted in calculating this deadline.

9. If the facility ceases to provide wireless services for a period of one year, this Decision and Order shall be void, and the Certificate Holder shall dismantle the tower and remove all associated equipment or reapply for any continued or new use to the Council before any such use is made.

10. Any antenna that becomes obsolete and ceases to function shall be removed within 60 days after such antennas become obsolete and cease to function.

11. Any request for extension of the time periods referred to in Conditions 8 and 9 shall be filed with the Council not later than sixty days prior to the expiration date of this Certificate and shall be served on all parties and intervenors and the Town of Salisbury, as listed in the service list. Any proposed modifications to this Decision and Order shall likewise be so served.

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

Pursuant to General Statutes § 16-50p, we hereby direct that a copy of the Findings of Fact, Opinion, and Decision and Order be served on each person listed below, and notice of issuance shall be published in the Litchfield County Times and in the Lakeville Journal.

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

The parties and intervenors to this proceeding are:

| **Status Granted** | **Status Holder (name, address & phone number)** | **Representative (name, address & phone number)** |
|---|---|---|
| **Applicant** | Wireless Edge Fairfield Group, LLC<br>270 North Avenue<br>New Rochelle, NY 10801 | Julie Donaldson Kohler, Esq.<br>Cohen & Wolf, P.C.<br>1115 Broad Street<br>Bridgeport, CT 06604<br>(203) 368-0211<br>(203) 394-9901 - fax<br>jkohler@cohenandwolf.com |
| **Intervenor**<br><br>(approved 7/20/05) | New Cingular Wireless PCS, LLC | Christopher B. Fisher, Esq.<br>Cuddy & Feder LLP<br>90 Maple Avenue<br>White Plains, NY 10601<br>(914) 761-1300<br>(914) 761-6405 Fax |
| **Intervenor**<br><br>(approved 8/24/05) | Berkshire-Litchfield Environmental Council (BLEC)<br>P.O. Box 552<br>Lakeville, CT 06039 | Send correspondence to:<br><br>B. Blake Levitt, Trustee<br>355 Lake Road<br>New Preston, CT 06777<br>(860) 868-7437<br>(860) 868-6010<br>blakelevit.com |

# Exhibit B


REVISED MARCH 2016

NOT TO BE USED FOR CONVEYANCES
FOR ASSESSMENT PURPOSES ONLY
NOT A TRUE SURVEY

LEGEND
PARCEL NUMBERS ..... 1
ADJACENT MAPS ..... 2
MATCH LINE .....

For Assessment Purposes
Not to be used for Conveyances

PROPERTY MAP
TOWN OF SALISBURY
LITCHFIELD COUNTY, CONNECTICUT
PREPARED BY
JAMES W. HEWALL COMPANY OLD TOWN, MAINE
SCALE 1 INCH = 100 = FEET

54

**Property Location:** 52 LIBRARY STREET | **MAP ID:** 54/ / 89/ / | **Bldg Name:** | **State Use:** 5-2

**Vision ID:** 2652 | **Account #** 98103071 | **Bldg #:** 1 of 1 | **Sec #:** 1 of 1 | **Card** 1 of 1 | **Print Date:** 09/16/2016 13:30

| CURRENT OWNER | TOPO. | UTILITIES | STRT./ROAD | LOCATION |
|---|---|---|---|---|
| SALISBURY TOWN OF | | | | |
| 27 MAIN ST | | | | |
| SALISBURY, CT 06068 | | | | |
| Additional Owners: | | | | |

**SUPPLEMENTAL DATA**

Other ID:
CENSUS TR
ACCTNUM 98103071
SURVEY 854
Hist. Distr.

GIS ID: ASSOC PID#

**CURRENT ASSESSMENT**

| Description | Code | Appraised Value | Assessed Value |
|---|---|---|---|
| COMM | 2-1 | 205,900 | 144,100 |
| 2-5 | 2-5 | 360,300 | 252,100 |
| VACANT | 5-2 | 186,800 | 130,800 |
| | Total | 753,000 | 527,000 |

6122
SALISBURY, CT

**VISION**

**RECORD OF OWNERSHIP**

| RECORD OF OWNERSHIP | BK-VOL/PAGE | SALE DATE | q/u | v/i | SALE PRICE | V.C. |
|---|---|---|---|---|---|---|
| SALISBURY TOWN OF | 84/ 121 | 10/31/1961 | U | V | 0 | 1N |

**PREVIOUS ASSESSMENTS (HISTORY)**

| Yr. | Code | Assessed Value | Yr. | Code | Assessed Value | Yr. | Code | Assessed Value |
|---|---|---|---|---|---|---|---|---|
| 2015 | 2-1 | 144,100 | 2014 | 2-1 | 186,300 | 2010 | 2-1 | 186,300 |
| 2015 | 2-5 | 252,100 | 2014 | 2-5 | 275,900 | 2010 | 2-5 | 275,900 |
| 2015 | 5-2 | 130,800 | 2014 | 5-2 | 65,400 | 2010 | 5-2 | 65,400 |
| | Total: | 527,000 | | Total: | 527,600 | | Total: | 527,600 |

**EXEMPTIONS**

| Year | Type | Description | Amount |
|---|---|---|---|
| | | | |
| | | Total: | |

**OTHER ASSESSMENTS**

| Code | Description | Number | Amount | Comm. Int. |
|---|---|---|---|---|
| | | | | |

*This signature acknowledges a visit by a Data Collector or Assessor*

**ASSESSING NEIGHBORHOOD**

| NBHD/ SUB | NBHD NAME | STREET INDEX NAME | TRACING | BATCH |
|---|---|---|---|---|
| 10/A | | | | |

**NOTES**

TOWN GARAGE
2006 REVIEW BUILDINGS

**APPRAISED VALUE SUMMARY**

| | |
|---|---|
| Appraised Bldg. Value (Card) | 0 |
| Appraised XF (B) Value (Bldg) | 0 |
| Appraised OB (L) Value (Bldg) | 360,300 |
| Appraised Land Value (Bldg) | 392,700 |
| Special Land Value | 0 |
| Total Appraised Parcel Value | 753,000 |
| Valuation Method: | C |
| Adjustment: | 0 |
| **Net Total Appraised Parcel Value** | 753,000 |

**BUILDING PERMIT RECORD**

| Permit ID | Issue Date | Type | Description | Amount | Insp. Date | % Comp. | Date Comp. | Comments |
|---|---|---|---|---|---|---|---|---|
| | 07/06/2006 | | REROOF | 11,000 | | 0 | | |

**VISIT/ CHANGE HISTORY**

| Date | Type | IS | ID | Cd. | Purpose/Result |
|---|---|---|---|---|---|
| 07/10/2006 | | | BB | 03 | MEAS/PART INT |

**LAND LINE VALUATION SECTION**

| B # | Use Code | Use Description | Zone | Frontage | Depth | Units | | Unit Price | I. Factor | S A | Acre Disc | C. Factor | ST. Idx | S.I. Adj. | Notes- Adj | Rec Y/N | CU Cond | Special Pricing | Adj. Unit Price | Land Value |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 5-2 | VACANT COM | C20 | | | 0.46 | AC | 139,040.00 | 1.7887 | 6 | 1.0000 | 1.00 | 7 | 1.80 | | N | 1.000 | | | 205,900 |
| 1 | 5-2 | VACANT COM | | | | 4.67 | AC | 20,000.00 | 1.0000 | 0 | 1.0000 | 2.00 | | 0.00 | in use | N | 1.000 | | | 186,800 |
| | | Total Card Land Units: | | | | 5.13 | AC | Parcel Total Land Area: | | 5.13 AC | | | | | | | | | Total Land Value: | 392,700 |

**Property Location: 52 LIBRARY STREET** **MAP ID: 54/ / 89/ /** **Bldg Name:** **State Use: 5-2**

**Vision ID: 2652** **Account #98103071** **Bldg #: 1 of 1** **Sec #: 1 of 1** **Card 1 of 1** **Print Date: 09/16/2016 13:30**

## CONSTRUCTION DETAIL

| Element | Cd. | Ch. | Description |
|---|---|---|---|
| Model | 00 | | Vacant |

## CONSTRUCTION DETAIL (CONTINUED)

| Element | Cd. | Ch. | Description |
|---|---|---|---|
| | | | |

## MIXED USE

| Code | Description | Percentage |
|---|---|---|
| 5-2 | VACANT COM | 100 |

## COST/MARKET VALUATION

| | |
|---|---|
| Adj. Base Rate: | 0.00 |
| Replace Cost | 0 |
| AYB | |
| Dep Code | |
| Remodel Rating | |
| Year Remodeled | |
| Dep % | |
| Functional Obsinc | |
| External Obsinc | |
| Cost Trend Factor | |
| Condition | |
| % Complete | |
| Overall % Cond | |
| Apprais Val | |
| Dep % Ovr | 0 |
| Dep Ovr Comment | |
| Misc Imp Ovr | 0 |
| Misc Imp Ovr Comment | |
| Cost to Cure Ovr | 0 |
| Cost to Cure Ovr Comment | |

## OB-OUTBUILDING & YARD ITEMS(L) / XF-BUILDING EXTRA FEATURES(B)

| Code | Description | Sub | Sub Descript | L/B | Units | Unit Price | Yr | Gde | Dp Rt | Cnd | %Cnd | Apr Value |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FGR1 | Garage | | | L | 7,260 | 25.00 | 1982 | | 1 | | 50 | 30,900 |
| SHP2 | Work Shop Gd | | | L | 400 | 20.00 | 1982 | | 1 | | 100 | 5,400 |
| FGR1 | Garage | | | L | 8,400 | 25.00 | 2001 | | 1 | | 70 | 117,600 |
| SHD2 | Shed aver | | | L | 2,960 | 16.00 | 1975 | | 1 | | 75 | 16,600 |
| SHD2 | Shed aver | | | L | 12,420 | 16.00 | 2000 | | 1 | | 100 | 168,900 |
| FGR1 | Garage | | | L | 1,160 | 25.00 | 1987 | | 1 | | 100 | 20,900 |
| SHD1 | Shed fair | | | L | 600 | 10.00 | 1940 | | 1 | | 75 | 0 |

## BUILDING SUB-AREA SUMMARY SECTION

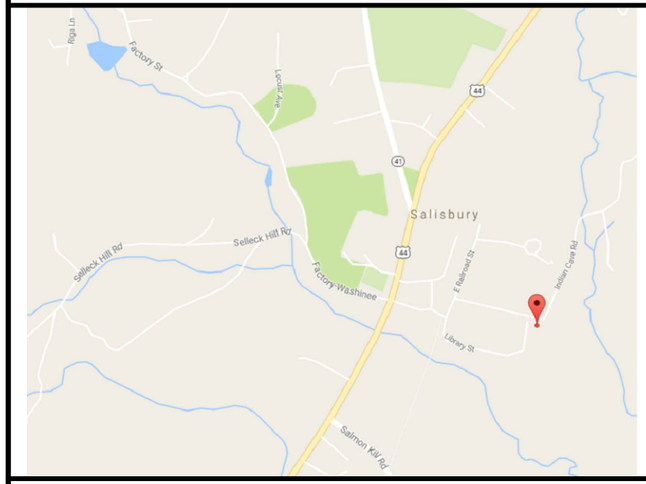
| Code | Description | Living Area | Gross Area | Eff. Area | Unit Cost | Undeprec. Value |
|---|---|---|---|---|---|---|
| | | | | | | |
| | Ttl. Gross Liv/Lease Area: | 0 | 0 | | | |

# Exhibit C

## GENERAL NOTES

1. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES. SUBCONTRACTORS SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS, AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK.
2. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.
3. UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES, AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
4. THE SUBCONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
5. IF THE SPECIFIED EQUIPMENT CANNOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE SUBCONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION SPACE FOR APPROVAL BY THE CONTRACTOR.
6. THE SUBCONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY. ANTENNAS REMOVED SHALL BE RETURNED TO THE OWNER'S DESIGNATED LOCATION.
7. THE SUBCONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION.
8. SUBCONTRACTOR SHALL VERIFY ALL EXISTING DIMENSIONS AND CONDITIONS PRIOR TO COMMENCING ANY WORK. ALL DIMENSIONS OF EXISTING CONSTRUCTION SHOWN ON THE DRAWING MUST BE VERIFIED. SUBCONTRACTOR SHALL NOTIFY THE CONTRACTOR OF ANY DISCREPANCIES PRIOR TO ORDERING MATERIAL OR PROCEEDING WITH CONSTRUCTION.
9. ALL SAFETY PRECAUTIONS MUCH BE TAKEN WHEN WORKING AROUND HIGH LEVELS OF ELECTROMAGNETIC RADIATION. EQUIPMENT SHOULD BE SHUTDOWN PRIOR TO PERFORMING ANY WORK THAT COULD EXPOSE THE WORKERS TO DANGER. PERSONAL RF EXPOSURE MONITORS ARE ADVISED TO BE WORN TO ALERT OF ANY DANGEROUS EXPOSURE LEVELS.

## LOCATION MAP




## HANDICAP REQUIREMENTS

FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION. HANDICAP ACCESS IS NOT REQUIRED.

## PLUMBING REQUIREMENTS

FACILITY HAS NO SANITARY OR POTABLE WATER

# T-Mobile

2016 INFILL/ROB/GREENFIELD

T-MOBILE SITE NUMBER

# CTNH547A

## 150' MONOPOLE

ATC SITE NUMBER

370630

SITE ADDRESS

52 LIBRARY ST.
SALISBURY, CT 06068

CONFIGURATION 707C

## SITE SUMMARY

| | |
|---|---|
| SITE TYPE: | PROPOSED EQUIPMENT INSTALLATION |
| TECHNOLOGY TYPE: | U1900/L2100/L700 |
| SITE ADDRESS: | 52 LIBRARY ST.<br>SALISBURY, CT 06068 |
| SITE LATITUDE: | 41.98080000 |
| SITE LONGITUDE: | −73.41830000 |
| JURISDICTION: | TOWN OF SALISBURY |
| POWER COMPANY: | EVERSOURCE |
| TELEPHONE COMPANY: | AT&T |
| TOWER OWNER: | AMERICAN TOWER<br>116 HUNTINGTON AVE, 11TH FLOOR<br>BOSTON, MA 02116<br>CONTACT: CUSTOMER SERVICE<br>PHONE: 877−518−6937 |
| TOWER MANAGER: | NORTHEAST SITE SOLUTIONS, LLC<br>199 BRICKYARD ROAD<br>FARMINGTON, CT 06032<br>SHELDON FREINCLE<br>(201) 776−8521 |
| WIRELESS CARRIER: | T−MOBILE<br>35 GRIFFIN RD S<br>BLOOMFIELD, CT 06002<br>OFFICE: 860−692−7100<br>FAX: 860−692−7159 |
| ENGINEER: | SMW ENGINEERING<br>158 BUSINESS CENTER DRIVE<br>BIRMINGHAM, AL 35244<br>CONTACT: V.G. DUVALL, JR., PE<br>PHONE: 205−252−6985 |

## BUILDING CODES

ALL CONSTRUCTION SHALL COMPLY WITH THE LATEST EDITION OF THE (AS ADOPTED BY LOCAL JURISDICTION):

- 2016 CONNECTICUT BUILDING CODE
- 2012 INTERNATIONAL BUILDING CODE W/AMENDMENTS
- 2009 ICC/ANSI A117.1 W/AMENDMENTS
- 2012 INTERNATIONAL EXISTING BUILDING CODE W/AMENDMENTS
- 2012 INTERNATIONAL PLUMBING CODE WITH AMENDMENTS
- 2012 INTERNATIONAL MECHANICAL CODE W/AMENDMENTS
- 2012 INTERNATIONAL ENERGY CONSERVATION CODE W/AMENDMENTS
- 2014 NFPA 70, NATIONAL ELECTRICAL CODE W/AMENDMENTS
- 2012 INTERNATIONAL RESIDENTIAL CODE W/AMENDMENTS

## CALL BEFORE YOU DIG

811 Know what's below. Call before you dig.

CONNECTICUT CALL BEFORE YOU DIG
STATE WIDE
1−800−922−4455 OR 811
HTTP://WWW.CBYD.COM/#

## APPROVALS

| DEPARTMENT | NAME/SIGNATURE | DATE |
|---|---|---|
| DEVELOPMENT MANAGER | | |
| PROPERTY/TOWER OWNER | | |
| SITE ACQUISITION MANAGER | | |
| CONSTRUCTION MANAGER | | |
| RF ENGINEER | | |
| OPERATIONS MANAGER | | |

## PROJECT SCOPE

THE PROPOSED PROJECT SCOPE WILL CONSIST OF CONSTRUCTING A NEW TELECOMMUNICATIONS BASE STATION INSTALLATION ON AN EXISTING TOWER SITE. THE PROPOSED CONSTRUCTION WILL INCLUDE THE INSTALLATION OF ANTENNA, RADIOS, CABLES AND RELATED EQUIPMENT ON THE TOWER AS WELL AS THE RADIOS, CABINETS, UTILITIES AND ANCILLARY EQUIPMENT ON THE GROUND.

## SHEET INDEX




T-Mobile
35 GRIFFIN RD S
BLOOMFIELD, CT 06002
OFFICE: 860−692−7100
FAX: 860−692−7159

PLANS PREPARED BY:
NSS NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development
NORTHEAST SITE SOLUTIONS, LLC
199 BRICKYARD ROAD
FARMINGTON CT 06032
(860) 677−1999

SMW ENGINEERING GROUP, INC.
TOGETHER PLANNING A BETTER TOMORROW


*PRELIMINARY DRAWING*

*(NOT VALID UNLESS STAMPED AND SIGNED)*

SITE INFORMATION:

CTNH547A
52 LIBRARY ST.
SALISBURY, CT 06068

| # | DATE | DESCRIPTION: |
|---|---|---|
| 0 | 10/21/16 | ISSUED FOR CLIENT REV. |

| T-MOBILE SITE ID: | ATC SITE ID: |
|---|---|
| CTNH547A | 370630 |

SHEET NAME:

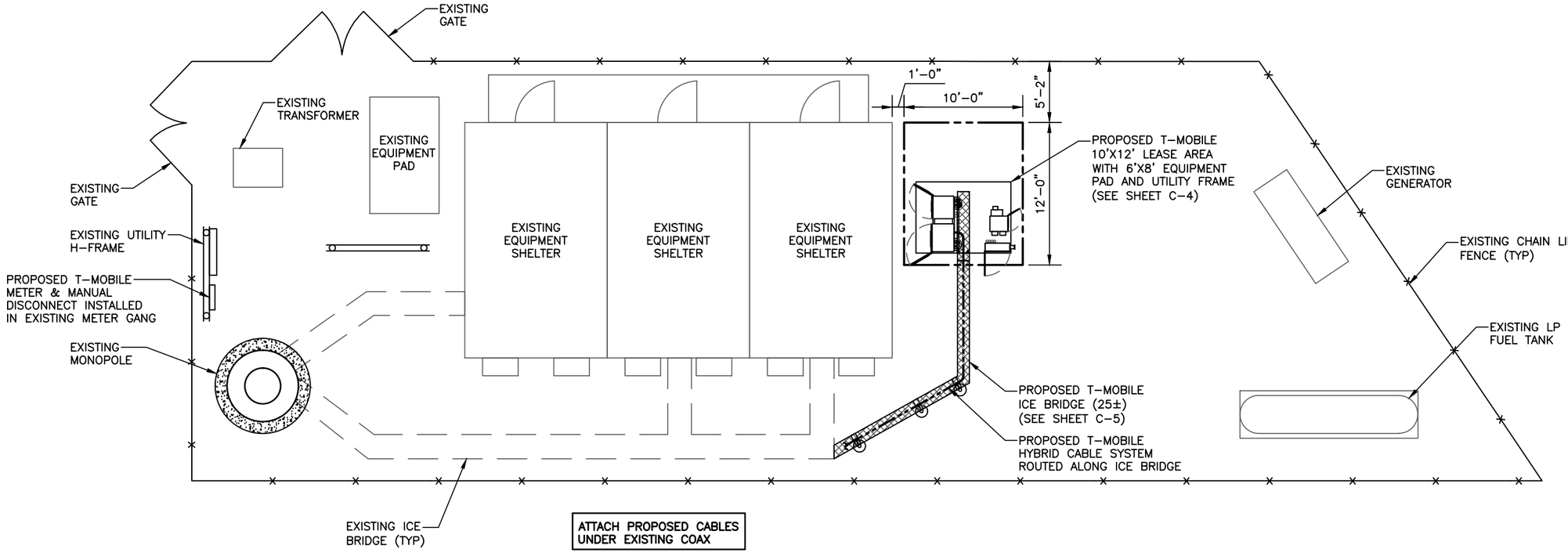
TITLE SHEET

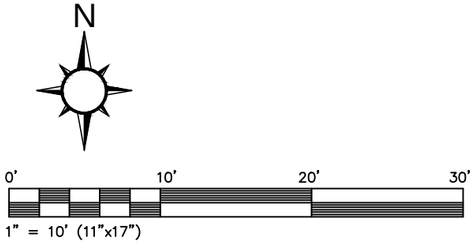
| SMW #: | SHEET NUMBER: |
|---|---|
| 16−2561 | T-1 |
| DESIGNER: BMD | |
| CHECKED BY: RTB | |
| ENGINEER: JDS | |

SUBJECT PROPERTY IS LOCATED IN PANEL # 0900520016B, DATED (JANUARY 5, 1989) AND IS IN THE BASE FLOOD ZONE "X" AND IS NOT IN A SPECIAL FLOOD HAZARD AREA.

UTILITY NOTE:
THERE ARE NOT ANY EXISTING STORM OR SANITARY SEWER LINES OR BURIED UTILITIES ON THE PARENT TRACK WITHIN THE VICINITY OF THE PROPOSED CONSTRUCTION.

NOTE TO CONTRACTORS:
DIGGING AND/OR TRENCHING INSIDE COMPOUND, MUST BE DONE BY HAND.




1/C-1 OVERALL SITE PLAN
SCALE: 1" = 10'

T-Mobile
35 GRIFFIN RD S
BLOOMFIELD, CT 06002
OFFICE: 860-692-7100
FAX: 860-692-7159

PLANS PREPARED BY:
NSS NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development
NORTHEAST SITE SOLUTIONS, LLC
199 BRICKYARD ROAD
FARMINGTON CT 06032
(860) 677-1999

SMW ENGINEERING GROUP, INC.
TOGETHER PLANNING A BETTER TOMORROW

PRELIMINARY DRAWING
*(NOT VALID UNLESS STAMPED AND SIGNED)*

SITE INFORMATION:
CTNH547A
52 LIBRARY ST.
SALISBURY, CT 06068

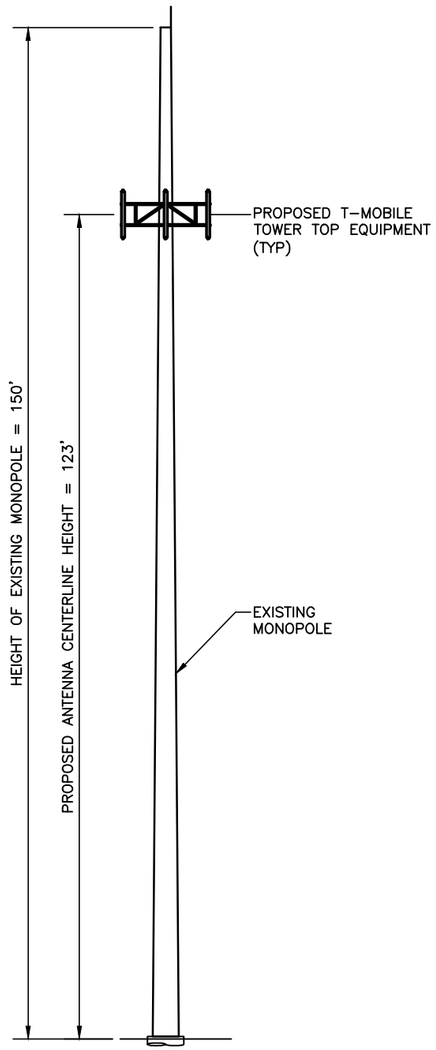
| # | DATE | DESCRIPTION: |
|---|---|---|
| 0 | 10/21/16 | ISSUED FOR CLIENT REV. |
| | | |
| | | |
| | | |
| | | |

| T-MOBILE SITE ID: | ATC SITE ID: |
|---|---|
| CTNH547A | 370630 |

SHEET NAME:
OVERALL SITE PLAN

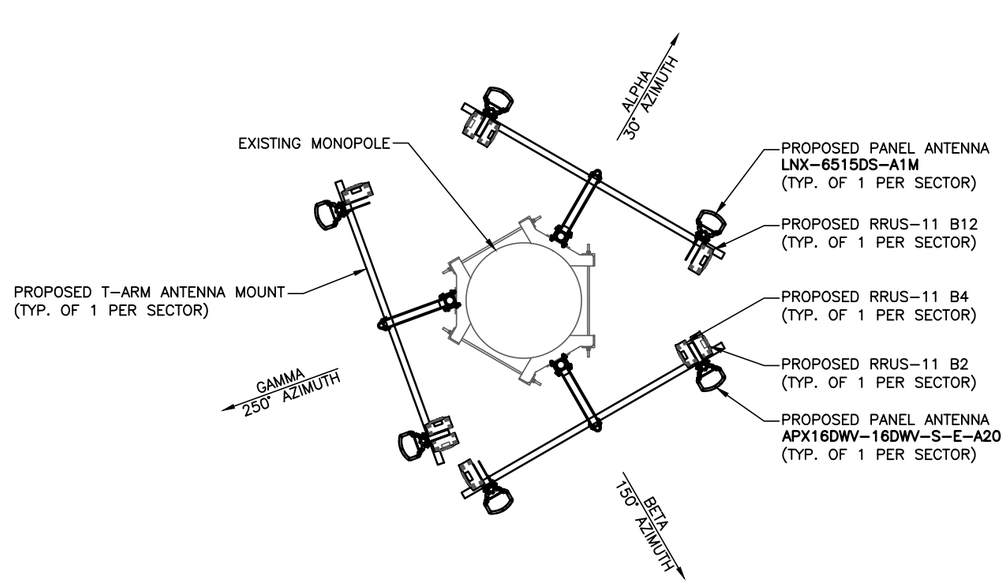
| SMW #: | SHEET NUMBER: |
|---|---|
| 16-2561 | C-1 |

| | |
|---|---|
| DESIGNER: | BMD |
| CHECKED BY: | RTB |
| ENGINEER: | JDS |

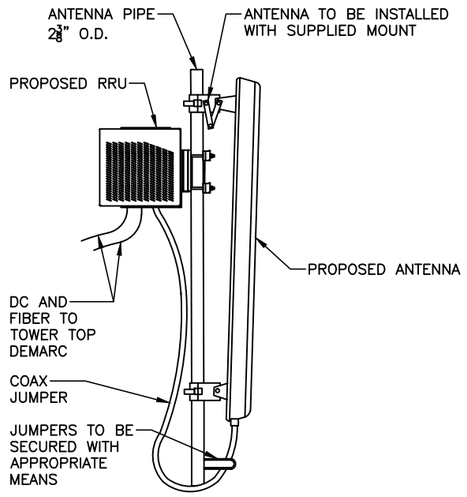



NOTES:
1. SMW HAS NOT PERFORMED A STRUCTURAL ANALYSIS OF THE EXISTING TOWER OR PROPOSED ANTENNA MOUNT. REFER TO STRUCTURAL ANALYSIS OR STRUCTURAL LETTER BY OTHERS FOR ADDITIONAL INFORMATION.
2. IF THE TOWER STRUCTURAL ANALYSIS SHOWS THE NEED FOR TOWER REINFORCEMENT REFER TO TOWER REINFORCEMENT DESIGN PRIOR TO THE INSTALLATION OF ANY PROPOSED EQUIPMENT.
3. REFER TO TOWER STRUCTURAL ANALYSIS FOR PROPOSED CABLE ROUTING AND ATTACHMENT DETAILS.
4. TOWER ELEVATION SHOWN IS NOT DRAWN TO SCALE AND IS INTENDED ONLY FOR REFERENCE PURPOSES. REFER TO ORIGINAL TOWER DESIGN FOR ADDITIONAL INFORMATION.

1 / C-2 TOWER ELEVATION
NOT TO SCALE




2 / C-2 PROPOSED ANTENNA ORIENTATION PLAN
NOT TO SCALE




3 / C-2 ANTENNA MOUNT DETAIL
NOT TO SCALE

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FAX: 860-692-7159

PLANS PREPARED BY:
NSS NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development
NORTHEAST SITE SOLUTIONS, LLC
199 BRICKYARD ROAD
FARMINGTON CT 06032
(860) 677-1999

SMW ENGINEERING GROUP, INC.
TOGETHER PLANNING A BETTER TOMORROW

**PRELIMINARY DRAWING**
*(NOT VALID UNLESS STAMPED AND SIGNED)*

SITE INFORMATION:
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T-MOBILE SITE ID: CTNH547A
ATC SITE ID: 370630

SHEET NAME:
TOWER ELEVATION & ANTENNA PLAN

SMW #: 16-2561

| | |
|---|---|
| DESIGNER: | BMD |
| CHECKED BY: | RTB |
| ENGINEER: | JDS |

SHEET NUMBER: C-2

| 707C_TOWER_1QP_1DP / U1900/L2100/L700 – TOWER TOP EQUIPMENT SCHEDULE | | | | | | | |
|---|---|---|---|---|---|---|---|
| ANTENNA SECTOR | ANTENNA MARK | ANTENNA AZIMUTH | ANTENNA MODEL | RRU MODEL | TMA MODEL | TOWER TOP COVP MODEL | ANTENNA CABLE DESCRIPTION |
| ALPHA | A1 | 30° | APX16DWV-16DWV-S-E-A20 (QUAD) | (1) RRUS-11 B2 (P)<br>(1) RRUS-11 B4 (P) | -- | -- | (1) 1 5/8" HYBRID CABLE SYSTEM (P) |
| | A2 | 30° | -- | -- | -- | -- | -- |
| | A3 | 30° | LNX-6515DS-A1M (DUAL) | (1) RRUS-11 B12 (P) | -- | -- | -- |
| BETA | B1 | 150° | APX16DWV-16DWV-S-E-A20 (QUAD) | (1) RRUS-11 B2 (P)<br>(1) RRUS-11 B4 (P) | -- | -- | (1) 1 5/8" HYBRID CABLE SYSTEM (R) |
| | B2 | 150° | -- | -- | -- | -- | -- |
| | B3 | 150° | LNX-6515DS-A1M (DUAL) | (1) RRUS-11 B12 (P) | -- | -- | -- |
| GAMMA | C1 | 250° | APX16DWV-16DWV-S-E-A20 (QUAD) | (1) RRUS-11 B2 (P)<br>(1) RRUS-11 B4 (P) | -- | -- | -- |
| | C2 | 250° | -- | -- | -- | -- | -- |
| | C3 | 250° | LNX-6515DS-A1M (DUAL) | (1) RRUS-11 B12 (P) | -- | -- | -- |

NOTE:
(P) DENOTES PROPOSED EQUIPMENT
(R) DENOTES RESERVED EQUIPMENT
(E) DENOTES EXISTING EQUIPMENT

NOTE:
1. THE HYBRID CABLE LENGTH SHOWN IS ONLY AN ESTIMATE AND SHOULD NOT BE USED FOR ORDERING MATERIALS. CONFIRM THE REQUIRED HYBRID CABLE LENGTH WITH T-MOBILE PRIOR TO ORDERING OR INSTALLATION.
2. THE CONTRACTOR SHALL TEST THE OPTICAL FIBER AFTER INSTALLATION IN ACCORDANCE WITH T-MOBILE STANDARDS AND SUPPLY THE RESULTS TO T-MOBILE.
3. THE CONTRACTOR SHALL CONFIRM THE TOWER TOP EQUIPMENT LIST ABOVE WITH THE FINAL T-MOBILE RFDS PRIOR TO INSTALLATION.
4. ALL EXISTING AND PROPOSED ANTENNA CABLES SHALL BE COLOR CODED PER T-MOBILE MARKET STANDARDS.
5. REFER MANUFACTURERS INSTALLATION STANDARDS FOR ADDITIONAL INFORMATION.
6. REFER TO EQUIPMENT MANUFACTURER'S SPECIFICATION SHEETS FOR ADDITIONAL INFORMATION NOT LISTED ABOVE.

| TOWER LOADING SUMMARY | | |
|---|---|---|
| EQUIPMENT TYPE | ADD QUANITY | TOTAL QUANITY |
| PANEL ANTENNA | 6 | 6 |
| COAX CABLE | 0 | 0 |
| RRUS | 9 | 9 |
| HYBRID CABLE | 2 | 2 |
| COVP | 0 | 0 |

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T-MOBILE SITE ID: CTNH547A
ATC SITE ID: 370630

SHEET NAME:
TOWER TOP EQUIPMENT SCHEDULE

SMW #: 16-2561

| | |
|---|---|
| DESIGNER: | BMD |
| CHECKED BY: | RTB |
| ENGINEER: | JDS |

SHEET NUMBER: C-3

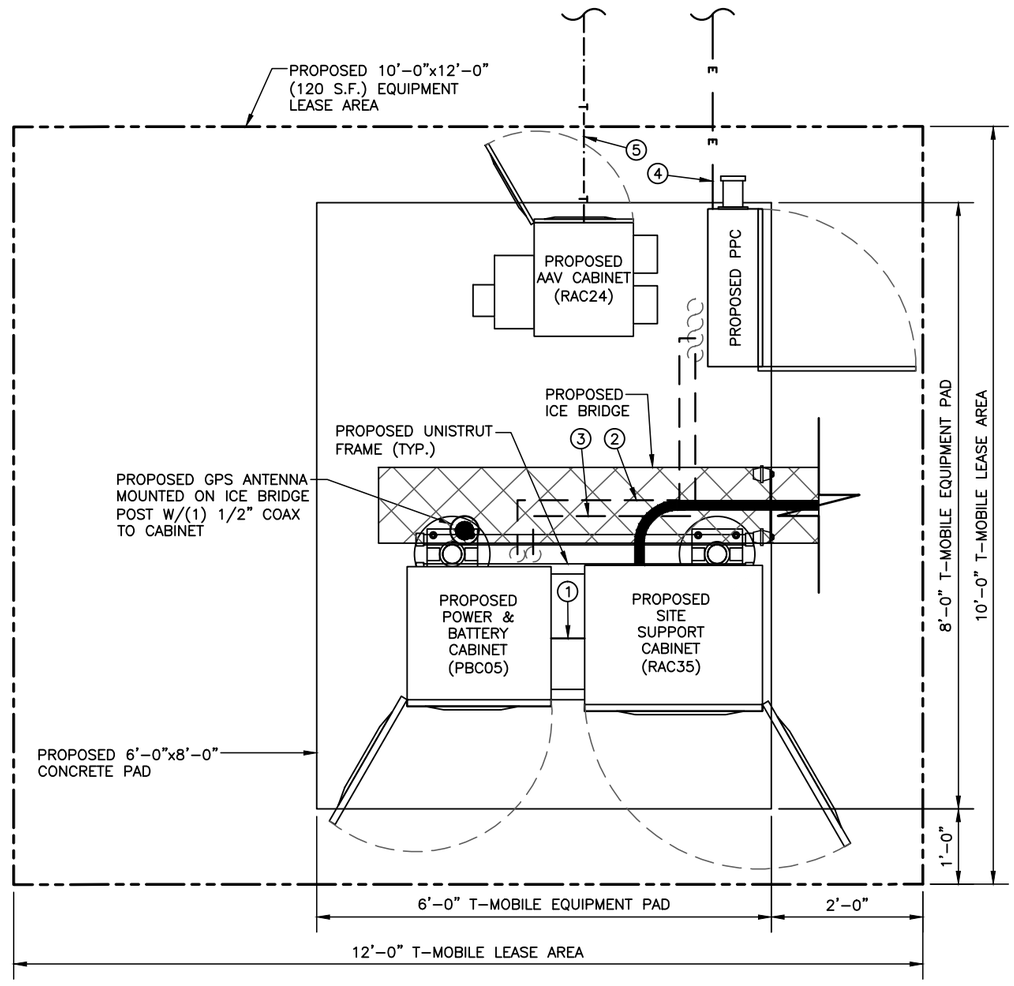
① 2"ø CONDUIT (ABOVE SLAB)

② 2"ø U/G CONDUIT (UNDER CONCRETE) FROM PROPOSED PPC TO PROPOSED PBC CABINETS

③ 2"ø U/G CONDUIT (UNDER CONCRETE) FROM PROPOSED PPC DAISY-CHAINING SSC CAGINETS

④ 2"ø PVC CONDUIT WITH (3) 3/0 + #4G FROM PROPOSED METER TO PPC CABINET. COORDINATE WITH THE LOCAL UTILITY COMPANY REGARDING FINAL SERVICE CONNECTION.

