

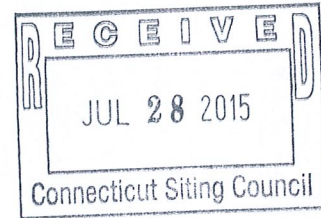


Crown Castle  
3 Corporate Park Drive, Suite 101  
Clifton Park, NY 12065

July 27, 2015

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

ORIGINAL



RE: **Sprint Modification - EM-SPRINT-014-130313; Crown: 876321**  
**Sprint Site ID: CT03XC040**  
**Located at: 150 North Main Street, Branford, CT 06405**

Dear Ms. Bachman:

This letter is to confirm that all construction activity has been completed. Pursuant to the Connecticut Siting Council approval of **EM-SPRINT-014-130313**, this letter is to satisfy item number three of the approval letter that the CSC will be notified in writing within 45 days after completion of construction.

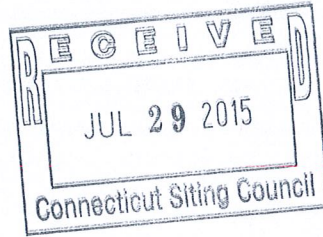
Please contact me if you have any questions.

Sincerely,

A handwritten signature in black ink, appearing to read 'Jeff Barbadora'.

Jeff Barbadora  
Real Estate Specialist  
781-970-0053

December 9, 2013



Wesley Young  
Aero Solutions LLC (Aero)  
550 Flatiron Pkwy, Suite 100  
Boulder, Co 80301  
(720) 279-8969  
[Wyoung@aerosolutionsllc.com](mailto:Wyoung@aerosolutionsllc.com)

Sinnott Gering and Schmitt Towers, INC  
14301 First National Parkway, SE 100  
Omaha, NE 68154  
(402) 507-5170  
[SGS PMI@sgstowers.com](mailto:SGS_PMI@sgstowers.com)

**Subject: Modification Inspection Report**

**Crown Castle Designation:** Crown Castle BU Number: 876321  
Crown Castle Site Name: Branford Banm Tower  
Aero SBA PO Number: 81683

**Engineering Firm Designation:** SGS Project Number 130357

**Site Data:** 150 North Main St.  
Branford, CT 06405  
N 41° 17' 19.0" W -72° 48' 49.9"  
147 Foot Monopole

Dear Mr. Young,

Sinnott Gering and Schmitt Towers, Inc. (SGS) is pleased to submit this "Modification Inspection Report" (MI Report) to Crown Castle and Aero Solutions LLC for the SBA Step Peg Remediation Project to the subject structure. This Modification Inspection (MI) was performed in accordance with Crown Castle ENG-SOW-10007 Modification Inspection SOW, and the Step Peg Remediation Drawings (Rev 2) provided by Aero. The purpose of this MI is to confirm that the modification installation configuration and workmanship are in accordance with the contract document(s) listed in Table 2. The MI is not a review of the adequacy or effectiveness of the modification/reinforcement solution.



Table 1 – General Information

|   | Company | Contact                            | Dates on Site    |
|---|---------|------------------------------------|------------------|
| MI Inspector  | SGS     | Nicholas J. Schmitt,<br>P.E., S.E. | N/A              |
| MI Inspector Field Representative (if applicable)   | SGS     | Daniel Sinnott                     | October 16, 2013 |
| <input checked="" type="checkbox"/> Independent <input type="checkbox"/> EOR <input type="checkbox"/> Turnkey |         |                                    |                  |
| Modification Design EOR   | Aero    | Ben Ude                            | N/A              |
| General Contractor  | Aero    | Wesley Young                       | Unknown          |
| Sub to the General Contractor   | N/A     | N/A                                | N/A              |
| Field CWI for the General Contractor  | N/A     | N/A                                | N/A              |
| Field NDE for the General Contractor  | N/A     | N/A                                | N/A              |

Table 2 – Documents

| Document(s)  | Remarks   | Source                            |
|--|---|-----------------------------------|
| Modification Drawings<br>Date: 7-23-2013<br>EOR: Ben Ude | Creator of Drawings:<br>Aero Solutions LLC<br>Date of Drawings: 7-23-2013 | CCI sites<br>Drawing File:<br>N/A |

Based on our inspection, SGS determines this project:

**X PASSING MI**

The configuration, materials and/or workmanship of the modifications are installed in accordance with the Contract Documents and no deficiencies were found.

**EXECUTIVE SUMMARY**

| <b>MODIFICATION</b>   | <b>CONFIGURATION</b> | <b>MATERIALS</b> | <b>WORKMANSHIP</b> |
|---|----------------------|------------------|--------------------|
| Install New Aero Step Ladders on Flat 12.<br>12' 4"-26' 4", 26' 8"-35' 8" & 49' 2"-58' 1 1/4" | Passing              | Passing          | Passing            |
| <b>Note: Horizontal Spacing Exceeded 24" max. See Section 6.3.2 for EOR Approval E-Mail.</b>  |                      |                  |                    |

All observations were performed after the construction was complete. SGS was not present during the construction phase. The onsite PMI was performed by Daniel Sinnott, SGS.

We at SGS 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,

12/9/2013

Krupakaran Kolandaivelu, PE  
CT PE License No. PEN.0028997



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)

April 5, 2013

David Weisman  
Vertical Development LLC  
7 Sycamore Way, Unit 1  
Branford, CT 06405

RE: **EM-SPRINT-NEXTEL-014-130313** –Sprint Nextel Corporation notice of intent to modify an existing telecommunications facility located at 150 North Main Street, Branford, Connecticut.

Dear Mr. Weisman:

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 reinforcements identified in the drawings entitled, “BU #876321; Branford BANM Tower Branford, CT Monopole Reinforcement and Retrofit Project” included as an attachment to the Structural Modification Report prepared by Paul J. Ford and Company dated September 04, 2012 and stamped by Joseph Jacobs shall be implemented;
- Within 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 structure 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;
- Within 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 March 11, 2013. 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.

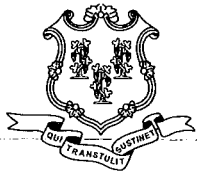
Very truly yours,



Linda Roberts  
Executive Director

LR/CDM/cm

c: The Honorable Anthony "Unk" DaRos, First Selectman, Town of Branford  
Laura Magaraci, Zoning Enforcement Officer, Town of Branford



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)

March 18, 2013

The Honorable Anthony "Unk" DaRos  
First Selectman  
Town of Branford  
P. O. Box 150  
Branford, CT 06405-0150

RE: **EM-SPRINT-NEXTEL-014-130313** –Sprint Nextel Corporation notice of intent to modify an existing telecommunications facility located at 150 North Main Street, Branford, Connecticut.

Dear Mr. DaRos:

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 April 1, 2013.

Thank you for your cooperation and consideration.

Very truly yours,

Linda Roberts  
Executive Director

LR/cm

c: Laura Magaraci, Zoning Enforcement Officer, Town of Branford



2255 Sewell Mill Road, Suite 130  
Marietta, Georgia 30062  
Phone: (678) 444-4463  
Fax: (678) 444-4472  
[www.infinigy.com](http://www.infinigy.com)

EM-SPRINT-NEXTEL-014-130313

March 11, 2013

Connecticut Siting Council  
Ten Franklin Square  
New Britain, CT 06051  
Attn: Ms. Linda Roberts, Executive Director



Re: 150 North Main Street, Branford, CT

CONNECTICUT  
SITING COUNCIL

Dear Ms. Roberts,

On behalf of Sprint Nextel Corporation ("Sprint"), enclosed for filing are an original and two (2) copies of Sprint's Notice of Exempt Modification for Proposed Modifications to an Existing Telecommunications Facility located at the above-referenced site.

I also enclose herewith a check in the amount of \$625.00 representing the fee for the Notice of Exempt Modification.

If you have any questions, please feel free to contact me.

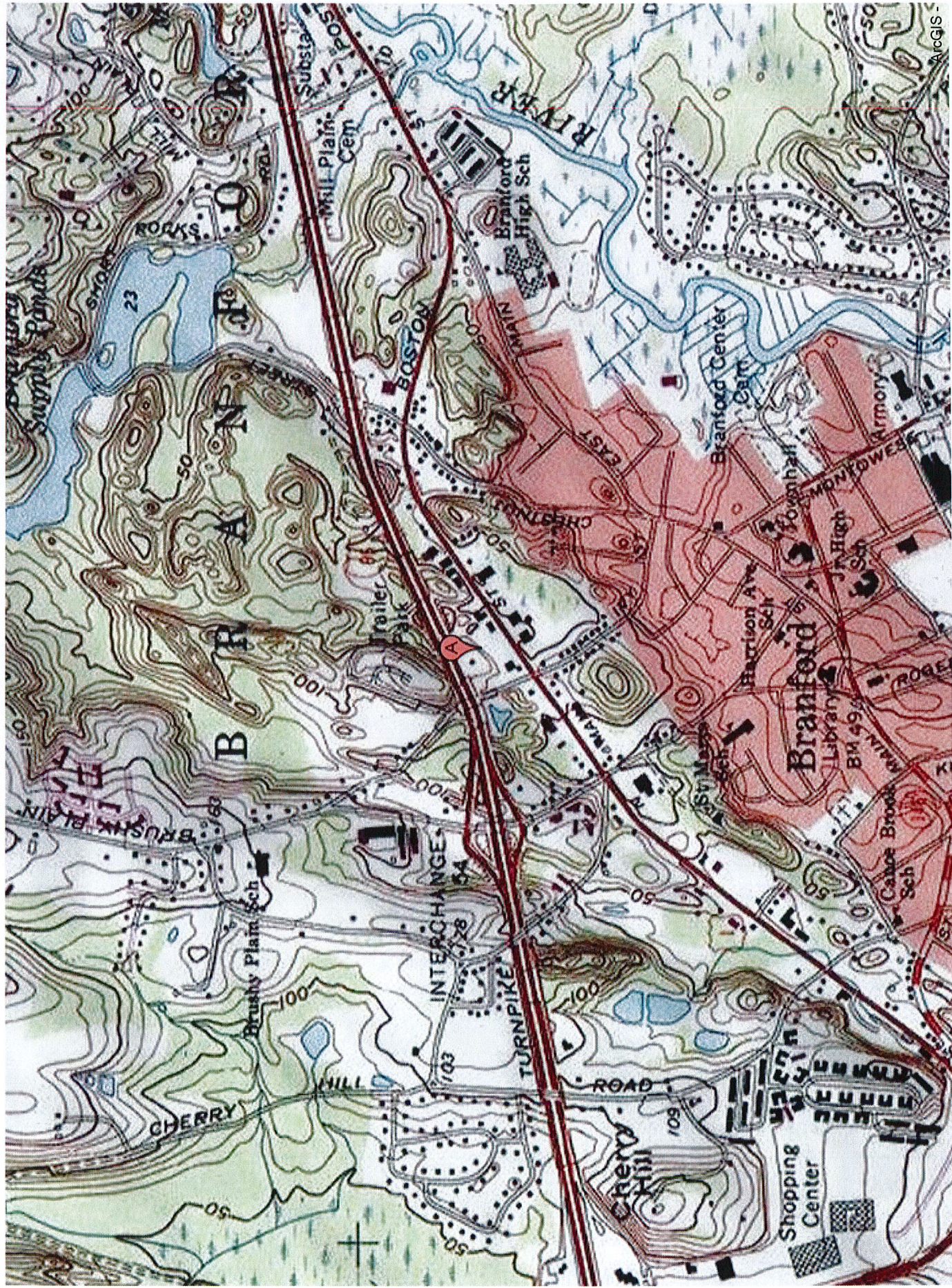
Thank you,

By: David Weisman

Name: David Weisman  
Vertical Development LLC, an authorized representative of Sprint Nextel  
Vertical Development LLC  
7 Sycamore Way, Unit 1  
Branford, CT 06405  
Phone – 401-743-9011  
Fax – 401-633-6202  
[DWeisman@verticaldevelopmentllc.com](mailto:DWeisman@verticaldevelopmentllc.com)

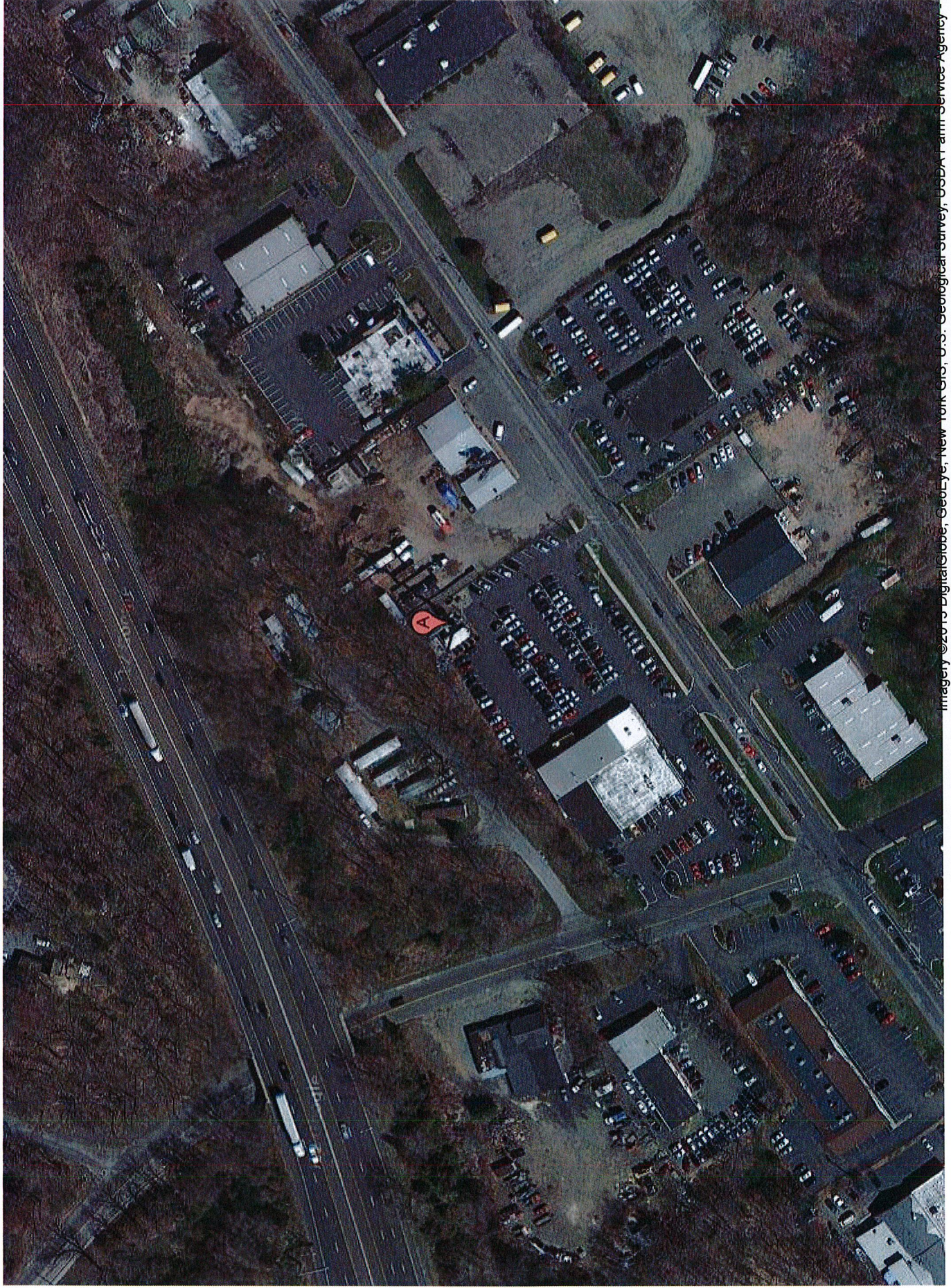
CC: Mr. Anthony DaRos, First Selectman  
Town of Branford  
1019 Main Street  
Branford, CT 06405





150 North Main Street, Branford, CT





Imagery ©2010 DigitalGlobe, GeoEye, New York GIS, U.S. Geological Survey, USDA Farm Service Agency

**150 North Main Street, Branford, CT**



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

**Sprint Existing Facility**

**Site ID: CT03XC040**

**Branford BANM Tower  
150 North Main Street  
Branford, CT 06405**

**August 18, 2012**



August 18, 2012

Sprint  
Attn: RF Engineering Manager  
1 International Boulevard, Suite 800  
Mahwah, NJ 07495

Re: Emissions Values for Site **CT03XC040 – Branford BANM Tower**

EBI Consulting was directed to analyze the proposed upgrades to the existing Sprint facility located at 150 North Main Street, Branford, CT, for the purpose of determining whether the emissions from the proposed Sprint equipment upgrades on this property are within specified federal limits.

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

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

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

Public exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ( $\mu\text{W}/\text{cm}^2$ ). The general population exposure limit for the cellular band is approximately 567  $\mu\text{W}/\text{cm}^2$ , and the general population exposure limit for the PCS band is 1000  $\mu\text{W}/\text{cm}^2$ . Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.

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

Additional details can be found in FCC OET 65.

## **CALCULATIONS**

Calculations were done for the proposed upgrades to the existing Sprint Wireless antenna facility located at 150 North Main Street, Branford, CT, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. All calculations were performed assuming the main lobe of the antenna was focused at the base of the tower to present a worst case scenario. Actual values seen from this site will be dramatically less than those shown in this report. For this report the sample point is the top of a 6 foot person standing at the base of the tower.

For all calculations, all emissions were calculated using the following assumptions:

- 1) 3 CDMA Carriers (1900 MHz) were considered for each sector of the proposed installation.
- 2) 1 CDMA Carrier (850 MHz ) was considered for each sector of the proposed installation
- 3) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.
- 4) For the following calculations the sample point was the top of a six foot person standing at the base of the tower. The actual gain in this direction was used per the manufactures supplied specifications.
- 5) The antenna used in this modeling is the RFS APXVSPP18-C-A20 and the Powerwave P40-16-XLPP-RR-A. This is based on feedback from the carrier with regards to anticipated antenna selection. The RFS APXVSPP18-C-A20 has a 15.9 dBd gain value at its main lobe at 1900 MHz and 13.4 dBd at its main lobe for 850 MHz. The Powerwave P40-16-XLPP-RR-A has a 15.9 dBd gain value at its main lobe at 1900 MHz and 14.2 dBd at its main lobe for 850 MHz. All calculations were performed assuming the main lobe of the antenna was focused at the base of the tower to present a worst case scenario.

- 6) The antenna mounting height centerline of the proposed antennas is **147.4 feet** above ground level (AGL)
- 7) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.

All calculation were done with respect to uncontrolled / general public threshold limits



|              |  |
|--------------|--|
| Site ID      | CT03XC040 - Brantford Bann Tower           |
| Site Address | 150 North Main Street, Brantford, CT 06405 |
| Site Type    | Monopole                                   |

| Sector 1                          |              |                |            |                |            |                               |                    |                 |   |                     |                 |            |                 |                 |           |                     |                          |  |
|-----------------------------------|--------------|----------------|------------|----------------|------------|-------------------------------|--------------------|-----------------|---|---------------------|-----------------|------------|-----------------|-----------------|-----------|---------------------|--------------------------|--|
| Antenna Number                    | Antenna Make | Antenna Model  | Radio Type | Frequency Band | Technology | Power Out Per Channel (Watts) | Number of Channels | Composite Power | Antenna Gain in direction of sample point (dBi) | Antenna Height (ft) | analysis height | Cable Size | Cable Loss (dB) | Additional Loss | ERP       | Power Density Value | Power Density Percentage |  |
| 1a                                | RFS          | APXSPP18-C-A20 | RRH        | 1900 MHz       | CDMA / LTE | 20                            | 3                  | 60              | 15.9  | 147.4               | 141.4           | 1/2"       | 0.5             | 0               | 2080.4211 | 37.40748            | 3.74075%                 |  |
|                                   | RFS          | APXSPP18-C-A20 | RRH        | 850 MHz        | CDMA / LTE | 20                            | 1                  | 20              | 13.4  | 147.4               | 141.4           | 1/2"       | 0.5             | 0               | 389.96892 | 7.011923            | 1.23667%                 |  |
| Sector total Power Density Value: |              |                |            |                |            |                               |                    |                 |   |                     |                 |            | 4.977%          |                 |           |                     |                          |  |

| Sector 2                          |              |                  |            |                |            |                               |                    |                 |   |                     |                 |            |                 |                 |           |                     |                          |  |
|-----------------------------------|--------------|------------------|------------|----------------|------------|-------------------------------|--------------------|-----------------|---|---------------------|-----------------|------------|-----------------|-----------------|-----------|---------------------|--------------------------|--|
| Antenna Number                    | Antenna Make | Antenna Model    | Radio Type | Frequency Band | Technology | Power Out Per Channel (Watts) | Number of Channels | Composite Power | Antenna Gain in direction of sample point (dBi) | Antenna Height (ft) | analysis height | Cable Size | Cable Loss (dB) | Additional Loss | ERP       | Power Density Value | Power Density Percentage |  |
| 2a                                | PowerWave    | P40-16-XLPP-RR-A | RRH        | 1900 MHz       | CDMA / LTE | 20                            | 3                  | 60              | 15.9  | 147.4               | 141.4           | 1/2"       | 0.5             | 0               | 2080.4211 | 37.40748            | 3.74075%                 |  |
| 2a                                | PowerWave    | P40-16-XLPP-RR-A | RRH        | 850 MHz        | CDMA / LTE | 20                            | 1                  | 20              | 14.2  | 147.4               | 141.4           | 1/2"       | 0.5             | 0               | 468.84576 | 8.430186            | 1.48681%                 |  |
| Sector total Power Density Value: |              |                  |            |                |            |                               |                    |                 |   |                     |                 |            | 5.228%          |                 |           |                     |                          |  |

| Sector 3                          |              |                |            |                |            |                               |                    |                 |   |                     |                 |            |                 |                 |           |                     |                          |  |
|-----------------------------------|--------------|----------------|------------|----------------|------------|-------------------------------|--------------------|-----------------|---|---------------------|-----------------|------------|-----------------|-----------------|-----------|---------------------|--------------------------|--|
| Antenna Number                    | Antenna Make | Antenna Model  | Radio Type | Frequency Band | Technology | Power Out Per Channel (Watts) | Number of Channels | Composite Power | Antenna Gain in direction of sample point (dBi) | Antenna Height (ft) | analysis height | Cable Size | Cable Loss (dB) | Additional Loss | ERP       | Power Density Value | Power Density Percentage |  |
| 3a                                | RFS          | APXSPP18-C-A20 | RRH        | 1900 MHz       | CDMA / LTE | 20                            | 3                  | 60              | 15.9  | 147.4               | 141.4           | 1/2"       | 0.5             | 0               | 2080.4211 | 37.40748            | 3.74075%                 |  |
| 3a                                | RFS          | APXSPP18-C-A20 | RRH        | 850 MHz        | CDMA / LTE | 20                            | 1                  | 20              | 13.4  | 147.4               | 141.4           | 1/2"       | 0.5             | 0               | 389.96892 | 7.011923            | 1.23667%                 |  |
| Sector total Power Density Value: |              |                |            |                |            |                               |                    |                 |   |                     |                 |            | 4.977%          |                 |           |                     |                          |  |

| Site Composite MPE %    |                |
|-------------------------|----------------|
| Carrier                 | MPE %          |
| Sprint                  | 15.182%        |
| AT&T                    | 26.180%        |
| Pocket                  | 2.760%         |
| PageNet                 | 1.000%         |
| Nextel                  | 4.170%         |
| Cleanwire               | 0.880%         |
| T-Mobile                |                |
| <b>Total Site MPE %</b> | <b>50.172%</b> |

## Summary

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

The anticipated Maximum Composite contributions from the Sprint facility are **15.182% (4.977% from each sector)** of the allowable FCC established general public limit considering all three sectors simultaneously sampled at the ground level.

The anticipated composite MPE value for this site assuming all carriers present is **50.172%** of the allowable FCC established general public limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions

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



**Scott Heffernan**

RF Engineering Director

---

### EBI Consulting

21 B Street  
Burlington, MA 01803

## **Notice of Exempt Modification**

### **150 North Main Street, Branford, CT**

Sprint Nextel Corporation ("Sprint") submits this Notice of Exempt Modification to the Connecticut Siting Council ("Council") pursuant to Sections 16-50j-73 and 16-50j-72(b) of the Regulations of Connecticut State Agencies ("Regulations") in connection with Sprint's planned modification of antennas and associated equipment on an existing 147' monopole tower located at 150 North Main Street in the Town of Branford. More particularly, Sprint plans to upgrade this site by adding 4G LTE technology to its facilities. The proposed modifications will not increase the tower height, extend the boundaries of the tower site, increase noise levels at the tower site boundary by six (6) decibels, or add radio frequency sending or receiving capability which increases the total radio frequency 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 Connecticut General Statutes § 22a-162.

To better meet the growing voice and data demands of its wireless customers, Sprint is upgrading their network nationwide to include 4G technology, which will provide faster service and better overall performance. Pursuant to the 4G upgrade at this site, Sprint will add antennas, install RRHs and notch filters, and install related equipment to its equipment area within the fenced compound at the base of the tower.

The 147' monopole tower located at 150 North Main Street in the Town of Branford (lat. 41° 17' 18.9", long. 72° 48' 49.9") is owned by Crown Castle. It is in an approx. 850+ square foot fenced compound. Sprint currently has six (6) CDMA antennas (two (2) per sector) with a centerline of 147" installed on the tower. There are also Wimax antennas and microwave dishes installed at that centerline. Sprint's base station equipment is located adjacent to the base of the tower within the fenced compound. A site plan depicting this is attached.

Sprint plans to replace the existing six (6) CDMA antennas with three (3) dual pole antennas (one (1) per sector) and two (2) RFS APXVSPP18-C-A20 antennas (one (1) per sector on two sectors), and one (1) Powerwave P40-16-XLPP-RR-A antenna (one (1) on one sector) all with a centerline of 147". Connected to two (2) RFS

APXVSPP18-C-A20 antennas and one (1) Powerwave P40-16-XLPP-RR-A antenna will be one (1) ALU 800 MHz RRH with one (1) ALU 800 MHz notch filter attached to it and one (1) ALU 1900 MHz RRH, which will be located behind the antenna. After the new antennas have been tested and are deployed on-air, the three (3) dual pole antennas will be removed. The height of the tower will not need to be increased. Sprint also plans to install a new fiber junction box on a new H-frame and new Ciena equipment enclosure into their equipment space within the tower compound's fenced border, and to extend the ice bridge and either retrofit or replace the existing BTS cabinet. The compound's boundaries will not need to be extended. Other than brief, construction-related noise, these modifications will not increase noise levels at the tower site boundary by six (6) decibels.

Crown Castle commissioned Paul J. Ford and Company, Structural Engineers, to perform a structural analysis of the tower to verify that it can support the proposed final loading. The structure and foundation were found to be of "Sufficient Capacity" with the proposed modifications (see the first page of Structural Modification Report, September 4, 2012). The tower is rated at 99.5% of its capacity with the proposed modifications (see Page 5 of Structural Modification Report, September 4, 2012).

The proposed modifications will not add radio frequency sending or receiving capability which increases the total radio frequency 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 Connecticut General Statutes § 22a-162. A radio frequency emissions analysis prepared by EBI Consulting indicates that the proposed final configuration (including other carriers on the tower) will emit 50.172% of the allowable FCC established general public limit sampled at the ground level (see the 5th page of Radio Frequency Emissions Analysis Report - Evaluation of Human Exposure Potential to Non-Ionizing Emissions, August 18, 2012). Emission values for the Sprint antennas have been calculated from the sample point, which is the top of a six foot person standing at the base of the tower. Emissions values for additional carriers were based upon values listed in Connecticut Siting Council active database (see the 3rd and 4th page of Radio Frequency Emissions Analysis Report - Evaluation of Human Exposure Potential to Non-Ionizing Emissions, August 18, 2012).



The information used in the report was analyzed as a percentage of current Maximum Permissible Exposure (% MPE) as listed in the FCC OET Bulletin 65 Edition 97-01 and ANSI/IEEE Std C95.1 (see the second page of Radio Frequency Emissions Analysis Report - Evaluation of Human Exposure Potential to Non-Ionizing Emissions, August 18, 2012).

In conclusion, Sprint's proposed modifications do not constitute a modification subject to the Council's review because Sprint will not change the height of the tower, will not extend the boundaries of the compound, will not increase the noise levels at the site, and will not increase the total radio frequency electromagnetic radiation power density at the site to levels above applicable standards. Therefore, Sprint respectfully requests that the Council acknowledge that this Notice of Exempt Modification meets the Council's exemption criteria.



PAUL J. FORD AND COMPANY  
STRUCTURAL ENGINEERS  
250 East Broad Street • Suite 1500 • Columbus, Ohio 43215-3708

Date: **September 04, 2012**

Steve Tuttle  
Crown Castle USA Inc.  
The Piano Works 349 West Commercial Street  
East Rochester, NY 14445

Paul J Ford and Company  
250 E. Broad Street, Suite 1500  
Columbus, OH 43215  
614.221.6679  
cmccartney@pjfweb.com

**Subject: Structural Modification Report**

**Carrier Designation:** *Sprint PCS Co-Locate*  
**Carrier Site Number:** CT03XC040  
**Carrier Site Name:** N/A

**Crown Castle Designation:**  
**Crown Castle BU Number:** 876321  
**Crown Castle Site Name:** BRANFORD BANM TOWER  
**Crown Castle JDE Job Number:** 189051  
**Crown Castle Work Order Number:** 522965  
**Crown Castle Application Number:** 151484 Rev. 1

**Engineering Firm Designation:** Paul J Ford and Company Project Number: 37512-1607

**Site Data:** 150 North Main Street, BRANFORD, New Haven County, CT  
Latitude 41° 17' 19", Longitude -72° 48' 49.9"  
147 Foot - Monopole Tower

Dear Steve Tuttle,

Paul J Ford and Company 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 484053, in accordance with application 151484, revision 1.

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:

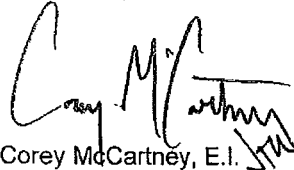
LC4.7: Modified Structure w/ Existing + Reserved + Proposed **Sufficient Capacity**  
Note: See Table I and Table II for the proposed and existing/reserved loading, respectively.

The analysis has been performed in accordance with the TIA/EIA-222-F standard and 2005 CT State Building Code based upon a wind speed of 85 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.

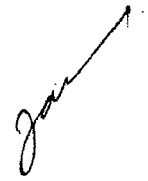
We at Paul J Ford and Company appreciate the opportunity of providing our continuing professional services to you and Crown Castle USA Inc. If you have any questions or need further assistance on this or any other projects please give us a call.

Respectfully submitted by:

  
Corey McCartney, E.I.  
Structural Engineer

tnxTower Report - version 6.0.3.0



  
SEP 06 2012



PAUL J. FORD AND COMPANY  
STRUCTURAL ENGINEERS  
250 East Broad Street • Suite 1500 • Columbus, Ohio 43215-3708

Date: **September 04, 2012**

Steve Tuttle  
Crown Castle USA Inc.  
The Piano Works 349 West Commercial Street  
East Rochester, NY 14445

Paul J Ford and Company  
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**Subject: Structural Modification Report**

**Carrier Designation:** *Sprint PCS Co-Locate*  
**Carrier Site Number:** CT03XC040  
**Carrier Site Name:** N/A

**Crown Castle Designation:**  
**Crown Castle BU Number:** 876321  
**Crown Castle Site Name:** BRANFORD BANM TOWER  
**Crown Castle JDE Job Number:** 189051  
**Crown Castle Work Order Number:** 522965  
**Crown Castle Application Number:** 151484 Rev. 1

**Engineering Firm Designation:** **Paul J Ford and Company Project Number:** 37512-1607

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We at *Paul J Ford and Company* appreciate the opportunity of providing our continuing professional services to you and Crown Castle USA Inc. If you have any questions or need further assistance on this or any other projects please give us a call.

Respectfully submitted by:

Corey McCartney, E.I.  
Structural Engineer

tnxTower Report - version 6.0.3.0



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**1) INTRODUCTION**

This tower is a 147-ft Monopole tower designed by SUMMIT in March of 2009. 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 85 mph with no ice, 37.6 mph with 0.75 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 |
|---------------------|----------------------------|--------------------|----------------------|--------------------------------|----------------------|---------------------|------|
| 147.0               | 147.0                      | 3                  | alcatel lucent       | 1900MHz RRH (65MHz)            | 3                    | 1-1/4               | -    |
|                     |                            | 3                  | alcatel lucent       | 800 EXTERNAL NOTCH FILTER      |                      |                     |      |
|                     |                            | 3                  | alcatel lucent       | 800MHZ RRH                     |                      |                     |      |
|                     |                            | 1                  | powerwave            | P40-16-XLPP-RR-A w/ Mount Pipe |                      |                     |      |
|                     |                            | 9                  | rfs celwave          | ACU-A20-N                      |                      |                     |      |
|                     |                            | 2                  | rfs celwave          | APXVSP18-C-A20 w/ Mount Pipe   |                      |                     |      |

**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 |
|---------------------|----------------------------|--------------------|---------------------------|---------------------------------|----------------------|---------------------|------|
| 147.0               | 149.0                      | 2                  | dragonwave                | A-ANT-23G-2-C                   | 4<br>6*              | 1/2<br>1-5/8        | 1    |
|                     | 147.0                      | 3                  | argus technologies        | LLPX310R w/ Mount Pipe          |                      |                     |      |
|                     |                            | 3                  | samsung                   | FDD_R6_RRH                      |                      |                     |      |
|                     |                            | 2                  | decibel                   | 950F65T2ZE-M w/ Mount Pipe      |                      |                     |      |
|                     |                            | 2                  | decibel                   | DB950F40T2E-M w/ Mount Pipe     |                      |                     |      |
|                     | 2                          | decibel            | DB980H90E-M w/ Mount Pipe | 6                               | 1-5/8                | 3                   |      |
|                     | 1                          | tower mounts       | Platform Mount [LP 404-1] |                                 |                      |                     | -    |
| 131.0               | 132.0                      | 12                 | decibel                   | DB844H90E-XY w/ Mount Pipe      | 12                   | 1-5/8               | 1    |
|                     | 131.0                      | 1                  | tower mounts              | Platform Mount [LP 601-1]       |                      |                     |      |
| 119.0               | 122.0                      | 6                  | remec                     | S20057A-1                       | 12<br>1              | 1-5/8<br>5/16       | 1    |
|                     |                            | 3                  | rfs celwave               | APX16DWV-16DWVS-C w/ Mount Pipe |                      |                     |      |
|                     | 119.0                      | 1                  | tower mounts              | T-Arm Mount [TA 601-3]          |                      |                     |      |



| Mounting Level (ft) | Center Line Elevation (ft) | Number of Antennas | Antenna Manufacturer | Antenna Model                     | Number of Feed Lines | Feed Line Size (in) | Note |
|---------------------|----------------------------|--------------------|----------------------|-----------------------------------|----------------------|---------------------|------|
| 110.0               | 112.0                      | 6                  | ericsson             | RRUS-11                           | 2                    | 7/8<br>1/4          | 2    |
|                     |                            | 1                  | raycap               | DC6-48-60-18-8F                   |                      |                     |      |
|                     |                            | 3                  | kathrein             | 800 10764 w/ Mount Pipe           |                      |                     |      |
|                     |                            | 6                  | powerwave            | 7770.00 w/ Mount Pipe             |                      |                     |      |
|                     | 12                         | powerwave          | LGP2140X             | 12                                | 1-1/4                | 1                   |      |
|                     | 110.0                      | 1                  | tower mounts         | Platform Mount [LP 401-1]         |                      |                     |      |
| 100.0               | 100.0                      | 3                  | rfs celwave          | APXV18-206517S-C<br>w/ Mount Pipe | 6                    | 1-5/8               | 1    |
|                     |                            | 1                  | tower mounts         | Pipe Mount [PM 601-3]             |                      |                     |      |
| 60.0                | 60.0                       | 1                  | tower mounts         | Pipe Mount [PM 501-1]             | -                    | -                   | 1    |
| 49.0                | 50.0                       | 1                  | lucent               | KS24019-L112A                     | 1                    | 1/2                 | 1    |
|                     | 49.0                       | 1                  | tower mounts         | Side Arm Mount<br>[SO 701-1]      |                      |                     |      |

- Notes:  
 1) Existing Equipment  
 2) Reserved Equipment  
 3) Equipment To Be Removed  
 \* Coax bundled in (2) 2-1/2" Conduit on outside of the pole

### 3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

| Document                                 | Remarks                     | Reference | Source   |
|--|-----------------------------|-----------|----------|
| GEOTECHNICAL REPORTS                     | Dr. Clarence Welti, 10/8/96 | 2135657   | CCISITES |
| POST-MODIFICATION INSPECTION             | PJF, 41709-0058, 6/15/99    | 2448190   | CCISITES |
| TOWER FOUNDATION DRAWINGS/DESIGN/SPECS   | PJF, 29299-111, 3/15/99     | 1613620   | CCISITES |
| TOWER MANUFACTURER DRAWINGS              | PJF, 29299-111, 3/15/99     | 1614568   | CCISITES |
| TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA | PJF, 41709-0058, 6/15/09    | 2431042   | CCISITES |
| PROPOSED TOWER MODIFICATION DRAWINGS     | PJF, 37512-1607, 09/04/12   | -         | PJF      |

#### 3.1) Analysis Method

tnxTower (version 6.0.3.0), 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) Monopole was reinforced in conformance with the referenced modification drawings.
- 5) Monopole will be reinforced in conformance with the attached proposed modification drawings.

This analysis may be affected if any assumptions are not valid or have been made in error. Paul J Ford and Company should be notified to determine the effect on the structural integrity of the tower.

### 4) ANALYSIS RESULTS

**Table 4 - Section Capacity (Summary)**

| Section No. | Elevation (ft) | Component Type | Size                     | Critical Element | P (K)  | SF*P_allow (K) | % Capacity | Pass / Fail |
|-------------|----------------|----------------|--------------------------|------------------|--------|----------------|------------|-------------|
| L1          | 147 - 99.5     | Pole           | TP30.313x22x0.25         | 1                | -10.39 | 1135.99        | 74.0       | Pass        |
| L2          | 99.5 - 69.5    | Pole           | TP35.0626x29.1567x0.3125 | 2                | -16.55 | 1817.84        | 99.5       | Pass        |
| L3          | 69.5 - 59      | Pole           | TP36.9x35.0626x0.4301    | 3                | -17.87 | 2267.58        | 87.0       | Pass        |
| L4          | 59 - 57.75     | Pole           | TP36.4938x35.2086x0.375  | 4                | -19.92 | 2267.33        | 95.3       | Pass        |
| L5          | 57.75 - 50.5   | Pole           | TP37.7624x36.4938x0.4555 | 5                | -21.72 | 2766.63        | 85.3       | Pass        |
| L6          | 50.5 - 29.25   | Pole           | TP41.481x37.7624x0.479   | 6                | -26.11 | 2851.53        | 97.0       | Pass        |
| L7          | 29.25 - 24     | Pole           | TP41.6499x39.6043x0.4857 | 7                | -30.14 | 3292.87        | 93.5       | Pass        |
| L8          | 24 - 0         | Pole           | TP45.85x41.6499x0.5728   | 8                | -38.32 | 3864.81        | 94.6       | Pass        |
|             |                |                |                          |                  |        |                | Summary    |             |
|             |                |                |                          |                  |        | Pole (L2)      | 99.5       | Pass        |
|             |                |                |                          |                  |        | Rating =       | 99.5       | Pass        |

**Table 5 - Tower Component Stresses vs. Capacity - LC4.7**

| Notes | Component                        | Elevation (ft) | % Capacity | Pass / Fail |
|-------|----------------------------------|----------------|------------|-------------|
| 1     | Anchor Rods                      | 0              | 93.4       | Pass        |
| 1     | Base Plate                       | 0              | 75.9       | Pass        |
| 1     | Base Foundation Steel            | 0              | 85.0       | Pass        |
| 1     | Base Foundation Soil Interaction | 0              | 99.0       | Pass        |

|   |              |
|---|--------------|
| <b>Structure Rating (max from all components) =</b> | <b>99.5%</b> |
|---|--------------|

Notes:

- 1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.

### 4.1) Recommendations

See the attached modification drawings



**APPENDIX A**

**TNXTOWER OUTPUT**

**Tower Input Data**

There is a pole section.

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

The following design criteria apply:

- 1) Tower is located in New Haven County, Connecticut.
- 2) Basic wind speed of 85 mph.
- 3) Nominal ice thickness of 0.7500 in.
- 4) Ice thickness is considered to increase with height.
- 5) Ice density of 56.00 pcf.
- 6) A wind speed of 38 mph is used in combination with ice.
- 7) Temperature drop of 50 °F.
- 8) Deflections calculated using a wind speed of 50 mph.
- 9) A non-linear (P-delta) analysis was used.
- 10) Pressures are calculated at each section.
- 11) Stress ratio used in pole design is 1.333.
- 12) Local bending stresses due to climbing loads, feedline supports, and appurtenance mounts are not considered.

**Options**

- |  |  |   |
|--|--|---|
| <ul style="list-style-type: none"> <li>Consider Moments - Legs</li> <li>Consider Moments - Horizontals</li> <li>Consider Moments - Diagonals</li> <li>Use Moment Magnification</li> <li>√ Use Code Stress Ratios</li> <li>√ Use Code Safety Factors - Guys</li> <li>√ Escalate Ice</li> <li>Always Use Max Kz</li> <li>Use Special Wind Profile</li> <li>Include Bolts In Member Capacity</li> <li>Leg Bolts Are At Top Of Section</li> <li>Secondary Horizontal Braces Leg</li> <li>Use Diamond Inner Bracing (4 Sided)</li> <li>Add IBC .6D+W Combination</li> </ul> | <ul style="list-style-type: none"> <li>Distribute Leg Loads As Uniform</li> <li>Assume Legs Pinned</li> <li>√ Assume Rigid Index Plate</li> <li>√ Use Clear Spans For Wind Area</li> <li>Use Clear Spans For KL/r</li> <li>Retention Guys To Initial Tension</li> <li>√ Bypass Mast Stability Checks</li> <li>√ Use Azimuth Dish Coefficients</li> <li>√ Project Wind Area of Appurt.</li> <li>√ Autocalc Torque Arm Areas</li> <li>SR Members Have Cut Ends</li> <li>Sort Capacity Reports By Component</li> <li>Triangulate Diamond Inner Bracing</li> </ul> | <ul style="list-style-type: none"> <li>√ Treat Feedline Bundles As Cylinder</li> <li>Use ASCE 10 X-Brace Ly Rules</li> <li>Calculate Redundant Bracing Forces</li> <li>Ignore Redundant Members in FEA</li> <li>SR Leg Bolts Resist Compression</li> <li>All Leg Panels Have Same Allowable</li> <li>Offset Girt At Foundation</li> <li>√ Consider Feedline Torque</li> <li>Include Angle Block Shear Check</li> <li style="padding-left: 20px;">Poles</li> <li>√ Include Shear-Torsion Interaction</li> <li>Always Use Sub-Critical Flow</li> <li>Use Top Mounted Sockets</li> </ul> |
|--|--|---|

**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      | 147.0000-<br>99.5000 | 47.5000                 | 3.75                   | 12                    | 22.0000               | 30.3130                  | 0.2500                  | 1.0000               | A607-60<br>(60 ksi)         |
| L2      | 99.5000-<br>69.5000  | 33.7500                 | 0.00                   | 12                    | 29.1567               | 35.0626                  | 0.3125                  | 1.2500               | A607-65<br>(65 ksi)         |
| L3      | 69.5000-<br>59.0000  | 10.5000                 | 4.75                   | 12                    | 35.0626               | 36.9000                  | 0.4301                  | 1.7205               | Reinf 57.44 ksi<br>(57 ksi) |
| L4      | 59.0000-<br>57.7500  | 6.0000                  | 0.00                   | 12                    | 35.2086               | 36.4937                  | 0.3750                  | 1.5000               | A607-65<br>(65 ksi)         |
| L5      | 57.7500-<br>50.5000  | 7.2500                  | 0.00                   | 12                    | 36.4937               | 37.7624                  | 0.4555                  | 1.8219               | Reinf 63.22 ksi<br>(63 ksi) |
| L6      | 50.5000-<br>29.2500  | 21.2500                 | 5.25                   | 12                    | 37.7624               | 41.4810                  | 0.4790                  | 1.9160               | Reinf 57.67 ksi<br>(58 ksi) |
| L7      | 29.2500-<br>24.0000  | 10.5000                 | 0.00                   | 12                    | 39.6043               | 41.6499                  | 0.4857                  | 1.9428               | Reinf 63.95 ksi<br>(64 ksi) |
| L8      | 24.0000-<br>0.0000   | 24.0000                 |                        | 12                    | 41.6499               | 45.8500                  | 0.5728                  | 2.2914               | Reinf 57.86 ksi<br>(58 ksi) |

### 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> | I/Q<br>in <sup>2</sup> | w<br>in | w/t    |
|---------|----------------|-------------------------|----------------------|---------|---------|------------------------|----------------------|------------------------|---------|--------|
| L1      | 22.7761        | 17.5087                 | 1057.2060            | 7.7865  | 11.3960 | 92.7699                | 2142.1860            | 8.6173                 | 5.2260  | 20.904 |
|         | 31.3823        | 24.2007                 | 2791.7645            | 10.7626 | 15.7021 | 177.7952               | 5656.8718            | 11.9109                | 7.4539  | 29.816 |
| L2      | 30.8646        | 29.0245                 | 3082.2495            | 10.3262 | 15.1032 | 204.0796               | 6245.4731            | 14.2850                | 6.9765  | 22.325 |
|         | 36.2995        | 34.9673                 | 5389.6479            | 12.4405 | 18.1624 | 296.7470               | 10920.8879           | 17.2098                | 8.5593  | 27.39  |
| L3      | 36.2995        | 47.9655                 | 7343.1536            | 12.3984 | 18.1624 | 404.3045               | 14879.2200           | 23.6072                | 8.2441  | 19.167 |
|         | 38.2017        | 50.5103                 | 8575.0066            | 13.0562 | 19.1142 | 448.6197               | 17375.2881           | 24.8596                | 8.7365  | 20.312 |
| L4      | 37.5039        | 42.0615                 | 6514.2838            | 12.4704 | 18.2380 | 357.1812               | 13199.7051           | 20.7014                | 8.4309  | 22.482 |
|         | 37.7811        | 43.6134                 | 7262.2505            | 12.9305 | 18.9038 | 384.1696               | 14715.2884           | 21.4652                | 8.7753  | 23.401 |
| L5      | 37.7811        | 52.8554                 | 8761.9937            | 12.9017 | 18.9038 | 463.5053               | 17754.1748           | 26.0138                | 8.5596  | 18.793 |
|         | 39.0945        | 54.7161                 | 9720.3157            | 13.3559 | 19.5609 | 496.9248               | 19695.9949           | 26.9296                | 8.8996  | 19.539 |
| L6      | 39.0945        | 57.5040                 | 10202.7254           | 13.3475 | 19.5609 | 521.5867               | 20673.4877           | 28.3017                | 8.8366  | 18.448 |
|         | 42.9443        | 63.2394                 | 13570.1207           | 14.6787 | 21.4872 | 631.5456               | 27496.7436           | 31.1245                | 9.8332  | 20.529 |
| L7      | 42.0603        | 61.1810                 | 11950.0423           | 14.0045 | 20.5150 | 582.5015               | 24214.0256           | 30.1114                | 9.3123  | 19.172 |
|         | 43.1191        | 64.3802                 | 13924.3946           | 14.7368 | 21.5746 | 645.4060               | 28214.5986           | 31.6860                | 9.8605  | 20.301 |
| L8      | 43.1191        | 75.7684                 | 16318.1885           | 14.7056 | 21.5746 | 756.3602               | 33065.0740           | 37.2909                | 9.6270  | 16.806 |
|         | 47.4674        | 83.5158                 | 21853.0818           | 16.2092 | 23.7503 | 920.1181               | 44280.2685           | 41.1039                | 10.7526 | 18.771 |

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

| Description                | Face or Leg | Allow Shield | Component Type     | Placement<br>ft   | Total Number |          | C <sub>A</sub> A <sub>A</sub><br>ft <sup>2</sup> /ft | Weight<br>plf |
|----------------------------|-------------|--------------|--------------------|-------------------|--------------|----------|--|---------------|
| 7983A(1/2")                | C           | No           | CaAa (Out Of Face) | 147.0000 - 0.0000 | 4            | No Ice   | 0.0000   | 0.08          |
|                            |             |              |                    |                   |              | 1/2" Ice | 0.0000   | 0.74          |
|                            |             |              |                    |                   |              | 1" Ice   | 0.0000   | 2.01          |
|                            |             |              |                    |                   |              | 2" Ice   | 0.0000   | 6.39          |
|                            |             |              |                    |                   |              | 4" Ice   | 0.0000   | 22.47         |
| 9207(5/16")                | C           | No           | CaAa (Out Of Face) | 147.0000 - 0.0000 | 6            | No Ice   | 0.0000   | 0.60          |
|                            |             |              |                    |                   |              | 1/2" Ice | 0.0000   | 1.11          |
|                            |             |              |                    |                   |              | 1" Ice   | 0.0000   | 2.22          |
|                            |             |              |                    |                   |              | 2" Ice   | 0.0000   | 6.29          |
|                            |             |              |                    |                   |              | 4" Ice   | 0.0000   | 21.76         |
| HB114-1-0813U4-M5J(1 1/4") | C           | No           | CaAa (Out Of Face) | 147.0000 - 0.0000 | 3            | No Ice   | 0.0000   | 1.20          |
|                            |             |              |                    |                   |              | 1/2" Ice | 0.0000   | 2.45          |
|                            |             |              |                    |                   |              | 1" Ice   | 0.0000   | 4.30          |
|                            |             |              |                    |                   |              | 2" Ice   | 0.0000   | 9.85          |
|                            |             |              |                    |                   |              | 4" Ice   | 0.0000   | 28.27         |
| 2" Rigid Conduit           | C           | No           | CaAa (Out Of Face) | 147.0000 - 0.0000 | 1            | No Ice   | 0.2000   | 2.80          |
|                            |             |              |                    |                   |              | 1/2" Ice | 0.3000   | 4.33          |
|                            |             |              |                    |                   |              | 1" Ice   | 0.4000   | 6.47          |
|                            |             |              |                    |                   |              | 2" Ice   | 0.6000   | 12.57         |
|                            |             |              |                    |                   |              | 4" Ice   | 1.0000   | 32.12         |
| 2" Rigid Conduit           | C           | No           | CaAa (Out Of Face) | 147.0000 - 0.0000 | 1            | No Ice   | 0.0000   | 2.80          |
|                            |             |              |                    |                   |              | 1/2" Ice | 0.0000   | 4.33          |
|                            |             |              |                    |                   |              | 1" Ice   | 0.0000   | 6.47          |
|                            |             |              |                    |                   |              | 2" Ice   | 0.0000   | 12.57         |
|                            |             |              |                    |                   |              | 4" Ice   | 0.0000   | 32.12         |
| ***                        |             |              |                    |                   |              |          |  |               |
| LDF7-50A(1-5/8")           | C           | No           | Inside Pole        | 131.0000 - 0.0000 | 12           | No Ice   | 0.0000   | 0.82          |
|                            |             |              |                    |                   |              | 1/2" Ice | 0.0000   | 0.82          |
|                            |             |              |                    |                   |              | 1" Ice   | 0.0000   | 0.82          |
|                            |             |              |                    |                   |              | 2" Ice   | 0.0000   | 0.82          |

| Description               | Face or Leg | Allow Shield | Component Type     | Placement<br>ft   | Total Number | C <sub>A</sub> A <sub>A</sub> |        | Weight |
|---------------------------|-------------|--------------|--------------------|-------------------|--------------|-------------------------------|--------|--------|
|                           |             |              |                    |                   |              | f <sup>2</sup> /ft            | plf    |        |
|                           |             |              |                    |                   |              | 4" Ice                        | 0.0000 | 0.82   |
| ***<br>LDF7-50A(1-5/8")   | C           | No           | Inside Pole        | 119.0000 - 0.0000 | 12           | No Ice                        | 0.0000 | 0.82   |
|                           |             |              |                    |                   |              | 1/2" Ice                      | 0.0000 | 0.82   |
|                           |             |              |                    |                   |              | 1" Ice                        | 0.0000 | 0.82   |
|                           |             |              |                    |                   |              | 2" Ice                        | 0.0000 | 0.82   |
|                           |             |              |                    |                   |              | 4" Ice                        | 0.0000 | 0.82   |
| 860-10025(5/16)           | C           | No           | Inside Pole        | 119.0000 - 0.0000 | 1            | No Ice                        | 0.0000 | 0.00   |
|                           |             |              |                    |                   |              | 1/2" Ice                      | 0.0000 | 0.00   |
|                           |             |              |                    |                   |              | 1" Ice                        | 0.0000 | 0.00   |
|                           |             |              |                    |                   |              | 2" Ice                        | 0.0000 | 0.00   |
|                           |             |              |                    |                   |              | 4" Ice                        | 0.0000 | 0.00   |
| ***<br>LDF6-50A(1-1/4")   | C           | No           | Inside Pole        | 110.0000 - 0.0000 | 12           | No Ice                        | 0.0000 | 0.66   |
|                           |             |              |                    |                   |              | 1/2" Ice                      | 0.0000 | 0.66   |
|                           |             |              |                    |                   |              | 1" Ice                        | 0.0000 | 0.66   |
|                           |             |              |                    |                   |              | 2" Ice                        | 0.0000 | 0.66   |
|                           |             |              |                    |                   |              | 4" Ice                        | 0.0000 | 0.66   |
| 6-8AWG 3 PAIR( 7/8")      | C           | No           | Inside Pole        | 110.0000 - 0.0000 | 2            | No Ice                        | 0.0000 | 0.68   |
|                           |             |              |                    |                   |              | 1/2" Ice                      | 0.0000 | 0.68   |
|                           |             |              |                    |                   |              | 1" Ice                        | 0.0000 | 0.68   |
|                           |             |              |                    |                   |              | 2" Ice                        | 0.0000 | 0.68   |
|                           |             |              |                    |                   |              | 4" Ice                        | 0.0000 | 0.68   |
| A-DQZNB2Yn1750 N( 1/4")   | C           | No           | Inside Pole        | 110.0000 - 0.0000 | 1            | No Ice                        | 0.0000 | 0.03   |
|                           |             |              |                    |                   |              | 1/2" Ice                      | 0.0000 | 0.03   |
|                           |             |              |                    |                   |              | 1" Ice                        | 0.0000 | 0.03   |
|                           |             |              |                    |                   |              | 2" Ice                        | 0.0000 | 0.03   |
|                           |             |              |                    |                   |              | 4" Ice                        | 0.0000 | 0.03   |
| ***<br>CR 50 1873(1-5/8") | C           | No           | CaAa (Out Of Face) | 100.0000 - 0.0000 | 1            | No Ice                        | 0.1980 | 0.83   |
|                           |             |              |                    |                   |              | 1/2" Ice                      | 0.2980 | 2.34   |
|                           |             |              |                    |                   |              | 1" Ice                        | 0.3980 | 4.47   |
|                           |             |              |                    |                   |              | 2" Ice                        | 0.5980 | 10.55  |
|                           |             |              |                    |                   |              | 4" Ice                        | 0.9980 | 30.05  |
| CR 50 1873(1-5/8")        | C           | No           | CaAa (Out Of Face) | 100.0000 - 0.0000 | 4            | No Ice                        | 0.0000 | 0.83   |
|                           |             |              |                    |                   |              | 1/2" Ice                      | 0.0000 | 2.34   |
|                           |             |              |                    |                   |              | 1" Ice                        | 0.0000 | 4.47   |
|                           |             |              |                    |                   |              | 2" Ice                        | 0.0000 | 10.55  |
|                           |             |              |                    |                   |              | 4" Ice                        | 0.0000 | 30.05  |
| ***<br>LDF4-50A(1/2")     | C           | No           | Inside Pole        | 49.0000 - 0.0000  | 1            | No Ice                        | 0.0000 | 0.15   |
|                           |             |              |                    |                   |              | 1/2" Ice                      | 0.0000 | 0.15   |
|                           |             |              |                    |                   |              | 1" Ice                        | 0.0000 | 0.15   |
|                           |             |              |                    |                   |              | 2" Ice                        | 0.0000 | 0.15   |
|                           |             |              |                    |                   |              | 4" Ice                        | 0.0000 | 0.15   |
| ***<br>Aero MP3-04        | C           | No           | CaAa (Out Of Face) | 25.5000 - 0.5000  | 1            | No Ice                        | 0.2690 | 0.00   |
|                           |             |              |                    |                   |              | 1/2" Ice                      | 0.3801 | 0.00   |
|                           |             |              |                    |                   |              | 1" Ice                        | 0.4913 | 0.00   |
|                           |             |              |                    |                   |              | 2" Ice                        | 0.7135 | 0.00   |
|                           |             |              |                    |                   |              | 4" Ice                        | 1.1579 | 0.00   |
| Aero MP3-04               | C           | No           | CaAa (Out Of Face) | 52.0000 - 32.0000 | 1            | No Ice                        | 0.2690 | 0.00   |
|                           |             |              |                    |                   |              | 1/2" Ice                      | 0.3801 | 0.00   |
|                           |             |              |                    |                   |              | 1" Ice                        | 0.4913 | 0.00   |
|                           |             |              |                    |                   |              | 2" Ice                        | 0.7135 | 0.00   |
|                           |             |              |                    |                   |              | 4" Ice                        | 1.1579 | 0.00   |
| Aero MP3-04               | C           | No           | CaAa (Out Of Face) | 71.0000 - 61.0000 | 1            | No Ice                        | 0.2690 | 0.00   |
|                           |             |              |                    |                   |              | 1/2" Ice                      | 0.3801 | 0.00   |
|                           |             |              |                    |                   |              | 1" Ice                        | 0.4913 | 0.00   |
|                           |             |              |                    |                   |              | 2" Ice                        | 0.7135 | 0.00   |
|                           |             |              |                    |                   |              | 4" Ice                        | 1.1579 | 0.00   |



### Feed Line/Linear Appurtenances Section Areas

| Tower<br>Section<br>n | Tower<br>Elevation<br>ft | Face | $A_R$<br>ft <sup>2</sup> | $A_F$<br>ft <sup>2</sup> | $C_{AA}$<br>In Face<br>ft <sup>2</sup> | $C_{AA}$<br>Out Face<br>ft <sup>2</sup> | Weight<br>K |
|-----------------------|--------------------------|------|--------------------------|--------------------------|--|---|-------------|
| L1                    | 147.0000-<br>99.5000     | A    | 0.000                    | 0.000                    | 0.000                                  | 0.000                                   | 0.00        |
|                       |                          | B    | 0.000                    | 0.000                    | 0.000                                  | 0.000                                   | 0.00        |
|                       |                          | C    | 0.000                    | 0.000                    | 0.000                                  | 9.599                                   | 1.23        |
| L2                    | 99.5000-69.5000          | A    | 0.000                    | 0.000                    | 0.000                                  | 0.000                                   | 0.00        |
|                       |                          | B    | 0.000                    | 0.000                    | 0.000                                  | 0.000                                   | 0.00        |
|                       |                          | C    | 0.000                    | 0.000                    | 0.000                                  | 12.344                                  | 1.39        |
| L3                    | 69.5000-59.0000          | A    | 0.000                    | 0.000                    | 0.000                                  | 0.000                                   | 0.00        |
|                       |                          | B    | 0.000                    | 0.000                    | 0.000                                  | 0.000                                   | 0.00        |
|                       |                          | C    | 0.000                    | 0.000                    | 0.000                                  | 6.466                                   | 0.49        |
| L4                    | 59.0000-57.7500          | A    | 0.000                    | 0.000                    | 0.000                                  | 0.000                                   | 0.00        |
|                       |                          | B    | 0.000                    | 0.000                    | 0.000                                  | 0.000                                   | 0.00        |
|                       |                          | C    | 0.000                    | 0.000                    | 0.000                                  | 0.498                                   | 0.06        |
| L5                    | 57.7500-50.5000          | A    | 0.000                    | 0.000                    | 0.000                                  | 0.000                                   | 0.00        |
|                       |                          | B    | 0.000                    | 0.000                    | 0.000                                  | 0.000                                   | 0.00        |
|                       |                          | C    | 0.000                    | 0.000                    | 0.000                                  | 3.289                                   | 0.34        |
| L6                    | 50.5000-29.2500          | A    | 0.000                    | 0.000                    | 0.000                                  | 0.000                                   | 0.00        |
|                       |                          | B    | 0.000                    | 0.000                    | 0.000                                  | 0.000                                   | 0.00        |
|                       |                          | C    | 0.000                    | 0.000                    | 0.000                                  | 13.435                                  | 0.99        |
| L7                    | 29.2500-24.0000          | A    | 0.000                    | 0.000                    | 0.000                                  | 0.000                                   | 0.00        |
|                       |                          | B    | 0.000                    | 0.000                    | 0.000                                  | 0.000                                   | 0.00        |
|                       |                          | C    | 0.000                    | 0.000                    | 0.000                                  | 2.493                                   | 0.24        |
| L8                    | 24.0000-0.0000           | A    | 0.000                    | 0.000                    | 0.000                                  | 0.000                                   | 0.00        |
|                       |                          | B    | 0.000                    | 0.000                    | 0.000                                  | 0.000                                   | 0.00        |
|                       |                          | C    | 0.000                    | 0.000                    | 0.000                                  | 15.874                                  | 1.11        |

