

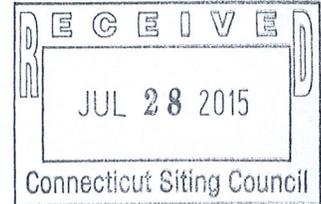


Crown Castle
3 Corporate Park Drive, Suite 101
Clifton Park, NY 12065

July 27, 2015

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

ORIGINAL



RE: **Sprint Modification - EM-SPRINT-025-130313; Crown: 801367**
Sprint Site ID: CT43XC844
Located at: 1119 Summit Road, Cheshire, CT 06410

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-025-130313**, 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.

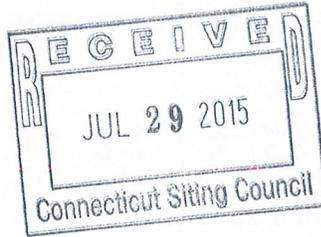
Sincerely,

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

Jeff Barbadora
Real Estate Specialist
781-970-0053

May 20, 2013

Mr. Joshua Mostow
Crown Castle USA, Inc.
1200 MacArthur Blvd, Suite 200
Mahwah, NJ 07430
(201) 236-9059
Joshua.Mostow@crowncastle.com



Tower Engineering Professionals
3703 Junction Boulevard
Raleigh, NC 27603
(919) 661-6351 (office)
(919) 661-6350 (fax)
PMI@tepgroup.net

Subject: Modification Inspection Report

| | | |
|--------------------------------------|-------------------------------------|---------------|
| Crown Castle Designation: | Crown Castle BU Number: | 801367 |
| | Crown Castle Site Name: | CT NHV-2075 |
| | Crown Castle JDE Job Number: | 206188 |
| Engineering Firm Designation: | TEP Project Number: | 131001.801367 |

Site Data:
1121 Summit Road
Cheshire, New Haven County, CT 06410
Latitude N 41° 32' 11.2", Longitude W 72° 57' 26.3"
167 Foot – Monopole Tower

Dear Mr. Mostow,

Tower Engineering Professionals is pleased to submit this **“Modification Inspection Report”** (MI Report) to Crown Castle for the modification/reinforcement to the subject structure. This Modification Inspection (MI) was performed in accordance with Crown Castle ENG-SOW-10007 Modification Inspection SOW, Contract Documents, and Crown Castle Purchase Order number 530109. 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 | Tower Engineering Professionals | Andrew T. Haldane, P.E., C.W.I. | N/A |
| MI Inspector Field Representative (if applicable) | Tower Engineering Professionals | Luke Troxler | 5/6/13 |
| <input checked="" type="checkbox"/> Independent <input type="checkbox"/> EOR <input type="checkbox"/> Turnkey | | | |
| Modification Design EOR | Paul J. Ford and Company | Joseph P. Jacobs, P.E. | N/A |
| General Contractor | AeroSolutions, LLC | 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 Date: February 5, 2013 EOR: Joseph P. Jacobs, P.E. Job#: 37513-0349 | Creator of Drawings: Paul J. Ford and Company Job #: 37513-0349 Date of Drawings: 2/5/13 | CClites Drawing File: 3461318 |

Based on our inspection, Tower Engineering Professionals, Inc. determines this project:

PASSING MI

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

PASS AS NOTED MI

The configuration, materials and/or workmanship of the modifications are accepted as noted (see detail below).

FAILED MI

The configuration, materials and/or workmanship of the modifications are NOT installed in accordance with the Contract Documents. The rejection is based on non-conformance in the following area(s):

- Materials (see detail below)
- Workmanship (see detail below)
- Configuration (see detail below)

Discrepancies were noted between the As-Built field conditions and the structural modification drawings. The As-Built field conditions were approved by the Engineer of Record. All discrepancies are noted in the executive summary.

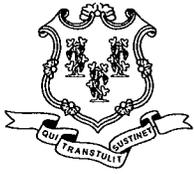
All observations were performed after the construction was complete. Tower Engineering Professionals, Inc. was not present during the construction phase. The onsite PMI was performed by Luke Troxler and Hannah Childers, Tower Engineering Professionals, Inc., (919) 661-6351.

We at Tower Engineering Professionals, Inc. 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,



Andrew T. Haldane, P.E., C.W.I.



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
www.ct.gov/csc

April 5, 2013

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

RE: **EM-SPRINT-NEXTEL-025-130313** –Sprint Nextel Corporation notice of intent to modify an existing telecommunications facility located at 1119 Summit Road, Cheshire, 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 modification drawings attached to the Structural Modification Report prepared by Paul J. Ford and Company dated January 28, 2013 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 Timothy Slocum, Council Chairman, Town of Cheshire
William S. Voelker, AICP, Town Planner, Town of Cheshire



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

www.ct.gov/csc

March 18, 2013

The Honorable Timothy Slocum
Council Chairman
Town of Cheshire
84 South Main Street
Cheshire, CT 06410

RE: **EM-SPRINT-NEXTEL-014-130313** –Sprint Nextel Corporation notice of intent to modify an existing telecommunications facility located at 1119 Summit Road, Cheshire, Connecticut.

Dear Mr. Slocum:

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,

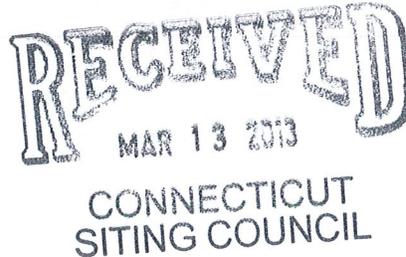
Linda Roberts
Executive Director

LR/cm

c: William S. Voelker, AICP, Town Planner, Town of Cheshire

March 11, 2013

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



Re: 1119 Summit Road, Cheshire, CT

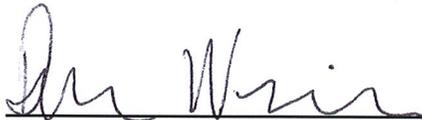
Dear Ms. Roberts,

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: 

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

CC: Mayor Tim Slocum
Town of Cheshire Town Hall
84 South Main Street
Cheshire, CT 06410

Notice of Exempt Modification

1119 Summit Road, Cheshire, 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 170' monopole tower located at 1119 Summit Road in the Town of Cheshire. 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 room in the equipment building at the base of the tower within the fenced compound.

The 170' monopole tower located at 1119 Summit Road in the Town of Cheshire (lat. 41° 32' 11", long. 72° 57' 28.2") is owned by Crown Castle. It is in an approx. 2,000 square foot fenced compound. Sprint currently has six (6) antennas (two (2) per sector) with a centerline of 147' installed on the tower. Sprint's base station equipment is located in its equipment room in the equipment building at the base of the tower within the fenced compound. A site plan depicting this is attached.

Sprint plans to add three (3) RFS APXVSP18-C-A20 antennas, one (1) per sector, all with a centerline of 147'. Connected to each new RFS 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, all of which will be located behind the antenna on a new ring

mount approximately 2 ft +/- from the platform. After the new antennas have been tested and are deployed on-air, the six (6) previously existing 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 and a new Ciena equipment enclosure, and to retrofit or replace the BTS cabinet, in its equipment room in the equipment building. 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 loading. The structure and foundation were found to be of "Sufficient Capacity" with the proposed modifications (see the first page of Structural Modification Report, January 28, 2013). The tower is rated at 99.8% of its capacity with the proposed modifications (see Pages 5-6 of Structural Modification Report, January 28, 2013). Sprint commissioned EBI Consulting to perform a structural assessment of the existing mounting system. They concluded that the existing mounting system is "[C]apable of supporting the existing and proposed equipment without causing an overstress condition in the mounting system" (see the second page of Structural Assessment Letter, September 7, 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 40.922% 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, September 9, 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, September 9, 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, September 9, 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.



Imagery ©2013 Datacube, GeoEye, USGS, Geological Survey, USDA, Terra Service Agency, Mapbox ©2013 Google

1119 Summit Road, Cheshire, CT

STRUCTURAL ASSESSMENT LETTER

September 7, 2012

Site Number: CT43XC844
Site Name: Cheshire-I84/Crown
Site Address: 1119 Summit Road, Cheshire, CT 06410

Project Number: 81121635
Project Name: Sprint Network Vision – Southern Connecticut Market

This letter is to confirm EBI's structural assessment of the existing Sprint antenna mounting system on the above listed site located in the Sprint Network Vision – Region 1, Southern Connecticut market. The intent of this review is to determine if the proposed modification of antennas and equipment will exceed the structural capacity of the existing mounting system.

The existing antenna mounting system has been categorized as a *Flat Low Profile Platform*. Currently, Sprint has (6) panel antennas and (6) 1 5/8" coax mounted to the platform at a centerline elevation of 147'-11" +/- above ground level. Sprint is proposing the following two steps to complete the equipment upgrade:

- **Step 1 – Interim Configuration**
Sprint is proposing to install (3) RFS APXVSP18-C-A20 panel antennas, (3) 800 MHz RRHs, (3) 1900 MHz RRHs, (3) 800 MHz Filters, and (3) hybrid fiber cables. The proposed panel antennas are to be installed on proposed 2-7/8" O.D. pipe masts attached to the mounting system face (one per sector, mounted at the center position on each platform face). The proposed RRHs and filters are to be installed on proposed mast pipes mounted to a proposed ring mount approximately 2 ft +/- from the platform. The interim configuration is to be in place for less than 1 year.
- **Step 2 – Final Configuration**
After interim configuration is completed, Sprint is proposing to remove (6) existing Sprint panel antennas and (6) 1-5/8" coax.

The generic Flat Low Profile Platform antenna mounting system has the following assumed characteristics:

- Triangular in plan with a nominal face width of between 12'-0" and 13'-0", designed to support (4) antennas per face.
- Horizontal platform perimeter members are made from L3x3x1/4" steel angles minimum or steel hollow structural sections HSS3x2.5x3/16" minimum.
- Main supporting members, spanning from the tower connection point to each of the triangular plan faces, made from steel hollow structural sections HSS4x4x3/16" minimum.
- Platform walking/standing surface consists of either 1"x3/16" steel bar or expanded metal grating.
- Connected to the tower with a robust ring mount with (3) 3/4" minimum diameter or (2) 7/8" minimum diameter high-strength steel threaded rods at each connection.

This analysis of the existing mounting system is in compliance with ANSI/TIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures, using a basic design wind speed of 85 mph with no ice and 50 mph with 0.75" of escalating ice (ASCE7 ice load provisions).

By engineering analysis and/or comparison, the existing antenna mounting system is capable of supporting the existing and proposed equipment without causing an overstress condition in the mounting system.

This certification is based on the physical platform characteristics as described above and as determined through site specific photos, proposed CDs, and existing structural analysis. This certification also assumes that all structural members and connections have been properly designed and remain in good condition. Prior to installation of any new antennas and/or RRHs, contractor shall inspect the condition of all relevant members and connectors. The contractor shall be responsible for the means and methods of construction and reporting to EBI Consulting if mount members are found to be smaller than assumed above, prior to placement of proposed appurtenances.

Analysis and certification of the existing tower structure may be performed by others and will be submitted separately.

Please contact us at 781-273-2500 if you have any questions.

Sincerely yours,
EBI Consulting



Andrew White, P.E., SECB
Structural Engineer





EBI Consulting

environmental | engineering | due diligence

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

Sprint Existing Facility

Site ID: CT43XC844

Upper Stepney - TLC
1118 Summit Road
Cheshire, CT 06410

September 09, 2012



September 9, 2012

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

Re: Emissions Values for Site **CT43XC844 - Cheshire I-84 Crown**

EBI Consulting was directed to analyze the proposed upgrades to the existing Sprint facility located at 1118 Summit Road, Cheshire, 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 1118 Summit Road, Cheshire, 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) 4 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 APXVSP18-C-A20. This is based on feedback from the carrier with regards to anticipated antenna selection. This antenna 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. 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 **147.9 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 | CT143XC844 - Cheshire I-84 Crown |
| Site Address | 1118 Summit Road, Cheshire, CT 06410 |
| 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 (dBd) | Antenna Height (ft) | Antenna analysis height | Cable Size | Cable Loss (dB) | Additional Loss | ERP | Power Density Value | Power Density Percentage |
|--|--------------|----------------|------------|----------------|------------|-------------------------------|--------------------|-----------------|---|---------------------|-------------------------|------------|-----------------|-----------------|-----------|---------------------|--------------------------|
| 1a | RFS | APXVSP18-C-A20 | RRH | 1900 MHz | CDMA / LTE | 20 | 4 | 80 | 15.9 | 147.9 | 141.9 | 1/2" | 0.5 | 0 | 2773.8948 | 49.52576 | 4.95258% |
| | RFS | APXVSP18-C-A20 | RRH | 850 MHz | CDMA / LTE | 20 | 1 | 20 | 13.4 | 147.9 | 141.9 | 1/2" | 0.5 | 0 | 389.96892 | 6.962596 | 1.22797% |
| Sector total Power Density Value: 6.181% | | | | | | | | | | | | | | | | | |

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 (dBd) | Antenna Height (ft) | Antenna analysis height | Cable Size | Cable Loss (dB) | Additional Loss | ERP | Power Density Value | Power Density Percentage |
|--|--------------|----------------|------------|----------------|------------|-------------------------------|--------------------|-----------------|---|---------------------|-------------------------|------------|-----------------|-----------------|-----------|---------------------|--------------------------|
| 2a | RFS | APXVSP18-C-A20 | RRH | 1900 MHz | CDMA / LTE | 20 | 4 | 80 | 15.9 | 147.9 | 141.9 | 1/2" | 0.5 | 0 | 2773.8948 | 49.52576 | 4.95258% |
| | RFS | APXVSP18-C-A20 | RRH | 850 MHz | CDMA / LTE | 20 | 1 | 20 | 13.4 | 147.9 | 141.9 | 1/2" | 0.5 | 0 | 389.96892 | 6.962596 | 1.22797% |
| Sector total Power Density Value: 6.181% | | | | | | | | | | | | | | | | | |

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 (dBd) | Antenna Height (ft) | Antenna analysis height | Cable Size | Cable Loss (dB) | Additional Loss | ERP | Power Density Value | Power Density Percentage |
|--|--------------|----------------|------------|----------------|------------|-------------------------------|--------------------|-----------------|---|---------------------|-------------------------|------------|-----------------|-----------------|-----------|---------------------|--------------------------|
| 3a | RFS | APXVSP18-C-A20 | RRH | 1900 MHz | CDMA / LTE | 20 | 4 | 80 | 15.9 | 147.9 | 141.9 | 1/2" | 0.5 | 0 | 2773.8948 | 49.52576 | 4.95258% |
| 3a | RFS | APXVSP18-C-A20 | RRH | 850 MHz | CDMA / LTE | 20 | 1 | 20 | 13.4 | 147.9 | 141.9 | 1/2" | 0.5 | 0 | 389.96892 | 6.962596 | 1.22797% |
| Sector total Power Density Value: 6.181% | | | | | | | | | | | | | | | | | |

| Site Composite MPE % | |
|-------------------------|----------------|
| Carrier | MPE % |
| Sprint | 18.542% |
| T-Mobile | 5.180% |
| Pocket | 4.890% |
| Verizon Wireless | 4.670% |
| AT&T | 3.000% |
| Nextel | 4.640% |
| Total Site MPE % | 40.922% |

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 **18.542% (3.597% 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 **40.922%** 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



**PAUL J. FORD AND COMPANY
STRUCTURAL ENGINEERS**

250 East Broad Street • Suite 1500 • Columbus, Ohio 43215-3708

Date: January 28, 2013

David Grimes
Crown Castle USA Inc.
3530 Toringdon Way Suite 300
Charlotte, NC 28277

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

Subject: Structural Modification Report

Carrier Designation: *Sprint PCS Co-Locate*
Carrier Site Number: CT43XC844
Carrier Site Name: N/A

Crown Castle Designation:
Crown Castle BU Number: 801367
Crown Castle Site Name: CT NHV-2075 CAC 801367
Crown Castle JDE Job Number: 206188
Crown Castle Work Order Number: 571187

Engineering Firm Designation: Paul J Ford and Company Project Number: 37513-0349 BP

Site Data: 1121 Summit Road, Cheshire, New Haven County, CT
Latitude 41° 32' 11.2", Longitude -72° 57' 26.3"
167 Foot - Monopole Tower

Dear David Grimes,

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 517975, in accordance with application 164085, revision 5.

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:

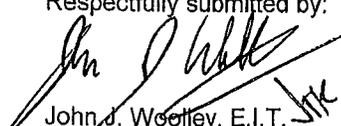
LC4.7: Modified Structure w/ Existing + Reserved + Proposed Equipment **Sufficient Capacity**
Note: See Table I and Table II for the proposed and existing/reserved loading, respectively.

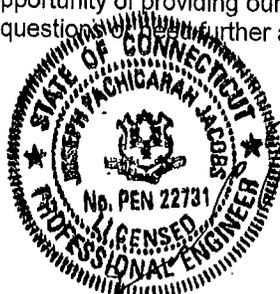
The structural analysis was performed for this tower in accordance with the requirements of TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures and 2005 CT state building code using a fastest mile wind speed of 85 mph with no ice, 37.6 mph with 0.75 inch ice thickness and 50 mph under service loads.

