

# STATE OF CONNECTICUT

## CONNECTICUT SITING COUNCIL

Ten Franklin Square, New Britain, CT 06051

Phone: (860) 827-2935 Fax: (860) 827-2950

E-Mail: [siting.council@ct.gov](mailto:siting.council@ct.gov)

[www.ct.gov/csc](http://www.ct.gov/csc)

November 5, 2012

Kenneth C. Baldwin, Esq.  
Robinson & Cole LLP  
280 Trumbull Street  
Hartford, CT 06103

RE: **EM-VER-064-121019** - Cellco Partnership d/b/a Verizon Wireless notice of intent to modify an existing telecommunications facility located at 219 New Park Avenue, Hartford, Connecticut.

Dear Attorney Baldwin:

The Connecticut Siting Council (Council) hereby acknowledges your notice to modify this existing telecommunications facility, pursuant to Section 16-50j-73 of the Regulations of Connecticut State Agencies with the following conditions:

- Prior to antenna installation, the modifications identified in the Structural Modification Report prepared by B+T Group dated October 16, 2012, and stamped by Chad Tuttle shall be implemented;
- Not more than 45 days following completion of the antenna installation, a signed letter from a Professional Engineer duly licensed in the State of Connecticut shall be submitted to the Council to certify that the recommended modifications have been completed and the tower and foundation do not exceed 100 percent of the post-construction structural rating;
- Any deviation from the proposed modification as specified in this notice and supporting materials with Council shall render this acknowledgement invalid;
- Any material changes to this modification as proposed shall require the filing of a new notice with the Council;
- Not less than 45 days after completion of construction, the Council shall be notified in writing that construction has been completed;
- The validity of this action shall expire one year from the date of this letter; and
- The applicant may file a request for an extension of time beyond the one year deadline provided that such request is submitted to the Council not less than 60 days prior to the expiration;

The proposed modifications including the placement of all necessary equipment and shelters within the tower compound are to be implemented as specified here and in your notice dated October 18, 2012. The modifications are in compliance with the exception criteria in Section 16-50j-72 (b) of the Regulations of Connecticut State Agencies as changes to an existing facility site that would not increase tower height, extend the boundaries of the tower site, increase noise levels at the tower site boundary by six decibels, and increase the total radio frequencies electromagnetic radiation power density measured at the tower site boundary to or above the standard adopted by the State Department of Environmental Protection pursuant to General Statutes § 22a-162. This facility has also been carefully modeled to ensure that radio frequency emissions are conservatively below State and federal standards applicable to the frequencies now used on this tower.



This decision is under the exclusive jurisdiction of the Council. Please be advised that the validity of this action shall expire one year from the date of this letter. Any additional change to this facility will require explicit notice to this agency pursuant to Regulations of Connecticut State Agencies Section 16-50j-73. Such notice shall include all relevant information regarding the proposed change with cumulative worst-case modeling of radio frequency exposure at the closest point of uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin 65. Thank you for your attention and cooperation.

Very truly yours,

A handwritten signature in black ink, appearing to read "L. Roberts".

Linda Roberts  
Executive Director

LR/CDM/jbw

c: The Honorable Pedro E. Segarra, Mayor, City of Hartford  
Sandra Kee Borges, Acting Chief Operating Officer, City of Hartford  
Crown Castle



280 Trumbull Street  
Hartford, CT 06103-3597  
Main (860) 275-8200  
Fax (860) 275-8299  
kbaldwin@rc.com  
Direct (860) 275-8345

EM-VER-064-121019

Also admitted in Massachusetts

October 18, 2012

ORIGINAL

RECEIVED  
OCT 19 2012

CONNECTICUT  
SITING COUNCIL

Linda Roberts  
Executive Director  
Connecticut Siting Council  
10 Franklin Square  
New Britain, CT 06051

Re: **Notice of Exempt Modification – Antenna Swap**  
**219 New Park Avenue, Hartford, Connecticut**

Dear Ms. Roberts:

Cellco Partnership d/b/a Verizon Wireless (“Cellco”) currently maintains twelve (12) wireless telecommunications antennas at the 105-foot level on an existing 108-foot tower at the above-referenced address. The tower is owned by Crown Castle. Cellco’s use of the tower was approved by the Council in 2009. Cellco now intends to replace six (6) of its existing antennas with three (3) model BXA-171063-12BF PCS antennas and three (3) model BXA-70063-6CF LTE antennas, all at the 105-foot level. Cellco also intends to replace all twelve (12) of its existing coax cables with eighteen (18) new coax cables attached to the outside of the monopole tower. Attached behind Tab 1 are the specifications for Cellco’s replacement antennas.

Please accept this letter as notification pursuant to R.C.S.A. § 16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to Pedro E. Segarra, Mayor of the City of Hartford. A copy of this letter is also being sent to the Connecticut Light and Power Company, the owner of the property on which the tower is located.

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



*Law Offices*

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11929375-v1

Linda Roberts  
October 18, 2012  
Page 2

1. The proposed modifications will not result in an increase in the height of the existing tower. Cellco's replacement antennas will be located at the 105-foot level on the existing 108-foot tower.

2. The proposed modifications do not involve any change to ground-mounted equipment and, therefore, will not require the extension of the site boundaries.

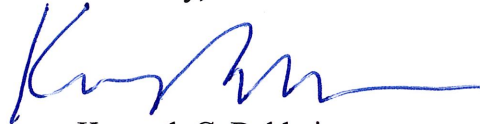
3. The proposed modifications will not increase noise levels at the facility by six decibels or more.

4. The operation of the replacement antennas will not increase radio frequency (RF) emissions at the facility to a level at or above the Federal Communications Commission (FCC) adopted safety standard. A cumulative General Power Density table for Cellco's modified facility is included behind Tab 2.

Also attached is a Structural Modification Report including Tower Modification Drawings confirming that the tower and foundation, with certain modifications, can support Cellco's proposed modifications. (See Tab 3).

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

Sincerely,



Kenneth C. Baldwin

Enclosures

Copy to:

Pedro E. Segarra, Hartford Mayor  
Connecticut Light and Power Company  
Sandy M. Carter



## BXA-171063-12BF-EDIN-X

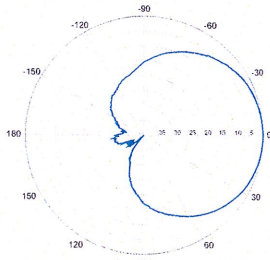
Replace "X" with desired electrical downtilt.

X-Pol | FET Panel | 63° | 19.0 dBi

| Electrical Characteristics              | 1710-2170 MHz                                                   |                                                      |                     |
|-----------------------------------------|-----------------------------------------------------------------|------------------------------------------------------|---------------------|
| Frequency bands                         | 1710-1880 MHz                                                   | 1850-1990 MHz                                        | 1920-2170 MHz       |
| Polarization                            | ±45°                                                            | ±45°                                                 | ±45°                |
| Horizontal beamwidth                    | 68°                                                             | 65°                                                  | 60°                 |
| Vertical beamwidth                      | 4.5°                                                            | 4.5°                                                 | 4.5°                |
| Gain                                    | 16.1 dBd / 18.2 dBi                                             | 16.5 dBd / 18.6 dBi                                  | 16.9 dBd / 19.0 dBi |
| Electrical downtilt (X)                 | 0, 2, 5                                                         |                                                      |                     |
| Impedance                               | 50Ω                                                             |                                                      |                     |
| VSWR                                    | ≤1.5:1                                                          |                                                      |                     |
| First upper sidelobe                    | < -17 dB                                                        |                                                      |                     |
| Front-to-back ratio                     | > 30 dB                                                         |                                                      |                     |
| In-band isolation                       | > 28 dB                                                         |                                                      |                     |
| IM3 (20W carrier)                       | < -150 dBc                                                      |                                                      |                     |
| Input power                             | 300 W                                                           |                                                      |                     |
| Lightning protection                    | Direct Ground                                                   |                                                      |                     |
| Connector(s)                            | 2 Ports / EDIN / Female / Bottom                                |                                                      |                     |
| Operating temperature                   | -40° to +60° C / -40° to +140° F                                |                                                      |                     |
| Mechanical Characteristics              |                                                                 |                                                      |                     |
| Dimensions Length x Width x Depth       | 1820 x 154 x 105 mm                                             | 71.7 x 6.1 x 4.1 in                                  |                     |
| Depth with z-brackets                   | 133 mm                                                          | 5.2 in                                               |                     |
| Weight without mounting brackets        | 6.8 kg                                                          | 15 lbs                                               |                     |
| Survival wind speed                     | > 201 km/hr                                                     |                                                      | > 125 mph           |
| Wind area                               | Front: 0.28 m <sup>2</sup> Side: 0.19 m <sup>2</sup>            | Front: 3.1 ft <sup>2</sup> Side: 2.1 ft <sup>2</sup> |                     |
| Wind load @ 161 km/hr (100 mph)         | Front: 460 N    Side: 304 N                                     | Front: 103 lbf    Side: 68 lbf                       |                     |
| Mounting Options                        | Part Number                                                     | Fits Pipe Diameter                                   | Weight              |
| 2-Point Mounting Bracket Kit            | 26799997                                                        | 50-102 mm    2.0-4.0 in                              | 2.3 kg    5 lbs     |
| 2-Point Mounting & Downtilt Bracket Kit | 26799999                                                        | 50-102 mm    2.0-4.0 in                              | 3.6 kg    8 lbs     |
| Concealment Configurations              | For concealment configurations, order BXA-171063-12BF-EDIN-X-FP |                                                      |                     |

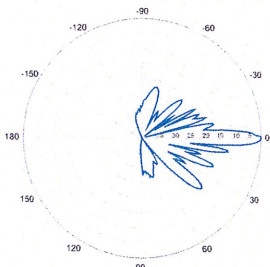


BXA-171063-12BF-EDIN-X



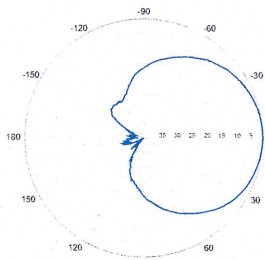
Horizontal | 1710-1880 MHz

BXA-171063-12BF-EDIN-0



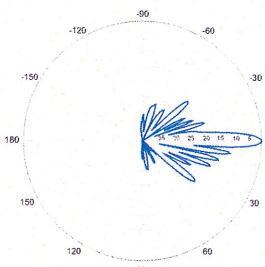
0° | Vertical | 1710-1880 MHz

BXA-171063-12BF-EDIN-X



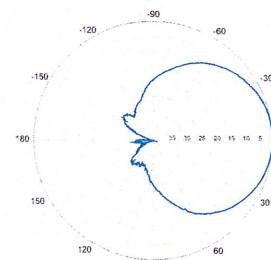
Horizontal | 1850-1990 MHz

BXA-171063-12BF-EDIN-0



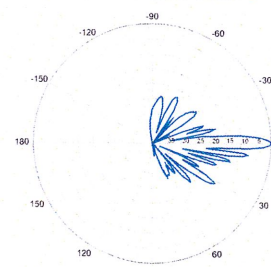
0° | Vertical | 1850-1990 MHz

BXA-171063-12BF-EDIN-X



Horizontal | 1920-2170 MHz

BXA-171063-12BF-EDIN-0



0° | Vertical | 1920-2170 MHz

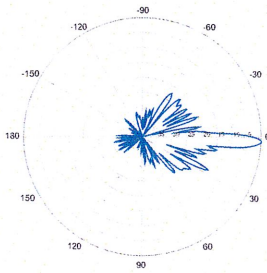
Quoted performance parameters are provided to offer typical or range values only and may vary as a result of normal manufacturing and operational conditions. Extreme operational conditions and/or stress on structural supports is beyond our control. Such conditions may result in damage to this product. Improvements to product may be made without notice.



**BXA-171063-12BF-EDIN-X**

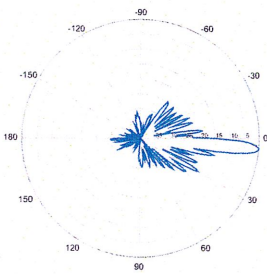
X-Pol | FET Panel | 63° | 19.0 dBi

**BXA-171063-12BF-EDIN-2**



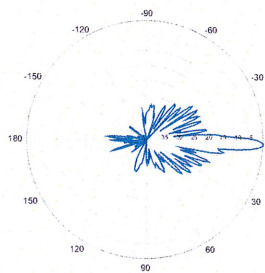
2° | Vertical | 1710-1880 MHz

**BXA-171063-12BF-EDIN-5**



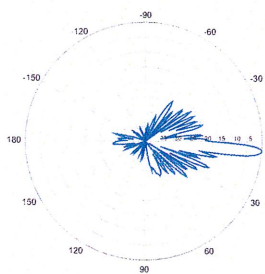
5° | Vertical | 1710-1880 MHz

**BXA-171063-12BF-EDIN-2**



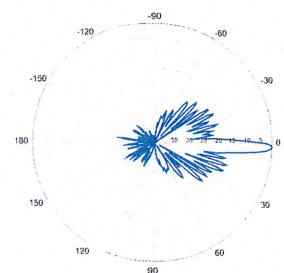
2° | Vertical | 1850-1990 MHz

**BXA-171063-12BF-EDIN-5**



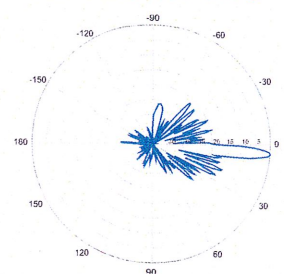
5° | Vertical | 1850-1990 MHz

**BXA-171063-12BF-EDIN-2**



2° | Vertical | 1920-2170 MHz

**BXA-171063-12BF-EDIN-5**



5° | Vertical | 1920-2170 MHz

Quoted performance parameters are provided to offer typical or range values only and may vary as a result of normal manufacturing and operational conditions. Extreme operational conditions and/or stress on structural supports is beyond our control. Such conditions may result in damage to this product. Improvements to product may be made without notice.

## BXA-70063-6CF-EDIN-X

X-Pol | FET Panel | 63° | 14.5 dBd

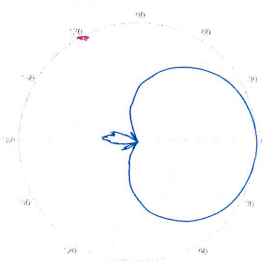
Replace "X" with desired electrical downtilt.

Antenna is also available with NE connector(s). Replace "EDIN" with "NE" in the model number when ordering.

| Electrical Characteristics              | 696-900 MHz                                                   |                           |                            |                           |
|-----------------------------------------|---------------------------------------------------------------|---------------------------|----------------------------|---------------------------|
| Frequency bands                         | 696-806 MHz                                                   |                           | 806-900 MHz                |                           |
| Polarization                            | ±45°                                                          |                           |                            |                           |
| Horizontal beamwidth                    | 65°                                                           |                           | 63°                        |                           |
| Vertical beamwidth                      | 13°                                                           |                           | 11°                        |                           |
| Gain                                    | 14.0 dBd (16.1 dBi)                                           |                           | 14.5 dBd (16.6 dBi)        |                           |
| Electrical downtilt (X)                 | 0, 2, 3, 4, 5, 6, 8, 10                                       |                           |                            |                           |
| Impedance                               | 50Ω                                                           |                           |                            |                           |
| VSWR                                    | ≤1.35:1                                                       |                           |                            |                           |
| Upper sidelobe suppression (0°)         | -18.3 dB                                                      |                           | -18.2 dB                   |                           |
| Front-to-back ratio (+/-30°)            | -33.4 dB                                                      |                           | -36.3 dB                   |                           |
| Null fill                               | 5% (-26.02 dB)                                                |                           |                            |                           |
| Isolation between ports                 | < -25 dB                                                      |                           |                            |                           |
| Input power with EDIN connectors        | 500 W                                                         |                           |                            |                           |
| Input power with NE connectors          | 300 W                                                         |                           |                            |                           |
| Lightning protection                    | Direct Ground                                                 |                           |                            |                           |
| Connector(s)                            | 2 Ports / EDIN or NE / Female / Center (Back)                 |                           |                            |                           |
| Mechanical Characteristics              |                                                               |                           |                            |                           |
| Dimensions Length x Width x Depth       | 1804 x 285 x 132 mm                                           |                           | 71.0 x 11.2 x 5.2 in       |                           |
| Depth with z-brackets                   | 172 mm                                                        |                           | 6.8 in                     |                           |
| Weight without mounting brackets        | 7.9 kg                                                        |                           | 17 lbs                     |                           |
| Survival wind speed                     | > 201 km/hr                                                   |                           | > 125 mph                  |                           |
| Wind area                               | Front: 0.51 m <sup>2</sup>                                    | Side: 0.24 m <sup>2</sup> | Front: 5.5 ft <sup>2</sup> | Side: 2.6 ft <sup>2</sup> |
| Wind load @ 161 km/hr (100 mph)         | Front: 759 N                                                  | Side: 391 N               | Front: 169 lbf             | Side: 89 lbf              |
| Mounting Options                        | Part Number                                                   | Fits Pipe Diameter        |                            | Weight                    |
| 3-Point Mounting & Downtilt Bracket Kit | 36210008                                                      | 40-115 mm 1.57-4.5 in     |                            | 6.9 kg 15.2 lbs           |
| Concealment Configurations              | For concealment configurations, order BXA-70063-6CF-EDIN-X-FP |                           |                            |                           |

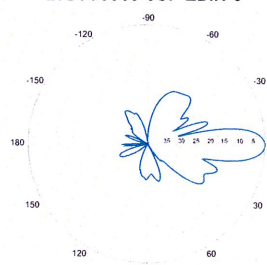


BXA-70063-6CF-EDIN-X



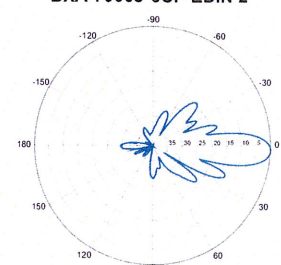
Horizontal | 750 MHz

BXA-70063-6CF-EDIN-0

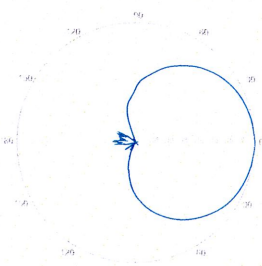


0° | Vertical | 750 MHz

BXA-70063-6CF-EDIN-2



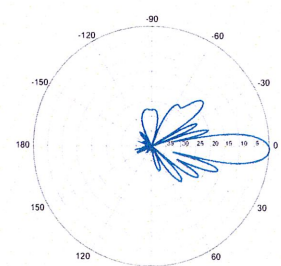
2° | Vertical | 750 MHz



Horizontal | 850 MHz



0° | Vertical | 850 MHz



2° | Vertical | 850 MHz

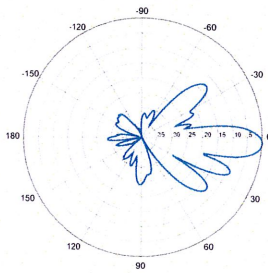
Quoted performance parameters are provided to offer typical or range values only and may vary as a result of normal manufacturing and operational conditions. Extreme operational conditions and/or stress on structural supports is beyond our control. Such conditions may result in damage to this product. Improvements to product may be made without notice.



**BXA-70063-6CF-EDIN-X**

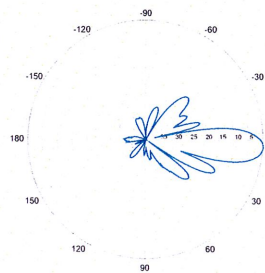
X-Pol | FET Panel | 63° | 14.5 dBd

**BXA-70063-6CF-EDIN-3**



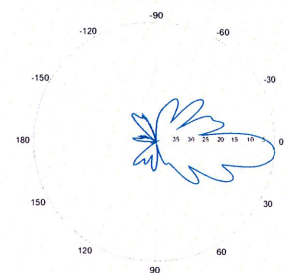
3° | Vertical | 750 MHz

**BXA-70063-6CF-EDIN-4**

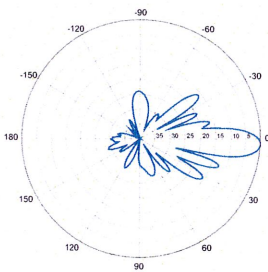


4° | Vertical | 750 MHz

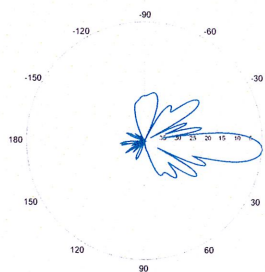
**BXA-70063-6CF-EDIN-5**



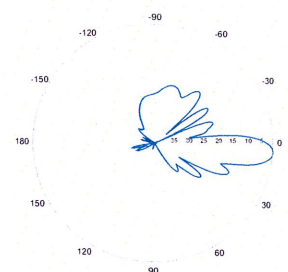
5° | Vertical | 750 MHz



3° | Vertical | 850 MHz

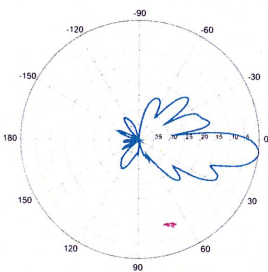


4° | Vertical | 850 MHz



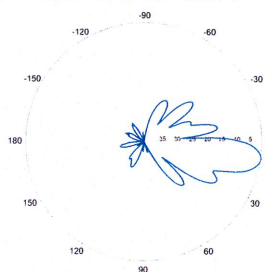
5° | Vertical | 850 MHz

**BXA-70063-6CF-EDIN-6**



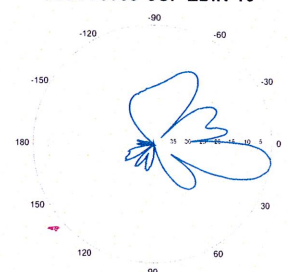
6° | Vertical | 750 MHz

**BXA-70063-6CF-EDIN-8**

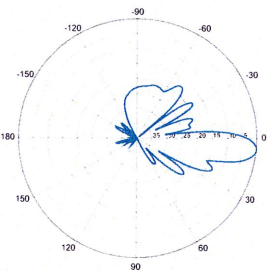


8° | Vertical | 750 MHz

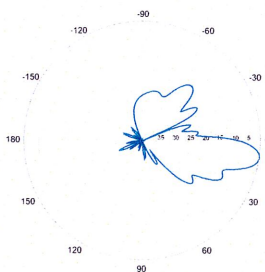
**BXA-70063-6CF-EDIN-10**



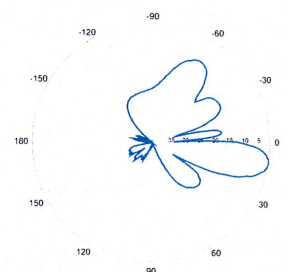
10° | Vertical | 750 MHz



6° | Vertical | 850 MHz



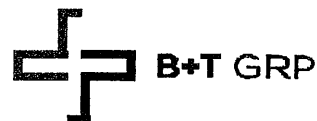
8° | Vertical | 850 MHz



10° | Vertical | 850 MHz

Quoted performance parameters are provided to offer typical or range values only and may vary as a result of normal manufacturing and operational conditions. Extreme operational conditions and/or stress on structural supports is beyond our control. Such conditions may result in damage to this product. Improvements to product may be made without notice.





October 16, 2012

Mr. Steve Tuttle  
Crown Castle USA Inc.  
The Piano Works 349 West Commercial Street  
East Rochester, NY 14445  
(585)899-3445

B+T Group  
1717 S. Boulder, Suite 300  
Tulsa, OK 74119  
(918) 587-4630  
ctuttle@btgrp.com

**Subject:** Structural Modification Report

**Carrier Designation:** Verizon Wireless Co-Locate  
**Carrier Site Number:** 118004  
**Carrier Site Name:** West Hartford 4 CT

**Crown Castle Designation:** Crown Castle BU Number: 876363  
Crown Castle Site Name: HARTFORD - NU (SSUSA)  
Crown Castle JDE Job Number: 190497  
Crown Castle Work Order Number: 537531  
Crown Castle Application Number: 156076 Rev. 3

**Engineering Firm Designation:** B+T Group Project Number: 85565.001

**Site Data:** 219 New Park Rd., Hartford, CT, Hartford County  
Latitude 41° 45' 2.79", Longitude -72° 42' 49.23"  
108 Foot - Monopole

Dear Mr. Tuttle,

B+T Group is pleased to submit this "Structural Modification Report" to determine the structural integrity of the above mentioned tower. This analysis has been performed in accordance with the Crown Castle Structural 'Statement of Work' and the terms of Crown Castle Purchase Order Number 492838, in accordance with application 156076, revision 3.

The purpose of the analysis is to determine acceptability of the tower stress level. Based on our analysis we have determined the tower stress level for the structure and foundation, under the following load case, to be:

LC4: TSA specified load case with proposed modifications

**Sufficient Capacity**

Note: See Table 1 and Table 2 for the proposed and existing/reserved loading, respectively.

The analysis has been performed in accordance with the TIA/EIA-222-F standard and the 2003 IBC; 2003 IRC (State Building Code, 2005 CT supplement) based upon a wind speed of 80 mph fastest mile.

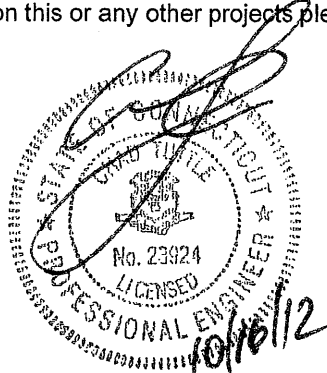
All modifications and equipment proposed in this report shall be installed in accordance with the attached drawings for the determined available structural capacity to be effective.

We at B+T Group appreciate the opportunity of providing our continuing professional services to you and Crown Castle. If you have any questions or need further assistance on this or any other projects please give us a call.

Respectfully submitted by:  
B+T Engineering, Inc.

Hari Rotithor, E.I.  
Project Engineer

Chad E. Tuttle, P.E.  
President





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tnxTower Output

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Base Level Drawing

### **7) APPENDIX C**

Additional Calculations

### **8) APPENDIX D**

Tower Modification Drawings

## 1) INTRODUCTION

This tower is a 108 ft. Monopole tower designed by SUMMIT in October of 2000. The tower was originally designed for a wind speed of 90 mph per TIA/EIA-222-F.

## 2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements of TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a fastest mile wind speed of 80 mph with no ice, 37.6 mph with 1 inch ice thickness and 50 mph under service loads.

**Table 1 - Proposed Antenna and Cable Information**

| Mounting Level (ft) | Center Line Elevation (ft) | Number of Antennas | Antenna Manufacturer | Antenna Model        | Number of Feed Lines | Feed Line Size (in) | Note |
|---------------------|----------------------------|--------------------|----------------------|----------------------|----------------------|---------------------|------|
| 105.0               | 105.0                      | 3                  | Antel                | BXA-171063-12BF      | 18                   | 1 5/8               | --   |
|                     |                            | 3                  | Antel                | BXA-70063-6CF-EDIN-0 |                      |                     |      |

**Table 2 - Existing and Reserved Antenna and Cable Information**

| Mounting Level (ft) | Center Line Elevation (ft) | Number of Antennas | Antenna Manufacturer       | Antenna Model             | Number of Feed Lines | Feed Line Size (in) | Note |
|---------------------|----------------------------|--------------------|----------------------------|---------------------------|----------------------|---------------------|------|
| 105.0               | 105.0                      | 6                  | Antel                      | LPA-80063-6CF-EDIN        | --                   | --                  | 1    |
|                     |                            | 1                  | --                         | Sector Mount [SM 405-3]   |                      |                     |      |
|                     |                            | 6                  | Antel                      | LPA-171080/8CFx2          | 12                   | 1 1/4               | 3    |
|                     |                            | 6                  | Ericsson                   | KRY 112 13/1              |                      |                     |      |
| 98.0                | 102.0                      | 1                  | Dragonwave                 | A-ANT-18G-2-C             | 2                    | 1/2                 | 1    |
|                     |                            | 1                  | Dragonwave                 | A-ANT-23G-1-C             |                      |                     |      |
|                     |                            | 2                  | Dragonwave                 | HORIZON COMPACT           |                      |                     |      |
|                     | 99.0                       | 3                  | Argus technologies         | LLPX310R                  | 3                    | 5/16                | 1    |
|                     |                            | 3                  | Samsung telecommunications | WIMAX DAP HEAD            |                      |                     |      |
|                     |                            | 3                  | RFS/Celwave                | APXV9ERR18-C-A20          | 3                    | 1 1/4               | 2    |
|                     |                            | 3                  | RFS/Celwave                | IBC1900HG-2A              |                      |                     |      |
|                     |                            | 3                  | RFS/Celwave                | IBC1900BB-1               |                      |                     |      |
|                     | 98.0                       | 1                  | --                         | Platform Mount [LP 712-1] | --                   | --                  | 1    |
|                     | 96.0                       | 6                  | Alcatel Lucent             | PCS1900MHz 4x45W-65MHz    | --                   | --                  | 2    |
|                     |                            | 3                  | Alcatel Lucent             | 800MHZ 2X50W RRH W/FILTER |                      |                     |      |
| 88.0                | 88.0                       | 12                 | Ddecibel                   | 844G65VTZAS               | 12                   | 1 1/4               | 1    |
|                     |                            | 1                  | --                         | Platform Mount [LP 303-1] |                      |                     |      |
| 80.0                | 80.0                       | 1                  | --                         | T-Arm Mount [TA 601-3]    | 1                    | 5/16                | 1    |
|                     | 79.0                       | 3                  | Andrew                     | HBX-6516DS-VTM            | 6                    | 7/8                 |      |
| 76.0                | 76.0                       | 1                  | Lucent                     | KS24019-L112A             | 1                    | 1/2                 | 1    |

Notes:

- 1) Existing Equipment
- 2) Reserved Equipment
- 3) Equipment to be removed

**Table 3 - Design Antenna and Cable Information**

| Mounting Level (ft) | Center Line Elevation (ft) | Number of Antennas | Antenna Manufacturer | Antenna Model            | Number of Feed Lines | Feed Line Size (in) |
|---------------------|----------------------------|--------------------|----------------------|--------------------------|----------------------|---------------------|
| 98                  | 98                         | 1                  | --                   | 14' Low Profile Platform | --                   | --                  |
|                     |                            | 12                 | Dapa                 | 48000 PCS Panel          |                      |                     |
| 88                  | 88                         | 1                  | --                   | 14' Low Profile Platform | --                   | --                  |
|                     |                            | 12                 | Dapa                 | 48000 PCS Panel          |                      |                     |
| 76                  | 76                         | --                 | GPS                  | Antenna w/ Mount         | --                   | --                  |

### 3) ANALYSIS PROCEDURE

**Table 4 - Documents Provided**

| Document                    | Remarks                         | Reference        | Source   |
|-----------------------------|---------------------------------|------------------|----------|
| Application                 | Sprint Rev: 5                   | 165586           | CCIsites |
| Tower Manufacturing Drawing | Summit, Job No. 11049           | 1947570          | CCIsites |
| Post Modification Drawing   | PJF/TRI, Project No: 67310-0013 | 2445631          | CCIsites |
| Foundation Drawing          | Summit, Job No. 11049           | 1613616          | CCIsites |
| Geotech Report              | FDH, Project No: 08-10012E G1   | 2337384          | CCIsites |
| Antenna Configuration       | CAD pack                        | Date: 10/05/2012 | CCIsites |

#### 3.1) Analysis Method

tnxTower (version 6.0.4.0), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A.

#### 3.2) Assumptions

- 1) Tower and structures were built in accordance with the manufacturer's specifications.
- 2) The tower and structures have been maintained in accordance with the manufacturer's specification.
- 3) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.
- 4) When applicable, transmission cables are considered as structural components for calculating wind loads as allowed by TIA/EIA-222-F.
- 5) Mount areas and weights are assumed based on photographs provided.
- 6) The existing base plate grout was not considered in this analysis.
- 7) The existing base plate grout was considered in this analysis. Grout must be maintained and inspected periodically, and must be replaced if damaged or cracked. Refer to crown document ENG-BUL-10122, Tower Base Plate Grout Inspection and Classification.
- 8) The top flange at 98' was assumed to be not governing in this analysis as there is no considerable increase in the reactions at that level in the tower.

This analysis may be affected if any assumptions are not valid or have been made in error. B+T Group should be notified to determine the effect on the structural integrity of the tower.

#### 4) ANALYSIS RESULTS

**Table 5 - Section Capacity (Summary) – LC4**

| Section No. | Elevation (ft) | Component Type | Size                  | Critical Element | P (K)   | SF*P_allow (K) | % Capacity (Refer Note 1) | Pass / Fail      |
|-------------|----------------|----------------|-----------------------|------------------|---------|----------------|---------------------------|------------------|
| L1          | 108 - 98.5     | Pole           | TP8.375x8.375x0.313   | 1                | -1.282  | 221.574        | 83.3                      | Pass             |
| L2          | 98.5 - 98      | Pole           | TP16.5x8.375x0.313    | 2                | -1.289  | 221.574        | 22.1                      | Pass             |
| L3          | 98 - 82        | Pole           | TP19.061x16.5x0.188   | 3                | -6.214  | 583.921        | 95.2                      | Pass             |
| L4          | 82 - 76.75     | Pole           | TP19.901x19.061x0.449 | 4                | -7.685  | 1010.209       | 48.7                      | Pass             |
| L5          | 76.75 - 60.5   | Pole           | TP22.502x19.901x0.627 | 5                | -13.173 | 1573.020       | 77.8                      | Pass             |
| L6          | 60.5 - 59.5    | Pole           | TP22.662x22.502x0.709 | 6                | -13.378 | 1777.715       | 79.6                      | Pass             |
| L7          | 59.5 - 47      | Pole           | TP24.663x22.662x0.686 | 7                | -15.310 | 1922.599       | 88.1                      | Pass             |
| L8          | 47 - 30.5      | Pole           | TP26.929x23.768x0.759 | 8                | -20.329 | 2284.535       | 98.4                      | Pass             |
| L9          | 30.5 - 29.75   | Pole           | TP27.049x26.929x0.688 | 9                | -20.513 | 2112.712       | 86.0                      | Pass             |
| L10         | 29.75 - 11.25  | Pole           | TP30.01x27.049x0.67   | 10               | -25.189 | 2460.225       | 87.3                      | Pass             |
| L11         | 11.25 - 10     | Pole           | TP30.21x30.01x0.689   | 11               | -25.516 | 2715.841       | 91.6                      | Pass             |
| L12         | 10 - 0         | Pole           | TP31.81x30.21x0.79    | 12               | -28.176 | 3276.807       | 81.1                      | Pass             |
|             |                |                |                       |                  |         |                | Summary                   |                  |
|             |                |                |                       |                  |         |                | Pole (L10)                | 98.4 Pass        |
|             |                |                |                       |                  |         |                | <b>RATING =</b>           | <b>98.4 Pass</b> |

**Table 6 - Tower Component Stresses vs. Capacity – LC4**

| Notes | Component       | Elevation (ft) | % Capacity | Pass / Fail |
|-------|-----------------|----------------|------------|-------------|
| 1     | Anchor Rods     | Base           | 85.3       | Pass        |
| 1     | Base Plate      | Base           | 89.4       | Pass        |
| 1     | Base Foundation | Base           | 63.2       | Pass        |

|                                                     |              |
|-----------------------------------------------------|--------------|
| <b>Structure Rating (max from all components) =</b> | <b>98.4%</b> |
|-----------------------------------------------------|--------------|

Notes:

- 1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.
- 2) The percent capacities shown above (excluding foundations) include the 1/3 increase in allowable stresses as allowed by TIA/EIA-222-F.