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

| Tower<br>Section<br>n | Tower<br>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> | $C_{AA}$<br>In Face<br>ft <sup>2</sup> | $C_{AA}$<br>Out Face<br>ft <sup>2</sup> | Weight<br>K |
|-----------------------|--------------------------|-------------------|------------------------|--------------------------|--------------------------|--|---|-------------|
| L1                    | 147.0000-<br>99.5000     | A                 | 0.878                  | 0.000                    | 0.000                    | 0.000                                  | 0.000                                   | 0.00        |
|                       |                          | B                 |                        | 0.000                    | 0.000                    | 0.000                                  | 0.000                                   | 0.00        |
|                       |                          | C                 |                        | 0.000                    | 0.000                    | 0.000                                  | 18.025                                  | 2.60        |
| L2                    | 99.5000-69.5000          | A                 | 0.839                  | 0.000                    | 0.000                    | 0.000                                  | 0.000                                   | 0.00        |
|                       |                          | B                 |                        | 0.000                    | 0.000                    | 0.000                                  | 0.000                                   | 0.00        |
|                       |                          | C                 |                        | 0.000                    | 0.000                    | 0.000                                  | 23.168                                  | 2.72        |
| L3                    | 69.5000-59.0000          | A                 | 0.812                  | 0.000                    | 0.000                    | 0.000                                  | 0.000                                   | 0.00        |
|                       |                          | B                 |                        | 0.000                    | 0.000                    | 0.000                                  | 0.000                                   | 0.00        |
|                       |                          | C                 |                        | 0.000                    | 0.000                    | 0.000                                  | 11.412                                  | 0.91        |
| L4                    | 59.0000-57.7500          | A                 | 0.803                  | 0.000                    | 0.000                    | 0.000                                  | 0.000                                   | 0.00        |
|                       |                          | B                 |                        | 0.000                    | 0.000                    | 0.000                                  | 0.000                                   | 0.00        |
|                       |                          | C                 |                        | 0.000                    | 0.000                    | 0.000                                  | 0.904                                   | 0.11        |
| L5                    | 57.7500-50.5000          | A                 | 0.796                  | 0.000                    | 0.000                    | 0.000                                  | 0.000                                   | 0.00        |
|                       |                          | B                 |                        | 0.000                    | 0.000                    | 0.000                                  | 0.000                                   | 0.00        |
|                       |                          | C                 |                        | 0.000                    | 0.000                    | 0.000                                  | 5.862                                   | 0.62        |
| L6                    | 50.5000-29.2500          | A                 | 0.767                  | 0.000                    | 0.000                    | 0.000                                  | 0.000                                   | 0.00        |
|                       |                          | B                 |                        | 0.000                    | 0.000                    | 0.000                                  | 0.000                                   | 0.00        |
|                       |                          | C                 |                        | 0.000                    | 0.000                    | 0.000                                  | 23.105                                  | 1.78        |
| L7                    | 29.2500-24.0000          | A                 | 0.750                  | 0.000                    | 0.000                    | 0.000                                  | 0.000                                   | 0.00        |
|                       |                          | B                 |                        | 0.000                    | 0.000                    | 0.000                                  | 0.000                                   | 0.00        |
|                       |                          | C                 |                        | 0.000                    | 0.000                    | 0.000                                  | 4.359                                   | 0.44        |
| L8                    | 24.0000-0.0000           | A                 | 0.750                  | 0.000                    | 0.000                    | 0.000                                  | 0.000                                   | 0.00        |
|                       |                          | B                 |                        | 0.000                    | 0.000                    | 0.000                                  | 0.000                                   | 0.00        |
|                       |                          | C                 |                        | 0.000                    | 0.000                    | 0.000                                  | 26.991                                  | 1.98        |

### Feed Line Center of Pressure

| Section | Elevation<br>ft  | $CP_x$<br>in | $CP_z$<br>in | $CP_x$<br>Ice<br>in | $CP_z$<br>Ice<br>in |
|---------|------------------|--------------|--------------|---------------------|---------------------|
| L1      | 147.0000-99.5000 | -0.2406      | 0.1389       | -0.3978             | 0.2297              |
| L2      | 99.5000-69.5000  | -0.4650      | 0.2685       | -0.7505             | 0.4333              |
| L3      | 69.5000-59.0000  | -0.6625      | 0.3825       | -1.0014             | 0.5782              |

| Section | Elevation       | CP <sub>x</sub> | CP <sub>z</sub> | CP <sub>x</sub> | CP <sub>z</sub> |
|---------|-----------------|-----------------|-----------------|-----------------|-----------------|
|         | ft              | in              | in              | Ice<br>in       | Ice<br>in       |
| L4      | 59.0000-57.7500 | -0.4570         | 0.2638          | -0.7318         | 0.4225          |
| L5      | 57.7500-50.5000 | -0.5148         | 0.2972          | -0.8066         | 0.4657          |
| L6      | 50.5000-29.2500 | -0.6877         | 0.3971          | -1.0303         | 0.5948          |
| L7      | 29.2500-24.0000 | -0.5426         | 0.3133          | -0.8441         | 0.4874          |
| L8      | 24.0000-0.0000  | -0.7270         | 0.4197          | -1.0876         | 0.6279          |

### Discrete Tower Loads

| Description                      | Face<br>or<br>Leg | Offset<br>Type | Offsets:              |            | Azimuth<br>Adjustmen<br>t | Placement<br><br>ft | C <sub>AA</sub><br>Front | C <sub>AA</sub><br>Side | Weight<br><br>K |      |
|----------------------------------|-------------------|----------------|-----------------------|------------|---------------------------|---------------------|--------------------------|-------------------------|-----------------|------|
|                                  |                   |                | Horz<br>Lateral<br>ft | Vert<br>ft |                           |                     |                          |                         |                 |      |
| LLPX310R w/ Mount Pipe           | A                 | From Leg       | 4.0000                | 0.00       | 0.00                      | 147.0000            | No Ice                   | 4.9623                  | 2.8484          | 0.04 |
|                                  |                   |                |                       |            |                           |                     | 1/2"                     | 5.3512                  | 3.3668          | 0.08 |
|                                  |                   |                |                       |            |                           |                     | Ice                      | 5.7501                  | 3.9019          | 0.12 |
|                                  |                   |                |                       |            |                           |                     | 1" Ice                   | 6.5777                  | 5.0799          | 0.23 |
|                                  |                   |                |                       |            |                           |                     | 2" Ice                   | 8.3714                  | 7.8368          | 0.53 |
| FDD_R6_RRH                       | A                 | From Leg       | 4.0000                | 0.00       | 0.00                      | 147.0000            | No Ice                   | 1.7889                  | 0.7778          | 0.03 |
|                                  |                   |                |                       |            |                           |                     | 1/2"                     | 1.9715                  | 0.9182          | 0.04 |
|                                  |                   |                |                       |            |                           |                     | Ice                      | 2.1627                  | 1.0673          | 0.06 |
|                                  |                   |                |                       |            |                           |                     | 1" Ice                   | 2.5710                  | 1.3914          | 0.09 |
|                                  |                   |                |                       |            |                           |                     | 2" Ice                   | 3.4914                  | 2.1432          | 0.20 |
| 1900MHz RRH (65MHz)              | A                 | From Leg       | 4.0000                | 0.00       | 0.00                      | 147.0000            | No Ice                   | 2.6979                  | 2.7708          | 0.06 |
|                                  |                   |                |                       |            |                           |                     | 1/2"                     | 2.9362                  | 3.0111          | 0.08 |
|                                  |                   |                |                       |            |                           |                     | Ice                      | 3.1832                  | 3.2600          | 0.11 |
|                                  |                   |                |                       |            |                           |                     | 1" Ice                   | 3.7030                  | 3.7837          | 0.18 |
|                                  |                   |                |                       |            |                           |                     | 2" Ice                   | 4.8463                  | 4.9348          | 0.35 |
| 800 EXTERNAL NOTCH<br>FILTER     | A                 | From Leg       | 4.0000                | 0.00       | 0.00                      | 147.0000            | No Ice                   | 0.7701                  | 0.3747          | 0.01 |
|                                  |                   |                |                       |            |                           |                     | 1/2"                     | 0.8898                  | 0.4647          | 0.02 |
|                                  |                   |                |                       |            |                           |                     | Ice                      | 1.0181                  | 0.5634          | 0.02 |
|                                  |                   |                |                       |            |                           |                     | 1" Ice                   | 1.3007                  | 0.7868          | 0.04 |
|                                  |                   |                |                       |            |                           |                     | 2" Ice                   | 1.9696                  | 1.3372          | 0.11 |
| 800MHZ RRH                       | A                 | From Leg       | 4.0000                | 0.00       | 0.00                      | 147.0000            | No Ice                   | 2.4899                  | 2.0685          | 0.05 |
|                                  |                   |                |                       |            |                           |                     | 1/2"                     | 2.7061                  | 2.2705          | 0.07 |
|                                  |                   |                |                       |            |                           |                     | Ice                      | 2.9310                  | 2.4812          | 0.10 |
|                                  |                   |                |                       |            |                           |                     | 1" Ice                   | 3.4068                  | 2.9284          | 0.16 |
|                                  |                   |                |                       |            |                           |                     | 2" Ice                   | 4.4620                  | 3.9265          | 0.32 |
| (3) ACU-A20-N                    | A                 | From Leg       | 4.0000                | 0.00       | 0.00                      | 147.0000            | No Ice                   | 0.0778                  | 0.1361          | 0.00 |
|                                  |                   |                |                       |            |                           |                     | 1/2"                     | 0.1210                  | 0.1890          | 0.00 |
|                                  |                   |                |                       |            |                           |                     | Ice                      | 0.1728                  | 0.2506          | 0.00 |
|                                  |                   |                |                       |            |                           |                     | 1" Ice                   | 0.3025                  | 0.3997          | 0.01 |
|                                  |                   |                |                       |            |                           |                     | 2" Ice                   | 0.6654                  | 0.8015          | 0.04 |
| APXVSPP18-C-A20 w/<br>Mount Pipe | A                 | From Leg       | 4.0000                | 0.00       | 0.00                      | 147.0000            | No Ice                   | 8.4975                  | 6.9458          | 0.08 |
|                                  |                   |                |                       |            |                           |                     | 1/2"                     | 9.1490                  | 8.1266          | 0.15 |
|                                  |                   |                |                       |            |                           |                     | Ice                      | 9.7672                  | 9.0212          | 0.22 |
|                                  |                   |                |                       |            |                           |                     | 1" Ice                   | 11.0311                 | 10.8440         | 0.41 |
|                                  |                   |                |                       |            |                           |                     | 2" Ice                   | 13.6786                 | 14.8507         | 0.91 |
| LLPX310R w/ Mount Pipe           | B                 | From Leg       | 4.0000                | 0.00       | 0.00                      | 147.0000            | No Ice                   | 4.9623                  | 2.8484          | 0.04 |
|                                  |                   |                |                       |            |                           |                     | 1/2"                     | 5.3512                  | 3.3668          | 0.08 |
|                                  |                   |                |                       |            |                           |                     | Ice                      | 5.7501                  | 3.9019          | 0.12 |
|                                  |                   |                |                       |            |                           |                     | 1" Ice                   | 6.5777                  | 5.0799          | 0.23 |
|                                  |                   |                |                       |            |                           |                     | 2" Ice                   | 8.3714                  | 7.8368          | 0.53 |
| FDD_R6_RRH                       | B                 | From Leg       | 4.0000                | 0.00       | 0.00                      | 147.0000            | No Ice                   | 1.7889                  | 0.7778          | 0.03 |
|                                  |                   |                |                       |            |                           |                     | 1/2"                     | 1.9715                  | 0.9182          | 0.04 |
|                                  |                   |                |                       |            |                           |                     | Ice                      | 2.1627                  | 1.0673          | 0.06 |
|                                  |                   |                |                       |            |                           |                     | 1" Ice                   | 2.5710                  | 1.3914          | 0.09 |

| Description                    | Face or Leg | Offset Type | Offsets: Horz Lateral Vert<br>ft<br>ft<br>ft | Azimuth 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 |
|--------------------------------|-------------|-------------|--|-------------------------|-----------------|--------|---|--|-------------|
| 1900MHz RRH (65MHz)            | B           | From Leg    | 4.0000<br>0.00<br>0.00                       | 0.00                    | 147.0000        | 2" Ice | 3.4914                                      | 2.1432                                     | 0.20        |
|                                |             |             |  |                         |                 | 4" Ice |   |  |             |
|                                |             |             |  |                         |                 | No Ice | 2.6979                                      | 2.7708                                     | 0.06        |
|                                |             |             |  |                         |                 | 1/2"   | 2.9362                                      | 3.0111                                     | 0.08        |
|                                |             |             |  |                         |                 | Ice    | 3.1832                                      | 3.2600                                     | 0.11        |
|                                |             |             |  |                         |                 | 1" Ice | 3.7030                                      | 3.7837                                     | 0.18        |
| 800 EXTERNAL NOTCH FILTER      | B           | From Leg    | 4.0000<br>0.00<br>0.00                       | 0.00                    | 147.0000        | 2" Ice | 4.8463                                      | 4.9348                                     | 0.35        |
|                                |             |             |  |                         |                 | 4" Ice |   |  |             |
|                                |             |             |  |                         |                 | No Ice | 0.7701                                      | 0.3747                                     | 0.01        |
|                                |             |             |  |                         |                 | 1/2"   | 0.8898                                      | 0.4647                                     | 0.02        |
|                                |             |             |  |                         |                 | Ice    | 1.0181                                      | 0.5634                                     | 0.02        |
|                                |             |             |  |                         |                 | 1" Ice | 1.3007                                      | 0.7868                                     | 0.04        |
| 800MHZ RRH                     | B           | From Leg    | 4.0000<br>0.00<br>0.00                       | 0.00                    | 147.0000        | 2" Ice | 1.9696                                      | 1.3372                                     | 0.11        |
|                                |             |             |  |                         |                 | 4" Ice |   |  |             |
|                                |             |             |  |                         |                 | No Ice | 2.4899                                      | 2.0685                                     | 0.05        |
|                                |             |             |  |                         |                 | 1/2"   | 2.7061                                      | 2.2705                                     | 0.07        |
|                                |             |             |  |                         |                 | Ice    | 2.9310                                      | 2.4812                                     | 0.10        |
|                                |             |             |  |                         |                 | 1" Ice | 3.4068                                      | 2.9284                                     | 0.16        |
| P40-16-XLPP-RR-A w/ Mount Pipe | B           | From Leg    | 4.0000<br>0.00<br>0.00                       | 0.00                    | 147.0000        | 2" Ice | 4.4620                                      | 3.9265                                     | 0.32        |
|                                |             |             |  |                         |                 | 4" Ice |   |  |             |
|                                |             |             |  |                         |                 | No Ice | 9.3725                                      | 4.8250                                     | 0.07        |
|                                |             |             |  |                         |                 | 1/2"   | 9.9120                                      | 5.5706                                     | 0.13        |
|                                |             |             |  |                         |                 | Ice    | 10.4497                                     | 6.2654                                     | 0.20        |
|                                |             |             |  |                         |                 | 1" Ice | 11.5558                                     | 7.8034                                     | 0.37        |
| (3) ACU-A20-N                  | B           | From Leg    | 4.0000<br>0.00<br>0.00                       | 0.00                    | 147.0000        | 2" Ice | 13.8921                                     | 11.1071                                    | 0.82        |
|                                |             |             |  |                         |                 | 4" Ice |   |  |             |
|                                |             |             |  |                         |                 | No Ice | 0.0778                                      | 0.1361                                     | 0.00        |
|                                |             |             |  |                         |                 | 1/2"   | 0.1210                                      | 0.1890                                     | 0.00        |
|                                |             |             |  |                         |                 | Ice    | 0.1728                                      | 0.2506                                     | 0.00        |
|                                |             |             |  |                         |                 | 1" Ice | 0.3025                                      | 0.3997                                     | 0.01        |
| LLPX310R w/ Mount Pipe         | C           | From Leg    | 4.0000<br>0.00<br>0.00                       | 0.00                    | 147.0000        | 2" Ice | 0.6654                                      | 0.8015                                     | 0.04        |
|                                |             |             |  |                         |                 | 4" Ice |   |  |             |
|                                |             |             |  |                         |                 | No Ice | 4.9623                                      | 2.8484                                     | 0.04        |
|                                |             |             |  |                         |                 | 1/2"   | 5.3512                                      | 3.3668                                     | 0.08        |
|                                |             |             |  |                         |                 | Ice    | 5.7501                                      | 3.9019                                     | 0.12        |
|                                |             |             |  |                         |                 | 1" Ice | 6.5777                                      | 5.0799                                     | 0.23        |
| FDD_R6_RRH                     | C           | From Leg    | 4.0000<br>0.00<br>0.00                       | 0.00                    | 147.0000        | 2" Ice | 8.3714                                      | 7.8368                                     | 0.53        |
|                                |             |             |  |                         |                 | 4" Ice |   |  |             |
|                                |             |             |  |                         |                 | No Ice | 1.7889                                      | 0.7778                                     | 0.03        |
|                                |             |             |  |                         |                 | 1/2"   | 1.9715                                      | 0.9182                                     | 0.04        |
|                                |             |             |  |                         |                 | Ice    | 2.1627                                      | 1.0673                                     | 0.06        |
|                                |             |             |  |                         |                 | 1" Ice | 2.5710                                      | 1.3914                                     | 0.09        |
| 1900MHz RRH (65MHz)            | C           | From Leg    | 4.0000<br>0.00<br>0.00                       | 0.00                    | 147.0000        | 2" Ice | 3.4914                                      | 2.1432                                     | 0.20        |
|                                |             |             |  |                         |                 | 4" Ice |   |  |             |
|                                |             |             |  |                         |                 | No Ice | 2.6979                                      | 2.7708                                     | 0.06        |
|                                |             |             |  |                         |                 | 1/2"   | 2.9362                                      | 3.0111                                     | 0.08        |
|                                |             |             |  |                         |                 | Ice    | 3.1832                                      | 3.2600                                     | 0.11        |
|                                |             |             |  |                         |                 | 1" Ice | 3.7030                                      | 3.7837                                     | 0.18        |
| 800 EXTERNAL NOTCH FILTER      | C           | From Leg    | 4.0000<br>0.00<br>0.00                       | 0.00                    | 147.0000        | 2" Ice | 4.8463                                      | 4.9348                                     | 0.35        |
|                                |             |             |  |                         |                 | 4" Ice |   |  |             |
|                                |             |             |  |                         |                 | No Ice | 0.7701                                      | 0.3747                                     | 0.01        |
|                                |             |             |  |                         |                 | 1/2"   | 0.8898                                      | 0.4647                                     | 0.02        |
|                                |             |             |  |                         |                 | Ice    | 1.0181                                      | 0.5634                                     | 0.02        |
|                                |             |             |  |                         |                 | 1" Ice | 1.3007                                      | 0.7868                                     | 0.04        |
| 800MHZ RRH                     | C           | From Leg    | 4.0000<br>0.00<br>0.00                       | 0.00                    | 147.0000        | 2" Ice | 1.9696                                      | 1.3372                                     | 0.11        |
|                                |             |             |  |                         |                 | 4" Ice |   |  |             |
|                                |             |             |  |                         |                 | No Ice | 2.4899                                      | 2.0685                                     | 0.05        |
|                                |             |             |  |                         |                 | 1/2"   | 2.7061                                      | 2.2705                                     | 0.07        |
|                                |             |             |  |                         |                 | Ice    | 2.9310                                      | 2.4812                                     | 0.10        |
|                                |             |             |  |                         |                 | 1" Ice | 3.4068                                      | 2.9284                                     | 0.16        |
| (3) ACU-A20-N                  | C           | From Leg    | 4.0000<br>0.00<br>0.00                       | 0.00                    | 147.0000        | 2" Ice | 4.4620                                      | 3.9265                                     | 0.32        |
|                                |             |             |  |                         |                 | 4" Ice |   |  |             |
|                                |             |             |  |                         |                 | No Ice | 0.0778                                      | 0.1361                                     | 0.00        |
|                                |             |             |  |                         |                 | 1/2"   | 0.1210                                      | 0.1890                                     | 0.00        |
|                                |             |             |  |                         |                 | Ice    | 0.1728                                      | 0.2506                                     | 0.00        |
|                                |             |             |  |                         |                 |        |   |  |             |



| Description                        | Face or Leg | Offset Type | Offsets: Horz Lateral Vert<br>ft<br>ft<br>ft | Azimuth Adjustment<br>° | Placement<br>ft | C <sub>A</sub> A <sub>A</sub> Front<br>ft <sup>2</sup> | C <sub>A</sub> A <sub>A</sub> Side<br>ft <sup>2</sup> | Weight<br>K |      |
|------------------------------------|-------------|-------------|--|-------------------------|-----------------|--|---|-------------|------|
| APXVSP18-C-A20 w/<br>Mount Pipe    | C           | From Leg    | 4.0000<br>0.00<br>0.00                       | 0.00                    | 147.0000        | 1" Ice   | 0.3025  | 0.3997      | 0.01 |
|                                    |             |             |  |                         |                 | 2" Ice   | 0.6654  | 0.8015      | 0.04 |
|                                    |             |             |  |                         |                 | 4" Ice   |   |             |      |
|                                    |             |             |  |                         |                 | No Ice   | 8.4975  | 6.9458      | 0.08 |
|                                    |             |             |  |                         |                 | 1/2"   | 9.1490  | 8.1266      | 0.15 |
|                                    |             |             |  |                         |                 | Ice  | 9.7672  | 9.0212      | 0.22 |
|                                    |             |             |  |                         |                 | 1" Ice   | 11.0311   | 10.8440     | 0.41 |
| 2" Ice                             | 13.6786     | 14.8507     | 0.91   |                         |                 |  |   |             |      |
| 4" Ice                             |             |             |  |                         |                 |  |   |             |      |
| ***                                |             |             |  |                         |                 |  |   |             |      |
| Platform Mount [LP 404-1]          | C           | None        |  | 0.00                    | 147.0000        | No Ice   | 32.7900   | 32.7900     | 2.04 |
|                                    |             |             |  |                         |                 | 1/2"   | 44.6300   | 44.6300     | 2.48 |
|                                    |             |             |  |                         |                 | Ice  | 56.4700   | 56.4700     | 2.91 |
|                                    |             |             |  |                         |                 | 1" Ice   | 80.1500   | 80.1500     | 3.77 |
|                                    |             |             |  |                         |                 | 2" Ice   | 127.5100  | 127.5100    | 5.50 |
|                                    |             |             |  |                         |                 | 4" Ice   |   |             |      |
| ***                                |             |             |  |                         |                 |  |   |             |      |
| (4) DB844H90E-XY w/<br>Mount Pipe  | A           | From Leg    | 4.0000<br>0.00<br>1.00                       | 0.00                    | 131.0000        | No Ice   | 3.2986  | 4.9208      | 0.03 |
|                                    |             |             |  |                         |                 | 1/2"   | 3.6900  | 5.5962      | 0.07 |
|                                    |             |             |  |                         |                 | Ice  | 4.1185  | 6.2837      | 0.12 |
|                                    |             |             |  |                         |                 | 1" Ice   | 5.0070  | 7.7123      | 0.23 |
|                                    |             |             |  |                         |                 | 2" Ice   | 6.9197  | 10.8330     | 0.56 |
|                                    |             |             |  |                         |                 | 4" Ice   |   |             |      |
| ***                                |             |             |  |                         |                 |  |   |             |      |
| (4) DB844H90E-XY w/<br>Mount Pipe  | B           | From Leg    | 4.0000<br>0.00<br>1.00                       | 0.00                    | 131.0000        | No Ice   | 3.2986  | 4.9208      | 0.03 |
|                                    |             |             |  |                         |                 | 1/2"   | 3.6900  | 5.5962      | 0.07 |
|                                    |             |             |  |                         |                 | Ice  | 4.1185  | 6.2837      | 0.12 |
|                                    |             |             |  |                         |                 | 1" Ice   | 5.0070  | 7.7123      | 0.23 |
|                                    |             |             |  |                         |                 | 2" Ice   | 6.9197  | 10.8330     | 0.56 |
|                                    |             |             |  |                         |                 | 4" Ice   |   |             |      |
| ***                                |             |             |  |                         |                 |  |   |             |      |
| (4) DB844H90E-XY w/<br>Mount Pipe  | C           | From Leg    | 4.0000<br>0.00<br>1.00                       | 0.00                    | 131.0000        | No Ice   | 3.2986  | 4.9208      | 0.03 |
|                                    |             |             |  |                         |                 | 1/2"   | 3.6900  | 5.5962      | 0.07 |
|                                    |             |             |  |                         |                 | Ice  | 4.1185  | 6.2837      | 0.12 |
|                                    |             |             |  |                         |                 | 1" Ice   | 5.0070  | 7.7123      | 0.23 |
|                                    |             |             |  |                         |                 | 2" Ice   | 6.9197  | 10.8330     | 0.56 |
|                                    |             |             |  |                         |                 | 4" Ice   |   |             |      |
| ***                                |             |             |  |                         |                 |  |   |             |      |
| Platform Mount [LP 601-1]          | C           | None        |  | 0.00                    | 131.0000        | No Ice   | 28.4700   | 28.4700     | 1.12 |
|                                    |             |             |  |                         |                 | 1/2"   | 33.5900   | 33.5900     | 1.51 |
|                                    |             |             |  |                         |                 | Ice  | 38.7100   | 38.7100     | 1.91 |
|                                    |             |             |  |                         |                 | 1" Ice   | 48.9500   | 48.9500     | 2.69 |
|                                    |             |             |  |                         |                 | 2" Ice   | 69.4300   | 69.4300     | 4.26 |
|                                    |             |             |  |                         |                 | 4" Ice   |   |             |      |
| ***                                |             |             |  |                         |                 |  |   |             |      |
| (2) S20057A-1                      | A           | From Leg    | 4.0000<br>0.00<br>3.00                       | 0.00                    | 119.0000        | No Ice   | 0.8286  | 0.3942      | 0.01 |
|                                    |             |             |  |                         |                 | 1/2"   | 0.9610  | 0.5048      | 0.01 |
|                                    |             |             |  |                         |                 | Ice  | 1.1019  | 0.6242      | 0.02 |
|                                    |             |             |  |                         |                 | 1" Ice   | 1.4098  | 0.8887      | 0.04 |
|                                    |             |             |  |                         |                 | 2" Ice   | 2.1292  | 1.5216      | 0.11 |
|                                    |             |             |  |                         |                 | 4" Ice   |   |             |      |
| ***                                |             |             |  |                         |                 |  |   |             |      |
| APX16DWV-16DWVS-C<br>w/ Mount Pipe | A           | From Leg    | 4.0000<br>0.00<br>3.00                       | 0.00                    | 119.0000        | No Ice   | 7.4657  | 3.4938      | 0.06 |
|                                    |             |             |  |                         |                 | 1/2"   | 7.9944  | 4.2631      | 0.11 |
|                                    |             |             |  |                         |                 | Ice  | 8.5176  | 4.9598      | 0.16 |
|                                    |             |             |  |                         |                 | 1" Ice   | 9.5949  | 6.4031      | 0.30 |
|                                    |             |             |  |                         |                 | 2" Ice   | 11.8728   | 9.4897      | 0.68 |
|                                    |             |             |  |                         |                 | 4" Ice   |   |             |      |
| ***                                |             |             |  |                         |                 |  |   |             |      |
| (2) S20057A-1                      | B           | From Leg    | 4.0000<br>0.00<br>3.00                       | 0.00                    | 119.0000        | No Ice   | 0.8286  | 0.3942      | 0.01 |
|                                    |             |             |  |                         |                 | 1/2"   | 0.9610  | 0.5048      | 0.01 |
|                                    |             |             |  |                         |                 | Ice  | 1.1019  | 0.6242      | 0.02 |
|                                    |             |             |  |                         |                 | 1" Ice   | 1.4098  | 0.8887      | 0.04 |
|                                    |             |             |  |                         |                 | 2" Ice   | 2.1292  | 1.5216      | 0.11 |
|                                    |             |             |  |                         |                 | 4" Ice   |   |             |      |
| ***                                |             |             |  |                         |                 |  |   |             |      |
| APX16DWV-16DWVS-C<br>w/ Mount Pipe | B           | From Leg    | 4.0000<br>0.00<br>3.00                       | 0.00                    | 119.0000        | No Ice   | 7.4657  | 3.4938      | 0.06 |
|                                    |             |             |  |                         |                 | 1/2"   | 7.9944  | 4.2631      | 0.11 |
|                                    |             |             |  |                         |                 | Ice  | 8.5176  | 4.9598      | 0.16 |
|                                    |             |             |  |                         |                 | 1" Ice   | 9.5949  | 6.4031      | 0.30 |
|                                    |             |             |  |                         |                 | 2" Ice   |   |             |      |
|                                    |             |             |  |                         |                 | 4" Ice   |   |             |      |

| Description                        | Face or Leg | Offset Type | Offsets: Horz Lateral Vert<br>ft<br>ft<br>ft | Azimuth Adjustmen<br>t<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 |      |
|------------------------------------|-------------|-------------|--|-----------------------------|-----------------|---|--|-------------|------|
| (2) S20057A-1                      | C           | From Leg    | 4.0000<br>0.00<br>3.00                       | 0.00                        | 119.0000        | 2" Ice                                      | 11.8728                                    | 9.4897      | 0.68 |
|                                    |             |             |  |                             |                 | 4" Ice                                      |  |             |      |
|                                    |             |             |  |                             |                 | No Ice                                      | 0.8286                                     | 0.3942      | 0.01 |
|                                    |             |             |  |                             |                 | 1/2"  | 0.9610                                     | 0.5048      | 0.01 |
|                                    |             |             |  |                             |                 | Ice   | 1.1019                                     | 0.6242      | 0.02 |
|                                    |             |             |  |                             |                 | 1" Ice                                      | 1.4098                                     | 0.8887      | 0.04 |
| APX16DWV-16DWVS-C<br>w/ Mount Pipe | C           | From Leg    | 4.0000<br>0.00<br>3.00                       | 0.00                        | 119.0000        | 2" Ice                                      | 2.1292                                     | 1.5216      | 0.11 |
|                                    |             |             |  |                             |                 | 4" Ice                                      |  |             |      |
|                                    |             |             |  |                             |                 | No Ice                                      | 7.4657                                     | 3.4938      | 0.06 |
|                                    |             |             |  |                             |                 | 1/2"  | 7.9944                                     | 4.2631      | 0.11 |
|                                    |             |             |  |                             |                 | Ice   | 8.5176                                     | 4.9598      | 0.16 |
|                                    |             |             |  |                             |                 | 1" Ice                                      | 9.5949                                     | 6.4031      | 0.30 |
| ***<br>T-Arm Mount [TA 601-3]      | C           | None        |  | 0.00                        | 119.0000        | No Ice                                      | 10.9000                                    | 10.9000     | 0.73 |
|                                    |             |             |  |                             |                 | 1/2"  | 14.6500                                    | 14.6500     | 0.93 |
|                                    |             |             |  |                             |                 | Ice   | 18.4000                                    | 18.4000     | 1.13 |
|                                    |             |             |  |                             |                 | 1" Ice                                      | 25.9000                                    | 25.9000     | 1.52 |
|                                    |             |             |  |                             |                 | 2" Ice                                      | 40.9000                                    | 40.9000     | 2.32 |
|                                    |             |             |  |                             |                 | 4" Ice                                      |  |             |      |
| (2) 7770.00 w/ Mount Pipe          | A           | From Leg    | 4.0000<br>0.00<br>2.00                       | 0.00                        | 110.0000        | No Ice                                      | 6.1194                                     | 4.2543      | 0.06 |
|                                    |             |             |  |                             |                 | 1/2"  | 6.6258                                     | 5.0137      | 0.10 |
|                                    |             |             |  |                             |                 | Ice   | 7.1283                                     | 5.7109      | 0.16 |
|                                    |             |             |  |                             |                 | 1" Ice                                      | 8.1643                                     | 7.1553      | 0.29 |
|                                    |             |             |  |                             |                 | 2" Ice                                      | 10.3599                                    | 10.4117     | 0.66 |
|                                    |             |             |  |                             |                 | 4" Ice                                      |  |             |      |
| (4) LGP2140X                       | A           | From Leg    | 4.0000<br>0.00<br>2.00                       | 0.00                        | 110.0000        | No Ice                                      | 1.2600                                     | 0.3780      | 0.01 |
|                                    |             |             |  |                             |                 | 1/2"  | 1.4160                                     | 0.4932      | 0.02 |
|                                    |             |             |  |                             |                 | Ice   | 1.5806                                     | 0.6170      | 0.03 |
|                                    |             |             |  |                             |                 | 1" Ice                                      | 1.9358                                     | 0.8905      | 0.05 |
|                                    |             |             |  |                             |                 | 2" Ice                                      | 2.7499                                     | 1.5412      | 0.13 |
|                                    |             |             |  |                             |                 | 4" Ice                                      |  |             |      |
| (2) RRUS-11                        | A           | From Leg    | 4.0000<br>0.00<br>2.00                       | 0.00                        | 110.0000        | No Ice                                      | 4.4236                                     | 1.1855      | 0.05 |
|                                    |             |             |  |                             |                 | 1/2"  | 4.7079                                     | 1.3512      | 0.07 |
|                                    |             |             |  |                             |                 | Ice   | 5.0009                                     | 1.5256      | 0.10 |
|                                    |             |             |  |                             |                 | 1" Ice                                      | 5.6127                                     | 1.9002      | 0.17 |
|                                    |             |             |  |                             |                 | 2" Ice                                      | 6.9402                                     | 2.7532      | 0.36 |
|                                    |             |             |  |                             |                 | 4" Ice                                      |  |             |      |
| 800 10764 w/ Mount Pipe            | A           | From Leg    | 4.0000<br>0.00<br>2.00                       | 0.00                        | 110.0000        | No Ice                                      | 6.2031                                     | 4.2940      | 0.06 |
|                                    |             |             |  |                             |                 | 1/2"  | 6.6897                                     | 4.9925      | 0.11 |
|                                    |             |             |  |                             |                 | Ice   | 7.1782                                     | 5.6620      | 0.16 |
|                                    |             |             |  |                             |                 | 1" Ice                                      | 8.1863                                     | 7.1004      | 0.30 |
|                                    |             |             |  |                             |                 | 2" Ice                                      | 10.3284                                    | 10.3001     | 0.67 |
|                                    |             |             |  |                             |                 | 4" Ice                                      |  |             |      |
| DC6-48-60-18-8F                    | A           | From Leg    | 4.0000<br>0.00<br>2.00                       | 0.00                        | 110.0000        | No Ice                                      | 1.4667                                     | 1.4667      | 0.02 |
|                                    |             |             |  |                             |                 | 1/2"  | 1.6667                                     | 1.6667      | 0.04 |
|                                    |             |             |  |                             |                 | Ice   | 1.8778                                     | 1.8778      | 0.06 |
|                                    |             |             |  |                             |                 | 1" Ice                                      | 2.3333                                     | 2.3333      | 0.11 |
|                                    |             |             |  |                             |                 | 2" Ice                                      | 3.3778                                     | 3.3778      | 0.24 |
|                                    |             |             |  |                             |                 | 4" Ice                                      |  |             |      |
| (2) 7770.00 w/ Mount Pipe          | B           | From Leg    | 4.0000<br>0.00<br>2.00                       | 0.00                        | 110.0000        | No Ice                                      | 6.1194                                     | 4.2543      | 0.06 |
|                                    |             |             |  |                             |                 | 1/2"  | 6.6258                                     | 5.0137      | 0.10 |
|                                    |             |             |  |                             |                 | Ice   | 7.1283                                     | 5.7109      | 0.16 |
|                                    |             |             |  |                             |                 | 1" Ice                                      | 8.1643                                     | 7.1553      | 0.29 |
|                                    |             |             |  |                             |                 | 2" Ice                                      | 10.3599                                    | 10.4117     | 0.66 |
|                                    |             |             |  |                             |                 | 4" Ice                                      |  |             |      |
| (4) LGP2140X                       | B           | From Leg    | 4.0000<br>0.00<br>2.00                       | 0.00                        | 110.0000        | No Ice                                      | 1.2600                                     | 0.3780      | 0.01 |
|                                    |             |             |  |                             |                 | 1/2"  | 1.4160                                     | 0.4932      | 0.02 |
|                                    |             |             |  |                             |                 | Ice   | 1.5806                                     | 0.6170      | 0.03 |
|                                    |             |             |  |                             |                 | 1" Ice                                      | 1.9358                                     | 0.8905      | 0.05 |
|                                    |             |             |  |                             |                 | 2" Ice                                      | 2.7499                                     | 1.5412      | 0.13 |
|                                    |             |             |  |                             |                 | 4" Ice                                      |  |             |      |
| (2) RRUS-11                        | B           | From Leg    | 4.0000                                       | 0.00                        | 110.0000        | No Ice                                      | 4.4236                                     | 1.1855      | 0.05 |
|                                    |             |             |  |                             |                 |   |  |             |      |

| Description                    | Face or Leg | Offset Type | Offsets:     |      | Azimuth Adjustment | Placement | C <sub>AA</sub> Front | C <sub>AA</sub> Side | Weight |
|--------------------------------|-------------|-------------|--------------|------|--------------------|-----------|-----------------------|----------------------|--------|
|                                |             |             | Horz Lateral | Vert |                    |           |                       |                      |        |
|                                |             |             |              | 0.00 |                    |           |                       |                      |        |
|                                |             |             |              | 2.00 |                    | 1/2"      | 4.7079                | 1.3512               | 0.07   |
|                                |             |             |              |      |                    | Ice       | 5.0009                | 1.5256               | 0.10   |
|                                |             |             |              |      |                    | 1" Ice    | 5.6127                | 1.9002               | 0.17   |
|                                |             |             |              |      |                    | 2" Ice    | 6.9402                | 2.7532               | 0.36   |
|                                |             |             |              |      |                    | 4" Ice    |                       |                      |        |
| 800 10764 w/ Mount Pipe        | B           | From Leg    | 4.0000       | 0.00 | 110.0000           | No Ice    | 6.2031                | 4.2940               | 0.06   |
|                                |             |             | 0.00         |      |                    | 1/2"      | 6.6897                | 4.9925               | 0.11   |
|                                |             |             | 2.00         |      |                    | Ice       | 7.1782                | 5.6620               | 0.16   |
|                                |             |             |              |      |                    | 1" Ice    | 8.1863                | 7.1004               | 0.30   |
|                                |             |             |              |      |                    | 2" Ice    | 10.3284               | 10.3001              | 0.67   |
|                                |             |             |              |      |                    | 4" Ice    |                       |                      |        |
| (2) 7770.00 w/ Mount Pipe      | C           | From Leg    | 4.0000       | 0.00 | 110.0000           | No Ice    | 6.1194                | 4.2543               | 0.06   |
|                                |             |             | 0.00         |      |                    | 1/2"      | 6.6258                | 5.0137               | 0.10   |
|                                |             |             | 2.00         |      |                    | Ice       | 7.1283                | 5.7109               | 0.16   |
|                                |             |             |              |      |                    | 1" Ice    | 8.1643                | 7.1553               | 0.29   |
|                                |             |             |              |      |                    | 2" Ice    | 10.3599               | 10.4117              | 0.66   |
|                                |             |             |              |      |                    | 4" Ice    |                       |                      |        |
| (4) LGP2140X                   | C           | From Leg    | 4.0000       | 0.00 | 110.0000           | No Ice    | 1.2600                | 0.3780               | 0.01   |
|                                |             |             | 0.00         |      |                    | 1/2"      | 1.4160                | 0.4932               | 0.02   |
|                                |             |             | 2.00         |      |                    | Ice       | 1.5806                | 0.6170               | 0.03   |
|                                |             |             |              |      |                    | 1" Ice    | 1.9358                | 0.8905               | 0.05   |
|                                |             |             |              |      |                    | 2" Ice    | 2.7499                | 1.5412               | 0.13   |
|                                |             |             |              |      |                    | 4" Ice    |                       |                      |        |
| (2) RRUS-11                    | C           | From Leg    | 4.0000       | 0.00 | 110.0000           | No Ice    | 4.4236                | 1.1855               | 0.05   |
|                                |             |             | 0.00         |      |                    | 1/2"      | 4.7079                | 1.3512               | 0.07   |
|                                |             |             | 2.00         |      |                    | Ice       | 5.0009                | 1.5256               | 0.10   |
|                                |             |             |              |      |                    | 1" Ice    | 5.6127                | 1.9002               | 0.17   |
|                                |             |             |              |      |                    | 2" Ice    | 6.9402                | 2.7532               | 0.36   |
|                                |             |             |              |      |                    | 4" Ice    |                       |                      |        |
| 800 10764 w/ Mount Pipe        | C           | From Leg    | 4.0000       | 0.00 | 110.0000           | No Ice    | 6.2031                | 4.2940               | 0.06   |
|                                |             |             | 0.00         |      |                    | 1/2"      | 6.6897                | 4.9925               | 0.11   |
|                                |             |             | 2.00         |      |                    | Ice       | 7.1782                | 5.6620               | 0.16   |
|                                |             |             |              |      |                    | 1" Ice    | 8.1863                | 7.1004               | 0.30   |
|                                |             |             |              |      |                    | 2" Ice    | 10.3284               | 10.3001              | 0.67   |
|                                |             |             |              |      |                    | 4" Ice    |                       |                      |        |
| ***                            |             |             |              |      |                    |           |                       |                      |        |
| Platform Mount [LP 401-1]      | C           | None        |              | 0.00 | 110.0000           | No Ice    | 24.3300               | 24.3300              | 1.65   |
|                                |             |             |              |      |                    | 1/2"      | 30.2200               | 30.2200              | 2.03   |
|                                |             |             |              |      |                    | Ice       | 36.1100               | 36.1100              | 2.41   |
|                                |             |             |              |      |                    | 1" Ice    | 47.8900               | 47.8900              | 3.18   |
|                                |             |             |              |      |                    | 2" Ice    | 71.4500               | 71.4500              | 4.72   |
|                                |             |             |              |      |                    | 4" Ice    |                       |                      |        |
| ***                            |             |             |              |      |                    |           |                       |                      |        |
| APXV18-206517S-C w/ Mount Pipe | A           | From Leg    | 4.0000       | 0.00 | 100.0000           | No Ice    | 5.4042                | 4.7000               | 0.05   |
|                                |             |             | 0.00         |      |                    | 1/2"      | 5.9597                | 5.8600               | 0.09   |
|                                |             |             | 0.00         |      |                    | Ice       | 6.4808                | 6.7338               | 0.15   |
|                                |             |             |              |      |                    | 1" Ice    | 7.5467                | 8.5150               | 0.28   |
|                                |             |             |              |      |                    | 2" Ice    | 9.9193                | 12.2774              | 0.68   |
|                                |             |             |              |      |                    | 4" Ice    |                       |                      |        |
| APXV18-206517S-C w/ Mount Pipe | B           | From Leg    | 4.0000       | 0.00 | 100.0000           | No Ice    | 5.4042                | 4.7000               | 0.05   |
|                                |             |             | 0.00         |      |                    | 1/2"      | 5.9597                | 5.8600               | 0.09   |
|                                |             |             | 0.00         |      |                    | Ice       | 6.4808                | 6.7338               | 0.15   |
|                                |             |             |              |      |                    | 1" Ice    | 7.5467                | 8.5150               | 0.28   |
|                                |             |             |              |      |                    | 2" Ice    | 9.9193                | 12.2774              | 0.68   |
|                                |             |             |              |      |                    | 4" Ice    |                       |                      |        |
| APXV18-206517S-C w/ Mount Pipe | C           | From Leg    | 4.0000       | 0.00 | 100.0000           | No Ice    | 5.4042                | 4.7000               | 0.05   |
|                                |             |             | 0.00         |      |                    | 1/2"      | 5.9597                | 5.8600               | 0.09   |
|                                |             |             | 0.00         |      |                    | Ice       | 6.4808                | 6.7338               | 0.15   |
|                                |             |             |              |      |                    | 1" Ice    | 7.5467                | 8.5150               | 0.28   |
|                                |             |             |              |      |                    | 2" Ice    | 9.9193                | 12.2774              | 0.68   |
|                                |             |             |              |      |                    | 4" Ice    |                       |                      |        |
| ***                            |             |             |              |      |                    |           |                       |                      |        |
| Pipe Mount [PM 601-3]          | C           | None        |              | 0.00 | 100.0000           | No Ice    | 4.3900                | 4.3900               | 0.20   |
|                                |             |             |              |      |                    | 1/2"      | 5.4800                | 5.4800               | 0.24   |
|                                |             |             |              |      |                    | Ice       | 6.5700                | 6.5700               | 0.28   |



| Description                      | Face or Leg | Offset Type | Offsets: Horz Lateral Vert<br>ft<br>ft<br>ft | Azimuth Adjustment<br>° | Placement<br>ft |        | C <sub>A</sub> A <sub>A</sub> Front<br>ft <sup>2</sup> | C <sub>A</sub> A <sub>A</sub> Side<br>ft <sup>2</sup> | Weight<br>K |
|----------------------------------|-------------|-------------|--|-------------------------|-----------------|--------|--|---|-------------|
|                                  |             |             |  |                         |                 | 1" Ice | 8.7500   | 8.7500  | 0.36        |
|                                  |             |             |  |                         |                 | 2" Ice | 13.1100  | 13.1100   | 0.53        |
|                                  |             |             |  |                         |                 | 4" Ice |  |   |             |
| ***<br>Pipe Mount [PM 501-1]     | C           | None        |  | 0.00                    | 60.0000         | No Ice | 3.4700   | 1.6700  | 0.05        |
|                                  |             |             |  |                         |                 | 1/2"   | 4.4500   | 2.1000  | 0.06        |
|                                  |             |             |  |                         |                 | Ice    | 5.4300   | 2.5300  | 0.07        |
|                                  |             |             |  |                         |                 | 1" Ice | 7.3900   | 3.3900  | 0.08        |
|                                  |             |             |  |                         |                 | 2" Ice | 11.3100  | 5.1100  | 0.11        |
|                                  |             |             |  |                         |                 | 4" Ice |  |   |             |
| ***<br>KS24019-L112A             | A           | From Leg    | 4.0000<br>0.00<br>1.00                       | 0.00                    | 49.0000         | No Ice | 0.1556   | 0.1556  | 0.01        |
|                                  |             |             |  |                         |                 | 1/2"   | 0.2247   | 0.2247  | 0.01        |
|                                  |             |             |  |                         |                 | Ice    | 0.3025   | 0.3025  | 0.01        |
|                                  |             |             |  |                         |                 | 1" Ice | 0.4840   | 0.4840  | 0.02        |
|                                  |             |             |  |                         |                 | 2" Ice | 0.9506   | 0.9506  | 0.06        |
|                                  |             |             |  |                         |                 | 4" Ice |  |   |             |
| ***<br>Side Arm Mount [SO 701-1] | C           | None        |  | 0.00                    | 49.0000         | No Ice | 0.8500   | 1.6700  | 0.07        |
|                                  |             |             |  |                         |                 | 1/2"   | 1.1400   | 2.3400  | 0.08        |
|                                  |             |             |  |                         |                 | Ice    | 1.4300   | 3.0100  | 0.09        |
|                                  |             |             |  |                         |                 | 1" Ice | 2.0100   | 4.3500  | 0.12        |
|                                  |             |             |  |                         |                 | 2" Ice | 3.1700   | 7.0300  | 0.18        |
|                                  |             |             |  |                         |                 | 4" Ice |  |   |             |

### Dishes

| Description   | Face or Leg | Dish Type             | Offset Type | Offsets: Horz Lateral Vert<br>ft<br>ft<br>ft | Azimuth Adjustment<br>° | 3 dB Beam Width<br>° | Elevation<br>ft | Outside Diameter<br>ft | Aperture Area<br>ft <sup>2</sup>                 | Weight<br>K                                    |
|---------------|-------------|-----------------------|-------------|--|-------------------------|----------------------|-----------------|------------------------|--|--|
| A-ANT-23G-2-C | A           | Paraboloid w/o Radome | From Leg    | 1.0000<br>0.00<br>2.00                       | 0.00                    |                      | 147.0000        | 2.1750                 | No Ice<br>1/2" Ice<br>1" Ice<br>2" Ice<br>4" Ice | 3.7200<br>4.0100<br>4.3000<br>4.8800<br>6.0400 |
| A-ANT-23G-2-C | C           | Paraboloid w/o Radome | From Leg    | 1.0000<br>0.00<br>2.00                       | 0.00                    |                      | 147.0000        | 2.1750                 | No Ice<br>1/2" Ice<br>1" Ice<br>2" Ice<br>4" Ice | 3.7200<br>4.0100<br>4.3000<br>4.8800<br>6.0400 |

### Tower Pressures - No Ice

$G_H = 1.690$

| Section Elevation<br>ft | z<br>ft  | K <sub>Z</sub> | q <sub>Z</sub><br>psf | A <sub>G</sub><br>ft <sup>2</sup> | F a c e | A <sub>F</sub><br>ft <sup>2</sup> | A <sub>R</sub><br>ft <sup>2</sup> | A <sub>leg</sub><br>ft <sup>2</sup> | Leg %  | C <sub>A</sub> A <sub>A</sub> In Face<br>ft <sup>2</sup> | C <sub>A</sub> A <sub>A</sub> Out Face<br>ft <sup>2</sup> |
|-------------------------|----------|----------------|-----------------------|-----------------------------------|---------|-----------------------------------|-----------------------------------|-------------------------------------|--------|--|---|
| L1 147.0000-99.5000     | 122.3179 | 1.454          | 26.85                 | 103.536                           | A       | 0.000                             | 103.536                           | 103.536                             | 100.00 | 0.000  | 0.000   |
|                         |          |                |                       |                                   | B       | 0.000                             | 103.536                           |                                     | 100.00 | 0.000  | 0.000   |
|                         |          |                |                       |                                   | C       | 0.000                             | 103.536                           |                                     | 100.00 | 0.000  | 9.599   |
| L2 99.5000-69.5000      | 84.0954  | 1.306          | 24.16                 | 81.094                            | A       | 0.000                             | 81.094                            | 81.094                              | 100.00 | 0.000  | 0.000   |
|                         |          |                |                       |                                   | B       | 0.000                             | 81.094                            |                                     | 100.00 | 0.000  | 0.000   |
|                         |          |                |                       |                                   | C       | 0.000                             | 81.094                            |                                     | 100.00 | 0.000  | 12.344  |
| L3 69.5000-59.0000      | 64.2053  | 1.209          | 22.37                 | 31.484                            | A       | 0.000                             | 31.484                            | 31.484                              | 100.00 | 0.000  | 0.000   |
|                         |          |                |                       |                                   | B       | 0.000                             | 31.484                            |                                     | 100.00 | 0.000  | 0.000   |
|                         |          |                |                       |                                   | C       | 0.000                             | 31.484                            |                                     | 100.00 | 0.000  | 6.466   |
| L4 59.0000-             | 58.3742  | 1.177          | 21.77                 | 3.787                             | A       | 0.000                             | 3.787                             | 3.787                               | 100.00 | 0.000  | 0.000   |

| Section Elevation  | z       | K <sub>Z</sub> | q <sub>z</sub> | A <sub>G</sub>  | F a c e | A <sub>F</sub>  | A <sub>R</sub>  | A <sub>leg</sub> | Leg %  | C <sub>A</sub> A <sub>A</sub> In Face | C <sub>A</sub> A <sub>A</sub> Out Face |
|--------------------|---------|----------------|----------------|-----------------|---------|-----------------|-----------------|------------------|--------|---------------------------------------|--|
| ft                 | ft      |                | psf            | ft <sup>2</sup> |         | ft <sup>2</sup> | ft <sup>2</sup> | ft <sup>2</sup>  |        | ft <sup>2</sup>                       | ft <sup>2</sup>                        |
| 57.7500            |         |                |                |                 | B       | 0.000           | 3.787           |                  | 100.00 | 0.000                                 | 0.000                                  |
|                    |         |                |                |                 | C       | 0.000           | 3.787           |                  | 100.00 | 0.000                                 | 0.498                                  |
| L5 57.7500-50.5000 | 54.1044 | 1.152          | 21.30          | 22.432          | A       | 0.000           | 22.432          | 22.432           | 100.00 | 0.000                                 | 0.000                                  |
|                    |         |                |                |                 | B       | 0.000           | 22.432          |                  | 100.00 | 0.000                                 | 0.000                                  |
|                    |         |                |                |                 | C       | 0.000           | 22.432          |                  | 100.00 | 0.000                                 | 3.289                                  |
| L6 50.5000-29.2500 | 39.7088 | 1.054          | 19.50          | 70.163          | A       | 0.000           | 70.163          | 70.163           | 100.00 | 0.000                                 | 0.000                                  |
|                    |         |                |                |                 | B       | 0.000           | 70.163          |                  | 100.00 | 0.000                                 | 0.000                                  |
|                    |         |                |                |                 | C       | 0.000           | 70.163          |                  | 100.00 | 0.000                                 | 13.435                                 |
| L7 29.2500-24.0000 | 26.6141 | 1              | 18.50          | 17.998          | A       | 0.000           | 17.998          | 17.998           | 100.00 | 0.000                                 | 0.000                                  |
|                    |         |                |                |                 | B       | 0.000           | 17.998          |                  | 100.00 | 0.000                                 | 0.000                                  |
|                    |         |                |                |                 | C       | 0.000           | 17.998          |                  | 100.00 | 0.000                                 | 2.493                                  |
| L8 24.0000-0.0000  | 11.8080 | 1              | 18.50          | 87.500          | A       | 0.000           | 87.500          | 87.500           | 100.00 | 0.000                                 | 0.000                                  |
|                    |         |                |                |                 | B       | 0.000           | 87.500          |                  | 100.00 | 0.000                                 | 0.000                                  |
|                    |         |                |                |                 | C       | 0.000           | 87.500          |                  | 100.00 | 0.000                                 | 15.874                                 |

### Tower Pressure - With Ice

$G_H = 1.690$

| Section Elevation   | z        | K <sub>Z</sub> | q <sub>z</sub> | t <sub>z</sub> | A <sub>G</sub>  | F a c e | A <sub>F</sub>  | A <sub>R</sub>  | A <sub>leg</sub> | Leg %  | C <sub>A</sub> A <sub>A</sub> In Face | C <sub>A</sub> A <sub>A</sub> Out Face |
|---------------------|----------|----------------|----------------|----------------|-----------------|---------|-----------------|-----------------|------------------|--------|---------------------------------------|--|
| ft                  | ft       |                | psf            | in             | ft <sup>2</sup> |         | ft <sup>2</sup> | ft <sup>2</sup> | ft <sup>2</sup>  |        | ft <sup>2</sup>                       | ft <sup>2</sup>                        |
| L1 147.0000-99.5000 | 122.3179 | 1.454          | 5.25           | 0.8777         | 110.484         | A       | 0.000           | 110.484         | 110.484          | 100.00 | 0.000                                 | 0.000                                  |
|                     |          |                |                |                |                 | B       | 0.000           | 110.484         |                  | 100.00 | 0.000                                 | 0.000                                  |
|                     |          |                |                |                |                 | C       | 0.000           | 110.484         |                  | 100.00 | 0.000                                 | 18.025                                 |
| L2 99.5000-69.5000  | 84.0954  | 1.306          | 4.73           | 0.8391         | 85.483          | A       | 0.000           | 85.483          | 85.483           | 100.00 | 0.000                                 | 0.000                                  |
|                     |          |                |                |                |                 | B       | 0.000           | 85.483          |                  | 100.00 | 0.000                                 | 0.000                                  |
|                     |          |                |                |                |                 | C       | 0.000           | 85.483          |                  | 100.00 | 0.000                                 | 23.168                                 |
| L3 69.5000-59.0000  | 64.2053  | 1.209          | 4.38           | 0.8124         | 32.905          | A       | 0.000           | 32.905          | 32.905           | 100.00 | 0.000                                 | 0.000                                  |
|                     |          |                |                |                |                 | B       | 0.000           | 32.905          |                  | 100.00 | 0.000                                 | 0.000                                  |
|                     |          |                |                |                |                 | C       | 0.000           | 32.905          |                  | 100.00 | 0.000                                 | 11.412                                 |
| L4 59.0000-57.7500  | 58.3742  | 1.177          | 4.26           | 0.8031         | 3.957           | A       | 0.000           | 3.957           | 3.957            | 100.00 | 0.000                                 | 0.000                                  |
|                     |          |                |                |                |                 | B       | 0.000           | 3.957           |                  | 100.00 | 0.000                                 | 0.000                                  |
|                     |          |                |                |                |                 | C       | 0.000           | 3.957           |                  | 100.00 | 0.000                                 | 0.904                                  |
| L5 57.7500-50.5000  | 54.1044  | 1.152          | 4.17           | 0.7958         | 23.393          | A       | 0.000           | 23.393          | 23.393           | 100.00 | 0.000                                 | 0.000                                  |
|                     |          |                |                |                |                 | B       | 0.000           | 23.393          |                  | 100.00 | 0.000                                 | 0.000                                  |
|                     |          |                |                |                |                 | C       | 0.000           | 23.393          |                  | 100.00 | 0.000                                 | 5.862                                  |
| L6 50.5000-29.2500  | 39.7088  | 1.054          | 3.82           | 0.7668         | 72.879          | A       | 0.000           | 72.879          | 72.879           | 100.00 | 0.000                                 | 0.000                                  |
|                     |          |                |                |                |                 | B       | 0.000           | 72.879          |                  | 100.00 | 0.000                                 | 0.000                                  |
|                     |          |                |                |                |                 | C       | 0.000           | 72.879          |                  | 100.00 | 0.000                                 | 23.105                                 |
| L7 29.2500-24.0000  | 26.6141  | 1              | 3.62           | 0.7500         | 18.669          | A       | 0.000           | 18.669          | 18.669           | 100.00 | 0.000                                 | 0.000                                  |
|                     |          |                |                |                |                 | B       | 0.000           | 18.669          |                  | 100.00 | 0.000                                 | 0.000                                  |
|                     |          |                |                |                |                 | C       | 0.000           | 18.669          |                  | 100.00 | 0.000                                 | 4.359                                  |
| L8 24.0000-0.0000   | 11.8080  | 1              | 3.62           | 0.7500         | 90.500          | A       | 0.000           | 90.500          | 90.500           | 100.00 | 0.000                                 | 0.000                                  |
|                     |          |                |                |                |                 | B       | 0.000           | 90.500          |                  | 100.00 | 0.000                                 | 0.000                                  |
|                     |          |                |                |                |                 | C       | 0.000           | 90.500          |                  | 100.00 | 0.000                                 | 26.991                                 |

