NORTHEAST SITE SOLUTIONS
*Turnkey Wireless Development*

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

April 18, 2017

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

RE: Tower Share Application
1291 BANTAM ROAD, BOROUGH of BANTAM, LITCHFIELD, CT 06750
Latitude: 41.717174
Longitude: -73.260911
T-Mobile Site#: CTNH546A-NSD-ROB

Dear Ms. Bachman:

This letter and attachments are submitted on behalf of T-Mobile Northeast LLC ("T-Mobile"). T-Mobile plans to install antennas and related equipment at the tower site located at 1291 Bantam Road in Borough of Bantam, Litchfield, Connecticut.

T-Mobile will install three (3) 700MHz antenna, three (3) 1900/2100 MHz antennas and nine (9) RRUs at the 115-foot level of the existing 149-foot support tower Two (2) hybrid cables will also be installed. T-Mobile's equipment cabinets will be placed within T-Mobile's 120 sq ft lease area, which includes a 8x6 equipment pad. Included are plans by SMW Engineering, dated April 13, 2017. **Exhibit C**. Also included is a structural analysis prepared by Tower Engineering Solutions, dated March 21, 2017, confirming that the existing tower is structurally capable of supporting the proposed equipment. Attached as **Exhibit D.**

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies 16-50aa, of T-Mobile's intent to share a telecommunications facility pursuant to R.C.S.A. 16-50j-88. In accordance with R.C.S.A., a copy of this letter is being sent to Leo Paul, Jr., First Selectman and Dennis P. Tobin, PhD, Land Use Official of the Town of Litchfield, as well as the tower owner (SBA) and property owner (Robert and Judith Hammer).

The planned modifications of the facility fall squarely within those activities explicitly provided for in R.C.S.A. 16-50j-89.

1. The proposed modification will not result in an increase in the height of the existing structure. The top of the support tower is 152.4-feet; T-Mobile's proposed antennas will be located at a center line height of 115-feet.

2. The proposed modifications will not result in the increase of the site boundary as depicted on the attached site plan.

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

4. The operation of the proposed antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communications Commission safety standard. As indicated in the attached power density calculations, the combined site operations will result in a total power density of 6.97% as evidenced by **Exhibit E.**

NORTHEAST SITE SOLUTIONS

*Turnkey Wireless Development*

Connecticut General Statutes 16-50aa indicates that the Council must approve the shared use of a telecommunications facility provided it finds the shared use is technically, legally, environmentally, and economically feasible and meets public safety concerns. As demonstrated in this letter, T-Mobile respectfully indicates that the shared use of this facility satisfies these criteria.

A. Technical Feasibility. The existing monopole has been deemed structurally capable of supporting T-Mobile's proposed loading. The structural analysis is included as **Exhibit D**.

B. Legal Feasibility. As referenced above, C.G.S. 16-50aa has been authorized to issue orders approving the shared use of an existing tower such as this support tower in Litchfield. Under the authority granted to the Council, an order of the Council approving the requested shared use would permit T-Mobile to obtain a building permit for the proposed installation. Further, a Letter of Authorization is included as **Exhibit F**, authorizing T-Mobile to file this application for shared use.

C. Environmental Feasibility. The proposed shared use of this facility would have a minimal environmental impact. The installation of T-Mobile equipment at the 115-foot level of the existing 149-foot tower would have an insignificant visual impact on the area around the tower. T-Mobile's ground equipment would be installed within the existing facility compound. T-Mobile's shared use would therefore not cause any significant alteration in the physical or environmental characteristics of the existing site. Additionally, as evidenced by **Exhibit E**, the proposed antennas would not increase radio frequency emissions to a level at or above the Federal Communications Commission safety standard.

D. Economic Feasibility. T-Mobile will be entering into an agreement with the owner of this facility to mutually agreeable terms. As previously mentioned, the Letter of Authorization has been provided by the owner to assist T-Mobile with this tower sharing application.

E. Public Safety Concerns. As discussed above, the guyed tower is structurally capable of supporting T-Mobile's proposed loading. T-Mobile is not aware of any public safety concerns relative to the proposed sharing of the existing guyed tower. T-Mobile's intentions of providing new and improved wireless service through the shared use of this facility is expected to enhance the safety and welfare of local residents and individuals traveling through Litchfield.

Sincerely,

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

Attachments

cc: Leo Paul, Jr, First Selectman, as elected official
Dennis P. Tobin, PhD, Land Use Official
SBA - as tower owner
Robert and Judith Hammer Et al- property owner

# Exhibit A

| | | |
|---|---|---|
| **DOCKET NO. 258** - Sprint Spectrum, L.P. d/b/a Sprint PCS application for a Certificate of Environmental Compatibility and Public Need for the construction, maintenance and operation of a wireless telecommunications facility at one of two sites on Bantam Road, Litchfield, Connecticut. | } | Connecticut<br>Siting<br>Council<br>December 9, 2003 |

**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 proposed site B located at 1291-1293 Bantam Road, Litchfield, Connecticut. The Council denies certification of proposed site A owned by Kathleen Higgins on Route 202 in Litchfield, 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 constructed as a monopole with low profile antennas, no taller than necessary to provide the proposed telecommunications services, sufficient to accommodate the antennas of Sprint and other entities, both public and private, but such tower shall not exceed a height of 150-feet above ground level.

2. 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 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, equipment building, access road, utility line, landscaping, and the movement of the tower compound not more than 50 feet to the southeast to increase wetland buffers; 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.

3. 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 if and when circumstances in operation cause a change in power density above the levels calculated and provided pursuant to this Decision and Order.

4. 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.

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

6. If the facility does not initially provide wireless services within one year of completion of construction or 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.

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

8. Unless otherwise approved by the Council, this Decision and Order shall be void if the facility authorized herein is not operational within one year of the effective date of this Decision and Order or within one year after all appeals to this Decision and Order have been resolved.

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 Waterbury Republican-American and The Litchfield Enquirer.

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:

| **Applicant** | **Its Representative** |
|---|---|
| Sprint Spectrum, L.P.<br>d/b/a Sprint PCS | Thomas J. Regan, Esq.<br>Brown Rudnick Berlack Israels LLP<br>CityPlace I, 38th Floor<br>185 Asylum Street<br>Hartford, CT 06103-3402 |
| **Intervenor** | **Its Representative** |
| Town of Litchfield | Steven E. Byrne, Esq.<br>Byrne & Byrne<br>2-B Farmington Commons<br>790 Farmington Avenue<br>Farmington, Connecticut 06032 |

# Exhibit B

# 1293 BANTAM RD

| | | | |
|---|---|---|---|
| **Location** | 1293 BANTAM RD | **Mblu** | 61/ 87/ 42/ / |
| **Acct#** | 008045 | **Owner** | HAMMER ROBERT & JUDITH ET AL |
| **Assessment** | $865,080 | **PID** | 1384 |
| **Building Count** | 4 | | |

## Current Value

| Assessment | | | |
|---|---|---|---|
| **Valuation Year** | **Improvements** | **Land** | **Total** |
| 2016 | $620,010 | $245,070 | $865,080 |

## Owner of Record

| | | | |
|---|---|---|---|
| **Owner** | HAMMER ROBERT & JUDITH ET AL | **Sale Price** | $300,000 |
| **Co-Owner** | | **Certificate** | |
| | | **Book & Page** | 307/ 353 |
| | | **Sale Date** | 03/14/2007 |
| | | **Instrument** | 08 |

## Ownership History

| Ownership History | | | | | |
|---|---|---|---|---|---|
| **Owner** | **Sale Price** | **Certificate** | **Book & Page** | **Instrument** | **Sale Date** |
| HAMMER ROBERT & JUDITH ET AL | $300,000 | | 307/ 353 | 08 | 03/14/2007 |
| HAMMER ROBERT ET AL | $0 | | 307/ 350 | | 03/14/2007 |
| HAMMER ROBERT & JOHN JR | $0 | | 135/ 574 | 25 | 04/19/1969 |

## Building Information

### Building 1 : Section 1

| | |
|---|---|
| **Year Built:** | 1970 |
| **Living Area:** | 988 |
| **Replacement Cost:** | $220,278 |
| **Building Percent Good:** | 68 |
| **Replacement Cost Less Depreciation:** | $149,790 |

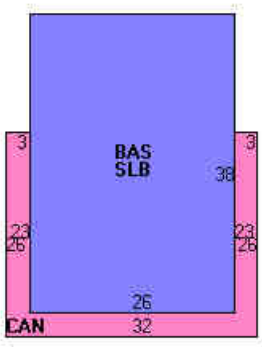
| Building Attributes | |
|---|---|
| **Field** | **Description** |

| | |
|---|---|
| STYLE | Restaurant |
| MODEL | Comm/Ind |
| Grade | D |
| Stories | 1 |
| Occupancy | 1 |
| Exterior Wall 1 | Brick |
| Exterior Wall 2 | Concr/Cinder |
| Roof Structure | Flat |
| Roof Cover | Tar & Gravel |
| Interior Wall 1 | Minimum |
| Interior Wall 2 | |
| Interior Floor 1 | Ceramic Tile |
| Interior Floor 2 | |
| Heating Fuel | Oil |
| Heating Type | Forced Hot Air |
| Central Air | None |
| Sprinkler % | 0 |
| Bldg Use | Commercial |
| Total Rooms | 0 |
| Full Baths | 0 |
| Half Baths | 0 |
| Extra Fixtures | 0 |
| Total Fixtures | 0 |
| 1st Floor Use | |
| Heat/AC | None |
| Frame Type | Reinf. Concr |
| Baths/Plumbing | Average |
| Common Wall | 0 |
| Wall Height | 10 |
| Perimeter | 128 |

### Building Photo

(http://images.vgsi.com/photos/LitchfieldCTPhotos//\00\00\92/

### Building Layout




| Building Sub-Areas (sq ft) | | | Legend |
|---|---|---|---|
| **Code** | **Description** | **Gross Area** | **Living Area** |
| BAS | First Floor | 988 | 988 |
| CAN | Canopy | 234 | 0 |
| SLB | Slab | 988 | 0 |
| | | 2,210 | 988 |

## Building 2 : Section 1

**Year Built:** 1977
**Living Area:** 450
**Replacement Cost:** $80,567
**Building Percent Good:** 82
**Replacement Cost Less Depreciation:** $66,060

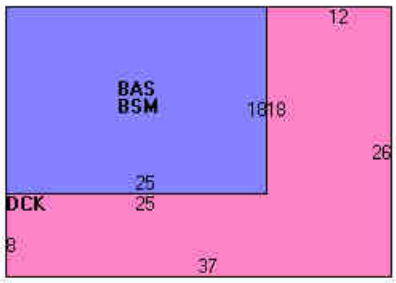
| Building Attributes : Bldg 2 of 4 | |
|---|---|
| **Field** | **Description** |
| STYLE | Office |

| | |
|---|---|
| MODEL | Comm/Ind |
| Grade | D |
| Stories | 1 |
| Occupancy | 1 |
| Exterior Wall 1 | Vinyl Siding |
| Exterior Wall 2 | |
| Roof Structure | Gable |
| Roof Cover | Arch Shingles |
| Interior Wall 1 | Drywall |
| Interior Wall 2 | |
| Interior Floor 1 | Hardwood |
| Interior Floor 2 | |
| Heating Fuel | Electric |
| Heating Type | Elec Baseboard |
| Central Air | None |
| Sprinkler % | 0 |
| Bldg Use | Commercial |
| Total Rooms | 0 |
| Full Baths | 0 |
| Half Baths | 1 |
| Extra Fixtures | 0 |
| Total Fixtures | 2 |
| 1st Floor Use | |
| Heat/AC | None |
| Frame Type | Wood Frame |
| Baths/Plumbing | Average |
| Common Wall | 0 |
| Wall Height | 9 |
| Perimeter | 86 |

### Building Photo

(http://images.vgsi.com/photos/LitchfieldCTPhotos//\00\00\92/

### Building Layout




| Building Sub-Areas (sq ft) | | | Legend |
|---|---|---|---|
| **Code** | **Description** | **Gross Area** | **Living Area** |
| BAS | First Floor | 450 | 450 |
| BSM | Basement | 450 | 0 |
| DCK | Deck | 512 | 0 |
| | | 1,412 | 450 |

### Building 3 : Section 1

**Year Built:** 2005
**Living Area:** 360
**Replacement Cost:** $33,787
**Building Percent Good:** 93
**Replacement Cost Less Depreciation:** $31,420

| Building Attributes : Bldg 3 of 4 | |
|---|---|
| **Field** | **Description** |
| STYLE | Pre-Eng Warehs |
| MODEL | Comm/Ind |

| | |
|---|---|
| Grade | A |
| Stories | 1 |
| Occupancy | 1 |
| Exterior Wall 1 | Concr/Cinder |
| Exterior Wall 2 | |
| Roof Structure | Flat |
| Roof Cover | Rolled |
| Interior Wall 1 | Minimum |
| Interior Wall 2 | |
| Interior Floor 1 | Concrete |
| Interior Floor 2 | |
| Heating Fuel | None |
| Heating Type | None |
| Central Air | None |
| Sprinkler % | 0 |
| Bldg Use | Commercial |
| Total Rooms | 0 |
| Full Baths | 0 |
| Half Baths | 0 |
| Extra Fixtures | 0 |
| Total Fixtures | 0 |
| 1st Floor Use | |
| Heat/AC | None |
| Frame Type | Reinf. Concr |
| Baths/Plumbing | Average |
| Common Wall | 0 |
| Wall Height | 10 |
| Perimeter | 84 |

### Building Photo

(http://images.vgsi.com/photos/LitchfieldCTPhotos//\00\00\92/

### Building Layout


| Building Sub-Areas (sq ft) | | | Legend |
|---|---|---|---|
| **Code** | **Description** | **Gross Area** | **Living Area** |
| BAS | First Floor | 360 | 360 |
| SLB | Slab | 360 | 0 |
| | | 720 | 360 |

## Building 4 : Section 1

**Year Built:** 2005
**Living Area:** 240
**Replacement Cost:** $23,950
**Building Percent Good:** 93
**Replacement Cost Less Depreciation:** $22,270

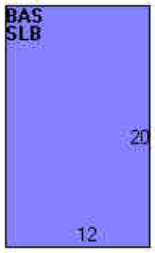
| Building Attributes : Bldg 4 of 4 | |
|---|---|
| **Field** | **Description** |
| STYLE | Pre-Eng Warehs |
| MODEL | Comm/Ind |
| Grade | A |

| | |
|---|---|
| Stories | 1 |
| Occupancy | 0 |
| Exterior Wall 1 | Concr/Cinder |
| Exterior Wall 2 | |
| Roof Structure | Flat |
| Roof Cover | Rolled |
| Interior Wall 1 | Minimum |
| Interior Wall 2 | |
| Interior Floor 1 | Average |
| Interior Floor 2 | |
| Heating Fuel | None |
| Heating Type | None |
| Central Air | None |
| Sprinkler % | 0 |
| Bldg Use | Commercial |
| Total Rooms | 0 |
| Full Baths | 0 |
| Half Baths | 0 |
| Extra Fixtures | 0 |
| Total Fixtures | 0 |
| 1st Floor Use | |
| Heat/AC | None |
| Frame Type | Reinf. Concr |
| Baths/Plumbing | Average |
| Common Wall | 0 |
| Wall Height | 10 |
| Perimeter | 64 |

### Building Photo

(http://images.vgsi.com/photos/LitchfieldCTPhotos//\00\00\92/

### Building Layout




| Building Sub-Areas (sq ft) | | | Legend |
|---|---|---|---|
| **Code** | **Description** | **Gross Area** | **Living Area** |
| BAS | First Floor | 240 | 240 |
| SLB | Slab | 240 | 0 |
| | | 480 | 240 |

### Extra Features

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

### Land

#### Land Use

| | |
|---|---|
| **Use Code** | 201 |
| **Description** | Commercial |
| **Zone** | 5 |

#### Land Line Valuation

| | |
|---|---|
| **Size (Acres)** | 12.51 |
| **Frontage** | |
| **Depth** | |

**Neighborhood Category** 200

**Assessed Value** $245,070

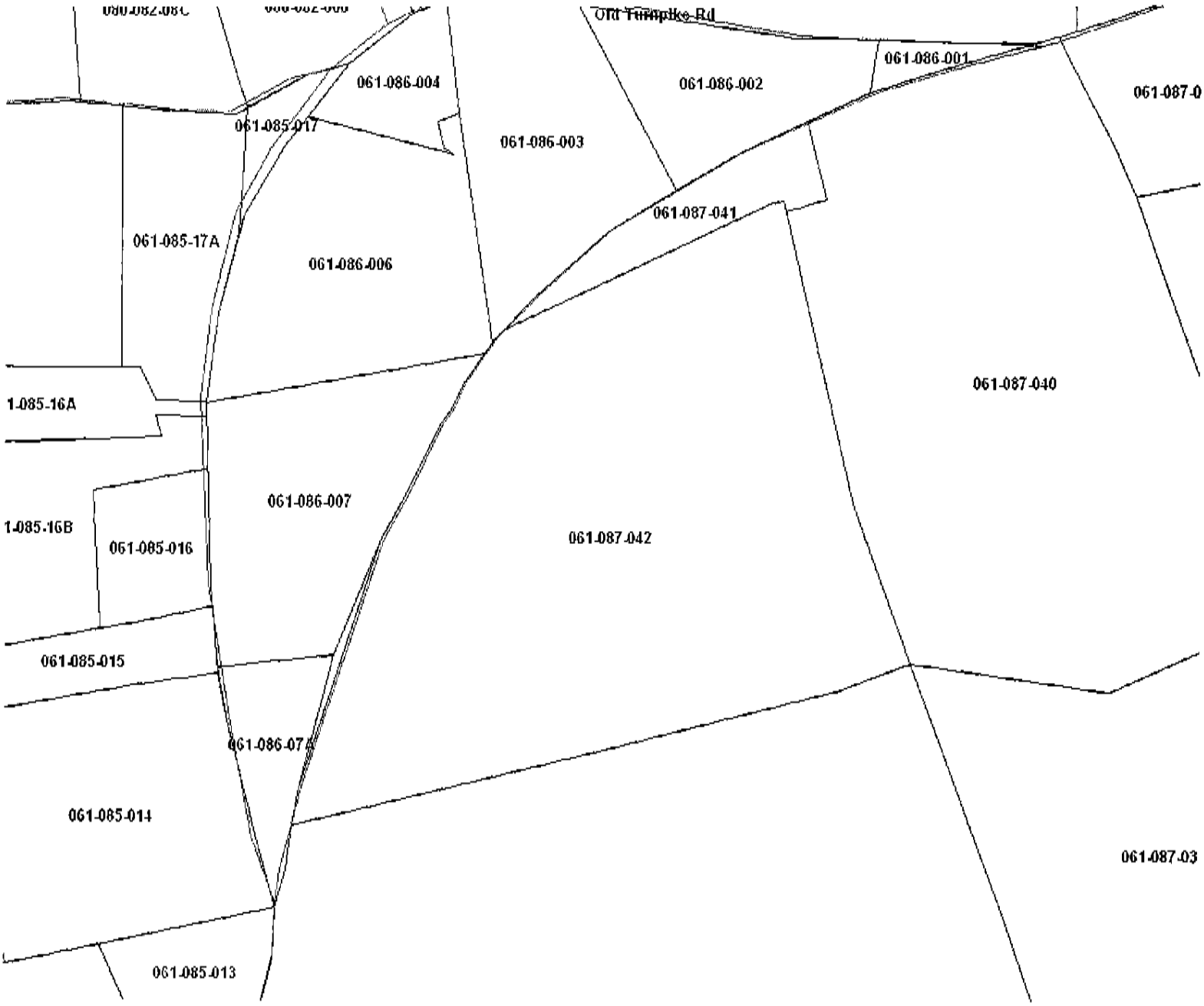
## Outbuildings

| Outbuildings | | | | | | Legend |
|---|---|---|---|---|---|---|
| **Code** | **Description** | **Sub Code** | **Sub Description** | **Size** | **Value** | **Bldg #** |
| CTWR | Cell Tower | | | 3 UNITS | $615,600 | 1 |
| FN1 | Fence | | | 200 L.F. | $600 | 4 |

## Valuation History

| Assessment | | | |
|---|---|---|---|
| **Valuation Year** | **Improvements** | **Land** | **Total** |
| 2015 | $620,010 | $245,070 | $865,080 |
| 2014 | $620,010 | $245,070 | $865,080 |
| 2013 | $620,010 | $245,070 | $865,080 |

From: Town of Litch, CT.




*

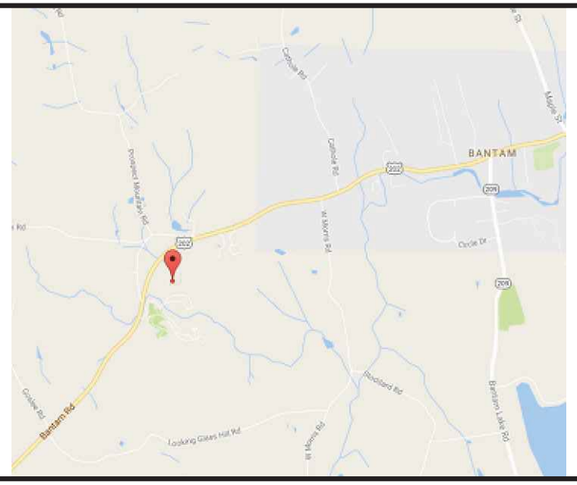
Parcel 061-087-042

# 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·

INFILL/ROB/GREENFIELD

T-MOBILE SITE NUMBER

# CTNH546A

149' MONOPOLE

SITE ADDRESS
1291 BANTAM ROAD
BANTAM, CT 06750

## SITE SUMMARY

| | |
|---|---|
| SITE TYPE: | PROPOSED EQUIPMENT INSTALLATION |
| TECHNOLOGY TYPE: | U1900/L2100/L700 |
| SITE ADDRESS: | 1291 BANTAM ROAD<br>BANTAM, CT 06750 |
| SITE LATITUDE: | 41° 43' 01.828" N |
| SITE LONGITUDE: | 73° 15' 39.280" W |
| JURISDICTION: | LITCHFIELD COUNTY |
| POWER COMPANY: | EVERSOURCE |
| TELEPHONE COMPANY: | TO BE DETERMINED |
| TOWER OWNER: | SBA COMMUNICATIONS CORPORATION<br>8051 CONGRESS AVENUE<br>BOCA RATON, FLORIDA 33487-1307 |
| TOWER MANAGER: | NORTHEAST SITE SOLUTIONS, LLC<br>420 MAIN STREET, BUILDING 4<br>STURBRIDGE, MA 01566<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

## 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



## 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/#


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

PLANS PREPARED BY:
NSS NORTHEAST SITE SOLUTIONS
NORTHEAST SITE SOLUTIONS, LLC
420 MAIN ST, BUILDING 4
STURBRIDGE, MA 01566
(860) 677-1999

SMW ENGINEERING GROUP, INC.
TOGETHER PLANNING A BETTER TOMORROW


STATE OF CONNECTICUT
KEVIN A. KRAFT
No. 20787
LICENSED PROFESSIONAL ENGINEER
04/13/17

SITE INFORMATION:
CTNH546A
1291 BANTAM ROAD
BANTAM, CT 06750

| # | DATE | DESCRIPTION: |
|---|---|---|
| 0 | 10/19/16 | ISSUED FOR CLIENT REV. |
| 1 | 04/10/17 | REISSUED FOR CLIENT REV. |
| 2 | 04/13/17 | ISSUED FOR CONSTRUCTION |

| T-MOBILE SITE ID: | SBA SITE ID: |
|---|---|
| CTNH546A | CT12215-A |

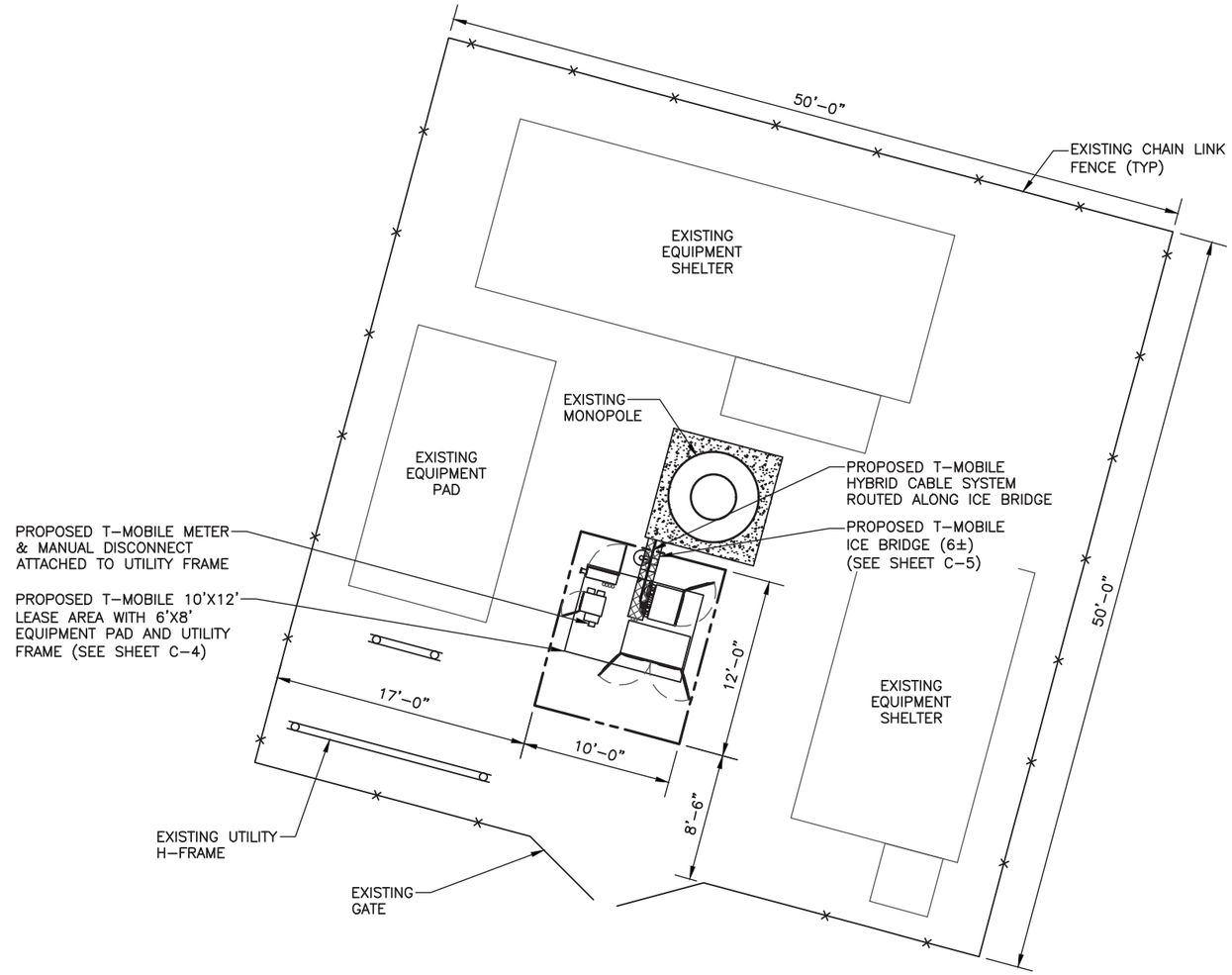
SHEET NAME:
TITLE SHEET

| SMW #: | SHEET NUMBER: |
|---|---|
| 16-2560 | T-1 |
| DESIGNER: BMD | |
| CHECKED BY: RTB | |
| ENGINEER: JDS | |

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

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.

SUBJECT PROPERTY IS LOCATED IN PANEL # 0900470011C, DATED (JULY 3, 1990) AND IS IN THE BASE FLOOD ZONE "C" AND IS NOT IN A SPECIAL FLOOD HAZARD AREA.




N

0' 10' 20' 30'
1" = 10' (11"x17")

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
NORTHEAST SITE SOLUTIONS, LLC
420 MAIN ST, BUILDING 4
STURBRIDGE, MA 01566
(860) 677-1999

SMW ENGINEERING GROUP, INC.
TOGETHER PLANNING A BETTER TOMORROW


STATE OF CONNECTICUT
KEVIN A. KRAFT
No. 20787
LICENSED PROFESSIONAL ENGINEER
04/13/17

SITE INFORMATION:
CTNH546A
1291 BANTAM ROAD
BANTAM, CT 06750

| # | DATE | DESCRIPTION: |
|---|---|---|
| 0 | 10/19/16 | ISSUED FOR CLIENT REV. |
| 1 | 04/10/17 | REISSUED FOR CLIENT REV. |
| 2 | 04/13/17 | ISSUED FOR CONSTRUCTION |
| | | |
| | | |

T-MOBILE SITE ID: CTNH546A
SBA SITE ID: CT12215-A

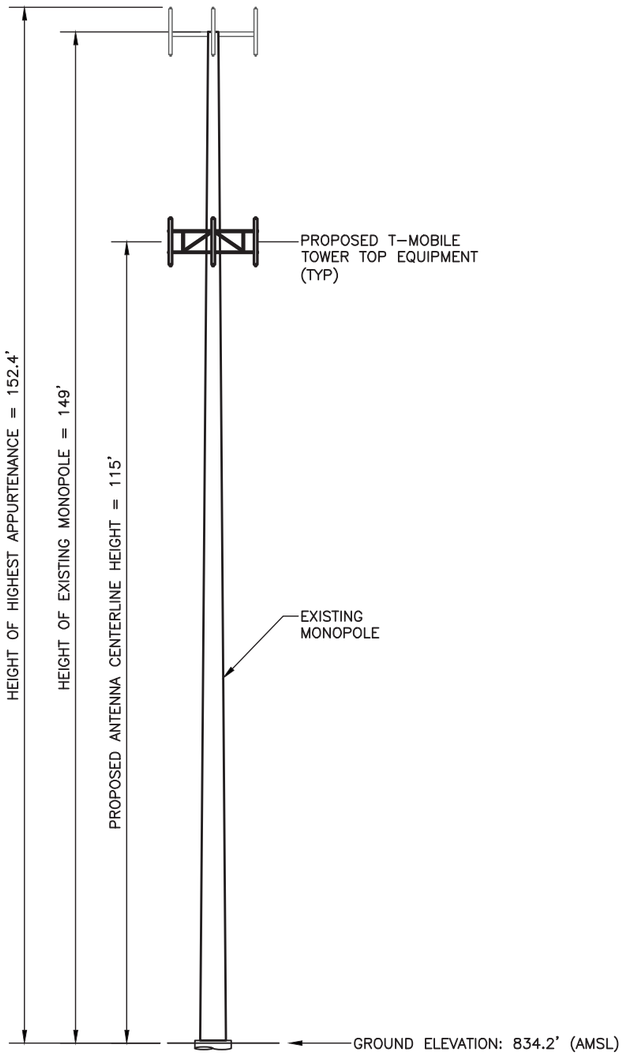
SHEET NAME:
OVERALL SITE PLAN

SMW #: 16-2560

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

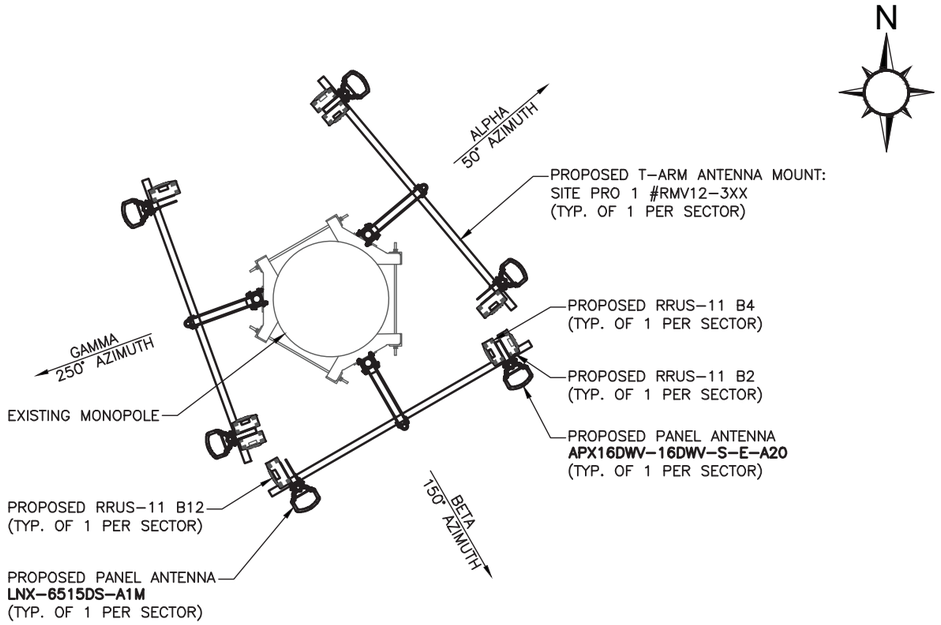
SHEET NUMBER:
C-1

**STRUCTURAL ANALYSIS COMPLETED BY TOWER ENGINEERING SOLUTIONS DATED 03/21/17, TES PROJECT #:31792**

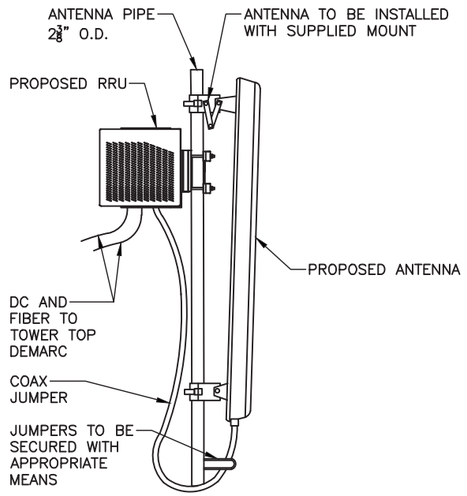



NOTES:
1. SMW HAS NOT PERFORMED A STRUCTURAL ANALYSIS OF THE EXISTING TOWER OR PROPOSED ANTENNA MOUNT. REFER TO STRUCTURAL ANALYSIS OR STRUCTURAL LETTER BY OTHERS FOR ADDITIONAL INFORMATION.
2. IF THE TOWER STRUCTURAL ANALYSIS SHOWS THE NEED FOR TOWER REINFORCEMENT REFER TO TOWER REINFORCEMENT DESIGN 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

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LICENSED PROFESSIONAL ENGINEER
04/13/17

SITE INFORMATION:
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1291 BANTAM ROAD
BANTAM, CT 06750

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| | | |
| | | |

| T-MOBILE SITE ID: | SBA SITE ID: |
|---|---|
| CTNH546A | CT12215-A |

SHEET NAME:
TOWER ELEVATION & ANTENNA PLAN

SMW #: 16-2560

| | |
|---|---|
| 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 | 50° | APX16DWV-16DWV-S-E-A20 (QUAD) | (1) RRUS-11 B2 (P)<br>(1) RRUS-11 B4 (P) | -- | -- | (2) 1 5/8" HYBRID CABLE SYSTEM (P) |
| | A2 | 50° | -- | -- | -- | -- | -- |
| | A3 | 50° | 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) | -- | -- | -- |
| | 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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KEVIN A. KRAFT
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LICENSED PROFESSIONAL ENGINEER
04/13/17

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T-MOBILE SITE ID: CTNH546A
SBA SITE ID: CT12215-A

SHEET NAME:
TOWER TOP EQUIPMENT SCHEDULE

SMW #: 16-2560

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

SHEET NUMBER:
C-3

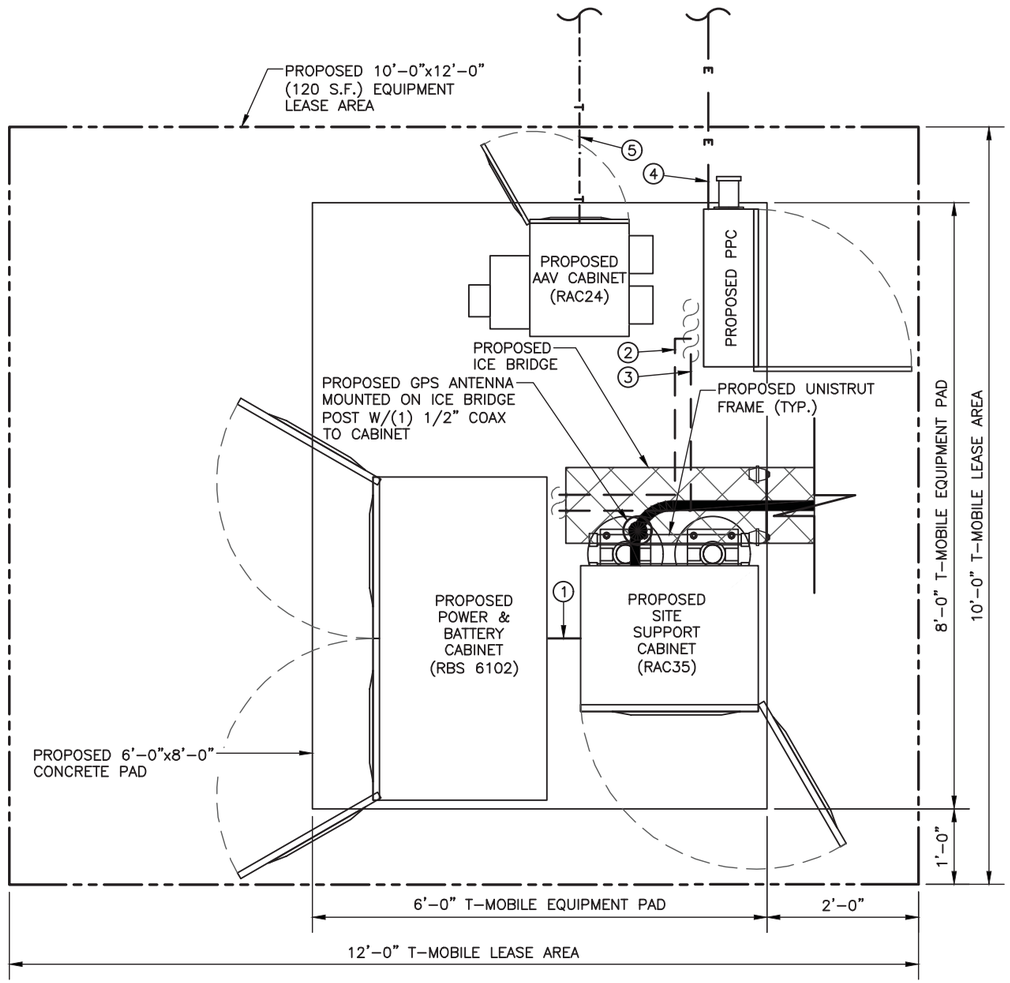
① 2"ø CONDUIT (ABOVE SLAB)