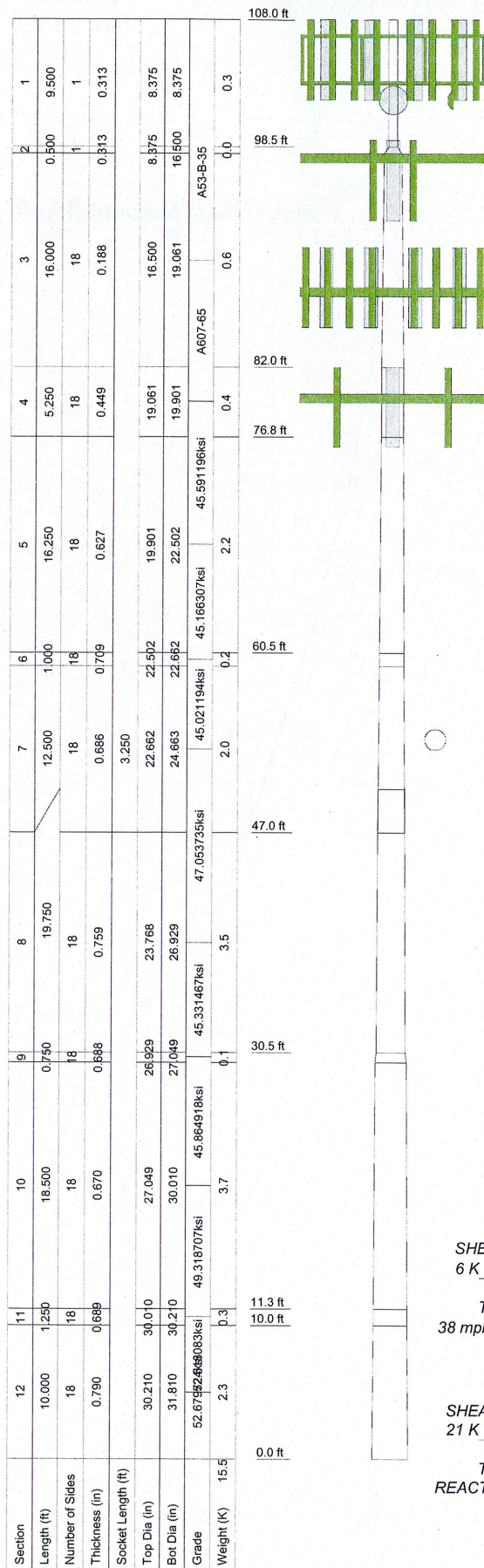
#### 4.1) Recommendations

- 1) All modifications proposed in this report shall be installed in accordance with the attached drawings (Appendix D) for the determined available structural capacity to be effective.



## **APPENDIX A**

### **tnxTOWER OUTPUT**



## DESIGNED APPURTENANCE LOADING

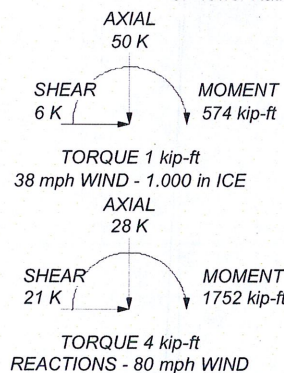
| TYPE                                     | ELEVATION | TYPE                              | ELEVATION |
|------------------------------------------|-----------|-----------------------------------|-----------|
| (2) LPA-80063-6CF-EDIN w/ Mount Pipe (E) | 105       | (2) 6' x 2" Mount Pipe (E)        | 98        |
| (2) LPA-80063-6CF-EDIN w/ Mount Pipe (E) | 105       | (2) 6' x 2" Mount Pipe (E)        | 98        |
| (2) LPA-80063-6CF-EDIN w/ Mount Pipe (E) | 105       | Platform Mount [LP 712-1] (E)     | 98        |
| BXA-70063-6CF-EDIN-0 w/ Mount Pipe (R)   | 105       | A-ANT-18G-2-C (E)                 | 98        |
| BXA-70063-6CF-EDIN-0 w/ Mount Pipe (R)   | 105       | A-ANT-23G-1-C (E)                 | 98        |
| BXA-70063-6CF-EDIN-0 w/ Mount Pipe (R)   | 105       | 800MHz 2X50W RRH W/FILTER (P)     | 96        |
| BXA-70063-6CF-EDIN-0 w/ Mount Pipe (R)   | 105       | (2) PCS 1900MHz 4x45W-65MHz (P)   | 96        |
| BXA-70063-6CF-EDIN-0 w/ Mount Pipe (R)   | 105       | 800MHz 2X50W RRH W/FILTER (P)     | 96        |
| BXA-171063-12BF w/ Mount Pipe (R)        | 105       | (2) PCS 1900MHz 4x45W-65MHz (P)   | 96        |
| BXA-171063-12BF w/ Mount Pipe (R)        | 105       | 6' x 2" Mount Pipe (P)            | 96        |
| BXA-171063-12BF w/ Mount Pipe (R)        | 105       | 6' x 2" Mount Pipe (P)            | 96        |
| BXA-171063-12BF w/ Mount Pipe (R)        | 105       | 6' x 2" Mount Pipe (P)            | 96        |
| Sector Mount [SM 405-3] (E)              | 105       | Side Arm Mount [SO 102-3] (P)     | 96        |
| LLPX310R w/ Mount Pipe (E)               | 98        | 800MHz 2X50W RRH W/FILTER (P)     | 96        |
| LLPX310R w/ Mount Pipe (E)               | 98        | (2) PCS 1900MHz 4x45W-65MHz (P)   | 96        |
| LLPX310R w/ Mount Pipe (E)               | 98        |                                   |           |
| WIMAX DAP HEAD (E)                       | 98        | (4) 844G65VTZAS w/ Mount Pipe (E) | 88        |
| WIMAX DAP HEAD (E)                       | 98        | Platform Mount [LP 303-1] (E)     | 88        |
| WIMAX DAP HEAD (E)                       | 98        | (4) 844G65VTZAS w/ Mount Pipe (E) | 88        |
| HORIZON COMPACT (E)                      | 98        |                                   |           |
| HORIZON COMPACT (E)                      | 98        | (4) 844G65VTZAS w/ Mount Pipe (E) | 88        |
| APXV9ERR18-C-A20 w/ Mount Pipe (P)       | 98        | HBX-6516DS-VTM w/ Mount Pipe (E)  | 80        |
| IBC1900BB-1 (P)                          | 98        |                                   |           |
| IBC1900HG-2A (P)                         | 98        | 6' x 2" Mount Pipe (E)            | 80        |
| APXVSP18-C-A20 w/ Mount Pipe (P)         | 98        | 6' x 2" Mount Pipe (E)            | 80        |
| IBC1900BB-1 (P)                          | 98        | 6' x 2" Mount Pipe (E)            | 80        |
| IBC1900HG-2A (P)                         | 98        | T-Arm Mount [TA 601-3]            | 80        |
| APXVSP18-C-A20 w/ Mount Pipe (P)         | 98        | HBX-6516DS-VTM w/ Mount Pipe (E)  | 80        |
| IBC1900BB-1 (P)                          | 98        | HBX-6516DS-VTM w/ Mount Pipe (E)  | 80        |
| IBC1900HG-2A (P)                         | 98        | KS24019-L112A (E)                 | 74        |
| (2) 6' x 2" Mount Pipe (E)               | 98        | Platform Mount [LP 701-1] (E)     | 74        |

## MATERIAL STRENGTH

| GRADE        | Fy     | Fu     | GRADE        | Fy     | Fu     |
|--------------|--------|--------|--------------|--------|--------|
| A53-B-35     | 35 ksi | 63 ksi | 45.331467ksi | 45 ksi | 60 ksi |
| A607-65      | 65 ksi | 80 ksi | 45.864918ksi | 46 ksi | 61 ksi |
| 45.591196ksi | 46 ksi | 61 ksi | 49.318707ksi | 49 ksi | 64 ksi |
| 45.166307ksi | 45 ksi | 60 ksi | 52.618083ksi | 53 ksi | 68 ksi |
| 45.021194ksi | 45 ksi | 60 ksi | 52.679724ksi | 53 ksi | 68 ksi |
| 47.053735ksi | 47 ksi | 62 ksi |              |        |        |

## TOWER DESIGN NOTES

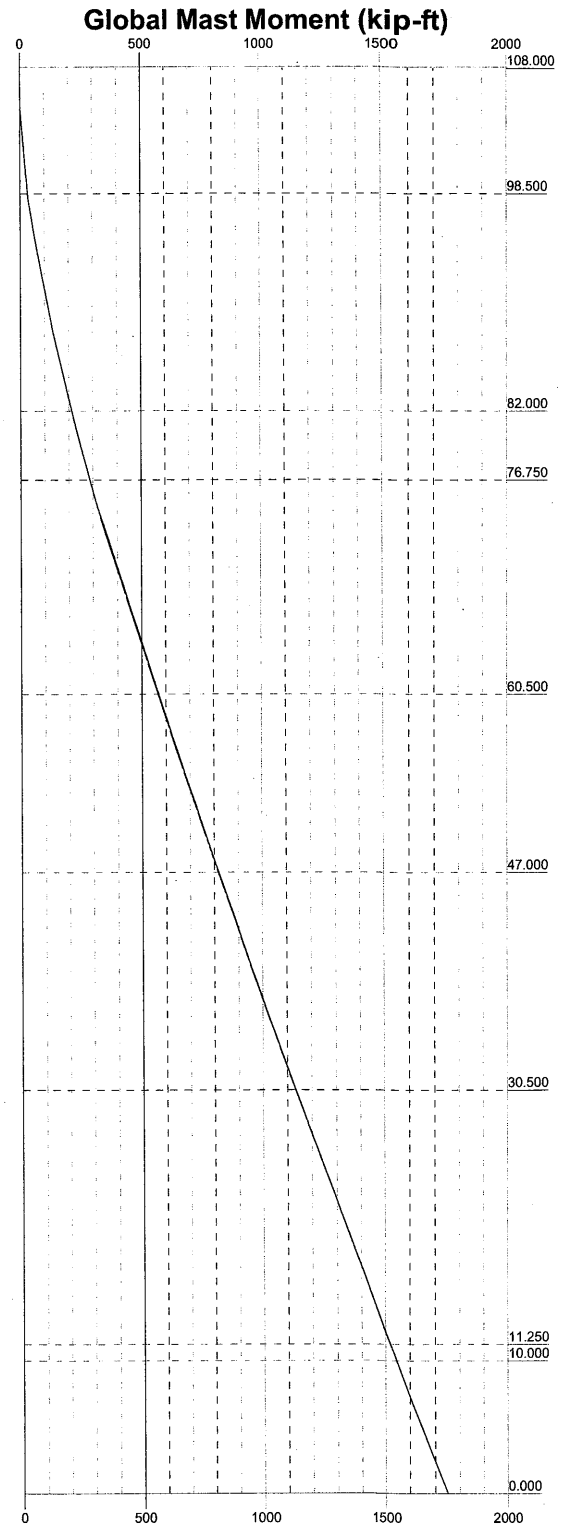
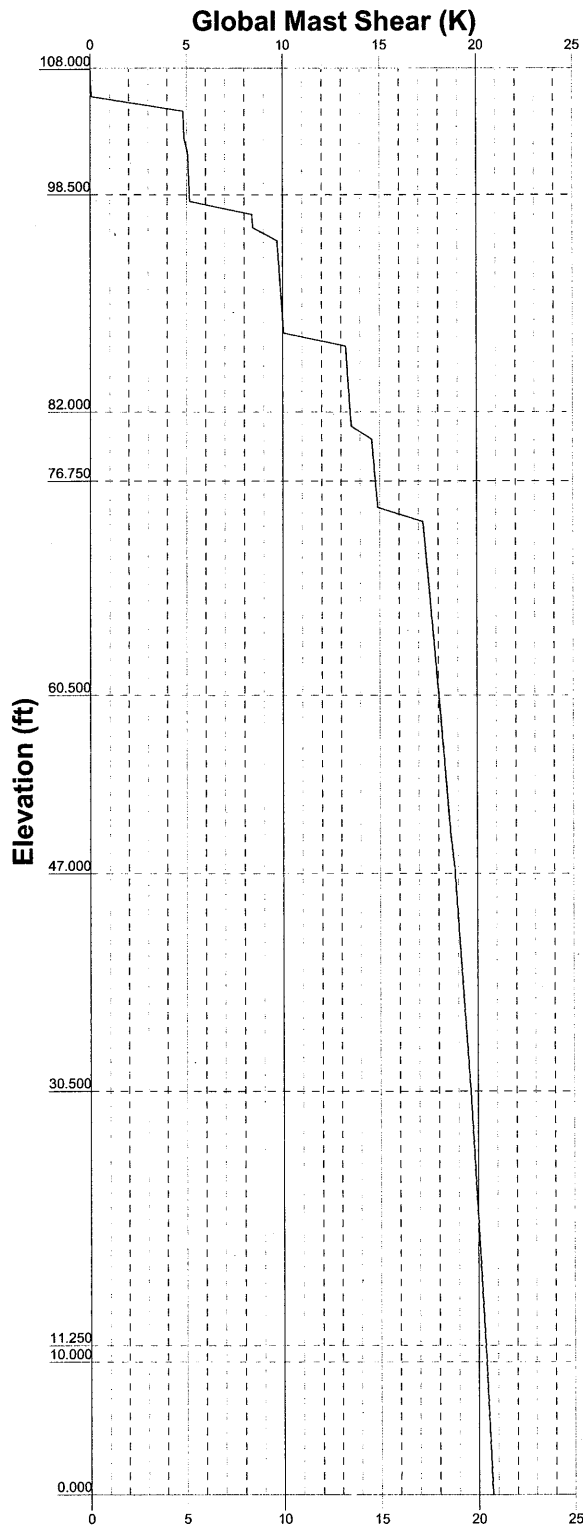
1. Tower is located in Hartford County, Connecticut.
2. Tower designed for a 80 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 38 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.
5. Tower Rating: 98.4%



|                                                                                                           |                                                        |                   |             |
|-----------------------------------------------------------------------------------------------------------|--------------------------------------------------------|-------------------|-------------|
| <b>B+T Group</b><br>1717 S Boulder Ave<br>Tulsa, OK 74119<br>Phone: (918) 587-4630<br>FAX: (918) 295-0265 | <b>Job: 85565.001- Hartford-NU,CT (BU#876363)</b>      |                   |             |
|                                                                                                           | <b>Project: 108' Summit MP/ App: Id: 156076 Rev: 3</b> |                   |             |
|                                                                                                           | Client: Crown Castle                                   | Drawn by: hrothor | App'd:      |
|                                                                                                           | Code: TIA/EIA-222-F                                    | Date: 10/15/12    | Scale: NTS  |
|                                                                                                           | Path:                                                  |                   | Dwg No. E-1 |

—— Vx      - - - - Vz

—— Mx      - - - - Mz



**B+T Group**

1717 S Boulder Ave

Tulsa, OK 74119

Phone: (918) 587-4630

FAX: (918) 295-0265

Job: **85565.001- Hartford-NU,CT (BU#876363)**

Project: **108' Summit MP/ App: Id: 156076 Rev: 3**

Client: Crown Castle

Drawn by: hrotithor

App'd:

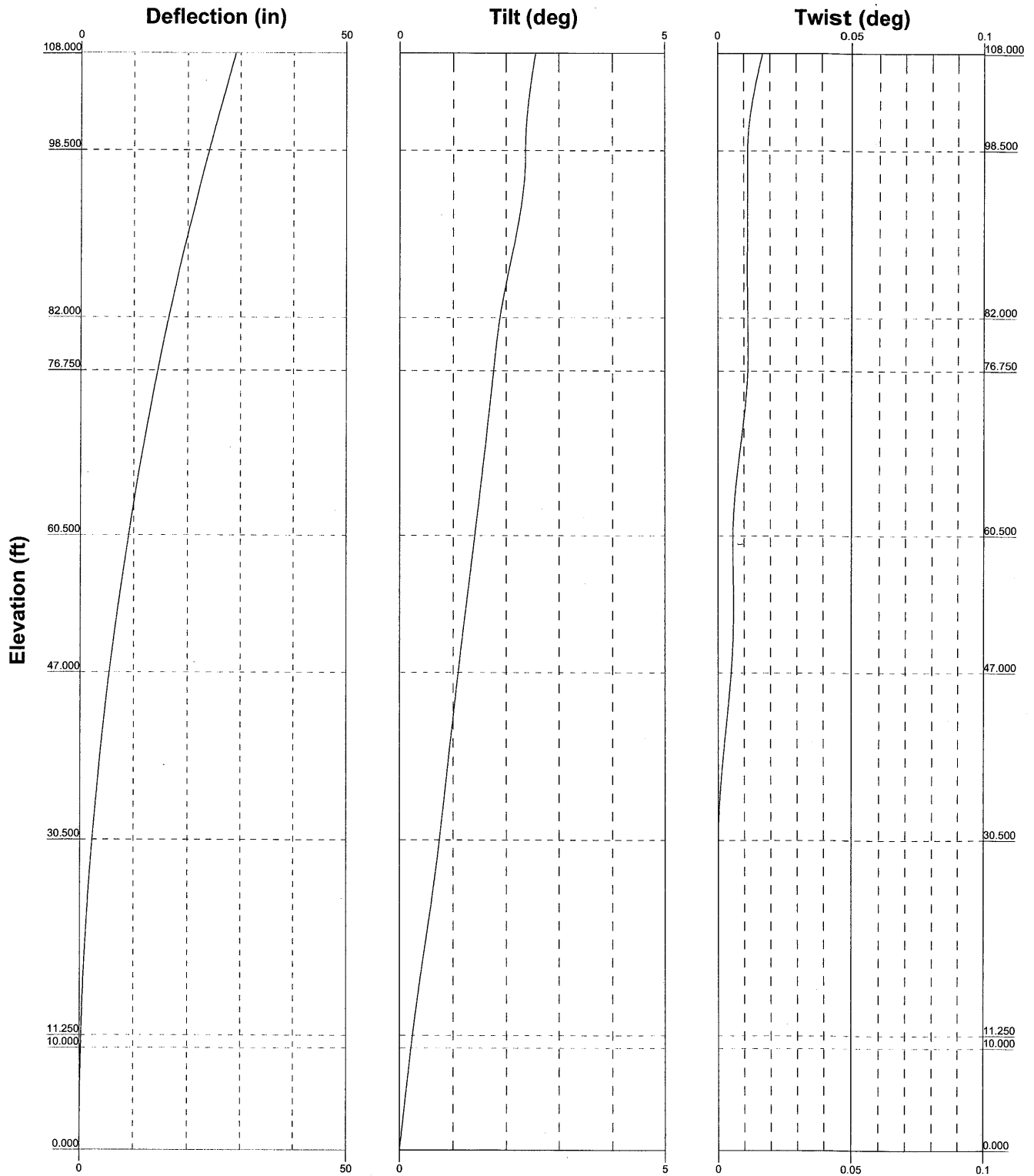
Code: TIA/EIA-222-F

Date: 10/15/12

Scale: NTS

Path:

Dwg No. E-4



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 FAX: (918) 295-0265

Job: **85565.001- Hartford-NU,CT (BU#876363)**

Project: **108' Summit MP/ App: Id: 156076 Rev: 3**

Client: Crown Castle

Drawn by: hrotithor

App'd:

Code: TIA/EIA-222-F

Date: 10/15/12

Scale: NTS

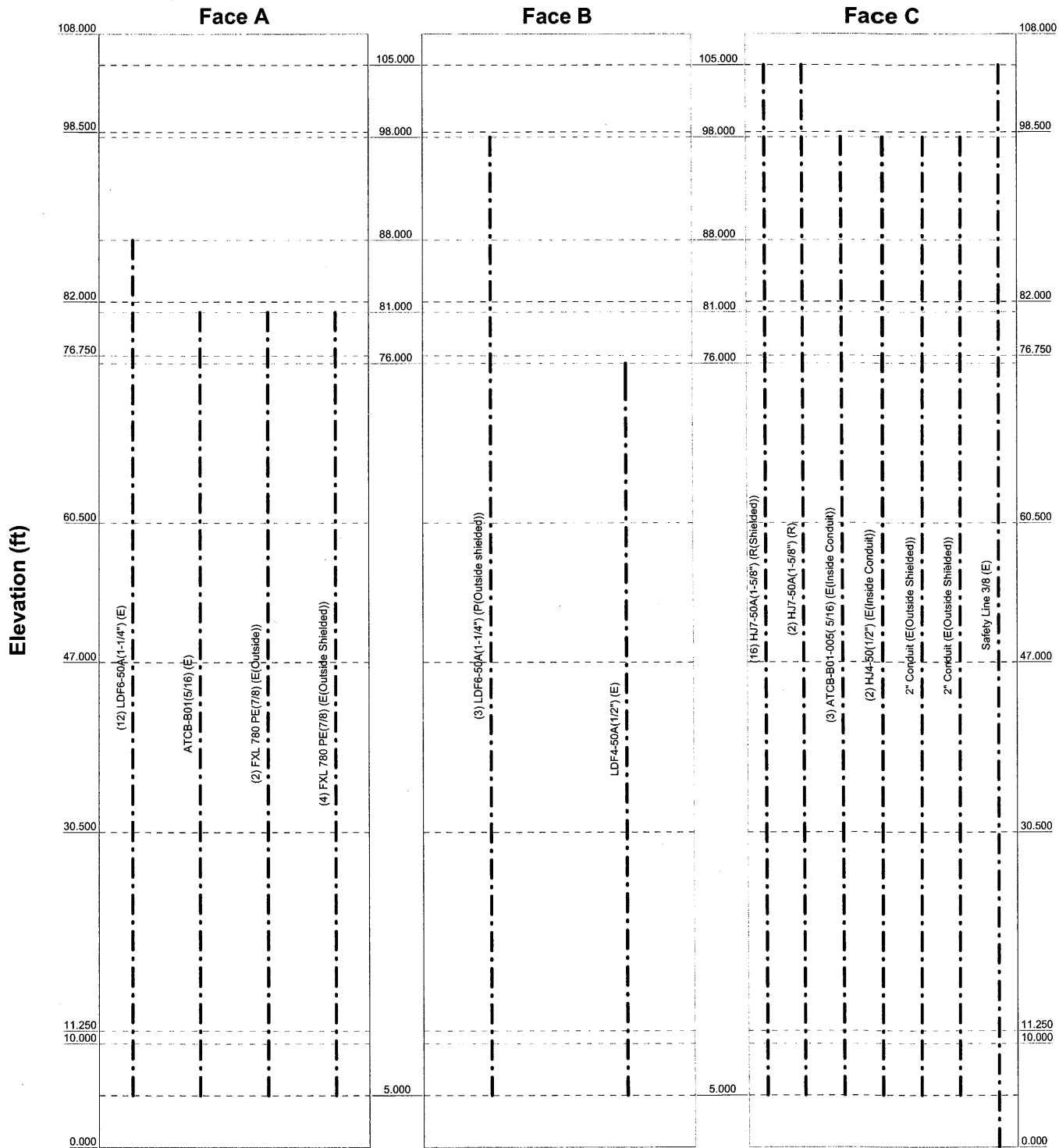
Path:

Dwg No. E-5

# Feedline Distribution Chart

0' - 108'

Round Flat App In Face App Out Face Truss Leg



|                                                                                                                                                                                                  |  |                                                        |                            |                   |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--------------------------------------------------------|----------------------------|-------------------|
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|                                                                                                                                                                                                  |  | <b>Project: 108' Summit MP/ App: Id: 156076 Rev: 3</b> |                            |                   |
|                                                                                                                                                                                                  |  | <b>Client: Crown Castle</b>                            | <b>Drawn by: hrotithor</b> | <b>App'd:</b>     |
|                                                                                                                                                                                                  |  | <b>Code: TIA/EIA-222-F</b>                             | <b>Date: 10/15/12</b>      | <b>Scale: NTS</b> |
|                                                                                                                                                                                                  |  | <b>Path:</b>                                           | <b>Dwg No. E-7</b>         |                   |



|                                                                                                                                  |                |                                        |                    |                   |
|----------------------------------------------------------------------------------------------------------------------------------|----------------|----------------------------------------|--------------------|-------------------|
| <b>tnxTower</b><br><br><b>B+T Group</b><br>1717 S Boulder Ave<br>Tulsa, OK 74119<br>Phone: (918) 587-4630<br>FAX: (918) 295-0265 | <b>Job</b>     | 85565.001- Hartford-NU,CT (BU#876363)  | <b>Page</b>        | 1 of 14           |
|                                                                                                                                  | <b>Project</b> | 108' Summit MP/ App: Id: 156076 Rev: 3 | <b>Date</b>        | 11:32:51 10/15/12 |
|                                                                                                                                  | <b>Client</b>  | Crown Castle                           | <b>Designed by</b> | hrotithor         |

## Tower Input Data

There is a pole section.

This tower is designed using the TIA/EIA-222-F standard.

The following design criteria apply:

Tower is located in Hartford County, Connecticut.

Basic wind speed of 80 mph.

Nominal ice thickness of 1.000 in.

Ice thickness is considered to increase with height.

Ice density of 56.000 pcf.

A wind speed of 38 mph is used in combination with ice.

Temperature drop of 50.000 °F.

Deflections calculated using a wind speed of 50 mph.

Tower Rating: 98.4%.

A non-linear (P-delta) analysis was used.

Pressures are calculated at each section.

Stress ratio used in pole design is 1.333.

Local bending stresses due to climbing loads, feedline supports, and appurtenance mounts are not considered.

## Tapered Pole Section Geometry

| Section | Elevation<br>ft | Section<br>Length<br>ft | Splice<br>Length<br>ft | Number<br>of<br>Sides | Top<br>Diameter<br>in | Bottom<br>Diameter<br>in | Wall<br>Thickness<br>in | Bend<br>Radius<br>in | Pole Grade               |
|---------|-----------------|-------------------------|------------------------|-----------------------|-----------------------|--------------------------|-------------------------|----------------------|--------------------------|
| L1      | 108.000-98.500  | 9.500                   | 0.000                  | Round                 | 8.375                 | 8.375                    | 0.313                   |                      | A53-B-35<br>(35 ksi)     |
| L2      | 98.500-98.000   | 0.500                   | 0.000                  | Round                 | 8.375                 | 16.500                   | 0.313                   |                      | A53-B-35<br>(35 ksi)     |
| L3      | 98.000-82.000   | 16.000                  | 0.000                  | 18                    | 16.500                | 19.061                   | 0.188                   | 0.750                | A607-65<br>(65 ksi)      |
| L4      | 82.000-76.750   | 5.250                   | 0.000                  | 18                    | 19.061                | 19.901                   | 0.449                   | 1.795                | 45.591196ksi<br>(46 ksi) |
| L5      | 76.750-60.500   | 16.250                  | 0.000                  | 18                    | 19.901                | 22.502                   | 0.627                   | 2.509                | 45.166307ksi<br>(45 ksi) |
| L6      | 60.500-59.500   | 1.000                   | 0.000                  | 18                    | 22.502                | 22.662                   | 0.709                   | 2.834                | 45.021194ksi<br>(45 ksi) |
| L7      | 59.500-47.000   | 12.500                  | 3.250                  | 18                    | 22.662                | 24.663                   | 0.686                   | 2.745                | 47.053735ksi<br>(47 ksi) |
| L8      | 47.000-30.500   | 19.750                  | 0.000                  | 18                    | 23.768                | 26.929                   | 0.759                   | 3.034                | 45.331467ksi<br>(45 ksi) |
| L9      | 30.500-29.750   | 0.750                   | 0.000                  | 18                    | 26.929                | 27.049                   | 0.688                   | 2.753                | 45.864918ksi<br>(46 ksi) |
| L10     | 29.750-11.250   | 18.500                  | 0.000                  | 18                    | 27.049                | 30.010                   | 0.670                   | 2.679                | 49.318707ksi<br>(49 ksi) |
| L11     | 11.250-10.000   | 1.250                   | 0.000                  | 18                    | 30.010                | 30.210                   | 0.689                   | 2.755                | 52.618083ksi<br>(53 ksi) |
| L12     | 10.000-0.000    | 10.000                  |                        | 18                    | 30.210                | 31.810                   | 0.790                   | 3.160                | 52.679724ksi<br>(53 ksi) |



|                                                                                                                                  |         |                                        |             |                   |
|----------------------------------------------------------------------------------------------------------------------------------|---------|----------------------------------------|-------------|-------------------|
| <b>tnxTower</b><br><br><b>B+T Group</b><br>1717 S Boulder Ave<br>Tulsa, OK 74119<br>Phone: (918) 587-4630<br>FAX: (918) 295-0265 | Job     | 85565.001- Hartford-NU,CT (BU#876363)  | Page        | 2 of 14           |
|                                                                                                                                  | Project | 108' Summit MP/ App: Id: 156076 Rev: 3 | Date        | 11:32:51 10/15/12 |
|                                                                                                                                  | Client  | Crown Castle                           | Designed by | hrotithor         |

### Tapered Pole Properties

| Section | Tip Dia.<br>in | Area<br>in <sup>2</sup> | I<br>in <sup>4</sup> | r<br>in | C<br>in | I/C<br>in <sup>3</sup> | J<br>in <sup>4</sup> | It/Q<br>in <sup>2</sup> | w<br>in | w/t    |
|---------|----------------|-------------------------|----------------------|---------|---------|------------------------|----------------------|-------------------------|---------|--------|
| L1      | 8.375          | 7.915                   | 64.365               | 2.854   | 4.188   | 15.371                 | 128.555              | 3.955                   | 0.000   | 0      |
|         | 8.375          | 7.915                   | 64.365               | 2.854   | 4.188   | 15.371                 | 128.555              | 3.955                   | 0.000   | 0      |
| L2      | 8.375          | 7.915                   | 64.365               | 2.854   | 4.188   | 15.371                 | 128.555              | 3.955                   | 0.000   | 0      |
|         | 16.500         | 15.892                  | 520.933              | 5.730   | 8.250   | 63.143                 | 1040.447             | 7.941                   | 0.000   | 0      |
| L3      | 16.755         | 9.708                   | 326.368              | 5.791   | 8.382   | 38.937                 | 653.165              | 4.855                   | 2.574   | 13.728 |
|         | 19.355         | 11.232                  | 505.474              | 6.700   | 9.683   | 52.202                 | 1011.613             | 5.617                   | 3.025   | 16.132 |
| L4      | 19.355         | 26.508                  | 1160.127             | 6.607   | 9.683   | 119.811                | 2321.780             | 13.256                  | 2.565   | 5.716  |
|         | 20.208         | 27.704                  | 1324.461             | 6.906   | 10.110  | 131.007                | 2650.664             | 13.855                  | 2.713   | 6.046  |
| L5      | 20.208         | 38.367                  | 1800.725             | 6.842   | 10.110  | 178.116                | 3603.820             | 19.187                  | 2.399   | 3.825  |
|         | 22.849         | 43.545                  | 2632.527             | 7.766   | 11.431  | 230.295                | 5268.518             | 21.777                  | 2.857   | 4.555  |
| L6      | 22.849         | 49.010                  | 2940.930             | 7.737   | 11.431  | 257.274                | 5885.730             | 24.510                  | 2.713   | 3.83   |
|         | 23.012         | 49.370                  | 3006.204             | 7.794   | 11.512  | 261.127                | 6016.364             | 24.690                  | 2.742   | 3.869  |
| L7      | 23.012         | 47.863                  | 2920.363             | 7.802   | 11.512  | 253.670                | 5844.569             | 23.936                  | 2.781   | 4.053  |
|         | 25.043         | 52.220                  | 3792.806             | 8.512   | 12.529  | 302.727                | 7590.603             | 26.115                  | 3.133   | 4.566  |
| L8      | 24.663         | 55.400                  | 3705.566             | 8.168   | 12.074  | 306.903                | 7416.008             | 27.705                  | 2.848   | 3.754  |
|         | 27.344         | 63.011                  | 5452.103             | 9.290   | 13.680  | 398.552                | 10911.379            | 31.511                  | 3.404   | 4.488  |
| L9      | 27.344         | 57.332                  | 4987.356             | 9.315   | 13.680  | 364.579                | 9981.275             | 28.671                  | 3.528   | 5.125  |
|         | 27.466         | 57.594                  | 5056.112             | 9.358   | 13.741  | 367.965                | 10118.876            | 28.802                  | 3.549   | 5.156  |
| L10     | 27.466         | 56.077                  | 4929.873             | 9.365   | 13.741  | 358.778                | 9866.233             | 28.044                  | 3.582   | 5.348  |
|         | 30.472         | 62.371                  | 6783.171             | 10.416  | 15.245  | 444.949                | 13575.267            | 31.191                  | 4.103   | 6.126  |
| L11     | 30.472         | 64.097                  | 6961.830             | 10.409  | 15.245  | 456.668                | 13932.820            | 32.054                  | 4.069   | 5.909  |
|         | 30.676         | 64.534                  | 7105.306             | 10.480  | 15.346  | 462.993                | 14219.960            | 32.273                  | 4.105   | 5.96   |
| L12     | 30.676         | 73.760                  | 8065.534             | 10.444  | 15.346  | 525.563                | 16141.682            | 36.887                  | 3.927   | 4.971  |
|         | 32.301         | 77.772                  | 9454.741             | 11.012  | 16.159  | 585.089                | 18921.922            | 38.894                  | 4.208   | 5.328  |

| Tower<br>Elevation | Gusset<br>Area<br>(per face) | Gusset<br>Thickness | Gusset Grade | Adjust. Factor<br>A <sub>f</sub> | Adjust. Factor<br>A <sub>r</sub> | Weight Mult. | Double Angle<br>Stitch Bolt<br>Spacing<br>Diagonals<br>in | Double Angle<br>Stitch Bolt<br>Spacing<br>Horizontal<br>in |
|--------------------|------------------------------|---------------------|--------------|----------------------------------|----------------------------------|--------------|-----------------------------------------------------------|------------------------------------------------------------|
| ft                 | ft <sup>2</sup>              | in                  |              |                                  |                                  |              |                                                           |                                                            |
| L1                 |                              |                     |              | 1                                | 1                                | 1            |                                                           |                                                            |
| 108.000-98.500     |                              |                     |              |                                  |                                  |              |                                                           |                                                            |
| L2                 |                              |                     |              | 1                                | 1                                | 1            |                                                           |                                                            |
| 98.500-98.000      |                              |                     |              |                                  |                                  |              |                                                           |                                                            |
| L3                 |                              |                     |              | 1                                | 1                                | 1            |                                                           |                                                            |
| 98.000-82.000      |                              |                     |              |                                  |                                  |              |                                                           |                                                            |
| L4                 |                              |                     |              | 1                                | 1                                | 0.911527     |                                                           |                                                            |
| 82.000-76.750      |                              |                     |              |                                  |                                  |              |                                                           |                                                            |
| L5                 |                              |                     |              | 1                                | 1                                | 0.960435     |                                                           |                                                            |
| 76.750-60.500      |                              |                     |              |                                  |                                  |              |                                                           |                                                            |
| L6                 |                              |                     |              | 1                                | 1                                | 0.94031      |                                                           |                                                            |
| 60.500-59.500      |                              |                     |              |                                  |                                  |              |                                                           |                                                            |
| L7                 |                              |                     |              | 1                                | 1                                | 0.953528     |                                                           |                                                            |
| 59.500-47.000      |                              |                     |              |                                  |                                  |              |                                                           |                                                            |
| L8                 |                              |                     |              | 1                                | 1                                | 0.882814     |                                                           |                                                            |
| 47.000-30.500      |                              |                     |              |                                  |                                  |              |                                                           |                                                            |
| L9                 |                              |                     |              | 1                                | 1                                | 0.967501     |                                                           |                                                            |
| 30.500-29.750      |                              |                     |              |                                  |                                  |              |                                                           |                                                            |
| L10                |                              |                     |              | 1                                | 1                                | 0.98379      |                                                           |                                                            |
| 29.750-11.250      |                              |                     |              |                                  |                                  |              |                                                           |                                                            |
| L11                |                              |                     |              | 1                                | 1                                | 0.95328      |                                                           |                                                            |
| 11.250-10.000      |                              |                     |              |                                  |                                  |              |                                                           |                                                            |
| L12                |                              |                     |              | 1                                | 1                                | 0.891848     |                                                           |                                                            |
| 10.000-0.000       |                              |                     |              |                                  |                                  |              |                                                           |                                                            |



|                                                                                                                                  |                                                          |                                  |
|----------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|----------------------------------|
| <b>tnxTower</b><br><br><b>B+T Group</b><br>1717 S Boulder Ave<br>Tulsa, OK 74119<br>Phone: (918) 587-4630<br>FAX: (918) 295-0265 | <b>Job</b><br>85565.001- Hartford-NU,CT (BU#876363)      | <b>Page</b><br>3 of 14           |
|                                                                                                                                  | <b>Project</b><br>108' Summit MP/ App: Id: 156076 Rev: 3 | <b>Date</b><br>11:32:51 10/15/12 |
|                                                                                                                                  | <b>Client</b><br>Crown Castle                            | <b>Designed by</b><br>hrotithor  |