### Tower Pressure - Service

$G_H = 1.690$

| Section Elevation   | z        | K <sub>Z</sub> | q <sub>z</sub> | A <sub>G</sub>  | F a c e | A <sub>F</sub>  | A <sub>R</sub>  | A <sub>leg</sub> | Leg %  | C <sub>A</sub> A <sub>A</sub> In Face | C <sub>A</sub> A <sub>A</sub> Out Face |
|---------------------|----------|----------------|----------------|-----------------|---------|-----------------|-----------------|------------------|--------|---------------------------------------|--|
| ft                  | ft       |                | psf            | ft <sup>2</sup> |         | ft <sup>2</sup> | ft <sup>2</sup> | ft <sup>2</sup>  |        | ft <sup>2</sup>                       | ft <sup>2</sup>                        |
| L1 147.0000-99.5000 | 122.3179 | 1.454          | 9.29           | 103.536         | A       | 0.000           | 103.536         | 103.536          | 100.00 | 0.000                                 | 0.000                                  |
|                     |          |                |                |                 | B       | 0.000           | 103.536         |                  | 100.00 | 0.000                                 | 0.000                                  |
|                     |          |                |                |                 | C       | 0.000           | 103.536         |                  | 100.00 | 0.000                                 | 9.599                                  |
| L2 99.5000-69.5000  | 84.0954  | 1.306          | 8.36           | 81.094          | A       | 0.000           | 81.094          | 81.094           | 100.00 | 0.000                                 | 0.000                                  |
|                     |          |                |                |                 | B       | 0.000           | 81.094          |                  | 100.00 | 0.000                                 | 0.000                                  |
|                     |          |                |                |                 | C       | 0.000           | 81.094          |                  | 100.00 | 0.000                                 | 12.344                                 |
| L3 69.5000-59.0000  | 64.2053  | 1.209          | 7.74           | 31.484          | A       | 0.000           | 31.484          | 31.484           | 100.00 | 0.000                                 | 0.000                                  |
|                     |          |                |                |                 | B       | 0.000           | 31.484          |                  | 100.00 | 0.000                                 | 0.000                                  |

| Section Elevation<br>ft | z<br>ft | K <sub>Z</sub> | q <sub>Z</sub><br>psf | A <sub>G</sub><br>ft <sup>2</sup> | F a c e | A <sub>F</sub><br>ft <sup>2</sup> | A <sub>R</sub><br>ft <sup>2</sup> | A <sub>leg</sub><br>ft <sup>2</sup> | Leg %  | C <sub>A</sub> A <sub>A</sub><br>In Face<br>ft <sup>2</sup> | C <sub>A</sub> A <sub>A</sub><br>Out Face<br>ft <sup>2</sup> |
|-------------------------|---------|----------------|-----------------------|-----------------------------------|---------|-----------------------------------|-----------------------------------|-------------------------------------|--------|---|--|
| L4 59.0000-57.7500      | 58.3742 | 1.177          | 7.53                  | 3.787                             | C       | 0.000                             | 31.484                            | 3.787                               | 100.00 | 0.000   | 6.466  |
|                         |         |                |                       |                                   | A       | 0.000                             | 3.787                             |                                     | 100.00 | 0.000   | 0.000  |
|                         |         |                |                       |                                   | B       | 0.000                             | 3.787                             |                                     | 100.00 | 0.000   | 0.000  |
| L5 57.7500-50.5000      | 54.1044 | 1.152          | 7.37                  | 22.432                            | C       | 0.000                             | 3.787                             | 22.432                              | 100.00 | 0.000   | 0.498  |
|                         |         |                |                       |                                   | A       | 0.000                             | 22.432                            |                                     | 100.00 | 0.000   | 0.000  |
|                         |         |                |                       |                                   | B       | 0.000                             | 22.432                            |                                     | 100.00 | 0.000   | 0.000  |
| L6 50.5000-29.2500      | 39.7088 | 1.054          | 6.75                  | 70.163                            | C       | 0.000                             | 22.432                            | 70.163                              | 100.00 | 0.000   | 3.289  |
|                         |         |                |                       |                                   | A       | 0.000                             | 70.163                            |                                     | 100.00 | 0.000   | 0.000  |
|                         |         |                |                       |                                   | B       | 0.000                             | 70.163                            |                                     | 100.00 | 0.000   | 0.000  |
| L7 29.2500-24.0000      | 26.6141 | 1              | 6.40                  | 17.998                            | C       | 0.000                             | 70.163                            | 17.998                              | 100.00 | 0.000   | 13.435   |
|                         |         |                |                       |                                   | A       | 0.000                             | 17.998                            |                                     | 100.00 | 0.000   | 0.000  |
|                         |         |                |                       |                                   | B       | 0.000                             | 17.998                            |                                     | 100.00 | 0.000   | 0.000  |
| L8 24.0000-0.0000       | 11.8080 | 1              | 6.40                  | 87.500                            | C       | 0.000                             | 17.998                            | 87.500                              | 100.00 | 0.000   | 2.493  |
|                         |         |                |                       |                                   | A       | 0.000                             | 87.500                            |                                     | 100.00 | 0.000   | 0.000  |
|                         |         |                |                       |                                   | B       | 0.000                             | 87.500                            |                                     | 100.00 | 0.000   | 0.000  |
|                         |         |                |                       |                                   | C       | 0.000                             | 87.500                            |                                     | 100.00 | 0.000   | 15.874   |

### Load Combinations

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



### Maximum Member Forces

| Section No. | Elevation ft | Component Type | Condition        | Gov. Load Comb. | Force K | Major Axis Moment kip-ft | Minor Axis Moment kip-ft |
|-------------|--------------|----------------|------------------|-----------------|---------|--------------------------|--------------------------|
| L1          | 147 - 99.5   | Pole           | Max Tension      | 1               | 0.00    | 0.00                     | 0.00                     |
|             |              |                | Max. Compression | 14              | -20.71  | 2.04                     | -0.74                    |
|             |              |                | Max. Mx          | 5               | -10.41  | -491.29                  | 3.88                     |
|             |              |                | Max. My          | 8               | -10.41  | -0.80                    | -493.09                  |
|             |              |                | Max. Vy          | 5               | 19.79   | -491.29                  | 3.88                     |
|             |              |                | Max. Vx          | 8               | 19.81   | -0.80                    | -493.09                  |
|             |              |                | Max. Torque      | 4               |         |                          | 0.95                     |
| L2          | 99.5 - 69.5  | Pole           | Max Tension      | 1               | 0.00    | 0.00                     | 0.00                     |
|             |              |                | Max. Compression | 14              | -29.57  | 4.55                     | -2.17                    |
|             |              |                | Max. Mx          | 5               | -16.57  | -1257.20                 | 6.52                     |
|             |              |                | Max. My          | 8               | -16.56  | -1.24                    | -1260.71                 |
|             |              |                | Max. Vy          | 5               | 24.97   | -1257.20                 | 6.52                     |
|             |              |                | Max. Vx          | 8               | 24.99   | -1.24                    | -1260.71                 |
|             |              |                | Max. Torque      | 4               |         |                          | 0.95                     |
| L3          | 69.5 - 59    | Pole           | Max Tension      | 1               | 0.00    | 0.00                     | 0.00                     |
|             |              |                | Max. Compression | 14              | -31.24  | 5.01                     | -2.44                    |
|             |              |                | Max. Mx          | 5               | -17.88  | -1402.76                 | 6.95                     |
|             |              |                | Max. My          | 8               | -17.88  | -1.30                    | -1406.59                 |
|             |              |                | Max. Vy          | 5               | 25.74   | -1402.76                 | 6.95                     |
|             |              |                | Max. Vx          | 8               | 25.76   | -1.30                    | -1406.59                 |
|             |              |                | Max. Torque      | 3               |         |                          | 0.97                     |
| L4          | 59 - 57.75   | Pole           | Max Tension      | 1               | 0.00    | 0.00                     | 0.00                     |
|             |              |                | Max. Compression | 14              | -33.91  | 5.48                     | -2.71                    |
|             |              |                | Max. Mx          | 5               | -19.93  | -1559.94                 | 7.40                     |
|             |              |                | Max. My          | 8               | -19.93  | -1.36                    | -1564.10                 |
|             |              |                | Max. Vy          | 5               | 26.73   | -1559.94                 | 7.40                     |
|             |              |                | Max. Vx          | 8               | 26.75   | -1.36                    | -1564.10                 |
|             |              |                | Max. Torque      | 8               |         |                          | -0.99                    |
| L5          | 57.75 - 50.5 | Pole           | Max Tension      | 1               | 0.00    | 0.00                     | 0.00                     |
|             |              |                | Max. Compression | 14              | -36.13  | 6.06                     | -3.04                    |
|             |              |                | Max. Mx          | 5               | -21.73  | -1756.66                 | 7.94                     |
|             |              |                | Max. My          | 8               | -21.73  | -1.43                    | -1761.23                 |
|             |              |                | Max. Vy          | 5               | 27.61   | -1756.66                 | 7.94                     |
|             |              |                | Max. Vx          | 8               | 27.63   | -1.43                    | -1761.23                 |
|             |              |                | Max. Torque      | 8               |         |                          | -1.03                    |
| L6          | 50.5 - 29.25 | Pole           | Max Tension      | 1               | 0.00    | 0.00                     | 0.00                     |
|             |              |                | Max. Compression | 14              | -41.43  | 7.35                     | -3.74                    |
|             |              |                | Max. Mx          | 5               | -26.12  | -2213.98                 | 9.13                     |
|             |              |                | Max. My          | 8               | -26.12  | -1.55                    | -2219.46                 |
|             |              |                | Max. Vy          | 5               | 29.58   | -2213.98                 | 9.13                     |
|             |              |                | Max. Vx          | 8               | 29.60   | -1.55                    | -2219.46                 |
|             |              |                | Max. Torque      | 8               |         |                          | -1.15                    |
| L7          | 29.25 - 24   | Pole           | Max Tension      | 1               | 0.00    | 0.00                     | 0.00                     |
|             |              |                | Max. Compression | 14              | -46.28  | 8.18                     | -4.22                    |
|             |              |                | Max. Mx          | 5               | -30.15  | -2531.24                 | 9.89                     |
|             |              |                | Max. My          | 8               | -30.14  | -1.63                    | -2537.34                 |
|             |              |                | Max. Vy          | 5               | 30.85   | -2531.24                 | 9.89                     |
|             |              |                | Max. Vx          | 8               | 30.86   | -1.63                    | -2537.34                 |
|             |              |                | Max. Torque      | 8               |         |                          | -1.22                    |
| L8          | 24 - 0       | Pole           | Max Tension      | 1               | 0.00    | 0.00                     | 0.00                     |
|             |              |                | Max. Compression | 14              | -55.77  | 10.19                    | -5.38                    |
|             |              |                | Max. Mx          | 5               | -38.32  | -3303.46                 | 11.55                    |
|             |              |                | Max. My          | 8               | -38.32  | -1.76                    | -3311.04                 |
|             |              |                | Max. Vy          | 5               | 33.60   | -3303.46                 | 11.55                    |
|             |              |                | Max. Vx          | 8               | 33.62   | -1.76                    | -3311.04                 |
|             |              |                | Max. Torque      | 8               |         |                          | -1.42                    |

### Maximum Reactions

| Location | Condition | Gov. Load Comb. | Vertical K | Horizontal, X K | Horizontal, Z K |
|----------|-----------|-----------------|------------|-----------------|-----------------|
| Pole     | Max. Vert | 14              | 55.77      | -0.00           | 0.00            |

| Location | Condition           | Gov. Load Comb. | Vertical K | Horizontal, X K | Horizontal, Z K |
|----------|---------------------|-----------------|------------|-----------------|-----------------|
|          | Max. H <sub>x</sub> | 11              | 38.34      | 33.50           | 0.06            |
|          | Max. H <sub>z</sub> | 2               | 38.34      | -0.17           | 33.59           |
|          | Max. M <sub>x</sub> | 2               | 3305.50    | -0.17           | 33.59           |
|          | Max. M <sub>z</sub> | 5               | 3303.46    | -33.59          | 0.08            |
|          | Max. Torsion        | 3               | 1.25       | -16.90          | 29.01           |
|          | Min. Vert           | 8               | 38.34      | -0.03           | -33.60          |
|          | Min. H <sub>x</sub> | 5               | 38.34      | -33.59          | 0.08            |
|          | Min. H <sub>z</sub> | 8               | 38.34      | -0.03           | -33.60          |
|          | Min. M <sub>x</sub> | 8               | -3311.04   | -0.03           | -33.60          |
|          | Min. M <sub>z</sub> | 11              | -3296.80   | 33.50           | 0.06            |
|          | Min. Torsion        | 8               | -1.42      | -0.03           | -33.60          |

### Tower Mast Reaction Summary

| Load Combination            | Vertical | Shear <sub>x</sub> | Shear <sub>z</sub> | Overtuning Moment, M <sub>x</sub> | Overtuning Moment, M <sub>z</sub> | Torque |
|-----------------------------|----------|--------------------|--------------------|-----------------------------------|-----------------------------------|--------|
|                             | K        | K                  | K                  | kip-ft                            | kip-ft                            | kip-ft |
| Dead Only                   | 38.34    | 0.00               | -0.00              | 1.53                              | 3.00                              | 0.00   |
| Dead+Wind 0 deg - No Ice    | 38.34    | 0.17               | -33.59             | -3305.50                          | -23.63                            | -1.21  |
| Dead+Wind 30 deg - No Ice   | 38.34    | 16.90              | -29.01             | -2850.08                          | -1667.53                          | -1.25  |
| Dead+Wind 60 deg - No Ice   | 38.34    | 29.12              | -16.78             | -1649.11                          | -2865.72                          | -0.97  |
| Dead+Wind 90 deg - No Ice   | 38.34    | 33.59              | -0.08              | -11.55                            | -3303.46                          | -0.39  |
| Dead+Wind 120 deg - No Ice  | 38.34    | 29.18              | 16.85              | 1663.21                           | -2874.91                          | 0.45   |
| Dead+Wind 150 deg - No Ice  | 38.34    | 16.72              | 29.13              | 2872.02                           | -1638.98                          | 1.18   |
| Dead+Wind 180 deg - No Ice  | 38.34    | 0.03               | 33.60              | 3311.04                           | -1.76                             | 1.42   |
| Dead+Wind 210 deg - No Ice  | 38.34    | -16.67             | 29.14              | 2874.22                           | 1637.40                           | 1.25   |
| Dead+Wind 240 deg - No Ice  | 38.34    | -29.01             | 16.94              | 1678.46                           | 2854.04                           | 0.76   |
| Dead+Wind 270 deg - No Ice  | 38.34    | -33.50             | -0.06              | -6.90                             | 3296.80                           | 0.16   |
| Dead+Wind 300 deg - No Ice  | 38.34    | -29.05             | -16.77             | -1648.72                          | 2861.52                           | -0.45  |
| Dead+Wind 330 deg - No Ice  | 38.34    | -16.80             | -28.99             | -2846.91                          | 1657.48                           | -0.95  |
| Dead+Ice+Temp               | 55.77    | 0.00               | -0.00              | 5.38                              | 10.19                             | 0.00   |
| Dead+Wind 0 deg+Ice+Temp    | 55.77    | 0.04               | -7.98              | -816.57                           | 4.19                              | -0.39  |
| Dead+Wind 30 deg+Ice+Temp   | 55.77    | 4.02               | -6.90              | -703.53                           | -404.56                           | -0.36  |
| Dead+Wind 60 deg+Ice+Temp   | 55.77    | 6.92               | -3.99              | -404.86                           | -702.59                           | -0.24  |
| Dead+Wind 90 deg+Ice+Temp   | 55.77    | 7.98               | -0.02              | 2.43                              | -811.56                           | -0.05  |
| Dead+Wind 120 deg+Ice+Temp  | 55.77    | 6.93               | 4.00               | 418.30                            | -704.72                           | 0.19   |
| Dead+Wind 150 deg+Ice+Temp  | 55.77    | 3.98               | 6.92               | 718.76                            | -397.99                           | 0.37   |
| Dead+Wind 180 deg+Ice+Temp  | 55.77    | 0.01               | 7.99               | 828.03                            | 9.22                              | 0.43   |
| Dead+Wind 210 deg+Ice+Temp  | 55.77    | -3.96              | 6.93               | 719.26                            | 416.88                            | 0.36   |
| Dead+Wind 240 deg+Ice+Temp  | 55.77    | -6.89              | 4.02               | 421.80                            | 719.16                            | 0.20   |
| Dead+Wind 270 deg+Ice+Temp  | 55.77    | -7.96              | -0.01              | 3.51                              | 829.27                            | 0.00   |
| Dead+Wind 300 deg+Ice+Temp  | 55.77    | -6.91              | -3.99              | -404.77                           | 720.87                            | -0.19  |
| Dead+Wind 330 deg+Ice+Temp  | 55.77    | -3.99              | -6.89              | -702.78                           | 421.50                            | -0.33  |
| Dead+Wind 0 deg - Service   | 38.34    | 0.06               | -11.62             | -1144.36                          | -6.16                             | -0.43  |
| Dead+Wind 30 deg - Service  | 38.34    | 5.85               | -10.04             | -986.52                           | -575.76                           | -0.44  |
| Dead+Wind 60 deg - Service  | 38.34    | 10.08              | -5.80              | -570.38                           | -990.94                           | -0.34  |
| Dead+Wind 90 deg - Service  | 38.34    | 11.62              | -0.03              | -2.97                             | -1142.66                          | -0.13  |
| Dead+Wind 120 deg - Service | 38.34    | 10.10              | 5.83               | 577.35                            | -994.14                           | 0.16   |
| Dead+Wind 150 deg - Service | 38.34    | 5.79               | 10.08              | 996.20                            | -565.87                           | 0.40   |
| Dead+Wind 180 deg - Service | 38.34    | 0.01               | 11.63              | 1148.36                           | 1.43                              | 0.49   |
| Dead+Wind 210 deg - Service | 38.34    | -5.77              | 10.08              | 996.96                            | 569.40                            | 0.44   |

| Load Combination               | Vertical<br>K | Shear <sub>x</sub><br>K | Shear <sub>z</sub><br>K | Overturning<br>Moment, M <sub>x</sub><br>kip-ft | Overturning<br>Moment, M <sub>z</sub><br>kip-ft | Torque<br>kip-ft |
|--------------------------------|---------------|-------------------------|-------------------------|---|---|------------------|
| Service                        |               |                         |                         |   |   |                  |
| Dead+Wind 240 deg -<br>Service | 38.34         | -10.04                  | 5.86                    | 582.63  | 990.97  | 0.28             |
| Dead+Wind 270 deg -<br>Service | 38.34         | -11.59                  | -0.02                   | -1.36   | 1144.41   | 0.06             |
| Dead+Wind 300 deg -<br>Service | 38.34         | -10.05                  | -5.80                   | -570.24   | 993.55  | -0.16            |
| Dead+Wind 330 deg -<br>Service | 38.34         | -5.81                   | -10.03                  | -985.40   | 576.35  | -0.33            |

### Solution Summary

| Load Comb. | Sum of Applied Forces |         |         | Sum of Reactions |         |         | % Error |
|------------|-----------------------|---------|---------|------------------|---------|---------|---------|
|            | PX<br>K               | PY<br>K | PZ<br>K | PX<br>K          | PY<br>K | PZ<br>K |         |
| 1          | 0.00                  | -38.34  | 0.00    | -0.00            | 38.34   | 0.00    | 0.001%  |
| 2          | 0.17                  | -38.34  | -33.59  | -0.17            | 38.34   | 33.59   | 0.006%  |
| 3          | 16.90                 | -38.34  | -29.01  | -16.90           | 38.34   | 29.01   | 0.000%  |
| 4          | 29.12                 | -38.34  | -16.78  | -29.12           | 38.34   | 16.78   | 0.000%  |
| 5          | 33.59                 | -38.34  | -0.08   | -33.59           | 38.34   | 0.08    | 0.006%  |
| 6          | 29.18                 | -38.34  | 16.85   | -29.18           | 38.34   | -16.85  | 0.000%  |
| 7          | 16.72                 | -38.34  | 29.13   | -16.72           | 38.34   | -29.13  | 0.000%  |
| 8          | 0.03                  | -38.34  | 33.61   | -0.03            | 38.34   | -33.60  | 0.006%  |
| 9          | -16.67                | -38.34  | 29.14   | 16.67            | 38.34   | -29.14  | 0.000%  |
| 10         | -29.01                | -38.34  | 16.94   | 29.01            | 38.34   | -16.94  | 0.000%  |
| 11         | -33.51                | -38.34  | -0.06   | 33.50            | 38.34   | 0.06    | 0.006%  |
| 12         | -29.05                | -38.34  | -16.77  | 29.05            | 38.34   | 16.77   | 0.000%  |
| 13         | -16.80                | -38.34  | -28.99  | 16.80            | 38.34   | 28.99   | 0.000%  |
| 14         | 0.00                  | -55.77  | 0.00    | -0.00            | 55.77   | 0.00    | 0.001%  |
| 15         | 0.04                  | -55.77  | -7.98   | -0.04            | 55.77   | 7.98    | 0.000%  |
| 16         | 4.02                  | -55.77  | -6.90   | -4.02            | 55.77   | 6.90    | 0.000%  |
| 17         | 6.92                  | -55.77  | -3.99   | -6.92            | 55.77   | 3.99    | 0.000%  |
| 18         | 7.98                  | -55.77  | -0.02   | -7.98            | 55.77   | 0.02    | 0.000%  |
| 19         | 6.93                  | -55.77  | 4.00    | -6.93            | 55.77   | -4.00   | 0.000%  |
| 20         | 3.98                  | -55.77  | 6.92    | -3.98            | 55.77   | -6.92   | 0.000%  |
| 21         | 0.01                  | -55.77  | 7.99    | -0.01            | 55.77   | -7.99   | 0.000%  |
| 22         | -3.96                 | -55.77  | 6.93    | 3.96             | 55.77   | -6.93   | 0.000%  |
| 23         | -6.89                 | -55.77  | 4.03    | 6.89             | 55.77   | -4.02   | 0.000%  |
| 24         | -7.96                 | -55.77  | -0.01   | 7.96             | 55.77   | 0.01    | 0.000%  |
| 25         | -6.91                 | -55.77  | -3.99   | 6.91             | 55.77   | 3.99    | 0.000%  |
| 26         | -3.99                 | -55.77  | -6.89   | 3.99             | 55.77   | 6.89    | 0.000%  |
| 27         | 0.06                  | -38.34  | -11.62  | -0.06            | 38.34   | 11.62   | 0.003%  |
| 28         | 5.85                  | -38.34  | -10.04  | -5.85            | 38.34   | 10.04   | 0.001%  |
| 29         | 10.08                 | -38.34  | -5.80   | -10.08           | 38.34   | 5.80    | 0.001%  |
| 30         | 11.62                 | -38.34  | -0.03   | -11.62           | 38.34   | 0.03    | 0.003%  |
| 31         | 10.10                 | -38.34  | 5.83    | -10.10           | 38.34   | -5.83   | 0.001%  |
| 32         | 5.79                  | -38.34  | 10.08   | -5.79            | 38.34   | -10.08  | 0.001%  |
| 33         | 0.01                  | -38.34  | 11.63   | -0.01            | 38.34   | -11.63  | 0.003%  |
| 34         | -5.77                 | -38.34  | 10.08   | 5.77             | 38.34   | -10.08  | 0.001%  |
| 35         | -10.04                | -38.34  | 5.86    | 10.04            | 38.34   | -5.86   | 0.001%  |
| 36         | -11.59                | -38.34  | -0.02   | 11.59            | 38.34   | 0.02    | 0.003%  |
| 37         | -10.05                | -38.34  | -5.80   | 10.05            | 38.34   | 5.80    | 0.001%  |
| 38         | -5.81                 | -38.34  | -10.03  | 5.81             | 38.34   | 10.03   | 0.001%  |

### Maximum Tower Deflections - Service Wind

| Section No. | Elevation<br>ft | Horz.<br>Deflection<br>in | Gov.<br>Load<br>Comb. | Tilt<br>° | Twist<br>° |
|-------------|-----------------|---------------------------|-----------------------|-----------|------------|
| L1          | 147 - 99.5      | 36.36                     | 31                    | 2.14      | 0.00       |
| L2          | 103.25 - 69.5   | 17.98                     | 31                    | 1.74      | 0.00       |
| L3          | 69.5 - 59       | 7.78                      | 31                    | 1.08      | 0.00       |
| L4          | 63.75 - 57.75   | 6.54                      | 31                    | 0.98      | 0.00       |
| L5          | 57.75 - 50.5    | 5.34                      | 31                    | 0.91      | 0.00       |
| L6          | 50.5 - 29.25    | 4.06                      | 31                    | 0.78      | 0.00       |
| L7          | 34.5 - 24       | 1.90                      | 31                    | 0.51      | 0.00       |

| Section No. | Elevation<br>ft | Horz. Deflection<br>in | Gov. Load Comb. | Tilt<br>° | Twist<br>° |
|-------------|-----------------|------------------------|-----------------|-----------|------------|
| L8          | 24 - 0          | 0.91                   | 31              | 0.36      | 0.00       |

### Critical Deflections and Radius of Curvature - Service Wind

| Elevation<br>ft | Appurtenance                   | Gov. Load Comb. | Deflection<br>in | Tilt<br>° | Twist<br>° | Radius of Curvature<br>ft |
|-----------------|--------------------------------|-----------------|------------------|-----------|------------|---------------------------|
| 149.0000        | A-ANT-23G-2-C                  | 31              | 36.36            | 2.14      | 0.00       | 30012                     |
| 147.0000        | LLPX310R w/ Mount Pipe         | 31              | 36.36            | 2.14      | 0.00       | 30012                     |
| 131.0000        | (4) DB844H90E-XY w/ Mount Pipe | 31              | 29.28            | 2.04      | 0.00       | 9378                      |
| 119.0000        | (2) S20057A-1                  | 31              | 24.17            | 1.94      | 0.00       | 5358                      |
| 110.0000        | (2) 7770.00 w/ Mount Pipe      | 31              | 20.55            | 1.83      | 0.00       | 4054                      |
| 100.0000        | APXV18-206517S-C w/ Mount Pipe | 31              | 16.80            | 1.68      | 0.00       | 3306                      |
| 60.0000         | Pipe Mount [PM 501-1]          | 31              | 5.78             | 0.94      | 0.00       | 4037                      |
| 49.0000         | KS24019-L112A                  | 31              | 3.82             | 0.75      | 0.00       | 3112                      |

### Maximum Tower Deflections - Design Wind

| Section No. | Elevation<br>ft | Horz. Deflection<br>in | Gov. Load Comb. | Tilt<br>° | Twist<br>° |
|-------------|-----------------|------------------------|-----------------|-----------|------------|
| L1          | 147 - 99.5      | 104.74                 | 6               | 6.17      | 0.01       |
| L2          | 103.25 - 69.5   | 51.86                  | 6               | 5.01      | 0.00       |
| L3          | 69.5 - 59       | 22.47                  | 6               | 3.13      | 0.00       |
| L4          | 63.75 - 57.75   | 18.88                  | 6               | 2.84      | 0.00       |
| L5          | 57.75 - 50.5    | 15.43                  | 6               | 2.63      | 0.00       |
| L6          | 50.5 - 29.25    | 11.71                  | 6               | 2.26      | 0.00       |
| L7          | 34.5 - 24       | 5.48                   | 6               | 1.46      | 0.00       |
| L8          | 24 - 0          | 2.64                   | 6               | 1.05      | 0.00       |

### Critical Deflections and Radius of Curvature - Design Wind

| Elevation<br>ft | Appurtenance                   | Gov. Load Comb. | Deflection<br>in | Tilt<br>° | Twist<br>° | Radius of Curvature<br>ft |
|-----------------|--------------------------------|-----------------|------------------|-----------|------------|---------------------------|
| 149.0000        | A-ANT-23G-2-C                  | 6               | 104.74           | 6.17      | 0.01       | 10638                     |
| 147.0000        | LLPX310R w/ Mount Pipe         | 6               | 104.74           | 6.17      | 0.01       | 10638                     |
| 131.0000        | (4) DB844H90E-XY w/ Mount Pipe | 6               | 84.39            | 5.88      | 0.01       | 3322                      |
| 119.0000        | (2) S20057A-1                  | 6               | 69.69            | 5.59      | 0.01       | 1895                      |
| 110.0000        | (2) 7770.00 w/ Mount Pipe      | 6               | 59.25            | 5.29      | 0.01       | 1432                      |
| 100.0000        | APXV18-206517S-C w/ Mount Pipe | 6               | 48.46            | 4.86      | 0.00       | 1165                      |
| 60.0000         | Pipe Mount [PM 501-1]          | 6               | 16.69            | 2.71      | 0.00       | 1406                      |
| 49.0000         | KS24019-L112A                  | 6               | 11.02            | 2.18      | 0.00       | 1081                      |

### Compression Checks

### Pole Design Data

| Section No. | Elevation<br>ft | Size                     | L<br>ft | L <sub>u</sub><br>ft | KI/r | F <sub>a</sub><br>ksi | A<br>in <sup>2</sup> | Actual P<br>K | Allow. P <sub>a</sub><br>K | Ratio P<br>P <sub>a</sub> |
|-------------|-----------------|--------------------------|---------|----------------------|------|-----------------------|----------------------|---------------|----------------------------|---------------------------|
| L1          | 147 - 99.5 (1)  | TP30.313x22x0.25         | 47.5000 | 0.0000               | 0.0  | 36.00                 | 23.6724              | -10.39        | 852.21                     | 0.012                     |
| L2          | 99.5 - 69.5 (2) | TP35.0626x29.1567x0.3125 | 33.7500 | 0.0000               | 0.0  | 39.00                 | 34.9673              | -16.55        | 1363.72                    | 0.012                     |
| L3          | 69.5 - 59 (3)   | TP36.9x35.0626x0.4301    | 10.5000 | 0.0000               | 0.0  | 34.46                 | 49.3591              | -17.87        | 1701.11                    | 0.011                     |



| Section No. | Elevation<br>ft     | Size                    | L<br>ft | L <sub>u</sub><br>ft | Kl/r | F <sub>a</sub><br>ksi | A<br>in <sup>2</sup> | Actual P<br>K | Allow. P <sub>a</sub><br>K | Ratio<br>$\frac{P}{P_a}$ |
|-------------|---------------------|-------------------------|---------|----------------------|------|-----------------------|----------------------|---------------|----------------------------|--------------------------|
| L4          | 59 - 57.75 (4)      | TP36.4938x35.2086x0.375 | 6.0000  | 0.0000               | 0.0  | 39.00                 | 43.6134              | -19.92        | 1700.92                    | 0.012                    |
| L5          | 57.75 - 50.5<br>(5) | TP37.7624x36.4938x0.455 | 7.2500  | 0.0000               | 0.0  | 37.93                 | 54.7161              | -21.72        | 2075.49                    | 0.010                    |
| L6          | 50.5 - 29.25<br>(6) | TP41.481x37.7624x0.479  | 21.2500 | 0.0000               | 0.0  | 34.60                 | 61.8224              | -26.11        | 2139.18                    | 0.012                    |
| L7          | 29.25 - 24 (7)      | TP41.6499x39.6043x0.485 | 10.5000 | 0.0000               | 0.0  | 38.37                 | 64.3802              | -30.14        | 2470.27                    | 0.012                    |
| L8          | 24 - 0 (8)          | TP45.85x41.6499x0.5728  | 24.0000 | 0.0000               | 0.0  | 34.72                 | 83.5157              | -38.32        | 2899.33                    | 0.013                    |

### Pole Bending Design Data

| Section No. | Elevation<br>ft     | Size                   | Actual M <sub>x</sub><br>kip-ft | Actual f <sub>bx</sub><br>ksi | Allow. F <sub>bx</sub><br>ksi | Ratio<br>$\frac{f_{bx}}{F_{bx}}$ | Actual M <sub>y</sub><br>kip-ft | Actual f <sub>by</sub><br>ksi | Allow. F <sub>by</sub><br>ksi | Ratio<br>$\frac{f_{by}}{F_{by}}$ |
|-------------|---------------------|------------------------|---------------------------------|-------------------------------|-------------------------------|----------------------------------|---------------------------------|-------------------------------|-------------------------------|----------------------------------|
| L1          | 147 - 99.5 (1)      | TP30.313x22x0.25       | 496.46                          | 35.03                         | 36.00                         | 0.973                            | 0.00                            | 0.00                          | 36.00                         | 0.000                            |
| L2          | 99.5 - 69.5 (2)     | TP35.0626x29.1567x0.31 | 1266.5                          | 51.22                         | 39.00                         | 1.313                            | 0.00                            | 0.00                          | 39.00                         | 0.000                            |
| L3          | 69.5 - 59 (3)       | TP36.9x35.0626x0.4301  | 1412.7                          | 39.58                         | 34.46                         | 1.149                            | 0.00                            | 0.00                          | 34.46                         | 0.000                            |
| L4          | 59 - 57.75 (4)      | TP36.4938x35.2086x0.37 | 1570.7                          | 49.06                         | 39.00                         | 1.258                            | 0.00                            | 0.00                          | 39.00                         | 0.000                            |
| L5          | 57.75 - 50.5<br>(5) | TP37.7624x36.4938x0.45 | 1768.3                          | 42.70                         | 37.93                         | 1.126                            | 0.00                            | 0.00                          | 37.93                         | 0.000                            |
| L6          | 50.5 - 29.25<br>(6) | TP41.481x37.7624x0.479 | 2227.6                          | 44.30                         | 34.60                         | 1.280                            | 0.00                            | 0.00                          | 34.60                         | 0.000                            |
| L7          | 29.25 - 24 (7)      | TP41.6499x39.6043x0.48 | 2546.1                          | 47.34                         | 38.37                         | 1.234                            | 0.00                            | 0.00                          | 38.37                         | 0.000                            |
| L8          | 24 - 0 (8)          | TP45.85x41.6499x0.5728 | 3321.3                          | 43.32                         | 34.72                         | 1.248                            | 0.00                            | 0.00                          | 34.72                         | 0.000                            |

### Pole Shear Design Data

| Section No. | Elevation<br>ft     | Size                   | Actual V<br>K | Actual f <sub>v</sub><br>ksi | Allow. F <sub>v</sub><br>ksi | Ratio<br>$\frac{f_v}{F_v}$ | Actual T<br>kip-ft | Actual f <sub>vt</sub><br>ksi | Allow. F <sub>vt</sub><br>ksi | Ratio<br>$\frac{f_{vt}}{F_{vt}}$ |
|-------------|---------------------|------------------------|---------------|------------------------------|------------------------------|----------------------------|--------------------|-------------------------------|-------------------------------|----------------------------------|
| L1          | 147 - 99.5 (1)      | TP30.313x22x0.25       | 19.91         | 0.84                         | 24.00                        | 0.071                      | 0.21               | 0.01                          | 24.00                         | 0.000                            |
| L2          | 99.5 - 69.5 (2)     | TP35.0626x29.1567x0.31 | 25.08         | 0.72                         | 26.00                        | 0.056                      | 0.05               | 0.00                          | 26.00                         | 0.000                            |
| L3          | 69.5 - 59 (3)       | TP36.9x35.0626x0.4301  | 25.85         | 0.52                         | 22.98                        | 0.046                      | 0.00               | 0.00                          | 22.98                         | 0.000                            |
| L4          | 59 - 57.75 (4)      | TP36.4938x35.2086x0.37 | 26.84         | 0.62                         | 26.00                        | 0.048                      | 0.05               | 0.00                          | 26.00                         | 0.000                            |
| L5          | 57.75 - 50.5<br>(5) | TP37.7624x36.4938x0.45 | 27.73         | 0.51                         | 25.29                        | 0.041                      | 0.09               | 0.00                          | 25.29                         | 0.000                            |
| L6          | 50.5 - 29.25<br>(6) | TP41.481x37.7624x0.479 | 29.69         | 0.48                         | 23.07                        | 0.042                      | 0.18               | 0.00                          | 23.07                         | 0.000                            |
| L7          | 29.25 - 24 (7)      | TP41.6499x39.6043x0.48 | 30.96         | 0.48                         | 25.58                        | 0.038                      | 0.25               | 0.00                          | 25.58                         | 0.000                            |
| L8          | 24 - 0 (8)          | TP45.85x41.6499x0.5728 | 33.71         | 0.40                         | 23.14                        | 0.035                      | 0.45               | 0.00                          | 23.14                         | 0.000                            |

### Pole Interaction Design Data

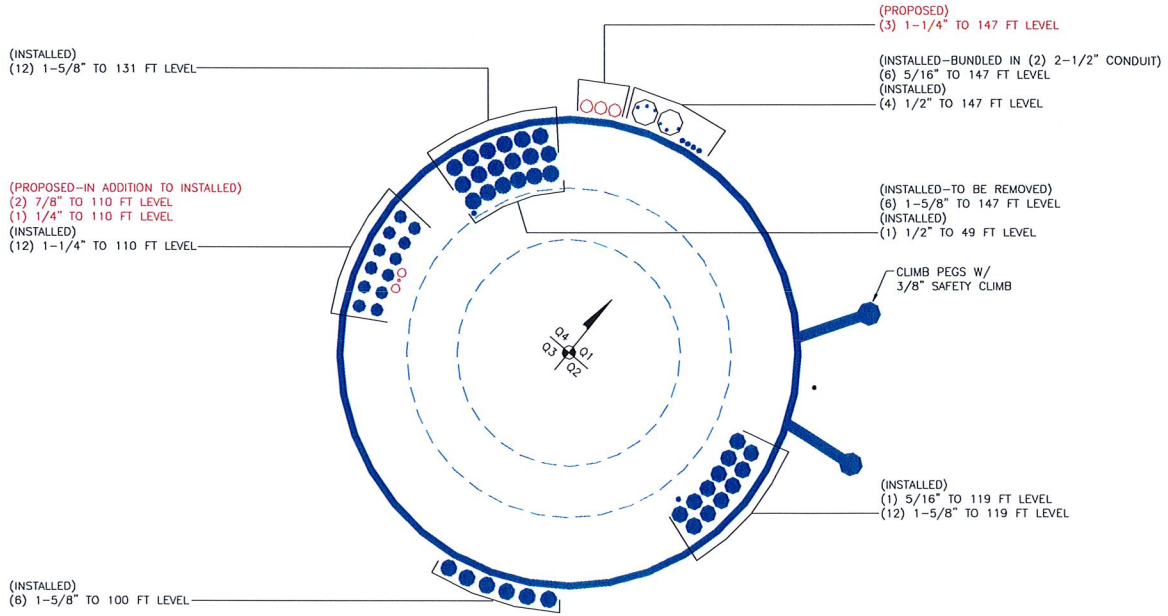
| Section No. | Elevation<br>ft | Ratio<br>$\frac{P}{P_a}$ | Ratio<br>$\frac{f_{bx}}{F_{bx}}$ | Ratio<br>$\frac{f_{by}}{F_{by}}$ | Ratio<br>$\frac{f_v}{F_v}$ | Ratio<br>$\frac{f_{vt}}{F_{vt}}$ | Comb. Stress Ratio | Allow. Stress Ratio | Criteria  |
|-------------|-----------------|--------------------------|----------------------------------|----------------------------------|----------------------------|----------------------------------|--------------------|---------------------|-----------|
| L1          | 147 - 99.5 (1)  | 0.012                    | 0.973                            | 0.000                            | 0.071                      | 0.000                            | 0.986              | 1.333               | H1-3+VT ✓ |
| L2          | 99.5 - 69.5 (2) | 0.012                    | 1.313                            | 0.000                            | 0.056                      | 0.000                            | 1.326              | 1.333               | H1-3+VT ✓ |
| L3          | 69.5 - 59 (3)   | 0.011                    | 1.149                            | 0.000                            | 0.046                      | 0.000                            | 1.160              | 1.333               | H1-3+VT ✓ |

| Section No. | Elevation<br>ft  | Ratio           | Ratio                   | Ratio                   | Ratio             | Ratio                   | Comb. Stress Ratio | Allow. Stress Ratio | Criteria  |
|-------------|------------------|-----------------|-------------------------|-------------------------|-------------------|-------------------------|--------------------|---------------------|-----------|
|             |                  | $\frac{P}{P_a}$ | $\frac{f_{bx}}{F_{bx}}$ | $\frac{f_{by}}{F_{by}}$ | $\frac{f_v}{F_v}$ | $\frac{f_{vt}}{F_{vt}}$ |                    |                     |           |
| L4          | 59 - 57.75 (4)   | 0.012           | 1.258                   | 0.000                   | 0.048             | 0.000                   | 1.270              | 1.333               | H1-3+VT ✓ |
| L5          | 57.75 - 50.5 (5) | 0.010           | 1.126                   | 0.000                   | 0.041             | 0.000                   | 1.137              | 1.333               | H1-3+VT ✓ |
| L6          | 50.5 - 29.25 (6) | 0.012           | 1.280                   | 0.000                   | 0.042             | 0.000                   | 1.293              | 1.333               | H1-3+VT ✓ |
| L7          | 29.25 - 24 (7)   | 0.012           | 1.234                   | 0.000                   | 0.038             | 0.000                   | 1.246              | 1.333               | H1-3+VT ✓ |
| L8          | 24 - 0 (8)       | 0.013           | 1.248                   | 0.000                   | 0.035             | 0.000                   | 1.261              | 1.333               | H1-3+VT ✓ |

### Section Capacity Table

| Section No.     | Elevation ft | Component Type | Size                     | Critical Element | P K    | SF*P <sub>allow</sub> K | % Capacity  | Pass Fail   |
|-----------------|--------------|----------------|--------------------------|------------------|--------|-------------------------|-------------|-------------|
| L1              | 147 - 99.5   | Pole           | TP30.313x22x0.25         | 1                | -10.39 | 1135.99                 | 74.0        | Pass        |
| L2              | 99.5 - 69.5  | Pole           | TP35.0626x29.1567x0.3125 | 2                | -16.55 | 1817.84                 | 99.5        | Pass        |
| L3              | 69.5 - 59    | Pole           | TP36.9x35.0626x0.4301    | 3                | -17.87 | 2267.58                 | 87.0        | Pass        |
| L4              | 59 - 57.75   | Pole           | TP36.4938x35.2086x0.375  | 4                | -19.92 | 2267.33                 | 95.3        | Pass        |
| L5              | 57.75 - 50.5 | Pole           | TP37.7624x36.4938x0.4555 | 5                | -21.72 | 2766.63                 | 85.3        | Pass        |
| L6              | 50.5 - 29.25 | Pole           | TP41.481x37.7624x0.479   | 6                | -26.11 | 2851.53                 | 97.0        | Pass        |
| L7              | 29.25 - 24   | Pole           | TP41.6499x39.6043x0.4857 | 7                | -30.14 | 3292.87                 | 93.5        | Pass        |
| L8              | 24 - 0       | Pole           | TP45.85x41.6499x0.5728   | 8                | -38.32 | 3864.81                 | 94.6        | Pass        |
| Summary         |              |                |                          |                  |        |                         |             |             |
| Pole (L2)       |              |                |                          |                  |        |                         | 99.5        | Pass        |
| <b>RATING =</b> |              |                |                          |                  |        |                         | <b>99.5</b> | <b>Pass</b> |

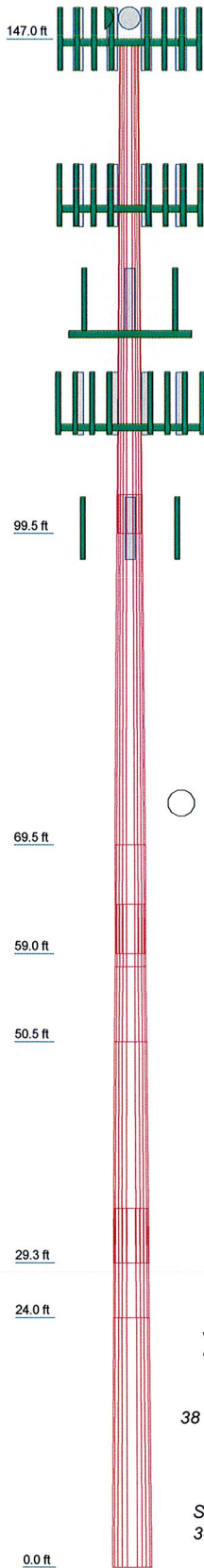
### APPENDIX B BASE LEVEL DRAWING



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



| Section            | 1       | 2       | 3              | 4               | 5               | 6               | 7               | 8               |
|--------------------|---------|---------|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Length (ft)        | 47.5000 | 33.7500 | 6.0000, 5.0000 | 7.2500          | 10.5000         | 21.2500         | 10.5000         | 24.0000         |
| Number of Sides    | 12      | 12      | 12             | 12              | 12              | 12              | 12              | 12              |
| Thickness (in)     | 0.2500  | 0.3125  | 0.4301         | 0.4555          | 0.3750          | 0.4790          | 0.4857          | 0.5728          |
| Socket Length (ft) | 3.7500  |         | 4.7500         |                 |                 | 5.2500          |                 |                 |
| Top Dia (in)       | 22.0000 | 29.1667 | 35.0626        | 36.49375        | 20.86           | 37.7624         | 39.6043         | 41.6499         |
| Bot Dia (in)       | 30.3130 | 35.0626 | 36.9000        | 37.76246        | 43.37           | 41.4810         | 41.6499         | 45.8500         |
| Grade              | A607-60 | A607-65 | A607-65        | Reinf 63.22 ksi | Reinf 57.44 ksi | Reinf 57.67 ksi | Reinf 63.22 ksi | Reinf 57.86 ksi |
| Weight (K)         | 3.4     | 3.7     | 1.8            | 0.9             | 1.3             | 4.4             | 2.2             | 6.5             |



### DESIGNED APPURTENANCE LOADING

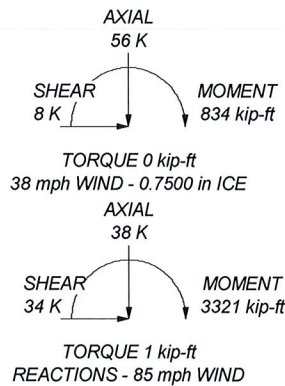
| TYPE                           | ELEVATION | TYPE                           | ELEVATION |
|--------------------------------|-----------|--------------------------------|-----------|
| LLPX310R w/ Mount Pipe         | 147       | (2) S20057A-1                  | 119       |
| FDD_R6_RRH                     | 147       | APX16DWW-16DWS-C w/ Mount Pipe | 119       |
| 1900MHz RRH (65MHz)            | 147       | T-Arm Mount [TA 601-3]         | 119       |
| 800 EXTERNAL NOTCH FILTER      | 147       | (2) S20057A-1                  | 119       |
| 800MHz RRH                     | 147       | APX16DWW-16DWS-C w/ Mount Pipe | 119       |
| (3) ACU-A20-N                  | 147       | (2) RRU5-11                    | 110       |
| APXVSP18-C-A20 w/ Mount Pipe   | 147       | 800 10764 w/ Mount Pipe        | 110       |
| LLPX310R w/ Mount Pipe         | 147       | DC6-48-60-18-8F                | 110       |
| FDD_R6_RRH                     | 147       | (2) 7770.00 w/ Mount Pipe      | 110       |
| 1900MHz RRH (65MHz)            | 147       | (4) LGP2140X                   | 110       |
| 800 EXTERNAL NOTCH FILTER      | 147       | (2) RRU5-11                    | 110       |
| 800MHz RRH                     | 147       | 800 10764 w/ Mount Pipe        | 110       |
| P40-16-XLPP-RR-A w/ Mount Pipe | 147       | (2) 7770.00 w/ Mount Pipe      | 110       |
| (3) ACU-A20-N                  | 147       | (4) LGP2140X                   | 110       |
| LLPX310R w/ Mount Pipe         | 147       | (2) RRU5-11                    | 110       |
| FDD_R6_RRH                     | 147       | 800 10764 w/ Mount Pipe        | 110       |
| 1900MHz RRH (65MHz)            | 147       | Platform Mount [LP 401-1]      | 110       |
| 800 EXTERNAL NOTCH FILTER      | 147       | (2) 7770.00 w/ Mount Pipe      | 110       |
| 800MHz RRH                     | 147       | (4) LGP2140X                   | 110       |
| (3) ACU-A20-N                  | 147       | APXV18-206517S-C w/ Mount Pipe | 100       |
| APXVSP18-C-A20 w/ Mount Pipe   | 147       | Pipe Mount [PM 601-3]          | 100       |
| Platform Mount [LP 404-1]      | 147       | APXV18-206517S-C w/ Mount Pipe | 100       |
| A-ANT-23G-2-C                  | 147       | APXV18-206517S-C w/ Mount Pipe | 100       |
| A-ANT-23G-2-C                  | 147       | Pipe Mount [PM 501-1]          | 60        |
| (4) DB844H90E-XY w/ Mount Pipe | 131       | Side Arm Mount [SO 701-1]      | 49        |
| Platform Mount [LP 601-1]      | 131       | KS24019-L112A                  | 49        |
| (4) DB844H90E-XY w/ Mount Pipe | 131       |                                |           |
| (4) DB844H90E-XY w/ Mount Pipe | 131       |                                |           |
| (2) S20057A-1                  | 119       |                                |           |
| APX16DWW-16DWS-C w/ Mount Pipe | 119       |                                |           |

### MATERIAL STRENGTH

| GRADE           | Fy     | Fu     | GRADE           | Fy     | Fu     |
|-----------------|--------|--------|-----------------|--------|--------|
| A607-60         | 60 ksi | 75 ksi | Reinf 57.67 ksi | 58 ksi | 73 ksi |
| A607-65         | 65 ksi | 80 ksi | Reinf 63.95 ksi | 64 ksi | 80 ksi |
| Reinf 57.44 ksi | 57 ksi | 65 ksi | Reinf 57.86 ksi | 58 ksi | 73 ksi |
| Reinf 63.22 ksi | 63 ksi | 80 ksi |                 |        |        |

### TOWER DESIGN NOTES

1. Tower is located in New Haven County, Connecticut.
2. Tower designed for a 85 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 38 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 99.5%



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 FAX: 614.448.4105

|  |                           |             |  |
|--|---------------------------|-------------|--|
| Job: <b>147' MP; Branford Banm Tower; Branford, CT</b> |                           |             |  |
| Project: <b>PJF# 37512-1607 (BU# 876321)</b>           |                           |             |  |
| Client: CCI  | Drawn by: Corey McCartney | App'd:      |  |
| Code: TIA/EIA-222-F                                    | Date: 09/06/12            | Scale: NTS  |  |
| Path:  |                           | Dwg No. E-1 |  |

## 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  $(1) \times (\text{Rod Diameter})$

### Site Data

BU#: 876321  
 Site Name: Branford Banm  
 App #:

| Anchor Rod Data |         |
|-----------------|---------|
| Qty:            | 16      |
| Diam:           | 2.25 in |
| Rod Material:   | A615-J  |
| Yield, Fy:      | 75 ksi  |
| Strength, Fu:   | 100 ksi |
| Bolt Circle:    | 54 in   |
| Anchor Spacing: | 6 in    |

| Plate Data     |        |
|----------------|--------|
| W=Side:        | 54 in  |
| Thick:         | 3.5 in |
| Grade:         | 50 ksi |
| Clip Distance: | 4 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:       | 45.85 in        |
| Thick:      | 0.4375 in       |
| Grade:      | 65 ksi          |
| # of Sides: | 12 "0" IF Round |

| Stress Increase Factor |       |
|------------------------|-------|
| ASD ASIF:              | 1.333 |

| Base Reactions        |      |         |
|-----------------------|------|---------|
| TIA Revision:         | F    |         |
| Unfactored Moment, M: | 3321 | ft-kips |
| Unfactored Axial, P:  | 38   | kips    |
| Unfactored Shear, V:  | 34   | kips    |

### Anchor Rod Results

TIA F --> Maximum Rod Tension: 182.1 Kips  
 Allowable Tension: 195.0 Kips  
 Anchor Rod Stress Ratio: 93.4% **Pass**

### Base Plate Results

Base Plate Stress: 37.9 ksi  
 Allowable PL Bending Stress: 50.0 ksi  
 Base Plate Stress Ratio: 75.9% **Pass**

### Flexural Check

| PL Ref. Data     |       |
|------------------|-------|
| Yield Line (in): | 30.52 |
| Max PL Length:   | 30.52 |

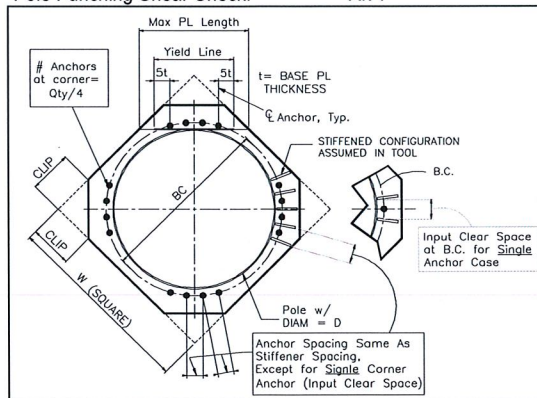
### N/A - Unstiffened

### 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



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

Foundation Loads:

Pole weight or tower leg compression = 38 (kips)  
 Horizontal load at top of pier = 34 (kips)  
 Overturning moment at top of pier = 3321 (ft-kips)

Design criteria:

Safety factor against overturning = 1.5

Soil Properties:

Soil density = 125 (pcf)  
 Allowable soil bearing = 4 (ksf)  
 Depth to water table = 4.5 (ft)

Dimensions:

Pier shape (round or square) S ("R" or "S")  
 Pier width = 7 (ft)  
 Pier height above grade = 0.5 (ft)  
 depth to bottom of footing = 11 (ft)  
 Footing thickness = 3 (ft)  
 Footing width = 20.5 (ft)  
 Footing length = 20.5 (ft)

Concrete:

Concrete strength = 3 (ksi)  
 Rebar strength = 60 (ksi)  
 ultimate load factor = 1.3

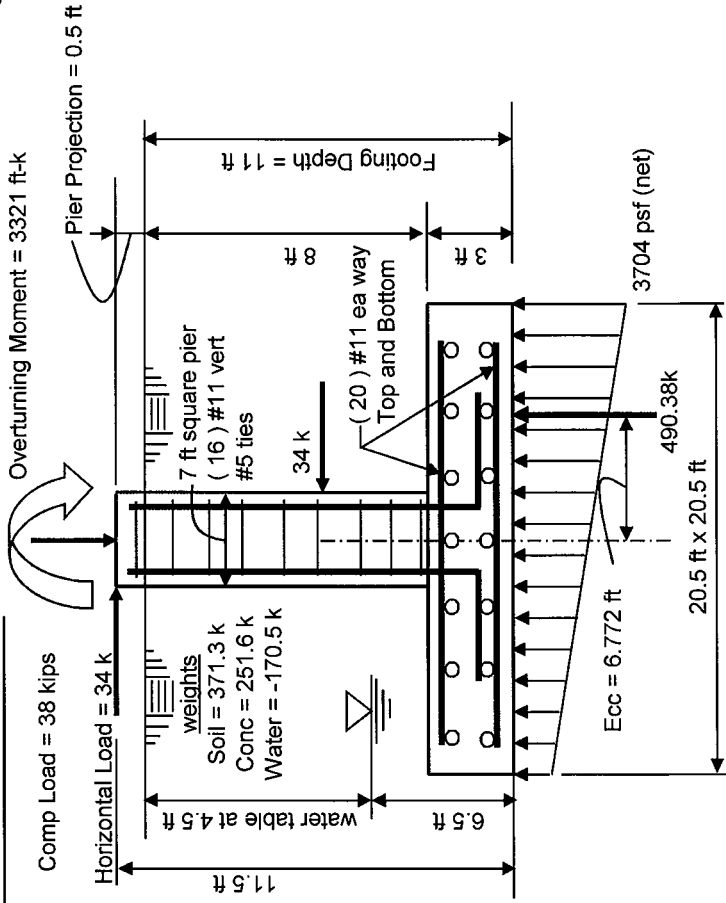
Reinforcing Steel:

minimum cover over rebar = 3 inches  
 size of pad rebar = #11 bar  
 quantity of pad rebar = 20 (ea direction)

Reinforcing Steel:

size of vert rebar in pier = #11 bar  
 vertical rebar quantity = 16  
 size of pier ties = #5 bar  
 minimum cover over rebar = 3 inches

Total volume of concrete = 62.1 cu yd



**Summary of analysis results**

Maximum Net Soil Bearing = 3,704 ksf  
 Allowable Net Soil Bearing = 4 ksf  
**Soil Bearing Stress Ratio = 0.93 Okay**

Ult Bending Shear Capacity = 110 psi  
 Ult Bending Shear Stress = 53 psi  
**Bending Shear Stress Ratio = 0.48 Okay**

Fig Overturning Resistance = 5026 ft-kips  
 Overturning Moment = 3321 ft-kips  
 Required Overturning Safety Factor = 1.5  
 Overturning Safety Factor = 1.514  
**Ratio = 0.99 Okay**

Pad Bending Moment Capacity = 4134 ft-k  
 Pad Bending Moment = 1550 ft-k  
**Bending Moment Stress Ratio = 0.37 OK**

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spColumn v4.80 (TM)  
Computer program for the Strength Design of Reinforced Concrete Sections  
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General Information:

=====  
 File Name: g:\tower\375\_crown\_castle\2012\37512-1607 bu 876321\wo522965 bu876321\37512-1607.col  
 Project: 37512-1607  
 Column: Engineer:  
 Code: ACI 318-02 Units: English  
 Run Option: Investigation Slenderness: Not considered  
 Run Axis: X-axis Column Type: Structural

Material Properties:

=====  
 f'c = 3 ksi fy = 60 ksi  
 Ec = 3122.02 ksi Es = 29000 ksi  
 Ultimate strain = 0.003 in/in  
 Beta1 = 0.85

Section:

=====  
 Rectangular: Width = 84 in Depth = 84 in  
 Gross section area, Ag = 7056 in^2  
 Ix = 4.14893e+006 in^4 Iy = 4.14893e+006 in^4  
 rx = 24.2487 in ry = 24.2487 in  
 Xo = 0 in Yo = 0 in

Reinforcement:

=====  
 Bar Set: ASTM A615  

| Size | Diam (in) | Area (in^2) | Size | Diam (in) | Area (in^2) | Size | Diam (in) | Area (in^2) |
|------|-----------|-------------|------|-----------|-------------|------|-----------|-------------|
| # 3  | 0.38      | 0.11        | # 4  | 0.50      | 0.20        | # 5  | 0.63      | 0.31        |
| # 6  | 0.75      | 0.44        | # 7  | 0.88      | 0.60        | # 8  | 1.00      | 0.79        |
| # 9  | 1.13      | 1.00        | # 10 | 1.27      | 1.27        | # 11 | 1.41      | 1.56        |
| # 14 | 1.69      | 2.25        | # 18 | 2.26      | 4.00        |      |           |             |

Confinement: Tied; #5 ties with #11 bars, #5 with larger bars.  
 phi(a) = 0.8, phi(b) = 0.9, phi(c) = 0.65

Pattern: Irregular

Total steel area: As = 30.21 in^2 at rho = 0.43% (Note: rho < 0.50%)  
 Minimum clear spacing = 10.31 in

| Area in^2 | X (in) | Y (in) | Area in^2 | X (in) | Y (in) | Area in^2 | X (in) | Y (in) |
|-----------|--------|--------|-----------|--------|--------|-----------|--------|--------|
| 1.56      | -37.7  | 37.7   | 1.75      | 16.5   | 26.1   | 1.56      | -18.8  | 37.7   |
| 1.75      | -21.9  | 21.9   | 1.56      | 0.0    | 37.7   | 1.75      | 9.5    | -29.4  |
| 1.56      | 18.8   | 37.7   | 1.56      | 37.7   | 37.7   | 1.56      | -37.7  | -37.7  |
| 1.56      | -18.8  | -37.7  | 1.56      | 0.0    | -37.7  | 1.56      | 18.8   | -37.7  |
| 1.56      | 37.7   | -37.7  | 1.56      | -37.7  | 18.8   | 1.56      | -37.7  | 0.0    |
| 1.56      | -37.7  | -18.8  | 1.56      | 37.7   | 18.8   | 1.56      | 37.7   | 0.0    |
| 1.56      | 37.7   | -18.8  |           |        |        |           |        |        |

Factored Loads and Moments with Corresponding Capacities:

=====  

| No. | Pu<br>kip | Mux<br>k-ft | PhiMnx<br>k-ft | PhiMn/Mu | NA depth<br>in | Dt depth<br>in | eps_t   | Phi   |
|-----|-----------|-------------|----------------|----------|----------------|----------------|---------|-------|
| 1   | 38.00     | 4693.00     | 5525.95        | 1.177    | 6.49           | 79.67          | 0.03384 | 0.900 |

\*\*\* End of output \*\*\*

CROWN CASTLE PROJECT: BU #876321; BRANFORD BANM TOWER; BRANFORD, CT  
MONOPOLE RETROFIT PROJECT MASTER NOTES DOCUMENT (REV. 2, 1/22/2008)

UPON THE SUCCESSFUL AND COMPLETE INSTALLATION OF THE REINFORCING SYSTEM SPECIFIED IN THESE PLANS, THE REINFORCED POLE MEETS THE WIND DESIGN RECOMMENDATIONS OF THE TIA/EIA-222-F-1986 STANDARD FOR WIND SPEEDS OF 85 MPH AND 38 MPH + 3/4" RADIAL ICE

**A. GENERAL NOTES**

- IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO FIELD VERIFY ALL EXISTING CONDITIONS AND DIMENSIONS PRIOR TO FABRICATION AND CONSTRUCTION. THESE DRAWINGS WERE PREPARED FROM INFORMATION AND DOCUMENTS PROVIDED TO PAUL J. FORD & COMPANY BY CROWN CASTLE. THIS INFORMATION PROVIDED HAS NOT BEEN FIELD VERIFIED BY PAUL J. FORD & COMPANY FOR ACCURACY AND THEREFORE DISCREPANCIES BETWEEN THESE DRAWINGS AND ACTUAL SITE CONDITIONS SHOULD BE ANTICIPATED. ANY DISCREPANCIES AND/OR CHANGES BETWEEN THE INFORMATION CONTAINED IN THESE DRAWINGS AND THE ACTUAL VERIFIED SITE CONDITIONS SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF CROWN CASTLE AND PAUL J. FORD & COMPANY SO THAT ANY CHANGES AND/OR ADJUSTMENTS, IF NECESSARY, CAN BE MADE TO THE DESIGN AND DRAWINGS.
- THE EXISTING UNREINFORCED MONOPOLE STRUCTURE DOES NOT HAVE THE STRUCTURAL CAPACITY TO CARRY ALL OF THE ANTENNA AND PLATFORM LOADS SHOWN ON THESE DRAWINGS. THE REQUIRED MINIMUM TIA/EIA-222-F BASIC WIND SPEEDS TO NOT INSTALL ANY ADDITIONAL OR NEW ANTENNA AND PLATFORM LOADS UNTIL THE MONOPOLE REINFORCING SYSTEM IS COMPLETELY AND SUCCESSFULLY INSTALLED.
- IF MATERIALS, QUANTITIES, STRENGTHS OR SIZES INDICATED BY THE DRAWINGS OR SPECIFICATIONS ARE NOT IN AGREEMENT WITH THESE NOTES, THE BETTER QUALITY AND/OR GREATER QUANTITY, STRENGTH OR SIZE INDICATED, SPECIFIED OR NOTED SHALL BE PROVIDED.
- THIS STRUCTURE IS DESIGNED TO BE SELF-SUPPORTING AND STABLE AFTER THE INSTALLATION OF THE REINFORCING REPAIR SYSTEM HAS BEEN PROPERLY AND ADEQUATELY COMPLETED. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO INSURE THE SAFETY AND STABILITY OF THE MONOPOLE AND ITS COMPONENT PARTS DURING FIELD MODIFICATIONS. THIS INCLUDES, BUT IS NOT LIMITED TO, THE ADDITION OF WHATEVER TEMPORARY BRACING, GUYS OR TIE DOWNS THAT MAY BE NECESSARY. SUCH MATERIAL SHALL BE REMOVED AND SHALL REMAIN THE PROPERTY OF THE CONTRACTOR AFTER THE COMPLETION OF THE PROJECT. IMPORTANT CUTTING, WELDING AND SAFETY GUIDELINES: THE CONTRACTOR SHALL FOLLOW ALL CROWN CASTLE CUTTING, WELDING AND SAFETY GUIDELINES. THE CROWN CASTLE GUIDELINES FROM CROWN CASTLE, PER THE 12-01-2005 CROWN CASTLE DIRECTIVE, "ALL CUTTING AND WELDING ACTIVITIES SHALL BE CONDUCTED IN ACCORDANCE WITH CROWN CASTLE POLICY CUTTING AND WELDING PLAN" (DOC # ENG-PLAN-100151) ON AN ONGOING BASIS THROUGHOUT THE ENTIRE LIFE OF THE PROJECT.
- THE STRUCTURAL CONTRACT DOCUMENTS DO NOT INDICATE THE METHOD OR MEANS OF CONSTRUCTION. THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK AND SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES. OBSERVATION VISITS TO THE SITE BY THE OWNER AND/OR THE ENGINEER SHALL NOT INCLUDE INSPECTIONS OF THE PROTECTIVE MEASURES OR THE CONSTRUCTION PROCEDURES.
- ANY SUPPORT SERVICES PERFORMED BY THE ENGINEER DURING CONSTRUCTION SHALL BE DISTINGUISHED FROM CONTINUOUS AND DETAILED INSPECTION SERVICES WHICH ARE FURNISHED BY THE INSPECTING/TESTING AGENCY. THESE SUPPORT SERVICES PERFORMED BY THE ENGINEER ARE SOLELY FOR THE PURPOSE OF ASSISTING IN QUALITY CONTROL AND IN ACHIEVING CONFORMANCE WITH CONTRACT DOCUMENTS. THEY DO NOT GUARANTEE CONTRACTOR'S PERFORMANCE AND SHALL NOT BE CONSTRUED AS SUPERVISION OF CONSTRUCTION.
- ALL MATERIALS AND EQUIPMENT FURNISHED WILL BE NEW AND OF GOOD QUALITY, FREE FROM FAULTS AND DEFECTS AND IN CONFORMANCE WITH THE CONTRACT DOCUMENTS. ANY AND ALL SUBSTITUTIONS MUST BE PROPERLY APPROVED AND AUTHORIZED IN WRITING BY THE OWNER AND ENGINEER PRIOR TO INSTALLATION. THE CONTRACTOR SHALL FURNISH SATISFACTORY EVIDENCE AS TO THE KIND AND QUALITY OF MATERIALS AND EQUIPMENT BEING SUBSTITUTED.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR INITIATING, MAINTAINING, AND SUPERVISING ALL SAFETY PRECAUTIONS AND PROGRAMS IN CONNECTION WITH THE WORK. THE CONTRACTOR IS RESPONSIBLE TO INSURE THAT THIS PROJECT AND RELATED WORK COMPLES WITH ALL APPLICABLE LOCAL, STATE, AND FEDERAL SAFETY CODES AND REGULATIONS GOVERNING THIS WORK AS WELL AS CROWN CASTLE SAFETY GUIDELINES.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING ALL EXISTING AND NEW COAXIAL CABLES AND OTHER EQUIPMENT DURING CONSTRUCTION.
- ANY EXISTING ATTACHMENTS AND/OR PROJECTIONS ON THE POLE THAT MAY INTERFERE WITH THE INSTALLATION OF THE REINFORCING SYSTEM WILL HAVE TO BE REMOVED, AND/OR RELOCATED, AND/OR REPLACED AND RE-INSTALLED AFTER THE REINFORCING IS SUCCESSFULLY COMPLETED. THE CONTRACTOR SHALL IDENTIFY AND COORDINATE THESE ITEMS PRIOR TO CONSTRUCTION WITH THE OWNER, TESTING AGENCY, AND ENGINEER.
- ANY AND ALL EXISTING PLATFORMS THAT ARE LOCATED IN AREAS OF THE POLE SHAFT WHERE SHAFT REINFORCING MUST BE APPLIED SHALL BE TEMPORARILY REMOVED OR OTHERWISE SUPPORTED TO PERMIT NEW CONTINUOUS REINFORCEMENT TO BE ATTACHED. AFTER THE CONTRACTOR HAS SUCCESSFULLY INSTALLED THE MONOPOLE REINFORCEMENT SYSTEM, THE CONTRACTOR SHALL RE-INSTALL THE PLATFORMS. IN NO CASE SHALL ANY NEW AND/OR ADDITIONAL PLATFORMS AND/OR ANTENNAS AND/OR COAX CABLES AND/OR OTHER EQUIPMENT BE INSTALLED ON THE MONOPOLE UNTIL THE CONTRACTOR HAS SUCCESSFULLY COMPLETED THE INSTALLATION OF ALL OF THE REQUIRED STRUCTURAL REINFORCING SYSTEM COMPONENTS.