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: CTNH546A

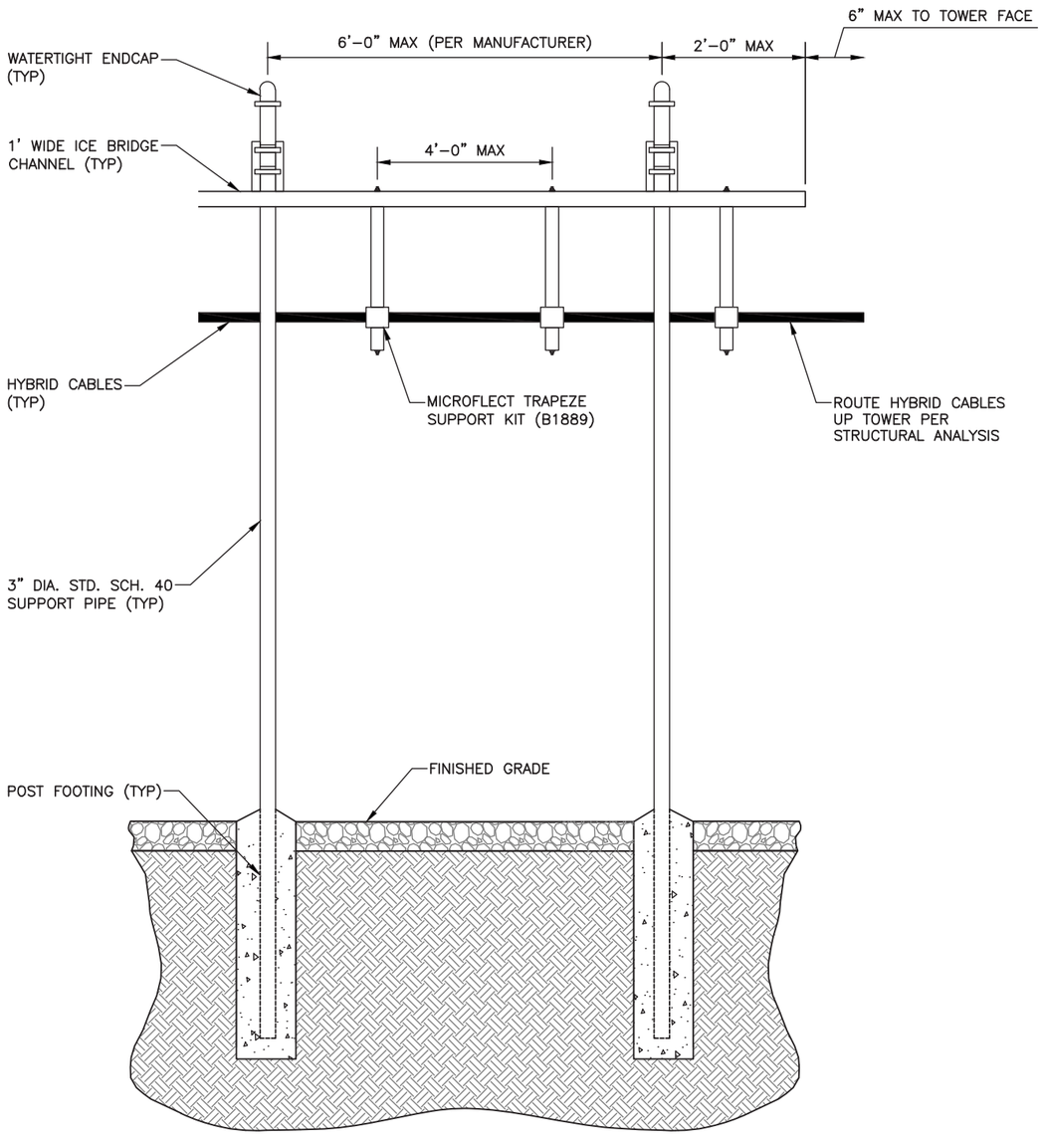
SBA SITE ID: CT12215-A

SHEET NAME: GROUND EQUIPMENT DETAIL

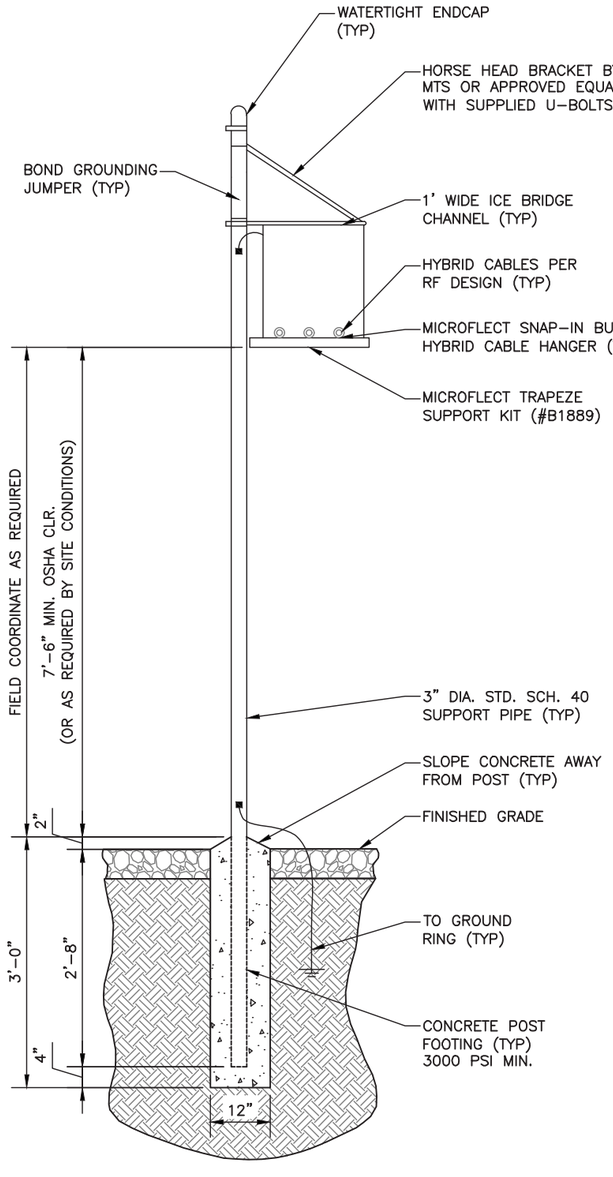
SMW #: 16-2560

| | |
|---|---|
| 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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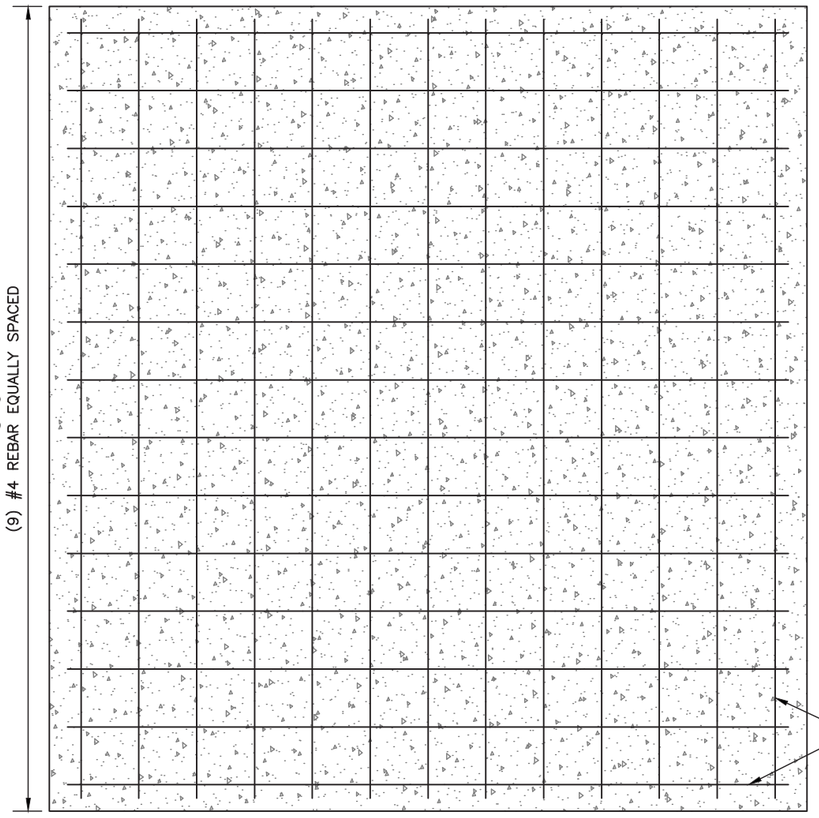
T-MOBILE SITE ID: CTNH546A
SBA SITE ID: CT12215-A

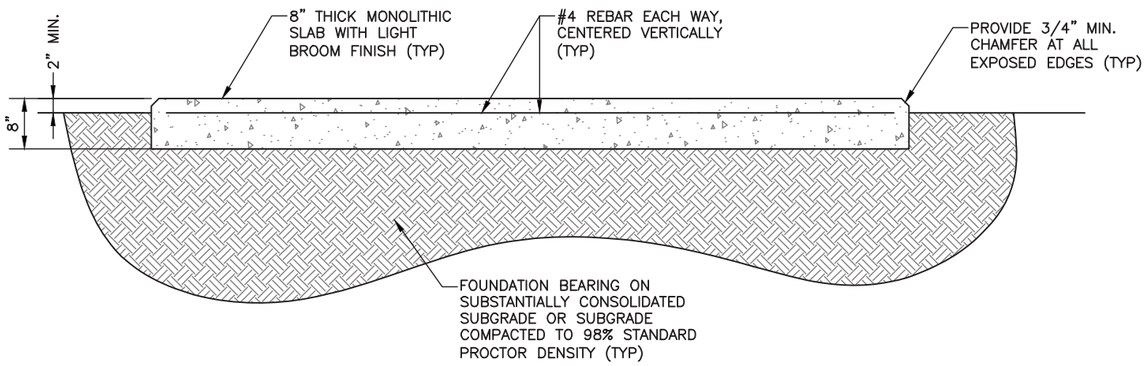
SHEET NAME:
ICE BRIDGE DETAILS

SMW #: 16-2560

| | |
|---|---|
| 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:

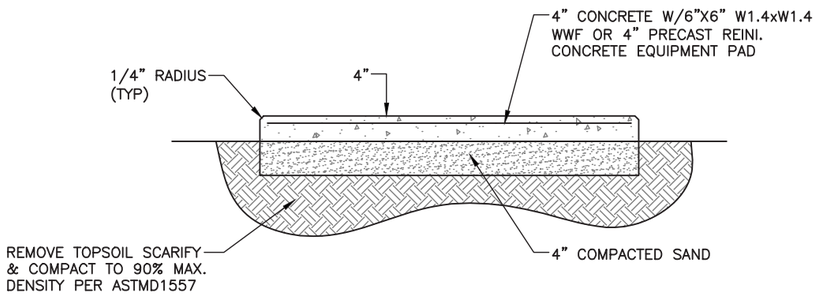
   CONCRETE CAST AGAINST EARTH.....3"
   CONCRETE EXPOSED TO EARTH OR WEATHER
   #6 AND LARGER.....2"
   #5 AND SMALLER & W.W.F.....1-1/2"

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.




2 C-6 3'x3' TANK SLAB
NOT TO SCALE

T-Mobile
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04/13/17

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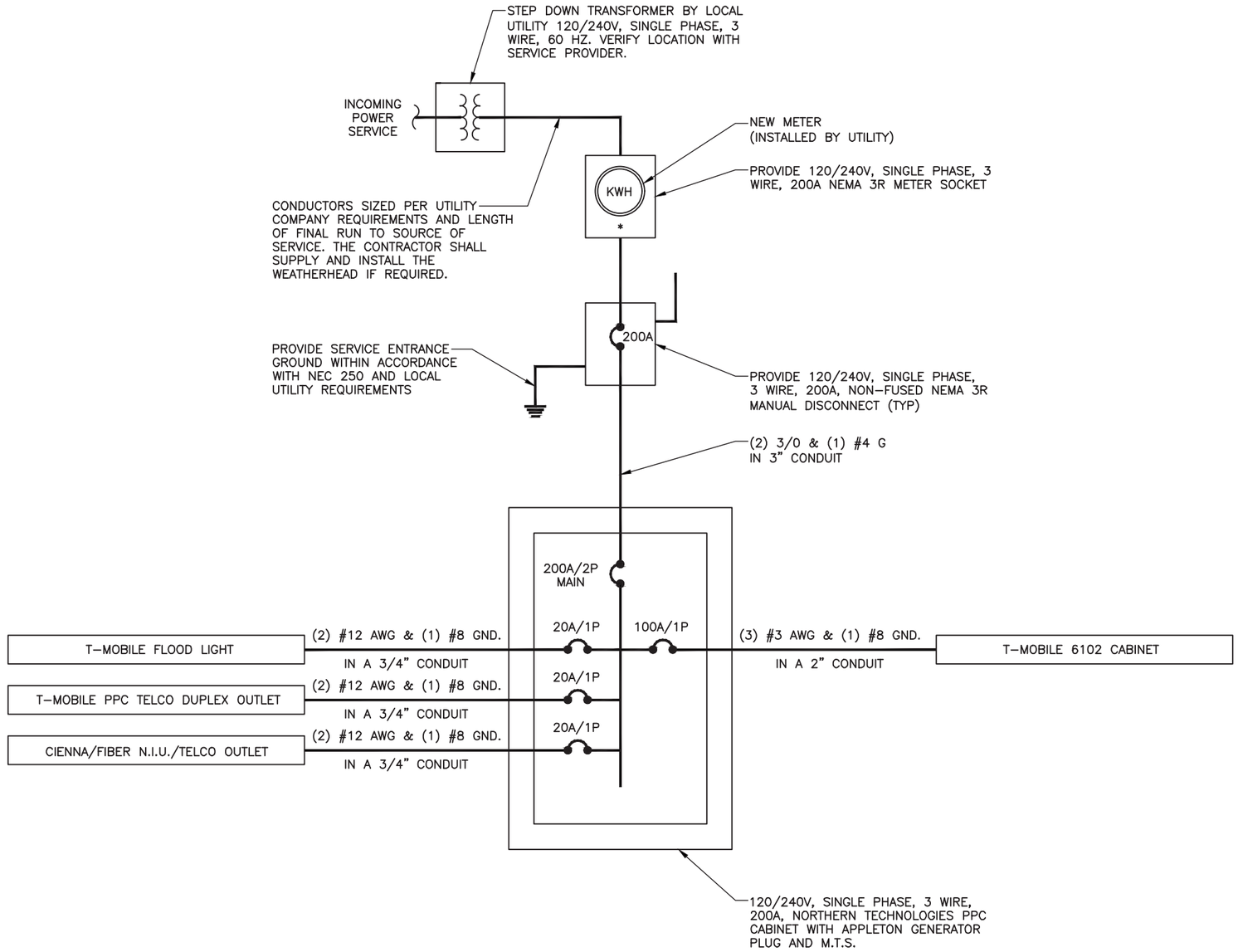
T-MOBILE SITE ID: CTNH546A
SBA SITE ID: CT12215-A

SHEET NAME:
FOUNDATION DETAILS & NOTES

SMW #: 16-2560

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

SHEET NUMBER: C-6




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

T-Mobile
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T-MOBILE SITE ID: CTNH546A
SBA SITE ID: CT12215-A

SHEET NAME: ONE-LINE DIAGRAM

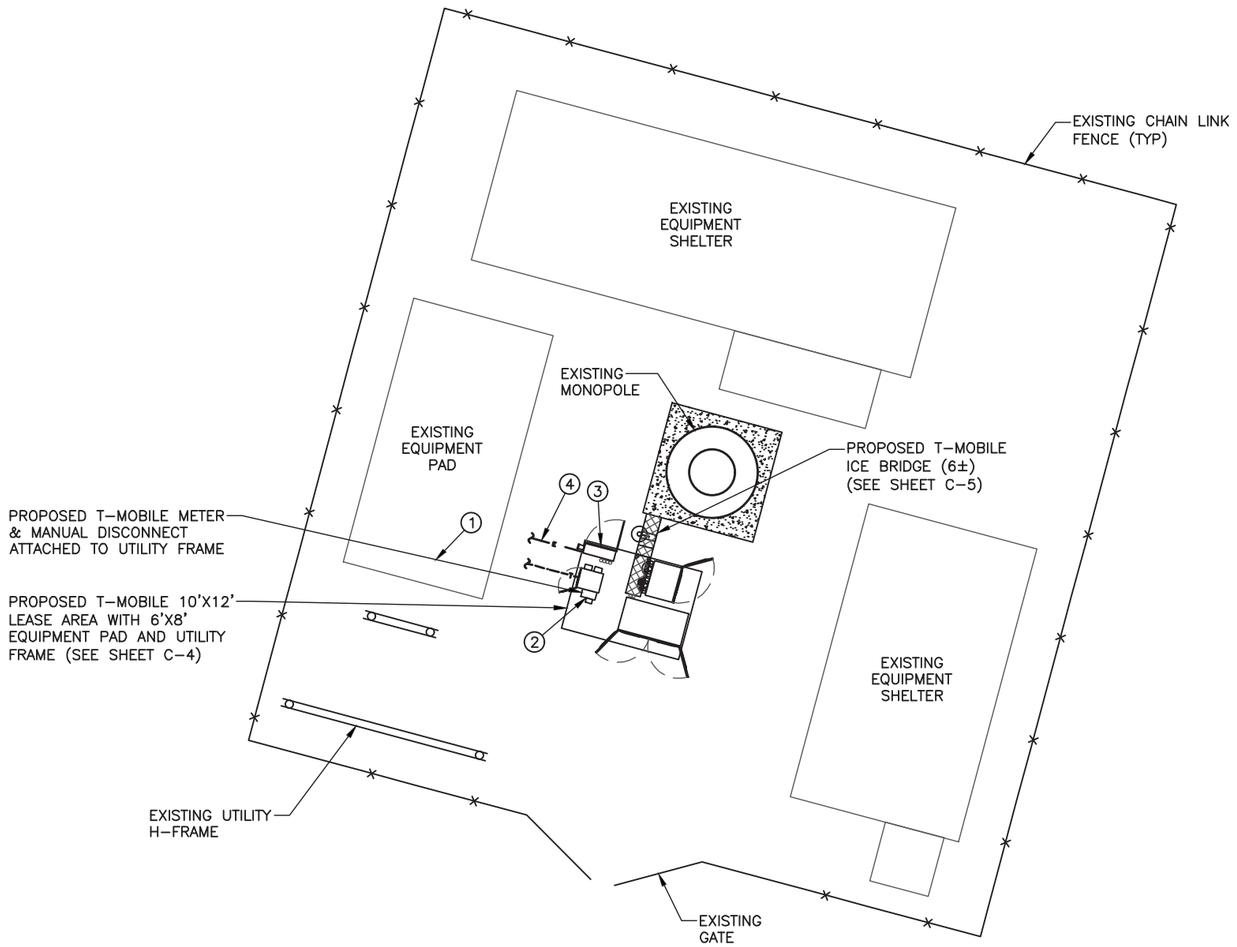
SMW #: 16-2560

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

SHEET NUMBER: E-1

ELECTRICAL KEY NOTES:

1. PROPOSED 3" PVC CONDUIT WITH (3) 3/0 + #4G FROM EXISTING UTILITY POLE TO METER BASE. THE CONTRACTOR SHALL PROVIDE AND INSTALL THE WEATHERHEAD WITH COILED EXCESS CONDUCTORS. 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 EXISTING TELCO BOX ON H-FRAME TO PROPOSED TELCO BOX. COORDINATE WITH THE LOCAL UTILITY COMPANY REGARDING FINAL SERVICE CONNECTION.




N

0' 10' 20' 30'

1" = 10' (11"x17")

1 / E-2 ELECTRICAL UTILITY PLAN
SCALE: 1" = 10'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SBA SITE ID: CT12215-A

SHEET NAME:
ELECTRICAL UTILITY PLAN

SMW #: 16-2560

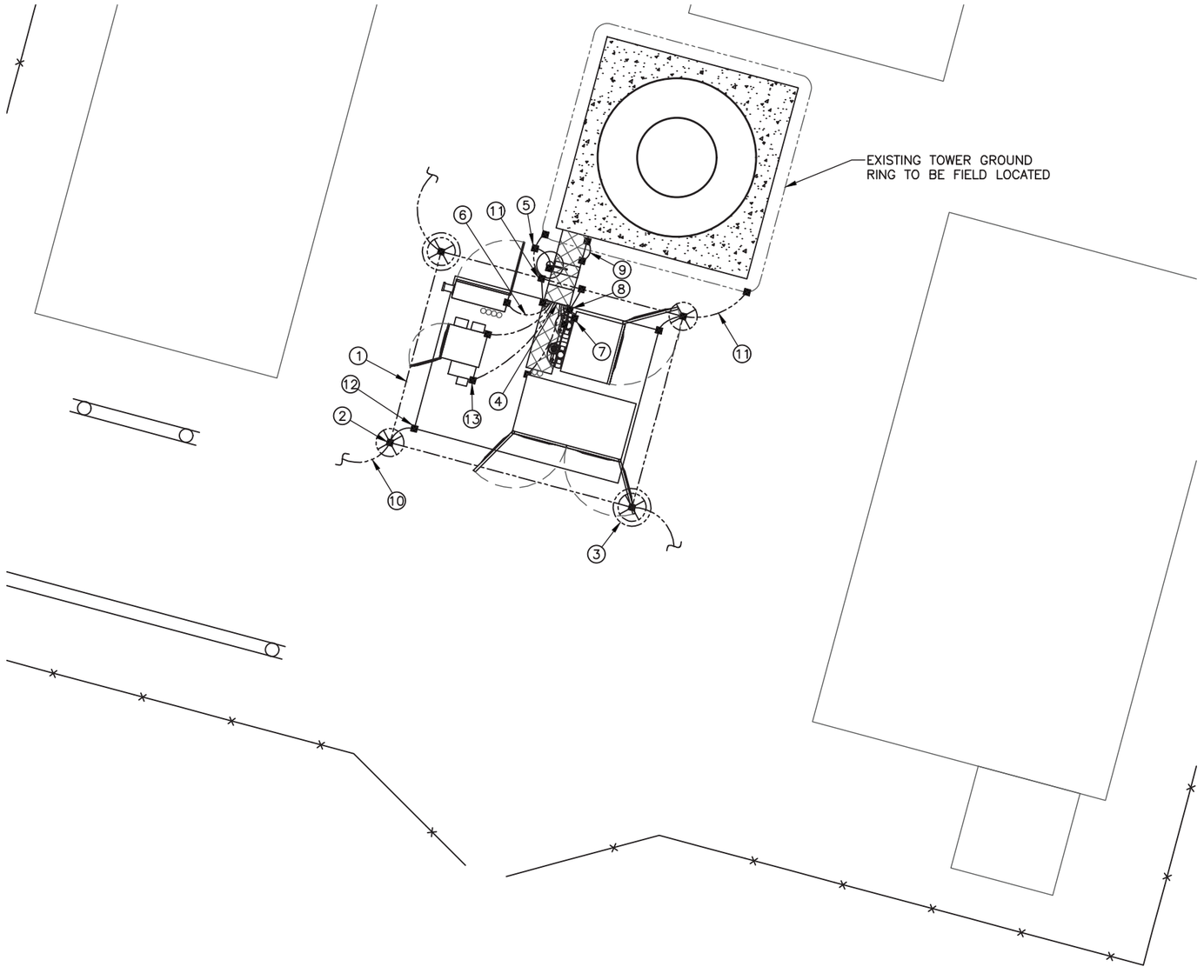
| | |
|---|---|
| DESIGNER: | BMD |
| CHECKED BY: | RTB |
| ENGINEER: | JDS |

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)
13. GROUND PROPOSED DISCONNECT PER NEC 250 AND LOCAL UTILITY REQUIREMENTS (TYP)

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




N

1 E-3 GROUNDING PLAN
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
420 MAIN ST, BUILDING 4
STURBRIDGE, MA 01566
(860) 677-1999

SMW ENGINEERING GROUP, INC.
TOGETHER PLANNING A BETTER TOMORROW

STATE OF CONNECTICUT
KEVIN A. KRAFT
No. 20787
LICENSED PROFESSIONAL ENGINEER
04/13/17

SITE INFORMATION:

CTNH546A
1291 BANTAM ROAD
BANTAM, CT 06750

| # | DATE | DESCRIPTION: |
|---|---|---|
| 0 | 10/19/16 | ISSUED FOR CLIENT REV. |
| 1 | 04/10/17 | REISSUED FOR CLIENT REV. |
| 2 | 04/13/17 | ISSUED FOR CONSTRUCTION |
| | | |
| | | |

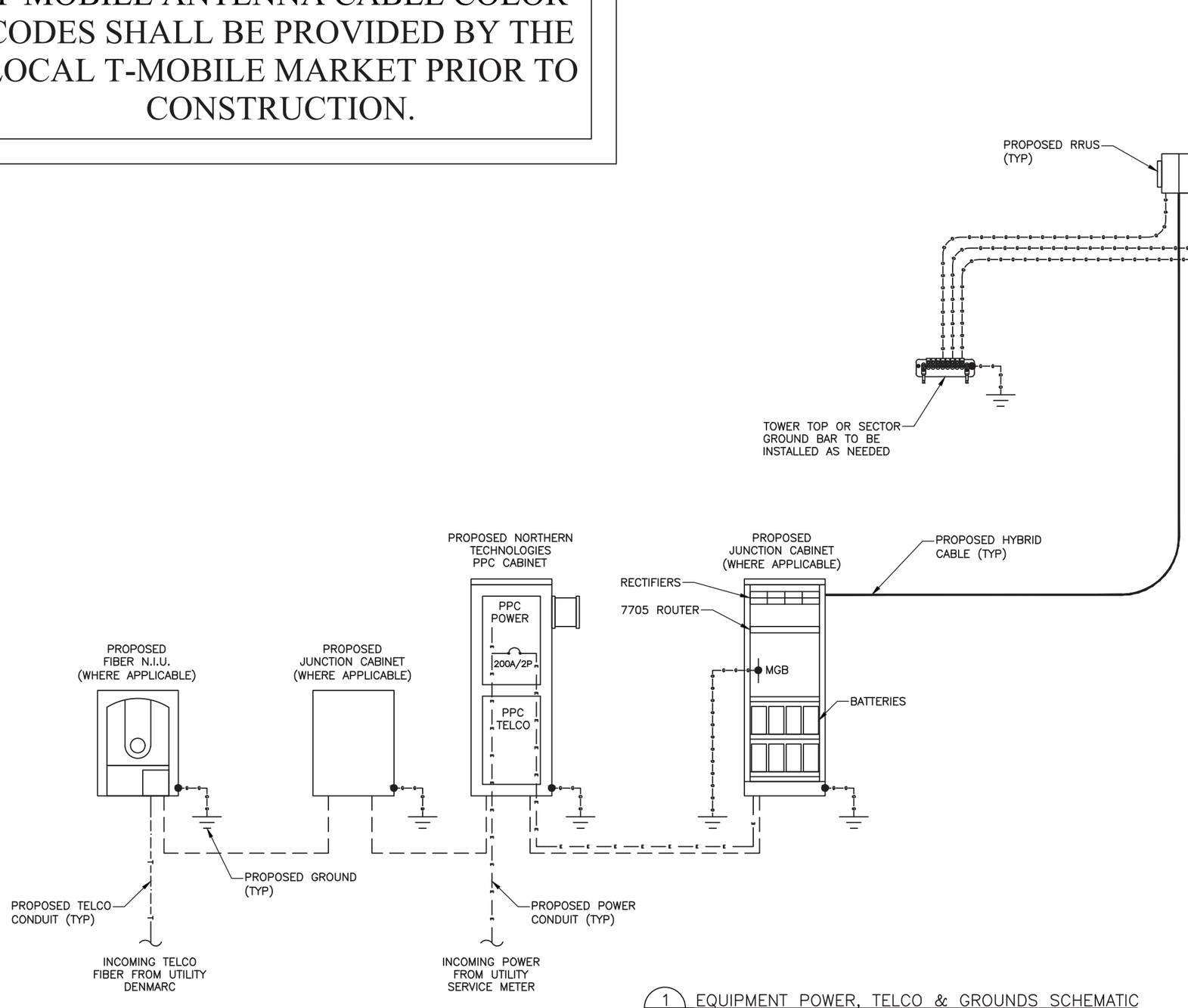
T-MOBILE SITE ID: CTNH546A
SBA SITE ID: CT12215-A

SHEET NAME:
GROUNDING PLAN

SMW #: 16-2560
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


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

PLANS PREPARED BY:
NSS NORTHEAST SITE SOLUTIONS
NORTHEAST SITE SOLUTIONS, LLC
420 MAIN ST, BUILDING 4
STURBRIDGE, MA 01566
(860) 677-1999

SMW ENGINEERING GROUP, INC.
TOGETHER PLANNING A BETTER TOMORROW


STATE OF CONNECTICUT
KEVIN A. KRAFT
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LICENSED PROFESSIONAL ENGINEER
04/13/17

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T-MOBILE SITE ID: CTNH546A
SBA SITE ID: CT12215-A

SHEET NAME:
EQUIPMENT SCHEMATIC

SMW #: 16-2560

| | |
|---|---|
| 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.

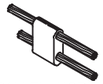
16. SUPPLEMENTAL GROUND MAY CONSIST OF ONE OR MORE OF THE FOLLOWING:
    COUNTERPOISE, USER GROUND, GROUND ROD AND/OR GROUND WELL IN EXTREMELY ADVERSE SOIL CONDITIONS. WHERE THE EXISTING BUILDING STEEL DOES NOT PROVIDE AN EFFECTIVE GROUND RESISTANCE, THEN THE CONTRACTOR SHALL PROVIDE A SEPARATE GROUND 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):

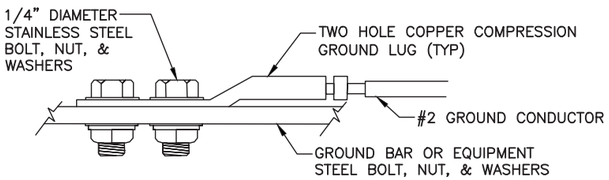
    FOR INSTALLATIONS WHERE WOODEN STRUCTURES, TOWERS, CONCRETE SILOS ETC. ARE ENCOUNTERED A PARATE DOWNLEAD SHALL BE PROVIDED FROM THE 3 ANTENNAS SEPARATED BY A MINIMUM OF 12 INCHES FROM THE COAXIAL CABLES. THE GROUND CONDUCTOR SHALL BE SECURELY FASTENED TO THE EXTERIOR OF OUTSIDE STRUCTURES WITH NONMETALLIC 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).

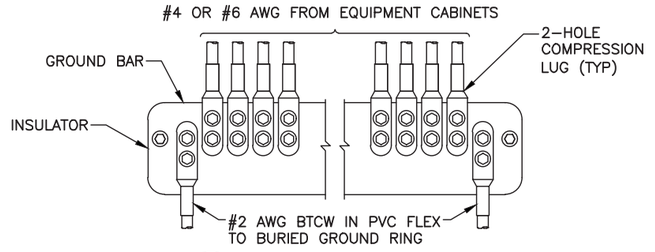
18. CONTRACTOR TO PROVIDE GUTTER TAP.

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

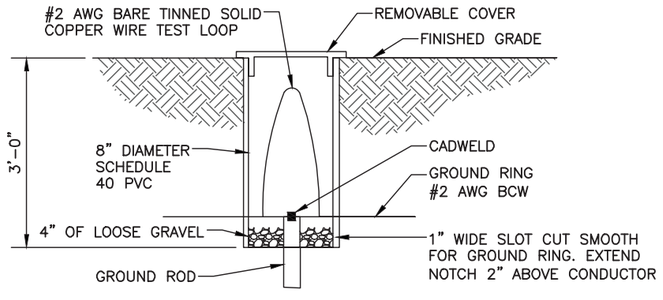
| CADWELD CONNECTIONS OR APPROVED EQUAL | | | BURNDY CONNECTIONS OR APPROVED EQUAL |
|---|---|---|---|
|  PARALLEL HORIZONTAL CONDUCTORS<br>PARALLEL THROUGH CONNECTION OF HORIZONTAL CABLES<br>TYPE PT |  HORIZONTAL STEEL SURFACE<br>TO FLAT STEEL SURFACE OR HORIZONTAL PIPE<br>TYPE HS |  VERTICAL PIPE<br>CABLE 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

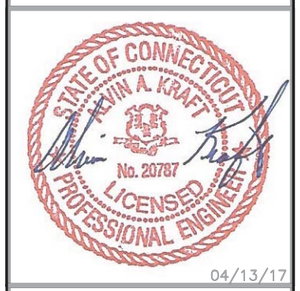



3 / E–5 TEST WELL DETAIL
NOT TO SCALE


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

PLANS PREPARED BY:
NORTHEAST SITE SOLUTIONS, LLC
420 MAIN ST, BUILDING 4
STURBRIDGE, MA 01566
(860) 677–1999

SMW ENGINEERING GROUP, INC.
TOGETHER PLANNING A BETTER TOMORROW


04/13/17

SITE INFORMATION:

CTNH546A
1291 BANTAM ROAD
BANTAM, CT 06750

| # | DATE | DESCRIPTION: |
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| | | |

T-MOBILE SITE ID: CTNH546A
SBA SITE ID: CT12215–A

SHEET NAME:
ELECTRICAL & GROUNDING DETAILS

SMW #: 16–2560

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

SHEET NUMBER: E-5

**SMW Engineering Group, Inc.**
158 Business Center Drive
Birmingham, Alabama 35244
Telephone: (205) 252-6985
Fax: (205)320-1504

# *2-C CERTIFICATION*

**Date: April 12, 2017**

| | | |
|---|---|---|
| **RE:** | **Site Name:** | **CTNH546A** |
| | **Address:** | **1291 Bantam Road<br>Bantam, CT 06750** |
| | **Ground Elevation:** | **834.2' (AMSL)** |
| | **Top of Tower:** | **149.0' (AGL)** |
| | **Highest Appurtenance:<br>(Top Antenna)** | **152.4' (AGL)** |

**City Name: Bantam** **County: Litchfield** **State: Connecticut**

**I certify that the Latitude of 41 Degrees 43 Min. 01.828 Sec. North and the longitude of 73 Degrees 15 Min. 39.280 Sec. West is accurate to within +/- 50 feet horizontally; and is accurate to within +/- 20 feet vertically. The horizontal datum (coordinates) is in terms of the North America Datum of 1983 (NAD83) and is expressed in degrees, minutes and seconds. The vertical datum (heights) is in terms of the North American Vertical Datum of 1988 (NAVD88).**

**Decimal Format**

41.717174 Latitude
-73.260911 Longitude

State of Connecticut Date: 4/12/17


Alvin A. Kraft
Connecticut Registered No. 20787
SMW Job No. 16-2560
Prepared By: WE

# Exhibit D

TES
Tower Engineering Solutions
Phone (972) 483-0607, Fax (972) 975-9615
8445 Freeport Parkway, Suite 375, Irving, Texas 75063

# Structural Analysis Report

**Existing 149 ft EEI Monopole**

**Customer Name: SBA Communications Corp**

**Customer Site Number: CT12215-A**

**Customer Site Name: Litchfield 3, CT**

**Carrier Name: T-Mobile**

**Carrier Site ID / Name: CTNH546A / BayCom Litchfield**

**Site Location: 1291 Bantam Road**

**Bantam, Connecticut**

**Litchfield County**

**Latitude: 41.717183**

**Longitude: -73.260928**


**Analysis Result:**

**Max Structural Usage: 98.0% [Pass]**

**Max Foundation Usage: 65% [Pass]**

**Report Prepared By : Jie Chen**

Tower Engineering Solutions
Phone (972) 483-0607, Fax (972) 975-9615
8445 Freeport Parkway, Suite 375, Irving, Texas 75063

# Structural Analysis Report

**Existing 149 ft EEI Monopole**

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## Analysis Result:

**Max Structural Usage: 98.0% [Pass]**

**Max Foundation Usage: 65% [Pass]**

**Report Prepared By : Jie Chen**

## Introduction

The purpose of this report is to summarize the analysis results on the 149 ft EEI Monopole to support the proposed antennas and transmission lines in addition to those currently installed. Any modification listed under Sources of Information was assumed completed and was included in this analysis.

## Sources of Information

| | |
|---|---|
| **Tower Drawings** | Engineered Endeavors, Inc. (Job No. 12278) Structure and Foundation Design Calculations dated January 26, 2004 |
| **Foundation Drawing** | Engineered Endeavors, Inc. (Job No. 12278) Design Calculations for a Spread Footer Foundation dated January 27, 2004 |
| **Geotechnical Report** | Clarence Welti Associates, Inc. (Project Name: Sprint Site CT33XC204) Geotechnical Study dated January 24, 2004 |
| **Modification Drawings** | FDH Engineering, Inc. (Project No. 12-06691E S3) Modification Drawings for a 149' Monopole dated February 6, 2013 |

## Analysis Criteria

The rigorous analysis was performed in accordance with the requirements and stipulations of the ANSI/TIA/EIA 222-G**.** In accordance with this standard, the structure was analyzed using **TESPoles,** a proprietary analysis software. The program considers the structure as an elastic 3-D model with second-order effects and temperature effects incorporated in the analysis. The analysis was performed using multiple wind directions.

| | |
|---|---|
| **Wind Speed Used in the Analysis:** | Ultimate Design Wind Speed $V_{ult}$ = 115.0 mph (3-Sec. Gust)/ Nominal Design Wind Speed $V_{asd}$ = 89.0 mph (3-Sec. Gust) |
| **Wind Speed with Ice:** | 40 mph (3-Sec. Gust) with 1" radial ice concurrent |
| **Operational Wind Speed:** | 60 mph + 0" Radial ice |
| **Standard/Codes:** | ANSI/TIA/EIA 222-G / 2012 IBC / 2016 Connecticut State Building Code |
| **Exposure Category:** | C |
| **Structure Class:** | II |
| **Topographic Category:** | 1 |
| **Crest Height:** | 0 ft |
| **Seismic Parameters:** | $S_S$ = 0.187, $S_1$ = 0.065 |

## Existing Antennas, Mounts and Transmission Lines

The table below summarizes the antennas, mounts and transmission lines that were considered in the analysis as existing on the tower.

| Items | Elevation (ft) | Qty. | Antenna Descriptions | Mount Type & Qty. | Transmission Lines | Owner |
|---|---|---|---|---|---|---|
| 1 | 150.0 | 3 | RFS APXVSPP18-C-A20 - Panel | Low Profile Platform | (4) 1-1/4" Fiber | Sprint |
| 2 | | 3 | RFS APXVTM14-C-I20 - Panel | | | |
| 3 | | 3 | ALU 1900MHz | | | |
| 4 | | 3 | ALU 800MHZ | | | |
| 5 | | 3 | ALU TD-RRH8x20-25 | | | |
| 6 | | 3 | ALU 800MHz Filter | | | |
| 7 | | 4 | RFS ACU-A20-N | | | |
| 8 | 138.0 | 3 | Antel LPA-80080/6CF - Panel | Low Profile Platform | (12) 1 5/8" (1) 1/2" | Verizon |
| 9 | | 3 | Antel BXA-70063-6CF_2 - Panel | | | |
| 10 | | 3 | Antel BXA-171085-12B_2 - Panel | | | |
| 11 | | 1 | GPS Receiver | | | |
| 12 | | 6 | RFS FD9R6004/2C-3L Diplexer | | | |
| 13 | 128.0 | 6 | Powerwave 7770.00 - Panel | Low Profile Platform | (12) 1 5/8" (2) 3/4" DC (1) 7/16" Fiber | AT&T |
| 14 | | 3 | KMW AM-X-CD-16-65-00T-RET - Panel | | | |
| 15 | | 12 | Powerwave LGP 21401 | | | |
| 16 | | 6 | Ericsson RRUS-11 | | | |
| 17 | | 1 | Raycap DC6-48-60-18-8F | | | |
| 18 | | 1 | Commscope ABT-DF-DM-ADBH | | | |
| 24 | 73.0 | 1 | GPS Receiver | - | (1) 1/2" | Sprint |

## Proposed Carrier's Final Configuration of Antennas, Mounts and Transmission Lines

Information pertaining to the proposed carrier's final configuration of antennas and transmission lines was provided by SBA Communications Corp. The proposed antennas and lines are listed below.

| Items | Elevation (ft) | Qty. | Antenna Descriptions | Mount Type & Qty. | Transmission Lines | Owner |
|---|---|---|---|---|---|---|
| 19 | 115.0 | 3 | Commscope LNX-6515DS-A1M - Panel | (3) T-Arm (Site Pro 1 #RMV12-3XX) | (2) 1 5/8" Hybrid | T-Mobile |
| 20 | | 3 | RFS APX16DWV-16DWVS-E-A20 - Panel | | | |
| 21 | | 3 | Ericsson RRUS 11 (Band 4) | | | |
| 22 | | 3 | Ericsson RRUS 11 (Band 12) | | | |
| 23 | | 3 | Ericsson RRUS 11 | | | |
| 25 | 50 | 1 | Symmetricom 58532A | - | (1) 1/2" | |

All the proposed transmission lines are assumed running outside of the pole shafts. These lines shall be strapped tightly to the face of the pole shafts. Stacking lines is not allowed.

## Analysis Results

The results of the structural analysis, performed for the wind and ice loading and antenna equipment as defined above, are summarized as the following:

| | Pole shafts | Anchor Bolts | Base Plate |
|---|---|---|---|
| Max. Usage: | **98.0%** | **73.0%** | **97.2%** |
| Pass/Fail | **Pass** | **Pass** | **Pass** |

## Foundations

| | Moment (Kip-Ft) | Shear (Kips) | Axial (Kips) |
|---|---|---|---|
| Analysis Reactions | 2577.5 | 23.0 | 60.3 |

The foundation has been investigated using the supplied documents and soils report and was found adequate. Therefore, no modification to the foundation will be required.

## Operational Condition (Rigidity):

Operational characteristics of the tower are found to be within the limits prescribed by ANSI/TIA/EIA 222-G for the installed antennas. The maximum twist/sway at the elevation of the proposed equipment is 2.1850 degrees under the operational wind speed as specified in the Analysis Criteria.

## Conclusions

Based on the analysis results, the existing structure and its foundation were found to be adequate to safely support the existing and proposed equipment and meet the minimum requirements per the ANSI/TIA-222-G standards and the 2012 IBC under the design basic wind speed specified in the Analysis Criteria.

**Antenna Mount Note:**

The new proposed mount contributes 2.2% of additional stress to the tower structure.

# Standard Conditions

1. This analysis was performed based on the information supplied to **(TES) Tower Engineering Solutions, LLC.** Verification of the information provided was not included in the Scope of Work for **TES**. The accuracy of the analysis is dependent on the accuracy of the information provided.

2. The analysis is based on the presumption that the tower members and components along with any existing reinforcement items have been correctly and properly designed, manufactured, installed and maintained.

3. All the existing structural members were assumed to be in good condition with no physical damage or deterioration associated with corrosion.

4. An initial tension of 10% of the break strength on all the existing guy wires was assumed in all the structural analyses of guyed towers unless different values were provided by the client. **TES** cannot take responsibility for the deviations in the analysis results because of differences in the initial tension forces of the existing guy wires.

5. Secondary component or connection secondary components, welds and bolts are assumed to be able to carry their intended original design loads. **TES** cannot take responsibility for verification of the adequacy on the connections, bolts and welds present in the structure.

6. The analyses will be performed based on the codes as specified by the client or based on the best knowledge of the engineering staff of **TES**. In the absence of information to the contrary, all work will be performed in accordance with the latest relevant revision of ANSI/TIA-222. If wind speed and/or ice loads are different from the minimum values recommended by the EIA/TIA-222 standard or other codes, **TES** should be notified in writing and the applicable minimum values provided by the client.

7. The configuration of the existing mounts, antennas, coax and other appurtenances were supplied by the customer for the current structural analysis. **TES** has not visited the tower site to verify the adequacy of the information provided. If there is any discrepancy found in the report regarding the existing conditions, **TES** should be notified immediately to evaluate the effect of the discrepancy on the analysis results.

8. The client will assume responsibility for rework associated with the differences in initially provided information, including tower and foundation information, existing and/or proposed equipment and transmission lines.

9. If a feasibility analysis was performed, final acceptance of changed conditions shall be based upon a rigorous structural analysis.