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

| Description | Face<br>or<br>Leg | Allow<br>Shield | Component<br>Type | Placement<br>ft | Total<br>Number | Number<br>Per Row | Clear<br>Spacing<br>in | Width or<br>Diameter<br>in | Perimeter<br>in | Weight<br>klf |
|-------------|-------------------|-----------------|-------------------|-----------------|-----------------|-------------------|------------------------|----------------------------|-----------------|---------------|
| **/**       |                   |                 |                   |                 |                 |                   |                        |                            |                 |               |

### Feed Line/Linear Appurtenances - Entered As Area

| Description                                | Face<br>or<br>Leg | Allow<br>Shield | Component<br>Type     | Placement<br>ft | Total<br>Number | CAAA<br>ft <sup>2</sup> /ft |       | Weight<br>klf |
|--------------------------------------------|-------------------|-----------------|-----------------------|-----------------|-----------------|-----------------------------|-------|---------------|
| HJ7-50A(1-5/8")<br>(R(Shielded))           | C                 | No              | CaAa (Out Of<br>Face) | 105.000 - 5.000 | 16              | No Ice                      | 0.000 | 0.001         |
|                                            |                   |                 |                       |                 |                 | 1/2" Ice                    | 0.000 | 0.003         |
|                                            |                   |                 |                       |                 |                 | 1" Ice                      | 0.000 | 0.005         |
|                                            |                   |                 |                       |                 |                 | 2" Ice                      | 0.000 | 0.011         |
|                                            |                   |                 |                       |                 |                 | 4" Ice                      | 0.000 | 0.030         |
| HJ7-50A(1-5/8")<br>(R)                     | C                 | No              | CaAa (Out Of<br>Face) | 105.000 - 5.000 | 2               | No Ice                      | 0.198 | 0.001         |
|                                            |                   |                 |                       |                 |                 | 1/2" Ice                    | 0.298 | 0.003         |
|                                            |                   |                 |                       |                 |                 | 1" Ice                      | 0.398 | 0.005         |
|                                            |                   |                 |                       |                 |                 | 2" Ice                      | 0.598 | 0.011         |
|                                            |                   |                 |                       |                 |                 | 4" Ice                      | 0.998 | 0.030         |
| **/**                                      |                   |                 |                       |                 |                 |                             |       |               |
| ATCB-B01-005( 5/16)<br>(E(Inside Conduit)) | C                 | No              | Inside Pole           | 98.000 - 5.000  | 3               | No Ice                      | 0.000 | 0.000         |
|                                            |                   |                 |                       |                 |                 | 1/2" Ice                    | 0.000 | 0.000         |
|                                            |                   |                 |                       |                 |                 | 1" Ice                      | 0.000 | 0.000         |
|                                            |                   |                 |                       |                 |                 | 2" Ice                      | 0.000 | 0.000         |
|                                            |                   |                 |                       |                 |                 | 4" Ice                      | 0.000 | 0.000         |
| HJ4-50(1/2")<br>(E(Inside Conduit))        | C                 | No              | Inside Pole           | 98.000 - 5.000  | 2               | No Ice                      | 0.000 | 0.000         |
|                                            |                   |                 |                       |                 |                 | 1/2" Ice                    | 0.000 | 0.000         |
|                                            |                   |                 |                       |                 |                 | 1" Ice                      | 0.000 | 0.000         |
|                                            |                   |                 |                       |                 |                 | 2" Ice                      | 0.000 | 0.000         |
|                                            |                   |                 |                       |                 |                 | 4" Ice                      | 0.000 | 0.000         |
| LDF6-50A(1-1/4")<br>(P(Outside shielded))  | B                 | No              | CaAa (Out Of<br>Face) | 98.000 - 5.000  | 3               | No Ice                      | 0.000 | 0.001         |
|                                            |                   |                 |                       |                 |                 | 1/2" Ice                    | 0.000 | 0.002         |
|                                            |                   |                 |                       |                 |                 | 1" Ice                      | 0.000 | 0.004         |
|                                            |                   |                 |                       |                 |                 | 2" Ice                      | 0.000 | 0.009         |
|                                            |                   |                 |                       |                 |                 | 4" Ice                      | 0.000 | 0.028         |
| LDF4-50A(1/2")<br>(E)                      | B                 | No              | Inside Pole           | 76.000 - 5.000  | 1               | No Ice                      | 0.000 | 0.000         |
|                                            |                   |                 |                       |                 |                 | 1/2" Ice                    | 0.000 | 0.000         |
|                                            |                   |                 |                       |                 |                 | 1" Ice                      | 0.000 | 0.000         |
|                                            |                   |                 |                       |                 |                 | 2" Ice                      | 0.000 | 0.000         |
|                                            |                   |                 |                       |                 |                 | 4" Ice                      | 0.000 | 0.000         |
| 2" Conduit<br>(E(Outside Shielded))        | C                 | No              | CaAa (Out Of<br>Face) | 98.000 - 5.000  | 1               | No Ice                      | 0.000 | 0.001         |
|                                            |                   |                 |                       |                 |                 | 1/2" Ice                    | 0.000 | 0.001         |
|                                            |                   |                 |                       |                 |                 | 1" Ice                      | 0.000 | 0.001         |
|                                            |                   |                 |                       |                 |                 | 2" Ice                      | 0.000 | 0.001         |
|                                            |                   |                 |                       |                 |                 | 4" Ice                      | 0.000 | 0.001         |
| 2" Conduit<br>(E(Outside Shielded))        | C                 | No              | CaAa (Out Of<br>Face) | 98.000 - 5.000  | 1               | No Ice                      | 0.000 | 0.001         |
|                                            |                   |                 |                       |                 |                 | 1/2" Ice                    | 0.000 | 0.001         |
|                                            |                   |                 |                       |                 |                 | 1" Ice                      | 0.000 | 0.001         |
|                                            |                   |                 |                       |                 |                 | 2" Ice                      | 0.000 | 0.001         |
|                                            |                   |                 |                       |                 |                 | 4" Ice                      | 0.000 | 0.001         |
| **/**                                      |                   |                 |                       |                 |                 |                             |       |               |
| LDF6-50A(1-1/4")<br>(E)                    | A                 | No              | Inside Pole           | 88.000 - 5.000  | 12              | No Ice                      | 0.000 | 0.001         |
|                                            |                   |                 |                       |                 |                 | 1/2" Ice                    | 0.000 | 0.001         |
|                                            |                   |                 |                       |                 |                 | 1" Ice                      | 0.000 | 0.001         |
|                                            |                   |                 |                       |                 |                 | 2" Ice                      | 0.000 | 0.001         |
|                                            |                   |                 |                       |                 |                 | 4" Ice                      | 0.000 | 0.001         |



|                                                                                                                                  |                |                                        |                    |                   |
|----------------------------------------------------------------------------------------------------------------------------------|----------------|----------------------------------------|--------------------|-------------------|
| <b>tnxTower</b><br><br><b>B+T Group</b><br>1717 S Boulder Ave<br>Tulsa, OK 74119<br>Phone: (918) 587-4630<br>FAX: (918) 295-0265 | <b>Job</b>     | 85565.001- Hartford-NU,CT (BU#876363)  | <b>Page</b>        | 4 of 14           |
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|                                                                                                                                  | <b>Client</b>  | Crown Castle                           | <b>Designed by</b> | hrotithor         |

| Description                              | Face<br>or<br>Leg | Allow<br>Shield | Component<br>Type     | Placement<br>ft | Total<br>Number |          | C <sub>AA</sub><br>ft <sup>2</sup> /ft | Weight<br>klf |
|------------------------------------------|-------------------|-----------------|-----------------------|-----------------|-----------------|----------|----------------------------------------|---------------|
| ****                                     |                   |                 |                       |                 |                 |          |                                        |               |
| ATCB-B01(5/16)<br>(E)                    | A                 | No              | CaAa (Out Of<br>Face) | 81.000 - 5.000  | 1               | No Ice   | 0.000                                  | 0.000         |
|                                          |                   |                 |                       |                 |                 | 1/2" Ice | 0.000                                  | 0.000         |
|                                          |                   |                 |                       |                 |                 | 1" Ice   | 0.000                                  | 0.000         |
|                                          |                   |                 |                       |                 |                 | 2" Ice   | 0.000                                  | 0.000         |
|                                          |                   |                 |                       |                 |                 | 4" Ice   | 0.000                                  | 0.000         |
| FXL 780 PE(7/8)<br>(E(Outside))          | A                 | No              | CaAa (Out Of<br>Face) | 81.000 - 5.000  | 2               | No Ice   | 0.109                                  | 0.000         |
|                                          |                   |                 |                       |                 |                 | 1/2" Ice | 0.209                                  | 0.001         |
|                                          |                   |                 |                       |                 |                 | 1" Ice   | 0.309                                  | 0.003         |
|                                          |                   |                 |                       |                 |                 | 2" Ice   | 0.509                                  | 0.008         |
|                                          |                   |                 |                       |                 |                 | 4" Ice   | 0.909                                  | 0.025         |
| FXL 780 PE(7/8)<br>(E(Outside Shielded)) | A                 | No              | CaAa (Out Of<br>Face) | 81.000 - 5.000  | 4               | No Ice   | 0.000                                  | 0.000         |
|                                          |                   |                 |                       |                 |                 | 1/2" Ice | 0.000                                  | 0.000         |
|                                          |                   |                 |                       |                 |                 | 1" Ice   | 0.000                                  | 0.000         |
|                                          |                   |                 |                       |                 |                 | 2" Ice   | 0.000                                  | 0.000         |
|                                          |                   |                 |                       |                 |                 | 4" Ice   | 0.000                                  | 0.000         |
| ****                                     |                   |                 |                       |                 |                 |          |                                        |               |
| ****                                     |                   |                 |                       |                 |                 |          |                                        |               |
| Safety Line 3/8<br>(E)                   | C                 | No              | Inside Pole           | 105.000 - 0.000 | 1               | No Ice   | 0.000                                  | 0.000         |
|                                          |                   |                 |                       |                 |                 | 1/2" Ice | 0.000                                  | 0.000         |
|                                          |                   |                 |                       |                 |                 | 1" Ice   | 0.000                                  | 0.000         |
|                                          |                   |                 |                       |                 |                 | 2" Ice   | 0.000                                  | 0.000         |
|                                          |                   |                 |                       |                 |                 | 4" Ice   | 0.000                                  | 0.000         |
| ****                                     |                   |                 |                       |                 |                 |          |                                        |               |

### Feed Line/Linear Appurtenances Section Areas

| Tower<br>Section | Tower<br>Elevation<br>ft | Face | A <sub>R</sub><br>ft <sup>2</sup> | A <sub>F</sub><br>ft <sup>2</sup> | C <sub>AA</sub><br>In Face<br>ft <sup>2</sup> | C <sub>AA</sub><br>Out Face<br>ft <sup>2</sup> | Weight<br>K |
|------------------|--------------------------|------|-----------------------------------|-----------------------------------|-----------------------------------------------|------------------------------------------------|-------------|
| L1               | 108.000-98.500           | A    | 0.000                             | 0.000                             | 0.000                                         | 0.000                                          | 0.000       |
|                  |                          | B    | 0.000                             | 0.000                             | 0.000                                         | 0.000                                          | 0.000       |
|                  |                          | C    | 0.000                             | 0.000                             | 0.000                                         | 2.574                                          | 0.123       |
| L2               | 98.500-98.000            | A    | 0.000                             | 0.000                             | 0.000                                         | 0.000                                          | 0.000       |
|                  |                          | B    | 0.000                             | 0.000                             | 0.000                                         | 0.000                                          | 0.000       |
|                  |                          | C    | 0.000                             | 0.000                             | 0.000                                         | 0.198                                          | 0.009       |
| L3               | 98.000-82.000            | A    | 0.000                             | 0.000                             | 0.000                                         | 0.000                                          | 0.048       |
|                  |                          | B    | 0.000                             | 0.000                             | 0.000                                         | 0.000                                          | 0.032       |
|                  |                          | C    | 0.000                             | 0.000                             | 0.000                                         | 6.336                                          | 0.345       |
| L4               | 82.000-76.750            | A    | 0.000                             | 0.000                             | 0.000                                         | 0.926                                          | 0.048       |
|                  |                          | B    | 0.000                             | 0.000                             | 0.000                                         | 0.000                                          | 0.010       |
|                  |                          | C    | 0.000                             | 0.000                             | 0.000                                         | 2.079                                          | 0.113       |
| L5               | 76.750-60.500            | A    | 0.000                             | 0.000                             | 0.000                                         | 3.542                                          | 0.154       |
|                  |                          | B    | 0.000                             | 0.000                             | 0.000                                         | 0.000                                          | 0.035       |
|                  |                          | C    | 0.000                             | 0.000                             | 0.000                                         | 6.435                                          | 0.350       |
| L6               | 60.500-59.500            | A    | 0.000                             | 0.000                             | 0.000                                         | 0.218                                          | 0.009       |
|                  |                          | B    | 0.000                             | 0.000                             | 0.000                                         | 0.000                                          | 0.002       |
|                  |                          | C    | 0.000                             | 0.000                             | 0.000                                         | 0.396                                          | 0.022       |
| L7               | 59.500-47.000            | A    | 0.000                             | 0.000                             | 0.000                                         | 2.725                                          | 0.119       |
|                  |                          | B    | 0.000                             | 0.000                             | 0.000                                         | 0.000                                          | 0.027       |
|                  |                          | C    | 0.000                             | 0.000                             | 0.000                                         | 4.950                                          | 0.270       |
| L8               | 47.000-30.500            | A    | 0.000                             | 0.000                             | 0.000                                         | 3.597                                          | 0.157       |
|                  |                          | B    | 0.000                             | 0.000                             | 0.000                                         | 0.000                                          | 0.035       |
|                  |                          | C    | 0.000                             | 0.000                             | 0.000                                         | 6.534                                          | 0.356       |
| L9               | 30.500-29.750            | A    | 0.000                             | 0.000                             | 0.000                                         | 0.163                                          | 0.007       |
|                  |                          | B    | 0.000                             | 0.000                             | 0.000                                         | 0.000                                          | 0.002       |
|                  |                          | C    | 0.000                             | 0.000                             | 0.000                                         | 0.297                                          | 0.016       |
| L10              | 29.750-11.250            | A    | 0.000                             | 0.000                             | 0.000                                         | 4.033                                          | 0.176       |



|                                                                                                                                  |                |                                        |                    |                   |
|----------------------------------------------------------------------------------------------------------------------------------|----------------|----------------------------------------|--------------------|-------------------|
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|                                                                                                                                  | <b>Project</b> | 108' Summit MP/ App: Id: 156076 Rev: 3 | <b>Date</b>        | 11:32:51 10/15/12 |
|                                                                                                                                  | <b>Client</b>  | Crown Castle                           | <b>Designed by</b> | hrotithor         |

| Tower Section | Tower Elevation<br>ft | Face | $A_R$<br>ft <sup>2</sup> | $A_F$<br>ft <sup>2</sup> | $C_A A_A$<br>In Face<br>ft <sup>2</sup> | $C_A A_A$<br>Out Face<br>ft <sup>2</sup> | Weight<br>K |
|---------------|-----------------------|------|--------------------------|--------------------------|-----------------------------------------|------------------------------------------|-------------|
| L11           | 11.250-10.000         | B    | 0.000                    | 0.000                    | 0.000                                   | 0.000                                    | 0.039       |
|               |                       | C    | 0.000                    | 0.000                    | 0.000                                   | 7.326                                    | 0.399       |
|               |                       | A    | 0.000                    | 0.000                    | 0.000                                   | 0.272                                    | 0.012       |
|               |                       | B    | 0.000                    | 0.000                    | 0.000                                   | 0.000                                    | 0.003       |
| L12           | 10.000-0.000          | C    | 0.000                    | 0.000                    | 0.000                                   | 0.495                                    | 0.027       |
|               |                       | A    | 0.000                    | 0.000                    | 0.000                                   | 1.090                                    | 0.047       |
|               |                       | B    | 0.000                    | 0.000                    | 0.000                                   | 0.000                                    | 0.011       |
|               |                       | C    | 0.000                    | 0.000                    | 0.000                                   | 1.980                                    | 0.109       |

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

| Tower Section | Tower Elevation<br>ft | Face<br>or<br>Leg | Ice<br>Thickness<br>in | $A_R$<br>ft <sup>2</sup> | $A_F$<br>ft <sup>2</sup> | $C_A A_A$<br>In Face<br>ft <sup>2</sup> | $C_A A_A$<br>Out Face<br>ft <sup>2</sup> | Weight<br>K |
|---------------|-----------------------|-------------------|------------------------|--------------------------|--------------------------|-----------------------------------------|------------------------------------------|-------------|
| L1            | 108.000-98.500        | A                 | 1.147                  | 0.000                    | 0.000                    | 0.000                                   | 0.000                                    | 0.000       |
|               |                       | B                 |                        | 0.000                    | 0.000                    | 0.000                                   | 0.000                                    | 0.000       |
|               |                       | C                 |                        | 0.000                    | 0.000                    | 0.000                                   | 5.555                                    | 0.654       |
| L2            | 98.500-98.000         | A                 | 1.140                  | 0.000                    | 0.000                    | 0.000                                   | 0.000                                    | 0.000       |
|               |                       | B                 |                        | 0.000                    | 0.000                    | 0.000                                   | 0.000                                    | 0.000       |
|               |                       | C                 |                        | 0.000                    | 0.000                    | 0.000                                   | 0.426                                    | 0.050       |
| L3            | 98.000-82.000         | A                 | 1.128                  | 0.000                    | 0.000                    | 0.000                                   | 0.000                                    | 0.048       |
|               |                       | B                 |                        | 0.000                    | 0.000                    | 0.000                                   | 0.000                                    | 0.215       |
|               |                       | C                 |                        | 0.000                    | 0.000                    | 0.000                                   | 13.553                                   | 1.617       |
| L4            | 82.000-76.750         | A                 | 1.111                  | 0.000                    | 0.000                    | 0.000                                   | 2.815                                    | 0.075       |
|               |                       | B                 |                        | 0.000                    | 0.000                    | 0.000                                   | 0.000                                    | 0.069       |
|               |                       | C                 |                        | 0.000                    | 0.000                    | 0.000                                   | 4.412                                    | 0.521       |
| L5            | 76.750-60.500         | A                 | 1.092                  | 0.000                    | 0.000                    | 0.000                                   | 10.637                                   | 0.252       |
|               |                       | B                 |                        | 0.000                    | 0.000                    | 0.000                                   | 0.000                                    | 0.211       |
|               |                       | C                 |                        | 0.000                    | 0.000                    | 0.000                                   | 13.530                                   | 1.578       |
| L6            | 60.500-59.500         | A                 | 1.074                  | 0.000                    | 0.000                    | 0.000                                   | 0.648                                    | 0.015       |
|               |                       | B                 |                        | 0.000                    | 0.000                    | 0.000                                   | 0.000                                    | 0.013       |
|               |                       | C                 |                        | 0.000                    | 0.000                    | 0.000                                   | 0.826                                    | 0.095       |
| L7            | 59.500-47.000         | A                 | 1.059                  | 0.000                    | 0.000                    | 0.000                                   | 8.019                                    | 0.190       |
|               |                       | B                 |                        | 0.000                    | 0.000                    | 0.000                                   | 0.000                                    | 0.156       |
|               |                       | C                 |                        | 0.000                    | 0.000                    | 0.000                                   | 10.244                                   | 1.169       |
| L8            | 47.000-30.500         | A                 | 1.019                  | 0.000                    | 0.000                    | 0.000                                   | 10.586                                   | 0.251       |
|               |                       | B                 |                        | 0.000                    | 0.000                    | 0.000                                   | 0.000                                    | 0.206       |
|               |                       | C                 |                        | 0.000                    | 0.000                    | 0.000                                   | 13.523                                   | 1.544       |
| L9            | 30.500-29.750         | A                 | 1.000                  | 0.000                    | 0.000                    | 0.000                                   | 0.464                                    | 0.011       |
|               |                       | B                 |                        | 0.000                    | 0.000                    | 0.000                                   | 0.000                                    | 0.009       |
|               |                       | C                 |                        | 0.000                    | 0.000                    | 0.000                                   | 0.597                                    | 0.065       |
| L10           | 29.750-11.250         | A                 | 1.000                  | 0.000                    | 0.000                    | 0.000                                   | 11.433                                   | 0.270       |
|               |                       | B                 |                        | 0.000                    | 0.000                    | 0.000                                   | 0.000                                    | 0.212       |
|               |                       | C                 |                        | 0.000                    | 0.000                    | 0.000                                   | 14.726                                   | 1.611       |
| L11           | 11.250-10.000         | A                 | 1.000                  | 0.000                    | 0.000                    | 0.000                                   | 0.772                                    | 0.018       |
|               |                       | B                 |                        | 0.000                    | 0.000                    | 0.000                                   | 0.000                                    | 0.014       |
|               |                       | C                 |                        | 0.000                    | 0.000                    | 0.000                                   | 0.995                                    | 0.109       |
| L12           | 10.000-0.000          | A                 | 1.000                  | 0.000                    | 0.000                    | 0.000                                   | 3.090                                    | 0.073       |
|               |                       | B                 |                        | 0.000                    | 0.000                    | 0.000                                   | 0.000                                    | 0.057       |
|               |                       | C                 |                        | 0.000                    | 0.000                    | 0.000                                   | 3.980                                    | 0.437       |



|                                                                                                                                  |         |                                        |             |                   |
|----------------------------------------------------------------------------------------------------------------------------------|---------|----------------------------------------|-------------|-------------------|
| <b>tnxTower</b><br><br><b>B+T Group</b><br>1717 S Boulder Ave<br>Tulsa, OK 74119<br>Phone: (918) 587-4630<br>FAX: (918) 295-0265 | Job     | 85565.001- Hartford-NU,CT (BU#876363)  | Page        | 6 of 14           |
|                                                                                                                                  | Project | 108' Summit MP/ App: Id: 156076 Rev: 3 | Date        | 11:32:51 10/15/12 |
|                                                                                                                                  | Client  | Crown Castle                           | Designed by | hrotithor         |

### Feed Line Center of Pressure

| Section | Elevation      | CP <sub>X</sub> | CP <sub>Z</sub> | CP <sub>X</sub><br>Ice | CP <sub>Z</sub><br>Ice |
|---------|----------------|-----------------|-----------------|------------------------|------------------------|
|         | ft             | in              | in              | in                     | in                     |
| L1      | 108.000-98.500 | -0.254          | 0.146           | -0.360                 | 0.208                  |
| L2      | 98.500-98.000  | -0.372          | 0.215           | -0.552                 | 0.319                  |
| L3      | 98.000-82.000  | -0.406          | 0.234           | -0.648                 | 0.374                  |
| L4      | 82.000-76.750  | -0.380          | 0.023           | -0.556                 | -0.090                 |
| L5      | 76.750-60.500  | -0.382          | -0.022          | -0.556                 | -0.184                 |
| L6      | 60.500-59.500  | -0.388          | -0.023          | -0.571                 | -0.188                 |
| L7      | 59.500-47.000  | -0.392          | -0.023          | -0.582                 | -0.190                 |
| L8      | 47.000-30.500  | -0.399          | -0.023          | -0.602                 | -0.197                 |
| L9      | 30.500-29.750  | -0.404          | -0.024          | -0.607                 | -0.194                 |
| L10     | 29.750-11.250  | -0.409          | -0.024          | -0.621                 | -0.198                 |
| L11     | 11.250-10.000  | -0.413          | -0.024          | -0.634                 | -0.202                 |
| L12     | 10.000-0.000   | -0.227          | -0.013          | -0.381                 | -0.122                 |

### Discrete Tower Loads

| Description                                    | Face<br>or<br>Leg | Offset<br>Type | Offsets:<br>Horz<br>Lateral<br>Vert<br>ft<br>ft<br>ft | Azimuth<br>Adjustment<br>° | Placement<br>ft |                                                  | C <sub>A</sub> A <sub>A</sub><br>Front<br>ft <sup>2</sup> | C <sub>A</sub> A <sub>A</sub><br>Side<br>ft <sup>2</sup> | Weight<br>K                               |
|------------------------------------------------|-------------------|----------------|-------------------------------------------------------|----------------------------|-----------------|--------------------------------------------------|-----------------------------------------------------------|----------------------------------------------------------|-------------------------------------------|
| (2) LPA-80063-6CF-EDIN<br>w/ Mount Pipe<br>(E) | A                 | From Leg       | 4.000<br>0.000<br>0.000                               | 0.000                      | 105.000         | No Ice<br>1/2" Ice<br>1" Ice<br>2" Ice<br>4" Ice | 10.745<br>11.412<br>12.045<br>13.341<br>16.054            | 10.700<br>11.967<br>12.948<br>14.963<br>19.208           | 0.050<br>0.143<br>0.246<br>0.480<br>1.095 |
| (2) LPA-80063-6CF-EDIN<br>w/ Mount Pipe<br>(E) | B                 | From Leg       | 4.000<br>0.000<br>0.000                               | 0.000                      | 105.000         | No Ice<br>1/2" Ice<br>1" Ice<br>2" Ice<br>4" Ice | 10.745<br>11.412<br>12.045<br>13.341<br>16.054            | 10.700<br>11.967<br>12.948<br>14.963<br>19.208           | 0.050<br>0.143<br>0.246<br>0.480<br>1.095 |
| (2) LPA-80063-6CF-EDIN<br>w/ Mount Pipe<br>(E) | C                 | From Leg       | 4.000<br>0.000<br>0.000                               | 0.000                      | 105.000         | No Ice<br>1/2" Ice<br>1" Ice<br>2" Ice<br>4" Ice | 10.745<br>11.412<br>12.045<br>13.341<br>16.054            | 10.700<br>11.967<br>12.948<br>14.963<br>19.208           | 0.050<br>0.143<br>0.246<br>0.480<br>1.095 |
| BXA-70063-6CF-EDIN-0 w/<br>Mount Pipe<br>(R)   | A                 | From Leg       | 4.000<br>0.000<br>0.000                               | 0.000                      | 105.000         | No Ice<br>1/2" Ice<br>1" Ice<br>2" Ice<br>4" Ice | 7.969<br>8.609<br>9.216<br>10.459<br>13.066               | 5.801<br>6.953<br>7.819<br>9.601<br>13.366               | 0.042<br>0.100<br>0.170<br>0.335<br>0.803 |
| BXA-70063-6CF-EDIN-0 w/<br>Mount Pipe<br>(R)   | B                 | From Leg       | 4.000<br>0.000<br>0.000                               | 0.000                      | 105.000         | No Ice<br>1/2" Ice<br>1" Ice<br>2" Ice<br>4" Ice | 7.969<br>8.609<br>9.216<br>10.459<br>13.066               | 5.801<br>6.953<br>7.819<br>9.601<br>13.366               | 0.042<br>0.100<br>0.170<br>0.335<br>0.803 |
| BXA-70063-6CF-EDIN-0 w/<br>Mount Pipe<br>(R)   | C                 | From Leg       | 4.000<br>0.000<br>0.000                               | 0.000                      | 105.000         | No Ice<br>1/2" Ice<br>1" Ice<br>2" Ice<br>4" Ice | 7.969<br>8.609<br>9.216<br>10.459<br>13.066               | 5.801<br>6.953<br>7.819<br>9.601<br>13.366               | 0.042<br>0.100<br>0.170<br>0.335<br>0.803 |
| BXA-171063-12BF w/<br>Mount Pipe<br>(R)        | A                 | From Leg       | 4.000<br>0.000<br>0.000                               | 0.000                      | 105.000         | No Ice<br>1/2" Ice<br>1" Ice                     | 4.971<br>5.521<br>6.036                                   | 5.228<br>6.389<br>7.261                                  | 0.040<br>0.083<br>0.137                   |



|                                                                                                                                  |         |                                        |             |                   |
|----------------------------------------------------------------------------------------------------------------------------------|---------|----------------------------------------|-------------|-------------------|
| <b>tnxTower</b><br><br><b>B+T Group</b><br>1717 S Boulder Ave<br>Tulsa, OK 74119<br>Phone: (918) 587-4630<br>FAX: (918) 295-0265 | Job     | 85565.001- Hartford-NU,CT (BU#876363)  | Page        | 7 of 14           |
|                                                                                                                                  | Project | 108' Summit MP/ App: Id: 156076 Rev: 3 | Date        | 11:32:51 10/15/12 |
|                                                                                                                                  | Client  | Crown Castle                           | Designed by | hrotithor         |

| Description                             | Face<br>or<br>Leg | Offset<br>Type | Offsets:<br>Horz<br>Lateral<br>Vert<br>ft<br>ft<br>ft | Azimuth<br>Adjustment<br>° | Placement<br>ft |          | C <sub>AA</sub><br>Front<br>ft <sup>2</sup> | C <sub>AA</sub><br>Side<br>ft <sup>2</sup> | Weight<br>K |
|-----------------------------------------|-------------------|----------------|-------------------------------------------------------|----------------------------|-----------------|----------|---------------------------------------------|--------------------------------------------|-------------|
| BXA-171063-12BF w/<br>Mount Pipe<br>(R) | B                 | From Leg       | 4.000<br>0.000<br>0.000                               | 0.000                      | 105.000         | 2" Ice   | 7.091                                       | 9.046                                      | 0.271       |
|                                         |                   |                |                                                       |                            |                 | 4" Ice   | 9.359                                       | 12.817                                     | 0.671       |
|                                         |                   |                |                                                       |                            |                 | No Ice   | 4.971                                       | 5.228                                      | 0.040       |
|                                         |                   |                |                                                       |                            |                 | 1/2" Ice | 5.521                                       | 6.389                                      | 0.083       |
|                                         |                   |                |                                                       |                            |                 | 1" Ice   | 6.036                                       | 7.261                                      | 0.137       |
| BXA-171063-12BF w/<br>Mount Pipe<br>(R) | C                 | From Leg       | 4.000<br>0.000<br>0.000                               | 0.000                      | 105.000         | 2" Ice   | 7.091                                       | 9.046                                      | 0.271       |
|                                         |                   |                |                                                       |                            |                 | 4" Ice   | 9.359                                       | 12.817                                     | 0.671       |
|                                         |                   |                |                                                       |                            |                 | No Ice   | 4.971                                       | 5.228                                      | 0.040       |
|                                         |                   |                |                                                       |                            |                 | 1/2" Ice | 5.521                                       | 6.389                                      | 0.083       |
|                                         |                   |                |                                                       |                            |                 | 1" Ice   | 6.036                                       | 7.261                                      | 0.137       |
| Sector Mount [SM 405-3]<br>(E)          | C                 | None           |                                                       | 0.000                      | 105.000         | 2" Ice   | 7.091                                       | 9.046                                      | 0.271       |
|                                         |                   |                |                                                       |                            |                 | 4" Ice   | 9.359                                       | 12.817                                     | 0.671       |
|                                         |                   |                |                                                       |                            |                 | No Ice   | 18.730                                      | 18.730                                     | 0.861       |
|                                         |                   |                |                                                       |                            |                 | 1/2" Ice | 27.190                                      | 27.190                                     | 1.262       |
|                                         |                   |                |                                                       |                            |                 | 1" Ice   | 35.650                                      | 35.650                                     | 1.664       |
|                                         |                   |                |                                                       |                            |                 | 2" Ice   | 52.570                                      | 52.570                                     | 2.467       |
|                                         |                   |                |                                                       |                            |                 | 4" Ice   | 86.410                                      | 86.410                                     | 4.074       |
| ***//**                                 |                   |                |                                                       |                            |                 |          |                                             |                                            |             |
| LLPX310R w/ Mount Pipe<br>(E)           | A                 | From Leg       | 4.000<br>0.000<br>1.000                               | 0.000                      | 98.000          | No Ice   | 5.065                                       | 2.985                                      | 0.045       |
|                                         |                   |                |                                                       |                            |                 | 1/2" Ice | 5.480                                       | 3.528                                      | 0.081       |
|                                         |                   |                |                                                       |                            |                 | 1" Ice   | 5.905                                       | 4.087                                      | 0.125       |
|                                         |                   |                |                                                       |                            |                 | 2" Ice   | 6.788                                       | 5.314                                      | 0.232       |
|                                         |                   |                |                                                       |                            |                 | 4" Ice   | 8.705                                       | 8.133                                      | 0.544       |
| LLPX310R w/ Mount Pipe<br>(E)           | B                 | From Leg       | 4.000<br>0.000<br>1.000                               | 0.000                      | 98.000          | No Ice   | 5.065                                       | 2.985                                      | 0.045       |
|                                         |                   |                |                                                       |                            |                 | 1/2" Ice | 5.480                                       | 3.528                                      | 0.081       |
|                                         |                   |                |                                                       |                            |                 | 1" Ice   | 5.905                                       | 4.087                                      | 0.125       |
|                                         |                   |                |                                                       |                            |                 | 2" Ice   | 6.788                                       | 5.314                                      | 0.232       |
|                                         |                   |                |                                                       |                            |                 | 4" Ice   | 8.705                                       | 8.133                                      | 0.544       |
| LLPX310R w/ Mount Pipe<br>(E)           | C                 | From Leg       | 4.000<br>0.000<br>1.000                               | 0.000                      | 98.000          | No Ice   | 5.065                                       | 2.985                                      | 0.045       |
|                                         |                   |                |                                                       |                            |                 | 1/2" Ice | 5.480                                       | 3.528                                      | 0.081       |
|                                         |                   |                |                                                       |                            |                 | 1" Ice   | 5.905                                       | 4.087                                      | 0.125       |
|                                         |                   |                |                                                       |                            |                 | 2" Ice   | 6.788                                       | 5.314                                      | 0.232       |
|                                         |                   |                |                                                       |                            |                 | 4" Ice   | 8.705                                       | 8.133                                      | 0.544       |
| WIMAX DAP HEAD<br>(E)                   | A                 | From Leg       | 4.000<br>0.000<br>1.000                               | 0.000                      | 98.000          | No Ice   | 1.804                                       | 0.778                                      | 0.033       |
|                                         |                   |                |                                                       |                            |                 | 1/2" Ice | 1.988                                       | 0.918                                      | 0.045       |
|                                         |                   |                |                                                       |                            |                 | 1" Ice   | 2.180                                       | 1.067                                      | 0.058       |
|                                         |                   |                |                                                       |                            |                 | 2" Ice   | 2.589                                       | 1.391                                      | 0.094       |
|                                         |                   |                |                                                       |                            |                 | 4" Ice   | 3.512                                       | 2.143                                      | 0.201       |
| WIMAX DAP HEAD<br>(E)                   | B                 | From Leg       | 4.000<br>0.000<br>1.000                               | 0.000                      | 98.000          | No Ice   | 1.804                                       | 0.778                                      | 0.033       |
|                                         |                   |                |                                                       |                            |                 | 1/2" Ice | 1.988                                       | 0.918                                      | 0.045       |
|                                         |                   |                |                                                       |                            |                 | 1" Ice   | 2.180                                       | 1.067                                      | 0.058       |
|                                         |                   |                |                                                       |                            |                 | 2" Ice   | 2.589                                       | 1.391                                      | 0.094       |
|                                         |                   |                |                                                       |                            |                 | 4" Ice   | 3.512                                       | 2.143                                      | 0.201       |
| WIMAX DAP HEAD<br>(E)                   | C                 | From Leg       | 4.000<br>0.000<br>1.000                               | 0.000                      | 98.000          | No Ice   | 1.804                                       | 0.778                                      | 0.033       |
|                                         |                   |                |                                                       |                            |                 | 1/2" Ice | 1.988                                       | 0.918                                      | 0.045       |
|                                         |                   |                |                                                       |                            |                 | 1" Ice   | 2.180                                       | 1.067                                      | 0.058       |
|                                         |                   |                |                                                       |                            |                 | 2" Ice   | 2.589                                       | 1.391                                      | 0.094       |
|                                         |                   |                |                                                       |                            |                 | 4" Ice   | 3.512                                       | 2.143                                      | 0.201       |
| HORIZON COMPACT<br>(E)                  | A                 | From Leg       | 4.000<br>0.000<br>4.000                               | 0.000                      | 98.000          | No Ice   | 0.841                                       | 0.429                                      | 0.012       |
|                                         |                   |                |                                                       |                            |                 | 1/2" Ice | 0.966                                       | 0.525                                      | 0.018       |
|                                         |                   |                |                                                       |                            |                 | 1" Ice   | 1.099                                       | 0.629                                      | 0.026       |
|                                         |                   |                |                                                       |                            |                 | 2" Ice   | 1.392                                       | 0.863                                      | 0.048       |
|                                         |                   |                |                                                       |                            |                 | 4" Ice   | 2.082                                       | 1.435                                      | 0.122       |
| HORIZON COMPACT<br>(E)                  | B                 | From Leg       | 4.000<br>0.000<br>4.000                               | 0.000                      | 98.000          | No Ice   | 0.841                                       | 0.429                                      | 0.012       |
|                                         |                   |                |                                                       |                            |                 | 1/2" Ice | 0.966                                       | 0.525                                      | 0.018       |
|                                         |                   |                |                                                       |                            |                 | 1" Ice   | 1.099                                       | 0.629                                      | 0.026       |
|                                         |                   |                |                                                       |                            |                 | 2" Ice   | 1.392                                       | 0.863                                      | 0.048       |
|                                         |                   |                |                                                       |                            |                 |          |                                             |                                            |             |