**B. "LOW HEAT" WELDING PROCEDURES**

- ANY AND ALL FIELD WELDING REQUIRED ON THIS PROJECT SHALL BE PERFORMED BY AWS CERTIFIED WELDERS USING "LOW HEAT" WELDING TECHNIQUES.
- FOR THE PURPOSES OF THIS PROJECT, "LOW HEAT" WELDING IS DEFINED AS A CAREFUL AND CONTROLLED WELDING PROCESS, PERFORMED BY EXPERIENCED AWS CERTIFIED WELDERS, SUCH THAT THE CORRECT AMOUNT OF WELD METAL IS DEPOSITED AND IS PROPERLY FUSED IN SUCH A WAY THAT EXCESSIVE AMOUNTS OF HEAT BUILDUP AT THE WELDED JOINT, DUE TO EXCESSIVE MOLTEN WELD METAL POOLING, IS AVOIDED.
- THE "LOW HEAT" WELDING PROCESS SHALL BE SET UP SO THAT ANY FIELD WELDING ACTIVITY ON THE POLE STRUCTURE DOES NOT SCORCH OR OTHERWISE DAMAGE THE EXISTING GALVANIZED SURFACE ON THE INSIDE OF THE POLE SHAFT IN AND AROUND THE REGION OF THE WELD.
- THE "LOW HEAT" WELDING PROCESS, USED IN CONJUNCTION WITH THE CROWN CASTLE COAX PROTECTION AND FIRE SAFETY GUIDELINES, SHALL BE SET UP SO THAT ANY FIELD WELDING ACTIVITY ON THE POLE STRUCTURE DOES NOT SCORCH AND/OR OTHERWISE DAMAGE THE EXISTING COAX CABLES THAT RUN ON THE INSIDE AND/OR OUTSIDE OF THE POLE SHAFT IN AND AROUND THE REGION OF THE WELD.
- "LOW HEAT" WELD DEMONSTRATION REQUIRED: PRIOR TO BEGINNING THE FIELD WELDING FOR THE REINFORCEMENT WORK, THE CONTRACTOR'S AWS CERTIFIED WELDER SHALL DEMONSTRATE THE "LOW HEAT" WELDING PROCESS THAT WILL BE USED ON THIS PROJECT SO THAT CROWN CASTLE REPRESENTATIVES CAN OBSERVE AND VERIFY THAT THE PROPOSED PROCESS DOES NOT DAMAGE THE EXISTING GALVANIZED SURFACE ON THE BACK SIDE OF THE SAMPLE PLATE THAT IS BEING WELDED. THE CONTRACTOR SHALL USE TEMPERATURE MONITORING DEVICES SUCH AS THERMOCOUPLE, HEAT CRAYON, AND/OR INFRARED SENSOR TO MEASURE AND DEMONSTRATE THE TEMPERATURE OF THE STEEL ON THE BACK SURFACE IN THE REGION OF THE WELD. THE "LOW HEAT" WELD DEMONSTRATION SHALL BE CARRIED OUT ON-SITE AND USING A GALVANIZED STEEL PLATE SAMPLE WITH A THICKNESS EQUAL TO THE MINIMUM SHAFT THICKNESS THAT WILL BE REINFORCED. ONLY AFTER THE "LOW HEAT" TECHNIQUES HAVE BEEN SUCCESSFULLY DEMONSTRATED AND ARE APPROVED BY CROWN CASTLE REPRESENTATIVES, CAN THE CONTRACTOR PROCEED WITH THE FIELD WELDING ON THE STRUCTURE. CAUTION: THE CONTRACTOR SHALL CAREFULLY FOLLOW ALL CROWN CASTLE CUTTING, WELDING, FIRE SAFETY, AND ALL OTHER SAFETY GUIDELINES WHICH ALSO INCLUDE "LOW HEAT WELDING TECHNIQUES". THE CONTRACTOR IS SOLELY RESPONSIBLE FOR MAINTAINING THE SAFETY AND STABILITY OF THE STRUCTURE DURING CONSTRUCTION. THE CONTRACTOR SHALL BE HELD FULLY LIABLE FOR ANY DAMAGE INCLUDING HEAT AND FIRE DAMAGE CAUSED BY FIELD WELDING TO THE STRUCTURE AND ANY OF ITS COMPONENTS WHICH OCCURS DURING CONSTRUCTION.

**C. SPECIAL INSPECTION AND TESTING**

- ALL WORK SHALL BE SUBJECT TO REVIEW AND OBSERVATION BY THE OWNER'S REPRESENTATIVE AND THE OWNER'S AUTHORIZED INDEPENDENT INSPECTION AND TESTING AGENCY. REFER TO CROWN CASTLE DOCUMENT ENG-SOW-10066 FOR SPECIFICATION.
- ANY SUPPORT SERVICES PERFORMED BY THE ENGINEER DURING CONSTRUCTION SHALL BE DISTINGUISHED FROM CONTINUOUS AND DETAILED INSPECTION SERVICES WHICH ARE FURNISHED BY OTHERS. THESE SUPPORT SERVICES PERFORMED BY THE ENGINEER ARE PERFORMED SOLELY FOR THE PURPOSE OF ASSISTING IN QUALITY CONTROL AND IN ACHIEVING CONFORMANCE WITH CONTRACT DOCUMENTS. THEY DO NOT GUARANTEE CONTRACTOR'S PERFORMANCE AND SHALL NOT BE CONSTRUED AS SUPERVISION OF CONSTRUCTION.
- ANY DISCREPANCIES BETWEEN THE WORK AND THE CONTRACT DOCUMENTS SHALL BE OBSERVED BY THE CONTRACTOR AT NO ADDITIONAL COST.
- AN UNDERPENT THE CROWN CASTLE INSPECTING/TESTING AGENCY SHALL BE SELECTED, RETAINED AND PAID FOR BY THE OWNER FOR THE SOLE PURPOSE OF INSPECTING, TESTING, DOCUMENTING, AND APPROVING WELDING AND FIELD WORK PERFORMED BY THE CONTRACTOR. ACCESS TO ANY PLACE WHERE WORK IS BEING DONE SHALL BE PERMITTED AT ALL TIMES. THE INSPECTING AGENCY SHALL SO SCHEDULE THIS WORK AS TO CAUSE A MINIMUM OF INTERRUPTION TO, AND COORDINATE WITH, THE WORK IN PROGRESS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE THE WORK SCHEDULE WITH THE TESTING AGENCY. THE CONTRACTOR SHALL ALLOW FOR ADEQUATE TIME AND ACCESS FOR THE TESTING AGENCY TO PERFORM THEIR DUTIES.
- THE INSPECTION AND TESTING AGENCY SHALL BE RESPONSIBLE TO PERFORM THE FOLLOWING SERVICES FOR THE OWNER. THE TESTING AGENCY SHALL INSPECT THE FOLLOWING ITEMS IN ACCORDANCE WITH THE CONSTRUCTION DRAWINGS. THE TESTING AGENCY SHALL INSPECT ITEMS ON THIS LIST AND OTHER ITEMS AS NECESSARY TO FULFILL THEIR RESPONSIBILITY. THE TESTING AGENCY SHALL UTILIZE EXPERIENCED, TRAINED INSPECTORS INCLUDING AWS CERTIFIED WELDING INSPECTORS (CWI). INSPECTORS SHALL HAVE THE TRAINING, CREDENTIALS, AND EXPERIENCE APPROPRIATE FOR A. GENERAL:
  - PERFORM CONTINUOUS ON-SITE OBSERVATION, INSPECTION, VERIFICATION, AND TESTING DURING THE TIME THE CONTRACTOR IS WORKING ON-SITE. AGENCY SHALL NOTIFY OWNER IMMEDIATELY WHEN FIELD PROBLEMS OR DISCREPANCIES OCCUR.
  - FOUNDATIONS, CONCRETE, AND SOIL PREPARATION - (NOT REQUIRED)
  - STRUCTURAL TESTING PER AISC - (NOT REQUIRED)
  - STRUCTURAL STEEL:
    - CHECK THE STEEL ON THE JOB WITH THE PLANS.
    - CHECK MILL CERTIFICATIONS.
    - CHECK GRADE OF STEEL MEMBERS, AND BOLTS FOR CONFORMANCE WITH DRAWINGS.
    - INSPECT STEEL MEMBERS FOR DISTORTION, EXCESSIVE RUST, FLAWS AND BURNED HOLES.
    - CALL FOR LABORATORY TEST REPORTS WHEN IN DOUBT.
    - CHECK STEEL MEMBERS FOR SIZES, SWEEP AND DIMENSIONAL TOLERANCES.
    - CHECK FOR SURFACE FINISH SPECIFIED, GALVANIZED.
    - CHECK BOLT TIGHTENING ACCORDING TO AISC "TURN OF THE NUT" METHOD.
- WELDING:
  - VERIFY FIELD WELDING PROCEDURES, WELDERS, AND WELDING OPERATORS, NOT DEEMED PREQUALIFIED, IN ACCORDANCE WITH AWS D1.1.
  - INSPECT FIELD WELDED CONNECTIONS IN ACCORDANCE WITH THE REQUIREMENTS SPECIFIED AND IN ACCORDANCE WITH AWS D1.1.
  - APPROVE FIELD WELDING SEQUENCE.
    - A PROGRAM OF THE APPROVED SEQUENCES SHALL BE SUBMITTED TO THE OWNER BEFORE WELDING BEGINS. NO CHANGE IN APPROVED SEQUENCES MAY BE MADE WITHOUT PERMISSION FROM THE OWNER.
- INSPECT WELDED CONNECTIONS AS FOLLOWS AND IN ACCORDANCE WITH AWS D1.1:
  - INSPECT WELDING EQUIPMENT FOR CAPACITY, MAINTENANCE AND WORKING CONDITIONS.
  - VERIFY SPECIFIED ELECTRODES AND HANDLING AND STORAGE OF ELECTRODES FOR CONFORMANCE TO SPECIFICATIONS.
  - INSPECT PREHEATING AND INTERPASS TEMPERATURES FOR CONFORMANCE WITH AWS D1.1.
  - VISUALLY INSPECT ALL WELDS AND VERIFY THAT QUALITY OF WELDS MEETS THE REQUIREMENTS OF AWS D1.1.
  - SPOT TEST AT LEAST ONE TYPICAL WELD OF EACH MEMBER USING MAGNETIC PARTICLE OR DYE PENETRANT.
  - INSPECT FOR SIZE, SPACING, TYPE AND LOCATION AS PER APPROVED PLANS.
  - VERIFY THAT THE BASE METAL CONFORMS TO THE DRAWINGS.
  - REVIEW THE REPORTS BY TESTING LABS.
  - CHECK TO SEE THAT WELDS ARE CLEAN AND FREE FROM SLAG.
  - INSPECT TRUST PROTECTION ON WELDS AS PER SPECIFICATIONS.
  - CHECK THAT DEFECTIVE WELDS ARE CLEARLY MARKED AND HAVE BEEN ADEQUATELY REPAIRED.
- SPECIAL INSPECTION OF EXISTING SHAFT-TO-FLANGE WELD CONNECTIONS:
  - PRIOR TO CONSTRUCTION, TESTING AGENCY SHALL INSPECT CONDITION OF EXISTING SHAFT-TO-BASE-PLATE WELD CONNECTION. ALSO INSPECT EXISTING STIFFENERS IF PRESENT. THE INSPECTOR SHALL USE THE FOLLOWING INSPECTION METHODS, OR COMBINATION OF METHODS, AS REQUIRED TO IDENTIFY ANY CRACKS, VISUAL, MAGNETIC PARTICLE, AND/OR ULTRASONIC. IN ADDITION, OTHER TEST METHODS MAY ALSO BE USED AT THE RECOMMENDATION OF THE TESTING AGENCY AND UPON THE APPROVAL OF THE OWNER AND THE ENGINEER. THE TESTING AGENCY SHALL PROVIDE CAREFUL AND THOROUGH DOCUMENTATION OF THIS INSPECTION TO THE OWNER AND THE ENGINEER. TESTING AGENCY SHALL COORDINATE THESE INSPECTION ACTIVITIES WITH THE OWNER'S REQUIRED PROCESSES AND PROCEDURES. IMPORTANT: THE TESTING AGENCY SHALL IMMEDIATELY REPORT ANY INDICATIONS OF CRACKS, FRACTURES, DISTRESS, AND/OR CORROSION TO THE OWNER AND ENGINEER.
  - AFTER CONSTRUCTION, TESTING AGENCY SHALL INSPECT ANY AND ALL FIELD REPAIRS IMPLEMENTED AS REQUIRED BY THE OWNER FROM THE RESULTS OF THE INSPECTION IN THE PREVIOUS NOTE 3.F.(1), ABOVE.
  - REFER TO CROWN CASTLE DOCUMENTS ENG-SOW-10033 AND ENG-BUL-10051 FOR SPECIFICATIONS.
- REPORTS:
  - COMPLETE AND PERIODICALLY SUBMIT DAILY INSPECTION REPORTS TO THE OWNER.

THE INSPECTION PLAN OUTLINED HEREIN IS INTENDED AS A DESCRIPTION OF GENERAL AND SPECIFIC ITEMS OF CONCERN. IT IS NOT INTENDED TO BE ALL-INCLUSIVE. IT DOES NOT LIMIT THE TESTING AND INSPECTION AGENCY TO THE ITEMS LISTED. ADDITIONAL TESTING, INSPECTION, AND CHECKING MAY BE REQUIRED AND SHOULD BE ANTICIPATED. THE TESTING AGENCY SHALL USE THEIR PROFESSIONAL JUDGMENT AND KNOWLEDGE OF THE JOB SITE CONDITIONS AND THE CONTRACTOR'S PERFORMANCE TO DECIDE WHAT OTHER ITEMS REQUIRE ADDITIONAL ATTENTION. THE TESTING AGENCY'S JUDGMENT MUST PREVAIL ON ITEMS NOT SPECIFICALLY COVERED. ANY DISCREPANCIES AND PROBLEMS SHALL BE BROUGHT IMMEDIATELY TO THE OWNER'S ATTENTION. RESOLUTIONS ARE NOT TO BE MADE WITHOUT THE OWNER'S REVIEW AND SPECIFIC WRITTEN CONSENT. THE OWNER RESERVES THE RIGHT TO DETERMINE WHAT IS AN ACCEPTABLE RESOLUTION OF DISCREPANCIES AND PROBLEMS. AFTER EACH INSPECTION, THE TESTING AGENCY WILL PREPARE A WRITTEN ACCEPTANCE OR REJECTION WHICH WILL BE GIVEN TO THE CONTRACTOR AND FILED AS DAILY REPORTS TO THE OWNER. THIS WRITTEN ACTION WILL GIVE THE CONTRACTOR A LIST OF ITEMS TO BE CORRECTED, PRIOR TO CONTINUING CONSTRUCTION, AND/OR LOADING OF STRUCTURAL ITEMS.

WHICH WILL BE GIVEN TO THE CONTRACTOR AND FILED AS DAILY REPORTS TO THE OWNER. THIS WRITTEN ACTION WILL GIVE THE CONTRACTOR A LIST OF ITEMS TO BE CORRECTED, PRIOR TO CONTINUING CONSTRUCTION, AND/OR LOADING OF STRUCTURAL ITEMS.

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**BU #876321; BRANFORD BANM TOWER**  
**BRANFORD, CT**

**MONOPOLE REINFORCEMENT AND RETROFIT PROJECT**

|              |             |
|--------------|-------------|
| PROJECT No:  | 3/5/12-1607 |
| DRAWN BY:    | B.M.S.      |
| CHECKED BY:  | C.M.M.      |
| APPROVED BY: |             |
| DATE:        | 9-4-2012    |

ISSUE DATE OF  
PERMIT: 9-4-2012

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- D. STRUCTURAL STEEL**  
STRUCTURAL STEEL MATERIALS, FABRICATION, DETAILING, AND WORKMANSHIP SHALL CONFORM TO THE LATEST EDITION OF THE FOLLOWING REFERENCE STANDARDS:
- BY THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC):  
(A) "SPECIFICATION FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS;"
  - "SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM A325 OR A490 BOLTS," AS APPROVED BY THE RESEARCH COUNCIL ON STRUCTURAL CONNECTIONS OF THE ENGINEERING FOUNDATION.
  - "CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES" (PARAGRAPH 4.2.1 SPECIFICALLY EXCLUDED).
- B. BY THE AMERICAN WELDING SOCIETY (AWS):**  
(A) "STRUCTURAL WELDING CODE - STEEL D1.1;"
- "SYMBOLS FOR WELDING AND NON-DESTRUCTIVE TESTING"
- ANY MATERIAL OR WORKMANSHIP WHICH IS OBSERVED TO BE DEFECTIVE OR INCONSISTENT WITH THE CONTRACT DOCUMENTS SHALL BE CORRECTED, MODIFIED, OR REPLACED AT THE CONTRACTOR'S EXPENSE.
- TIGHTEN ALL STRUCTURAL BOLTS, INCLUDING THE AJAX M20 BOLTS WITH SHEAR SLEEVES, ACCORDING TO THE REQUIREMENTS OF THE AISC "TURN OF THE NUT" METHOD. TIGHTEN BOLTS 1/3 TURN PAST THE SNUG TIGHT CONDITION AS DEFINED BY AISC.
  - WELDED CONNECTIONS SHALL CONFORM TO THE LATEST REVISED CODE OF THE AMERICAN WELDING SOCIETY, AWS D1.1. ALL WELD ELECTRODES SHALL BE E60XX UNLESS NOTED OTHERWISE ON THE DRAWINGS.
  - ALL WELDED CONNECTIONS SHALL BE MADE BY WELDERS CERTIFIED BY AWS. CONTRACTOR SHALL SUBMIT WELDERS' CERTIFICATION AND QUALIFICATION DOCUMENTATION TO THE OWNER'S TESTING AGENCY FOR REVIEW AND APPROVAL PRIOR TO CONSTRUCTION.
  - STRUCTURAL STEEL PLATES SHALL CONFORM TO ASTM A572 GRADE 65 (FY = 65 KSI MIN.) UNLESS NOTED OTHERWISE ON THE DRAWINGS.
  - SURFACES OF EXISTING STEEL SHALL BE PREPARED AS REQUIRED FOR FIELD WELDING PER AWS. SEE SECTION I NOTES REGARDING TOUCH-UP OF GALVANIZED SURFACES DAMAGED DURING TRANSPORTATION OR ERECTION AND ASSEMBLY AS WELL AS HOT-DIP GALVANIZING.
  - UNLESS OTHERWISE NOTED, ALL STEEL MEMBERS SHALL BE FIELD-PREPARED, AFTER FABRICATION, IN ACCORDANCE WITH ASTM A123. SEE SECTION J FOR FURTHER NOTES AND FOR EXCEPTIONS (IF ANY).
  - ALL WELDS SHALL BE VISUALLY INSPECTED BY THE OWNER'S APPROVED TESTING AGENCY. OTHER TESTS MAY ALSO BE PERFORMED ON THE WELDS BY THE TESTING AGENCY IN ORDER FOR THEM TO PERFORM THEIR DUTIES FOR THIS PROJECT. THE CONTRACTOR SHALL COOPERATE WITH THE TESTING AGENCY IN THEIR TESTING EFFORTS.
  - NO WELDING SHALL BE DONE TO THE EXISTING STRUCTURE WITHOUT THE PRIOR APPROVAL AND SUPERVISION OF THE TESTING AGENCY.
  - FIELD CUTTING OF STEEL:  
(A) PRIOR TO ANY FIELD CUTTING, THE CONTRACTOR SHALL MARK THE CUT OUTLINES ON THE STEEL AND THE INSPECTION/TESTING AGENCY SHALL VERIFY PROPOSED LAYOUT, LOCATION, AND DIMENSIONS.  
(B) ANY REQUIRED CUTS IN THE STEEL SHALL BE CAREFULLY CUT BY MECHANICAL METHODS SUCH AS DRILLING, SAW CUTTING, AND GRINDING. THE CONTRACTOR IS RESPONSIBLE TO PREVENT ANY DAMAGE TO THE COAX CABLES, AND/OR OTHER EQUIPMENT AND/OR THE STRUCTURE DURING THE CUTTING WORK. ANY DAMAGE TO THE COAX CABLES, AND/OR OTHER EQUIPMENT AND/OR THE STRUCTURE, RESULTING FROM THE CONTRACTOR'S ACTIVITIES SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE. THE INSPECTION/TESTING AGENCY SHALL BE REPAIRED CONTINUOUSLY MONITOR THIS ACTIVITY.  
(C) ALL REQUIRED CUTS SHALL BE CUT WITHIN THE DIMENSIONS SHOWN ON THE DRAWINGS. NO CUTS SHALL EXTEND BEYOND THE OUTLINE OF THE DIMENSIONS SHOWN ON THE DRAWINGS. ALL CUT EDGES SHALL BE GROUND SMOOTH AND DE-BURRED. CUT EDGES THAT ARE TO BE FIELD WELDED SHALL BE PREPARED FOR FIELD WELDING PER AWS D1.1 AND AS SHOWN ON THE DRAWINGS. IT MAY BE NECESSARY TO DRILL STARTER HOLES AS REQUIRED TO MAKE THE CUTS. THE INSPECTION/TESTING AGENCY SHALL CLOSELY AND CONTINUOUSLY MONITOR THIS ACTIVITY.
- E. BASE PLATE GROUT**  
FOR THE POLE BASE SHALL BE NON-SHRINK, NON-METALLIC, GROUT (EUCONS GROUT BY EUCLID, OR APPROVED EQUAL) WITH A 7500 PSI MINIMUM COMPRESSIVE STRENGTH. PVC DRAINAGE PIPES SHALL BE PROVIDED FROM INSIDE THE POLE SHAFT OUT THROUGH THE GROUT SPACE UNDER THE BASE PLATE IN ORDER TO ALLOW MOISTURE TO ADEQUATELY DRAIN FROM THE INTERIOR OF THE POLE SHAFT. CONTRACTOR SHALL SUBMIT PROPOSED GROUT SPECIFICATION INFORMATION TO THE OWNER FOR REVIEW AND APPROVAL PRIOR TO CONSTRUCTION. CONTRACTOR SHALL FOLLOW GROUT MANUFACTURER'S SPECIFICATIONS FOR COLD WEATHER GROUTING PROCEDURES (IF NECESSARY) AND THE TESTING AGENCY SHALL PREPARE GROUT SAMPLE SPECIMENS FOR COMPRESSIVE STRENGTH TESTING AND VERIFICATION. GROUT SHALL BE INSTALLED TIGHT UNDER BASE PLATE WITH NO Voids REMAINING BETWEEN TOP OF EXISTING CONCRETE AND UNDERSIDE OF EXISTING BASE PLATE (EXCEPT FOR DRAIN PIPES). GROUT COMPLETELY SOLID (EXCEPT FOR DRAIN PIPES) UNDER ENTIRE SURFACE OF BASE PLATE FROM OUTSIDE EDGE TO INSIDE EDGE.
- F. FOUNDATION WORK - (NOT REQUIRED)**

**CAST-IN-PLACE CONCRETE - (NOT REQUIRED)**

**EPOXY GROUTED REINFORCING ANCHOR RODS**  
UNLESS OTHERWISE NOTED, REINFORCING ANCHOR RODS SHALL BE #60 KSI ALL-THREAD BAR CONFORMING TO ASTM A772. RECOMMENDED MANUFACTURERS/SUPPLIERS OF #60 KSI ALL-THREAD BAR ARE WILLIAMS FORM ENGINEERING CORPORATION AND DUNWIDIG SYSTEMS INTERNATIONAL. ALL REINFORCING ANCHOR RODS SHALL BE HOT-DIP GALVANIZED PER ASTM A153. ALTERNATIVELY, ALL REINFORCING ANCHOR RODS MAY BE EPOXY COATED PER ASTM A773. THE CORE-DRILLED HOLES IN THE CONCRETE FOR THE ANCHOR RODS SHALL BE CLEAN AND DRY, AND OTHERWISE PROPERLY PREPARED ACCORDING TO THE ANCHOR RODS SHALL BE CLEAN AND DRY. MANUFACTURER'S INSTRUCTIONS, PRIOR TO PLACEMENT OF ANCHOR RODS AND EPOXY. CONTRACTOR SHALL FOLLOW ALL ANCHOR ROD AND EPOXY MANUFACTURER RECOMMENDATIONS REGARDING HANDLING OF RODS, EPOXY, ACCEPTABLE AMBIENT TEMPERATURE RANGE DURING INSTALLATION AND POST-INSTALLATION CURING, THE EFFECT OF TEMPERATURE ON EPOXY CURING TIME, PREPARATION OF HOLE, ETC.  
ULTRA-HIGH STRENGTH EPOXY SHALL BE USED TO ANCHOR THE #60 KSI ALL-THREAD BAR IN THE DRILL HOLES. IF CONTRACTOR WISHES TO USE A DIFFERENT EPOXY, A REQUEST INCLUDING THE EPOXY TECHNICAL DATA SHEET(S) SHALL BE SUBMITTED TO PAUL J. FORD AND COMPANY FOR REVIEW PRIOR TO CONSTRUCTION. AS NOTED ABOVE, FOLLOW ALL EPOXY MANUFACTURER RECOMMENDATIONS REGARDING HANDLING OF EPOXY, ACCEPTABLE AMBIENT TEMPERATURE RANGE DURING INSTALLATION AND POST-INSTALLATION CURING, THE EFFECT OF TEMPERATURE ON EPOXY CURING TIME, PREPARATION OF HOLE, ETC.  
ONCE THE REINFORCING ANCHOR RODS HAVE BEEN INSTALLED AND ALL EPOXY AND GROUT HAVE CURED (IF BASE PLATE AND/OR BEARING PLATES HAVE BEEN GROUTED PRIOR TO TESTING), ALL REINFORCING ANCHOR RODS SHALL BE LOAD TESTED PER CROWN CASTLE ENGINEERING DOCUMENT #ENG-PRC-10119. REFER TO THE NEW ANCHOR & BRACKET DETAIL ON FOLLOWING DRAWING SHEETS FOR SPECIFIED ANCHOR ROD PROOF LOAD.  
ONCE THE REINFORCING ANCHOR RODS HAVE BEEN SUCCESSFULLY LOAD TESTED AND APPROVED AND BASE PLATE / BEARING PLATE GROUT HAS CURED (IF BASE PLATE AND/OR BEARING PLATES HAVE BEEN GROUTED AFTER TESTING), CONTRACTOR SHALL TIGHTEN ALL HEAVY HEX ANCHOR NUTS TO SNUG TIGHT PLUS 1/8 TURN OF NUT.

**TOUCH UP OF GALVANIZING**

THE CONTRACTOR SHALL TOUCH UP ANY AND/OR ALL AREAS OF GALVANIZING ON THE EXISTING STRUCTURE OR NEW COMPONENTS THAT ARE DAMAGED OR ABRADED DURING CONSTRUCTION. GALVANIZED SURFACES DAMAGED DURING TRANSPORTATION OR ERECTION AND ASSEMBLY AS WELL AS ANY AND ALL ABRASIONS, CUTS, DRILLING, AND ALL FIELD WELDING SHALL BE TOUCHED UP WITH TWO (2) COATS OF ZRC-BRAND ZINC-RICH COLD GALVANIZING COMPOUND. FILM THICKNESS PER COAT SHALL BE: WET 3.0 MILS; DRY 1.5 MILS. APPLY PER ZRC (MANUFACTURER) RECOMMENDED PROCEDURES. CONTACT ZRC AT 1-800-931-3275 FOR PRODUCT INFORMATION. CONTRACTOR SHALL CLEAN AND PREPARE ALL FIELD WELDS ON GALVANIZED AND PRIME PAINTED SURFACES FOR TOUCH-UP COATING IN ACCORDANCE WITH AWS D1.1. THE OWNER'S TESTING AGENCY SHALL VERIFY THE PREPARED SURFACE PRIOR TO APPLICATION OF THE TOUCH-UP COATING.

THE OWNER'S TESTING AGENCY SHALL TEST AND VERIFY THE COATING THICKNESS AFTER THE CONTRACTOR HAS APPLIED THE ZRC COLD GALVANIZING COMPOUND AND IT HAS SUFFICIENTLY DRIED. AREAS FOUND TO BE INADEQUATELY COATED, SHALL BE RE-COATED BY THE CONTRACTOR AND RE-TESTED BY THE TESTING AGENCY.

**HOT-DIP GALVANIZING**

TO TOUCH UP GALVANIZE ALL STRUCTURAL STEEL MEMBERS AND ALL STEEL ACCESSORIES, BOLTS, WASHERS, ETC. PER ASTM A123 OR PER ASTM A153, AS APPROPRIATE. PROPERLY PREPARE STEEL ITEMS FOR GALVANIZING. DRILL OR PUNCH WEEP AND/OR DRAINAGE HOLES AS REQUIRED. ALL GALVANIZING SHALL BE DONE AFTER FABRICATION IS COMPLETED AND PRIOR TO FIELD INSTALLATION.

**PERPETUAL INSPECTION AND MAINTENANCE BY THE OWNER**

REINFORCING SYSTEM AND THE WORK HAS BEEN ACCEPTED BY THE OWNER. THE OWNER WILL BE RESPONSIBLE FOR THE LONG TERM AND PERPETUAL INSPECTION AND MAINTENANCE OF THE POLE AND REINFORCING SYSTEM.

THE MONOPOLE REINFORCING SYSTEM INDICATED IN THESE DOCUMENTS USES REINFORCING COMPONENTS THAT INVOLVE FIELD WELDED STEEL MEMBERS TO THE EXISTING GALVANIZED STEEL POLE STRUCTURE. THESE FIELD WELDED CONNECTIONS ARE SUBJECT TO CORROSION DAMAGE AND DETERIORATION IF THEY ARE NOT PROPERLY MAINTAINED AND COVERED WITH CORROSION PREVENTIVE COATING SUCH AS THE ZRC GALVANIZING COMPOUND SPECIFIED PREVIOUSLY. THE STRUCTURAL LOAD CARRYING CAPACITY OF THE REINFORCED POLE SYSTEM IS DEPENDENT UPON THE INSTALLED SIZE AND QUALITY, MAINTAINED SOUND CONDITION AND STRENGTH OF THESE FIELD WELDED CONNECTIONS. ANY CORROSION OF, DAMAGE TO, FATIGUE, FRACTURE, AND/OR DETERIORATION OF THESE WELDS AND/OR OF THE CONNECTED COMPONENTS WILL RESULT IN THE LOSS OF STRUCTURAL LOAD CARRYING CAPACITY AND MAY LEAD TO FAILURE OF THE STRUCTURAL SYSTEM. THEREFORE, IT IS IMPERATIVE THAT THE OWNER REGULARLY INSPECTS, MAINTAINS AND REPAIRS AS NECESSARY, ALL OF THESE WELDS, CONNECTIONS, AND COMPONENTS FOR THE LIFE OF THE STRUCTURE.

THE OWNER SHALL REFER TO TIA/EIA-222-E-1996, SECTION 14 AND ANNEX E FOR RECOMMENDATIONS FOR MAINTENANCE AND INSPECTION. THE FREQUENCY OF THE INSPECTION AND MAINTENANCE INTERVALS IS TO BE DETERMINED BY THE OWNER BASED UPON ACTUAL SITE AND ENVIRONMENTAL CONDITIONS. PAUL J. FORD & COMPANY RECOMMENDS THAT A COMPLETE AND THOROUGH INSPECTION OF THE ENTIRE REINFORCED MONOPOLE STRUCTURAL SYSTEM BE PERFORMED YEARLY AND/OR AS FREQUENTLY AS CONDITIONS WARRANT. ACCORDING TO TIA/EIA-222-F-1996 SECTION 14.1, NOTE 1: "IT IS RECOMMENDED THAT THE STRUCTURE BE INSPECTED AFTER SEVERE WIND AND/OR ICE STORMS OR OTHER EXTREME LOADING CONDITIONS."



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PROJECT No:  
37512-1607  
DRAWN BY:  
B.M.S.  
CHECKED BY:  
C.M.M.  
APPROVED BY:

BU #876321; BRANFORD BANM TOWER  
BRANFORD, CT  
MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

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PERMIT: 9-4-2012

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DATE:  
9-4-2012



AJAX BOLT NOTE SHEET: REV. 1.2, 01-23-2012

**NOTES:** 1. ALL STRUCTURAL BOLTS SHALL BE INSTALLED AND TIGHTENED TO THE PRETENSIONED 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 PRETENSIONED 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 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 BELLOW FALLS, VERMONT, USA 05101  
PHONE 1-800-552-1999  
WEBSITE: [WWW.APPLIEDBOLTING.COM](http://WWW.APPLIEDBOLTING.COM)

DISTRIBUTORS OF SQUIRTER® DTIS:  
[HTTP://WWW.APPLIEDBOLTING.COM/APPLIEDBOLTING-DISTRIBUTORS.HTML](http://WWW.APPLIEDBOLTING.COM/APPLIEDBOLTING-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.

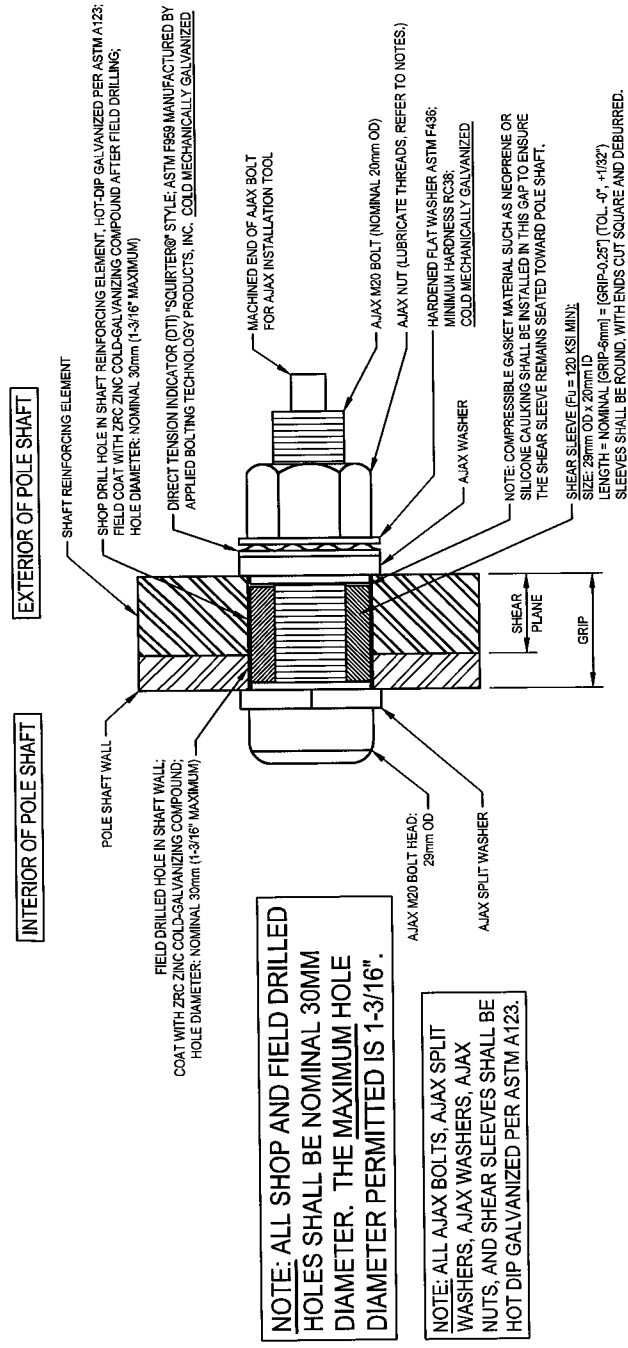
**HARDENED WASHERS REQUIRED:** USE A HARDENED WASHER FOR A 3/4" NOMINAL BOLT BETWEEN THE TOP OF THE DIRECT TENSION INDICATOR (DTI) WASHER AND THE NUT OF THE AJAX M20 BOLTS. HARDENED WASHERS SHALL CONFORM TO ASTM F436 AND HAVE A MINIMUM HARDNESS OF RC 38 OR HIGHER. THE HARDENED WASHERS SHALL BE MECHANICALLY 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.

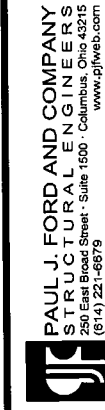
**NOTE:** COMPLETELY COMPRESSED DTIS SHOWING NO VISIBLE REMAINING GAP ARE ACCEPTABLE. DTI WASHERS SHALL BE PLACED DIRECTLY AGAINST THE OUTER AJAX WASHER WITH THE DTI BUMPS FACING AWAY FROM THE AJAX WASHER. PLACE A HARDENED WASHER BETWEEN THE DTI AND THE AJAX NUT. THE DTI BUMPS SHALL BEAR AGAINST THE 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, 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 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.



TYPICAL AJAX BOLT DETAIL S-3



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PROJECT No:

37512-1607

DRAWN BY:

B.M.S.

CHECKED BY:

C.M.M.

APPROVED BY:

DATE:

9-4-2012

ISSUE DATE OF  
PERMIT: 9-4-2012

**BU #876321; BRANFORD BANM TOWER**  
**BRANFORD, CT**

MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

**S-3**



**NOTE: NO DETAILED INFORMATION REGARDING INTERFERENCES WAS PROVIDED. THEREFORE, CONTRACTOR SHALL FIELD VERIFY ALL EXISTING CONDITIONS AND DIMENSIONS BEFORE PROCEEDING WITH THE WORK. REPORT ANY AND ALL DISCREPANCIES TO PAUL J. FORD AND COMPANY AND CROWN CASTLE FIELD PERSONNEL IMMEDIATELY.**

**THIS POLE REINFORCEMENT DRAWING IS FOR THE POLE DESIGN AND ANTENNA LOADING DOCUMENTED IN THE PJF CO-LOCATION ANALYSIS FOR THIS SITE (PJF#37512-1607), DATED 9-4-2012.**

| POLE SPECIFICATIONS |                                    |
|---------------------|------------------------------------|
| POLE SHAPE TYPE:    | 12-SIDED POLYGON                   |
| TAPER:              | 0.175008 IN/FT                     |
| SHAFT STEEL:        | ASTM A667 GRADE 65 & GRADE 60      |
| BASE PL STEEL:      | ASTM A633 GR. E (50 KSI)           |
| ANCHOR RODS:        | 2 1/4"Ø<br>#18J ASTM A615 GRADE 75 |

| SHAFT SECTION DATA |                     |                      |                       |                  |
|--------------------|---------------------|----------------------|-----------------------|------------------|
| SHAFT SECTION      | SECTION LENGTH (FT) | PLATE THICKNESS (IN) | DIAMETER ACROSS FLATS |                  |
|                    |                     |                      | LAP SPLICE (IN)       | @ TOP @ BOTTOM   |
| 1                  | 47.50               | 0.2500               | 45.00                 | 30.313<br>22.000 |
| 2                  | 44.25               | 0.3125               | 57.00                 | 29.157<br>35.900 |
| 3                  | 34.50               | 0.3750               | 63.00                 | 35.444<br>41.461 |
| 4                  | 34.50               | 0.4375               | 69.812                | 39.812<br>45.650 |

NOTE: DIMENSIONS SHOWN DO NOT INCLUDE GALVANIZING TOLERANCES

CONTRACTOR SHALL PROVIDE ASTM A38 SHIM PLATES BELOW SLIP JOINTS. THE SHIM PLATES SHALL BE PLACED BETWEEN THE NEW SHAFT REINFORCEMENT AND THE EXISTING POLE SHAFT FROM THE SLIP JOINT TO THE NEW SHAFT REINFORCEMENT SPLICE PLATE LOCATION AND AN EXTRA LONG SPLICE SHIM SHALL BE PLACED BETWEEN THE NEW UPPER AND LOWER SHAFT REINFORCEMENT PLATES AT THE SHAFT REINFORCEMENT SPLICE PLATE LOCATION.

**NOTES:**

- ALL STRUCTURAL BOLTS SHALL BE INSTALLED AND TIGHTENED TO THE PRETENSIONED CONDITION ACCORDING TO THE REQUIREMENTS OF THE AISC SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS, DEC. 31, 2006.
- ALL STRUCTURAL BOLTS SHALL BE INSPECTED ACCORDING TO THE REQUIREMENTS OF THE AISC SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS, DEC. 31, 2006.
- ALL AJAX M20 BOLTS WITH SHEAR SLEEVES SHALL BE PRETENSIONED AND TIGHTENED UNTIL THE DIRECT TENSION INDICATOR (DTI) WASHERS SHOW THAT THE PROPER BOLT TENSION HAS BEEN REACHED. SEE NOTES AND DETAIL ON SHEET S-3 FOR THE USE OF DIRECT TENSION INDICATOR (DTI) WASHERS WITH THE AJAX M20 BOLTS.
- DTIS REQUIRED: \* ALL AJAX BOLTS SHALL BE INSTALLED USING DIRECT TENSION INDICATORS (DTIS) AND HARDENED WASHERS. DTIS SHALL BE THE SQUIRTER® STYLE, MADE TO ASTM F869 LATEST REVISION; AND HARDENED WASHERS SHALL CONFORM TO ASTM F436 AND HAVE A HARDNESS OF RC 38 OR HIGHER.
- 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. REFER TO SHEET S-3.
- AJAX BOLT HOLE SIZE: ALL SHOP- AND FIELD-DRILLED HOLES SHALL BE NOMINAL 30MM DIAMETER. THE MAXIMUM HOLE DIAMETER PERMITTED IS 1-3/16". REFER TO SHEET S-3.

\* AS OF 5/30/2012, UNTIL FURTHER NOTICE, CROWN CASTLE WILL ACCEPT AJAX BOLTS TIGHTENED USING AISC "TURN-OF-THE-NUT" METHODOLOGY. INSTALLERS SHALL FOLLOW CROWN GUIDELINES FOR AISC "TURN-OF-THE-NUT" METHOD AND ALSO PROVIDE COMPLETE INSPECTION DOCUMENTATION IN THE PML.

NOTE OF THE CIRCUMFERENTIAL WELD OF THE BASE PLATE TO SHAFT CONNECTION IS REQUIRED. PLEASE SEE ENGSOW-1033 : TOWER BASE PLATE NDE AND ENG-BUL-10081 : NDE REQUIREMENTS FOR MONOPOLE BASE PLATE TO PREVENT CONNECTION FAILURE. NOTIFY EOR AND CROWN ENGINEERING IMMEDIATELY IF ANY CRACKS ARE SUSPECTED OR HAVE BEEN IDENTIFIED. THE NDE SHALL INCLUDE ALL WELDS TO THE BASE PLATE THAT HAVE BEEN WELDED TO THE BASE PLATE. ALL FRETWORK TO THE BASE PLATE IS TO BE REMOVED AS PART OF THIS ACTIVE REINFORCEMENT DESIGN. THIS FRETWORK SHALL BE INCLUDED IN THE NDE SCOPE OF WORK.

REINFORCING BAR SPLICE DETAILS TO BE COORDINATED BY RESPECTIVE CONTRACTORS.

| NEW AEROSOLUTIONS MP3 REINFORCING (OPTION #1) |        |
|---|--------|
| ELEVATION                                     | FLAT # |
| 0'-6" TO 35'-5"                               | MP304  |
| 45'-0" TO 59'-0"                              | MP303  |

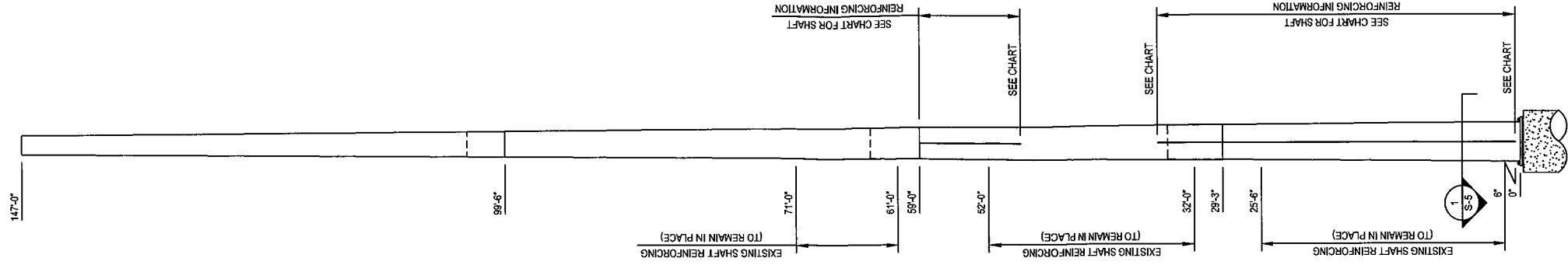
ALL BOLTS SHALL BE AJAX M20 BOLTS WITH HIGH STRENGTH SHEAR SLEEVES (ASTM A450 WITH MIN. F<sub>u</sub> 105 KSI). CONTACT SUPPLIER FOR MATERIAL (PLATE & BOLTS) AND INSTALLATION PROCEDURES.

| NEW SABRE FLAT PLATE REINFORCING (OPTION #2) |        |
|--|--------|
| ELEVATION                                    | FLAT # |
| 0'-6" TO 35'-5"                              | MS-650 |
| 45'-0" TO 59'-0"                             | MS-650 |

ALL BOLTS SHALL BE AJAX M20 BOLTS WITH HIGH STRENGTH SHEAR SLEEVES (ASTM A450 WITH MIN. F<sub>u</sub> 105 KSI). CONTACT SUPPLIER FOR MATERIAL (PLATE & BOLTS) AND INSTALLATION PROCEDURES.

| NEW CCI FLAT PLATE (100 KSI) REINFORCING (OPTION #3) |             |
|--|-------------|
| ELEVATION  | FLAT #      |
| 0'-6" TO 35'-5"                                      | ISP-LR-0754 |
| 45'-0" TO 59'-0"                                     | ISP-LR-0754 |

NOTES FOR CROWN REINFORCING OPTION (100 KSI) MATERIAL:  
 1. DO NOT FIELD WELD DIRECTLY TO THE 100 KSI MATERIAL.  
 2. THE 100 KSI MATERIAL SHALL CONFORM TO THE FOLLOWING:  
 A. MATERIAL 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 CHERRY V-NOTCH (CVN) IMPACT VALUES 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 4.5X MINIMUM.  
 E. ANY AND ALL WELDING TO THE MATERIAL SHALL BE PERFORMED ACCORDING TO AN 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 ANY WORK, FABRICATION OR WELDING, THE WPS SHALL BE SUBMITTED TO CROWN CASTLE AND PAUL J. FORD AND COMPANY FOR REVIEW.



POLE ELEVATION 1 S-4



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PROJECT No: 37512-1607  
 DRAWN BY: B.M.S.  
 CHECKED BY: C.M.M.  
 APPROVED BY: [Signature]  
 DATE: 9-4-2012

BU #876321; BRANFORD BANM TOWER  
 BRANFORD, CT  
 MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

ISSUE DATE OF PERMIT: 9-4-2012

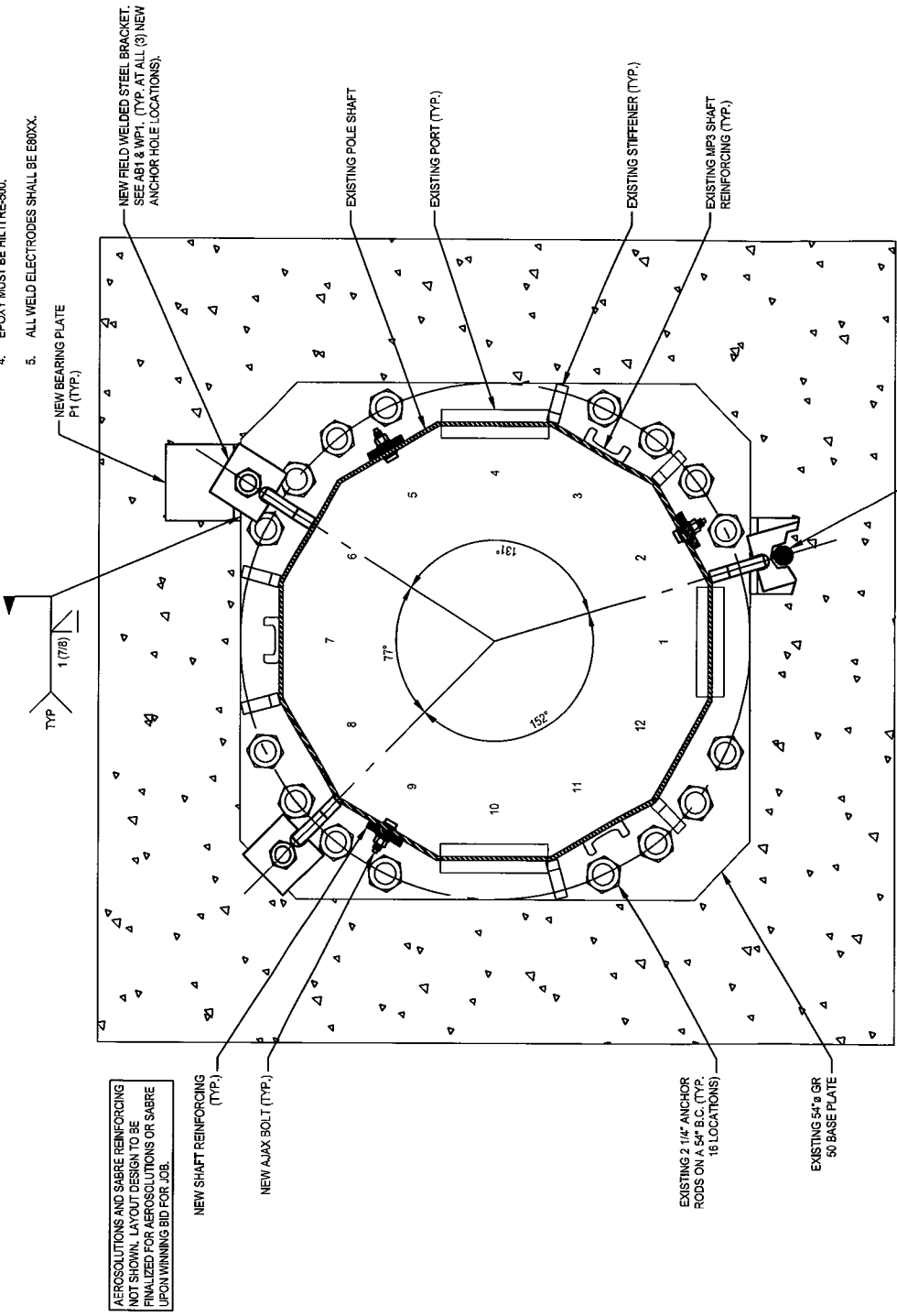
S-4

**SPECIAL INSPECTION OF EXISTING SHAFT-TO-FRANGE WELD CONNECTIONS:**  
 (1) PRIOR TO CONSTRUCTION, CONTRACTOR'S INSPECTION AGENCY SHALL INSPECT CONDITION OF EXISTING SHAFT-TO-BASE-PLATE WELD CONNECTION. ALSO INSPECT EXISTING STIFFENERS IF PRESENT. THE CONTRACTOR'S INSPECTION AGENCY SHALL USE THE FOLLOWING INSPECTION METHODS, OR COMBINATION OF METHODS, AS REQUIRED TO DETECT ANY CRACKS: VISUAL, MAGNETIC PARTICLE, AND/OR ULTRASONIC. IN ADDITION, OTHER TEST METHODS TO BE DETERMINED BY THE TESTING AGENCY AND UPON THE APPROVAL OF THE OWNER AND THE ENGINEER. ON THE RECOMMENDATION OF THE TESTING AGENCY AND UPON THE APPROVAL OF THE OWNER AND THE ENGINEER, THE CONTRACTOR SHALL PROVIDE ADEQUATE PROTECTION AND DOCUMENTATION OF THIS INSPECTION TO THE OWNER AND THE ENGINEER BEFORE PROCEEDING WITH CONSTRUCTION. THE TESTING AGENCY SHALL IMMEDIATELY REPORT ANY INDICATIONS OF CRACKS, FRACTURES, DISTRESS, AND/OR CORROSION TO THE OWNER AND ENGINEER.  
 (2) AFTER CONSTRUCTION, TESTING AGENCY SHALL INSPECT ANY AND ALL FIELD WELDS AND FIELD REPAIRS IMPLEMENTED AS REQUIRED BY THE OWNER FROM THE RESULTS OF THE INSPECTION IN THE PREVIOUS NOTE (1) ABOVE.