# Usage Diagram - Max Ratio 98.00% at 53.0ft

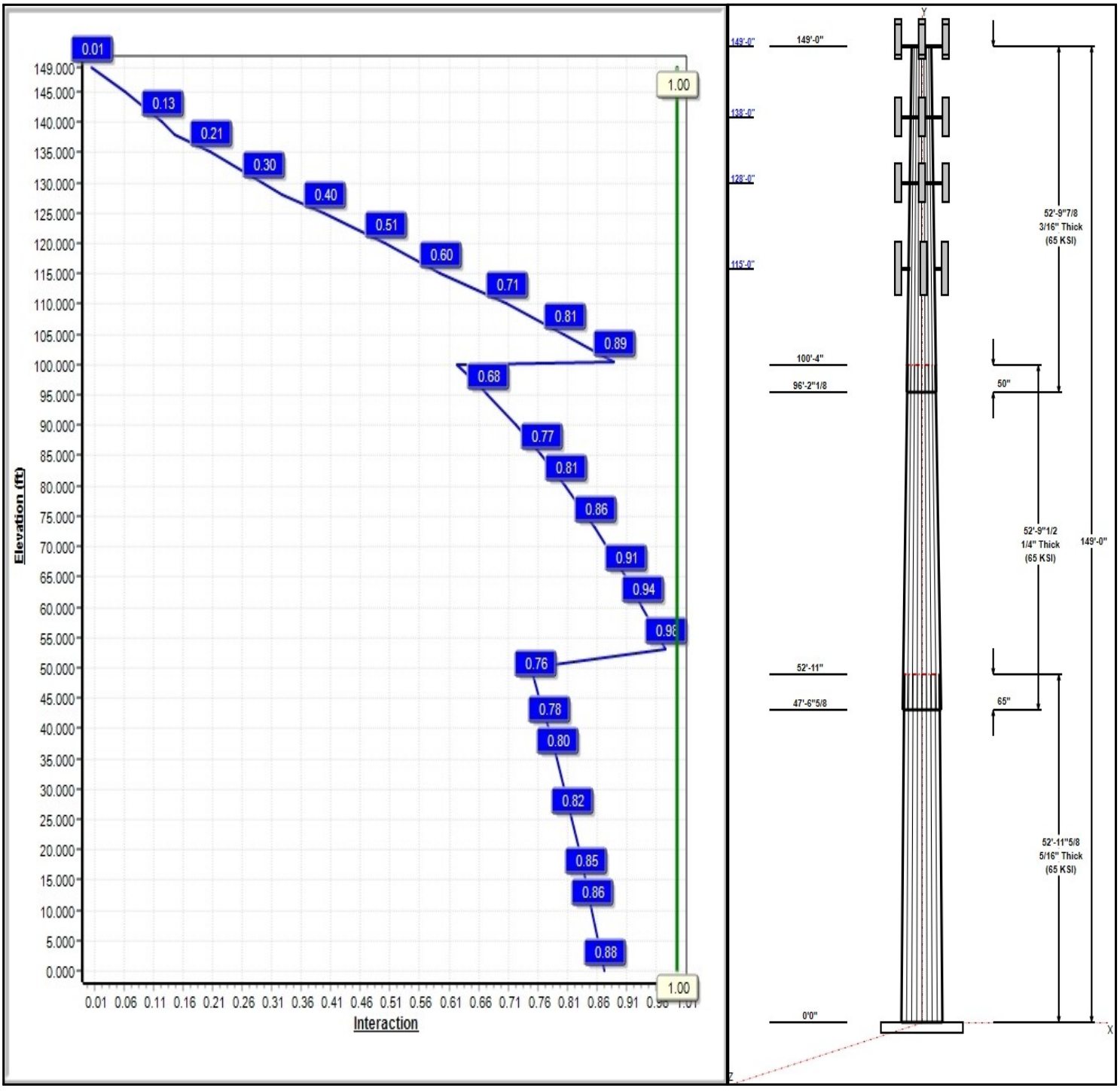
| | | | | | |
|---|---|---|---|---|---|
| **Structure:** | CT12215-A-SBA | **Code:** | EIA/TIA-222-G | 3/21/2017 | |
| **Site Name:** | Litchfield 3, CT | **Exposure:** | C | | |
| **Height:** | 149.00 (ft) | **Gh:** | 1.1 | | |
| **Base Elev:** | 0.000 (ft) | | | Page: 1 | |

Tower Engineering Solutions

| | | | |
|---|---|---|---|
| Dead Load Factor: | 1.20 | **Iterations:** | 27 |
| Wind Load Factor: | 1.60 | | |

**Load Case : 1.2D + 1.6W 89 mph Wind**





# Structure: CT12215-A-SBA

**Type:** Tapered
**Site Name:** Litchfield 3, CT
**Height:** 149.00 (ft)
**Base Elev:** 0.00 (ft)

**Base Shape:** 18 Sided
**Taper:** 0.20721

3/21/2017



Tower Engineering Solutions

## Shaft Properties

| Seq | Length (ft) | Top (in) | Bottom (in) | Thick (in) | Joint Type | Taper | Grade (ksi) |
|---|---|---|---|---|---|---|---|
| 1 | 52.97 | 37.02 | 48.00 | 0.313 | | 0.20721 | 65 |
| 2 | 52.79 | 27.71 | 38.65 | 0.250 | Slip | 0.20721 | 65 |
| 3 | 52.82 | 18.00 | 28.95 | 0.188 | Slip | 0.20721 | 65 |

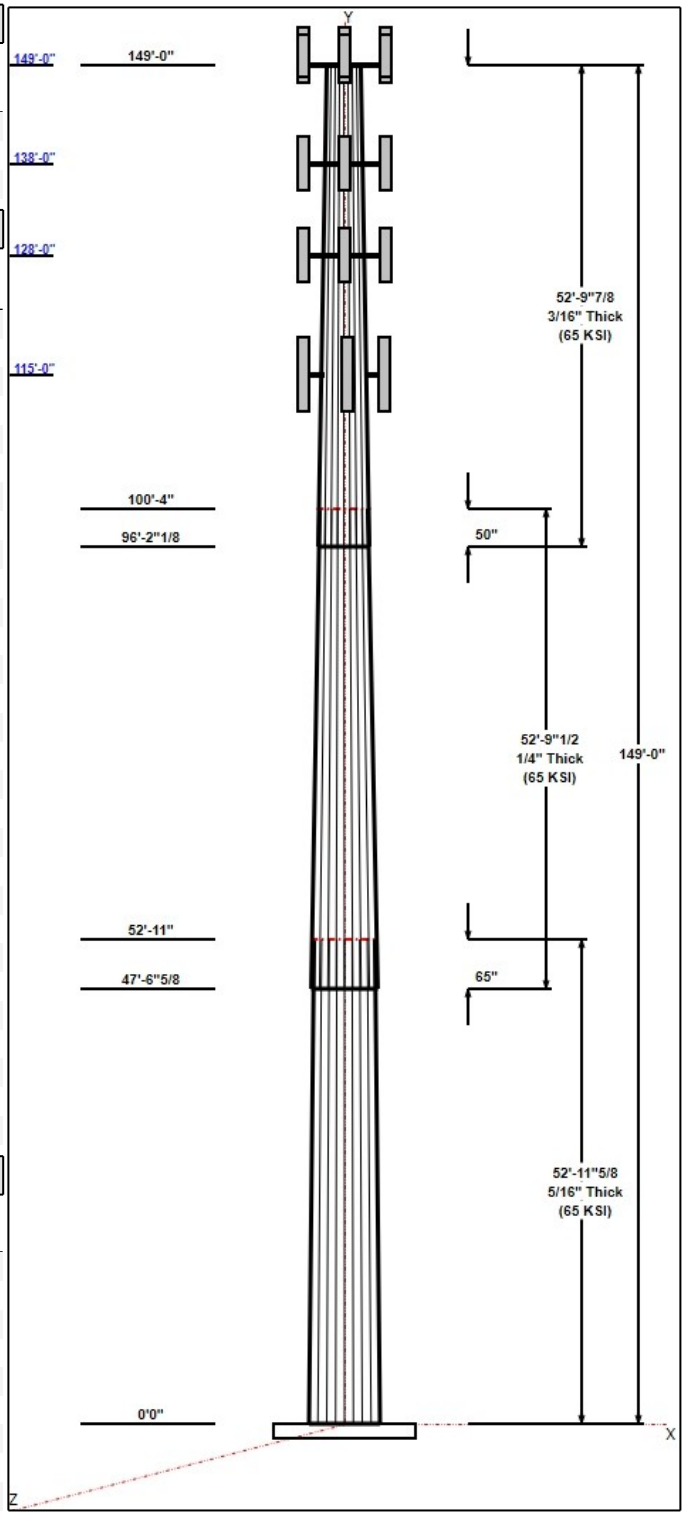
## Discrete Appurtenances

| Attach Elev (ft) | Force Elev (ft) | Qty | Description | Carrier |
|---|---|---|---|---|
| 149.00 | 150.00 | 3 | APXVSPP18-C-A20 | Sprint |
| 149.00 | 150.00 | 3 | APXVTM14-C-I20 | Sprint |
| 149.00 | 150.00 | 3 | 1900MHz | Sprint |
| 149.00 | 150.00 | 3 | 800MHZ | Sprint |
| 149.00 | 150.00 | 3 | TD-RRH8x20-25 | Sprint |
| 149.00 | 150.00 | 3 | 800MHz Filter | Sprint |
| 149.00 | 150.00 | 4 | ACU-A20-N | Sprint |
| 149.00 | 149.00 | 1 | Low Profile Platform | Sprint |
| 138.00 | 138.00 | 3 | LPA-80080/6CF | Verizon |
| 138.00 | 138.00 | 3 | BXA-70063-6CF_2 | Verizon |
| 138.00 | 138.00 | 3 | BXA-171085-12B_2 | Verizon |
| 138.00 | 138.00 | 1 | GPS Receiver | Verizon |
| 138.00 | 138.00 | 6 | FD9R6004/2C-3L | Verizon |
| 138.00 | 138.00 | 1 | Low Profile Platform | Verizon |
| 128.00 | 128.00 | 6 | 7770.00 | AT&T |
| 128.00 | 128.00 | 3 | AM-X-CD-16-65-00T-RET | AT&T |
| 128.00 | 128.00 | 12 | LGP 21401 | AT&T |
| 128.00 | 128.00 | 6 | RRUS-11 | AT&T |
| 128.00 | 128.00 | 1 | DC6-48-60-18-8F | AT&T |
| 128.00 | 128.00 | 1 | ABT-DF-DM-ADBH | AT&T |
| 128.00 | 128.00 | 1 | Low Profile Platform | AT&T |
| 115.00 | 115.00 | 3 | LNX-6515DS-A1M | T-Mobile |
| 115.00 | 115.00 | 3 | APX16DWV-16DWVS-E-A | T-Mobile |
| 115.00 | 115.00 | 3 | RRUS 11 (Band 4) | T-Mobile |
| 115.00 | 115.00 | 3 | RRUS 11 (Band 12) | T-Mobile |
| 115.00 | 115.00 | 3 | RRUS 11 | T-Mobile |
| 115.00 | 115.00 | 3 | T-Arm | T-Mobile |
| 73.00 | 73.00 | 1 | GPS Receiver | Sprint |
| 50.00 | 50.00 | 1 | 58532A | T-Mobile |

## Linear Appurtenances

| Elev From (ft) | Elev To (ft) | Placement | Description | Carrier |
|---|---|---|---|---|
| 0.00 | 149.00 | Inside | 1-1/4" Fiber | Sprint |
| 0.00 | 138.00 | Inside | 1 5/8" Coax | Verizon |
| 0.00 | 138.00 | Inside | 1/2" Coax | Verizon |
| 0.00 | 128.00 | Inside | 1 5/8" Coax | AT&T |
| 0.00 | 128.00 | Inside | 3/4" DC | AT&T |
| 0.00 | 128.00 | Inside | 7/16" Fiber | AT&T |
| 0.00 | 115.00 | Outside | 1 5/8" Hybrid | T-Mobile |
| 97.00 | 105.00 | Outside | 1.25" Reinforcing plate | |
| 50.00 | 77.00 | Outside | 1.25" Reinforcing plate | |
| 0.00 | 73.00 | Inside | 1/2" Coax | Sprint |
| 0.00 | 50.00 | Outside | 1/2" Coax | T-Mobile |

## Anchor Bolts



| Qty | Specifications | Grade (ksi) | Arrangement |
|---|---|---|---|
| 12 | 2.25" 18J | 75.0 | Radial |

## Base Plate

| Thickness (in) | Specifications (in) | Grade (ksi) | Geometry |
|---|---|---|---|
| 1.7500 | 63.0 | 60.0 | Round |

## Reactions

| Load Case | Moment (FT-Kips) | Shear (Kips) | Axial (Kips) |
|---|---|---|---|
| 1.2D + 1.6W 89 mph Wind | 2577.5 | 23.0 | 31.7 |
| 0.9D + 1.6W 89 mph Wind | 2537.7 | 23.0 | 23.8 |
| 1.2D + 1.0Di + 1.0Wi 40 mph Wind | 636.8 | 5.4 | 60.3 |
| 1.2D + 1.0E | 104.3 | 0.9 | 31.8 |
| 0.9D + 1.0E | 102.6 | 0.9 | 23.8 |
| 1.0D + 1.0W 60 mph Wind | 726.9 | 6.5 | 26.5 |

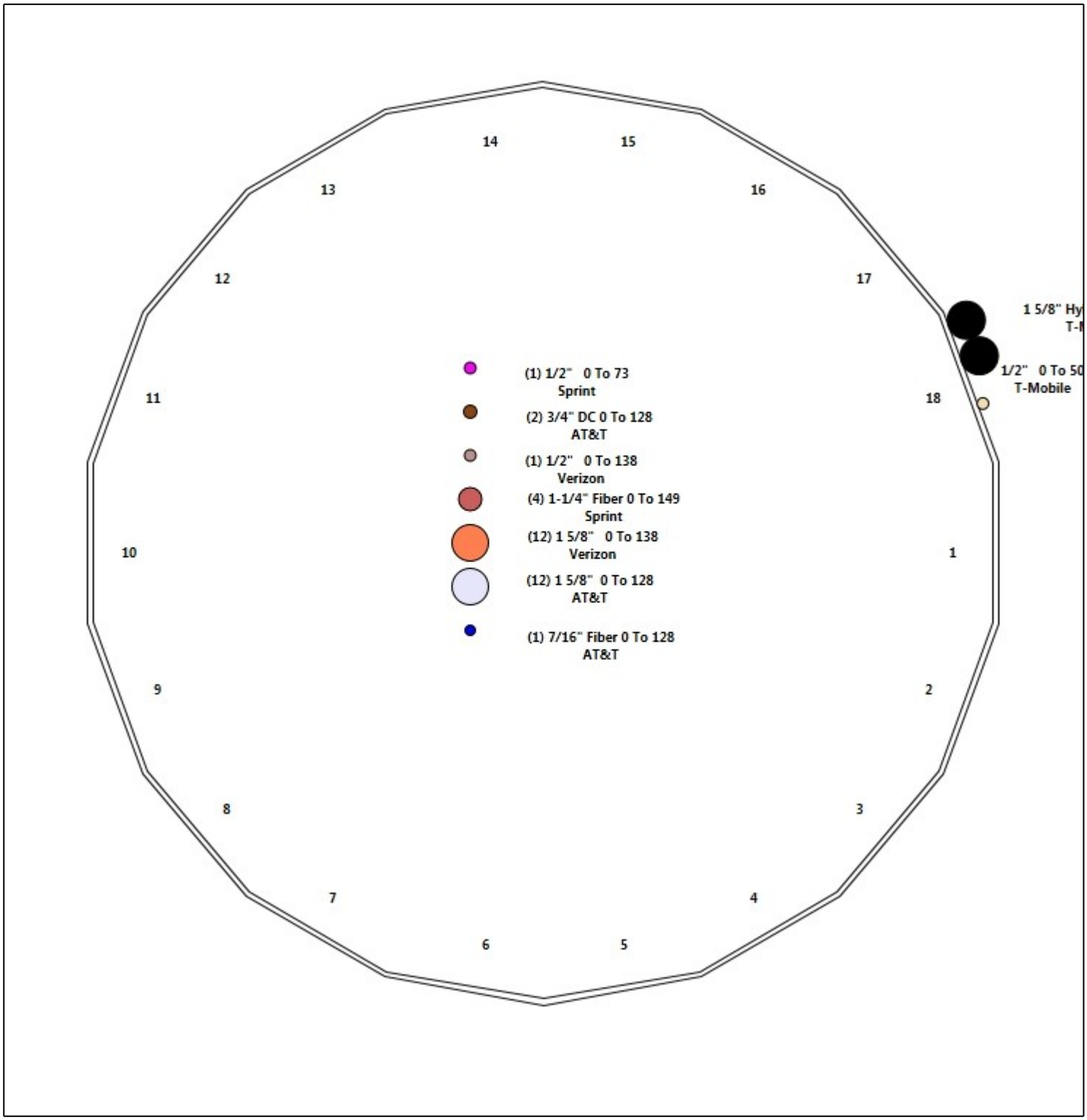
# Structure: CT12215-A-SBA - Coax Line Placement

**Type:** Monopole
**Site Name:** Litchfield 3, CT
**Height:** 149.00 (ft)

3/21/2017



Tower Engineering Solutions



# Shaft Properties

| | | | | | |
|---|---|---|---|---|---|
| **Structure:** | CT12215-A-SBA | | **Code:** | EIA/TIA-222-G | 3/21/2017 |
| **Site Name:** | Litchfield 3, CT | | **Exposure:** | C | |
| **Height:** | 149.00 (ft) | | **Crest Height:** | 0.00 | |
| **Base Elev:** | 0.000 (ft) | | **Site Class:** | B - Competent Rock | |
| **Gh:** | 1.1 | **Topography:** 1 | **Struct Class:** | II | Page: 5 |

Tower Engineering Solutions

| Sec. No. | Shape | Length (ft) | Thick (in) | Fy (ksi) | Joint Type | Overlap (in) | Weight (lb) |
|---|---|---|---|---|---|---|---|
| 1 | 18 | 52.970 | 0.3125 | 65 | | 0.00 | 7,544 |
| 2 | 18 | 52.790 | 0.2500 | 65 | Slip | 65.00 | 4,693 |
| 3 | 18 | 52.823 | 0.1875 | 65 | Slip | 50.00 | 2,491 |
| | | | | | **Total Shaft Weight:** | | **14,728** |

| | Bottom | | | | | | Top | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sec. No.** | **Dia (in)** | **Elev (ft)** | **Area (sqin)** | **Ix (in^4)** | **W/t Ratio** | **D/t Ratio** | **Dia (in)** | **Elev (ft)** | **Area (sqin)** | **Ix (in^4)** | **W/t Ratio** | **D/t Ratio** | **Taper** |
| 1 | 48.00 | 0.00 | 47.30 | 13589.64 | 25.67 | 153.60 | 37.02 | 52.97 | 36.41 | 6200.05 | 19.48 | 118.4 | 0.207215 |
| 2 | 38.65 | 47.55 | 30.47 | 5674.80 | 25.85 | 154.58 | 27.71 | 100.34 | 21.79 | 2075.21 | 18.13 | 110.8 | 0.207215 |
| 3 | 28.95 | 96.18 | 17.11 | 1788.27 | 25.81 | 154.38 | 18.00 | 149.00 | 10.60 | 424.93 | 15.52 | 96.00 | 0.207215 |

# Load Summary

| | | | | | |
|---|---|---|---|---|---|
| **Structure:** | CT12215-A-SBA | **Code:** | EIA/TIA-222-G | 3/21/2017 | |
| **Site Name:** | Litchfield 3, CT | **Exposure:** | C | | |
| **Height:** | 149.00 (ft) | **Crest Height:** | 0.00 | | |
| **Base Elev:** | 0.000 (ft) | **Site Class:** | B - Competent Rock | | |
| **Gh:** | 1.1 **Topography:** 1 | **Struct Class:** | II | Page: 6 | |

Tower Engineering Solutions

## Discrete Appurtenances

| | | | | No Ice | | | Ice | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| No. | Elev (ft) | Description | Qty | Weight (lb) | CaAa (sf) | CaAa Factor | Weight (lb) | CaAa (sf) | CaAa Factor | Hor. Ecc. (ft) | Vert Ecc (ft) |
| 1 | 149.00 | APXVSPP18-C-A20 | 3 | 57.00 | 8.02 | 0.83 | 287.31 | 11.742 | 0.83 | 0.00 | 1.00 |
| 2 | 149.00 | APXVTM14-C-I20 | 3 | 56.00 | 6.34 | 0.79 | 284.31 | 7.855 | 0.79 | 0.00 | 1.00 |
| 3 | 149.00 | 1900MHz | 3 | 60.00 | 2.77 | 0.50 | 171.17 | 4.460 | 0.50 | 0.00 | 1.00 |
| 4 | 149.00 | 800MHZ | 3 | 59.50 | 2.64 | 0.87 | 163.44 | 4.182 | 0.87 | 0.00 | 1.00 |
| 5 | 149.00 | TD-RRH8x20-25 | 3 | 70.00 | 4.05 | 0.69 | 227.60 | 5.161 | 0.69 | 0.00 | 1.00 |
| 6 | 149.00 | 800MHz Filter | 3 | 8.80 | 0.78 | 0.69 | 32.31 | 1.642 | 0.69 | 0.00 | 1.00 |
| 7 | 149.00 | ACU-A20-N | 4 | 1.00 | 0.14 | 0.79 | 6.72 | 0.535 | 0.79 | 0.00 | 1.00 |
| 8 | 149.00 | Low Profile Platform | 1 | 1200.00 | 25.00 | 1.00 | 2595.24 | 52.905 | 1.00 | 0.00 | 0.00 |
| 9 | 138.00 | LPA-80080/6CF | 3 | 21.00 | 4.33 | 1.70 | 295.20 | 5.937 | 1.70 | 0.00 | 0.00 |
| 10 | 138.00 | BXA-70063-6CF_2 | 3 | 17.00 | 7.57 | 0.73 | 263.39 | 9.275 | 0.73 | 0.00 | 0.00 |
| 11 | 138.00 | BXA-171085-12B_2 | 3 | 15.00 | 4.74 | 0.84 | 140.53 | 7.846 | 0.84 | 0.00 | 0.00 |
| 12 | 138.00 | GPS Receiver | 1 | 10.00 | 1.00 | 1.00 | 48.77 | 1.942 | 1.00 | 0.00 | 0.00 |
| 13 | 138.00 | FD9R6004/2C-3L | 6 | 3.10 | 0.36 | 0.67 | 13.71 | 0.946 | 0.67 | 0.00 | 0.00 |
| 14 | 138.00 | Low Profile Platform | 1 | 1200.00 | 25.00 | 1.00 | 2584.58 | 52.692 | 1.00 | 0.00 | 0.00 |
| 15 | 128.00 | 7770.00 | 6 | 35.00 | 5.50 | 0.73 | 225.19 | 6.927 | 0.73 | 0.00 | 0.00 |
| 16 | 128.00 | AM-X-CD-16-65-00T-RET | 3 | 48.50 | 8.02 | 0.75 | 261.47 | 11.686 | 0.75 | 0.00 | 0.00 |
| 17 | 128.00 | LGP 21401 | 12 | 17.50 | 0.00 | 0.50 | 59.70 | 1.386 | 0.50 | 0.00 | 0.00 |
| 18 | 128.00 | RRUS-11 | 6 | 51.00 | 2.52 | 0.71 | 145.85 | 3.351 | 0.71 | 0.00 | 0.00 |
| 19 | 128.00 | DC6-48-60-18-8F | 1 | 31.80 | 0.92 | 1.00 | 112.94 | 1.495 | 1.00 | 0.00 | 0.00 |
| 20 | 128.00 | ABT-DF-DM-ADBH | 1 | 1.10 | 0.05 | 1.00 | 4.03 | 0.303 | 1.00 | 0.00 | 0.00 |
| 21 | 128.00 | Low Profile Platform | 1 | 1200.00 | 25.00 | 1.00 | 2574.20 | 52.484 | 1.00 | 0.00 | 0.00 |
| 22 | 115.00 | LNX-6515DS-A1M | 3 | 49.80 | 11.47 | 0.80 | 347.84 | 15.712 | 0.80 | 0.00 | 0.00 |
| 23 | 115.00 | APX16DWV-16DWVS-E-A20 | 3 | 40.70 | 6.61 | 0.62 | 192.68 | 9.438 | 0.62 | 0.00 | 0.00 |
| 24 | 115.00 | RRUS 11 (Band 4) | 3 | 51.00 | 2.52 | 0.71 | 144.84 | 3.342 | 0.71 | 0.00 | 0.00 |
| 25 | 115.00 | RRUS 11 (Band 12) | 3 | 54.00 | 2.52 | 0.78 | 138.67 | 3.342 | 0.78 | 0.00 | 0.00 |
| 26 | 115.00 | RRUS 11 | 3 | 54.00 | 2.94 | 0.67 | 177.76 | 3.388 | 0.67 | 0.00 | 0.00 |
| 27 | 115.00 | T-Arm | 3 | 350.00 | 8.00 | 0.75 | 667.23 | 17.064 | 0.75 | 0.00 | 0.00 |
| 28 | 73.00 | GPS Receiver | 1 | 10.00 | 1.00 | 1.00 | 46.38 | 1.883 | 1.00 | 0.00 | 0.00 |
| 29 | 50.00 | 58532A | 1 | 0.40 | 0.22 | 1.00 | 9.96 | 0.662 | 1.00 | 0.00 | 0.00 |
| | | **Totals:** | **90** | **7,438.80** | | | **22,415.11** | | | | |

## Linear Appurtenances

| Bottom Elev. (ft) | Top Elev. (ft) | Description | Exposed Width | Exposed |
|---|---|---|---|---|
| 0.00 | 149.00 | (4) 1-1/4" Fiber | 0.00 | Inside |
| 0.00 | 138.00 | (12) 1 5/8" Coax | 0.00 | Inside |
| 0.00 | 138.00 | (1) 1/2" Coax | 0.00 | Inside |
| 0.00 | 128.00 | (12) 1 5/8" Coax | 0.00 | Inside |
| 0.00 | 128.00 | (2) 3/4" DC | 0.00 | Inside |
| 0.00 | 128.00 | (1) 7/16" Fiber | 0.00 | Inside |
| 0.00 | 115.00 | (2) 1 5/8" Hybrid | 2.00 | Outside |
| 97.00 | 105.00 | (3) 1.25" Reinforcing plate | 1.00 | Outside |
| 50.00 | 77.00 | (3) 1.25" Reinforcing plate | 1.00 | Outside |
| 0.00 | 73.00 | (1) 1/2" Coax | 0.00 | Inside |
| 0.00 | 50.00 | (1) 1/2" Coax | 1.00 | Outside |

## Discrete Appurtenances

| No. | Elev (ft) | Description | Qty | No Ice Weight (lb) | No Ice CaAa (sf) | No Ice CaAa Factor | Ice Weight (lb) | Ice CaAa (sf) | Ice CaAa Factor | Hor. Ecc. (ft) | Vert Ecc (ft) |
|---|---|---|---|---|---|---|---|---|---|---|---|

# Shaft Section Properties

| | | | | | |
|---|---|---|---|---|---|
| **Structure:** | CT12215-A-SBA | **Code:** | EIA/TIA-222-G | 3/21/2017 | |
| **Site Name:** | Litchfield 3, CT | **Exposure:** | C | | |
| **Height:** | 149.00 (ft) | **Crest Height:** | 0.00 | | |
| **Base Elev:** | 0.000 (ft) | **Site Class:** | B - Competent Rock | | |
| **Gh:** | 1.1 **Topography:** 1 | **Struct Class:** | II | Page: 8 | |

Tower Engineering Solutions

**Increment Length: 5 (ft)**

| Elev (ft) | Description | Thick (in) | Dia (in) | Area (in^2) | Ix (in^4) | W/t Ratio | D/t Ratio | Fpy (ksi) | S (in^3) | Weight (lb) |
|---|---|---|---|---|---|---|---|---|---|---|
| 0.00 | | 0.3125 | 48.000 | 47.298 | 13589.6 | 25.67 | 153.60 | 71.2 | 557.6 | 0.0 |
| 5.00 | | 0.3125 | 46.964 | 46.271 | 12723.0 | 25.09 | 150.28 | 71.9 | 533.6 | 796.0 |
| 10.00 | | 0.3125 | 45.928 | 45.243 | 11894.0 | 24.50 | 146.97 | 72.6 | 510.1 | 778.5 |
| 15.00 | | 0.3125 | 44.892 | 44.215 | 11101.8 | 23.92 | 143.65 | 73.3 | 487.1 | 761.0 |
| 20.00 | | 0.3125 | 43.856 | 43.188 | 10345.6 | 23.33 | 140.34 | 74.0 | 464.6 | 743.5 |
| 25.00 | | 0.3125 | 42.820 | 42.160 | 9624.5 | 22.75 | 137.02 | 74.6 | 442.7 | 726.1 |
| 30.00 | | 0.3125 | 41.784 | 41.133 | 8937.8 | 22.17 | 133.71 | 75.3 | 421.3 | 708.6 |
| 35.00 | | 0.3125 | 40.747 | 40.105 | 8284.5 | 21.58 | 130.39 | 76.0 | 400.4 | 691.1 |
| 40.00 | | 0.3125 | 39.711 | 39.077 | 7663.8 | 21.00 | 127.08 | 76.7 | 380.1 | 673.6 |
| 45.00 | | 0.3125 | 38.675 | 38.050 | 7075.0 | 20.41 | 123.76 | 77.4 | 360.3 | 656.1 |
| 47.55 | Bot - Section 2 | 0.3125 | 38.146 | 37.525 | 6786.3 | 20.11 | 122.07 | 77.7 | 350.4 | 328.3 |
| 50.00 | | 0.3125 | 37.639 | 37.022 | 6517.1 | 19.83 | 120.45 | 78.1 | 341.0 | 562.3 |
| 52.97 | Top - Section 1 | 0.2500 | 37.524 | 29.576 | 5191.5 | 25.06 | 150.10 | 0.0 | 0.0 | 672.4 |
| 55.00 | | 0.2500 | 37.103 | 29.242 | 5017.8 | 24.76 | 148.41 | 72.3 | 266.4 | 203.1 |
| 60.00 | | 0.2500 | 36.067 | 28.420 | 4606.3 | 24.03 | 144.27 | 73.1 | 251.6 | 490.5 |
| 65.00 | | 0.2500 | 35.031 | 27.598 | 4218.1 | 23.30 | 140.12 | 74.0 | 237.2 | 476.5 |
| 70.00 | | 0.2500 | 33.995 | 26.776 | 3852.2 | 22.57 | 135.98 | 74.9 | 223.2 | 462.6 |
| 73.00 | | 0.2500 | 33.373 | 26.282 | 3643.2 | 22.13 | 133.49 | 75.4 | 215.0 | 270.8 |
| 75.00 | | 0.2500 | 32.959 | 25.954 | 3508.2 | 21.84 | 131.84 | 75.7 | 209.6 | 177.7 |
| 80.00 | | 0.2500 | 31.923 | 25.131 | 3185.3 | 21.10 | 127.69 | 76.6 | 196.5 | 434.6 |
| 85.00 | | 0.2500 | 30.887 | 24.309 | 2882.8 | 20.37 | 123.55 | 77.4 | 183.8 | 420.6 |
| 90.00 | | 0.2500 | 29.851 | 23.487 | 2600.1 | 19.64 | 119.40 | 78.3 | 171.6 | 406.6 |
| 95.00 | | 0.2500 | 28.815 | 22.665 | 2336.5 | 18.91 | 115.26 | 79.2 | 159.7 | 392.6 |
| 96.18 | Bot - Section 3 | 0.2500 | 28.571 | 22.472 | 2277.2 | 18.74 | 114.28 | 79.4 | 157.0 | 90.4 |
| 100.00 | | 0.2500 | 27.779 | 21.843 | 2091.4 | 18.18 | 111.11 | 80.0 | 148.3 | 507.9 |
| 100.34 | Top - Section 2 | 0.1875 | 28.082 | 16.600 | 1632.0 | 25.00 | 149.77 | 0.0 | 0.0 | 44.9 |
| 105.00 | | 0.1875 | 27.117 | 16.026 | 1468.4 | 24.09 | 144.63 | 73.1 | 106.7 | 258.5 |
| 110.00 | | 0.1875 | 26.081 | 15.410 | 1305.4 | 23.12 | 139.10 | 74.2 | 98.6 | 267.4 |
| 115.00 | | 0.1875 | 25.045 | 14.793 | 1154.9 | 22.14 | 133.57 | 75.4 | 90.8 | 256.9 |
| 120.00 | | 0.1875 | 24.009 | 14.176 | 1016.4 | 21.17 | 128.05 | 76.5 | 83.4 | 246.4 |
| 125.00 | | 0.1875 | 22.973 | 13.560 | 889.5 | 20.19 | 122.52 | 77.6 | 76.3 | 236.0 |
| 128.00 | | 0.1875 | 22.352 | 13.190 | 818.6 | 19.61 | 119.21 | 78.3 | 72.1 | 136.5 |
| 130.00 | | 0.1875 | 21.937 | 12.943 | 773.6 | 19.22 | 117.00 | 78.8 | 69.5 | 88.9 |
| 135.00 | | 0.1875 | 20.901 | 12.327 | 668.2 | 18.24 | 111.47 | 79.9 | 63.0 | 215.0 |
| 138.00 | | 0.1875 | 20.279 | 11.957 | 609.8 | 17.66 | 108.16 | 80.6 | 59.2 | 123.9 |
| 140.00 | | 0.1875 | 19.865 | 11.710 | 572.9 | 17.27 | 105.95 | 81.1 | 56.8 | 80.5 |
| 145.00 | | 0.1875 | 18.829 | 11.094 | 487.1 | 16.30 | 100.42 | 82.2 | 50.9 | 194.0 |
| 149.00 | | 0.1875 | 18.000 | 10.600 | 424.9 | 15.52 | 96.00 | 82.5 | 46.5 | 147.6 |
| | | | | | | | | | | **14728.1** |

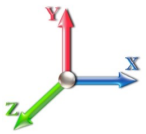
# Wind Loading - Shaft

| | | | | | |
|---|---|---|---|---|---|
| **Structure:** | CT12215-A-SBA | **Code:** | EIA/TIA-222-G | 3/21/2017 | |
| **Site Name:** | Litchfield 3, CT | **Exposure:** | C | | |
| **Height:** | 149.00 (ft) | **Crest Height:** | 0.00 | | |
| **Base Elev:** | 0.000 (ft) | **Site Class:** | B - Competent Rock | | |
| **Gh:** | 1.1 **Topography:** 1 | **Struct Class:** | II | Page: 9 | |

**Load Case:** 1.2D + 1.6W 89 mph Wind

**Dead Load Factor** 1.20

**Wind Load Factor** 1.60




**Iterations** 27

| Elev (ft) | Description | Kzt | Kz | qz (psf) | qzGh (psf) | C (mph-ft) | Cf | Ice Thick (in) | Tributary (ft) | Aa (sf) | CfAa (sf) | Wind Force X (lb) | Dead Load Ice (lb) | Tot Dead Load (lb) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.00 | | 1.00 | 0.85 | 16.374 | 18.01 | 333.28 | 0.650 | 0.000 | 0.00 | 0.000 | 0.00 | 0.0 | 0.0 | 0.0 |
| 5.00 | | 1.00 | 0.85 | 16.374 | 18.01 | 326.09 | 0.650 | 0.000 | 5.00 | 20.089 | 13.06 | 376.3 | 0.0 | 955.2 |
| 10.00 | | 1.00 | 0.85 | 16.374 | 18.01 | 318.89 | 0.650 | 0.000 | 5.00 | 19.651 | 12.77 | 368.1 | 0.0 | 934.2 |
| 15.00 | | 1.00 | 0.85 | 16.374 | 18.01 | 311.70 | 0.650 | 0.000 | 5.00 | 19.213 | 12.49 | 359.9 | 0.0 | 913.2 |
| 20.00 | | 1.00 | 0.90 | 17.374 | 19.11 | 313.66 | 0.650 | 0.000 | 5.00 | 18.774 | 12.20 | 373.2 | 0.0 | 892.2 |
| 25.00 | | 1.00 | 0.95 | 18.209 | 20.03 | 313.53 | 0.650 | 0.000 | 5.00 | 18.336 | 11.92 | 382.0 | 0.0 | 871.3 |
| 30.00 | | 1.00 | 0.98 | 18.922 | 20.81 | 311.87 | 0.650 | 0.000 | 5.00 | 17.898 | 11.63 | 387.4 | 0.0 | 850.3 |
| 35.00 | | 1.00 | 1.01 | 19.546 | 21.50 | 309.11 | 0.650 | 0.000 | 5.00 | 17.459 | 11.35 | 390.4 | 0.0 | 829.3 |
| 40.00 | | 1.00 | 1.04 | 20.103 | 22.11 | 305.52 | 0.650 | 0.000 | 5.00 | 17.021 | 11.06 | 391.5 | 0.0 | 808.3 |
| 45.00 | | 1.00 | 1.07 | 20.608 | 22.67 | 301.26 | 0.650 | 0.000 | 5.00 | 16.582 | 10.78 | 390.9 | 0.0 | 787.3 |
| 47.55 | Bot - Section 2 | 1.00 | 1.08 | 20.849 | 22.93 | 298.87 | 0.650 | 0.000 | 2.55 | 8.299 | 5.39 | 197.9 | 0.0 | 394.0 |
| 50.00 | Appurtenance(s) | 1.00 | 1.09 | 21.070 | 23.18 | 296.46 | 0.650 | 0.000 | 2.45 | 7.949 | 5.17 | 191.6 | 0.0 | 674.7 |
| 52.97 | Top - Section 1 | 1.00 | 1.11 | 21.328 | 23.46 | 293.39 | 0.650 | 0.000 | 2.97 | 9.508 | 6.18 | 232.0 | 0.0 | 806.9 |
| 55.00 | | 1.00 | 1.12 | 21.497 | 23.65 | 295.18 | 0.650 | 0.000 | 2.03 | 6.410 | 4.17 | 157.6 | 0.0 | 243.8 |
| 60.00 | | 1.00 | 1.14 | 21.895 | 24.08 | 289.58 | 0.650 | 0.000 | 5.00 | 15.479 | 10.06 | 387.7 | 0.0 | 588.6 |
| 65.00 | | 1.00 | 1.16 | 22.267 | 24.49 | 283.64 | 0.650 | 0.000 | 5.00 | 15.041 | 9.78 | 383.1 | 0.0 | 571.8 |
| 70.00 | | 1.00 | 1.17 | 22.617 | 24.88 | 277.41 | 0.650 | 0.000 | 5.00 | 14.602 | 9.49 | 377.8 | 0.0 | 555.1 |
| 73.00 | Appurtenance(s) | 1.00 | 1.18 | 22.818 | 25.10 | 273.54 | 0.650 | 0.000 | 3.00 | 8.551 | 5.56 | 223.2 | 0.0 | 325.0 |
| 75.00 | | 1.00 | 1.19 | 22.948 | 25.24 | 270.91 | 0.650 | 0.000 | 2.00 | 5.613 | 3.65 | 147.4 | 0.0 | 213.3 |
| 80.00 | | 1.00 | 1.21 | 23.262 | 25.59 | 264.19 | 0.650 | 0.000 | 5.00 | 13.726 | 8.92 | 365.3 | 0.0 | 521.5 |
| 85.00 | | 1.00 | 1.22 | 23.561 | 25.92 | 257.25 | 0.650 | 0.000 | 5.00 | 13.287 | 8.64 | 358.1 | 0.0 | 504.7 |
| 90.00 | | 1.00 | 1.24 | 23.846 | 26.23 | 250.12 | 0.650 | 0.000 | 5.00 | 12.849 | 8.35 | 350.5 | 0.0 | 487.9 |
| 95.00 | | 1.00 | 1.25 | 24.119 | 26.53 | 242.82 | 0.650 | 0.000 | 5.00 | 12.410 | 8.07 | 342.4 | 0.0 | 471.1 |
| 96.18 | Bot - Section 3 | 1.00 | 1.26 | 24.181 | 26.60 | 241.07 | 0.650 | 0.000 | 1.18 | 2.857 | 1.86 | 79.0 | 0.0 | 108.4 |
| 100.00 | | 1.00 | 1.27 | 24.381 | 26.82 | 235.35 | 0.658 * | 0.000 | 3.82 | 9.237 | 6.08 | 260.9 | 0.0 | 609.4 |
| 100.34 | Top - Section 2 | 1.00 | 1.27 | 24.398 | 26.84 | 234.83 | 0.680 * | 0.000 | 0.34 | 0.817 | 0.56 | 23.9 | 0.0 | 53.9 |
| 105.00 | | 1.00 | 1.28 | 24.632 | 27.10 | 230.93 | 0.681 * | 0.000 | 4.66 | 10.876 | 7.41 | 321.1 | 0.0 | 310.2 |
| 110.00 | | 1.00 | 1.29 | 24.875 | 27.36 | 223.20 | 0.650 | 0.000 | 5.00 | 11.254 | 7.32 | 320.3 | 0.0 | 320.9 |
| 115.00 | Appurtenance(s) | 1.00 | 1.30 | 25.109 | 27.62 | 215.34 | 0.650 | 0.000 | 5.00 | 10.816 | 7.03 | 310.7 | 0.0 | 308.3 |
| 120.00 | | 1.00 | 1.32 | 25.335 | 27.87 | 207.36 | 0.650 | 0.000 | 5.00 | 10.377 | 6.75 | 300.8 | 0.0 | 295.7 |
| 125.00 | | 1.00 | 1.33 | 25.553 | 28.11 | 199.26 | 0.650 | 0.000 | 5.00 | 9.939 | 6.46 | 290.5 | 0.0 | 283.1 |
| 128.00 | Appurtenance(s) | 1.00 | 1.33 | 25.681 | 28.25 | 194.36 | 0.650 | 0.000 | 3.00 | 5.753 | 3.74 | 169.0 | 0.0 | 163.8 |
| 130.00 | | 1.00 | 1.34 | 25.765 | 28.34 | 191.07 | 0.650 | 0.000 | 2.00 | 3.748 | 2.44 | 110.5 | 0.0 | 106.7 |
| 135.00 | | 1.00 | 1.35 | 25.971 | 28.57 | 182.77 | 0.650 | 0.000 | 5.00 | 9.062 | 5.89 | 269.2 | 0.0 | 258.0 |
| 138.00 | Appurtenance(s) | 1.00 | 1.35 | 26.091 | 28.70 | 177.74 | 0.650 | 0.000 | 3.00 | 5.227 | 3.40 | 156.0 | 0.0 | 148.7 |
| 140.00 | | 1.00 | 1.36 | 26.170 | 28.79 | 174.37 | 0.650 | 0.000 | 2.00 | 3.397 | 2.21 | 101.7 | 0.0 | 96.6 |
| 145.00 | | 1.00 | 1.37 | 26.364 | 29.00 | 165.89 | 0.650 | 0.000 | 5.00 | 8.186 | 5.32 | 246.9 | 0.0 | 232.8 |
| 149.00 | Appurtenance(s) | 1.00 | 1.38 | 26.516 | 29.17 | 159.04 | 0.650 | 0.000 | 4.00 | 6.233 | 4.05 | 189.1 | 0.0 | 177.2 |
| | | | | | | | | **Totals:** | **149.00** | | | **10,283.9** | | **17,673.7** |