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:


John J. Woolley, E.I.T.
Structural Engineer





**PAUL J. FORD AND COMPANY
STRUCTURAL ENGINEERS**

250 East Broad Street • Suite 1500 • Columbus, Ohio 43215-3708

Date: **January 28, 2013**

David Grimes
Crown Castle USA Inc.
3530 Toringdon Way Suite 300
Charlotte, NC 28277

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

Subject: Structural Modification Report

Carrier Designation: **Sprint PCS Co-Locate**
Carrier Site Number: CT43XC844
Carrier Site Name: N/A

Crown Castle Designation: **Crown Castle BU Number:** 801367
Crown Castle Site Name: CT NHV-2075 CAC 801367
Crown Castle JDE Job Number: 206188
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LC4.7: Modified Structure w/ Existing + Reserved + Proposed Equipment **Sufficient Capacity**
Note: See Table I and Table II for the proposed and existing/reserved loading, respectively.

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 and 2005 CT state building code 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.

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.

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John J. Woolley, E.I.T.
Structural Engineer

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1) INTRODUCTION

This tower is a 167 ft Monopole tower designed by SUMMIT in June of 2001. The tower was originally designed for a wind speed of 85 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 and 2005 CT state building code 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 |
|---------------------|----------------------------|--------------------|----------------------|-------------------------------|----------------------|---------------------|------|
| 148.0 | 147.0 | 3 | alcatel lucent | 800 EXTERNAL NOTCH FILTER | 3 | 1/2 | - |
| | | 9 | rfs celwave | ACU-A20-N | | | |
| | | 3 | rfs celwave | APXVSPP18-C-A20 w/ Mount Pipe | | | |
| 146.0 | 146.0 | 3 | alcatel lucent | PCS 1900MHz 4x45W-65MHz | - | - | - |
| | | 3 | alcatel lucent | TME-800MHZ RRH | | | |
| | | 1 | tower mounts | Side Arm Mount [SO 102-3] | | | |

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 | |
|---------------------|----------------------------|------------------------|-------------------------------|--------------------------------------|------------------------------------|---------------------|-------|---|
| 167.0 | 172.0 | 1 | decibel | DB222-A | 1 | 1/2 | 1 | |
| | 171.0 | 1 | gps | GPS_A | 1 | 7/8 | | |
| | 168.0 | | 3 | antel | BXA-171063/8CFx2 w/ Mount Pipe | 6 | 1-5/8 | 2 |
| | | | 3 | antel | BXA-70063-6CF-EDIN-2 w/ Mount Pipe | | | |
| | | | 6 | antel | LPA-80063-6CF-EDIN w/ Mount Pipe | 12 | 1-5/8 | 1 |
| 167.0 | 1 | tower mounts | Platform Mount [LP 712-1] | | | | | |
| 158.0 | 160.0 | 3 | andrew | SBNH-1D6565C w/ Mount Pipe | - | - | 2 | |
| | | 1 | raycap | DC6-48-60-18-8F | | | | |
| | | 6 | powerwave technologies | 7770.00 w/ Mount Pipe | 1 2 12 | 3/8 3/4 1-5/8 | 1 | |
| | | 6 | powerwave technologies | LGP13519 | | | | |
| | 6 | powerwave technologies | LGP21401 | | | | | |
| | 158.0 | 1 | tower mounts | Platform Mount [LP 712-1] | | | | |
| 156.0 | 156.0 | 1 | tower mounts | Side Arm Mount [SO 102-3] | - | - | 2 | |
| | | 6 | ericsson | RRUS-11 | | | | |
| 148.0 | 148.0 | 1 | tower mounts | Platform Mount [LP 712-1] | - | - | 1 | |
| | 147.0 | 6 | decibel | DB980F65T4E-M w/ Mount Pipe | 6 | 1-5/8 | 3 | |
| 138.0 | 139.0 | 3 | ericsson | KRY 112 134/1 | 18 | 1-5/8 | 1 | |
| | | 3 | ericsson | KRY 112 89/5 | | | | |
| | | 6 | remec | S20057A-1 | | | | |
| | | 3 | rfs celwave | APX16DWV-16DWV-S-E-A20 w/ Mount Pipe | | | | |
| | 3 | rfs celwave | APX16PV-16PVL-E w/ Mount Pipe | | | | | |
| 138.0 | 1 | tower mounts | Platform Mount [LP 712-1] | | | | | |
| 128.0 | 128.0 | 12 | decibel | DB846G90A-XY w/ Mount Pipe | 12 | 1-1/4 | 1 | |
| | | 1 | tower mounts | Platform Mount [LP 712-1] | | | | |
| 120.0 | 120.0 | 1 | tower mounts | Pipe Mount [PM 601-3] | 6 | 1-5/8 | 1 | |
| | 119.0 | 3 | rfs celwave | APXV18-206517S-C w/ Mount Pipe | | | | |

- Notes:
 1) Existing Equipment
 2) Reserved Equipment
 3) Equipment To Be Removed

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

| Document | Remarks | Reference | Source |
|--|--|-----------|----------|
| Original Tower Drawings | Summit, Job #: 14620, dated 6/12/2001 | 799210 | CCISITES |
| Foundation Drawings | PJF Job #: 29201-0692, dated 6/6/2001 | 842573 | CCISITES |
| Geotechnical Report | CHA Project #: 8961.07.08, dated 5/15/2001 | 445076 | CCISITES |
| 4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA | PJF, 37512-1657 BP Sabre, 6/19/2012 | 3245562 | CCISITES |

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 has been reinforced in conformance with the referenced modification drawings.
- 5) Monopole will be reinforced in conformance with referenced modification design.
- 6) This analysis analyzes both foundation options in the manufacturer's drawings as it is not clear which was installed.

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 | 167 - 118.25 | Pole | TP35.36x24x0.25 | 1 | -12.78 | 1405.09 | 78.3 | Pass |
| L2 | 118.25 - 90.5 | Pole | TP41.3282x33.8114x0.3125 | 2 | -20.06 | 2114.96 | 99.8 | Pass |
| L3 | 90.5 - 77.75 | Pole | TP44.3x41.3282x0.3819 | 3 | -21.93 | 2347.81 | 98.5 | Pass |
| L4 | 77.75 - 63.5 | Pole | TP46.9913x42.2543x0.375 | 4 | -28.11 | 2884.51 | 98.6 | Pass |
| L5 | 63.5 - 51.5 | Pole | TP49.7851x46.9913x0.4599 | 5 | -31.98 | 3276.31 | 95.6 | Pass |
| L6 | 51.5 - 45 | Pole | TP51.2985x49.7851x0.4572 | 6 | -34.15 | 3358.00 | 97.5 | Pass |
| L7 | 45 - 0 | Pole | TP61.04x51.2985x0.4375 | 7 | -50.03 | 4374.92 | 96.3 | Pass |
| | | | | | | | Summary | |
| | | | | | | Pole (L2) | 99.8 | Pass |
| | | | | | | Rating = | 99.8 | Pass |

Table 5 - Tower Component Stresses vs. Capacity

| Notes | Component | Elevation (ft) | % Capacity | Pass / Fail |
|---------|----------------------------------|----------------|------------|-------------|
| 1 | Anchor Rods | 0 | 92.6 | Pass |
| 1 | Base Plate | 0 | 79.3 | Pass |
| 1, 3 | Base Foundation Structural Steel | 0 | 64.2 | Pass |
| 1, 3 | Base Foundation Soil Interaction | 0 | 89.0 | Pass |
| 1, 2 | Base Foundation Structural Steel | 0 | 99.5 | Pass |
| 1, 2, 4 | Base Foundation Soil Interaction | 0 | 90.3 | Pass |

| | |
|---|--------------|
| Structure Rating (max from all components) = | 99.8% |
|---|--------------|

Notes:

- 1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.
- 2) Caisson foundation
- 3) Spread footing foundation
- 4) Foundation Analysis Notes: According to the procedures prescribed and agreed to by the Crown Castle Engineering Foundation Committee, held in January 2010, the existing caisson foundation was analyzed using the methodology in the software 'PLS-Caisson' (Version 8.10, or newer, by Power Line Systems, Inc.). Per the methods in PLS-Caisson, the soil reactions of cohesive soils are calculated using 8CD independent of the depth of the soil layer. The depth of soil to be ignored at the top of the caisson is the greater of the geotechnical report's recommendation, the frost depth of the site or half of the caisson diameter.

4.1) Recommendations

See 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 85.00 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 37.60 mph is used in combination with ice.
- 7) Temperature drop of 50.00 °F.
- 8) Deflections calculated using a wind speed of 50.00 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"> Consider Moments - Legs Consider Moments - Horizontals Consider Moments - Diagonals Use Moment Magnification √ Use Code Stress Ratios √ Use Code Safety Factors - Guys √ Escalate Ice Always Use Max Kz Use Special Wind Profile Include Bolts In Member Capacity Leg Bolts Are At Top Of Section Secondary Horizontal Braces Leg Use Diamond Inner Bracing (4 Sided) Add IBC .6D+W Combination | <ul style="list-style-type: none"> Distribute Leg Loads As Uniform Assume Legs Pinned √ Assume Rigid Index Plate √ Use Clear Spans For Wind Area Use Clear Spans For KL/r Retension Guys To Initial Tension √ Bypass Mast Stability Checks √ Use Azimuth Dish Coefficients √ Project Wind Area of Appurt. Autocalc Torque Arm Areas SR Members Have Cut Ends Sort Capacity Reports By Component Triangulate Diamond Inner Bracing | <ul style="list-style-type: none"> Treat Feedline Bundles As Cylinder Use ASCE 10 X-Brace Ly Rules Calculate Redundant Bracing Forces Ignore Redundant Members in FEA SR Leg Bolts Resist Compression All Leg Panels Have Same Allowable Offset Girt At Foundation √ Consider Feedline Torque Include Angle Block Shear Check Poles √ Include Shear-Torsion Interaction Always Use Sub-Critical Flow Use Top Mounted Sockets |
|--|--|--|

Tapered Pole Section Geometry

| Section | Elevation | Section Length | Splice Length | Number of Sides | Top Diameter | Bottom Diameter | Wall Thickness | Bend Radius | Pole Grade |
|---------|-------------------|----------------|---------------|-----------------|--------------|-----------------|----------------|-------------|--------------------------|
| | ft | ft | ft | | in | in | in | in | |
| L1 | 167.0000-118.2500 | 48.7500 | 4.50 | 18 | 24.0000 | 35.3600 | 0.2500 | 1.0000 | A607-65 (65 ksi) |
| L2 | 118.2500-90.5000 | 32.2500 | 0.00 | 18 | 33.8114 | 41.3282 | 0.3125 | 1.2500 | A607-65 (65 ksi) |
| L3 | 90.5000-77.7500 | 12.7500 | 5.50 | 18 | 41.3282 | 44.3000 | 0.3819 | 1.5276 | Reinf 56.80 ksi (57 ksi) |
| L4 | 77.7500-63.5000 | 19.7500 | 0.00 | 18 | 42.2542 | 46.9913 | 0.3750 | 1.5000 | A607-65 (65 ksi) |
| L5 | 63.5000-51.5000 | 12.0000 | 0.00 | 18 | 46.9913 | 49.7851 | 0.4599 | 1.8397 | Reinf 56.89 ksi (57 ksi) |
| L6 | 51.5000-45.0000 | 6.5000 | 0.00 | 18 | 49.7851 | 51.2985 | 0.4572 | 1.8287 | Reinf 56.91 ksi (57 ksi) |
| L7 | 45.0000-0.0000 | 45.0000 | | 18 | 51.2985 | 61.0400 | 0.4375 | 1.7500 | A607-65 (65 ksi) |

Tapered Pole Properties

| Section | Tip Dia. in | Area in ² | I in ⁴ | r in | C in | I/C in ³ | J in ⁴ | I/Q in ² | w in | w/t |
|---------|----------------|-------------------------|----------------------|---------|---------|------------------------|----------------------|------------------------|---------|--------|
| L1 | 24.3702 | 18.8456 | 1342.9976 | 8.4313 | 12.1920 | 110.1540 | 2687.7623 | 9.4246 | 3.7840 | 15.136 |
| | 35.9055 | 27.8598 | 4338.8723 | 12.4641 | 17.9629 | 241.5466 | 8683.4538 | 13.9325 | 5.7834 | 23.133 |
| L2 | 35.3980 | 33.2267 | 4710.6979 | 11.8921 | 17.1762 | 274.2576 | 9427.5943 | 16.6165 | 5.4008 | 17.283 |
| | 41.9658 | 40.6825 | 8646.6072 | 14.5606 | 20.9947 | 411.8463 | 17304.5919 | 20.3451 | 6.7238 | 21.516 |
| L3 | 41.9658 | 49.6331 | 10513.2981 | 14.5359 | 20.9947 | 500.7586 | 21040.4298 | 24.8213 | 6.6016 | 17.286 |
| | 44.9834 | 53.2354 | 12972.5293 | 15.5909 | 22.5044 | 576.4441 | 25962.1282 | 26.6227 | 7.1247 | 18.656 |
| L4 | 44.2456 | 49.8468 | 11045.1680 | 14.8671 | 21.4652 | 514.5626 | 22104.8696 | 24.9281 | 6.7767 | 18.071 |
| | 47.7162 | 55.4851 | 15233.1262 | 16.5488 | 23.8716 | 638.1281 | 30486.2966 | 27.7478 | 7.6105 | 20.295 |
| L5 | 47.7162 | 67.9273 | 18581.1945 | 16.5186 | 23.8716 | 778.3814 | 37186.8386 | 33.9701 | 7.4610 | 16.222 |
| | 50.5532 | 72.0058 | 22133.1353 | 17.5104 | 25.2909 | 875.1439 | 44295.3940 | 36.0098 | 7.9527 | 17.291 |
| L6 | 50.5532 | 71.5793 | 22004.4775 | 17.5114 | 25.2909 | 870.0568 | 44037.9092 | 35.7964 | 7.9575 | 17.406 |
| | 52.0898 | 73.7753 | 24092.4674 | 18.0487 | 26.0596 | 924.5133 | 48216.6363 | 36.8946 | 8.2239 | 17.988 |
| L7 | 52.0898 | 70.6268 | 23082.1546 | 18.0556 | 26.0596 | 885.7440 | 46194.6813 | 35.3201 | 8.2585 | 18.877 |
| | 61.9816 | 84.1541 | 39047.5735 | 21.5139 | 31.0083 | 1259.2612 | 78146.5267 | 42.0851 | 9.9730 | 22.796 |

| Tower Elevation | Gusset Area (per face) | Gusset Thickness | Gusset Grade | Adjust. Factor A _r | Adjust. Factor A _r | Weight Mult. | Double Angle Stitch Bolt Spacing Diagonals | Double Angle Stitch Bolt Spacing Horizontals |
|----------------------|------------------------|------------------|--------------|-------------------------------|-------------------------------|--------------|--|--|
| ft | ft ² | in | | | | | in | in |
| L1 167.0000-118.2500 | | | | 1 | 1 | 1 | | |
| L2 118.2500-90.5000 | | | | 1 | 1 | 1 | | |
| L3 90.5000-77.7500 | | | | 1 | 1 | 1 | | |
| L4 77.7500-63.5000 | | | | 1 | 1 | 1 | | |
| L5 63.5000-51.5000 | | | | 1 | 1 | 1 | | |
| L6 51.5000-45.0000 | | | | 1 | 1 | 1 | | |
| L7 45.0000-0.0000 | | | | 1 | 1 | 1 | | |