⑤ 2"ø PVC CONDUIT WITH PULLSTRING FOR TELCO FROM PROPOSED AAV CABINET TO EXISTING TELCO SERVICE. COORDINATE WITH THE LOCAL UTILITY COMPANY REGARDING FINAL SERVICE CONNECTION.




N

0' 2' 4' 6'

1" = 2' (11"x17")

1 / C-4 GROUND EQUIPMENT DETAIL
SCALE: 1" = 2'

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T-MOBILE SITE ID: CTNH547A

ATC SITE ID: 370630

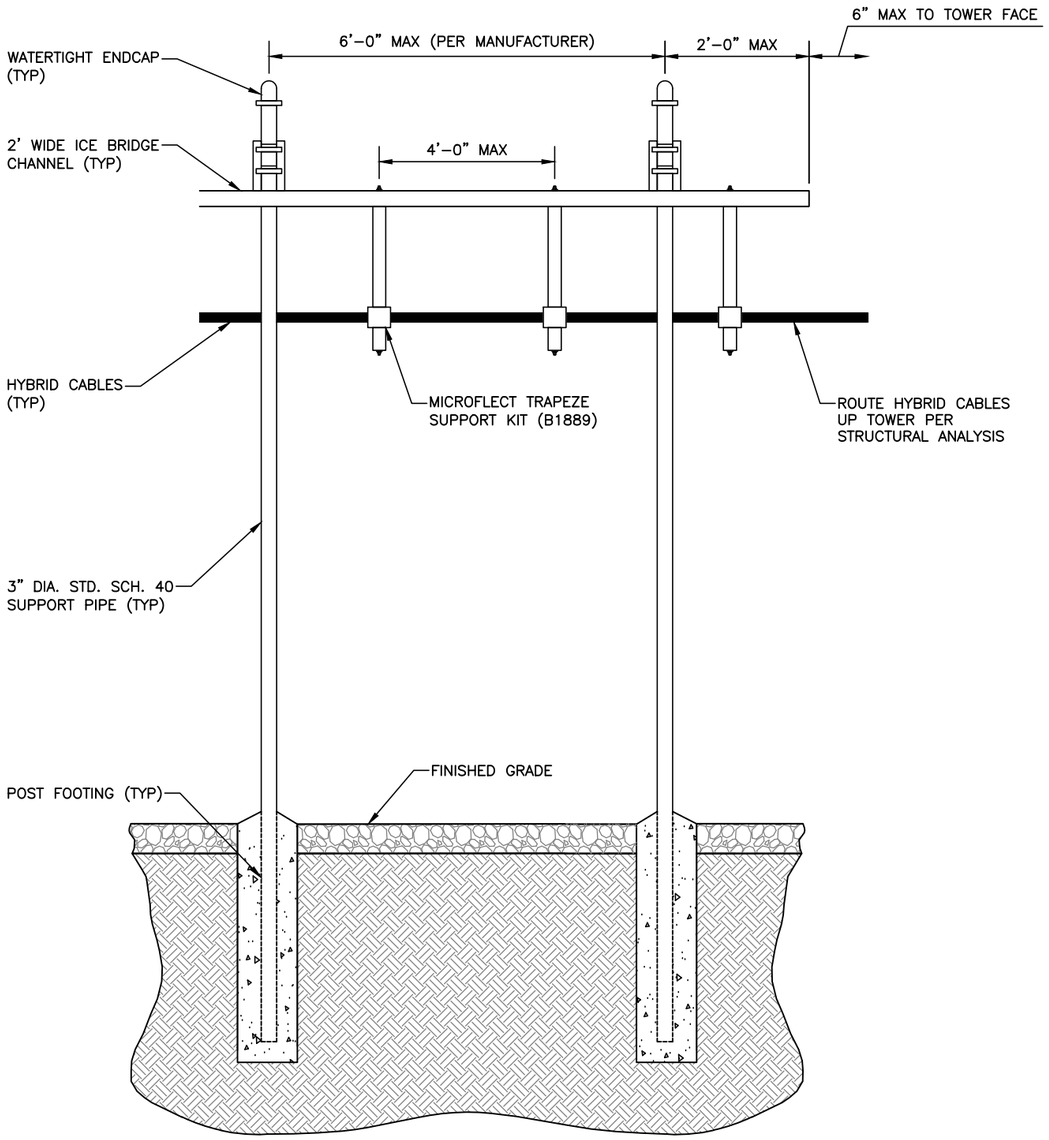
SHEET NAME:

GROUND EQUIPMENT DETAIL

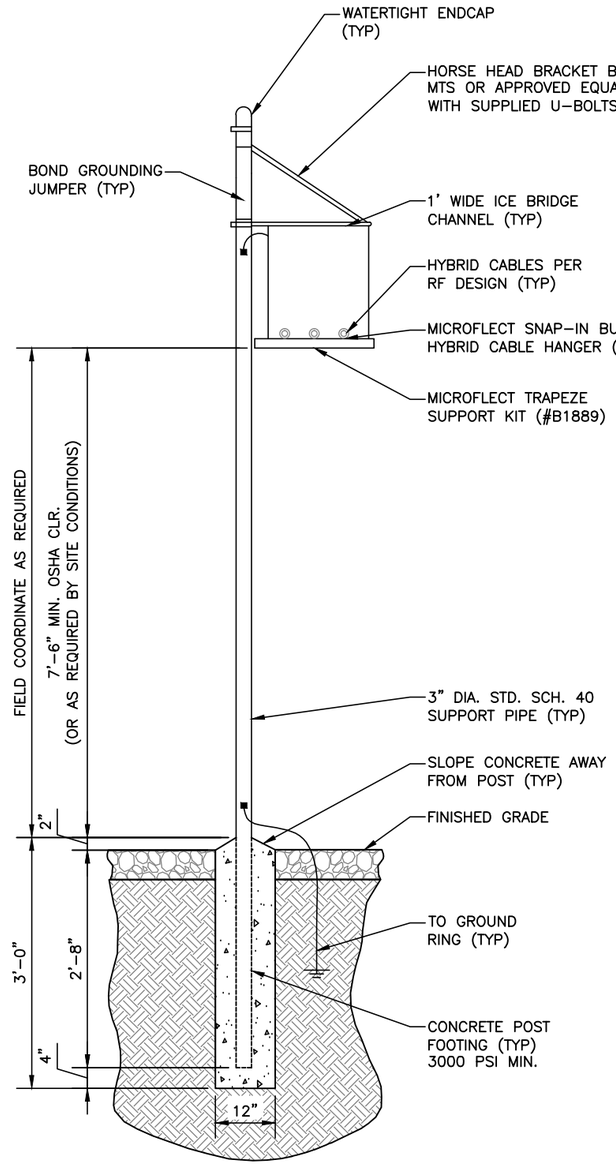
SMW #: 16-2561

| | |
|---|---|
| DESIGNER: | BMD |
| CHECKED BY: | RTB |
| ENGINEER: | JDS |

SHEET NUMBER: C-4




1 C-5 ICE BRIDGE ELEVATION
NOT TO SCALE




2 C-5 ICE BRIDGE SECTION (WITH 1 SUPPORT POST)
NOT TO SCALE

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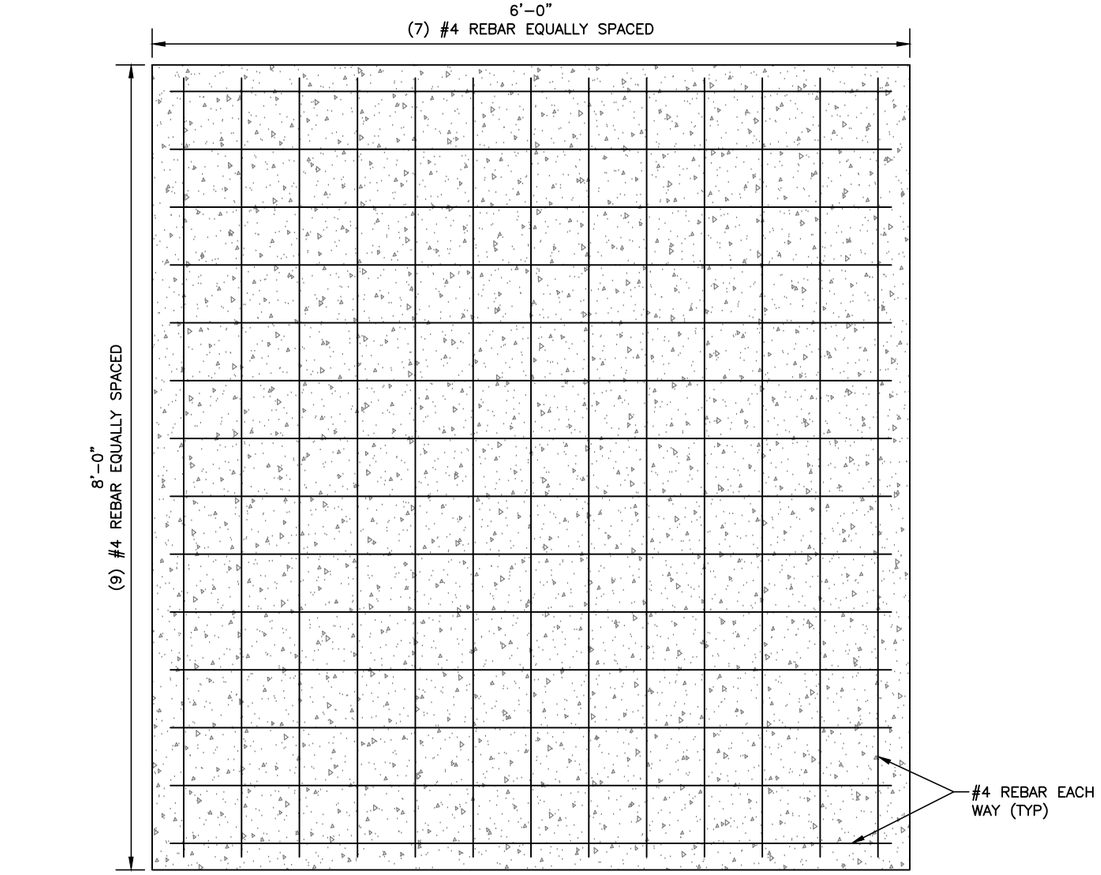
T-MOBILE SITE ID: CTNH547A
ATC SITE ID: 370630

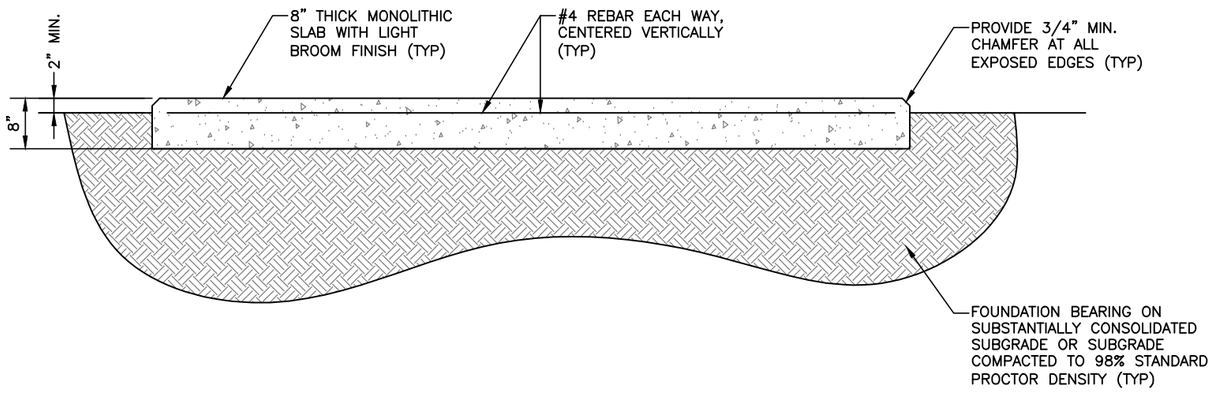
SHEET NAME:
ICE BRIDGE DETAILS

SMW #: 16-2561

| | |
|---|---|
| DESIGNER: | BMD |
| CHECKED BY: | RTB |
| ENGINEER: | JDS |

SHEET NUMBER: C-5




1 / C-6 MONOLITHIC EQUIPMENT SLAB DETAIL
NOT TO SCALE

REINFORCED CONCRETE NOTES:

1. ALL CONCRETE WORK SHALL BE IN ACCORDANCE WITH THE ACI SPECIFICATIONS FOR THE DESIGN & CONSTRUCTION OF CAST-IN-PLACE CONCRETE, AND WHERE CODES CONFLICT THE MORE STRINGENT NATIONAL OR LOCAL CODE SHALL GOVERN.

2. SITECAST CONCRETE FOR SLABS AND POST FOOTINGS SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI AT 28 DAYS. CONCRETE TESTING IS NOT REQUIRED FOR SLABS AND POST FOOTINGS UNLESS NOTED OTHERWISE.

   SLUMP – 4" MIN. / 6" MAX.
   AIR ENTRAINMENT – 2% TO 3% BY VOLUME

| CLASSES OF CONCRETE | | | | |
|---|---|---|---|---|
| CLASS | 28 DAY STRENGTH (PSI) | MAX WATER/CEMENT RATIO | PLACEMENT LOCATION | NOTES |
| TYPE I | 3000 | 0.55 | SLABS & POST FOOTINGS | NORMAL WEIGHT |
| TYPE II* | 5000 | 0.45 | SLABS & POST FOOTINGS | HIGH EARLY STRENGTH |

   *IF REQUIRED BY THE CONSTRUCTION SCHEDULE THE CONTRACTOR MAY SUBSTITUTE TYPE III HIGH EARLY STRENGTH CONCRETE WITH THE APPROVAL OF THE CONSTRUCTION MANAGER.

3. REINFORCING STEEL SHALL CONFORM TO ASTM A 615, GRADE 60, DEFORMED UNLESS NOTED OTHERWISE. WELDED WIRE FABRIC SHALL CONFORM TO ASTM A185 WELDED STEEL WIRE FABRIC UNLESS NOTED OTHERWISE. SPLICES FOR REBAR SHALL BE CLASS "B" AND ALL HOOKS SHALL BE STANDARD, UNO. LAPS FOR WELDED WIRE FABRIC SHALL BE AST LEAST 8", UNO.

4. THE FOLLOWING MINIMUM CONCRETE COVER SHALL BE PROVIDED FOR REINFORCING STEEL UNLESS SHOWN OTHERWISE ON DRAWINGS:

   CONCRETE CAST AGAINST EARTH.....3"
   CONCRETE EXPOSED TO EARTH OR WEATHER
   #6 AND LARGER.....2"
   #5 AND SMALLER & W.W.F.....1-1/2"

5. MAXIMUM COARSE AGGREGATE SIZE SHALL BE 3/4"

6. INSTALLATION OF CONCRETE ANCHORS SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S WRITTEN SPECIFICATIONS. THE ANCHOR BOLT, DOWEL, OR ROD SHALL CONFORM TO THE ANCHOR MANUFACTURER'S SPECIFICATIONS FOR MATERIAL STRENGTH, EMBEDMENT DEPTH, SPACING, AND EDGE DISTANCE OR AS DETAILED ON THE DRAWINGS. NO REBAR SHALL BE CUT WITHOUT PRIOR ENGINEERING APPROVAL WHEN DRILLING HOLES IN CONCRETE. EXPANSION BOLTS SHALL BE PROVIDED BY RAMSET/REDHEAD, HILTI, OR APPROVED EQUAL. IF THE MANUFACTURER'S SPECIFICATIONS AND DETAILS ARE FOUND TO CONFLICT WITH THAT SHOWN HEREIN, THE ENGINEER SHAL LBE NOTIFIED IMMEDIATELY.

7. THE CONTRACTOR SHALL VERIFY FROST LINE AND FOOTING DEPTH REQUIREMENTS WITH THE JURISDICTION HAVING AUTHORITY PRIOR TO CONSTRUCTION AND CONSULT THE ENGINEER ACCORDINGLY.

8. THE CONTRACTOR SHALL VERIFY ALL ELECTRICAL CONDUIT SIZES AND PENETRATION LOCATIONS PRIOR TO POURING THE SLAB.

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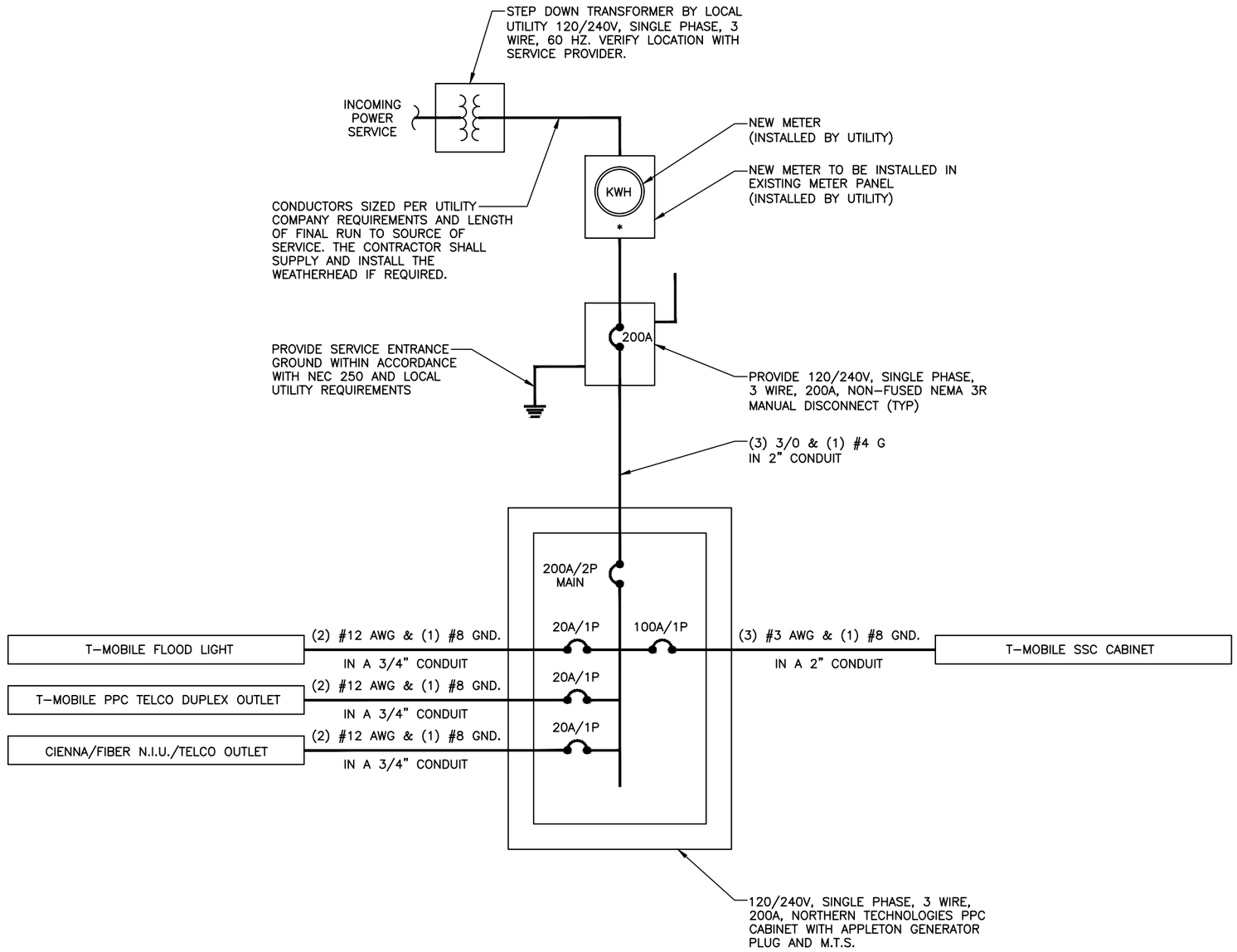
T-MOBILE SITE ID: CTNH547A
ATC SITE ID: 370630

SHEET NAME:
FOUNDATION DETAILS & NOTES

SMW #: 16-2561

| | |
|---|---|
| DESIGNER: | BMD |
| CHECKED BY: | RTB |
| ENGINEER: | JDS |

SHEET NUMBER: C-6




1 / E-1 ONE-LINE DIAGRAM
NOT TO SCALE

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T-MOBILE SITE ID: CTNH547A
ATC SITE ID: 370630

SHEET NAME: ONE-LINE DIAGRAM

SMW #: 16-2561

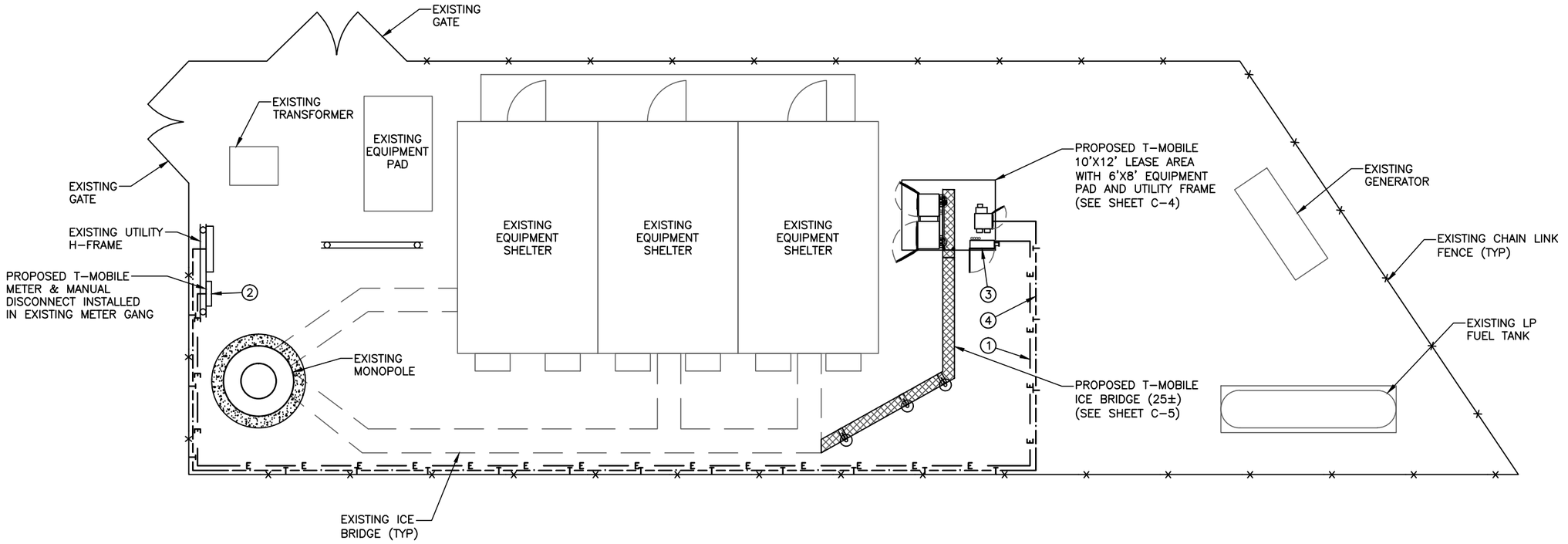
| | |
|---|---|
| DESIGNER: | BMD |
| CHECKED BY: | RTB |
| ENGINEER: | JDS |

SHEET NUMBER: E-1

ELECTRICAL KEY NOTES:

1. PROPOSED 2" PVC CONDUIT WITH (3) 3/0 + #4G FROM PROPOSED METER TO PPC CABINET. COORDINATE WITH THE LOCAL UTILITY COMPANY REGARDING FINAL SERVICE CONNECTION.
2. PROPOSED METER & 200A MANUAL DISCONNECT. COORDINATE WITH LOCAL UTILITY COMPANY REGARDING FINAL SERVICE CONNECTION.
3. PROPOSED 200A NORTHERN TECHNOLOGIES PPC CABINET WITH INTEGRATED 200A APPLETON GENERATOR BACKUP PLUG.
4. PROPOSED 2" PVC CONDUIT WITH PULLSTRING FOR TELCO FROM PROPOSED AAV CABINET TO EXISTING TELCO SERVICE. COORDINATE WITH THE LOCAL UTILITY COMPANY REGARDING FINAL SERVICE CONNECTION.

REFER TO C-4 FOR EQUIPMENT UTILITY PLAN




N

0' 10' 20' 30'

1" = 10' (11"x17")

1/E-2 ELECTRICAL UTILITY PLAN
SCALE: 1" = 10'

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T-MOBILE SITE ID: CTNH547A
ATC SITE ID: 370630

SHEET NAME:
ELECTRICAL UTILITY PLAN

SMW #: 16-2561

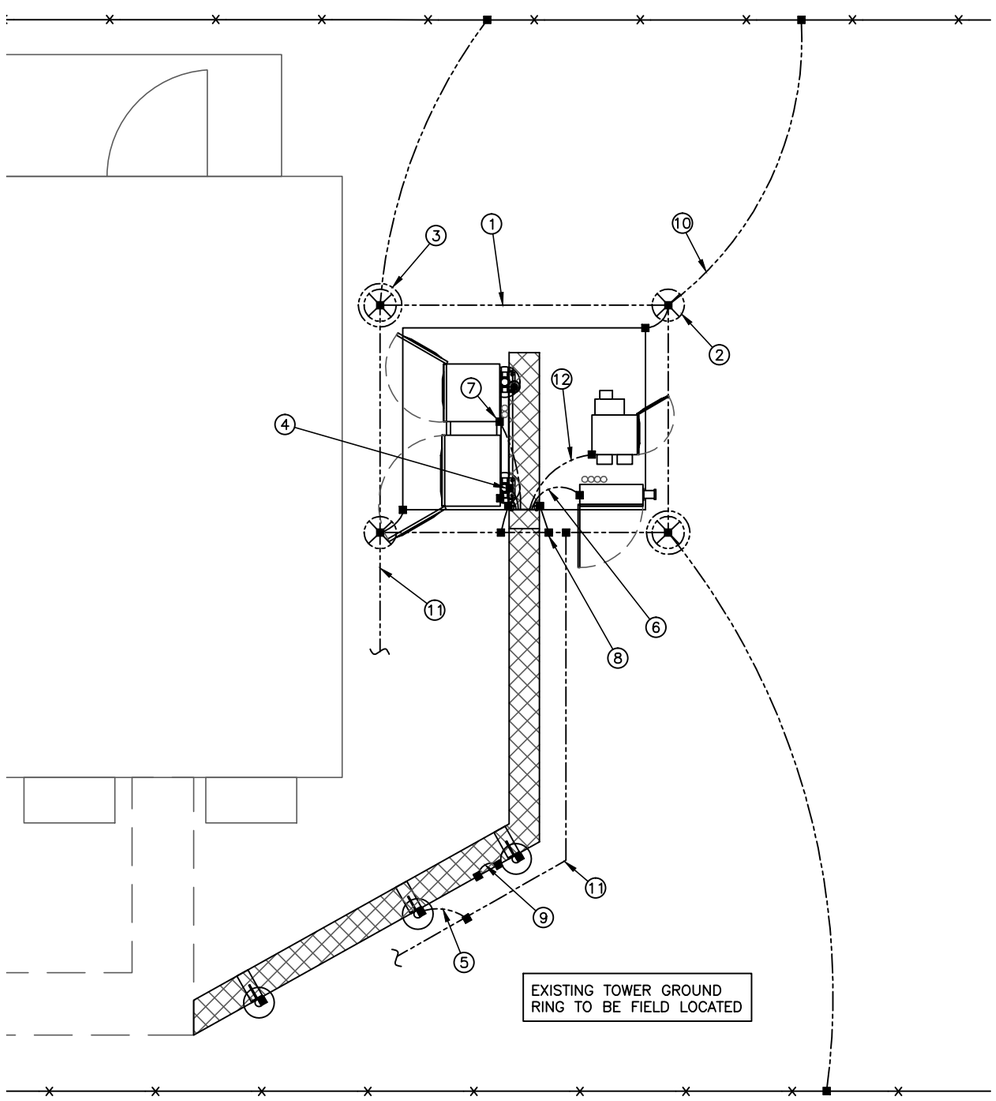
| | |
|---|---|
| DESIGNER: | BMD |
| CHECKED BY: | RTB |
| ENGINEER: | JDS |

SHEET NUMBER: E-2

GROUNDING KEY NOTES:

1. PROPOSED #2 BARE TINNED SOLID COPPER GROUND RING (TYP)
2. PROPOSED 5/8" DIA. X 8' LONG STEEL SHAFT COPPER CLAD GROUND ROD (TYP)
3. PROPOSED GROUND ROD WITH COVERED PVC TEST WELL (TYP)
4. GROUND PROPOSED UTILITY FRAME POST WITH CADWELD CONNECTION TO BASE PLATE (TYP)
5. GROUND PROPOSED ICE BRIDGE POST WITH CADWELD CONNECTION TO BASE (TYP)
6. GROUND PROPOSED PPC POWER PANEL PER NEC 250 AND LOCAL UTILITY REQUIREMENTS (TYP)
7. GROUND PROPOSED SSC CABINET MAIN GROUND BAR WITH 2–HOLE LUG CONNECTION (TYP)
8. PROVIDE 12 POSITION MAIN EQUIPMENT COLLECTOR GROUND BAR ATTACHED TO UNISTRUT FRAME WITH STANDOFF INSULATORS, GROUND WITH (2) CADWELDED CONNECTIONS, 1 PER SITE (TYP)
9. GROUND ICE BRIDGE CHANNEL SECTIONS WITH 2–HOLE LUG CONNECTION. BOND ADJOINING CHANNEL SECTIONS TOGETHER WITH 2–HOLE LUG JUMPERS (TYP)
10. GROUND TO ALL METALLIC OBJECTS WITHIN 6' OF THE PROPOSED EQUIPMENT AND BURIED GROUND RING (TYP)
11. GROUND PROPOSED T–MOBILE BURIED EQUIPMENT GROUND RING TO EXISTING SITE GROUND RING. CONDUCT GROUNDING SYSTEM TEST AND INCLUDE IN THE CLOSEOUT PACKAGE TO T–MOBILE. ADDITIONAL GROUNDING MAY BE REQUIRED PENDING THE RESULTS OF THE GROUNDING SYSTEM TEST (TYP x2)'
12. CADWELD CONNECTION (SEE SHEET E–6)

NOTE TO CONTRACTORS:
DIGGING AND/OR TRENCHING INSIDE COMPOUND, MUST BE DONE BY HAND.