|                                                                                                                                  |                |                                        |                    |                   |
|----------------------------------------------------------------------------------------------------------------------------------|----------------|----------------------------------------|--------------------|-------------------|
| <b>tnxTower</b><br><br><b>B+T Group</b><br>1717 S Boulder Ave<br>Tulsa, OK 74119<br>Phone: (918) 587-4630<br>FAX: (918) 295-0265 | <b>Job</b>     | 85565.001- Hartford-NU,CT (BU#876363)  | <b>Page</b>        | 8 of 14           |
|                                                                                                                                  | <b>Project</b> | 108' Summit MP/ App: Id: 156076 Rev: 3 | <b>Date</b>        | 11:32:51 10/15/12 |
|                                                                                                                                  | <b>Client</b>  | Crown Castle                           | <b>Designed by</b> | hrotithor         |

| Description                              | Face<br>or<br>Leg | Offset<br>Type | Offsets:<br>Horz<br>Lateral<br>Vert<br>ft<br>ft<br>ft | Azimuth<br>Adjustment<br>° | Placement<br>ft |                                                            | C <sub>AA</sub><br>Front<br>ft <sup>2</sup>          | C <sub>AA</sub><br>Side<br>ft <sup>2</sup>           | Weight<br>K                                        |
|------------------------------------------|-------------------|----------------|-------------------------------------------------------|----------------------------|-----------------|------------------------------------------------------------|------------------------------------------------------|------------------------------------------------------|----------------------------------------------------|
| APXV9ERR18-C-A20 w/<br>Mount Pipe<br>(P) | A                 | From Leg       | 4.000<br>0.000<br>1.000                               | 0.000                      | 98.000          | 4" Ice<br>No Ice<br>1/2" Ice<br>1" Ice<br>2" Ice<br>4" Ice | 2.082<br>8.498<br>9.149<br>9.767<br>11.031<br>13.679 | 1.435<br>7.471<br>8.656<br>9.556<br>11.388<br>15.527 | 0.122<br>0.088<br>0.155<br>0.235<br>0.421<br>0.935 |
| IBC1900BB-1<br>(P)                       | A                 | From Leg       | 4.000<br>0.000<br>1.000                               | 0.000                      | 98.000          | No Ice<br>1/2" Ice<br>1" Ice<br>2" Ice<br>4" Ice           | 1.127<br>1.273<br>1.427<br>1.761<br>2.534            | 0.533<br>0.647<br>0.770<br>1.041<br>1.688            | 0.022<br>0.030<br>0.039<br>0.065<br>0.147          |
| IBC1900HG-2A<br>(P)                      | A                 | From Leg       | 4.000<br>0.000<br>1.000                               | 0.000                      | 98.000          | No Ice<br>1/2" Ice<br>1" Ice<br>2" Ice<br>4" Ice           | 1.127<br>1.273<br>1.427<br>1.761<br>2.534            | 0.533<br>0.647<br>0.770<br>1.041<br>1.688            | 0.022<br>0.030<br>0.039<br>0.065<br>0.147          |
| APXVSPP18-C-A20 w/<br>Mount Pipe<br>(P)  | B                 | From Leg       | 4.000<br>0.000<br>1.000                               | 0.000                      | 98.000          | No Ice<br>1/2" Ice<br>1" Ice<br>2" Ice<br>4" Ice           | 8.498<br>9.149<br>9.767<br>11.031<br>13.679          | 6.946<br>8.127<br>9.021<br>10.844<br>14.851          | 0.083<br>0.148<br>0.225<br>0.406<br>0.909          |
| IBC1900BB-1<br>(P)                       | B                 | From Leg       | 4.000<br>0.000<br>1.000                               | 0.000                      | 98.000          | No Ice<br>1/2" Ice<br>1" Ice<br>2" Ice<br>4" Ice           | 1.127<br>1.273<br>1.427<br>1.761<br>2.534            | 0.533<br>0.647<br>0.770<br>1.041<br>1.688            | 0.022<br>0.030<br>0.039<br>0.065<br>0.147          |
| IBC1900HG-2A<br>(P)                      | B                 | From Leg       | 4.000<br>0.000<br>1.000                               | 0.000                      | 98.000          | No Ice<br>1/2" Ice<br>1" Ice<br>2" Ice<br>4" Ice           | 1.127<br>1.273<br>1.427<br>1.761<br>2.534            | 0.533<br>0.647<br>0.770<br>1.041<br>1.688            | 0.022<br>0.030<br>0.039<br>0.065<br>0.147          |
| APXVSPP18-C-A20 w/<br>Mount Pipe<br>(P)  | C                 | From Leg       | 4.000<br>0.000<br>1.000                               | 0.000                      | 98.000          | No Ice<br>1/2" Ice<br>1" Ice<br>2" Ice<br>4" Ice           | 8.498<br>9.149<br>9.767<br>11.031<br>13.679          | 6.946<br>8.127<br>9.021<br>10.844<br>14.851          | 0.083<br>0.148<br>0.225<br>0.406<br>0.909          |
| IBC1900BB-1<br>(P)                       | C                 | From Leg       | 4.000<br>0.000<br>1.000                               | 0.000                      | 98.000          | No Ice<br>1/2" Ice<br>1" Ice<br>2" Ice<br>4" Ice           | 1.127<br>1.273<br>1.427<br>1.761<br>2.534            | 0.533<br>0.647<br>0.770<br>1.041<br>1.688            | 0.022<br>0.030<br>0.039<br>0.065<br>0.147          |
| IBC1900HG-2A<br>(P)                      | C                 | From Leg       | 4.000<br>0.000<br>1.000                               | 0.000                      | 98.000          | No Ice<br>1/2" Ice<br>1" Ice<br>2" Ice<br>4" Ice           | 1.127<br>1.273<br>1.427<br>1.761<br>2.534            | 0.533<br>0.647<br>0.770<br>1.041<br>1.688            | 0.022<br>0.030<br>0.039<br>0.065<br>0.147          |
| (2) 6' x 2" Mount Pipe<br>(E)            | A                 | From Leg       | 4.000<br>0.000<br>0.000                               | 0.000                      | 98.000          | No Ice<br>1/2" Ice<br>1" Ice<br>2" Ice<br>4" Ice           | 1.425<br>1.925<br>2.294<br>3.060<br>4.702            | 1.425<br>1.925<br>2.294<br>3.060<br>4.702            | 0.022<br>0.033<br>0.048<br>0.090<br>0.231          |
| (2) 6' x 2" Mount Pipe<br>(E)            | B                 | From Leg       | 4.000<br>0.000<br>0.000                               | 0.000                      | 98.000          | No Ice<br>1/2" Ice<br>1" Ice<br>2" Ice<br>4" Ice           | 1.425<br>1.925<br>2.294<br>3.060<br>4.702            | 1.425<br>1.925<br>2.294<br>3.060<br>4.702            | 0.022<br>0.033<br>0.048<br>0.090<br>0.231          |
| (2) 6' x 2" Mount Pipe                   | C                 | From Leg       | 4.000                                                 | 0.000                      | 98.000          | No Ice                                                     | 1.425                                                | 1.425                                                | 0.022                                              |



|                                                                                                                                  |         |                                        |             |                   |
|----------------------------------------------------------------------------------------------------------------------------------|---------|----------------------------------------|-------------|-------------------|
| <b>tnxTower</b><br><br><b>B+T Group</b><br>1717 S Boulder Ave<br>Tulsa, OK 74119<br>Phone: (918) 587-4630<br>FAX: (918) 295-0265 | Job     | 85565.001- Hartford-NU,CT (BU#876363)  | Page        | 9 of 14           |
|                                                                                                                                  | Project | 108' Summit MP/ App: Id: 156076 Rev: 3 | Date        | 11:32:51 10/15/12 |
|                                                                                                                                  | Client  | Crown Castle                           | Designed by | hrotithor         |

| Description                           | Face<br>or<br>Leg | Offset<br>Type | Offsets:<br>Horz<br>Lateral<br>Vert<br>ft<br>ft<br>ft | Azimuth<br>Adjustment<br>° | Placement<br>ft |          | C <sub>A</sub> A <sub>A</sub><br>Front<br>ft <sup>2</sup> | C <sub>A</sub> A <sub>A</sub><br>Side<br>ft <sup>2</sup> | Weight<br>K |
|---------------------------------------|-------------------|----------------|-------------------------------------------------------|----------------------------|-----------------|----------|-----------------------------------------------------------|----------------------------------------------------------|-------------|
| (E)                                   |                   |                | 0.000<br>0.000                                        |                            |                 | 1/2" Ice | 1.925                                                     | 1.925                                                    | 0.033       |
|                                       |                   |                |                                                       |                            |                 | 1" Ice   | 2.294                                                     | 2.294                                                    | 0.048       |
|                                       |                   |                |                                                       |                            |                 | 2" Ice   | 3.060                                                     | 3.060                                                    | 0.090       |
|                                       |                   |                |                                                       |                            |                 | 4" Ice   | 4.702                                                     | 4.702                                                    | 0.231       |
| Platform Mount [LP 712-1]             | C                 | None           |                                                       | 0.000                      | 98.000          | No Ice   | 24.530                                                    | 24.530                                                   | 1.335       |
| (E)                                   |                   |                |                                                       |                            |                 | 1/2" Ice | 29.940                                                    | 29.940                                                   | 1.646       |
|                                       |                   |                |                                                       |                            |                 | 1" Ice   | 35.350                                                    | 35.350                                                   | 1.956       |
|                                       |                   |                |                                                       |                            |                 | 2" Ice   | 46.170                                                    | 46.170                                                   | 2.577       |
|                                       |                   |                |                                                       |                            |                 | 4" Ice   | 67.810                                                    | 67.810                                                   | 3.820       |
| ***//***                              |                   |                |                                                       |                            |                 |          |                                                           |                                                          |             |
| 800MHz 2X50W RRH<br>W/FILTER<br>(P)   | A                 | From Leg       | 1.000<br>0.000<br>0.000                               | 0.000                      | 96.000          | No Ice   | 2.401                                                     | 2.254                                                    | 0.064       |
|                                       |                   |                |                                                       |                            |                 | 1/2" Ice | 2.613                                                     | 2.460                                                    | 0.086       |
|                                       |                   |                |                                                       |                            |                 | 1" Ice   | 2.833                                                     | 2.675                                                    | 0.111       |
|                                       |                   |                |                                                       |                            |                 | 2" Ice   | 3.300                                                     | 3.132                                                    | 0.172       |
|                                       |                   |                |                                                       |                            |                 | 4" Ice   | 4.337                                                     | 4.148                                                    | 0.338       |
| (2) PCS 1900MHz<br>4x45W-65MHz<br>(P) | A                 | From Leg       | 1.000<br>0.000<br>0.000                               | 0.000                      | 96.000          | No Ice   | 2.709                                                     | 2.611                                                    | 0.060       |
|                                       |                   |                |                                                       |                            |                 | 1/2" Ice | 2.948                                                     | 2.847                                                    | 0.083       |
|                                       |                   |                |                                                       |                            |                 | 1" Ice   | 3.195                                                     | 3.092                                                    | 0.110       |
|                                       |                   |                |                                                       |                            |                 | 2" Ice   | 3.716                                                     | 3.608                                                    | 0.173       |
|                                       |                   |                |                                                       |                            |                 | 4" Ice   | 4.862                                                     | 4.744                                                    | 0.347       |
| 800MHz 2X50W RRH<br>W/FILTER<br>(P)   | B                 | From Leg       | 1.000<br>0.000<br>0.000                               | 0.000                      | 96.000          | No Ice   | 2.401                                                     | 2.254                                                    | 0.064       |
|                                       |                   |                |                                                       |                            |                 | 1/2" Ice | 2.613                                                     | 2.460                                                    | 0.086       |
|                                       |                   |                |                                                       |                            |                 | 1" Ice   | 2.833                                                     | 2.675                                                    | 0.111       |
|                                       |                   |                |                                                       |                            |                 | 2" Ice   | 3.300                                                     | 3.132                                                    | 0.172       |
|                                       |                   |                |                                                       |                            |                 | 4" Ice   | 4.337                                                     | 4.148                                                    | 0.338       |
| (2) PCS 1900MHz<br>4x45W-65MHz<br>(P) | B                 | From Leg       | 1.000<br>0.000<br>0.000                               | 0.000                      | 96.000          | No Ice   | 2.709                                                     | 2.611                                                    | 0.060       |
|                                       |                   |                |                                                       |                            |                 | 1/2" Ice | 2.948                                                     | 2.847                                                    | 0.083       |
|                                       |                   |                |                                                       |                            |                 | 1" Ice   | 3.195                                                     | 3.092                                                    | 0.110       |
|                                       |                   |                |                                                       |                            |                 | 2" Ice   | 3.716                                                     | 3.608                                                    | 0.173       |
|                                       |                   |                |                                                       |                            |                 | 4" Ice   | 4.862                                                     | 4.744                                                    | 0.347       |
| 800MHz 2X50W RRH<br>W/FILTER<br>(P)   | C                 | From Leg       | 1.000<br>0.000<br>0.000                               | 0.000                      | 96.000          | No Ice   | 2.401                                                     | 2.254                                                    | 0.064       |
|                                       |                   |                |                                                       |                            |                 | 1/2" Ice | 2.613                                                     | 2.460                                                    | 0.086       |
|                                       |                   |                |                                                       |                            |                 | 1" Ice   | 2.833                                                     | 2.675                                                    | 0.111       |
|                                       |                   |                |                                                       |                            |                 | 2" Ice   | 3.300                                                     | 3.132                                                    | 0.172       |
|                                       |                   |                |                                                       |                            |                 | 4" Ice   | 4.337                                                     | 4.148                                                    | 0.338       |
| (2) PCS 1900MHz<br>4x45W-65MHz<br>(P) | C                 | From Leg       | 1.000<br>0.000<br>0.000                               | 0.000                      | 96.000          | No Ice   | 2.709                                                     | 2.611                                                    | 0.060       |
|                                       |                   |                |                                                       |                            |                 | 1/2" Ice | 2.948                                                     | 2.847                                                    | 0.083       |
|                                       |                   |                |                                                       |                            |                 | 1" Ice   | 3.195                                                     | 3.092                                                    | 0.110       |
|                                       |                   |                |                                                       |                            |                 | 2" Ice   | 3.716                                                     | 3.608                                                    | 0.173       |
|                                       |                   |                |                                                       |                            |                 | 4" Ice   | 4.862                                                     | 4.744                                                    | 0.347       |
| 6' x 2" Mount Pipe<br>(P)             | A                 | From Leg       | 1.000<br>0.000<br>0.000                               | 0.000                      | 96.000          | No Ice   | 1.425                                                     | 1.425                                                    | 0.022       |
|                                       |                   |                |                                                       |                            |                 | 1/2" Ice | 1.925                                                     | 1.925                                                    | 0.033       |
|                                       |                   |                |                                                       |                            |                 | 1" Ice   | 2.294                                                     | 2.294                                                    | 0.048       |
|                                       |                   |                |                                                       |                            |                 | 2" Ice   | 3.060                                                     | 3.060                                                    | 0.090       |
|                                       |                   |                |                                                       |                            |                 | 4" Ice   | 4.702                                                     | 4.702                                                    | 0.231       |
| 6' x 2" Mount Pipe<br>(P)             | B                 | From Leg       | 1.000<br>0.000<br>0.000                               | 0.000                      | 96.000          | No Ice   | 1.425                                                     | 1.425                                                    | 0.022       |
|                                       |                   |                |                                                       |                            |                 | 1/2" Ice | 1.925                                                     | 1.925                                                    | 0.033       |
|                                       |                   |                |                                                       |                            |                 | 1" Ice   | 2.294                                                     | 2.294                                                    | 0.048       |
|                                       |                   |                |                                                       |                            |                 | 2" Ice   | 3.060                                                     | 3.060                                                    | 0.090       |
|                                       |                   |                |                                                       |                            |                 | 4" Ice   | 4.702                                                     | 4.702                                                    | 0.231       |
| 6' x 2" Mount Pipe<br>(P)             | C                 | From Leg       | 1.000<br>0.000<br>0.000                               | 0.000                      | 96.000          | No Ice   | 1.425                                                     | 1.425                                                    | 0.022       |
|                                       |                   |                |                                                       |                            |                 | 1/2" Ice | 1.925                                                     | 1.925                                                    | 0.033       |
|                                       |                   |                |                                                       |                            |                 | 1" Ice   | 2.294                                                     | 2.294                                                    | 0.048       |
|                                       |                   |                |                                                       |                            |                 | 2" Ice   | 3.060                                                     | 3.060                                                    | 0.090       |
|                                       |                   |                |                                                       |                            |                 | 4" Ice   | 4.702                                                     | 4.702                                                    | 0.231       |
| Side Arm Mount [SO 102-3]<br>(P)      | C                 | None           |                                                       | 0.000                      | 96.000          | No Ice   | 3.000                                                     | 3.000                                                    | 0.081       |
|                                       |                   |                |                                                       |                            |                 | 1/2" Ice | 3.480                                                     | 3.480                                                    | 0.111       |



|                                                                                                                                  |         |                                        |             |                   |
|----------------------------------------------------------------------------------------------------------------------------------|---------|----------------------------------------|-------------|-------------------|
| <b>tnxTower</b><br><br><b>B+T Group</b><br>1717 S Boulder Ave<br>Tulsa, OK 74119<br>Phone: (918) 587-4630<br>FAX: (918) 295-0265 | Job     | 85565.001- Hartford-NU,CT (BU#876363)  | Page        | 10 of 14          |
|                                                                                                                                  | Project | 108' Summit MP/ App: Id: 156076 Rev: 3 | Date        | 11:32:51 10/15/12 |
|                                                                                                                                  | Client  | Crown Castle                           | Designed by | hrotithor         |

| Description                             | Face<br>or<br>Leg | Offset<br>Type | Offsets:<br>Horz<br>Lateral<br>Vert<br>ft<br>ft<br>ft | Azimuth<br>Adjustment<br>° | Placement<br>ft |          | C <sub>A</sub> A <sub>A</sub><br>Front<br>ft <sup>2</sup> | C <sub>A</sub> A <sub>A</sub><br>Side<br>ft <sup>2</sup> | Weight<br>K |
|-----------------------------------------|-------------------|----------------|-------------------------------------------------------|----------------------------|-----------------|----------|-----------------------------------------------------------|----------------------------------------------------------|-------------|
|                                         |                   |                |                                                       |                            |                 | 1" Ice   | 3.960                                                     | 3.960                                                    | 0.141       |
|                                         |                   |                |                                                       |                            |                 | 2" Ice   | 4.920                                                     | 4.920                                                    | 0.201       |
|                                         |                   |                |                                                       |                            |                 | 4" Ice   | 6.840                                                     | 6.840                                                    | 0.321       |
| ****                                    |                   |                |                                                       |                            |                 |          |                                                           |                                                          |             |
| (4) 844G65VTZAS w/ Mount<br>Pipe<br>(E) | A                 | From Leg       | 4.000<br>0.000<br>0.000                               | 0.000                      | 88.000          | No Ice   | 6.071                                                     | 5.154                                                    | 0.034       |
|                                         |                   |                |                                                       |                            |                 | 1/2" Ice | 6.529                                                     | 5.833                                                    | 0.084       |
|                                         |                   |                |                                                       |                            |                 | 1" Ice   | 6.996                                                     | 6.523                                                    | 0.143       |
|                                         |                   |                |                                                       |                            |                 | 2" Ice   | 7.963                                                     | 7.959                                                    | 0.281       |
|                                         |                   |                |                                                       |                            |                 | 4" Ice   | 10.031                                                    | 11.092                                                   | 0.667       |
| (4) 844G65VTZAS w/ Mount<br>Pipe<br>(E) | B                 | From Leg       | 4.000<br>0.000<br>0.000                               | 0.000                      | 88.000          | No Ice   | 6.071                                                     | 5.154                                                    | 0.034       |
|                                         |                   |                |                                                       |                            |                 | 1/2" Ice | 6.529                                                     | 5.833                                                    | 0.084       |
|                                         |                   |                |                                                       |                            |                 | 1" Ice   | 6.996                                                     | 6.523                                                    | 0.143       |
|                                         |                   |                |                                                       |                            |                 | 2" Ice   | 7.963                                                     | 7.959                                                    | 0.281       |
|                                         |                   |                |                                                       |                            |                 | 4" Ice   | 10.031                                                    | 11.092                                                   | 0.667       |
| (4) 844G65VTZAS w/ Mount<br>Pipe<br>(E) | C                 | From Leg       | 4.000<br>0.000<br>0.000                               | 0.000                      | 88.000          | No Ice   | 6.071                                                     | 5.154                                                    | 0.034       |
|                                         |                   |                |                                                       |                            |                 | 1/2" Ice | 6.529                                                     | 5.833                                                    | 0.084       |
|                                         |                   |                |                                                       |                            |                 | 1" Ice   | 6.996                                                     | 6.523                                                    | 0.143       |
|                                         |                   |                |                                                       |                            |                 | 2" Ice   | 7.963                                                     | 7.959                                                    | 0.281       |
|                                         |                   |                |                                                       |                            |                 | 4" Ice   | 10.031                                                    | 11.092                                                   | 0.667       |
| Platform Mount [LP 303-1]<br>(E)        | C                 | None           |                                                       | 0.000                      | 88.000          | No Ice   | 14.660                                                    | 14.660                                                   | 1.250       |
|                                         |                   |                |                                                       |                            |                 | 1/2" Ice | 18.870                                                    | 18.870                                                   | 1.481       |
|                                         |                   |                |                                                       |                            |                 | 1" Ice   | 23.080                                                    | 23.080                                                   | 1.713       |
|                                         |                   |                |                                                       |                            |                 | 2" Ice   | 31.500                                                    | 31.500                                                   | 2.175       |
|                                         |                   |                |                                                       |                            |                 | 4" Ice   | 48.340                                                    | 48.340                                                   | 3.101       |
| ****                                    |                   |                |                                                       |                            |                 |          |                                                           |                                                          |             |
| HBX-6516DS-VTM w/<br>Mount Pipe<br>(E)  | A                 | From Leg       | 4.000<br>0.000<br>-1.000                              | 0.000                      | 80.000          | No Ice   | 3.598                                                     | 3.241                                                    | 0.029       |
|                                         |                   |                |                                                       |                            |                 | 1/2" Ice | 3.998                                                     | 3.914                                                    | 0.060       |
|                                         |                   |                |                                                       |                            |                 | 1" Ice   | 4.435                                                     | 4.564                                                    | 0.100       |
|                                         |                   |                |                                                       |                            |                 | 2" Ice   | 5.368                                                     | 5.914                                                    | 0.199       |
|                                         |                   |                |                                                       |                            |                 | 4" Ice   | 7.361                                                     | 8.877                                                    | 0.504       |
| HBX-6516DS-VTM w/<br>Mount Pipe<br>(E)  | B                 | From Leg       | 4.000<br>0.000<br>-1.000                              | 0.000                      | 80.000          | No Ice   | 3.598                                                     | 3.241                                                    | 0.029       |
|                                         |                   |                |                                                       |                            |                 | 1/2" Ice | 3.998                                                     | 3.914                                                    | 0.060       |
|                                         |                   |                |                                                       |                            |                 | 1" Ice   | 4.435                                                     | 4.564                                                    | 0.100       |
|                                         |                   |                |                                                       |                            |                 | 2" Ice   | 5.368                                                     | 5.914                                                    | 0.199       |
|                                         |                   |                |                                                       |                            |                 | 4" Ice   | 7.361                                                     | 8.877                                                    | 0.504       |
| HBX-6516DS-VTM w/<br>Mount Pipe<br>(E)  | C                 | From Leg       | 4.000<br>0.000<br>-1.000                              | 0.000                      | 80.000          | No Ice   | 3.598                                                     | 3.241                                                    | 0.029       |
|                                         |                   |                |                                                       |                            |                 | 1/2" Ice | 3.998                                                     | 3.914                                                    | 0.060       |
|                                         |                   |                |                                                       |                            |                 | 1" Ice   | 4.435                                                     | 4.564                                                    | 0.100       |
|                                         |                   |                |                                                       |                            |                 | 2" Ice   | 5.368                                                     | 5.914                                                    | 0.199       |
|                                         |                   |                |                                                       |                            |                 | 4" Ice   | 7.361                                                     | 8.877                                                    | 0.504       |
| 6' x 2" Mount Pipe<br>(E)               | A                 | From Leg       | 4.000<br>0.000<br>0.000                               | 0.000                      | 80.000          | No Ice   | 1.425                                                     | 1.425                                                    | 0.022       |
|                                         |                   |                |                                                       |                            |                 | 1/2" Ice | 1.925                                                     | 1.925                                                    | 0.033       |
|                                         |                   |                |                                                       |                            |                 | 1" Ice   | 2.294                                                     | 2.294                                                    | 0.048       |
|                                         |                   |                |                                                       |                            |                 | 2" Ice   | 3.060                                                     | 3.060                                                    | 0.090       |
|                                         |                   |                |                                                       |                            |                 | 4" Ice   | 4.702                                                     | 4.702                                                    | 0.231       |
| 6' x 2" Mount Pipe<br>(E)               | B                 | From Leg       | 4.000<br>0.000<br>0.000                               | 0.000                      | 80.000          | No Ice   | 1.425                                                     | 1.425                                                    | 0.022       |
|                                         |                   |                |                                                       |                            |                 | 1/2" Ice | 1.925                                                     | 1.925                                                    | 0.033       |
|                                         |                   |                |                                                       |                            |                 | 1" Ice   | 2.294                                                     | 2.294                                                    | 0.048       |
|                                         |                   |                |                                                       |                            |                 | 2" Ice   | 3.060                                                     | 3.060                                                    | 0.090       |
|                                         |                   |                |                                                       |                            |                 | 4" Ice   | 4.702                                                     | 4.702                                                    | 0.231       |
| 6' x 2" Mount Pipe<br>(E)               | C                 | From Leg       | 4.000<br>0.000<br>0.000                               | 0.000                      | 80.000          | No Ice   | 1.425                                                     | 1.425                                                    | 0.022       |
|                                         |                   |                |                                                       |                            |                 | 1/2" Ice | 1.925                                                     | 1.925                                                    | 0.033       |
|                                         |                   |                |                                                       |                            |                 | 1" Ice   | 2.294                                                     | 2.294                                                    | 0.048       |
|                                         |                   |                |                                                       |                            |                 | 2" Ice   | 3.060                                                     | 3.060                                                    | 0.090       |
|                                         |                   |                |                                                       |                            |                 | 4" Ice   | 4.702                                                     | 4.702                                                    | 0.231       |
| T-Arm Mount [TA 601-3]                  | C                 | None           |                                                       | 0.000                      | 80.000          | No Ice   | 10.900                                                    | 10.900                                                   | 0.726       |
|                                         |                   |                |                                                       |                            |                 | 1/2" Ice | 14.650                                                    | 14.650                                                   | 0.926       |



|                                                                                                                                  |         |                                        |             |                   |
|----------------------------------------------------------------------------------------------------------------------------------|---------|----------------------------------------|-------------|-------------------|
| <b>tnxTower</b><br><br><b>B+T Group</b><br>1717 S Boulder Ave<br>Tulsa, OK 74119<br>Phone: (918) 587-4630<br>FAX: (918) 295-0265 | Job     | 85565.001- Hartford-NU,CT (BU#876363)  | Page        | 11 of 14          |
|                                                                                                                                  | Project | 108' Summit MP/ App: Id: 156076 Rev: 3 | Date        | 11:32:51 10/15/12 |
|                                                                                                                                  | Client  | Crown Castle                           | Designed by | hrotithor         |

| Description                      | Face<br>or<br>Leg | Offset<br>Type | Offsets:<br>Horz<br>Lateral<br>Vert<br>ft<br>ft<br>ft | Azimuth<br>Adjustment<br>° | Placement<br>ft | C <sub>AA</sub><br>Front<br>ft <sup>2</sup> | C <sub>AA</sub><br>Side<br>ft <sup>2</sup> | Weight<br>K |
|----------------------------------|-------------------|----------------|-------------------------------------------------------|----------------------------|-----------------|---------------------------------------------|--------------------------------------------|-------------|
| ****<br>KS24019-L112A<br>(E)     | A                 | From Leg       | 1.000<br>0.000<br>2.000                               | 0.000                      | 74.000          | 1" Ice                                      | 18.400                                     | 1.125       |
|                                  |                   |                |                                                       |                            |                 | 2" Ice                                      | 25.900                                     | 1.524       |
|                                  |                   |                |                                                       |                            |                 | 4" Ice                                      | 40.900                                     | 2.322       |
|                                  |                   |                |                                                       |                            |                 | No Ice                                      | 0.156                                      | 0.005       |
| Platform Mount [LP 701-1]<br>(E) | A                 | From Leg       | 1.000<br>0.000<br>0.000                               | 0.000                      | 74.000          | 1/2" Ice                                    | 0.225                                      | 0.007       |
|                                  |                   |                |                                                       |                            |                 | 1" Ice                                      | 0.302                                      | 0.009       |
|                                  |                   |                |                                                       |                            |                 | 2" Ice                                      | 0.484                                      | 0.018       |
|                                  |                   |                |                                                       |                            |                 | 4" Ice                                      | 0.951                                      | 0.056       |
|                                  |                   |                |                                                       |                            |                 | No Ice                                      | 59.150                                     | 2.750       |
|                                  |                   |                |                                                       |                            |                 | 1/2" Ice                                    | 71.120                                     | 3.424       |
|                                  |                   |                |                                                       |                            |                 | 1" Ice                                      | 83.090                                     | 4.099       |
|                                  |                   |                |                                                       |                            |                 | 2" Ice                                      | 107.030                                    | 5.448       |
| ****                             |                   |                |                                                       |                            |                 | 4" Ice                                      | 154.910                                    | 8.145       |

## Dishes

| Description          | Face<br>or<br>Leg | Dish<br>Type             | Offset<br>Type | Offsets:<br>Horz<br>Lateral<br>Vert<br>ft | Azimuth<br>Adjustment<br>° | 3 dB<br>Beam<br>Width<br>° | Elevation<br>ft | Outside<br>Diameter<br>ft | Aperture<br>Area<br>ft <sup>2</sup> | Weight<br>K |       |
|----------------------|-------------------|--------------------------|----------------|-------------------------------------------|----------------------------|----------------------------|-----------------|---------------------------|-------------------------------------|-------------|-------|
| A-ANT-18G-2-C<br>(E) | A                 | Paraboloid<br>w/Radome   | From<br>Leg    | 4.000                                     | 52.000                     |                            | 98.000          | 2.175                     | No Ice                              | 3.715       | 0.027 |
|                      |                   |                          |                | 0.000                                     |                            |                            |                 |                           | 1/2" Ice                            | 4.006       | 0.048 |
|                      |                   |                          |                | 4.000                                     |                            |                            |                 |                           | 1" Ice                              | 4.296       | 0.068 |
|                      |                   |                          |                |                                           |                            |                            |                 |                           | 2" Ice                              | 4.876       | 0.109 |
| A-ANT-23G-1-C<br>(E) | B                 | Paraboloid w/o<br>Radome | From<br>Leg    | 4.000                                     | 81.000                     |                            | 98.000          | 1.275                     | 4" Ice                              | 6.037       | 0.192 |
|                      |                   |                          |                | 0.000                                     |                            |                            |                 |                           | No Ice                              | 1.277       | 0.007 |
|                      |                   |                          |                | 4.000                                     |                            |                            |                 |                           | 1/2" Ice                            | 1.449       | 0.007 |
|                      |                   |                          |                |                                           |                            |                            |                 |                           | 1" Ice                              | 1.621       | 0.007 |
|                      |                   |                          |                |                                           |                            |                            |                 |                           | 2" Ice                              | 1.966       | 0.007 |
|                      |                   |                          |                |                                           |                            |                            |                 |                           | 4" Ice                              | 2.656       | 0.007 |
| **/**                |                   |                          |                |                                           |                            |                            |                 |                           |                                     |             |       |



|                                                                                                                                  |                |                                        |                    |                   |
|----------------------------------------------------------------------------------------------------------------------------------|----------------|----------------------------------------|--------------------|-------------------|
| <b>tnxTower</b><br><br><b>B+T Group</b><br>1717 S Boulder Ave<br>Tulsa, OK 74119<br>Phone: (918) 587-4630<br>FAX: (918) 295-0265 | <b>Job</b>     | 85565.001- Hartford-NU,CT (BU#876363)  | <b>Page</b>        | 12 of 14          |
|                                                                                                                                  | <b>Project</b> | 108' Summit MP/ App: Id: 156076 Rev: 3 | <b>Date</b>        | 11:32:51 10/15/12 |
|                                                                                                                                  | <b>Client</b>  | Crown Castle                           | <b>Designed by</b> | hrotithor         |