Feed Line/Linear Appurtenances - Entered As Area

| Description | Face or Leg | Allow Shield | Component Type | Placement | Total Number | C _A A _A | Weight |
|------------------|-------------|--------------|----------------|-------------------|--------------|-------------------------------|--------|
| | | | | ft | | ft ² /ft | plf |
| HJ7-50A(1-5/8") | C | No | Inside Pole | 167.0000 - 0.0000 | 6 | No Ice | 0.0000 |
| | | | | | | 1/2" Ice | 0.0000 |
| | | | | | | 1" Ice | 0.0000 |
| | | | | | | 2" Ice | 0.0000 |
| | | | | | | 4" Ice | 0.0000 |
| LDF7-50A(1-5/8") | C | No | Inside Pole | 167.0000 - 0.0000 | 6 | No Ice | 0.0000 |
| | | | | | | 1/2" Ice | 0.0000 |
| | | | | | | 1" Ice | 0.0000 |
| | | | | | | 2" Ice | 0.0000 |
| | | | | | | 4" Ice | 0.0000 |

| Description | Face or Leg | Allow Shield | Component Type | Placement ft | Total Number | C _A A _A | | Weight plf | |
|-------------------------|---------------------|--------------|--------------------|---------------------|-------------------|-------------------------------|--------|---------------|------|
| | | | | | | ft ² /ft | | | |
| LDF4-50A(1/2") | C | No | Inside Pole | 167.0000 - 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 | |
| LDF5-50A(7/8") | C | No | Inside Pole | 167.0000 - 0.0000 | 1 | No Ice | 0.0000 | 0.33 | |
| | | | | | | 1/2" Ice | 0.0000 | 0.33 | |
| | | | | | | 1" Ice | 0.0000 | 0.33 | |
| | | | | | | 2" Ice | 0.0000 | 0.33 | |
| | | | | | | 4" Ice | 0.0000 | 0.33 | |
| 561(1-5/8") | C | No | CaAa (Out Of Face) | 167.0000 - 138.0000 | 1 | No Ice | 0.1625 | 1.35 | |
| | | | | | | 1/2" Ice | 0.2625 | 2.65 | |
| | | | | | | 1" Ice | 0.3625 | 4.56 | |
| | | | | | | 2" Ice | 0.5625 | 10.21 | |
| | | | | | | 4" Ice | 0.9625 | 28.84 | |
| 561(1-5/8") | C | No | CaAa (Out Of Face) | 167.0000 - 0.0000 | 5 | No Ice | 0.0000 | 1.35 | |
| | | | | | | 1/2" Ice | 0.0000 | 2.65 | |
| | | | | | | 1" Ice | 0.0000 | 4.56 | |
| | | | | | | 2" Ice | 0.0000 | 10.21 | |
| | | | | | | 4" Ice | 0.0000 | 28.84 | |
| 561(1-5/8") | C | No | CaAa (Out Of Face) | 138.0000 - 0.0000 | 1 | No Ice | 0.0000 | 1.35 | |
| | | | | | | 1/2" Ice | 0.0000 | 2.65 | |
| | | | | | | 1" Ice | 0.0000 | 4.56 | |
| | | | | | | 2" Ice | 0.0000 | 10.21 | |
| | | | | | | 4" Ice | 0.0000 | 28.84 | |
| *** | LDF7-50A(1-5/8") | C | No | Inside Pole | 158.0000 - 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 | |
| FB-L98B-002-75000(3/8") | C | No | CaAa (Out Of Face) | 158.0000 - 0.0000 | 1 | No Ice | 0.0000 | 0.06 | |
| | | | | | | 1/2" Ice | 0.0000 | 0.60 | |
| | | | | | | 1" Ice | 0.0000 | 1.76 | |
| | | | | | | 2" Ice | 0.0000 | 5.91 | |
| | | | | | | 4" Ice | 0.0000 | 21.53 | |
| WR-VG86ST-BRD(3/4) | C | No | CaAa (Out Of Face) | 158.0000 - 0.0000 | 1 | No Ice | 0.0000 | 0.59 | |
| | | | | | | 1/2" Ice | 0.0000 | 1.37 | |
| | | | | | | 1" Ice | 0.0000 | 2.76 | |
| | | | | | | 2" Ice | 0.0000 | 7.37 | |
| | | | | | | 4" Ice | 0.0000 | 23.92 | |
| WR-VG86ST-BRD(3/4) | C | No | CaAa (Out Of Face) | 158.0000 - 0.0000 | 1 | No Ice | 0.0774 | 0.59 | |
| | | | | | | 1/2" Ice | 0.1774 | 1.37 | |
| | | | | | | 1" Ice | 0.2774 | 2.76 | |
| | | | | | | 2" Ice | 0.4774 | 7.37 | |
| | | | | | | 4" Ice | 0.8774 | 23.92 | |
| *** | LDF7-50A(1-5/8") | C | No | Inside Pole | 148.0000 - 0.0000 | 6 | 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 | |
| *** | FLC 158-50J(1-5/8") | C | No | Inside Pole | 138.0000 - 0.0000 | 14 | No Ice | 0.0000 | 0.92 |
| 1/2" Ice | | | | | | | 0.0000 | 0.92 | |
| 1" Ice | | | | | | | 0.0000 | 0.92 | |
| 2" Ice | | | | | | | 0.0000 | 0.92 | |
| 4" Ice | | | | | | | 0.0000 | 0.92 | |
| FLC 158-50J(1-5/8") | C | No | CaAa (Out Of Face) | 138.0000 - 0.0000 | 2 | No Ice | 0.0000 | 0.92 | |
| | | | | | | 1/2" Ice | 0.0000 | 2.46 | |
| | | | | | | 1" Ice | 0.0000 | 4.60 | |
| | | | | | | 2" Ice | 0.0000 | 10.73 | |
| | | | | | | 4" Ice | 0.0000 | 30.31 | |
| FLC 158-50J(1-5/8") | C | No | CaAa (Out Of Face) | 138.0000 - 0.0000 | 2 | No Ice | 0.2015 | 0.92 | |
| | | | | | | 1/2" Ice | 0.3015 | 2.46 | |
| | | | | | | 1" Ice | 0.4015 | 4.60 | |
| | | | | | | 2" Ice | 0.6015 | 10.73 | |
| | | | | | | 4" Ice | 1.0015 | 30.31 | |
| LDF6-50A(1-1/4") | C | No | Inside Pole | 128.0000 - 0.0000 | 12 | No Ice | 0.0000 | 0.66 | |

| Description | Face or Leg | Allow Shield | Component Type | Placement ft | Total Number | | C _A A _A ft ² /ft | Weight plf |
|------------------------------|-------------|--------------|--------------------|-------------------|--------------|----------|---|------------|
| LCF158-50JL(1-5/8") | C | No | CaAa (Out Of Face) | 120.0000 - 0.0000 | 6 | 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 |
| | | | | | | No Ice | 0.0000 | 0.52 |
| | | | | | | 1/2" Ice | 0.0000 | 2.03 |
| | | | | | | 1" Ice | 0.0000 | 4.16 |
| 2" Ice | 0.0000 | 10.24 | | | | | | |
| 4" Ice | 0.0000 | 29.74 | | | | | | |
| ***** | | | | | | | | |
| Aero MP3-04 | C | No | CaAa (Out Of Face) | 65.0000 - 43.0000 | 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 |
| Aero MP3-03 | C | No | CaAa (Out Of Face) | 91.5000 - 81.5000 | 1 | 4" Ice | 1.1579 | 0.00 |
| | | | | | | No Ice | 0.2625 | 0.00 |
| | | | | | | 1/2" Ice | 0.3736 | 0.00 |
| | | | | | | 1" Ice | 0.4847 | 0.00 |
| | | | | | | 2" Ice | 0.7069 | 0.00 |
| 4" Ice | 1.1514 | 0.00 | | | | | | |
| *** | | | | | | | | |
| HYBRIFLEX RRH 1-SECTOR(1/2") | C | No | CaAa (Out Of Face) | 148.0000 - 0.0000 | 3 | No Ice | 0.0000 | 0.15 |
| | | | | | | 1/2" Ice | 0.0000 | 0.83 |
| | | | | | | 1" Ice | 0.0000 | 2.13 |
| | | | | | | 2" Ice | 0.0000 | 6.55 |
| | | | | | | 4" Ice | 0.0000 | 22.73 |

Feed Line/Linear Appurtenances Section Areas

| Tower Section n | Tower Elevation ft | Face | A _R ft ² | A _F ft ² | C _A A _A In Face ft ² | C _A A _A Out Face ft ² | Weight K |
|-----------------|--------------------|------|--------------------------------|--------------------------------|---|--|----------|
| L1 | 167.0000-118.2500 | 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 | 15.749 | 1.97 |
| L2 | 118.2500-90.5000 | 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 | 13.594 | 1.77 |
| L3 | 90.5000-77.7500 | 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 | 8.487 | 0.81 |
| L4 | 77.7500-63.5000 | 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 | 7.249 | 0.91 |
| L5 | 63.5000-51.5000 | 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 | 8.993 | 0.77 |
| L6 | 51.5000-45.0000 | 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 | 4.871 | 0.41 |
| L7 | 45.0000-0.0000 | 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 | 22.156 | 2.87 |

Feed Line/Linear Appurtenances Section Areas - With Ice

| Tower Section n | Tower Elevation ft | Face or Leg | Ice Thickness in | A _R ft ² | A _F ft ² | C _A A _A In Face ft ² | C _A A _A Out Face ft ² | Weight K |
|-----------------|--------------------|-------------|------------------|--------------------------------|--------------------------------|---|--|----------|
| L1 | 167.0000-118.2500 | A | 0.893 | 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 | 35.083 | 3.44 |
| L2 | 118.2500- | A | 0.861 | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |

| Tower Section n | Tower Elevation ft | Face or Leg | Ice Thickness in | A _R ft ² | A _F ft ² | C _A A _A In Face ft ² | C _A A _A Out Face ft ² | Weight K |
|-----------------|--------------------|-------------|------------------|--------------------------------|--------------------------------|---|--|----------|
| | 90.5000 | B | | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |
| L3 | 90.5000-77.7500 | C | | 0.000 | 0.000 | 0.000 | 28.661 | 3.41 |
| | | A | 0.839 | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |
| L4 | 77.7500-63.5000 | B | | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |
| | | C | | 0.000 | 0.000 | 0.000 | 16.584 | 1.51 |
| L5 | 63.5000-51.5000 | A | 0.822 | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |
| | | B | | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |
| L6 | 51.5000-45.0000 | C | | 0.000 | 0.000 | 0.000 | 14.703 | 1.69 |
| | | A | 0.802 | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |
| L7 | 45.0000-0.0000 | B | | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |
| | | C | | 0.000 | 0.000 | 0.000 | 16.902 | 1.39 |
| | | A | 0.785 | 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 | 9.066 | 0.74 |
| | | 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 | 42.739 | 5.01 |

Feed Line Center of Pressure

| Section | Elevation ft | CP _x in | CP _z in | CP _x Ice in | CP _z Ice in |
|---------|-------------------|--------------------|--------------------|------------------------|------------------------|
| L1 | 167.0000-118.2500 | -0.3865 | 0.2231 | -0.7176 | 0.4143 |
| L2 | 118.2500-90.5000 | -0.5522 | 0.3188 | -0.9790 | 0.5652 |
| L3 | 90.5000-77.7500 | -0.7267 | 0.4196 | -1.2007 | 0.6932 |
| L4 | 77.7500-63.5000 | -0.5834 | 0.3369 | -1.0244 | 0.5914 |
| L5 | 63.5000-51.5000 | -0.8210 | 0.4740 | -1.3235 | 0.7641 |
| L6 | 51.5000-45.0000 | -0.8265 | 0.4772 | -1.3301 | 0.7679 |
| L7 | 45.0000-0.0000 | -0.5776 | 0.3335 | -1.0017 | 0.5783 |

Discrete Tower Loads

| Description | Face or Leg | Offset Type | Offsets: Horz Lateral ft | Azimuth Adjustmen t | Placement ft | C _A A _A Front ft ² | C _A A _A Side ft ² | Weight K | |
|--|-------------|-------------|--------------------------|---------------------|--------------|---|--|----------|------|
| Lightning Rod 5/8x4' | C | From Face | 0.0000 | 0.0000 | 167.0000 | No Ice | 0.2500 | 0.2500 | 0.03 |
| | | | 0.00 | | | 1/2" | 0.6635 | 0.6635 | 0.03 |
| | | | 2.00 | | | Ice | 0.9732 | 0.9732 | 0.04 |
| | | | | | | 1" Ice | 1.4936 | 1.4936 | 0.06 |
| | | | | | | 2" Ice | 2.6833 | 2.6833 | 0.14 |
| **** (2) LPA-80063-6CF-EDIN w/ Mount Pipe | A | From Leg | 4.0000 | 0.0000 | 167.0000 | No Ice | 10.7445 | 10.7001 | 0.05 |
| | | | 0.00 | | | 1/2" | 11.4117 | 11.9672 | 0.14 |
| | | | 1.00 | | | Ice | 12.0450 | 12.9479 | 0.25 |
| | | | | | | 1" Ice | 13.3414 | 14.9632 | 0.48 |
| | | | | | | 2" Ice | 16.0541 | 19.2085 | 1.09 |
| (2) LPA-80063-6CF-EDIN w/ Mount Pipe | B | From Leg | 4.0000 | 0.0000 | 167.0000 | No Ice | 10.7445 | 10.7001 | 0.05 |
| | | | 0.00 | | | 1/2" | 11.4117 | 11.9672 | 0.14 |
| | | | 1.00 | | | Ice | 12.0450 | 12.9479 | 0.25 |
| | | | | | | 1" Ice | 13.3414 | 14.9632 | 0.48 |
| | | | | | | 2" Ice | 16.0541 | 19.2085 | 1.09 |
| (2) LPA-80063-6CF-EDIN | C | From Leg | 4.0000 | 0.0000 | 167.0000 | No Ice | 10.7445 | 10.7001 | 0.05 |

| Description | Face or Leg | Offset Type | Offsets: | | Azimuth Adjustment | Placement | | C _{AA} | C _{AA} | Weight |
|------------------------------------|-------------|-------------|--------------|--------|--------------------|-----------|--------|-----------------|-----------------|--------|
| | | | Horz Lateral | Vert | | | | Front | Side | |
| | | | | | | | ft | ft ² | ft ² | K |
| w/ Mount Pipe | | | 0.00 | | | | 1/2" | 11.4117 | 11.9672 | 0.14 |
| | | | 1.00 | | | | Ice | 12.0450 | 12.9479 | 0.25 |
| | | | | | | | 1" Ice | 13.3414 | 14.9632 | 0.48 |
| | | | | | | | 2" Ice | 16.0541 | 19.2085 | 1.09 |
| | | | | | | | 4" Ice | | | |
| DB222-A | A | From Leg | 4.0000 | 0.0000 | 167.0000 | | No Ice | 1.6000 | 1.6000 | 0.02 |
| | | | 0.00 | | | | 1/2" | 2.8800 | 2.8800 | 0.02 |
| | | | 5.00 | | | | Ice | 4.1600 | 4.1600 | 0.03 |
| | | | | | | | 1" Ice | 6.7200 | 6.7200 | 0.04 |
| | | | | | | | 2" Ice | 11.8400 | 11.8400 | 0.05 |
| | | | | | | | 4" Ice | | | |
| GPS_A | A | From Leg | 4.0000 | 0.0000 | 167.0000 | | No Ice | 0.2975 | 0.2975 | 0.00 |
| | | | 0.00 | | | | 1/2" | 0.3739 | 0.3739 | 0.00 |
| | | | 4.00 | | | | Ice | 0.4589 | 0.4589 | 0.01 |
| | | | | | | | 1" Ice | 0.6549 | 0.6549 | 0.02 |
| | | | | | | | 2" Ice | 1.1506 | 1.1506 | 0.08 |
| | | | | | | | 4" Ice | | | |
| BXA-171063/8CFx2 w/ Mount Pipe | A | From Leg | 4.0000 | 0.0000 | 167.0000 | | No Ice | 3.1396 | 3.5101 | 0.03 |
| | | | 0.00 | | | | 1/2" | 3.5152 | 4.1303 | 0.06 |
| | | | 1.00 | | | | Ice | 3.9152 | 4.7565 | 0.10 |
| | | | | | | | 1" Ice | 4.8036 | 6.0591 | 0.20 |
| | | | | | | | 2" Ice | 6.7148 | 9.0948 | 0.49 |
| | | | | | | | 4" Ice | | | |
| BXA-171063/8CFx2 w/ Mount Pipe | B | From Leg | 4.0000 | 0.0000 | 167.0000 | | No Ice | 3.1396 | 3.5101 | 0.03 |
| | | | 0.00 | | | | 1/2" | 3.5152 | 4.1303 | 0.06 |
| | | | 1.00 | | | | Ice | 3.9152 | 4.7565 | 0.10 |
| | | | | | | | 1" Ice | 4.8036 | 6.0591 | 0.20 |
| | | | | | | | 2" Ice | 6.7148 | 9.0948 | 0.49 |
| | | | | | | | 4" Ice | | | |
| BXA-171063/8CFx2 w/ Mount Pipe | C | From Leg | 4.0000 | 0.0000 | 167.0000 | | No Ice | 3.1396 | 3.5101 | 0.03 |
| | | | 0.00 | | | | 1/2" | 3.5152 | 4.1303 | 0.06 |
| | | | 1.00 | | | | Ice | 3.9152 | 4.7565 | 0.10 |
| | | | | | | | 1" Ice | 4.8036 | 6.0591 | 0.20 |
| | | | | | | | 2" Ice | 6.7148 | 9.0948 | 0.49 |
| | | | | | | | 4" Ice | | | |
| BXA-70063-6CF-EDIN-2 w/ Mount Pipe | A | From Leg | 4.0000 | 0.0000 | 167.0000 | | No Ice | 7.9686 | 5.8008 | 0.04 |
| | | | 0.00 | | | | 1/2" | 8.6091 | 6.9529 | 0.10 |
| | | | 1.00 | | | | Ice | 9.2158 | 7.8191 | 0.17 |
| | | | | | | | 1" Ice | 10.4591 | 9.6015 | 0.34 |
| | | | | | | | 2" Ice | 13.0655 | 13.3662 | 0.80 |
| | | | | | | | 4" Ice | | | |
| BXA-70063-6CF-EDIN-2 w/ Mount Pipe | B | From Leg | 4.0000 | 0.0000 | 167.0000 | | No Ice | 7.9686 | 5.8008 | 0.04 |
| | | | 0.00 | | | | 1/2" | 8.6091 | 6.9529 | 0.10 |
| | | | 1.00 | | | | Ice | 9.2158 | 7.8191 | 0.17 |
| | | | | | | | 1" Ice | 10.4591 | 9.6015 | 0.34 |
| | | | | | | | 2" Ice | 13.0655 | 13.3662 | 0.80 |
| | | | | | | | 4" Ice | | | |
| BXA-70063-6CF-EDIN-2 w/ Mount Pipe | C | From Leg | 4.0000 | 0.0000 | 167.0000 | | No Ice | 7.9686 | 5.8008 | 0.04 |
| | | | 0.00 | | | | 1/2" | 8.6091 | 6.9529 | 0.10 |
| | | | 1.00 | | | | Ice | 9.2158 | 7.8191 | 0.17 |
| | | | | | | | 1" Ice | 10.4591 | 9.6015 | 0.34 |
| | | | | | | | 2" Ice | 13.0655 | 13.3662 | 0.80 |
| | | | | | | | 4" Ice | | | |
| Platform Mount [LP 712-1] | C | None | | 0.0000 | 167.0000 | | No Ice | 24.5300 | 24.5300 | 1.34 |
| | | | | | | | 1/2" | 29.9400 | 29.9400 | 1.65 |
| | | | | | | | Ice | 35.3500 | 35.3500 | 1.96 |
| | | | | | | | 1" Ice | 46.1700 | 46.1700 | 2.58 |
| | | | | | | | 2" Ice | 67.8100 | 67.8100 | 3.82 |
| | | | | | | | 4" Ice | | | |
| *** | | | | | | | | | | |
| (2) 7770.00 w/ Mount Pipe | A | From Leg | 4.0000 | 0.0000 | 158.0000 | | 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 |