N

1 / E–3 GROUNDING PLAN
NOT TO SCALE

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OFFICE: 860–692–7100
FAX: 860–692–7159

PLANS PREPARED BY:
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T-MOBILE SITE ID: CTNH547A
ATC SITE ID: 370630

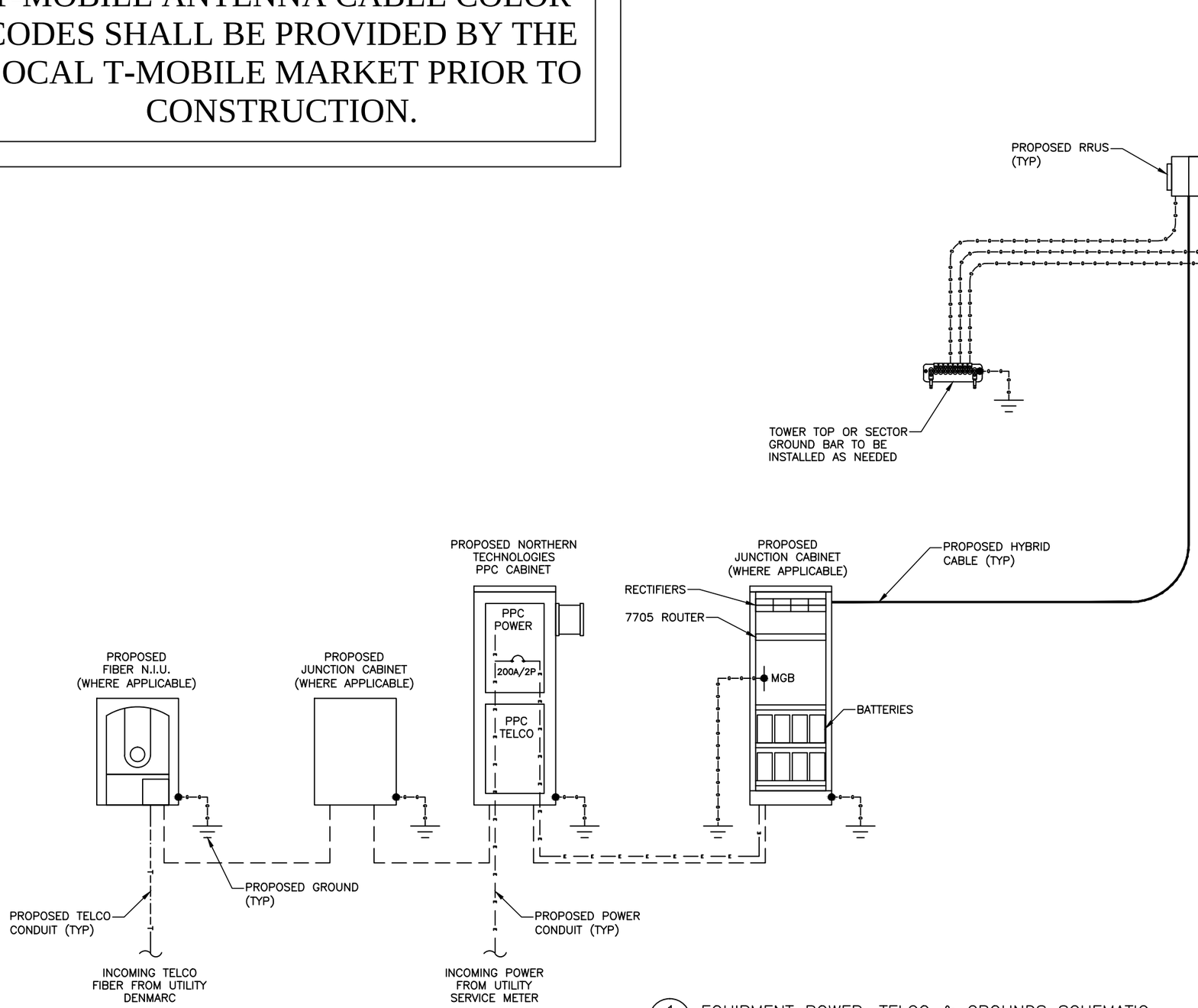
SHEET NAME: GROUNDING PLAN

SMW #: 16–2561

| | |
|---|---|
| DESIGNER: | BMD |
| CHECKED BY: | RTB |
| ENGINEER: | JDS |

SHEET NUMBER: E-3

T-MOBILE ANTENNA CABLE COLOR CODES SHALL BE PROVIDED BY THE LOCAL T-MOBILE MARKET PRIOR TO CONSTRUCTION.




1 / E-4 EQUIPMENT POWER, TELCO & GROUNDS SCHEMATIC
NOT TO SCALE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T-MOBILE SITE ID: CTNH547A
ATC SITE ID: 370630

SHEET NAME:
EQUIPMENT SCHEMATIC

SMW #: 16-2561

| | |
|---|---|
| DESIGNER: | BMD |
| CHECKED BY: | RTB |
| ENGINEER: | JDS |

SHEET NUMBER: E-4

1. ALL WORK IS TO COMPLY WITH THE LATEST EDITION OF THE NATIONAL ELECTRIC CODE (NEC) AND ANY LOCAL ORDINANCES, CODES, AND ALL OTHER ADMINISTRATIVE AUTHORITIES HAVING JURISDICTION. THE CONTRACTOR SHALL FURNISH AND PAY FOR ALL PERMITS AND RELATED FEES.

2. ALL EQUIPMENT AND MATERIAL FURNISHED AND INSTALLED UNDER THIS CONTRACT SHALL BE UNDERWRITERS LABORATORIES (U.L.) LISTED, NEW, FREE FROM DEFECTS, AND SHALL BE GUARANTEED FOR A PERIOD OF ONE YEAR FROM DATE OF FINAL ACCEPTANCE BY OWNER OR HIS REPRESENTATIVE. SHOULD ANY TROUBLE DEVELOP DURING THIS PERIOD DUE TO FAULTY WORKMANSHIP, MATERIAL, OR EQUIPMENT, THE CONTRACTOR SHALL FURNISH ALL NECESSARY MATERIALS AND LABOR TO CORRECT THE TROUBLE WITHOUT COST TO THE OWNER.

3. ALL WORK SHALL BE EXECUTED IN A WORKMAN LIKE MANNER AND SHALL PRESENT A NEAT MECHANICAL APPEARANCE WHEN COMPLETED. CONTRACTOR SHOULD AVOID DAMAGE TO EXISTING UTILITIES WHEREVER POSSIBLE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CUTTING AND PATCHING RELATED TO ELECTRICAL WORK, AND SHALL RESTORE ALL EXISTING LANDSCAPING, SPRINKLER SYSTEMS, CONDUITS, WIRING, PIPING, ETC. DAMAGED BY THE ELECTRICAL WORK TO MATCH EXISTING CONDITIONS.

4. ELECTRICAL WORK SHALL INCLUDE, BUT NOT BE LIMITED TO, ALL LABOR, MATERIALS AND EQUIPMENT REQUIRED TO COMPLETE ELECTRICAL POWER AND LIGHTING SYSTEMS, TELEPHONE AND COMMUNICATION SYSTEMS, PANELBOARDS, CONDUIT, CONTROL WIRING, GROUNDING, ETC. AS INDICATED ON ELECTRICAL DRAWINGS AND/OR AS REQUIRED BY GOVERNING CODES.

5. PRIOR TO INSTALLING ANY ELECTRICAL WORK, THE CONTRACTOR SHALL VISIT THE JOB SITE AND VERIFY EXISTING SITE LOCATIONS AND CONDITIONS AND UTILITY SERVICE REQUIREMENTS OF THE JOB, AND BY REFERENCE TO ENGINEERING AND EQUIPMENT SUPPLIERS' DRAWINGS. SHOULD THERE BE ANY QUESTION OR PROBLEM CONCERNING THE NECESSARY PROVISIONS TO BE MADE. PROPER DIRECTIONS SHALL BE OBTAINED BEFORE PROCEEDING WITH ANY WORK.

6. PROVIDE POWER AND TELEPHONE TO SERVICE POINTS PER UTILITY COMPANY REQUIREMENTS. CONTRACTOR SHALL CONTACT UTILITY SERVICE PLANNERS AND OBTAIN ALL SERVICE REQUIREMENTS AND INCLUDE COSTS FOR SUCH IN THEIR BID.

7. SERVICE EQUIPMENT SHALL HAVE A SHORT CIRCUIT WITHSTAND RATING EXCEEDING THE MAXIMUM AVAILABLE FAULT CURRENT AT THE SUPPLY TERMINAL ON THE UTILITY TRANSFORMER SECONDARY, THE INSULATION SHALL BE FREE FROM ANY SHORT CIRCUITS AND GROUNDS. CONTRACTOR TO OBTAIN THE AVAILABLE SHORT CIRCUIT CURRENT FROM THE ELECTRICAL SERVICE PROVIDER.

8. ALL WIRES SHALL BE STRANDED COPPER WITH THHN/THWN AND 600 VOLTS INSULATION. ALL GROUND CONDUCTORS TO BE PROPERLY SIZED COPPER. (STRANDED OR SOLID)

9. IN THE EVENT OF ANY CONFLICT OR INCONSISTENCY BETWEEN ITEMS SHOWN ON THE PLANS AND/OR SPECIFICATIONS, THE NOTE, SPECIFICATION OR CODE WHICH PRESCRIBES AND ESTABLISHES THE HIGHEST STANDARD OF PERFORMANCE SHALL PREVAIL.

10. SERVICE CONDUITS SHALL HAVE NO MORE THAN (4) –50° BENDS IN ANY SINGLE RUN. THE CONTRACTOR SHALL PROVIDE PULL BOXES AS NEEDED WHERE CONDUIT REQUIREMENTS EXCEED THESE CONDITIONS. PULL WIRES AND CAPS SHALL BE PROVIDED AT ALL SPARE CONDUITS FOR FUTURE USE.

11. ALL ELECTRICAL EQUIPMENT SHALL BE ANCHORED TO WITHSTAND LOCAL WIND SPEED REQUIREMENTS AND DESIGNED FOR OUTDOOR EXPOSURE.

12. ALL COAX, POWER AND TELEPHONE SYSTEM CONDUITS SHALL HAVE A MINIMUM 24" SCH. 80 PVC RADIUS SWEEPS TO EQUIPMENT, PULLBOXES, GUY, ETC., UNLESS OTHERWISE NOTED, OR AS REQUIRED BY UTILITY COMPANIES.

13. FUSE TYPE SHALL BE BUSSMAN RKI LOW PEAK FUSE (LPN–RK–140).

14. UPON COMPLETION OF THE JOB, THE CONTRACTOR SHALL FURNISH AS–BUILT DRAWINGS TO THE OWNER.

15. GENERAL GROUNDING CRITERIA
    1ST STEP: GROUND TO EXISTING BUILDING STRUCTURAL STEEL AND TO THE EXISTING COLD WATER METAL PIPE LINE. (WHERE APPLICABLE) THEN TEST GROUNDING RESISTANCE FOR 5 OHMS OR LESS OVERALL GROUND RESISTANCE. WHERE THE EFFECTIVE RESISTANCE DOES NOT MEET THIS CRITERIA, PROVIDE SUPPLEMENTAL GROUNDING AND RE–TEST UNTIL GROUND RESISTANCE FALLS BELOW THIS LEVEL.

16. SUPPLEMENTAL GROUND MAY CONSIST OF ONE OR MORE OF THE FOLLOWING:
    COUNTERPOISE, USER GROUND, GROUND ROD AND/OR GROUND WELL IN EXTREMELY ADVERSE SOIL CONDITIONS. WHERE THE EXISTING BUILDING STEEL DOES NOT PROVIDE AN EFFECTIVE GROUND RESISTANCE, THEN THE CONTRACTOR SHALL PROVIDE A SEPARATE GROUND CONDUCTOR FROM ROOF MOUNTED BTS EQUIPMENT LOCATIONS EITHER DOWN THROUGH THE INSIDE OF THE BUILDING OR DOWN THE OUTSIDE OF THE BUILDING, DEPENDING UPON OWNER PREFERENCE. WHERE THE GROUND CONDUCTOR FROM THE ROOF MOUNTED EQUIPMENT IS ROUTED IN CONDUIT, THE CONDUIT SHALL BE EFFECTIVELY GROUNDED TO THE GROUND CONDUCTOR AT BOTH ENDS OF THE CONDUIT. (GUY INSTALLATIONS):

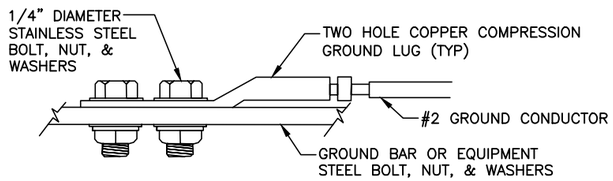
    FOR INSTALLATIONS WHERE WOODEN STRUCTURES, TOWERS, CONCRETE SILOS ETC. ARE ENCOUNTERED A PARATE DOWNLEAD SHALL BE PROVIDED FROM THE 3 ANTENNAS SEPARATED BY A MINIMUM OF 12 INCHES FROM THE COAXIAL CABLES. THE GROUND CONDUCTOR SHALL BE SECURELY FASTENED TO THE EXTERIOR OF OUTSIDE STRUCTURES WITH NONMETALLIC GROUND STRAPS EVERY 10 FEET. AGAIN, AS FOR TENANT IMPROVEMENT PROJECTS, TEST THE GROUND RESISTANCE FOR GUY INSTALLATIONS AND PROCEED PER THE ABOVE STEPS.

17. CONTRACTOR TO COLOR PHASE CONDUCTORS BLACK (B PHASE), RED (A PHASE), WHITE (NEUTRAL), AND GREEN (GROUND).

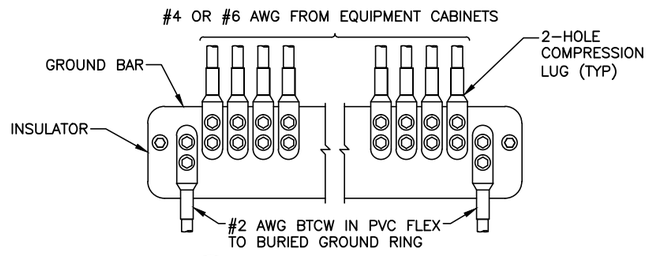
18. CONTRACTOR TO PROVIDE GUTTER TAP.

19. THERE SHALL BE A MINIMUM CLEARANCE OF 48" BETWEEN FRONT OF ELECTRICAL EQUIPMENT AND ANY WALL OR OBSTRUCTION.

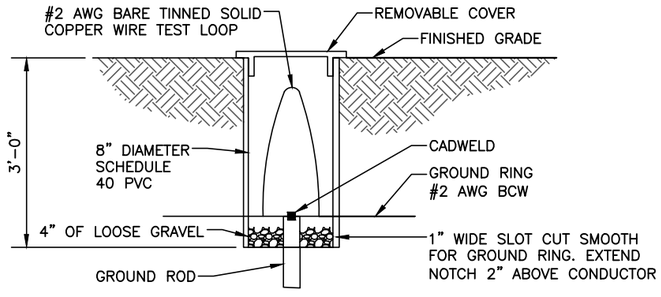
| CADWELD CONNECTIONS OR APPROVED EQUAL | | | BURNDY CONNECTIONS OR APPROVED EQUAL |
|---|---|---|---|
| PARALLEL HORIZONTAL CONDUCTORS<br>PARALLEL THROUGH CONNECTION OF HORIZONTAL CABLES<br>TYPE PT | HORIZONTAL STEEL SURFACE<br>TO FLAT STEEL SURFACE OR HORIZONTAL PIPE<br>TYPE HS | VERTICAL PIPE<br>CABLE DOWN AT 45° TO RANGE OF VERTICAL PIPES<br>TYPE VS | BOND JUMPER<br>FIELD FABRICATED GREEN STRANDED INSULATED<br>TYPE 2–YA–2 |
| THROUGH CABLE TO GROUND ROD<br>THROUGH CABLE TO TOP OF GROUND ROD<br>TYPE GT | VERTICAL STEEL SURFACE<br>CABLE DOWN AT 45° TO VERTICAL STEEL SURFACE INCLUDING PIPE<br>TYPE VS | | COPPER LUGS<br>TWO HOLE – LONG BARREL LENGTH<br>TYPE YA–2 |




1 / E–5 TWO HOLE LUG CONNECTION DETAIL
NOT TO SCALE




2 / E–5 GROUND BAR DETAIL
NOT TO SCALE




3 / E–5 TEST WELL DETAIL
NOT TO SCALE


T-Mobile
35 GRIFFIN RD S
BLOOMFIELD, CT 06002
OFFICE: 860–692–7100
FAX: 860–692–7159

PLANS PREPARED BY:
NSS NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development
NORTHEAST SITE SOLUTIONS, LLC
199 BRICKYARD ROAD
FARMINGTON CT 06032
(860) 677–1999

SMW ENGINEERING GROUP, INC.
TOGETHER PLANNING A BETTER TOMORROW


*PRELIMINARY DRAWING*
*(NOT VALID UNLESS STAMPED AND SIGNED)*

SITE INFORMATION:
CTNH547A
52 LIBRARY ST.
SALISBURY, CT 06068

| # | DATE | DESCRIPTION: |
|---|---|---|
| 0 | 10/21/16 | ISSUED FOR CLIENT REV. |
| | | |
| | | |
| | | |
| | | |

T-MOBILE SITE ID: CTNH547A
ATC SITE ID: 370630

SHEET NAME:
ELECTRICAL & GROUNDING DETAILS

SMW #: 16–2561

| | |
|---|---|
| DESIGNER: | BMD |
| CHECKED BY: | RTB |
| ENGINEER: | JDS |

SHEET NUMBER:
E-5

# Exhibit D

AMERICAN TOWER®
CORPORATION

This report was prepared for American Tower Corporation by

CLSGroup

# Structural Analysis Report

| | | |
|---|---|---|
| **Structure** | : | **148.5 ft Monopole** |
| **ATC Site Name** | : | **Salisbury CT, CT** |
| **ATC Site Number** | : | **370630** |
| **Engineering Number** | : | **OAA686579_C3_03** |
| **Proposed Carrier** | : | **T-Mobile** |
| **Carrier Site Name** | : | **ROB9** |
| **Carrier Site Number** | : | **CTNH547A** |
| **Site Location** | : | **52 Library St.**<br>**Salisbury, CT 06068-0000**<br>**41.980528,-73.418056** |
| **County** | : | **Litchfield** |
| **Date** | : | **October 5, 2016** |
| **Max Usage** | : | **22%** |
| **Result** | : | **Pass** |

Prepared By:
Spencer Collins
CLS

Reviewed By:

**COA: PEC.0001553**

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## Table of Contents

## Introduction

The purpose of this report is to summarize results of a structural analysis performed on the 148.5 ft monopole to reflect the change in loading by T-Mobile.

## Supporting Documents

| | |
|---|---|
| **Tower Drawings** | Paul J. Ford Job #29206-0003, dated January 9, 2006 |
| **Foundation Drawing** | Paul J. Ford Job #29206-0003, dated January 9, 2006 |
| **Geotechnical Report** | JGI Eastern, Inc. Project #05463G, dated August 11, 2005 |

## Analysis

The tower was analyzed using American Tower Corporation's tower analysis software. This program considers an elastic three-dimensional model and second-order effects per ANSI/TIA-222.

| | |
|---|---|
| **Basic Wind Speed:** | 90 mph (3-Second Gust, $V_{asd}$) / 115 mph (3-Second Gust, $V_{ult}$) |
| **Basic Wind Speed w/ Ice:** | 40 mph (3-Second Gust) w/ 1" radial ice concurrent |
| **Code:** | ANSI/TIA-222-G / 2012 IBC / 2016 Connecticut State Building Code |
| **Structure Class:** | II |
| **Exposure Category:** | B |
| **Topographic Category:** | 1 |
| **Crest Height:** | 0 ft |
| **Spectral Response:** | Ss = 0.17, $S_1$ = 0.06 |
| **Site Class:** | D - Stiff Soil |

## Conclusion

Based on the analysis results, the structure meets the requirements per the applicable codes listed above. The tower and foundation can support the equipment as described in this report.

If you have any questions or require additional information, please contact American Tower via email at Engineering@americantower.com. Please include the American Tower site name, site number, and engineering number in the subject line for any questions.

## Existing and Reserved Equipment

| Elevation[1] (ft) | | Qty | Antenna | Mount Type | Lines | Carrier |
|---|---|---|---|---|---|---|
| Mount | RAD | | | | | |
| 146.0 | 150.0 | 1 | RFS Celwave PD220 | T-Arms | (1) 1/2" Coax | Salisbury Volunteer Ambulance |
| | 146.0 | 1 | RFS Celwave PD220 | | | Town Of Salisbury |
| 141.0 | 141.0 | 6 | Powerwave LGP21401 | T-Arms | (6) 1/2" Coax<br>(12) 1 5/8" Coax<br>(2) 0.78" 8 AWG 6<br>(1) 0.39" Fiber Trunk | AT&T Mobility |
| | | 1 | Raycap DC6-48-60-18-8F | | | |
| | | 6 | Ericsson RRUS 11 (Band 12) (55 lb) | | | |
| | | 9 | Powerwave 7770.00 | | | |
| | | 3 | KMW AM-X-CD-16-65-00T-RET | | | |
| 134.0 | 134.0 | 3 | Antel BXA-185085/12CF | T-Arms | (18) 1 5/8" Coax | Verizon |
| | | 3 | Antel BXA-70063/6CF | | | |
| | | 6 | Antel LPA-80080/6CF | | | |

## Equipment to be Removed

| Elevation[1] (ft) | | Qty | Antenna | Mount Type | Lines | Carrier |
|---|---|---|---|---|---|---|
| Mount | RAD | | | | | |
| No loading considered as to be removed | | | | | | |

## Proposed Equipment

| Elevation[1] (ft) | | Qty | Antenna | Mount Type | Lines | Carrier |
|---|---|---|---|---|---|---|
| Mount | RAD | | | | | |
| 123.0 | 123.0 | 1 | Symmetricom 58532A | T-Arms | (2) 1 5/8" Hybriflex<br>(1) 1/2" Coax | T-Mobile |
| | | 3 | Ericsson RRUS 11 B12 | | | |
| | | 3 | Ericsson RRUS 11 B2 | | | |
| | | 3 | Ericsson RRUS 11 B4 | | | |
| | | 3 | RFS APX16DWV-16DWVS-E-A20 | | | |
| | | 3 | Commscope LNX-6515DS-A1M | | | |

**[1]Mount elevation is defined as height above bottom of steel structure to the bottom of mount, RAD elevation is defined as center of antenna above ground level (AGL).**

Install proposed coax inside the pole shaft.

## Structure Usages

| Structural Component | Controlling Usage | Pass/Fail |
|---|---|---|
| Anchor Bolts | 18% | Pass |
| Shaft | 22% | Pass |
| Base Plate | 19% | Pass |

## Foundations

| Reaction Component | Original Design Reactions | Factored Design Reactions* | Analysis Reactions | % of Design |
|---|---|---|---|---|
| Moment (Kips-Ft) | 7,150.0 | 9,652.5 | 2,042.3 | 21% |
| Shear (Kips) | 62.0 | 83.7 | 20.5 | 25% |

*** The design reactions are factored by 1.35 per ANSI/TIA-222-G, Sec. 15.5.1**

The structure base reactions resulting from this analysis are acceptable when compared to those shown on the original structure drawings, therefore no modification or reinforcement of the foundation will be required.

## Deflection and Sway*

| Antenna Elevation (ft) | Antenna | Carrier | Deflection (ft) | Sway (Rotation) (°) |
|---|---|---|---|---|
| 123.0 | Symmetricom 58532A | T-Mobile | 0.324 | 0.333 |
| | Ericsson RRUS 11 B12 | | | |
| | Ericsson RRUS 11 B4 | | | |
| | Ericsson RRUS 11 B2 | | | |
| | RFS APX16DWV-16DWVS-E-A20 | | | |
| | Commscope LNX-6515DS-A1M | | | |

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

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## Standard Conditions

All engineering services are performed on the basis that the information used is current and correct. This information may consist of, but is not necessary limited, to:

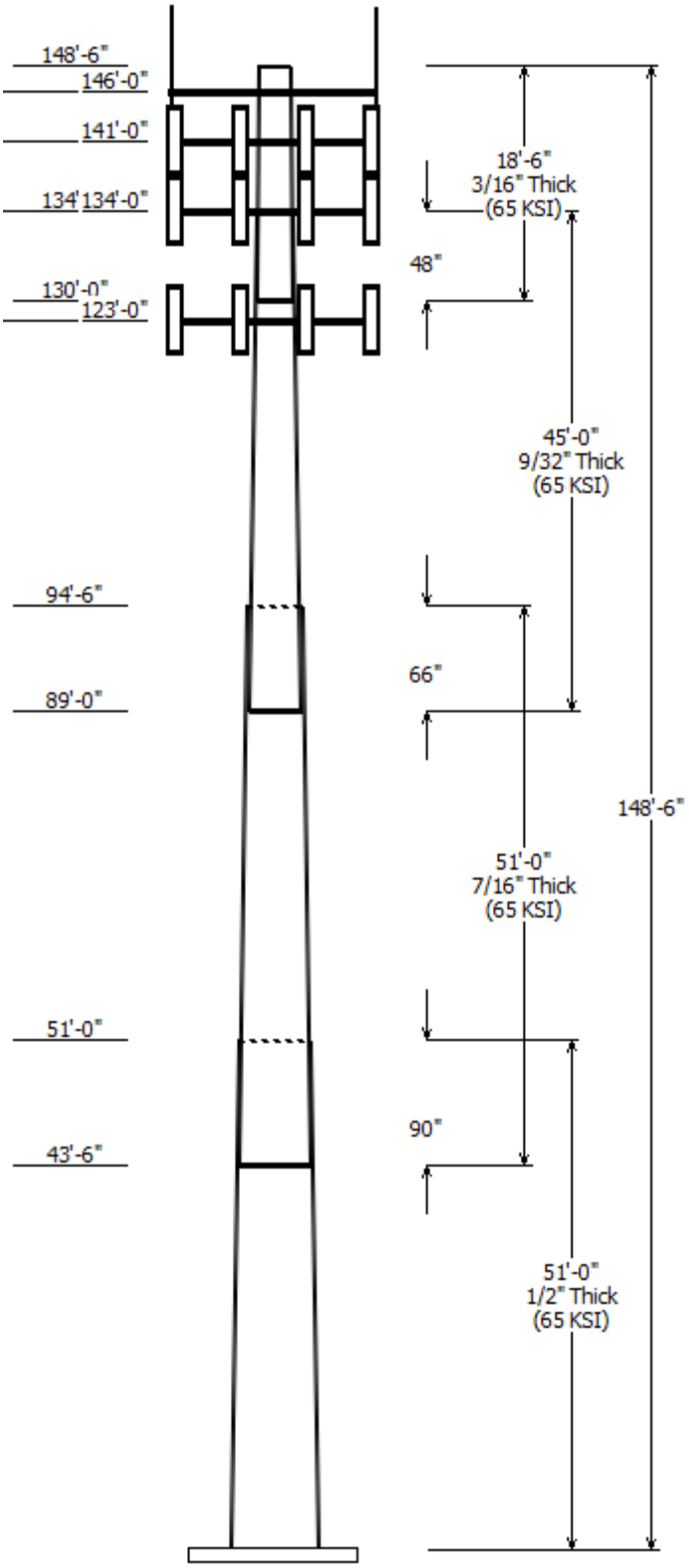
-- Information supplied by the client regarding the structure itself, antenna, mounts and feed line loading on the structure and its components, or other relevant information.

-- Information from drawings in the possession of American Tower Corporation, or generated by field inspections or measurements of the structure.

It is the responsibility of the client to ensure that the information provided to A.T. Engineering Service, PLLC and used in the performance of our engineering services is correct and complete. In the absence of information to the contrary, we assume that all structures were constructed in accordance with the drawings and specifications and that their capacity has not significantly changed from the "as new" condition.

Unless explicitly agreed by both the client and American Tower Corporation, all services will be performed in accordance with the current revision of ANSI/TIA -222. The design basic wind speed will be determined based on the minimum basic wind speed as prescribed in ANSI/TIA-222. Although every effort is taken to ensure that the loading considered is adequate to meet the requirements of all applicable regulatory entities, we can provide no assurance to meet any other local and state codes or requirements. If wind and ice loads or other relevant parameters are to be different from the minimum values recommended by the codes, the client shall specify the exact requirement.

All services are performed, results obtained, and recommendations made in accordance with generally accepted engineering principles and practices. A.T. Engineering Service, PLLC is not responsible for the conclusions, opinions and recommendations made by others based on the information we supply.




## Job Information

| | | | |
|---|---|---|---|
| Pole : | 370630 | Code: | ANSI/TIA-222-G |
| Description : | 149 ft Monopole | | |
| Client : | T- Mobile | Struct Class : | II |
| Location : | Salisbury CT, CT | | |
| Shape : | 18 Sides | Exposure : | B |
| Height : | 148.50 (ft) | Topo : | 1 |
| Base Elev (ft): | 0.00 | | |
| Taper: | 0.340018 (in/ft) | | |

## Sections Properties

| Shaft Section | Length (ft) | Diameter (in) Accross Flats Top | Bottom | Thick (in) | Joint Type | Overlap Length (in) | Taper (in/ft) | Steel Grade (ksi) |
|---|---|---|---|---|---|---|---|---|
| 1 | 51.000 | 55.73 | 73.08 | 0.500 | | 0.000 | 0.340000 | 65 |
| 2 | 51.000 | 41.82 | 59.16 | 0.438 | Slip Joint | 90.000 | 0.340000 | 65 |
| 3 | 45.000 | 28.95 | 44.25 | 0.281 | Slip Joint | 66.000 | 0.340000 | 65 |
| 4 | 18.500 | 24.40 | 30.69 | 0.188 | Slip Joint | 48.000 | 0.340000 | 65 |

## Discrete Appurtenance

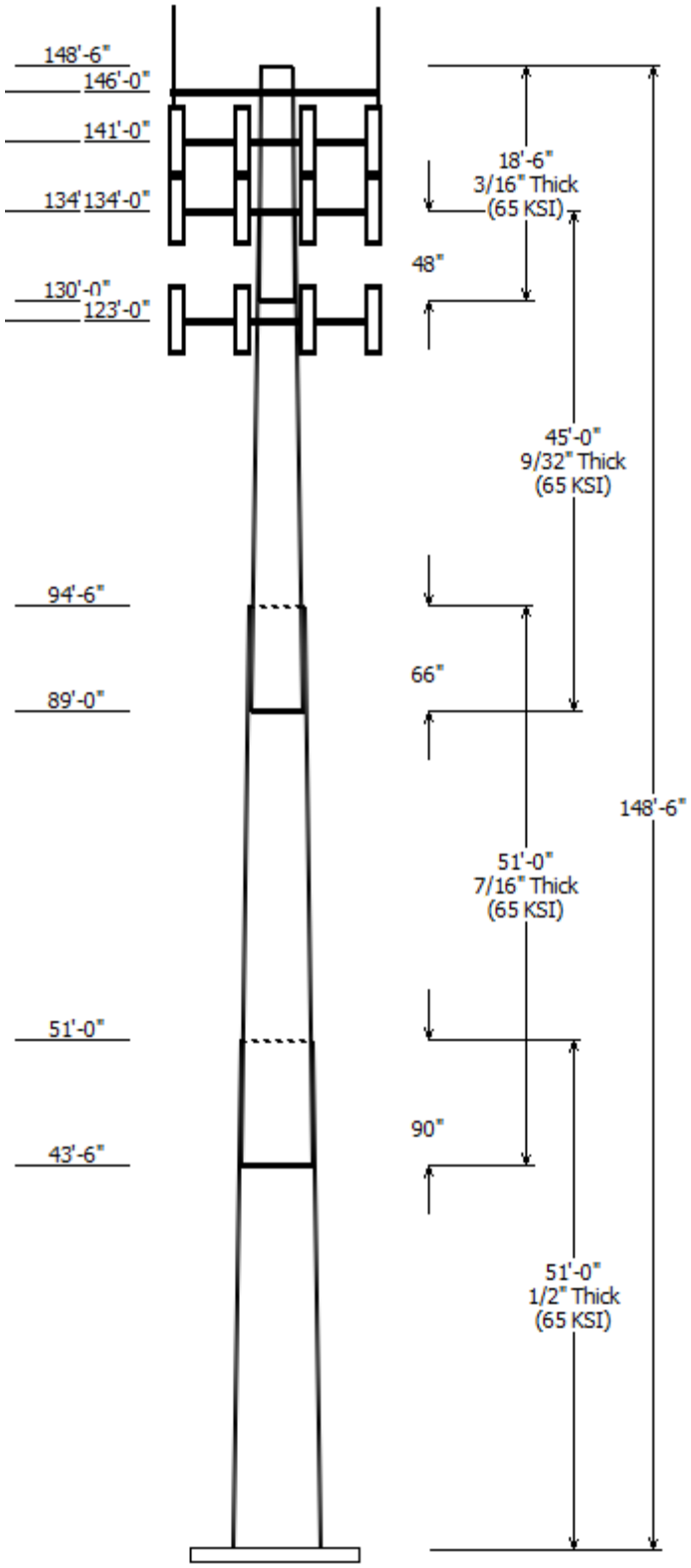
| Attach Elev (ft) | Force Elev (ft) | Qty | Description |
|---|---|---|---|
| 146.000 | 146.000 | 3 | Flat T-Arm |
| 146.000 | 146.000 | 1 | RFS Celwave PD220 |
| 146.000 | 150.000 | 1 | RFS Celwave PD220 |
| 141.000 | 141.000 | 3 | Flat T-Arm |
| 141.000 | 141.000 | 3 | KMW AM-X-CD-16-65-00T-RET |
| 141.000 | 141.000 | 9 | Powerwave 7770.00 |
| 141.000 | 141.000 | 6 | Ericsson RRUS 11 (Band 12) (55 |
| 141.000 | 141.000 | 1 | Raycap DC6-48-60-18-8F |
| 141.000 | 141.000 | 6 | Powerwave Allgon LGP21401 |
| 134.000 | 134.750 | 3 | Round T-Arm |
| 134.000 | 134.000 | 6 | Antel LPA-80080/6CF |
| 134.000 | 134.000 | 3 | Antel BXA-70063/6CF |
| 134.000 | 134.000 | 3 | Antel BXA-185085/12CF |
| 123.000 | 123.000 | 3 | Flat T-Arm |
| 123.000 | 123.000 | 3 | Commscope LNX-6515DS-A1M |
| 123.000 | 123.000 | 3 | RFS APX16DWV-16DWVS-E-A20 |
| 123.000 | 123.000 | 3 | Ericsson RRUS 11 B2 |
| 123.000 | 123.000 | 3 | Ericsson RRUS 11 B4 |
| 123.000 | 123.000 | 3 | Ericsson RRUS 11 B12 |
| 123.000 | 123.000 | 1 | Symmetricom 58532A |