* Cf Adjusted by Linear Load Ra Effect

# Discrete Appurtenance Forces

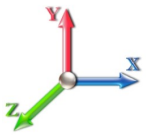
| | | | | | |
|---|---|---|---|---|---|
| **Structure:** | CT12215-A-SBA | **Code:** | EIA/TIA-222-G | 3/21/2017 | |
| **Site Name:** | Litchfield 3, CT | **Exposure:** | C | | |
| **Height:** | 149.00 (ft) | **Crest Height:** | 0.00 | | |
| **Base Elev:** | 0.000 (ft) | **Site Class:** | B - Competent Rock | | |
| **Gh:** | 1.1 **Topography:** 1 | **Struct Class:** | II | Page: 10 | |

Tower Engineering Solutions

**Load Case:** 1.2D + 1.6W 89 mph Wind

**Dead Load Factor** 1.20

**Wind Load Factor** 1.60




**Iterations** 27

| No. | Elev (ft) | Description | Qty | qz (psf) | qzGh (psf) | CaAa x Ka | Ka | Total CaAa (sf) | Dead Load (lb) | Horiz Ecc (ft) | Vert Ecc (ft) | Wind FX (lb) | Mom Y (lb-ft) | Mom Z (lb-ft) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 149.00 | 800MHZ | 3 | 26.553 | 29.209 | 0.87 | 1.00 | 6.89 | 214.20 | 0.000 | 1.000 | 322.01 | 0.00 | 322.01 |
| 2 | 149.00 | APXVSPP18-C-A20 | 3 | 26.553 | 29.209 | 0.83 | 1.00 | 19.97 | 205.20 | 0.000 | 1.000 | 933.26 | 0.00 | 933.26 |
| 3 | 149.00 | APXVTM14-C-I20 | 3 | 26.553 | 29.209 | 0.79 | 1.00 | 15.03 | 201.60 | 0.000 | 1.000 | 702.21 | 0.00 | 702.21 |
| 4 | 149.00 | 1900MHz | 3 | 26.553 | 29.209 | 0.50 | 1.00 | 4.16 | 216.00 | 0.000 | 1.000 | 194.18 | 0.00 | 194.18 |
| 5 | 149.00 | Low Profile Platform | 1 | 26.516 | 29.168 | 1.00 | 1.00 | 25.00 | 1440.00 | 0.000 | 0.000 | 1166.70 | 0.00 | 0.00 |
| 6 | 149.00 | TD-RRH8x20-25 | 3 | 26.553 | 29.209 | 0.69 | 1.00 | 8.38 | 252.00 | 0.000 | 1.000 | 391.79 | 0.00 | 391.79 |
| 7 | 149.00 | 800MHz Filter | 3 | 26.553 | 29.209 | 0.69 | 1.00 | 1.61 | 31.68 | 0.000 | 1.000 | 75.46 | 0.00 | 75.46 |
| 8 | 149.00 | ACU-A20-N | 4 | 26.553 | 29.209 | 0.79 | 1.00 | 0.44 | 4.80 | 0.000 | 1.000 | 20.68 | 0.00 | 20.68 |
| 9 | 138.00 | Low Profile Platform | 1 | 26.091 | 28.700 | 1.00 | 1.00 | 25.00 | 1440.00 | 0.000 | 0.000 | 1148.01 | 0.00 | 0.00 |
| 10 | 138.00 | FD9R6004/2C-3L | 6 | 26.091 | 28.700 | 0.54 | 0.80 | 1.16 | 22.32 | 0.000 | 0.000 | 53.17 | 0.00 | 0.00 |
| 11 | 138.00 | GPS Receiver | 1 | 26.091 | 28.700 | 1.00 | 1.00 | 1.00 | 12.00 | 0.000 | 0.000 | 45.92 | 0.00 | 0.00 |
| 12 | 138.00 | BXA-171085-12B_2 | 3 | 26.091 | 28.700 | 0.67 | 0.80 | 9.56 | 54.00 | 0.000 | 0.000 | 438.81 | 0.00 | 0.00 |
| 13 | 138.00 | BXA-70063-6CF_2 | 3 | 26.091 | 28.700 | 0.58 | 0.80 | 13.26 | 61.20 | 0.000 | 0.000 | 609.03 | 0.00 | 0.00 |
| 14 | 138.00 | LPA-80080/6CF | 3 | 26.091 | 28.700 | 1.36 | 0.80 | 17.67 | 75.60 | 0.000 | 0.000 | 811.25 | 0.00 | 0.00 |
| 15 | 128.00 | Low Profile Platform | 1 | 25.681 | 28.249 | 1.00 | 1.00 | 25.00 | 1440.00 | 0.000 | 0.000 | 1129.98 | 0.00 | 0.00 |
| 16 | 128.00 | DC6-48-60-18-8F | 1 | 25.681 | 28.249 | 1.00 | 1.00 | 0.92 | 38.16 | 0.000 | 0.000 | 41.58 | 0.00 | 0.00 |
| 17 | 128.00 | RRUS-11 | 6 | 25.681 | 28.249 | 0.57 | 0.80 | 8.59 | 367.20 | 0.000 | 0.000 | 388.18 | 0.00 | 0.00 |
| 18 | 128.00 | LGP 21401 | 12 | 25.681 | 28.249 | 0.40 | 0.80 | 0.00 | 252.00 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 |
| 19 | 128.00 | AM-X-CD-16-65-00T-RET | 3 | 25.681 | 28.249 | 0.60 | 0.80 | 14.44 | 174.60 | 0.000 | 0.000 | 652.49 | 0.00 | 0.00 |
| 20 | 128.00 | 7770.00 | 6 | 25.681 | 28.249 | 0.58 | 0.80 | 19.27 | 252.00 | 0.000 | 0.000 | 871.08 | 0.00 | 0.00 |
| 21 | 128.00 | ABT-DF-DM-ADBH | 1 | 25.681 | 28.249 | 1.00 | 1.00 | 0.05 | 1.32 | 0.000 | 0.000 | 2.26 | 0.00 | 0.00 |
| 22 | 115.00 | RRUS 11 (Band 4) | 3 | 25.109 | 27.620 | 0.57 | 0.80 | 4.29 | 183.60 | 0.000 | 0.000 | 189.76 | 0.00 | 0.00 |
| 23 | 115.00 | LNX-6515DS-A1M | 3 | 25.109 | 27.620 | 0.64 | 0.80 | 22.02 | 179.28 | 0.000 | 0.000 | 973.20 | 0.00 | 0.00 |
| 24 | 115.00 | APX16DWV-16DWVS-E- | 3 | 25.109 | 27.620 | 0.50 | 0.80 | 9.84 | 146.52 | 0.000 | 0.000 | 434.65 | 0.00 | 0.00 |
| 25 | 115.00 | T-Arm | 3 | 25.109 | 27.620 | 0.56 | 0.75 | 13.50 | 1260.00 | 0.000 | 0.000 | 596.58 | 0.00 | 0.00 |
| 26 | 115.00 | RRUS 11 (Band 12) | 3 | 25.109 | 27.620 | 0.62 | 0.80 | 4.72 | 194.40 | 0.000 | 0.000 | 208.47 | 0.00 | 0.00 |
| 27 | 115.00 | RRUS 11 | 3 | 25.109 | 27.620 | 0.54 | 0.80 | 4.73 | 194.40 | 0.000 | 0.000 | 208.92 | 0.00 | 0.00 |
| 28 | 73.00 | GPS Receiver | 1 | 22.818 | 25.099 | 1.00 | 1.00 | 1.00 | 12.00 | 0.000 | 0.000 | 40.16 | 0.00 | 0.00 |
| 29 | 50.00 | 58532A | 1 | 21.070 | 23.177 | 1.00 | 1.00 | 0.22 | 0.48 | 0.000 | 0.000 | 8.16 | 0.00 | 0.00 |
| | | | | | | | **Totals:** | | **8,926.56** | | | **12,657.95** | | |

# Total Applied Force Summary

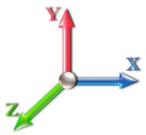
| | | | | | |
|---|---|---|---|---|---|
| **Structure:** | CT12215-A-SBA | | **Code:** | EIA/TIA-222-G | 3/21/2017 |
| **Site Name:** | Litchfield 3, CT | | **Exposure:** | C | |
| **Height:** | 149.00 (ft) | | **Crest Height:** | 0.00 | |
| **Base Elev:** | 0.000 (ft) | | **Site Class:** | B - Competent Rock | |
| **Gh:** | 1.1 | **Topography:** 1 | **Struct Class:** | II | Page: 11 |

Tower Engineering Solutions

**Load Case:** 1.2D + 1.6W 89 mph Wind

**Dead Load Factor** 1.20

**Wind Load Factor** 1.60




**Iterations** 27

| Elev (ft) | Description | Lateral FX (-) (lb) | Axial FY (-) (lb) | Torsion MY (lb-ft) | Moment MZ (lb-ft) |
|---|---|---|---|---|---|
| 0.00 | | 0.00 | 0.00 | 0.00 | 0.00 |
| 5.00 | | 376.32 | 1150.28 | 0.00 | 0.00 |
| 10.00 | | 368.11 | 1129.30 | 0.00 | 0.00 |
| 15.00 | | 359.89 | 1108.32 | 0.00 | 0.00 |
| 20.00 | | 373.15 | 1087.34 | 0.00 | 0.00 |
| 25.00 | | 381.97 | 1066.36 | 0.00 | 0.00 |
| 30.00 | | 387.42 | 1045.38 | 0.00 | 0.00 |
| 35.00 | | 390.40 | 1024.40 | 0.00 | 0.00 |
| 40.00 | | 391.45 | 1003.42 | 0.00 | 0.00 |
| 45.00 | | 390.94 | 982.44 | 0.00 | 0.00 |
| 47.55 | | 197.94 | 493.60 | 0.00 | 0.00 |
| 50.00 | (1) attachments | 199.76 | 770.70 | 0.00 | 0.00 |
| 52.97 | | 231.98 | 922.24 | 0.00 | 0.00 |
| 55.00 | | 157.63 | 322.59 | 0.00 | 0.00 |
| 60.00 | | 387.71 | 782.77 | 0.00 | 0.00 |
| 65.00 | | 383.13 | 765.98 | 0.00 | 0.00 |
| 70.00 | | 377.82 | 749.20 | 0.00 | 0.00 |
| 73.00 | (1) attachments | 263.37 | 453.46 | 0.00 | 0.00 |
| 75.00 | | 147.35 | 290.57 | 0.00 | 0.00 |
| 80.00 | | 365.26 | 714.67 | 0.00 | 0.00 |
| 85.00 | | 358.13 | 697.88 | 0.00 | 0.00 |
| 90.00 | | 350.51 | 681.10 | 0.00 | 0.00 |
| 95.00 | | 342.43 | 664.32 | 0.00 | 0.00 |
| 96.18 | | 79.03 | 153.90 | 0.00 | 0.00 |
| 100.00 | | 260.86 | 757.14 | 0.00 | 0.00 |
| 100.34 | | 23.85 | 67.15 | 0.00 | 0.00 |
| 105.00 | | 321.15 | 490.10 | 0.00 | 0.00 |
| 110.00 | | 320.26 | 514.08 | 0.00 | 0.00 |
| 115.00 | (18) attachments | 2922.26 | 2659.69 | 0.00 | 0.00 |
| 120.00 | | 300.77 | 475.70 | 0.00 | 0.00 |
| 125.00 | | 290.55 | 463.12 | 0.00 | 0.00 |
| 128.00 | (30) attachments | 3254.59 | 2797.11 | 0.00 | 0.00 |
| 130.00 | | 110.46 | 146.20 | 0.00 | 0.00 |
| 135.00 | | 269.25 | 356.70 | 0.00 | 0.00 |
| 138.00 | (17) attachments | 3262.21 | 1873.10 | 0.00 | 0.00 |
| 140.00 | | 101.70 | 105.80 | 0.00 | 0.00 |
| 145.00 | | 246.88 | 255.68 | 0.00 | 0.00 |
| 149.00 | (23) attachments | 3995.36 | 2760.96 | 0.00 | 2639.59 |
| | **Totals:** | **22,941.85** | **31,782.75** | **0.00** | **2,639.59** |

# Linear Appurtenance Segment Forces (Factored)

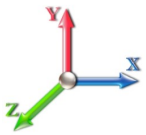
| | | | | | |
|---|---|---|---|---|---|
| **Structure:** | CT12215-A-SBA | **Code:** | EIA/TIA-222-G | 3/21/2017 | |
| **Site Name:** | Litchfield 3, CT | **Exposure:** | C | | |
| **Height:** | 149.00 (ft) | **Crest Height:** | 0.00 | | |
| **Base Elev:** | 0.000 (ft) | **Site Class:** | B - Competent Rock | | |
| **Gh:** | 1.1 **Topography:** 1 | **Struct Class:** | II | Page: 12 | |

Tower Engineering Solutions

**Load Case:** 1.2D + 1.6W 89 mph Wind

**Dead Load Factor** 1.20

**Wind Load Factor** 1.60




**Iterations** 27

| Top Elev (ft) | Description | Wind Exposed | Length (ft) | Ca | Exposed Width (in) | Area (sqft) | CaAa (sqft) | Ra | Cf Adjust Factor | qz (psf) | F X (lb) | Dead Load (lb) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5.00 | 1 5/8" Hybrid | Yes | 5.00 | 0.000 | 2.00 | 0.83 | 0.00 | 0.055 | 0.000 | 16.374 | 0.00 | 13.20 |
| 5.00 | 1/2" Coax | Yes | 5.00 | 0.000 | 0.65 | 0.27 | 0.00 | 0.055 | 0.000 | 16.374 | 0.00 | 0.96 |
| 10.00 | 1 5/8" Hybrid | Yes | 5.00 | 0.000 | 2.00 | 0.83 | 0.00 | 0.056 | 0.000 | 16.374 | 0.00 | 13.20 |
| 10.00 | 1/2" Coax | Yes | 5.00 | 0.000 | 0.65 | 0.27 | 0.00 | 0.056 | 0.000 | 16.374 | 0.00 | 0.96 |
| 15.00 | 1 5/8" Hybrid | Yes | 5.00 | 0.000 | 2.00 | 0.83 | 0.00 | 0.057 | 0.000 | 16.374 | 0.00 | 13.20 |
| 15.00 | 1/2" Coax | Yes | 5.00 | 0.000 | 0.65 | 0.27 | 0.00 | 0.057 | 0.000 | 16.374 | 0.00 | 0.96 |
| 20.00 | 1 5/8" Hybrid | Yes | 5.00 | 0.000 | 2.00 | 0.83 | 0.00 | 0.059 | 0.000 | 17.374 | 0.00 | 13.20 |
| 20.00 | 1/2" Coax | Yes | 5.00 | 0.000 | 0.65 | 0.27 | 0.00 | 0.059 | 0.000 | 17.374 | 0.00 | 0.96 |
| 25.00 | 1 5/8" Hybrid | Yes | 5.00 | 0.000 | 2.00 | 0.83 | 0.00 | 0.060 | 0.000 | 18.209 | 0.00 | 13.20 |
| 25.00 | 1/2" Coax | Yes | 5.00 | 0.000 | 0.65 | 0.27 | 0.00 | 0.060 | 0.000 | 18.209 | 0.00 | 0.96 |
| 30.00 | 1 5/8" Hybrid | Yes | 5.00 | 0.000 | 2.00 | 0.83 | 0.00 | 0.062 | 0.000 | 18.922 | 0.00 | 13.20 |
| 30.00 | 1/2" Coax | Yes | 5.00 | 0.000 | 0.65 | 0.27 | 0.00 | 0.062 | 0.000 | 18.922 | 0.00 | 0.96 |
| 35.00 | 1 5/8" Hybrid | Yes | 5.00 | 0.000 | 2.00 | 0.83 | 0.00 | 0.063 | 0.000 | 19.546 | 0.00 | 13.20 |
| 35.00 | 1/2" Coax | Yes | 5.00 | 0.000 | 0.65 | 0.27 | 0.00 | 0.063 | 0.000 | 19.546 | 0.00 | 0.96 |
| 40.00 | 1 5/8" Hybrid | Yes | 5.00 | 0.000 | 2.00 | 0.83 | 0.00 | 0.065 | 0.000 | 20.103 | 0.00 | 13.20 |
| 40.00 | 1/2" Coax | Yes | 5.00 | 0.000 | 0.65 | 0.27 | 0.00 | 0.065 | 0.000 | 20.103 | 0.00 | 0.96 |
| 45.00 | 1 5/8" Hybrid | Yes | 5.00 | 0.000 | 2.00 | 0.83 | 0.00 | 0.067 | 0.000 | 20.608 | 0.00 | 13.20 |
| 45.00 | 1/2" Coax | Yes | 5.00 | 0.000 | 0.65 | 0.27 | 0.00 | 0.067 | 0.000 | 20.608 | 0.00 | 0.96 |
| 47.55 | 1 5/8" Hybrid | Yes | 2.55 | 0.000 | 2.00 | 0.43 | 0.00 | 0.068 | 0.000 | 20.849 | 0.00 | 6.74 |
| 47.55 | 1/2" Coax | Yes | 2.55 | 0.000 | 0.65 | 0.14 | 0.00 | 0.068 | 0.000 | 20.849 | 0.00 | 0.49 |
| 50.00 | 1 5/8" Hybrid | Yes | 2.45 | 0.000 | 2.00 | 0.41 | 0.00 | 0.069 | 0.000 | 21.070 | 0.00 | 6.46 |
| 50.00 | 1/2" Coax | Yes | 2.45 | 0.000 | 0.65 | 0.13 | 0.00 | 0.069 | 0.000 | 21.070 | 0.00 | 0.47 |
| 52.97 | 1 5/8" Hybrid | Yes | 2.97 | 0.000 | 2.00 | 0.49 | 0.00 | 0.086 | 0.000 | 21.328 | 0.00 | 7.84 |
| 52.97 | 1.25" Reinforcing | Yes | 2.97 | 0.000 | 1.25 | 0.31 | 0.00 | 0.086 | 0.000 | 21.328 | 0.00 | 0.00 |
| 55.00 | 1 5/8" Hybrid | Yes | 2.03 | 0.000 | 2.00 | 0.34 | 0.00 | 0.086 | 0.000 | 21.497 | 0.00 | 5.36 |
| 55.00 | 1.25" Reinforcing | Yes | 2.03 | 0.000 | 1.25 | 0.21 | 0.00 | 0.086 | 0.000 | 21.497 | 0.00 | 0.00 |
| 60.00 | 1 5/8" Hybrid | Yes | 5.00 | 0.000 | 2.00 | 0.83 | 0.00 | 0.087 | 0.000 | 21.895 | 0.00 | 13.20 |
| 60.00 | 1.25" Reinforcing | Yes | 5.00 | 0.000 | 1.25 | 0.52 | 0.00 | 0.087 | 0.000 | 21.895 | 0.00 | 0.00 |
| 65.00 | 1 5/8" Hybrid | Yes | 5.00 | 0.000 | 2.00 | 0.83 | 0.00 | 0.090 | 0.000 | 22.267 | 0.00 | 13.20 |
| 65.00 | 1.25" Reinforcing | Yes | 5.00 | 0.000 | 1.25 | 0.52 | 0.00 | 0.090 | 0.000 | 22.267 | 0.00 | 0.00 |
| 70.00 | 1 5/8" Hybrid | Yes | 5.00 | 0.000 | 2.00 | 0.83 | 0.00 | 0.093 | 0.000 | 22.617 | 0.00 | 13.20 |
| 70.00 | 1.25" Reinforcing | Yes | 5.00 | 0.000 | 1.25 | 0.52 | 0.00 | 0.093 | 0.000 | 22.617 | 0.00 | 0.00 |
| 73.00 | 1 5/8" Hybrid | Yes | 3.00 | 0.000 | 2.00 | 0.50 | 0.00 | 0.095 | 0.000 | 22.818 | 0.00 | 7.92 |
| 73.00 | 1.25" Reinforcing | Yes | 3.00 | 0.000 | 1.25 | 0.31 | 0.00 | 0.095 | 0.000 | 22.818 | 0.00 | 0.00 |
| 75.00 | 1 5/8" Hybrid | Yes | 2.00 | 0.000 | 2.00 | 0.33 | 0.00 | 0.097 | 0.000 | 22.948 | 0.00 | 5.28 |
| 75.00 | 1.25" Reinforcing | Yes | 2.00 | 0.000 | 1.25 | 0.21 | 0.00 | 0.097 | 0.000 | 22.948 | 0.00 | 0.00 |
| 80.00 | 1 5/8" Hybrid | Yes | 5.00 | 0.000 | 2.00 | 0.83 | 0.00 | 0.076 | 0.000 | 23.262 | 0.00 | 13.20 |
| 80.00 | 1.25" Reinforcing | Yes | 2.00 | 0.000 | 1.25 | 0.21 | 0.00 | 0.076 | 0.000 | 23.262 | 0.00 | 0.00 |
| 85.00 | 1 5/8" Hybrid | Yes | 5.00 | 0.000 | 2.00 | 0.83 | 0.00 | 0.063 | 0.000 | 23.561 | 0.00 | 13.20 |
| 90.00 | 1 5/8" Hybrid | Yes | 5.00 | 0.000 | 2.00 | 0.83 | 0.00 | 0.065 | 0.000 | 23.846 | 0.00 | 13.20 |
| 95.00 | 1 5/8" Hybrid | Yes | 5.00 | 0.000 | 2.00 | 0.83 | 0.00 | 0.067 | 0.000 | 24.119 | 0.00 | 13.20 |
| 96.18 | 1 5/8" Hybrid | Yes | 1.18 | 0.000 | 2.00 | 0.20 | 0.00 | 0.069 | 0.000 | 24.181 | 0.00 | 3.11 |
| 100.00 | 1 5/8" Hybrid | Yes | 3.82 | 0.000 | 2.00 | 0.64 | 0.00 | 0.104 | 1.013 | 24.381 | 0.00 | 10.09 |
| 100.00 | 1.25" Reinforcing | Yes | 3.00 | 0.000 | 1.25 | 0.31 | 0.00 | 0.104 | 1.013 | 24.381 | 0.00 | 0.00 |
| 100.34 | 1 5/8" Hybrid | Yes | 0.34 | 0.000 | 2.00 | 0.06 | 0.00 | 0.115 | 1.046 | 24.398 | 0.00 | 0.91 |
| 100.34 | 1.25" Reinforcing | Yes | 0.34 | 0.000 | 1.25 | 0.04 | 0.00 | 0.115 | 1.046 | 24.398 | 0.00 | 0.00 |
| 105.00 | 1 5/8" Hybrid | Yes | 4.66 | 0.000 | 2.00 | 0.78 | 0.00 | 0.116 | 1.048 | 24.632 | 0.00 | 12.29 |

# Linear Appurtenance Segment Forces (Factored)

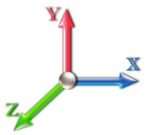
| | | | | | |
|---|---|---|---|---|---|
| **Structure:** | CT12215-A-SBA | **Code:** | EIA/TIA-222-G | 3/21/2017 | |
| **Site Name:** | Litchfield 3, CT | **Exposure:** | C | | |
| **Height:** | 149.00 (ft) | **Crest Height:** | 0.00 | | |
| **Base Elev:** | 0.000 (ft) | **Site Class:** | B - Competent Rock | | |
| **Gh:** | 1.1 **Topography:** 1 | **Struct Class:** | II | Page: 13 | |

Tower Engineering Solutions

**Load Case:** 1.2D + 1.6W 89 mph Wind

**Dead Load Factor** 1.20

**Wind Load Factor** 1.60




**Iterations** 27

| Top Elev (ft) | Description | Wind Exposed | Length (ft) | Ca | Exposed Width (in) | Area (sqft) | CaAa (sqft) | Ra | Cf Adjust Factor | qz (psf) | F X (lb) | Dead Load (lb) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 105.00 | 1.25" Reinforcing | Yes | 4.66 | 0.000 | 1.25 | 0.49 | 0.00 | 0.116 | 1.048 | 24.632 | 0.00 | 0.00 |
| 110.00 | 1 5/8" Hybrid | Yes | 5.00 | 0.000 | 2.00 | 0.83 | 0.00 | 0.074 | 0.000 | 24.875 | 0.00 | 13.20 |
| 115.00 | 1 5/8" Hybrid | Yes | 5.00 | 0.000 | 2.00 | 0.83 | 0.00 | 0.077 | 0.000 | 25.109 | 0.00 | 13.20 |
| | | | | | | | | | | **Totals:** | **0.0** | **313.2** |

# Calculated Forces

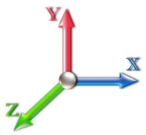
| | | | | | |
|---|---|---|---|---|---|
| **Structure:** | CT12215-A-SBA | **Code:** | EIA/TIA-222-G | 3/21/2017 | |
| **Site Name:** | Litchfield 3, CT | **Exposure:** | C | | |
| **Height:** | 149.00 (ft) | **Crest Height:** | 0.00 | | |
| **Base Elev:** | 0.000 (ft) | **Site Class:** | B - Competent Rock | | |
| **Gh:** | 1.1 **Topography:** 1 | **Struct Class:** | II | Page: 14 | |

Tower Engineering Solutions

**Load Case:** 1.2D + 1.6W 89 mph Wind

**Dead Load Factor** 1.20

**Wind Load Factor** 1.60




**Iterations** 27

| 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 Sway (deg) | Rotation Twist (deg) | Stress Ratio |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.00 | -31.73 | -23.02 | 0.00 | -2577.5 | 0.00 | 2577.52 | 3031.07 | 1515.53 | 5947.06 | 2977.95 | 0.00 | 0.000 | 0.000 | 0.876 |
| 5.00 | -30.47 | -22.78 | 0.00 | -2462.4 | 0.00 | 2462.45 | 2993.85 | 1496.92 | 5745.58 | 2877.06 | 0.14 | -0.264 | 0.000 | 0.866 |
| 10.00 | -29.24 | -22.54 | 0.00 | -2348.5 | 0.00 | 2348.56 | 2955.36 | 1477.68 | 5544.90 | 2776.57 | 0.56 | -0.533 | 0.000 | 0.856 |
| 15.00 | -28.03 | -22.30 | 0.00 | -2235.8 | 0.00 | 2235.85 | 2915.59 | 1457.80 | 5345.20 | 2676.57 | 1.27 | -0.807 | 0.000 | 0.845 |
| 20.00 | -26.84 | -22.05 | 0.00 | -2124.3 | 0.00 | 2124.33 | 2874.56 | 1437.28 | 5146.64 | 2577.14 | 2.26 | -1.086 | 0.000 | 0.834 |
| 25.00 | -25.67 | -21.77 | 0.00 | -2014.1 | 0.00 | 2014.10 | 2832.25 | 1416.12 | 4949.37 | 2478.36 | 3.55 | -1.371 | 0.000 | 0.822 |
| 30.00 | -24.53 | -21.48 | 0.00 | -1905.2 | 0.00 | 1905.26 | 2788.67 | 1394.33 | 4753.57 | 2380.32 | 5.14 | -1.660 | 0.000 | 0.809 |
| 35.00 | -23.41 | -21.18 | 0.00 | -1797.8 | 0.00 | 1797.86 | 2743.82 | 1371.91 | 4559.39 | 2283.08 | 7.04 | -1.955 | 0.000 | 0.796 |
| 40.00 | -22.31 | -20.87 | 0.00 | -1691.9 | 0.00 | 1691.96 | 2697.69 | 1348.85 | 4367.01 | 2186.75 | 9.24 | -2.255 | 0.000 | 0.782 |
| 45.00 | -21.26 | -20.52 | 0.00 | -1587.6 | 0.00 | 1587.62 | 2650.30 | 1325.15 | 4176.57 | 2091.39 | 11.77 | -2.559 | 0.000 | 0.767 |
| 47.55 | -20.72 | -20.36 | 0.00 | -1535.2 | 0.00 | 1535.22 | 2625.60 | 1312.80 | 4080.13 | 2043.10 | 13.18 | -2.719 | 0.000 | 0.760 |
| 50.00 | -19.90 | -20.18 | 0.00 | -1485.4 | 0.00 | 1485.40 | 2601.63 | 1300.82 | 3988.26 | 1997.09 | 14.61 | -2.874 | 0.000 | 0.752 |
| 52.97 | -18.94 | -19.96 | 0.00 | -1425.4 | 0.00 | 1425.46 | 1914.68 | 957.34 | 2935.86 | 1470.11 | 16.46 | -3.063 | 0.000 | 0.980 |
| 55.00 | -18.53 | -19.86 | 0.00 | -1384.9 | 0.00 | 1384.95 | 1902.26 | 951.13 | 2883.67 | 1443.98 | 17.79 | -3.194 | 0.000 | 0.969 |
| 60.00 | -17.65 | -19.55 | 0.00 | -1285.6 | 0.00 | 1285.63 | 1870.76 | 935.38 | 2755.66 | 1379.88 | 21.34 | -3.572 | 0.000 | 0.942 |
| 65.00 | -16.78 | -19.23 | 0.00 | -1187.8 | 0.00 | 1187.89 | 1837.99 | 919.00 | 2628.54 | 1316.22 | 25.28 | -3.954 | 0.000 | 0.912 |
| 70.00 | -15.96 | -18.88 | 0.00 | -1091.7 | 0.00 | 1091.75 | 1803.95 | 901.98 | 2502.46 | 1253.09 | 29.63 | -4.339 | 0.000 | 0.881 |
| 73.00 | -15.46 | -18.64 | 0.00 | -1035.1 | 0.00 | 1035.10 | 1782.92 | 891.46 | 2427.38 | 1215.49 | 32.43 | -4.574 | 0.000 | 0.861 |
| 75.00 | -15.10 | -18.54 | 0.00 | -997.82 | 0.00 | 997.82 | 1768.64 | 884.32 | 2377.59 | 1190.56 | 34.37 | -4.733 | 0.000 | 0.847 |
| 80.00 | -14.29 | -18.21 | 0.00 | -905.12 | 0.00 | 905.12 | 1732.06 | 866.03 | 2254.10 | 1128.72 | 39.53 | -5.119 | 0.000 | 0.811 |
| 85.00 | -13.51 | -17.88 | 0.00 | -814.06 | 0.00 | 814.06 | 1694.20 | 847.10 | 2132.15 | 1067.66 | 45.09 | -5.503 | 0.000 | 0.771 |
| 90.00 | -12.75 | -17.55 | 0.00 | -724.65 | 0.00 | 724.65 | 1655.08 | 827.54 | 2011.90 | 1007.44 | 51.05 | -5.882 | 0.000 | 0.727 |
| 95.00 | -12.06 | -17.19 | 0.00 | -636.90 | 0.00 | 636.90 | 1614.68 | 807.34 | 1893.51 | 948.16 | 57.40 | -6.255 | 0.000 | 0.680 |
| 96.18 | -11.86 | -17.13 | 0.00 | -616.68 | 0.00 | 616.68 | 1604.99 | 802.49 | 1865.94 | 934.36 | 58.95 | -6.345 | 0.000 | 0.668 |
| 100.00 | -11.10 | -16.81 | 0.00 | -551.19 | 0.00 | 551.19 | 1573.01 | 786.50 | 1777.16 | 889.90 | 64.14 | -6.624 | 0.000 | 0.627 |
| 100.34 | -10.98 | -16.82 | 0.00 | -545.42 | 0.00 | 545.42 | 1075.68 | 537.84 | 1234.34 | 618.09 | 64.61 | -6.649 | 0.000 | 0.894 |
| 105.00 | -10.42 | -16.51 | 0.00 | -467.10 | 0.00 | 467.10 | 1053.86 | 526.93 | 1167.20 | 584.47 | 71.25 | -6.972 | 0.000 | 0.810 |
| 110.00 | -9.84 | -16.19 | 0.00 | -384.57 | 0.00 | 384.57 | 1029.21 | 514.60 | 1095.73 | 548.68 | 78.76 | -7.385 | 0.000 | 0.711 |
| 115.00 | -7.51 | -12.99 | 0.00 | -303.60 | 0.00 | 303.60 | 1003.28 | 501.64 | 1025.09 | 513.31 | 86.67 | -7.760 | 0.000 | 0.600 |
| 120.00 | -7.01 | -12.67 | 0.00 | -238.63 | 0.00 | 238.63 | 976.09 | 488.04 | 955.42 | 478.42 | 94.96 | -8.094 | 0.000 | 0.507 |
| 125.00 | -6.55 | -12.34 | 0.00 | -175.29 | 0.00 | 175.29 | 947.62 | 473.81 | 886.90 | 444.11 | 103.57 | -8.384 | 0.000 | 0.402 |
| 128.00 | -4.25 | -8.72 | 0.00 | -138.28 | 0.00 | 138.28 | 929.93 | 464.96 | 846.40 | 423.83 | 108.87 | -8.534 | 0.000 | 0.331 |
| 130.00 | -4.10 | -8.60 | 0.00 | -120.84 | 0.00 | 120.84 | 917.88 | 458.94 | 819.69 | 410.45 | 112.45 | -8.624 | 0.000 | 0.299 |
| 135.00 | -3.77 | -8.28 | 0.00 | -77.86 | 0.00 | 77.86 | 886.87 | 443.43 | 753.94 | 377.53 | 121.55 | -8.807 | 0.000 | 0.211 |
| 138.00 | -2.41 | -4.78 | 0.00 | -53.01 | 0.00 | 53.01 | 867.65 | 433.83 | 715.27 | 358.17 | 127.09 | -8.890 | 0.000 | 0.151 |
| 140.00 | -2.32 | -4.66 | 0.00 | -43.46 | 0.00 | 43.46 | 854.59 | 427.29 | 689.83 | 345.43 | 130.81 | -8.935 | 0.000 | 0.129 |
| 145.00 | -2.10 | -4.38 | 0.00 | -20.16 | 0.00 | 20.16 | 821.03 | 410.52 | 627.52 | 314.23 | 140.18 | -9.014 | 0.000 | 0.067 |
| 149.00 | 0.00 | -4.00 | 0.00 | -2.64 | 0.00 | 2.64 | 787.55 | 393.77 | 574.90 | 287.88 | 147.71 | -9.041 | 0.000 | 0.009 |

# Wind Loading - Shaft

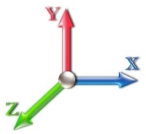
**Structure:** CT12215-A-SBA
**Site Name:** Litchfield 3, CT
**Height:** 149.00 (ft)
**Base Elev:** 0.000 (ft)
**Gh:** 1.1 **Topography:** 1

**Code:** EIA/TIA-222-G 3/21/2017
**Exposure:** C
**Crest Height:** 0.00
**Site Class:** B - Competent Rock
**Struct Class:** II



Tower Engineering Solutions

**Load Case:** 0.9D + 1.6W 89 mph Wind
**Dead Load Factor** 0.90
**Wind Load Factor** 1.60




**Iterations** 27

| Elev (ft) | Description | Kzt | Kz | qz (psf) | qzGh (psf) | C (mph-ft) | Cf | Ice Thick (in) | Tributary (ft) | Aa (sf) | CfAa (sf) | Wind Force X (lb) | Dead Load Ice (lb) | Tot Dead Load (lb) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.00 | | 1.00 | 0.85 | 16.374 | 18.01 | 333.28 | 0.650 | 0.000 | 0.00 | 0.000 | 0.00 | 0.0 | 0.0 | 0.0 |
| 5.00 | | 1.00 | 0.85 | 16.374 | 18.01 | 326.09 | 0.650 | 0.000 | 5.00 | 20.089 | 13.06 | 376.3 | 0.0 | 716.4 |
| 10.00 | | 1.00 | 0.85 | 16.374 | 18.01 | 318.89 | 0.650 | 0.000 | 5.00 | 19.651 | 12.77 | 368.1 | 0.0 | 700.7 |
| 15.00 | | 1.00 | 0.85 | 16.374 | 18.01 | 311.70 | 0.650 | 0.000 | 5.00 | 19.213 | 12.49 | 359.9 | 0.0 | 684.9 |
| 20.00 | | 1.00 | 0.90 | 17.374 | 19.11 | 313.66 | 0.650 | 0.000 | 5.00 | 18.774 | 12.20 | 373.2 | 0.0 | 669.2 |
| 25.00 | | 1.00 | 0.95 | 18.209 | 20.03 | 313.53 | 0.650 | 0.000 | 5.00 | 18.336 | 11.92 | 382.0 | 0.0 | 653.4 |
| 30.00 | | 1.00 | 0.98 | 18.922 | 20.81 | 311.87 | 0.650 | 0.000 | 5.00 | 17.898 | 11.63 | 387.4 | 0.0 | 637.7 |
| 35.00 | | 1.00 | 1.01 | 19.546 | 21.50 | 309.11 | 0.650 | 0.000 | 5.00 | 17.459 | 11.35 | 390.4 | 0.0 | 622.0 |
| 40.00 | | 1.00 | 1.04 | 20.103 | 22.11 | 305.52 | 0.650 | 0.000 | 5.00 | 17.021 | 11.06 | 391.5 | 0.0 | 606.2 |
| 45.00 | | 1.00 | 1.07 | 20.608 | 22.67 | 301.26 | 0.650 | 0.000 | 5.00 | 16.582 | 10.78 | 390.9 | 0.0 | 590.5 |
| 47.55 | Bot - Section 2 | 1.00 | 1.08 | 20.849 | 22.93 | 298.87 | 0.650 | 0.000 | 2.55 | 8.299 | 5.39 | 197.9 | 0.0 | 295.5 |
| 50.00 | Appurtenance(s) | 1.00 | 1.09 | 21.070 | 23.18 | 296.46 | 0.650 | 0.000 | 2.45 | 7.949 | 5.17 | 191.6 | 0.0 | 506.1 |
| 52.97 | Top - Section 1 | 1.00 | 1.11 | 21.328 | 23.46 | 293.39 | 0.650 | 0.000 | 2.97 | 9.508 | 6.18 | 232.0 | 0.0 | 605.2 |
| 55.00 | | 1.00 | 1.12 | 21.497 | 23.65 | 295.18 | 0.650 | 0.000 | 2.03 | 6.410 | 4.17 | 157.6 | 0.0 | 182.8 |
| 60.00 | | 1.00 | 1.14 | 21.895 | 24.08 | 289.58 | 0.650 | 0.000 | 5.00 | 15.479 | 10.06 | 387.7 | 0.0 | 441.5 |
| 65.00 | | 1.00 | 1.16 | 22.267 | 24.49 | 283.64 | 0.650 | 0.000 | 5.00 | 15.041 | 9.78 | 383.1 | 0.0 | 428.9 |
| 70.00 | | 1.00 | 1.17 | 22.617 | 24.88 | 277.41 | 0.650 | 0.000 | 5.00 | 14.602 | 9.49 | 377.8 | 0.0 | 416.3 |
| 73.00 | Appurtenance(s) | 1.00 | 1.18 | 22.818 | 25.10 | 273.54 | 0.650 | 0.000 | 3.00 | 8.551 | 5.56 | 223.2 | 0.0 | 243.7 |
| 75.00 | | 1.00 | 1.19 | 22.948 | 25.24 | 270.91 | 0.650 | 0.000 | 2.00 | 5.613 | 3.65 | 147.4 | 0.0 | 160.0 |
| 80.00 | | 1.00 | 1.21 | 23.262 | 25.59 | 264.19 | 0.650 | 0.000 | 5.00 | 13.726 | 8.92 | 365.3 | 0.0 | 391.1 |
| 85.00 | | 1.00 | 1.22 | 23.561 | 25.92 | 257.25 | 0.650 | 0.000 | 5.00 | 13.287 | 8.64 | 358.1 | 0.0 | 378.5 |
| 90.00 | | 1.00 | 1.24 | 23.846 | 26.23 | 250.12 | 0.650 | 0.000 | 5.00 | 12.849 | 8.35 | 350.5 | 0.0 | 365.9 |
| 95.00 | | 1.00 | 1.25 | 24.119 | 26.53 | 242.82 | 0.650 | 0.000 | 5.00 | 12.410 | 8.07 | 342.4 | 0.0 | 353.4 |
| 96.18 | Bot - Section 3 | 1.00 | 1.26 | 24.181 | 26.60 | 241.07 | 0.650 | 0.000 | 1.18 | 2.857 | 1.86 | 79.0 | 0.0 | 81.3 |
| 100.00 | | 1.00 | 1.27 | 24.381 | 26.82 | 235.35 | 0.658 * | 0.000 | 3.82 | 9.237 | 6.08 | 260.9 | 0.0 | 457.1 |
| 100.34 | Top - Section 2 | 1.00 | 1.27 | 24.398 | 26.84 | 234.83 | 0.680 * | 0.000 | 0.34 | 0.817 | 0.56 | 23.9 | 0.0 | 40.4 |
| 105.00 | | 1.00 | 1.28 | 24.632 | 27.10 | 230.93 | 0.681 * | 0.000 | 4.66 | 10.876 | 7.41 | 321.1 | 0.0 | 232.6 |
| 110.00 | | 1.00 | 1.29 | 24.875 | 27.36 | 223.20 | 0.650 | 0.000 | 5.00 | 11.254 | 7.32 | 320.3 | 0.0 | 240.7 |
| 115.00 | Appurtenance(s) | 1.00 | 1.30 | 25.109 | 27.62 | 215.34 | 0.650 | 0.000 | 5.00 | 10.816 | 7.03 | 310.7 | 0.0 | 231.2 |
| 120.00 | | 1.00 | 1.32 | 25.335 | 27.87 | 207.36 | 0.650 | 0.000 | 5.00 | 10.377 | 6.75 | 300.8 | 0.0 | 221.8 |
| 125.00 | | 1.00 | 1.33 | 25.553 | 28.11 | 199.26 | 0.650 | 0.000 | 5.00 | 9.939 | 6.46 | 290.5 | 0.0 | 212.4 |
| 128.00 | Appurtenance(s) | 1.00 | 1.33 | 25.681 | 28.25 | 194.36 | 0.650 | 0.000 | 3.00 | 5.753 | 3.74 | 169.0 | 0.0 | 122.9 |
| 130.00 | | 1.00 | 1.34 | 25.765 | 28.34 | 191.07 | 0.650 | 0.000 | 2.00 | 3.748 | 2.44 | 110.5 | 0.0 | 80.0 |
| 135.00 | | 1.00 | 1.35 | 25.971 | 28.57 | 182.77 | 0.650 | 0.000 | 5.00 | 9.062 | 5.89 | 269.2 | 0.0 | 193.5 |
| 138.00 | Appurtenance(s) | 1.00 | 1.35 | 26.091 | 28.70 | 177.74 | 0.650 | 0.000 | 3.00 | 5.227 | 3.40 | 156.0 | 0.0 | 111.6 |
| 140.00 | | 1.00 | 1.36 | 26.170 | 28.79 | 174.37 | 0.650 | 0.000 | 2.00 | 3.397 | 2.21 | 101.7 | 0.0 | 72.5 |
| 145.00 | | 1.00 | 1.37 | 26.364 | 29.00 | 165.89 | 0.650 | 0.000 | 5.00 | 8.186 | 5.32 | 246.9 | 0.0 | 174.6 |
| 149.00 | Appurtenance(s) | 1.00 | 1.38 | 26.516 | 29.17 | 159.04 | 0.650 | 0.000 | 4.00 | 6.233 | 4.05 | 189.1 | 0.0 | 132.9 |
| | | | | | | | | **Totals:** | **149.00** | | | **10,283.9** | | **13,255.3** |