| Description | Face or Leg | Offset Type | Offsets: | | Azimuth Adjustment | Placement | C _A A _A Front | C _A A _A Side | Weight |
|----------------------------|-------------|-------------|----------|--------------|--------------------|-----------|-------------------------------------|------------------------------------|--------|
| | | | Horz | Lateral Vert | | | | | |
| | | | | | | | ft ² | ft ² | K |
| (2) 7770.00 w/ Mount Pipe | B | From Leg | 4.0000 | 0.0000 | 158.0000 | 4" Ice | | | |
| | | | | | | No Ice | 6.1194 | 4.2543 | 0.06 |
| | | | | | | 1/2" Ice | 6.6258 | 5.0137 | 0.10 |
| | | | | | | 1" Ice | 7.1283 | 5.7109 | 0.16 |
| | | | | | | 2" Ice | 8.1643 | 7.1553 | 0.29 |
| (2) 7770.00 w/ Mount Pipe | C | From Leg | 4.0000 | 0.0000 | 158.0000 | 4" Ice | | | |
| | | | | | | No Ice | 6.1194 | 4.2543 | 0.06 |
| | | | | | | 1/2" Ice | 6.6258 | 5.0137 | 0.10 |
| | | | | | | 1" Ice | 7.1283 | 5.7109 | 0.16 |
| | | | | | | 2" Ice | 8.1643 | 7.1553 | 0.29 |
| (2) LGP13519 | A | From Leg | 4.0000 | 0.0000 | 158.0000 | 4" Ice | | | |
| | | | | | | No Ice | 0.3379 | 0.2074 | 0.01 |
| | | | | | | 1/2" Ice | 0.4220 | 0.2804 | 0.01 |
| | | | | | | 1" Ice | 0.5147 | 0.3621 | 0.01 |
| | | | | | | 2" Ice | 0.7260 | 0.5513 | 0.02 |
| (2) LGP13519 | B | From Leg | 4.0000 | 0.0000 | 158.0000 | 4" Ice | | | |
| | | | | | | No Ice | 0.3379 | 0.2074 | 0.01 |
| | | | | | | 1/2" Ice | 0.4220 | 0.2804 | 0.01 |
| | | | | | | 1" Ice | 0.5147 | 0.3621 | 0.01 |
| | | | | | | 2" Ice | 0.7260 | 0.5513 | 0.02 |
| (2) LGP13519 | C | From Leg | 4.0000 | 0.0000 | 158.0000 | 4" Ice | | | |
| | | | | | | No Ice | 0.3379 | 0.2074 | 0.01 |
| | | | | | | 1/2" Ice | 0.4220 | 0.2804 | 0.01 |
| | | | | | | 1" Ice | 0.5147 | 0.3621 | 0.01 |
| | | | | | | 2" Ice | 0.7260 | 0.5513 | 0.02 |
| (2) LGP21401 | A | From Leg | 4.0000 | 0.0000 | 158.0000 | 4" Ice | | | |
| | | | | | | No Ice | 1.2880 | 0.2326 | 0.01 |
| | | | | | | 1/2" Ice | 1.4453 | 0.3134 | 0.02 |
| | | | | | | 1" Ice | 1.6112 | 0.4028 | 0.03 |
| | | | | | | 2" Ice | 1.9690 | 0.6076 | 0.05 |
| (2) LGP21401 | B | From Leg | 4.0000 | 0.0000 | 158.0000 | 4" Ice | | | |
| | | | | | | No Ice | 1.2880 | 0.2326 | 0.01 |
| | | | | | | 1/2" Ice | 1.4453 | 0.3134 | 0.02 |
| | | | | | | 1" Ice | 1.6112 | 0.4028 | 0.03 |
| | | | | | | 2" Ice | 1.9690 | 0.6076 | 0.05 |
| (2) LGP21401 | C | From Leg | 4.0000 | 0.0000 | 158.0000 | 4" Ice | | | |
| | | | | | | No Ice | 1.2880 | 0.2326 | 0.01 |
| | | | | | | 1/2" Ice | 1.4453 | 0.3134 | 0.02 |
| | | | | | | 1" Ice | 1.6112 | 0.4028 | 0.03 |
| | | | | | | 2" Ice | 1.9690 | 0.6076 | 0.05 |
| SBNH-1D6565C w/ Mount Pipe | A | From Leg | 4.0000 | 0.0000 | 158.0000 | 4" Ice | | | |
| | | | | | | No Ice | 11.5561 | 9.7151 | 0.09 |
| | | | | | | 1/2" Ice | 12.2227 | 11.1857 | 0.18 |
| | | | | | | 1" Ice | 12.8929 | 12.5942 | 0.28 |
| | | | | | | 2" Ice | 14.2911 | 14.8689 | 0.51 |
| SBNH-1D6565C w/ Mount Pipe | B | From Leg | 4.0000 | 0.0000 | 158.0000 | 4" Ice | | | |
| | | | | | | No Ice | 11.5561 | 9.7151 | 0.09 |
| | | | | | | 1/2" Ice | 12.2227 | 11.1857 | 0.18 |
| | | | | | | 1" Ice | 12.8929 | 12.5942 | 0.28 |
| | | | | | | 2" Ice | 14.2911 | 14.8689 | 0.51 |
| SBNH-1D6565C w/ Mount Pipe | C | From Leg | 4.0000 | 0.0000 | 158.0000 | 4" Ice | | | |
| | | | | | | No Ice | 11.5561 | 9.7151 | 0.09 |
| | | | | | | 1/2" Ice | 12.2227 | 11.1857 | 0.18 |
| | | | | | | 1" Ice | 12.8929 | 12.5942 | 0.28 |
| | | | | | | 2" Ice | 14.2911 | 14.8689 | 0.51 |

| Description | Face or Leg | Offset Type | Offsets: Horz Lateral Vert ft ft ft | Azimuth Adjustmen t ° | Placement ft | C _A A _A Front ft ² | C _A A _A Side ft ² | Weight K |
|----------------------------------|-------------|-------------|--|-----------------------------|-----------------|---|---|--|
| (2) RRUS-11 | A | From Leg | 4.0000 0.00 0.00 | 0.0000 | 156.0000 | 2" Ice 17.4280 4" Ice 3.2486 No Ice 3.2486 1/2" 3.4905 Ice 3.7411 1" Ice 4.2682 2" Ice 5.4260 | 19.6184 1.3726 1.3726 1.5510 1.7380 2.1381 3.0418 | 1.14 0.05 0.07 0.09 0.15 0.31 |
| (2) RRUS-11 | B | From Leg | 4.0000 0.00 0.00 | 0.0000 | 156.0000 | 4" Ice 3.2486 No Ice 3.2486 1/2" 3.4905 Ice 3.7411 1" Ice 4.2682 2" Ice 5.4260 | 1.3726 1.3726 1.5510 1.7380 2.1381 3.0418 | 0.05 0.07 0.09 0.15 0.31 |
| (2) RRUS-11 | C | From Leg | 4.0000 0.00 0.00 | 0.0000 | 156.0000 | 4" Ice 3.2486 No Ice 3.2486 1/2" 3.4905 Ice 3.7411 1" Ice 4.2682 2" Ice 5.4260 | 1.3726 1.3726 1.5510 1.7380 2.1381 3.0418 | 0.05 0.07 0.09 0.15 0.31 |
| DC6-48-60-18-8F | A | From Leg | 4.0000 0.00 2.00 | 0.0000 | 158.0000 | 4" Ice 1.4667 No Ice 1.4667 1/2" 1.6667 Ice 1.8778 1" Ice 2.3333 2" Ice 3.3778 | 1.4667 1.4667 1.6667 1.8778 2.3333 3.3778 | 0.02 0.04 0.06 0.11 0.24 |
| Platform Mount [LP 712-1] | C | None | | 0.0000 | 158.0000 | 4" Ice 24.5300 No Ice 24.5300 1/2" 29.9400 Ice 35.3500 1" Ice 46.1700 2" Ice 67.8100 | 24.5300 24.5300 29.9400 35.3500 46.1700 67.8100 | 1.34 1.65 1.96 2.58 3.82 |
| 6' x 2" Mount Pipe | A | From Leg | 4.0000 0.00 1.00 | 0.0000 | 158.0000 | 4" Ice 1.4250 No Ice 1.4250 1/2" 1.9250 Ice 2.2939 1" Ice 3.0596 2" Ice 4.7022 | 1.4250 1.4250 1.9250 2.2939 3.0596 4.7022 | 0.02 0.03 0.05 0.09 0.23 |
| 6' x 2" Mount Pipe | B | From Leg | 4.0000 0.00 1.00 | 0.0000 | 158.0000 | 4" Ice 1.4250 No Ice 1.4250 1/2" 1.9250 Ice 2.2939 1" Ice 3.0596 2" Ice 4.7022 | 1.4250 1.4250 1.9250 2.2939 3.0596 4.7022 | 0.02 0.03 0.05 0.09 0.23 |
| 6' x 2" Mount Pipe | C | From Leg | 4.0000 0.00 1.00 | 0.0000 | 158.0000 | 4" Ice 1.4250 No Ice 1.4250 1/2" 1.9250 Ice 2.2939 1" Ice 3.0596 2" Ice 4.7022 | 1.4250 1.4250 1.9250 2.2939 3.0596 4.7022 | 0.02 0.03 0.05 0.09 0.23 |
| **** | | | | | | | | |
| Platform Mount [LP 712-1] | C | None | | 0.0000 | 148.0000 | 4" Ice 24.5300 No Ice 24.5300 1/2" 29.9400 Ice 35.3500 1" Ice 46.1700 2" Ice 67.8100 | 24.5300 24.5300 29.9400 35.3500 46.1700 67.8100 | 1.34 1.65 1.96 2.58 3.82 |
| **** | | | | | | | | |
| APX16PV-16PVL-E w/ Mount Pipe | A | From Leg | 4.0000 0.00 1.00 | 0.0000 | 138.0000 | 4" Ice 6.9361 No Ice 6.9361 1/2" 7.4389 Ice 7.9415 1" Ice 8.9779 2" Ice 11.1750 | 3.2893 3.2893 3.9953 4.6615 6.0439 9.0230 | 0.06 0.10 0.16 0.28 0.65 |
| APX16PV-16PVL-E w/ | B | From Leg | 4.0000 | 0.0000 | 138.0000 | 4" Ice 6.9361 No Ice 6.9361 | 3.2893 3.2893 | 0.06 |

| Description | Face or Leg | Offset Type | Offsets: Horz Lateral Vert ft ft ft | Azimuth Adjustmen t ° | Placement ft | C _A A _A Front ft ² | C _A A _A Side ft ² | Weight K | |
|--------------------------------------|-------------|-------------|--|-----------------------------|-----------------|--|---|-------------|------|
| Mount Pipe | | | 0.00 | | | 1/2" | 7.4389 | 3.9953 | 0.10 |
| | | | 1.00 | | | Ice | 7.9415 | 4.6615 | 0.16 |
| | | | | | | 1" Ice | 8.9779 | 6.0439 | 0.28 |
| | | | | | | 2" Ice | 11.1750 | 9.0230 | 0.65 |
| | | | | | | 4" Ice | | | |
| APX16PV-16PVL-E w/ Mount Pipe | C | From Leg | 4.0000 | 0.0000 | 138.0000 | No Ice | 6.9361 | 3.2893 | 0.06 |
| | | | 0.00 | | | 1/2" | 7.4389 | 3.9953 | 0.10 |
| | | | 1.00 | | | Ice | 7.9415 | 4.6615 | 0.16 |
| | | | | | | 1" Ice | 8.9779 | 6.0439 | 0.28 |
| | | | | | | 2" Ice | 11.1750 | 9.0230 | 0.65 |
| APX16DWV-16DWV-S-E-A20 w/ Mount Pipe | A | From Leg | 4.0000 | 0.0000 | 138.0000 | No Ice | 7.4657 | 3.4938 | 0.06 |
| | | | 0.00 | | | 1/2" | 7.9944 | 4.2631 | 0.11 |
| | | | 1.00 | | | Ice | 8.5176 | 4.9598 | 0.16 |
| | | | | | | 1" Ice | 9.5949 | 6.4031 | 0.30 |
| | | | | | | 2" Ice | 11.8728 | 9.4897 | 0.68 |
| APX16DWV-16DWV-S-E-A20 w/ Mount Pipe | B | From Leg | 4.0000 | 0.0000 | 138.0000 | No Ice | 7.4657 | 3.4938 | 0.06 |
| | | | 0.00 | | | 1/2" | 7.9944 | 4.2631 | 0.11 |
| | | | 1.00 | | | Ice | 8.5176 | 4.9598 | 0.16 |
| | | | | | | 1" Ice | 9.5949 | 6.4031 | 0.30 |
| | | | | | | 2" Ice | 11.8728 | 9.4897 | 0.68 |
| APX16DWV-16DWV-S-E-A20 w/ Mount Pipe | C | From Leg | 4.0000 | 0.0000 | 138.0000 | No Ice | 7.4657 | 3.4938 | 0.06 |
| | | | 0.00 | | | 1/2" | 7.9944 | 4.2631 | 0.11 |
| | | | 1.00 | | | Ice | 8.5176 | 4.9598 | 0.16 |
| | | | | | | 1" Ice | 9.5949 | 6.4031 | 0.30 |
| | | | | | | 2" Ice | 11.8728 | 9.4897 | 0.68 |
| KRY 112 134/1 | A | From Leg | 4.0000 | 0.0000 | 138.0000 | No Ice | 1.0082 | 0.4869 | 0.01 |
| | | | 0.00 | | | 1/2" | 1.1488 | 0.6009 | 0.02 |
| | | | 1.00 | | | Ice | 1.2980 | 0.7236 | 0.03 |
| | | | | | | 1" Ice | 1.6223 | 0.9950 | 0.05 |
| | | | | | | 2" Ice | 2.3747 | 1.6413 | 0.13 |
| KRY 112 134/1 | B | From Leg | 4.0000 | 0.0000 | 138.0000 | No Ice | 1.0082 | 0.4869 | 0.01 |
| | | | 0.00 | | | 1/2" | 1.1488 | 0.6009 | 0.02 |
| | | | 1.00 | | | Ice | 1.2980 | 0.7236 | 0.03 |
| | | | | | | 1" Ice | 1.6223 | 0.9950 | 0.05 |
| | | | | | | 2" Ice | 2.3747 | 1.6413 | 0.13 |
| KRY 112 134/1 | C | From Leg | 4.0000 | 0.0000 | 138.0000 | No Ice | 1.0082 | 0.4869 | 0.01 |
| | | | 0.00 | | | 1/2" | 1.1488 | 0.6009 | 0.02 |
| | | | 1.00 | | | Ice | 1.2980 | 0.7236 | 0.03 |
| | | | | | | 1" Ice | 1.6223 | 0.9950 | 0.05 |
| | | | | | | 2" Ice | 2.3747 | 1.6413 | 0.13 |
| KRY 112 89/5 | A | From Leg | 4.0000 | 0.0000 | 138.0000 | No Ice | 0.6417 | 0.4278 | 0.02 |
| | | | 0.00 | | | 1/2" | 0.7562 | 0.5293 | 0.02 |
| | | | 1.00 | | | Ice | 0.8793 | 0.6395 | 0.03 |
| | | | | | | 1" Ice | 1.1515 | 0.8858 | 0.05 |
| | | | | | | 2" Ice | 1.7997 | 1.4821 | 0.11 |
| KRY 112 89/5 | B | From Leg | 4.0000 | 0.0000 | 138.0000 | No Ice | 0.6417 | 0.4278 | 0.02 |
| | | | 0.00 | | | 1/2" | 0.7562 | 0.5293 | 0.02 |
| | | | 1.00 | | | Ice | 0.8793 | 0.6395 | 0.03 |
| | | | | | | 1" Ice | 1.1515 | 0.8858 | 0.05 |
| | | | | | | 2" Ice | 1.7997 | 1.4821 | 0.11 |
| KRY 112 89/5 | C | From Leg | 4.0000 | 0.0000 | 138.0000 | No Ice | 0.6417 | 0.4278 | 0.02 |
| | | | 0.00 | | | 1/2" | 0.7562 | 0.5293 | 0.02 |
| | | | 1.00 | | | Ice | 0.8793 | 0.6395 | 0.03 |
| | | | | | | 1" Ice | 1.1515 | 0.8858 | 0.05 |
| | | | | | | 2" Ice | 1.7997 | 1.4821 | 0.11 |
| KRY 112 89/5 | C | From Leg | 4.0000 | 0.0000 | 138.0000 | No Ice | 0.6417 | 0.4278 | 0.02 |
| | | | 0.00 | | | 1/2" | 0.7562 | 0.5293 | 0.02 |
| | | | 1.00 | | | Ice | 0.8793 | 0.6395 | 0.03 |
| | | | | | | 1" Ice | 1.1515 | 0.8858 | 0.05 |
| | | | | | | 2" Ice | 1.7997 | 1.4821 | 0.11 |
| KRY 112 89/5 | C | From Leg | 4.0000 | 0.0000 | 138.0000 | No Ice | 0.6417 | 0.4278 | 0.02 |
| | | | 0.00 | | | 1/2" | 0.7562 | 0.5293 | 0.02 |
| | | | 1.00 | | | Ice | 0.8793 | 0.6395 | 0.03 |
| | | | | | | 1" Ice | 1.1515 | 0.8858 | 0.05 |
| | | | | | | 2" Ice | 1.7997 | 1.4821 | 0.11 |
| KRY 112 89/5 | C | From Leg | 4.0000 | 0.0000 | 138.0000 | No Ice | 0.6417 | 0.4278 | 0.02 |
| | | | 0.00 | | | 1/2" | 0.7562 | 0.5293 | 0.02 |
| | | | 1.00 | | | Ice | 0.8793 | 0.6395 | 0.03 |
| | | | | | | 1" Ice | 1.1515 | 0.8858 | 0.05 |
| | | | | | | 2" Ice | 1.7997 | 1.4821 | 0.11 |
| KRY 112 89/5 | C | From Leg | 4.0000 | 0.0000 | 138.0000 | No Ice | 0.6417 | 0.4278 | 0.02 |
| | | | 0.00 | | | 1/2" | 0.7562 | 0.5293 | 0.02 |
| | | | 1.00 | | | Ice | 0.8793 | 0.6395 | 0.03 |
| | | | | | | 1" Ice | 1.1515 | 0.8858 | 0.05 |
| | | | | | | 2" Ice | 1.7997 | 1.4821 | 0.11 |
| KRY 112 89/5 | C | From Leg | 4.0000 | 0.0000 | 138.0000 | No Ice | 0.6417 | 0.4278 | 0.02 |
| | | | 0.00 | | | 1/2" | 0.7562 | 0.5293 | 0.02 |
| | | | 1.00 | | | Ice | 0.8793 | 0.6395 | 0.03 |
| | | | | | | 1" Ice | 1.1515 | 0.8858 | 0.05 |
| | | | | | | 2" Ice | 1.7997 | 1.4821 | 0.11 |
| KRY 112 89/5 | C | From Leg | 4.0000 | 0.0000 | 138.0000 | No Ice | 0.6417 | 0.4278 | 0.02 |
| | | | 0.00 | | | 1/2" | 0.7562 | 0.5293 | 0.02 |
| | | | 1.00 | | | Ice | 0.8793 | 0.6395 | 0.03 |
| | | | | | | 1" Ice | 1.1515 | 0.8858 | 0.05 |
| | | | | | | 2" Ice | 1.7997 | 1.4821 | 0.11 |
| KRY 112 89/5 | C | From Leg | 4.0000 | 0.0000 | 138.0000 | No Ice | 0.6417 | 0.4278 | 0.02 |
| | | | 0.00 | | | 1/2" | 0.7562 | 0.5293 | 0.02 |
| | | | 1.00 | | | Ice | 0.8793 | 0.6395 | 0.03 |
| | | | | | | 1" Ice | 1.1515 | 0.8858 | 0.05 |
| | | | | | | 2" Ice | 1.7997 | 1.4821 | 0.11 |
| KRY 112 89/5 | C | From Leg | 4.0000 | 0.0000 | 138.0000 | No Ice | 0.6417 | 0.4278 | 0.02 |
| | | | 0.00 | | | 1/2" | 0.7562 | 0.5293 | 0.02 |
| | | | 1.00 | | | Ice | 0.8793 | 0.6395 | 0.03 |
| | | | | | | 1" Ice | 1.1515 | 0.8858 | 0.05 |
| | | | | | | 2" Ice | 1.7997 | 1.4821 | 0.11 |
| KRY 112 89/5 | C | From Leg | 4.0000 | 0.0000 | 138.0000 | No Ice | 0.6417 | 0.4278 | 0.02 |
| | | | 0.00 | | | 1/2" | 0.7562 | 0.5293 | 0.02 |
| | | | 1.00 | | | Ice | 0.8793 | 0.6395 | 0.03 |
| | | | | | | 1" Ice | 1.1515 | 0.8858 | 0.05 |
| | | | | | | 2" Ice | 1.7997 | 1.4821 | 0.11 |
| KRY 112 89/5 | C | From Leg | 4.0000 | 0.0000 | 138.0000 | No Ice | 0.6417 | 0.4278 | 0.02 |
| | | | 0.00 | | | 1/2" | 0.7562 | 0.5293 | 0.02 |
| | | | 1.00 | | | Ice | 0.8793 | 0.6395 | 0.03 |
| | | | | | | 1" Ice | 1.1515 | 0.8858 | 0.05 |
| | | | | | | 2" Ice | 1.7997 | 1.4821 | 0.11 |