## Linear Appurtenance

| Elev (ft) From | To | Description | Exposed To Wind |
|---|---|---|---|
| 0.000 | 123.0 | 1 5/8" Hybriflex | No |
| 0.000 | 123.0 | 1/2" Coax | No |
| 0.000 | 134.0 | 1 5/8" Coax | No |
| 0.000 | 141.0 | 0.39" Fiber Trunk | No |
| 0.000 | 141.0 | 0.78" 8 AWG 6 | No |
| 0.000 | 141.0 | 1 5/8" Coax | No |
| 0.000 | 141.0 | 1/2" Coax | No |
| 0.000 | 146.0 | 1/2" Coax | No |

## Load Cases

| | |
|---|---|
| 1.2D + 1.6W | 90 mph with No Ice |
| 0.9D + 1.6W | 90 mph with No Ice (Reduced DL) |
| 1.2D + 1.0Di + 1.0Wi | 40 mph with 1.00 in Radial Ice |
| (1.2 + 0.2Sds) * DL + E | Seismic Equivalent Lateral Forces Method |
| (1.2 + 0.2Sds) * DL + E | Seismic Equivalent Modal Analysis Method |



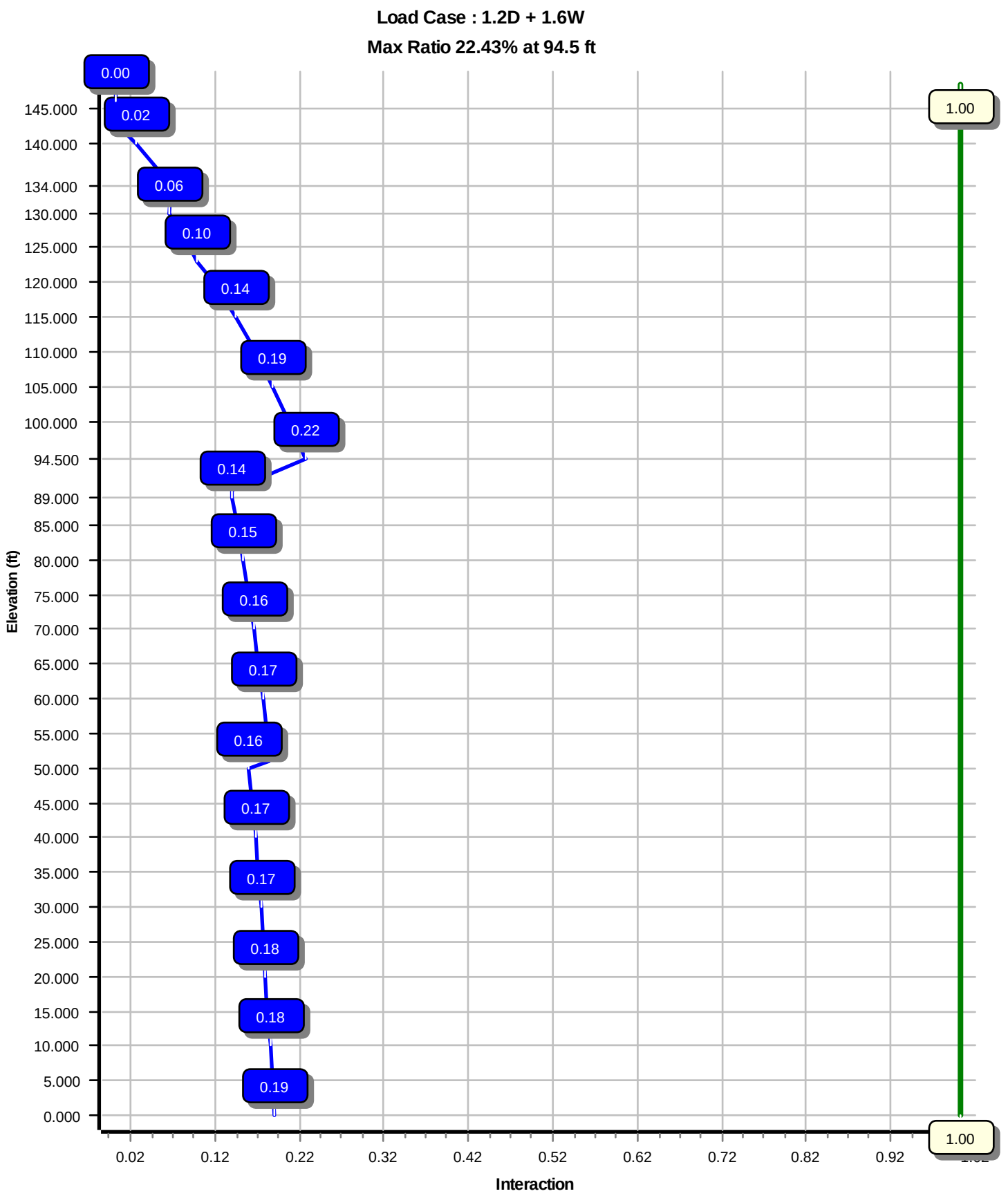

| | |
|---|---|
| (0.9 - 0.2Sds) * DL + E | Seismic (Reduced DL) Equivalent Lateral |
| (0.9 - 0.2Sds) * DL + E | Seismic (Reduced DL) Equivalent Modal |
| 1.0D + 1.0W | Serviceability 60 mph |

## Reactions

| Load Case | Moment (kip-ft) | Shear (kip) | Axial (kip) |
|---|---|---|---|
| 1.2D + 1.6W | 2042.30 | 20.53 | 53.50 |
| 0.9D + 1.6W | 2035.98 | 20.53 | 40.12 |
| 1.2D + 1.0Di + 1.0Wi | 431.54 | 4.47 | 85.34 |
| (1.2 + 0.2Sds) * DL + E ELFM | 341.18 | 3.45 | 52.58 |
| (1.2 + 0.2Sds) * DL + E EMAM | 246.77 | 2.40 | 52.58 |
| (0.9 - 0.2Sds) * DL + E ELFM | 340.02 | 3.45 | 36.67 |
| (0.9 - 0.2Sds) * DL + E EMAM | 245.87 | 2.40 | 36.67 |
| 1.0D + 1.0W | 566.10 | 5.70 | 44.59 |

## Dish Deflections

| Load Case | Attach Elev (ft) | Deflection (in) | Rotation (deg) |
|---|---|---|---|
| | 0.00 | 0.000 | 0.000 |


Load Case : 1.2D + 1.6W
Max Ratio 22.43% at 94.5 ft
0.00
0.02
0.06
0.10
0.14
0.19
0.22
0.14
0.15
0.16
0.17
0.16
0.17
0.17
0.18
0.18
0.19
1.00
1.00
145.000
140.000
134.000
130.000
125.000
120.000
115.000
110.000
105.000
100.000
94.500
89.000
85.000
80.000
75.000
70.000
65.000
60.000
55.000
50.000
45.000
40.000
35.000
30.000
25.000
20.000
15.000
10.000
5.000
0.000
Elevation (ft)
0.02
0.12
0.22
0.32
0.42
0.52
0.62
0.72
0.82
0.92
Interaction

| | | | |
|---|---|---|---|
| Site Number: | 370630 | Code: ANSI/TIA-222-G |  |
| Site Name: | Salisbury CT, CT | Engineering Number:OAA686579_C3_03 | 10/5/2016 8:39:16 PM |
| Customer: | T- Mobile | | |

## Analysis Parameters

| | | | |
|---|---|---|---|
| Location: | Litchfield County, CT | | |
| Code: | ANSI/TIA-222-G | Height (ft): | 148. |
| Shape: | 18 Sides | Base Diameter (in): | 73.08 |
| Pole Type: | Taper | Top Diameter (in): | 24.40 |
| Pole Manfacturer: | PennSummit Tub | Taper (in/ft) : | 0.340 |

## Ice & Wind Parameters

| | | | |
|---|---|---|---|
| Structure Class: | II | Design Wind Speed Without Ice: | 90 mph |
| Exposure Catagory: | B | Design Wind Speed With Ice: | 40 mph |
| Topographic Catagory: | 1 | Operational Wind Speed: | 60 mph |
| Crest Height: | 0.0 ft | Design Ice Thickness: | 0.50 in |

## Seismic Parameters

| | | | | | |
|---|---|---|---|---|---|
| Analysis Method: | Equivalent Modal Analysis & Equivalent Lateral Force Methods | | | | |
| Site Class: | D - Stiff Soil | | | | |
| Period Based on Rayleigh Method (sec): | 1.17 | | | | |
| $T_L$ (sec): | 6 | p: | 1.3 | $C_s$: | 0.059 |
| $S_s$: | 0.174 | $S_1$: | 0.065 | $C_s$ Max: | 0.059 |
| $F_a$: | 1.600 | $F_v$: | 2.400 | $C_s$ Min: | 0.030 |
| $S_{ds}$: | 0.186 | $S_{d1}$: | 0.104 | | |

## Load Cases

| | |
|---|---|
| 1.2D + 1.6W | 90 mph with No Ice |
| 0.9D + 1.6W | 90 mph with No Ice (Reduced DL) |
| 1.2D + 1.0Di + 1.0Wi | 40 mph with 1.00 in Radial Ice |
| (1.2 + 0.2Sds) * DL + E ELFM | Seismic Equivalent Lateral Forces Method |
| (1.2 + 0.2Sds) * DL + E EMAM | Seismic Equivalent Modal Analysis Method |
| (0.9 - 0.2Sds) * DL + E ELFM | Seismic (Reduced DL) Equivalent Lateral Forces Method |
| (0.9 - 0.2Sds) * DL + E EMAM | Seismic (Reduced DL) Equivalent Modal Analysis Method |
| 1.0D + 1.0W | Serviceability 60 mph |

Site Number: 370630 Code: ANSI/TIA-222-G 

Site Name: Salisbury CT, CT Engineering Number:OAA686579_C3_03 10/5/2016 8:39:16 PM

Customer: T- Mobile

## Shaft Section Properties

| Sect Info | Length (ft) | Thick (in) | Fy (ksi) | Joint Type | Slip Joint Len (in) | Weight (lb) | Bottom Dia (in) | Bottom Elev (ft) | Bottom Area (in²) | Bottom Ix (in⁴) | Bottom W/t Ratio | Bottom D/t Ratio | Top Dia (in) | Top Elev (ft) | Top Area (in²) | Top Ix (in⁴) | Top W/t Ratio | Top D/t Ratio | Taper (in/ft) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1-18 | 51.000 | 0.5000 | 65 | | 0.00 | 17,601 | 73.08 | 0.00 | 115.18 | 76659.4 | 24.36 | 146.16 | 55.73 | 51.00 | 87.66 | 33795.1 | 18.25 | 111.48 | 0.340018 |
| 2-18 | 51.000 | 0.4375 | 65 | Slip | 90.00 | 12,062 | 59.16 | 43.50 | 81.55 | 35532.9 | 22.43 | 135.23 | 41.82 | 94.50 | 57.47 | 12435.9 | 15.45 | 95.60 | 0.340018 |
| 3-18 | 45.000 | 0.2813 | 65 | Slip | 66.00 | 4,966 | 44.25 | 89.00 | 39.26 | 9592.3 | 26.33 | 157.33 | 28.95 | 134.00 | 25.60 | 2659.4 | 16.74 | 102.93 | 0.340018 |
| 4-18 | 18.500 | 0.1875 | 65 | Slip | 48.00 | 1,025 | 30.69 | 130.00 | 18.15 | 2133.9 | 27.45 | 163.68 | 24.40 | 148.50 | 14.41 | 1067.2 | 21.54 | 130.13 | 0.340018 |
| | | | | Shaft Weight | | 35,654 | | | | | | | | | | | | | |

## Discrete Appurtenance Properties

| Attach Elev (ft) | Description | Qty | No Ice Weight (lb) | No Ice EPAa (sf) | No Ice Orientation Factor | Ice Weight (lb) | Ice EPAa (sf) | Ice Orientation Factor | Distance From Face (ft) | Vert Ecc (ft) |
|---|---|---|---|---|---|---|---|---|---|---|
| 146.00 | Flat T-Arm | 3 | 250.00 | 12.900 | 0.67 | 528.39 | 23.793 | 0.67 | 0.000 | 0.000 |
| 146.00 | RFS Celwave PD220 | 1 | 25.00 | 5.500 | 1.00 | 395.40 | 14.963 | 1.00 | 0.000 | 4.000 |
| 146.00 | RFS Celwave PD220 | 1 | 25.00 | 5.500 | 1.00 | 395.40 | 14.963 | 1.00 | 0.000 | 0.000 |
| 141.00 | Ericsson RRUS 11 (Band 12) | 6 | 55.00 | 2.520 | 0.67 | 170.01 | 3.401 | 0.67 | 0.000 | 0.000 |
| 141.00 | Flat T-Arm | 3 | 250.00 | 12.900 | 0.67 | 527.41 | 23.755 | 0.67 | 0.000 | 0.000 |
| 141.00 | KMW AM-X-CD-16-65-00T- | 3 | 48.50 | 8.020 | 0.79 | 315.23 | 9.772 | 0.79 | 0.000 | 0.000 |
| 141.00 | Powerwave 7770.00 | 9 | 35.00 | 5.510 | 0.77 | 227.49 | 6.941 | 0.77 | 0.000 | 0.000 |
| 141.00 | Powerwave Allgon LGP21401 | 6 | 14.10 | 1.100 | 0.50 | 64.50 | 1.738 | 0.50 | 0.000 | 0.000 |
| 141.00 | Raycap DC6-48-60-18-8F | 1 | 32.80 | 1.280 | 1.00 | 165.12 | 3.091 | 1.00 | 0.000 | 0.000 |
| 134.00 | Antel BXA-185085/12CF | 3 | 13.00 | 4.790 | 0.88 | 186.15 | 6.418 | 0.88 | 0.000 | 0.000 |
| 134.00 | Antel BXA-70063/6CF | 3 | 17.00 | 7.570 | 0.75 | 253.07 | 9.273 | 0.75 | 0.000 | 0.000 |
| 134.00 | Antel LPA-80080/6CF | 6 | 21.00 | 8.630 | 0.75 | 293.75 | 5.931 | 0.75 | 0.000 | 0.000 |
| 134.00 | Round T-Arm | 3 | 250.00 | 9.700 | 0.67 | 525.69 | 20.575 | 0.67 | 0.000 | 0.750 |
| 123.00 | Commscope LNX-6515DS- | 3 | 50.30 | 11.450 | 0.84 | 413.85 | 13.628 | 0.84 | 0.000 | 0.000 |
| 123.00 | Ericsson RRUS 11 B12 | 3 | 50.70 | 2.790 | 0.67 | 171.70 | 3.701 | 0.67 | 0.000 | 0.000 |
| 123.00 | Ericsson RRUS 11 B2 | 3 | 50.70 | 2.790 | 0.67 | 171.70 | 3.701 | 0.67 | 0.000 | 0.000 |
| 123.00 | Ericsson RRUS 11 B4 | 3 | 50.70 | 2.790 | 0.67 | 171.70 | 3.701 | 0.67 | 0.000 | 0.000 |
| 123.00 | Flat T-Arm | 3 | 250.00 | 12.900 | 0.67 | 523.41 | 23.599 | 0.67 | 0.000 | 0.000 |
| 123.00 | RFS APX16DWV-16DWVS-E- | 3 | 40.70 | 6.590 | 0.66 | 233.95 | 8.082 | 0.66 | 0.000 | 0.000 |
| 123.00 | Symmetricom 58532A | 1 | 0.40 | 0.220 | 0.50 | 10.84 | 0.703 | 0.50 | 0.000 | 0.000 |
| | Totals | 67 | 4903.60 | | 18,250.47 | | | Number of Loadings : | | 20 |

## Linear Appurtenance Properties

| Elev From (ft) | Elev To (ft) | Qty | Description | Coax Diameter (in) | Coax Weight (lb/ft) | Flat | Projected Width (in) | Exposed To Wind | Carrier |
|---|---|---|---|---|---|---|---|---|---|
| 0.00 | 146.00 | 1 | 1/2" Coax | 0.63 | 0.15 | N | 0.00 | N | Town of Salisbury |
| 0.00 | 141.00 | 1 | 0.39" Fiber Trunk | 0.39 | 0.07 | N | 0.00 | N | AT&T Mobility |
| 0.00 | 141.00 | 2 | 0.78" 8 AWG 6 | 0.78 | 0.59 | N | 0.00 | N | AT&T Mobility |
| 0.00 | 141.00 | 12 | 1 5/8" Coax | 1.98 | 0.82 | N | 0.00 | N | AT&T Mobility |
| 0.00 | 141.00 | 6 | 1/2" Coax | 0.63 | 0.15 | N | 0.00 | N | AT&T Mobility |
| 0.00 | 134.00 | 18 | 1 5/8" Coax | 1.98 | 0.82 | N | 0.00 | N | Verizon |
| 0.00 | 123.00 | 2 | 1 5/8" Hybriflex | 1.98 | 1.30 | N | 0.00 | N | T-Mobile |
| 0.00 | 123.00 | 1 | 1/2" Coax | 0.63 | 0.15 | N | 0.00 | N | T-Mobile |

## Segment Properties (Max Len : 5. ft)

| Seg Top Elev (ft) | Description | Thick (in) | Flat Dia (in) | Area ($in^2$) | Ix ($in^4$) | W/t Ratio | D/t Ratio | F'y (ksi) | S ($in^3$) | Z ($in^3$) | Weight (lb) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.00 | | 0.5000 | 73.080 | 115.180 | 76,659.4 | 24.36 | 146.16 | 72.7 | 2066. | 0.0 | 0.0 |
| 5.00 | | 0.5000 | 71.380 | 112.482 | 71,397.6 | 23.76 | 142.76 | 73.5 | 1970. | 0.0 | 1,936.7 |
| 10.00 | | 0.5000 | 69.680 | 109.784 | 66,382.4 | 23.16 | 139.36 | 74.2 | 1876. | 0.0 | 1,890.8 |
| 15.00 | | 0.5000 | 67.980 | 107.086 | 61,607.6 | 22.56 | 135.96 | 74.9 | 1785. | 0.0 | 1,844.9 |
| 20.00 | | 0.5000 | 66.280 | 104.389 | 57,067.5 | 21.96 | 132.56 | 75.6 | 1695. | 0.0 | 1,799.0 |
| 25.00 | | 0.5000 | 64.580 | 101.691 | 52,756.1 | 21.36 | 129.16 | 76.3 | 1609. | 0.0 | 1,753.1 |
| 30.00 | | 0.5000 | 62.879 | 98.993 | 48,667.6 | 20.76 | 125.76 | 77.0 | 1524. | 0.0 | 1,707.2 |
| 35.00 | | 0.5000 | 61.179 | 96.295 | 44,795.9 | 20.16 | 122.36 | 77.7 | 1442. | 0.0 | 1,661.3 |
| 40.00 | | 0.5000 | 59.479 | 93.597 | 41,135.2 | 19.56 | 118.96 | 78.4 | 1362. | 0.0 | 1,615.4 |
| 43.50 | Bot - Section 2 | 0.5000 | 58.289 | 91.708 | 38,695.0 | 19.15 | 116.58 | 78.9 | 1307. | 0.0 | 1,103.5 |
| 45.00 | | 0.5000 | 57.779 | 90.899 | 37,679.5 | 18.97 | 115.56 | 79.1 | 1284. | 0.0 | 880.4 |
| 50.00 | | 0.5000 | 56.079 | 88.201 | 34,423.1 | 18.37 | 112.16 | 79.8 | 1209. | 0.0 | 2,878.9 |
| 51.00 | Top - Section 1 | 0.4375 | 56.614 | 78.005 | 31,102.0 | 21.41 | 129.40 | 76.2 | 1082. | 0.0 | 565.4 |
| 55.00 | | 0.4375 | 55.254 | 76.117 | 28,897.3 | 20.86 | 126.29 | 76.9 | 1030. | 0.0 | 1,048.9 |
| 60.00 | | 0.4375 | 53.554 | 73.756 | 26,291.2 | 20.17 | 122.41 | 77.7 | 966.9 | 0.0 | 1,275.0 |
| 65.00 | | 0.4375 | 51.854 | 71.395 | 23,846.6 | 19.49 | 118.52 | 78.5 | 905.8 | 0.0 | 1,234.8 |
| 70.00 | | 0.4375 | 50.154 | 69.035 | 21,558.5 | 18.80 | 114.64 | 79.3 | 846.6 | 0.0 | 1,194.6 |
| 75.00 | | 0.4375 | 48.454 | 66.674 | 19,421.6 | 18.12 | 110.75 | 80.1 | 789.5 | 0.0 | 1,154.5 |
| 80.00 | | 0.4375 | 46.754 | 64.313 | 17,430.8 | 17.43 | 106.87 | 80.9 | 734.3 | 0.0 | 1,114.3 |
| 85.00 | | 0.4375 | 45.054 | 61.953 | 15,581.0 | 16.75 | 102.98 | 81.7 | 681.2 | 0.0 | 1,074.1 |
| 89.00 | Bot - Section 3 | 0.4375 | 43.693 | 60.064 | 14,199.1 | 16.20 | 99.87 | 82.3 | 640.1 | 0.0 | 830.4 |
| 90.00 | | 0.4375 | 43.353 | 59.592 | 13,866.9 | 16.06 | 99.09 | 82.5 | 630.0 | 0.0 | 336.7 |
| 94.50 | Top - Section 2 | 0.2813 | 42.386 | 37.592 | 8,419.8 | 25.16 | 150.68 | 71.8 | 391.3 | 0.0 | 1,482.3 |
| 95.00 | | 0.2813 | 42.216 | 37.440 | 8,318.3 | 25.05 | 150.07 | 71.9 | 388.1 | 0.0 | 63.8 |
| 100.0 | | 0.2813 | 40.516 | 35.922 | 7,347.0 | 23.99 | 144.03 | 73.2 | 357.2 | 0.0 | 624.1 |
| 105.0 | | 0.2813 | 38.816 | 34.404 | 6,454.5 | 22.92 | 137.99 | 74.4 | 327.5 | 0.0 | 598.3 |
| 110.0 | | 0.2813 | 37.116 | 32.886 | 5,637.3 | 21.85 | 131.94 | 75.7 | 299.2 | 0.0 | 572.4 |
| 115.0 | | 0.2813 | 35.416 | 31.368 | 4,892.2 | 20.79 | 125.90 | 76.9 | 272.1 | 0.0 | 546.6 |
| 120.0 | | 0.2813 | 33.716 | 29.851 | 4,215.9 | 19.72 | 119.86 | 78.2 | 246.3 | 0.0 | 520.8 |
| 123.0 | | 0.2813 | 32.695 | 28.940 | 3,841.7 | 19.08 | 116.23 | 79.0 | 231.4 | 0.0 | 300.1 |
| 125.0 | | 0.2813 | 32.015 | 28.333 | 3,604.9 | 18.66 | 113.81 | 79.5 | 221.8 | 0.0 | 194.9 |
| 130.0 | Bot - Section 4 | 0.2813 | 30.315 | 26.815 | 3,056.0 | 17.59 | 107.77 | 80.7 | 198.6 | 0.0 | 469.1 |
| 134.0 | Top - Section 3 | 0.1875 | 29.330 | 17.343 | 1,861.0 | 26.17 | 156.43 | 70.6 | 125.0 | 0.0 | 598.3 |
| 135.0 | | 0.1875 | 28.990 | 17.141 | 1,796.6 | 25.85 | 154.61 | 71.0 | 122.1 | 0.0 | 58.7 |
| 140.0 | | 0.1875 | 27.290 | 16.129 | 1,496.9 | 24.25 | 145.55 | 72.9 | 108.0 | 0.0 | 283.0 |
| 141.0 | | 0.1875 | 26.950 | 15.927 | 1,441.2 | 23.93 | 143.73 | 73.3 | 105.3 | 0.0 | 54.5 |
| 145.0 | | 0.1875 | 25.590 | 15.117 | 1,232.5 | 22.65 | 136.48 | 74.8 | 94.9 | 0.0 | 211.3 |
| 146.0 | | 0.1875 | 25.250 | 14.915 | 1,183.6 | 22.33 | 134.67 | 75.1 | 92.3 | 0.0 | 51.1 |
| 148.5 | | 0.1875 | 24.400 | 14.409 | 1,067.2 | 21.54 | 130.13 | 76.1 | 86.2 | 0.0 | 124.7 |
| | | | | | | | | | | | 35,654.0 |

Site Number: 370630 Code: ANSI/TIA-222-G 

Site Name: Salisbury CT, CT Engineering Number:OAA686579_C3_03 10/5/2016 8:39:17 PM

Customer: T- Mobile

Load Case: 1.2D + 1.6W 90 mph with No Ice 19 Iterations

Gust Response Factor :1.10 Wind Importance Factor 1.00

Dead Load Factor :1.20

Wind Load Factor :1.60

## Applied Segment Forces Summary

| | | Shaft Forces | | Discrete Forces | | | | Linear Forces | | Sum of Forces | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Seg Elev (ft) | Description | Wind FX (lb) | Dead Load (lb) | Wind FX (lb) | Torsion MY (lb-ft) | Moment MZ (lb-ft) | Dead Load (lb) | Wind FX (lb) | Dead Load (lb) | Wind FX (lb) | Dead Load (lb) | Torsion MY (lb-ft) | Moment MZ (lb) |
| 0.00 | | 241.0 | 0.0 | | | | | 0.0 | 0.0 | 241.0 | 0.0 | 0.0 | 0.0 |
| 5.00 | | 476.4 | 2,324.1 | | | | | 0.0 | 177.9 | 476.4 | 2,502.0 | 0.0 | 0.0 |
| 10.00 | | 465.1 | 2,269.0 | | | | | 0.0 | 177.9 | 465.1 | 2,446.9 | 0.0 | 0.0 |
| 15.00 | | 453.7 | 2,213.9 | | | | | 0.0 | 177.9 | 453.7 | 2,391.8 | 0.0 | 0.0 |
| 20.00 | | 442.4 | 2,158.8 | | | | | 0.0 | 177.9 | 442.4 | 2,336.7 | 0.0 | 0.0 |
| 25.00 | | 431.0 | 2,103.7 | | | | | 0.0 | 177.9 | 431.0 | 2,281.6 | 0.0 | 0.0 |
| 30.00 | | 424.6 | 2,048.6 | | | | | 0.0 | 177.9 | 424.6 | 2,226.5 | 0.0 | 0.0 |
| 35.00 | | 426.7 | 1,993.6 | | | | | 0.0 | 177.9 | 426.7 | 2,171.5 | 0.0 | 0.0 |
| 40.00 | | 366.1 | 1,938.5 | | | | | 0.0 | 177.9 | 366.1 | 2,116.4 | 0.0 | 0.0 |
| 43.50 | Bot - Section 2 | 217.3 | 1,324.2 | | | | | 0.0 | 124.5 | 217.3 | 1,448.7 | 0.0 | 0.0 |
| 45.00 | | 286.1 | 1,056.5 | | | | | 0.0 | 53.4 | 286.1 | 1,109.9 | 0.0 | 0.0 |
| 50.00 | | 264.2 | 3,454.7 | | | | | 0.0 | 177.9 | 264.2 | 3,632.6 | 0.0 | 0.0 |
| 51.00 | Top - Section 1 | 219.9 | 678.5 | | | | | 0.0 | 35.6 | 219.9 | 714.1 | 0.0 | 0.0 |
| 55.00 | | 394.7 | 1,258.7 | | | | | 0.0 | 142.3 | 394.7 | 1,401.0 | 0.0 | 0.0 |
| 60.00 | | 435.9 | 1,530.0 | | | | | 0.0 | 177.9 | 435.9 | 1,707.9 | 0.0 | 0.0 |
| 65.00 | | 431.9 | 1,481.8 | | | | | 0.0 | 177.9 | 431.9 | 1,659.7 | 0.0 | 0.0 |
| 70.00 | | 426.7 | 1,433.6 | | | | | 0.0 | 177.9 | 426.7 | 1,611.5 | 0.0 | 0.0 |
| 75.00 | | 420.4 | 1,385.4 | | | | | 0.0 | 177.9 | 420.4 | 1,563.3 | 0.0 | 0.0 |
| 80.00 | | 413.2 | 1,337.2 | | | | | 0.0 | 177.9 | 413.2 | 1,515.1 | 0.0 | 0.0 |
| 85.00 | | 365.4 | 1,289.0 | | | | | 0.0 | 177.9 | 365.4 | 1,466.9 | 0.0 | 0.0 |
| 89.00 | Bot - Section 3 | 201.0 | 996.5 | | | | | 0.0 | 142.3 | 201.0 | 1,138.8 | 0.0 | 0.0 |
| 90.00 | | 219.0 | 404.0 | | | | | 0.0 | 35.6 | 219.0 | 439.6 | 0.0 | 0.0 |
| 94.50 | Top - Section 2 | 198.4 | 1,778.8 | | | | | 0.0 | 160.1 | 198.4 | 1,938.9 | 0.0 | 0.0 |
| 95.00 | | 213.1 | 76.6 | | | | | 0.0 | 17.8 | 213.1 | 94.4 | 0.0 | 0.0 |
| 100.00 | | 381.7 | 748.9 | | | | | 0.0 | 177.9 | 381.7 | 926.8 | 0.0 | 0.0 |
| 105.00 | | 370.8 | 717.9 | | | | | 0.0 | 177.9 | 370.8 | 895.8 | 0.0 | 0.0 |
| 110.00 | | 359.3 | 686.9 | | | | | 0.0 | 177.9 | 359.3 | 864.8 | 0.0 | 0.0 |
| 115.00 | | 347.2 | 655.9 | | | | | 0.0 | 177.9 | 347.2 | 833.8 | 0.0 | 0.0 |
| 120.00 | | 269.8 | 624.9 | | | | | 0.0 | 177.9 | 269.8 | 802.8 | 0.0 | 0.0 |
| 123.00 | Appertunance(s) | 164.1 | 360.1 | 2,417.9 | 0.0 | 0.0 | 1,775.6 | 0.0 | 106.7 | 2,581.9 | 2,242.5 | 0.0 | 0.0 |
| 125.00 | | 222.2 | 233.9 | | | | | 0.0 | 64.6 | 222.2 | 298.4 | 0.0 | 0.0 |
| 130.00 | Bot - Section 4 | 279.8 | 563.0 | | | | | 0.0 | 161.4 | 279.8 | 724.4 | 0.0 | 0.0 |
| 134.00 | Top - Section 3 | 152.4 | 717.9 | 2,587.3 | 0.0 | 409.2 | 1,159.2 | 0.0 | 129.1 | 2,739.7 | 2,006.3 | 0.0 | 0.0 |
| 135.00 | | 175.1 | 70.4 | | | | | 0.0 | 14.6 | 175.1 | 85.0 | 0.0 | 0.0 |
| 140.00 | | 173.4 | 339.6 | | | | | 0.0 | 72.8 | 173.4 | 412.5 | 0.0 | 0.0 |
| 141.00 | Appertunance(s) | 137.8 | 65.4 | 2,909.2 | 0.0 | 0.0 | 1,989.5 | 0.0 | 14.6 | 3,047.0 | 2,069.5 | 0.0 | 0.0 |
| 145.00 | | 136.3 | 253.5 | | | | | 0.0 | 0.7 | 136.3 | 254.2 | 0.0 | 0.0 |
| 146.00 | Appertunance(s) | 92.0 | 61.3 | 1,079.6 | 0.0 | 677.1 | 960.0 | 0.0 | 0.2 | 1,171.6 | 1,021.5 | 0.0 | 0.0 |
| 148.50 | | 65.3 | 149.7 | | | | | 0.0 | 0.0 | 65.3 | 149.7 | 0.0 | 0.0 |
| | | | | | | | | Totals: | | 20,755.3 | 53,503.3 | 0.00 | 0.00 |

Site Number: 370630 Code: ANSI/TIA-222-G 

Site Name: Salisbury CT, CT Engineering Number:OAA686579_C3_03 10/5/2016 8:39:18 PM