* Cf Adjusted by Linear Load Ra Effect

# Discrete Appurtenance Forces

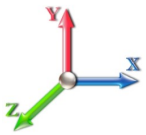
| | | | | | |
|---|---|---|---|---|---|
| **Structure:** | CT12215-A-SBA | **Code:** | EIA/TIA-222-G | 3/21/2017 | |
| **Site Name:** | Litchfield 3, CT | **Exposure:** | C | | |
| **Height:** | 149.00 (ft) | **Crest Height:** | 0.00 | | |
| **Base Elev:** | 0.000 (ft) | **Site Class:** | B - Competent Rock | | |
| **Gh:** | 1.1 **Topography:** 1 | **Struct Class:** | II | Page: 16 | |

Tower Engineering Solutions

**Load Case:** 0.9D + 1.6W 89 mph Wind

**Dead Load Factor** 0.90

**Wind Load Factor** 1.60




**Iterations** 27

| No. | Elev (ft) | Description | Qty | qz (psf) | qzGh (psf) | CaAa x Ka | Ka | Total CaAa (sf) | Dead Load (lb) | Horiz Ecc (ft) | Vert Ecc (ft) | Wind FX (lb) | Mom Y (lb-ft) | Mom Z (lb-ft) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 149.00 | 800MHZ | 3 | 26.553 | 29.209 | 0.87 | 1.00 | 6.89 | 160.65 | 0.000 | 1.000 | 322.01 | 0.00 | 322.01 |
| 2 | 149.00 | APXVSPP18-C-A20 | 3 | 26.553 | 29.209 | 0.83 | 1.00 | 19.97 | 153.90 | 0.000 | 1.000 | 933.26 | 0.00 | 933.26 |
| 3 | 149.00 | APXVTM14-C-I20 | 3 | 26.553 | 29.209 | 0.79 | 1.00 | 15.03 | 151.20 | 0.000 | 1.000 | 702.21 | 0.00 | 702.21 |
| 4 | 149.00 | 1900MHz | 3 | 26.553 | 29.209 | 0.50 | 1.00 | 4.16 | 162.00 | 0.000 | 1.000 | 194.18 | 0.00 | 194.18 |
| 5 | 149.00 | Low Profile Platform | 1 | 26.516 | 29.168 | 1.00 | 1.00 | 25.00 | 1080.00 | 0.000 | 0.000 | 1166.70 | 0.00 | 0.00 |
| 6 | 149.00 | TD-RRH8x20-25 | 3 | 26.553 | 29.209 | 0.69 | 1.00 | 8.38 | 189.00 | 0.000 | 1.000 | 391.79 | 0.00 | 391.79 |
| 7 | 149.00 | 800MHz Filter | 3 | 26.553 | 29.209 | 0.69 | 1.00 | 1.61 | 23.76 | 0.000 | 1.000 | 75.46 | 0.00 | 75.46 |
| 8 | 149.00 | ACU-A20-N | 4 | 26.553 | 29.209 | 0.79 | 1.00 | 0.44 | 3.60 | 0.000 | 1.000 | 20.68 | 0.00 | 20.68 |
| 9 | 138.00 | Low Profile Platform | 1 | 26.091 | 28.700 | 1.00 | 1.00 | 25.00 | 1080.00 | 0.000 | 0.000 | 1148.01 | 0.00 | 0.00 |
| 10 | 138.00 | FD9R6004/2C-3L | 6 | 26.091 | 28.700 | 0.54 | 0.80 | 1.16 | 16.74 | 0.000 | 0.000 | 53.17 | 0.00 | 0.00 |
| 11 | 138.00 | GPS Receiver | 1 | 26.091 | 28.700 | 1.00 | 1.00 | 1.00 | 9.00 | 0.000 | 0.000 | 45.92 | 0.00 | 0.00 |
| 12 | 138.00 | BXA-171085-12B_2 | 3 | 26.091 | 28.700 | 0.67 | 0.80 | 9.56 | 40.50 | 0.000 | 0.000 | 438.81 | 0.00 | 0.00 |
| 13 | 138.00 | BXA-70063-6CF_2 | 3 | 26.091 | 28.700 | 0.58 | 0.80 | 13.26 | 45.90 | 0.000 | 0.000 | 609.03 | 0.00 | 0.00 |
| 14 | 138.00 | LPA-80080/6CF | 3 | 26.091 | 28.700 | 1.36 | 0.80 | 17.67 | 56.70 | 0.000 | 0.000 | 811.25 | 0.00 | 0.00 |
| 15 | 128.00 | Low Profile Platform | 1 | 25.681 | 28.249 | 1.00 | 1.00 | 25.00 | 1080.00 | 0.000 | 0.000 | 1129.98 | 0.00 | 0.00 |
| 16 | 128.00 | DC6-48-60-18-8F | 1 | 25.681 | 28.249 | 1.00 | 1.00 | 0.92 | 28.62 | 0.000 | 0.000 | 41.58 | 0.00 | 0.00 |
| 17 | 128.00 | RRUS-11 | 6 | 25.681 | 28.249 | 0.57 | 0.80 | 8.59 | 275.40 | 0.000 | 0.000 | 388.18 | 0.00 | 0.00 |
| 18 | 128.00 | LGP 21401 | 12 | 25.681 | 28.249 | 0.40 | 0.80 | 0.00 | 189.00 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 |
| 19 | 128.00 | AM-X-CD-16-65-00T-RET | 3 | 25.681 | 28.249 | 0.60 | 0.80 | 14.44 | 130.95 | 0.000 | 0.000 | 652.49 | 0.00 | 0.00 |
| 20 | 128.00 | 7770.00 | 6 | 25.681 | 28.249 | 0.58 | 0.80 | 19.27 | 189.00 | 0.000 | 0.000 | 871.08 | 0.00 | 0.00 |
| 21 | 128.00 | ABT-DF-DM-ADBH | 1 | 25.681 | 28.249 | 1.00 | 1.00 | 0.05 | 0.99 | 0.000 | 0.000 | 2.26 | 0.00 | 0.00 |
| 22 | 115.00 | RRUS 11 (Band 4) | 3 | 25.109 | 27.620 | 0.57 | 0.80 | 4.29 | 137.70 | 0.000 | 0.000 | 189.76 | 0.00 | 0.00 |
| 23 | 115.00 | LNX-6515DS-A1M | 3 | 25.109 | 27.620 | 0.64 | 0.80 | 22.02 | 134.46 | 0.000 | 0.000 | 973.20 | 0.00 | 0.00 |
| 24 | 115.00 | APX16DWV-16DWVS-E- | 3 | 25.109 | 27.620 | 0.50 | 0.80 | 9.84 | 109.89 | 0.000 | 0.000 | 434.65 | 0.00 | 0.00 |
| 25 | 115.00 | T-Arm | 3 | 25.109 | 27.620 | 0.56 | 0.75 | 13.50 | 945.00 | 0.000 | 0.000 | 596.58 | 0.00 | 0.00 |
| 26 | 115.00 | RRUS 11 (Band 12) | 3 | 25.109 | 27.620 | 0.62 | 0.80 | 4.72 | 145.80 | 0.000 | 0.000 | 208.47 | 0.00 | 0.00 |
| 27 | 115.00 | RRUS 11 | 3 | 25.109 | 27.620 | 0.54 | 0.80 | 4.73 | 145.80 | 0.000 | 0.000 | 208.92 | 0.00 | 0.00 |
| 28 | 73.00 | GPS Receiver | 1 | 22.818 | 25.099 | 1.00 | 1.00 | 1.00 | 9.00 | 0.000 | 0.000 | 40.16 | 0.00 | 0.00 |
| 29 | 50.00 | 58532A | 1 | 21.070 | 23.177 | 1.00 | 1.00 | 0.22 | 0.36 | 0.000 | 0.000 | 8.16 | 0.00 | 0.00 |
| | | | | | | | **Totals:** | | **6,694.92** | | | **12,657.95** | | |

# Total Applied Force Summary

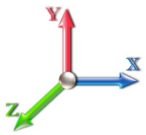
| | | | | | |
|---|---|---|---|---|---|
| **Structure:** | CT12215-A-SBA | | **Code:** | EIA/TIA-222-G | 3/21/2017 |
| **Site Name:** | Litchfield 3, CT | | **Exposure:** | C | |
| **Height:** | 149.00 (ft) | | **Crest Height:** | 0.00 | |
| **Base Elev:** | 0.000 (ft) | | **Site Class:** | B - Competent Rock | |
| **Gh:** | 1.1 | **Topography:** 1 | **Struct Class:** | II | Page: 17 |

Tower Engineering Solutions

**Load Case:** 0.9D + 1.6W 89 mph Wind

**Dead Load Factor** 0.90

**Wind Load Factor** 1.60




**Iterations** 27

| Elev (ft) | Description | Lateral FX (-) (lb) | Axial FY (-) (lb) | Torsion MY (lb-ft) | Moment MZ (lb-ft) |
|---|---|---|---|---|---|
| 0.00 | | 0.00 | 0.00 | 0.00 | 0.00 |
| 5.00 | | 376.32 | 862.71 | 0.00 | 0.00 |
| 10.00 | | 368.11 | 846.97 | 0.00 | 0.00 |
| 15.00 | | 359.89 | 831.24 | 0.00 | 0.00 |
| 20.00 | | 373.15 | 815.50 | 0.00 | 0.00 |
| 25.00 | | 381.97 | 799.77 | 0.00 | 0.00 |
| 30.00 | | 387.42 | 784.03 | 0.00 | 0.00 |
| 35.00 | | 390.40 | 768.30 | 0.00 | 0.00 |
| 40.00 | | 391.45 | 752.56 | 0.00 | 0.00 |
| 45.00 | | 390.94 | 736.83 | 0.00 | 0.00 |
| 47.55 | | 197.94 | 370.20 | 0.00 | 0.00 |
| 50.00 | (1) attachments | 199.76 | 578.02 | 0.00 | 0.00 |
| 52.97 | | 231.98 | 691.68 | 0.00 | 0.00 |
| 55.00 | | 157.63 | 241.95 | 0.00 | 0.00 |
| 60.00 | | 387.71 | 587.08 | 0.00 | 0.00 |
| 65.00 | | 383.13 | 574.49 | 0.00 | 0.00 |
| 70.00 | | 377.82 | 561.90 | 0.00 | 0.00 |
| 73.00 | (1) attachments | 263.37 | 340.10 | 0.00 | 0.00 |
| 75.00 | | 147.35 | 217.93 | 0.00 | 0.00 |
| 80.00 | | 365.26 | 536.00 | 0.00 | 0.00 |
| 85.00 | | 358.13 | 523.41 | 0.00 | 0.00 |
| 90.00 | | 350.51 | 510.83 | 0.00 | 0.00 |
| 95.00 | | 342.43 | 498.24 | 0.00 | 0.00 |
| 96.18 | | 79.03 | 115.42 | 0.00 | 0.00 |
| 100.00 | | 260.86 | 567.86 | 0.00 | 0.00 |
| 100.34 | | 23.85 | 50.36 | 0.00 | 0.00 |
| 105.00 | | 321.15 | 367.58 | 0.00 | 0.00 |
| 110.00 | | 320.26 | 385.56 | 0.00 | 0.00 |
| 115.00 | (18) attachments | 2922.26 | 1994.77 | 0.00 | 0.00 |
| 120.00 | | 300.77 | 356.78 | 0.00 | 0.00 |
| 125.00 | | 290.55 | 347.34 | 0.00 | 0.00 |
| 128.00 | (30) attachments | 3254.59 | 2097.83 | 0.00 | 0.00 |
| 130.00 | | 110.46 | 109.65 | 0.00 | 0.00 |
| 135.00 | | 269.25 | 267.52 | 0.00 | 0.00 |
| 138.00 | (17) attachments | 3262.21 | 1404.82 | 0.00 | 0.00 |
| 140.00 | | 101.70 | 79.35 | 0.00 | 0.00 |
| 145.00 | | 246.88 | 191.76 | 0.00 | 0.00 |
| 149.00 | (23) attachments | 3995.36 | 2070.72 | 0.00 | 2639.59 |
| | **Totals:** | **22,941.85** | **23,837.06** | **0.00** | **2,639.59** |

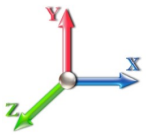
# Linear Appurtenance Segment Forces (Factored)

| | | | | | |
|---|---|---|---|---|---|
| **Structure:** | CT12215-A-SBA | **Code:** | EIA/TIA-222-G | 3/21/2017 | |
| **Site Name:** | Litchfield 3, CT | **Exposure:** | C | | |
| **Height:** | 149.00 (ft) | **Crest Height:** | 0.00 | | |
| **Base Elev:** | 0.000 (ft) | **Site Class:** | B - Competent Rock | | |
| **Gh:** | 1.1 **Topography:** 1 | **Struct Class:** | II | Page: 18 | |

**Load Case:** 0.9D + 1.6W 89 mph Wind

**Dead Load Factor** 0.90

**Wind Load Factor** 1.60




**Iterations** 27

| Top Elev (ft) | Description | Wind Exposed | Length (ft) | Ca | Exposed Width (in) | Area (sqft) | CaAa (sqft) | Ra | Cf Adjust Factor | qz (psf) | F X (lb) | Dead Load (lb) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5.00 | 1 5/8" Hybrid | Yes | 5.00 | 0.000 | 2.00 | 0.83 | 0.00 | 0.055 | 0.000 | 16.374 | 0.00 | 9.90 |
| 5.00 | 1/2" Coax | Yes | 5.00 | 0.000 | 0.65 | 0.27 | 0.00 | 0.055 | 0.000 | 16.374 | 0.00 | 0.72 |
| 10.00 | 1 5/8" Hybrid | Yes | 5.00 | 0.000 | 2.00 | 0.83 | 0.00 | 0.056 | 0.000 | 16.374 | 0.00 | 9.90 |
| 10.00 | 1/2" Coax | Yes | 5.00 | 0.000 | 0.65 | 0.27 | 0.00 | 0.056 | 0.000 | 16.374 | 0.00 | 0.72 |
| 15.00 | 1 5/8" Hybrid | Yes | 5.00 | 0.000 | 2.00 | 0.83 | 0.00 | 0.057 | 0.000 | 16.374 | 0.00 | 9.90 |
| 15.00 | 1/2" Coax | Yes | 5.00 | 0.000 | 0.65 | 0.27 | 0.00 | 0.057 | 0.000 | 16.374 | 0.00 | 0.72 |
| 20.00 | 1 5/8" Hybrid | Yes | 5.00 | 0.000 | 2.00 | 0.83 | 0.00 | 0.059 | 0.000 | 17.374 | 0.00 | 9.90 |
| 20.00 | 1/2" Coax | Yes | 5.00 | 0.000 | 0.65 | 0.27 | 0.00 | 0.059 | 0.000 | 17.374 | 0.00 | 0.72 |
| 25.00 | 1 5/8" Hybrid | Yes | 5.00 | 0.000 | 2.00 | 0.83 | 0.00 | 0.060 | 0.000 | 18.209 | 0.00 | 9.90 |
| 25.00 | 1/2" Coax | Yes | 5.00 | 0.000 | 0.65 | 0.27 | 0.00 | 0.060 | 0.000 | 18.209 | 0.00 | 0.72 |
| 30.00 | 1 5/8" Hybrid | Yes | 5.00 | 0.000 | 2.00 | 0.83 | 0.00 | 0.062 | 0.000 | 18.922 | 0.00 | 9.90 |
| 30.00 | 1/2" Coax | Yes | 5.00 | 0.000 | 0.65 | 0.27 | 0.00 | 0.062 | 0.000 | 18.922 | 0.00 | 0.72 |
| 35.00 | 1 5/8" Hybrid | Yes | 5.00 | 0.000 | 2.00 | 0.83 | 0.00 | 0.063 | 0.000 | 19.546 | 0.00 | 9.90 |
| 35.00 | 1/2" Coax | Yes | 5.00 | 0.000 | 0.65 | 0.27 | 0.00 | 0.063 | 0.000 | 19.546 | 0.00 | 0.72 |
| 40.00 | 1 5/8" Hybrid | Yes | 5.00 | 0.000 | 2.00 | 0.83 | 0.00 | 0.065 | 0.000 | 20.103 | 0.00 | 9.90 |
| 40.00 | 1/2" Coax | Yes | 5.00 | 0.000 | 0.65 | 0.27 | 0.00 | 0.065 | 0.000 | 20.103 | 0.00 | 0.72 |
| 45.00 | 1 5/8" Hybrid | Yes | 5.00 | 0.000 | 2.00 | 0.83 | 0.00 | 0.067 | 0.000 | 20.608 | 0.00 | 9.90 |
| 45.00 | 1/2" Coax | Yes | 5.00 | 0.000 | 0.65 | 0.27 | 0.00 | 0.067 | 0.000 | 20.608 | 0.00 | 0.72 |
| 47.55 | 1 5/8" Hybrid | Yes | 2.55 | 0.000 | 2.00 | 0.43 | 0.00 | 0.068 | 0.000 | 20.849 | 0.00 | 5.06 |
| 47.55 | 1/2" Coax | Yes | 2.55 | 0.000 | 0.65 | 0.14 | 0.00 | 0.068 | 0.000 | 20.849 | 0.00 | 0.37 |
| 50.00 | 1 5/8" Hybrid | Yes | 2.45 | 0.000 | 2.00 | 0.41 | 0.00 | 0.069 | 0.000 | 21.070 | 0.00 | 4.84 |
| 50.00 | 1/2" Coax | Yes | 2.45 | 0.000 | 0.65 | 0.13 | 0.00 | 0.069 | 0.000 | 21.070 | 0.00 | 0.35 |
| 52.97 | 1 5/8" Hybrid | Yes | 2.97 | 0.000 | 2.00 | 0.49 | 0.00 | 0.086 | 0.000 | 21.328 | 0.00 | 5.88 |
| 52.97 | 1.25" Reinforcing | Yes | 2.97 | 0.000 | 1.25 | 0.31 | 0.00 | 0.086 | 0.000 | 21.328 | 0.00 | 0.00 |
| 55.00 | 1 5/8" Hybrid | Yes | 2.03 | 0.000 | 2.00 | 0.34 | 0.00 | 0.086 | 0.000 | 21.497 | 0.00 | 4.02 |
| 55.00 | 1.25" Reinforcing | Yes | 2.03 | 0.000 | 1.25 | 0.21 | 0.00 | 0.086 | 0.000 | 21.497 | 0.00 | 0.00 |
| 60.00 | 1 5/8" Hybrid | Yes | 5.00 | 0.000 | 2.00 | 0.83 | 0.00 | 0.087 | 0.000 | 21.895 | 0.00 | 9.90 |
| 60.00 | 1.25" Reinforcing | Yes | 5.00 | 0.000 | 1.25 | 0.52 | 0.00 | 0.087 | 0.000 | 21.895 | 0.00 | 0.00 |
| 65.00 | 1 5/8" Hybrid | Yes | 5.00 | 0.000 | 2.00 | 0.83 | 0.00 | 0.090 | 0.000 | 22.267 | 0.00 | 9.90 |
| 65.00 | 1.25" Reinforcing | Yes | 5.00 | 0.000 | 1.25 | 0.52 | 0.00 | 0.090 | 0.000 | 22.267 | 0.00 | 0.00 |
| 70.00 | 1 5/8" Hybrid | Yes | 5.00 | 0.000 | 2.00 | 0.83 | 0.00 | 0.093 | 0.000 | 22.617 | 0.00 | 9.90 |
| 70.00 | 1.25" Reinforcing | Yes | 5.00 | 0.000 | 1.25 | 0.52 | 0.00 | 0.093 | 0.000 | 22.617 | 0.00 | 0.00 |
| 73.00 | 1 5/8" Hybrid | Yes | 3.00 | 0.000 | 2.00 | 0.50 | 0.00 | 0.095 | 0.000 | 22.818 | 0.00 | 5.94 |
| 73.00 | 1.25" Reinforcing | Yes | 3.00 | 0.000 | 1.25 | 0.31 | 0.00 | 0.095 | 0.000 | 22.818 | 0.00 | 0.00 |
| 75.00 | 1 5/8" Hybrid | Yes | 2.00 | 0.000 | 2.00 | 0.33 | 0.00 | 0.097 | 0.000 | 22.948 | 0.00 | 3.96 |
| 75.00 | 1.25" Reinforcing | Yes | 2.00 | 0.000 | 1.25 | 0.21 | 0.00 | 0.097 | 0.000 | 22.948 | 0.00 | 0.00 |
| 80.00 | 1 5/8" Hybrid | Yes | 5.00 | 0.000 | 2.00 | 0.83 | 0.00 | 0.076 | 0.000 | 23.262 | 0.00 | 9.90 |
| 80.00 | 1.25" Reinforcing | Yes | 2.00 | 0.000 | 1.25 | 0.21 | 0.00 | 0.076 | 0.000 | 23.262 | 0.00 | 0.00 |
| 85.00 | 1 5/8" Hybrid | Yes | 5.00 | 0.000 | 2.00 | 0.83 | 0.00 | 0.063 | 0.000 | 23.561 | 0.00 | 9.90 |
| 90.00 | 1 5/8" Hybrid | Yes | 5.00 | 0.000 | 2.00 | 0.83 | 0.00 | 0.065 | 0.000 | 23.846 | 0.00 | 9.90 |
| 95.00 | 1 5/8" Hybrid | Yes | 5.00 | 0.000 | 2.00 | 0.83 | 0.00 | 0.067 | 0.000 | 24.119 | 0.00 | 9.90 |
| 96.18 | 1 5/8" Hybrid | Yes | 1.18 | 0.000 | 2.00 | 0.20 | 0.00 | 0.069 | 0.000 | 24.181 | 0.00 | 2.33 |
| 100.00 | 1 5/8" Hybrid | Yes | 3.82 | 0.000 | 2.00 | 0.64 | 0.00 | 0.104 | 1.013 | 24.381 | 0.00 | 7.57 |
| 100.00 | 1.25" Reinforcing | Yes | 3.00 | 0.000 | 1.25 | 0.31 | 0.00 | 0.104 | 1.013 | 24.381 | 0.00 | 0.00 |
| 100.34 | 1 5/8" Hybrid | Yes | 0.34 | 0.000 | 2.00 | 0.06 | 0.00 | 0.115 | 1.046 | 24.398 | 0.00 | 0.68 |
| 100.34 | 1.25" Reinforcing | Yes | 0.34 | 0.000 | 1.25 | 0.04 | 0.00 | 0.115 | 1.046 | 24.398 | 0.00 | 0.00 |
| 105.00 | 1 5/8" Hybrid | Yes | 4.66 | 0.000 | 2.00 | 0.78 | 0.00 | 0.116 | 1.048 | 24.632 | 0.00 | 9.22 |

# Linear Appurtenance Segment Forces (Factored)

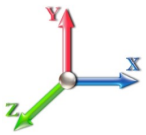
| | | | | | |
|---|---|---|---|---|---|
| **Structure:** | CT12215-A-SBA | **Code:** | EIA/TIA-222-G | 3/21/2017 | |
| **Site Name:** | Litchfield 3, CT | **Exposure:** | C | | |
| **Height:** | 149.00 (ft) | **Crest Height:** | 0.00 | | |
| **Base Elev:** | 0.000 (ft) | **Site Class:** | B - Competent Rock | | |
| **Gh:** | 1.1 **Topography:** 1 | **Struct Class:** | II | Page: 19 | |

Tower Engineering Solutions

**Load Case:** 0.9D + 1.6W 89 mph Wind

**Dead Load Factor** 0.90

**Wind Load Factor** 1.60




**Iterations** 27

| Top Elev (ft) | Description | Wind Exposed | Length (ft) | Ca | Exposed Width (in) | Area (sqft) | CaAa (sqft) | Ra | Cf Adjust Factor | qz (psf) | F X (lb) | Dead Load (lb) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 105.00 | 1.25" Reinforcing | Yes | 4.66 | 0.000 | 1.25 | 0.49 | 0.00 | 0.116 | 1.048 | 24.632 | 0.00 | 0.00 |
| 110.00 | 1 5/8" Hybrid | Yes | 5.00 | 0.000 | 2.00 | 0.83 | 0.00 | 0.074 | 0.000 | 24.875 | 0.00 | 9.90 |
| 115.00 | 1 5/8" Hybrid | Yes | 5.00 | 0.000 | 2.00 | 0.83 | 0.00 | 0.077 | 0.000 | 25.109 | 0.00 | 9.90 |
| | | | | | | | | | | **Totals:** | **0.0** | **234.9** |

# Calculated Forces

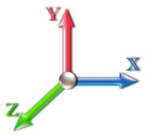
| | | | | | |
|---|---|---|---|---|---|
| **Structure:** | CT12215-A-SBA | **Code:** | EIA/TIA-222-G | 3/21/2017 | |
| **Site Name:** | Litchfield 3, CT | **Exposure:** | C | | |
| **Height:** | 149.00 (ft) | **Crest Height:** | 0.00 | | |
| **Base Elev:** | 0.000 (ft) | **Site Class:** | B - Competent Rock | | |
| **Gh:** | 1.1 **Topography:** 1 | **Struct Class:** | II | Page: 20 | |

Tower Engineering Solutions

**Load Case:** 0.9D + 1.6W 89 mph Wind

**Dead Load Factor** 0.90

**Wind Load Factor** 1.60




**Iterations** 27

| 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 Sway (deg) | Rotation Twist (deg) | Stress Ratio |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.00 | -23.78 | -23.00 | 0.00 | -2537.7 | 0.00 | 2537.74 | 3031.07 | 1515.53 | 5947.06 | 2977.95 | 0.00 | 0.000 | 0.000 | 0.860 |
| 5.00 | -22.82 | -22.72 | 0.00 | -2422.7 | 0.00 | 2422.76 | 2993.85 | 1496.92 | 5745.58 | 2877.06 | 0.14 | -0.260 | 0.000 | 0.850 |
| 10.00 | -21.87 | -22.45 | 0.00 | -2309.1 | 0.00 | 2309.15 | 2955.36 | 1477.68 | 5544.90 | 2776.57 | 0.55 | -0.524 | 0.000 | 0.839 |
| 15.00 | -20.94 | -22.18 | 0.00 | -2196.9 | 0.00 | 2196.90 | 2915.59 | 1457.80 | 5345.20 | 2676.57 | 1.25 | -0.794 | 0.000 | 0.828 |
| 20.00 | -20.02 | -21.89 | 0.00 | -2085.9 | 0.00 | 2085.99 | 2874.56 | 1437.28 | 5146.64 | 2577.14 | 2.22 | -1.068 | 0.000 | 0.817 |
| 25.00 | -19.12 | -21.59 | 0.00 | -1976.5 | 0.00 | 1976.53 | 2832.25 | 1416.12 | 4949.37 | 2478.36 | 3.49 | -1.347 | 0.000 | 0.805 |
| 30.00 | -18.25 | -21.27 | 0.00 | -1868.6 | 0.00 | 1868.60 | 2788.67 | 1394.33 | 4753.57 | 2380.32 | 5.05 | -1.631 | 0.000 | 0.792 |
| 35.00 | -17.38 | -20.95 | 0.00 | -1762.2 | 0.00 | 1762.25 | 2743.82 | 1371.91 | 4559.39 | 2283.08 | 6.92 | -1.920 | 0.000 | 0.778 |
| 40.00 | -16.54 | -20.61 | 0.00 | -1657.5 | 0.00 | 1657.52 | 2697.69 | 1348.85 | 4367.01 | 2186.75 | 9.09 | -2.214 | 0.000 | 0.764 |
| 45.00 | -15.74 | -20.25 | 0.00 | -1554.4 | 0.00 | 1554.45 | 2650.30 | 1325.15 | 4176.57 | 2091.39 | 11.56 | -2.512 | 0.000 | 0.749 |
| 47.55 | -15.32 | -20.08 | 0.00 | -1502.7 | 0.00 | 1502.74 | 2625.60 | 1312.80 | 4080.13 | 2043.10 | 12.95 | -2.669 | 0.000 | 0.742 |
| 50.00 | -14.70 | -19.90 | 0.00 | -1453.6 | 0.00 | 1453.61 | 2601.63 | 1300.82 | 3988.26 | 1997.09 | 14.36 | -2.821 | 0.000 | 0.734 |
| 52.97 | -13.97 | -19.67 | 0.00 | -1394.5 | 0.00 | 1394.51 | 1914.68 | 957.34 | 2935.86 | 1470.11 | 16.17 | -3.005 | 0.000 | 0.956 |
| 55.00 | -13.65 | -19.56 | 0.00 | -1354.5 | 0.00 | 1354.59 | 1902.26 | 951.13 | 2883.67 | 1443.98 | 17.48 | -3.133 | 0.000 | 0.946 |
| 60.00 | -12.96 | -19.22 | 0.00 | -1256.8 | 0.00 | 1256.80 | 1870.76 | 935.38 | 2755.66 | 1379.88 | 20.95 | -3.503 | 0.000 | 0.918 |
| 65.00 | -12.29 | -18.88 | 0.00 | -1160.6 | 0.00 | 1160.69 | 1837.99 | 919.00 | 2628.54 | 1316.22 | 24.82 | -3.877 | 0.000 | 0.889 |
| 70.00 | -11.66 | -18.53 | 0.00 | -1066.2 | 0.00 | 1066.28 | 1803.95 | 901.98 | 2502.46 | 1253.09 | 29.08 | -4.252 | 0.000 | 0.858 |
| 73.00 | -11.28 | -18.28 | 0.00 | -1010.6 | 0.00 | 1010.69 | 1782.92 | 891.46 | 2427.38 | 1215.49 | 31.82 | -4.482 | 0.000 | 0.838 |
| 75.00 | -10.98 | -18.16 | 0.00 | -974.14 | 0.00 | 974.14 | 1768.64 | 884.32 | 2377.59 | 1190.56 | 33.73 | -4.637 | 0.000 | 0.825 |
| 80.00 | -10.36 | -17.82 | 0.00 | -883.32 | 0.00 | 883.32 | 1732.06 | 866.03 | 2254.10 | 1128.72 | 38.79 | -5.014 | 0.000 | 0.789 |
| 85.00 | -9.76 | -17.48 | 0.00 | -794.20 | 0.00 | 794.20 | 1694.20 | 847.10 | 2132.15 | 1067.66 | 44.23 | -5.389 | 0.000 | 0.750 |
| 90.00 | -9.18 | -17.14 | 0.00 | -706.78 | 0.00 | 706.78 | 1655.08 | 827.54 | 2011.90 | 1007.44 | 50.06 | -5.759 | 0.000 | 0.708 |
| 95.00 | -8.65 | -16.79 | 0.00 | -621.06 | 0.00 | 621.06 | 1614.68 | 807.34 | 1893.51 | 948.16 | 56.28 | -6.122 | 0.000 | 0.661 |
| 96.18 | -8.49 | -16.72 | 0.00 | -601.31 | 0.00 | 601.31 | 1604.99 | 802.49 | 1865.94 | 934.36 | 57.80 | -6.210 | 0.000 | 0.649 |
| 100.00 | -7.92 | -16.42 | 0.00 | -537.38 | 0.00 | 537.38 | 1573.01 | 786.50 | 1777.16 | 889.90 | 62.87 | -6.482 | 0.000 | 0.609 |
| 100.34 | -7.82 | -16.41 | 0.00 | -531.74 | 0.00 | 531.74 | 1075.68 | 537.84 | 1234.34 | 618.09 | 63.34 | -6.507 | 0.000 | 0.868 |
| 105.00 | -7.39 | -16.10 | 0.00 | -455.30 | 0.00 | 455.30 | 1053.86 | 526.93 | 1167.20 | 584.47 | 69.83 | -6.822 | 0.000 | 0.787 |
| 110.00 | -6.94 | -15.78 | 0.00 | -374.80 | 0.00 | 374.80 | 1029.21 | 514.60 | 1095.73 | 548.68 | 77.18 | -7.224 | 0.000 | 0.691 |
| 115.00 | -5.26 | -12.66 | 0.00 | -295.90 | 0.00 | 295.90 | 1003.28 | 501.64 | 1025.09 | 513.31 | 84.92 | -7.589 | 0.000 | 0.582 |
| 120.00 | -4.89 | -12.34 | 0.00 | -232.61 | 0.00 | 232.61 | 976.09 | 488.04 | 955.42 | 478.42 | 93.03 | -7.915 | 0.000 | 0.492 |
| 125.00 | -4.54 | -12.02 | 0.00 | -170.91 | 0.00 | 170.91 | 947.62 | 473.81 | 886.90 | 444.11 | 101.45 | -8.197 | 0.000 | 0.390 |
| 128.00 | -2.91 | -8.50 | 0.00 | -134.86 | 0.00 | 134.86 | 929.93 | 464.96 | 846.40 | 423.83 | 106.63 | -8.344 | 0.000 | 0.322 |
| 130.00 | -2.80 | -8.38 | 0.00 | -117.85 | 0.00 | 117.85 | 917.88 | 458.94 | 819.69 | 410.45 | 110.13 | -8.432 | 0.000 | 0.291 |
| 135.00 | -2.56 | -8.08 | 0.00 | -75.94 | 0.00 | 75.94 | 886.87 | 443.43 | 753.94 | 377.53 | 119.03 | -8.610 | 0.000 | 0.204 |
| 138.00 | -1.66 | -4.65 | 0.00 | -51.69 | 0.00 | 51.69 | 867.65 | 433.83 | 715.27 | 358.17 | 124.45 | -8.691 | 0.000 | 0.146 |
| 140.00 | -1.59 | -4.54 | 0.00 | -42.39 | 0.00 | 42.39 | 854.59 | 427.29 | 689.83 | 345.43 | 128.09 | -8.735 | 0.000 | 0.125 |
| 145.00 | -1.43 | -4.27 | 0.00 | -19.70 | 0.00 | 19.70 | 821.03 | 410.52 | 627.52 | 314.23 | 137.24 | -8.812 | 0.000 | 0.065 |
| 149.00 | 0.00 | -4.00 | 0.00 | -2.64 | 0.00 | 2.64 | 787.55 | 393.77 | 574.90 | 287.88 | 144.61 | -8.838 | 0.000 | 0.009 |

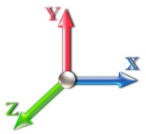
# Wind Loading - Shaft

| | | | | | |
|---|---|---|---|---|---|
| **Structure:** | CT12215-A-SBA | **Code:** | EIA/TIA-222-G | 3/21/2017 | |
| **Site Name:** | Litchfield 3, CT | **Exposure:** | C | | |
| **Height:** | 149.00 (ft) | **Crest Height:** | 0.00 | | |
| **Base Elev:** | 0.000 (ft) | **Site Class:** | B - Competent Rock | | |
| **Gh:** | 1.1 **Topography:** 1 | **Struct Class:** | II | Page: 21 | |

**Load Case:** 1.2D + 1.0Di + 1.0Wi 40 mph Wind

**Dead Load Factor** 1.20

**Wind Load Factor** 1.00




**Iterations** 27

| Elev (ft) | Description | Kzt | Kz | qz (psf) | qzGh (psf) | C (mph-ft) | Cf | Ice Thick (in) | Tributary (ft) | Aa (sf) | CfAa (sf) | Wind Force X (lb) | Dead Load Ice (lb) | Tot Dead Load (lb) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.00 | | 1.00 | 0.85 | 3.308 | 3.64 | 0.00 | 1.200 | 0.000 | 0.00 | 0.000 | 0.00 | 0.0 | 0.0 | 0.0 |
| 5.00 | | 1.00 | 0.85 | 3.308 | 3.64 | 0.00 | 1.200 | 1.656 | 5.00 | 21.469 | 25.76 | 93.7 | 504.3 | 1459.5 |
| 10.00 | | 1.00 | 0.85 | 3.308 | 3.64 | 0.00 | 1.200 | 1.775 | 5.00 | 21.130 | 25.36 | 92.3 | 530.3 | 1464.5 |
| 15.00 | | 1.00 | 0.85 | 3.308 | 3.64 | 0.00 | 1.200 | 1.848 | 5.00 | 20.753 | 24.90 | 90.6 | 541.1 | 1454.3 |
| 20.00 | | 1.00 | 0.90 | 3.509 | 3.86 | 0.00 | 1.200 | 1.902 | 5.00 | 20.360 | 24.43 | 94.3 | 545.1 | 1437.4 |
| 25.00 | | 1.00 | 0.95 | 3.678 | 4.05 | 0.00 | 1.200 | 1.945 | 5.00 | 19.957 | 23.95 | 96.9 | 545.3 | 1416.6 |
| 30.00 | | 1.00 | 0.98 | 3.822 | 4.20 | 0.00 | 1.200 | 1.981 | 5.00 | 19.548 | 23.46 | 98.6 | 542.9 | 1393.2 |
| 35.00 | | 1.00 | 1.01 | 3.948 | 4.34 | 0.00 | 1.200 | 2.012 | 5.00 | 19.136 | 22.96 | 99.7 | 538.7 | 1368.0 |
| 40.00 | | 1.00 | 1.04 | 4.061 | 4.47 | 0.00 | 1.200 | 2.039 | 5.00 | 18.720 | 22.46 | 100.3 | 533.0 | 1341.4 |
| 45.00 | | 1.00 | 1.07 | 4.163 | 4.58 | 0.00 | 1.200 | 2.063 | 5.00 | 18.302 | 21.96 | 100.6 | 526.3 | 1313.6 |
| 47.55 | Bot - Section 2 | 1.00 | 1.08 | 4.211 | 4.63 | 0.00 | 1.200 | 2.074 | 2.55 | 9.182 | 11.02 | 51.0 | 266.8 | 660.8 |
| 50.00 | Appurtenance(s) | 1.00 | 1.09 | 4.256 | 4.68 | 0.00 | 1.200 | 2.085 | 2.45 | 8.799 | 10.56 | 49.4 | 257.0 | 931.7 |
| 52.97 | Top - Section 1 | 1.00 | 1.11 | 4.308 | 4.74 | 0.00 | 1.200 | 2.097 | 2.97 | 10.546 | 12.65 | 60.0 | 309.0 | 1115.9 |
| 55.00 | | 1.00 | 1.12 | 4.342 | 4.78 | 0.00 | 1.200 | 2.105 | 2.03 | 7.122 | 8.55 | 40.8 | 209.8 | 453.6 |
| 60.00 | | 1.00 | 1.14 | 4.423 | 4.86 | 0.00 | 1.200 | 2.123 | 5.00 | 17.248 | 20.70 | 100.7 | 507.7 | 1096.3 |
| 65.00 | | 1.00 | 1.16 | 4.498 | 4.95 | 0.00 | 1.200 | 2.140 | 5.00 | 16.824 | 20.19 | 99.9 | 498.1 | 1070.0 |
| 70.00 | | 1.00 | 1.17 | 4.569 | 5.03 | 0.00 | 1.200 | 2.156 | 5.00 | 16.399 | 19.68 | 98.9 | 488.0 | 1043.1 |
| 73.00 | Appurtenance(s) | 1.00 | 1.18 | 4.609 | 5.07 | 0.00 | 1.200 | 2.165 | 3.00 | 9.634 | 11.56 | 58.6 | 289.1 | 614.0 |
| 75.00 | | 1.00 | 1.19 | 4.635 | 5.10 | 0.00 | 1.200 | 2.171 | 2.00 | 6.337 | 7.60 | 38.8 | 191.0 | 404.3 |
| 80.00 | | 1.00 | 1.21 | 4.699 | 5.17 | 0.00 | 1.200 | 2.185 | 5.00 | 15.547 | 18.66 | 96.4 | 466.6 | 988.1 |
| 85.00 | | 1.00 | 1.22 | 4.759 | 5.24 | 0.00 | 1.200 | 2.198 | 5.00 | 15.119 | 18.14 | 95.0 | 455.4 | 960.1 |
| 90.00 | | 1.00 | 1.24 | 4.817 | 5.30 | 0.00 | 1.200 | 2.211 | 5.00 | 14.691 | 17.63 | 93.4 | 443.8 | 931.7 |
| 95.00 | | 1.00 | 1.25 | 4.872 | 5.36 | 0.00 | 1.200 | 2.223 | 5.00 | 14.263 | 17.12 | 91.7 | 431.9 | 903.1 |
| 96.18 | Bot - Section 3 | 1.00 | 1.26 | 4.885 | 5.37 | 0.00 | 1.200 | 2.226 | 1.18 | 3.293 | 3.95 | 21.2 | 101.0 | 209.4 |
| 100.00 | | 1.00 | 1.27 | 4.925 | 5.42 | 0.00 | 1.215 * | 2.234 | 3.82 | 10.660 | 12.95 | 70.2 | 325.0 | 934.4 |
| 100.34 | Top - Section 2 | 1.00 | 1.27 | 4.928 | 5.42 | 0.00 | 1.255 * | 2.235 | 0.34 | 0.945 | 1.19 | 6.4 | 29.1 | 83.0 |
| 105.00 | | 1.00 | 1.28 | 4.976 | 5.47 | 0.00 | 1.257 * | 2.245 | 4.66 | 12.618 | 15.87 | 86.8 | 384.4 | 694.5 |
| 110.00 | | 1.00 | 1.29 | 5.025 | 5.53 | 0.00 | 1.200 | 2.256 | 5.00 | 13.134 | 15.76 | 87.1 | 400.1 | 721.0 |
| 115.00 | Appurtenance(s) | 1.00 | 1.30 | 5.072 | 5.58 | 0.00 | 1.200 | 2.266 | 5.00 | 12.704 | 15.24 | 85.1 | 387.3 | 695.6 |
| 120.00 | | 1.00 | 1.32 | 5.117 | 5.63 | 0.00 | 1.200 | 2.276 | 5.00 | 12.274 | 14.73 | 82.9 | 374.3 | 670.1 |
| 125.00 | | 1.00 | 1.33 | 5.162 | 5.68 | 0.00 | 1.200 | 2.285 | 5.00 | 11.843 | 14.21 | 80.7 | 361.2 | 644.3 |
| 128.00 | Appurtenance(s) | 1.00 | 1.33 | 5.187 | 5.71 | 0.00 | 1.200 | 2.290 | 3.00 | 6.898 | 8.28 | 47.2 | 211.9 | 375.7 |
| 130.00 | | 1.00 | 1.34 | 5.204 | 5.72 | 0.00 | 1.200 | 2.294 | 2.00 | 4.512 | 5.41 | 31.0 | 139.1 | 245.8 |
| 135.00 | | 1.00 | 1.35 | 5.246 | 5.77 | 0.00 | 1.200 | 2.303 | 5.00 | 10.981 | 13.18 | 76.0 | 334.3 | 592.3 |
| 138.00 | Appurtenance(s) | 1.00 | 1.35 | 5.270 | 5.80 | 0.00 | 1.200 | 2.308 | 3.00 | 6.381 | 7.66 | 44.4 | 195.7 | 344.4 |
| 140.00 | | 1.00 | 1.36 | 5.286 | 5.81 | 0.00 | 1.200 | 2.311 | 2.00 | 4.167 | 5.00 | 29.1 | 128.3 | 224.9 |
| 145.00 | | 1.00 | 1.37 | 5.325 | 5.86 | 0.00 | 1.200 | 2.319 | 5.00 | 10.118 | 12.14 | 71.1 | 306.8 | 539.6 |
| 149.00 | Appurtenance(s) | 1.00 | 1.38 | 5.356 | 5.89 | 0.00 | 1.200 | 2.325 | 4.00 | 7.783 | 9.34 | 55.0 | 236.5 | 413.7 |
| | | | | | | | | **Totals:** | **149.00** | | | **2,716.1** | | **31,210.1** |