| Description | Face or Leg | Offset Type | Offsets: | | Azimuth Adjustment | Placement | | C _{AA} | C _{AA} | Weight |
|--------------------------------|-------------|-------------|----------|---------|--------------------|-----------|-----------------|-----------------|-----------------|--------|
| | | | Horz | Lateral | | | | Front | Side | |
| | | | ft | ft | ° | ft | ft ² | ft ² | K | |
| (2) S20057A-1 | A | From Leg | 4.0000 | 0.0000 | 138.0000 | No Ice | 0.8286 | 0.3942 | 0.01 | |
| | | | 0.00 | | | 1/2" | 0.9610 | 0.5048 | 0.01 | |
| | | | 1.00 | | | Ice | 1.1019 | 0.6242 | 0.02 | |
| | | | | | | 1" Ice | 1.4098 | 0.8887 | 0.04 | |
| | | | | | | 2" Ice | 2.1292 | 1.5216 | 0.11 | |
| (2) S20057A-1 | B | From Leg | 4.0000 | 0.0000 | 138.0000 | No Ice | 0.8286 | 0.3942 | 0.01 | |
| | | | 0.00 | | | 1/2" | 0.9610 | 0.5048 | 0.01 | |
| | | | 1.00 | | | Ice | 1.1019 | 0.6242 | 0.02 | |
| | | | | | | 1" Ice | 1.4098 | 0.8887 | 0.04 | |
| | | | | | | 2" Ice | 2.1292 | 1.5216 | 0.11 | |
| (2) S20057A-1 | C | From Leg | 4.0000 | 0.0000 | 138.0000 | No Ice | 0.8286 | 0.3942 | 0.01 | |
| | | | 0.00 | | | 1/2" | 0.9610 | 0.5048 | 0.01 | |
| | | | 1.00 | | | Ice | 1.1019 | 0.6242 | 0.02 | |
| | | | | | | 1" Ice | 1.4098 | 0.8887 | 0.04 | |
| | | | | | | 2" Ice | 2.1292 | 1.5216 | 0.11 | |
| Platform Mount [LP 712-1] | C | None | | 0.0000 | 138.0000 | No Ice | 24.5300 | 24.5300 | 1.34 | |
| | | | | | | 1/2" | 29.9400 | 29.9400 | 1.65 | |
| | | | | | | Ice | 35.3500 | 35.3500 | 1.96 | |
| | | | | | | 1" Ice | 46.1700 | 46.1700 | 2.58 | |
| | | | | | | 2" Ice | 67.8100 | 67.8100 | 3.82 | |
| 6' x 2" Mount Pipe | A | From Leg | 4.0000 | 0.0000 | 138.0000 | No Ice | 1.4250 | 1.4250 | 0.02 | |
| | | | 0.00 | | | 1/2" | 1.9250 | 1.9250 | 0.03 | |
| | | | 1.00 | | | Ice | 2.2939 | 2.2939 | 0.05 | |
| | | | | | | 1" Ice | 3.0596 | 3.0596 | 0.09 | |
| | | | | | | 2" Ice | 4.7022 | 4.7022 | 0.23 | |
| 6' x 2" Mount Pipe | B | From Leg | 4.0000 | 0.0000 | 138.0000 | No Ice | 1.4250 | 1.4250 | 0.02 | |
| | | | 0.00 | | | 1/2" | 1.9250 | 1.9250 | 0.03 | |
| | | | 1.00 | | | Ice | 2.2939 | 2.2939 | 0.05 | |
| | | | | | | 1" Ice | 3.0596 | 3.0596 | 0.09 | |
| | | | | | | 2" Ice | 4.7022 | 4.7022 | 0.23 | |
| 6' x 2" Mount Pipe | C | From Leg | 4.0000 | 0.0000 | 138.0000 | No Ice | 1.4250 | 1.4250 | 0.02 | |
| | | | 0.00 | | | 1/2" | 1.9250 | 1.9250 | 0.03 | |
| | | | 1.00 | | | Ice | 2.2939 | 2.2939 | 0.05 | |
| | | | | | | 1" Ice | 3.0596 | 3.0596 | 0.09 | |
| | | | | | | 2" Ice | 4.7022 | 4.7022 | 0.23 | |
| **** | | | | | | | | | | |
| (4) DB846G90A-XY w/ Mount Pipe | A | From Leg | 4.0000 | 0.0000 | 128.0000 | No Ice | 5.2292 | 7.5292 | 0.04 | |
| | | | 0.00 | | | 1/2" | 5.7831 | 8.7153 | 0.09 | |
| | | | 0.00 | | | Ice | 6.3025 | 9.6153 | 0.16 | |
| | | | | | | 1" Ice | 7.3652 | 11.4489 | 0.32 | |
| | | | | | | 2" Ice | 9.6937 | 15.6025 | 0.77 | |
| (4) DB846G90A-XY w/ Mount Pipe | B | From Leg | 4.0000 | 0.0000 | 128.0000 | No Ice | 5.2292 | 7.5292 | 0.04 | |
| | | | 0.00 | | | 1/2" | 5.7831 | 8.7153 | 0.09 | |
| | | | 0.00 | | | Ice | 6.3025 | 9.6153 | 0.16 | |
| | | | | | | 1" Ice | 7.3652 | 11.4489 | 0.32 | |
| | | | | | | 2" Ice | 9.6937 | 15.6025 | 0.77 | |
| (4) DB846G90A-XY w/ Mount Pipe | C | From Leg | 4.0000 | 0.0000 | 128.0000 | No Ice | 5.2292 | 7.5292 | 0.04 | |
| | | | 0.00 | | | 1/2" | 5.7831 | 8.7153 | 0.09 | |
| | | | 0.00 | | | Ice | 6.3025 | 9.6153 | 0.16 | |
| | | | | | | 1" Ice | 7.3652 | 11.4489 | 0.32 | |
| | | | | | | 2" Ice | 9.6937 | 15.6025 | 0.77 | |
| Platform Mount [LP 712-1] | C | None | | 0.0000 | 128.0000 | No Ice | 24.5300 | 24.5300 | 1.34 | |
| | | | | | | 1/2" | 29.9400 | 29.9400 | 1.65 | |
| | | | | | | Ice | 35.3500 | 35.3500 | 1.96 | |
| | | | | | | 1" Ice | 46.1700 | 46.1700 | 2.58 | |
| | | | | | | 2" Ice | | | | |

| Description | Face or Leg | Offset Type | Offsets: Horz Lateral Vert ft ft ft | Azimuth Adjustmen t ° | Placement ft | | C _A A _A Front ft ² | C _A A _A Side ft ² | Weight K |
|-----------------------------------|-------------|-------------|--|-----------------------------|-----------------|--------|---|--|-------------|
| | | | | | | 2" Ice | 67.8100 | 67.8100 | 3.82 |
| | | | | | | 4" Ice | | | |
| **** | | | | | | | | | |
| APXV18-206517S-C w/ Mount Pipe | A | From Leg | 1.0000 0.00 -1.00 | 30.0000 | 120.0000 | No Ice | 5.4042 | 4.7000 | 0.05 |
| | | | | | | 1/2" | 5.9597 | 5.8600 | 0.09 |
| | | | | | | 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 | 1.0000 0.00 -1.00 | 30.0000 | 120.0000 | No Ice | 5.4042 | 4.7000 | 0.05 |
| | | | | | | 1/2" | 5.9597 | 5.8600 | 0.09 |
| | | | | | | 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 | 1.0000 0.00 -1.00 | 30.0000 | 120.0000 | No Ice | 5.4042 | 4.7000 | 0.05 |
| | | | | | | 1/2" | 5.9597 | 5.8600 | 0.09 |
| | | | | | | 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 | | 0.0000 | 120.0000 | No Ice | 4.3900 | 4.3900 | 0.20 |
| | | | | | | 1/2" | 5.4800 | 5.4800 | 0.24 |
| | | | | | | Ice | 6.5700 | 6.5700 | 0.28 |
| | | | | | | 1" Ice | 8.7500 | 8.7500 | 0.36 |
| | | | | | | 2" Ice | 13.1100 | 13.1100 | 0.53 |
| | | | | | | 4" Ice | | | |
| *** | | | | | | | | | |
| Side Arm Mount [SO 102-3] | C | None | | 0.0000 | 156.0000 | No Ice | 3.0000 | 3.0000 | 0.08 |
| | | | | | | 1/2" | 3.4800 | 3.4800 | 0.11 |
| | | | | | | Ice | 3.9600 | 3.9600 | 0.14 |
| | | | | | | 1" Ice | 4.9200 | 4.9200 | 0.20 |
| | | | | | | 2" Ice | 6.8400 | 6.8400 | 0.32 |
| | | | | | | 4" Ice | | | |
| **** | | | | | | | | | |
| 800 EXTERNAL NOTCH FILTER | A | From Leg | 4.0000 0.00 -1.00 | 0.0000 | 148.0000 | 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 |
| | | | | | | 4" Ice | | | |
| (3) ACU-A20-N | A | From Leg | 4.0000 0.00 -1.00 | 0.0000 | 148.0000 | 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 |
| | | | | | | 4" Ice | | | |
| APXVSP18-C-A20 w/ Mount Pipe | A | From Leg | 4.0000 0.00 -1.00 | 30.0000 | 148.0000 | 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 |
| | | | | | | 4" Ice | | | |
| 800 EXTERNAL NOTCH FILTER | B | From Leg | 4.0000 0.00 -1.00 | 0.0000 | 148.0000 | 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 |
| | | | | | | 4" Ice | | | |
| (3) ACU-A20-N | B | From Leg | 4.0000 0.00 -1.00 | 0.0000 | 148.0000 | 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 |
| | | | | | | 4" Ice | | | |

| Description | Face or Leg | Offset Type | Offsets: Horz Lateral Vert ft ft ft | Azimuth Adjustmen t ° | Placement ft | | C _A A _A Front ft ² | C _A A _A Side ft ² | Weight K |
|------------------------------------|-------------|-------------|-------------------------------------|-----------------------|--------------|----------|---|--|----------|
| APXVSPP18-C-A20 w/ Mount Pipe | B | From Leg | 4.0000 0.00 -1.00 | 70.0000 | 148.0000 | No Ice | 8.4975 | 6.9458 | 0.08 |
| | | | | | | 1/2" Ice | 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 |
| 800 EXTERNAL NOTCH FILTER | C | From Leg | 4.0000 0.00 -1.00 | 0.0000 | 148.0000 | No Ice | 0.7701 | 0.3747 | 0.01 |
| | | | | | | 1/2" Ice | 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 |
| (3) ACU-A20-N | C | From Leg | 4.0000 0.00 -1.00 | 0.0000 | 148.0000 | No Ice | 0.0778 | 0.1361 | 0.00 |
| | | | | | | 1/2" Ice | 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/ Mount Pipe | C | From Leg | 4.0000 0.00 -1.00 | 30.0000 | 148.0000 | No Ice | 8.4975 | 6.9458 | 0.08 |
| | | | | | | 1/2" Ice | 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 |
| 6' x 2" Mount Pipe | A | From Leg | 4.0000 0.00 0.00 | 0.0000 | 148.0000 | No Ice | 1.4250 | 1.4250 | 0.02 |
| | | | | | | 1/2" Ice | 1.9250 | 1.9250 | 0.03 |
| | | | | | | Ice | 2.2939 | 2.2939 | 0.05 |
| | | | | | | 1" Ice | 3.0596 | 3.0596 | 0.09 |
| | | | | | | 2" Ice | 4.7022 | 4.7022 | 0.23 |
| 6' x 2" Mount Pipe | B | From Leg | 4.0000 0.00 0.00 | 0.0000 | 148.0000 | No Ice | 1.4250 | 1.4250 | 0.02 |
| | | | | | | 1/2" Ice | 1.9250 | 1.9250 | 0.03 |
| | | | | | | Ice | 2.2939 | 2.2939 | 0.05 |
| | | | | | | 1" Ice | 3.0596 | 3.0596 | 0.09 |
| | | | | | | 2" Ice | 4.7022 | 4.7022 | 0.23 |
| 6' x 2" Mount Pipe | C | From Leg | 4.0000 0.00 0.00 | 0.0000 | 148.0000 | No Ice | 1.4250 | 1.4250 | 0.02 |
| | | | | | | 1/2" Ice | 1.9250 | 1.9250 | 0.03 |
| | | | | | | Ice | 2.2939 | 2.2939 | 0.05 |
| | | | | | | 1" Ice | 3.0596 | 3.0596 | 0.09 |
| | | | | | | 2" Ice | 4.7022 | 4.7022 | 0.23 |
| ***** Side Arm Mount [SO 102-3] | C | None | | 0.0000 | 146.0000 | No Ice | 3.0000 | 3.0000 | 0.08 |
| | | | | | | 1/2" Ice | 3.4800 | 3.4800 | 0.11 |
| | | | | | | Ice | 3.9600 | 3.9600 | 0.14 |
| | | | | | | 1" Ice | 4.9200 | 4.9200 | 0.20 |
| | | | | | | 2" Ice | 6.8400 | 6.8400 | 0.32 |
| PCS 1900MHz 4x45W-65MHz | A | From Leg | 4.0000 0.00 0.00 | 30.0000 | 146.0000 | No Ice | 2.7087 | 2.6111 | 0.06 |
| | | | | | | 1/2" Ice | 2.9477 | 2.8475 | 0.08 |
| | | | | | | Ice | 3.1953 | 3.0925 | 0.11 |
| | | | | | | 1" Ice | 3.7164 | 3.6084 | 0.17 |
| | | | | | | 2" Ice | 4.8623 | 4.7439 | 0.35 |
| TME-800MHZ RRH | A | From Leg | 4.0000 0.00 0.00 | 30.0000 | 146.0000 | No Ice | 2.4899 | 2.0685 | 0.05 |
| | | | | | | 1/2" Ice | 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 |
| PCS 1900MHz 4x45W-65MHz | B | From Leg | 4.0000 0.00 0.00 | 70.0000 | 146.0000 | No Ice | 2.7087 | 2.6111 | 0.06 |
| | | | | | | 1/2" Ice | 2.9477 | 2.8475 | 0.08 |
| | | | | | | Ice | 3.1953 | 3.0925 | 0.11 |
| | | | | | | 1" Ice | 3.7164 | 3.6084 | 0.17 |

| Description | Face or Leg | Offset Type | Offsets: Horz Lateral Vert ft ft ft | Azimuth Adjustment ° | Placement ft | C _{AA} Front ft ² | C _{AA} Side ft ² | Weight K | |
|-------------------------|-------------|-------------|--|-------------------------|-----------------|---|--|-------------|------|
| TME-800MHZ RRH | B | From Leg | 4.0000 0.00 0.00 | 70.0000 | 146.0000 | 2" Ice | 4.8623 | 4.7439 | 0.35 |
| | | | | | | 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 |
| PCS 1900MHz 4x45W-65MHz | C | From Leg | 4.0000 0.00 0.00 | 30.0000 | 146.0000 | 2" Ice | 4.4620 | 3.9265 | 0.32 |
| | | | | | | 4" Ice | | | |
| | | | | | | No Ice | 2.7087 | 2.6111 | 0.06 |
| | | | | | | 1/2" | 2.9477 | 2.8475 | 0.08 |
| | | | | | | Ice | 3.1953 | 3.0925 | 0.11 |
| | | | | | | 1" Ice | 3.7164 | 3.6084 | 0.17 |
| TME-800MHZ RRH | C | From Leg | 4.0000 0.00 0.00 | 30.0000 | 146.0000 | 2" Ice | 4.8623 | 4.7439 | 0.35 |
| | | | | | | 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 |
| | | | | | 2" Ice | 4.4620 | 3.9265 | 0.32 | |
| | | | | | 4" Ice | | | | |