Customer: T- Mobile

Load Case: 1.2D + 1.6W 90 mph with No Ice 19 Iterations

Gust Response Factor :1.10 Wind Importance Factor 1.00

Dead Load Factor :1.20

Wind Load Factor :1.60

## Calculated Forces

| Seg Elev (ft) | Pu FY (-) (kips) | Vu FX (-) (kips) | Tu MY (ft-kips) | Mu MZ (ft-kips) | Mu MX (ft-kips) | Resultant Moment (ft-kips) | phi Pn (kips) | phi Vn (kips) | phi Tn (ft-kips) | phi Mn (ft-kips) | Total Deflect (in) | Rotation (deg) | Ratio |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.00 | -53.50 | -20.53 | 0.00 | -2,042.30 | 0.00 | 2,042.30 | 7,541.17 | 3,770.58 | 22,511.9 | 11,272.6 | 0.00 | 0.00 | 0.188 |
| 5.00 | -50.98 | -20.09 | 0.00 | -1,939.65 | 0.00 | 1,939.65 | 7,435.91 | 3,717.96 | 21,674.1 | 10,853.2 | 0.02 | -0.04 | 0.186 |
| 10.00 | -48.52 | -19.65 | 0.00 | -1,839.21 | 0.00 | 1,839.21 | 7,327.23 | 3,663.62 | 20,841.5 | 10,436.2 | 0.08 | -0.07 | 0.183 |
| 15.00 | -46.12 | -19.23 | 0.00 | -1,740.95 | 0.00 | 1,740.95 | 7,215.13 | 3,607.56 | 20,014.7 | 10,022.2 | 0.18 | -0.11 | 0.180 |
| 20.00 | -43.77 | -18.81 | 0.00 | -1,644.82 | 0.00 | 1,644.82 | 7,099.60 | 3,549.80 | 19,194.4 | 9,611.47 | 0.32 | -0.15 | 0.177 |
| 25.00 | -41.48 | -18.40 | 0.00 | -1,550.78 | 0.00 | 1,550.78 | 6,980.64 | 3,490.32 | 18,381.3 | 9,204.34 | 0.50 | -0.19 | 0.174 |
| 30.00 | -39.24 | -17.99 | 0.00 | -1,458.78 | 0.00 | 1,458.78 | 6,858.27 | 3,429.13 | 17,576.2 | 8,801.21 | 0.72 | -0.23 | 0.171 |
| 35.00 | -37.06 | -17.59 | 0.00 | -1,368.81 | 0.00 | 1,368.81 | 6,732.46 | 3,366.23 | 16,779.9 | 8,402.42 | 0.99 | -0.27 | 0.168 |
| 40.00 | -34.93 | -17.23 | 0.00 | -1,280.89 | 0.00 | 1,280.89 | 6,603.24 | 3,301.62 | 15,992.9 | 8,008.36 | 1.30 | -0.32 | 0.165 |
| 43.50 | -33.48 | -17.02 | 0.00 | -1,220.58 | 0.00 | 1,220.58 | 6,510.74 | 3,255.37 | 15,448.0 | 7,735.51 | 1.54 | -0.35 | 0.163 |
| 45.00 | -32.36 | -16.74 | 0.00 | -1,195.05 | 0.00 | 1,195.05 | 6,470.58 | 3,235.29 | 15,216.1 | 7,619.37 | 1.65 | -0.36 | 0.162 |
| 50.00 | -28.72 | -16.47 | 0.00 | -1,111.35 | 0.00 | 1,111.35 | 6,334.51 | 3,167.25 | 14,450.1 | 7,235.83 | 2.05 | -0.40 | 0.158 |
| 51.00 | -28.00 | -16.25 | 0.00 | -1,094.89 | 0.00 | 1,094.89 | 5,351.19 | 2,675.60 | 12,353.0 | 6,185.72 | 2.14 | -0.41 | 0.182 |
| 55.00 | -26.59 | -15.87 | 0.00 | -1,029.88 | 0.00 | 1,029.88 | 5,265.80 | 2,632.90 | 11,859.3 | 5,938.51 | 2.50 | -0.45 | 0.179 |
| 60.00 | -24.88 | -15.44 | 0.00 | -950.55 | 0.00 | 950.55 | 5,155.98 | 2,577.99 | 11,249.0 | 5,632.89 | 2.99 | -0.50 | 0.174 |
| 65.00 | -23.21 | -15.01 | 0.00 | -873.37 | 0.00 | 873.37 | 5,042.74 | 2,521.37 | 10,646.9 | 5,331.40 | 3.54 | -0.55 | 0.168 |
| 70.00 | -21.59 | -14.59 | 0.00 | -798.32 | 0.00 | 798.32 | 4,926.07 | 2,463.04 | 10,053.8 | 5,034.40 | 4.14 | -0.60 | 0.163 |
| 75.00 | -20.02 | -14.17 | 0.00 | -725.39 | 0.00 | 725.39 | 4,805.98 | 2,402.99 | 9,470.41 | 4,742.24 | 4.79 | -0.65 | 0.157 |
| 80.00 | -18.49 | -13.75 | 0.00 | -654.55 | 0.00 | 654.55 | 4,682.46 | 2,341.23 | 8,897.37 | 4,455.30 | 5.50 | -0.70 | 0.151 |
| 85.00 | -17.02 | -13.38 | 0.00 | -585.79 | 0.00 | 585.79 | 4,555.52 | 2,277.76 | 8,335.45 | 4,173.92 | 6.25 | -0.75 | 0.144 |
| 89.00 | -15.88 | -13.17 | 0.00 | -532.27 | 0.00 | 532.27 | 4,451.50 | 2,225.75 | 7,894.42 | 3,953.08 | 6.90 | -0.79 | 0.138 |
| 90.00 | -15.44 | -12.96 | 0.00 | -519.10 | 0.00 | 519.10 | 4,425.16 | 2,212.58 | 7,785.39 | 3,898.48 | 7.06 | -0.80 | 0.137 |
| 94.50 | -13.50 | -12.73 | 0.00 | -460.80 | 0.00 | 460.80 | 2,429.52 | 1,214.76 | 4,208.21 | 2,107.23 | 7.84 | -0.84 | 0.224 |
| 95.00 | -13.40 | -12.53 | 0.00 | -454.43 | 0.00 | 454.43 | 2,423.93 | 1,211.97 | 4,181.46 | 2,093.84 | 7.93 | -0.85 | 0.223 |
| 100.00 | -12.46 | -12.15 | 0.00 | -391.78 | 0.00 | 391.78 | 2,366.19 | 1,183.09 | 3,915.26 | 1,960.54 | 8.86 | -0.92 | 0.205 |
| 105.00 | -11.56 | -11.78 | 0.00 | -331.04 | 0.00 | 331.04 | 2,305.01 | 1,152.51 | 3,651.76 | 1,828.59 | 9.86 | -0.99 | 0.186 |
| 110.00 | -10.69 | -11.41 | 0.00 | -272.15 | 0.00 | 272.15 | 2,240.42 | 1,120.21 | 3,391.69 | 1,698.37 | 10.94 | -1.06 | 0.165 |
| 115.00 | -9.85 | -11.06 | 0.00 | -215.08 | 0.00 | 215.08 | 2,172.39 | 1,086.20 | 3,135.78 | 1,570.22 | 12.08 | -1.12 | 0.142 |
| 120.00 | -9.04 | -10.78 | 0.00 | -159.77 | 0.00 | 159.77 | 2,100.95 | 1,050.47 | 2,884.74 | 1,444.51 | 13.28 | -1.17 | 0.115 |
| 123.00 | -6.85 | -8.16 | 0.00 | -127.43 | 0.00 | 127.43 | 2,056.44 | 1,028.22 | 2,736.75 | 1,370.41 | 14.03 | -1.20 | 0.096 |
| 125.00 | -6.55 | -7.93 | 0.00 | -111.11 | 0.00 | 111.11 | 2,026.08 | 1,013.04 | 2,639.30 | 1,321.61 | 14.54 | -1.22 | 0.087 |
| 130.00 | -5.83 | -7.64 | 0.00 | -71.46 | 0.00 | 71.46 | 1,947.78 | 973.89 | 2,400.18 | 1,201.87 | 15.84 | -1.26 | 0.063 |
| 134.00 | -3.88 | -4.86 | 0.00 | -40.49 | 0.00 | 40.49 | 1,102.25 | 551.13 | 1,321.80 | 661.88 | 16.90 | -1.28 | 0.065 |
| 135.00 | -3.80 | -4.68 | 0.00 | -35.63 | 0.00 | 35.63 | 1,095.19 | 547.60 | 1,297.91 | 649.92 | 17.17 | -1.28 | 0.058 |
| 140.00 | -3.39 | -4.50 | 0.00 | -12.23 | 0.00 | 12.23 | 1,057.85 | 528.92 | 1,179.18 | 590.46 | 18.52 | -1.30 | 0.024 |
| 141.00 | -1.39 | -1.41 | 0.00 | -7.73 | 0.00 | 7.73 | 1,049.97 | 524.98 | 1,155.61 | 578.66 | 18.80 | -1.30 | 0.015 |
| 145.00 | -1.14 | -1.26 | 0.00 | -2.11 | 0.00 | 2.11 | 1,017.07 | 508.54 | 1,062.12 | 531.85 | 19.89 | -1.31 | 0.005 |
| 146.00 | -0.15 | -0.07 | 0.00 | -0.17 | 0.00 | 0.17 | 1,008.51 | 504.25 | 1,038.98 | 520.26 | 20.16 | -1.31 | 0.000 |
| 148.50 | 0.00 | -0.07 | 0.00 | 0.00 | 0.00 | 0.00 | 986.50 | 493.25 | 981.57 | 491.52 | 20.85 | -1.31 | 0.000 |

Site Number: 370630 Code: ANSI/TIA-222-G 

Site Name: Salisbury CT, CT Engineering Number:OAA686579_C3_03 10/5/2016 8:39:18 PM

Customer: T- Mobile

**Load Case:** 0.9D + 1.6W — 90 mph with No Ice (Reduced DL) — 19 Iterations

Gust Response Factor :1.10 Wind Importance Factor 1.00

Dead Load Factor :0.90

Wind Load Factor :1.60

## Applied Segment Forces Summary

| | | Shaft Forces | | Discrete Forces | | | | Linear Forces | | Sum of Forces | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Seg Elev (ft) | Description | Wind FX (lb) | Dead Load (lb) | Wind FX (lb) | Torsion MY (lb-ft) | Moment MZ (lb-ft) | Dead Load (lb) | Wind FX (lb) | Dead Load (lb) | Wind FX (lb) | Dead Load (lb) | Torsion MY (lb-ft) | Moment MZ (lb) |
| 0.00 | | 241.0 | 0.0 | | | | | 0.0 | 0.0 | 241.0 | 0.0 | 0.0 | 0.0 |
| 5.00 | | 476.4 | 1,743.0 | | | | | 0.0 | 133.4 | 476.4 | 1,876.5 | 0.0 | 0.0 |
| 10.00 | | 465.1 | 1,701.7 | | | | | 0.0 | 133.4 | 465.1 | 1,835.2 | 0.0 | 0.0 |
| 15.00 | | 453.7 | 1,660.4 | | | | | 0.0 | 133.4 | 453.7 | 1,793.8 | 0.0 | 0.0 |
| 20.00 | | 442.4 | 1,619.1 | | | | | 0.0 | 133.4 | 442.4 | 1,752.5 | 0.0 | 0.0 |
| 25.00 | | 431.0 | 1,577.8 | | | | | 0.0 | 133.4 | 431.0 | 1,711.2 | 0.0 | 0.0 |
| 30.00 | | 424.6 | 1,536.5 | | | | | 0.0 | 133.4 | 424.6 | 1,669.9 | 0.0 | 0.0 |
| 35.00 | | 426.7 | 1,495.2 | | | | | 0.0 | 133.4 | 426.7 | 1,628.6 | 0.0 | 0.0 |
| 40.00 | | 366.1 | 1,453.9 | | | | | 0.0 | 133.4 | 366.1 | 1,587.3 | 0.0 | 0.0 |
| 43.50 | Bot - Section 2 | 217.3 | 993.1 | | | | | 0.0 | 93.4 | 217.3 | 1,086.5 | 0.0 | 0.0 |
| 45.00 | | 286.1 | 792.4 | | | | | 0.0 | 40.0 | 286.1 | 832.4 | 0.0 | 0.0 |
| 50.00 | | 264.2 | 2,591.0 | | | | | 0.0 | 133.4 | 264.2 | 2,724.4 | 0.0 | 0.0 |
| 51.00 | Top - Section 1 | 219.9 | 508.9 | | | | | 0.0 | 26.7 | 219.9 | 535.6 | 0.0 | 0.0 |
| 55.00 | | 394.7 | 944.0 | | | | | 0.0 | 106.7 | 394.7 | 1,050.7 | 0.0 | 0.0 |
| 60.00 | | 435.9 | 1,147.5 | | | | | 0.0 | 133.4 | 435.9 | 1,280.9 | 0.0 | 0.0 |
| 65.00 | | 431.9 | 1,111.3 | | | | | 0.0 | 133.4 | 431.9 | 1,244.7 | 0.0 | 0.0 |
| 70.00 | | 426.7 | 1,075.2 | | | | | 0.0 | 133.4 | 426.7 | 1,208.6 | 0.0 | 0.0 |
| 75.00 | | 420.4 | 1,039.0 | | | | | 0.0 | 133.4 | 420.4 | 1,172.4 | 0.0 | 0.0 |
| 80.00 | | 413.2 | 1,002.9 | | | | | 0.0 | 133.4 | 413.2 | 1,136.3 | 0.0 | 0.0 |
| 85.00 | | 365.4 | 966.7 | | | | | 0.0 | 133.4 | 365.4 | 1,100.1 | 0.0 | 0.0 |
| 89.00 | Bot - Section 3 | 201.0 | 747.4 | | | | | 0.0 | 106.7 | 201.0 | 854.1 | 0.0 | 0.0 |
| 90.00 | | 219.0 | 303.0 | | | | | 0.0 | 26.7 | 219.0 | 329.7 | 0.0 | 0.0 |
| 94.50 | Top - Section 2 | 198.4 | 1,334.1 | | | | | 0.0 | 120.1 | 198.4 | 1,454.2 | 0.0 | 0.0 |
| 95.00 | | 213.1 | 57.4 | | | | | 0.0 | 13.3 | 213.1 | 70.8 | 0.0 | 0.0 |
| 100.00 | | 381.7 | 561.7 | | | | | 0.0 | 133.4 | 381.7 | 695.1 | 0.0 | 0.0 |
| 105.00 | | 370.8 | 538.4 | | | | | 0.0 | 133.4 | 370.8 | 671.9 | 0.0 | 0.0 |
| 110.00 | | 359.3 | 515.2 | | | | | 0.0 | 133.4 | 359.3 | 648.6 | 0.0 | 0.0 |
| 115.00 | | 347.2 | 491.9 | | | | | 0.0 | 133.4 | 347.2 | 625.4 | 0.0 | 0.0 |
| 120.00 | | 269.8 | 468.7 | | | | | 0.0 | 133.4 | 269.8 | 602.1 | 0.0 | 0.0 |
| 123.00 | Appertunance(s) | 164.1 | 270.1 | 2,417.9 | 0.0 | 0.0 | 1,331.7 | 0.0 | 80.1 | 2,581.9 | 1,681.9 | 0.0 | 0.0 |
| 125.00 | | 222.2 | 175.4 | | | | | 0.0 | 48.4 | 222.2 | 223.8 | 0.0 | 0.0 |
| 130.00 | Bot - Section 4 | 279.8 | 422.2 | | | | | 0.0 | 121.0 | 279.8 | 543.3 | 0.0 | 0.0 |
| 134.00 | Top - Section 3 | 152.4 | 538.5 | 2,587.3 | 0.0 | 409.2 | 869.4 | 0.0 | 96.8 | 2,739.7 | 1,504.7 | 0.0 | 0.0 |
| 135.00 | | 175.1 | 52.8 | | | | | 0.0 | 10.9 | 175.1 | 63.7 | 0.0 | 0.0 |
| 140.00 | | 173.4 | 254.7 | | | | | 0.0 | 54.6 | 173.4 | 309.3 | 0.0 | 0.0 |
| 141.00 | Appertunance(s) | 137.8 | 49.1 | 2,909.2 | 0.0 | 0.0 | 1,492.1 | 0.0 | 10.9 | 3,047.0 | 1,552.1 | 0.0 | 0.0 |
| 145.00 | | 136.3 | 190.1 | | | | | 0.0 | 0.5 | 136.3 | 190.7 | 0.0 | 0.0 |
| 146.00 | Appertunance(s) | 92.0 | 46.0 | 1,079.6 | 0.0 | 677.1 | 720.0 | 0.0 | 0.1 | 1,171.6 | 766.1 | 0.0 | 0.0 |
| 148.50 | | 65.3 | 112.3 | | | | | 0.0 | 0.0 | 65.3 | 112.3 | 0.0 | 0.0 |
| | | | | | | | | Totals: | | 20,755.3 | 40,127.5 | 0.00 | 0.00 |

Site Number: 370630 Code: ANSI/TIA-222-G 

Site Name: Salisbury CT, CT Engineering Number:OAA686579_C3_03 10/5/2016 8:39:20 PM

Customer: T- Mobile

Load Case: 0.9D + 1.6W 90 mph with No Ice (Reduced DL) 19 Iterations

Gust Response Factor :1.10 Wind Importance Factor 1.00

Dead Load Factor :0.90

Wind Load Factor :1.60

## Calculated Forces

| Seg Elev (ft) | Pu FY (-) (kips) | Vu FX (-) (kips) | Tu MY (ft-kips) | Mu MZ (ft-kips) | Mu MX (ft-kips) | Resultant Moment (ft-kips) | phi Pn (kips) | phi Vn (kips) | phi Tn (ft-kips) | phi Mn (ft-kips) | Total Deflect (in) | Rotation (deg) | Ratio |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.00 | -40.12 | -20.53 | 0.00 | -2,035.98 | 0.00 | 2,035.98 | 7,541.17 | 3,770.58 | 22,511.9 | 11,272.6 | 0.00 | 0.00 | 0.186 |
| 5.00 | -38.23 | -20.08 | 0.00 | -1,933.35 | 0.00 | 1,933.35 | 7,435.91 | 3,717.96 | 21,674.1 | 10,853.2 | 0.02 | -0.04 | 0.183 |
| 10.00 | -36.38 | -19.63 | 0.00 | -1,832.97 | 0.00 | 1,832.97 | 7,327.23 | 3,663.62 | 20,841.5 | 10,436.2 | 0.08 | -0.07 | 0.181 |
| 15.00 | -34.58 | -19.20 | 0.00 | -1,734.81 | 0.00 | 1,734.81 | 7,215.13 | 3,607.56 | 20,014.7 | 10,022.2 | 0.18 | -0.11 | 0.178 |
| 20.00 | -32.81 | -18.77 | 0.00 | -1,638.82 | 0.00 | 1,638.82 | 7,099.60 | 3,549.80 | 19,194.4 | 9,611.47 | 0.32 | -0.15 | 0.175 |
| 25.00 | -31.09 | -18.36 | 0.00 | -1,544.94 | 0.00 | 1,544.94 | 6,980.64 | 3,490.32 | 18,381.3 | 9,204.34 | 0.50 | -0.19 | 0.172 |
| 30.00 | -29.41 | -17.95 | 0.00 | -1,453.14 | 0.00 | 1,453.14 | 6,858.27 | 3,429.13 | 17,576.2 | 8,801.21 | 0.72 | -0.23 | 0.169 |
| 35.00 | -27.77 | -17.54 | 0.00 | -1,363.39 | 0.00 | 1,363.39 | 6,732.46 | 3,366.23 | 16,779.9 | 8,402.42 | 0.99 | -0.27 | 0.166 |
| 40.00 | -26.17 | -17.18 | 0.00 | -1,275.71 | 0.00 | 1,275.71 | 6,603.24 | 3,301.62 | 15,992.9 | 8,008.36 | 1.29 | -0.31 | 0.163 |
| 43.50 | -25.08 | -16.96 | 0.00 | -1,215.58 | 0.00 | 1,215.58 | 6,510.74 | 3,255.37 | 15,448.0 | 7,735.51 | 1.54 | -0.34 | 0.161 |
| 45.00 | -24.24 | -16.69 | 0.00 | -1,190.13 | 0.00 | 1,190.13 | 6,470.58 | 3,235.29 | 15,216.1 | 7,619.37 | 1.65 | -0.36 | 0.160 |
| 50.00 | -21.51 | -16.41 | 0.00 | -1,106.71 | 0.00 | 1,106.71 | 6,334.51 | 3,167.25 | 14,450.1 | 7,235.83 | 2.05 | -0.40 | 0.156 |
| 51.00 | -20.97 | -16.20 | 0.00 | -1,090.29 | 0.00 | 1,090.29 | 5,351.19 | 2,675.60 | 12,353.0 | 6,185.72 | 2.13 | -0.41 | 0.180 |
| 55.00 | -19.91 | -15.81 | 0.00 | -1,025.50 | 0.00 | 1,025.50 | 5,265.80 | 2,632.90 | 11,859.3 | 5,938.51 | 2.49 | -0.45 | 0.177 |
| 60.00 | -18.62 | -15.38 | 0.00 | -946.45 | 0.00 | 946.45 | 5,155.98 | 2,577.99 | 11,249.0 | 5,632.89 | 2.98 | -0.49 | 0.172 |
| 65.00 | -17.37 | -14.95 | 0.00 | -869.56 | 0.00 | 869.56 | 5,042.74 | 2,521.37 | 10,646.9 | 5,331.40 | 3.53 | -0.54 | 0.167 |
| 70.00 | -16.15 | -14.53 | 0.00 | -794.80 | 0.00 | 794.80 | 4,926.07 | 2,463.04 | 10,053.8 | 5,034.40 | 4.13 | -0.59 | 0.161 |
| 75.00 | -14.97 | -14.11 | 0.00 | -722.17 | 0.00 | 722.17 | 4,805.98 | 2,402.99 | 9,470.41 | 4,742.24 | 4.77 | -0.64 | 0.155 |
| 80.00 | -13.83 | -13.69 | 0.00 | -651.63 | 0.00 | 651.63 | 4,682.46 | 2,341.23 | 8,897.37 | 4,455.30 | 5.48 | -0.69 | 0.149 |
| 85.00 | -12.72 | -13.32 | 0.00 | -583.17 | 0.00 | 583.17 | 4,555.52 | 2,277.76 | 8,335.45 | 4,173.92 | 6.23 | -0.74 | 0.143 |
| 89.00 | -11.87 | -13.12 | 0.00 | -529.88 | 0.00 | 529.88 | 4,451.50 | 2,225.75 | 7,894.42 | 3,953.08 | 6.87 | -0.78 | 0.137 |
| 90.00 | -11.53 | -12.90 | 0.00 | -516.76 | 0.00 | 516.76 | 4,425.16 | 2,212.58 | 7,785.39 | 3,898.48 | 7.04 | -0.80 | 0.135 |
| 94.50 | -10.08 | -12.68 | 0.00 | -458.72 | 0.00 | 458.72 | 2,429.52 | 1,214.76 | 4,208.21 | 2,107.23 | 7.81 | -0.84 | 0.222 |
| 95.00 | -10.00 | -12.48 | 0.00 | -452.38 | 0.00 | 452.38 | 2,423.93 | 1,211.97 | 4,181.46 | 2,093.84 | 7.90 | -0.85 | 0.220 |
| 100.00 | -9.30 | -12.10 | 0.00 | -390.00 | 0.00 | 390.00 | 2,366.19 | 1,183.09 | 3,915.26 | 1,960.54 | 8.82 | -0.92 | 0.203 |
| 105.00 | -8.62 | -11.72 | 0.00 | -329.52 | 0.00 | 329.52 | 2,305.01 | 1,152.51 | 3,651.76 | 1,828.59 | 9.82 | -0.99 | 0.184 |
| 110.00 | -7.96 | -11.36 | 0.00 | -270.90 | 0.00 | 270.90 | 2,240.42 | 1,120.21 | 3,391.69 | 1,698.37 | 10.89 | -1.05 | 0.163 |
| 115.00 | -7.33 | -11.01 | 0.00 | -214.09 | 0.00 | 214.09 | 2,172.39 | 1,086.20 | 3,135.78 | 1,570.22 | 12.03 | -1.11 | 0.140 |
| 120.00 | -6.73 | -10.73 | 0.00 | -159.04 | 0.00 | 159.04 | 2,100.95 | 1,050.47 | 2,884.74 | 1,444.51 | 13.23 | -1.17 | 0.113 |
| 123.00 | -5.10 | -8.12 | 0.00 | -126.84 | 0.00 | 126.84 | 2,056.44 | 1,028.22 | 2,736.75 | 1,370.41 | 13.98 | -1.20 | 0.095 |
| 125.00 | -4.87 | -7.89 | 0.00 | -110.60 | 0.00 | 110.60 | 2,026.08 | 1,013.04 | 2,639.30 | 1,321.61 | 14.48 | -1.22 | 0.086 |
| 130.00 | -4.33 | -7.61 | 0.00 | -71.12 | 0.00 | 71.12 | 1,947.78 | 973.89 | 2,400.18 | 1,201.87 | 15.78 | -1.25 | 0.061 |
| 134.00 | -2.89 | -4.83 | 0.00 | -40.29 | 0.00 | 40.29 | 1,102.25 | 551.13 | 1,321.80 | 661.88 | 16.83 | -1.27 | 0.064 |
| 135.00 | -2.83 | -4.66 | 0.00 | -35.46 | 0.00 | 35.46 | 1,095.19 | 547.60 | 1,297.91 | 649.92 | 17.10 | -1.28 | 0.057 |
| 140.00 | -2.52 | -4.48 | 0.00 | -12.17 | 0.00 | 12.17 | 1,057.85 | 528.92 | 1,179.18 | 590.46 | 18.45 | -1.29 | 0.023 |
| 141.00 | -1.04 | -1.40 | 0.00 | -7.69 | 0.00 | 7.69 | 1,049.97 | 524.98 | 1,155.61 | 578.66 | 18.72 | -1.30 | 0.014 |
| 145.00 | -0.85 | -1.26 | 0.00 | -2.10 | 0.00 | 2.10 | 1,017.07 | 508.54 | 1,062.12 | 531.85 | 19.81 | -1.30 | 0.005 |
| 146.00 | -0.11 | -0.07 | 0.00 | -0.17 | 0.00 | 0.17 | 1,008.51 | 504.25 | 1,038.98 | 520.26 | 20.08 | -1.30 | 0.000 |
| 148.50 | 0.00 | -0.07 | 0.00 | 0.00 | 0.00 | 0.00 | 986.50 | 493.25 | 981.57 | 491.52 | 20.76 | -1.30 | 0.000 |

Site Number: 370630 Code: ANSI/TIA-222-G 

Site Name: Salisbury CT, CT Engineering Number:OAA686579_C3_03 10/5/2016 8:39:20 PM

Customer: T- Mobile

**Load Case:** 1.2D + 1.0Di + 1.0Wi 40 mph with 1.00 in Radial Ice 18 Iterations

Gust Response Factor :1.10 Ice Dead Load Factor :1.00 Wind Importance Factor :1.00

Dead Load Factor :1.20 Ice Importance Factor :1.00

Wind Load Factor :1.00

## Applied Segment Forces Summary

| | | Shaft Forces | | Discrete Forces | | | | Linear Forces | | Sum of Forces | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Seg Elev (ft) | Description | Wind FX (lb) | Dead Load (lb) | Wind FX (lb) | Torsion MY (lb-ft) | Moment MZ (lb-ft) | Dead Load (lb) | Wind FX (lb) | Dead Load (lb) | Wind FX (lb) | Dead Load (lb) | Torsion MY (lb-ft) | Moment MZ (lb) |
| 0.00 | | 57.3 | 0.0 | | | | | 0.0 | 0.0 | 57.3 | 0.0 | 0.0 | 0.0 |
| 5.00 | | 113.5 | 3,030.0 | | | | | 0.0 | 177.9 | 113.5 | 3,207.9 | 0.0 | 0.0 |
| 10.00 | | 111.3 | 3,040.4 | | | | | 0.0 | 177.9 | 111.3 | 3,218.3 | 0.0 | 0.0 |
| 15.00 | | 108.9 | 3,007.4 | | | | | 0.0 | 177.9 | 108.9 | 3,185.3 | 0.0 | 0.0 |
| 20.00 | | 106.5 | 2,960.2 | | | | | 0.0 | 177.9 | 106.5 | 3,138.1 | 0.0 | 0.0 |
| 25.00 | | 104.1 | 2,905.6 | | | | | 0.0 | 177.9 | 104.1 | 3,083.5 | 0.0 | 0.0 |
| 30.00 | | 102.8 | 2,846.3 | | | | | 0.0 | 177.9 | 102.8 | 3,024.2 | 0.0 | 0.0 |
| 35.00 | | 103.6 | 2,783.8 | | | | | 0.0 | 177.9 | 103.6 | 2,961.7 | 0.0 | 0.0 |
| 40.00 | | 89.0 | 2,718.9 | | | | | 0.0 | 177.9 | 89.0 | 2,896.8 | 0.0 | 0.0 |
| 43.50 | Bot - Section 2 | 52.9 | 1,865.8 | | | | | 0.0 | 124.5 | 52.9 | 1,990.4 | 0.0 | 0.0 |
| 45.00 | | 69.8 | 1,291.5 | | | | | 0.0 | 53.4 | 69.8 | 1,344.9 | 0.0 | 0.0 |
| 50.00 | | 64.5 | 4,221.5 | | | | | 0.0 | 177.9 | 64.5 | 4,399.4 | 0.0 | 0.0 |
| 51.00 | Top - Section 1 | 53.8 | 832.0 | | | | | 0.0 | 35.6 | 53.8 | 867.6 | 0.0 | 0.0 |
| 55.00 | | 96.7 | 1,861.3 | | | | | 0.0 | 142.3 | 96.7 | 2,003.6 | 0.0 | 0.0 |
| 60.00 | | 107.1 | 2,267.1 | | | | | 0.0 | 177.9 | 107.1 | 2,445.0 | 0.0 | 0.0 |
| 65.00 | | 106.4 | 2,202.6 | | | | | 0.0 | 177.9 | 106.4 | 2,380.5 | 0.0 | 0.0 |
| 70.00 | | 105.5 | 2,137.3 | | | | | 0.0 | 177.9 | 105.5 | 2,315.2 | 0.0 | 0.0 |
| 75.00 | | 104.3 | 2,071.3 | | | | | 0.0 | 177.9 | 104.3 | 2,249.2 | 0.0 | 0.0 |
| 80.00 | | 102.9 | 2,004.6 | | | | | 0.0 | 177.9 | 102.9 | 2,182.5 | 0.0 | 0.0 |
| 85.00 | | 91.3 | 1,937.5 | | | | | 0.0 | 177.9 | 91.3 | 2,115.4 | 0.0 | 0.0 |
| 89.00 | Bot - Section 3 | 50.3 | 1,503.1 | | | | | 0.0 | 142.3 | 50.3 | 1,645.5 | 0.0 | 0.0 |
| 90.00 | | 55.0 | 531.7 | | | | | 0.0 | 35.6 | 55.0 | 567.2 | 0.0 | 0.0 |
| 94.50 | Top - Section 2 | 49.8 | 2,335.9 | | | | | 0.0 | 160.1 | 49.8 | 2,496.1 | 0.0 | 0.0 |
| 95.00 | | 53.7 | 138.4 | | | | | 0.0 | 17.8 | 53.7 | 156.2 | 0.0 | 0.0 |
| 100.00 | | 96.4 | 1,345.5 | | | | | 0.0 | 177.9 | 96.4 | 1,523.4 | 0.0 | 0.0 |
| 105.00 | | 94.1 | 1,293.8 | | | | | 0.0 | 177.9 | 94.1 | 1,471.7 | 0.0 | 0.0 |
| 110.00 | | 91.7 | 1,241.7 | | | | | 0.0 | 177.9 | 91.7 | 1,419.6 | 0.0 | 0.0 |
| 115.00 | | 89.1 | 1,189.3 | | | | | 0.0 | 177.9 | 89.1 | 1,367.2 | 0.0 | 0.0 |
| 120.00 | | 69.6 | 1,136.6 | | | | | 0.0 | 177.9 | 69.6 | 1,314.5 | 0.0 | 0.0 |
| 123.00 | Appertunance(s) | 42.5 | 659.4 | 421.8 | 0.0 | 0.0 | 5,171.3 | 0.0 | 106.7 | 464.3 | 5,937.5 | 0.0 | 0.0 |
| 125.00 | | 57.9 | 430.0 | | | | | 0.0 | 64.6 | 57.9 | 494.5 | 0.0 | 0.0 |
| 130.00 | Bot - Section 4 | 73.2 | 1,030.2 | | | | | 0.0 | 161.4 | 73.2 | 1,191.6 | 0.0 | 0.0 |
| 134.00 | Top - Section 3 | 40.0 | 1,081.8 | 380.2 | 0.0 | 107.2 | 4,658.4 | 0.0 | 129.1 | 420.2 | 5,869.3 | 0.0 | 0.0 |
| 135.00 | | 46.3 | 160.6 | | | | | 0.0 | 14.6 | 46.3 | 175.1 | 0.0 | 0.0 |
| 140.00 | | 45.9 | 767.0 | | | | | 0.0 | 72.8 | 45.9 | 839.8 | 0.0 | 0.0 |
| 141.00 | Appertunance(s) | 36.8 | 150.1 | 515.2 | 0.0 | 0.0 | 6,287.1 | 0.0 | 14.6 | 552.0 | 6,451.8 | 0.0 | 0.0 |
| 145.00 | | 36.5 | 577.1 | | | | | 0.0 | 0.7 | 36.5 | 577.8 | 0.0 | 0.0 |
| 146.00 | Appertunance(s) | 24.8 | 141.4 | 282.3 | 0.0 | 227.4 | 2,344.0 | 0.0 | 0.2 | 307.1 | 2,485.5 | 0.0 | 0.0 |
| 148.50 | | 17.6 | 343.9 | | | | | 0.0 | 0.0 | 17.6 | 343.9 | 0.0 | 0.0 |
| | | | | | | | | Totals: | | 4,522.86 | 85,337.3 | 0.00 | 0.00 |

Site Number: 370630 Code: ANSI/TIA-222-G 

Site Name: Salisbury CT, CT Engineering Number:OAA686579_C3_03 10/5/2016 8:39:21 PM

Customer: T- Mobile

Load Case: 1.2D + 1.0Di + 1.0Wi 40 mph with 1.00 in Radial Ice 18 Iterations

Gust Response Factor :1.10 Ice Dead Load Factor :1.00 Wind Importance Factor :1.00