* Cf Adjusted by Linear Load Ra Effect

# Discrete Appurtenance Forces

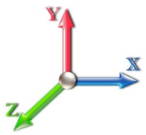
| | | | | | |
|---|---|---|---|---|---|
| **Structure:** | CT12215-A-SBA | **Code:** | EIA/TIA-222-G | 3/21/2017 | |
| **Site Name:** | Litchfield 3, CT | **Exposure:** | C | | |
| **Height:** | 149.00 (ft) | **Crest Height:** | 0.00 | | |
| **Base Elev:** | 0.000 (ft) | **Site Class:** | B - Competent Rock | | |
| **Gh:** | 1.1 **Topography:** 1 | **Struct Class:** | II | Page: 22 | |

Tower Engineering Solutions

**Load Case:** 1.2D + 1.0Di + 1.0Wi 40 mph Wind

**Dead Load Factor** 1.20

**Wind Load Factor** 1.00




**Iterations** 27

| No. | Elev (ft) | Description | Qty | qz (psf) | qzGh (psf) | CaAa x Ka | Ka | Total CaAa (sf) | Dead Load (lb) | Horiz Ecc (ft) | Vert Ecc (ft) | Wind FX (lb) | Mom Y (lb-ft) | Mom Z (lb-ft) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 149.00 | 800MHZ | 3 | 5.364 | 5.900 | 0.87 | 1.00 | 10.92 | 458.81 | 0.000 | 1.000 | 64.40 | 0.00 | 64.40 |
| 2 | 149.00 | APXVSPP18-C-A20 | 3 | 5.364 | 5.900 | 0.83 | 1.00 | 29.24 | 747.64 | 0.000 | 1.000 | 172.51 | 0.00 | 172.51 |
| 3 | 149.00 | APXVTM14-C-I20 | 3 | 5.364 | 5.900 | 0.79 | 1.00 | 18.62 | 886.54 | 0.000 | 1.000 | 109.84 | 0.00 | 109.84 |
| 4 | 149.00 | 1900MHz | 3 | 5.364 | 5.900 | 0.50 | 1.00 | 6.69 | 477.82 | 0.000 | 1.000 | 39.47 | 0.00 | 39.47 |
| 5 | 149.00 | Low Profile Platform | 1 | 5.356 | 5.892 | 1.00 | 1.00 | 52.90 | 2535.24 | 0.000 | 0.000 | 311.70 | 0.00 | 0.00 |
| 6 | 149.00 | TD-RRH8x20-25 | 3 | 5.364 | 5.900 | 0.69 | 1.00 | 10.68 | 724.79 | 0.000 | 1.000 | 63.03 | 0.00 | 63.03 |
| 7 | 149.00 | 800MHz Filter | 3 | 5.364 | 5.900 | 0.69 | 1.00 | 3.40 | 87.21 | 0.000 | 1.000 | 20.05 | 0.00 | 20.05 |
| 8 | 149.00 | ACU-A20-N | 4 | 5.364 | 5.900 | 0.79 | 1.00 | 1.69 | 22.50 | 0.000 | 1.000 | 9.98 | 0.00 | 9.98 |
| 9 | 138.00 | Low Profile Platform | 1 | 5.270 | 5.797 | 1.00 | 1.00 | 52.69 | 2524.58 | 0.000 | 0.000 | 305.47 | 0.00 | 0.00 |
| 10 | 138.00 | FD9R6004/2C-3L | 6 | 5.270 | 5.797 | 0.54 | 0.80 | 3.04 | 72.20 | 0.000 | 0.000 | 17.64 | 0.00 | 0.00 |
| 11 | 138.00 | GPS Receiver | 1 | 5.270 | 5.797 | 1.00 | 1.00 | 1.94 | 42.77 | 0.000 | 0.000 | 11.26 | 0.00 | 0.00 |
| 12 | 138.00 | BXA-171085-12B_2 | 3 | 5.270 | 5.797 | 0.67 | 0.80 | 15.82 | 348.98 | 0.000 | 0.000 | 91.70 | 0.00 | 0.00 |
| 13 | 138.00 | BXA-70063-6CF_2 | 3 | 5.270 | 5.797 | 0.58 | 0.80 | 16.25 | 800.36 | 0.000 | 0.000 | 94.21 | 0.00 | 0.00 |
| 14 | 138.00 | LPA-80080/6CF | 3 | 5.270 | 5.797 | 1.36 | 0.80 | 24.22 | 898.19 | 0.000 | 0.000 | 140.44 | 0.00 | 0.00 |
| 15 | 128.00 | Low Profile Platform | 1 | 5.187 | 5.706 | 1.00 | 1.00 | 52.48 | 2514.20 | 0.000 | 0.000 | 299.49 | 0.00 | 0.00 |
| 16 | 128.00 | DC6-48-60-18-8F | 1 | 5.187 | 5.706 | 1.00 | 1.00 | 1.49 | 101.60 | 0.000 | 0.000 | 8.53 | 0.00 | 0.00 |
| 17 | 128.00 | RRUS-11 | 6 | 5.187 | 5.706 | 0.57 | 0.80 | 11.42 | 840.28 | 0.000 | 0.000 | 65.17 | 0.00 | 0.00 |
| 18 | 128.00 | LGP 21401 | 12 | 5.187 | 5.706 | 0.40 | 0.80 | 6.65 | 758.35 | 0.000 | 0.000 | 37.97 | 0.00 | 0.00 |
| 19 | 128.00 | AM-X-CD-16-65-00T-RET | 3 | 5.187 | 5.706 | 0.60 | 0.80 | 21.04 | 674.00 | 0.000 | 0.000 | 120.03 | 0.00 | 0.00 |
| 20 | 128.00 | 7770.00 | 6 | 5.187 | 5.706 | 0.58 | 0.80 | 24.27 | 1393.16 | 0.000 | 0.000 | 138.49 | 0.00 | 0.00 |
| 21 | 128.00 | ABT-DF-DM-ADBH | 1 | 5.187 | 5.706 | 1.00 | 1.00 | 0.30 | 3.55 | 0.000 | 0.000 | 1.73 | 0.00 | 0.00 |
| 22 | 115.00 | RRUS 11 (Band 4) | 3 | 5.072 | 5.579 | 0.57 | 0.80 | 5.70 | 417.11 | 0.000 | 0.000 | 31.77 | 0.00 | 0.00 |
| 23 | 115.00 | LNX-6515DS-A1M | 3 | 5.072 | 5.579 | 0.64 | 0.80 | 30.17 | 876.01 | 0.000 | 0.000 | 168.30 | 0.00 | 0.00 |
| 24 | 115.00 | APX16DWV-16DWVS-E- | 3 | 5.072 | 5.579 | 0.50 | 0.80 | 14.04 | 501.97 | 0.000 | 0.000 | 78.35 | 0.00 | 0.00 |
| 25 | 115.00 | T-Arm | 3 | 5.072 | 5.579 | 0.56 | 0.75 | 28.80 | 2001.69 | 0.000 | 0.000 | 160.65 | 0.00 | 0.00 |
| 26 | 115.00 | RRUS 11 (Band 12) | 3 | 5.072 | 5.579 | 0.62 | 0.80 | 6.26 | 401.62 | 0.000 | 0.000 | 34.91 | 0.00 | 0.00 |
| 27 | 115.00 | RRUS 11 | 3 | 5.072 | 5.579 | 0.54 | 0.80 | 5.45 | 565.69 | 0.000 | 0.000 | 30.40 | 0.00 | 0.00 |
| 28 | 73.00 | GPS Receiver | 1 | 4.609 | 5.070 | 1.00 | 1.00 | 1.88 | 40.38 | 0.000 | 0.000 | 9.55 | 0.00 | 0.00 |
| 29 | 50.00 | 58532A | 1 | 4.256 | 4.682 | 1.00 | 1.00 | 0.66 | 7.64 | 0.000 | 0.000 | 3.10 | 0.00 | 0.00 |
| | | | | | | | **Totals:** | | **21,724.87** | | | **2,640.13** | | |

# Total Applied Force Summary

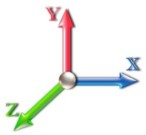
| | | | | | |
|---|---|---|---|---|---|
| **Structure:** | CT12215-A-SBA | | **Code:** | EIA/TIA-222-G | 3/21/2017 |
| **Site Name:** | Litchfield 3, CT | | **Exposure:** | C | |
| **Height:** | 149.00 (ft) | | **Crest Height:** | 0.00 | |
| **Base Elev:** | 0.000 (ft) | | **Site Class:** | B - Competent Rock | |
| **Gh:** | 1.1 | **Topography:** 1 | **Struct Class:** | II | Page: 23 |

Tower Engineering Solutions

**Load Case:** 1.2D + 1.0Di + 1.0Wi 40 mph Wind

**Dead Load Factor** 1.20

**Wind Load Factor** 1.00




**Iterations** 27

| Elev (ft) | Description | Lateral FX (-) (lb) | Axial FY (-) (lb) | Torsion MY (lb-ft) | Moment MZ (lb-ft) |
|---|---|---|---|---|---|
| 0.00 | | 0.00 | 0.00 | 0.00 | 0.00 |
| 5.00 | | 93.73 | 1721.56 | 0.00 | 0.00 |
| 10.00 | | 92.25 | 1733.69 | 0.00 | 0.00 |
| 15.00 | | 90.61 | 1728.07 | 0.00 | 0.00 |
| 20.00 | | 94.31 | 1714.61 | 0.00 | 0.00 |
| 25.00 | | 96.90 | 1696.61 | 0.00 | 0.00 |
| 30.00 | | 98.63 | 1675.60 | 0.00 | 0.00 |
| 35.00 | | 99.73 | 1652.43 | 0.00 | 0.00 |
| 40.00 | | 100.34 | 1627.62 | 0.00 | 0.00 |
| 45.00 | | 100.56 | 1601.52 | 0.00 | 0.00 |
| 47.55 | | 51.04 | 808.20 | 0.00 | 0.00 |
| 50.00 | (1) attachments | 52.53 | 1080.96 | 0.00 | 0.00 |
| 52.97 | | 59.97 | 1303.85 | 0.00 | 0.00 |
| 55.00 | | 40.82 | 582.27 | 0.00 | 0.00 |
| 60.00 | | 100.69 | 1414.84 | 0.00 | 0.00 |
| 65.00 | | 99.89 | 1389.87 | 0.00 | 0.00 |
| 70.00 | | 98.89 | 1364.31 | 0.00 | 0.00 |
| 73.00 | (1) attachments | 68.16 | 847.60 | 0.00 | 0.00 |
| 75.00 | | 38.77 | 532.90 | 0.00 | 0.00 |
| 80.00 | | 96.43 | 1272.98 | 0.00 | 0.00 |
| 85.00 | | 94.98 | 1220.30 | 0.00 | 0.00 |
| 90.00 | | 93.41 | 1192.48 | 0.00 | 0.00 |
| 95.00 | | 91.72 | 1164.34 | 0.00 | 0.00 |
| 96.18 | | 21.23 | 270.93 | 0.00 | 0.00 |
| 100.00 | | 70.17 | 1173.63 | 0.00 | 0.00 |
| 100.34 | | 6.43 | 105.46 | 0.00 | 0.00 |
| 105.00 | | 86.84 | 999.78 | 0.00 | 0.00 |
| 110.00 | | 87.11 | 983.71 | 0.00 | 0.00 |
| 115.00 | (18) attachments | 589.42 | 5722.87 | 0.00 | 0.00 |
| 120.00 | | 82.91 | 850.04 | 0.00 | 0.00 |
| 125.00 | | 80.69 | 824.28 | 0.00 | 0.00 |
| 128.00 | (30) attachments | 718.64 | 6768.87 | 0.00 | 0.00 |
| 130.00 | | 31.00 | 285.33 | 0.00 | 0.00 |
| 135.00 | | 76.04 | 691.01 | 0.00 | 0.00 |
| 138.00 | (17) attachments | 705.10 | 5090.73 | 0.00 | 0.00 |
| 140.00 | | 29.08 | 234.05 | 0.00 | 0.00 |
| 145.00 | | 71.13 | 562.51 | 0.00 | 0.00 |
| 149.00 | (23) attachments | 846.01 | 6372.57 | 0.00 | 479.29 |
| | **Totals:** | **5,356.19** | **60,262.41** | **0.00** | **479.29** |

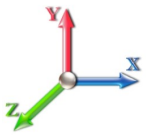
# Linear Appurtenance Segment Forces (Factored)

| | | | | | |
|---|---|---|---|---|---|
| **Structure:** | CT12215-A-SBA | **Code:** | EIA/TIA-222-G | 3/21/2017 | |
| **Site Name:** | Litchfield 3, CT | **Exposure:** | C | | |
| **Height:** | 149.00 (ft) | **Crest Height:** | 0.00 | | |
| **Base Elev:** | 0.000 (ft) | **Site Class:** | B - Competent Rock | | |
| **Gh:** | 1.1 **Topography:** 1 | **Struct Class:** | II | Page: 24 | |

**Load Case:** 1.2D + 1.0Di + 1.0Wi 40 mph Wind

**Dead Load Factor** 1.20

**Wind Load Factor** 1.00




**Iterations** 27

| Top Elev (ft) | Description | Wind Exposed | Length (ft) | Ca | Exposed Width (in) | Area (sqft) | CaAa (sqft) | Ra | Cf Adjust Factor | qz (psf) | F X (lb) | Dead Load (lb) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5.00 | 1 5/8" Hybrid | Yes | 5.00 | 0.000 | 2.00 | 2.21 | 0.00 | 0.055 | 0.000 | 3.308 | 0.00 | 59.05 |
| 5.00 | 1/2" Coax | Yes | 5.00 | 0.000 | 0.65 | 1.65 | 0.00 | 0.055 | 0.000 | 3.308 | 0.00 | 22.08 |
| 10.00 | 1 5/8" Hybrid | Yes | 5.00 | 0.000 | 2.00 | 2.31 | 0.00 | 0.056 | 0.000 | 3.308 | 0.00 | 63.39 |
| 10.00 | 1/2" Coax | Yes | 5.00 | 0.000 | 0.65 | 1.75 | 0.00 | 0.056 | 0.000 | 3.308 | 0.00 | 24.87 |
| 15.00 | 1 5/8" Hybrid | Yes | 5.00 | 0.000 | 2.00 | 2.37 | 0.00 | 0.057 | 0.000 | 3.308 | 0.00 | 66.16 |
| 15.00 | 1/2" Coax | Yes | 5.00 | 0.000 | 0.65 | 1.81 | 0.00 | 0.057 | 0.000 | 3.308 | 0.00 | 26.68 |
| 20.00 | 1 5/8" Hybrid | Yes | 5.00 | 0.000 | 2.00 | 2.42 | 0.00 | 0.059 | 0.000 | 3.509 | 0.00 | 68.24 |
| 20.00 | 1/2" Coax | Yes | 5.00 | 0.000 | 0.65 | 1.86 | 0.00 | 0.059 | 0.000 | 3.509 | 0.00 | 28.05 |
| 25.00 | 1 5/8" Hybrid | Yes | 5.00 | 0.000 | 2.00 | 2.45 | 0.00 | 0.060 | 0.000 | 3.678 | 0.00 | 69.91 |
| 25.00 | 1/2" Coax | Yes | 5.00 | 0.000 | 0.65 | 1.89 | 0.00 | 0.060 | 0.000 | 3.678 | 0.00 | 29.17 |
| 30.00 | 1 5/8" Hybrid | Yes | 5.00 | 0.000 | 2.00 | 2.48 | 0.00 | 0.062 | 0.000 | 3.822 | 0.00 | 71.33 |
| 30.00 | 1/2" Coax | Yes | 5.00 | 0.000 | 0.65 | 1.92 | 0.00 | 0.062 | 0.000 | 3.822 | 0.00 | 30.12 |
| 35.00 | 1 5/8" Hybrid | Yes | 5.00 | 0.000 | 2.00 | 2.51 | 0.00 | 0.063 | 0.000 | 3.948 | 0.00 | 72.56 |
| 35.00 | 1/2" Coax | Yes | 5.00 | 0.000 | 0.65 | 1.95 | 0.00 | 0.063 | 0.000 | 3.948 | 0.00 | 30.95 |
| 40.00 | 1 5/8" Hybrid | Yes | 5.00 | 0.000 | 2.00 | 2.53 | 0.00 | 0.065 | 0.000 | 4.061 | 0.00 | 73.65 |
| 40.00 | 1/2" Coax | Yes | 5.00 | 0.000 | 0.65 | 1.97 | 0.00 | 0.065 | 0.000 | 4.061 | 0.00 | 31.68 |
| 45.00 | 1 5/8" Hybrid | Yes | 5.00 | 0.000 | 2.00 | 2.55 | 0.00 | 0.067 | 0.000 | 4.163 | 0.00 | 74.63 |
| 45.00 | 1/2" Coax | Yes | 5.00 | 0.000 | 0.65 | 1.99 | 0.00 | 0.067 | 0.000 | 4.163 | 0.00 | 32.35 |
| 47.55 | 1 5/8" Hybrid | Yes | 2.55 | 0.000 | 2.00 | 1.31 | 0.00 | 0.068 | 0.000 | 4.211 | 0.00 | 38.35 |
| 47.55 | 1/2" Coax | Yes | 2.55 | 0.000 | 0.65 | 1.02 | 0.00 | 0.068 | 0.000 | 4.211 | 0.00 | 16.68 |
| 50.00 | 1 5/8" Hybrid | Yes | 2.45 | 0.000 | 2.00 | 1.26 | 0.00 | 0.069 | 0.000 | 4.256 | 0.00 | 36.96 |
| 50.00 | 1/2" Coax | Yes | 2.45 | 0.000 | 0.65 | 0.98 | 0.00 | 0.069 | 0.000 | 4.256 | 0.00 | 16.13 |
| 52.97 | 1 5/8" Hybrid | Yes | 2.97 | 0.000 | 2.00 | 1.53 | 0.00 | 0.086 | 0.000 | 4.308 | 0.00 | 45.15 |
| 52.97 | 1.25" Reinforcing | Yes | 2.97 | 0.000 | 1.25 | 1.35 | 0.00 | 0.086 | 0.000 | 4.308 | 0.00 | 35.28 |
| 55.00 | 1 5/8" Hybrid | Yes | 2.03 | 0.000 | 2.00 | 1.05 | 0.00 | 0.086 | 0.000 | 4.342 | 0.00 | 31.00 |
| 55.00 | 1.25" Reinforcing | Yes | 2.03 | 0.000 | 1.25 | 0.92 | 0.00 | 0.086 | 0.000 | 4.342 | 0.00 | 24.24 |
| 60.00 | 1 5/8" Hybrid | Yes | 5.00 | 0.000 | 2.00 | 2.60 | 0.00 | 0.087 | 0.000 | 4.423 | 0.00 | 77.10 |
| 60.00 | 1.25" Reinforcing | Yes | 5.00 | 0.000 | 1.25 | 2.29 | 0.00 | 0.087 | 0.000 | 4.423 | 0.00 | 60.46 |
| 65.00 | 1 5/8" Hybrid | Yes | 5.00 | 0.000 | 2.00 | 2.62 | 0.00 | 0.090 | 0.000 | 4.498 | 0.00 | 77.81 |
| 65.00 | 1.25" Reinforcing | Yes | 5.00 | 0.000 | 1.25 | 2.30 | 0.00 | 0.090 | 0.000 | 4.498 | 0.00 | 61.15 |
| 70.00 | 1 5/8" Hybrid | Yes | 5.00 | 0.000 | 2.00 | 2.63 | 0.00 | 0.093 | 0.000 | 4.569 | 0.00 | 78.48 |
| 70.00 | 1.25" Reinforcing | Yes | 5.00 | 0.000 | 1.25 | 2.32 | 0.00 | 0.093 | 0.000 | 4.569 | 0.00 | 61.80 |
| 73.00 | 1 5/8" Hybrid | Yes | 3.00 | 0.000 | 2.00 | 1.58 | 0.00 | 0.095 | 0.000 | 4.609 | 0.00 | 47.32 |
| 73.00 | 1.25" Reinforcing | Yes | 3.00 | 0.000 | 1.25 | 1.40 | 0.00 | 0.095 | 0.000 | 4.609 | 0.00 | 37.30 |
| 75.00 | 1 5/8" Hybrid | Yes | 2.00 | 0.000 | 2.00 | 1.06 | 0.00 | 0.097 | 0.000 | 4.635 | 0.00 | 31.64 |
| 75.00 | 1.25" Reinforcing | Yes | 2.00 | 0.000 | 1.25 | 0.93 | 0.00 | 0.097 | 0.000 | 4.635 | 0.00 | 24.97 |
| 80.00 | 1 5/8" Hybrid | Yes | 5.00 | 0.000 | 2.00 | 2.65 | 0.00 | 0.076 | 0.000 | 4.699 | 0.00 | 79.70 |
| 80.00 | 1.25" Reinforcing | Yes | 2.00 | 0.000 | 1.25 | 0.94 | 0.00 | 0.076 | 0.000 | 4.699 | 0.00 | 25.20 |
| 85.00 | 1 5/8" Hybrid | Yes | 5.00 | 0.000 | 2.00 | 2.67 | 0.00 | 0.063 | 0.000 | 4.759 | 0.00 | 80.26 |
| 90.00 | 1 5/8" Hybrid | Yes | 5.00 | 0.000 | 2.00 | 2.68 | 0.00 | 0.065 | 0.000 | 4.817 | 0.00 | 80.80 |
| 95.00 | 1 5/8" Hybrid | Yes | 5.00 | 0.000 | 2.00 | 2.69 | 0.00 | 0.067 | 0.000 | 4.872 | 0.00 | 81.31 |
| 96.18 | 1 5/8" Hybrid | Yes | 1.18 | 0.000 | 2.00 | 0.63 | 0.00 | 0.069 | 0.000 | 4.885 | 0.00 | 19.16 |
| 100.00 | 1 5/8" Hybrid | Yes | 3.82 | 0.000 | 2.00 | 2.06 | 0.00 | 0.104 | 1.013 | 4.925 | 0.00 | 62.55 |
| 100.00 | 1.25" Reinforcing | Yes | 3.00 | 0.000 | 1.25 | 1.43 | 0.00 | 0.104 | 1.013 | 4.925 | 0.00 | 39.03 |
| 100.34 | 1 5/8" Hybrid | Yes | 0.34 | 0.000 | 2.00 | 0.19 | 0.00 | 0.115 | 1.046 | 4.928 | 0.00 | 5.62 |
| 100.34 | 1.25" Reinforcing | Yes | 0.34 | 0.000 | 1.25 | 0.16 | 0.00 | 0.115 | 1.046 | 4.928 | 0.00 | 4.47 |
| 105.00 | 1 5/8" Hybrid | Yes | 4.66 | 0.000 | 2.00 | 2.52 | 0.00 | 0.116 | 1.048 | 4.976 | 0.00 | 76.62 |

# Linear Appurtenance Segment Forces (Factored)

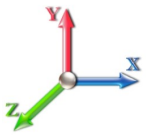
| | | | | | |
|---|---|---|---|---|---|
| **Structure:** | CT12215-A-SBA | **Code:** | EIA/TIA-222-G | 3/21/2017 | |
| **Site Name:** | Litchfield 3, CT | **Exposure:** | C | | |
| **Height:** | 149.00 (ft) | **Crest Height:** | 0.00 | | |
| **Base Elev:** | 0.000 (ft) | **Site Class:** | B - Competent Rock | | |
| **Gh:** | 1.1 **Topography:** 1 | **Struct Class:** | II | Page: 25 | |

Tower Engineering Solutions

**Load Case:** 1.2D + 1.0Di + 1.0Wi 40 mph Wind

**Dead Load Factor** 1.20

**Wind Load Factor** 1.00




**Iterations** 27

| Top Elev (ft) | Description | Wind Exposed | Length (ft) | Ca | Exposed Width (in) | Area (sqft) | CaAa (sqft) | Ra | Cf Adjust Factor | qz (psf) | F X (lb) | Dead Load (lb) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 105.00 | 1.25" Reinforcing | Yes | 4.66 | 0.000 | 1.25 | 2.23 | 0.00 | 0.116 | 1.048 | 4.976 | 0.00 | 61.00 |
| 110.00 | 1 5/8" Hybrid | Yes | 5.00 | 0.000 | 2.00 | 2.71 | 0.00 | 0.074 | 0.000 | 5.025 | 0.00 | 82.72 |
| 115.00 | 1 5/8" Hybrid | Yes | 5.00 | 0.000 | 2.00 | 2.72 | 0.00 | 0.077 | 0.000 | 5.072 | 0.00 | 83.15 |
| | | | | | | | | | | **Totals:** | **0.0** | **2,458.2** |

# Calculated Forces

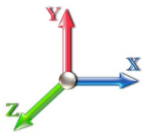
| | | | | | |
|---|---|---|---|---|---|
| **Structure:** | CT12215-A-SBA | **Code:** | EIA/TIA-222-G | 3/21/2017 | |
| **Site Name:** | Litchfield 3, CT | **Exposure:** | C | | |
| **Height:** | 149.00 (ft) | **Crest Height:** | 0.00 | | |
| **Base Elev:** | 0.000 (ft) | **Site Class:** | B - Competent Rock | | |
| **Gh:** | 1.1 **Topography:** 1 | **Struct Class:** | II | Page: 26 | |

Tower Engineering Solutions

**Load Case:** 1.2D + 1.0Di + 1.0Wi 40 mph Wind

**Dead Load Factor** 1.20

**Wind Load Factor** 1.00




**Iterations** 27

| 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 Sway (deg) | Rotation Twist (deg) | Stress Ratio |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.00 | -60.26 | -5.39 | 0.00 | -636.81 | 0.00 | 636.81 | 3031.07 | 1515.53 | 5947.06 | 2977.95 | 0.00 | 0.000 | 0.000 | 0.234 |
| 5.00 | -58.53 | -5.36 | 0.00 | -609.86 | 0.00 | 609.86 | 2993.85 | 1496.92 | 5745.58 | 2877.06 | 0.03 | -0.065 | 0.000 | 0.232 |
| 10.00 | -56.79 | -5.34 | 0.00 | -583.04 | 0.00 | 583.04 | 2955.36 | 1477.68 | 5544.90 | 2776.57 | 0.14 | -0.132 | 0.000 | 0.229 |
| 15.00 | -55.06 | -5.31 | 0.00 | -556.37 | 0.00 | 556.37 | 2915.59 | 1457.80 | 5345.20 | 2676.57 | 0.31 | -0.200 | 0.000 | 0.227 |
| 20.00 | -53.34 | -5.27 | 0.00 | -529.84 | 0.00 | 529.84 | 2874.56 | 1437.28 | 5146.64 | 2577.14 | 0.56 | -0.270 | 0.000 | 0.224 |
| 25.00 | -51.63 | -5.23 | 0.00 | -503.49 | 0.00 | 503.49 | 2832.25 | 1416.12 | 4949.37 | 2478.36 | 0.88 | -0.341 | 0.000 | 0.221 |
| 30.00 | -49.95 | -5.18 | 0.00 | -477.35 | 0.00 | 477.35 | 2788.67 | 1394.33 | 4753.57 | 2380.32 | 1.28 | -0.413 | 0.000 | 0.218 |
| 35.00 | -48.29 | -5.13 | 0.00 | -451.44 | 0.00 | 451.44 | 2743.82 | 1371.91 | 4559.39 | 2283.08 | 1.75 | -0.487 | 0.000 | 0.215 |
| 40.00 | -46.66 | -5.08 | 0.00 | -425.77 | 0.00 | 425.77 | 2697.69 | 1348.85 | 4367.01 | 2186.75 | 2.30 | -0.562 | 0.000 | 0.212 |
| 45.00 | -45.06 | -5.01 | 0.00 | -400.37 | 0.00 | 400.37 | 2650.30 | 1325.15 | 4176.57 | 2091.39 | 2.93 | -0.639 | 0.000 | 0.208 |
| 47.55 | -44.24 | -4.98 | 0.00 | -387.59 | 0.00 | 387.59 | 2625.60 | 1312.80 | 4080.13 | 2043.10 | 3.28 | -0.680 | 0.000 | 0.207 |
| 50.00 | -43.16 | -4.95 | 0.00 | -375.41 | 0.00 | 375.41 | 2601.63 | 1300.82 | 3988.26 | 1997.09 | 3.64 | -0.719 | 0.000 | 0.205 |
| 52.97 | -41.85 | -4.90 | 0.00 | -360.72 | 0.00 | 360.72 | 1914.68 | 957.34 | 2935.86 | 1470.11 | 4.10 | -0.766 | 0.000 | 0.267 |
| 55.00 | -41.27 | -4.90 | 0.00 | -350.78 | 0.00 | 350.78 | 1902.26 | 951.13 | 2883.67 | 1443.98 | 4.44 | -0.800 | 0.000 | 0.265 |
| 60.00 | -39.85 | -4.84 | 0.00 | -326.30 | 0.00 | 326.30 | 1870.76 | 935.38 | 2755.66 | 1379.88 | 5.32 | -0.895 | 0.000 | 0.258 |
| 65.00 | -38.45 | -4.78 | 0.00 | -302.09 | 0.00 | 302.09 | 1837.99 | 919.00 | 2628.54 | 1316.22 | 6.31 | -0.993 | 0.000 | 0.250 |
| 70.00 | -37.08 | -4.71 | 0.00 | -278.17 | 0.00 | 278.17 | 1803.95 | 901.98 | 2502.46 | 1253.09 | 7.41 | -1.090 | 0.000 | 0.243 |
| 73.00 | -36.23 | -4.66 | 0.00 | -264.04 | 0.00 | 264.04 | 1782.92 | 891.46 | 2427.38 | 1215.49 | 8.11 | -1.150 | 0.000 | 0.238 |
| 75.00 | -35.69 | -4.65 | 0.00 | -254.72 | 0.00 | 254.72 | 1768.64 | 884.32 | 2377.59 | 1190.56 | 8.60 | -1.191 | 0.000 | 0.234 |
| 80.00 | -34.41 | -4.59 | 0.00 | -231.46 | 0.00 | 231.46 | 1732.06 | 866.03 | 2254.10 | 1128.72 | 9.90 | -1.290 | 0.000 | 0.225 |
| 85.00 | -33.19 | -4.52 | 0.00 | -208.52 | 0.00 | 208.52 | 1694.20 | 847.10 | 2132.15 | 1067.66 | 11.30 | -1.388 | 0.000 | 0.215 |
| 90.00 | -31.99 | -4.45 | 0.00 | -185.91 | 0.00 | 185.91 | 1655.08 | 827.54 | 2011.90 | 1007.44 | 12.81 | -1.485 | 0.000 | 0.204 |
| 95.00 | -30.83 | -4.36 | 0.00 | -163.66 | 0.00 | 163.66 | 1614.68 | 807.34 | 1893.51 | 948.16 | 14.42 | -1.581 | 0.000 | 0.192 |
| 96.18 | -30.55 | -4.36 | 0.00 | -158.53 | 0.00 | 158.53 | 1604.99 | 802.49 | 1865.94 | 934.36 | 14.81 | -1.604 | 0.000 | 0.189 |
| 100.00 | -29.38 | -4.27 | 0.00 | -141.87 | 0.00 | 141.87 | 1573.01 | 786.50 | 1777.16 | 889.90 | 16.12 | -1.676 | 0.000 | 0.178 |
| 100.34 | -29.27 | -4.29 | 0.00 | -140.40 | 0.00 | 140.40 | 1075.68 | 537.84 | 1234.34 | 618.09 | 16.24 | -1.682 | 0.000 | 0.254 |
| 105.00 | -28.27 | -4.22 | 0.00 | -120.44 | 0.00 | 120.44 | 1053.86 | 526.93 | 1167.20 | 584.47 | 17.93 | -1.765 | 0.000 | 0.233 |
| 110.00 | -27.28 | -4.15 | 0.00 | -99.35 | 0.00 | 99.35 | 1029.21 | 514.60 | 1095.73 | 548.68 | 19.83 | -1.872 | 0.000 | 0.208 |
| 115.00 | -21.57 | -3.40 | 0.00 | -78.62 | 0.00 | 78.62 | 1003.28 | 501.64 | 1025.09 | 513.31 | 21.85 | -1.969 | 0.000 | 0.175 |
| 120.00 | -20.72 | -3.32 | 0.00 | -61.61 | 0.00 | 61.61 | 976.09 | 488.04 | 955.42 | 478.42 | 23.96 | -2.055 | 0.000 | 0.150 |
| 125.00 | -19.90 | -3.23 | 0.00 | -45.03 | 0.00 | 45.03 | 947.62 | 473.81 | 886.90 | 444.11 | 26.15 | -2.130 | 0.000 | 0.122 |
| 128.00 | -13.16 | -2.26 | 0.00 | -35.35 | 0.00 | 35.35 | 929.93 | 464.96 | 846.40 | 423.83 | 27.50 | -2.168 | 0.000 | 0.098 |
| 130.00 | -12.87 | -2.23 | 0.00 | -30.83 | 0.00 | 30.83 | 917.88 | 458.94 | 819.69 | 410.45 | 28.41 | -2.191 | 0.000 | 0.089 |
| 135.00 | -12.19 | -2.13 | 0.00 | -19.69 | 0.00 | 19.69 | 886.87 | 443.43 | 753.94 | 377.53 | 30.74 | -2.238 | 0.000 | 0.066 |
| 138.00 | -7.13 | -1.23 | 0.00 | -13.30 | 0.00 | 13.30 | 867.65 | 433.83 | 715.27 | 358.17 | 32.15 | -2.259 | 0.000 | 0.045 |
| 140.00 | -6.89 | -1.19 | 0.00 | -10.84 | 0.00 | 10.84 | 854.59 | 427.29 | 689.83 | 345.43 | 33.10 | -2.270 | 0.000 | 0.039 |
| 145.00 | -6.33 | -1.10 | 0.00 | -4.88 | 0.00 | 4.88 | 821.03 | 410.52 | 627.52 | 314.23 | 35.49 | -2.290 | 0.000 | 0.023 |
| 149.00 | 0.00 | -0.85 | 0.00 | -0.48 | 0.00 | 0.48 | 787.55 | 393.77 | 574.90 | 287.88 | 37.41 | -2.296 | 0.000 | 0.002 |

# Seismic Segment Forces (Factored)

| | | | | | |
|---|---|---|---|---|---|
| **Structure:** | CT12215-A-SBA | | **Code:** | EIA/TIA-222-G | 3/21/2017 |
| **Site Name:** | Litchfield 3, CT | | **Exposure:** | C | |
| **Height:** | 149.00 (ft) | | **Crest Height:** | 0.00 | |
| **Base Elev:** | 0.000 (ft) | | **Site Class:** | B - Competent Rock | |
| **Gh:** | 1.1 | **Topography:** 1 | **Struct Class:** | II | Page: 27 |

Tower Engineering Solutions

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Load Case:** | 1.2D + 1.0E | | | | | | | **Iterations** | 24 |
| **Gust Response Factor** | 1.10 | | | | **Sds** | 0.12 | | **Ss** | 0.19 |
| **Dead Load Factor** | 1.20 | **Seismic Load Factor** | 1.00 | | **Sd1** | 0.04 | | **S1** | 0.07 |
| **Wind Load Factor** | 0.00 | **Structure Frequency** | 0.31 | | **SA** | 0.01 | **Seismic Importance Factor** | | 1.00 |

| Top Elev (ft) | Description | Wz (lb) | a | b | c | Lateral Fs (lb) | R: 1.50 |
|---|---|---|---|---|---|---|---|
| 0.00 | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 5.00 | | 795.99 | 0.00 | 0.03 | 0.02 | 12.61 | |
| 10.00 | | 778.50 | 0.01 | 0.05 | 0.03 | 16.67 | |
| 15.00 | | 761.02 | 0.02 | 0.06 | 0.04 | 18.22 | |
| 20.00 | | 743.54 | 0.03 | 0.07 | 0.04 | 18.73 | |
| 25.00 | | 726.05 | 0.05 | 0.07 | 0.04 | 18.83 | |
| 30.00 | | 708.57 | 0.08 | 0.07 | 0.04 | 18.83 | |
| 35.00 | | 691.08 | 0.10 | 0.07 | 0.04 | 18.85 | |
| 40.00 | | 673.60 | 0.14 | 0.07 | 0.03 | 18.90 | |
| 45.00 | | 656.12 | 0.17 | 0.07 | 0.03 | 18.88 | |
| 47.55 | Bot - Section 2 | 328.31 | 0.19 | 0.06 | 0.02 | 9.52 | |
| 50.00 | Appurtenance(s) | 562.69 | 0.21 | 0.06 | 0.02 | 16.35 | |
| 52.97 | Top - Section 1 | 672.44 | 0.24 | 0.06 | 0.02 | 19.38 | |
| 55.00 | | 203.15 | 0.26 | 0.05 | 0.02 | 5.76 | |
| 60.00 | | 490.53 | 0.31 | 0.04 | 0.01 | 12.67 | |
| 65.00 | | 476.54 | 0.36 | 0.03 | 0.01 | 9.68 | |
| 70.00 | | 462.55 | 0.42 | 0.01 | 0.01 | 5.04 | |
| 73.00 | Appurtenance(s) | 280.82 | 0.45 | 0.00 | 0.01 | 0.98 | |
| 75.00 | | 177.75 | 0.48 | -0.01 | 0.01 | -0.33 | |
| 80.00 | | 434.58 | 0.54 | -0.03 | 0.01 | -6.57 | |
| 85.00 | | 420.59 | 0.62 | -0.06 | 0.02 | -10.75 | |
| 90.00 | | 406.60 | 0.69 | -0.08 | 0.03 | -12.90 | |
| 95.00 | | 392.62 | 0.77 | -0.11 | 0.05 | -13.22 | |
| 96.18 | Bot - Section 3 | 90.36 | 0.79 | -0.11 | 0.05 | -3.03 | |
| 100.00 | | 507.85 | 0.85 | -0.12 | 0.07 | -16.21 | |
| 100.34 | Top - Section 2 | 44.90 | 0.86 | -0.12 | 0.07 | -1.42 | |
| 105.00 | | 258.49 | 0.94 | -0.12 | 0.10 | -6.94 | |
| 110.00 | | 267.42 | 1.03 | -0.10 | 0.15 | -4.99 | |
| 115.00 | Appurtenance(s) | 2055.4 | 1.13 | -0.05 | 0.20 | -15.21 | |
| 120.00 | | 246.44 | 1.23 | 0.03 | 0.27 | 1.71 | |
| 125.00 | | 235.95 | 1.33 | 0.16 | 0.36 | 5.76 | |
| 128.00 | Appurtenance(s) | 2240.9 | 1.39 | 0.27 | 0.43 | 81.65 | |
| 130.00 | | 88.93 | 1.44 | 0.36 | 0.47 | 4.01 | |
| 135.00 | | 214.97 | 1.55 | 0.64 | 0.61 | 14.86 | |
| 138.00 | Appurtenance(s) | 1511.5 | 1.62 | 0.85 | 0.70 | 128.80 | |
| 140.00 | | 80.53 | 1.67 | 1.01 | 0.77 | 7.78 | |
| 145.00 | | 193.99 | 1.79 | 1.49 | 0.96 | 24.76 | |
| 149.00 | Appurtenance(s) | 2285.5 | 1.89 | 1.98 | 1.14 | 354.34 | |
| | **Totals:** | **22,166.9** | | | | **772.0** | **Total Wind:** **22,941.9** |

Seismic Base Shear is Less Than 50% of Wind Force - An Analysis is NOT Required

# Calculated Forces

| | | | | | |
|---|---|---|---|---|---|
| **Structure:** | CT12215-A-SBA | **Code:** | EIA/TIA-222-G | 3/21/2017 | |
| **Site Name:** | Litchfield 3, CT | **Exposure:** | C | | |
| **Height:** | 149.00 (ft) | **Crest Height:** | 0.00 | | |
| **Base Elev:** | 0.000 (ft) | **Site Class:** | B - Competent Rock | | |
| **Gh:** | 1.1 **Topography:** 1 | **Struct Class:** | II | Page: 28 | |