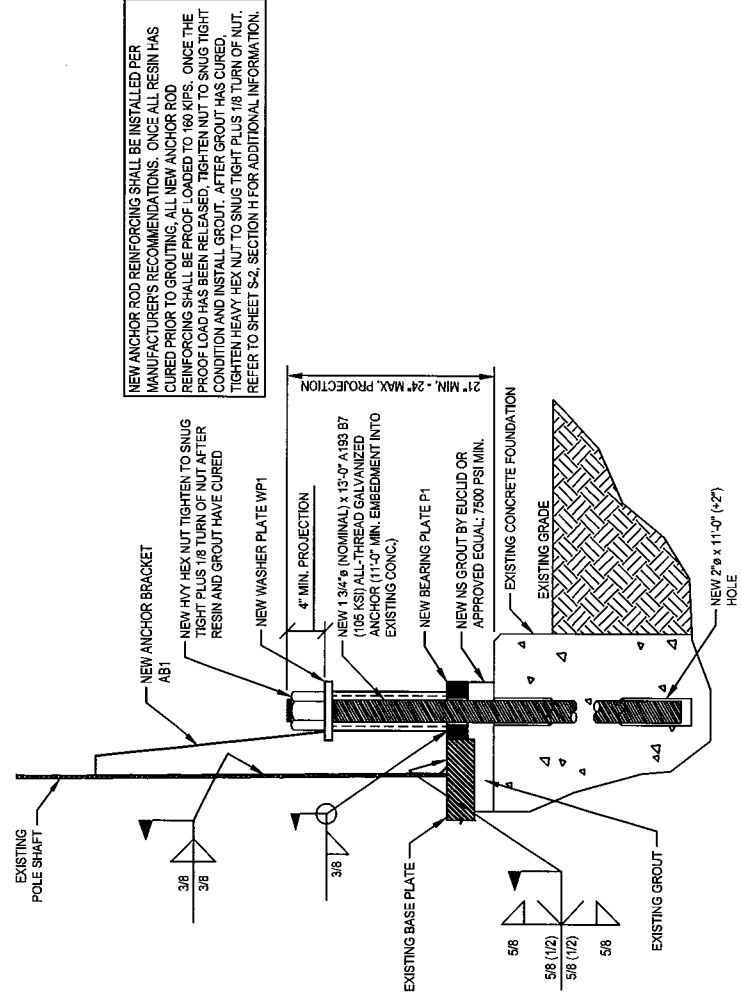
**GENERAL NOTES:**

1. AJAX BOLTS ARE TO BE 20 mm Ø WITH CORRESPONDING 20 mm Ø SHEAR SLEEVE WITH MATCHING STEEL GRADE. DRILLED HOLE DIAMETERS IN REINFORCING STEEL AND EXISTING SHAFT SHALL BE 1/16" MAX.
2. ALL STEEL SHALL BE HOT-DIP GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123. ALTERNATIVELY, ALL NEW STIFFENER PLATE STEEL REINFORCING MAY BE COLD GALVANIZED AS FOLLOWS: APPLY A MINIMUM OF TWO COATS OF EPOXY OR APPROVED GALVANIZING COMPOUND. FILM THICKNESS PER COAT SHALL BE MET TO MEET A MINIMUM OF 0.005 MILS. APPLY PER ZPC (MANUFACTURER'S RECOMMENDED PROCEDURES. CONTACT ZPC AT 1-800-861-5275 FOR PRODUCT INFORMATION.
3. ALL SHAFT REINFORCING IS A572 GR 65, UNLESS NOTED OTHERWISE.
4. EPOXY MUST BE HILTI RE-500.
5. ALL WELD ELECTRODES SHALL BE E80XX.

PROVIDE NON-SHRINK GROUT (NS GROUT) BY EUCLID OR APPROVED. EQUAL: 7500 PSI MIN. BELOW NEW BEARING PLATES. GROUT SHALL BE INSTALLED TIGHT UNDER NEW BEARING PLATES WITH NO VOIDS REMAINING BETWEEN TOP OF EXISTING CONCRETE AND UNDERSIDE OF NEW BEARING PLATES.



**BASE PLATE** 1 S-5



NEW ANCHOR ROD REINFORCING SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS. ONCE ALL RESIN HAS CURED PRIOR TO GROUTING, ALL NEW ANCHOR ROD REINFORCING SHALL BE PROOF LOADED TO 160 KIPS. ONCE THE PROOF LOAD HAS BEEN RELEASED, TIGHTEN NUT TO SNUG TIGHT CONDITION AND INSTALL GROUT. AFTER GROUT HAS CURED, TIGHTEN HEAVY HEX NUT TO SNUG TIGHT PLUS 1/8 TURN OF NUT. REFER TO SHEET S-2, SECTION H FOR ADDITIONAL INFORMATION.

**NEW ANCHOR & BRACKET DETAIL** 2 S-5

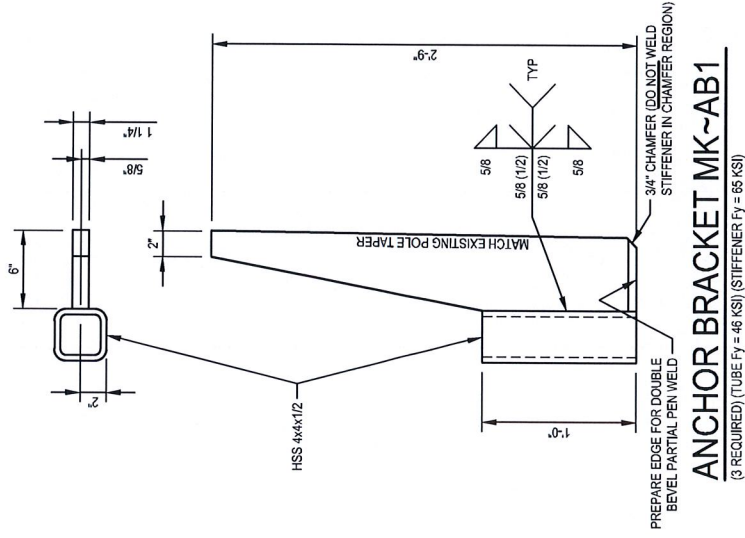
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**BRANFORD, CT**  
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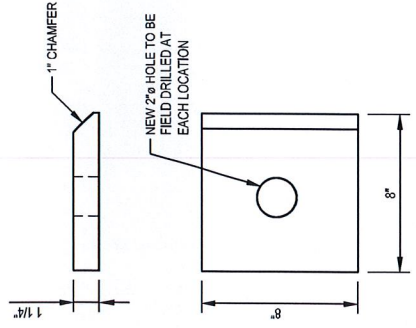
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| PROJECT No:<br>37512-1607 | ISSUE DATE OF<br>PERMIT: 9-4-2012 |
| DRAWN BY:<br>B.M.S.       | CHECKED BY:<br>C.M.M.             |
| APPROVED BY:              | DATE:<br>9-4-2012                 |

**S-5**



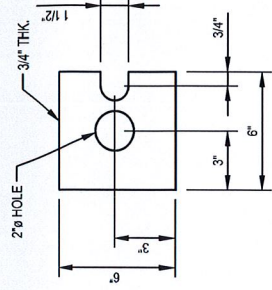
**ANCHOR BRACKET MK~AB1**

(3 REQUIRED) (TUBE Fy = 46 KSI) (STIFFENER Fy = 65 KSI)



**BEARING PLATE MK~P1**

(2 REQUIRED) (Fy = 50 KSI)



**WASHER PLATE MK~WP1**

(3 REQUIRED) (Fy = 50 KSI)

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ISSUE DATE OF  
 PERMIT: 9-4-2012

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**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 THE MODIFICATION DESIGN ITSELF, NOR DOES THE MI INSPECTOR TAKE OWNERSHIP OF THE MODIFICATION DESIGN. OWNERSHIP OF THE STRUCTURAL MODIFICATION DESIGN EFFECTIVENESS AND INTEGRITY RESIDES WITH THE EOR AT ALL TIMES.

ALL MTS 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, CONDUCTING THE IN-FIELD INSPECTIONS, AND SUBMITTING THE MI REPORT TO CROWN.

**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 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 AN DENG-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, PREFERABLE 10, TO THE MI INSPECTOR AS TO WHEN THE SITE WILL BE READY FOR THE MI TO BE CONDUCTED.
- 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 INSPECTIONS TO COMMENCE WITH ONE SITE VISIT.
- 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 DEPOSITS 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.). IF CROWN CONTRACTS DIRECTLY FOR A THIRD PARTY MI, 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 MTS**

IF THE MODIFICATION INSTALLATION WOULD FAIL THE MI (FAILED MTP), 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 CONTRACT DOCUMENTS AND COORDINATE A SUPPLEMENT MI
- OR, WITH CROWN'S APPROVAL, THE GC MAY WORK WITH 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 INSPECTIONS 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 AEV/AESV 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.

**PHOTOGRAPHS**

BETWEEN THE GC AND 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/RECTION AND INSPECTION
- RAW MATERIALS
- PHOTOS OF ALL CRITICAL DETAILS
- PHOTOGRAPHS OF ALL JOINTS
- WELD REPAIRS
- BOLT INSTALLATION AND TORQUE
- FINAL INSTALLED CONDITION
- SURFACE CORROSION REPAIR
- POST CONSTRUCTION PHOTOGRAPHS
- FINAL INFIELD 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.

| MI CHECKLIST  |  |
|---|--|
| CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REQUIRED (COMPLETED BY EOR) | REPORT ITEM  |
| <b>PRE-CONSTRUCTION</b>   |  |
| X   | MI CHECKLIST DRAWINGS  |
| X   | EOR APPROVED SHOP DRAWINGS                                       |
| X   | FABRICATION INSPECTION   |
| NA  | FABRICATOR CERTIFIED WELD INSPECTION                             |
| X   | MATERIAL TEST REPORT (MTR)                                       |
| NA  | FABRICATOR NDE INSPECTION  |
| X   | NDE REPORT OF MONOPOLE BASE PLATE (AS REQUIRED)                  |
| X   | PACKING SLIPS  |
| ADDITIONAL TESTING AND INSPECTIONS: _____                                     |  |
| <b>CONSTRUCTION</b>   |  |
| X   | CONSTRUCTION INSPECTIONS   |
| X   | FOUNDATION INSPECTIONS   |
| NA  | CONCRETE COMP. STRENGTH AND SLUMP TESTS                          |
| X   | POST INSTALLED ANCHOR ROD VERIFICATION                           |
| X   | BASE PLATE GROUT VERIFICATION                                    |
| X   | CONTRACTOR'S CERTIFIED WELD INSPECTION                           |
| NA  | EARTHWORK: LIFT AND DENSITY                                      |
| X   | ON SITE COLD GALVANIZING VERIFICATION                            |
| NA  | GUY WIRE TENSION REPORT  |
| X   | GC AS-BUILT DOCUMENTS  |
| X   | INSPECTION OF BOLT PRETENSION PER AISC BOLT SPEC.                |
| X   | INSPECTION OF AJAX BOLTS AND DTTIS PER REQUIREMENTS ON SHEET S-3 |
| ADDITIONAL TESTING AND INSPECTIONS: _____                                     |  |
| <b>POST-CONSTRUCTION</b>  |  |
| X   | MI INSPECTOR REDLINE OR RECORD DRAWING(S)                        |
| X   | POST INSTALLED ANCHOR ROD PULL-OUT TESTING                       |
| X   | PHOTOGRAPHS  |
| ADDITIONAL TESTING AND INSPECTIONS: _____                                     |  |

NOTE: X DENOTES A DOCUMENT NEEDED FOR THE PMI REPORT

NA DENOTES A DOCUMENT THAT IS NOT REQUIRED FOR THE PMI REPORT

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**BU #876321; BRANFORD BANM TOWER**  
**BRANFORD, CT**  
MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

PROJECT No:  
37512-1607  
DRAWN BY:  
B.M.S.  
CHECKED BY:  
C.M.M.  
APPROVED BY:

ISSUE DATE OF  
PERMIT: 9-4-2012

DATE:  
9-4-2012

**S-7**



CROWN CASTLE PROJECT: BU #876321; BRANFORD BANNN TOWER; BRANFORD, CT  
 MONOPOLE RETROFIT PROJECT MASTER NOTES DOCUMENT (REV. 2, 1/22/2009)

UPON THE SUCCESSFUL AND COMPLETE INSTALLATION OF THE REINFORCING SYSTEM SPECIFIED IN THESE PLANS, THE REINFORCED POLE MEETS THE WIND DESIGN RECOMMENDATIONS OF THE TIAEIA-223-1998 STANDARD FOR WIND SPEEDS OF 85 MPH AND 38 MPH + 3/4" RADIAL ICE

**A. GENERAL NOTES**

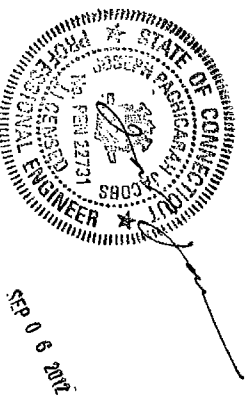
- IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO FIELD VERIFY ALL EXISTING CONDITIONS AND DIMENSIONS PRIOR TO FABRICATION AND CONSTRUCTION. THESE DRAWINGS WERE PREPARED FROM INFORMATION AND DOCUMENTS PROVIDED TO PAUL J. FORD & COMPANY BY CROWN CASTLE. THIS INFORMATION PROVIDED HAS NOT BEEN FIELD VERIFIED BY PAUL J. FORD & COMPANY FOR E-CLURCY AND THEREFORE DISCREPANCIES BETWEEN THESE DRAWINGS AND ACTUAL SITE CONDITIONS SHOULD BE ANNOTATED AND DISCREPANCIES REPORTED TO THE ENGINEER PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE DESIGN AND CONDITIONS Brought to the Attention of Crown Castle and Paul J. Ford & Company so that any changes and/or adjustments necessary can be made to the design and drawings.
- THE DESIGN OF REINFORCED MONOPOLE STRUCTURE DOES NOT HAVE THE STRUCTURAL CAPACITY TO BEVERLY OF THE ANTENNA AND PLATFORM LOADS SHOWN ON THESE DRAWINGS AT THE REQUIRED MINIMUM TIAEIA-223-BASIC WIND SPEEDS. DO NOT INSTALL ANY ADDITIONAL OR NEW ANTENNA AND PLATFORM LOADS UNTIL THE MONOPOLE REINFORCING SYSTEM IS COMPLETELY AND SUCCESSFULLY INSTALLED.
- IF MATERIALS, QUANTITIES, STRENGTHS OR SIZES INDICATED BY THE DRAWINGS OR SPECIFICATIONS ARE NOT IN AGREEMENT WITH THESE NOTES, THE BETTER QUALITY AND/OR GREATER QUANTITY, STRENGTH OR SIZE INDICATED, SPECIFIED OR NOTED SHALL BE PROVIDED.
- THIS STRUCTURE IS DESIGNED TO BE SELF-SUPPORTING AND STABLE AFTER THE INSTALLATION OF THE REINFORCING REPAIR SYSTEM HAS BEEN PROPERLY AND ADEQUATELY COMPLETED. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO INSURE THE SAFETY AND STABILITY OF THE MONOPOLE AND ITS COMPONENT PARTS DURING FIELD MODIFICATIONS. THIS INCLUDES, BUT IS NOT LIMITED TO, THE ADDITION OF WHATEVER TEMPORARY BRACING, GUYS OR THE DOWNS THAT MAY BE NECESSARY. SUCH MATERIAL SHALL BE REMOVED AND SHALL REMAIN THE PROPERTY OF THE CONTRACTOR AFTER THE COMPLETION OF THE PROJECT. IMPORTANT CUTTING, WELDING AND SAFETY GUIDELINES: THE CONTRACTOR SHALL FOLLOW ALL CROWN CASTLE CUTTING, WELDING, PREVENTION AND SAFETY GUIDELINES PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL OBTAIN A COPY OF THE CURRENT CROWN CASTLE GUIDELINES FROM CROWN CASTLE. PER THE 12-01-2008 CROWN CASTLE DIRECTIVE, ALL CUTTING AND WELDING ACTIVITIES SHALL BE CONDUCTED IN ACCORDANCE WITH CROWN CASTLE POLICY CUTTING AND WELDING PLAN "DOC # ENG-PLAN-10019) ON AN Ongoing BASIS THROUGHOUT THE ENTIRE LIFE OF THE PROJECT.
- THE STRUCTURAL CONTRACT DOCUMENTS DO NOT INDICATE THE METHOD OR MEANS OF CONSTRUCTION. THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK AND SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES AND PROCEDURES. OBSERVATION VISITS TO THE SITE BY THE OWNER AND/OR THE ENGINEER SHALL NOT INCLUDE INSPECTIONS OF THE PROTECTIVE MEASURES OR THE CONSTRUCTION PROCEDURES.
- ANY SUPPORT SERVICES PERFORMED BY THE ENGINEER DURING CONSTRUCTION SHALL BE DISTINGUISHED FROM CONTINUOUS AND DETAILED INSPECTION SERVICES WHICH ARE FURNISHED BY THE INSPECTION/TESTING AGENCY. THESE SUPPORT SERVICES PERFORMED BY THE ENGINEER ARE SOLELY FOR THE PURPOSE OF ASSISTING IN QUALITY CONTROL AND IN ACHIEVING CONFORMANCE WITH CONTRACT DOCUMENTS. THEY DO NOT GUARANTEE CONTRACTOR'S PERFORMANCE AND SHALL NOT BE CONSTRUED AS SUPERVISION OF CONSTRUCTION.
- ALL MATERIALS AND EQUIPMENT FURNISHED WILL BE NEW AND OF GOOD QUALITY, FREE FROM FAULTS AND DEFECTS AND IN CONFORMANCE WITH THE CONTRACT DOCUMENTS. ANY AND ALL SUBSTITUTIONS MUST BE PROPERLY APPROVED AND AUTHORIZED IN WRITING BY THE ENGINEER AND PRIOR TO INSTALLATION. THE CONTRACTOR SHALL FURNISH SATISFACTORY EVIDENCE AS TO THE KIND AND QUALITY OF MATERIALS AND EQUIPMENT BEING SUBSTITUTED.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING AND SUPERVISING ALL SAFETY PRECAUTIONS AND PROGRAMS IN CONNECTION WITH THE WORK. THE CONTRACTOR IS RESPONSIBLE TO INSURE THAT THIS PROPER AND RELATED WORK COMBINING THIS WORK AS WELL AS LOCAL, STATE AND FEDERAL SAFETY CODES AND REGULATIONS GOVERNING THIS WORK AS WELL AS CROWN CASTLE SAFETY GUIDELINES.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING ALL EXISTING AND NEW COAXIAL CABLES AND OTHER EQUIPMENT DURING CONSTRUCTION ON THE POLE THAT MAY INTERFERE WITH THE AND/OR REPLACED AND RE-INSTALLED AFTER THE REINFORCING IS SUCCESSFULLY COMPLETED. THE CONTRACTOR SHALL IDENTIFY AND CORRELATE THESE ITEMS PRIOR TO CONSTRUCTION WITH THE OWNER, TESTING AGENCY, AND ENGINEER.
- ANY AND ALL EXISTING PLATFORMS THAT ARE LOCATED IN AREAS OF THE POLE SHAFT WHERE SHAFTE REINFORCING MUST BE APPLIED SHALL BE TEMPORARILY REMOVED OR OTHERWISE SHIPPED TO PERMIT NEW CONTINUOUS REINFORCEMENT TO BE ATTACHED. AFTER THE CONTRACTOR HAS SUCCESSFULLY INSTALLED THE MONOPOLE REINFORCEMENT SYSTEM, THE CONTRACTOR SHALL RE-INSTALL THE PLATFORMS. IN NO CASE SHALL ANY NEW, AND/OR ADDITIONAL PLATFORMS AND/OR ANTENNAS AND/OR COAX CABLES AND/OR OTHER EQUIPMENT BE INSTALLED ON THE MONOPOLE UNTIL THE CONTRACTOR HAS SUCCESSFULLY COMPLETED THE INSTALLATION OF ALL OF THE REQUIRED STRUCTURAL REINFORCING SYSTEM COMPONENTS.

**B. LOW HEAT WELDING PROCEDURES:**

- ANY AND ALL FIELD WELDING REQUIRED ON THIS PROJECT SHALL BE PERFORMED BY AWS CERTIFIED WELDERS USING LOW HEAT WELDING TECHNIQUES.
- FOR THE PURPOSES OF THIS PROJECT, "LOW HEAT WELDING IS DEFINED AS A CAREFUL AND CONTROLLED WELDING PROCESS, PERFORMED BY EXPERIENCED AWS CERTIFIED WELDERS, SUCH THAT EXCESSIVE AMOUNTS OF HEAT BUILDUP AT THE WELDED JOINT." DUE TO EXCESSIVE MOISTEN WELD METAL POOLING, IS AVOIDED.
- THE "LOW HEAT WELDING PROCESS SHALL BE SET UP SO THAT ANY FIELD WELDING ACTIVITY ON THE POLE STRUCTURE DOES NOT SCORCH OR OTHERWISE DAMAGE THE EXISTING GALVANIZED SURFACE ON THE INSIDE OF THE POLE SHAFT IN AND AROUND THE REGION OF THE WELD.
- THE "LOW HEAT WELDING PROCESS, USED IN CONJUNCTION WITH THE CROWN CASTLE COAX PROTECTION AND FIRE SAFETY GUIDELINES, SHALL BE SET UP SO THAT ANY FIELD WELDING ACTIVITY ON THE POLE STRUCTURE DOES NOT SCORCH AND/OR OTHERWISE DAMAGE THE EXISTING COAX CABLES THAT RUN ON THE INSIDE AND/OR OUTSIDE OF THE POLE SHAFT IN AND AROUND THE REGION OF THE WELD.
- "LOW HEAT WELD DEMONSTRATION REQUIRED: PRIOR TO BEGINNING THE FIELD WELDING FOR THE REINFORCEMENT WORK, THE CONTRACTOR'S AWS CERTIFIED WELDER SHALL DEMONSTRATE THE LOW HEAT WELDING PROCESS THAT WILL BE USED ON THIS PROJECT SO THAT CROWN CASTLE REPRESENTATIVES CAN OBSERVE AND VERIFY THAT THE PROPOSED WELDING PROCESS DOES NOT DAMAGE THE EXISTING GALVANIZED SURFACE ON THE BACK SIDE OF THE SHAFT. STATE AND FEDERAL SAFETY CODES, ORAYON, AND/OR IN-PAKED SAFETY REGULATIONS MONITORING SERVICES SHOULD BE PROVIDED ON THE BACK SIDE OF THE SHAFT TO MONITOR THE TEMPERATURE OF THE WELD METAL POOLING. THE WELDER SHALL USE A GALVANIZED STEEL PLATE SAMPLE WITH A THICKNESS EQUAL TO THAT OF THE SHAFTE THICKNESS THAT WILL BE REINFORCED. ONLY AFTER THE "LOW HEAT WELDING DEMONSTRATION HAS BEEN SUCCESSFULLY DEMONSTRATED AND APPROVED BY CROWN CASTLE REPRESENTATIVES CAN THE CONTRACTOR PROCEED WITH THE FIELD WELDING ON THE STRUCTURE.
- "LOW HEAT WELDING DEMONSTRATION REQUIRED: PRIOR TO BEGINNING THE FIELD WELDING, FIRE SAFETY AND ALL OTHER SAFETY GUIDELINES WHICH ALSO INCLUDE TOW HEAT WELDING TECHNIQUES, THE CONTRACTOR'S SHALL BE RESPONSIBLE FOR MAINTAINING THE SAFETY AND STABILITY OF THE STRUCTURE DURING CONSTRUCTION. THE CONTRACTOR SHALL BE HELD FULLY LIABLE FOR ANY DAMAGE (INCLUDING HEAT AND FIRE DAMAGE CAUSED BY FIELD WELDING) TO THE STRUCTURE AND ANY OF ITS COMPONENTS WHICH OCCURS DURING CONSTRUCTION.

**C. SPECIAL INSPECTION AND TESTING**

- ALL WORK SHALL BE SUBJECT TO REVIEW AND OBSERVATION BY THE OWNER'S REPRESENTATIVE AND THE OWNER'S AUTHORIZED AGENCY FOR DESIGN AND TESTING AGENCY. REFER TO CROWN CASTLE DOCUMENTS FOR WELDING AND TESTING SPECIFICATIONS.
- ANY SUPPORT SERVICES PERFORMED BY THE ENGINEER DURING CONSTRUCTION SHALL BE DISTINGUISHED FROM CONTINUOUS AND DETAILED INSPECTION SERVICES WHICH ARE FURNISHED BY OTHERS. THESE SUPPORT SERVICES PERFORMED BY THE ENGINEER ARE PERFORMED SOLELY FOR THE PURPOSE OF ASSISTING IN QUALITY CONTROL AND IN ACHIEVING CONFORMANCE WITH CONTRACT DOCUMENTS. THEY DO NOT GUARANTEE CONTRACTOR'S PERFORMANCE AND SHALL NOT BE CONSTRUED AS SUPERVISION OF CONSTRUCTION.
- OBSERVED DISCREPANCIES BETWEEN THE WORK AND THE CONTRACT DOCUMENTS SHALL BE CORRECTED BY THE CONTRACTOR AT NO ADDITIONAL COST.
- AN INDEPENDENT QUALIFIED INSPECTION/TESTING AGENCY SHALL BE SELECTED, RETAINED AND PAID FOR BY THE OWNER FOR THE SOLE PURPOSE OF INSPECTING, TESTING, DOCUMENTING, AND APPROVING ALL WELDING AND FIELD WORK PERFORMED BY THE CONTRACTOR.
  - ACCESS TO ANY PLACE WHERE WORK IS BEING DONE SHALL BE PERMITTED AT ALL TIMES. THE INSPECTION AGENCY SHALL SO SCHEDULE THIS WORK AS TO CAUSE A MINIMUM OF INTERRUPTION TO AND COORDINATE WITH THE WORK IN PROGRESS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE THE WORK SCHEDULE WITH THE TESTING AGENCY. THE CONTRACTOR SHALL ALLOW FOR ADEQUATE TIME AND ACCESS FOR THE TESTING AGENCY TO PERFORM THEIR DUTIES.
- THE INSPECTION AND TESTING AGENCY SHALL BE RESPONSIBLE TO PERFORM THE FOLLOWING SERVICES FOR THE OWNER. THE TESTING AGENCY SHALL INSPECT THE FOLLOWING ITEMS IN ACCORDANCE WITH THE CONSTRUCTION DRAWINGS. THE TESTING AGENCY SHALL INSPECT ITEMS ON THIS LIST AND OTHER ITEMS AS NECESSARY TO FULFILL THEIR RESPONSIBILITY. THE TESTING AGENCY SHALL UTILIZE EXPERIENCED, TRAINED INSPECTORS INCLUDING AWS CERTIFIED WELDING INSPECTORS (CWI). INSPECTORS SHALL HAVE THE TRAINING, CREDENTIALS, AND EXPERIENCE APPROPRIATE FOR COMPLEMENTS/STATE WITH THE SCOPE AND TYPE OF INSPECTION WORK TO BE PERFORMED.
  - GENERAL:
    - PERFORM CONTINUOUS ON-SITE OBSERVATION, INSPECTION, VERIFICATION, AND TESTING DURING THE TIME THE CONTRACTOR IS WORKING ON-SITE. AGENCY SHALL NOTIFY OWNER IMMEDIATELY WHEN FIELD PROBLEMS OR DISCREPANCIES OCCUR.
    - FOUNDATIONS: CONCRETE AND SOIL PREPARATION. (NOT REQUIRED)
    - CONCRETE TESTING PER A/C 308 (NOT REQUIRED)
    - STRUCTURAL STEEL:
      - CHECK THE STEEL ON THE JOB WITH THE PLANS.
      - CHECK THE CERTIFICATIONS.
      - CHECK GRADE OF STEEL, MEMBERS AND BOLTS FOR CONFORMANCE WITH DRAWINGS.
      - CHECK FOR STEEL MEMBERS FOR DEFECTS, EXCESSIVE RUST, FLAWS AND BURNED HOLES.
      - CALL FOR LABORATORY TEST RESULTS FOR THE MEMBER.
      - CHECK STEEL MEMBERS FOR STEEL SLIP AND DIMENSIONAL TOLERANCES.
      - CHECK FOR SURFACE FINISH SPECIFIED GALVANIZED.
      - CHECK BOLT TIGHTENING ACCORDING TO AISC TURN OF THE NUT METHOD.
    - WELDING:
      - VERIFY FIELD WELDING PROCEDURES, WELDERS, AND WELDING OPERATORS, NOT DEEMED REQUALIFIED, IN ACCORDANCE WITH AWS D1.1.
      - INSPECT FIELD WELDED CONNECTIONS IN ACCORDANCE WITH THE REQUIREMENTS SPECIFIED AND IN ACCORDANCE WITH AWS D1.1.
        - APPROVE FIELD WELDING SEQUENCE.
        - VERIFY THE TIME THE CONTRACTOR IS WORKING ON-SITE. AGENCY SHALL NOTIFY OWNER IMMEDIATELY WHEN FIELD PROBLEMS OR DISCREPANCIES OCCUR.
        - APPROVE OF THE WELDING BEFORE WELDING BEGINS. NO CHANGE IN APPROVED SEQUENCES MAY BE MADE WITHOUT PERMISSION FROM THE OWNER.
        - INSPECT WELDED CONNECTIONS AS FOLLOWS AND IN ACCORDANCE WITH AWS D1.1:
          - INSPECT WELDING EQUIPMENT FOR CAPACITY, MAINTENANCE AND WORKING CONDITIONS.
          - VERIFY SPECIFIED ELECTRODES AND HANDLING AND STORAGE OF ELECTRODES FOR CONFORMANCE TO SPECIFICATIONS.
          - INSPECT PREHEATING AND INTERPASS TEMPERATURES FOR CONFORMANCE WITH AWS D1.1.
          - VISUALLY INSPECT ALL WELDS AND VERIFY THAT QUALITY OF WELDS MEETS THE REQUIREMENTS OF AWS D1.1.
          - SPOT TEST AT LEAST ONE FILLET WELD OF EACH MEMBER USING MAGNETIC PARTICLE OR DYE PENETRANT.
          - INSPECT FOR SIZE, SPACING, TYPE AND LOCATION AS PER APPROVED PLANS.
          - VERIFY THAT THE BASE METAL CONFORMS TO THE DRAWINGS.
          - REVIEW THE REPORTS BY TESTING LABS.
          - CHECK TO SEE THAT WELDS ARE CLEAN AND FREE FROM SLAG.
          - INSPECT FULST PROTECTION OF WELDS AS PER SPECIFICATIONS.
          - CHECK THAT DEFECTIVE WELDS ARE CLEARLY MARKED AND HAVE BEEN ADEQUATELY REPAIRED.
      - SPECIAL INSPECTION OF EXISTING SHAFTE TO-FLANGE WELD CONNECTIONS:
        - PRIOR TO CONSTRUCTION, TESTING AGENCY SHALL INSPECT CONDITION OF EXISTING SHAFTE TO-BASE-PLATE WELD CONNECTION. ALSO INSPECT EXISTING STRIPPERS IF PRESENT. THE INSPECTOR SHALL USE THE FOLLOWING INSPECTION METHODS OR COMBINATIONS OF METHODS AS REQUIRED TO IDENTIFY ANY CRACKS, VISUAL, MAGNETIC PARTICLE, AND/OR ULTRASONIC. IN ADDITION, OTHER TEST METHODS MAY ALSO BE USED AT THE RECOMMENDATION OF THE TESTING AGENCY AND UPON THE APPROVAL OF THE OWNER AND THE ENGINEER. THE TESTING AGENCY SHALL PROVIDE CORRECT AND THOROUGH TESTING DOCUMENTATION OF THIS INSPECTION TO THE OWNER AND THE ENGINEER'S REQUIRED PROCESSES SHALL COORDINATE THESE INSPECTION ACTIVITIES WITH THE ENGINEER'S REQUIRED PROCESSES AND PROCEDURES. IMPORTANT: THE TESTING AGENCY SHALL IMMEDIATELY REPORT ANY INDICATIONS OF CRACKS, FRACTURES, DISTRESS, AND/OR CORROSION TO THE OWNER AND THE ENGINEER.
        - AFTER CONSTRUCTION, TESTING AGENCY SHALL INSPECT ANY AND ALL FIELD REPAIRS IMPLEMENTED AS REQUIRED BY THE OWNER FROM THE RESULTS OF THE INSPECTION IN THE PREVIOUS NOTE BY (1) ABOVE.
        - REFER TO CROWN CASTLE DOCUMENTS ENG-SOV-10033 AND ENG-BU-10051 FOR SPECIFICATIONS.
      - REPORTS:
        - COMPLETE AND PERIODICALLY SUBMIT DAILY INSPECTION REPORTS TO THE OWNER.
  - THE INSPECTION PLAN OUTLINED HEREIN IS INTENDED AS A DESCRIPTION OF GENERAL AND SPECIFIC ITEMS OF CONCERN. IT IS NOT INTENDED TO BE ALL-INCLUSIVE. IT DOES NOT LIMIT THE TESTING AND INSPECTION AGENCY TO THE ITEMS LISTED. ADDITIONAL TESTING, INSPECTION, AND CHECKING MAY BE REQUIRED AND SHOULD BE ANTICIPATED. THE TESTING AGENCY SHALL USE THEIR PROFESSIONAL JUDGMENT AND KNOWLEDGE OF THE JOB SITE CONDITIONS AND THE CONTRACTOR'S PERFORMANCE TO DECIDE WHAT OTHER ITEMS REQUIRE ADDITIONAL ATTENTION. THE TESTING AGENCY'S JUDGMENT MUST PREVAIL ON ITEMS NOT SPECIFICALLY COVERED. ANY DISCREPANCIES AND PROBLEMS SHALL BE BROUGHT IMMEDIATELY TO THE OWNER'S ATTENTION. RESOLUTIONS ARE NOT TO BE MADE WITHOUT THE OWNER'S REVIEW AND SPECIFIC WRITTEN CONSENT. THE OWNER RESERVES THE RIGHT TO DETERMINE WHAT IS AN ACCEPTABLE RESOLUTION OF DISCREPANCIES AND PROBLEMS. AFTER EACH INSPECTION, THE TESTING AGENCY WILL PREPARE A WRITTEN ACCEPTANCE OR REJECTION WHICH WILL BE GIVEN TO THE CONTRACTOR AND FILED AS DAILY REPORTS TO THE OWNER. THIS WRITTEN ACTION WILL GIVE THE CONTRACTOR A LIST OF ITEMS TO BE CORRECTED, PRIOR TO CONTINUING CONSTRUCTION, AND/OR LOADING OF STRUCTURAL ITEMS.
  - RESPONSIBILITY: THE TESTING AGENCY DOES NOT RELIEVE THE CONTRACTOR'S CONTRACTUAL OR STATUTORY OBLIGATIONS. THE CONTRACTOR HAS THE SOLE RESPONSIBILITY FOR ANY DEVIATIONS FROM THE OFFICIAL CONTRACT DOCUMENTS. THE TESTING AGENCY WILL NOT REPLACE THE CONTRACTOR'S QUALITY CONTROL PERSONNEL.



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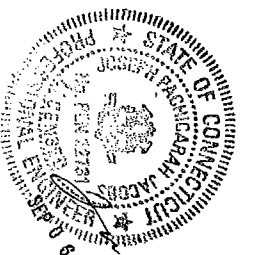
**BU #876321; BRANFORD BANNN TOWER**  
**BRANFORD, CT**  
 MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

|                           |                                   |
|---------------------------|-----------------------------------|
| PROJECT No.<br>37612-1607 | ISSUE DATE OF<br>PERMIT: 9-4-2012 |
| DRAWN BY:<br>B.M.S.       |                                   |
| CHECKED BY:<br>C.M.M.     |                                   |
| APPROVED BY:              |                                   |
| DATE:<br>9-4-2012         | <b>S-1</b>                        |



- D. STRUCTURAL STEEL MATERIALS, FABRICATION, DETAILING, AND WORKMANSHIP SHALL CONFORM TO THE LATEST EDITION OF THE FOLLOWING REFERENCE STANDARDS:
  - A. "SPECIFICATION FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS," APPROVED BY THE RESEARCH COUNCIL ON STRUCTURAL CONNECTIONS OF THE ENGINEERING FOUNDATION.
  - (B) "SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM A325 OR A490 BOLTS," AS APPROVED BY THE RESEARCH COUNCIL ON STRUCTURAL CONNECTIONS OF THE ENGINEERING FOUNDATION.
  - (C) "CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES" (PARAGRAPH 4.2.1 SPECIFICALLY EXCLUDED).
- B. BY THE AMERICAN WELDING SOCIETY (AWS):
  - (A) "STRUCTURAL WELDING CODE - STEEL D1.1."
  - (B) "SYMBOLS FOR WELDING AND NON-DESTRUCTIVE TESTING" ANY MATERIAL OR WORKMANSHIP WHICH IS OBSERVED TO BE DEFECTIVE OR INCONSISTENT WITH THE CONTRACT DOCUMENTS SHALL BE CORRECTED, MODIFIED, OR REPLACED AT THE CONTRACTOR'S EXPENSE.
- 3. TIGHTEN ALL STRUCTURAL BOLTS, INCLUDING THE AXIAL M20 BOLTS WITH SHEAR SLEEVES, ACCORDING TO THE REQUIREMENTS OF THE AISC TURN OF THE NUT METHOD. TIGHTEN BOLTS 1/3 TURN PAST THE SNUG TIGHT CONDITION AS DEFINED BY AISC.
- 4. WELDED CONNECTIONS SHALL CONFORM TO THE LATEST REVISED CODE OF THE AMERICAN WELDING SOCIETY, AWS D1.1. ALL WELD ELECTRODES SHALL BE E80XX UNLESS NOTED OTHERWISE ON THE DRAWINGS.
- 5. ALL WELDED CONNECTIONS SHALL BE MADE BY WELDERS CERTIFIED BY AWS. CONTRACTOR SHALL SUBMIT WELDERS CERTIFICATION AND QUALIFICATION DOCUMENTATION TO THE OWNER'S TESTING AGENCY FOR REVIEW AND APPROVAL PRIOR TO CONSTRUCTION.
- 6. STRUCTURAL STEEL PLATES SHALL CONFORM TO ASTM A572 GRADE 65 (FY = 65 KSI MIN.) UNLESS NOTED OTHERWISE ON THE DRAWINGS.
- 7. SURFACES OF EXISTING STEEL SHALL BE PREPARED AS REQUIRED FOR FIELD WELDING PER AWS. SEE SECTION 1 NOTES REGARDING TOUCH-UP OF GALVANIZED SURFACES DAMAGED DURING TRANSPORTATION OR ERECTION AND ASSEMBLY AS WELL AS FIELD WELDING.
- 8. UNLESS OTHERWISE NOTED, ALL STEEL MEMBERS SHALL BE HOT-DIP GALVANIZED AFTER FABRICATION, IN ACCORDANCE WITH ASTM A123. SEE SECTION 1 FOR FURTHER NOTES AND FOR EXCEPTIONS (IF ANY).
- 9. ALL WELDS SHALL BE VISUALLY INSPECTED BY THE OWNER'S APPROVED TESTING AGENCY. OTHER TESTS MAY ALSO BE PERFORMED ON THE WELDS BY THE TESTING AGENCY IN ORDER FOR THEM TO PERFORM THEIR DUTIES FOR THIS PROJECT. THE CONTRACTOR SHALL COOPERATE WITH THE TESTING AGENCY IN THEIR TESTING EFFORTS.
- 10. NO WELDING SHALL BE DONE TO THE EXISTING STRUCTURE WITHOUT THE PRIOR APPROVAL AND SUPERVISION OF THE TESTING AGENCY.
- 11. FIELD CUTTING OF STEEL:
  - (A) PRIOR TO ANY FIELD CUTTING, THE CONTRACTOR SHALL MARK THE CUT OUTLINES ON THE STEEL, AND THE INSPECTION/TESTING AGENCY SHALL VERIFY PROPOSED LAYOUT, LOCATION, AND DIMENSIONS.
  - (B) ANY REQUIRED CUTS IN THE STEEL SHALL BE CAREFULLY CUT BY MECHANICAL METHODS SUCH AS DRILLING, SAW CUTTING, AND GRINDING. THE CONTRACTOR IS RESPONSIBLE TO PREVENT ANY DAMAGE TO THE COAX CABLES, AND/OR OTHER EQUIPMENT AND/OR THE STRUCTURE DURING THE CUTTING WORK. ANY DAMAGE TO THE COAX CABLES, AND/OR OTHER EQUIPMENT AND/OR THE STRUCTURE, RESULTING FROM THE CONTRACTOR'S ACTIVITIES SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE. THE INSPECTION/TESTING AGENCY SHALL CLOSELY AND CONTINUOUSLY MONITOR THIS ACTIVITY.
  - (C) ALL REQUIRED CUTS SHALL BE CUT WITHIN THE DIMENSIONS SHOWN ON THE DRAWINGS. NO CUTS SHALL EXTEND BEYOND THE OUTLINE OF THE DIMENSIONS SHOWN ON THE DRAWINGS. ALL CUT EDGES SHALL BE PREPARED FOR FIELD WELDING PER AWS D1.1, AND AS SHOWN ON THE DRAWINGS. IT MAY BE NECESSARY TO DRILL STARTER HOLES AS REQUIRED TO MAKE THE CUTS. THE INSPECTION/TESTING AGENCY SHALL CLOSELY AND CONTINUOUSLY MONITOR THIS ACTIVITY.

- 5. CAST-IN-PLACE CONCRETE - (NOT REQUIRED)
- H. EPOXY GROUTED REINFORCING ANCHOR RODS
  - 1. UNLESS OTHERWISE NOTED, REINFORCING ANCHOR RODS SHALL BE 150 KSI ALL-THREAD BAR CONFORMING TO ASTM A722. RECOMMENDED MANUFACTURERS/SUPPLIERS OF 150 KSI ALL-THREAD BAR ARE WILLIAMS FORM ENGINEERING CORPORATION AND DYWIDAG SYSTEMS INTERNATIONAL. ALL REINFORCING ANCHOR RODS SHALL BE HOT DIP GALVANIZED PER ASTM A153. ALTERNATIVELY, THE CORE-DRILLED HOLES IN THE CONCRETE FOR THE ANCHOR RODS SHALL BE CLEAN AND DRY, AND OTHERWISE PROPERLY PREPARED ACCORDING TO THE ANCHOR ROD AND EPOXY MANUFACTURERS' INSTRUCTIONS, PRIOR TO PLACEMENT OF ANCHOR RODS AND EPOXY.
  - 2. CONTRACTOR SHALL FOLLOW ALL ANCHOR ROD AND EPOXY MANUFACTURER'S RECOMMENDATIONS REGARDING HANDLING OF RODS, EPOXY, ACCEPTABLE AMBIENT TEMPERATURE RANGE DURING INSTALLATION AND POST-INSTALLATION CURING, THE EFFECT OF TEMPERATURE ON EPOXY CURING TIME, PREPARATION OF HOLE, ETC.
  - 3. ULTRA-BOND 1, HILTI HIT RE-500 OR ANCHORTITE EPOXY SHALL BE USED TO ANCHOR THE 150 KSI ALL-THREAD BAR IN THE DRILL HOLES. IF CONTRACTOR WISHES TO USE A DIFFERENT EPOXY, A REQUEST INCLUDING THE EPOXY TECHNICAL DATA SHEET(S) SHALL BE SUBMITTED TO PAUL J. FORD AND COMPANY FOR REVIEW PRIOR TO CONSTRUCTION. AS NOTED ABOVE, FOLLOW ALL EPOXY MANUFACTURER RECOMMENDATIONS REGARDING HANDLING OF EPOXY, ACCEPTABLE AMBIENT TEMPERATURE RANGE DURING INSTALLATION AND POST-INSTALLATION CURING, THE EFFECT OF TEMPERATURE ON EPOXY CURING TIME, PREPARATION OF HOLE, ETC.
  - 4. ONCE THE REINFORCING ANCHOR RODS HAVE BEEN INSTALLED AND ALL EPOXY AND GROUT HAVE CURED (IF BASE PLATE AND/OR BEARING PLATES HAVE BEEN GROUTED PRIOR TO TESTING), ALL REINFORCING ANCHOR RODS SHALL BE LOAD TESTED PER CROWN CASTLE ENGINEERING DOCUMENT #ENG-PFC-10119. REFER TO THE NEW ANCHOR & BRACKET DETAIL ON FOLLOWING DRAWING SHEETS FOR SPECIFIED ANCHOR ROD PROOF LOAD.
  - 5. ONCE THE REINFORCING ANCHOR RODS HAVE BEEN SUCCESSFULLY LOAD TESTED AND APPROVED AND BASE PLATE / BEARING PLATE GROUT HAS CURED (IF BASE PLATE AND/OR BEARING PLATES HAVE BEEN GROUTED AFTER TESTING), CONTRACTOR SHALL TIGHTEN ALL HEAVY HEX ANCHOR NUTS TO SNUG TIGHT PLUS 1/8 TURN OF NUT.
- 6. TOUCH UP OF GALVANIZING
  - 1. THE CONTRACTOR SHALL TOUCH UP ANY AND/OR ALL AREAS OF GALVANIZING ON THE EXISTING STRUCTURE OR NEW COMPONENTS THAT ARE DAMAGED OR ABRADED DURING CONSTRUCTION, GALVANIZED SURFACES DAMAGED DURING TRANSPORTATION OR ERECTION AND ASSEMBLY AS WELL AS ANY AND ALL ABRASIONS, CUTS, FIELD DRILLING, AND ALL FIELD WELDING SHALL BE TOUCHED UP WITH TWO (2) COATS OF ZRC-BRAND ZINC-RICH COLD GALVANIZING COMPOUND. FILM THICKNESS PER COAT SHALL BE: WET 3.0 MILS; DRY 1.5 MILS. APPLY PER ZRC (MANUFACTURER) RECOMMENDED PROCEDURES. CONTACT ZRC AT 1-800-831-3275 FOR PRODUCT INFORMATION.
  - 2. CONTRACTOR SHALL CLEAN AND PREPARE ALL FIELD WELDS ON GALVANIZED AND PRIME PAINTED SURFACES FOR TOUCH-UP COATING IN ACCORDANCE WITH AWS D1.1. THE OWNER'S TESTING AGENCY SHALL VERIFY THE PREPARED SURFACE PRIOR TO APPLICATION OF THE TOUCH-UP COATING.
  - 3. THE OWNER'S TESTING AGENCY SHALL TEST AND VERIFY THE COATING THICKNESS AFTER THE CONTRACTOR HAS APPLIED THE ZRC COLD GALVANIZING COMPOUND AND IT HAS SUFFICIENTLY DRIED. AREAS FOUND TO BE INADEQUATELY COATED, SHALL BE RE-COATED BY THE CONTRACTOR AND RE-TESTED BY THE TESTING AGENCY.
- 7. HOT DIP GALVANIZING
  - 1. ALL STRUCTURAL STEEL MEMBERS AND ALL STEEL ACCESSORIES, BOLTS, WASHERS, ETC. PER ASTM A123 OR PER ASTM A153, AS APPROPRIATE.
  - 2. PROPERLY PREPARE STEEL ITEMS FOR GALVANIZING.
  - 3. DRILL OR PUNCH WEEP AND/OR DRAINAGE HOLES AS REQUIRED.
  - 4. ALL GALVANIZING SHALL BE DONE AFTER FABRICATION IS COMPLETED AND PRIOR TO FIELD INSTALLATION.
- 8. PERPETUAL INSPECTION AND MAINTENANCE BY THE OWNER
  - 1. AFTER THE CONTRACTOR HAS SUCCESSFULLY COMPLETED THE INSTALLATION OF THE MONOPOLE REINFORCING SYSTEM AND THE WORK HAS BEEN ACCEPTED BY THE OWNER, THE OWNER WILL BE RESPONSIBLE FOR THE LONG TERM AND PERPETUAL INSPECTION AND MAINTENANCE OF THE POLE AND REINFORCING SYSTEMS. THESE DOCUMENTS USES REINFORCING AND MONITORING SYSTEMS INCLUDING SYSTEM INDICATED IN THESE DOCUMENTS USES REINFORCING AND MONITORING SYSTEMS INCLUDING SYSTEM INDICATED IN THESE DOCUMENTS. THE POLE AND REINFORCING SYSTEMS SHALL BE MAINTAINED AND COVERED WITH CORROSION PREVENTATIVE COATING SUCH AS THE ZRC GALVANIZING COMPOUND AND SPECIFIED PREVIOUSLY. THE INSPECTED SIZE AND QUALITY MAINTAINED SOUND CONDITION AND STRENGTH OF THESE FIELD WELDED CONNECTIONS. ANY CORROSION OF DAMAGE TO FATIGUE FRACTURE AND/OR DETEIORATION OF THESE WELDS AND/OR THE CONNECTED COMPONENTS WILL RESULT IN THE LOSS OF STRUCTURAL LOAD CARRYING CAPACITY AND MAY LEAD TO FAILURE OF THE STRUCTURAL SYSTEM. THEREFORE, IT IS IMPERATIVE THAT THE OWNER REGULARLY INSPECTS, MAINTAINS AND REPAIRS AS NECESSARY ALL OF THESE WELDS, CONNECTIONS, AND COMPONENTS TO THE REINFORCING SYSTEM.
  - 2. THE OWNER SHALL REFER TO LAE-2225-1998, SECTION 14 AND ANNEX E FOR RECOMMENDATIONS FOR MAINTENANCE AND INSPECTION. THE FREQUENCY OF THE INSPECTION AND MAINTENANCE INTERVALS IS TO BE DETERMINED BY THE OWNER BASED UPON ACTUAL SITE AND ENVIRONMENTAL CONDITIONS. PAUL J. FORD & COMPANY RECOMMENDS THAT A COMPLETE AND THOROUGH INSPECTION OF THE ENTIRE REINFORCED MONOPOLE STRUCTURAL SYSTEM BE PERFORMED YEARLY AND/OR AS FREQUENTLY AS CONDITIONS WARRANT. ACCORDING TO TIA/EIA-222-E-1998 SECTION 14.1 NOTE 1: "IT IS RECOMMENDED THAT THE STRUCTURE BE INSPECTED AFTER SEVERE WIND AND/OR ICE STORMS OR OTHER EXTREME LOADING CONDITIONS."



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**BU #876321; BRANFORD BANIM TOWER**  
**BRANFORD, CT**  
 MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

|                           |                                   |
|---------------------------|-----------------------------------|
| PROJECT NO.<br>37512-1607 | ISSUE DATE OF<br>PERMIT: 9-4-2012 |
| DRAWN BY:<br>B.M.S.       |                                   |
| CHECKED BY:<br>C.M.M.     |                                   |
| APPROVED BY:              |                                   |
| DATE:<br>9-4-2012         | <b>S-2</b>                        |



## AJAX BOLT NOTE SHEET, REV. 1.2, 01-23-2012

- NOTES:**
- ALL STRUCTURAL BOLTS SHALL BE INSTALLED AND TIGHTENED TO THE PRETENSIONED CONDITION ACCORDING TO THE REQUIREMENTS OF THE AISC 'SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS', DEC. 31, 2009.
  - ALL STRUCTURAL BOLTS SHALL BE INSPECTED ACCORDING TO THE REQUIREMENTS OF THE AISC 'SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS', DEC. 31, 2009.
  - ALL AJAX M20 BOLTS WITH SHEAR SLEEVES SHALL BE PRETENSIONED 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.
  - 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 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 BELLOW FALLS, VERMONT, USA 05101  
PHONE 1-800-552-1999  
WEBSITE: [WWW.APPLIEDBOLTING.COM](http://WWW.APPLIEDBOLTING.COM)

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

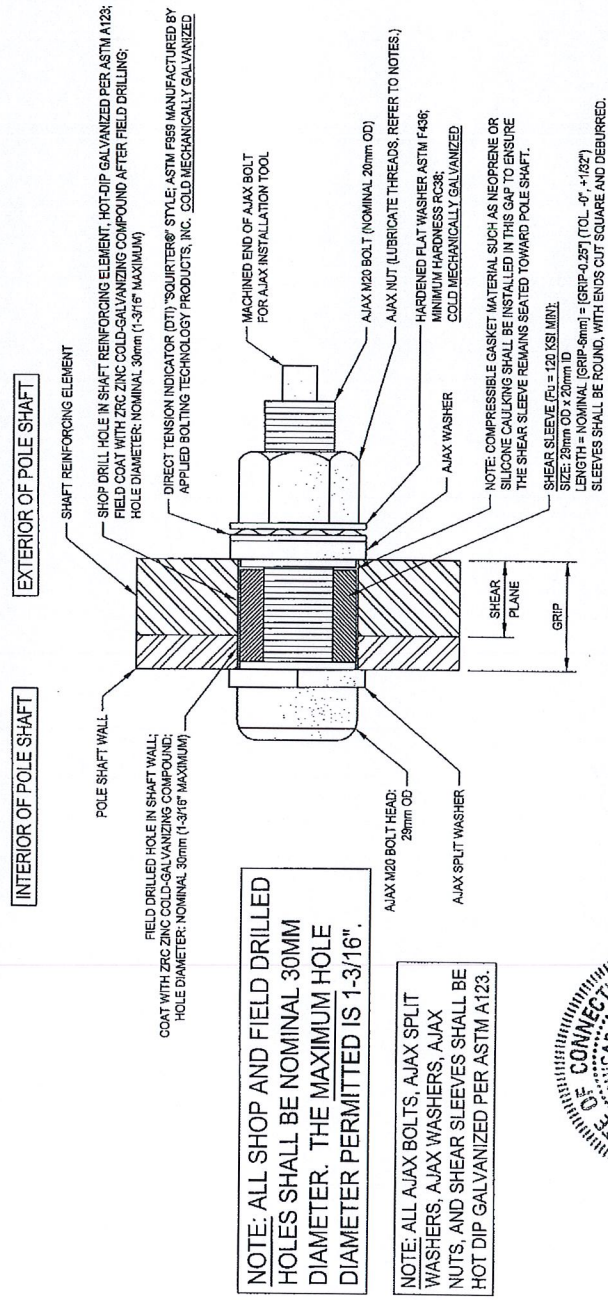
HARDENED WASHERS REQUIRED: USE A HARDENED WASHER FOR A 3/4" NOMINAL BOLT BETWEEN THE TOP OF THE DIRECT TENSION INDICATOR (DTI) WASHER AND THE NUT OF THE AJAX M20 BOLTS. HARDENED WASHERS SHALL CONFORM TO ASTM F436 AND HAVE A MINIMUM HARDNESS OF RC 38 OR HIGHER. THE HARDENED WASHERS SHALL BE MECHANICALLY 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 FACING AWAY FROM THE AJAX WASHER. PLACE A HARDENED WASHER BETWEEN THE DTI AND THE AJAX NUT. THE DTI BUMPS SHALL BEAR AGAINST THE UNDERSIDE OF A HARDENED FLAT WASHER, NEVER DIRECTLY AGAINST THE NUT.

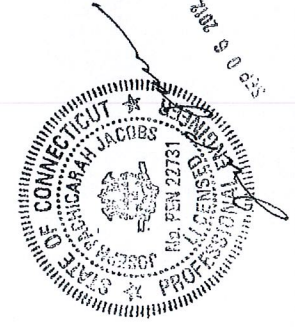
CONTRACTOR SHALL FOLLOW DTI MANUFACTURER'S INSTRUCTIONS FOR INSTALLATION, LUBRICATION, TIGHTENING AND INSPECTION.

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, 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 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.



**TYPICAL AJAX BOLT DETAIL 1**

**S-3**



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PROJECT No:  
37512-1607

DRAWN BY:  
B.M.S.

CHECKED BY:  
C.M.M.

APPROVED BY:

DATE:  
9-4-2012

**BU #876321; BRANFORD BANM TOWER**  
**BRANFORD, CT**  
MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

ISSUE DATE OF  
PERMIT: 9-4-2012

**S-3**



**NOTE:** NO DETAILED INFORMATION REGARDING INTERFERENCES WAS PROVIDED. THEREFORE, CONTRACTOR SHALL FIELD VERIFY ALL EXISTING CONDITIONS AND DIMENSIONS BEFORE PROCEEDING WITH THE WORK. REPORT ANY AND ALL DISCREPANCIES TO PAUL J. FORD AND COMPANY AND CROWN CASTLE FIELD PERSONNEL IMMEDIATELY.

THIS POLE REINFORCEMENT DRAWING IS FOR THE POLE DESIGN AND ANTENNA LOADING DOCUMENTED IN THE PJF CO-LOCATION ANALYSIS FOR THIS SITE (PJF#37512-1607), DATED 9-4-2012.

| POLE SPECIFICATIONS |                                     |
|---------------------|-------------------------------------|
| POLE SHAPE TYPE:    | 12 SIDED POLYGON                    |
| TAPER:              | 0.15002 IN/FT                       |
| SHAFT STEEL:        | ASTM A507 GRADE 65 & GRADE 60       |
| BASE PL. STEEL:     | ASTM A633 GR. E (50 KSI)            |
| ANCHOR RODS:        | 2 1/4" Ø<br>#18L ASTM A815 GRADE 75 |

| SHAFT SECTION DATA |                     |                      |                 |                            |          |
|--------------------|---------------------|----------------------|-----------------|----------------------------|----------|
| SHAFT SECTION      | SECTION LENGTH (FT) | PLATE THICKNESS (IN) | LAP SPLICE (IN) | DIAMETER ACROSS FLATS (IN) |          |
|                    |                     |                      |                 | @ TOP                      | @ BOTTOM |
| 1                  | 47.50               | 0.2500               | 45.00           | 22.000                     | 30.313   |
| 2                  | 44.25               | 0.3125               | 57.00           | 23.157                     | 36.900   |
| 3                  | 34.50               | 0.3750               | 63.00           | 35.444                     | 41.481   |
| 4                  | 34.50               | 0.4375               |                 | 38.812                     | 46.850   |

NOTE: DIMENSIONS SHOWN DO NOT INCLUDE GALVANIZING TOLERANCES

CONTRACTOR SHALL PROVIDE ASTM A36 SHIM PLATES BELOW SLIP JOINTS. THE SHIM PLATES SHALL BE PLACED BETWEEN THE NEW SHAFT REINFORCEMENT AND THE EXISTING POLE SHAFT FROM THE SLIP JOINT TO THE NEW SHAFT REINFORCEMENT SPLICE PLATE LOCATION AND AN EXTRA LONG 'SPLICE SHIM' SHALL BE PLACED BETWEEN THE NEW UPPER AND LOWER SHAFT REINFORCEMENT PLATES AT THE SHAFT REINFORCEMENT SPLICE PLATE LOCATION.

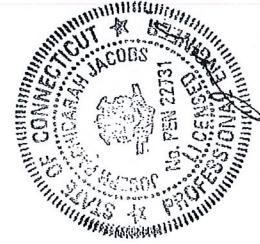
**NOTES:**

1. ALL STRUCTURAL BOLTS SHALL BE INSTALLED AND TIGHTENED TO THE PRETENSIONED CONDITION ACCORDING TO THE REQUIREMENTS OF THE AISC SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS, DEC. 31, 2005.
2. ALL STRUCTURAL BOLTS SHALL BE INSPECTED ACCORDING TO THE REQUIREMENTS OF THE AISC SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS, DEC. 31, 2005.
3. \* ALL AJAX M20 BOLTS WITH SHEAR SLEEVES SHALL BE PRETENSIONED AND TIGHTENED UNTIL THE DIRECT TENSION INDICATOR (DTI) WASHERS SHOW THAT THE PROPER BOLT TENSION HAS BEEN REACHED. SEE NOTES AND DETAIL ON SHEET S-3 FOR THE USE OF DIRECT TENSION INDICATOR (DTI) WASHERS WITH THE AJAX M20 BOLTS.
4. DTIS REQUIRED: \* ALL AJAX BOLTS SHALL BE INSTALLED USING DIRECT TENSION INDICATORS (DTIS) AND HARDENED WASHERS. DTIS SHALL BE THE SQUIRTER® STYLE, MADE TO ASTM F880 LATEST REVISION; AND HARDENED WASHERS SHALL CONFORM TO ASTM F436 AND HAVE A HARDNESS OF RC 39 OR HIGHER.
5. 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. REFER TO SHEET S-3.
6. AJAX BOLT HOLE SIZE: ALL SHOP- AND FIELD-DRILLED HOLES SHALL BE NOMINAL 30MM DIAMETER. THE MAXIMUM HOLE DIAMETER PERMITTED IS 1.516". REFER TO SHEET S-3.