Dead Load Factor :1.20 Ice Importance Factor :1.00

Wind Load Factor :1.00

## Calculated Forces

| Seg Elev (ft) | Pu FY (-) (kips) | Vu FX (-) (kips) | Tu MY (ft-kips) | Mu MZ (ft-kips) | Mu MX (ft-kips) | Resultant Moment (ft-kips) | phi Pn (kips) | phi Vn (kips) | phi Tn (ft-kips) | phi Mn (ft-kips) | Total Deflect (in) | Rotation (deg) | Ratio |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.00 | -85.34 | -4.47 | 0.00 | -431.54 | 0.00 | 431.54 | 7,541.17 | 3,770.58 | 22,511.9 | 11,272.6 | 0.00 | 0.00 | 0.050 |
| 5.00 | -82.13 | -4.37 | 0.00 | -409.18 | 0.00 | 409.18 | 7,435.91 | 3,717.96 | 21,674.1 | 10,853.2 | 0.00 | -0.01 | 0.049 |
| 10.00 | -78.91 | -4.27 | 0.00 | -387.34 | 0.00 | 387.34 | 7,327.23 | 3,663.62 | 20,841.5 | 10,436.2 | 0.02 | -0.02 | 0.048 |
| 15.00 | -75.72 | -4.17 | 0.00 | -366.00 | 0.00 | 366.00 | 7,215.13 | 3,607.56 | 20,014.7 | 10,022.2 | 0.04 | -0.02 | 0.047 |
| 20.00 | -72.59 | -4.07 | 0.00 | -345.16 | 0.00 | 345.16 | 7,099.60 | 3,549.80 | 19,194.4 | 9,611.47 | 0.07 | -0.03 | 0.046 |
| 25.00 | -69.50 | -3.98 | 0.00 | -324.81 | 0.00 | 324.81 | 6,980.64 | 3,490.32 | 18,381.3 | 9,204.34 | 0.11 | -0.04 | 0.045 |
| 30.00 | -66.48 | -3.88 | 0.00 | -304.93 | 0.00 | 304.93 | 6,858.27 | 3,429.13 | 17,576.2 | 8,801.21 | 0.15 | -0.05 | 0.044 |
| 35.00 | -63.51 | -3.78 | 0.00 | -285.53 | 0.00 | 285.53 | 6,732.46 | 3,366.23 | 16,779.9 | 8,402.42 | 0.21 | -0.06 | 0.043 |
| 40.00 | -60.62 | -3.70 | 0.00 | -266.62 | 0.00 | 266.62 | 6,603.24 | 3,301.62 | 15,992.9 | 8,008.36 | 0.27 | -0.07 | 0.042 |
| 43.50 | -58.63 | -3.65 | 0.00 | -253.67 | 0.00 | 253.67 | 6,510.74 | 3,255.37 | 15,448.0 | 7,735.51 | 0.32 | -0.07 | 0.042 |
| 45.00 | -57.28 | -3.58 | 0.00 | -248.20 | 0.00 | 248.20 | 6,470.58 | 3,235.29 | 15,216.1 | 7,619.37 | 0.35 | -0.08 | 0.041 |
| 50.00 | -52.88 | -3.52 | 0.00 | -230.29 | 0.00 | 230.29 | 6,334.51 | 3,167.25 | 14,450.1 | 7,235.83 | 0.43 | -0.08 | 0.040 |
| 51.00 | -52.01 | -3.47 | 0.00 | -226.77 | 0.00 | 226.77 | 5,351.19 | 2,675.60 | 12,353.0 | 6,185.72 | 0.45 | -0.09 | 0.046 |
| 55.00 | -50.01 | -3.37 | 0.00 | -212.91 | 0.00 | 212.91 | 5,265.80 | 2,632.90 | 11,859.3 | 5,938.51 | 0.52 | -0.09 | 0.045 |
| 60.00 | -47.56 | -3.27 | 0.00 | -196.04 | 0.00 | 196.04 | 5,155.98 | 2,577.99 | 11,249.0 | 5,632.89 | 0.63 | -0.10 | 0.044 |
| 65.00 | -45.18 | -3.17 | 0.00 | -179.68 | 0.00 | 179.68 | 5,042.74 | 2,521.37 | 10,646.9 | 5,331.40 | 0.74 | -0.11 | 0.043 |
| 70.00 | -42.87 | -3.07 | 0.00 | -163.84 | 0.00 | 163.84 | 4,926.07 | 2,463.04 | 10,053.8 | 5,034.40 | 0.87 | -0.12 | 0.041 |
| 75.00 | -40.62 | -2.96 | 0.00 | -148.52 | 0.00 | 148.52 | 4,805.98 | 2,402.99 | 9,470.41 | 4,742.24 | 1.00 | -0.13 | 0.040 |
| 80.00 | -38.44 | -2.86 | 0.00 | -133.70 | 0.00 | 133.70 | 4,682.46 | 2,341.23 | 8,897.37 | 4,455.30 | 1.15 | -0.14 | 0.038 |
| 85.00 | -36.32 | -2.77 | 0.00 | -119.39 | 0.00 | 119.39 | 4,555.52 | 2,277.76 | 8,335.45 | 4,173.92 | 1.31 | -0.16 | 0.037 |
| 89.00 | -34.68 | -2.72 | 0.00 | -108.30 | 0.00 | 108.30 | 4,451.50 | 2,225.75 | 7,894.42 | 3,953.08 | 1.44 | -0.16 | 0.035 |
| 90.00 | -34.11 | -2.67 | 0.00 | -105.58 | 0.00 | 105.58 | 4,425.16 | 2,212.58 | 7,785.39 | 3,898.48 | 1.47 | -0.17 | 0.035 |
| 94.50 | -31.61 | -2.61 | 0.00 | -93.59 | 0.00 | 93.59 | 2,429.52 | 1,214.76 | 4,208.21 | 2,107.23 | 1.64 | -0.17 | 0.057 |
| 95.00 | -31.46 | -2.56 | 0.00 | -92.28 | 0.00 | 92.28 | 2,423.93 | 1,211.97 | 4,181.46 | 2,093.84 | 1.65 | -0.18 | 0.057 |
| 100.00 | -29.93 | -2.47 | 0.00 | -79.47 | 0.00 | 79.47 | 2,366.19 | 1,183.09 | 3,915.26 | 1,960.54 | 1.85 | -0.19 | 0.053 |
| 105.00 | -28.46 | -2.38 | 0.00 | -67.13 | 0.00 | 67.13 | 2,305.01 | 1,152.51 | 3,651.76 | 1,828.59 | 2.05 | -0.20 | 0.049 |
| 110.00 | -27.04 | -2.29 | 0.00 | -55.24 | 0.00 | 55.24 | 2,240.42 | 1,120.21 | 3,391.69 | 1,698.37 | 2.28 | -0.22 | 0.045 |
| 115.00 | -25.67 | -2.20 | 0.00 | -43.82 | 0.00 | 43.82 | 2,172.39 | 1,086.20 | 3,135.78 | 1,570.22 | 2.51 | -0.23 | 0.040 |
| 120.00 | -24.36 | -2.12 | 0.00 | -32.84 | 0.00 | 32.84 | 2,100.95 | 1,050.47 | 2,884.74 | 1,444.51 | 2.76 | -0.24 | 0.034 |
| 123.00 | -18.42 | -1.64 | 0.00 | -26.46 | 0.00 | 26.46 | 2,056.44 | 1,028.22 | 2,736.75 | 1,370.41 | 2.91 | -0.25 | 0.028 |
| 125.00 | -17.93 | -1.58 | 0.00 | -23.19 | 0.00 | 23.19 | 2,026.08 | 1,013.04 | 2,639.30 | 1,321.61 | 3.02 | -0.25 | 0.026 |
| 130.00 | -16.74 | -1.50 | 0.00 | -15.30 | 0.00 | 15.30 | 1,947.78 | 973.89 | 2,400.18 | 1,201.87 | 3.29 | -0.26 | 0.021 |
| 134.00 | -10.87 | -1.06 | 0.00 | -9.18 | 0.00 | 9.18 | 1,102.25 | 551.13 | 1,321.80 | 661.88 | 3.50 | -0.26 | 0.024 |
| 135.00 | -10.69 | -1.01 | 0.00 | -8.13 | 0.00 | 8.13 | 1,095.19 | 547.60 | 1,297.91 | 649.92 | 3.56 | -0.26 | 0.022 |
| 140.00 | -9.85 | -0.96 | 0.00 | -3.08 | 0.00 | 3.08 | 1,057.85 | 528.92 | 1,179.18 | 590.46 | 3.84 | -0.27 | 0.015 |
| 141.00 | -3.41 | -0.38 | 0.00 | -2.12 | 0.00 | 2.12 | 1,049.97 | 524.98 | 1,155.61 | 578.66 | 3.90 | -0.27 | 0.007 |
| 145.00 | -2.83 | -0.34 | 0.00 | -0.61 | 0.00 | 0.61 | 1,017.07 | 508.54 | 1,062.12 | 531.85 | 4.12 | -0.27 | 0.004 |
| 146.00 | -0.34 | -0.02 | 0.00 | -0.05 | 0.00 | 0.05 | 1,008.51 | 504.25 | 1,038.98 | 520.26 | 4.18 | -0.27 | 0.000 |
| 148.50 | 0.00 | -0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 986.50 | 493.25 | 981.57 | 491.52 | 4.32 | -0.27 | 0.000 |

Load Case: 1.0D + 1.0W Serviceability 60 mph 18 Iterations

Gust Response Factor :1.10 Wind Importance Factor 1.00
Dead Load Factor :1.00
Wind Load Factor :1.00

## Applied Segment Forces Summary

| | | Shaft Forces | | Discrete Forces | | | | Linear Forces | | Sum of Forces | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Seg Elev (ft) | Description | Wind FX (lb) | Dead Load (lb) | Wind FX (lb) | Torsion MY (lb-ft) | Moment MZ (lb-ft) | Dead Load (lb) | Wind FX (lb) | Dead Load (lb) | Wind FX (lb) | Dead Load (lb) | Torsion MY (lb-ft) | Moment MZ (lb) |
| 0.00 | | 67.0 | 0.0 | | | | | 0.0 | 0.0 | 67.0 | 0.0 | 0.0 | 0.0 |
| 5.00 | | 132.3 | 1,936.7 | | | | | 0.0 | 148.3 | 132.3 | 2,085.0 | 0.0 | 0.0 |
| 10.00 | | 129.2 | 1,890.8 | | | | | 0.0 | 148.3 | 129.2 | 2,039.1 | 0.0 | 0.0 |
| 15.00 | | 126.0 | 1,844.9 | | | | | 0.0 | 148.3 | 126.0 | 1,993.2 | 0.0 | 0.0 |
| 20.00 | | 122.9 | 1,799.0 | | | | | 0.0 | 148.3 | 122.9 | 1,947.3 | 0.0 | 0.0 |
| 25.00 | | 119.7 | 1,753.1 | | | | | 0.0 | 148.3 | 119.7 | 1,901.4 | 0.0 | 0.0 |
| 30.00 | | 118.0 | 1,707.2 | | | | | 0.0 | 148.3 | 118.0 | 1,855.5 | 0.0 | 0.0 |
| 35.00 | | 118.5 | 1,661.3 | | | | | 0.0 | 148.3 | 118.5 | 1,809.5 | 0.0 | 0.0 |
| 40.00 | | 101.7 | 1,615.4 | | | | | 0.0 | 148.3 | 101.7 | 1,763.6 | 0.0 | 0.0 |
| 43.50 | Bot - Section 2 | 60.4 | 1,103.5 | | | | | 0.0 | 103.8 | 60.4 | 1,207.2 | 0.0 | 0.0 |
| 45.00 | | 79.5 | 880.4 | | | | | 0.0 | 44.5 | 79.5 | 924.9 | 0.0 | 0.0 |
| 50.00 | | 73.4 | 2,878.9 | | | | | 0.0 | 148.3 | 73.4 | 3,027.1 | 0.0 | 0.0 |
| 51.00 | Top - Section 1 | 61.1 | 565.4 | | | | | 0.0 | 29.7 | 61.1 | 595.1 | 0.0 | 0.0 |
| 55.00 | | 109.6 | 1,048.9 | | | | | 0.0 | 118.6 | 109.6 | 1,167.5 | 0.0 | 0.0 |
| 60.00 | | 121.1 | 1,275.0 | | | | | 0.0 | 148.3 | 121.1 | 1,423.2 | 0.0 | 0.0 |
| 65.00 | | 120.0 | 1,234.8 | | | | | 0.0 | 148.3 | 120.0 | 1,383.0 | 0.0 | 0.0 |
| 70.00 | | 118.5 | 1,194.6 | | | | | 0.0 | 148.3 | 118.5 | 1,342.9 | 0.0 | 0.0 |
| 75.00 | | 116.8 | 1,154.5 | | | | | 0.0 | 148.3 | 116.8 | 1,302.7 | 0.0 | 0.0 |
| 80.00 | | 114.8 | 1,114.3 | | | | | 0.0 | 148.3 | 114.8 | 1,262.6 | 0.0 | 0.0 |
| 85.00 | | 101.5 | 1,074.1 | | | | | 0.0 | 148.3 | 101.5 | 1,222.4 | 0.0 | 0.0 |
| 89.00 | Bot - Section 3 | 55.8 | 830.4 | | | | | 0.0 | 118.6 | 55.8 | 949.0 | 0.0 | 0.0 |
| 90.00 | | 60.8 | 336.7 | | | | | 0.0 | 29.7 | 60.8 | 366.3 | 0.0 | 0.0 |
| 94.50 | Top - Section 2 | 55.1 | 1,482.3 | | | | | 0.0 | 133.4 | 55.1 | 1,615.7 | 0.0 | 0.0 |
| 95.00 | | 59.2 | 63.8 | | | | | 0.0 | 14.8 | 59.2 | 78.7 | 0.0 | 0.0 |
| 100.00 | | 106.0 | 624.1 | | | | | 0.0 | 148.3 | 106.0 | 772.3 | 0.0 | 0.0 |
| 105.00 | | 103.0 | 598.3 | | | | | 0.0 | 148.3 | 103.0 | 746.5 | 0.0 | 0.0 |
| 110.00 | | 99.8 | 572.4 | | | | | 0.0 | 148.3 | 99.8 | 720.7 | 0.0 | 0.0 |
| 115.00 | | 96.5 | 546.6 | | | | | 0.0 | 148.3 | 96.5 | 694.9 | 0.0 | 0.0 |
| 120.00 | | 74.9 | 520.8 | | | | | 0.0 | 148.3 | 74.9 | 669.0 | 0.0 | 0.0 |
| 123.00 | Appertunance(s) | 45.6 | 300.1 | 671.6 | 0.0 | 0.0 | 1,479.7 | 0.0 | 88.9 | 717.2 | 1,868.7 | 0.0 | 0.0 |
| 125.00 | | 61.7 | 194.9 | | | | | 0.0 | 53.8 | 61.7 | 248.7 | 0.0 | 0.0 |
| 130.00 | Bot - Section 4 | 77.7 | 469.1 | | | | | 0.0 | 134.5 | 77.7 | 603.6 | 0.0 | 0.0 |
| 134.00 | Top - Section 3 | 42.3 | 598.3 | 718.7 | 0.0 | 113.7 | 966.0 | 0.0 | 107.6 | 761.0 | 1,671.9 | 0.0 | 0.0 |
| 135.00 | | 48.6 | 58.7 | | | | | 0.0 | 12.1 | 48.6 | 70.8 | 0.0 | 0.0 |
| 140.00 | | 48.2 | 283.0 | | | | | 0.0 | 60.7 | 48.2 | 343.7 | 0.0 | 0.0 |
| 141.00 | Appertunance(s) | 38.3 | 54.5 | 808.1 | 0.0 | 0.0 | 1,657.9 | 0.0 | 12.1 | 846.4 | 1,724.6 | 0.0 | 0.0 |
| 145.00 | | 37.9 | 211.3 | | | | | 0.0 | 0.6 | 37.9 | 211.9 | 0.0 | 0.0 |
| 146.00 | Appertunance(s) | 25.5 | 51.1 | 299.9 | 0.0 | 188.1 | 800.0 | 0.0 | 0.2 | 325.4 | 851.2 | 0.0 | 0.0 |
| 148.50 | | 18.1 | 124.7 | | | | | 0.0 | 0.0 | 18.1 | 124.7 | 0.0 | 0.0 |
| | | | | | | | | Totals: | | 5,765.38 | 44,586.1 | 0.00 | 0.00 |

Load Case: 1.0D + 1.0W Serviceability 60 mph 18 Iterations

Gust Response Factor :1.10 Wind Importance Factor 1.00
Dead Load Factor :1.00
Wind Load Factor :1.00

## Calculated Forces

| Seg Elev (ft) | Pu FY (-) (kips) | Vu FX (-) (kips) | Tu MY (ft-kips) | Mu MZ (ft-kips) | Mu MX (ft-kips) | Resultant Moment (ft-kips) | phi Pn (kips) | phi Vn (kips) | phi Tn (ft-kips) | phi Mn (ft-kips) | Total Deflect (in) | Rotation (deg) | Ratio |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.00 | -44.59 | -5.70 | 0.00 | -566.10 | 0.00 | 566.10 | 7,541.17 | 3,770.58 | 22,511.9 | 11,272.6 | 0.00 | 0.00 | 0.056 |
| 5.00 | -42.50 | -5.58 | 0.00 | -537.59 | 0.00 | 537.59 | 7,435.91 | 3,717.96 | 21,674.1 | 10,853.2 | 0.01 | -0.01 | 0.055 |
| 10.00 | -40.46 | -5.45 | 0.00 | -509.70 | 0.00 | 509.70 | 7,327.23 | 3,663.62 | 20,841.5 | 10,436.2 | 0.02 | -0.02 | 0.054 |
| 15.00 | -38.47 | -5.33 | 0.00 | -482.43 | 0.00 | 482.43 | 7,215.13 | 3,607.56 | 20,014.7 | 10,022.2 | 0.05 | -0.03 | 0.053 |
| 20.00 | -36.52 | -5.22 | 0.00 | -455.76 | 0.00 | 455.76 | 7,099.60 | 3,549.80 | 19,194.4 | 9,611.47 | 0.09 | -0.04 | 0.053 |
| 25.00 | -34.62 | -5.10 | 0.00 | -429.67 | 0.00 | 429.67 | 6,980.64 | 3,490.32 | 18,381.3 | 9,204.34 | 0.14 | -0.05 | 0.052 |
| 30.00 | -32.76 | -4.99 | 0.00 | -404.15 | 0.00 | 404.15 | 6,858.27 | 3,429.13 | 17,576.2 | 8,801.21 | 0.20 | -0.06 | 0.051 |
| 35.00 | -30.95 | -4.88 | 0.00 | -379.20 | 0.00 | 379.20 | 6,732.46 | 3,366.23 | 16,779.9 | 8,402.42 | 0.27 | -0.08 | 0.050 |
| 40.00 | -29.18 | -4.78 | 0.00 | -354.83 | 0.00 | 354.83 | 6,603.24 | 3,301.62 | 15,992.9 | 8,008.36 | 0.36 | -0.09 | 0.049 |
| 43.50 | -27.98 | -4.72 | 0.00 | -338.11 | 0.00 | 338.11 | 6,510.74 | 3,255.37 | 15,448.0 | 7,735.51 | 0.43 | -0.10 | 0.048 |
| 45.00 | -27.05 | -4.64 | 0.00 | -331.04 | 0.00 | 331.04 | 6,470.58 | 3,235.29 | 15,216.1 | 7,619.37 | 0.46 | -0.10 | 0.048 |
| 50.00 | -24.02 | -4.56 | 0.00 | -307.84 | 0.00 | 307.84 | 6,334.51 | 3,167.25 | 14,450.1 | 7,235.83 | 0.57 | -0.11 | 0.046 |
| 51.00 | -23.43 | -4.50 | 0.00 | -303.27 | 0.00 | 303.27 | 5,351.19 | 2,675.60 | 12,353.0 | 6,185.72 | 0.59 | -0.11 | 0.053 |
| 55.00 | -22.26 | -4.40 | 0.00 | -285.26 | 0.00 | 285.26 | 5,265.80 | 2,632.90 | 11,859.3 | 5,938.51 | 0.69 | -0.12 | 0.052 |
| 60.00 | -20.84 | -4.28 | 0.00 | -263.28 | 0.00 | 263.28 | 5,155.98 | 2,577.99 | 11,249.0 | 5,632.89 | 0.83 | -0.14 | 0.051 |
| 65.00 | -19.45 | -4.16 | 0.00 | -241.89 | 0.00 | 241.89 | 5,042.74 | 2,521.37 | 10,646.9 | 5,331.40 | 0.98 | -0.15 | 0.049 |
| 70.00 | -18.11 | -4.04 | 0.00 | -221.10 | 0.00 | 221.10 | 4,926.07 | 2,463.04 | 10,053.8 | 5,034.40 | 1.15 | -0.17 | 0.048 |
| 75.00 | -16.81 | -3.92 | 0.00 | -200.90 | 0.00 | 200.90 | 4,805.98 | 2,402.99 | 9,470.41 | 4,742.24 | 1.33 | -0.18 | 0.046 |
| 80.00 | -15.54 | -3.81 | 0.00 | -181.28 | 0.00 | 181.28 | 4,682.46 | 2,341.23 | 8,897.37 | 4,455.30 | 1.52 | -0.19 | 0.044 |
| 85.00 | -14.32 | -3.71 | 0.00 | -162.24 | 0.00 | 162.24 | 4,555.52 | 2,277.76 | 8,335.45 | 4,173.92 | 1.73 | -0.21 | 0.042 |
| 89.00 | -13.37 | -3.65 | 0.00 | -147.41 | 0.00 | 147.41 | 4,451.50 | 2,225.75 | 7,894.42 | 3,953.08 | 1.91 | -0.22 | 0.040 |
| 90.00 | -13.00 | -3.59 | 0.00 | -143.76 | 0.00 | 143.76 | 4,425.16 | 2,212.58 | 7,785.39 | 3,898.48 | 1.96 | -0.22 | 0.040 |
| 94.50 | -11.39 | -3.53 | 0.00 | -127.62 | 0.00 | 127.62 | 2,429.52 | 1,214.76 | 4,208.21 | 2,107.23 | 2.17 | -0.23 | 0.065 |
| 95.00 | -11.31 | -3.47 | 0.00 | -125.85 | 0.00 | 125.85 | 2,423.93 | 1,211.97 | 4,181.46 | 2,093.84 | 2.20 | -0.24 | 0.065 |
| 100.00 | -10.54 | -3.36 | 0.00 | -108.50 | 0.00 | 108.50 | 2,366.19 | 1,183.09 | 3,915.26 | 1,960.54 | 2.45 | -0.26 | 0.060 |
| 105.00 | -9.79 | -3.26 | 0.00 | -91.68 | 0.00 | 91.68 | 2,305.01 | 1,152.51 | 3,651.76 | 1,828.59 | 2.73 | -0.27 | 0.054 |
| 110.00 | -9.07 | -3.16 | 0.00 | -75.37 | 0.00 | 75.37 | 2,240.42 | 1,120.21 | 3,391.69 | 1,698.37 | 3.03 | -0.29 | 0.048 |
| 115.00 | -8.37 | -3.06 | 0.00 | -59.56 | 0.00 | 59.56 | 2,172.39 | 1,086.20 | 3,135.78 | 1,570.22 | 3.35 | -0.31 | 0.042 |
| 120.00 | -7.70 | -2.99 | 0.00 | -44.25 | 0.00 | 44.25 | 2,100.95 | 1,050.47 | 2,884.74 | 1,444.51 | 3.68 | -0.33 | 0.034 |
| 123.00 | -5.84 | -2.26 | 0.00 | -35.29 | 0.00 | 35.29 | 2,056.44 | 1,028.22 | 2,736.75 | 1,370.41 | 3.89 | -0.33 | 0.029 |
| 125.00 | -5.59 | -2.20 | 0.00 | -30.77 | 0.00 | 30.77 | 2,026.08 | 1,013.04 | 2,639.30 | 1,321.61 | 4.03 | -0.34 | 0.026 |
| 130.00 | -4.99 | -2.12 | 0.00 | -19.79 | 0.00 | 19.79 | 1,947.78 | 973.89 | 2,400.18 | 1,201.87 | 4.39 | -0.35 | 0.019 |
| 134.00 | -3.32 | -1.34 | 0.00 | -11.21 | 0.00 | 11.21 | 1,102.25 | 551.13 | 1,321.80 | 661.88 | 4.68 | -0.35 | 0.020 |
| 135.00 | -3.25 | -1.30 | 0.00 | -9.87 | 0.00 | 9.87 | 1,095.19 | 547.60 | 1,297.91 | 649.92 | 4.76 | -0.35 | 0.018 |
| 140.00 | -2.90 | -1.25 | 0.00 | -3.39 | 0.00 | 3.39 | 1,057.85 | 528.92 | 1,179.18 | 590.46 | 5.13 | -0.36 | 0.008 |
| 141.00 | -1.19 | -0.39 | 0.00 | -2.14 | 0.00 | 2.14 | 1,049.97 | 524.98 | 1,155.61 | 578.66 | 5.21 | -0.36 | 0.005 |
| 145.00 | -0.97 | -0.35 | 0.00 | -0.58 | 0.00 | 0.58 | 1,017.07 | 508.54 | 1,062.12 | 531.85 | 5.51 | -0.36 | 0.002 |
| 146.00 | -0.12 | -0.02 | 0.00 | -0.05 | 0.00 | 0.05 | 1,008.51 | 504.25 | 1,038.98 | 520.26 | 5.59 | -0.36 | 0.000 |
| 148.50 | 0.00 | -0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 986.50 | 493.25 | 981.57 | 491.52 | 5.78 | -0.36 | 0.000 |

## Equivalent Lateral Forces Method Analysis

(Based on ASCE7-10 Chapters 11, 12, 15)

| | | |
|---|---|---|
| Spectral Response Acceleration for Short Period ($S_s$): | 0.17 | |
| Spectral Response Acceleration at 1.0 Second Period ($S_1$): | 0.06 | |
| Long-Period Transition Period ($T_L$): | 6 | |
| Importance Factor ($I_E$): | 1.00 | |
| Site Coefficient $F_a$: | 1.60 | |
| Site Coeffiecient $F_v$: | 2.40 | |
| Response Modification Coefficient (R): | 1.50 | |
| Design Spectral Response Acceleration at Short Period ($S_{ds}$): | 0.19 | |
| Design Spectral Response Acceleration at 1.0 Second Period ($S_{d1}$): | 0.10 | |
| Seismic Response Coefficient ($C_s$): | 0.06 | |
| Upper Limit $C_s$ | 0.06 | |
| Lower Limit $C_s$ | 0.03 | |
| Period based on Rayleigh Method (sec): | 1.17 | |
| Redundancy Factor (p): | 1.30 | |
| Seismic Force Distribution Exponent (k): | 1.33 | |
| Total Unfactored Dead Load: | 44.59 | k |
| Seismic Base Shear (E): | 3.45 | k |

Load Case (1.2 + 0.2Sds) * DL + E ELFM

Seismic Equivalent Lateral Forces Method

| Segment | Height Above Base (ft) | Weight (lb) | $W_z$ (lb-ft) | $C_{vx}$ | Horizontal Force (lb) | Vertical Force (lb) |
|---|---|---|---|---|---|---|
| 38 | 147.25 | 125 | 97 | 0.008 | 26 | 154 |
| 37 | 145.50 | 51 | 39 | 0.003 | 11 | 63 |
| 36 | 143.00 | 212 | 158 | 0.013 | 43 | 262 |
| 35 | 140.50 | 67 | 49 | 0.004 | 13 | 82 |
| 34 | 137.50 | 344 | 243 | 0.019 | 66 | 425 |
| 33 | 134.50 | 71 | 49 | 0.004 | 13 | 88 |
| 32 | 132.00 | 706 | 473 | 0.037 | 129 | 873 |
| 31 | 127.50 | 604 | 386 | 0.031 | 105 | 747 |
| 30 | 124.00 | 249 | 153 | 0.012 | 42 | 308 |
| 29 | 121.50 | 389 | 233 | 0.018 | 64 | 481 |
| 28 | 117.50 | 669 | 384 | 0.030 | 105 | 828 |
| 27 | 112.50 | 695 | 376 | 0.030 | 103 | 860 |
| 26 | 107.50 | 721 | 367 | 0.029 | 100 | 892 |
| 25 | 102.50 | 747 | 357 | 0.028 | 97 | 924 |
| 24 | 97.50 | 772 | 346 | 0.027 | 94 | 955 |
| 23 | 94.75 | 79 | 34 | 0.003 | 9 | 97 |
| 22 | 92.25 | 1,616 | 672 | 0.053 | 183 | 1,999 |
| 21 | 89.50 | 366 | 146 | 0.012 | 40 | 453 |
| 20 | 87.00 | 949 | 365 | 0.029 | 100 | 1,174 |
| 19 | 82.50 | 1,222 | 438 | 0.035 | 119 | 1,512 |
| 18 | 77.50 | 1,263 | 416 | 0.033 | 114 | 1,562 |
| 17 | 72.50 | 1,303 | 393 | 0.031 | 107 | 1,612 |
| 16 | 67.50 | 1,343 | 368 | 0.029 | 100 | 1,661 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 15 | 62.50 | 1,383 | 342 | 0.027 | 93 | 1,711 |
| 14 | 57.50 | 1,423 | 315 | 0.025 | 86 | 1,761 |
| 13 | 53.00 | 1,167 | 232 | 0.018 | 63 | 1,444 |
| 12 | 50.50 | 595 | 111 | 0.009 | 30 | 736 |
| 11 | 47.50 | 3,027 | 520 | 0.041 | 142 | 3,745 |
| 10 | 44.25 | 925 | 144 | 0.011 | 39 | 1,144 |
| 9 | 41.75 | 1,207 | 174 | 0.014 | 48 | 1,494 |
| 8 | 37.50 | 1,764 | 221 | 0.017 | 60 | 2,182 |
| 7 | 32.50 | 1,810 | 187 | 0.015 | 51 | 2,239 |
| 6 | 27.50 | 1,855 | 154 | 0.012 | 42 | 2,295 |
| 5 | 22.50 | 1,901 | 121 | 0.010 | 33 | 2,352 |
| 4 | 17.50 | 1,947 | 88 | 0.007 | 24 | 2,409 |
| 3 | 12.50 | 1,993 | 58 | 0.005 | 16 | 2,466 |
| 2 | 7.50 | 2,039 | 30 | 0.002 | 8 | 2,523 |
| 1 | 2.50 | 2,085 | 7 | 0.001 | 2 | 2,579 |
| RFS Celwave PD220 | 146.00 | 25 | 19 | 0.002 | 5 | 31 |
| RFS Celwave PD220 | 146.00 | 25 | 19 | 0.002 | 5 | 31 |
| Flat T-Arm | 146.00 | 750 | 575 | 0.045 | 157 | 928 |
| Powerwave Allgon LGP | 141.00 | 85 | 62 | 0.005 | 17 | 105 |
| Raycap DC6-48-60-18- | 141.00 | 33 | 24 | 0.002 | 7 | 41 |
| Ericsson RRUS 11 (Ba | 141.00 | 330 | 241 | 0.019 | 66 | 408 |
| Powerwave 7770.00 | 141.00 | 315 | 230 | 0.018 | 63 | 390 |
| KMW AM-X-CD-16-65-00 | 141.00 | 146 | 106 | 0.008 | 29 | 180 |
| Flat T-Arm | 141.00 | 750 | 549 | 0.043 | 150 | 928 |
| Antel BXA-185085/12C | 134.00 | 39 | 27 | 0.002 | 7 | 48 |
| Antel BXA-70063/6CF | 134.00 | 51 | 35 | 0.003 | 10 | 63 |
| Antel LPA-80080/6CF | 134.00 | 126 | 86 | 0.007 | 24 | 156 |
| Round T-Arm | 134.00 | 750 | 513 | 0.041 | 140 | 928 |
| Symmetricom 58532A | 123.00 | 0 | 0 | 0.000 | 0 | 0 |
| Ericsson RRUS 11 B12 | 123.00 | 152 | 93 | 0.007 | 25 | 188 |
| Ericsson RRUS 11 B4 | 123.00 | 152 | 93 | 0.007 | 25 | 188 |
| Ericsson RRUS 11 B2 | 123.00 | 152 | 93 | 0.007 | 25 | 188 |
| RFS APX16DWV-16DWVS- | 123.00 | 122 | 74 | 0.006 | 20 | 151 |
| Commscope LNX-6515DS | 123.00 | 151 | 92 | 0.007 | 25 | 187 |
| Flat T-Arm | 123.00 | 750 | 457 | 0.036 | 125 | 928 |
| | | 44,586 | 12,634 | 1.000 | 3,448 | 55,158 |