Tower Engineering Solutions

**Load Case:** 1.2D + 1.0E

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Gust Response Factor** | 1.10 | | | **Sds** | 0.12 | | | **Iterations** | 24 |
| **Dead Load Factor** | 1.20 | **Seismic Load Factor** | 1.00 | **Sd1** | 0.04 | | | **Ss** | 0.19 |
| **Wind Load Factor** | 0.00 | **Structure Frequency** | 0.31 | **SA** | 0.01 | | | **S1** | 0.07 |
| | | | | | | | | **Seismic Importance Factor** | 1.00 |

| 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 Sway (deg) | Rotation Twist (deg) | Stress Ratio |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.00 | -31.78 | -0.87 | 0.00 | -104.33 | 0.00 | 104.33 | 3031.07 | 1515.53 | 5947.06 | 2977.95 | | 0.00 | 0.00 | 0.046 |
| 5.00 | -30.63 | -0.86 | 0.00 | -100.00 | 0.00 | 100.00 | 2993.85 | 1496.92 | 5745.58 | 2877.06 | | 0.01 | -0.01 | 0.045 |
| 10.00 | -29.50 | -0.85 | 0.00 | -95.71 | 0.00 | 95.71 | 2955.36 | 1477.68 | 5544.90 | 2776.57 | | 0.02 | -0.02 | 0.044 |
| 15.00 | -28.39 | -0.83 | 0.00 | -91.47 | 0.00 | 91.47 | 2915.59 | 1457.80 | 5345.20 | 2676.57 | | 0.05 | -0.03 | 0.044 |
| 20.00 | -27.31 | -0.82 | 0.00 | -87.30 | 0.00 | 87.30 | 2874.56 | 1437.28 | 5146.64 | 2577.14 | | 0.09 | -0.04 | 0.043 |
| 25.00 | -26.24 | -0.81 | 0.00 | -83.20 | 0.00 | 83.20 | 2832.25 | 1416.12 | 4949.37 | 2478.36 | | 0.14 | -0.06 | 0.043 |
| 30.00 | -25.19 | -0.79 | 0.00 | -79.17 | 0.00 | 79.17 | 2788.67 | 1394.33 | 4753.57 | 2380.32 | | 0.21 | -0.07 | 0.042 |
| 35.00 | -24.17 | -0.78 | 0.00 | -75.21 | 0.00 | 75.21 | 2743.82 | 1371.91 | 4559.39 | 2283.08 | | 0.29 | -0.08 | 0.042 |
| 40.00 | -23.17 | -0.76 | 0.00 | -71.32 | 0.00 | 71.32 | 2697.69 | 1348.85 | 4367.01 | 2186.75 | | 0.38 | -0.09 | 0.041 |
| 45.00 | -22.18 | -0.74 | 0.00 | -67.52 | 0.00 | 67.52 | 2650.30 | 1325.15 | 4176.57 | 2091.39 | | 0.48 | -0.11 | 0.041 |
| 47.55 | -21.69 | -0.74 | 0.00 | -65.62 | 0.00 | 65.62 | 2625.60 | 1312.80 | 4080.13 | 2043.10 | | 0.54 | -0.11 | 0.040 |
| 50.00 | -20.92 | -0.72 | 0.00 | -63.81 | 0.00 | 63.81 | 2601.63 | 1300.82 | 3988.26 | 1997.09 | | 0.60 | -0.12 | 0.040 |
| 52.97 | -20.00 | -0.70 | 0.00 | -61.67 | 0.00 | 61.67 | 1914.68 | 957.34 | 2935.86 | 1470.11 | | 0.68 | -0.13 | 0.052 |
| 55.00 | -19.67 | -0.70 | 0.00 | -60.25 | 0.00 | 60.25 | 1902.26 | 951.13 | 2883.67 | 1443.98 | | 0.73 | -0.13 | 0.052 |
| 60.00 | -18.89 | -0.69 | 0.00 | -56.75 | 0.00 | 56.75 | 1870.76 | 935.38 | 2755.66 | 1379.88 | | 0.88 | -0.15 | 0.051 |
| 65.00 | -18.13 | -0.68 | 0.00 | -53.29 | 0.00 | 53.29 | 1837.99 | 919.00 | 2628.54 | 1316.22 | | 1.05 | -0.17 | 0.050 |
| 70.00 | -17.38 | -0.68 | 0.00 | -49.87 | 0.00 | 49.87 | 1803.95 | 901.98 | 2502.46 | 1253.09 | | 1.23 | -0.18 | 0.049 |
| 73.00 | -16.92 | -0.68 | 0.00 | -47.83 | 0.00 | 47.83 | 1782.92 | 891.46 | 2427.38 | 1215.49 | | 1.35 | -0.19 | 0.049 |
| 75.00 | -16.63 | -0.68 | 0.00 | -46.46 | 0.00 | 46.46 | 1768.64 | 884.32 | 2377.59 | 1190.56 | | 1.43 | -0.20 | 0.048 |
| 80.00 | -15.92 | -0.69 | 0.00 | -43.04 | 0.00 | 43.04 | 1732.06 | 866.03 | 2254.10 | 1128.72 | | 1.65 | -0.22 | 0.047 |
| 85.00 | -15.22 | -0.69 | 0.00 | -39.61 | 0.00 | 39.61 | 1694.20 | 847.10 | 2132.15 | 1067.66 | | 1.89 | -0.24 | 0.046 |
| 90.00 | -14.54 | -0.69 | 0.00 | -36.16 | 0.00 | 36.16 | 1655.08 | 827.54 | 2011.90 | 1007.44 | | 2.15 | -0.26 | 0.045 |
| 95.00 | -13.87 | -0.69 | 0.00 | -32.71 | 0.00 | 32.71 | 1614.68 | 807.34 | 1893.51 | 948.16 | | 2.43 | -0.28 | 0.043 |
| 96.18 | -13.72 | -0.69 | 0.00 | -31.89 | 0.00 | 31.89 | 1604.99 | 802.49 | 1865.94 | 934.36 | | 2.50 | -0.28 | 0.043 |
| 100.00 | -12.96 | -0.69 | 0.00 | -29.25 | 0.00 | 29.25 | 1573.01 | 786.50 | 1777.16 | 889.90 | | 2.73 | -0.30 | 0.041 |
| 100.34 | -12.89 | -0.69 | 0.00 | -29.01 | 0.00 | 29.01 | 1075.68 | 537.84 | 1234.34 | 618.09 | | 2.76 | -0.30 | 0.059 |
| 105.00 | -12.40 | -0.69 | 0.00 | -25.79 | 0.00 | 25.79 | 1053.86 | 526.93 | 1167.20 | 584.47 | | 3.05 | -0.31 | 0.056 |
| 110.00 | -11.89 | -0.70 | 0.00 | -22.32 | 0.00 | 22.32 | 1029.21 | 514.60 | 1095.73 | 548.68 | | 3.40 | -0.34 | 0.052 |
| 115.00 | -9.23 | -0.68 | 0.00 | -18.84 | 0.00 | 18.84 | 1003.28 | 501.64 | 1025.09 | 513.31 | | 3.76 | -0.36 | 0.046 |
| 120.00 | -8.75 | -0.68 | 0.00 | -15.43 | 0.00 | 15.43 | 976.09 | 488.04 | 955.42 | 478.42 | | 4.15 | -0.38 | 0.041 |
| 125.00 | -8.29 | -0.67 | 0.00 | -12.02 | 0.00 | 12.02 | 947.62 | 473.81 | 886.90 | 444.11 | | 4.56 | -0.40 | 0.036 |
| 128.00 | -5.49 | -0.57 | 0.00 | -9.99 | 0.00 | 9.99 | 929.93 | 464.96 | 846.40 | 423.83 | | 4.82 | -0.41 | 0.029 |
| 130.00 | -5.35 | -0.57 | 0.00 | -8.85 | 0.00 | 8.85 | 917.88 | 458.94 | 819.69 | 410.45 | | 4.99 | -0.42 | 0.027 |
| 135.00 | -4.99 | -0.55 | 0.00 | -6.00 | 0.00 | 6.00 | 886.87 | 443.43 | 753.94 | 377.53 | | 5.43 | -0.43 | 0.022 |
| 138.00 | -3.12 | -0.41 | 0.00 | -4.34 | 0.00 | 4.34 | 867.65 | 433.83 | 715.27 | 358.17 | | 5.71 | -0.44 | 0.016 |
| 140.00 | -3.01 | -0.40 | 0.00 | -3.52 | 0.00 | 3.52 | 854.59 | 427.29 | 689.83 | 345.43 | | 5.89 | -0.44 | 0.014 |
| 145.00 | -2.76 | -0.38 | 0.00 | -1.50 | 0.00 | 1.50 | 821.03 | 410.52 | 627.52 | 314.23 | | 6.36 | -0.45 | 0.008 |
| 149.00 | 0.00 | -0.35 | 0.00 | 0.00 | 0.00 | 0.00 | 787.55 | 393.77 | 574.90 | 287.88 | | 6.73 | -0.45 | 0.000 |

# Seismic Segment Forces (Factored)

| | | | | | |
|---|---|---|---|---|---|
| **Structure:** | CT12215-A-SBA | | **Code:** | EIA/TIA-222-G | 3/21/2017 |
| **Site Name:** | Litchfield 3, CT | | **Exposure:** | C | |
| **Height:** | 149.00 (ft) | | **Crest Height:** | 0.00 | |
| **Base Elev:** | 0.000 (ft) | | **Site Class:** | B - Competent Rock | |
| **Gh:** | 1.1 | **Topography:** 1 | **Struct Class:** | II | Page: 29 |

Tower Engineering Solutions

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Load Case:** | 0.9D + 1.0E | | | | | | | **Iterations** | 24 |
| **Gust Response Factor** | 1.10 | | | | **Sds** | 0.12 | | **Ss** | 0.19 |
| **Dead Load Factor** | 0.90 | **Seismic Load Factor** | 1.00 | | **Sd1** | 0.04 | | **S1** | 0.07 |
| **Wind Load Factor** | 0.00 | **Structure Frequency** | 0.31 | | **SA** | 0.01 | **Seismic Importance Factor** | | 1.00 |

| Top Elev (ft) | Description | Wz (lb) | a | b | c | Lateral Fs (lb) | R: 1.50 |
|---|---|---|---|---|---|---|---|
| 0.00 | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 5.00 | | 795.99 | 0.00 | 0.03 | 0.02 | 12.61 | |
| 10.00 | | 778.50 | 0.01 | 0.05 | 0.03 | 16.67 | |
| 15.00 | | 761.02 | 0.02 | 0.06 | 0.04 | 18.22 | |
| 20.00 | | 743.54 | 0.03 | 0.07 | 0.04 | 18.73 | |
| 25.00 | | 726.05 | 0.05 | 0.07 | 0.04 | 18.83 | |
| 30.00 | | 708.57 | 0.08 | 0.07 | 0.04 | 18.83 | |
| 35.00 | | 691.08 | 0.10 | 0.07 | 0.04 | 18.85 | |
| 40.00 | | 673.60 | 0.14 | 0.07 | 0.03 | 18.90 | |
| 45.00 | | 656.12 | 0.17 | 0.07 | 0.03 | 18.88 | |
| 47.55 | Bot - Section 2 | 328.31 | 0.19 | 0.06 | 0.02 | 9.52 | |
| 50.00 | Appurtenance(s) | 562.69 | 0.21 | 0.06 | 0.02 | 16.35 | |
| 52.97 | Top - Section 1 | 672.44 | 0.24 | 0.06 | 0.02 | 19.38 | |
| 55.00 | | 203.15 | 0.26 | 0.05 | 0.02 | 5.76 | |
| 60.00 | | 490.53 | 0.31 | 0.04 | 0.01 | 12.67 | |
| 65.00 | | 476.54 | 0.36 | 0.03 | 0.01 | 9.68 | |
| 70.00 | | 462.55 | 0.42 | 0.01 | 0.01 | 5.04 | |
| 73.00 | Appurtenance(s) | 280.82 | 0.45 | 0.00 | 0.01 | 0.98 | |
| 75.00 | | 177.75 | 0.48 | -0.01 | 0.01 | -0.33 | |
| 80.00 | | 434.58 | 0.54 | -0.03 | 0.01 | -6.57 | |
| 85.00 | | 420.59 | 0.62 | -0.06 | 0.02 | -10.75 | |
| 90.00 | | 406.60 | 0.69 | -0.08 | 0.03 | -12.90 | |
| 95.00 | | 392.62 | 0.77 | -0.11 | 0.05 | -13.22 | |
| 96.18 | Bot - Section 3 | 90.36 | 0.79 | -0.11 | 0.05 | -3.03 | |
| 100.00 | | 507.85 | 0.85 | -0.12 | 0.07 | -16.21 | |
| 100.34 | Top - Section 2 | 44.90 | 0.86 | -0.12 | 0.07 | -1.42 | |
| 105.00 | | 258.49 | 0.94 | -0.12 | 0.10 | -6.94 | |
| 110.00 | | 267.42 | 1.03 | -0.10 | 0.15 | -4.99 | |
| 115.00 | Appurtenance(s) | 2055.4 | 1.13 | -0.05 | 0.20 | -15.21 | |
| 120.00 | | 246.44 | 1.23 | 0.03 | 0.27 | 1.71 | |
| 125.00 | | 235.95 | 1.33 | 0.16 | 0.36 | 5.76 | |
| 128.00 | Appurtenance(s) | 2240.9 | 1.39 | 0.27 | 0.43 | 81.65 | |
| 130.00 | | 88.93 | 1.44 | 0.36 | 0.47 | 4.01 | |
| 135.00 | | 214.97 | 1.55 | 0.64 | 0.61 | 14.86 | |
| 138.00 | Appurtenance(s) | 1511.5 | 1.62 | 0.85 | 0.70 | 128.80 | |
| 140.00 | | 80.53 | 1.67 | 1.01 | 0.77 | 7.78 | |
| 145.00 | | 193.99 | 1.79 | 1.49 | 0.96 | 24.76 | |
| 149.00 | Appurtenance(s) | 2285.5 | 1.89 | 1.98 | 1.14 | 354.34 | |
| | **Totals:** | **22,166.9** | | | | **772.0** | **Total Wind:** **22,941.9** |

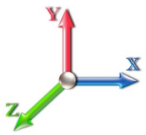
Seismic Base Shear is Less Than 50% of Wind Force - An Analysis is NOT Required

# Calculated Forces

| | | | | | |
|---|---|---|---|---|---|
| **Structure:** | CT12215-A-SBA | **Code:** | EIA/TIA-222-G | 3/21/2017 | |
| **Site Name:** | Litchfield 3, CT | **Exposure:** | C | | |
| **Height:** | 149.00 (ft) | **Crest Height:** | 0.00 | | |
| **Base Elev:** | 0.000 (ft) | **Site Class:** | B - Competent Rock | | |
| **Gh:** | 1.1 **Topography:** 1 | **Struct Class:** | II | Page: 30 | |

Tower Engineering Solutions

**Load Case:** 0.9D + 1.0E




| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Gust Response Factor** | 1.10 | | | **Sds** | 0.12 | **Iterations** | 24 | | |
| **Dead Load Factor** | 0.90 | **Seismic Load Factor** | 1.00 | **Sd1** | 0.04 | **Ss** | 0.19 | | |
| **Wind Load Factor** | 0.00 | **Structure Frequency** | 0.31 | **SA** | 0.01 | **S1** | 0.07 | **Seismic Importance Factor** | 1.00 |

| 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 Sway (deg) | Rotation Twist (deg) | Stress Ratio |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.00 | -23.84 | -0.87 | 0.00 | -102.57 | 0.00 | 102.57 | 3031.07 | 1515.53 | 5947.06 | 2977.95 | | 0.00 | 0.00 | 0.042 |
| 5.00 | -22.97 | -0.86 | 0.00 | -98.25 | 0.00 | 98.25 | 2993.85 | 1496.92 | 5745.58 | 2877.06 | | 0.01 | -0.01 | 0.042 |
| 10.00 | -22.13 | -0.84 | 0.00 | -93.96 | 0.00 | 93.96 | 2955.36 | 1477.68 | 5544.90 | 2776.57 | | 0.02 | -0.02 | 0.041 |
| 15.00 | -21.30 | -0.83 | 0.00 | -89.74 | 0.00 | 89.74 | 2915.59 | 1457.80 | 5345.20 | 2676.57 | | 0.05 | -0.03 | 0.041 |
| 20.00 | -20.48 | -0.81 | 0.00 | -85.60 | 0.00 | 85.60 | 2874.56 | 1437.28 | 5146.64 | 2577.14 | | 0.09 | -0.04 | 0.040 |
| 25.00 | -19.68 | -0.80 | 0.00 | -81.52 | 0.00 | 81.52 | 2832.25 | 1416.12 | 4949.37 | 2478.36 | | 0.14 | -0.05 | 0.040 |
| 30.00 | -18.90 | -0.78 | 0.00 | -77.53 | 0.00 | 77.53 | 2788.67 | 1394.33 | 4753.57 | 2380.32 | | 0.21 | -0.07 | 0.039 |
| 35.00 | -18.13 | -0.77 | 0.00 | -73.62 | 0.00 | 73.62 | 2743.82 | 1371.91 | 4559.39 | 2283.08 | | 0.28 | -0.08 | 0.039 |
| 40.00 | -17.37 | -0.75 | 0.00 | -69.78 | 0.00 | 69.78 | 2697.69 | 1348.85 | 4367.01 | 2186.75 | | 0.37 | -0.09 | 0.038 |
| 45.00 | -16.64 | -0.73 | 0.00 | -66.03 | 0.00 | 66.03 | 2650.30 | 1325.15 | 4176.57 | 2091.39 | | 0.47 | -0.10 | 0.038 |
| 47.55 | -16.27 | -0.73 | 0.00 | -64.15 | 0.00 | 64.15 | 2625.60 | 1312.80 | 4080.13 | 2043.10 | | 0.53 | -0.11 | 0.038 |
| 50.00 | -15.69 | -0.71 | 0.00 | -62.38 | 0.00 | 62.38 | 2601.63 | 1300.82 | 3988.26 | 1997.09 | | 0.59 | -0.12 | 0.037 |
| 52.97 | -15.00 | -0.69 | 0.00 | -60.27 | 0.00 | 60.27 | 1914.68 | 957.34 | 2935.86 | 1470.11 | | 0.66 | -0.12 | 0.049 |
| 55.00 | -14.76 | -0.69 | 0.00 | -58.87 | 0.00 | 58.87 | 1902.26 | 951.13 | 2883.67 | 1443.98 | | 0.72 | -0.13 | 0.049 |
| 60.00 | -14.17 | -0.68 | 0.00 | -55.43 | 0.00 | 55.43 | 1870.76 | 935.38 | 2755.66 | 1379.88 | | 0.86 | -0.15 | 0.048 |
| 65.00 | -13.59 | -0.67 | 0.00 | -52.05 | 0.00 | 52.05 | 1837.99 | 919.00 | 2628.54 | 1316.22 | | 1.03 | -0.16 | 0.047 |
| 70.00 | -13.03 | -0.67 | 0.00 | -48.70 | 0.00 | 48.70 | 1803.95 | 901.98 | 2502.46 | 1253.09 | | 1.21 | -0.18 | 0.046 |
| 73.00 | -12.69 | -0.67 | 0.00 | -46.70 | 0.00 | 46.70 | 1782.92 | 891.46 | 2427.38 | 1215.49 | | 1.32 | -0.19 | 0.046 |
| 75.00 | -12.47 | -0.67 | 0.00 | -45.37 | 0.00 | 45.37 | 1768.64 | 884.32 | 2377.59 | 1190.56 | | 1.40 | -0.20 | 0.045 |
| 80.00 | -11.94 | -0.67 | 0.00 | -42.03 | 0.00 | 42.03 | 1732.06 | 866.03 | 2254.10 | 1128.72 | | 1.62 | -0.22 | 0.044 |
| 85.00 | -11.41 | -0.67 | 0.00 | -38.68 | 0.00 | 38.68 | 1694.20 | 847.10 | 2132.15 | 1067.66 | | 1.86 | -0.23 | 0.043 |
| 90.00 | -10.90 | -0.67 | 0.00 | -35.32 | 0.00 | 35.32 | 1655.08 | 827.54 | 2011.90 | 1007.44 | | 2.11 | -0.25 | 0.042 |
| 95.00 | -10.40 | -0.67 | 0.00 | -31.96 | 0.00 | 31.96 | 1614.68 | 807.34 | 1893.51 | 948.16 | | 2.38 | -0.27 | 0.040 |
| 96.18 | -10.29 | -0.67 | 0.00 | -31.17 | 0.00 | 31.17 | 1604.99 | 802.49 | 1865.94 | 934.36 | | 2.45 | -0.27 | 0.040 |
| 100.00 | -9.72 | -0.67 | 0.00 | -28.59 | 0.00 | 28.59 | 1573.01 | 786.50 | 1777.16 | 889.90 | | 2.68 | -0.29 | 0.038 |
| 100.34 | -9.67 | -0.67 | 0.00 | -28.36 | 0.00 | 28.36 | 1075.68 | 537.84 | 1234.34 | 618.09 | | 2.70 | -0.29 | 0.055 |
| 105.00 | -9.30 | -0.68 | 0.00 | -25.22 | 0.00 | 25.22 | 1053.86 | 526.93 | 1167.20 | 584.47 | | 2.99 | -0.31 | 0.052 |
| 110.00 | -8.92 | -0.68 | 0.00 | -21.85 | 0.00 | 21.85 | 1029.21 | 514.60 | 1095.73 | 548.68 | | 3.32 | -0.33 | 0.048 |
| 115.00 | -6.92 | -0.67 | 0.00 | -18.46 | 0.00 | 18.46 | 1003.28 | 501.64 | 1025.09 | 513.31 | | 3.68 | -0.35 | 0.043 |
| 120.00 | -6.56 | -0.67 | 0.00 | -15.13 | 0.00 | 15.13 | 976.09 | 488.04 | 955.42 | 478.42 | | 4.06 | -0.37 | 0.038 |
| 125.00 | -6.22 | -0.66 | 0.00 | -11.80 | 0.00 | 11.80 | 947.62 | 473.81 | 886.90 | 444.11 | | 4.46 | -0.39 | 0.033 |
| 128.00 | -4.12 | -0.56 | 0.00 | -9.82 | 0.00 | 9.82 | 929.93 | 464.96 | 846.40 | 423.83 | | 4.71 | -0.40 | 0.028 |
| 130.00 | -4.01 | -0.56 | 0.00 | -8.70 | 0.00 | 8.70 | 917.88 | 458.94 | 819.69 | 410.45 | | 4.88 | -0.41 | 0.026 |
| 135.00 | -3.74 | -0.54 | 0.00 | -5.90 | 0.00 | 5.90 | 886.87 | 443.43 | 753.94 | 377.53 | | 5.32 | -0.42 | 0.020 |
| 138.00 | -2.34 | -0.40 | 0.00 | -4.27 | 0.00 | 4.27 | 867.65 | 433.83 | 715.27 | 358.17 | | 5.59 | -0.43 | 0.015 |
| 140.00 | -2.26 | -0.40 | 0.00 | -3.46 | 0.00 | 3.46 | 854.59 | 427.29 | 689.83 | 345.43 | | 5.77 | -0.43 | 0.013 |
| 145.00 | -2.07 | -0.37 | 0.00 | -1.48 | 0.00 | 1.48 | 821.03 | 410.52 | 627.52 | 314.23 | | 6.22 | -0.44 | 0.007 |
| 149.00 | 0.00 | -0.35 | 0.00 | 0.00 | 0.00 | 0.00 | 787.55 | 393.77 | 574.90 | 287.88 | | 6.59 | -0.44 | 0.000 |

# Wind Loading - Shaft

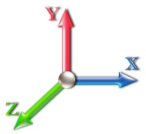
| | | | | | |
|---|---|---|---|---|---|
| **Structure:** | CT12215-A-SBA | **Code:** | EIA/TIA-222-G | 3/21/2017 | |
| **Site Name:** | Litchfield 3, CT | **Exposure:** | C | | |
| **Height:** | 149.00 (ft) | **Crest Height:** | 0.00 | | |
| **Base Elev:** | 0.000 (ft) | **Site Class:** | B - Competent Rock | | |
| **Gh:** | 1.1 **Topography:** 1 | **Struct Class:** | II | Page: 31 | |

Tower Engineering Solutions

**Load Case:** 1.0D + 1.0W 60 mph Wind

**Dead Load Factor** 1.00

**Wind Load Factor** 1.00




**Iterations** 26

| Elev (ft) | Description | Kzt | Kz | qz (psf) | qzGh (psf) | C (mph-ft) | Cf | Ice Thick (in) | Tributary (ft) | Aa (sf) | CfAa (sf) | Wind Force X (lb) | Dead Load Ice (lb) | Tot Dead Load (lb) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.00 | | 1.00 | 0.85 | 7.442 | 8.19 | 224.68 | 0.650 | 0.000 | 0.00 | 0.000 | 0.00 | 0.0 | 0.0 | 0.0 |
| 5.00 | | 1.00 | 0.85 | 7.442 | 8.19 | 219.83 | 0.650 | 0.000 | 5.00 | 20.089 | 13.06 | 106.9 | 0.0 | 796.0 |
| 10.00 | | 1.00 | 0.85 | 7.442 | 8.19 | 214.98 | 0.650 | 0.000 | 5.00 | 19.651 | 12.77 | 104.6 | 0.0 | 778.5 |
| 15.00 | | 1.00 | 0.85 | 7.442 | 8.19 | 210.13 | 0.650 | 0.000 | 5.00 | 19.213 | 12.49 | 102.2 | 0.0 | 761.0 |
| 20.00 | | 1.00 | 0.90 | 7.896 | 8.69 | 211.46 | 0.650 | 0.000 | 5.00 | 18.774 | 12.20 | 106.0 | 0.0 | 743.5 |
| 25.00 | | 1.00 | 0.95 | 8.276 | 9.10 | 211.37 | 0.650 | 0.000 | 5.00 | 18.336 | 11.92 | 108.5 | 0.0 | 726.1 |
| 30.00 | | 1.00 | 0.98 | 8.600 | 9.46 | 210.25 | 0.650 | 0.000 | 5.00 | 17.898 | 11.63 | 110.0 | 0.0 | 708.6 |
| 35.00 | | 1.00 | 1.01 | 8.883 | 9.77 | 208.39 | 0.650 | 0.000 | 5.00 | 17.459 | 11.35 | 110.9 | 0.0 | 691.1 |
| 40.00 | | 1.00 | 1.04 | 9.137 | 10.05 | 205.97 | 0.650 | 0.000 | 5.00 | 17.021 | 11.06 | 111.2 | 0.0 | 673.6 |
| 45.00 | | 1.00 | 1.07 | 9.366 | 10.30 | 203.10 | 0.650 | 0.000 | 5.00 | 16.582 | 10.78 | 111.0 | 0.0 | 656.1 |
| 47.55 | Bot - Section 2 | 1.00 | 1.08 | 9.476 | 10.42 | 201.48 | 0.650 | 0.000 | 2.55 | 8.299 | 5.39 | 56.2 | 0.0 | 328.3 |
| 50.00 | Appurtenance(s) | 1.00 | 1.09 | 9.576 | 10.53 | 199.86 | 0.650 | 0.000 | 2.45 | 7.949 | 5.17 | 54.4 | 0.0 | 562.3 |
| 52.97 | Top - Section 1 | 1.00 | 1.11 | 9.693 | 10.66 | 197.79 | 0.650 | 0.000 | 2.97 | 9.508 | 6.18 | 65.9 | 0.0 | 672.4 |
| 55.00 | | 1.00 | 1.12 | 9.770 | 10.75 | 199.00 | 0.650 | 0.000 | 2.03 | 6.410 | 4.17 | 44.8 | 0.0 | 203.1 |
| 60.00 | | 1.00 | 1.14 | 9.951 | 10.95 | 195.22 | 0.650 | 0.000 | 5.00 | 15.479 | 10.06 | 110.1 | 0.0 | 490.5 |
| 65.00 | | 1.00 | 1.16 | 10.120 | 11.13 | 191.22 | 0.650 | 0.000 | 5.00 | 15.041 | 9.78 | 108.8 | 0.0 | 476.5 |
| 70.00 | | 1.00 | 1.17 | 10.279 | 11.31 | 187.02 | 0.650 | 0.000 | 5.00 | 14.602 | 9.49 | 107.3 | 0.0 | 462.6 |
| 73.00 | Appurtenance(s) | 1.00 | 1.18 | 10.370 | 11.41 | 184.41 | 0.650 | 0.000 | 3.00 | 8.551 | 5.56 | 63.4 | 0.0 | 270.8 |
| 75.00 | | 1.00 | 1.19 | 10.430 | 11.47 | 182.64 | 0.650 | 0.000 | 2.00 | 5.613 | 3.65 | 41.9 | 0.0 | 177.7 |
| 80.00 | | 1.00 | 1.21 | 10.572 | 11.63 | 178.10 | 0.650 | 0.000 | 5.00 | 13.726 | 8.92 | 103.8 | 0.0 | 434.6 |
| 85.00 | | 1.00 | 1.22 | 10.708 | 11.78 | 173.43 | 0.650 | 0.000 | 5.00 | 13.287 | 8.64 | 101.7 | 0.0 | 420.6 |
| 90.00 | | 1.00 | 1.24 | 10.838 | 11.92 | 168.62 | 0.650 | 0.000 | 5.00 | 12.849 | 8.35 | 99.6 | 0.0 | 406.6 |
| 95.00 | | 1.00 | 1.25 | 10.962 | 12.06 | 163.70 | 0.650 | 0.000 | 5.00 | 12.410 | 8.07 | 97.3 | 0.0 | 392.6 |
| 96.18 | Bot - Section 3 | 1.00 | 1.26 | 10.990 | 12.09 | 162.52 | 0.650 | 0.000 | 1.18 | 2.857 | 1.86 | 22.4 | 0.0 | 90.4 |
| 100.00 | | 1.00 | 1.27 | 11.081 | 12.19 | 158.66 | 0.658 * | 0.000 | 3.82 | 9.237 | 6.08 | 74.1 | 0.0 | 507.9 |
| 100.34 | Top - Section 2 | 1.00 | 1.27 | 11.089 | 12.20 | 158.32 | 0.680 * | 0.000 | 0.34 | 0.817 | 0.56 | 6.8 | 0.0 | 44.9 |
| 105.00 | | 1.00 | 1.28 | 11.195 | 12.31 | 155.69 | 0.681 * | 0.000 | 4.66 | 10.876 | 7.41 | 91.2 | 0.0 | 258.5 |
| 110.00 | | 1.00 | 1.29 | 11.305 | 12.44 | 150.47 | 0.650 | 0.000 | 5.00 | 11.254 | 7.32 | 91.0 | 0.0 | 267.4 |
| 115.00 | Appurtenance(s) | 1.00 | 1.30 | 11.412 | 12.55 | 145.17 | 0.650 | 0.000 | 5.00 | 10.816 | 7.03 | 88.2 | 0.0 | 256.9 |
| 120.00 | | 1.00 | 1.32 | 11.514 | 12.67 | 139.79 | 0.650 | 0.000 | 5.00 | 10.377 | 6.75 | 85.4 | 0.0 | 246.4 |
| 125.00 | | 1.00 | 1.33 | 11.614 | 12.78 | 134.34 | 0.650 | 0.000 | 5.00 | 9.939 | 6.46 | 82.5 | 0.0 | 236.0 |
| 128.00 | Appurtenance(s) | 1.00 | 1.33 | 11.672 | 12.84 | 131.03 | 0.650 | 0.000 | 3.00 | 5.753 | 3.74 | 48.0 | 0.0 | 136.5 |
| 130.00 | | 1.00 | 1.34 | 11.710 | 12.88 | 128.81 | 0.650 | 0.000 | 2.00 | 3.748 | 2.44 | 31.4 | 0.0 | 88.9 |
| 135.00 | | 1.00 | 1.35 | 11.803 | 12.98 | 123.21 | 0.650 | 0.000 | 5.00 | 9.062 | 5.89 | 76.5 | 0.0 | 215.0 |
| 138.00 | Appurtenance(s) | 1.00 | 1.35 | 11.858 | 13.04 | 119.83 | 0.650 | 0.000 | 3.00 | 5.227 | 3.40 | 44.3 | 0.0 | 123.9 |
| 140.00 | | 1.00 | 1.36 | 11.894 | 13.08 | 117.55 | 0.650 | 0.000 | 2.00 | 3.397 | 2.21 | 28.9 | 0.0 | 80.5 |
| 145.00 | | 1.00 | 1.37 | 11.982 | 13.18 | 111.84 | 0.650 | 0.000 | 5.00 | 8.186 | 5.32 | 70.1 | 0.0 | 194.0 |
| 149.00 | Appurtenance(s) | 1.00 | 1.38 | 12.051 | 13.26 | 107.22 | 0.650 | 0.000 | 4.00 | 6.233 | 4.05 | 53.7 | 0.0 | 147.6 |
| | | | | | | | | **Totals:** | **149.00** | | | **2,921.2** | | **14,728.1** |

* Cf Adjusted by Linear Load Ra Effect

# Discrete Appurtenance Forces

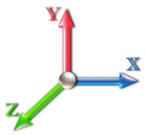
| | | | | | |
|---|---|---|---|---|---|
| **Structure:** | CT12215-A-SBA | **Code:** | EIA/TIA-222-G | 3/21/2017 | |
| **Site Name:** | Litchfield 3, CT | **Exposure:** | C | | |
| **Height:** | 149.00 (ft) | **Crest Height:** | 0.00 | | |
| **Base Elev:** | 0.000 (ft) | **Site Class:** | B - Competent Rock | | |
| **Gh:** | 1.1 **Topography:** 1 | **Struct Class:** | II | Page: 32 | |

Tower Engineering Solutions

**Load Case:** 1.0D + 1.0W 60 mph Wind

**Dead Load Factor** 1.00

**Wind Load Factor** 1.00




**Iterations** 26

| No. | Elev (ft) | Description | Qty | qz (psf) | qzGh (psf) | CaAa x Ka | Ka | Total CaAa (sf) | Dead Load (lb) | Horiz Ecc (ft) | Vert Ecc (ft) | Wind FX (lb) | Mom Y (lb-ft) | Mom Z (lb-ft) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 149.00 | 800MHZ | 3 | 12.068 | 13.275 | 0.87 | 1.00 | 6.89 | 178.50 | 0.000 | 1.000 | 91.47 | 0.00 | 91.47 |
| 2 | 149.00 | APXVSPP18-C-A20 | 3 | 12.068 | 13.275 | 0.83 | 1.00 | 19.97 | 171.00 | 0.000 | 1.000 | 265.10 | 0.00 | 265.10 |
| 3 | 149.00 | APXVTM14-C-I20 | 3 | 12.068 | 13.275 | 0.79 | 1.00 | 15.03 | 168.00 | 0.000 | 1.000 | 199.47 | 0.00 | 199.47 |
| 4 | 149.00 | 1900MHz | 3 | 12.068 | 13.275 | 0.50 | 1.00 | 4.16 | 180.00 | 0.000 | 1.000 | 55.16 | 0.00 | 55.16 |
| 5 | 149.00 | Low Profile Platform | 1 | 12.051 | 13.256 | 1.00 | 1.00 | 25.00 | 1200.00 | 0.000 | 0.000 | 331.41 | 0.00 | 0.00 |
| 6 | 149.00 | TD-RRH8x20-25 | 3 | 12.068 | 13.275 | 0.69 | 1.00 | 8.38 | 210.00 | 0.000 | 1.000 | 111.29 | 0.00 | 111.29 |
| 7 | 149.00 | 800MHz Filter | 3 | 12.068 | 13.275 | 0.69 | 1.00 | 1.61 | 26.40 | 0.000 | 1.000 | 21.43 | 0.00 | 21.43 |
| 8 | 149.00 | ACU-A20-N | 4 | 12.068 | 13.275 | 0.79 | 1.00 | 0.44 | 4.00 | 0.000 | 1.000 | 5.87 | 0.00 | 5.87 |
| 9 | 138.00 | Low Profile Platform | 1 | 11.858 | 13.044 | 1.00 | 1.00 | 25.00 | 1200.00 | 0.000 | 0.000 | 326.10 | 0.00 | 0.00 |
| 10 | 138.00 | FD9R6004/2C-3L | 6 | 11.858 | 13.044 | 0.54 | 0.80 | 1.16 | 18.60 | 0.000 | 0.000 | 15.10 | 0.00 | 0.00 |
| 11 | 138.00 | GPS Receiver | 1 | 11.858 | 13.044 | 1.00 | 1.00 | 1.00 | 10.00 | 0.000 | 0.000 | 13.04 | 0.00 | 0.00 |
| 12 | 138.00 | BXA-171085-12B_2 | 3 | 11.858 | 13.044 | 0.67 | 0.80 | 9.56 | 45.00 | 0.000 | 0.000 | 124.65 | 0.00 | 0.00 |
| 13 | 138.00 | BXA-70063-6CF_2 | 3 | 11.858 | 13.044 | 0.58 | 0.80 | 13.26 | 51.00 | 0.000 | 0.000 | 173.00 | 0.00 | 0.00 |
| 14 | 138.00 | LPA-80080/6CF | 3 | 11.858 | 13.044 | 1.36 | 0.80 | 17.67 | 63.00 | 0.000 | 0.000 | 230.44 | 0.00 | 0.00 |
| 15 | 128.00 | Low Profile Platform | 1 | 11.672 | 12.839 | 1.00 | 1.00 | 25.00 | 1200.00 | 0.000 | 0.000 | 320.98 | 0.00 | 0.00 |
| 16 | 128.00 | DC6-48-60-18-8F | 1 | 11.672 | 12.839 | 1.00 | 1.00 | 0.92 | 31.80 | 0.000 | 0.000 | 11.81 | 0.00 | 0.00 |
| 17 | 128.00 | RRUS-11 | 6 | 11.672 | 12.839 | 0.57 | 0.80 | 8.59 | 306.00 | 0.000 | 0.000 | 110.26 | 0.00 | 0.00 |
| 18 | 128.00 | LGP 21401 | 12 | 11.672 | 12.839 | 0.40 | 0.80 | 0.00 | 210.00 | 0.000 | 0.000 | 0.00 | 0.00 | 0.00 |
| 19 | 128.00 | AM-X-CD-16-65-00T-RET | 3 | 11.672 | 12.839 | 0.60 | 0.80 | 14.44 | 145.50 | 0.000 | 0.000 | 185.34 | 0.00 | 0.00 |
| 20 | 128.00 | 7770.00 | 6 | 11.672 | 12.839 | 0.58 | 0.80 | 19.27 | 210.00 | 0.000 | 0.000 | 247.43 | 0.00 | 0.00 |
| 21 | 128.00 | ABT-DF-DM-ADBH | 1 | 11.672 | 12.839 | 1.00 | 1.00 | 0.05 | 1.10 | 0.000 | 0.000 | 0.64 | 0.00 | 0.00 |
| 22 | 115.00 | RRUS 11 (Band 4) | 3 | 11.412 | 12.553 | 0.57 | 0.80 | 4.29 | 153.00 | 0.000 | 0.000 | 53.90 | 0.00 | 0.00 |
| 23 | 115.00 | LNX-6515DS-A1M | 3 | 11.412 | 12.553 | 0.64 | 0.80 | 22.02 | 149.40 | 0.000 | 0.000 | 276.44 | 0.00 | 0.00 |
| 24 | 115.00 | APX16DWV-16DWVS-E- | 3 | 11.412 | 12.553 | 0.50 | 0.80 | 9.84 | 122.10 | 0.000 | 0.000 | 123.47 | 0.00 | 0.00 |
| 25 | 115.00 | T-Arm | 3 | 11.412 | 12.553 | 0.56 | 0.75 | 13.50 | 1050.00 | 0.000 | 0.000 | 169.46 | 0.00 | 0.00 |
| 26 | 115.00 | RRUS 11 (Band 12) | 3 | 11.412 | 12.553 | 0.62 | 0.80 | 4.72 | 162.00 | 0.000 | 0.000 | 59.22 | 0.00 | 0.00 |
| 27 | 115.00 | RRUS 11 | 3 | 11.412 | 12.553 | 0.54 | 0.80 | 4.73 | 162.00 | 0.000 | 0.000 | 59.34 | 0.00 | 0.00 |
| 28 | 73.00 | GPS Receiver | 1 | 10.370 | 11.407 | 1.00 | 1.00 | 1.00 | 10.00 | 0.000 | 0.000 | 11.41 | 0.00 | 0.00 |
| 29 | 50.00 | 58532A | 1 | 9.576 | 10.534 | 1.00 | 1.00 | 0.22 | 0.40 | 0.000 | 0.000 | 2.32 | 0.00 | 0.00 |
| | | | | | | | **Totals:** | | **7,438.80** | | | **3,595.56** | | |

# Total Applied Force Summary

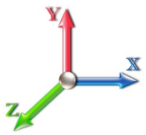
| | | | | | |
|---|---|---|---|---|---|
| **Structure:** | CT12215-A-SBA | | **Code:** | EIA/TIA-222-G | 3/21/2017 |
| **Site Name:** | Litchfield 3, CT | | **Exposure:** | C | |
| **Height:** | 149.00 (ft) | | **Crest Height:** | 0.00 | |
| **Base Elev:** | 0.000 (ft) | | **Site Class:** | B - Competent Rock | |
| **Gh:** | 1.1 | **Topography:** 1 | **Struct Class:** | II | Page: 33 |