## Compression Checks

### Pole Design Data

| Section No. | Elevation<br>ft    | Size                   | L<br>ft | $L_u$<br>ft | Kl/r | $F_a$<br>ksi | A<br>in <sup>2</sup> | Actual P<br>K | Allow.<br>$P_a$<br>K | Ratio<br>$\frac{P}{P_a}$ |
|-------------|--------------------|------------------------|---------|-------------|------|--------------|----------------------|---------------|----------------------|--------------------------|
| L1          | 108 - 98.5 (1)     | TP8.375x8.375x0.313    | 9.500   | 0.000       | 0.0  | 21.000       | 7.915                | -1.282        | 166.222              | 0.008                    |
| L2          | 98.5 - 98 (2)      | TP16.5x8.375x0.313     | 0.500   | 0.000       | 0.0  | 21.000       | 7.915                | -1.289        | 166.222              | 0.008                    |
| L3          | 98 - 82 (3)        | TP19.061x16.5x0.188    | 16.000  | 0.000       | 0.0  | 39.000       | 11.232               | -6.214        | 438.050              | 0.014                    |
| L4          | 82 - 76.75 (4)     | TP19.901x19.061x0.449  | 5.250   | 0.000       | 0.0  | 27.355       | 27.704               | -7.685        | 757.846              | 0.010                    |
| L5          | 76.75 - 60.5 (5)   | TP22.502x19.901x0.627  | 16.250  | 0.000       | 0.0  | 27.100       | 43.545               | -13.173       | 1180.060             | 0.011                    |
| L6          | 60.5 - 59.5 (6)    | TP22.662x22.502x0.709  | 1.000   | 0.000       | 0.0  | 27.013       | 49.370               | -13.378       | 1333.620             | 0.010                    |
| L7          | 59.5 - 47 (7)      | TP24.663x22.662x0.686  | 12.500  | 0.000       | 0.0  | 28.232       | 51.088               | -15.310       | 1442.310             | 0.011                    |
| L8          | 47 - 30.5 (8)      | TP26.929x23.768x0.759  | 19.750  | 0.000       | 0.0  | 27.199       | 63.011               | -20.329       | 1713.830             | 0.012                    |
| L9          | 30.5 - 29.75 (9)   | TP27.049x26.929x0.688  | 0.750   | 0.000       | 0.0  | 27.519       | 57.594               | -20.513       | 1584.930             | 0.013                    |
|             |                    | H1-3+VT (1.38 CR) - 9  |         |             |      |              |                      |               |                      |                          |
| L10         | 29.75 - 11.25 (10) | TP30.01x27.049x0.67    | 18.500  | 0.000       | 0.0  | 29.591       | 62.371               | -25.189       | 1845.630             | 0.014                    |
|             |                    | H1-3+VT (1.40 CR) - 10 |         |             |      |              |                      |               |                      |                          |
| L11         | 11.25 - 10 (11)    | TP30.21x30.01x0.689    | 1.250   | 0.000       | 0.0  | 31.571       | 64.534               | -25.516       | 2037.390             | 0.013                    |
| L12         | 10 - 0 (12)        | TP31.81x30.21x0.79     | 10.000  | 0.000       | 0.0  | 31.608       | 77.772               | -28.176       | 2458.220             | 0.011                    |

### Pole Bending Design Data

| Section No. | Elevation<br>ft    | Size                  | Actual $M_x$<br>kip-ft | Actual $f_{bx}$<br>ksi | Allow. $F_{bx}$<br>ksi | Ratio $\frac{f_{bx}}{F_{bx}}$ | Actual $M_y$<br>kip-ft | Actual $f_{by}$<br>ksi | Allow. $F_{by}$<br>ksi | Ratio $\frac{f_{by}}{F_{by}}$ |
|-------------|--------------------|-----------------------|------------------------|------------------------|------------------------|-------------------------------|------------------------|------------------------|------------------------|-------------------------------|
| L1          | 108 - 98.5 (1)     | TP8.375x8.375x0.313   | 32.660                 | 25.497                 | 23.100                 | 1.104                         | 0.000                  | 0.000                  | 23.100                 | 0.000                         |
| L2          | 98.5 - 98 (2)      | TP16.5x8.375x0.313    | 32.660                 | 25.497                 | 23.100                 | 1.104                         | 0.000                  | 0.000                  | 23.100                 | 0.000                         |
| L3          | 98 - 82 (3)        | TP19.061x16.5x0.188   | 213.021                | 48.968                 | 39.000                 | 1.256                         | 0.000                  | 0.000                  | 39.000                 | 0.000                         |
| L4          | 82 - 76.75 (4)     | TP19.901x19.061x0.449 | 287.558                | 26.340                 | 27.355                 | 0.963                         | 0.000                  | 0.000                  | 27.355                 | 0.000                         |
| L5          | 76.75 - 60.5 (5)   | TP22.502x19.901x0.627 | 570.193                | 29.711                 | 27.100                 | 1.096                         | 0.000                  | 0.000                  | 27.100                 | 0.000                         |
| L6          | 60.5 - 59.5 (6)    | TP22.662x22.502x0.709 | 588.243                | 27.033                 | 27.013                 | 1.001                         | 0.000                  | 0.000                  | 27.013                 | 0.000                         |
| L7          | 59.5 - 47 (7)      | TP24.663x22.662x0.686 | 757.847                | 31.407                 | 28.232                 | 1.112                         | 0.000                  | 0.000                  | 28.232                 | 0.000                         |
| L8          | 47 - 30.5 (8)      | TP26.929x23.768x0.759 | 1135.76                | 34.197                 | 27.199                 | 1.257                         | 0.000                  | 0.000                  | 27.199                 | 0.000                         |
|             |                    |                       | 7                      |                        |                        |                               |                        |                        |                        |                               |
| L9          | 30.5 - 29.75 (9)   | TP27.049x26.929x0.688 | 1150.48                | 37.519                 | 27.519                 | 1.363                         | 0.000                  | 0.000                  | 27.519                 | 0.000                         |
|             |                    |                       | 3                      |                        |                        |                               |                        |                        |                        |                               |
| L10         | 29.75 - 11.25 (10) | TP30.01x27.049x0.67   | 1520.50                | 41.007                 | 29.591                 | 1.386                         | 0.000                  | 0.000                  | 29.591                 | 0.000                         |
|             |                    |                       | 8                      |                        |                        |                               |                        |                        |                        |                               |
| L11         | 11.25 - 10 (11)    | TP30.21x30.01x0.689   | 1545.97                | 40.069                 | 31.571                 | 1.269                         | 0.000                  | 0.000                  | 31.571                 | 0.000                         |
|             |                    |                       | 5                      |                        |                        |                               |                        |                        |                        |                               |
| L12         | 10 - 0 (12)        | TP31.81x30.21x0.79    | 1751.64                | 35.926                 | 31.608                 | 1.137                         | 0.000                  | 0.000                  | 31.608                 | 0.000                         |
|             |                    |                       | 2                      |                        |                        |                               |                        |                        |                        |                               |



|                                                                                                                                  |         |                                        |             |                   |
|----------------------------------------------------------------------------------------------------------------------------------|---------|----------------------------------------|-------------|-------------------|
| <b>tnxTower</b><br><br><b>B+T Group</b><br>1717 S Boulder Ave<br>Tulsa, OK 74119<br>Phone: (918) 587-4630<br>FAX: (918) 295-0265 | Job     | 85565.001- Hartford-NU,CT (BU#876363)  | Page        | 13 of 14          |
|                                                                                                                                  | Project | 108' Summit MP/ App: Id: 156076 Rev: 3 | Date        | 11:32:51 10/15/12 |
|                                                                                                                                  | Client  | Crown Castle                           | Designed by | hrotithor         |

### Pole Shear Design Data

| Section No. | Elevation<br>ft       | Size                  | Actual<br>V<br>K | Actual<br>f <sub>v</sub><br>ksi | Allow.<br>F <sub>v</sub><br>ksi | Ratio<br>f <sub>v</sub><br>F <sub>v</sub> | Actual<br>T<br>kip-ft | Actual<br>f <sub>vt</sub><br>ksi | Allow.<br>F <sub>vt</sub><br>ksi | Ratio<br>f <sub>vt</sub><br>F <sub>vt</sub> |
|-------------|-----------------------|-----------------------|------------------|---------------------------------|---------------------------------|-------------------------------------------|-----------------------|----------------------------------|----------------------------------|---------------------------------------------|
| L1          | 108 - 98.5 (1)        | TP8.375x8.375x0.313   | 5.164            | 0.652                           | 14.000                          | 0.093                                     | 0.132                 | 0.050                            | 14.000                           | 0.004                                       |
| L2          | 98.5 - 98 (2)         | TP16.5x8.375x0.313    | 5.184            | 0.655                           | 14.000                          | 0.047                                     | 0.131                 | 0.049                            | 14.000                           | 0.004                                       |
| L3          | 98 - 82 (3)           | TP19.061x16.5x0.188   | 13.500           | 1.202                           | 26.000                          | 0.092                                     | 0.119                 | 0.013                            | 26.000                           | 0.001                                       |
| L4          | 82 - 76.75 (4)        | TP19.901x19.061x0.449 | 14.786           | 0.534                           | 18.236                          | 0.059                                     | 0.126                 | 0.006                            | 18.236                           | 0.000                                       |
| L5          | 76.75 - 60.5 (5)      | TP22.502x19.901x0.627 | 18.043           | 0.414                           | 18.067                          | 0.046                                     | 1.783                 | 0.044                            | 18.067                           | 0.002                                       |
| L6          | 60.5 - 59.5 (6)       | TP22.662x22.502x0.709 | 18.102           | 0.367                           | 18.009                          | 0.041                                     | 1.785                 | 0.039                            | 18.009                           | 0.002                                       |
| L7          | 59.5 - 47 (7)         | TP24.663x22.662x0.686 | 18.616           | 0.364                           | 18.822                          | 0.039                                     | 1.799                 | 0.036                            | 18.822                           | 0.002                                       |
| L8          | 47 - 30.5 (8)         | TP26.929x23.768x0.759 | 19.639           | 0.312                           | 18.133                          | 0.034                                     | 1.830                 | 0.026                            | 18.133                           | 0.001                                       |
| L9          | 30.5 - 29.75 (9)      | TP27.049x26.929x0.688 | 19.668           | 0.341                           | 18.346                          | 0.037                                     | 1.832                 | 0.029                            | 18.346                           | 0.002                                       |
| L10         | 29.75 - 11.25<br>(10) | TP30.01x27.049x0.67   | 20.389           | 0.327                           | 19.727                          | 0.033                                     | 1.863                 | 0.024                            | 19.727                           | 0.001                                       |
| L11         | 11.25 - 10 (11)       | TP30.21x30.01x0.689   | 20.438           | 0.317                           | 21.047                          | 0.030                                     | 1.866                 | 0.023                            | 21.047                           | 0.001                                       |
| L12         | 10 - 0 (12)           | TP31.81x30.21x0.79    | 20.744           | 0.267                           | 21.072                          | 0.025                                     | 1.875                 | 0.018                            | 21.072                           | 0.001                                       |

### Pole Interaction Design Data

| Section No. | Elevation<br>ft       | Ratio<br>P<br>P <sub>a</sub> | Ratio<br>f <sub>bx</sub><br>F <sub>bx</sub> | Ratio<br>f <sub>by</sub><br>F <sub>by</sub> | Ratio<br>f <sub>v</sub><br>F <sub>v</sub> | Ratio<br>f <sub>vt</sub><br>F <sub>vt</sub> | Comb.<br>Stress<br>Ratio | Allow.<br>Stress<br>Ratio | Criteria  |
|-------------|-----------------------|------------------------------|---------------------------------------------|---------------------------------------------|-------------------------------------------|---------------------------------------------|--------------------------|---------------------------|-----------|
| L1          | 108 - 98.5 (1)        | 0.008                        | 1.104                                       | 0.000                                       | 0.093                                     | 0.004                                       | 1.114                    | 1.333                     | H1-3+VT ✓ |
| L2          | 98.5 - 98 (2)         | 0.008                        | 1.104                                       | 0.000                                       | 0.047                                     | 0.004                                       | 1.114                    | 1.333                     | H1-3+VT ✓ |
| L3          | 98 - 82 (3)           | 0.014                        | 1.256                                       | 0.000                                       | 0.092                                     | 0.001                                       | 1.272                    | 1.333                     | H1-3+VT ✓ |
| L4          | 82 - 76.75 (4)        | 0.010                        | 0.963                                       | 0.000                                       | 0.059                                     | 0.000                                       | 0.974                    | 1.333                     | H1-3+VT ✓ |
| L5          | 76.75 - 60.5 (5)      | 0.011                        | 1.096                                       | 0.000                                       | 0.046                                     | 0.002                                       | 1.108                    | 1.333                     | H1-3+VT ✓ |
| L6          | 60.5 - 59.5 (6)       | 0.010                        | 1.001                                       | 0.000                                       | 0.041                                     | 0.002                                       | 1.011                    | 1.333                     | H1-3+VT ✓ |
| L7          | 59.5 - 47 (7)         | 0.011                        | 1.112                                       | 0.000                                       | 0.039                                     | 0.002                                       | 1.124                    | 1.333                     | H1-3+VT ✓ |
| L8          | 47 - 30.5 (8)         | 0.012                        | 1.257                                       | 0.000                                       | 0.034                                     | 0.001                                       | 1.270                    | 1.333                     | H1-3+VT ✓ |
| L9          | 30.5 - 29.75 (9)      | 0.013                        | 1.363                                       | 0.000                                       | 0.037                                     | 0.002                                       | 1.377                    | 1.333                     | H1-3+VT ✗ |
| L10         | 29.75 - 11.25<br>(10) | 0.014                        | 1.386                                       | 0.000                                       | 0.033                                     | 0.001                                       | 1.400                    | 1.333                     | H1-3+VT ✗ |
| L11         | 11.25 - 10 (11)       | 0.013                        | 1.269                                       | 0.000                                       | 0.030                                     | 0.001                                       | 1.282                    | 1.333                     | H1-3+VT ✓ |
| L12         | 10 - 0 (12)           | 0.011                        | 1.137                                       | 0.000                                       | 0.025                                     | 0.001                                       | 1.148                    | 1.333                     | H1-3+VT ✓ |



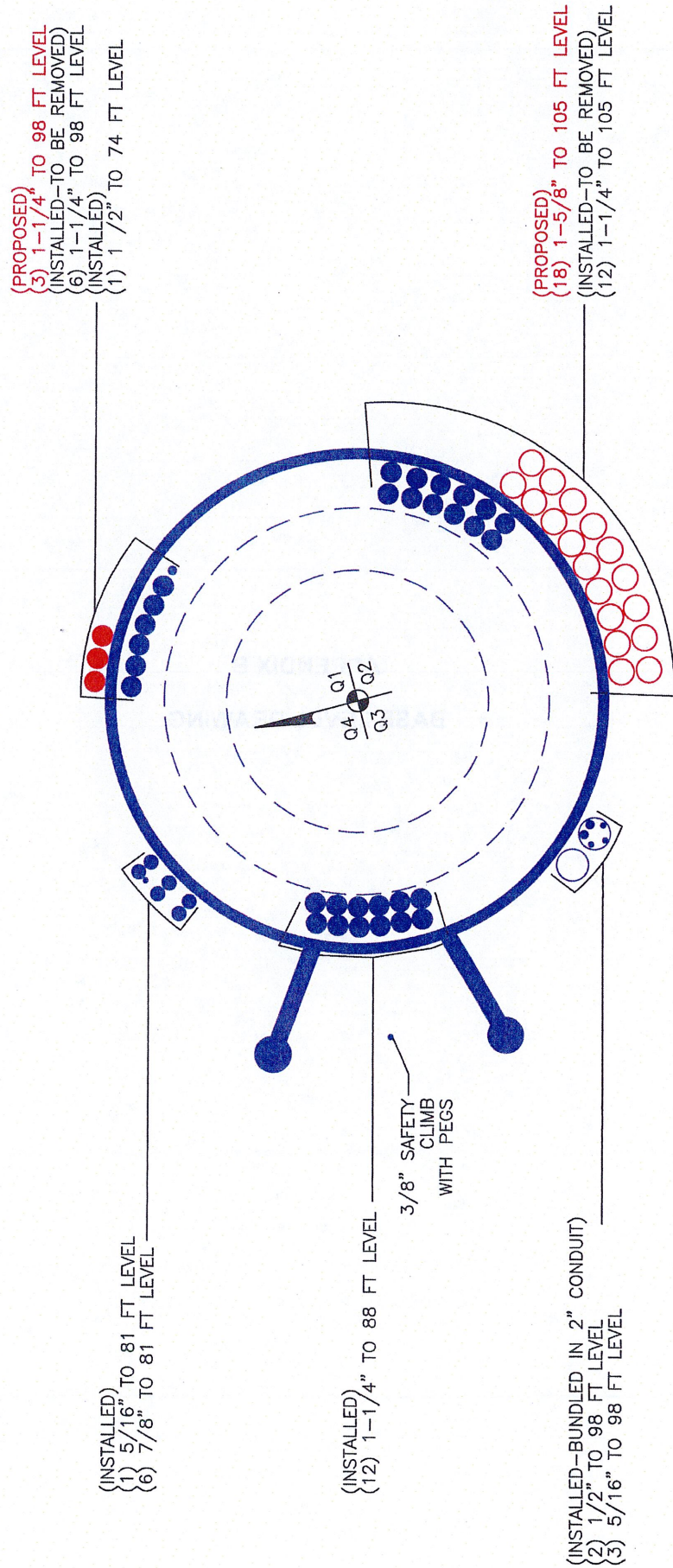
|                                                                                                                                  |                |                                        |                    |                   |
|----------------------------------------------------------------------------------------------------------------------------------|----------------|----------------------------------------|--------------------|-------------------|
| <b>tnxTower</b><br><br><b>B+T Group</b><br>1717 S Boulder Ave<br>Tulsa, OK 74119<br>Phone: (918) 587-4630<br>FAX: (918) 295-0265 | <b>Job</b>     | 85565.001- Hartford-NU,CT (BU#876363)  | <b>Page</b>        | 14 of 14          |
|                                                                                                                                  | <b>Project</b> | 108' Summit MP/ App: Id: 156076 Rev: 3 | <b>Date</b>        | 11:32:51 10/15/12 |
|                                                                                                                                  | <b>Client</b>  | Crown Castle                           | <b>Designed by</b> | hrotithor         |

### Section Capacity Table

| Section No. | Elevation ft  | Component Type | Size                  | Critical Element | P K     | SF*P <sub>allow</sub> K | % Capacity      | Pass Fail           |
|-------------|---------------|----------------|-----------------------|------------------|---------|-------------------------|-----------------|---------------------|
| L1          | 108 - 98.5    | Pole           | TP8.375x8.375x0.313   | 1                | -1.282  | 221.574                 | 83.6            | Pass                |
| L2          | 98.5 - 98     | Pole           | TP16.5x8.375x0.313    | 2                | -1.289  | 221.574                 | 83.6            | Pass                |
| L3          | 98 - 82       | Pole           | TP19.061x16.5x0.188   | 3                | -6.214  | 583.921                 | 95.4            | Pass                |
| L4          | 82 - 76.75    | Pole           | TP19.901x19.061x0.449 | 4                | -7.685  | 1010.209                | 73.1            | Pass                |
| L5          | 76.75 - 60.5  | Pole           | TP22.502x19.901x0.627 | 5                | -13.173 | 1573.020                | 83.1            | Pass                |
| L6          | 60.5 - 59.5   | Pole           | TP22.662x22.502x0.709 | 6                | -13.378 | 1777.715                | 75.9            | Pass                |
| L7          | 59.5 - 47     | Pole           | TP24.663x22.662x0.686 | 7                | -15.310 | 1922.599                | 84.3            | Pass                |
| L8          | 47 - 30.5     | Pole           | TP26.929x23.768x0.759 | 8                | -20.329 | 2284.535                | 95.2            | Pass                |
| L9          | 30.5 - 29.75  | Pole           | TP27.049x26.929x0.688 | 9                | -20.513 | 2112.712                | 103.3           | Fail X              |
| L10         | 29.75 - 11.25 | Pole           | TP30.01x27.049x0.67   | 10               | -25.189 | 2460.225                | 105.0           | Fail X              |
| L11         | 11.25 - 10    | Pole           | TP30.21x30.01x0.689   | 11               | -25.516 | 2715.841                | 96.2            | Pass                |
| L12         | 10 - 0        | Pole           | TP31.81x30.21x0.79    | 12               | -28.176 | 3276.807                | 86.1            | Pass                |
|             |               |                |                       |                  |         |                         | Summary         |                     |
|             |               |                |                       |                  |         |                         | Pole (L10)      | 105.0 Fail X        |
|             |               |                |                       |                  |         |                         | <b>RATING =</b> | <b>105.0 Fail X</b> |



**APPENDIX B**  
**BASE LEVEL DRAWING**





**APPENDIX C**  
**ADDITIONAL CALCULATIONS**

**Agro Solutions**  
1550 Harkness Parkway, Suite 120  
Evanston, IL 60202  
708.333.4100  
www.agrosolutions.com



Flats (Used for relative orientation only. Actual flat numbers may vary.)

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|
|   |   | 1 |   |   |   | 1 |   |   |    |    | 1  |    |    |    |    | 1  |    |
|   |   |   |   | 1 |   |   |   |   |    |    | 1  |    |    |    |    | 1  |    |
|   |   |   |   | 1 |   |   |   |   |    |    | 1  |    |    |    |    | 1  |    |
|   |   |   |   | 1 |   |   |   |   |    |    | 1  |    |    |    |    | 1  |    |
|   |   |   |   |   |   |   |   |   |    |    | 1  |    |    |    |    |    |    |

Rein2

|   |   |   |
|---|---|---|
| 1 | 1 | 1 |
| 1 | 1 | 1 |
| 1 | 1 | 1 |
| 1 | 1 | 1 |

Rein3

\_\_\_\_\_

# Reinforcement Capacity

| Dimensions and Properties |                   | Compression             |                                         |                                         |                                         |                                              |                          |            |                      |                             |                          |                       |                          |                                 | Axial                   |                                 |                         | LRFD                     |                                            |                                |                    |
|---------------------------|-------------------|-------------------------|-----------------------------------------|-----------------------------------------|-----------------------------------------|----------------------------------------------|--------------------------|------------|----------------------|-----------------------------|--------------------------|-----------------------|--------------------------|---------------------------------|-------------------------|---------------------------------|-------------------------|--------------------------|--------------------------------------------|--------------------------------|--------------------|
| Model                     | Weight<br>(lb/ft) | Area (in <sup>2</sup> ) | Moment of<br>Inertia (in <sup>4</sup> ) | Moment of<br>Inertia (in <sup>4</sup> ) | Centroid<br>from<br>Mating Edge<br>(in) | Centroid<br>from Bolt<br>Hole Center<br>(in) | Web<br>Thickness<br>(in) | Width (in) | Flange<br>Width (in) | Flange<br>Thickness<br>(in) | Hole<br>Diameter<br>(in) | Yield Stress<br>(ksi) | Ultimate<br>Stress (ksi) | Slender<br>Ratio<br>Coefficient | Unbraced<br>Length (in) | Slender<br>Ratio<br>Coefficient | Unbraced<br>Length (in) | Allowable<br>Axial (kip) | Allowable<br>Axial w/<br>increase<br>(kip) | Governing<br>Strength<br>(kip) | Governing<br>Axial |
| VS(L 25x5.25)             | 22.3              | 6.56                    | 0.85                                    | 15.07                                   | 0.625                                   | 0                                            | 1.25                     | 5.25       | 0                    | 0                           | 1.21875                  | 65                    | 80                       | 0.80                            | 18                      | 1.00                            | 18                      | 198.4                    | 264.6                                      | 297.7                          | Rupture            |
| VS(L 25x4.375)            | 18.6              | 5.47                    | 0.71                                    | 8.72                                    | 0.625                                   | 0                                            | 1.25                     | 4.375      | 0                    | 0                           | 1.21875                  | 65                    | 80                       | 0.80                            | 21                      | 1.00                            | 21                      | 154.7                    | 206.3                                      | 232.0                          | Rupture            |
| VS(L 25x4)                | 17.0              | 5.00                    | 0.65                                    | 6.67                                    | 0.625                                   | 0                                            | 1.25                     | 4          | 0                    | 0                           | 1.21875                  | 65                    | 80                       | 0.80                            | 21                      | 1.00                            | 21                      | 135.9                    | 181.3                                      | 203.9                          | Rupture            |
| PJF(Lx4.5)                | 15.3              | 4.50                    | 0.38                                    | 7.59                                    | 0.5                                     | 0                                            | 1                        | 4.5        | 0                    | 0                           | 1.21875                  | 65                    | 80                       | 0.80                            | 20                      | 1.00                            | 20                      | 128.8                    | 171.7                                      | 193.1                          | Rupture            |
| PJF(Lx4)                  | 13.6              | 4.00                    | 0.33                                    | 5.33                                    | 0.5                                     | 0                                            | 1                        | 4          | 0                    | 0                           | 1.21875                  | 65                    | 80                       | 0.80                            | 22                      | 1.00                            | 22                      | 108.8                    | 145.0                                      | 163.1                          | Rupture            |
| PJF(0.75x3.625)           | 9.3               | 2.72                    | 0.13                                    | 2.98                                    | 0.375                                   | 0                                            | 0.75                     | 3.625      | 0                    | 0                           | 1.21875                  | 65                    | 80                       | 0.80                            | 18                      | 1.00                            | 18                      | 70.1                     | 93.5                                       | 104.5                          | Compress.          |
| MS400                     | 10.2              | 3.00                    | 0.14                                    | 4.00                                    | 0.375                                   | 0                                            | 0.75                     | 4          | 0                    | 0                           | 1.25                     | 65                    | 80                       | 0.80                            | 16.875                  | 1.00                            | 16.875                  | 80.6                     | 107.5                                      | 120.9                          | Rupture            |
| MS450                     | 15.3              | 4.50                    | 0.38                                    | 7.59                                    | 0.5                                     | 0                                            | 1                        | 4.5        | 0                    | 0                           | 1.25                     | 65                    | 80                       | 0.80                            | 20.625                  | 1.00                            | 20.625                  | 127.5                    | 170.0                                      | 191.3                          | Rupture            |
| MS600                     | 20.4              | 6.00                    | 0.50                                    | 18.00                                   | 0.5                                     | 0                                            | 1                        | 6          | 0                    | 0                           | 1.25                     | 65                    | 80                       | 0.80                            | 16.375                  | 1.00                            | 16.375                  | 187.5                    | 250.0                                      | 281.3                          | Rupture            |
| MS550                     | 27.6              | 8.13                    | 1.06                                    | 28.61                                   | 0.625                                   | 0                                            | 1.25                     | 6.5        | 0                    | 0                           | 1.25                     | 65                    | 80                       | 0.80                            | 19.25                   | 1.00                            | 19.25                   | 259.4                    | 345.8                                      | 389.1                          | Rupture            |
| MS850                     | 36.2              | 10.63                   | 1.38                                    | 63.97                                   | 0.625                                   | 0                                            | 1.25                     | 8.5        | 0                    | 0                           | 1.25                     | 65                    | 80                       | 0.80                            | 17.25                   | 1.00                            | 17.25                   | 349.7                    | 466.2                                      | 599.1                          | Rupture            |



PROJECT BU 876363 HARTFORD, NU CT

SUBJECT ANCHOR ROD CAPACITY

DATE 10/15/2012 PAGE 1 OF 1

HGR



B+T GRP

1717 S. Boulder, Suite 300

Tulsa, OK 74119

(918) 587-4630

BT 85565-001

$$M = 1752 \text{ K-FT}$$

$$\text{NEW ANCHOR RODS M.I.} = 9749.6 \text{ in}^4.$$

$$T_{\text{ACTUAL}} = \frac{1752 \text{ K-FT} \times 12 \text{ in/FT} \times (43.51/2) \text{ in} \times 3.98 \text{ in}^2}{9749.6 \text{ in}^4}$$

$$T_{\text{ACTUAL}} = 186.71 \text{ Kips} \quad (< 195 \text{ Kips for 75 ksi } 2\frac{1}{4}'' \text{ ROD IN REV F})$$

$$T_{\text{ALLOWED}} = 0.33 \times 125 \times 3.98 \times 4/3$$
$$= 218.9 \text{ KIPS.}$$

$$\text{UNITY FOR NEW RODS} = \frac{186.71}{218.9} = 85.3\%$$

$$M_{\text{NEW RODS}} = \frac{186.71 \text{ K} \times 43.51 \text{ in}}{12 \text{ in/ft}} = 676.98 \text{ K-FT}$$

+ EXISTING RODS

$$M_{\text{REMAINING}} = 1752 - 676.98 = 1075.02 \text{ K-FT.}$$

RUN THE SPREADSHEET WITH THESE NUMBERS.

A.R. @ 85.3%.

B.P. @ 89.4%.



## Square, Stiffened / Unstiffened Base Plate, Any Rod Material - Rev. F /G

- Assumptions:**
- 1) Rod groups at corners. Total # rods divisible by 4. Maximum total # of rods = 48 (12 per Corner).
  - 2) Rod Spacing = Straight Center-to-Center distance between any (2) adjacent rods (same corner)
  - 3) Clear space between bottom of leveling nut and top of concrete **not** exceeding (1)\*(Rod Diameter)

### Site Data

|                        |                |
|------------------------|----------------|
| BU#:                   | 876363         |
| Site Name:             | Hartford-NU,CT |
| App #:                 | 165586 Rev : 5 |
| <b>Anchor Rod Data</b> |                |
| Qty:                   | 8              |
| Diam:                  | 2.25 in        |
| Rod Material:          | A615-J         |
| Yield, Fy:             | 75 ksi         |
| Strength, Fu:          | 100 ksi        |
| Bolt Circle:           | 38 in          |
| Anchor Spacing:        | 6 in           |

### Plate Data

|                |        |
|----------------|--------|
| W=Side:        | 36 in  |
| Thick:         | 2.5 in |
| Grade:         | 55 ksi |
| Clip Distance: | 0 in   |

### Stiffener Data (Welding at both sides)

|                 |               |
|-----------------|---------------|
| Configuration:  | Unstiffened   |
| Weld Type:      | **            |
| Groove Depth:   | in **         |
| Groove Angle:   | degrees       |
| Fillet H. Weld: | <-- Disregard |
| Fillet V. Weld: | in            |
| Width:          | in            |
| Height:         | in            |
| Thick:          | in            |
| Notch:          | in            |
| Grade:          | ksi           |
| Weld str.:      | ksi           |

### Pole Data

|             |                 |
|-------------|-----------------|
| Diam:       | 31.81 in        |
| Thick:      | 0.25 in         |
| Grade:      | 65 ksi          |
| # of Sides: | 18 "0" IF Round |

### Stress Increase Factor

|           |       |
|-----------|-------|
| ASD ASIF: | 1.333 |
|-----------|-------|

\*\* Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

### Base Reactions

|                       |         |         |
|-----------------------|---------|---------|
| TIA Revision:         | F       |         |
| Unfactored Moment, M: | 1075.02 | ft-kips |
| Unfactored Axial, P:  | 28      | kips    |
| Unfactored Shear, V:  | 21      | kips    |

### Anchor Rod Results

|                               |                   |
|-------------------------------|-------------------|
| TIA F --> Maximum Rod Tension | 166.2 Kips        |
| Allowable Tension:            | 195.0 Kips        |
| Anchor Rod Stress Ratio:      | 85.3% <b>Pass</b> |

### Base Plate Results

|                              |                   |
|------------------------------|-------------------|
| Base Plate Stress:           | 49.1 ksi          |
| Allowable PL Bending Stress: | 55.0 ksi          |
| Base Plate Stress Ratio:     | 89.4% <b>Pass</b> |

### Flexural Check

### PL Ref. Data

|                  |       |
|------------------|-------|
| Yield Line (in): | 19.10 |
| Max PL Length:   | 19.10 |

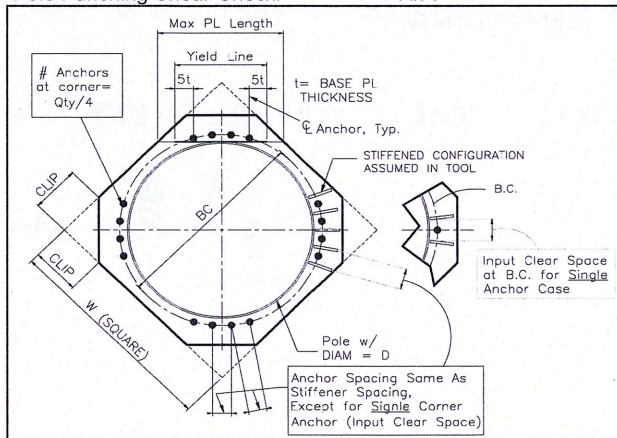
### N/A - Unstiffened

### Stiffener Results

|                                                |     |
|------------------------------------------------|-----|
| Horizontal Weld :                              | N/A |
| Vertical Weld:                                 | N/A |
| Plate Flex+Shear, $f_b/F_b + (f_v/F_v)^2$ :    | N/A |
| Plate Tension+Shear, $f_t/F_t + (f_v/F_v)^2$ : | N/A |
| Plate Comp. (AISC Bracket):                    | N/A |

### Pole Results

|                            |     |
|----------------------------|-----|
| Pole Punching Shear Check: | N/A |
|----------------------------|-----|





**(Bearing and Stability Checks) Tool for TIA Rev F or G - Application (MP, SST with unitbase)**

**Site Data**

|                           |
|---------------------------|
| BU#: 876363               |
| Site Name: Hartford-NU,CT |
| App #: 165586 Rev: 5      |

**Enter Load Factors Below:**

|                     |      |                    |
|---------------------|------|--------------------|
| For P (DL)          | 1.2  | <---- Enter Factor |
| For P,V, and M (WL) | 1.35 | <---- Enter Factor |

**Pad & Pier Data**

|                           |        |              |
|---------------------------|--------|--------------|
| Base PL Dist. Above Pier: | 0      | in           |
| Pier Dist. Above Grade:   | 6      | in           |
| Pad Bearing Depth, D:     | 7      | ft           |
| Pad Thickness, T:         | 3      | ft           |
| Pad Width=Length, L:      | 21.5   | ft           |
| Pier Cross Section Shape: | Square | <--Pull Down |
| Enter Pier Side Width:    | 5      | ft           |
| Concrete Density:         | 150.0  | pcf          |
| Pier Cross Section Area:  | 25.00  | ft^2         |
| Pier Height:              | 4.50   | ft           |
| Soil (above pad) Height:  | 4.00   | ft           |

**Soil Parameters**

|                                    |       |         |
|------------------------------------|-------|---------|
| Unit Weight, $\gamma$ :            | 110.0 | pcf     |
| Ultimate Bearing Capacity, $q_n$ : | 6.90  | ksf     |
| Strength Reduct. factor, $\phi$ :  | 0.75  |         |
| Angle of Friction, $\Phi$ :        | 30.0  | degrees |
| Undrained Shear Strength, $C_u$ :  | 0.00  | ksf     |
| Allowable Bearing: $\phi * q_n$ :  | 5.18  | ksf     |
| Passive Pres. Coeff., $K_p$ :      | 3.00  |         |