Tower Forces - No Ice - Wind Normal To Face

| Section Elevation ft | Add Weight K | Self Weight K | F a c e | e | C _F | R _R | D _F | D _R | A _E ft ² | F K | w plf | Ctrl. Face |
|-------------------------|-----------------|------------------|------------------|---|----------------|----------------|----------------|----------------|-----------------------------------|--------|----------|---------------|
| L1 167.0000-118.2500 | 1.97 | 3.87 | A | 1 | 0.65 | 1 | 1 | 1 | 120.575 | 4.45 | 91.33 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 1 | 120.575 | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 1 | 120.575 | | | |
| L2 118.2500-90.5000 | 1.77 | 4.06 | A | 1 | 0.65 | 1 | 1 | 1 | 88.093 | 3.07 | 110.78 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 1 | 88.093 | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 1 | 88.093 | | | |
| L3 90.5000-77.7500 | 0.81 | 2.23 | A | 1 | 0.65 | 1 | 1 | 1 | 45.490 | 1.55 | 121.87 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 1 | 45.490 | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 1 | 45.490 | | | |
| L4 77.7500-63.5000 | 0.91 | 3.54 | A | 1 | 0.65 | 1 | 1 | 1 | 53.773 | 1.64 | 115.01 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 1 | 53.773 | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 1 | 53.773 | | | |
| L5 63.5000-51.5000 | 0.77 | 2.86 | A | 1 | 0.65 | 1 | 1 | 1 | 48.388 | 1.48 | 123.43 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 1 | 48.388 | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 1 | 48.388 | | | |
| L6 51.5000-45.0000 | 0.41 | 1.61 | A | 1 | 0.65 | 1 | 1 | 1 | 27.377 | 0.79 | 121.49 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 1 | 27.377 | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 1 | 27.377 | | | |
| L7 45.0000-0.0000 | 2.87 | 11.85 | A | 1 | 0.65 | 1 | 1 | 1 | 210.635 | 4.98 | 110.76 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 1 | 210.635 | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 1 | 210.635 | | | |
| Sum Weight: | 9.52 | 30.02 | | | | | | OTM | 1427.50 kip-ft | 17.97 | | |

Tower Forces - No Ice - Wind 60 To Face

| Section Elevation | Add Weight | Self Weight | F a c e | e | C _F | R _R | D _F | D _R | A _E | F | w | Ctrl. Face |
|----------------------|------------|-------------|---------|---|----------------|----------------|----------------|----------------|-------------------|-------|--------|------------|
| ft | K | K | | | | | | | ft ² | K | plf | |
| L1 167.0000-118.2500 | 1.97 | 3.87 | A | 1 | 0.65 | 1 | 1 | 1 | 120.575 | 4.45 | 91.33 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 120.575 | | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 120.575 | | | | |
| L2 118.2500-90.5000 | 1.77 | 4.06 | A | 1 | 0.65 | 1 | 1 | 1 | 88.093 | 3.07 | 110.78 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 88.093 | | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 88.093 | | | | |
| L3 90.5000-77.7500 | 0.81 | 2.23 | A | 1 | 0.65 | 1 | 1 | 1 | 45.490 | 1.55 | 121.87 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 45.490 | | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 45.490 | | | | |
| L4 77.7500-63.5000 | 0.91 | 3.54 | A | 1 | 0.65 | 1 | 1 | 1 | 53.773 | 1.64 | 115.01 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 53.773 | | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 53.773 | | | | |
| L5 63.5000-51.5000 | 0.77 | 2.86 | A | 1 | 0.65 | 1 | 1 | 1 | 48.388 | 1.48 | 123.43 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 48.388 | | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 48.388 | | | | |
| L6 51.5000-45.0000 | 0.41 | 1.61 | A | 1 | 0.65 | 1 | 1 | 1 | 27.377 | 0.79 | 121.49 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 27.377 | | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 27.377 | | | | |
| L7 45.0000-0.0000 | 2.87 | 11.85 | A | 1 | 0.65 | 1 | 1 | 1 | 210.635 | 4.98 | 110.76 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 210.635 | | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 210.635 | | | | |
| Sum Weight: | 9.52 | 30.02 | | | | | | OTM | 1427.50 kip-ft | 17.97 | | |

Tower Forces - No Ice - Wind 90 To Face

| Section Elevation | Add Weight | Self Weight | F a c e | e | C _F | R _R | D _F | D _R | A _E | F | w | Ctrl. Face |
|----------------------|------------|-------------|---------|---|----------------|----------------|----------------|----------------|-------------------|-------|--------|------------|
| ft | K | K | | | | | | | ft ² | K | plf | |
| L1 167.0000-118.2500 | 1.97 | 3.87 | A | 1 | 0.65 | 1 | 1 | 1 | 120.575 | 4.45 | 91.33 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 120.575 | | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 120.575 | | | | |
| L2 118.2500-90.5000 | 1.77 | 4.06 | A | 1 | 0.65 | 1 | 1 | 1 | 88.093 | 3.07 | 110.78 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 88.093 | | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 88.093 | | | | |
| L3 90.5000-77.7500 | 0.81 | 2.23 | A | 1 | 0.65 | 1 | 1 | 1 | 45.490 | 1.55 | 121.87 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 45.490 | | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 45.490 | | | | |
| L4 77.7500-63.5000 | 0.91 | 3.54 | A | 1 | 0.65 | 1 | 1 | 1 | 53.773 | 1.64 | 115.01 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 53.773 | | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 53.773 | | | | |
| L5 63.5000-51.5000 | 0.77 | 2.86 | A | 1 | 0.65 | 1 | 1 | 1 | 48.388 | 1.48 | 123.43 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 48.388 | | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 48.388 | | | | |
| L6 51.5000-45.0000 | 0.41 | 1.61 | A | 1 | 0.65 | 1 | 1 | 1 | 27.377 | 0.79 | 121.49 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 27.377 | | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 27.377 | | | | |
| L7 45.0000-0.0000 | 2.87 | 11.85 | A | 1 | 0.65 | 1 | 1 | 1 | 210.635 | 4.98 | 110.76 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 210.635 | | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 210.635 | | | | |
| Sum Weight: | 9.52 | 30.02 | | | | | | OTM | 1427.50 kip-ft | 17.97 | | |

Tower Forces - With Ice - Wind Normal To Face

| Section Elevation | Add Weight | Self Weight | F a c e | e | C _F | R _R | D _F | D _R | A _E | F | w | Ctrl. Face |
|-------------------|------------|-------------|---------|---|----------------|----------------|----------------|----------------|-----------------|---|-----|------------|
| ft | K | K | | | | | | | ft ² | K | plf | |

| Section Elevation | Add Weight | Self Weight | F a c e | e | C _F | R _R | D _F | D _R | A _E | F | w | Ctrl. Face |
|----------------------|------------|-------------|---------|---|----------------|----------------|----------------|----------------|------------------|------|-------|------------|
| ft | K | K | | | | | | | ft ² | K | plf | |
| L1 167.0000-118.2500 | 3.44 | 5.52 | A | 1 | 0.65 | 1 | 1 | 1 | 127.831 | 1.09 | 22.44 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 1 | 127.831 | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 1 | 127.831 | | | |
| L2 118.2500-90.5000 | 3.41 | 5.20 | A | 1 | 0.65 | 1 | 1 | 1 | 92.223 | 0.75 | 27.11 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 1 | 92.223 | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 1 | 92.223 | | | |
| L3 90.5000-77.7500 | 1.51 | 2.81 | A | 1 | 0.65 | 1 | 1 | 1 | 47.273 | 0.38 | 29.65 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 1 | 47.273 | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 1 | 47.273 | | | |
| L4 77.7500-63.5000 | 1.69 | 4.21 | A | 1 | 0.65 | 1 | 1 | 1 | 55.766 | 0.39 | 27.17 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 1 | 55.766 | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 1 | 55.766 | | | |
| L5 63.5000-51.5000 | 1.39 | 3.44 | A | 1 | 0.65 | 1 | 1 | 1 | 49.991 | 0.35 | 29.50 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 1 | 49.991 | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 1 | 49.991 | | | |
| L6 51.5000-45.0000 | 0.74 | 1.93 | A | 1 | 0.65 | 1 | 1 | 1 | 28.227 | 0.19 | 28.75 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 1 | 28.227 | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 1 | 28.227 | | | |
| L7 45.0000-0.0000 | 5.01 | 14.22 | A | 1 | 0.65 | 1 | 1 | 1 | 216.260 | 1.12 | 24.98 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 1 | 216.260 | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 1 | 216.260 | | | |
| Sum Weight: | 17.18 | 37.33 | | | | | | OTM | 345.87 kip-ft | 4.28 | | |

Tower Forces - With Ice - Wind 60 To Face

| Section Elevation | Add Weight | Self Weight | F a c e | e | C _F | R _R | D _F | D _R | A _E | F | w | Ctrl. Face |
|----------------------|------------|-------------|---------|---|----------------|----------------|----------------|----------------|------------------|------|-------|------------|
| ft | K | K | | | | | | | ft ² | K | plf | |
| L1 167.0000-118.2500 | 3.44 | 5.52 | A | 1 | 0.65 | 1 | 1 | 1 | 127.831 | 1.09 | 22.44 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 1 | 127.831 | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 1 | 127.831 | | | |
| L2 118.2500-90.5000 | 3.41 | 5.20 | A | 1 | 0.65 | 1 | 1 | 1 | 92.223 | 0.75 | 27.11 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 1 | 92.223 | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 1 | 92.223 | | | |
| L3 90.5000-77.7500 | 1.51 | 2.81 | A | 1 | 0.65 | 1 | 1 | 1 | 47.273 | 0.38 | 29.65 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 1 | 47.273 | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 1 | 47.273 | | | |
| L4 77.7500-63.5000 | 1.69 | 4.21 | A | 1 | 0.65 | 1 | 1 | 1 | 55.766 | 0.39 | 27.17 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 1 | 55.766 | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 1 | 55.766 | | | |
| L5 63.5000-51.5000 | 1.39 | 3.44 | A | 1 | 0.65 | 1 | 1 | 1 | 49.991 | 0.35 | 29.50 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 1 | 49.991 | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 1 | 49.991 | | | |
| L6 51.5000-45.0000 | 0.74 | 1.93 | A | 1 | 0.65 | 1 | 1 | 1 | 28.227 | 0.19 | 28.75 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 1 | 28.227 | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 1 | 28.227 | | | |
| L7 45.0000-0.0000 | 5.01 | 14.22 | A | 1 | 0.65 | 1 | 1 | 1 | 216.260 | 1.12 | 24.98 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 1 | 216.260 | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 1 | 216.260 | | | |
| Sum Weight: | 17.18 | 37.33 | | | | | | OTM | 345.87 kip-ft | 4.28 | | |

Tower Forces - With Ice - Wind 90 To Face

| Section Elevation | Add Weight | Self Weight | F a c e | e | C _F | R _R | D _F | D _R | A _E | F | w | Ctrl. Face |
|-------------------|------------|-------------|---------|---|----------------|----------------|----------------|----------------|-----------------|---|-----|------------|
| ft | K | K | | | | | | | ft ² | K | plf | |

| Section Elevation | Add Weight | Self Weight | F a c e | e | C _F | R _R | D _F | D _R | A _E | F | w | Ctrl. Face |
|----------------------|------------|-------------|---------|---|----------------|----------------|----------------|----------------|------------------|------|-------|------------|
| ft | K | K | | | | | | | ft ² | K | plf | |
| L1 167.0000-118.2500 | 3.44 | 5.52 | A | 1 | 0.65 | 1 | 1 | 1 | 127.831 | 1.09 | 22.44 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 1 | 127.831 | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 1 | 127.831 | | | |
| L2 118.2500-90.5000 | 3.41 | 5.20 | A | 1 | 0.65 | 1 | 1 | 1 | 92.223 | 0.75 | 27.11 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 1 | 92.223 | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 1 | 92.223 | | | |
| L3 90.5000-77.7500 | 1.51 | 2.81 | A | 1 | 0.65 | 1 | 1 | 1 | 47.273 | 0.38 | 29.65 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 1 | 47.273 | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 1 | 47.273 | | | |
| L4 77.7500-63.5000 | 1.69 | 4.21 | A | 1 | 0.65 | 1 | 1 | 1 | 55.766 | 0.39 | 27.17 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 1 | 55.766 | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 1 | 55.766 | | | |
| L5 63.5000-51.5000 | 1.39 | 3.44 | A | 1 | 0.65 | 1 | 1 | 1 | 49.991 | 0.35 | 29.50 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 1 | 49.991 | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 1 | 49.991 | | | |
| L6 51.5000-45.0000 | 0.74 | 1.93 | A | 1 | 0.65 | 1 | 1 | 1 | 28.227 | 0.19 | 28.75 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 1 | 28.227 | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 1 | 28.227 | | | |
| L7 45.0000-0.0000 | 5.01 | 14.22 | A | 1 | 0.65 | 1 | 1 | 1 | 216.260 | 1.12 | 24.98 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 1 | 216.260 | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 1 | 216.260 | | | |
| Sum Weight: | 17.18 | 37.33 | | | | | | OTM | 345.87 kip-ft | 4.28 | | |

Tower Forces - Service - Wind Normal To Face

| Section Elevation | Add Weight | Self Weight | F a c e | e | C _F | R _R | D _F | D _R | A _E | F | w | Ctrl. Face |
|----------------------|------------|-------------|---------|---|----------------|----------------|----------------|----------------|------------------|------|-------|------------|
| ft | K | K | | | | | | | ft ² | K | plf | |
| L1 167.0000-118.2500 | 1.97 | 3.87 | A | 1 | 0.65 | 1 | 1 | 1 | 120.575 | 1.54 | 31.60 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 1 | 120.575 | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 1 | 120.575 | | | |
| L2 118.2500-90.5000 | 1.77 | 4.06 | A | 1 | 0.65 | 1 | 1 | 1 | 88.093 | 1.06 | 38.33 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 1 | 88.093 | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 1 | 88.093 | | | |
| L3 90.5000-77.7500 | 0.81 | 2.23 | A | 1 | 0.65 | 1 | 1 | 1 | 45.490 | 0.54 | 42.17 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 1 | 45.490 | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 1 | 45.490 | | | |
| L4 77.7500-63.5000 | 0.91 | 3.54 | A | 1 | 0.65 | 1 | 1 | 1 | 53.773 | 0.57 | 39.80 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 1 | 53.773 | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 1 | 53.773 | | | |
| L5 63.5000-51.5000 | 0.77 | 2.86 | A | 1 | 0.65 | 1 | 1 | 1 | 48.388 | 0.51 | 42.71 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 1 | 48.388 | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 1 | 48.388 | | | |
| L6 51.5000-45.0000 | 0.41 | 1.61 | A | 1 | 0.65 | 1 | 1 | 1 | 27.377 | 0.27 | 42.04 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 1 | 27.377 | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 1 | 27.377 | | | |
| L7 45.0000-0.0000 | 2.87 | 11.85 | A | 1 | 0.65 | 1 | 1 | 1 | 210.635 | 1.72 | 38.32 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 1 | 210.635 | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 1 | 210.635 | | | |
| Sum Weight: | 9.52 | 30.02 | | | | | | OTM | 493.94 kip-ft | 6.22 | | |