\* AS OF 5/6/2012, UNTIL FURTHER NOTICE, CROWN CASTLE WILL ACCEPT AJAX BOLTS TIGHTENED USING ALSO "TURN-OF-THE-NUT" METHODOLOGY. INSTALLERS SHALL FOLLOW CROWN GUIDELINES FOR AISC "TURN-OF-THE-NUT" METHOD AND ALSO PROVIDE COMPLETE INSPECTION DOCUMENTATION IN THE PMI.

NDE OF THE CIRCUMFERENTIAL WELD OF THE BASE PLATE TO SHAFT CONNECTION IS REQUIRED. PLEASE SEE ENGS-SOW-1033. TOWER BASE PLATE NDE AND ENG-BUL-10951. 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.

REINFORCING BAR SPLICE DETAILS TO BE COORDINATED BY RESPECTIVE CONTRACTORS.



SEP 6 2012

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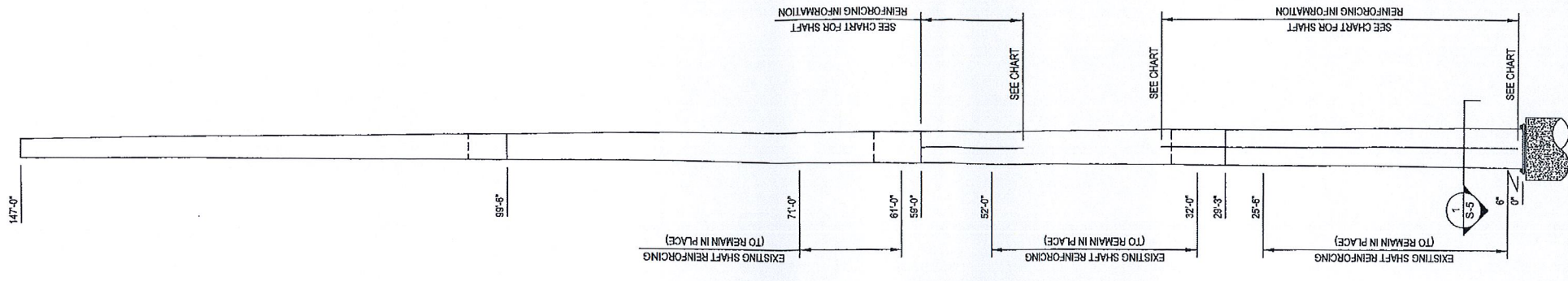
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**BU #876321; BRANFORD BANIM TOWER**  
**BRANFORD, CT**  
MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

PROJECT No: 37512-1607  
DRAWN BY: B.M.S.  
CHECKED BY: C.M.M.  
APPROVED BY:  
DATE: 9-4-2012

ISSUE DATE OF PERMIT: 9-4-2012

**S-4**



**POLE ELEVATION 1**  
**S-4**

**NEW AEROSOLUTIONS MP3 REINFORCING (OPTION #1)**

| ELEVATION        | FLAT #   | MP3   |
|------------------|----------|-------|
| 0'-6" TO 35'-6"  | 2, 5 & 9 | MP304 |
| 49'-0" TO 59'-0" | 1, 5 & 9 | MP303 |

ALL BOLTS SHALL BE AJAX M20 BOLTS WITH HIGH STRENGTH SHEAR SLEEVES ASTM A519 WITH MIN. Fu=105 KSI). CONTACT SUPPLIER FOR MATERIAL (PLATE & BOLTS) AND INSTALLATION PROCEDURES.

**NEW SABRE FLAT PLATE REINFORCING (OPTION #2)**

| ELEVATION        | FLAT #   | FLAT PLATE |
|------------------|----------|------------|
| 0'-6" TO 35'-6"  | 2, 5 & 9 | MS-550     |
| 49'-0" TO 59'-0" | 1, 5 & 9 | MS-550     |

ALL BOLTS SHALL BE AJAX M20 BOLTS WITH HIGH STRENGTH SHEAR SLEEVES ASTM A519 WITH MIN. Fu=105 KSI). CONTACT SUPPLIER FOR MATERIAL (PLATE & BOLTS) AND INSTALLATION PROCEDURES.

**NEW CCI FLAT PLATE (100 KSI) REINFORCING (OPTION #3)**

| ELEVATION        | FLAT #   | FLAT PLATE |
|------------------|----------|------------|
| 0'-6" TO 35'-6"  | 2, 5 & 9 | SP-LR-0754 |
| 49'-0" TO 59'-0" | 1, 5 & 9 | SP-LR-0754 |

**NOTES FOR CROWN REINFORCING OPTION (100 KSI) MATERIAL:**  
1. DO NOT FIELD WELD DIRECTLY TO THE 100 KSI MATERIAL.  
2. THE 100 KSI MATERIAL SHALL CONFORM TO THE FOLLOWING:  
A. MATERIAL SHALL BE ASTM A514, GRADE A, GRADE E, or GRADE F, HAVING A MINIMUM TENSILE STRENGTH (Fu) OF 110 KSI AND A MINIMUM YIELD STRENGTH (Fy) OF 100 KSI.  
B. MATERIAL SHALL BE HEAT TREATED, QUENCHED AND TEMPERED PER ASTM A514.  
C. MATERIAL SHALL HAVE CHARPY V-NOTCH (CVN) IMPACT VALUES OF NOT LESS THAN 15 FT-LB AT -20 DEGREES F, IN ACCORDANCE WITH ASTM A570.  
D. MINIMUM INSIDE BEND RADIUS FOR COLD BENDING, PER ASTM A6 TABLE X-2.2, SHALL BE 4.5 MINIMUM.  
E. ANY AND ALL WELDING TO THE MATERIAL SHALL BE PERFORMED IN ACCORDANCE WITH THE AISC WELDING QUALIFICATION PROCEDURE (WQPS) 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 ANY WORK, FABRICATION OR WELDING, THE WPS SHALL BE SUBMITTED TO CROWN CASTLE AND PAUL J. FORD AND COMPANY FOR REVIEW.

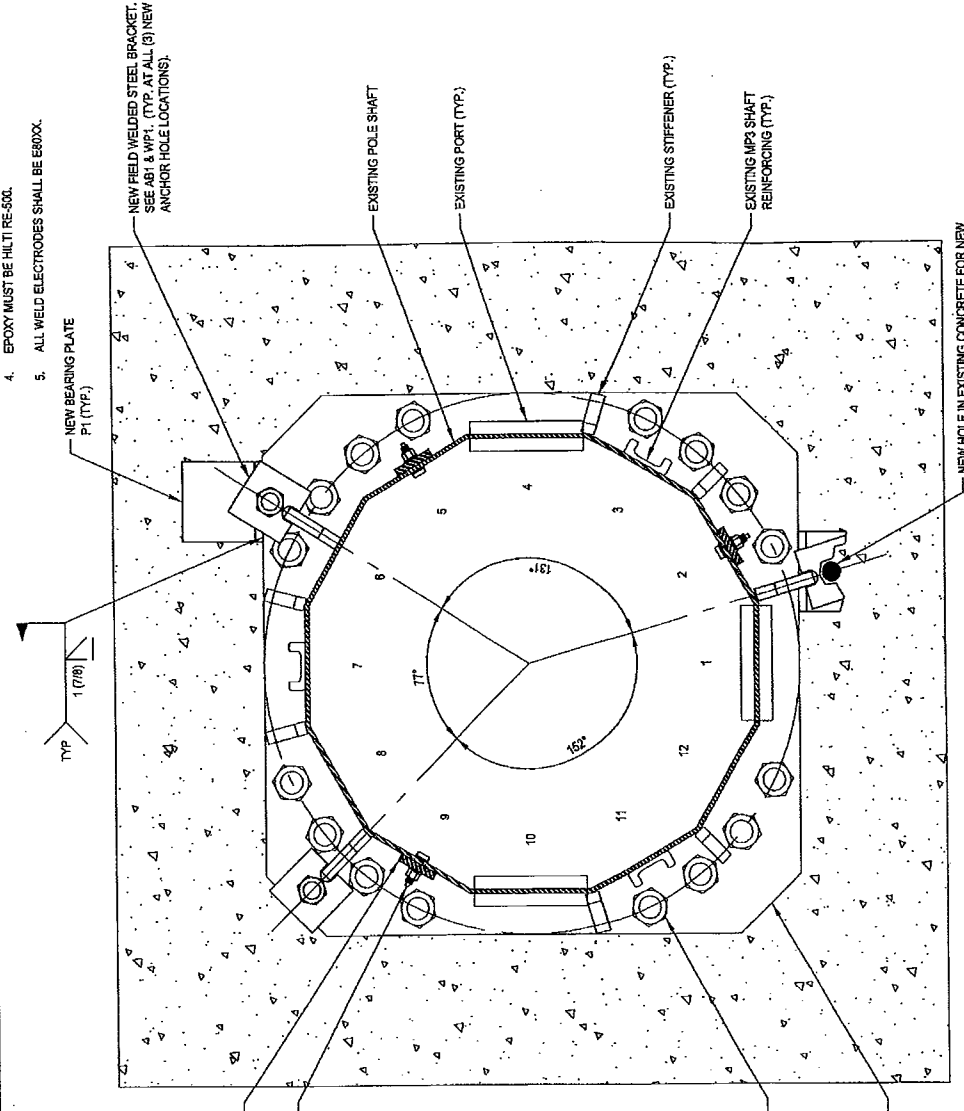


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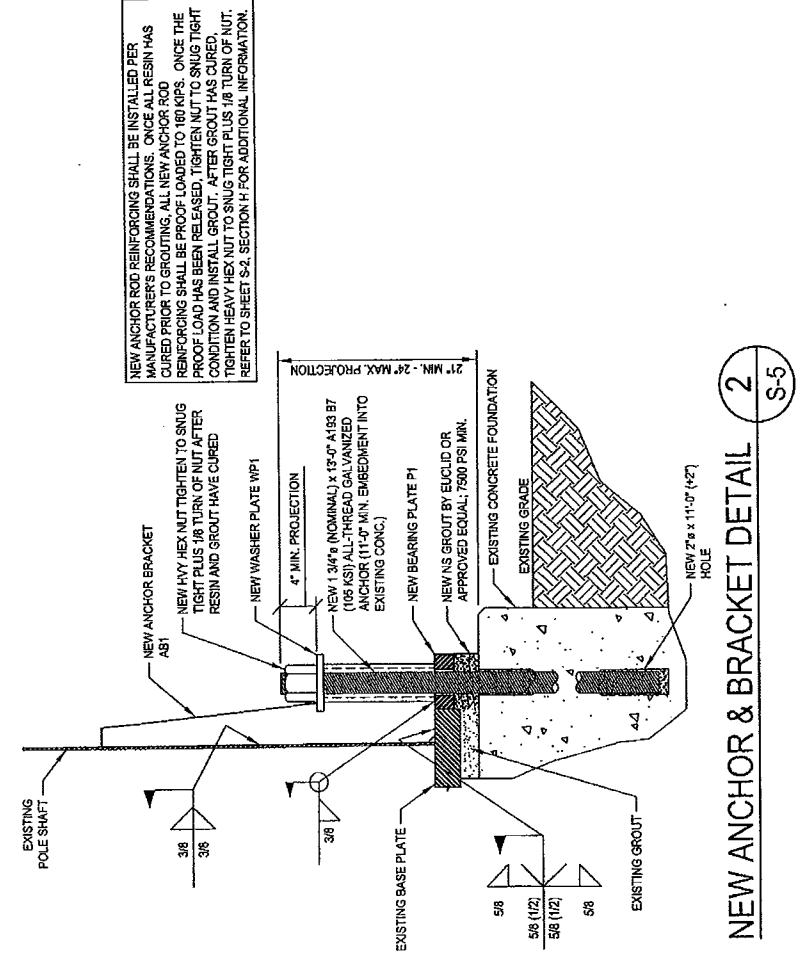
**SPECIAL INSPECTION OF EXISTING SHAFT TO LARGE WELD CONNECTIONS:**  
 (1) PRIOR TO CONSTRUCTION, CONTRACTOR'S INSPECTION AGENCY SHALL INSPECT CONDITION OF EXISTING SHAFT-TO-BASE-PLATE WELD CONNECTION. ALSO INSPECT EXISTING STIFFENERS IF PRESENT. THE CONTRACTOR'S INSPECTION AGENCY SHALL USE THE FOLLOWING INSPECTION METHODS, OR COMBINATION OF METHODS, AS REQUIRED TO IDENTIFY ANY CRACKS: VISUAL, MAGNETIC PARTICLE, AND/OR ULTRASONIC. IN ADDITION, OTHER TEST METHODS MAY ALSO BE USED AT THE RECOMMENDATION OF THE TESTING AGENCY AND UPON THE APPROVAL OF THE ENGINEER AND THE OWNER. CONTRACTOR SHALL PROVIDE CAREFUL AND THOROUGH LOGS OF ALL INSPECTION AND TESTING ACTIVITIES WITH THE OWNER'S RECOMMENDING WRITERS AND PROCEDURES. IMPORTANT: THE TESTING AGENCY SHALL REPORT ANY INDICATIONS OF CRACKS, FRACTURES, DISTRESS, AND/OR CORROSION TO THE ENGINEER AND THE OWNER IMMEDIATELY.  
 (2) AFTER CONSTRUCTION, TESTING AGENCY SHALL INSPECT ANY AND ALL FIELD WELDS AND FIELD REPAIRS IMPLEMENTED AS REQUIRED BY THE OWNER FROM THE RESULTS OF THE INSPECTION IN THE PREVIOUS NOTE (1) ABOVE.

**GENERAL NOTES:**  
 1. ALL BOLTS ARE TO BE 20 mm Ø WITH CORRESPONDING 20 mm Ø SHEAR SLEEVE WITH MATCHING STEEL GRADE. DRILLED HOLE DIAMETERS IN REINFORCING STEEL AND EXISTING SHAFT SHALL BE 1/32" MAX.  
 2. ALL STEEL SHALL BE HOT-DIP GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123. ALTERNATIVELY, ALL NEW STIFFENER PLATE STEEL REINFORCING MAY BE COLD GALVANIZED AS FOLLOWS: APPLY A MINIMUM OF TWO COATS OF ZRC-BRAND ZINC-RICH COLD GALVANIZING COMPOUND. FILM THICKNESS PER COAT SHALL BE: WET 3.0 MILS; DRY 1.5 MILS. APPLY PER ZRC (MANUFACTURER) RECOMMENDED PROCEDURES. CONTACT ZRC AT 1-800-831-5275 FOR PRODUCT INFORMATION.  
 3. ALL SHAFT REINFORCING IS A572 GR. 68, UNLESS NOTED OTHERWISE.  
 4. EPOXY MUST BE HITL RE-500.  
 5. ALL WELD ELECTRODES SHALL BE E80XX.

PROVIDE NON-SHRINK GROUT (NS GROUT) BY EUCILD OR APPROVED, EQUAL: 7500 PSI MIN. BELOW NEW BEARING PLATES. GROUT SHALL BE INSTALLED TIGHT UNDER NEW BEARING PLATES WITH NO VOIDS REMAINING BETWEEN TOP OF EXISTING CONCRETE AND UNDERSIDE OF NEW BEARING PLATES.

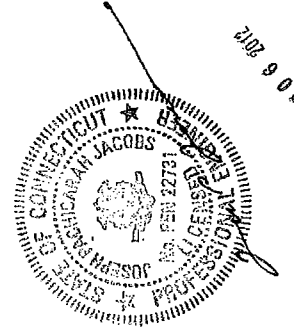


**BASE PLATE 1**  
S-5



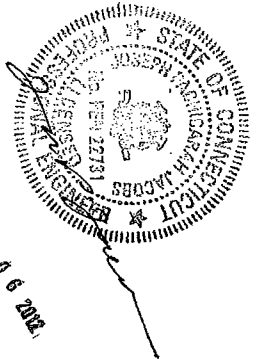
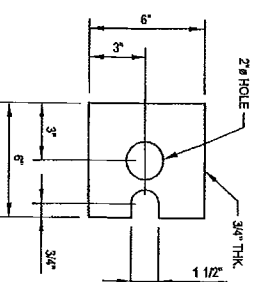
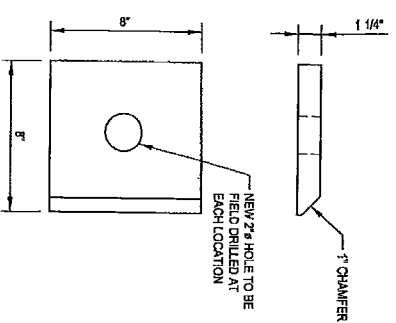
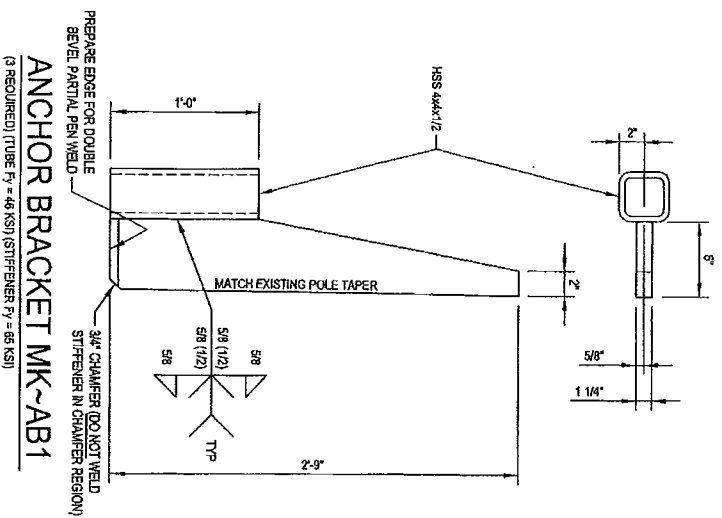
**NEW ANCHOR & BRACKET DETAIL 2**  
S-5

NEW ANCHOR ROD REINFORCING SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS. ONCE ALL RESIN HAS CURED PRIOR TO GROUTING, ALL NEW ANCHOR ROD REINFORCING SHALL BE PROOF LOADED TO 160 KIPS. ONCE THE PROOF LOAD HAS BEEN RELEASED, TIGHTEN NUT TO SNUG TIGHT CONDITION AND INSTALL GROUT. AFTER GROUT HAS CURED, TIGHTEN HEAVY HEX NUT TO SNUG TIGHT PLUS 1/8 TURN OF NUT. REFER TO SHEET S-2, SECTION H FOR ADDITIONAL INFORMATION.



|  |  |                                   |
|--|--|-----------------------------------|
| PROJECT No:<br>37512-1607<br>DRAWN BY:<br>B.M.S.<br>CHECKED BY:<br>C.M.M.<br>APPROVED BY:  |  | ISSUE DATE OF<br>PERMIT: 9-4-2012 |
| <b>BU #876321; BRANFORD BANM TOWER</b><br><b>BRANFORD, CT</b><br>MONOPOLE REINFORCEMENT AND RETROFIT PROJECT   |  |                                   |
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**BU #876321; BRANFORD BANM TOWER**  
**BRANFORD, CT**  
 MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

PROJECT NO:  
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 B.M.S.  
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 C.M.M.  
 DATE:  
 9-4-2012

ISSUE DATE OF  
 PERMIT: 9-4-2012

**S-6**



**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, VALUED THE MODIFICATION DRAWINGS, AS DESIGNED BY THE ENGINEER OF RECORD (EOR).  
 THE MI IS TO CORRECT INSTALLATION CONSTRUCTION AND WORKMANSHIP ONLY AND IS NOT A REVIEW OF THE MODIFICATION DESIGN. DESIGN EFFECTIVENESS AND INTEGRITY REMAINS WITH THE EOR AT ALL TIMES.  
 ALL MTS SHALL BE CONDUCTED BY A CROWN ENGINEERING VENOR (AEV) OR ENGINEERING SERVICE VENOR (AESV) THAT IS APPROVED TO PERFORM ELEVATED WORK FOR CROWN. SEE ENG-SUL-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, CONDUCTING THE IN-FIELD INSPECTIONS, AND SUBMITTING THE MI REPORT TO CROWN.

**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 INSPECTIONS, INCLUDING FOUNDATION INSPECTIONS  
 • BETTER UNDERSTAND ALL INSPECTION AND TESTING REQUIREMENTS  
 THE GC SHALL BE RESPONSIBLE AND RECORD THE TEST AND INSPECTION RESULTS IN ACCORDANCE WITH THE REQUIREMENTS OF THE MI CHECKLIST IN 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 6 BUSINESS DAYS NOTICE, PREFERABLE 10, TO THE MI INSPECTOR AS TO WHEN THE SITE WILL BE READY FOR THE MI TO BE CONDUCTED.  
 • 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 INSPECTIONS TO COMMENCE WITH ONE SITE VISIT.  
 • WHEN POSSIBLE, IT IS PREFERRED TO HAVE THE GC AND MI INSPECTOR ON-SITE DURING THE MI TO HAVE ANY DEGREES OF CORRECTION DURING THE INITIAL MI. THEREAFTER, THE GC AND MI INSPECTOR SHALL BE AVAILABLE TO THE MI CHECKLIST TO ENSURE ALL CONSTRUCTION FACILITIES ARE AT THEIR ORIGINAL, 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.). IF CROWN CONTRACTS DIRECTLY FOR A THIRD PARTY, 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.

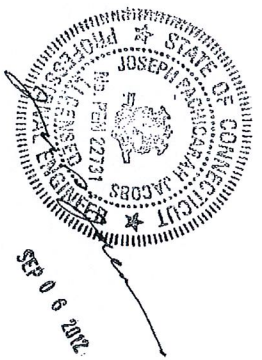
**CORRECTION OF FAILING MTS**  
 IF THE MODIFICATION INSTALLATION WOULD FAIL THE MI ("FAILED MI"), THE GC SHALL WORK WITH CROWN TO COORDINATE A REMEDIATION PLAN IN ONE OF TWO WAYS:  
 • CORRECT FAILING ISSUES TO COMPLY WITH THE SPECIFICATIONS CONTAINED IN THE ORIGINAL CONTRACT DOCUMENTS AND COORDINATE A SUPERSEMENT MI.  
 • OR, WITH CROWN'S APPROVAL, THE GC MAY WORK WITH 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 INSPECTIONS 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 AGENCY FINAL 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.  
**PHOTOGRAPHS**  
 BETWEEN THE GC AND 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/CONNECTION AND INSPECTION
- RAW MATERIALS
- PHOTOS OF ALL CRITICAL DETAILS
- FOUNDATION MODIFICATIONS
- WELD PREPARATION
- BOLT INSTALLATION AND TORQUE
- FINAL INSTALLED CONDITION
- SURFACE COATING REPAIR
- POST CONSTRUCTION PHOTOGRAPHS
- FINAL IN-FIELD 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.



**PAUL J. FORD AND COMPANY**  
 STRUCTURAL ENGINEERS  
 250 East Broad Street, Suite 1500 Columbus, Ohio 43215  
 (614) 221-0875 www.pjfandco.com

**CROWN CASTLE**  
 348 WEST COMMERCIAL STREET, EAST ROCHESTER, NY 14445  
 Ph: (585) 899-3448 FAX: (585) 899-3448

**BU #876321, BRANFORD BANM TOWER**  
**BRANFORD, CT**  
 MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

PROJECT No: 37512-1607  
 DRAWN BY: B.M.S.  
 CHECKED BY: C.M.M.  
 APPROVED BY: \_\_\_\_\_  
 DATE: 9-4-2012

ISSUE DATE OF PERMIT: 9-4-2012

**S-7**

| MI CHECKLIST  |  | REPORT ITEM |
|---|--|-------------|
| CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REQUIRED (COMPLETED BY EOR) |  |             |
| PRE-CONSTRUCTION  |  |             |
| X   | MI CHECKLIST DRAWINGS  |             |
| X   | EOR APPROVED SHOP DRAWINGS                                     |             |
| X   | FABRICATION INSPECTION   |             |
| NA  | FABRICATOR CERTIFIED WELD INSPECTION                           |             |
| X   | MATERIAL TEST REPORT (MTR)                                     |             |
| NA  | FABRICATOR NDE INSPECTION                                      |             |
| X   | NDE REPORT OF MONOPOLE BASE PLATE (AS REQUIRED)                |             |
| X   | PACKING SLIPS  |             |
| ADDITIONAL TESTING AND INSPECTIONS:   |  |             |
| CONSTRUCTION  |  |             |
| X   | CONSTRUCTION INSPECTIONS                                       |             |
| X   | FOUNDATION INSPECTIONS   |             |
| NA  | CONCRETE COMP. STRENGTH AND SLUMP TESTS                        |             |
| X   | POST INSTALLED ANCHOR ROD VERIFICATION                         |             |
| X   | BASE PLATE GROUT VERIFICATION                                  |             |
| X   | CONTRACTORS CERTIFIED WELD INSPECTION                          |             |
| NA  | EARTHWORK LIFT AND DENSITY                                     |             |
| X   | ON SITE COLD GALVANIZING VERIFICATION                          |             |
| NA  | GUY WIRE TENSION REPORT  |             |
| X   | GC AS-BUILT DOCUMENTS  |             |
| X   | INSPECTION OF BOLT PRETENSION PER ASSC BOLT SPEC.              |             |
| X   | INSPECTION OF MAX BOLTS AND DTTS PER REQUIREMENTS ON SHEET S-3 |             |
| ADDITIONAL TESTING AND INSPECTIONS:   |  |             |
| POST-CONSTRUCTION   |  |             |
| X   | MI INSPECTOR REVIEW OR RECORD DRAWINGS                         |             |
| X   | POST INSTALLED ANCHOR ROD PULL-OUT TESTING                     |             |
| X   | PHOTOGRAPHS  |             |
| ADDITIONAL TESTING AND INSPECTIONS:   |  |             |

NOTE: X DENOTES A DOCUMENT NEEDED FOR THE PM REPORT  
 NA DENOTES A DOCUMENT THAT IS NOT REQUIRED FOR THE PM REPORT

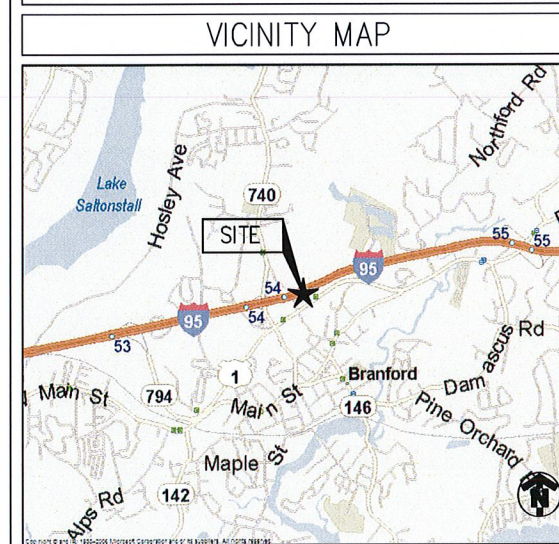



| SHEET INDEX |   |
|-------------|---|
| NO.         | DESCRIPTION                             |
| T1          | TITLE SHEET                             |
| AAV1        | OVERALL AND ENLARGED SITE PLANS         |
| AAV2        | NOTES AND DETAILS                       |
| C1          | GENERAL NOTES                           |
| C2          | COMPOUND SITE PLAN                      |
| C3          | EQUIPMENT SITE PLANS                    |
| C4          | SITE ELEVATION AND ANTENNA/RRH DETAILS  |
| C5          | ANTENNA PLANS                           |
| C6          | ANTENNA CABLE RISER AND H-FRAME DETAILS |
| C7          | RF AND CABLE DETAILS                    |
| C8          | JUNCTION BOX DETAILS                    |
| C9          | DETAILS                                 |
| E1          | UTILITY SITE PLAN                       |
| E2          | ONE-LINE DIAGRAMS AND DETAILS           |
| E3          | GROUNDING PLAN AND DETAILS              |

**DRIVING DIRECTIONS**

**DEPART FROM SPRINT:**  
1 INTERNATIONAL BLVD. MAHWAH, NJ 07495

1. HEAD SOUTH ON INTERNATIONAL BLVD TOWARD AVE OF AMERICAS 0.1 MI 2. TURN RIGHT ONTO PARK LN 197 FT 3. CONTINUE STRAIGHT ONTO LEISURE LN 0.1 MI 4. SLIGHT RIGHT ONTO NJ-17 N 0.3 MI 5. MERGE ONTO I-287 N/NJ-17 N VIA THE RAMP ON THE LEFT TO I-87/N.Y. THRUWAY ENTERING NEW YORK 0.6 MI 6. KEEP RIGHT AT THE FORK, FOLLOW SIGNS FOR I-87 S/I-287/TAPPAN ZEE BR/NEW YORK CITY/NEW YORK THRUWAY AND MERGE ONTO I-287 E/I-87 N CONTINUE TO FOLLOW I-287 E PARTIAL TOLL ROAD 30.2 MI 7. TAKE THE EXIT ONTO I-95 N ENTERING CONNECTICUT 53.7 MI 8. TAKE EXIT 54 FOR CEDAR ST TOWARD BRANFORD 0.2 MI 9. TURN RIGHT ONTO CEDAR ST 0.2 MI 10. TAKE THE 1ST LEFT ONTO N MAIN ST DESTINATION WILL BE ON THE LEFT 0.3 MI





# NETWORK VISION MMBTS LAUNCH CONNECTICUT MARKET

**SITE NAME**  
**BRANFORD BANM TOWER**

**SITE NUMBER**  
**CT03XC040**

**CROWN SITE NAME**  
**BRANFORD BANM TOWER**

**CROWN BU NUMBER**  
**876321**



**SITE ADDRESS**  
150 NORTH MAIN STREET  
BRANFORD, CT 06405

**STRUCTURE TYPE**  
**MONOPOLE**



**UNDERGROUND SERVICE ALERT**  
CALL TOLL FREE  
1-800-922-4455  
THREE WORKING DAYS BEFORE YOU DIG

**PROJECT TEAM**

|   |  |
|---|--|
|  <p>808 AVIATION PARKWAY<br/>SUITE 700<br/>MORRISVILLE, NC 27650</p> <p><b>PROJECT MANAGER</b></p> |  <p>11 Herbert Drive<br/>Latham, NY 12110<br/>OFFICE #: (518) 690-0790<br/>FAX #: (518) 690-0793</p> <p><b>ENGINEER</b></p> |
|---|--|

- SCOPE OF WORK:**
- HANDICAP ACCESS REQUIREMENTS ARE NOT REQUIRED
  - FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION
  - FACILITY HAS NO PLUMBING OR REFRIGERANTS
  - THIS FACILITY SHALL MEET OR EXCEED ALL FAA AND FCC REGULATORY REQUIREMENTS
  - ALL NEW MATERIAL SHALL BE FURNISHED AND INSTALLED BY CONTRACTOR UNLESS NOTED OTHERWISE. CABINETS, ANTENNAS/RRU AND CABLES FURNISHED BY OWNER AND INSTALLED BY CONTRACTOR
  - INSTALL NEW ANTENNAS/RRH'S ON EXISTING TOWER
  - INSTALL NEW BTS OR RETROFIT EXISTING BTS IN EXISTING EQUIPMENT AREA
  - REMOVE EXISTING CDMA ANTENNAS AND COAX CABLES
  - SPRINT TO REPLACE EXISTING POWER CABINET WITH NEW SECOND BATTERY CABINET OR INSTALL NEW SECOND BATTERY CABINET IF THERE IS AVAILABLE SPACE IN EXISTING SPRINT LEASE AREA.

**PROJECT SUMMARY**

|                              |  |          |
|------------------------------|--|----------|
| <b>SITE NAME:</b>            | BRANFORD BANM TOWER  |          |
| <b>SITE NO.:</b>             | CT03XC040  |          |
| <b>SITE ADDRESS:</b>         | 150 NORTH MAIN STREET<br>BRANFORD, CT 06405                                |          |
| <b>COUNTY:</b>               | NEW HAVEN  |          |
| <b>SITE COORDINATES:</b>     |  |          |
| <b>LATITUDE:</b>             | 41° 17' 18.85" N   | (NAD 83) |
| <b>LONGITUDE:</b>            | 72° 48' 49.88" W   | (NAD 83) |
| <b>GROUND ELEV.:</b>         | ±59'   | (AMSL)   |
| <b>JURISDICTION:</b>         | TOWN OF BRANFORD   |          |
| <b>APPLICANT:</b>            | SPRINT<br>1 INTERNATIONAL BLVD.<br>MAHWAH, NJ 07495                        |          |
| <b>LAND OWNER:</b>           | GLOBAL SIGNAL/CROWN CASTLE<br>2000 CORPORATE DRIVE<br>CANONSBURG, PA 15317 |          |
| <b>CONSTRUCTION MANAGER:</b> | TODD AMANN<br>914-715-9363   |          |
| <b>BUILDING CODE:</b>        | 2006 INTERNATIONAL BUILDING CODE<br>2009 CONNECTICUT BUILDING CODE         |          |
| <b>ELECTRICAL CODE:</b>      | 2008 NATIONAL ELECTRIC CODE<br>2009 CONNECTICUT ELECTRICAL CODE            |          |

**ENGINEER'S LICENSE**

**CERTIFICATION STATEMENT:**  
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF CONNECTICUT.

LICENSED ENGINEER - STATE OF CONNECTICUT

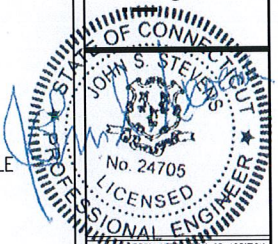
**APPROVALS**

|                             |                              |
|-----------------------------|------------------------------|
| SPRINT CONST.               | DATE                         |
| ALU RF                      | DATE                         |
| ALU LEASING/SITE ACQ.       | DATE                         |
| IN-MARKET CONSTRUCTION LEAD | DATE                         |
| SITE OWNER                  | NAME/COMPANY:<br>TITLE: DATE |

A/E Consultant:

**infinigy engineering**

11 Herbert Drive  
Latham, NY 12110  
(518) 690-0790




|                  |                     |             |
|------------------|---------------------|-------------|
| NO. OF REVISIONS |                     | DATE        |
| 4                | FINAL CD'S          | EDM 2/28/12 |
| 3                | FINAL CD'S          | EDM 7/16/12 |
| 2                | REVISED PER COMMENT | EDM 8/11/12 |
| 1                | REVISED PER COMMENT | EDM 5/7/12  |
| 0                | ISSUED FOR REVIEW   | EDM 3/30/12 |
| No.              | Submittal/Revision  | App'd Date  |

Drawn: W.B. Date: 3/30/12  
Designed: EDM Date: 3/30/12  
Checked: A.B. Date: 3/30/12

Project Number: 286-021

Project Title:  
**CT03XC040  
BRANFORD  
BANM TOWER**

Client:  **ALCATEL-LUCENT**  
1 INTERNATIONAL BLVD.  
MORRISVILLE, NC 27650

Implementation Team:

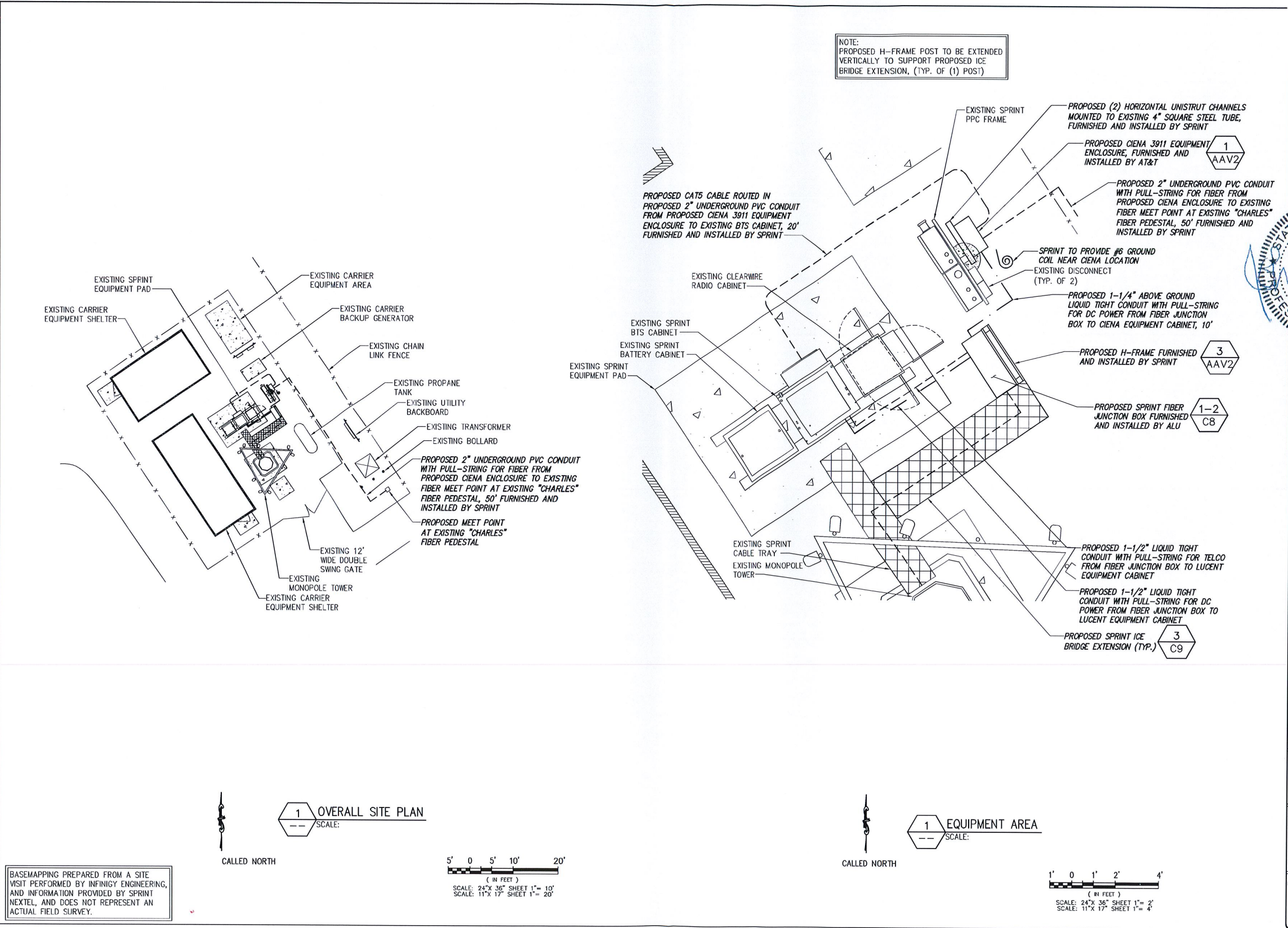
Drawing Scale:  
**AS NOTED**

Date:  
2/28/12

Drawing Title:  
**TITLE SHEET**

Drawing Number:  
**T1**



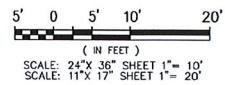


NOTE:  
 PROPOSED H-FRAME POST TO BE EXTENDED  
 VERTICALLY TO SUPPORT PROPOSED ICE  
 BRIDGE EXTENSION. (TYP. OF (1) POST)

BASEMAPMING PREPARED FROM A SITE  
 VISIT PERFORMED BY INFINGY ENGINEERING,  
 AND INFORMATION PROVIDED BY SPRINT  
 NEXTEL, AND DOES NOT REPRESENT AN  
 ACTUAL FIELD SURVEY.

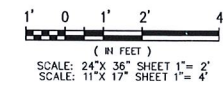
1 OVERALL SITE PLAN  
 SCALE:

CALLLED NORTH



1 EQUIPMENT AREA  
 SCALE:

CALLLED NORTH



A/E Consultant:

**infingy**  
 engineering  
 11 Herbert Drive  
 Latham, NY 12110  
 (518) 680-0790

STATE OF CONNECTICUT  
 PROFESSIONAL ENGINEER  
 No. 24705

|     |                      |       |         |
|-----|----------------------|-------|---------|
| 4   | FINAL CD'S           | EDM   | 2/28/12 |
| 3   | FINAL CD'S           | EDM   | 7/16/12 |
| 2   | REVISED PER COMMENT  | EDM   | 6/11/12 |
| 1   | REVISED PER COMMENT  | EDM   | 5/7/12  |
| 0   | ISSUED FOR REVIEW    | EDM   | 3/29/12 |
| No. | Submittal / Revision | App'd | Date    |

Drawn: M.B. Date: 3/29/12  
 Designed: EDM Date: 3/29/12  
 Checked: A.B. Date: 3/29/12

Project Number: 286-021

Project Title:  
 CT03XC040  
 BRANFORD  
 BANM TOWER

150 NORTH MAIN STREET  
 BRANFORD, CT 06405

Client: SPRINT  
 Implementation Team: ALCATEL-LUCENT

ALCATEL-LUCENT  
 808 AVIATION PARKWAY  
 SUITE 700  
 MORRISVILLE, NC 27560

Drawing Scale:  
 AS NOTED

Date:  
 2/28/12

Drawing Title:  
**OVERALL & ENLARGED SITE PLANS**

Drawing Number:  
**AAV1**

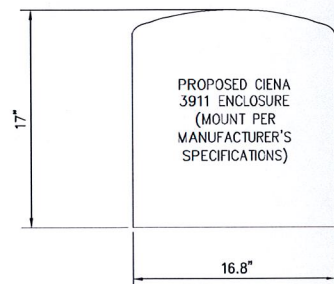
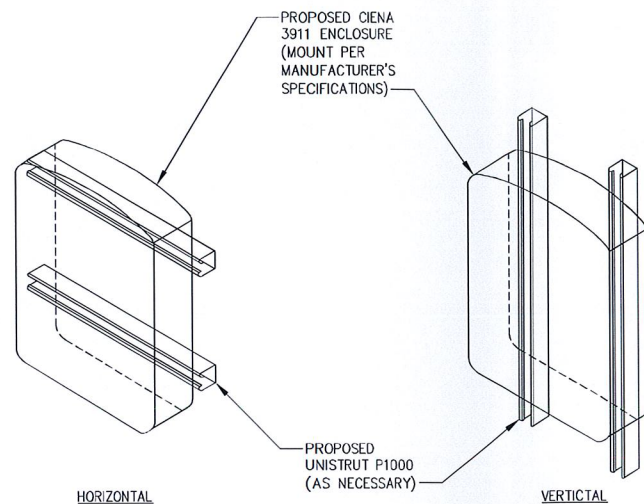


**GENERAL NOTES:**

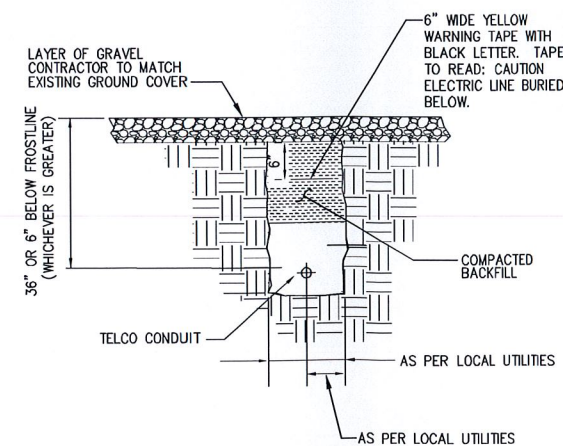
1. THE CONTRACTOR SHALL GIVE ALL NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY, MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS, AND LOCAL AND STATE JURISDICTIONAL CODES BEARING ON THE PERFORMANCE OF THE WORK. THE WORK PERFORMED ON THE PROJECT AND THE MATERIALS INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES.
2. THE ARCHITECT/ENGINEER HAVE MADE EVERY EFFORT TO SET FORTH IN THE CONSTRUCTION AND CONTRACT DOCUMENTS THE COMPLETE SCOPE OF WORK. THE CONTRACTOR BIDDING THE JOB IS NEVERTHELESS CAUTIONED THAT MINOR OMISSIONS OR ERRORS IN THE DRAWINGS AND OR SPECIFICATIONS SHALL NOT EXCUSE SAID CONTRACTOR FROM COMPLETING THE PROJECT AND IMPROVEMENTS IN ACCORDANCE WITH THE INTENT OF THESE DOCUMENTS.
3. THE SCOPE OF WORK SHALL INCLUDE FURNISHING ALL MATERIALS, EQUIPMENT, LABOR AND ALL OTHER MATERIALS AND LABOR DEEMED NECESSARY TO COMPLETE THE WORK/PROJECT AS DESCRIBED HEREIN.
4. THE CONTRACTOR SHALL VISIT THE JOB SITE PRIOR TO THE SUBMISSION OF BIDS OF PERFORMING WORK TO FAMILIARIZE HIMSELF WITH THE FIELD CONDITIONS AND TO VERIFY THAT THE PROJECT CAN BE CONSTRUCTED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
5. THE CONTRACTOR SHALL OBTAIN AUTHORIZATION TO PROCEED WITH CONSTRUCTION PRIOR TO STARTING WORK ON ANY ITEM NOT CLEARLY DEFINED BY THE CONSTRUCTION DRAWINGS/CONTRACT DOCUMENTS.
6. THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS ACCORDING TO THE MANUFACTURER'S/VENDORS SPECIFICATIONS UNLESS NOTED OTHERWISE OR WHERE LOCAL CODES OR ORDINANCES TAKE PRECEDENCE.
7. THE CONTRACTOR SHALL PROVIDE A FULL SET OF CONSTRUCTION DOCUMENTS AT THE SITE UPDATED WITH THE LATEST REVISIONS AND ADDENDUMS OR CLARIFICATIONS AVAILABLE FOR THE USE BY ALL PERSONNEL INVOLVED WITH THE PROJECT.
8. THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE PROJECT DESCRIBED HEREIN. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES AND PROCEDURES AND FOR COORDINATING ALL PORTIONS OF THE WORK UNDER THE CONTRACT.
9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND INSPECTIONS WHICH MAY BE REQUIRED FOR THE WORK BY THE ARCHITECT/ENGINEER, THE STATE, COUNTY OR LOCAL GOVERNMENT AUTHORITY.
10. THE CONTRACTOR SHALL MAKE NECESSARY PROVISIONS TO PROTECT EXISTING IMPROVEMENTS, EASEMENTS, PAVING, CURBING, ETC. DURING CONSTRUCTION. UPON COMPLETION OF WORK, THE CONTRACTOR SHALL REPAIR ANY DAMAGE THAT MAY HAVE OCCURRED DUE TO CONSTRUCTION ON OR ABOUT THE PROPERTY.
11. THE CONTRACTOR SHALL KEEP THE GENERAL WORK AREA CLEAN AND HAZARD FREE DURING CONSTRUCTION AND DISPOSE OF ALL DIRT, DEBRIS, RUBBISH AND REMOVE EQUIPMENT NOT SPECIFIED AS REMAINING ON THE PROPERTY. PREMISES SHALL BE LEFT IN CLEAN CONDITION AND FREE FROM PAINT SPOTS, DUST, OR SMUDGES OF ANY NATURE.
12. THE CONTRACTOR SHALL COMPLY WITH ALL OSHA REQUIREMENTS AS THEY APPLY TO THIS PROJECT.
13. THE CONTRACTOR SHALL NOTIFY THE REPRESENTATIVE WHERE A CONFLICT OCCURS ON ANY OF THE CONTRACT DOCUMENTS. THE CONTRACTOR IS NOT TO ORDER MATERIAL OR CONSTRUCT ANY PORTION OF THE WORK THAT IS IN CONFLICT UNTIL CONFLICT IS RESOLVED BY THE REPRESENTATIVE.
14. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS, ELEVATIONS, PROPERTY LINES, ETC. ON THE JOB.
15. ALL UNDERGROUND UTILITY INFORMATION WAS DETERMINED FROM SURFACE INVESTIGATIONS AND EXISTING PLANS OF RECORD OR VIA A REPRESENTATIVE. THE CONTRACTOR SHALL LOCATE ALL UNDERGROUND UTILITIES IN THE FIELD PRIOR TO ANY SITE WORK. SEE UNDERGROUND UTILITY COMPANY SHEET T-1 (DIG SAFE, MISS UTILITY, ETC.)
16. IF ASSUMED EXISTING CONDITION DIFFERS, ENGINEER MUST BE INFORMED OF ACTUAL FIELD CONDITION.
17. REFER TO THE SITE PLAN FOR APPROXIMATE LENGTH OF ALL U/G WORK AND LOCATION. FINAL LOCATION TO BE DETERMINED BY CLIENT. ALL MATERIALS TO BE USED AS ACCORDING TO DETAIL INSTRUCTIONS. ALL MATERIALS NOT INCLUDED IN THE DETAILS SHALL BE USED ACCORDING TO CODE AND/OR LOCAL JURISDICTION REGULATIONS INCLUDING MATERIALS, PREPARATION, EXACERBATION, EQUIPMENT AND INSTALLATION FOR UNDERGROUND WORK.
18. CONTRACTOR TO COORDINATE WITH SPRINT & PROVIDE GROUND BOND PER NE-250 & SPRINT STANDARDS FOR CLIENT EQUIPMENT AS REQUIRED.
19. ALL ELECTRICAL SPECIFICATIONS SHALL BE IN STRICT ACCORDANCE TO SECTIONS 16010, 16075, 16110, 16120, 16410 AND 16450 OF THE N.E.C.

**ELECTRICAL AND GROUNDING NOTES:**

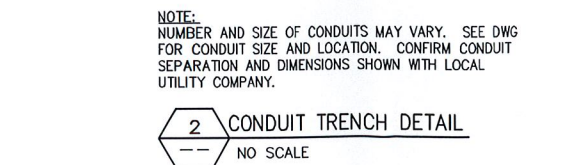
1. ALL ELECTRICAL WORK SHALL CONFORM TO THE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE (NEC) AS WELL AS APPLICABLE STATE AND LOCAL CODES.
2. ALL ELECTRICAL ITEMS SHALL BE U.L. APPROVED OR LISTED AND PROCURED PER SPECIFICATION REQUIREMENTS. ALL EQUIPMENT LOCATED OUTSIDE SHALL HAVE NEMA 3R ENCLOSURE.
3. ELECTRICAL AND TELCO WIRING OUTSIDE A BUILDING AND EXPOSED TO WEATHER SHALL BE IN WATER TIGHT GALVANIZED RIGID STEEL CONDUITS OR SCHEDULE 80 PVC (AS PERMITTED BY CODE) AND WHERE REQUIREMENT IN LIQUID TIGHT FLEXIBLE METAL OR NONMETALLIC CONDUITS.
4. PROVISION OF AC/DC POWER IS UNDER SEPARATE SCOPE OF WORK.
5. GROUNDING SHALL COMPLY WITH NEC ART. 250. APPLY OXIDE INHIBITING COMPOUND TO ALL COMPRESSION FITTINGS. TEST COMPLETED GROUND SYSTEM AND ENSURE ADEQUACY.
6. CONTRACTOR TO PROVIDE GALV. P1000 UNISTRUT FRAMING AND 3/8" GALV. U-BOLTS/BOLTS AS NECESSARY FOR EXISTING CONDITIONS AND TO VERIFY SPACE IS APPROVED BY ALL NECESSARY PARTIES.



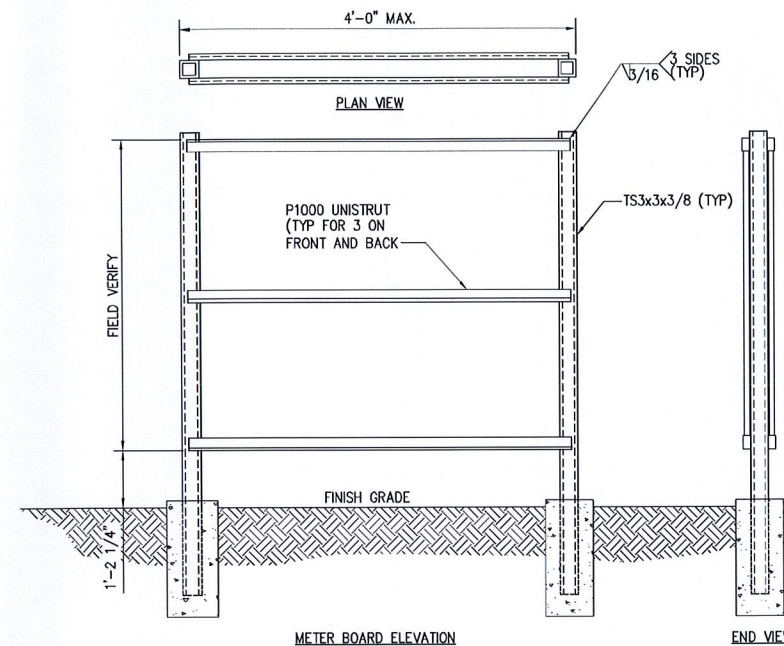
**1 TYPICAL CIENA 3911 MOUNTING DETAIL**  
SCALE: NOT TO SCALE



**3 H-FRAME FABRICATION DETAIL**  
NOT TO SCALE



**4 SUPPORT PIER**  
NOT TO SCALE



**3 H-FRAME FABRICATION DETAIL**  
NOT TO SCALE

A/E Consultant:

**engineering**  
11 Herbert Drive  
Latham, NY 12110  
(518) 986-0780

STATE OF CONNECTICUT  
JOHN S. STEINBERG  
No. 24705  
LICENSED PROFESSIONAL ENGINEER

|     |                      |       |         |
|-----|----------------------|-------|---------|
| 4   | FINAL D'S            | DM    | 2/28/12 |
| 3   | FINAL D'S            | DM    | 7/16/12 |
| 2   | REVISED PER COMMENT  | DM    | 6/11/12 |
| 1   | REVISED PER COMMENT  | DM    | 5/7/12  |
| 0   | ISSUED FOR REVIEW    | DM    | 5/29/12 |
| No. | Submittal / Revision | App'd | Date    |

Drawn: **W.B.** Date: **3/20/12**  
Designed: **DM** Date: **3/20/12**  
Checked: **A.B.** Date: **3/20/12**

Project Number: **286-021**

Project Title:  
**CT03XC040  
BRANFORD  
BANN TOWER**

150 NORTH MAIN STREET  
BRANFORD, CT 06405

Client: **Sprint**  
Implementation Team: **ALCATEL-LUCENT**  
808 AVIATION PARKWAY  
SUITE 700  
MORRISVILLE, NC 27560

Drawing Scale: **AS NOTED**  
Date: **2/28/12**

Drawing Title:  
**NOTES & DETAILS**

Drawing Number:  
**AAV2**

**NOTE:**  
NUMBER AND SIZE OF CONDUITS MAY VARY. SEE DWG FOR CONDUIT SIZE AND LOCATION. CONFIRM CONDUIT SEPARATION AND DIMENSIONS SHOWN WITH LOCAL UTILITY COMPANY.



## GENERAL NOTES

### PART 1 – GENERAL REQUIREMENTS

- 1.1 THE WORK SHALL COMPLY WITH APPLICABLE NATIONAL CODES AND STANDARDS, LATEST EDITION, AND PORTIONS THEREOF, INCLUDED BUT NOT LIMITED TO THE FOLLOWING:
- A. GR-63-CORE NEBS REQUIREMENTS: PHYSICAL PROTECTION
  - B. GR-78-CORE GENERIC REQUIREMENTS FOR THE PHYSICAL DESIGN AND MANUFACTURE OF TELECOMMUNICATIONS EQUIPMENT.
  - C. NATIONAL FIRE PROTECTION ASSOCIATION CODES AND STANDARDS (NFPA) INCLUDING NFPA 70 (NATIONAL ELECTRICAL CODE - "NEC").
  - D. AND NFPA 101 (LIFE SAFETY CODE).
  - E. AMERICAN SOCIETY FOR TESTING OF MATERIALS (ASTM).
  - F. INSTITUTE OF ELECTRONIC AND ELECTRICAL ENGINEERS (IEEE).
- 1.2 DEFINITIONS:
- A. WORK: THE SUM OF TASKS AND RESPONSIBILITIES IDENTIFIED IN THE CONTRACT DOCUMENTS.
  - B. COMPANY: SPRINT NEXTEL CORPORATION
  - C. ENGINEER: SYNONYMOUS WITH ARCHITECT & ENGINEER AND "A&E". THE DESIGN PROFESSIONAL HAVING PROFESSIONAL RESPONSIBILITY FOR DESIGN OF THE PROJECT.
  - D. CONTRACTOR: CONSTRUCTION CONTRACTOR; CONSTRUCTION VENDOR; INDIVIDUAL OR ENTITY WHO AFTER EXECUTION OF A CONTRACT IS BOUND TO ACCOMPLISH THE WORK.
  - E. THIRD PARTY VENDOR OR AGENCY: A VENDOR OR AGENCY ENGAGED SEPARATELY BY THE COMPANY, A&E, OR CONTRACTOR TO PROVIDE MATERIALS OR TO ACCOMPLISH SPECIFIC TASKS RELATED TO BUT NOT INCLUDED IN THE WORK.
- 1.3 POINT OF CONTACT: COMMUNICATION BETWEEN THE COMPANY AND THE CONTRACTOR SHALL FLOW THROUGH THE SINGLE COMPANY SITE DEVELOPMENT SPECIALIST OR OTHER PROJECT COORDINATOR APPOINTED TO MANAGE THE PROJECT FOR THE COMPANY.
- 1.4 ON-SITE SUPERVISION: THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK AND SHALL BE RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES IN ACCORDANCE WITH THE CONTRACT DOCUMENTS. THE CONTRACTOR SHALL EMPLOY A COMPETENT SUPERINTENDENT WHO SHALL BE IN ATTENDANCE AT THE SITE AT ALL TIMES DURING PERFORMANCE OF THE WORK.
- 1.5 DRAWINGS, SPECIFICATIONS AND DETAILS REQUIRED AT JOBSITE: THE CONSTRUCTION CONTRACTOR SHALL MAINTAIN A FULL SET OF THE CONSTRUCTION DRAWINGS, STANDARD CONSTRUCTION DETAILS FOR WIRELESS SITES, AND THE STANDARD CONSTRUCTION SPECIFICATIONS FOR WIRELESS SITES AT THE JOBSITE FROM MOBILIZATION THROUGH CONSTRUCTION COMPLETION.
- A. THE JOBSITE DRAWINGS, SPECIFICATIONS AND DETAILS SHALL BE CLEARLY MARKED DAILY IN PENCIL WITH ANY CHANGES IN CONSTRUCTION OVER WHAT IS DEPICTED IN THE DOCUMENTS. AT CONSTRUCTION COMPLETION, THIS JOBSITE MARKUP SET SHALL BE DELIVERED TO THE COMPANY OR COMPANY'S DESIGNATED REPRESENTATIVE TO BE FORWARDED TO THE COMPANY'S A&E VENDOR FOR PRODUCTION OF "AS-BUILT" DRAWINGS.
- 1.6 USE OF JOB SITE: THE CONTRACTOR SHALL CONFINE ALL CONSTRUCTION AND RELATED OPERATIONS INCLUDING STAGING AND STORAGE OF MATERIALS AND EQUIPMENT, PARKING, TEMPORARY FACILITIES, AND WASTE STORAGE TO THE LEASE PARCEL UNLESS OTHERWISE PERMITTED BY THE CONTRACT DOCUMENTS.
- 1.7 NOTICE TO PROCEED:
- A. NO WORK SHALL COMMENCE PRIOR TO COMPANY'S WRITTEN NOTICE TO PROCEED.
  - B. UPON RECEIVING NOTICE TO PROCEED, CONTRACTOR SHALL FULLY PERFORM ALL WORK NECESSARY TO PROVIDE SPRINT NEXTEL WITH AN OPERATIONAL WIRELESS FACILITY.