**Forces/Moments due to Wind and Lateral Soil**

|                                                                  |         |         |
|------------------------------------------------------------------|---------|---------|
| Minimum of ( $\phi * \text{Ultimate Pad Passive Force, } V_u$ ): | 28.4    | kips    |
| Pad Force Location Above D:                                      | 1.36    | ft      |
| $\phi$ (Passive Pressure Moment):                                | 38.66   | ft-kips |
| Factored O.T. M(WL), "1.6W":                                     | 2577.8  | ft-kips |
| Factored OT (MW-Msoil), M1                                       | 2539.17 | ft-kips |

**Resistance due to Foundation Gravity**

|                                 |        |      |
|---------------------------------|--------|------|
| Soil Wedge Projection grade, a: | 2.31   | ft   |
| Sum of Soil Wedges Wt:          | 23.83  | kips |
| Soil Wedges ecc, K1:            | 8.50   | ft   |
| Ftg+Soil above Pad wt:          | 417.3  | kips |
| Unfactored (Total ftg-soil Wt): | 441.11 | kips |
| 1.2D. <b>No Soil Wedges.</b>    | 534.33 | kips |
| 0.9D. <b>With Soil Wedges</b>   | 422.20 | kips |

**Resistance due to Cohesion (Vertical)**

|                                                  |      |      |
|--------------------------------------------------|------|------|
| $\phi * (1/2 * C_u) (\text{Total Vert. Planes})$ | 0.00 | kips |
| Cohesion Force Eccentricity, K2                  | 0.00 | ft   |

**Monopole Base Reaction Forces**

|                          |      |              |
|--------------------------|------|--------------|
| TIA Revision:            | F    | <--Pull Down |
| Unfactored DL Axial, PD: | 28   | kips         |
| Unfactored WL Axial, PW: | 0    | kips         |
| Unfactored WL Shear, V:  | 21   | kips         |
| Unfactored WL Moment, M: | 1752 | ft-kips      |

**Load Factor      Shaft Factored Loads**

|      |                |        |         |
|------|----------------|--------|---------|
| 1.20 | 1.2D+1.6W, Pu: | 33.6   | kips    |
| 0.90 | 0.9D+1.6W, Pu: | 25.2   | kips    |
| 1.35 | Vu:            | 28.35  | kips    |
|      | Mu:            | 2365.2 | ft-kips |

**1.2D+1.6W Load Combination, Bearing Results:**

|                                                   |         |                          |
|---------------------------------------------------|---------|--------------------------|
| <b>(No Soil Wedges)</b><br>[Reaction+Conc+Soil]   | 534.33  | P1="1.2D+1.6W"<br>(Kips) |
| Factored "1.6W" Overturning Moment (MW-Msoil), M1 | 2539.17 | ft-kips                  |

Orthogonal Direction:

$$\begin{aligned} \text{ecc1} = M1/P1 &= 4.75 \text{ ft} \\ \text{Orthogonal } q_u &= 2.18 \text{ ksf} \\ q_u/\phi * q_n \text{ Ratio} &= \mathbf{42.09\%} \text{ Pass} \end{aligned}$$

Diagonal Direction:

$$\begin{aligned} \text{ecc2} = (0.707M1)/P1 &= 3.36 \text{ ft} \\ \text{Diagonal } q_u &= 2.45 \text{ ksf} \\ q_u/\phi * q_n \text{ Ratio} &= \mathbf{47.26\%} \text{ Pass} \end{aligned}$$

**Run**

<-- Press Upon Completing All Input

**Overturning Stability Check**

**0.9D+1.6W Load Combination, Bearing Results:**

|                                                                                     |         |                          |
|-------------------------------------------------------------------------------------|---------|--------------------------|
| <b>(w/ Soil Wedges)</b><br>[Reaction+Conc+Soil]                                     | 422.20  | P2="0.9D+1.6W"<br>(Kips) |
| Factored "1.6W" Overturning Moment (MW-Msoil) - 0.9(M of Wedge + M of Cohesion), M2 | 2356.79 | ft-kips                  |

$$\begin{aligned} \text{Orthogonal ecc3} = M2/P2 &= 5.58 \text{ ft} \\ \text{Ortho Non Bearing Length, NBL} &= \mathbf{11.16} \text{ ft} \\ \text{Orthogonal } q_u &= 1.90 \text{ ksf} \\ \text{Diagonal } q_u &= 2.28 \text{ ksf} \end{aligned}$$

Max Reaction Moment (ft-kips) so that  $q_u = \phi * q_n = 100\%$  Capacity Rating

|               |         |               |             |
|---------------|---------|---------------|-------------|
| Actual M:     | 1752.00 |               |             |
| M Orthogonal: | 2789.19 | <b>62.81%</b> | <b>Pass</b> |
| M Diagonal:   | 2771.90 | <b>63.21%</b> | <b>Pass</b> |



**APPENDIX D**  
**TOWER MODIFICATION DRAWINGS**





# TOWER MODIFICATION DRAWINGS

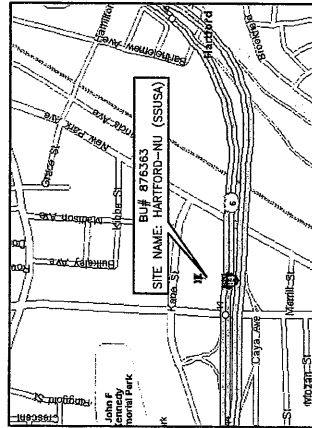
SITE NAME: HARTFORD-NU (SSUSA) PROJECT CONTACTS:  
BU NUMBER: 876363 1. CROWN TOWER STRUCTURAL ANALYST

SITE ADDRESS:  
219 NEW PARK RD  
HARTFORD, CT  
HARTFORD COUNTY, USA

- STEVE TUTTLE  
(585) 899-3445  
STEVE.TUTTLE@CROWNCastle.COM  
THE PIANO WORKS  
349 WEST COMMERCIAL STREET, SUITE  
2630 EAST ROCHESTER, NY 14445
2. CROWN PROJECT MANAGER  
JOSHUA MOSTOW  
(201) 236-9059  
JOSHUA.MOSTOW@CROWNCastle.COM  
1200 MACARTHUR BLVD., SUITE 200  
MAHWAH, NJ 07430

3. B+T GROUP PROJECT ENGINEER  
HARI ROTTHOR  
(918) 587-4630  
HROTTHOR@BTGRP.COM  
1717 S BOULDER AVENUE, SUITE 300  
TULSA, OKLA. 74119

4. B+T GROUP ENGINEER (EOR)  
CHAD E TUTTLE, P.E.  
(918) 587-4630  
CTUTTLE@BTGRP.COM  
1717 S BOULDER AVENUE, SUITE 300  
TULSA, OKLA. 74119



MAP

## DIRECTIONS

84 WEST TO EXIT 44. TURN RIGHT OFF RAMP AND  
CONTINUE STRAIGHT THROUGH LIGHT. TURN RIGHT ON  
NEW PARK AVENUE AND GO TO ADDRESS.

## TOWER INFORMATION

TOWER MANUFACTURER / DWG #: SUMMIT MFG LLC / # 1947570  
TOWER HEIGHT / TYPE: 108' MONOPOLE  
TOWER LOCATION:  
LAT. 41° 45' 2.78"  
LONG. -72° 42' 49.23"  
ELEV. 76 FT AMSL  
STRUCTURAL DESIGN DRAWING REPORT: B+T GROUP / WO. # 537531  
STRUCTURAL ANALYSIS REPORT: B+T GROUP / WO. # 538047  
STRUCTURAL ANALYSIS DATE: 10/11/12  
COSITES DOCUMENT ID: ---

## CODE COMPLIANCE

THIS REINFORCEMENT DESIGN IS BASED ON THE  
REQUIREMENTS OF TIA/EIA-222F STRUCTURAL  
STANDARDS FOR STEEL ANTENNA TOWERS AND ANTENNA  
SUPPORTING STRUCTURES USING A FASTEST MILE WIND  
SPEED OF 80 MPH WITH NO ICE, 37.8 MPH WITH 1 INCH ICE  
THICKNESS AND 50 MPH UNDER SERVICE LOADS.

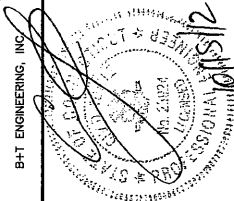
## DRAWINGS INCLUDED

| SHEET NUMBER | DESCRIPTION                                    |
|--------------|------------------------------------------------|
| S1           | TITLE SHEET                                    |
| S2           | MODIFICATION INSPECTION NOTES AND CHECKLIST    |
| S3           | GENERAL NOTES, AJAX BOLT NOTES AND DETAIL      |
| S4           | TOWER ELEV., SCHEDULES & TX LINE DIST. DIAG.   |
| S5           | TOWER SECTION (0'-60.25')                      |
| S6           | TOWER SECTION (60.25'-85.5')                   |
| S7           | CCI FLAT PLATE-B.O.M., SPLICE DETAIL AND NOTES |
| D1           | DETAILS                                        |
| D1           | ANCHOR ROD BRACKET DETAILS                     |



| REV | DATE     | DESCRIPTION             |
|-----|----------|-------------------------|
| 0   | 10/15/12 | ISSUED FOR CONSTRUCTION |

PROJECT NO: 85565.001  
PROJECT ENG: HARI ROTTHOR  
DRAWN BY: GLS  
CHECKED BY: SSV



IT IS A VIOLATION OF LAW FOR ANY PERSON  
TO REPRODUCE OR TRANSMIT THIS DOCUMENT  
WITHOUT THE WRITTEN PERMISSION OF  
B+T ENGINEERING, INC.

HARTFORD-NU (SSUSA)  
876363  
219 NEW PARK RD  
HARTFORD, CT  
HARTFORD COUNTY, USA  
EXISTING 108' MONOPOLE

SHEET TITLE  
TITLE SHEET

SHEET NUMBER: S1  
REVISION: 0

**B+T GRP**  
177 S. BOULDER  
SUIT 300  
BOULDER, CO 80501  
PH: (303) 440-7419  
WWW.BTGRP.COM

**MCROWN CASTLE**

| REV | DATE     | DESCRIPTION             |
|-----|----------|-------------------------|
| 1   | 10/15/12 | ISSUED FOR CONSTRUCTION |
| 2   |          |                         |
| 3   |          |                         |
| 4   |          |                         |
| 5   |          |                         |
| 6   |          |                         |
| 7   |          |                         |
| 8   |          |                         |
| 9   |          |                         |
| 10  |          |                         |

|              |              |
|--------------|--------------|
| PROJECT NO.  | 85661.001    |
| PROJECT ENG. | HARI ROTHMAN |
| DRAWN BY:    | GLS          |
| CHECKED BY:  | BSV          |

**B+T ENGINEERING, INC.**

Professional Engineer  
No. 23994

10/15/12

**HARTFORD-NI (SSUSA)**  
876383  
210 NEW PARK RD  
HARTFORD, CT 06105  
EXISTING 108' MONOPOLE

**MODIFICATION INSPECTION NOTES AND CHECKLIST**

SHEET NUMBER: **S2**

REVISION: **0**

**GENERAL CONTRACTOR**

THE GC IS REQUIRED TO CONTACT THE MI INSPECTOR AS SOON AS RECEIVING A PO FOR THE MODIFICATION INSTALLATION OR TURNKEY PROJECT TO, AT A MINIMUM:

- REVIEW THE REQUIREMENTS OF THE MI CHECKLIST
- WORK WITH THE MI INSPECTOR TO DEVELOP A SCHEDULE TO CONDUCT ON-SITE MI INSPECTIONS, INCLUDING FOUNDATION INSPECTIONS
- BETTER UNDERSTAND ALL INSPECTION AND TESTING REQUIREMENTS

THE GC SHALL PERFORM AND RECORD THE TEST AND INSPECTION RESULTS IN ACCORDANCE WITH THE REQUIREMENTS OF THE MI CHECKLIST AND ENG-SOW-10007.

**RECOMMENDATIONS**

THE FOLLOWING RECOMMENDATIONS AND SUGGESTIONS ARE OFFERED TO ENHANCE THE EFFICIENCY AND EFFECTIVENESS OF DELIVERING A MI REPORT:

- IT IS SUGGESTED THAT THE GC PROVIDE A MINIMUM OF 5 BUSINESS DAYS NOTICE, PREFERABLY 10, TO THE MI INSPECTOR AS TO WHEN THE SITE WILL BE READY FOR THE MI INSPECTION.
- THE GC AND MI INSPECTOR COORDINATE CLOSELY THROUGHOUT THE ENTIRE PROJECT.
- WHEN POSSIBLE, IT IS PREFERRED TO HAVE THE GC AND MI INSPECTOR ON-SITE SIMULTANEOUSLY FOR ANY GUY WIRE TENSIONING OR RE-TENSIONING OPERATIONS.
- IT MAY BE BENEFICIAL TO INSTALL ALL TOWER MODIFICATIONS PRIOR TO CONDUCTING THE FOUNDATION INSPECTIONS TO ALLOW FOUNDATION AND MI INSPECTION(S) TO COMMENCE WITH WHEN POSSIBLE.
- WHEN POSSIBLE, IT IS PREFERRED TO HAVE THE GC AND MI INSPECTOR ON-SITE DURING THE MI TO HAVE ANY DEFICIENCIES CORRECTED DURING THE INITIAL MI. THEREFORE, THE GC MAY CHOOSE TO COORDINATE THE MI CAREFULLY TO ENSURE ALL CONSTRUCTION FACILITIES ARE AT THEIR DISPOSAL WHEN THE MI INSPECTOR IS ON SITE.

**CANCELLATION OR DELAYS IN SCHEDULED MI**

IF THE GC AND MI INSPECTOR AGREE TO A DATE ON WHICH THE MI WILL BE CONDUCTED, AND EITHER PARTY CANCELS OR DELAYS, CROWN SHALL NOT BE RESPONSIBLE FOR ANY COSTS, FEES, LOSS OF DEPOSIT AND/OR OTHER PENALTIES RELATED TO THE CANCELLATION OR DELAY INCURRED BY EITHER PARTY FOR ANY TIME (E.G. TRAVEL AND LODGING, COSTS OF KEEPING EQUIPMENT ON SITE, ETC.). THE GC SHALL BE RESPONSIBLE FOR ANY SUCH COSTS. EXCEPTIONS MAY BE MADE IN THE EVENT THAT THE DELAY/CANCELLATION IS CAUSED BY WEATHER OR OTHER CONDITIONS THAT MAY COMPROMISE THE SAFETY OF THE PARTIES INVOLVED.

**CORRECTION OF FAILING MI'S**

IF THE MODIFICATION INSTALLATION WOULD FAIL THE MI ("FAILING MI"), THE GC SHALL WORK WITH CROWN TO COORDINATE A REMEDIATION PLAN IN ONE OF TWO WAYS:

- CORRECT FAILING ISSUES TO COMPLY WITH THE SPECIFICATIONS CONTAINED IN THE ORIGINAL MI REPORT.
- OR, WITH CROWN'S APPROVAL, THE GC MAY FORFEIT THE EOR TO RE-ANALYZE THE MODIFICATION/REINFORCEMENT USING THE AS-BUILT CONDITION.

**MI VERIFICATION INSPECTIONS**

CROWN RESERVES THE RIGHT TO CONDUCT A MI VERIFICATION INSPECTION TO VERIFY THE ACCURACY AND COMPLETENESS OF PREVIOUSLY COMPLETED MI INSPECTION(S) ON TOWER MODIFICATION PROJECTS.

ALL VERIFICATION INSPECTIONS SHALL BE HELD TO THE SAME SPECIFICATIONS AND REQUIREMENTS IN THE CONTRACT DOCUMENTS AND IN ACCORDANCE WITH ENG-SOW-10007.

VERIFICATION INSPECTION MAY BE CONDUCTED BY AN INDEPENDENT A/EV/ASV FIRM AFTER A MODIFICATION PROJECT IS COMPLETED, AS MARKED BY THE DATE OF AN ACCEPTED "PASSING MI" OR "PASS AS NOTED MI" REPORT FOR THE ORIGINAL PROJECT.

**REQUIRED PHOTOS**

REQUIREMENTS FOR THE MI INSPECTOR THE FOLLOWING PHOTOGRAPHS, AT A MINIMUM, ARE TO BE TAKEN AND INCLUDED IN THE MI REPORT:

- PRE-CONSTRUCTION GENERAL SITE CONDITION
- PHOTOGRAPHS DURING THE REINFORCEMENT MODIFICATION CONSTRUCTION/ERECTION AND INSPECTION
- RAW MATERIALS
- PHOTOS OF ALL CRITICAL DETAILS
- FOUNDATION MODIFICATIONS
- WELD PREPARATION AND TORQUE
- FINAL INSTALLED CONDITION
- SURFACE COATING REPAIR
- POST CONSTRUCTION PHOTOGRAPHS
- FINAL IN-FILED CONDITION

PHOTOS OF ELEVATED MODIFICATIONS TAKEN FROM THE GROUND SHALL BE CONSIDERED INADEQUATE.

THIS IS NOT A COMPLETE LIST OF REQUIRED PHOTOS, PLEASE REFER TO ENG-SOW-10007.

| REQUIRED                | REPORT ITEM                          | BRIEF DESCRIPTION                                                                                                                                                                                                                                                |
|-------------------------|--------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>MI CHECKLIST</b>     |                                      |                                                                                                                                                                                                                                                                  |
| <b>PRE-CONSTRUCTION</b> |                                      |                                                                                                                                                                                                                                                                  |
| X                       | MI CHECKLIST DRAWING                 | THIS CHECKLIST SHALL BE INCLUDED IN THE MI REPORT.                                                                                                                                                                                                               |
| X                       | EOR APPROVED SHOP DRAWINGS           | FABRICATION DRAWINGS SHALL BE SUBMITTED TO THE ENGINEER OF RECORD FOR REVIEW. THE CONTRACTOR SHALL PROVIDE APPROVED SHOP DRAWINGS TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.                                                                            |
| N/A                     | FABRICATION INSPECTION               | A LETTER FROM THE FABRICATOR, STATING THAT THE WORK WAS PERFORMED IN ACCORDANCE WITH INDUSTRY STANDARDS AND THE CONTRACT DOCUMENTS, SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.                                                        |
| N/A                     | FABRICATOR CERTIFIED WELD INSPECTION | A VISUAL OBSERVATION BY A CMAA OR A PORTION OF THE PROPOSED STRUCTURAL MEMBERS IS REQUIRED AND A WRITTEN REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.                                                                            |
| X                       | MATERIAL TEST REPORT (MTR)           | WELD CERTIFICATION SHALL BE PROVIDED FOR ALL STEEL AS SPECIFIED IN THE MODIFICATION DRAWINGS AND THIS DOCUMENTATION SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.                                                                        |
| N/A                     | FABRICATOR NDE INSPECTION            | CRITICAL SHOP WELDS THAT REQUIRE TESTING (PER ENG-SOW-10069) ARE NOTED ON THESE CONTRACT DRAWINGS. A CMAA OR A PORTION OF THE PROPOSED STRUCTURAL MEMBERS IS REQUIRED AND A WRITTEN REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT. |
| X                       | NDE REPORT OF MONOPOLE BASE PLATE    | A NDE (PER ENG-SOW-10033) OF THE POLE TO BASE PLATE CONNECTION IS REQUIRED AND A WRITTEN REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.                                                                                            |
| X                       | PACKING SLIPS                        | THE MATERIAL SHIPPING LIST SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.                                                                                                                                                                 |

|                     |                                         |                                                                                                                                                                                                                         |
|---------------------|-----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>CONSTRUCTION</b> |                                         |                                                                                                                                                                                                                         |
| X                   | CONSTRUCTION INSPECTIONS                | A LETTER FROM THE GENERAL CONTRACTOR STATING THAT THE WORKMANSHIP WAS PERFORMED IN ACCORDANCE WITH INDUSTRY STANDARDS AND THESE CONTRACT DRAWINGS SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT. |
| N/A                 | FOUNDATION INSPECTIONS                  | A VISUAL OBSERVATION OF THE EXCAVATION AND REBAR SHALL BE PERFORMED BEFORE PLACING THE CONCRETE. A WRITTEN REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.                                 |
| N/A                 | CONCRETE COMP. STRENGTH AND SLUMP TESTS | THE CONCRETE MIX DESIGN, SLUMP TEST, AND COMPRESSIVE STRENGTH TESTS SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.                                                                               |
| X                   | POST INSTALLED ANCHOR ROD VERIFICATION  | POST INSTALLED ANCHOR ROD VERIFICATION SHALL BE PERFORMED IN ACCORDANCE WITH CROWN REQUIREMENTS AND A REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.                                      |
| X                   | BASE PLATE GROUT VERIFICATION           | THE GENERAL CONTRACTOR SHALL PROVIDE DOCUMENTATION TO THE MI INSPECTOR THAT CERTIFIES THAT THE GROUT WAS INSTALLED IN ACCORDANCE WITH CROWN ENG-PROC-10012 FOR INCLUSION IN THE MI REPORT.                              |
| X                   | CONTRACTOR'S CERTIFIED WELD INSPECTION  | A CERTIFIED WELD INSPECTOR SHALL INSPECT AND TEST AS NECESSARY ALL FIELD WELDS. A REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.                                                          |
| N/A                 | EARTHWORK: LIFT AND DENSITY             | FOUNDATION SUB-GRADERS SHALL BE INSPECTED AND APPROVED BY A GEOTECHNICAL ENGINEER AND A REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.                                                    |
| X                   | ON SITE COLD GALVANIZING VERIFICATION   | THE GENERAL CONTRACTOR SHALL PROVIDE DOCUMENTATION TO THE MI INSPECTOR VERIFYING THAT ANY ON-SITE COLD GALVANIZING WAS APPLIED IN ACCORDANCE WITH ENG-BUL-10149.                                                        |
| N/A                 | GUY WIRE TENSION REPORT                 | THE GENERAL CONTRACTOR SHALL PROVIDE A REPORT TO THE MI INSPECTOR INDICATING THE TEMPERATURE AND TENSION IN EVERY GUY CABLE IS PART OF PLUMB AND TENSION PROCEDURE FOR INCLUSION IN THE MI REPORT.                      |
| X                   | GC AS-BUILT DOCUMENTS                   | THE GENERAL CONTRACTOR SHALL SUBMIT A COPY OF THE CONTRACT DRAWINGS EITHER STATING "INSTALLED AS SHOWN" OR NOTING ANY CHANGES THAT WERE REQUIRED AND APPROVED BY THE ENGINEER OF RECORD DUE TO FIELD CONDITIONS.        |

|                                                                                                                      |                                            |                                                                                                                                                                                           |
|----------------------------------------------------------------------------------------------------------------------|--------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>POST-CONSTRUCTION</b>                                                                                             |                                            |                                                                                                                                                                                           |
| X                                                                                                                    | MI INSPECTOR REDLINE OR RECORD DRAWING(S)  | THE MI INSPECTOR SHALL OBSERVE AND REPORT ANY DISCREPANCIES BETWEEN THE CONTRACTORS REDLINE DRAWING AND THE ACTUAL COMPLETED INSTALLATION.                                                |
| X                                                                                                                    | POST INSTALLED ANCHOR ROD PULL-OUT TESTING | POST-INSTALLED ANCHOR RODS SHALL BE TESTED IN ACCORDANCE WITH ENG-PROC-10119 AND A REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.                           |
| X                                                                                                                    | PHOTOGRAPHS                                | PHOTOGRAPHS SHALL BE SUBMITTED TO THE MI WHICH DOCUMENT ALL PHASES OF THE CONSTRUCTION. THE PHOTOS SHALL BE ORGANIZED IN A MANNER THAT EASILY IDENTIFIES THE EXACT LOCATION OF THE PHOTO. |
| <b>ADDITIONAL TESTING AND INSPECTIONS:</b>                                                                           |                                            |                                                                                                                                                                                           |
| NOTE: X DENOTES A DOCUMENT NEEDED FOR THE MI REPORT<br>N/A DENOTES A DOCUMENT THAT IS NOT REQUIRED FOR THE MI REPORT |                                            |                                                                                                                                                                                           |

**MODIFICATION INSPECTION NOTES:**

**GENERAL**

THE MODIFICATION INSPECTION (MI) IS A VISUAL INSPECTION OF TOWER MODIFICATIONS AND A REVIEW OF CONSTRUCTION INSPECTIONS AND OTHER REPORTS TO ENSURE THE INSTALLATION WAS CONSTRUCTED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS, NAMELY THE MODIFICATION DRAWINGS, AS DESIGNED BY THE ENGINEER OF RECORD (EOR).

THE MI IS TO CONFIRM INSTALLATION CONFIGURATION AND WORKMANSHIP ONLY AND IS NOT A REVIEW OF MODIFICATION DESIGN. IT IS THE MI INSPECTOR'S RESPONSIBILITY TO REVIEW THE MODIFICATION DESIGN AND REPORT ON THE STRUCTURAL MODIFICATION DESIGN EFFECTIVENESS AND INTEGRITY RESULTS WITH THE EOR AT ALL TIMES.

ALL MI'S SHALL BE CONDUCTED BY A CROWN ENGINEERING VENDOR (AEV) OR ENGINEERING SERVICE VENDOR (AESV) THAT IS APPROVED TO PERFORM ELEVATED WORK FOR CROWN. SEE ENG-BUL-10173 LIST OF APPROVED MI VENDORS.

TO ENSURE THAT THE REQUIREMENTS OF THE MI ARE MET, IT IS VITAL THAT THE GENERAL CONTRACTOR (GC) AND THE MI INSPECTOR BEGIN COMMUNICATING AND COORDINATING AS SOON AS A PO IS RECEIVED. IT IS EXPECTED THAT EACH PARTY WILL BE PROACTIVE IN REACHING OUT TO THE OTHER PARTY. IF CONTACT INFORMATION IS NOT KNOWN, CONTACT YOUR CROWN POINT OF CONTACT (POC).

REFER TO ENG-SOW-10007 : MODIFICATION INSPECTION SOW FOR FURTHER DETAILS AND REQUIREMENTS.

**MI INSPECTOR**

THE MI INSPECTOR IS REQUIRED TO CONTACT THE GC AS SOON AS RECEIVING A PO FOR THE MI TO, AT A MINIMUM:

- REVIEW THE REQUIREMENTS OF THE MI CHECKLIST
- WORK WITH THE GC TO DEVELOP A SCHEDULE TO CONDUCT ON-SITE INSPECTIONS, INCLUDING FOUNDATION INSPECTIONS

THE MI INSPECTOR IS RESPONSIBLE FOR COLLECTING ALL GENERAL CONTRACTOR (GC) INSPECTION AND TEST REPORTS, REVIEWING THE DOCUMENTS FOR ADHERENCE TO THE CONTRACT DOCUMENTS, AND SUBMITTING THE MI REPORT TO CROWN.



NOTES:

1. ALL STRUCTURAL BOLTS SHALL BE INSTALLED AND TIGHTENED TO THE PRE-TENSIONED CONDITION ACCORDING TO THE REQUIREMENTS OF THE ABC SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS, DEC. 31, 2009.
2. ALL STRUCTURAL BOLTS SHALL BE INSPECTED ACCORDING TO THE REQUIREMENTS OF THE ABC SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS, DEC. 31, 2009.
3. ALL AJAX M20 BOLTS WITH SHEAR SLEEVES SHALL BE PRE-TENSIONED AND TIGHTENED UNTIL THE DIRECT TENSION INDICATOR (DTI) WASHERS SHOW THAT THE PROPER BOLT TENSION HAS BEEN REACHED. SEE NOTES AND DETAIL BELOW FOR THE USE OF DIRECT TENSION INDICATOR (DTI) WASHERS WITH THE AJAX M20 BOLTS.
4. ALL AJAX BOLTS SHALL BE INSTALLED USING DIRECT TENSION INDICATORS (DTIS) AND HARDENED WASHERS. DTIS SHALL BE THE SQUIRTER® STYLE, MADE TO ASTM F959 LATEST REVISION, AND HARDENED WASHERS SHALL CONFORM TO ASTM F436 AND HAVE A HARDNESS OF RC 38 OF HIGHER.

NOTES FOR AJAX M20 "ONE-SIDE" BOLTS WITH DIRECT TENSION INDICATORS (DTIS):

DTIS REQUIRED: DTIS SHALL BE "SELF-INDICATING" SQUIRTER® STYLE DTIS MADE WITH SILICONE EMBEDDED IN THEM, INSPECTED BY MEANS OF THE VISUAL EJECTION OF SILICONE AS THE DTI PROTRUSIONS COMPRESS. SQUIRTER® DTIS SHALL BE CALIBRATED PER MANUFACTURER'S INSTRUCTIONS PRIOR TO USE.

THE DIRECT TENSION INDICATOR (DTI) WASHERS SHALL BE THE "SQUIRTER® STYLE" AS MANUFACTURED BY:

APPLIED BOLTING TECHNOLOGY PRODUCTS, INC.  
1413 ROCKINGHAM ROAD  
BELLFLOW FALLS, VERMONT 05101, USA  
PHONE: 1-800-552-1999  
WEBSITE: WWW.APPLIEDBOLTING.COM

DISTRIBUTORS OF SQUIRTER® DTIS:  
HTTP://WWW.APPLIEDBOLTING.COM/APPLIED-BOLTING-DISTRIBUTORS.HTML

DTI: USE DIRECT TENSION INDICATOR (DTI) WASHERS COMPATIBLE WITH 3/4" NOMINAL A325 BOLTS FOR THE AJAX M20 BOLTS. DTIS SHALL NOT BE HOT-DIP GALVANIZED. DTIS SHALL BE MECHANICALLY GALVANIZED (MG) BY THE COLD MECHANICAL PROCESS ONLY AS PROVIDED BY THE DTI MANUFACTURER.

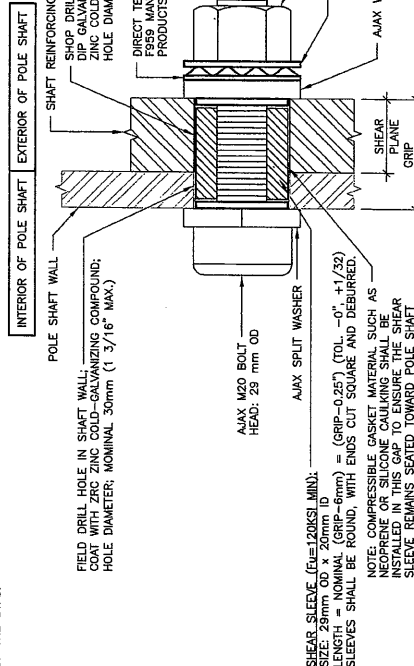
HARDENED WASHERS REQUIRED: USE A HARDENED WASHER FOR A 3/4" NOMINAL BOLT BETWEEN THE TOP OF THE DIRECT TENSION INDICATOR (DTI) WASHER AND THE NUT OF THE AJAX M20 BOLT. HARDENED WASHERS SHALL CONFORM TO ASTM F436 AND HAVE A MINIMUM HARDNESS OF RC 38 OR HIGHER. THE HARDENED WASHERS SHALL BE MECHANICALLY GALVANIZED. MECHANICAL PROCESS. ALTERNATIVELY, CORRECTLY MADE HOT DIP GALVANIZED HARDENED FLAT WASHERS HAVING A MINIMUM HARDNESS OF RC 38 CAN BE USED; CONTRACTOR SHALL PROVIDE DOCUMENTATION OF WASHER SPECIFICATION AND HARDNESS.

NUT LUBRICATION REQUIRED: PROPERLY LUBRICATE THE THROUS OF THE NUT OF THE AJAX BOLT SO THAT IT CAN BE PROPERLY TIGHTENED WITHOUT GALLING AND/OR LOOKING UP ON THE BOLT THREADS. CONTRACTOR SHALL FOLLOW DTI MANUFACTURER INSTRUCTIONS FOR PROPER LUBRICATION AND TIGHTENING.

NOTE: COMPLETELY COMPRESSED DTIS SHOWING NO VISIBLE REMAINING GAP ARE ACCEPTABLE. DTI WASHERS SHALL BE PLACED DIRECTLY AGAINST THE OUTER AJAX WASHER WITH THE DTI BUMPS FACING AWAY FROM THE AJAX WASHER. PLACE A HARDENED WASHER BETWEEN THE DTI AND AJAX NUT. THE DTI BUMPS SHALL BEAR AGAINST THE UNDERSIDE OF A HARDENED FLAT WASHER, NEVER DIRECTLY AGAINST THE NUT.

CONTRACTOR SHALL FOLLOW DTI MANUFACTURER'S INSTRUCTIONS FOR INSTALLATION, LUBRICATION, TIGHTENING AND INSPECTION.

INSPECTION REQUIRED: ALL AJAX BOLTS SHALL BE INSPECTED ACCORDING TO THE REQUIREMENTS OF THE ABC SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS, DEC. 31, 2009. BY A QUALIFIED BOLT INSPECTOR. DURING INSTALLATION, THE BOLT INSPECTOR SHALL VERIFY AND DOCUMENT THE SHOP-DRILLED AND FIELD-DRILLED HOLE SIZES; THE INSTALLATION OF THE AJAX BOLTS; THE INSTALLATION OF THE SHEAR SLEEVES; THE SHEAR SLEEVE PLACEMENT AND NUT LUBRICATION AND THE CONTRACTOR'S TENSIONING PROCEDURE. IN ADDITION, ALL AJAX BOLTS AND DTIS SHALL BE VISUALLY INSPECTED FOR CONFORMANCE WITH THE DTI MANUFACTURER'S INSTRUCTIONS. THE BOLT INSPECTOR SHALL PROVIDE COMPLETE PHOTO DOCUMENTATION OF ALL BOLTS AFTER TIGHTENING CLEARLY SHOWING THE CONDITION OF THE DTIS.



1 TYPICAL AJAX BOLT DETAIL  
SCALE: NTS.

GENERAL NOTES

- 1.1 ALL WORK SHALL COMPLY WITH THE TIA/EIA-222-F STANDARD AS WELL AS ALL OTHER APPLICABLE STANDARDS AND CODES.
- 1.2 FIELD WORK WILL BE DONE AROUND EXISTING COAXIAL CABLE AND EQUIPMENT. ALL WORK SHALL BE DONE IN A MANNER SUCH THAT NO DAMAGE OCCURS TO THE EXISTING EQUIPMENT OR CABLE.
- 1.3 A MINIMUM OF TWO COATS OF ZINCA COLD GALVANIZING COMPOUND (OR APPROVED EQUIVALENT) SHALL BE APPLIED TO ANY FIELD CUTS OR FIELD DRILLED HOLES.
- 1.4 THE USE OF A WELDER OR WELDER WILL NOT BE PERMITTED ON THE TOWER. THE WELDER SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
- 1.5 ANALYSIS PERFORMED BY AN ENGINEER LICENSED IN THE STATE THE TOWER IS LOCATED. THE ANALYSIS SHALL USE A MINIMUM WIND SPEED OF 45 mph (3-SEC) PER TIA-1019.

FABRICATION

- 2.1 ALL WORK SHALL BE DONE IN ACCORDANCE WITH AISC "SPECIFICATIONS FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS."
- 2.2 STRUCTURAL STEEL SHALL MEET THE FOLLOWING SPECIFICATIONS:

A. STEEL SHAPES AND PLATES, U.N.O. YIELD ASTM SPEC'S  
65ksi A572  
50ksi A-53B

- 2.3 ALL NEW MATERIAL INCLUDING STRUCTURAL STEEL AND FASTENERS SHALL BE HOT DIPPED GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123 AND A153.
- 2.4 ALL WELDING SHALL BE DONE IN ACCORDANCE WITH THE LATEST REVISIONS. ELECTRODES SHALL BE E60 SERIES (LATEST REVISION). CONTRACTOR SHALL PROVIDE SHOP FABRICATION DRAWINGS TO BHT GROUP 2 WEEKS PRIOR TO FABRICATION.