Tower Engineering Solutions

**Load Case:** 1.0D + 1.0W 60 mph Wind

**Dead Load Factor** 1.00

**Wind Load Factor** 1.00




**Iterations** 26

| Elev (ft) | Description | Lateral FX (-) (lb) | Axial FY (-) (lb) | Torsion MY (lb-ft) | Moment MZ (lb-ft) |
|---|---|---|---|---|---|
| 0.00 | | 0.00 | 0.00 | 0.00 | 0.00 |
| 5.00 | | 106.89 | 958.57 | 0.00 | 0.00 |
| 10.00 | | 104.56 | 941.08 | 0.00 | 0.00 |
| 15.00 | | 102.23 | 923.60 | 0.00 | 0.00 |
| 20.00 | | 106.00 | 906.12 | 0.00 | 0.00 |
| 25.00 | | 108.50 | 888.63 | 0.00 | 0.00 |
| 30.00 | | 110.05 | 871.15 | 0.00 | 0.00 |
| 35.00 | | 110.90 | 853.66 | 0.00 | 0.00 |
| 40.00 | | 111.19 | 836.18 | 0.00 | 0.00 |
| 45.00 | | 111.05 | 818.70 | 0.00 | 0.00 |
| 47.55 | | 56.23 | 411.34 | 0.00 | 0.00 |
| 50.00 | (1) attachments | 56.74 | 642.25 | 0.00 | 0.00 |
| 52.97 | | 65.90 | 768.54 | 0.00 | 0.00 |
| 55.00 | | 44.78 | 268.83 | 0.00 | 0.00 |
| 60.00 | | 110.13 | 652.31 | 0.00 | 0.00 |
| 65.00 | | 108.83 | 638.32 | 0.00 | 0.00 |
| 70.00 | | 107.32 | 624.33 | 0.00 | 0.00 |
| 73.00 | (1) attachments | 74.81 | 377.89 | 0.00 | 0.00 |
| 75.00 | | 41.86 | 242.14 | 0.00 | 0.00 |
| 80.00 | | 103.75 | 595.56 | 0.00 | 0.00 |
| 85.00 | | 101.73 | 581.57 | 0.00 | 0.00 |
| 90.00 | | 99.56 | 567.58 | 0.00 | 0.00 |
| 95.00 | | 97.27 | 553.60 | 0.00 | 0.00 |
| 96.18 | | 22.45 | 128.25 | 0.00 | 0.00 |
| 100.00 | | 74.10 | 630.95 | 0.00 | 0.00 |
| 100.34 | | 6.78 | 55.96 | 0.00 | 0.00 |
| 105.00 | | 91.22 | 408.42 | 0.00 | 0.00 |
| 110.00 | | 90.97 | 428.40 | 0.00 | 0.00 |
| 115.00 | (18) attachments | 830.08 | 2216.41 | 0.00 | 0.00 |
| 120.00 | | 85.43 | 396.42 | 0.00 | 0.00 |
| 125.00 | | 82.53 | 385.93 | 0.00 | 0.00 |
| 128.00 | (30) attachments | 924.48 | 2330.92 | 0.00 | 0.00 |
| 130.00 | | 31.38 | 121.84 | 0.00 | 0.00 |
| 135.00 | | 76.48 | 297.25 | 0.00 | 0.00 |
| 138.00 | (17) attachments | 926.65 | 1560.91 | 0.00 | 0.00 |
| 140.00 | | 28.89 | 88.17 | 0.00 | 0.00 |
| 145.00 | | 70.13 | 213.07 | 0.00 | 0.00 |
| 149.00 | (23) attachments | 1134.90 | 2300.80 | 0.00 | 749.79 |
| | **Totals:** | **6,516.75** | **26,485.62** | **0.00** | **749.79** |

# Linear Appurtenance Segment Forces (Factored)

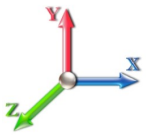
| | | | | | |
|---|---|---|---|---|---|
| **Structure:** | CT12215-A-SBA | **Code:** | EIA/TIA-222-G | 3/21/2017 | |
| **Site Name:** | Litchfield 3, CT | **Exposure:** | C | | |
| **Height:** | 149.00 (ft) | **Crest Height:** | 0.00 | | |
| **Base Elev:** | 0.000 (ft) | **Site Class:** | B - Competent Rock | | |
| **Gh:** | 1.1 **Topography:** 1 | **Struct Class:** | II | Page: 34 | |

Tower Engineering Solutions

**Load Case:** 1.0D + 1.0W 60 mph Wind

**Dead Load Factor** 1.00

**Wind Load Factor** 1.00




**Iterations** 26

| Top Elev (ft) | Description | Wind Exposed | Length (ft) | Ca | Exposed Width (in) | Area (sqft) | CaAa (sqft) | Ra | Cf Adjust Factor | qz (psf) | F X (lb) | Dead Load (lb) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5.00 | 1 5/8" Hybrid | Yes | 5.00 | 0.000 | 2.00 | 0.83 | 0.00 | 0.055 | 0.000 | 7.442 | 0.00 | 11.00 |
| 5.00 | 1/2" Coax | Yes | 5.00 | 0.000 | 0.65 | 0.27 | 0.00 | 0.055 | 0.000 | 7.442 | 0.00 | 0.80 |
| 10.00 | 1 5/8" Hybrid | Yes | 5.00 | 0.000 | 2.00 | 0.83 | 0.00 | 0.056 | 0.000 | 7.442 | 0.00 | 11.00 |
| 10.00 | 1/2" Coax | Yes | 5.00 | 0.000 | 0.65 | 0.27 | 0.00 | 0.056 | 0.000 | 7.442 | 0.00 | 0.80 |
| 15.00 | 1 5/8" Hybrid | Yes | 5.00 | 0.000 | 2.00 | 0.83 | 0.00 | 0.057 | 0.000 | 7.442 | 0.00 | 11.00 |
| 15.00 | 1/2" Coax | Yes | 5.00 | 0.000 | 0.65 | 0.27 | 0.00 | 0.057 | 0.000 | 7.442 | 0.00 | 0.80 |
| 20.00 | 1 5/8" Hybrid | Yes | 5.00 | 0.000 | 2.00 | 0.83 | 0.00 | 0.059 | 0.000 | 7.896 | 0.00 | 11.00 |
| 20.00 | 1/2" Coax | Yes | 5.00 | 0.000 | 0.65 | 0.27 | 0.00 | 0.059 | 0.000 | 7.896 | 0.00 | 0.80 |
| 25.00 | 1 5/8" Hybrid | Yes | 5.00 | 0.000 | 2.00 | 0.83 | 0.00 | 0.060 | 0.000 | 8.276 | 0.00 | 11.00 |
| 25.00 | 1/2" Coax | Yes | 5.00 | 0.000 | 0.65 | 0.27 | 0.00 | 0.060 | 0.000 | 8.276 | 0.00 | 0.80 |
| 30.00 | 1 5/8" Hybrid | Yes | 5.00 | 0.000 | 2.00 | 0.83 | 0.00 | 0.062 | 0.000 | 8.600 | 0.00 | 11.00 |
| 30.00 | 1/2" Coax | Yes | 5.00 | 0.000 | 0.65 | 0.27 | 0.00 | 0.062 | 0.000 | 8.600 | 0.00 | 0.80 |
| 35.00 | 1 5/8" Hybrid | Yes | 5.00 | 0.000 | 2.00 | 0.83 | 0.00 | 0.063 | 0.000 | 8.883 | 0.00 | 11.00 |
| 35.00 | 1/2" Coax | Yes | 5.00 | 0.000 | 0.65 | 0.27 | 0.00 | 0.063 | 0.000 | 8.883 | 0.00 | 0.80 |
| 40.00 | 1 5/8" Hybrid | Yes | 5.00 | 0.000 | 2.00 | 0.83 | 0.00 | 0.065 | 0.000 | 9.137 | 0.00 | 11.00 |
| 40.00 | 1/2" Coax | Yes | 5.00 | 0.000 | 0.65 | 0.27 | 0.00 | 0.065 | 0.000 | 9.137 | 0.00 | 0.80 |
| 45.00 | 1 5/8" Hybrid | Yes | 5.00 | 0.000 | 2.00 | 0.83 | 0.00 | 0.067 | 0.000 | 9.366 | 0.00 | 11.00 |
| 45.00 | 1/2" Coax | Yes | 5.00 | 0.000 | 0.65 | 0.27 | 0.00 | 0.067 | 0.000 | 9.366 | 0.00 | 0.80 |
| 47.55 | 1 5/8" Hybrid | Yes | 2.55 | 0.000 | 2.00 | 0.43 | 0.00 | 0.068 | 0.000 | 9.476 | 0.00 | 5.62 |
| 47.55 | 1/2" Coax | Yes | 2.55 | 0.000 | 0.65 | 0.14 | 0.00 | 0.068 | 0.000 | 9.476 | 0.00 | 0.41 |
| 50.00 | 1 5/8" Hybrid | Yes | 2.45 | 0.000 | 2.00 | 0.41 | 0.00 | 0.069 | 0.000 | 9.576 | 0.00 | 5.38 |
| 50.00 | 1/2" Coax | Yes | 2.45 | 0.000 | 0.65 | 0.13 | 0.00 | 0.069 | 0.000 | 9.576 | 0.00 | 0.39 |
| 52.97 | 1 5/8" Hybrid | Yes | 2.97 | 0.000 | 2.00 | 0.49 | 0.00 | 0.086 | 0.000 | 9.693 | 0.00 | 6.53 |
| 52.97 | 1.25" Reinforcing | Yes | 2.97 | 0.000 | 1.25 | 0.31 | 0.00 | 0.086 | 0.000 | 9.693 | 0.00 | 0.00 |
| 55.00 | 1 5/8" Hybrid | Yes | 2.03 | 0.000 | 2.00 | 0.34 | 0.00 | 0.086 | 0.000 | 9.770 | 0.00 | 4.47 |
| 55.00 | 1.25" Reinforcing | Yes | 2.03 | 0.000 | 1.25 | 0.21 | 0.00 | 0.086 | 0.000 | 9.770 | 0.00 | 0.00 |
| 60.00 | 1 5/8" Hybrid | Yes | 5.00 | 0.000 | 2.00 | 0.83 | 0.00 | 0.087 | 0.000 | 9.951 | 0.00 | 11.00 |
| 60.00 | 1.25" Reinforcing | Yes | 5.00 | 0.000 | 1.25 | 0.52 | 0.00 | 0.087 | 0.000 | 9.951 | 0.00 | 0.00 |
| 65.00 | 1 5/8" Hybrid | Yes | 5.00 | 0.000 | 2.00 | 0.83 | 0.00 | 0.090 | 0.000 | 10.120 | 0.00 | 11.00 |
| 65.00 | 1.25" Reinforcing | Yes | 5.00 | 0.000 | 1.25 | 0.52 | 0.00 | 0.090 | 0.000 | 10.120 | 0.00 | 0.00 |
| 70.00 | 1 5/8" Hybrid | Yes | 5.00 | 0.000 | 2.00 | 0.83 | 0.00 | 0.093 | 0.000 | 10.279 | 0.00 | 11.00 |
| 70.00 | 1.25" Reinforcing | Yes | 5.00 | 0.000 | 1.25 | 0.52 | 0.00 | 0.093 | 0.000 | 10.279 | 0.00 | 0.00 |
| 73.00 | 1 5/8" Hybrid | Yes | 3.00 | 0.000 | 2.00 | 0.50 | 0.00 | 0.095 | 0.000 | 10.370 | 0.00 | 6.60 |
| 73.00 | 1.25" Reinforcing | Yes | 3.00 | 0.000 | 1.25 | 0.31 | 0.00 | 0.095 | 0.000 | 10.370 | 0.00 | 0.00 |
| 75.00 | 1 5/8" Hybrid | Yes | 2.00 | 0.000 | 2.00 | 0.33 | 0.00 | 0.097 | 0.000 | 10.430 | 0.00 | 4.40 |
| 75.00 | 1.25" Reinforcing | Yes | 2.00 | 0.000 | 1.25 | 0.21 | 0.00 | 0.097 | 0.000 | 10.430 | 0.00 | 0.00 |
| 80.00 | 1 5/8" Hybrid | Yes | 5.00 | 0.000 | 2.00 | 0.83 | 0.00 | 0.076 | 0.000 | 10.572 | 0.00 | 11.00 |
| 80.00 | 1.25" Reinforcing | Yes | 2.00 | 0.000 | 1.25 | 0.21 | 0.00 | 0.076 | 0.000 | 10.572 | 0.00 | 0.00 |
| 85.00 | 1 5/8" Hybrid | Yes | 5.00 | 0.000 | 2.00 | 0.83 | 0.00 | 0.063 | 0.000 | 10.708 | 0.00 | 11.00 |
| 90.00 | 1 5/8" Hybrid | Yes | 5.00 | 0.000 | 2.00 | 0.83 | 0.00 | 0.065 | 0.000 | 10.838 | 0.00 | 11.00 |
| 95.00 | 1 5/8" Hybrid | Yes | 5.00 | 0.000 | 2.00 | 0.83 | 0.00 | 0.067 | 0.000 | 10.962 | 0.00 | 11.00 |
| 96.18 | 1 5/8" Hybrid | Yes | 1.18 | 0.000 | 2.00 | 0.20 | 0.00 | 0.069 | 0.000 | 10.990 | 0.00 | 2.59 |
| 100.00 | 1 5/8" Hybrid | Yes | 3.82 | 0.000 | 2.00 | 0.64 | 0.00 | 0.104 | 1.013 | 11.081 | 0.00 | 8.41 |
| 100.00 | 1.25" Reinforcing | Yes | 3.00 | 0.000 | 1.25 | 0.31 | 0.00 | 0.104 | 1.013 | 11.081 | 0.00 | 0.00 |
| 100.34 | 1 5/8" Hybrid | Yes | 0.34 | 0.000 | 2.00 | 0.06 | 0.00 | 0.115 | 1.046 | 11.089 | 0.00 | 0.76 |
| 100.34 | 1.25" Reinforcing | Yes | 0.34 | 0.000 | 1.25 | 0.04 | 0.00 | 0.115 | 1.046 | 11.089 | 0.00 | 0.00 |
| 105.00 | 1 5/8" Hybrid | Yes | 4.66 | 0.000 | 2.00 | 0.78 | 0.00 | 0.116 | 1.048 | 11.195 | 0.00 | 10.24 |

# Linear Appurtenance Segment Forces (Factored)

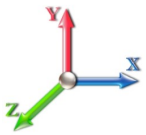
| | | | | | |
|---|---|---|---|---|---|
| **Structure:** | CT12215-A-SBA | **Code:** | EIA/TIA-222-G | 3/21/2017 | |
| **Site Name:** | Litchfield 3, CT | **Exposure:** | C | | |
| **Height:** | 149.00 (ft) | **Crest Height:** | 0.00 | | |
| **Base Elev:** | 0.000 (ft) | **Site Class:** | B - Competent Rock | | |
| **Gh:** | 1.1 **Topography:** 1 | **Struct Class:** | II | Page: 35 | |

Tower Engineering Solutions

**Load Case:** 1.0D + 1.0W 60 mph Wind

**Dead Load Factor** 1.00

**Wind Load Factor** 1.00




**Iterations** 26

| Top Elev (ft) | Description | Wind Exposed | Length (ft) | Ca | Exposed Width (in) | Area (sqft) | CaAa (sqft) | Ra | Cf Adjust Factor | qz (psf) | F X (lb) | Dead Load (lb) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 105.00 | 1.25" Reinforcing | Yes | 4.66 | 0.000 | 1.25 | 0.49 | 0.00 | 0.116 | 1.048 | 11.195 | 0.00 | 0.00 |
| 110.00 | 1 5/8" Hybrid | Yes | 5.00 | 0.000 | 2.00 | 0.83 | 0.00 | 0.074 | 0.000 | 11.305 | 0.00 | 11.00 |
| 115.00 | 1 5/8" Hybrid | Yes | 5.00 | 0.000 | 2.00 | 0.83 | 0.00 | 0.077 | 0.000 | 11.412 | 0.00 | 11.00 |
| | | | | | | | | | | **Totals:** | **0.0** | **261.0** |

# Calculated Forces

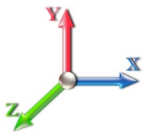
| | | | | | |
|---|---|---|---|---|---|
| **Structure:** | CT12215-A-SBA | **Code:** | EIA/TIA-222-G | 3/21/2017 | |
| **Site Name:** | Litchfield 3, CT | **Exposure:** | C | | |
| **Height:** | 149.00 (ft) | **Crest Height:** | 0.00 | | |
| **Base Elev:** | 0.000 (ft) | **Site Class:** | B - Competent Rock | | |
| **Gh:** | 1.1 **Topography:** 1 | **Struct Class:** | II | Page: 36 | |

Tower Engineering Solutions

**Load Case:** 1.0D + 1.0W 60 mph Wind

**Dead Load Factor** 1.00

**Wind Load Factor** 1.00




**Iterations** 26

| 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 Sway (deg) | Rotation Twist (deg) | Stress Ratio |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.00 | -26.48 | -6.53 | 0.00 | -726.85 | 0.00 | 726.85 | 3031.07 | 1515.53 | 5947.06 | 2977.95 | 0.00 | 0.000 | 0.000 | 0.253 |
| 5.00 | -25.51 | -6.46 | 0.00 | -694.18 | 0.00 | 694.18 | 2993.85 | 1496.92 | 5745.58 | 2877.06 | 0.04 | -0.074 | 0.000 | 0.250 |
| 10.00 | -24.56 | -6.39 | 0.00 | -661.88 | 0.00 | 661.88 | 2955.36 | 1477.68 | 5544.90 | 2776.57 | 0.16 | -0.150 | 0.000 | 0.247 |
| 15.00 | -23.63 | -6.31 | 0.00 | -629.95 | 0.00 | 629.95 | 2915.59 | 1457.80 | 5345.20 | 2676.57 | 0.36 | -0.227 | 0.000 | 0.243 |
| 20.00 | -22.72 | -6.23 | 0.00 | -598.39 | 0.00 | 598.39 | 2874.56 | 1437.28 | 5146.64 | 2577.14 | 0.64 | -0.306 | 0.000 | 0.240 |
| 25.00 | -21.82 | -6.15 | 0.00 | -567.22 | 0.00 | 567.22 | 2832.25 | 1416.12 | 4949.37 | 2478.36 | 1.00 | -0.386 | 0.000 | 0.237 |
| 30.00 | -20.94 | -6.06 | 0.00 | -536.46 | 0.00 | 536.46 | 2788.67 | 1394.33 | 4753.57 | 2380.32 | 1.45 | -0.468 | 0.000 | 0.233 |
| 35.00 | -20.08 | -5.98 | 0.00 | -506.14 | 0.00 | 506.14 | 2743.82 | 1371.91 | 4559.39 | 2283.08 | 1.98 | -0.551 | 0.000 | 0.229 |
| 40.00 | -19.24 | -5.88 | 0.00 | -476.26 | 0.00 | 476.26 | 2697.69 | 1348.85 | 4367.01 | 2186.75 | 2.61 | -0.635 | 0.000 | 0.225 |
| 45.00 | -18.41 | -5.78 | 0.00 | -446.84 | 0.00 | 446.84 | 2650.30 | 1325.15 | 4176.57 | 2091.39 | 3.32 | -0.721 | 0.000 | 0.221 |
| 47.55 | -18.00 | -5.74 | 0.00 | -432.07 | 0.00 | 432.07 | 2625.60 | 1312.80 | 4080.13 | 2043.10 | 3.71 | -0.766 | 0.000 | 0.218 |
| 50.00 | -17.35 | -5.69 | 0.00 | -418.04 | 0.00 | 418.04 | 2601.63 | 1300.82 | 3988.26 | 1997.09 | 4.12 | -0.810 | 0.000 | 0.216 |
| 52.97 | -16.58 | -5.62 | 0.00 | -401.15 | 0.00 | 401.15 | 1914.68 | 957.34 | 2935.86 | 1470.11 | 4.64 | -0.863 | 0.000 | 0.282 |
| 55.00 | -16.31 | -5.59 | 0.00 | -389.74 | 0.00 | 389.74 | 1902.26 | 951.13 | 2883.67 | 1443.98 | 5.01 | -0.899 | 0.000 | 0.279 |
| 60.00 | -15.65 | -5.50 | 0.00 | -361.77 | 0.00 | 361.77 | 1870.76 | 935.38 | 2755.66 | 1379.88 | 6.01 | -1.006 | 0.000 | 0.271 |
| 65.00 | -15.00 | -5.41 | 0.00 | -334.26 | 0.00 | 334.26 | 1837.99 | 919.00 | 2628.54 | 1316.22 | 7.12 | -1.113 | 0.000 | 0.262 |
| 70.00 | -14.37 | -5.31 | 0.00 | -307.22 | 0.00 | 307.22 | 1803.95 | 901.98 | 2502.46 | 1253.09 | 8.35 | -1.222 | 0.000 | 0.253 |
| 73.00 | -13.99 | -5.24 | 0.00 | -291.28 | 0.00 | 291.28 | 1782.92 | 891.46 | 2427.38 | 1215.49 | 9.14 | -1.288 | 0.000 | 0.248 |
| 75.00 | -13.74 | -5.21 | 0.00 | -280.80 | 0.00 | 280.80 | 1768.64 | 884.32 | 2377.59 | 1190.56 | 9.69 | -1.333 | 0.000 | 0.244 |
| 80.00 | -13.14 | -5.12 | 0.00 | -254.74 | 0.00 | 254.74 | 1732.06 | 866.03 | 2254.10 | 1128.72 | 11.14 | -1.441 | 0.000 | 0.233 |
| 85.00 | -12.55 | -5.03 | 0.00 | -229.14 | 0.00 | 229.14 | 1694.20 | 847.10 | 2132.15 | 1067.66 | 12.71 | -1.549 | 0.000 | 0.222 |
| 90.00 | -11.98 | -4.93 | 0.00 | -204.01 | 0.00 | 204.01 | 1655.08 | 827.54 | 2011.90 | 1007.44 | 14.39 | -1.656 | 0.000 | 0.210 |
| 95.00 | -11.42 | -4.83 | 0.00 | -179.34 | 0.00 | 179.34 | 1614.68 | 807.34 | 1893.51 | 948.16 | 16.18 | -1.761 | 0.000 | 0.196 |
| 96.18 | -11.29 | -4.82 | 0.00 | -173.66 | 0.00 | 173.66 | 1604.99 | 802.49 | 1865.94 | 934.36 | 16.62 | -1.786 | 0.000 | 0.193 |
| 100.00 | -10.66 | -4.73 | 0.00 | -155.25 | 0.00 | 155.25 | 1573.01 | 786.50 | 1777.16 | 889.90 | 18.08 | -1.865 | 0.000 | 0.181 |
| 100.34 | -10.60 | -4.73 | 0.00 | -153.62 | 0.00 | 153.62 | 1075.68 | 537.84 | 1234.34 | 618.09 | 18.21 | -1.872 | 0.000 | 0.258 |
| 105.00 | -10.18 | -4.64 | 0.00 | -131.60 | 0.00 | 131.60 | 1053.86 | 526.93 | 1167.20 | 584.47 | 20.08 | -1.963 | 0.000 | 0.235 |
| 110.00 | -9.75 | -4.56 | 0.00 | -108.38 | 0.00 | 108.38 | 1029.21 | 514.60 | 1095.73 | 548.68 | 22.20 | -2.079 | 0.000 | 0.207 |
| 115.00 | -7.56 | -3.66 | 0.00 | -85.59 | 0.00 | 85.59 | 1003.28 | 501.64 | 1025.09 | 513.31 | 24.44 | -2.185 | 0.000 | 0.174 |
| 120.00 | -7.16 | -3.57 | 0.00 | -67.30 | 0.00 | 67.30 | 976.09 | 488.04 | 955.42 | 478.42 | 26.78 | -2.279 | 0.000 | 0.148 |
| 125.00 | -6.77 | -3.48 | 0.00 | -49.46 | 0.00 | 49.46 | 947.62 | 473.81 | 886.90 | 444.11 | 29.21 | -2.361 | 0.000 | 0.119 |
| 128.00 | -4.48 | -2.46 | 0.00 | -39.03 | 0.00 | 39.03 | 929.93 | 464.96 | 846.40 | 423.83 | 30.71 | -2.403 | 0.000 | 0.097 |
| 130.00 | -4.36 | -2.43 | 0.00 | -34.11 | 0.00 | 34.11 | 917.88 | 458.94 | 819.69 | 410.45 | 31.72 | -2.429 | 0.000 | 0.088 |
| 135.00 | -4.07 | -2.34 | 0.00 | -21.98 | 0.00 | 21.98 | 886.87 | 443.43 | 753.94 | 377.53 | 34.29 | -2.480 | 0.000 | 0.063 |
| 138.00 | -2.55 | -1.35 | 0.00 | -14.96 | 0.00 | 14.96 | 867.65 | 433.83 | 715.27 | 358.17 | 35.86 | -2.504 | 0.000 | 0.045 |
| 140.00 | -2.46 | -1.31 | 0.00 | -12.27 | 0.00 | 12.27 | 854.59 | 427.29 | 689.83 | 345.43 | 36.91 | -2.517 | 0.000 | 0.038 |
| 145.00 | -2.25 | -1.24 | 0.00 | -5.69 | 0.00 | 5.69 | 821.03 | 410.52 | 627.52 | 314.23 | 39.56 | -2.539 | 0.000 | 0.021 |
| 149.00 | 0.00 | -1.13 | 0.00 | -0.75 | 0.00 | 0.75 | 787.55 | 393.77 | 574.90 | 287.88 | 41.69 | -2.546 | 0.000 | 0.003 |

# Final Analysis Summary

| | | | | | |
|---|---|---|---|---|---|
| **Structure:** | CT12215-A-SBA | | **Code:** | EIA/TIA-222-G | 3/21/2017 |
| **Site Name:** | Litchfield 3, CT | | **Exposure:** | C | |
| **Height:** | 149.00 (ft) | | **Crest Height:** | 0.00 | |
| **Base Elev:** | 0.000 (ft) | | **Site Class:** | B - Competent Rock | |
| **Gh:** | 1.1 | **Topography:** 1 | **Struct Class:** | II | Page: 37 |

Tower Engineering Solutions

## Reactions

| Load Case | Shear FX (kips) | Shear FZ (kips) | Axial FY (kips) | Moment MX (ft-kips) | Moment MY (ft-kips) | Moment MZ (ft-kips) |
|---|---|---|---|---|---|---|
| 1.2D + 1.6W 89 mph Wind | 23.0 | 0.00 | 31.73 | 0.00 | 0.00 | 2577.52 |
| 0.9D + 1.6W 89 mph Wind | 23.0 | 0.00 | 23.78 | 0.00 | 0.00 | 2537.74 |
| 1.2D + 1.0Di + 1.0Wi 40 mph Wind | 5.4 | 0.00 | 60.26 | 0.00 | 0.00 | 636.81 |
| 1.2D + 1.0E | 0.9 | 0.00 | 31.78 | 0.00 | 0.00 | 104.33 |
| 0.9D + 1.0E | 0.9 | 0.00 | 23.84 | 0.00 | 0.00 | 102.57 |
| 1.0D + 1.0W 60 mph Wind | 6.5 | 0.00 | 26.48 | 0.00 | 0.00 | 726.85 |

## Max Stresses

| Load Case | 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) | Elev (ft) | Stress Ratio |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1.2D + 1.6W 89 mph Wind | -18.94 | -19.96 | 0.00 | -1425.4 | 0.00 | -1425.4 | 1914.68 | 957.34 | 2935.86 | 1470.11 | 52.97 | 0.980 |
| 0.9D + 1.6W 89 mph Wind | -13.97 | -19.67 | 0.00 | -1394.5 | 0.00 | -1394.5 | 1914.68 | 957.34 | 2935.86 | 1470.11 | 52.97 | 0.956 |
| 1.2D + 1.0Di + 1.0Wi 40 mph Wind | -41.85 | -4.90 | 0.00 | -360.72 | 0.00 | -360.72 | 1914.68 | 957.34 | 2935.86 | 1470.11 | 52.97 | 0.267 |
| 1.2D + 1.0E | -12.89 | -0.69 | 0.00 | -29.01 | 0.00 | -29.01 | 1075.68 | 537.84 | 1234.34 | 618.09 | 100.34 | 0.059 |
| 0.9D + 1.0E | -9.67 | -0.67 | 0.00 | -28.36 | 0.00 | -28.36 | 1075.68 | 537.84 | 1234.34 | 618.09 | 100.34 | 0.055 |
| 1.0D + 1.0W 60 mph Wind | -16.58 | -5.62 | 0.00 | -401.15 | 0.00 | -401.15 | 1914.68 | 957.34 | 2935.86 | 1470.11 | 52.97 | 0.282 |

# Monopole Mat Foundation Design

| | | | |
|---|---|---|---|
| | | | Date: 3/21/2017 |
| **Customer Name:** | T-Mobile | **EIA/TIA Standard:** | EIA-222-G |
| **Site Name:** | | **Structure Height (Ft.):** | 149 |
| **Site Number:** | CT12215-A-SBA | **Engineer Name:** | J. Chen |
| **Engr. Number:** | 31792 | **Engineer Login ID:** | |

**Foundation Info Obtained from:** Drawings/Calculations

**Structure Type:** Monopole

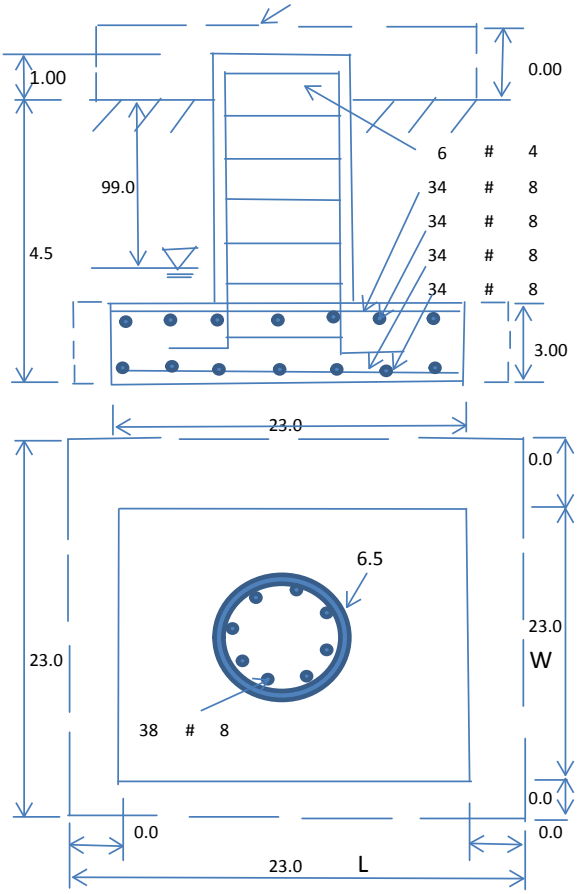
**Analysis or Design?** Analysis

**Base Reactions (Factored):**

| | | | |
|---|---|---|---|
| Axial Load (Kips): | 60.3 | Shear Force (Kips): | 23.0 |
| Uplift Force (Kips): | 0.0 | Moment (Kips-ft): | 2577.5 |
| Allowable overstress %: | 5.0% | | |

**Foundation Geometries:**

| | | | |
|---|---|---|---|
| | | Mods required -Yes/No ?: | No |
| Diameter of Pier (ft.): | 6.5 | Depth of Base BG (ft.): | 4.5 |
| Pier Height A. G. (ft.): | 1.00 | Thickness of Pad (ft): | 3.00 |
| Length of Pad (ft.): | 23 | Width of Pad (ft.): | 23 |
| Final Length of pad (ft) | 23.0 | Final width of pad (ft): | 23.0 |
| Control Value for Cell D18: | 0 | Control Value for Cell F18: | 0 |




**Material Properties and Reabr Info:**

| | | | | |
|---|---|---|---|---|
| Concrete Strength (psi): | 4000 | Steel Elastic Modulus: | 29000 | ksi |
| Vertical bar yield (ksi) | 60 | Tie steel yield (ksi): | 60 | |
| Vertical Rebar Size #: | 8 | Tie / Stirrup Size #: | 4 | |
| Qty. of Vertical Rebars: | 38 | Tie Spacing (in): | 12.0 | |
| Pad Rebar Yield (Ksi): | 60 | Pad Steel Rebar Size (#): | 8 | |
| Concrete Cover (in.): | 3 | Unit Weight of Concrete: | 150.0 | pcf |
| Rebar at the bottom of the concrete pad: | | | | |
| Qty. of Rebar in Pad (L): | 34 | Qty. of Rebar in Pad (W): | 34 | |
| Rebar at the top of the concrete pad: | | | | |
| Qty. of Rebar in Pad (L): | 34 | Qty. of Rebar in Pad (W): | 34 | |
| Apply 1.35 factor for e/w Per G: | 1.35 | | | |

**Soil Design Parameters:**

| | | | | | | |
|---|---|---|---|---|---|---|
| Soil Unit Weight (pcf): | 110.0 | Soil Buoyant Weight: | 50.0 | Pcf | | |
| Water Table B.G.S. (ft): | 99.0 | Unit Weight of Water: | 62.4 | pcf | Angle from Top of Pad: | 30 |
| Ultimate Bearing Pressure (psf): | 12000 | Ultimate Skin Friction: | | Psf | Angle from Bottm of Pad: | 25 |
| Consider Friction for O.T.M. (Y/N): | No | Consider Friction for bearing (Y/N): | No | | Angle from Bottm of Pad: | 25 |
| Consider soil hor. resist. for OTM.: | No | Reduction factor on the maximum soil bearing pressure: | | | 1.00 | |

**Foundation Analysis and Design:** Uplift Strength Reduction Factor: 0.75 — Compression Strength Reduction Factor: 0.75

| | | | |
|---|---|---|---|
| Total Dry Soil Volume (cu. Ft.): | 743.73 | Total Dry Soil Weight (Kips): | 81.84 |
| Total Buoyant Soil Volume (cu. Ft.): | 0.00 | Total Buoyant Soil Weight (Kips): | 0.00 |
| Total Effective Soil Weight (Kips): | 81.84 | Weight from the Concrete Block at Top (K): | 0.00 |
| Total Dry Concrete Volume (cu. Ft.): | 1669.96 | Total Dry Concrete Weight (Kips): | 250.49 |
| Total Buoyant Concrete Volume (cu. Ft.): | 0.00 | Total Buoyant Concrete Weight (Kips): | 0.00 |
| Total Effective Concrete Weight (Kips): | 250.49 | Total Vertical Load on Base (Kips): | 392.63 |

**Check Soil Capacities:**

| | | | | | Load/ Capacity Ratio | |
|---|---|---|---|---|---|---|
| Calculated Maxium Net Soil Pressure under the base (psf): | 2576 | < | Allowable Factored Soil Bearing (psf): | 9000 | 0.29 | OK! |
| Allowable Foundation Overturning Resistance (kips-ft.): | 4133.1 | > | Design Factored Momont (kips-ft): | 2704 | 0.65 | OK! |
| Factor of Safety Against Overturning (O. R. Moment/Design Moment): | 1.53 | OK! | | | | |

**Check the capacities of Reinforceing Concrete:**

| | | | | | |
|---|---|---|---|---|---|
| Strength reduction factor (Flexure and axial tension): | 0.90 | Strength reduction factor (Shear): | 0.75 | | |
| Strength reduction factor (Axial compresion): | 0.65 | Wind Load Factor on Concrete Design: | 1.00 | | |
| | | | | Load/ Capacity Ratio | |
| (1) Concrete Pier: | | | | | |
| Vertical Steel Rebar Area (sq. in./each): | 0.79 | Tie / Stirrup Area (sq. in./each): | 0.20 | | |
| Calculated Moment Capacity (Mn,Kips-Ft): | 4704.5 > | Design Factored Moment (Mu, Kips-Ft | 2635.0 | 0.56 | OK! |
| Calculated Shear Capacity (Kips): | 578.1 > | Design Factored Shear (Kips): | 23.0 | 0.04 | OK! |
| Calculated Tension Capacity (Tn, Kips): | 1621.1 > | Design Factored Tension (Tu Kips): | 0.0 | 0.00 | OK! |
| Calculated Compression Capacity (Pn, Kips): | 8395.1 > | Design Factored Axial Load (Pu Kips): | 60.3 | 0.01 | OK! |
| Moment & Axial Strength Combination: | 0.56 OK! | Check Tie Spacing (Design/Required): | | 1 | OK! |
| Pier Reinforcement Ratio: | 0.006 | Reinforcement Ratio is satisfied per ACI | | | |
| (2).Concrete Pad: | | | | | |
| One-Way Design Shear Capacity (L-Direction, Kips): | 851.0 > | One-Way Factored Shear (L-D. Kips): | 182.3 | 0.21 | OK! |
| One-Way Design Shear Capacity (W-Direction, Kips): | 851.0 > | One-Way Factored Shear (W-D., Kips) | 182.3 | 0.21 | OK! |
| One-Way Design Shear Capacity (Corner-Corner. Kips): | 963.0 > | One-Way Factored Shear (C-C, Kips): | 180.4 | 0.19 | OK! |
| Lower Steel Pad Reinforcement Ratio (L-Direct. ): | 0.0030 OK! | Lower Steel Pad Reinf. Ratio (W-Direc | 0.0030 | | |
| Lower Steel Pad Moment Capacity (L-Direction. Kips-ft): | 3824.5 > | Moment at Bottom ( L-Direct. K-Ft): | 505.1 | 0.13 | OK! |
| Lower Steel Pad Moment Capacity (W-Direction. Kips-ft): | 3824.5 > | Moment at Bottom ( W-Direct. K-Ft): | 505.1 | 0.13 | OK! |
| Lower Steel Pad Moment Capacity (Corner-Corner,K-ft): | 5372.0 > | Moment at Bottom ( C-C Dir. K-Ft): | 714.3 | 0.13 | OK! |
| Upper Steel Pad Reinforcement Ratio (L-Direct. ): | 0.0030 OK! | Upper Steel Reinf. Ratio (W-Direct. ): | 0.0030 | | |
| Upper Steel Pad Moment Capacity (L-Direction. Kips-ft): | 3824.5 > | Moment at the top (L-Dir Kips-Ft): | 137.8 | 0.04 | OK! |
| Upper Steel Pad Moment Capacity (W-Direction. Kips-ft): | 3824.5 > | Moment at the top (W-Dir Kips-Ft): | 137.8 | 0.04 | OK! |
| Upper Steel Pad Moment Capacity (Corner-Corner. K-ft): | 5372.0 > | Moment at the top (C-C Direc. K-Ft): | 295.6 | 0.06 | OK! |

# 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: CTNH546A

SBA Bantam Rd
1291 Bantam Road
Bantam, CT 06750

**April 10, 2017**

**EBI Project Number: 6217001426**

| 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

April 10, 2017

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

Emissions Analysis for Site: **CTNH546A – SBA Bantam Rd**

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **1291 Bantam Road, Bantam, 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 **1291 Bantam Road, Bantam, 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-16DWV-S-E-A20** for 1900 MHz (PCS) and 2100 MHz (AWS) channels and the **Commscope LNX-6515DS-A1M** for 700 MHz channels. This is based on feedback from the carrier with regards to anticipated antenna selection. The **RFS APX16DWV-16DWV-S-E-A20** has a maximum gain of **16.3 dBd** at its main lobe at 1900 MHz and 2100 MHz. The **Commscope LNX-6515DS-A1M** 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 **115 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-16DWV-S-E-A20 | Make / Model: | RFS APX16DWV-16DWV-S-E-A20 | Make / Model: | RFS APX16DWV-16DWV-S-E-A20 |
| Gain: | 16.3 dBd | Gain: | 16.3 dBd | Gain: | 16.3 dBd |
| Height (AGL): | 115 | Height (AGL): | 115 | Height (AGL): | 115 |
| 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% | 2.32 | Antenna B1 MPE% | 2.32 | Antenna C1 MPE% | 2.32 |
| Antenna #: | **2** | Antenna #: | **2** | Antenna #: | **2** |
| Make / Model: | Commscope LNX-6515DS-A1M | Make / Model: | Commscope LNX-6515DS-A1M | Make / Model: | Commscope LNX-6515DS-A1M |
| Gain: | 14.6 dBd | Gain: | 14.6 dBd | Gain: | 14.6 dBd |
| Height (AGL): | 115 | Height (AGL): | 115 | Height (AGL): | 115 |
| 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% | 0.56 | Antenna B2 MPE% | 0.56 | Antenna C2 MPE% | 0.56 |

| **Site Composite MPE%** | |
|---|---|
| **Carrier** | **MPE%** |
| T-Mobile (Per Sector Max) | **2.88 %** |
| Sprint | 0.30 % |
| AT&T | 2.14 % |
| Verizon Wireless | 1.65 % |
| **Site Total MPE %:** | **6.97 %** |

| | |
|---|---|
| T-Mobile Sector A Total: | 2.88 % |
| T-Mobile Sector B Total: | 2.88 % |
| T-Mobile Sector C Total: | 2.88 % |
| | |
| Site Total: | 6.97 % |

| T-Mobile _Max Values 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 PCS - 1900 MHz UMTS | 2 | 1,279.74 | 115 | 7.74 | PCS - 1900 MHz | 1000 | 0.77% |
| T-Mobile 2100 MHz LTE | 2 | 2,559.48 | 115 | 15.49 | 2100 MHz | 1000 | 1.55% |
| T-Mobile 700 MHz LTE | 1 | 865.21 | 115 | 2.62 | 700 MHz | 467 | 0.56% |
| | | | | | | **Total:** | **2.88%** |

## 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: | 2.88 % |
| Sector B: | 2.88 % |
| Sector C: | 2.88 % |
| T-Mobile Per Sector Maximum: | 2.88 % |
| | |
| 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.

# Exhibit F

SBA Communications Corporation
8051 Congress Avenue
Boca Raton, FL 33487-1307

T + 561.995.7670
F + 561.995.7626

sbasite.com

# LETTER OF AUTHORIZATION

**SBA Site ID:** CT12215-A, Litchfield 3, CT

**Property Located at:** 1291 Bantam Road, Bantam, CT,

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**THE CITY/COUNTY OF: Bantam / Litchfield/Litchfield**

## APPLICATION FOR ZONING/USE/BUILDING PERMIT

This letter authorizes T-Mobile and its authorized agents to file for all necessary zoning, planning and building permits (local, state and federal) for the purposes of installing, operating and maintaining a telecommunications facility on the existing tower on the property referenced above on behalf of William L. & Deborah A. Downes.

All approval conditions that may be granted to T-Mobile in connection with above referenced facility relating to this specific application are the sole responsibility of T-Mobile.

SBA Towers V, LLC

Jason Silberstein

Executive VP, Site Leasing

Date: 3/31/2017