### PART 2 – EXECUTION

- 2.1 TEMPORARY UTILITIES AND FACILITIES: THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TEMPORARY UTILITIES AND FACILITIES NECESSARY EXCEPT AS OTHERWISE INDICATED IN THE CONSTRUCTION DOCUMENTS. TEMPORARY UTILITIES AND FACILITIES INCLUDE, POTABLE WATER, HEAT, HVAC, ELECTRICITY, SANITARY FACILITIES, WASTE DISPOSAL FACILITIES, AND TELEPHONE/COMMUNICATION SERVICES. PROVIDE TEMPORARY UTILITIES AND FACILITIES IN ACCORDANCE WITH OSHA AND THE AUTHORITY HAVING JURISDICTION. CONTRACTOR MAY UTILIZE THE COMPANY ELECTRICAL SERVICE IN THE COMPLETION OF THE WORK WHEN IT BECOMES AVAILABLE. USE OF THE LESSORS OR SITE OWNER'S UTILITIES OR FACILITIES IS EXPRESSLY FORBIDDEN EXCEPT AS OTHERWISE ALLOWED IN THE CONTRACT DOCUMENTS.
- 2.2 ACCESS TO WORK: THE CONTRACTOR SHALL PROVIDE ACCESS TO THE JOB SITE FOR AUTHORIZED COMPANY PERSONNEL AND AUTHORIZED REPRESENTATIVES OF THE ARCHITECT/ENGINEER DURING ALL PHASES OF THE WORK.
- 2.3 TESTING: REQUIREMENTS FOR TESTING BY THIS CONTRACTOR SHALL BE AS INDICATED HEREWITH, ON THE CONSTRUCTION DRAWINGS, AND IN THE INDIVIDUAL SECTIONS OF THESE SPECIFICATIONS. SHOULD COMPANY CHOOSE TO ENGAGE ANY THIRD-PARTY TO CONDUCT ADDITIONAL TESTING, THE CONTRACTOR SHALL COOPERATE WITH AND PROVIDE A WORK AREA FOR COMPANY'S TEST AGENCY.

- 2.4 COMPANY FURNISHED MATERIAL AND EQUIPMENT: ALL HANDLING, STORAGE AND INSTALLATION OF COMPANY FURNISHED MATERIAL AND EQUIPMENT SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE CONTRACT DOCUMENTS AND WITH THE MANUFACTURER'S INSTRUCTIONS AND RECOMMENDATIONS.
- A. CONTRACTOR SHALL PROCURE ALL OTHER REQUIRED WORK RELATED MATERIALS NOT PROVIDED BY SPRINT NEXTEL TO SUCCESSFULLY CONSTRUCT A WIRELESS FACILITY.
- 2.5 DIMENSIONS: VERIFY DIMENSIONS INDICATED ON DRAWINGS WITH FIELD DIMENSIONS BEFORE FABRICATION OR ORDERING OF MATERIALS. DO NOT SCALE DRAWINGS.
- 2.6 EXISTING CONDITIONS: NOTIFY THE COMPANY REPRESENTATIVE OF EXISTING CONDITIONS DIFFERING FROM THOSE INDICATED ON THE DRAWINGS. DO NOT REMOVE OR ALTER STRUCTURAL COMPONENTS WITHOUT PRIOR WRITTEN APPROVAL FROM THE ARCHITECT AND ENGINEER.

### PART 3 – RECEIPT OF MATERIAL & EQUIPMENT

- 3.1 RECEIPT OF MATERIAL AND EQUIPMENT: CONTRACTOR IS RESPONSIBLE FOR SPRINT NEXTEL PROVIDED MATERIAL AND EQUIPMENT AND UPON RECEIPT SHALL:
- A. ACCEPT DELIVERIES AS SHIPPED AND TAKE RECEIPT.
  - B. VERIFY COMPLETENESS AND CONDITION OF ALL DELIVERIES.
  - C. TAKE RESPONSIBILITY FOR EQUIPMENT AND PROVIDE INSURANCE PROTECTION AS REQUIRED IN AGREEMENT.
  - D. RECORD ANY DEFECTS OR DAMAGES AND WITHIN TWENTY-FOUR HOURS AFTER RECEIPT, REPORT TO SPRINT NEXTEL OR ITS DESIGNATED PROJECT REPRESENTATIVE OF SUCH.
  - E. PROVIDE SECURE AND NECESSARY WEATHER PROTECTED WAREHOUSING.
  - F. COORDINATE SAFE AND SECURE TRANSPORTATION OF MATERIAL AND EQUIPMENT, DELIVERING AND OFF-LOADING FROM CONTRACTOR'S WAREHOUSE TO SITE.

### PART 4 – GENERAL REQUIREMENTS FOR CONSTRUCTION

- 4.1 CONTRACTOR SHALL KEEP THE SITE FREE FROM ACCUMULATING WASTE MATERIAL, DEBRIS, AND TRASH, AT THE COMPLETION OF THE WORK, CONTRACTOR SHALL REMOVE FROM THE SITE ALL REMAINING RUBBISH, IMPLEMENTS, TEMPORARY FACILITIES, AND SURPLUS MATERIALS.
- 4.2 EQUIPMENT ROOMS SHALL AT ALL TIMES BE MAINTAINED "BROOM CLEAN" AND CLEAR OF DEBRIS.
- 4.3 CONTRACTOR SHALL TAKE ALL REASONABLE PRECAUTIONS TO DISCOVER AND LOCATE ANY HAZARDOUS CONDITION.
- A. IN THE EVENT CONTRACTOR ENCOUNTERS ANY HAZARDOUS CONDITION WHICH HAS NOT BEEN ABATED OR OTHERWISE MITIGATED, CONTRACTOR AND ALL OTHER PERSONS SHALL IMMEDIATELY STOP WORK IN THE AFFECTED AREA AND NOTIFY COMPANY IN WRITING. THE WORK IN THE AFFECTED AREA SHALL NOT BE RESUMED EXCEPT BY WRITTEN NOTIFICATION BY COMPANY.
  - B. CONTRACTOR AGREES TO USE CARE WHILE ON THE SITE AND SHALL NOT TAKE ANY ACTION THAT WILL OR MAY RESULT IN OR CAUSE THE HAZARDOUS CONDITION TO BE FURTHER RELEASED IN THE ENVIRONMENT, OR TO FURTHER EXPOSE INDIVIDUALS TO THE HAZARD.
- 4.4 CONTRACTOR'S ACTIVITIES SHALL BE RESTRICTED TO THE PROJECT LIMITS. SHOULD AREAS OUTSIDE THE PROJECT LIMITS BE AFFECTED BY CONTRACTOR'S ACTIVITIES, CONTRACTOR SHALL IMMEDIATELY RETURN THEM TO ORIGINAL CONDITION
- 4.5 CONDUCT TESTING AS REQUIRED HEREIN.

### PART 5 – TESTS AND INSPECTIONS

- 5.1 TESTS AND INSPECTIONS:
- A. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CONSTRUCTION TESTS, INSPECTIONS AND PROJECT DOCUMENTATION.
  - B. CONTRACTOR SHALL COORDINATE TEST AND INSPECTION SCHEDULES WITH COMPANY'S REPRESENTATIVE WHO MUST BE ON SITE TO WITNESS SUCH TESTS AND INSPECTIONS.
  - C. WHEN THE USE OF A THIRD PARTY INDEPENDENT TESTING AGENCY IS REQUIRED, THE AGENCY THAT IS SELECTED MUST PERFORM SUCH WORK ON A REGULAR BASIS IN THE STATE WHERE THE PROJECT IS LOCATED AND HAVE A THOROUGH UNDERSTANDING OF LOCAL AVAILABLE MATERIALS, INCLUDING THE SOIL, ROCK, AND GROUNDWATER CONDITIONS.
  - D. THE THIRD PARTY TESTING AGENCY IS TO BE FAMILIAR WITH THE APPLICABLE REQUIREMENTS FOR THE TESTS TO BE DONE, EQUIPMENT TO BE USED, AND ASSOCIATED HEALTH AND SAFETY ISSUES.
  - E. SITE RESISTANCE TO EARTH TESTING PER EXHIBIT: CELL SITE GROUNDING SYSTEM DESIGN.
  - F. ANTENNA AND COAX SWEEP TESTS PER EXHIBIT: ANTENNA TRANSMISSION LINE ACCEPTANCE STANDARDS. HYBERFLEX TESTING NOT LIMITED TO COAX SWEEPS.
  - G. ALL OTHER TESTS REQUIRED BY COMPANY OR JURISDICTION.

### PART 6 – TRENCHING AND BACKFILLING

- 6.1 TRENCHING AND BACKFILLING: THE CONTRACTOR SHALL PERFORM ALL EXCAVATION OF EVERY DESCRIPTION AND OF WHATEVER SUBSTANCES ENCOUNTERED, TO THE DEPTHS INDICATED ON THE CONSTRUCTION DRAWINGS OR AS OTHERWISE SPECIFIED.
- A. PROTECTION OF EXISTING UTILITIES: THE CONTRACTOR SHALL CHECK WITH THE LOCAL UTILITIES AND THE RESPECTIVE UTILITY LOCATOR COMPANIES PRIOR TO STARTING EXCAVATION OPERATIONS IN EACH RESPECTIVE AREA TO ASCERTAIN THE LOCATIONS OF KNOWN UTILITY LINES. THE LOCATIONS, NUMBER AND TYPES OF EXISTING UTILITY LINES DETAILED ON THE CONSTRUCTION DRAWINGS ARE APPROXIMATE AND DO NOT REPRESENT EXACT INFORMATION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIRING ALL LINES DAMAGED DURING EXCAVATION AND ALL ASSOCIATED OPERATIONS. ALL UTILITY LINES UNCOVERED DURING THE EXCAVATION OPERATIONS, SHALL BE PROTECTED FROM DAMAGE DURING EXCAVATION AND ASSOCIATED OPERATIONS. ALL REPAIRS SHALL BE APPROVED BY THE UTILITY COMPANY.
  - B. HAND DIGGING: UNLESS APPROVED IN WRITING OTHERWISE, ALL DIGGING WITHIN AN EXISTING CELL SITE COMPOUND IS TO BE DONE BY HAND.
  - C. DURING EXCAVATION, MATERIAL SUITABLE FOR BACKFILLING SHALL BE STOCKPILED IN AN ORDERLY MANNER A SUFFICIENT DISTANCE FROM THE BANKS OF THE TRENCH TO AVOID OVERLOADING AND TO PREVENT SLIDES OR CAVE-INS. ALL EXCAVATED MATERIALS NOT REQUIRED OR SUITABLE FOR BACKFILL SHALL BE REMOVED AND DISPOSED OF AT THE CONTRACTOR'S EXPENSE.
  - D. GRADING SHALL BE DONE AS MAY BE NECESSARY TO PREVENT SURFACE WATER FROM FLOWING INTO TRENCHES OR OTHER EXCAVATIONS, AND ANY WATER ACCUMULATING THEREIN SHALL BE REMOVED BY PUMPING OR BY OTHER APPROVED METHOD.
  - E. SHEETING AND SHORING SHALL BE DONE AS NECESSARY FOR THE PROTECTION OF THE WORK AND FOR THE SAFETY OF PERSONNEL. UNLESS OTHERWISE INDICATED, EXCAVATION SHALL BE BY OPEN CUT. EXCEPT THAT SHORT SECTIONS OF A TRENCH MAY BE TUNNELED IF, THE CONDUIT CAN BE SAFELY AND PROPERLY INSTALLED AND BACKFILL CAN BE PROPERLY TAMPED IN SUCH TUNNEL SECTIONS. EARTH EXCAVATION SHALL COMPRISE ALL MATERIALS AND SHALL INCLUDE CLAY, SILT, SAND, MUCK, GRAVEL, HARDPAN, LOOSE SHALE, AND LOOSE STONE.
  - F. TRENCHES SHALL BE OF NECESSARY WIDTH FOR THE PROPER LAYING OF THE CONDUIT OR CABLE, AND THE BANKS SHALL BE AS NEARLY VERTICAL AS PRACTICABLE. THE BOTTOM OF THE TRENCHES SHALL BE ACCURATELY GRADED TO PROVIDE UNIFORM BEARING AND SUPPORT FOR EACH SECTION OF THE CONDUIT OR CABLE ON UNDISTURBED SOIL AT EVERY POINT ALONG ITS ENTIRE LENGTH. EXCEPT WHERE ROCK IS ENCOUNTERED, CARE SHALL BE TAKEN NOT TO EXCAVATE BELOW THE DEPTHS INDICATED. WHERE ROCK EXCAVATIONS ARE NECESSARY, THE ROCK SHALL BE EXCAVATED TO A MINIMUM OVER DEPTH OF 6 INCHES BELOW THE TRENCH DEPTHS INDICATED ON THE CONSTRUCTION DRAWINGS OR SPECIFIED. OVER DEPTHS IN THE ROCK EXCAVATION AND UNAUTHORIZED OVER DEPTHS SHALL BE THOROUGHLY BACK FILLED AND TAMPED TO THE APPROPRIATE GRADE. WHENEVER MET OR OTHERWISE UNSTABLE SOIL THAT IS INCAPABLE OF PROPERLY SUPPORTING THE CONDUIT OR CABLE IS ENCOUNTERED IN THE BOTTOM OF THE TRENCH, SUCH SOLID SHALL BE REMOVED TO A MINIMUM OVER DEPTH OF 6 INCHES AND THE TRENCH BACKFILLED TO THE PROPER GRADE WITH EARTH OF OTHER SUITABLE MATERIAL, AS HERINAFTER SPECIFIED.
  - G. BACKFILLING OF TRENCHES. TRENCHES SHALL NOT BE BACKFILLED UNTIL ALL SPECIFIED TESTS HAVE BEEN PERFORMED AND ACCEPTED. WHERE COMPACTED BACKFILL IS NOT INDICATED THE TRENCHES SHALL BE CAREFULLY BACKFILLED WITH SELECT MATERIAL SUCH AS EXCAVATED SOILS THAT ARE FREE OF ROOTS, SOD, RUBBISH OR STONES, DEPOSITED IN 6 INCH LAYERS AND THOROUGHLY AND CAREFULLY RAMMED UNTIL THE CONDUIT OR CABLE HAS A COVER OF NOT LESS THAN 1 FOOT. THE REMAINDER OF THE BACKFILL MATERIAL SHALL BE GRANULAR IN NATURE AND SHALL NOT CONTAIN ROOTS, SOD, RUBBING, OR STONES OF 2-1/2 INCH MAXIMUM DIMENSION. BACKFILL SHALL BE CAREFULLY TAMPED IN THE TRENCH AND IN 1 FOOT LAYERS AND EACH LAYER PLACED. SETTLING THE BACKFILL WITH WATER WILL BE PERMITTED. THE SURFACE SHALL BE GRADED TO A REASONABLE UNIFORMITY AND THE MOUNDING OVER THE TRENCHES LEFT IN A UNIFORM AND NEAT CONDITION.

## PROJECT INFORMATION

THIS IS AN UNMANNED AND RESTRICTED ACCESS EQUIPMENT FACILITY AND WILL BE USED FOR THE TRANSMISSION OF RADIO SIGNALS FOR THE PURPOSE OF PROVIDING PUBLIC WIRELESS COMMUNICATIONS SERVICE.

NO POTABLE WATER SUPPLY IS TO BE PROVIDED AT THIS LOCATION.

NO WASTE WATER WILL BE GENERATED AT THIS LOCATION.

NO SOLID WASTE WILL BE GENERATED AT THIS LOCATION.

SPRINT MAINTENANCE CREW (TYPICALLY ONE PERSON) WILL MAKE AN AVERAGE OF ONE TRIP PER MONTH AT ONE HOUR PER VISIT.

## LEGEND

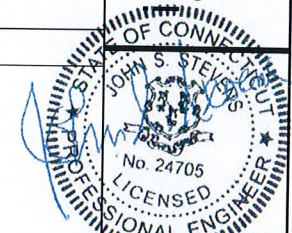
| SYMBOL | DESCRIPTION                         |
|--------|-------------------------------------|
|        | CIRCUIT BREAKER                     |
|        | NON-FUSIBLE DISCONNECT SWITCH       |
|        | FUSIBLE DISCONNECT SWITCH           |
|        | SURFACE MOUNTED PANEL BOARD         |
|        | TRANSFORMER                         |
|        | KILOWATT HOUR METER                 |
|        | JUNCTION BOX                        |
|        | PULL BOX TO NEC/TELCO STANDARDS     |
|        | UNDERGROUND UTILITIES               |
|        | DENOTES REFERENCE NOTE              |
|        | EXOTHERMIC WELD CONNECTION          |
|        | MECHANICAL CONNECTION (E.G. LTR) C- |
|        | GROUND ROD                          |
|        | GROUND ROD WITH INSPECTION SLEEVE   |
|        | GROUND BAR                          |
|        | PIN AND SLEEVE RECEPTACLE           |
|        | 120AC DUPLEX RECEPTACLE             |
|        | GROUND CONDUCTOR                    |
|        | REPRESENTS DETAIL NUMBER            |
|        | REF. DRAWING NUMBER                 |

## ABBREVIATIONS

|       |                                   |
|-------|-----------------------------------|
| CIGBE | COAX ISOLATED GROUND BAR EXTERNAL |
| MIGB  | MASTER ISOLATED GROUND BAR        |
| SST   | SELF SUPPORTING TOWER             |
| GPS   | GLOBAL POSITIONING SYSTEM         |
| TYP.  | TYPICAL                           |
| DWG   | DRAWING                           |
| BCW   | BARE COPPER WIRE                  |
| BFG   | BELOW FINISH GRADE                |
| PVC   | POLYVINYL CHLORIDE                |
| CAB   | CABINET                           |
| C     | CONDUIT                           |
| SS    | STAINLESS STEEL                   |
| G     | GROUND                            |
| AWG   | AMERICAN WIRE GAUGE               |
| RGS   | RIGID GALVANIZED STEEL            |
| AHJ   | AUTHORITY HAVING JURISDICTION     |
| TTLNA | TOWER TOP LOW NOISE AMPLIFIER     |
| UNO   | UNLESS NOTED OTHERWISE            |
| EMT   | ELECTRICAL METALLIC TUBING        |
| AGL   | ABOVE GROUND LEVEL                |
| PVC   | POLYVINYL CHLORIDE                |

A/E Consultant:

**engineering**  
 11 Herbert Drive  
 Latham, NY 12110  
 (518) 680-0790



UNLAWFUL TO REPRODUCE OR ADAPT TO THE PROJECT IS A VIOLATION OF APPLICABLE STATE AND/OR LOCAL LAWS

| No. | Submit / Revision   | App'd | Date    |
|-----|---------------------|-------|---------|
| 4   | FINAL CD'S          | DM    | 2/28/12 |
| 3   | FINAL CD'S          | DM    | 7/16/12 |
| 2   | REVISED PER COMMENT | DM    | 6/11/12 |
| 1   | REVISED PER COMMENT | DM    | 5/7/12  |
| 0   | ISSUED FOR REVIEW   | DM    | 3/20/12 |

Drawn: M.B. Date: 3/20/12  
 Designed: DM Date: 3/20/12  
 Checked: A.B. Date: 3/20/12

Project Number  
286-021

Project Title  
**CT03XC040  
 BRANFORD  
 BANM TOWER**

150 NORTH MAIN STREET  
 BRANFORD, CT 06405

Client: Implementation Team:

**ALCATE-LUCENT**  
 808 AVATION PARKWAY  
 MORRISVILLE, NC 27650

Drawing Scale:  
AS NOTED

Date:  
2/28/12

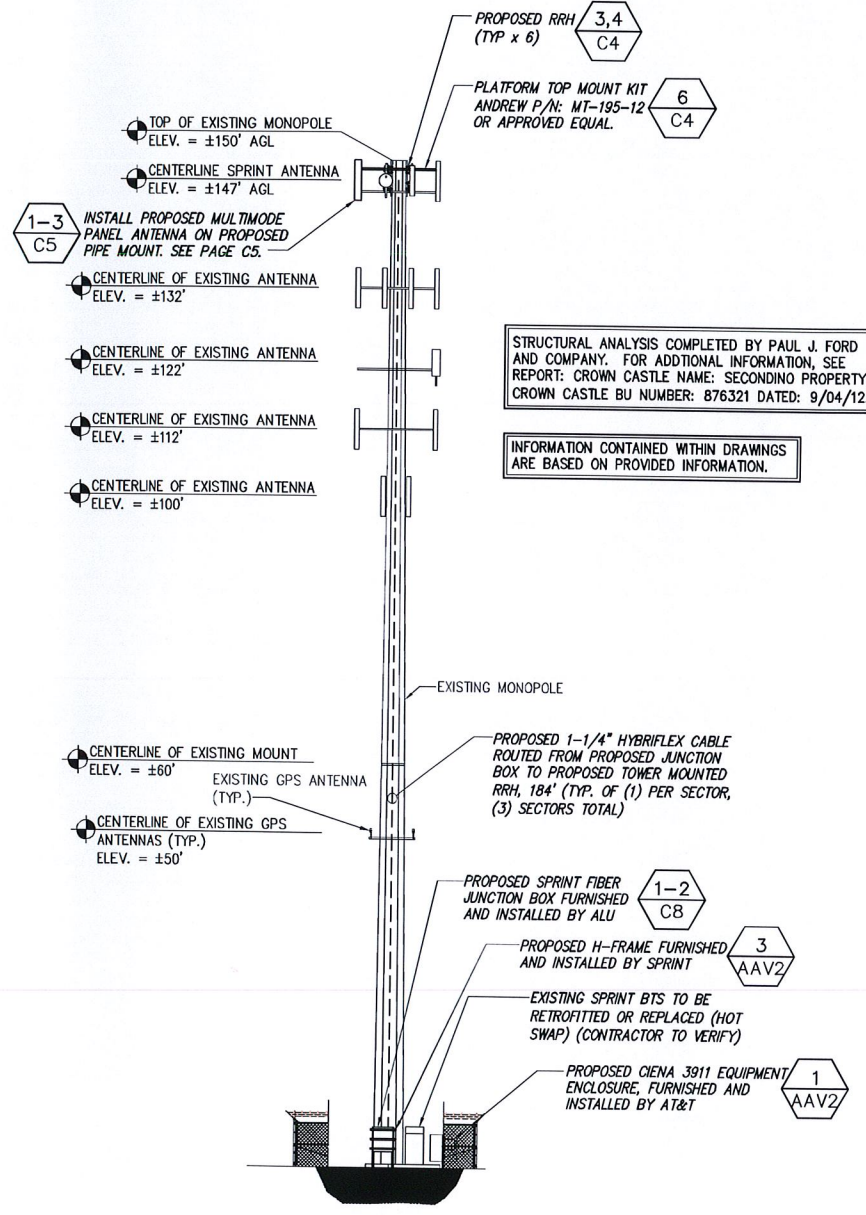
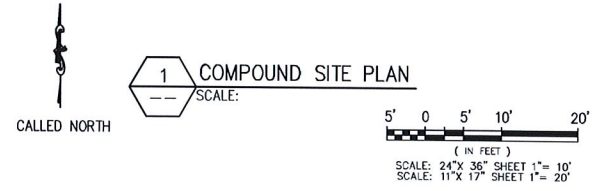
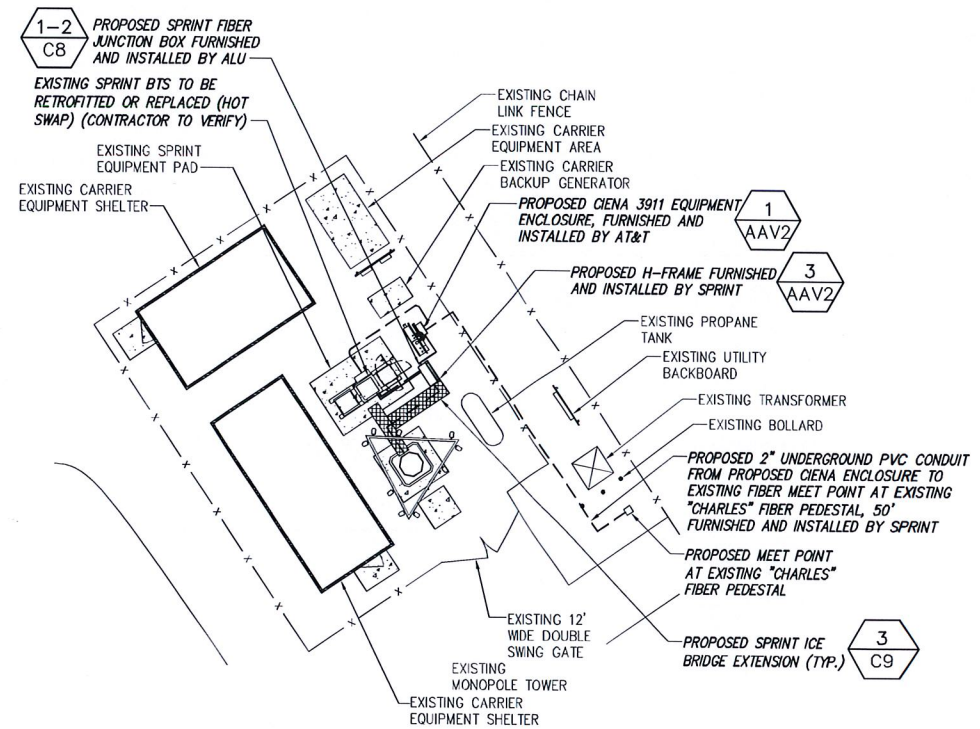
Drawing Title

**GENERAL  
 NOTES**

Drawing Number

**C1**





STRUCTURAL ANALYSIS COMPLETED BY PAUL J. FORD AND COMPANY. FOR ADDITIONAL INFORMATION, SEE REPORT: CROWN CASTLE NAME: SECONDINO PROPERTY, CROWN CASTLE BU NUMBER: 876321 DATED: 9/04/12.

INFORMATION CONTAINED WITHIN DRAWINGS ARE BASED ON PROVIDED INFORMATION.

2 SITE ELEVATION  
NOT TO SCALE

A/E Consultant:

**ntfining**  
engineering  
11 Herbert Drive  
Latham, NY 12110  
(518) 680-0780

STATE OF CONNECTICUT  
JOHN S. STEINBERG  
No. 24705  
LICENSED PROFESSIONAL ENGINEER

|     |                     |       |         |
|-----|---------------------|-------|---------|
| 4   | FINAL CD'S          | EXM   | 2/28/12 |
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Designed: E.M. Date: 3/29/12  
Checked: A.D. Date: 3/29/12

Project Number: 286-021

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BRANFORD  
BANM TOWER  
150 NORTH MAIN STREET  
BRANFORD, CT 06405

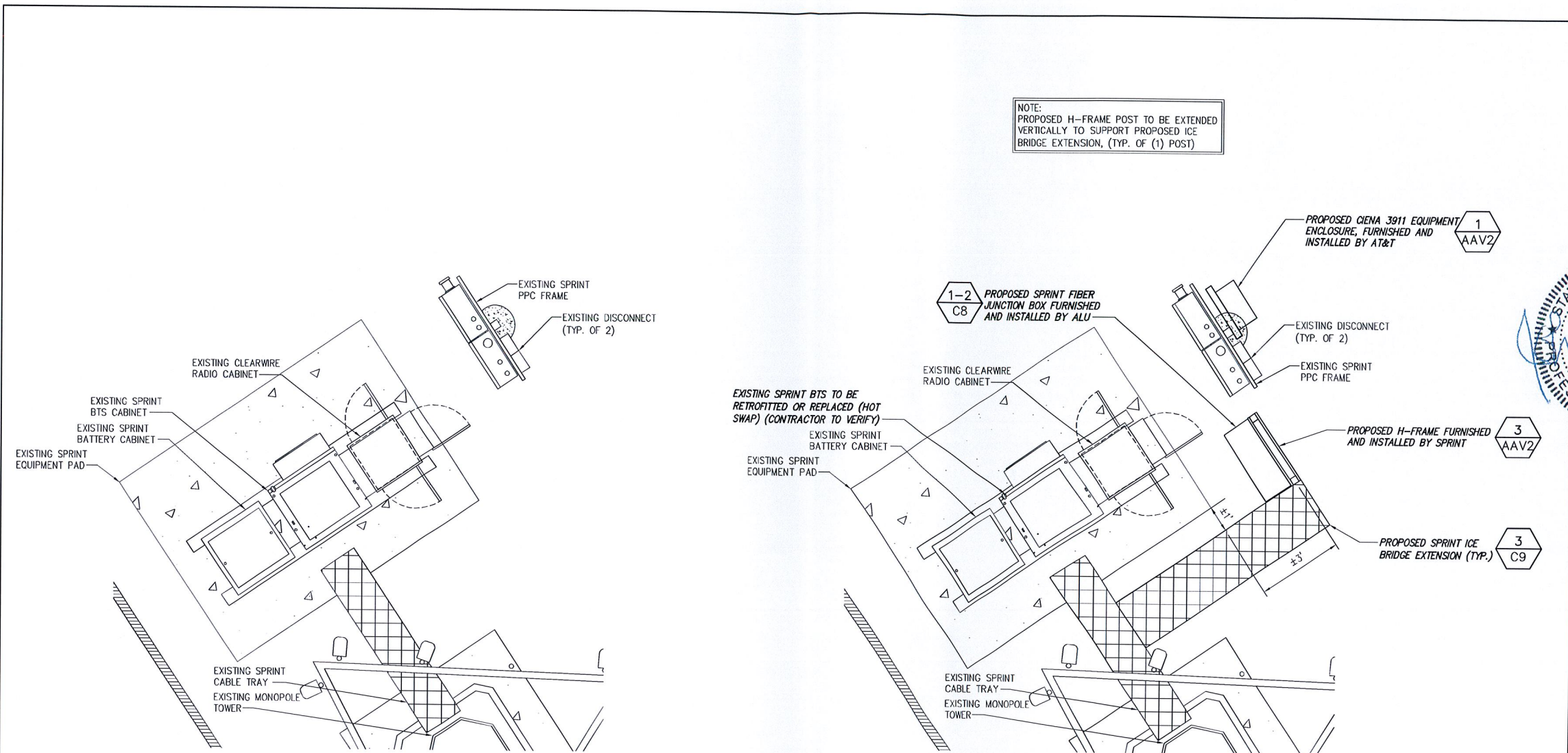
Client: SPRINT  
Implementation Team: ALCATEL-LUCENT  
808 AVIATION PARKWAY  
SUITE 700  
MORRISVILLE, NC 27650

Drawing Scale: AS NOTED  
Date: 2/28/12

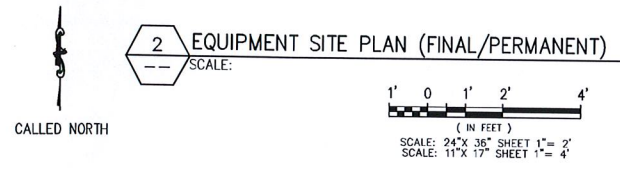
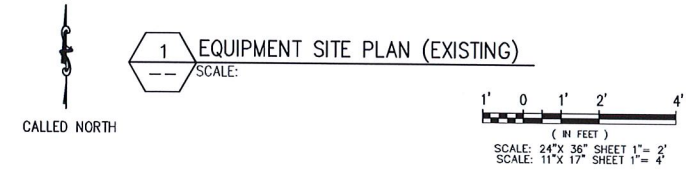
Drawing Title:  
**COMPOUND SITE PLAN**

Drawing Number:  
**C2**





NOTE:  
 PROPOSED H-FRAME POST TO BE EXTENDED  
 VERTICALLY TO SUPPORT PROPOSED ICE  
 BRIDGE EXTENSION, (TYP. OF (1) POST)



A/E Consultant:

**engineering**  
 engineering  
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 Latham, NY 12110  
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**STATE OF CONNECTICUT**  
 JOHN S. STEVENSON  
 No. 24705  
 LICENSED PROFESSIONAL ENGINEER

|     |                     |       |         |
|-----|---------------------|-------|---------|
| 4   | FINAL CD'S          | EDM   | 2/28/12 |
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Project Title:  
**CT03XC040  
 BRANFORD  
 BANM TOWER**  
 150 NORTH MAIN STREET  
 BRANFORD, CT 06405

Client: **SPRINT**  
 INTERNATIONAL, INC.  
 BURLINGTON, NC 27680

Implementation Team:  
**ALCATEL-LUCENT**  
 808 AVANTON PARKWAY  
 SUITE 700  
 MARSHFIELD, NC 27560

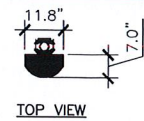
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Date:  
 2/28/12

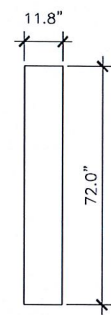
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**EQUIPMENT SITE PLANS**

Drawing Number:  
**C3**



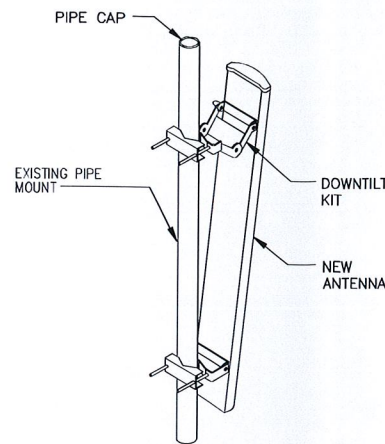


TOP VIEW

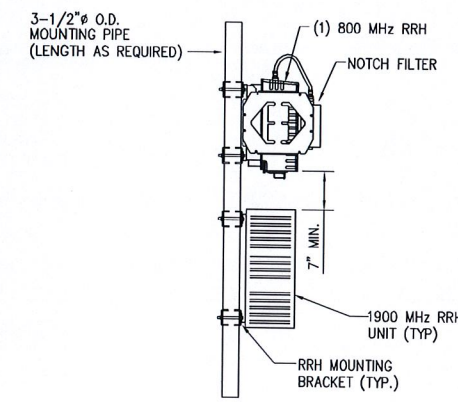
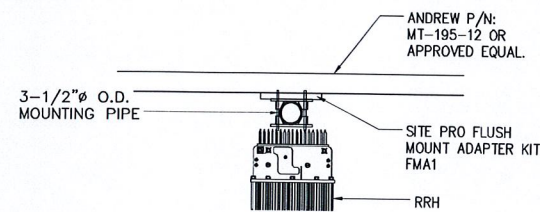


FRONT VIEW  
800/1900  
MULTI-MODE

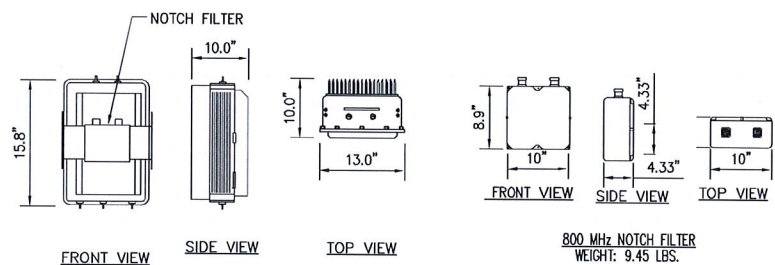
1 ANTENNA DETAILS  
--- NOT TO SCALE



3 PANEL ANTENNA MOUNT DETAIL  
--- NOT TO SCALE

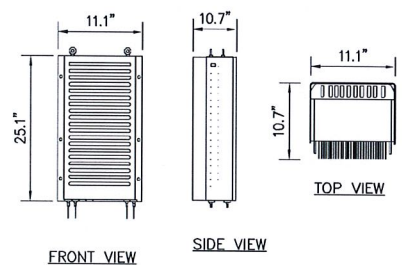


4 RRH MOUNTING DETAIL (TYP.)  
--- NOT TO SCALE



800 MHz RRH (ALU)  
WEIGHT = 50.6 LBS.

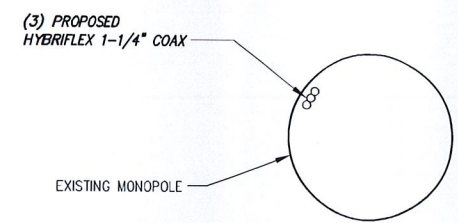
800 MHz NOTCH FILTER  
WEIGHT: 9.45 LBS.



1900 MHz RRH (ALU)  
WEIGHT = 60 LBS.

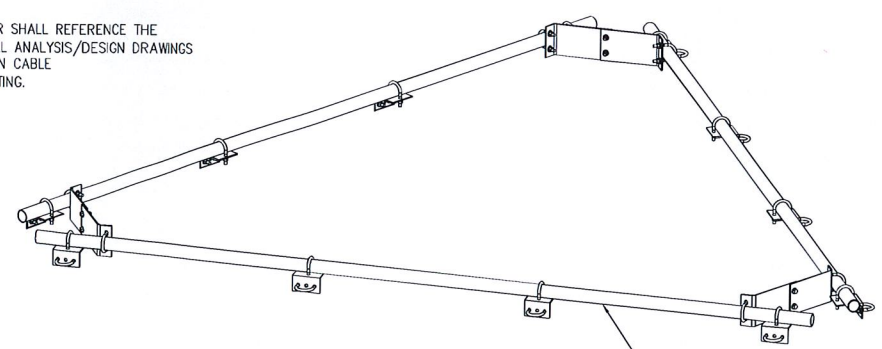
2 RRH EQUIPMENT DETAILS  
--- NOT TO SCALE

NOTE:  
REFER TO R.F. SYSTEM SCHEDULE FOR EXACT RRH SPECIFICATIONS AND QUANTITIES.



5 COAX ROUTING DETAIL  
--- NOT TO SCALE

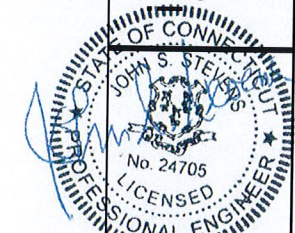
NOTE:  
1. SUBCONTRACTOR SHALL REFERENCE THE TOWER STRUCTURAL ANALYSIS/DESIGN DRAWINGS FOR DIRECTIONS ON CABLE DISTRIBUTION/ROUTING.



6 PLATFORM TOP MOUNT KIT  
--- NOT TO SCALE

A/E Consultant:

engineering  
11 Herbert Drive  
Latham, NY 12110  
(518) 690-0790



USE OF THIS SEAL OR ADDITION TO THIS DOCUMENT IS A VIOLATION OF APPLICABLE STATE AND/OR LOCAL LAWS

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BRANFORD  
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150 NORTH MAIN STREET  
BRANFORD, CT 06405

Client:



Implementation Team:

Drawing Scale: AS NOTED

Date: 2/28/12

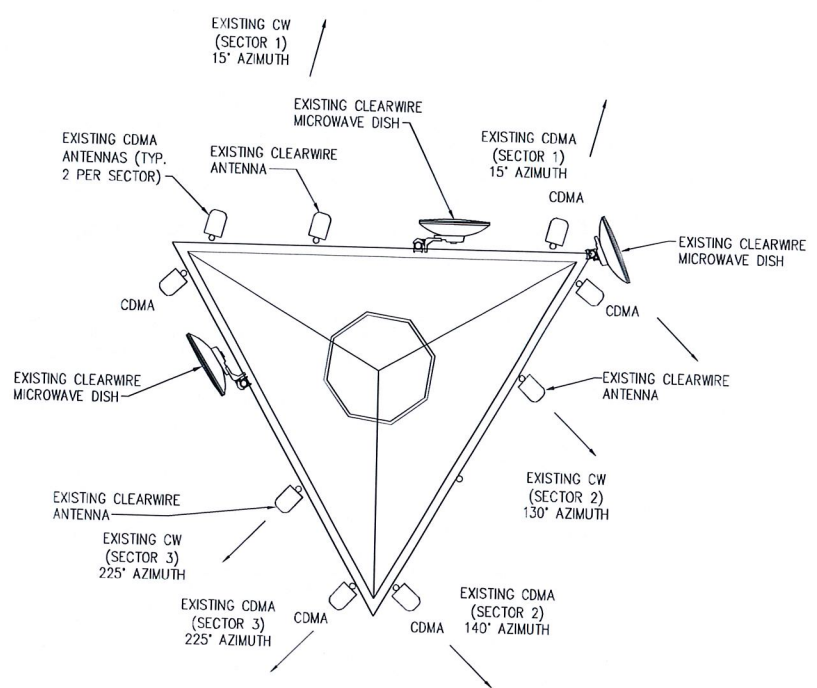
Drawing Title:

SITE ELEVATION & ANTENNA/RRH DETAILS

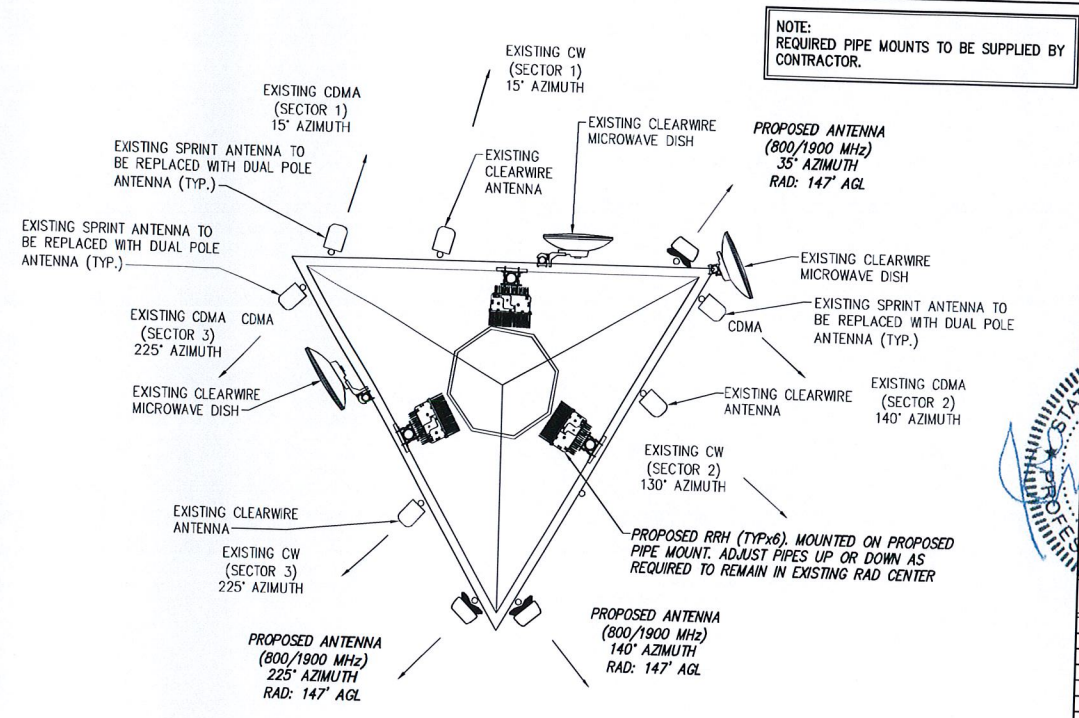
Drawing Number:

C4

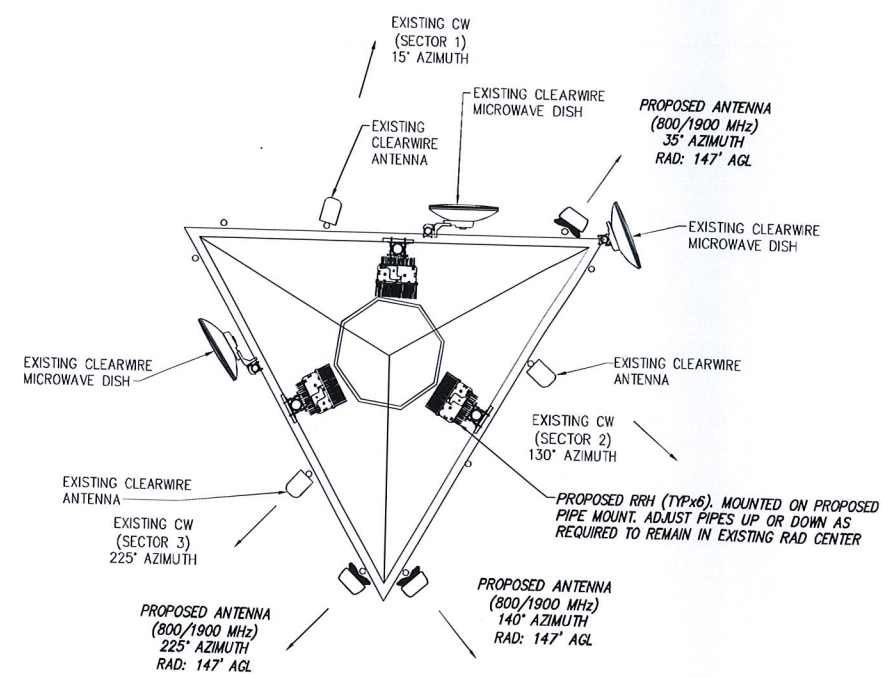




1 ANTENNA CONFIGURATION (EXISTING)  
NOT TO SCALE  
CALLED NORTH



2 ANTENNA CONFIGURATION (INTERIM/TEMPORARY)  
NOT TO SCALE  
CALLED NORTH



3 ANTENNA CONFIGURATION (FINAL/PERMANENT)  
NOT TO SCALE  
CALLED NORTH

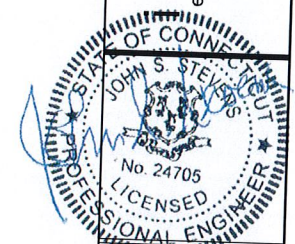
NOTE:  
REQUIRED PIPE MOUNTS TO BE SUPPLIED BY CONTRACTOR.

NOTES:  
EXISTING RF DATA PROVIDED BY SPRINT SIOP RF DATA SHEET, DATED MAY, 2012.

RRH NOTES:  
- SEE PAGE C4 FOR RRH MOUNTING INFORMATION (TYP. ALL SECTORS).  
- REFER TO RF SCHEDULE ON SHEET C7 FOR RRH UNIT SPECS AND QUANTITIES.

GENERAL NOTES:  
1. NEW SPRINT PANEL ANTENNAS TO MEET RF DESIGN REQUIREMENTS PER EBTS, PER APPROVED STRUCTURAL ANALYSIS.  
2. CONTRACTOR TO PROVIDE EXISTING ANTENNA VERIFICATION AND TO INCLUDE MOUNTING HEIGHT, RAD CENTER, TOP AND BOTTOM OF ANTENNA AND AZIMUTHS FOR ALL ANTENNAS.  
3. CONTRACTOR SHALL VERIFY NEW PARTS BEFORE ORDERING.  
4. REFER TO "R.F. SYSTEM SCHEDULE", SHEET C7 FOR ANTENNAS SPECS.  
5. CONTRACTOR TO USE PROPER TORQUE WRENCH WHEN INSTALLING AND TIGHTENING CONNECTORS TO INSURE PROPER FIT.  
6. ALL HYBRID CABLES SHALL BE MARKED WITHIN 24" OF THE END OF EACH CABLE WITH 2" WIDE VINYL TAPE. THIS INCLUDES ALL JUMPERS AND MAIN LINE HYBRID CABLE.  
7. CDMA ANTENNAS SHALL NOT BE REMOVED UNTIL ALL NEW MULTI-MODE ANTENNAS ARE INSTALLED AND ON-AIR.

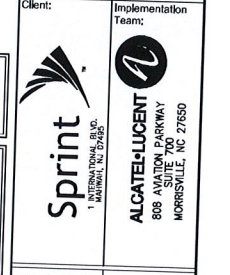
A/E Consultant:  
**engineering**  
11 Herbert Drive  
Latham, NY 12110  
(518) 690-0790



| No. | Submitted / Revised | App'd. | Date    |
|-----|---------------------|--------|---------|
| 4   | FINAL CD'S          | DM     | 3/28/12 |
| 3   | FINAL CD'S          | DM     | 3/28/12 |
| 2   | REVISED PER COMMENT | DM     | 3/19/12 |
| 1   | REVISED PER COMMENT | DM     | 3/19/12 |
| 0   | ISSUED FOR REVIEW   | DM     | 3/20/12 |

Drawn: W.B. Date: 3/20/12  
Designed: DM Date: 3/20/12  
Checked: A.B. Date: 3/20/12

Project Number: 288-021  
Project Title: CT03XC040 BRANFORD BANM TOWER  
150 NORTH MAIN STREET  
BRANFORD, CT 06405



Drawing Scale: AS NOTED  
Date: 2/28/12

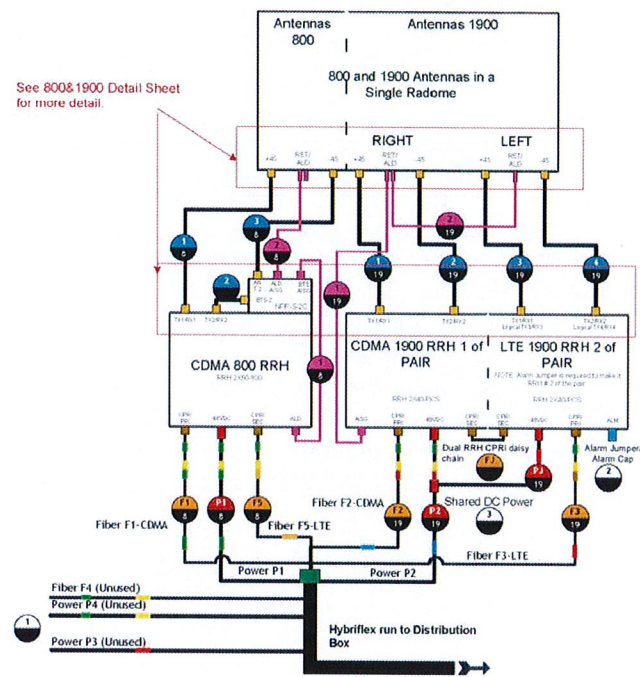
Drawing Title: ANTENNA PLANS

Drawing Number: C5



## TOWER TOP SCENARIO 2

800 AND SINGLE 1900 RRH PAIR WITH SINGLE 800/1900 RADOME ANTENNA



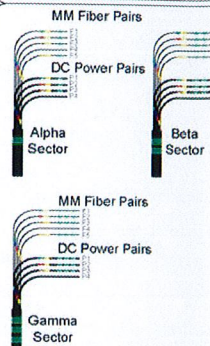
**Power Feed Polarity Definition:**  
 Black= -48VDC Feed (Battery)  
 Black/White Stripe= Return

**NOTE:** For power feed use the same Hybriflex OEM color designator as the fiber

MM Pair 1= F1= Green= P1(Green)  
 MM Pair 2= F2= Blue= P2(Blue)  
 MM Pair 3= F3= Red= P3(Red)  
 MM Pair 4= F4= Yellow= P4(Yellow)  
 MM Pair 5= F5= Orange= (No P5 power feed)

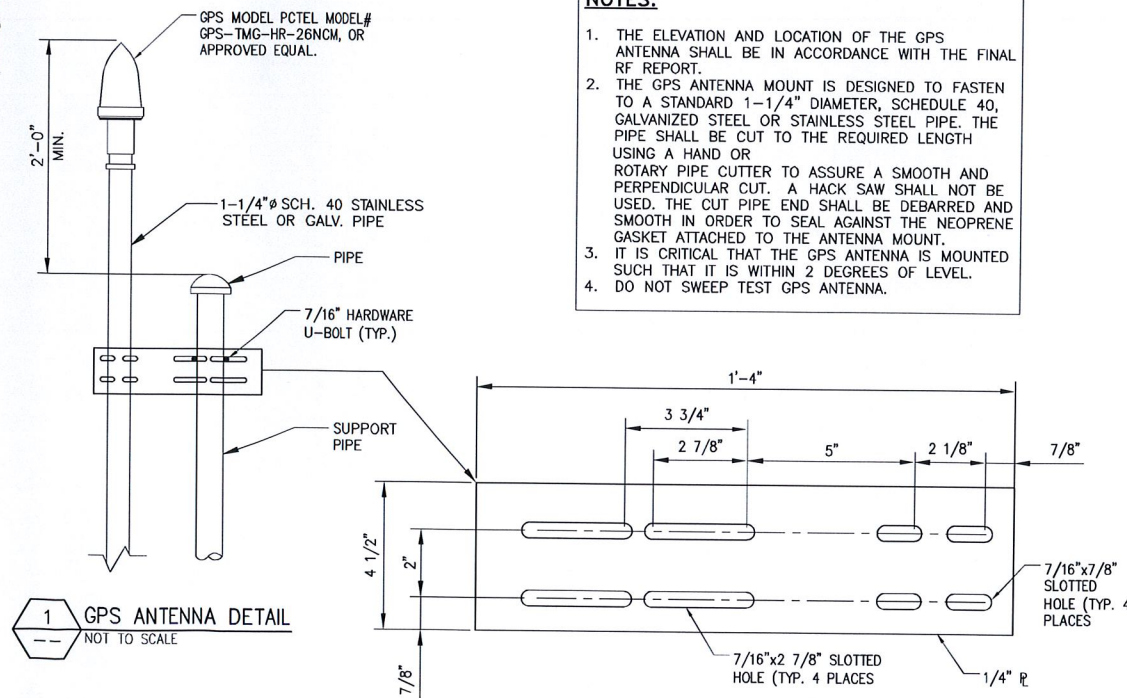
### OEM COLOR CODE

HYBRIFLEX



SEE CONNECTION LEGEND FOR MORE DETAILS

**NOTES:**  
 CONTRACTOR TO FIELD VERIFY GPS LOCATION.



### GPS MINIMUM SKY VIEW REQUIREMENTS

#### NOTES:

1. THE ELEVATION AND LOCATION OF THE GPS ANTENNA SHALL BE IN ACCORDANCE WITH THE FINAL RF REPORT.
2. THE GPS ANTENNA MOUNT IS DESIGNED TO FASTEN TO A STANDARD 1-1/4" DIAMETER, SCHEDULE 40, GALVANIZED STEEL OR STAINLESS STEEL PIPE. THE PIPE SHALL BE CUT TO THE REQUIRED LENGTH USING A HAND OR ROTARY PIPE CUTTER TO ASSURE A SMOOTH AND PERPENDICULAR CUT. A HACK SAW SHALL NOT BE USED. THE CUT PIPE END SHALL BE DEBARRED AND SMOOTH IN ORDER TO SEAL AGAINST THE NEOPRENE GASKET ATTACHED TO THE ANTENNA MOUNT.
3. IT IS CRITICAL THAT THE GPS ANTENNA IS MOUNTED SUCH THAT IT IS WITHIN 2 DEGREES OF LEVEL.
4. DO NOT SWEEP TEST GPS ANTENNA.

INSTALLER VERIFY LATEST PLUMBING/WIRING DIAGRAMS, PRIOR TO INSTALLATION.

PLUMBING DIAGRAM VERSION 1.9

### WEATHERPROOFING CONNECTORS AND GROUND KITS NOTE:

- A. ALL CONNECTORS AND GROUND KITS SHALL BE WEATHERPROOFED USING BUTYL RUBBER WEATHERPROOFING AND TAPE, THIS INSTALLATION MUST BE DONE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATION OR PER THE FOLLOWING INSTRUCTIONS (WHICHEVER IS GREATER):
1. THE COAXIAL CABLE CONNECTION OR GROUND KIT CAN BE ENCOMPASSED INTO COLD SHRINK AND COMPLETELY WRAPPED WITH 2 IN. WIDE ELECTRICAL TAPE OVERLAPPING EACH ROW BY APPROXIMATELY 1/2" AND EXTENDING PAST THE CONNECTION BY TWO INCHES AS DISCUSSED BELOW; OR
  2. THE COAXIAL CABLE CONNECTION OR GROUND KIT CAN BE WRAPPED WITH LAYERS OR ELECTRICAL/BUTYL RUBBER/ELECTRICAL TAPE AS DISCUSSED BELOW; OR
  3. THE COAXIAL CABLE CONNECTION OR GROUND KIT CAN BE WRAPPED WITH TWO LAYERS OF 1.5 INCH WIDE SELF-AMALGAMATING TAPE COVERED WITH TWO LAYERS OF ELECTRICAL TAPE.

### RRH JUMPERS NOTES:

1. FOR DISTANCES BETWEEN RRH'S AND ANTENNAS LESS THAN 10'-0" USE A 1/2" JUMPER.
2. FOR DISTANCES BETWEEN RRH'S AND ANTENNAS GREATER THAN 10'-0" USE A 7/8" JUMPER.

A/E Consultant:  
**infingy engineering**  
 11 Herbert Drive  
 Latham, NY 12110  
 (518) 890-0790

STATE OF CONNECTICUT  
 JOHN S. STEINER  
 No. 24705  
 LICENSED PROFESSIONAL ENGINEER

| No. | Submit/Revision     | App'd | Date    |
|-----|---------------------|-------|---------|
| 4   | FINAL CD'S          | DM    | 2/28/12 |
| 3   | FINAL CD'S          | DM    | 7/16/12 |
| 2   | REVISED PER COMMENT | DM    | 6/11/12 |
| 1   | REVISED PER COMMENT | DM    | 5/7/12  |
| 0   | ISSUED FOR REVIEW   | DM    | 3/29/12 |

Drawn: **AS** Date: 3/29/12  
 Designed: **DM** Date: 3/29/12  
 Checked: **AS** Date: 3/29/12

Project Number: 288-021

Project Title:  
**CT03XC040**  
**BRANFORD**  
**BANM TOWER**

150 NORTH MAIN STREET  
 BRANFORD, CT 06405

Client: **Sprint**  
 Implementation Team: **ALCATEL-LUCENT**  
 808 AVANTON PARKWAY  
 MORRISVILLE, NC 27560

Drawing Title:  
**ANTENNA**  
**CABLE RISER**  
**AND H-FRAME**  
**DETAILS**

Drawing Number:  
**C6**



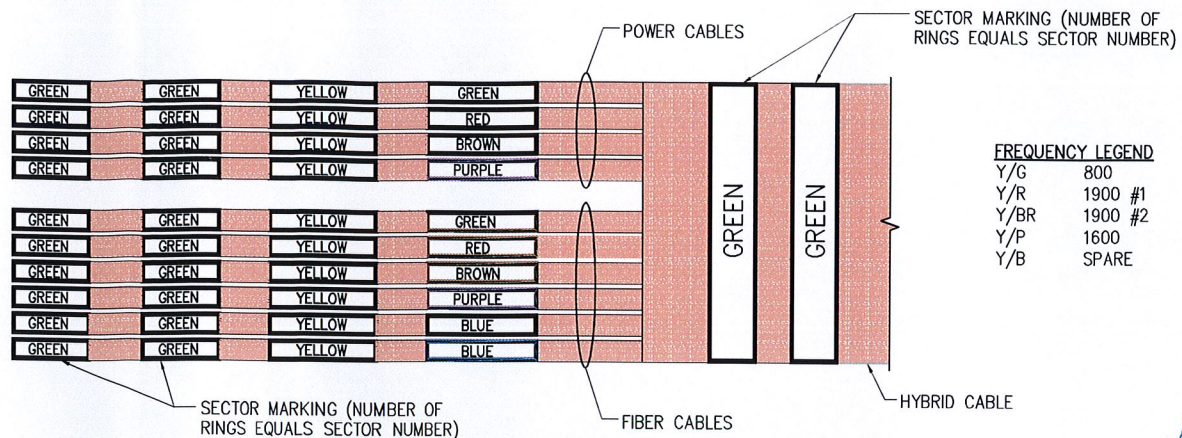
| Market   | Southern Connecticut           |                                  |                                |
|--|--------------------------------|----------------------------------|--------------------------------|
| Cascade ID   | CT03XC040                      |                                  |                                |
|  | SECTOR 1                       | SECTOR 2                         | SECTOR 3                       |
| Split sector present   | No                             | No                               | No                             |
| 1900MHz_Azimuth  | 35                             | 140                              | 225                            |
| 1900MHz_No_of_Antennas   | 1                              | 1                                | 1                              |
| 1900MHz_RADCenter(ft)  | 147.4                          | 147.4                            | 147.4                          |
| 1900MHz_Antenna_Make   | RFS                            | Powerwave                        | RFS                            |
| 1900MHz_Antenna_Model  | APXVSP18-C-A20                 | P40-16-XLPP-RR-A                 | APXVSP18-C-A20                 |
| 1900MHz_Horizontal_Beamwidth   | 65                             | 40                               | 65                             |
| 1900MHz_Vertical_Beamwidth   | 5.5                            | 6.5                              | 5.5                            |
| 1900MHz_AntennaHeight (ft)   | 6                              | 4.5                              | 6                              |
| 1900MHz_AntennaGain(dBd)   | 15.9                           | 15.9                             | 15.9                           |
| 1900MHz_E_Tilt   | 0                              | -1                               | 0                              |
| 1900MHz_M_Tilt   | 0                              | 0                                | 0                              |
| 1900MHz_Carrier_Forecast_Year_2013   | 3                              | 3                                | 3                              |
| 1900MHz_RRH_Manufacturer   | ALU                            | ALU                              | ALU                            |
| 1900MHz_RRH_Model  | RRH 1900 4X45 65MHz            | RRH 1900 4X45 65MHz              | RRH 1900 4X45 65MHz            |
| 1900MHz_RRH_Count  | 1                              | 1                                | 1                              |
| 1900MHz_RRH_Location   | Top of the Pole/Tower          | Top of the Pole/Tower            | Top of the Pole/Tower          |
| 1900MHz_Combiner_Model   | No Combiner Required           | No Combiner Required             | No Combiner Required           |
| 1900MHz_Top_Jumper #1_Length (RRH or Combiner-to-Antenna for TT or Main Coax to      | 10                             | 10                               | 10                             |
| 1900MHz_Top_Jumper #1_Cable_Model (RRH or Combiner-to-Antenna for TT or Main Coax    | LCF12-50J                      | LCF12-50J                        | LCF12-50J                      |
| 1900MHz_Top_Jumper #2_Length (RRH to Combiner for TT if applicable, ft)              | N/A                            | N/A                              | N/A                            |
| 1900MHz_Top_Jumper #2_Cable_Model (RRH to Combiner for TT if applicable)             | N/A                            | N/A                              | N/A                            |
| 1900MHz_Main_Coax_Cable_Length (ft)  | N/A                            | N/A                              | N/A                            |
| 1900MHz_Main_Coax_Cable_Model  | N/A                            | N/A                              | N/A                            |
| 1900MHz_Bottom_Jumper #1_Length (Ground based RRH to Combiner-OR-Main Coax, ft)      | N/A                            | N/A                              | N/A                            |
| 1900MHz_Bottom_Jumper #1_Cable_Model (Ground based RRH to Combiner-OR-Main Coax)     | N/A                            | N/A                              | N/A                            |
| 1900MHz_Bottom_Jumper #2_Length (Ground based-Combiner to Main Coax, ft)             | N/A                            | N/A                              | N/A                            |
| 1900MHz_Bottom_Jumper #2_Cable_Model (Ground based-Combiner to Main Coax)            | N/A                            | N/A                              | N/A                            |
| 800MHz_Azimuth   | 35                             | 140                              | 225                            |
| 800MHz_No_of_Antennas  | 0                              | 0                                | 0                              |
| 800MHz_RADCenter(ft)   | 147.4                          | 147.4                            | 147.4                          |
| 800MHz_AntennaMake   | RFS                            | RFS                              | RFS                            |
| 800MHz_AntennaModel  | APXVSP18-C-A20 (Shared w/1900) | P40-16-XLPP-RR-A (Shared w/1900) | APXVSP18-C-A20 (Shared w/1900) |
| 800MHz_Horizontal_Beamwidth  | 65                             | 40                               | 65                             |
| 800MHz_Vertical_Beamwidth  | 11.5                           | 16                               | 11.5                           |
| 800MHz_AntennaHeight (ft)  | 6                              | 4.5                              | 6                              |
| 800MHz_AntennaGain (dBd)   | 13.4                           | 14.2                             | 13.4                           |
| 800MHz_E_Tilt  | 0                              | 0                                | -8                             |
| 800MHz_M_Tilt  | 0                              | 0                                | 0                              |
| 800MHz_RRH_Manufacturer  | ALU                            | ALU                              | ALU                            |
| 800MHz_RRH_Model   | RRH 800 MHz 2x50W              | RRH 800 MHz 2x50W                | RRH 800 MHz 2x50W              |
| 800MHz_RRH_Count   | 1                              | 1                                | 1                              |
| 800MHz_RRH_Location  | Top of the Pole/Tower          | Top of the Pole/Tower            | Top of the Pole/Tower          |
| 800_Top_Jumper #1_Length (RRH to Antenna for TT or Main Coax to Antenna for GM)      | 10                             | 10                               | 10                             |
| 800_Top_Jumper #1_Cable_Model (RRH to Antenna for TT or Main Coax to Antenna for GM) | LCF12-50J                      | LCF12-50J                        | LCF12-50J                      |
| 800MHz_Main_Coax_Cable_Length (ft)   | N/A                            | N/A                              | N/A                            |
| 800MHz_Main_Coax_Cable_Model   | N/A                            | N/A                              | N/A                            |
| 800_Bottom_Jumper #1_Length (Ground based RRH to Main Coax)                          | N/A                            | N/A                              | N/A                            |
| 800_Bottom_Jumper #1_Cable_Model (Ground based RRH to Main Coax)                     | N/A                            | N/A                              | N/A                            |
| Plumbing Scenario *  | 124                            | 131                              | 124                            |

Comments  
11/9/2012

1 SPRINT RFDS  
NOT TO SCALE

NOTE:  
COORDINATE RF ANTENNA INSTALLATION WITH FINAL SPRINT RFDS. COORDINATE RF MW DISH (IF APPLICABLE) INSTALLATION WITH FINAL SPRINT RFDS.