Tower Forces - Service - Wind 60 To Face

| Section Elevation | Add Weight | Self Weight | F a c e | e | C _F | R _R | D _F | D _R | A _E | F | w | Ctrl. Face |
|-------------------|------------|-------------|---------|---|----------------|----------------|----------------|----------------|-----------------|---|-----|------------|
| ft | K | K | | | | | | | ft ² | K | plf | |

| Section Elevation ft | Add Weight K | Self Weight K | F a c e | e | C _F | R _R | D _F | D _R | A _E ft ² | F K | w plf | Ctrl. Face |
|-------------------------|-----------------|------------------|---------|---|----------------|----------------|----------------|----------------|-----------------------------------|--------|----------|------------|
| L1 167.0000-118.2500 | 1.97 | 3.87 | A | 1 | 0.65 | 1 | 1 | 1 | 120.575 | 1.54 | 31.60 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 1 | 120.575 | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 1 | 120.575 | | | |
| L2 118.2500-90.5000 | 1.77 | 4.06 | A | 1 | 0.65 | 1 | 1 | 1 | 88.093 | 1.06 | 38.33 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 1 | 88.093 | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 1 | 88.093 | | | |
| L3 90.5000-77.7500 | 0.81 | 2.23 | A | 1 | 0.65 | 1 | 1 | 1 | 45.490 | 0.54 | 42.17 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 1 | 45.490 | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 1 | 45.490 | | | |
| L4 77.7500-63.5000 | 0.91 | 3.54 | A | 1 | 0.65 | 1 | 1 | 1 | 53.773 | 0.57 | 39.80 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 1 | 53.773 | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 1 | 53.773 | | | |
| L5 63.5000-51.5000 | 0.77 | 2.86 | A | 1 | 0.65 | 1 | 1 | 1 | 48.388 | 0.51 | 42.71 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 1 | 48.388 | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 1 | 48.388 | | | |
| L6 51.5000-45.0000 | 0.41 | 1.61 | A | 1 | 0.65 | 1 | 1 | 1 | 27.377 | 0.27 | 42.04 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 1 | 27.377 | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 1 | 27.377 | | | |
| L7 45.0000-0.0000 | 2.87 | 11.85 | A | 1 | 0.65 | 1 | 1 | 1 | 210.635 | 1.72 | 38.32 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 1 | 210.635 | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 1 | 210.635 | | | |
| Sum Weight: | 9.52 | 30.02 | | | | | | OTM | 493.94 kip-ft | 6.22 | | |

Tower Forces - Service - Wind 90 To Face

| Section Elevation ft | Add Weight K | Self Weight K | F a c e | e | C _F | R _R | D _F | D _R | A _E ft ² | F K | w plf | Ctrl. Face |
|-------------------------|-----------------|------------------|---------|---|----------------|----------------|----------------|----------------|-----------------------------------|--------|----------|------------|
| L1 167.0000-118.2500 | 1.97 | 3.87 | A | 1 | 0.65 | 1 | 1 | 1 | 120.575 | 1.54 | 31.60 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 1 | 120.575 | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 1 | 120.575 | | | |
| L2 118.2500-90.5000 | 1.77 | 4.06 | A | 1 | 0.65 | 1 | 1 | 1 | 88.093 | 1.06 | 38.33 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 1 | 88.093 | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 1 | 88.093 | | | |
| L3 90.5000-77.7500 | 0.81 | 2.23 | A | 1 | 0.65 | 1 | 1 | 1 | 45.490 | 0.54 | 42.17 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 1 | 45.490 | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 1 | 45.490 | | | |
| L4 77.7500-63.5000 | 0.91 | 3.54 | A | 1 | 0.65 | 1 | 1 | 1 | 53.773 | 0.57 | 39.80 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 1 | 53.773 | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 1 | 53.773 | | | |
| L5 63.5000-51.5000 | 0.77 | 2.86 | A | 1 | 0.65 | 1 | 1 | 1 | 48.388 | 0.51 | 42.71 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 1 | 48.388 | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 1 | 48.388 | | | |
| L6 51.5000-45.0000 | 0.41 | 1.61 | A | 1 | 0.65 | 1 | 1 | 1 | 27.377 | 0.27 | 42.04 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 1 | 27.377 | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 1 | 27.377 | | | |
| L7 45.0000-0.0000 | 2.87 | 11.85 | A | 1 | 0.65 | 1 | 1 | 1 | 210.635 | 1.72 | 38.32 | C |
| | | | B | 1 | 0.65 | 1 | 1 | 1 | 210.635 | | | |
| | | | C | 1 | 0.65 | 1 | 1 | 1 | 210.635 | | | |
| Sum Weight: | 9.52 | 30.02 | | | | | | OTM | 493.94 kip-ft | 6.22 | | |

Load Combinations

| Comb. No. | Description |
|-----------|--------------------------|
| 1 | Dead Only |
| 2 | Dead+Wind 0 deg - No Ice |

| Comb. No. | Description |
|-----------|-----------------------------|
| 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

| Sectio n No. | Elevation ft | Component Type | Condition | Gov. Load Comb. | Force K | Major Axis Moment kip-ft | Minor Axis Moment kip-ft |
|--------------|---------------|----------------|------------------|-----------------|---------|--------------------------|--------------------------|
| L1 | 167 - 118.25 | Pole | Max Tension | 1 | 0.00 | 0.00 | 0.00 |
| | | | Max. Compression | 14 | -27.04 | 2.24 | -0.87 |
| | | | Max. Mx | 11 | -12.79 | 758.73 | -1.70 |
| | | | Max. My | 8 | -12.79 | 2.08 | -759.42 |
| | | | Max. Vy | 11 | -28.39 | 758.73 | -1.70 |
| | | | Max. Vx | 8 | 28.43 | 2.08 | -759.42 |
| | | | Max. Torque | 11 | | | -0.82 |
| L2 | 118.25 - 90.5 | Pole | Max Tension | 1 | 0.00 | 0.00 | 0.00 |
| | | | Max. Compression | 14 | -37.40 | 5.61 | -2.80 |
| | | | Max. Mx | 11 | -20.07 | 1758.49 | -4.12 |
| | | | Max. My | 8 | -20.07 | 4.81 | -1760.33 |
| | | | Max. Vy | 11 | -32.87 | 1758.49 | -4.12 |
| | | | Max. Vx | 8 | 32.92 | 4.81 | -1760.33 |
| | | | Max. Torque | 11 | | | -0.54 |
| L3 | 90.5 - 77.75 | Pole | Max Tension | 1 | 0.00 | 0.00 | 0.00 |
| | | | Max. Compression | 14 | -39.84 | 6.46 | -3.29 |
| | | | Max. Mx | 11 | -21.94 | 1999.94 | -4.68 |
| | | | Max. My | 8 | -21.93 | 5.46 | -2002.04 |
| | | | Max. Vy | 11 | -33.71 | 1999.94 | -4.68 |
| | | | Max. Vx | 8 | 33.76 | 5.46 | -2002.04 |
| | | | Max. Torque | 11 | | | -0.46 |
| L4 | 77.75 - 63.5 | Pole | Max Tension | 1 | 0.00 | 0.00 | 0.00 |
| | | | Max. Compression | 14 | -47.88 | 8.88 | -4.68 |
| | | | Max. Mx | 11 | -28.11 | 2689.55 | -6.22 |

| Sectio n No. | Elevation ft | Component Type | Condition | Gov. Load Comb. | Force K | Major Axis Moment kip-ft | Minor Axis Moment kip-ft |
|--------------------|-----------------|-------------------|------------------|-----------------------|------------|--------------------------------|--------------------------------|
| L5 | 63.5 - 51.5 | Pole | Max. My | 8 | -28.11 | 7.24 | -2692.30 |
| | | | Max. Vy | 11 | -35.96 | 2689.55 | -6.22 |
| | | | Max. Vx | 8 | 36.01 | 7.24 | -2692.30 |
| | | | Max. Torque | 10 | | | -0.41 |
| | | | Max Tension | 1 | 0.00 | 0.00 | 0.00 |
| | | | Max. Compression | 14 | -52.70 | 10.39 | -5.55 |
| | | | Max. Mx | 11 | -31.99 | 3129.43 | -7.17 |
| | | | Max. My | 8 | -31.99 | 8.34 | -3132.57 |
| | | | Max. Vy | 11 | -37.33 | 3129.43 | -7.17 |
| | | | Max. Vx | 8 | 37.37 | 8.34 | -3132.57 |
| L6 | 51.5 - 45 | Pole | Max. Torque | 3 | | | 0.41 |
| | | | Max Tension | 1 | 0.00 | 0.00 | 0.00 |
| | | | Max. Compression | 14 | -55.37 | 11.22 | -6.03 |
| | | | Max. Mx | 11 | -34.15 | 3374.47 | -7.69 |
| | | | Max. My | 8 | -34.15 | 8.94 | -3377.82 |
| | | | Max. Vy | 11 | -38.04 | 3374.47 | -7.69 |
| | | | Max. Vx | 8 | 38.08 | 8.94 | -3377.82 |
| | | | Max. Torque | 3 | | | 0.44 |
| | | | Max Tension | 1 | 0.00 | 0.00 | 0.00 |
| | | | Max. Compression | 14 | -74.60 | 17.11 | -9.43 |
| L7 | 45 - 0 | Pole | Max. Mx | 11 | -50.03 | 5174.53 | -11.32 |
| | | | Max. My | 8 | -50.03 | 13.22 | -5179.23 |
| | | | Max. Vy | 11 | -41.96 | 5174.53 | -11.32 |
| | | | Max. Vx | 8 | 42.00 | 13.22 | -5179.23 |
| | | | Max. Torque | 2 | | | 0.60 |

Maximum Reactions

| Location | Condition | Gov. Load Comb. | Vertical K | Horizontal, X K | Horizontal, Z K |
|----------|---------------------|-----------------------|---------------|--------------------|--------------------|
| Pole | Max. Vert | 23 | 74.60 | 8.87 | -5.13 |
| | Max. H _x | 11 | 50.06 | 41.92 | -0.06 |
| | Max. H _z | 2 | 50.06 | -0.06 | 41.96 |
| | Max. M _x | 2 | 5174.82 | -0.06 | 41.96 |
| | Max. M _z | 5 | 5166.32 | -41.92 | 0.06 |
| | Max. Torsion | 2 | 0.60 | -0.06 | 41.96 |
| | Min. Vert | 1 | 50.06 | 0.00 | 0.00 |
| | Min. H _x | 5 | 50.06 | -41.92 | 0.06 |
| | Min. H _z | 8 | 50.06 | 0.06 | -41.96 |
| | Min. M _x | 8 | -5179.23 | 0.06 | -41.96 |
| | Min. M _z | 11 | -5174.53 | 41.92 | -0.06 |
| | Min. Torsion | 8 | -0.59 | 0.06 | -41.96 |

Tower Mast Reaction Summary

| Load Combination | Vertical K | Shear _x K | Shear _z K | Overturing Moment, M _x kip-ft | Overturing Moment, M _z kip-ft | Torque kip-ft |
|----------------------------|---------------|-------------------------|-------------------------|--|--|------------------|
| Dead Only | 50.06 | 0.00 | 0.00 | 2.15 | 3.99 | 0.00 |
| Dead+Wind 0 deg - No Ice | 50.06 | 0.06 | -41.96 | -5174.82 | -4.98 | -0.60 |
| Dead+Wind 30 deg - No Ice | 50.06 | 21.01 | -36.37 | -4485.77 | -2588.96 | -0.58 |
| Dead+Wind 60 deg - No Ice | 50.06 | 36.33 | -21.03 | -2594.19 | -4478.14 | -0.41 |
| Dead+Wind 90 deg - No Ice | 50.06 | 41.92 | -0.06 | -6.89 | -5166.32 | -0.12 |
| Dead+Wind 120 deg - No Ice | 50.06 | 36.27 | 20.93 | 2582.88 | -4469.09 | 0.19 |
| Dead+Wind 150 deg - No Ice | 50.06 | 20.91 | 36.31 | 4481.14 | -2573.22 | 0.45 |
| Dead+Wind 180 deg - No Ice | 50.06 | -0.06 | 41.96 | 5179.23 | 13.22 | 0.59 |
| Dead+Wind 210 deg - No Ice | 50.06 | -21.01 | 36.37 | 4490.17 | 2597.18 | 0.58 |
| Dead+Wind 240 deg - No Ice | 50.06 | -36.33 | 21.03 | 2598.60 | 4486.35 | 0.41 |
| Dead+Wind 270 deg - No Ice | 50.06 | -41.92 | 0.06 | 11.32 | 5174.53 | 0.13 |
| Dead+Wind 300 deg - No Ice | 50.06 | -36.27 | -20.93 | -2578.44 | 4477.31 | -0.19 |

| Load Combination | Vertical | Shear _x | Shear _z | Overturning Moment, M _x | Overturning Moment, M _z | Torque |
|-----------------------------|----------|--------------------|--------------------|------------------------------------|------------------------------------|--------|
| | K | K | K | kip-ft | kip-ft | kip-ft |
| Dead+Wind 330 deg - No Ice | 50.06 | -20.91 | -36.31 | -4476.71 | 2581.46 | -0.46 |
| Dead+Ice+Temp | 74.60 | -0.00 | 0.00 | 9.43 | 17.11 | 0.00 |
| Dead+Wind 0 deg+Ice+Temp | 74.60 | 0.01 | -10.24 | -1302.04 | 16.02 | -0.32 |
| Dead+Wind 30 deg+Ice+Temp | 74.60 | 5.12 | -8.87 | -1126.93 | -639.15 | -0.31 |
| Dead+Wind 60 deg+Ice+Temp | 74.60 | 8.87 | -5.13 | -647.31 | -1118.45 | -0.22 |
| Dead+Wind 90 deg+Ice+Temp | 74.60 | 10.24 | -0.01 | 8.29 | -1293.45 | -0.07 |
| Dead+Wind 120 deg+Ice+Temp | 74.60 | 8.86 | 5.11 | 664.21 | -1117.25 | 0.10 |
| Dead+Wind 150 deg+Ice+Temp | 74.60 | 5.11 | 8.87 | 1144.70 | -637.08 | 0.24 |
| Dead+Wind 180 deg+Ice+Temp | 74.60 | -0.01 | 10.24 | 1321.01 | 18.40 | 0.32 |
| Dead+Wind 210 deg+Ice+Temp | 74.60 | -5.12 | 8.87 | 1145.89 | 673.57 | 0.31 |
| Dead+Wind 240 deg+Ice+Temp | 74.60 | -8.87 | 5.13 | 666.28 | 1152.86 | 0.22 |
| Dead+Wind 270 deg+Ice+Temp | 74.60 | -10.24 | 0.01 | 10.68 | 1327.86 | 0.07 |
| Dead+Wind 300 deg+Ice+Temp | 74.60 | -8.86 | -5.11 | -645.24 | 1151.67 | -0.10 |
| Dead+Wind 330 deg+Ice+Temp | 74.60 | -5.11 | -8.87 | -1125.73 | 671.50 | -0.24 |
| Dead+Wind 0 deg - Service | 50.06 | 0.02 | -14.52 | -1792.19 | 0.97 | -0.21 |
| Dead+Wind 30 deg - Service | 50.06 | 7.27 | -12.59 | -1553.37 | -894.66 | -0.20 |
| Dead+Wind 60 deg - Service | 50.06 | 12.57 | -7.28 | -897.72 | -1549.47 | -0.14 |
| Dead+Wind 90 deg - Service | 50.06 | 14.51 | -0.02 | -0.94 | -1787.98 | -0.05 |
| Dead+Wind 120 deg - Service | 50.06 | 12.55 | 7.24 | 896.69 | -1546.31 | 0.06 |
| Dead+Wind 150 deg - Service | 50.06 | 7.23 | 12.56 | 1554.64 | -889.20 | 0.16 |
| Dead+Wind 180 deg - Service | 50.06 | -0.02 | 14.52 | 1796.62 | 7.28 | 0.21 |
| Dead+Wind 210 deg - Service | 50.06 | -7.27 | 12.59 | 1557.79 | 902.91 | 0.20 |
| Dead+Wind 240 deg - Service | 50.06 | -12.57 | 7.28 | 902.15 | 1557.71 | 0.14 |
| Dead+Wind 270 deg - Service | 50.06 | -14.51 | 0.02 | 5.37 | 1796.23 | 0.05 |
| Dead+Wind 300 deg - Service | 50.06 | -12.55 | -7.24 | -892.26 | 1554.56 | -0.06 |
| Dead+Wind 330 deg - Service | 50.06 | -7.23 | -12.56 | -1550.21 | 897.45 | -0.16 |