Load Case (0.9 - 0.2Sds) * DL + E ELFM Seismic (Reduced DL) Equivalent Lateral Forces Method

| Segment | Height Above Base (ft) | Weight (lb) | $W_z$ (lb-ft) | $C_{vx}$ | Horizontal Force (lb) | Vertical Force (lb) |
|---|---|---|---|---|---|---|
| 38 | 147.25 | 125 | 97 | 0.008 | 26 | 108 |
| 37 | 145.50 | 51 | 39 | 0.003 | 11 | 44 |
| 36 | 143.00 | 212 | 158 | 0.013 | 43 | 183 |
| 35 | 140.50 | 67 | 49 | 0.004 | 13 | 58 |
| 34 | 137.50 | 344 | 243 | 0.019 | 66 | 297 |
| 33 | 134.50 | 71 | 49 | 0.004 | 13 | 61 |
| 32 | 132.00 | 706 | 473 | 0.037 | 129 | 609 |
| 31 | 127.50 | 604 | 386 | 0.031 | 105 | 521 |
| 30 | 124.00 | 249 | 153 | 0.012 | 42 | 215 |
| 29 | 121.50 | 389 | 233 | 0.018 | 64 | 336 |
| 28 | 117.50 | 669 | 384 | 0.030 | 105 | 577 |
| 27 | 112.50 | 695 | 376 | 0.030 | 103 | 600 |
| 26 | 107.50 | 721 | 367 | 0.029 | 100 | 622 |
| 25 | 102.50 | 747 | 357 | 0.028 | 97 | 644 |
| 24 | 97.50 | 772 | 346 | 0.027 | 94 | 666 |
| 23 | 94.75 | 79 | 34 | 0.003 | 9 | 68 |
| 22 | 92.25 | 1,616 | 672 | 0.053 | 183 | 1,394 |
| 21 | 89.50 | 366 | 146 | 0.012 | 40 | 316 |
| 20 | 87.00 | 949 | 365 | 0.029 | 100 | 819 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 19 | 82.50 | 1,222 | 438 | 0.035 | 119 | 1,055 |
| 18 | 77.50 | 1,263 | 416 | 0.033 | 114 | 1,089 |
| 17 | 72.50 | 1,303 | 393 | 0.031 | 107 | 1,124 |
| 16 | 67.50 | 1,343 | 368 | 0.029 | 100 | 1,159 |
| 15 | 62.50 | 1,383 | 342 | 0.027 | 93 | 1,193 |
| 14 | 57.50 | 1,423 | 315 | 0.025 | 86 | 1,228 |
| 13 | 53.00 | 1,167 | 232 | 0.018 | 63 | 1,007 |
| 12 | 50.50 | 595 | 111 | 0.009 | 30 | 513 |
| 11 | 47.50 | 3,027 | 520 | 0.041 | 142 | 2,612 |
| 10 | 44.25 | 925 | 144 | 0.011 | 39 | 798 |
| 9 | 41.75 | 1,207 | 174 | 0.014 | 48 | 1,042 |
| 8 | 37.50 | 1,764 | 221 | 0.017 | 60 | 1,522 |
| 7 | 32.50 | 1,810 | 187 | 0.015 | 51 | 1,561 |
| 6 | 27.50 | 1,855 | 154 | 0.012 | 42 | 1,601 |
| 5 | 22.50 | 1,901 | 121 | 0.010 | 33 | 1,641 |
| 4 | 17.50 | 1,947 | 88 | 0.007 | 24 | 1,680 |
| 3 | 12.50 | 1,993 | 58 | 0.005 | 16 | 1,720 |
| 2 | 7.50 | 2,039 | 30 | 0.002 | 8 | 1,759 |
| 1 | 2.50 | 2,085 | 7 | 0.001 | 2 | 1,799 |
| RFS Celwave PD220 | 146.00 | 25 | 19 | 0.002 | 5 | 22 |
| RFS Celwave PD220 | 146.00 | 25 | 19 | 0.002 | 5 | 22 |
| Flat T-Arm | 146.00 | 750 | 575 | 0.045 | 157 | 647 |
| Powerwave Allgon LGP | 141.00 | 85 | 62 | 0.005 | 17 | 73 |
| Raycap DC6-48-60-18- | 141.00 | 33 | 24 | 0.002 | 7 | 28 |
| Ericsson RRUS 11 (Ba | 141.00 | 330 | 241 | 0.019 | 66 | 285 |
| Powerwave 7770.00 | 141.00 | 315 | 230 | 0.018 | 63 | 272 |
| KMW AM-X-CD-16-65-00 | 141.00 | 146 | 106 | 0.008 | 29 | 126 |
| Flat T-Arm | 141.00 | 750 | 549 | 0.043 | 150 | 647 |
| Antel BXA-185085/12C | 134.00 | 39 | 27 | 0.002 | 7 | 34 |
| Antel BXA-70063/6CF | 134.00 | 51 | 35 | 0.003 | 10 | 44 |
| Antel LPA-80080/6CF | 134.00 | 126 | 86 | 0.007 | 24 | 109 |
| Round T-Arm | 134.00 | 750 | 513 | 0.041 | 140 | 647 |
| Symmetricom 58532A | 123.00 | 0 | 0 | 0.000 | 0 | 0 |
| Ericsson RRUS 11 B12 | 123.00 | 152 | 93 | 0.007 | 25 | 131 |
| Ericsson RRUS 11 B4 | 123.00 | 152 | 93 | 0.007 | 25 | 131 |
| Ericsson RRUS 11 B2 | 123.00 | 152 | 93 | 0.007 | 25 | 131 |
| RFS APX16DWV-16DWVS- | 123.00 | 122 | 74 | 0.006 | 20 | 105 |
| Commscope LNX-6515DS | 123.00 | 151 | 92 | 0.007 | 25 | 130 |
| Flat T-Arm | 123.00 | 750 | 457 | 0.036 | 125 | 647 |
| | | 44,586 | 12,634 | 1.000 | 3,448 | 38,472 |

Load Case (1.2 + 0.2Sds) * DL + E ELFM Seismic Equivalent Lateral Forces Method

Calculated Forces

| Seg Elev (ft) | Pu FY (-) (kips) | Vu FX (-) (kips) | Tu MY (ft-kips) | Mu MZ (ft-kips) | Mu MX (ft-kips) | Resultant Moment (ft-kips) | phi Pn (kips) | phi Vn (kips) | phi Tn (ft-kips) | phi Mn (ft-kips) | Total Deflect (in) | Rotation (deg) | Ratio |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.00 | -52.58 | -3.45 | 0.00 | -341.18 | 0.00 | 341.18 | 7,541.17 | 3,770.58 | 22,511.9 | 11,272.6 | 0.00 | 0.00 | 0.037 |
| 5.00 | -50.06 | -3.45 | 0.00 | -323.93 | 0.00 | 323.93 | 7,435.91 | 3,717.96 | 21,674.1 | 10,853.2 | 0.00 | -0.01 | 0.037 |
| 10.00 | -47.59 | -3.44 | 0.00 | -306.70 | 0.00 | 306.70 | 7,327.23 | 3,663.62 | 20,841.5 | 10,436.2 | 0.01 | -0.01 | 0.036 |
| 15.00 | -45.18 | -3.42 | 0.00 | -289.53 | 0.00 | 289.53 | 7,215.13 | 3,607.56 | 20,014.7 | 10,022.2 | 0.03 | -0.02 | 0.035 |
| 20.00 | -42.83 | -3.39 | 0.00 | -272.45 | 0.00 | 272.45 | 7,099.60 | 3,549.80 | 19,194.4 | 9,611.47 | 0.05 | -0.03 | 0.034 |
| 25.00 | -40.53 | -3.35 | 0.00 | -255.52 | 0.00 | 255.52 | 6,980.64 | 3,490.32 | 18,381.3 | 9,204.34 | 0.08 | -0.03 | 0.034 |
| 30.00 | -38.29 | -3.30 | 0.00 | -238.78 | 0.00 | 238.78 | 6,858.27 | 3,429.13 | 17,576.2 | 8,801.21 | 0.12 | -0.04 | 0.033 |
| 35.00 | -36.11 | -3.24 | 0.00 | -222.28 | 0.00 | 222.28 | 6,732.46 | 3,366.23 | 16,779.9 | 8,402.42 | 0.16 | -0.05 | 0.032 |
| 40.00 | -34.62 | -3.20 | 0.00 | -206.07 | 0.00 | 206.07 | 6,603.24 | 3,301.62 | 15,992.9 | 8,008.36 | 0.22 | -0.05 | 0.031 |
| 43.50 | -33.47 | -3.16 | 0.00 | -194.88 | 0.00 | 194.88 | 6,510.74 | 3,255.37 | 15,448.0 | 7,735.51 | 0.26 | -0.06 | 0.030 |
| 45.00 | -29.73 | -3.02 | 0.00 | -190.14 | 0.00 | 190.14 | 6,470.58 | 3,235.29 | 15,216.1 | 7,619.37 | 0.27 | -0.06 | 0.030 |
| 50.00 | -28.99 | -2.99 | 0.00 | -175.06 | 0.00 | 175.06 | 6,334.51 | 3,167.25 | 14,450.1 | 7,235.83 | 0.34 | -0.07 | 0.029 |
| 51.00 | -27.55 | -2.92 | 0.00 | -172.08 | 0.00 | 172.08 | 5,351.19 | 2,675.60 | 12,353.0 | 6,185.72 | 0.35 | -0.07 | 0.033 |
| 55.00 | -25.79 | -2.84 | 0.00 | -160.38 | 0.00 | 160.38 | 5,265.80 | 2,632.90 | 11,859.3 | 5,938.51 | 0.41 | -0.07 | 0.032 |
| 60.00 | -24.07 | -2.75 | 0.00 | -146.20 | 0.00 | 146.20 | 5,155.98 | 2,577.99 | 11,249.0 | 5,632.89 | 0.49 | -0.08 | 0.031 |
| 65.00 | -22.41 | -2.65 | 0.00 | -132.47 | 0.00 | 132.47 | 5,042.74 | 2,521.37 | 10,646.9 | 5,331.40 | 0.58 | -0.09 | 0.029 |
| 70.00 | -20.80 | -2.54 | 0.00 | -119.24 | 0.00 | 119.24 | 4,926.07 | 2,463.04 | 10,053.8 | 5,034.40 | 0.68 | -0.10 | 0.028 |
| 75.00 | -19.24 | -2.42 | 0.00 | -106.55 | 0.00 | 106.55 | 4,805.98 | 2,402.99 | 9,470.41 | 4,742.24 | 0.78 | -0.10 | 0.026 |
| 80.00 | -17.73 | -2.30 | 0.00 | -94.43 | 0.00 | 94.43 | 4,682.46 | 2,341.23 | 8,897.37 | 4,455.30 | 0.89 | -0.11 | 0.025 |
| 85.00 | -16.55 | -2.20 | 0.00 | -82.90 | 0.00 | 82.90 | 4,555.52 | 2,277.76 | 8,335.45 | 4,173.92 | 1.01 | -0.12 | 0.023 |
| 89.00 | -16.10 | -2.16 | 0.00 | -74.08 | 0.00 | 74.08 | 4,451.50 | 2,225.75 | 7,894.42 | 3,953.08 | 1.12 | -0.12 | 0.022 |
| 90.00 | -14.10 | -1.98 | 0.00 | -71.92 | 0.00 | 71.92 | 4,425.16 | 2,212.58 | 7,785.39 | 3,898.48 | 1.14 | -0.12 | 0.022 |
| 94.50 | -14.00 | -1.97 | 0.00 | -63.02 | 0.00 | 63.02 | 2,429.52 | 1,214.76 | 4,208.21 | 2,107.23 | 1.26 | -0.13 | 0.036 |
| 95.00 | -13.05 | -1.87 | 0.00 | -62.03 | 0.00 | 62.03 | 2,423.93 | 1,211.97 | 4,181.46 | 2,093.84 | 1.28 | -0.13 | 0.035 |
| 100.00 | -12.12 | -1.78 | 0.00 | -52.66 | 0.00 | 52.66 | 2,366.19 | 1,183.09 | 3,915.26 | 1,960.54 | 1.42 | -0.14 | 0.032 |
| 105.00 | -11.23 | -1.68 | 0.00 | -43.78 | 0.00 | 43.78 | 2,305.01 | 1,152.51 | 3,651.76 | 1,828.59 | 1.57 | -0.15 | 0.029 |
| 110.00 | -10.37 | -1.57 | 0.00 | -35.40 | 0.00 | 35.40 | 2,240.42 | 1,120.21 | 3,391.69 | 1,698.37 | 1.74 | -0.16 | 0.025 |
| 115.00 | -9.55 | -1.47 | 0.00 | -27.54 | 0.00 | 27.54 | 2,172.39 | 1,086.20 | 3,135.78 | 1,570.22 | 1.91 | -0.17 | 0.022 |
| 120.00 | -9.06 | -1.40 | 0.00 | -20.21 | 0.00 | 20.21 | 2,100.95 | 1,050.47 | 2,884.74 | 1,444.51 | 2.09 | -0.17 | 0.018 |
| 123.00 | -6.93 | -1.11 | 0.00 | -16.00 | 0.00 | 16.00 | 2,056.44 | 1,028.22 | 2,736.75 | 1,370.41 | 2.20 | -0.18 | 0.015 |
| 125.00 | -6.18 | -1.00 | 0.00 | -13.79 | 0.00 | 13.79 | 2,026.08 | 1,013.04 | 2,639.30 | 1,321.61 | 2.27 | -0.18 | 0.013 |
| 130.00 | -5.31 | -0.87 | 0.00 | -8.79 | 0.00 | 8.79 | 1,947.78 | 973.89 | 2,400.18 | 1,201.87 | 2.46 | -0.18 | 0.010 |
| 134.00 | -4.03 | -0.67 | 0.00 | -5.31 | 0.00 | 5.31 | 1,102.25 | 551.13 | 1,321.80 | 661.88 | 2.62 | -0.19 | 0.012 |
| 135.00 | -3.60 | -0.60 | 0.00 | -4.64 | 0.00 | 4.64 | 1,095.19 | 547.60 | 1,297.91 | 649.92 | 2.66 | -0.19 | 0.010 |
| 140.00 | -3.52 | -0.59 | 0.00 | -1.62 | 0.00 | 1.62 | 1,057.85 | 528.92 | 1,179.18 | 590.46 | 2.86 | -0.19 | 0.006 |
| 141.00 | -1.21 | -0.21 | 0.00 | -1.03 | 0.00 | 1.03 | 1,049.97 | 524.98 | 1,155.61 | 578.66 | 2.90 | -0.19 | 0.003 |
| 145.00 | -1.14 | -0.20 | 0.00 | -0.20 | 0.00 | 0.20 | 1,017.07 | 508.54 | 1,062.12 | 531.85 | 3.06 | -0.19 | 0.001 |
| 146.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1,008.51 | 504.25 | 1,038.98 | 520.26 | 3.10 | -0.19 | 0.000 |
| 148.50 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 986.50 | 493.25 | 981.57 | 491.52 | 3.20 | -0.19 | 0.000 |

Load Case (0.9 - 0.2Sds) * DL + E ELFM Seismic (Reduced DL) Equivalent Lateral Forces Method

Calculated Forces

| Seg Elev (ft) | Pu FY (-) (kips) | Vu FX (-) (kips) | Tu MY (ft-kips) | Mu MZ (ft-kips) | Mu MX (ft-kips) | Resultant Moment (ft-kips) | phi Pn (kips) | phi Vn (kips) | phi Tn (ft-kips) | phi Mn (ft-kips) | Total Deflect (in) | Rotation (deg) | Ratio |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.00 | -36.67 | -3.45 | 0.00 | -340.02 | 0.00 | 340.02 | 7,541.17 | 3,770.58 | 22,511.9 | 11,272.6 | 0.00 | 0.00 | 0.035 |
| 5.00 | -34.91 | -3.44 | 0.00 | -322.78 | 0.00 | 322.78 | 7,435.91 | 3,717.96 | 21,674.1 | 10,853.2 | 0.00 | -0.01 | 0.034 |
| 10.00 | -33.19 | -3.43 | 0.00 | -305.57 | 0.00 | 305.57 | 7,327.23 | 3,663.62 | 20,841.5 | 10,436.2 | 0.01 | -0.01 | 0.034 |
| 15.00 | -31.51 | -3.41 | 0.00 | -288.41 | 0.00 | 288.41 | 7,215.13 | 3,607.56 | 20,014.7 | 10,022.2 | 0.03 | -0.02 | 0.033 |
| 20.00 | -29.87 | -3.38 | 0.00 | -271.36 | 0.00 | 271.36 | 7,099.60 | 3,549.80 | 19,194.4 | 9,611.47 | 0.05 | -0.03 | 0.032 |
| 25.00 | -28.27 | -3.34 | 0.00 | -254.46 | 0.00 | 254.46 | 6,980.64 | 3,490.32 | 18,381.3 | 9,204.34 | 0.08 | -0.03 | 0.032 |
| 30.00 | -26.71 | -3.29 | 0.00 | -237.76 | 0.00 | 237.76 | 6,858.27 | 3,429.13 | 17,576.2 | 8,801.21 | 0.12 | -0.04 | 0.031 |
| 35.00 | -25.19 | -3.23 | 0.00 | -221.30 | 0.00 | 221.30 | 6,732.46 | 3,366.23 | 16,779.9 | 8,402.42 | 0.16 | -0.05 | 0.030 |
| 40.00 | -24.14 | -3.19 | 0.00 | -205.14 | 0.00 | 205.14 | 6,603.24 | 3,301.62 | 15,992.9 | 8,008.36 | 0.21 | -0.05 | 0.029 |
| 43.50 | -23.35 | -3.15 | 0.00 | -193.98 | 0.00 | 193.98 | 6,510.74 | 3,255.37 | 15,448.0 | 7,735.51 | 0.25 | -0.06 | 0.029 |
| 45.00 | -20.73 | -3.01 | 0.00 | -189.26 | 0.00 | 189.26 | 6,470.58 | 3,235.29 | 15,216.1 | 7,619.37 | 0.27 | -0.06 | 0.028 |
| 50.00 | -20.22 | -2.98 | 0.00 | -174.23 | 0.00 | 174.23 | 6,334.51 | 3,167.25 | 14,450.1 | 7,235.83 | 0.34 | -0.07 | 0.027 |
| 51.00 | -19.21 | -2.91 | 0.00 | -171.26 | 0.00 | 171.26 | 5,351.19 | 2,675.60 | 12,353.0 | 6,185.72 | 0.35 | -0.07 | 0.031 |
| 55.00 | -17.98 | -2.83 | 0.00 | -159.60 | 0.00 | 159.60 | 5,265.80 | 2,632.90 | 11,859.3 | 5,938.51 | 0.41 | -0.07 | 0.030 |
| 60.00 | -16.79 | -2.73 | 0.00 | -145.47 | 0.00 | 145.47 | 5,155.98 | 2,577.99 | 11,249.0 | 5,632.89 | 0.49 | -0.08 | 0.029 |
| 65.00 | -15.63 | -2.63 | 0.00 | -131.79 | 0.00 | 131.79 | 5,042.74 | 2,521.37 | 10,646.9 | 5,331.40 | 0.58 | -0.09 | 0.028 |
| 70.00 | -14.51 | -2.53 | 0.00 | -118.62 | 0.00 | 118.62 | 4,926.07 | 2,463.04 | 10,053.8 | 5,034.40 | 0.68 | -0.10 | 0.027 |
| 75.00 | -13.42 | -2.41 | 0.00 | -105.99 | 0.00 | 105.99 | 4,805.98 | 2,402.99 | 9,470.41 | 4,742.24 | 0.78 | -0.10 | 0.025 |
| 80.00 | -12.36 | -2.29 | 0.00 | -93.92 | 0.00 | 93.92 | 4,682.46 | 2,341.23 | 8,897.37 | 4,455.30 | 0.89 | -0.11 | 0.024 |
| 85.00 | -11.54 | -2.19 | 0.00 | -82.45 | 0.00 | 82.45 | 4,555.52 | 2,277.76 | 8,335.45 | 4,173.92 | 1.01 | -0.12 | 0.022 |
| 89.00 | -11.23 | -2.15 | 0.00 | -73.67 | 0.00 | 73.67 | 4,451.50 | 2,225.75 | 7,894.42 | 3,953.08 | 1.11 | -0.12 | 0.021 |
| 90.00 | -9.83 | -1.97 | 0.00 | -71.52 | 0.00 | 71.52 | 4,425.16 | 2,212.58 | 7,785.39 | 3,898.48 | 1.14 | -0.12 | 0.021 |
| 94.50 | -9.77 | -1.96 | 0.00 | -62.66 | 0.00 | 62.66 | 2,429.52 | 1,214.76 | 4,208.21 | 2,107.23 | 1.26 | -0.13 | 0.034 |
| 95.00 | -9.10 | -1.86 | 0.00 | -61.68 | 0.00 | 61.68 | 2,423.93 | 1,211.97 | 4,181.46 | 2,093.84 | 1.27 | -0.13 | 0.033 |
| 100.00 | -8.46 | -1.77 | 0.00 | -52.36 | 0.00 | 52.36 | 2,366.19 | 1,183.09 | 3,915.26 | 1,960.54 | 1.41 | -0.14 | 0.030 |
| 105.00 | -7.83 | -1.67 | 0.00 | -43.52 | 0.00 | 43.52 | 2,305.01 | 1,152.51 | 3,651.76 | 1,828.59 | 1.57 | -0.15 | 0.027 |
| 110.00 | -7.23 | -1.56 | 0.00 | -35.19 | 0.00 | 35.19 | 2,240.42 | 1,120.21 | 3,391.69 | 1,698.37 | 1.73 | -0.16 | 0.024 |
| 115.00 | -6.66 | -1.46 | 0.00 | -27.37 | 0.00 | 27.37 | 2,172.39 | 1,086.20 | 3,135.78 | 1,570.22 | 1.90 | -0.17 | 0.020 |
| 120.00 | -6.32 | -1.39 | 0.00 | -20.09 | 0.00 | 20.09 | 2,100.95 | 1,050.47 | 2,884.74 | 1,444.51 | 2.08 | -0.17 | 0.017 |
| 123.00 | -4.83 | -1.10 | 0.00 | -15.91 | 0.00 | 15.91 | 2,056.44 | 1,028.22 | 2,736.75 | 1,370.41 | 2.19 | -0.18 | 0.014 |
| 125.00 | -4.31 | -0.99 | 0.00 | -13.70 | 0.00 | 13.70 | 2,026.08 | 1,013.04 | 2,639.30 | 1,321.61 | 2.26 | -0.18 | 0.012 |
| 130.00 | -3.70 | -0.86 | 0.00 | -8.73 | 0.00 | 8.73 | 1,947.78 | 973.89 | 2,400.18 | 1,201.87 | 2.45 | -0.18 | 0.009 |
| 134.00 | -2.81 | -0.67 | 0.00 | -5.28 | 0.00 | 5.28 | 1,102.25 | 551.13 | 1,321.80 | 661.88 | 2.61 | -0.19 | 0.011 |
| 135.00 | -2.51 | -0.60 | 0.00 | -4.61 | 0.00 | 4.61 | 1,095.19 | 547.60 | 1,297.91 | 649.92 | 2.65 | -0.19 | 0.009 |
| 140.00 | -2.45 | -0.59 | 0.00 | -1.61 | 0.00 | 1.61 | 1,057.85 | 528.92 | 1,179.18 | 590.46 | 2.85 | -0.19 | 0.005 |
| 141.00 | -0.84 | -0.21 | 0.00 | -1.02 | 0.00 | 1.02 | 1,049.97 | 524.98 | 1,155.61 | 578.66 | 2.89 | -0.19 | 0.003 |
| 145.00 | -0.80 | -0.20 | 0.00 | -0.20 | 0.00 | 0.20 | 1,017.07 | 508.54 | 1,062.12 | 531.85 | 3.04 | -0.19 | 0.001 |
| 146.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1,008.51 | 504.25 | 1,038.98 | 520.26 | 3.08 | -0.19 | 0.000 |
| 148.50 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 986.50 | 493.25 | 981.57 | 491.52 | 3.18 | -0.19 | 0.000 |

## Equivalent Modal Forces Analysis

(Based on ASCE7-10 Chapters 11, 12 & 15 and ANSI/TIA-G, section 2.7)

| | |
|---|---|
| Spectral Response Acceleration for Short Period ($S_s$): | 0.17 |
| Spectral Response Acceleration at 1.0 Second Period ($S_1$): | 0.06 |
| Importance Factor ($I_E$): | 1.00 |
| Site Coefficient $F_a$: | 1.60 |
| Site Coefficient $F_v$ | 2.40 |
| Response Modification Coefficient (R): | 1.50 |
| Design Spectral Response Acceleration at Short Period ($S_{ds}$): | 0.19 |
| Desing Spectral Response Acceleration at 1.0 Second Period ($S_{d1}$): | 0.10 |
| Period Based on Rayleigh Method (sec): | 1.17 |
| Redundancy Factor (p): | 1.30 |

Load Case (1.2 + 0.2Sds) * DL + E EMAM — Seismic Equivalent Modal Analysis Method

| Segment | Height Above Base (ft) | Weight (lb) | a | b | c | Saz | Horizontal Force (lb) | Vertical Force (lb) |
|---|---|---|---|---|---|---|---|---|
| 38 | 147.25 | 125 | 1.858 | 1.817 | 1.081 | 0.364 | 39 | 154 |
| 37 | 145.50 | 51 | 1.814 | 1.605 | 1.002 | 0.338 | 15 | 63 |
| 36 | 143.00 | 212 | 1.753 | 1.332 | 0.898 | 0.303 | 56 | 262 |
| 35 | 140.50 | 67 | 1.692 | 1.092 | 0.802 | 0.271 | 16 | 82 |
| 34 | 137.50 | 344 | 1.620 | 0.843 | 0.698 | 0.234 | 70 | 425 |
| 33 | 134.50 | 71 | 1.550 | 0.633 | 0.605 | 0.201 | 12 | 88 |
| 32 | 132.00 | 706 | 1.493 | 0.485 | 0.535 | 0.176 | 108 | 873 |
| 31 | 127.50 | 604 | 1.393 | 0.271 | 0.425 | 0.136 | 71 | 747 |
| 30 | 124.00 | 249 | 1.318 | 0.146 | 0.352 | 0.110 | 24 | 308 |
| 29 | 121.50 | 389 | 1.265 | 0.075 | 0.306 | 0.093 | 31 | 481 |
| 28 | 117.50 | 669 | 1.183 | -0.010 | 0.243 | 0.071 | 41 | 828 |
| 27 | 112.50 | 695 | 1.085 | -0.078 | 0.178 | 0.050 | 30 | 860 |
| 26 | 107.50 | 721 | 0.990 | -0.112 | 0.127 | 0.036 | 23 | 892 |
| 25 | 102.50 | 747 | 0.900 | -0.122 | 0.087 | 0.028 | 18 | 924 |
| 24 | 97.50 | 772 | 0.815 | -0.114 | 0.058 | 0.025 | 17 | 955 |
| 23 | 94.75 | 79 | 0.769 | -0.106 | 0.045 | 0.026 | 2 | 97 |
| 22 | 92.25 | 1,616 | 0.729 | -0.095 | 0.036 | 0.026 | 37 | 1,999 |
| 21 | 89.50 | 366 | 0.687 | -0.083 | 0.027 | 0.028 | 9 | 453 |
| 20 | 87.00 | 949 | 0.649 | -0.070 | 0.021 | 0.029 | 24 | 1,174 |
| 19 | 82.50 | 1,222 | 0.583 | -0.047 | 0.013 | 0.033 | 35 | 1,512 |
| 18 | 77.50 | 1,263 | 0.515 | -0.022 | 0.008 | 0.037 | 41 | 1,562 |
| 17 | 72.50 | 1,303 | 0.450 | 0.001 | 0.006 | 0.040 | 45 | 1,612 |
| 16 | 67.50 | 1,343 | 0.390 | 0.021 | 0.007 | 0.042 | 49 | 1,661 |
| 15 | 62.50 | 1,383 | 0.335 | 0.037 | 0.010 | 0.043 | 52 | 1,711 |
| 14 | 57.50 | 1,423 | 0.283 | 0.049 | 0.014 | 0.043 | 53 | 1,761 |
| 13 | 53.00 | 1,167 | 0.241 | 0.057 | 0.018 | 0.042 | 42 | 1,444 |
| 12 | 50.50 | 595 | 0.219 | 0.060 | 0.021 | 0.041 | 21 | 736 |
| 11 | 47.50 | 3,027 | 0.193 | 0.064 | 0.024 | 0.040 | 104 | 3,745 |
| 10 | 44.25 | 925 | 0.168 | 0.066 | 0.028 | 0.038 | 31 | 1,144 |
| 9 | 41.75 | 1,207 | 0.149 | 0.068 | 0.030 | 0.037 | 39 | 1,494 |
| 8 | 37.50 | 1,764 | 0.121 | 0.070 | 0.034 | 0.035 | 54 | 2,182 |
| 7 | 32.50 | 1,810 | 0.091 | 0.071 | 0.038 | 0.033 | 52 | 2,239 |
| 6 | 27.50 | 1,855 | 0.065 | 0.072 | 0.041 | 0.031 | 50 | 2,295 |
| 5 | 22.50 | 1,901 | 0.043 | 0.071 | 0.042 | 0.029 | 47 | 2,352 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 4 | 17.50 | 1,947 | 0.026 | 0.067 | 0.040 | 0.026 | 44 | 2,409 |
| 3 | 12.50 | 1,993 | 0.013 | 0.059 | 0.034 | 0.022 | 39 | 2,466 |
| 2 | 7.50 | 2,039 | 0.005 | 0.044 | 0.025 | 0.017 | 29 | 2,523 |
| 1 | 2.50 | 2,085 | 0.001 | 0.018 | 0.010 | 0.007 | 13 | 2,579 |
| RFS Celwave PD220 | 146.00 | 25 | 1.827 | 1.664 | 1.024 | 0.346 | 7 | 31 |
| RFS Celwave PD220 | 146.00 | 25 | 1.827 | 1.664 | 1.024 | 0.346 | 7 | 31 |
| Flat T-Arm | 146.00 | 750 | 1.827 | 1.664 | 1.024 | 0.346 | 225 | 928 |
| Powerwave Allgon LGP | 141.00 | 85 | 1.704 | 1.137 | 0.821 | 0.277 | 20 | 105 |
| Raycap DC6-48-60-18- | 141.00 | 33 | 1.704 | 1.137 | 0.821 | 0.277 | 8 | 41 |
| Ericsson RRUS 11 (Ba | 141.00 | 330 | 1.704 | 1.137 | 0.821 | 0.277 | 79 | 408 |
| Powerwave 7770.00 | 141.00 | 315 | 1.704 | 1.137 | 0.821 | 0.277 | 76 | 390 |
| KMW AM-X-CD-16-65-00 | 141.00 | 146 | 1.704 | 1.137 | 0.821 | 0.277 | 35 | 180 |
| Flat T-Arm | 141.00 | 750 | 1.704 | 1.137 | 0.821 | 0.277 | 180 | 928 |
| Antel BXA-185085/12C | 134.00 | 39 | 1.539 | 0.602 | 0.590 | 0.196 | 7 | 48 |
| Antel BXA-70063/6CF | 134.00 | 51 | 1.539 | 0.602 | 0.590 | 0.196 | 9 | 63 |
| Antel LPA-80080/6CF | 134.00 | 126 | 1.539 | 0.602 | 0.590 | 0.196 | 21 | 156 |
| Round T-Arm | 134.00 | 750 | 1.539 | 0.602 | 0.590 | 0.196 | 127 | 928 |
| Symmetricom 58532A | 123.00 | 0 | 1.297 | 0.116 | 0.333 | 0.103 | 0 | 0 |
| Ericsson RRUS 11 B12 | 123.00 | 152 | 1.297 | 0.116 | 0.333 | 0.103 | 14 | 188 |
| Ericsson RRUS 11 B4 | 123.00 | 152 | 1.297 | 0.116 | 0.333 | 0.103 | 14 | 188 |
| Ericsson RRUS 11 B2 | 123.00 | 152 | 1.297 | 0.116 | 0.333 | 0.103 | 14 | 188 |
| RFS APX16DWV- | 123.00 | 122 | 1.297 | 0.116 | 0.333 | 0.103 | 11 | 151 |
| Commscope LNX- | 123.00 | 151 | 1.297 | 0.116 | 0.333 | 0.103 | 13 | 187 |
| Flat T-Arm | 123.00 | 750 | 1.297 | 0.116 | 0.333 | 0.103 | 67 | 928 |
| | | 44,586 | 58.393 | 23.365 | 20.657 | 7.385 | 2,415 | 55,158 |