KEY NOTES

Ⓢ TOWER MODIFICATION I.D.

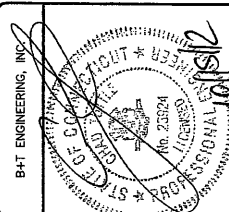


B+T GRP  
177 S. BOLDER  
TULSA, OK 74119  
PH: (918) 587-4600  
www.btgpr.com



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|-------------|----------|-------------------------|
|             | 10/15/12 | ISSUED FOR CONSTRUCTION |
|             |          |                         |
|             |          |                         |
|             |          |                         |
|             |          |                         |

|              |             |
|--------------|-------------|
| PROJECT NO:  | 88865.001   |
| PROJECT ENG: | HARI ROTHOR |
| DRAWN BY:    | GIS         |
| CHECKED BY:  | SSV         |



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876363  
218 NEW PARK RD  
HARTFORD, CT  
HARTFORD COUNTY, USA  
EXISTING 108' MONOPOLE

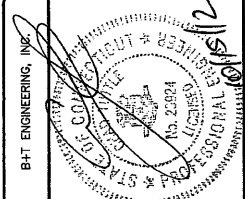
SHEET TITLE  
GENERAL NOTES,  
AJAX BOLT NOTES  
AND DETAILS

SHEET NUMBER  
S3  
REVISION  
0



| REV | DATE     | DESCRIPTION             |
|-----|----------|-------------------------|
| 0   | 10/15/12 | ISSUED FOR CONSTRUCTION |

PROJECT NO: 85665.001  
PROJECT ENG: HARI ROTTI-HOR  
DRAWN BY: GLS  
CHECKED BY: SSV



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HARTFORD-NU (SSUSA)  
876363  
218 NEW PARK RD  
HARTFORD, CT  
HARTFORD COUNTY, USA  
EXISTING 108 MONOPOLE

SHEET TITLE  
TOWER ELEV. SCHEDULES  
AND TX LINE DIST. DIAGRAM

SHEET NUMBER: S4  
REVISION: 0

| NEW CCI FLAT PLATE (100 KSI) |               |     |         |            |
|------------------------------|---------------|-----|---------|------------|
| REINFORCING ELEMENTS         |               |     |         |            |
| START ELEVATION              | END ELEVATION | QTY | FLAT #  | FLAT PLATE |
| 0.5'                         | 15.5'         | 1   | 16      | 1"x5"      |
| 10.25'                       | 85.25'        | 1   | 14      | 1"x5"      |
| 0'                           | 85.5'         | 2   | 2 AND 8 | 1"x5"      |

NOTES FOR CROWN REINFORCING OPTION (100 KSI) MATERIAL:  
1. THE 100 KSI MATERIAL SHALL CONFORM TO THE FOLLOWING:  
A) MATERIALS SHALL BE ASTM A514, GRADE A, GRADE E OR GRADE P, HAVING A MINIMUM TENSILE STRENGTH (F<sub>U</sub>) OF 110 KSI AND A MINIMUM YIELD STRENGTH (F<sub>y</sub>) OF 100 KSI.  
B) MATERIAL SHALL BE HEAT TREATED, QUENCHED AND TEMPERED PER ASTM A514.  
C) MATERIAL SHALL HAVE A V-NOTCH (CVN) IMPACT VALUE OF NOT LESS THAN 15 FT-LB AT -20 DEGREES F, IN ACCORDANCE WITH ASTM A370.  
D) MINIMUM INSIDE BEND RADIUS FOR COLD BENDING, PER ASTM A6 TABLE X.4.2, SHALL BE 4X MINIMUM.  
E) MATERIAL SHALL BE WELDED TO THE EXISTING BASE PLATE AND TO THE EXISTING TOWER. THE WELDING SHALL BE PERFORMED ACCORDING TO THE APPROVED WELDING PROCEDURE SPECIFICATION (WPS) SUITABLE FOR THE GRADE AND INTENDED USE AND SERVICE. THE WPS SHALL BE DEVELOPED BY A QUALIFIED CWI AND IN ACCORDANCE WITH AWS D1.1. PRIOR TO FABRICATING THE WPS, THE WPS SHALL BE SUBMITTED TO CROWN CASTLE AND B+T GROUP FOR REVIEW.

| NEW AEROSOLUTIONS MP3 |               |     |         |       |
|-----------------------|---------------|-----|---------|-------|
| REINFORCING ELEMENTS  |               |     |         |       |
| START ELEVATION       | END ELEVATION | QTY | FLAT #  | MP3   |
| 0.5'                  | 15.5'         | 1   | 16      | MP305 |
| 10.25'                | 80.25'        | 1   | 14      | MP305 |
| 0.5'                  | 60.5'         | 2   | 2 AND 8 | MP305 |
| 60.5'                 | 85.5'         | 2   | 2 AND 8 | MP303 |
| 60.25'                | 85.25'        | 1   | 14      | MP303 |

ALL BOLTS SHALL BE A307 BOLTS WITH HIGH STRENGTH SHEAR SLEEVES (ASTM A519 WITH MIN. F<sub>U</sub>=105 KSI). CONTACT SUPPLIER FOR MATERIAL (PLATE AND BOLTS) AND INSTALLATION PROCEDURES.

| NEW SABRE FLAT PLATE |               |     |          |            |
|----------------------|---------------|-----|----------|------------|
| REINFORCING ELEMENTS |               |     |          |            |
| START ELEVATION      | END ELEVATION | QTY | FLAT #   | FLAT PLATE |
| 0.5'                 | 15.5'         | 1   | 16       | MS-600     |
| 10.25'               | 60.25'        | 1   | 14       | MS-600     |
| 0.5'                 | 60.5'         | 2   | 2 AND 8  | MS-600     |
| 30.25'               | 40.25'        | 2   | 1 AND 9  | MS-600     |
| 40.25'               | 50.25'        | 1   | 13 OR 15 | MS-600     |
| 65.25'               | 75.25'        | 3   | 1 AND 11 | MS-600     |
| 60.5'                | 85.5'         | 2   | 2 AND 8  | MS-150     |
| 60.25'               | 85.25'        | 1   | 14       | MS-150     |

ALL BOLTS SHALL BE A307 BOLTS WITH HIGH STRENGTH SHEAR SLEEVES (ASTM A519 WITH MIN. F<sub>U</sub>=105 KSI). CONTACT SUPPLIER FOR MATERIAL (PLATE AND BOLTS) AND INSTALLATION PROCEDURES.

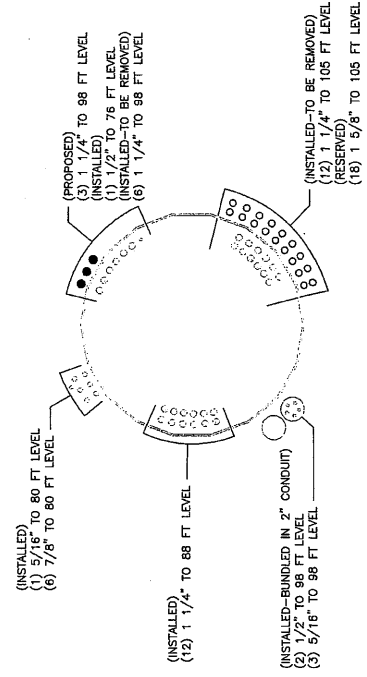
| EXISTING MEMBER SCHEDULE |                 |           |                 |              |
|--------------------------|-----------------|-----------|-----------------|--------------|
| SECTION                  | NUMBER OF SIDES | THICKNESS | BOTTOM DIAMETER | TOP DIAMETER |
| 1                        | 18              | 0.2500"   | 31.810"         | 23.767"      |
| 2                        | 18              | 0.1875"   | 24.663"         | 16.500"      |
| 3                        | ROUND           | 0.3125"   | 8.3750"         | 8.3750"      |

NOTE OF THE CIRCUMFERENTIAL WELD OF THE BASE PLATE TO SHIRT CONNECTION IS REQUIRED. PLEASE SEE ENG-SOW-1033; TOWER BASE PLATE NDE AND ENG-HUL-10031; NDE REQUIREMENTS FOR MONOPOLE BASE PLATE TO PREVENT CONNECTION FAILURE. NOTIFY THE EOR AND CROWN ENGINEERING IMMEDIATELY IF ANY CRACKS ARE SUSPECTED OR HAVE BEEN IDENTIFIED. THE NDE SHALL INCLUDE ALL EXISTING REINFORCEMENTS THAT HAVE BEEN WELDED TO THE BASE PLATE. FULL PENETRATION WELDING TO THE BASE PLATE REQUIRED AS PART OF THIS ACTIVE REINFORCEMENT DESIGN SHALL BE INCLUDED IN THE NDE SCOPE OF WORK.

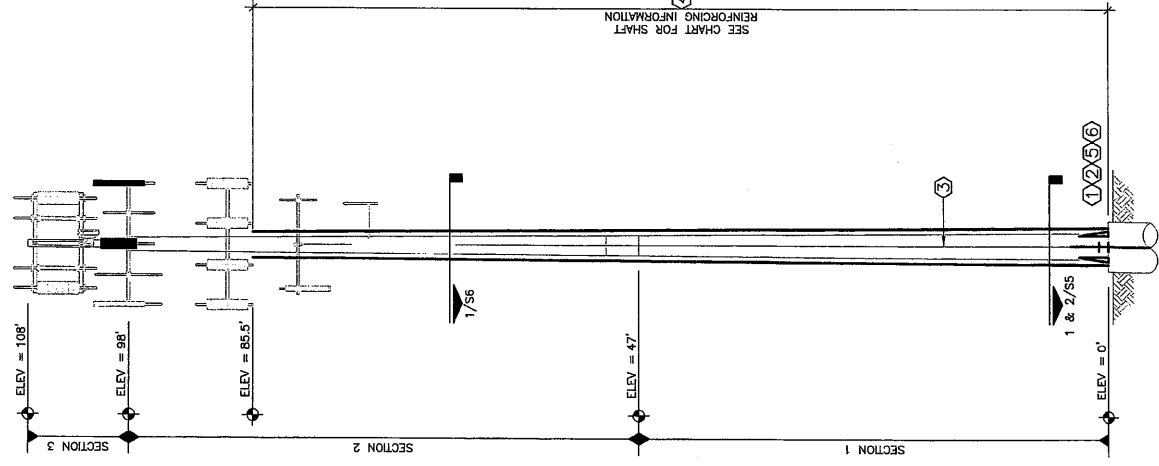
EXISTING TOWER HAS BEEN PREVIOUSLY MODIFIED. REFERENCE DRAWINGS BY VERTICAL SOLUTIONS DATED 01/28/09

EXISTING TOWER HAS BEEN PREVIOUSLY MODIFIED. REFERENCE DRAWINGS BY PAUL J FORD AND COMPANY DATED 05/21/10

- TOWER MODIFICATIONS.**
- CONTRACTOR SHALL BUDGET A SITE VISIT TO CHECK CRITICAL DIMENSIONS AND VERIFY UNKNOWN CONDITIONS PRIOR TO STEEL FABRICATION.
  - THE NEW AND EXISTING TRANSMISSION LINES MUST BE DISTRIBUTED AS SHOWN IN THE TX LINE DIST. DIAGRAM RE: DETAIL 2/51.
  - EXISTING PAUL J FORD MODIFICATION TO BE REMOVED FROM 0' TO 55.167' AND 75.75' TO 85.5' RE: DETAIL 1/55.
  - INSTALL NEW REINFORCING ELEMENTS RE: SHEET S4, S5, S6 AND S7.
  - INSTALL NEW ANCHOR RODS WITH NEW ANCHOR ROD BRACKETS RE: SHEET S5.
  - INSTALL NEW TRANSITION STIFFENERS RE: CONTRACTOR SHALL PROVIDE TEMPORARY BRACING FOR ALL REMOVE AND REPLACE PROCEDURES. CONTRACTOR SHALL BE RESPONSIBLE FOR ADDING THE PROPOSED APPURTENANCES.



2 TX LINE DISTRIBUTION DIAGRAM  
SCALE: N.T.S.

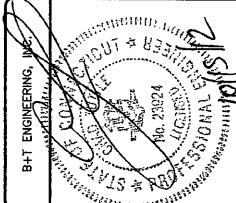


1 TOWER ELEVATION  
SCALE: N.T.S.



| REV | DATE     | DESCRIPTION             |
|-----|----------|-------------------------|
| 1   | 10/15/13 | ISSUED FOR CONSTRUCTION |

|              |               |
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| PROJECT NO:  | 85565.001     |
| PROJECT ENG: | HARI ROITTHOR |
| DRAWN BY:    | GLS           |
| CHECKED BY:  | SSV           |

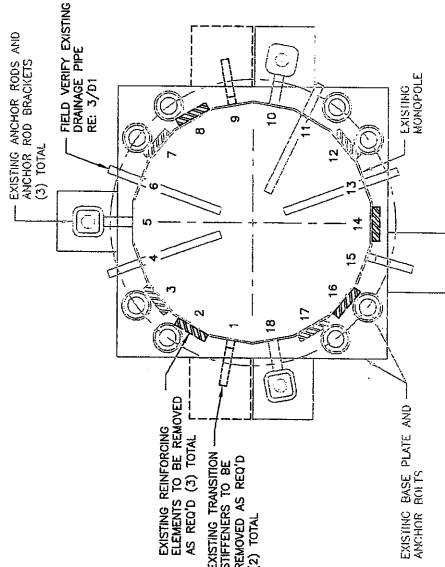


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**HARTFORD-NJ (SSUSA)**  
876363  
219 NEW PARK RD  
HARTFORD, CT  
HARTFORD COUNTY, USA  
EXISTING 108' MONOPOLE

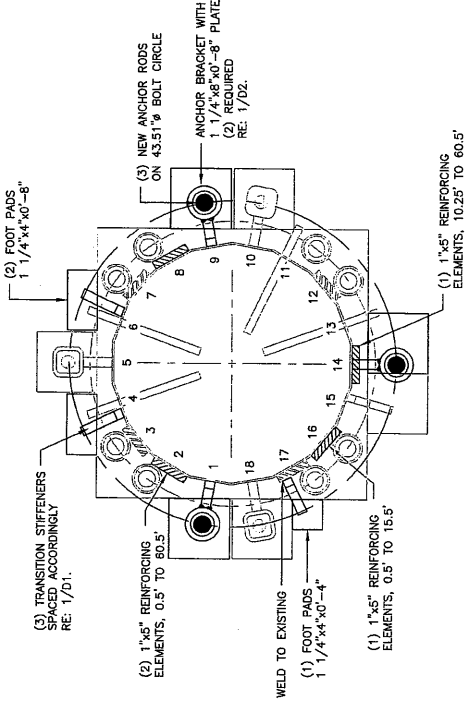
SHEET TITLE  
**TOWER SECTION**  
0'-60.5'

SHEET NUMBER:  
**S5**  
REVISION:  
**0**

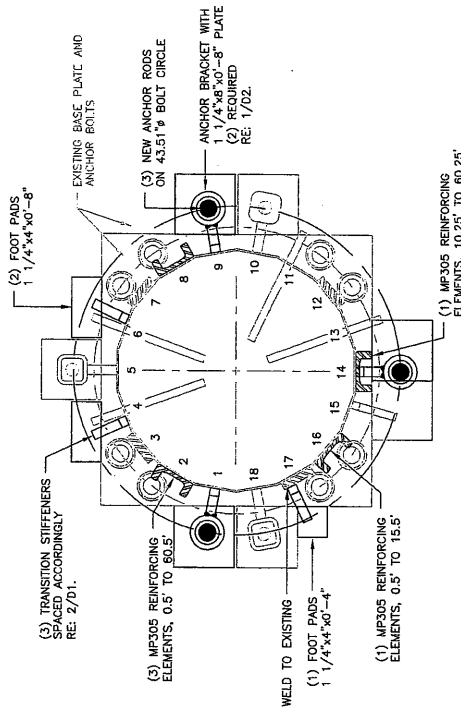


1 REINFORCEMENT TO BE REMOVED  
SCALE: N.T.S.

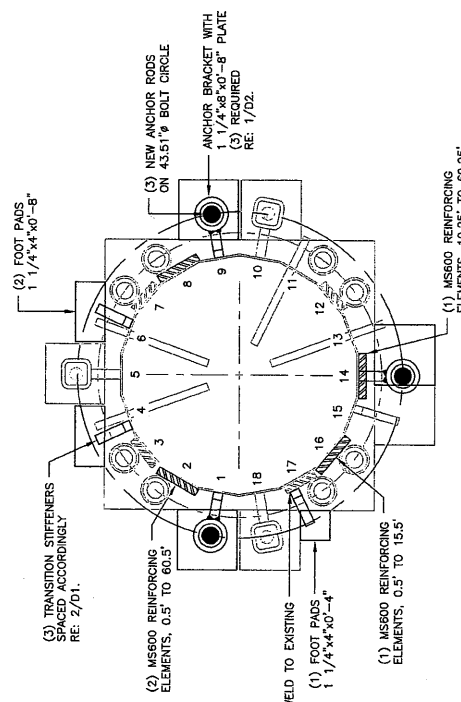
NOTE:  
CONTRACTOR TO USE EXISTING BOLT HOLES IF POSSIBLE. THE LEAST O.C.  
DISTANCE BETWEEN NEW HOLES AND EXISTING HOLES SHOULD NOT BE LESS  
THAN 3". FABRICATOR ON THIS JOB NEEDS TO TAKE EXTRA PRECAUTION TO  
REMOVE ONLY THE REINFORCING ELEMENTS THAT ARE TO BE REMOVED.  
REINFORCEMENT IS REMOVED. CONTACT B+T GROUP IMMEDIATELY AS AND  
WHEN REQUIRED. SMALL CHANGES TO LAYOUT MAY BE REQUIRED.



2 TOWER SECTION (0-60.25')  
SCALE: N.T.S.



3 REINFORCEMENT TO BE REMOVED  
SCALE: N.T.S.



4 TOWER SECTION (0-60.25')  
SCALE: N.T.S.

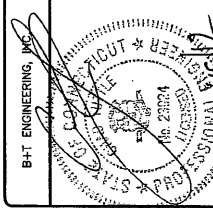


B+T GRP  
1717 S. BOLLER  
SUITE 300  
TULSA, OK 74119  
PH: (918) 587-4650  
www.btgpr.com



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| PROJECT NO:  | 85565.001    |
| PROJECT ENG: | HARI ROTTHOR |
| DRAWN BY:    | GLS          |
| CHECKED BY:  | SSV          |

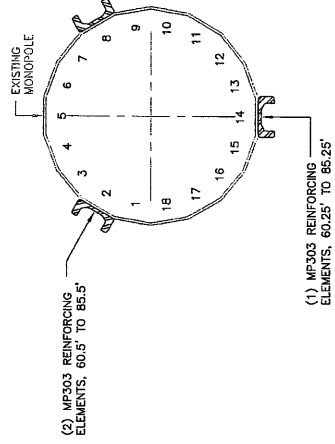


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876363  
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HARTFORD COUNTY, USA  
EXISTING 108' MONOPOLE

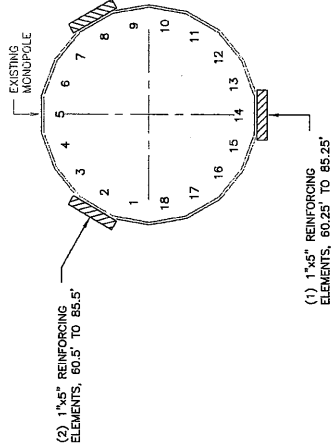
SHEET TITLE  
TOWER SECTION  
60.25'-85.5'

SHEET NUMBER: S6  
REVISION: 0

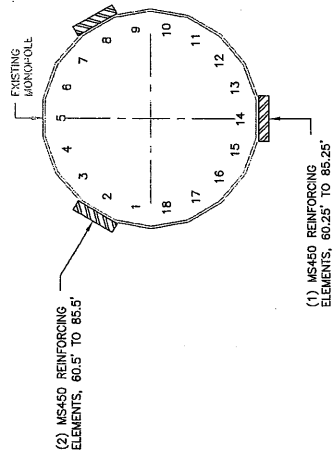


AEROSOLUTIONS

NOTE:  
CONTRACTOR TO USE EXISTING BOLT HOLES IF POSSIBLE. THE LEAST O.C. DISTANCE BETWEEN NEW HOLES AND EXISTING HOLES SHOULD NOT BE LESS THAN 3". FABRICATOR ON THIS JOB NEEDS TO TAKE EXTRA PRECAUTION TO AVOID CONFLICT WITH EXISTING BOLT HOLES ONCE THE EXISTING REINFORCEMENT IS REMOVED. REINFORCEMENT SHALL BE INSTALLED AS AND WHEN REQUIRED. SMALL CHANGES TO LAYOUT MAY BE REQUIRED.



CCI



SABRE

1 TOWER SECTION (60.25'-85.5')  
SCALE: N.T.S.





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**McCrown Castle**

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B+T ENGINEERING, INC.  


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 HARTFORD COUNTY, USA  
 EXISTING 108' MONOPOLE

SHEET TITLE  
**CCI FLAT PLATE  
 BILL OF MATERIALS,  
 SPLICE DETAIL AND NOTES**

SHEET NUMBER:  
**S7**  
 REVISION:  
**0**

CCI: FLAT PLATE-BILL OF MATERIALS

| BOTTOM ELEVATION | TOP ELEVATION | FLAT PLATE THICKNESS | FLAT PLATE WIDTH | FLAT PLATE LENGTH | FLAT PLATE QUANTITY | AXAX BOLTS PER PLATE | TOTAL AXAX BOLT QTY | TERMINATION BOLT (BOTTOM) | TERMINATION BOLT (TOP) | MAXIMUM INTERMEDIATE BOLT SPACING | TOTAL STEEL WEIGHT |
|------------------|---------------|----------------------|------------------|-------------------|---------------------|----------------------|---------------------|---------------------------|------------------------|-----------------------------------|--------------------|
| 0'-6"            | 15'-6"        | 1"                   | 5"               | 15'-0"            | 1                   | 27                   | 27                  | 9                         | 9                      | 15"                               | 268 LBS.           |
| 10'-3"           | 45'-3"        | 1"                   | 5"               | 35'-0"            | 1                   | 34                   | 34                  | 9                         | 9                      | 15"                               | 528 LBS.           |
| 47'-3"           | 72'-3"        | 1"                   | 5"               | 25'-0"            | 1                   | 17                   | 17                  | SPLICE                    | SPLICE                 | 15"                               | 447 LBS.           |
| 74'-3"           | 84'-3"        | 1"                   | 5"               | 10'-0"            | 3                   | 7                    | 21                  | SPLICE                    | 9                      | 15"                               | 536 LBS.           |
| 0'-6"            | 35'-6"        | 1"                   | 5"               | 35'-0"            | 2                   | 34                   | 68                  | 9                         | SPLICE                 | 15"                               | 1251 LBS.          |
| 37'-6"           | 72'-6"        | 1"                   | 5"               | 35'-0"            | 2                   | 34                   | 68                  | SPLICE                    | SPLICE                 | 15"                               | 1251 LBS.          |
| 66 (SPLICE)      |               |                      |                  |                   |                     |                      |                     |                           |                        |                                   | 4379 LBS.          |
| 301              |               |                      |                  |                   |                     |                      |                     |                           |                        |                                   |                    |

SPLICE PLATE-BILL OF MATERIALS

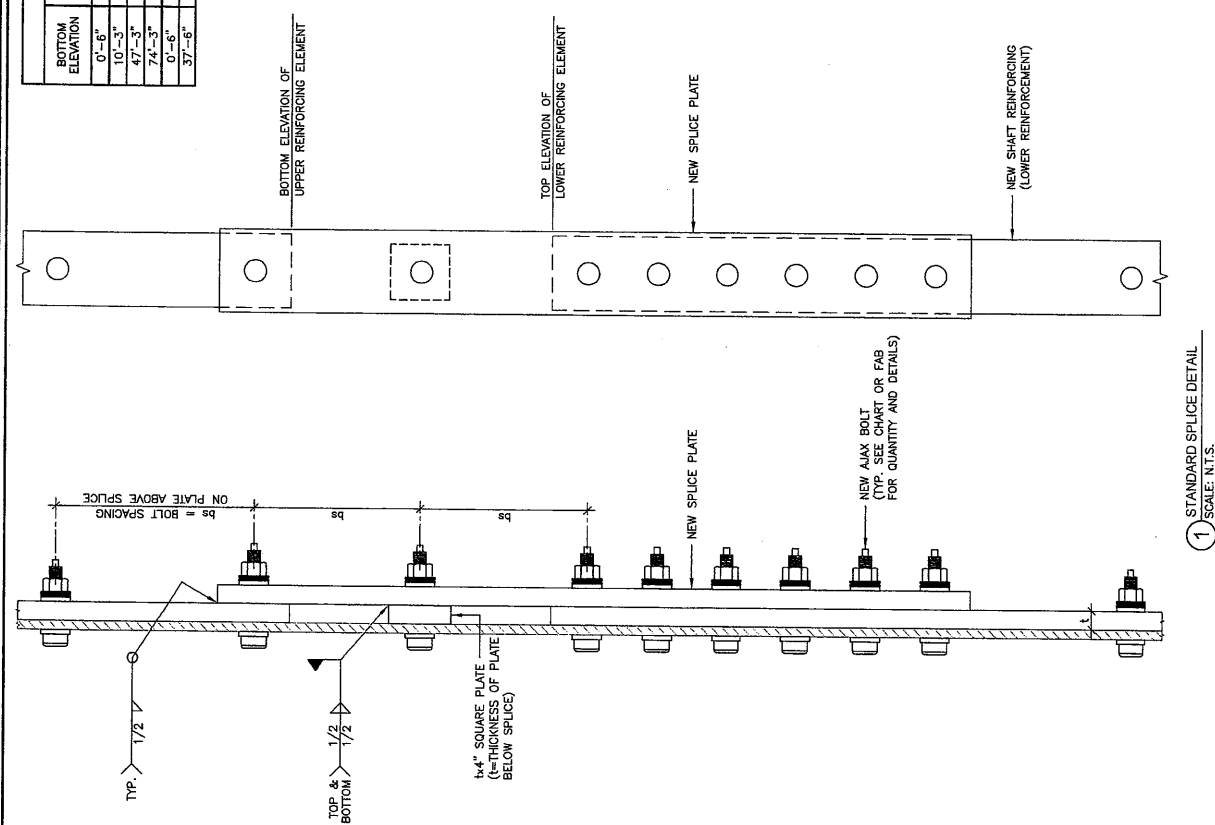
| ** ELEVATION | FLAT PLATE THICKNESS | FLAT PLATE WIDTH | FLAT PLATE LENGTH | FLAT PLATE QUANTITY | TOTAL WELD LENGTH (INCHES) | AXAX BOLTS PER SPLICE * | TOTAL STEEL WEIGHT |
|--------------|----------------------|------------------|-------------------|---------------------|----------------------------|-------------------------|--------------------|
| 45'-3"       | 1"                   | 6"               | 5'-0"             | 1                   | 17                         | 11                      | 89 LBS.            |
| 73'-3"       | 1"                   | 6"               | 5'-0"             | 1                   | 17                         | 11                      | 89 LBS.            |
| 35'-6"       | 1"                   | 6"               | 5'-0"             | 2                   | 34                         | 11                      | 178 LBS.           |
| 73'-3"       | 1"                   | 6"               | 5'-0"             | 2                   | 34                         | 11                      | 178 LBS.           |
| 102          |                      |                  |                   |                     |                            |                         | 534 LBS.           |

\* BOLTS INCLUDED IN THE TOTAL QUANTITY LISTED IN THE FLAT PLATE INSTALLATION CHART  
 \*\* CENTER LINE OF SECOND BOLT FROM TOP

SHIMS-BILL OF MATERIALS

| SHIM QUANTITY | SHIM WIDTH | SHIM LENGTH | SHIM THICKNESS | HOLE DIAMETER |
|---------------|------------|-------------|----------------|---------------|
| 6             | 6"         | 3'          | 1"             | 1 1/4"        |

NOTES:  
 1. AXAX BOLTS ARE TO BE 20mm DIAMETER WITH CORRESPONDING 29mm DIAMETER SLEEVE WITH MATCHING STEEL GRADE.  
 2. ALL STEEL SHALL BE HOT-DIP GALVANIZED AFTER FABRICATOR IN ACCORDANCE WITH ASTM A123. ALTERNATIVELY, ALL NEW STEEL SHALL BE GALVANNEAL. GALVANNEALING MAY BE COLD GALVANIZED AS FOLLOWS: APPLY A MINIMUM OF TWO COATS OF 700-800 ZINC-IRON GOLD GALVANIZING COMPOUND. FILM THICKNESS: 1-800-851-3275 FOR PRODUCT INFORMATION.  
 3. ALL REINFORCING SHALL BE ASTM A516 OR A514 GR B (Fy = 100 ksi, Fu = 110 ksi)  
 4. ALL SHIMS SHALL BE ASTM A36.  
 5. ALL AXAX BOLTS AND SLEEVES ARE 30mm UNLESS NOTED OTHERWISE.  
 6. SHOP WELDS ARE ASSUMED EBOX OR GREATER, PER STANDARD SPLICE DETAIL.



1 STANDARD SPLICE DETAIL  
 SCALE: N.T.S.



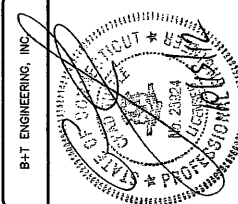


**B+T GRP**  
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TULSA, OK 74119  
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**MCROWN  
CASTLE**

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PROJECT NO: 85565.001  
PROJECT ENG: HARI ROTHOTHOR  
DRAWN BY: G.S.  
CHECKED BY: SSV

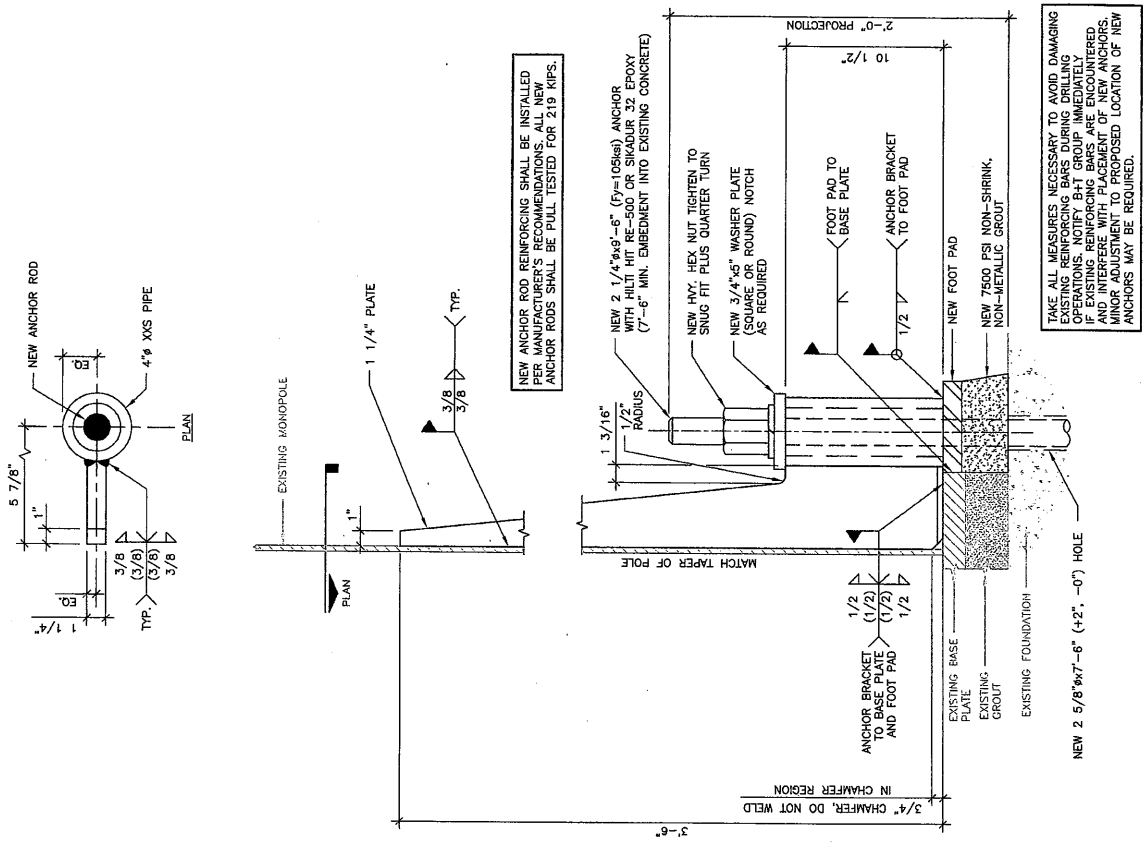


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HARTFORD-NU (SSUSA)  
876363  
219 NEW PARK RD  
HARTFORD, CT  
HARTFORD COUNTY, USA  
EXISTING 108 MONOPOLE

SHEET TITLE  
ANCHOR ROD  
BRACKET DETAILS

SHEET NUMBER  
D2  
REVISION  
0



1 ANCHOR ROD BRACKET  
SCALE: N.T.S.

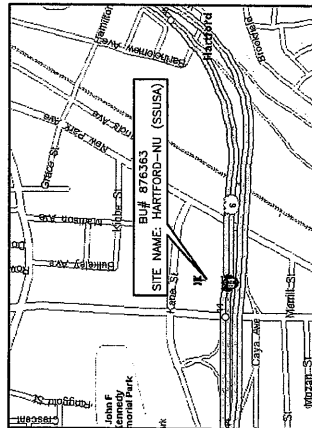


# TOWER MODIFICATION DRAWINGS

SITE NAME: HARTFORD-NU (SSUSA)  
BU NUMBER: 876363

PROJECT CONTACTS:  
1. CROWN TOWER STRUCTURAL ANALYST  
STEVE TUTTLE  
(585) 899-3445  
STEVE.TUTTLE@CROWNCastle.COM

SITE ADDRESS:  
219 NEW PARK RD  
HARTFORD, CT  
HARTFORD COUNTY, USA



MAP

## DIRECTIONS

84 WEST TO EXIT 44. TURN RIGHT OFF RAMP AND CONTINUE STRAIGHT THROUGH LIGHT. TURN RIGHT ON NEW PARK AVENUE AND GO TO ADDRESS.

## TOWER INFORMATION

TOWER MANUFACTURER / DWG #: SUMMIT MFG LLC / # 1947570  
TOWER HEIGHT / TYPE: 108' MONOPOLE  
TOWER LOCATION: LAT. 41° 45' 2.79"  
DUTUM (NAD 1983) LONG. -72° 42' 49.23"  
ELEV. 76 FT AMSL  
STRUCTURAL DESIGN DRAWING REPORT: B-T GROUP / W/O. # 537531  
STRUCTURAL ANALYSIS REPORT: B-T GROUP / W/O # 538047  
CO-SITES DOCUMENT ID: 10/11/12

## CODE COMPLIANCE

THIS REINFORCEMENT DESIGN IS BASED ON THE REQUIREMENTS OF TIA/EIA-222F STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND ANTENNA SUPPORTING STRUCTURES USING A FASTEST MILE WIND SPEED OF 80 MPH WITH NO ICE. 37.6 MPH WITH 1 INCH ICE THICKNESS AND 50 MPH UNDER SERVICE LOADS.