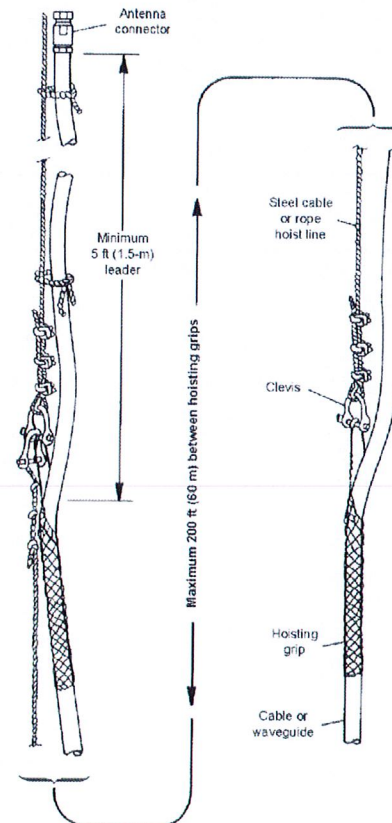
NOTE:  
RFDS SHOWN PROVIDED BY SPRINT DATED 11/09/12.



HYBRID CABLE WILL BE MARKED IN A SIMILAR MANNER AS COAX CABLES. THE MAIN TRUNK OF THE HYBRID CABLE IS TO BE MARKED WITH THE SECTOR MARKINGS ONLY. THE INDIVIDUAL POWER PAIRS AND FIBER CABLES WILL BE LABELED WITH BOTH THE SECTOR CABLE MARKINGS AND FREQUENCY (EXAMPLE ABOVE IS FOR SECTOR 2)

2 COLOR CODING  
NOT TO SCALE

- DO NOT USE ONE HOISTING GRIP FOR HOISTING TWO OR MORE CABLES OR CABLE TRAYS. THIS CAN CAUSE THE HOISTING GRIP TO BREAK OR THE CABLES OR WAVEGUIDES TO FALL.
- DO NOT USE THE HOISTING GRIP FOR LOWERING CABLE OR CABLE TRAY. SAGGING OF THE CABLE OR CABLE TRAY MAY LOOSEN THE GRIP AND POSSIBLY CAUSE THE CABLE TO CABLE TRAY TO SWAY OR FALL.
- DO NOT REUSE HOISTING GRIPS. USED GRIPS MAY HAVE LOST ELASTICITY, STRETCHED, OR BECOME WEAKENED. REUSING A GRIP CAN CAUSE THE CABLE OR CABLE TRAY TO SLIP, BREAK, OR FALL.
- USE HOISTING GRIPS AT INTERVALS OF NO MORE THAN 200 FT (60 M).
- MAKE SURE THAT THE PROPER HOISTING GRIP IS USED FOR THE CABLE OR CABLE TRAY BEING INSTALLED. SLIPPAGE OR INSUFFICIENT GRIPPING STRENGTH WILL RESULT IF YOU ARE USING THE WRONG HOISTING GRIP.



2 HOIST GRIP DETAIL  
NOT TO SCALE

A/E Consultant:

**infinity engineering**  
11 Herbert Drive  
Latham, NY 12110  
(518) 680-0790

JOHN S. STEINBERG  
No. 24705  
LICENSED PROFESSIONAL ENGINEER

UNLESS OTHERWISE NOTED OR ADDITION TO THIS DOCUMENT IS A VIOLATION OF APPLICABLE STATE AND/OR LOCAL LAWS

|   |                     |     |         |
|---|---------------------|-----|---------|
| 4 | FINAL CD'S          | EDM | 2/28/12 |
| 3 | FINAL CD'S          | EDM | 7/16/12 |
| 2 | REVISED PER COMMENT | EDM | 6/11/12 |
| 1 | REVISED PER COMMENT | EDM | 5/7/12  |
| 0 | ISSUED FOR REVIEW   | EDM | 3/30/12 |

Drawn: W.B. Date: 3/30/12  
Designed: EDM Date: 3/30/12  
Checked: A.D. Date: 3/30/12

Project Number: 286-021

Project Title:  
**CT03XC040  
BRANFORD  
BANM TOWER**

150 NORTH MAIN STREET  
BRANFORD, CT 06405

Client: **sprint**  
Implementation Team: **ALCATEL-LUCENT**  
808 AVIATION PARKWAY  
SUITE 700  
MORRISVILLE, NC 27650

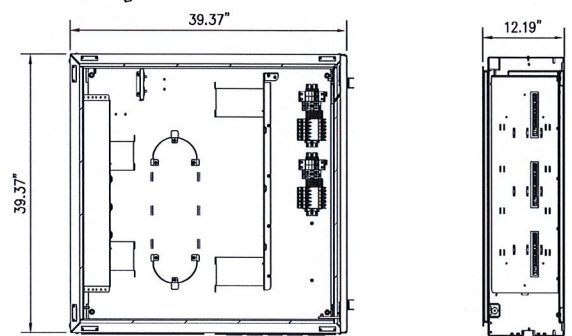
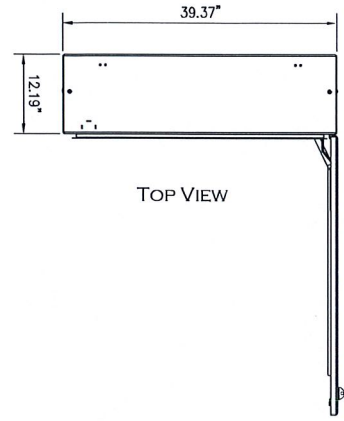
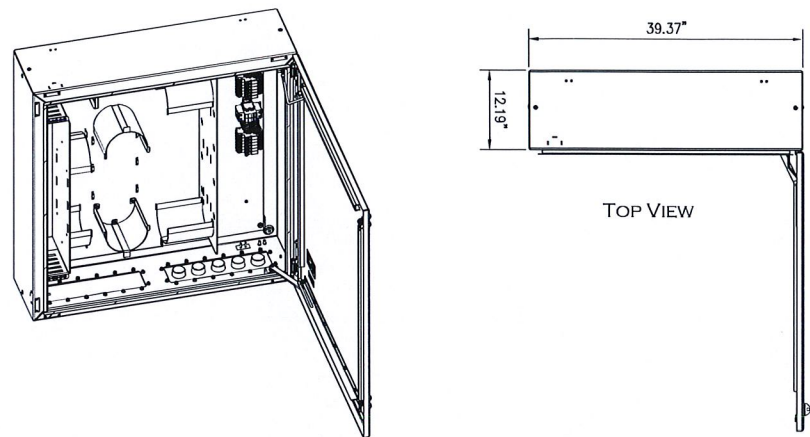
Drawing Scale:  
AS NOTED

Date:  
2/28/12

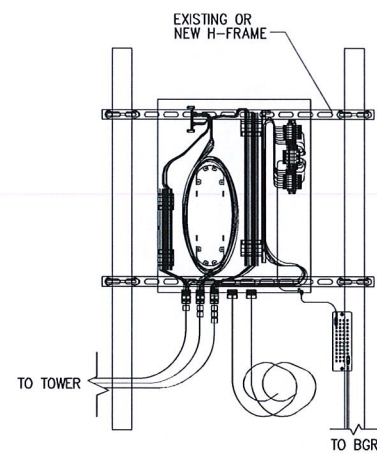
Drawing Title:  
**RF AND  
CABLE DETAILS**

Drawing Number:  
**C7**





1 DISTRIBUTION BOX DETAIL  
NOT TO SCALE



FRONT VIEW WITH DOOR REMOVED TO SHOW DETAIL

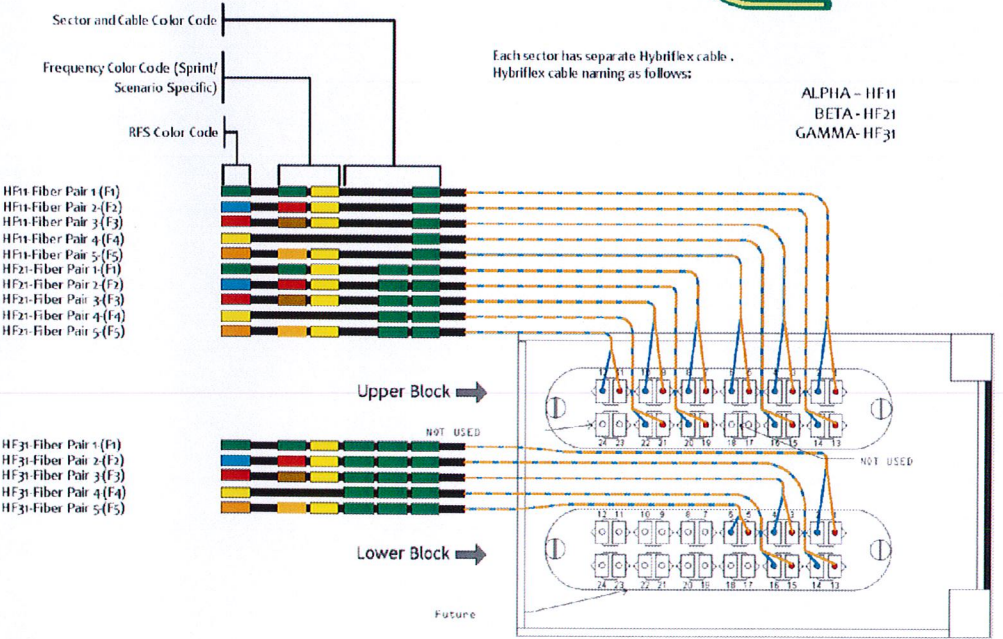
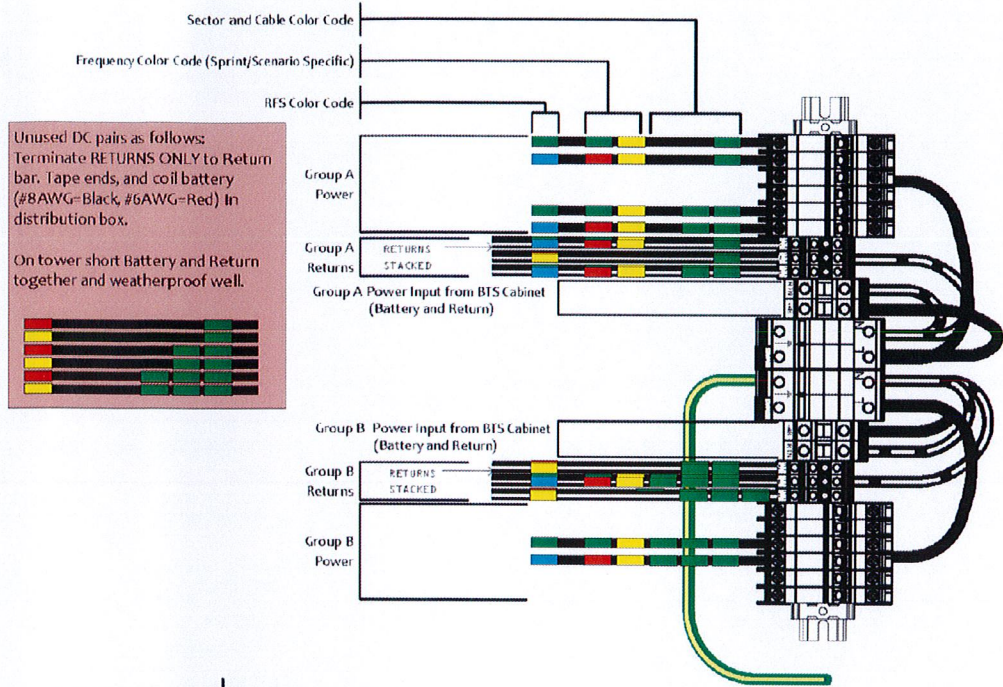
2 DISTRIBUTION BOX INSTALL COMPLETE VIEW  
NOT TO SCALE

**NOTES:**

- DISTRIBUTION BOX IS ALU SUPPLIED WITH 1-1/2" LIQUID-TIGHT CONDUIT AND CONNECTORS. THIS SHOULD BE:
  - \* SPLIT IN HALF,
  - \* TERMINATED TO THE DISTRIBUTION BOX AS SHOWN,
  - \* RAN TO AND COILED AS CLOSE TO WHERE THE CABINET IS GOING TO BE MOUNTED AS POSSIBLE.
- DISTRIBUTION BOX IS KITTED WITH 24AWG, POWER CABLE 27' x 2EA. RUNS RED AND 2EA. RUNS BLACK. THIS SHOULD BE COILED AND LEFT INSIDE DISTRIBUTION BOX.
- BTS INSTALLATION TEAM WILL TERMINATE LIQUID-TIGHT, RUN THE FIBER JUMPERS AND POWER CABLES FROM BTS CABINET TO DISTRIBUTION BOX.

Unused DC pairs as follows:  
Terminate RETURNS ONLY to Return bar. Tape ends, and coil battery (#8AWG-Black, #6AWG-Red) in distribution box.

On tower short Battery and Return together and weatherproof well.



INSTALLER VERIFY LATEST PLUMBING/WIRING DIAGRAMS, PRIOR TO INSTALLATION.

3 FIBER & DC CONNECTION DETAILS  
NOT TO SCALE

PLUMBING DIAGRAM VERSION 1.9

A/E Consultant:

**fining engineering**  
11 Herbert Drive  
Latham, NY 12110  
(518) 680-0790

STATE OF CONNECTICUT  
No. 24705  
LICENSED PROFESSIONAL ENGINEER

|     |                     |       |         |
|-----|---------------------|-------|---------|
| 4   | FINAL CD'S          | DM    | 2/28/12 |
| 3   | FINAL CD'S          | DM    | 7/16/12 |
| 2   | REVISED PER COMMENT | DM    | 6/11/12 |
| 1   | REVISED PER COMMENT | DM    | 5/7/12  |
| 0   | ISSUED FOR REVIEW   | DM    | 3/20/12 |
| No. | Submittal/Revision  | App'd | Date    |

Drawn: W.B. Date: 3/20/12  
Designed: E.M. Date: 3/20/12  
Checked: A.D. Date: 3/20/12

Project Number: 288-021

Project Title:  
CT03XC040  
BRANFORD  
BANM TOWER

150 NORTH MAIN STREET  
BRANFORD, CT 06405

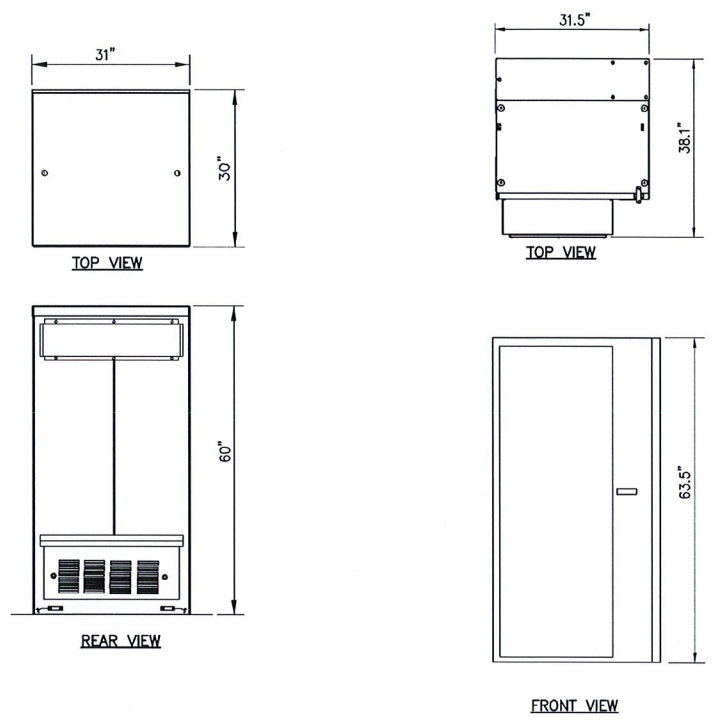
Client: Sprint  
Implementation Team: ALCATEL-LUCENT  
808 AVANTON PARKWAY  
SUITE 700  
MORRISVILLE, NC 27650

Drawing Scale: AS NOTED  
Date: 2/28/12

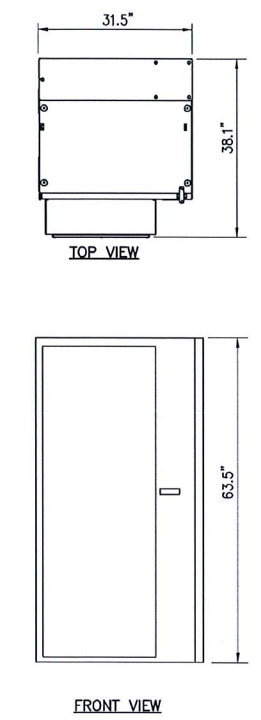
Drawing Title:  
**JUNCTION BOX DETAILS**

Drawing Number:  
**C8**





1 BATTERY CABINET PROFILE  
NOT TO SCALE

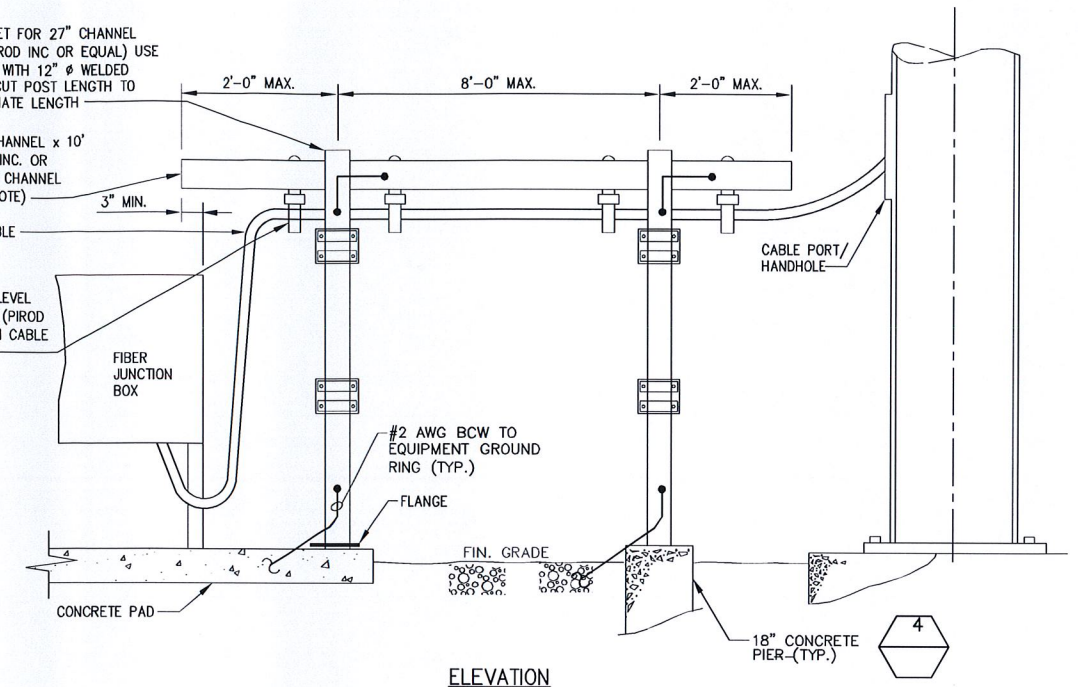


2 CABINET PROFILE  
NOT TO SCALE

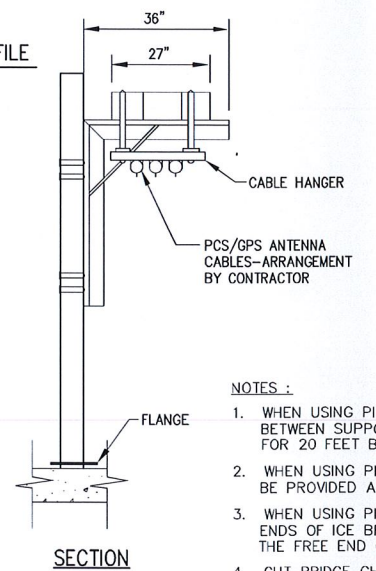
SUPPORT POST + BRACKET FOR 27\"/>

27\"/>

HANGER BRACKET TYPE LEVEL CHANNEL PART #802257 (PIROD INC OR EQUAL). MAXIMUM CABLE SPAN = 3' TYP.

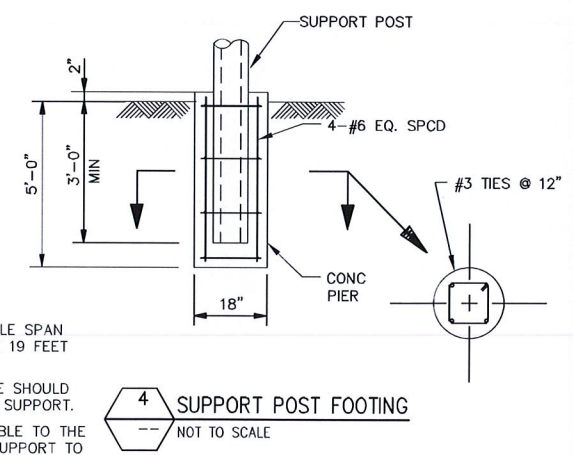


ELEVATION



SECTION

NOTE:  
CONTRACTOR TO SUPPORT HYBRIFLEX CABLING IN ACCORDANCE WITH MANUFACTURE'S SPECIFICATIONS.



4 SUPPORT POST FOOTING  
NOT TO SCALE

NOTES :

1. WHEN USING PIROD COMPONENTS AS SHOWN IN STANDARD DETAILS, MAXIMUM ALLOWABLE SPAN BETWEEN SUPPORTS ON A CONTINUOUS SINGLE SECTION OF BRIDGE CHANNEL SHALL BE 19 FEET FOR 20 FEET BRIDGE CHANNEL, OR 9 FEET FOR 10 FEET BRIDGE CHANNEL.
2. WHEN USING PIROD COMPONENTS FOR SPLICING BRIDGE CHANNEL SECTIONS, THE SPLICE SHOULD BE PROVIDED AT THE SUPPORT, IF POSSIBLE, OR AT A MAXIMUM OF 2 FEET FROM THE SUPPORT.
3. WHEN USING PIROD COMPONENTS, SUPPORT SHOULD BE PROVIDED AS CLOSE AS POSSIBLE TO THE ENDS OF ICE BRIDGES, WITH A MAXIMUM CANTILEVER DISTANCE OF 2 FEET FROM THE SUPPORT TO THE FREE END OF THE ICE BRIDGE.
4. CUT BRIDGE CHANNEL SECTIONS SHOULD HAVE RAW EDGES TREATED WITH A MATERIAL TO RESTORE THE EDGES TO THE ORIGINAL CHANNEL, OR EQUIVALENT, FINISH.
5. ICE BRIDGES MAY BE CONSTRUCTED WITH COMPONENTS FROM MANUFACTURERS OTHER THAN PIROD, PROVIDED THE MANUFACTURER'S INSTALLATION GUIDELINES ARE FOLLOWED.
6. DEVIATIONS FROM STANDARDS FOR COMPONENT INSTALLATIONS ARE PERMITTED WITH THE RESPECTIVE MANUFACTURER'S APPROVAL.
7. ATTACH FLANGED END OF SUPPORT POST TO CONCRETE PAD USING 4 - 3/8\"/>

3 ICE BRIDGE  
NOT TO SCALE

| DESIGN CRITERIA:                                       |                        |
|--|------------------------|
| 2009 INTERNATIONAL BUILDING CODE W/ STATE MODIFICATION |                        |
| WIND SPEED (ASCE-7-05)                                 | 90 MPH                 |
| EXPOSURE   | B                      |
| IMPORTANCE FACTOR                                      | 1.0                    |
| SEISMIC SITE CLASS                                     | D                      |
| S <sub>s</sub> =0.152                                  | S <sub>1</sub> = 0.050 |
| SEISMIC IMPORTANCE FACTOR                              | 1.0                    |
| SEISMIC DESIGN CATEGORY                                | B                      |
| CABINET WEIGHT:  |                        |
| 9927 MM BTS CABINET                                    | 594 lbs.               |
| 60EC V2 BATTERY CABINET                                | 2830 lbs.              |
| MATERIAL SPECIFICATIONS                                |                        |
| C-, M-, AND ANGLE SHAPES:                              | ASTM A36               |
| HIGH-STRENGTH BOLTS:                                   | ASTM A325SC OR (A325N) |
| STRUCTURAL WF SHAPES:                                  | ASTM A572-GR50         |
| TUBE STEEL & PIPE COLUMNS:                             | ASTM A500, GRADE B     |
| WELDING ELECTRODES:                                    | E70XX                  |
| W - SHAPES:  | ASTM A992, GRADE 50    |
| U-BOLTS:   | ASTM A36               |

A/E Consultant:

**infingy** engineering  
11 Herbert Drive  
Latham, NY 12110  
(518) 890-0790

STATE OF CONNECTICUT  
JOHN S. STEINER, P.E.  
No. 24705  
LICENSED PROFESSIONAL ENGINEER

| No. | Submittal / Revision | App'd | Date    |
|-----|----------------------|-------|---------|
| 4   | FINAL CD'S           | EDM   | 2/28/12 |
| 3   | FINAL CD'S           | EDM   | 7/16/12 |
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Drawn: W.B. Date: 3/29/12  
Designed: EDM Date: 3/29/12  
Checked: A.B. Date: 3/29/12

Project Number: 288-021

Project Title:  
**CT03XC040  
BRANFORD  
BANM TOWER**

150 NORTH MAIN STREET  
BRANFORD, CT 06405

Client: **Sprint**  
Implementation Team: **ALCATEL-LUCENT**  
808 AVIATION PARKWAY  
SUITE 700  
MORRISVILLE, NC 27650

Drawing Scale:  
AS NOTED

Date:  
2/28/12

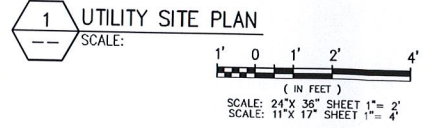
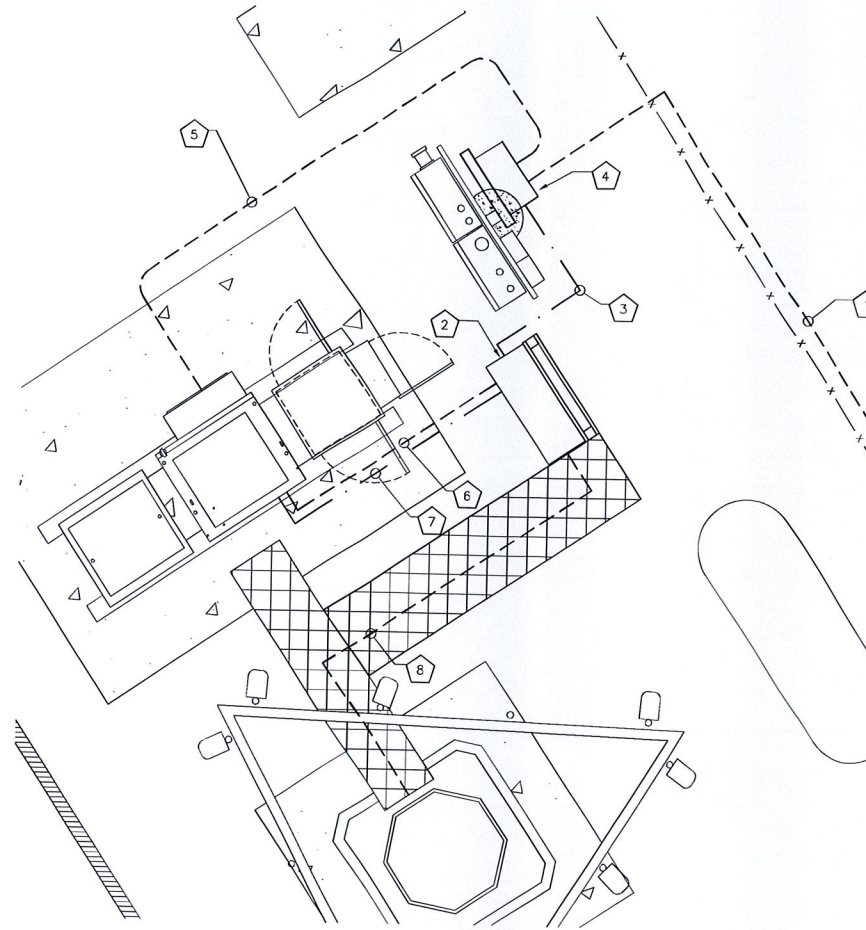
Drawing Title:  
**DETAILS**

Drawing Number:  
**C9**



**CODED NOTES:**

- 1 PROPOSED 2" UNDERGROUND PVC CONDUIT WITH PULL-STRING FOR FIBER FROM PROPOSED CIENA ENCLOSURE TO EXISTING FIBER MEET POINT AT EXISTING "CHARLES" FIBER PEDESTAL, 50' FURNISHED AND INSTALLED BY SPRINT
- 2 PROPOSED SPRINT FIBER JUNCTION BOX FURNISHED AND INSTALLED BY ALU
- 3 PROPOSED 1-1/4" ABOVE GROUND LIQUID TIGHT CONDUIT WITH PULL-STRING FOR DC POWER FROM FIBER JUNCTION BOX TO CIENA EQUIPMENT CABINET, 10'
- 4 PROPOSED CIENA EQUIPMENT ENCLOSURE, FURNISHED AND INSTALLED BY AT&T
- 5 PROPOSED CAT5 CABLE ROUTED IN PROPOSED 2" UNDERGROUND PVC CONDUIT FROM PROPOSED CIENA 3911 EQUIPMENT ENCLOSURE TO EXISTING BTS CABINET, 20' FURNISHED AND INSTALLED BY SPRINT
- 6 PROPOSED 1-1/2" LIQUID TIGHT CONDUIT WITH PULL-STRING FOR TELCO FROM FIBER JUNCTION BOX TO LUCENT EQUIPMENT CABINET
- 7 PROPOSED 1-1/2" LIQUID TIGHT CONDUIT WITH PULL-STRING FOR DC POWER FROM FIBER JUNCTION BOX TO LUCENT EQUIPMENT CABINET
- 8 PROPOSED 1-1/4" HYBRIFLEX CABLE ROUTED FROM PROPOSED JUNCTION BOX TO PROPOSED TOWER MOUNTED RRH, 184' (TYP. OF (1) PER SECTOR, (3) SECTORS TOTAL)



- NOTES:**
- 1. CONTRACTOR TO USE EXISTING SPARE CONDUITS, IF AVAILABLE. CONDUIT SIZES MUST BE EQUAL TO OR GREATER THAN THAT ALLOWED BY CODE.
  - 2. EXISTING ALARMS NEED TO BE RE-ROUTED AND VERIFIED IN PROPER WORKING CONDITION WHEN NEW MMBS EQUIPMENT IS INSTALLED.
  - 3. REMAINING GROUND LEADS FROM REMOVED CABINETS TO BE COILED (NOT ON WALKING SURFACE).
  - 4. REMAINING UNUSED CONDUITS FROM EXISTING CABINETS TO BE COVERED WITH WATERPROOF CAPS (NOT DUCT TAPE).

**UNDERGROUND SERVICE ALERT**  
CALL TOLL FREE  
1-800-922-4455  
THREE WORKING DAYS BEFORE YOU DIG

**ELECTRICAL NOTES:**

- 1. ALL ELECTRICAL WORK SHALL CONFORM TO THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE (N.E.C.), AND APPLICABLE LOCAL CODES
- 2. GROUNDING SHALL COMPLY WITH ARTICLE 250 OF NATIONAL ELECTRICAL CODE.
- 3. ALL ELECTRICAL ITEMS SHALL BE U.L. APPROVED OR LISTED.
- 4. ALL WIRES SHALL BE AWG MIN #12 THHN COPPER UNLESS NOTED.
- 5. CONDUCTORS SHALL BE INSTALLED IN SCHEDULE 40 PVC CONDUIT UNLESS NOTED OTHERWISE.
- 6. LABEL SPRINT SERVICE DISCONNECT SWITCH AND PPC CABINET WITH ENGRAVED LAMACOID LABELS, LETTERS 1" IN HEIGHT.
- 7. ROUTE GROUNDING CONDUCTORS ALONG THE SHORTEST AND STRAIGHTEST PATH POSSIBLE. BEND GROUNDING LEADS WITH A MINIMUM 8" RADIUS.
- 8. ENGAGE AN INDEPENDENT TESTING FIRM TO TEST AND VERIFY THAT RESISTANCE DOES NOT EXCEED 5 OHMS TO GROUND. TEST GROUND RING RESISTANCE PRIOR TO MAKING FINAL GROUND CONNECTIONS TO INFRASTRUCTURE AND EQUIPMENT. GROUNDING AND OTHER OPERATIONAL TESTING SHALL BE WITNESSED BY SPRINT'S REPRESENTATIVE.
- 9. PROVIDE PULL BOXES AND JUNCTION BOXES WHERE REQUIRED SO THAT CONDUIT BENDS DO NOT EXCEED 360°.
- 10. OBTAIN PERMITS AND PAY FEES RELATED TO ELECTRICAL WORK PERFORMED ON THIS PROJECT. DELIVER COPIES OF ALL PERMITS TO SPRINT REPRESENTATIVE.
- 11. SCHEDULE AND ATTEND INSPECTIONS RELATED TO ELECTRICAL WORK REQUIRED BY JURISDICTION HAVING AUTHORITY. CORRECT AND PAY FOR ANY WORK REQUIRED TO PASS ANY FAILED INSPECTION. RE-DEFINED AS-BUILTS ARE TO BE DELIVERED TO SPRINT REPRESENTATIVE.
- 12. PROVIDE TWO COPIES OF OPERATION AND MAINTENANCE MANUALS IN THREE-RING BINDER.
- 13. FURNISH AND INSTALL THE COMPLETE ELECTRICAL SERVICE, TELCO CONDUIT, AND THE COMPLETE GROUNDING SYSTEM.
- 14. ALL WORK SHALL BE PERFORMED IN STRICT ACCORDANCE WITH ALL APPLICABLE BUILDING CODES AND LOCAL ORDINANCES, INSTALLED IN A NEAT MANNER, AND SHALL BE SUBJECT TO APPROVAL BY SPRINT REPRESENTATIVE.
- 15. CONDUCT A PRE-CONSTRUCTION SITE VISIT AND VERIFY EXISTING SITE CONDITIONS AFFECTING THIS WORK. REPORT ANY OMISSIONS OR DISCREPANCIES FOR CLARIFICATION PRIOR TO THE START OF CONSTRUCTION.
- 16. PROJECT ADJACENT STRUCTURES AND FINISHES FROM DAMAGE. REPAIR TO ORIGINAL CONDITION ANY DAMAGED AREA.
- 17. REMOVE DEBRIS ON A DAILY BASIS. DEBRIS NOT REMOVED IN A TIMELY FASHION WILL BE REMOVED BY OTHERS AND THE RESPONSIBLE SUBCONTRACTOR SHALL BE CHARGED ACCORDINGLY. REMOVAL OF DEBRIS SHALL BE COORDINATED WITH THE OWNER'S REPRESENTATIVE. DEBRIS SHALL BE REMOVED FROM THE PROPERTY AND DISPOSED OF LEGALLY.
- 18. UPON COMPLETION OF WORK, THE SITE SHALL BE CLEAN AND FREE OF DUST AND FINGERPRINTS.
- 19. PRIOR TO ANY TRENCHING, CONTACT LOCAL UTILITY TO VERIFY LOCATION OF ANY EXISTING BURIED SERVICE CONDUITS.
- 20. DOCUMENT GROUND RING INSTALLATION AND CONNECTIONS TO IT WITH PHOTOGRAPHS PRIOR TO BACKFILLING SITE. PRESENT PHOTO ARCHIVE AT SITE "PUNCH LIST" WALK TO SPRINT'S REPRESENTATIVE.
- 21. ALL ABOVE GRADE CONDUIT TO BE RIGID METALLIC.

A/E Consultant:

enfinigy

11 Herbert Drive  
Latham, NY 12110  
(518) 680-0780

STATE OF CONNECTICUT

JOHN S. STEVENS

No. 24705

PROFESSIONAL ENGINEER

THIS SEAL IS VALID OR VALIDATION TO THIS DOCUMENT IS A VIOLATION OF APPLICABLE STATE AND/OR LOCAL LAWS

|     |                      |       |         |
|-----|----------------------|-------|---------|
| 4   | FINAL SETS           | DWG   | 2/28/12 |
| 3   | FINAL SETS           | DWG   | 2/16/12 |
| 2   | REVISED PER COMMENT  | DWG   | 4/11/12 |
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Drawn: **M.B.** Date: 3/29/12  
 Designed: **EM** Date: 3/29/12  
 Checked: **A.B.** Date: 3/29/12

Project Number: **286-021**

Project Title:  
**CT03XC040  
 BRANFORD  
 BANM TOWER**

150 NORTH MAIN STREET  
 BRANFORD, CT 06405

Client: **Sprint**  
 Implementation Team:  
**ALCATEL-LUCENT**  
 888 AVIATION PARKWAY  
 MORRISVILLE, NC 27650

Drawing Scale:  
**AS NOTED**

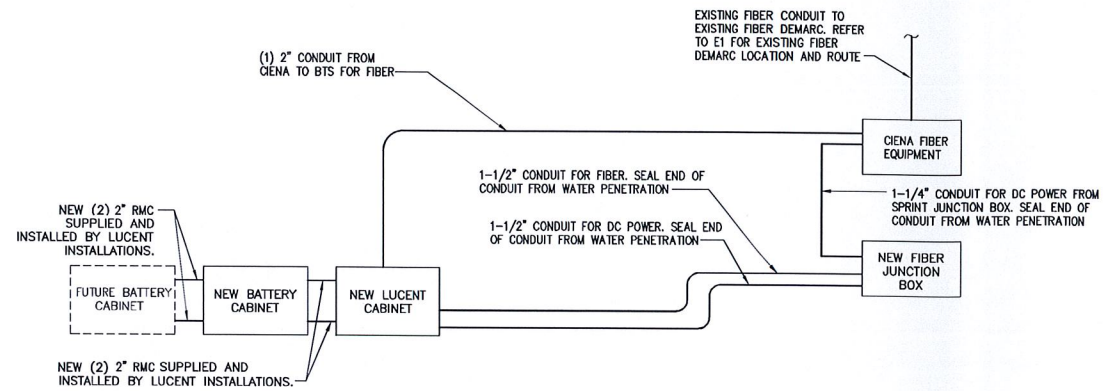
Date:  
 2/28/12

Drawing Title:  
**UTILITY SITE PLAN**

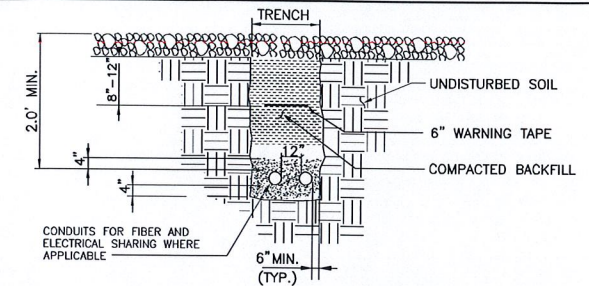
Drawing Number:  
**E1**



**GROUNDING NOTE:**  
 IN ADDITION TO POWER SERVICE GROUNDING AS REQUIRED BY NEC, CONTRACTOR SHALL BE RESPONSIBLE TO COORD AND INSTALL ALL SURGE AND LIGHTING PROTECTION GROUNDING AS REQUIRED AND SPECIFIED BY SPRINT

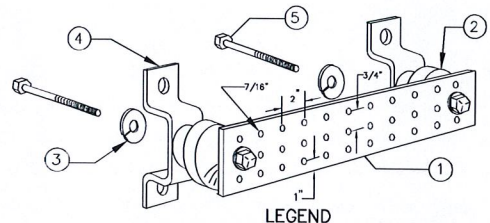


**1 ONE-LINE DIAGRAM**  
 NOT TO SCALE



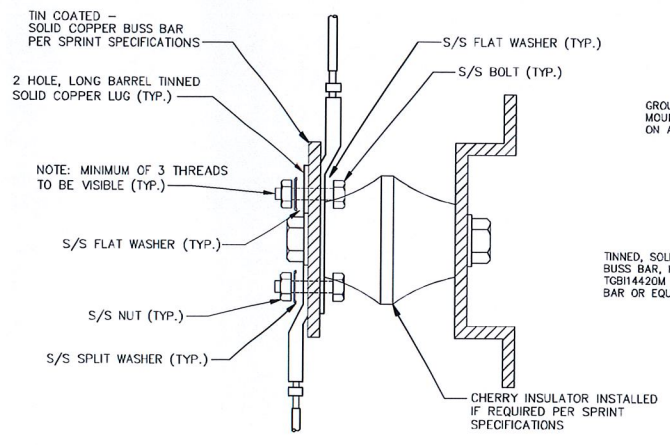
SEPARATION DIMENSIONS MUST BE VERIFIED WITH LOCAL UTILITY CO. REQUIREMENTS.  
 \*HAND DIG INSIDE COMPOUND

**2 UTILITY TRENCH DETAIL**  
 NOT TO SCALE



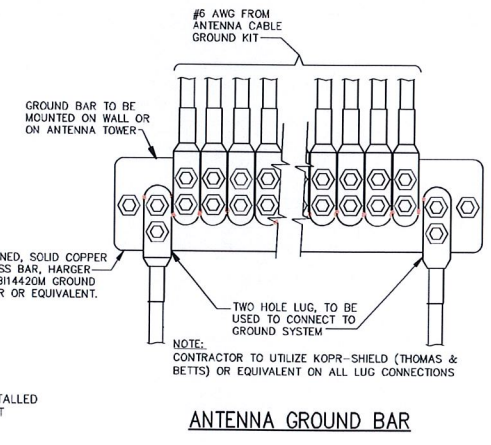
- TINNED COPPER GROUND BAR, 1" x 4" x 20", NEWTON INSTRUMENT Co., HARGER TGB14420M, OR EQUIVALENT. HOLE CENTERS TO MATCH
  - NEMA DOUBLE LUG CONFIGURATION.
  - INSULATORS, NEWTON INSTRUMENT Co. CAT. NO. 3061-4 OR HARGER EQUIVALENT.
  - EQUIVALENT
  - 5/8" LOCKWASHERS, NEWTON INSTRUMENT Co. CAT. NO. 3015-8 OR EQUIVALENT
- WALL MOUNTING BRACKET, NEWTON INSTRUMENT Co. CAT. NO. A-6056 OR HARGER EQUIVALENT.  
 5/8-11 x 1" H.H.C.S. BOLTS, NEWTON INSTRUMENT Co. CAT. NO. 3012-1 OR HARGER EQUIVALENT.
- NOTE:**  
 1) ALL MOUNTING HARDWARE CAN ALSO BE USED ON 6", 12", 18", ETC. GROUND BARS.  
 2) ENTIRE ASSEMBLY AVAILABLE FROM NEWTON INSTRUMENT Co. CAT. NO. 2106060010 OR AS HARGER TGB14420M.

**GROUND BAR**



- NOTES:**  
 1) ALL HARDWARE 18-8 STAINLESS STEEL INCLUDING SPLIT WASHERS.  
 2) COAT WIRE END WITH ANTI-OXIDATION COMPOUND PRIOR TO INSERTION INTO LUG BARREL AND CRIMPING.  
 3) APPLY ANTI-OXIDATION COMPOUND BETWEEN ALL LUGS AND BUSS BARS PRIOR TO MATING AND BOLTING.

**GROUND LUG**



**ANTENNA GROUND BAR**

**3 GROUND BAR DETAILS**  
 NOT TO SCALE

A/E Consultant:  
**enfinigy** engineering  
 11 Herbert Drive  
 Latham, NY 12110  
 (518) 690-0790

STATE OF CONNECTICUT  
 JOHN S. STEINER  
 No. 24705  
 LICENSED PROFESSIONAL ENGINEER

|     |                     |       |         |
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| 3   | FINAL CD'S          | EDM   | 7/16/12 |
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Project Number 286-021

Project Title  
**CT03XC040  
 BRANFORD  
 BANM TOWER**  
 150 NORTH MAIN STREET  
 BRANFORD, CT 06405

Client:  
**sprint**  
 INTERNATIONAL, INC.  
 10000 WOODBRIDGE AVENUE  
 ANN ARBOR, MI 48106

Implementation Team:  
**ALCATEL-LUCENT**  
 808 AVANTON PARKWAY  
 SUITE 700  
 MORRISVILLE, NC 27560

Drawing Scale:  
AS NOTED

Date:  
2/28/12

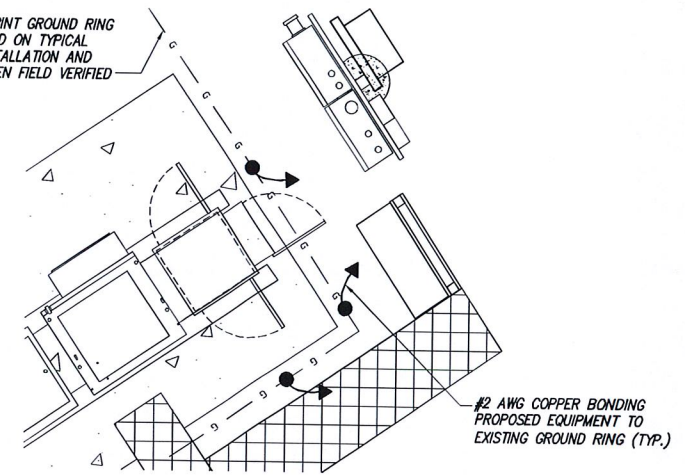
Drawing Title  
**ONE-LINE  
 DIAGRAM  
 AND DETAILS**

Drawing Number  
**E2**



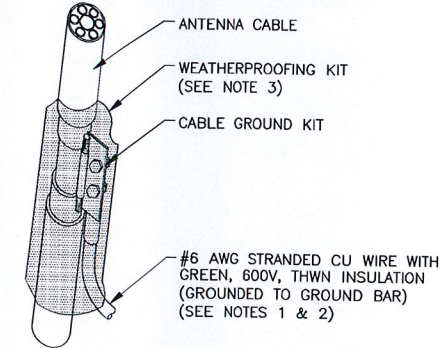
| SYMBOL |                                |
|--------|--------------------------------|
| ⊗      | COPPER GROUND ROD              |
| ▶      | CONNECT PER MANUFACTURER SPECS |
| ●      | CADWELD CONNECTION             |
| —      | GROUND BAR                     |

EXISTING SPRINT GROUND RING SHOWN BASED ON TYPICAL CARRIER INSTALLATION AND HAS NOT BEEN FIELD VERIFIED



1 EQUIPMENT GROUNDING PLAN  
NOT TO SCALE

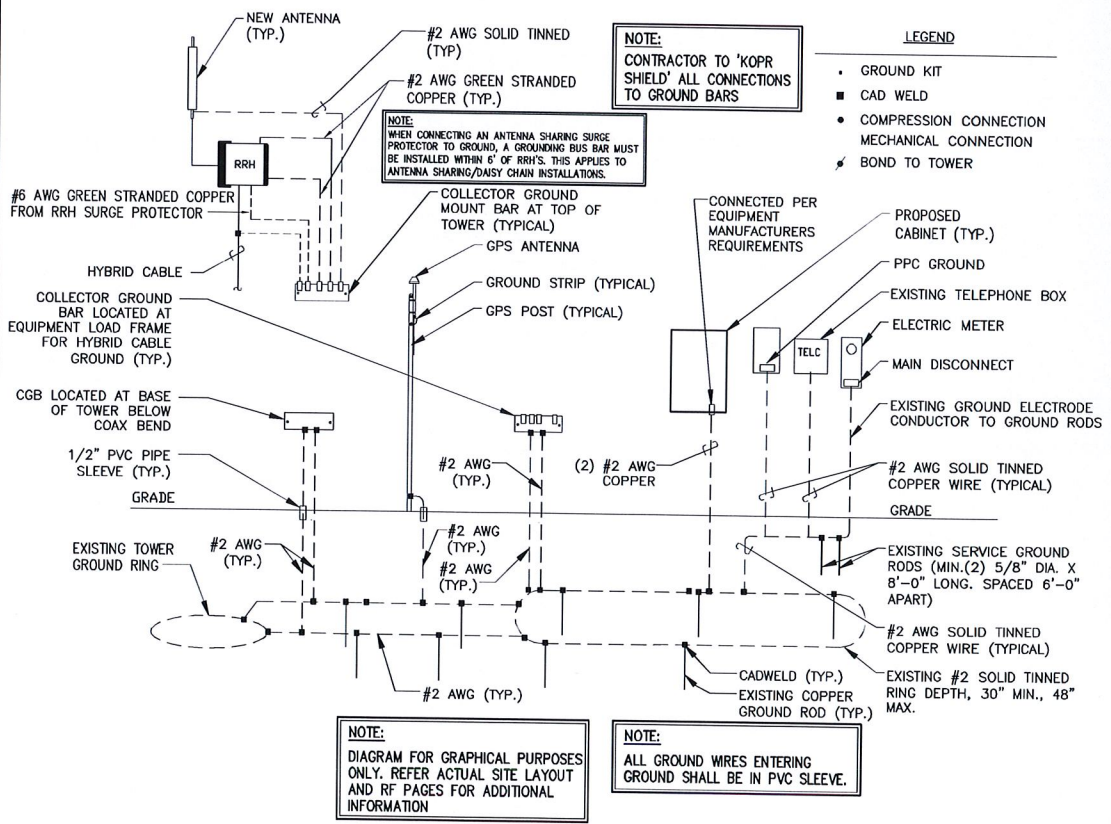
- NOTES:**
- DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO GROUND BAR.
  - GROUNDING KIT SHALL BE TYPE AND PART NUMBER AS SUPPLIED OR RECOMMENDED BY CABLE MANUFACTURER.
  - WEATHERPROOFING SHALL BE TYPE AND PART NUMBER AS SUPPLIED OR RECOMMENDED BY CABLE MANUFACTURER.



3 CONNECTION OF GROUND KIT TO ANTENNA CABLE  
NOT TO SCALE

**GROUNDING NOTES:**

- ALL DOWN CONDUCTORS AND GROUND RING CONDUCTOR SHALL BE #2 AWG, SOLID, BARE, TINNED COPPER, UNO. ALL CONNECTIONS TO GROUND RING SHALL BE EXOTHERMICALLY WELDED. CONDUCTOR SHALL BE A MINIMUM DEPTH BELOW GRADE OF 30 INCHES OR TO THE LEDGE. MINIMUM BEND RADIUS SHALL BE 8 INCHES. CONDUCTOR SHALL BE AT LEAST 24 INCHES FROM ANY FOUNDATION, UNO.
- WHERE MECHANICAL CONDUCTOR CONNECTIONS ARE SPECIFIED, BOLTED, COMPRESSION-TYPE CLAMPS OR SPLIT-BOLT TYPE CONNECTORS SHALL BE USED.
- GRIND OFF GALVANIZING IN AFFECTED AREA. EXOTHERMICALLY WELD #2 CONDUCTOR AT 6 INCHES ABOVE GRADE OR FOUNDATION, WHICHEVER IS HIGHER. COLD-GALV AFTER. EXOTHERMICALLY WELD OTHER END TO GROUND.
- GROUND CONDUCTORS ON EXTERIOR WALL OF SHELTER SHALL BE ENCASED IN 3/4" PVC CONDUIT TO GRADE. MOUNT PVC WITH GALVANIZED "C" CLAMPS. SEAL TOP ENDS.
- FOLLOWING COMPLETION OF WORK, CONDUCT GROUND TEST. SUBMIT WRITTEN TEST TO CONSTRUCTION MANAGER AND PROJECT MANAGER.
- ALL GROUNDING WORK SHALL COMPLY WITH CARRIER(S) STANDARDS.
- GROUNDING REQUIREMENTS SHOWN ON THIS PLAN ARE FOR ITEMS THAT ARE LOCATED NEAR GRADE LEVEL AND THAT NEED TO BE TIED TO THE BELOW GRADE GROUND RING.
- UNLESS NOTED OTHERWISE, ALL GROUNDING SHALL BE IN ACCORDANCE WITH SPRINT'S SSEO DOCUMENTS 3.018.02.004 "BONDING, GROUNDING AND TRANSIENT PROTECTION FOR CELL SITES", AND 3.018.10.002 "SITE RESISTANCE TO EARTH TESTING". ALL GROUNDING SHALL ALSO COMPLY WITH ALL STATE AND LOCAL CODES, AND THE NATIONAL ELECTRICAL CODE (NEC).
- UNLESS NOTED OTHERWISE, ALL GROUNDING CONNECTIONS SHALL BE MADE BY AN EXOTHERMIC WELD.
- RESISTANCE TO EARTH TESTING IS REQUIRED PER SPRINT STANDARDS ON ALL NEW SITES.

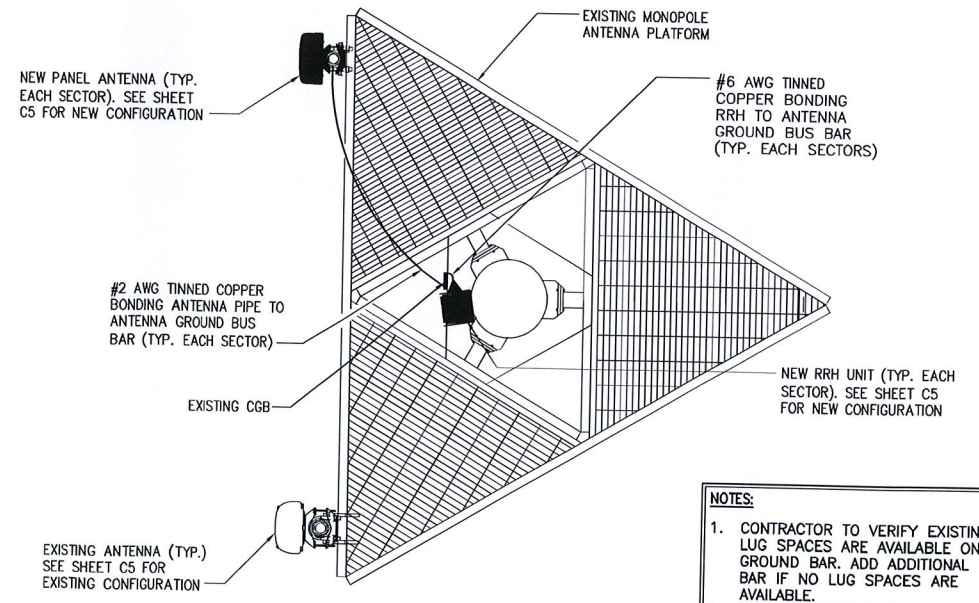


**NOTE:**  
DIAGRAM FOR GRAPHICAL PURPOSES ONLY. REFER ACTUAL SITE LAYOUT AND RF PAGES FOR ADDITIONAL INFORMATION

**NOTE:**  
ALL GROUND WIRES ENTERING GROUND SHALL BE IN PVC SLEEVE.

2 GROUNDING RISER DIAGRAM  
NOT TO SCALE

- LEGEND**
- GROUND KIT
  - CAD WELD
  - COMPRESSION CONNECTION
  - MECHANICAL CONNECTION
  - ▲ BOND TO TOWER



- NOTES:**
- CONTRACTOR TO VERIFY EXISTING LUG SPACES ARE AVAILABLE ON GROUND BAR. ADD ADDITIONAL BUS BAR IF NO LUG SPACES ARE AVAILABLE.
  - ANTENNA GROUNDING CONNECTIONS SHOWN ARE NOT EXACT TO THIS SITE. FOR EXACT ANTENNA LAYOUT REFER TO SHEET C5.

4 TYPICAL ANTENNA GROUNDING PLAN  
NOT TO SCALE

A/E Consultant:

**ministry engineering**  
11 Herbert Drive  
Latham, NY 12110  
(518) 680-0790

STATE OF CONNECTICUT  
JOHN S. STEINBERG  
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BRANFORD  
BANM TOWER

150 NORTH MAIN STREET  
BRANFORD, CT 06405

Client: Sprint  
Implementation Team: ALCATEL-LUCENT  
808 AVATION PARKWAY  
MORRISVILLE, NC 27650

Drawing Scale: AS NOTED  
Date: 2/28/12

Drawing Title: **GROUNDING PLAN AND DETAILS**

Drawing Number: **E3**