Load Case (0.9 - 0.2Sds) * DL + E EMAM — Seismic (Reduced DL) Equivalent Modal Analysis Method

| Segment | Height Above Base (ft) | Weight (lb) | a | b | c | Saz | Horizontal Force (lb) | Vertical Force (lb) |
|---|---|---|---|---|---|---|---|---|
| 38 | 147.25 | 125 | 1.858 | 1.817 | 1.081 | 0.364 | 39 | 108 |
| 37 | 145.50 | 51 | 1.814 | 1.605 | 1.002 | 0.338 | 15 | 44 |
| 36 | 143.00 | 212 | 1.753 | 1.332 | 0.898 | 0.303 | 56 | 183 |
| 35 | 140.50 | 67 | 1.692 | 1.092 | 0.802 | 0.271 | 16 | 58 |
| 34 | 137.50 | 344 | 1.620 | 0.843 | 0.698 | 0.234 | 70 | 297 |
| 33 | 134.50 | 71 | 1.550 | 0.633 | 0.605 | 0.201 | 12 | 61 |
| 32 | 132.00 | 706 | 1.493 | 0.485 | 0.535 | 0.176 | 108 | 609 |
| 31 | 127.50 | 604 | 1.393 | 0.271 | 0.425 | 0.136 | 71 | 521 |
| 30 | 124.00 | 249 | 1.318 | 0.146 | 0.352 | 0.110 | 24 | 215 |
| 29 | 121.50 | 389 | 1.265 | 0.075 | 0.306 | 0.093 | 31 | 336 |
| 28 | 117.50 | 669 | 1.183 | -0.010 | 0.243 | 0.071 | 41 | 577 |
| 27 | 112.50 | 695 | 1.085 | -0.078 | 0.178 | 0.050 | 30 | 600 |
| 26 | 107.50 | 721 | 0.990 | -0.112 | 0.127 | 0.036 | 23 | 622 |
| 25 | 102.50 | 747 | 0.900 | -0.122 | 0.087 | 0.028 | 18 | 644 |
| 24 | 97.50 | 772 | 0.815 | -0.114 | 0.058 | 0.025 | 17 | 666 |
| 23 | 94.75 | 79 | 0.769 | -0.106 | 0.045 | 0.026 | 2 | 68 |
| 22 | 92.25 | 1,616 | 0.729 | -0.095 | 0.036 | 0.026 | 37 | 1,394 |
| 21 | 89.50 | 366 | 0.687 | -0.083 | 0.027 | 0.028 | 9 | 316 |
| 20 | 87.00 | 949 | 0.649 | -0.070 | 0.021 | 0.029 | 24 | 819 |
| 19 | 82.50 | 1,222 | 0.583 | -0.047 | 0.013 | 0.033 | 35 | 1,055 |
| 18 | 77.50 | 1,263 | 0.515 | -0.022 | 0.008 | 0.037 | 41 | 1,089 |
| 17 | 72.50 | 1,303 | 0.450 | 0.001 | 0.006 | 0.040 | 45 | 1,124 |
| 16 | 67.50 | 1,343 | 0.390 | 0.021 | 0.007 | 0.042 | 49 | 1,159 |
| 15 | 62.50 | 1,383 | 0.335 | 0.037 | 0.010 | 0.043 | 52 | 1,193 |
| 14 | 57.50 | 1,423 | 0.283 | 0.049 | 0.014 | 0.043 | 53 | 1,228 |
| 13 | 53.00 | 1,167 | 0.241 | 0.057 | 0.018 | 0.042 | 42 | 1,007 |
| 12 | 50.50 | 595 | 0.219 | 0.060 | 0.021 | 0.041 | 21 | 513 |
| 11 | 47.50 | 3,027 | 0.193 | 0.064 | 0.024 | 0.040 | 104 | 2,612 |
| 10 | 44.25 | 925 | 0.168 | 0.066 | 0.028 | 0.038 | 31 | 798 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 9 | 41.75 | 1,207 | 0.149 | 0.068 | 0.030 | 0.037 | 39 | 1,042 |
| 8 | 37.50 | 1,764 | 0.121 | 0.070 | 0.034 | 0.035 | 54 | 1,522 |
| 7 | 32.50 | 1,810 | 0.091 | 0.071 | 0.038 | 0.033 | 52 | 1,561 |
| 6 | 27.50 | 1,855 | 0.065 | 0.072 | 0.041 | 0.031 | 50 | 1,601 |
| 5 | 22.50 | 1,901 | 0.043 | 0.071 | 0.042 | 0.029 | 47 | 1,641 |
| 4 | 17.50 | 1,947 | 0.026 | 0.067 | 0.040 | 0.026 | 44 | 1,680 |
| 3 | 12.50 | 1,993 | 0.013 | 0.059 | 0.034 | 0.022 | 39 | 1,720 |
| 2 | 7.50 | 2,039 | 0.005 | 0.044 | 0.025 | 0.017 | 29 | 1,759 |
| 1 | 2.50 | 2,085 | 0.001 | 0.018 | 0.010 | 0.007 | 13 | 1,799 |
| RFS Celwave PD220 | 146.00 | 25 | 1.827 | 1.664 | 1.024 | 0.346 | 7 | 22 |
| RFS Celwave PD220 | 146.00 | 25 | 1.827 | 1.664 | 1.024 | 0.346 | 7 | 22 |
| Flat T-Arm | 146.00 | 750 | 1.827 | 1.664 | 1.024 | 0.346 | 225 | 647 |
| Powerwave Allgon LGP | 141.00 | 85 | 1.704 | 1.137 | 0.821 | 0.277 | 20 | 73 |
| Raycap DC6-48-60-18- | 141.00 | 33 | 1.704 | 1.137 | 0.821 | 0.277 | 8 | 28 |
| Ericsson RRUS 11 (Ba | 141.00 | 330 | 1.704 | 1.137 | 0.821 | 0.277 | 79 | 285 |
| Powerwave 7770.00 | 141.00 | 315 | 1.704 | 1.137 | 0.821 | 0.277 | 76 | 272 |
| KMW AM-X-CD-16-65-00 | 141.00 | 146 | 1.704 | 1.137 | 0.821 | 0.277 | 35 | 126 |
| Flat T-Arm | 141.00 | 750 | 1.704 | 1.137 | 0.821 | 0.277 | 180 | 647 |
| Antel BXA-185085/12C | 134.00 | 39 | 1.539 | 0.602 | 0.590 | 0.196 | 7 | 34 |
| Antel BXA-70063/6CF | 134.00 | 51 | 1.539 | 0.602 | 0.590 | 0.196 | 9 | 44 |
| Antel LPA-80080/6CF | 134.00 | 126 | 1.539 | 0.602 | 0.590 | 0.196 | 21 | 109 |
| Round T-Arm | 134.00 | 750 | 1.539 | 0.602 | 0.590 | 0.196 | 127 | 647 |
| Symmetricom 58532A | 123.00 | 0 | 1.297 | 0.116 | 0.333 | 0.103 | 0 | 0 |
| Ericsson RRUS 11 B12 | 123.00 | 152 | 1.297 | 0.116 | 0.333 | 0.103 | 14 | 131 |
| Ericsson RRUS 11 B4 | 123.00 | 152 | 1.297 | 0.116 | 0.333 | 0.103 | 14 | 131 |
| Ericsson RRUS 11 B2 | 123.00 | 152 | 1.297 | 0.116 | 0.333 | 0.103 | 14 | 131 |
| RFS APX16DWV- | 123.00 | 122 | 1.297 | 0.116 | 0.333 | 0.103 | 11 | 105 |
| Commscope LNX- | 123.00 | 151 | 1.297 | 0.116 | 0.333 | 0.103 | 13 | 130 |
| Flat T-Arm | 123.00 | 750 | 1.297 | 0.116 | 0.333 | 0.103 | 67 | 647 |
| | | 44,586 | 58.393 | 23.365 | 20.657 | 7.385 | 2,415 | 38,472 |

Load Case (1.2 + 0.2Sds) * DL + E EMAM Seismic Equivalent Modal Analysis Method

Calculated Forces

| Seg Elev (ft) | Pu FY (-) (kips) | Vu FX (-) (kips) | Tu MY (ft-kips) | Mu MZ (ft-kips) | Mu MX (ft-kips) | Resultant Moment (ft-kips) | phi Pn (kips) | phi Vn (kips) | phi Tn (ft-kips) | phi Mn (ft-kips) | Total Deflect (in) | Rotation (deg) | Ratio |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.00 | -52.58 | -2.40 | 0.00 | -246.77 | 0.00 | 246.77 | 7,541.17 | 3,770.58 | 22,511.9 | 11,272.6 | 0.00 | 0.00 | 0.029 |
| 5.00 | -50.06 | -2.38 | 0.00 | -234.75 | 0.00 | 234.75 | 7,435.91 | 3,717.96 | 21,674.1 | 10,853.2 | 0.00 | 0.00 | 0.028 |
| 10.00 | -47.59 | -2.34 | 0.00 | -222.86 | 0.00 | 222.86 | 7,327.23 | 3,663.62 | 20,841.5 | 10,436.2 | 0.01 | -0.01 | 0.028 |
| 15.00 | -45.18 | -2.30 | 0.00 | -211.14 | 0.00 | 211.14 | 7,215.13 | 3,607.56 | 20,014.7 | 10,022.2 | 0.02 | -0.01 | 0.027 |
| 20.00 | -42.83 | -2.26 | 0.00 | -199.63 | 0.00 | 199.63 | 7,099.60 | 3,549.80 | 19,194.4 | 9,611.47 | 0.04 | -0.02 | 0.027 |
| 25.00 | -40.53 | -2.21 | 0.00 | -188.34 | 0.00 | 188.34 | 6,980.64 | 3,490.32 | 18,381.3 | 9,204.34 | 0.06 | -0.02 | 0.026 |
| 30.00 | -38.29 | -2.16 | 0.00 | -177.29 | 0.00 | 177.29 | 6,858.27 | 3,429.13 | 17,576.2 | 8,801.21 | 0.09 | -0.03 | 0.026 |
| 35.00 | -36.11 | -2.11 | 0.00 | -166.48 | 0.00 | 166.48 | 6,732.46 | 3,366.23 | 16,779.9 | 8,402.42 | 0.12 | -0.03 | 0.025 |
| 40.00 | -34.62 | -2.07 | 0.00 | -155.93 | 0.00 | 155.93 | 6,603.24 | 3,301.62 | 15,992.9 | 8,008.36 | 0.16 | -0.04 | 0.025 |
| 43.50 | -33.47 | -2.04 | 0.00 | -148.68 | 0.00 | 148.68 | 6,510.74 | 3,255.37 | 15,448.0 | 7,735.51 | 0.19 | -0.04 | 0.024 |
| 45.00 | -29.73 | -1.94 | 0.00 | -145.61 | 0.00 | 145.61 | 6,470.58 | 3,235.29 | 15,216.1 | 7,619.37 | 0.20 | -0.04 | 0.024 |
| 50.00 | -28.99 | -1.92 | 0.00 | -135.92 | 0.00 | 135.92 | 6,334.51 | 3,167.25 | 14,450.1 | 7,235.83 | 0.25 | -0.05 | 0.023 |
| 51.00 | -27.55 | -1.88 | 0.00 | -134.01 | 0.00 | 134.01 | 5,351.19 | 2,675.60 | 12,353.0 | 6,185.72 | 0.26 | -0.05 | 0.027 |
| 55.00 | -25.79 | -1.82 | 0.00 | -126.51 | 0.00 | 126.51 | 5,265.80 | 2,632.90 | 11,859.3 | 5,938.51 | 0.30 | -0.05 | 0.026 |
| 60.00 | -24.08 | -1.77 | 0.00 | -117.39 | 0.00 | 117.39 | 5,155.98 | 2,577.99 | 11,249.0 | 5,632.89 | 0.36 | -0.06 | 0.026 |
| 65.00 | -22.42 | -1.72 | 0.00 | -108.53 | 0.00 | 108.53 | 5,042.74 | 2,521.37 | 10,646.9 | 5,331.40 | 0.43 | -0.07 | 0.025 |
| 70.00 | -20.80 | -1.68 | 0.00 | -99.92 | 0.00 | 99.92 | 4,926.07 | 2,463.04 | 10,053.8 | 5,034.40 | 0.50 | -0.07 | 0.024 |
| 75.00 | -19.24 | -1.64 | 0.00 | -91.53 | 0.00 | 91.53 | 4,805.98 | 2,402.99 | 9,470.41 | 4,742.24 | 0.58 | -0.08 | 0.023 |
| 80.00 | -17.73 | -1.60 | 0.00 | -83.34 | 0.00 | 83.34 | 4,682.46 | 2,341.23 | 8,897.37 | 4,455.30 | 0.67 | -0.09 | 0.022 |
| 85.00 | -16.56 | -1.58 | 0.00 | -75.33 | 0.00 | 75.33 | 4,555.52 | 2,277.76 | 8,335.45 | 4,173.92 | 0.76 | -0.09 | 0.022 |
| 89.00 | -16.10 | -1.57 | 0.00 | -69.02 | 0.00 | 69.02 | 4,451.50 | 2,225.75 | 7,894.42 | 3,953.08 | 0.84 | -0.10 | 0.021 |
| 90.00 | -14.10 | -1.53 | 0.00 | -67.45 | 0.00 | 67.45 | 4,425.16 | 2,212.58 | 7,785.39 | 3,898.48 | 0.86 | -0.10 | 0.020 |
| 94.50 | -14.01 | -1.53 | 0.00 | -60.56 | 0.00 | 60.56 | 2,429.52 | 1,214.76 | 4,208.21 | 2,107.23 | 0.96 | -0.10 | 0.035 |
| 95.00 | -13.05 | -1.51 | 0.00 | -59.80 | 0.00 | 59.80 | 2,423.93 | 1,211.97 | 4,181.46 | 2,093.84 | 0.97 | -0.11 | 0.034 |
| 100.00 | -12.13 | -1.49 | 0.00 | -52.24 | 0.00 | 52.24 | 2,366.19 | 1,183.09 | 3,915.26 | 1,960.54 | 1.08 | -0.11 | 0.032 |
| 105.00 | -11.23 | -1.47 | 0.00 | -44.77 | 0.00 | 44.77 | 2,305.01 | 1,152.51 | 3,651.76 | 1,828.59 | 1.21 | -0.12 | 0.029 |
| 110.00 | -10.37 | -1.44 | 0.00 | -37.42 | 0.00 | 37.42 | 2,240.42 | 1,120.21 | 3,391.69 | 1,698.37 | 1.35 | -0.13 | 0.027 |
| 115.00 | -9.55 | -1.40 | 0.00 | -30.21 | 0.00 | 30.21 | 2,172.39 | 1,086.20 | 3,135.78 | 1,570.22 | 1.49 | -0.14 | 0.024 |
| 120.00 | -9.07 | -1.37 | 0.00 | -23.22 | 0.00 | 23.22 | 2,100.95 | 1,050.47 | 2,884.74 | 1,444.51 | 1.64 | -0.15 | 0.020 |
| 123.00 | -6.93 | -1.21 | 0.00 | -19.12 | 0.00 | 19.12 | 2,056.44 | 1,028.22 | 2,736.75 | 1,370.41 | 1.74 | -0.15 | 0.017 |
| 125.00 | -6.18 | -1.13 | 0.00 | -16.71 | 0.00 | 16.71 | 2,026.08 | 1,013.04 | 2,639.30 | 1,321.61 | 1.80 | -0.16 | 0.016 |
| 130.00 | -5.31 | -1.02 | 0.00 | -11.04 | 0.00 | 11.04 | 1,947.78 | 973.89 | 2,400.18 | 1,201.87 | 1.97 | -0.16 | 0.012 |
| 134.00 | -4.03 | -0.84 | 0.00 | -6.94 | 0.00 | 6.94 | 1,102.25 | 551.13 | 1,321.80 | 661.88 | 2.11 | -0.17 | 0.014 |
| 135.00 | -3.60 | -0.77 | 0.00 | -6.10 | 0.00 | 6.10 | 1,095.19 | 547.60 | 1,297.91 | 649.92 | 2.14 | -0.17 | 0.013 |
| 140.00 | -3.52 | -0.76 | 0.00 | -2.23 | 0.00 | 2.23 | 1,057.85 | 528.92 | 1,179.18 | 590.46 | 2.32 | -0.17 | 0.007 |
| 141.00 | -1.21 | -0.30 | 0.00 | -1.47 | 0.00 | 1.47 | 1,049.97 | 524.98 | 1,155.61 | 578.66 | 2.35 | -0.17 | 0.004 |
| 145.00 | -1.14 | -0.28 | 0.00 | -0.28 | 0.00 | 0.28 | 1,017.07 | 508.54 | 1,062.12 | 531.85 | 2.50 | -0.17 | 0.002 |
| 146.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1,008.51 | 504.25 | 1,038.98 | 520.26 | 2.53 | -0.17 | 0.000 |
| 148.50 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 986.50 | 493.25 | 981.57 | 491.52 | 2.62 | -0.17 | 0.000 |

Load Case (0.9 - 0.2Sds) * DL + E EMAM Seismic (Reduced DL) Equivalent Modal Analysis Method

Calculated Forces

| Seg Elev (ft) | Pu FY (-) (kips) | Vu FX (-) (kips) | Tu MY (ft-kips) | Mu MZ (ft-kips) | Mu MX (ft-kips) | Resultant Moment (ft-kips) | phi Pn (kips) | phi Vn (kips) | phi Tn (ft-kips) | phi Mn (ft-kips) | Total Deflect (in) | Rotation (deg) | Ratio |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.00 | -36.67 | -2.40 | 0.00 | -245.87 | 0.00 | 245.87 | 7,541.17 | 3,770.58 | 22,511.9 | 11,272.6 | 0.00 | 0.00 | 0.027 |
| 5.00 | -34.91 | -2.38 | 0.00 | -233.85 | 0.00 | 233.85 | 7,435.91 | 3,717.96 | 21,674.1 | 10,853.2 | 0.00 | 0.00 | 0.026 |
| 10.00 | -33.19 | -2.34 | 0.00 | -221.97 | 0.00 | 221.97 | 7,327.23 | 3,663.62 | 20,841.5 | 10,436.2 | 0.01 | -0.01 | 0.026 |
| 15.00 | -31.51 | -2.30 | 0.00 | -210.27 | 0.00 | 210.27 | 7,215.13 | 3,607.56 | 20,014.7 | 10,022.2 | 0.02 | -0.01 | 0.025 |
| 20.00 | -29.87 | -2.25 | 0.00 | -198.78 | 0.00 | 198.78 | 7,099.60 | 3,549.80 | 19,194.4 | 9,611.47 | 0.04 | -0.02 | 0.025 |
| 25.00 | -28.27 | -2.21 | 0.00 | -187.51 | 0.00 | 187.51 | 6,980.64 | 3,490.32 | 18,381.3 | 9,204.34 | 0.06 | -0.02 | 0.024 |
| 30.00 | -26.71 | -2.16 | 0.00 | -176.48 | 0.00 | 176.48 | 6,858.27 | 3,429.13 | 17,576.2 | 8,801.21 | 0.09 | -0.03 | 0.024 |
| 35.00 | -25.19 | -2.10 | 0.00 | -165.71 | 0.00 | 165.71 | 6,732.46 | 3,366.23 | 16,779.9 | 8,402.42 | 0.12 | -0.03 | 0.023 |
| 40.00 | -24.15 | -2.07 | 0.00 | -155.19 | 0.00 | 155.19 | 6,603.24 | 3,301.62 | 15,992.9 | 8,008.36 | 0.16 | -0.04 | 0.023 |
| 43.50 | -23.35 | -2.04 | 0.00 | -147.96 | 0.00 | 147.96 | 6,510.74 | 3,255.37 | 15,448.0 | 7,735.51 | 0.19 | -0.04 | 0.023 |
| 45.00 | -20.74 | -1.93 | 0.00 | -144.91 | 0.00 | 144.91 | 6,470.58 | 3,235.29 | 15,216.1 | 7,619.37 | 0.20 | -0.04 | 0.022 |
| 50.00 | -20.22 | -1.91 | 0.00 | -135.26 | 0.00 | 135.26 | 6,334.51 | 3,167.25 | 14,450.1 | 7,235.83 | 0.25 | -0.05 | 0.022 |
| 51.00 | -19.21 | -1.87 | 0.00 | -133.35 | 0.00 | 133.35 | 5,351.19 | 2,675.60 | 12,353.0 | 6,185.72 | 0.26 | -0.05 | 0.025 |
| 55.00 | -17.99 | -1.81 | 0.00 | -125.88 | 0.00 | 125.88 | 5,265.80 | 2,632.90 | 11,859.3 | 5,938.51 | 0.30 | -0.05 | 0.025 |
| 60.00 | -16.79 | -1.76 | 0.00 | -116.81 | 0.00 | 116.81 | 5,155.98 | 2,577.99 | 11,249.0 | 5,632.89 | 0.36 | -0.06 | 0.024 |
| 65.00 | -15.63 | -1.71 | 0.00 | -107.99 | 0.00 | 107.99 | 5,042.74 | 2,521.37 | 10,646.9 | 5,331.40 | 0.43 | -0.07 | 0.023 |
| 70.00 | -14.51 | -1.67 | 0.00 | -99.42 | 0.00 | 99.42 | 4,926.07 | 2,463.04 | 10,053.8 | 5,034.40 | 0.50 | -0.07 | 0.023 |
| 75.00 | -13.42 | -1.63 | 0.00 | -91.07 | 0.00 | 91.07 | 4,805.98 | 2,402.99 | 9,470.41 | 4,742.24 | 0.58 | -0.08 | 0.022 |
| 80.00 | -12.37 | -1.59 | 0.00 | -82.92 | 0.00 | 82.92 | 4,682.46 | 2,341.23 | 8,897.37 | 4,455.30 | 0.67 | -0.09 | 0.021 |
| 85.00 | -11.55 | -1.57 | 0.00 | -74.95 | 0.00 | 74.95 | 4,555.52 | 2,277.76 | 8,335.45 | 4,173.92 | 0.76 | -0.09 | 0.020 |
| 89.00 | -11.23 | -1.56 | 0.00 | -68.67 | 0.00 | 68.67 | 4,451.50 | 2,225.75 | 7,894.42 | 3,953.08 | 0.84 | -0.10 | 0.020 |
| 90.00 | -9.84 | -1.52 | 0.00 | -67.11 | 0.00 | 67.11 | 4,425.16 | 2,212.58 | 7,785.39 | 3,898.48 | 0.86 | -0.10 | 0.019 |
| 94.50 | -9.77 | -1.52 | 0.00 | -60.26 | 0.00 | 60.26 | 2,429.52 | 1,214.76 | 4,208.21 | 2,107.23 | 0.95 | -0.10 | 0.033 |
| 95.00 | -9.10 | -1.50 | 0.00 | -59.50 | 0.00 | 59.50 | 2,423.93 | 1,211.97 | 4,181.46 | 2,093.84 | 0.96 | -0.10 | 0.032 |
| 100.00 | -8.46 | -1.49 | 0.00 | -51.98 | 0.00 | 51.98 | 2,366.19 | 1,183.09 | 3,915.26 | 1,960.54 | 1.08 | -0.11 | 0.030 |
| 105.00 | -7.83 | -1.46 | 0.00 | -44.55 | 0.00 | 44.55 | 2,305.01 | 1,152.51 | 3,651.76 | 1,828.59 | 1.20 | -0.12 | 0.028 |
| 110.00 | -7.24 | -1.43 | 0.00 | -37.23 | 0.00 | 37.23 | 2,240.42 | 1,120.21 | 3,391.69 | 1,698.37 | 1.34 | -0.13 | 0.025 |
| 115.00 | -6.66 | -1.39 | 0.00 | -30.07 | 0.00 | 30.07 | 2,172.39 | 1,086.20 | 3,135.78 | 1,570.22 | 1.48 | -0.14 | 0.022 |
| 120.00 | -6.32 | -1.36 | 0.00 | -23.11 | 0.00 | 23.11 | 2,100.95 | 1,050.47 | 2,884.74 | 1,444.51 | 1.63 | -0.15 | 0.019 |
| 123.00 | -4.83 | -1.20 | 0.00 | -19.04 | 0.00 | 19.04 | 2,056.44 | 1,028.22 | 2,736.75 | 1,370.41 | 1.73 | -0.15 | 0.016 |
| 125.00 | -4.31 | -1.13 | 0.00 | -16.63 | 0.00 | 16.63 | 2,026.08 | 1,013.04 | 2,639.30 | 1,321.61 | 1.79 | -0.16 | 0.015 |
| 130.00 | -3.70 | -1.02 | 0.00 | -10.99 | 0.00 | 10.99 | 1,947.78 | 973.89 | 2,400.18 | 1,201.87 | 1.96 | -0.16 | 0.011 |
| 134.00 | -2.81 | -0.84 | 0.00 | -6.91 | 0.00 | 6.91 | 1,102.25 | 551.13 | 1,321.80 | 661.88 | 2.10 | -0.16 | 0.013 |
| 135.00 | -2.51 | -0.77 | 0.00 | -6.07 | 0.00 | 6.07 | 1,095.19 | 547.60 | 1,297.91 | 649.92 | 2.13 | -0.17 | 0.012 |
| 140.00 | -2.45 | -0.75 | 0.00 | -2.22 | 0.00 | 2.22 | 1,057.85 | 528.92 | 1,179.18 | 590.46 | 2.31 | -0.17 | 0.006 |
| 141.00 | -0.84 | -0.30 | 0.00 | -1.47 | 0.00 | 1.47 | 1,049.97 | 524.98 | 1,155.61 | 578.66 | 2.34 | -0.17 | 0.003 |
| 145.00 | -0.80 | -0.28 | 0.00 | -0.28 | 0.00 | 0.28 | 1,017.07 | 508.54 | 1,062.12 | 531.85 | 2.48 | -0.17 | 0.001 |
| 146.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1,008.51 | 504.25 | 1,038.98 | 520.26 | 2.52 | -0.17 | 0.000 |
| 148.50 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 986.50 | 493.25 | 981.57 | 491.52 | 2.61 | -0.17 | 0.000 |

## Analysis Summary

| | Reactions | | | | | | Max Usage | |
|---|---|---|---|---|---|---|---|---|
| Load Case | Shear FX (kips) | Shear FZ (kips) | Axial FY (kips) | Moment MX (ft-kips) | Moment MY (ft-kips) | Moment MZ (ft-kips) | Elev (ft) | Interaction Ratio |
| 1.2D + 1.6W | 20.53 | 0.00 | 53.50 | 0.00 | 0.00 | 2042.30 | 94.50 | 0.22 |
| 0.9D + 1.6W | 20.53 | 0.00 | 40.12 | 0.00 | 0.00 | 2035.98 | 94.50 | 0.22 |
| 1.2D + 1.0Di + 1.0Wi | 4.47 | 0.00 | 85.34 | 0.00 | 0.00 | 431.54 | 94.50 | 0.06 |
| (1.2 + 0.2Sds) * DL + E ELFM | 3.45 | 0.00 | 52.58 | 0.00 | 0.00 | 341.18 | 0.00 | 0.04 |
| (1.2 + 0.2Sds) * DL + E EMAM | 2.40 | 0.00 | 52.58 | 0.00 | 0.00 | 246.77 | 94.50 | 0.03 |
| (0.9 - 0.2Sds) * DL + E ELFM | 3.45 | 0.00 | 36.67 | 0.00 | 0.00 | 340.02 | 0.00 | 0.04 |
| (0.9 - 0.2Sds) * DL + E EMAM | 2.40 | 0.00 | 36.67 | 0.00 | 0.00 | 245.87 | 94.50 | 0.03 |
| 1.0D + 1.0W | 5.70 | 0.00 | 44.59 | 0.00 | 0.00 | 566.10 | 94.50 | 0.07 |

## Base Summary

### Reactions

| Original Design | | | Analysis | | | |
|---|---|---|---|---|---|---|
| Moment (kip-ft) | Axial (kip) | Shear (kip) | Moment (kip-ft) | Axial (kip) | Shear (kip) | Moment Design % |
| 7,150.00 | 53.00 | 62.00 | 2,042.30 | 85.34 | 20.53 | 21.16 |

### Base Plate

| Yield (ksi) | Thick (in) | Width (in) | Style | Poly Sides | Clip Len (in) | Effective Len (in) | Mu (kip-in) | Phi Mn (kip-in) | Ratio |
|---|---|---|---|---|---|---|---|---|---|
| 50.0 | 3.250 | 81.000 | Clipped | 8 | 18.00 | 8.284 | 183.23 | 984.35 | 0.19 |

### Anchor Bolts

| | | | | | | | | Start | Compression | | | Tension | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bolt Circle | Num Bolts | Bolt Type | Bolt Dia (in) | Yield (ksi) | Ultimate (ksi) | Arrange | Cluster Dist (in) | Angle (deg) | Force (kip) | Allow (kip) | Ratio | Force (kip) | Allow (kip) | Ratio |
| 81.00 | 28 | 2.25" 18J | 2.25 | 75.00 | 100.00 | Clustered | 6.00 | 45.0 | 46.27 | 260.00 | 0.18 | 40.18 | 260.00 | 0.16 |

# Exhibit E

EBI Consulting
environmental | engineering | due diligence

# RADIO FREQUENCY EMISSIONS ANALYSIS REPORT
# EVALUATION OF HUMAN EXPOSURE POTENTIAL TO NON-IONIZING EMISSIONS

T-Mobile Existing Facility

Site ID: CTNH547A

Salisbury
52 Library Street
Salisbury, CT 06068

**October 14, 2016**

**EBI Project Number: 6216004604**

| Site Compliance Summary | |
|---|---|
| Compliance Status: | COMPLIANT |
| Site total MPE% of FCC general public allowable limit: | 6.97 % |

21 B Street · Burlington, MA 01803 · Tel: (781) 273.2500 · Fax: (781) 273.3311

EBI Consulting
environmental | engineering | due diligence

October 14, 2016

T-Mobile USA
Attn: Jason Overbey, RF Manager
35 Griffin Road South
Bloomfield, CT 06002

Emissions Analysis for Site: **CTNH547A – Salisbury**

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **52 Library Street, Salisbury, CT**, for the purpose of determining whether the emissions from the Proposed T-Mobile Antenna Installation located on this property are within specified federal limits.

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

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

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

Public exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu W/cm^2$). The general population exposure limit for the 700 MHz Band is approximately 467 $\mu W/cm^2$, and the general population exposure limit for the 1900 MHz (PCS) and 2100 MHz (AWS) bands is 1000 $\mu W/cm^2$. Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.

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

Additional details can be found in FCC OET 65.

## CALCULATIONS

Calculations were done for the proposed T-Mobile Wireless antenna facility located at **52 Library Street, Salisbury, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since T-Mobile is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was focused at the base of the tower. For this report the sample point is the top of a 6-foot person standing at the base of the tower.

For all calculations, all equipment was calculated using the following assumptions:

1) 2 UMTS channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

2) 2 LTE channels (AWS Band – 2100 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel

3) 1 LTE channel (700 MHz Band) was considered for each sector of the proposed installation. This channel has a transmit power of 30 Watts.

4) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.

5) For the following calculations the sample point was the top of a 6-foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufactures supplied specifications minus 10 dB was used in this direction. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

6) The antennas used in this modeling are the **RFS APX16DWV-16DWVS-E-A20** for 1900 MHz (PCS) and 2100 MHz (AWS) channels and the **Commscope LNX-6515DS-VTM** for 700 MHz channels. This is based on feedback from the carrier with regards to anticipated antenna selection. The **RFS APX16DWV-16DWVS-E-A20** has a maximum gain of **16.3 dBd** at its main lobe at 1900 MHz and 2100 MHz. The **Commscope LNX-6515DS-VTM** has a maximum gain of **14.6 dBd** at its main lobe at 700 MHz. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

7) The antenna mounting height centerline of the proposed antennas is **123 feet** above ground level (AGL).

8) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.

9) All calculations were done with respect to uncontrolled / general public threshold limits.

## T-Mobile Site Inventory and Power Data

| Sector: | A | Sector: | B | Sector: | C |
|---|---|---|---|---|---|
| Antenna #: | **1** | Antenna #: | **1** | Antenna #: | **1** |
| Make / Model: | RFS APX16DWV-16DWVS-E-A20 | Make / Model: | RFS APX16DWV-16DWVS-E-A20 | Make / Model: | RFS APX16DWV-16DWVS-E-A20 |
| Gain: | 16.3 dBd | Gain: | 16.3 dBd | Gain: | 16.3 dBd |
| Height (AGL): | 123 | Height (AGL): | 123 | Height (AGL): | 123 |
| Frequency Bands | 1900 MHz (PCS) / 2100 MHz (AWS) | Frequency Bands | 1900 MHz (PCS) / 2100 MHz (AWS) | Frequency Bands | 1900 MHz (PCS) / 2100 MHz (AWS) |
| Channel Count | 4 | Channel Count | 4 | Channel Count | 4 |
| Total TX Power(W): | 180 | Total TX Power(W): | 180 | Total TX Power(W): | 180 |
| ERP (W): | 7,678.43 | ERP (W): | 7,678.43 | ERP (W): | 7,678.43 |
| Antenna A1 MPE% | 2.02 | Antenna B1 MPE% | 2.02 | Antenna C1 MPE% | 2.02 |
| Antenna #: | **2** | Antenna #: | **2** | Antenna #: | **2** |
| Make / Model: | Commscope LNX-6515DS-VTM | Make / Model: | Commscope LNX-6515DS-VTM | Make / Model: | Commscope LNX-6515DS-VTM |
| Gain: | 14.6 dBd | Gain: | 14.6 dBd | Gain: | 14.6 dBd |
| Height (AGL): | 123 | Height (AGL): | 123 | Height (AGL): | 123 |
| Frequency Bands | 700 MHz | Frequency Bands | 700 MHz | Frequency Bands | 700 MHz |
| Channel Count | 1 | Channel Count | 1 | Channel Count | 1 |
| Total TX Power(W): | 30 | Total TX Power(W): | 30 | Total TX Power(W): | 30 |
| ERP (W): | 865.21 | ERP (W): | 865.21 | ERP (W): | 865.21 |
| Antenna A2 MPE% | 0.49 | Antenna B2 MPE% | 0.49 | Antenna C2 MPE% | 0.49 |

| **Site Composite MPE%** | |
|---|---|
| **Carrier** | **MPE%** |
| T-Mobile (Per Sector Max) | **2.50 %** |
| Litchfield County Dispatch | 0.64 % |
| EMS | 0.32 % |
| AT&T | 1.69 % |
| Verizon Wireless | 1.82 % |
| **Site Total MPE %:** | **6.97 %** |

| | |
|---|---|
| T-Mobile Sector A Total: | 2.50 % |
| T-Mobile Sector B Total: | 2.50 % |
| T-Mobile Sector C Total: | 2.50 % |
| | |
| Site Total: | 6.97 % |

| **T-Mobile _per sector** | **# Channels** | **Watts ERP (Per Channel)** | **Height (feet)** | **Total Power Density ($\mu W/cm^2$)** | **Frequency (MHz)** | **Allowable MPE ($\mu W/cm^2$)** | **Calculated % MPE** |
|---|---|---|---|---|---|---|---|
| T-Mobile AWS - 2100 MHz LTE | 2 | 2,559.48 | 123 | 13.44 | AWS - 2100 MHz | 1000 | 1.34% |
| T-Mobile PCS - 1950 MHz UMTS | 2 | 1,279.74 | 123 | 6.72 | PCS - 1950 MHz | 1000 | 0.67% |
| T-Mobile 700 MHz LTE | 1 | 865.21 | 123 | 2.27 | 700 MHz | 467 | 0.49% |
| | | | | | | **Total*:** | **2.50%** |

*** NOTE: Totals may vary by 0.01% due to summing of remainders**

## Summary

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

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

| T-Mobile Sector | Power Density Value (%) |
|---|---|
| Sector A: | 2.50 % |
| Sector B: | 2.50 % |
| Sector C: | 2.50 % |
| T-Mobile Per Sector Maximum: | 2.50 % |
| | |
| Site Total: | 6.97 % |
| | |
| Site Compliance Status: | **COMPLIANT** |

The anticipated composite MPE value for this site assuming all carriers present is **6.97%** of the allowable FCC established general public limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

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