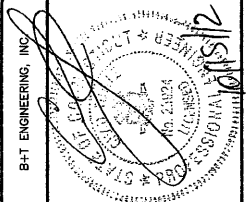
## DRAWINGS INCLUDED

| SHEET NUMBER | DESCRIPTION                                     |
|--------------|-------------------------------------------------|
| S1           | TITLE SHEET                                     |
| S2           | MODIFICATION INSPECTION NOTES AND CHECKLIST     |
| S3           | GENERAL NOTES, AJAX BOLT NOTES AND DETAIL       |
| S4           | TOWER ELEV., SCHEDULES & TX LINE DIST. DIAG.    |
| S5           | TOWER SECTION (0'-60.25')                       |
| S6           | TOWER SECTION (60.25'-85.5')                    |
| S7           | CCI FLAT PLATE--B.O.M., SPLICE DETAIL AND NOTES |
| D1           | DETAILS                                         |
| D1           | ANCHOR ROD BRACKET DETAILS                      |



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| PROJECT NO: | 85565.001    |
| DRAWN BY:   | HARI ROTTHOR |
| CHECKED BY: | SSV          |



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HARTFORD-NU (SSUSA)  
876363  
219 NEW PARK RD  
HARTFORD COUNTY, USA  
EXISTING 108' MONOPOLE

SHEET TITLE  
TITLE SHEET

SHEET NUMBER  
S1

REVISION  
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**NOTES:**

1. ALL STRUCTURAL BOLTS SHALL BE INSTALLED AND TIGHTENED TO THE PRE-TENSIONED CONDITION ACCORDING TO THE REQUIREMENTS OF THE AISC "SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS", DEC. 31, 2009.
2. ALL STRUCTURAL BOLTS SHALL BE INSPECTED ACCORDING TO THE REQUIREMENTS OF THE AISC "SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS", DEC. 31, 2009.
3. ALL AJAX M20 BOLTS WITH SHEAR SLEEVES SHALL BE PRE-TENSIONED AND TIGHTENED UNTIL THE DIRECT TENSION INDICATOR (DTI) WASHERS SHOW THAT THE PROPER BOLT TENSION HAS BEEN REACHED. SEE NOTES AND DETAIL BELOW FOR THE USE OF DIRECT TENSION INDICATOR (DTI) WASHERS WITH THE AJAX M20 BOLTS.
4. ALL AJAX BOLTS SHALL BE INSTALLED USING DIRECT TENSION INDICATORS (DTIS) AND HARDENED WASHERS. DTIS SHALL BE MANUFACTURED BY SQUIRTER® DTIS, INC. (P1999) AND HARDENED WASHERS SHALL CONFORM TO ASTM F436 AND HAVE A HARDNESS OF RC 38 OR HIGHER.

**NOTES FOR AJAX M20 "ONE-SIDE" BOLTS WITH DIRECT TENSION INDICATORS (DTIS):**

DTIS REQUIRED: DTIS SHALL BE "SELF-INDICATING" SQUIRTER®-STYLE DTIS MADE WITH SILICONE EMBEDDED IN THEM, INSPECTED BY MEANS OF THE VISUAL EJECTION OF SILICONE AS THE DTI PROTRUSIONS COMPRESS. SQUIRTER® DTIS SHALL BE CALIBRATED PER MANUFACTURER'S INSTRUCTIONS PRIOR TO USE.

THE DIRECT TENSION INDICATOR (DTI) WASHERS SHALL BE THE "SQUIRTER®-STYLE" AS MANUFACTURED BY:

APPLIED BOLTING TECHNOLOGY PRODUCTS, INC.  
1413 ROCKINGHAM ROAD  
ROCKINGHAM, VA 23153  
PHONE: 800-552-1889  
WEBSITE: WWW.APPLIEDBOLTING.COM

DISTRIBUTORS OF SQUIRTER® DTIS:  
HTTP://WWW.APPLIEDBOLTING.COM/APPLIED-BOLTING-DISTRIBUTORS.HTML

DTI: USE DIRECT TENSION INDICATOR (DTI) WASHERS COMPATIBLE WITH 3/4" NOMINAL A325 BOLTS FOR THE AJAX M20 BOLTS. DTIS SHALL NOT BE HOT-DIP GALVANIZED. DTIS SHALL BE MECHANICALLY GALVANIZED (MG) BY THE COLD MECHANICAL PROCESS ONLY AS PROVIDED BY THE DTI MANUFACTURER.

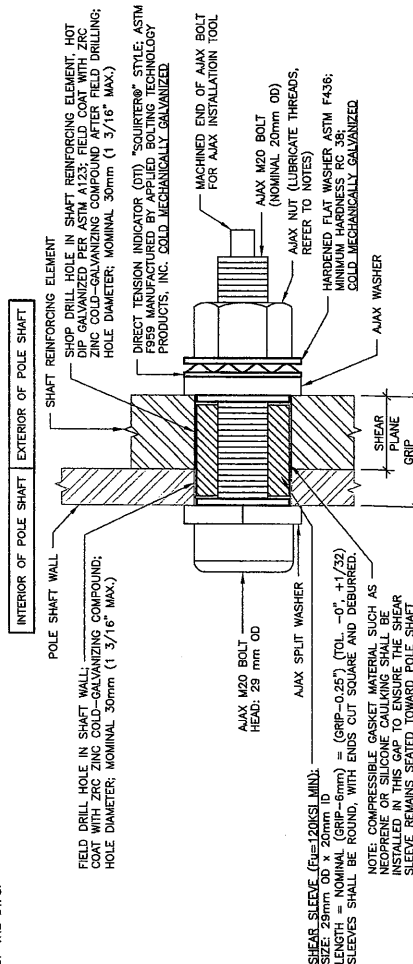
HARDENED WASHERS REQUIRED: USE A HARDENED WASHER FOR A 3/4" NOMINAL BOLT BETWEEN THE TOP OF THE DIRECT TENSION INDICATOR (DTI) WASHER AND THE NUT OF THE AJAX M20 BOLT. HARDENED WASHERS SHALL CONFORM TO ASTM F436 AND HAVE A MINIMUM HARDNESS OF RC 38 OR HIGHER. THE HARDENED WASHERS SHALL BE MECHANICALLY GALVANIZED BY THE COLD MECHANICAL PROCESS. ALTERNATIVELY, CORRECTLY MADE HOT DIP GALVANIZED HARDENED FLAT WASHERS HAVING A MINIMUM HARDNESS OF RC 38 CAN BE USED; CONTRACTOR SHALL PROVIDE DOCUMENTATION OF WASHER SPECIFICATION AND HARDNESS.

NUT LUBRICATION REQUIRED: PROPERLY LUBRICATE THE THREADS OF THE NUT OF THE AJAX BOLT SO THAT IT CAN BE PROPERLY TIGHTENED WITHOUT GALLING AND/OR LOCKING UP ON THE BOLT THREADS. CONTRACTOR SHALL FOLLOW DTI MANUFACTURER INSTRUCTIONS FOR PROPER LUBRICATION AND TIGHTENING.

NOTE: COMPLETELY COMPRESSED DTIS SHOWING NO VISIBLE REMAINING GAP ARE ACCEPTABLE. DTI WASHERS SHALL BE PLACED DIRECTLY AGAINST THE OUTER AJAX WASHER WITH THE DTI BUMPS BEARING AGAINST THE AJAX WASHER. PLACE A HARDENED WASHER BETWEEN THE DTI AND AJAX NUT. THE DTI BUMPS SHALL BEAR AGAINST THE UNDERSIDE OF A HARDENED FLAT WASHER, NEVER DIRECTLY AGAINST THE NUT.

CONTRACTOR SHALL FOLLOW DTI MANUFACTURER'S INSTRUCTIONS FOR INSTALLATION, LUBRICATION, TIGHTENING AND INSPECTION.

INSPECTION REQUIRED: ALL AJAX BOLTS SHALL BE INSPECTED ACCORDING TO THE REQUIREMENTS OF THE AISC "SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS", DEC. 31, 2009. THE BOLT ASSEMBLY, INCLUDING THE SHEAR SLEEVE PLACEMENT AND NUT LUBRICATION AND THE CONTRACTOR'S TENSIONING PROCEDURE IN ADDITION, ALL AJAX BOLTS AND DTIS SHALL BE VISUALLY INSPECTED ACCORDING TO THE DTI MANUFACTURER'S INSTRUCTIONS. THE BOLT INSPECTOR SHALL PROVIDE COMPLETE PHOTO DOCUMENTATION OF ALL BOLTS AFTER TIGHTENING CLEARLY SHOWING THE CONDITION OF THE DTIS.



1 TYPICAL AJAX BOLT DETAIL  
SCALE: N.T.S.

**GENERAL NOTES**

- 1.1 ALL WORK SHALL COMPLY WITH THE TIA-222-F STANDARD AS WELL AS ANY OTHER GOVERNING BUILDING CODES.
- 1.2 FIELD WORK SHALL BE DONE AROUND EXISTING COAXIAL CABLE AND/OR OTHER UTILITIES. THE CONTRACTOR SHALL TAKE SUCH PRECAUTIONS AS TO AVOID DAMAGE TO EXISTING UTILITIES. THE STRUCTURE.
- 1.3 A MINIMUM OF TWO COATS OF ZINGA COLD GALVANIZING COMPOUND OR EQUIVALENT SHALL BE APPLIED TO ANY FIELD CUTS OR FIELD DRILL HOLES.
- 1.4 ON THE TOWER WITHOUT THE CONSENT OF THE OWNER, THE USE OF A GAS TORCH OR WELDER WILL NOT BE PERMITTED.
- 1.5 IN THE EVENT OF TEMPORARY BRACING CONTRACTOR MAY HAVE A STABILITY ANALYSIS PERFORMED BY AN ENGINEER. THE ANALYSIS SHALL USE A MINIMUM WIND SPEED OF 45 mph (3-SEC) PER TIA-1019.

**FABRICATION**

- 2.1 ALL WORK SHALL BE DONE IN ACCORDANCE WITH A.I.S.C. "SPECIFICATIONS FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS."
- 2.2 STRUCTURAL STEEL SHALL MEET THE FOLLOWING SPECIFICATIONS:

A. STEEL SHAPES AND PLATES, U.N.O.  
B. STEEL PIPE

YIELD  
ASTM SPEC'S  
A572  
A-53B

- 2.3 ALL NEW MATERIAL INCLUDING STRUCTURAL STEEL AND FASTENERS SHALL BE ORDERED CONFORMING TO THE FABRICATION IN ACCORDANCE WITH ASTM A123 AND A153.
- 2.4 WELDING SHALL MEET ANSI/AWS D1.1 STRUCTURAL WELDING CODE (LATEST REVISION). ELECTRODES SHALL BE E60 SERIES.
- 2.5 CONTRACTOR SHALL PROVIDE SHOP FABRICATION DRAWINGS TO BHT GROUP 2 WEEKS PRIOR TO FABRICATION.

**KEY NOTES**

Ⓔ TOWER MODIFICATION I.D.

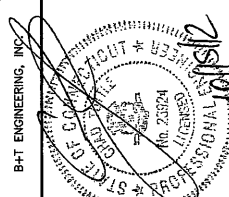


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177 S. BOULDER  
SUITE 300  
TULSA, OK 74119  
PHONE: 918-437-4000  
WWW.B+TGRP.COM



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| PROJECT ENG: | HAR ROTHROPE |
| DRAWN BY:    | GLS          |
| CHECKED BY:  | SSV          |



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HARTFORD-NU (SSUSA)  
876363  
219 NEW PARK RD  
HARTFORD, CT 06105  
HARTFORD COUNTY, USA  
EXISTING 108 MONOPOLE

SHEET TITLE  
GENERAL NOTES  
AJAX BOLT NOTES  
AND DETAILS

|              |    |
|--------------|----|
| SHEET NUMBER | S3 |
| REVISION     | 0  |



Table with 3 columns: SECTION OF SIDES, NUMBER, THICKNESS, BOTTOM DIAMETER, TOP DIAMETER. Rows 1-3.

Table with 3 columns: START ELEVATION, END ELEVATION, QTY, FLAT #, FLAT PLATE. Rows 1-3.

B+T GRP logo and address: 118 BOULDER SUITE 300 TULSA, OK 74119 PH: (918) 587-4830 www.btg.com

NOTE OF THE CIRCUMFERENTIAL WELD OF THE BASE PLATE TO SHIRT CONNECTION IS REQUIRED. PLEASE SEE ENG-SOW-1033; TOWER BASE PLATE NDE AND ENG-PUL-10051; NDE REQUIREMENTS FOR MONOPOLE BASE PLATE TO PREVENT CONNECTION FAILURE. NOTIFY THE EOR AND CROWN ENGINEERING IMMEDIATELY IF ANY CRACKS ARE SUSPECTED OR HAVE BEEN IDENTIFIED. THE NDE SHALL INCLUDE ALL EXISTING REINFORCEMENTS AND ALL NEW REINFORCEMENTS. PENNANT WELDING TO THE BASE PLATE SHALL BE WELDED TO THE BASE PLATE AS PART OF THIS ACTIVE REINFORCEMENT DESIGN SHALL BE INCLUDED IN THE NDE SCOPE OF WORK.

EXISTING TOWER HAS BEEN PREVIOUSLY MODIFIED. REFERENCE DRAWINGS BY VERTICAL SOLUTIONS DATED 01/28/09.

EXISTING TOWER HAS BEEN PREVIOUSLY MODIFIED. REFERENCE DRAWINGS BY PAUL J FORD AND COMPANY DATED 05/21/10.

- 1 CONTRACTOR SHALL BUDGET A SITE VISIT TO CHECK CRITICAL DIMENSIONS AND VERIFY UNKNOWN CONDITIONS PRIOR TO STEEL FABRICATION.
  - 2 THE NEW AND EXISTING TRANSMISSION LINES MUST BE DISTRIBUTED AS SHOWN IN THE TX LINE DIST. DIAGRAM RE: DETAIL 2/51.
  - 3 EXISTING PAUL J FORD MODIFICATION TO BE REMOVED FROM RE: DETAIL 1/55.
  - 4 INSTALL NEW REINFORCING ELEMENTS RE: SHEET S4, S5, S6 AND S7.
  - 5 INSTALL NEW ANCHOR RODS WITH NEW ANCHOR ROD BRACKETS RE: SHEET S5.
  - 6 INSTALL NEW TRANSITION STIFFENERS RE: SHEET S5.
- CONTRACTOR SHALL PROVIDE TEMPORARY BRACING FOR ALL NEW REINFORCEMENTS. MODIFICATIONS SHALL BE COMPLETED PRIOR TO ADDING THE PROPOSED APPURTENANCES.

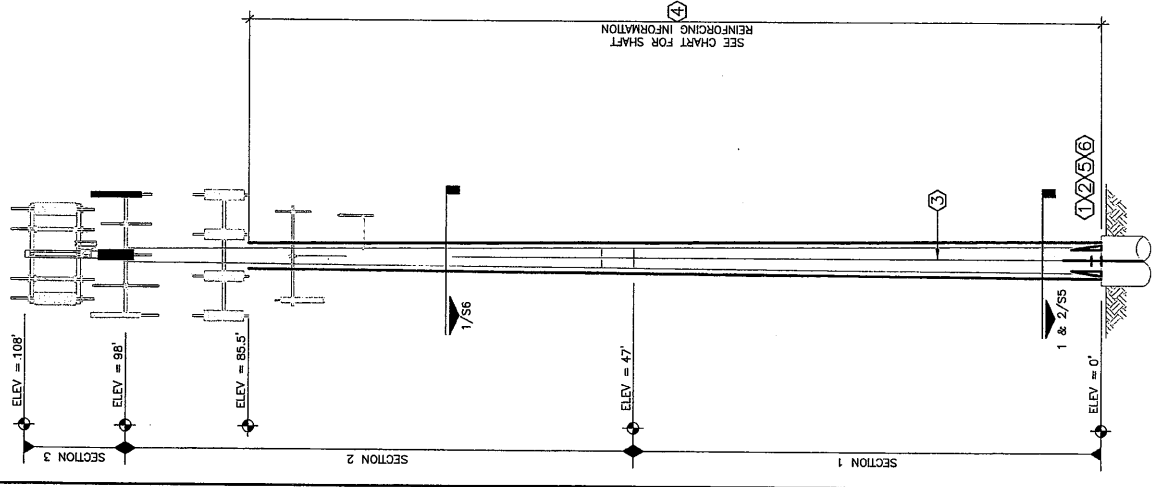


Table with 3 columns: START ELEVATION, END ELEVATION, QTY, FLAT #, FLAT PLATE. Rows 1-3.

Table with 3 columns: START ELEVATION, END ELEVATION, QTY, FLAT #, FLAT PLATE. Rows 1-3.

PROJECT NO: 85565.001  
PROJECT ENG: HARI ROTHOR  
DRAWN BY: GLS  
CHECKED BY: SSS

B+T ENGINEERING, INC. logo and address: 218 NEW PARK RD HARTFORD, CT 06105 HARTFORD COUNTY, USA EXISTING 105' MONOPOLE

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HARTFORD-NY (SSUSA) 876363  
218 NEW PARK RD  
HARTFORD, CT 06105  
HARTFORD COUNTY, USA  
EXISTING 105' MONOPOLE

SHEET TITLE  
TOWER ELEV. SCHEDULES  
AND TX LINE DIST. DIAGRAM

SHEET NUMBER: S4  
REVISION: 0

| REV | DATE     | DESCRIPTION             |
|-----|----------|-------------------------|
| 0   | 10/15/12 | ISSUED FOR CONSTRUCTION |

|              |                |
|--------------|----------------|
| PROJECT NO:  | 85565.001      |
| PROJECT ENG: | HARI ROTTIHOOR |
| DRAWN BY:    | GLS            |
| CHECKED BY:  | SSV            |

B+T ENGINEERING, INC.  
REGISTERED PROFESSIONAL ENGINEER  
STATE OF OKLAHOMA  
No. 23924  
10/15/12

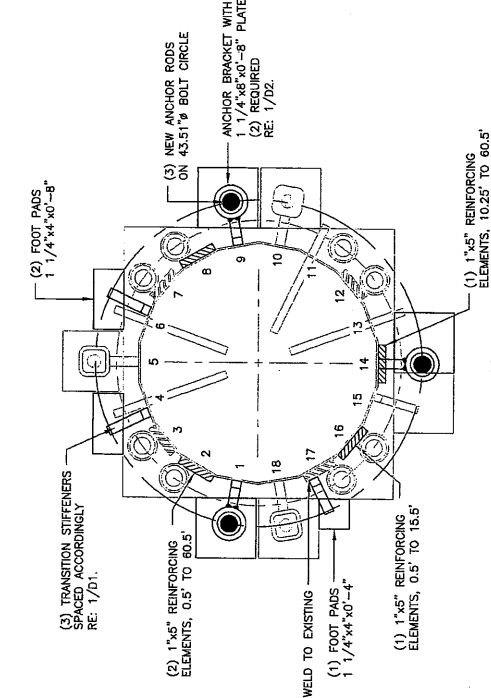
IT IS A VIOLATION OF LAW FOR ANY PERSON TO REPRODUCE OR TRANSMIT ANY PART OF A LICENSED PROFESSIONAL ENGINEER'S DESIGN OR CALCULATION WITHOUT THE WRITTEN CONSENT OF THE ENGINEER.

HARTFORD-NU (SSUSA)  
876363  
218 NEW PARK RD  
HARTFORD, CT 06105  
HARTFORD COUNTY, USA  
EXISTING 106' MONOPOLE

SHEET TITLE  
TOWER SECTION  
0-60.5'

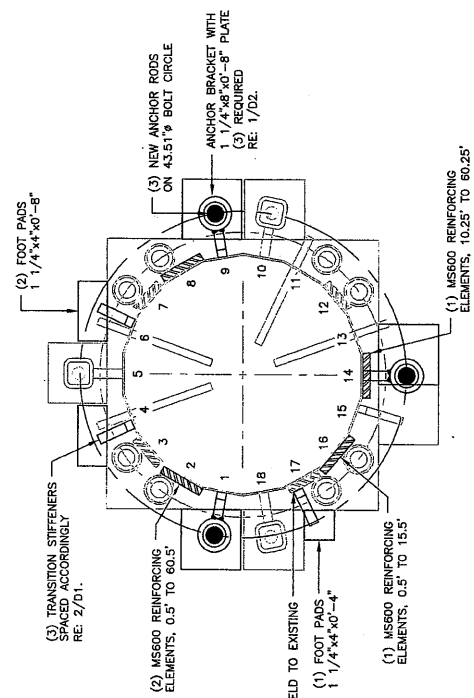
SHEET NUMBER  
S5

REVISION  
0

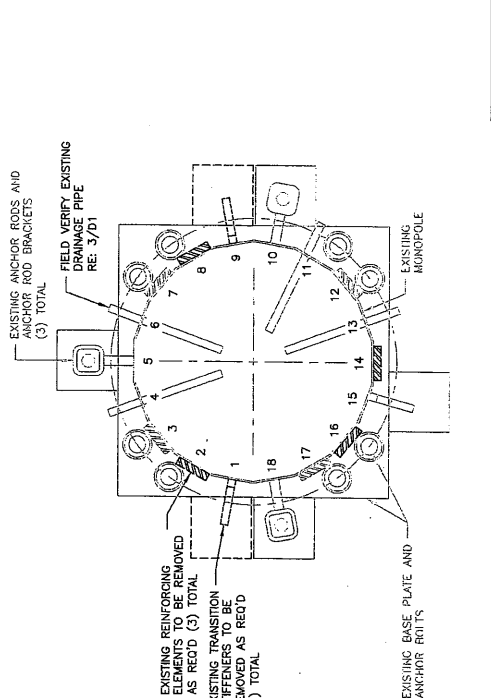


① REINFORCEMENT TO BE REMOVED  
SCALE: N.T.S.

NOTE:  
CONTRACTOR TO USE EXISTING BOLT HOLES IF POSSIBLE, THE LEAST O.C. DISTANCE BETWEEN NEW HOLES AND EXISTING HOLES SHOULD NOT BE LESS THAN 4 TIMES THE DIAMETER OF THE BOLT HOLES. EXERCISE CAUTION TO AVOID CONFLICT WITH EXISTING BOLT HOLES. ONLY THE EXISTING REINFORCEMENT IS REMOVED. CONTACT B+T GROUP IMMEDIATELY AS AND WHEN REQUIRED. SMALL CHANGES TO LAYOUT MAY BE REQUIRED.



SABRE



① REINFORCEMENT TO BE REMOVED  
SCALE: N.T.S.

AEROSOLUTIONS



**B+T GRP**  
1717 S. BOULDER  
SUITE 300  
BOULDER, CO 80502  
PH: (303) 440-7119  
FAX: (303) 440-7118  
WWW.BTGRP.COM

**MCROWN  
CASTLE**

| ISSUED FOR: |                                  |
|-------------|----------------------------------|
| REV         | DESCRIPTION                      |
| 0           | 10/15/12 ISSUED FOR CONSTRUCTION |
|             |                                  |
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PROJECT NO: 85565.001  
PROJECT ENG: HARI ROTHOR  
DRAWN BY: GLS  
CHECKED BY: SSV

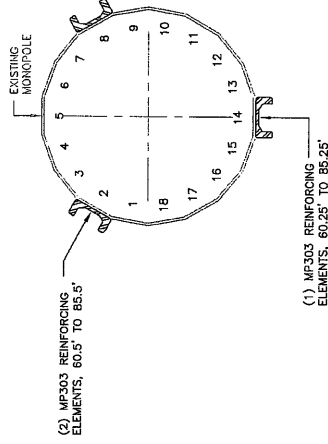


IT IS THE RESPONSIBILITY OF THE ENGINEER TO SIGN AND SEAL ANY DRAWING OR SPECIFICATION OF A LICENSED PROFESSIONAL ENGINEER.

HARTFORD-NU (SSUSA)  
876363  
219 NEW PARK RD  
HARTFORD, CT  
HARTFORD COUNTY, USA  
EXISTING 108' MONOPOLE

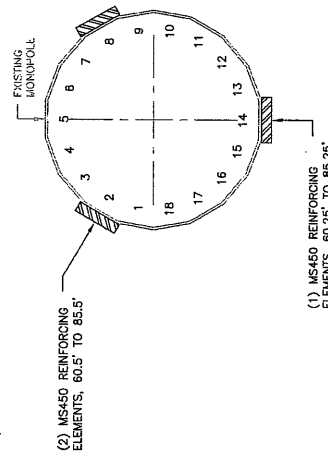
SHEET TITLE  
TOWER SECTION  
60.25'-85.5'

SHEET NUMBER: **S6**  
REVISION: **0**



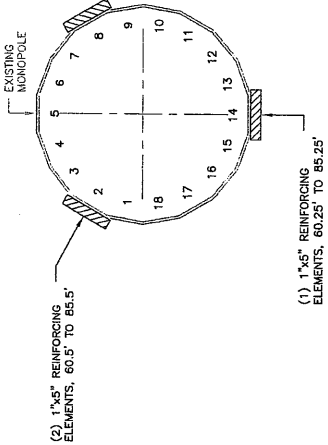
AEROSOLUTIONS

NOTE: CONTACTOR TO USE EXISTING BOLT HOLES IF POSSIBLE. THE LEAST O.C. DISTANCE BETWEEN BOLT HOLES AND EXISTING MONOPOLE SHALL BE LESS THAN 3". FABRICATOR ON THIS JOB NEEDS TO TAKE EXTRA PRECAUTION TO AVOID CONFLICT WITH EXISTING BOLT HOLES ONCE THE EXISTING REINFORCEMENT IS REMOVED. CONTACT B+T GROUP IMMEDIATELY AS AND WHEN REQUIRED. SMALL CHANGES TO LAYOUT MAY BE REQUIRED.



SABRE

1 TOWER SECTION (60.25'-85.5')  
SCALE: N.T.S.

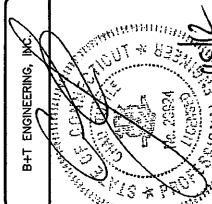


OCI



| REV | DATE     | DESCRIPTION             |
|-----|----------|-------------------------|
| 0   | 10/15/12 | ISSUED FOR CONSTRUCTION |
|     |          |                         |
|     |          |                         |
|     |          |                         |
|     |          |                         |

|              |             |
|--------------|-------------|
| PROJECT NO:  | 85565.001   |
| PROJECT ENG: | HARI ROTHOR |
| DRAWN BY:    | GLS         |
| CHECKED BY:  | SSV         |



IT IS A VIOLATION OF LAW FOR ANY PERSON TO REPRODUCE OR TRANSMIT ANY INFORMATION FROM THIS DOCUMENT.

HARTFORD-NU (SSUSA)  
876563  
218 NEW PARK RD  
HARTFORD, CT 06105  
HARTFORD, CT 06105, USA  
EASTING 106 MONOPOLE

SHEET TITLE  
CCI FLAT PLATE  
BILL OF MATERIALS  
SPICE DETAIL AND NOTES

SHEET NUMBER  
S7  
REVISION  
0

CCI: FLAT PLATE-BILL OF MATERIALS

| BOTTOM ELEVATION | FLAT PLATE THICKNESS | FLAT PLATE WIDTH | FLAT PLATE LENGTH | FLAT PLATE QUANTITY | AJAX BOLTS PER PLATE | TOTAL AJAX BOLTS | TERMINATION BOLTS (BOTTOM) | TERMINATION BOLTS (TOP) | MAXIMUM INTERMEDIATE BOLT SPACING | TOTAL STEEL WEIGHT |
|------------------|----------------------|------------------|-------------------|---------------------|----------------------|------------------|----------------------------|-------------------------|-----------------------------------|--------------------|
| 0'-6"            | 1"                   | 5"               | 15'-0"            | 1                   | 27                   | 27               | 9                          | 9                       | 15"                               | 288 LBS.           |
| 10'-3"           | 1"                   | 5"               | 35'-0"            | 1                   | 34                   | 34               | 9                          | 9                       | 15"                               | 626 LBS.           |
| 47'-3"           | 1"                   | 5"               | 25'-0"            | 1                   | 17                   | 17               | 9                          | 9                       | 15"                               | 447 LBS.           |
| 74'-3"           | 1"                   | 5"               | 10'-0"            | 3                   | 7                    | 21               | 9                          | 9                       | 15"                               | 536 LBS.           |
| 0'-6"            | 1"                   | 5"               | 35'-0"            | 2                   | 34                   | 68               | 9                          | 9                       | 15"                               | 1251 LBS.          |
| 37'-6"           | 1"                   | 5"               | 35'-0"            | 2                   | 34                   | 68               | 9                          | 9                       | 15"                               | 1251 LBS.          |
| 66 (SPICE)       |                      |                  |                   |                     |                      |                  |                            |                         |                                   | 4379 LBS.          |
| 301              |                      |                  |                   |                     |                      |                  |                            |                         |                                   |                    |

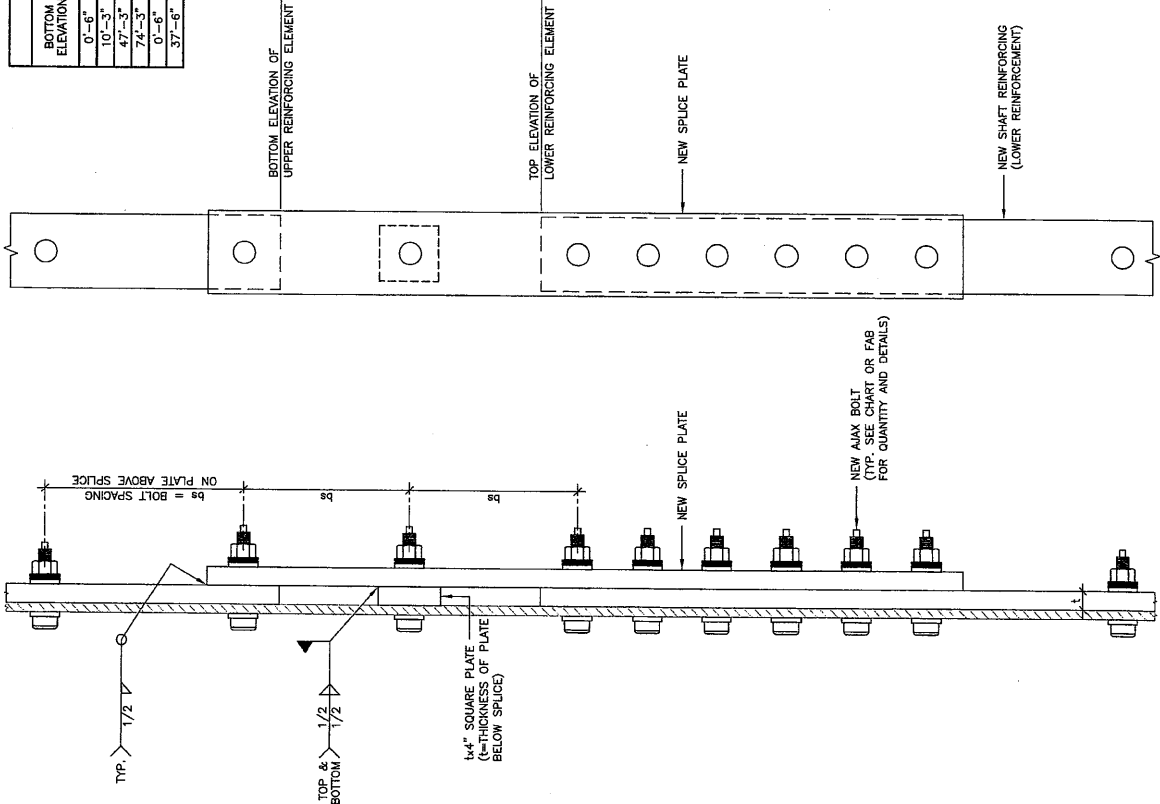
SPICE PLATE-BILL OF MATERIALS

| ** ELEVATION | FLAT PLATE THICKNESS | FLAT PLATE WIDTH | FLAT PLATE LENGTH | FLAT PLATE QUANTITY | TOTAL WELD LENGTH (INCHES) | AJAX BOLTS PER SPICE | TOTAL STEEL WEIGHT |
|--------------|----------------------|------------------|-------------------|---------------------|----------------------------|----------------------|--------------------|
| 48'-3"       | 1"                   | 6"               | 5'-0"             | 1                   | 17                         | 11                   | 89 LBS.            |
| 73'-3"       | 1"                   | 6"               | 5'-0"             | 1                   | 17                         | 11                   | 89 LBS.            |
| 35'-6"       | 1"                   | 6"               | 5'-0"             | 2                   | 34                         | 11                   | 178 LBS.           |
| 73'-3"       | 1"                   | 6"               | 5'-0"             | 2                   | 34                         | 11                   | 178 LBS.           |
| 102          |                      |                  |                   |                     |                            |                      | 534 LBS.           |

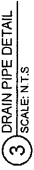
\* BOLTS INCLUDED IN THE TOTAL QUANTITY LISTED IN THE FLAT PLATE INSTALLATION CHART  
\*\* CENTER LINE OF SECOND BOLT FROM TOP

| SHIMS-BILL OF MATERIALS |            |             |               |
|-------------------------|------------|-------------|---------------|
| SHIM QUANTITY           | SHIM WIDTH | SHIM LENGTH | HOLE DIAMETER |
| 6                       | 6"         | 3'          | 1 1/4"        |

- NOTES:
1. AJAX BOLTS ARE TO BE 20mm DIAMETER WITH CORRESPONDING 29mm DIAMETER SLEEVE WITH MATCHING STEEL GRADE.
  2. ALL SHIMS SHALL BE ZINC-RICH GOLD GALVANIZING COMPOUND. FILM THICKNESS: 1-800-831-3275 FOR PRODUCT INFORMATION.
  3. ALL REINFORCING SHALL BE ASTM A516 OR A514 OR B (Fy = 100 ksi, Fu = 110 ksi)
  4. HOLES FOR AJAX BOLTS AND SHEAR SLEEVES ARE 30mm UNLESS NOTED OTHERWISE.
  5. HOLES FOR AJAX BOLTS AND SHEAR SLEEVES ARE 30mm UNLESS NOTED OTHERWISE.
  6. SHOP WELDS ARE ASSUMED EBOXX OR GREATER, PER STANDARD SPICE DETAIL.

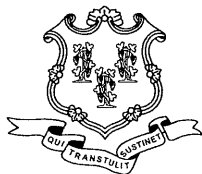


1 STANDARD SPICE DETAIL  
SCALE: N.T.S.





1 ANCHOR ROD BRACKET  
SCALE: N.T.S.



# STATE OF CONNECTICUT

## CONNECTICUT SITING COUNCIL

Ten Franklin Square, New Britain, CT 06051

Phone: (860) 827-2935 Fax: (860) 827-2950

E-Mail: [siting.council@ct.gov](mailto:siting.council@ct.gov)

[www.ct.gov/csc](http://www.ct.gov/csc)

October 19, 2012

The Honorable Pedro E. Segarra  
Mayor  
City of Hartford  
Municipal Building  
550 Main Street  
Hartford, CT 06103

RE: **EM-VER-064-121019** – Cellco Partnership d/b/a Verizon Wireless notice of intent to modify an existing telecommunications facility located at 219 New Park Avenue, Hartford, Connecticut.

Dear Mayor Segarra:

The Connecticut Siting Council (Council) received a request to modify an existing telecommunications facility, pursuant to Regulations of Connecticut State Agencies Section 16-50j-72. A copy of which has already been provided to you.

If you have any questions or comments regarding the proposal, please call me or inform the Council by November 2, 2012.

Thank you for your cooperation and consideration.

Very truly yours,

Linda Roberts  
Executive Director

LR/laf

c: Sandra Kee Borges, Acting Chief Operating Officer, City of Hartford