Solution Summary

| Load Comb. | Sum of Applied Forces | | | Sum of Reactions | | | % Error |
|------------|-----------------------|---------|---------|------------------|---------|---------|---------|
| | PX K | PY K | PZ K | PX K | PY K | PZ K | |
| 1 | 0.00 | -50.06 | 0.00 | 0.00 | 50.06 | 0.00 | 0.000% |
| 2 | 0.06 | -50.06 | -41.96 | -0.06 | 50.06 | 41.96 | 0.000% |
| 3 | 21.01 | -50.06 | -36.37 | -21.01 | 50.06 | 36.37 | 0.000% |
| 4 | 36.33 | -50.06 | -21.03 | -36.33 | 50.06 | 21.03 | 0.000% |
| 5 | 41.92 | -50.06 | -0.06 | -41.92 | 50.06 | 0.06 | 0.000% |
| 6 | 36.27 | -50.06 | 20.93 | -36.27 | 50.06 | -20.93 | 0.000% |
| 7 | 20.91 | -50.06 | 36.31 | -20.91 | 50.06 | -36.31 | 0.000% |
| 8 | -0.06 | -50.06 | 41.96 | 0.06 | 50.06 | -41.96 | 0.000% |
| 9 | -21.01 | -50.06 | 36.37 | 21.01 | 50.06 | -36.37 | 0.000% |
| 10 | -36.33 | -50.06 | 21.03 | 36.33 | 50.06 | -21.03 | 0.000% |
| 11 | -41.92 | -50.06 | 0.06 | 41.92 | 50.06 | -0.06 | 0.000% |
| 12 | -36.27 | -50.06 | -20.93 | 36.27 | 50.06 | 20.93 | 0.000% |
| 13 | -20.91 | -50.06 | -36.31 | 20.91 | 50.06 | 36.31 | 0.000% |
| 14 | 0.00 | -74.60 | 0.00 | 0.00 | 74.60 | -0.00 | 0.000% |

| Load Comb. | Sum of Applied Forces | | | Sum of Reactions | | | % Error |
|------------|-----------------------|---------|---------|------------------|---------|---------|---------|
| | PX K | PY K | PZ K | PX K | PY K | PZ K | |
| 15 | 0.01 | -74.60 | -10.24 | -0.01 | 74.60 | 10.24 | 0.000% |
| 16 | 5.12 | -74.60 | -8.87 | -5.12 | 74.60 | 8.87 | 0.000% |
| 17 | 8.87 | -74.60 | -5.13 | -8.87 | 74.60 | 5.13 | 0.000% |
| 18 | 10.24 | -74.60 | -0.01 | -10.24 | 74.60 | 0.01 | 0.000% |
| 19 | 8.86 | -74.60 | 5.11 | -8.86 | 74.60 | -5.11 | 0.000% |
| 20 | 5.11 | -74.60 | 8.87 | -5.11 | 74.60 | -8.87 | 0.000% |
| 21 | -0.01 | -74.60 | 10.24 | 0.01 | 74.60 | -10.24 | 0.000% |
| 22 | -5.12 | -74.60 | 8.87 | 5.12 | 74.60 | -8.87 | 0.000% |
| 23 | -8.87 | -74.60 | 5.13 | 8.87 | 74.60 | -5.13 | 0.000% |
| 24 | -10.24 | -74.60 | 0.01 | 10.24 | 74.60 | -0.01 | 0.000% |
| 25 | -8.86 | -74.60 | -5.11 | 8.86 | 74.60 | 5.11 | 0.000% |
| 26 | -5.11 | -74.60 | -8.87 | 5.11 | 74.60 | 8.87 | 0.000% |
| 27 | 0.02 | -50.06 | -14.52 | -0.02 | 50.06 | 14.52 | 0.000% |
| 28 | 7.27 | -50.06 | -12.59 | -7.27 | 50.06 | 12.59 | 0.000% |
| 29 | 12.57 | -50.06 | -7.28 | -12.57 | 50.06 | 7.28 | 0.000% |
| 30 | 14.51 | -50.06 | -0.02 | -14.51 | 50.06 | 0.02 | 0.000% |
| 31 | 12.55 | -50.06 | 7.24 | -12.55 | 50.06 | -7.24 | 0.000% |
| 32 | 7.23 | -50.06 | 12.56 | -7.23 | 50.06 | -12.56 | 0.000% |
| 33 | -0.02 | -50.06 | 14.52 | 0.02 | 50.06 | -14.52 | 0.000% |
| 34 | -7.27 | -50.06 | 12.59 | 7.27 | 50.06 | -12.59 | 0.000% |
| 35 | -12.57 | -50.06 | 7.28 | 12.57 | 50.06 | -7.28 | 0.000% |
| 36 | -14.51 | -50.06 | 0.02 | 14.51 | 50.06 | -0.02 | 0.000% |
| 37 | -12.55 | -50.06 | -7.24 | 12.55 | 50.06 | 7.24 | 0.000% |
| 38 | -7.23 | -50.06 | -12.56 | 7.23 | 50.06 | 12.56 | 0.000% |

Non-Linear Convergence Results

| Load Combination | Converged? | Number of Cycles | Displacement Tolerance | Force Tolerance |
|------------------|------------|------------------|------------------------|-----------------|
| 1 | Yes | 4 | 0.00000001 | 0.00000001 |
| 2 | Yes | 4 | 0.00000001 | 0.00058433 |
| 3 | Yes | 6 | 0.00000001 | 0.00005946 |
| 4 | Yes | 6 | 0.00000001 | 0.00006001 |
| 5 | Yes | 4 | 0.00000001 | 0.00069169 |
| 6 | Yes | 6 | 0.00000001 | 0.00005942 |
| 7 | Yes | 6 | 0.00000001 | 0.00005943 |
| 8 | Yes | 4 | 0.00000001 | 0.00076246 |
| 9 | Yes | 6 | 0.00000001 | 0.00006018 |
| 10 | Yes | 6 | 0.00000001 | 0.00005962 |
| 11 | Yes | 4 | 0.00000001 | 0.00057044 |
| 12 | Yes | 6 | 0.00000001 | 0.00005964 |
| 13 | Yes | 6 | 0.00000001 | 0.00005963 |
| 14 | Yes | 4 | 0.00000001 | 0.00015209 |
| 15 | Yes | 5 | 0.00000001 | 0.00075632 |
| 16 | Yes | 5 | 0.00000001 | 0.00088617 |
| 17 | Yes | 5 | 0.00000001 | 0.00088767 |
| 18 | Yes | 5 | 0.00000001 | 0.00075096 |
| 19 | Yes | 5 | 0.00000001 | 0.00089568 |
| 20 | Yes | 5 | 0.00000001 | 0.00089596 |
| 21 | Yes | 5 | 0.00000001 | 0.00076616 |
| 22 | Yes | 5 | 0.00000001 | 0.00092164 |
| 23 | Yes | 5 | 0.00000001 | 0.00091947 |
| 24 | Yes | 5 | 0.00000001 | 0.00077000 |
| 25 | Yes | 5 | 0.00000001 | 0.00090681 |
| 26 | Yes | 5 | 0.00000001 | 0.00090705 |
| 27 | Yes | 4 | 0.00000001 | 0.00033064 |
| 28 | Yes | 5 | 0.00000001 | 0.00014837 |
| 29 | Yes | 5 | 0.00000001 | 0.00015085 |
| 30 | Yes | 4 | 0.00000001 | 0.00033059 |
| 31 | Yes | 5 | 0.00000001 | 0.00014837 |
| 32 | Yes | 5 | 0.00000001 | 0.00014832 |
| 33 | Yes | 4 | 0.00000001 | 0.00033619 |
| 34 | Yes | 5 | 0.00000001 | 0.00015298 |
| 35 | Yes | 5 | 0.00000001 | 0.00015034 |
| 36 | Yes | 4 | 0.00000001 | 0.00032897 |

| | | | | |
|----|-----|---|------------|------------|
| 37 | Yes | 5 | 0.00000001 | 0.00014962 |
| 38 | Yes | 5 | 0.00000001 | 0.00014981 |

Maximum Tower Deflections - Service Wind

| Section No. | Elevation ft | Horz. Deflection in | Gov. Load Comb. | Tilt ° | Twist ° |
|-------------|-----------------|------------------------|-----------------|-----------|------------|
| L1 | 167 - 118.25 | 43.065 | 34 | 2.3246 | 0.0020 |
| L2 | 122.75 - 90.5 | 22.956 | 34 | 1.8747 | 0.0005 |
| L3 | 90.5 - 77.75 | 12.047 | 34 | 1.3052 | 0.0002 |
| L4 | 83.25 - 63.5 | 10.157 | 34 | 1.1844 | 0.0002 |
| L5 | 63.5 - 51.5 | 5.805 | 34 | 0.8842 | 0.0001 |
| L6 | 51.5 - 45 | 3.798 | 34 | 0.7140 | 0.0001 |
| L7 | 45 - 0 | 2.888 | 34 | 0.6231 | 0.0001 |

Critical Deflections and Radius of Curvature - Service Wind

| Elevation ft | Appurtenance | Gov. Load Comb. | Deflection in | Tilt ° | Twist ° | Radius of Curvature ft |
|-----------------|--------------------------------|-----------------|------------------|-----------|------------|---------------------------|
| 167.0000 | Lightning Rod 5/8x4' | 34 | 43.065 | 2.3246 | 0.0020 | 28931 |
| 158.0000 | (2) 7770.00 w/ Mount Pipe | 34 | 38.741 | 2.2545 | 0.0016 | 16072 |
| 156.0000 | (2) RRUS-11 | 34 | 37.786 | 2.2384 | 0.0015 | 13150 |
| 148.0000 | Platform Mount [LP 712-1] | 34 | 34.010 | 2.1699 | 0.0012 | 7612 |
| 146.0000 | Side Arm Mount [SO 102-3] | 34 | 33.080 | 2.1515 | 0.0011 | 6887 |
| 138.0000 | APX16PV-16PVL-E w/ Mount Pipe | 34 | 29.437 | 2.0708 | 0.0009 | 4986 |
| 128.0000 | (4) DB846G90A-XY w/ Mount Pipe | 34 | 25.106 | 1.9497 | 0.0006 | 3707 |
| 120.0000 | APXV18-206517S-C w/ Mount Pipe | 34 | 21.870 | 1.8319 | 0.0004 | 3235 |

Maximum Tower Deflections - Design Wind

| Section No. | Elevation ft | Horz. Deflection in | Gov. Load Comb. | Tilt ° | Twist ° |
|-------------|-----------------|------------------------|-----------------|-----------|------------|
| L1 | 167 - 118.25 | 123.673 | 9 | 6.6859 | 0.0056 |
| L2 | 122.75 - 90.5 | 66.008 | 9 | 5.3940 | 0.0014 |
| L3 | 90.5 - 77.75 | 34.668 | 9 | 3.7570 | 0.0007 |
| L4 | 83.25 - 63.5 | 29.233 | 9 | 3.4095 | 0.0006 |
| L5 | 63.5 - 51.5 | 16.714 | 9 | 2.5461 | 0.0004 |
| L6 | 51.5 - 45 | 10.936 | 9 | 2.0561 | 0.0003 |
| L7 | 45 - 0 | 8.316 | 9 | 1.7944 | 0.0003 |

Critical Deflections and Radius of Curvature - Design Wind

| Elevation ft | Appurtenance | Gov. Load Comb. | Deflection in | Tilt ° | Twist ° | Radius of Curvature ft |
|-----------------|--------------------------------|-----------------|------------------|-----------|------------|---------------------------|
| 167.0000 | Lightning Rod 5/8x4' | 9 | 123.673 | 6.6859 | 0.0057 | 10307 |
| 158.0000 | (2) 7770.00 w/ Mount Pipe | 9 | 111.277 | 6.4847 | 0.0046 | 5725 |
| 156.0000 | (2) RRUS-11 | 9 | 108.540 | 6.4384 | 0.0044 | 4683 |
| 148.0000 | Platform Mount [LP 712-1] | 9 | 97.715 | 6.2418 | 0.0035 | 2709 |
| 146.0000 | Side Arm Mount [SO 102-3] | 9 | 95.049 | 6.1889 | 0.0033 | 2451 |
| 138.0000 | APX16PV-16PVL-E w/ Mount Pipe | 9 | 84.602 | 5.9573 | 0.0025 | 1772 |
| 128.0000 | (4) DB846G90A-XY w/ Mount Pipe | 9 | 72.176 | 5.6094 | 0.0017 | 1315 |

| Elevation | Appurtenance | Gov. Load Comb. | Deflection | Tilt | Twist | Radius of Curvature |
|-----------|--------------------------------|-----------------|------------|--------|--------|---------------------|
| ft | | | in | ° | ° | ft |
| 120.0000 | APXV18-206517S-C w/ Mount Pipe | 9 | 62.889 | 5.2709 | 0.0013 | 1145 |

Compression Checks

Pole Design Data

| Section No. | Elevation | Size | L | L _u | KI/r | F _a | A | Actual P | Allow. P _a | Ratio P |
|-------------|-------------------|--------------------------|---------|----------------|------|----------------|-----------------|----------|-----------------------|-----------------|
| | ft | | ft | ft | | ksi | in ² | K | K | $\frac{P}{P_a}$ |
| L1 | 167 - 118.25 (1) | TP35.36x24x0.25 | 48.7500 | 0.0000 | 0.0 | 39.000 | 27.0277 | -12.78 | 1054.08 | 0.012 |
| L2 | 118.25 - 90.5 (2) | TP41.3282x33.8114x0.3125 | 32.2500 | 0.0000 | 0.0 | 39.000 | 40.6825 | -20.06 | 1586.62 | 0.013 |
| L3 | 90.5 - 77.75 (3) | TP44.3x41.3282x0.3819 | 12.7500 | 0.0000 | 0.0 | 34.080 | 51.6814 | -21.93 | 1761.30 | 0.012 |
| L4 | 77.75 - 63.5 (4) | TP46.9913x42.2543x0.375 | 19.7500 | 0.0000 | 0.0 | 39.000 | 55.4851 | -28.11 | 2163.92 | 0.013 |
| L5 | 63.5 - 51.5 (5) | TP49.7851x46.9913x0.459 | 12.0000 | 0.0000 | 0.0 | 34.134 | 72.0058 | -31.98 | 2457.85 | 0.013 |
| L6 | 51.5 - 45 (6) | TP51.2985x49.7851x0.4572 | 6.5000 | 0.0000 | 0.0 | 34.146 | 73.7753 | -34.15 | 2519.13 | 0.014 |
| L7 | 45 - 0 (7) | TP61.04x51.2985x0.4375 | 45.0000 | 0.0000 | 0.0 | 39.000 | 84.1541 | -50.03 | 3282.01 | 0.015 |

Pole Bending Design Data

| Section No. | Elevation | Size | Actual M _x | Actual f _{bx} | Allow. F _{bx} | Ratio $\frac{f_{bx}}{F_{bx}}$ | Actual M _y | Actual f _{by} | Allow. F _{by} | Ratio $\frac{f_{by}}{F_{by}}$ |
|-------------|-------------------|--------------------------|-----------------------|------------------------|------------------------|-------------------------------|-----------------------|------------------------|------------------------|-------------------------------|
| | ft | | kip-ft | ksi | ksi | | kip-ft | ksi | ksi | |
| L1 | 167 - 118.25 (1) | TP35.36x24x0.25 | 760.69 | 40.163 | 39.000 | 1.030 | 0.00 | 0.000 | 39.000 | 0.000 |
| L2 | 118.25 - 90.5 (2) | TP41.3282x33.8114x0.3125 | 1763.28 | 51.377 | 39.000 | 1.317 | 0.00 | 0.000 | 39.000 | 0.000 |
| L3 | 90.5 - 77.75 (3) | TP44.3x41.3282x0.3819 | 2005.38 | 44.306 | 34.080 | 1.300 | 0.00 | 0.000 | 34.080 | 0.000 |
| L4 | 77.75 - 63.5 (4) | TP46.9913x42.2543x0.375 | 2696.72 | 50.712 | 39.000 | 1.300 | 0.00 | 0.000 | 39.000 | 0.000 |
| L5 | 63.5 - 51.5 (5) | TP49.7851x46.9913x0.459 | 3137.65 | 43.024 | 34.134 | 1.260 | 0.00 | 0.000 | 34.134 | 0.000 |
| L6 | 51.5 - 45 (6) | TP51.2985x49.7851x0.4572 | 3383.26 | 43.914 | 34.146 | 1.286 | 0.00 | 0.000 | 34.146 | 0.000 |
| L7 | 45 - 0 (7) | TP61.04x51.2985x0.4375 | 5187.19 | 49.431 | 39.000 | 1.267 | 0.00 | 0.000 | 39.000 | 0.000 |

Pole Shear Design Data

| Section No. | Elevation | Size | Actual V | Actual f _v | Allow. F _v | Ratio $\frac{f_v}{F_v}$ | Actual T | Actual f _{vt} | Allow. F _{vt} | Ratio $\frac{f_{vt}}{F_{vt}}$ |
|-------------|-------------------|--------------------------|----------|-----------------------|-----------------------|-------------------------|----------|------------------------|------------------------|-------------------------------|
| | ft | | K | ksi | ksi | | kip-ft | ksi | ksi | |
| L1 | 167 - 118.25 (1) | TP35.36x24x0.25 | 28.48 | 1.054 | 26.000 | 0.081 | 0.16 | 0.004 | 26.000 | 0.000 |
| L2 | 118.25 - 90.5 (2) | TP41.3282x33.8114x0.3125 | 32.96 | 0.810 | 26.000 | 0.062 | 0.25 | 0.004 | 26.000 | 0.000 |
| L3 | 90.5 - 77.75 (3) | TP44.3x41.3282x0.3819 | 33.80 | 0.654 | 22.720 | 0.058 | 0.28 | 0.003 | 22.720 | 0.000 |
| L4 | 77.75 - 63.5 (4) | TP46.9913x42.2543x0.375 | 36.05 | 0.650 | 26.000 | 0.050 | 0.35 | 0.003 | 26.000 | 0.000 |
| L5 | 63.5 - 51.5 (5) | TP49.7851x46.9913x0.459 | 37.41 | 0.520 | 22.756 | 0.046 | 0.41 | 0.003 | 22.756 | 0.000 |

| Section No. | Elevation ft | Size | Actual V K | Actual f_v ksi | Allow. F_v ksi | Ratio $\frac{f_v}{F_v}$ | Actual T kip-ft | Actual f_{vt} ksi | Allow. F_{vt} ksi | Ratio $\frac{f_{vt}}{F_{vt}}$ |
|-------------|-----------------|------------------------------|------------------|------------------------|------------------------|----------------------------|-----------------------|---------------------------|---------------------------|----------------------------------|
| L6 | 51.5 - 45 (6) | TP51.2985x49.7851x0.45 72 | 38.12 | 0.517 | 22.764 | 0.045 | 0.44 | 0.003 | 22.764 | 0.000 |
| L7 | 45 - 0 (7) | TP61.04x51.2985x0.4375 | 42.04 | 0.500 | 26.000 | 0.038 | 0.58 | 0.003 | 26.000 | 0.000 |

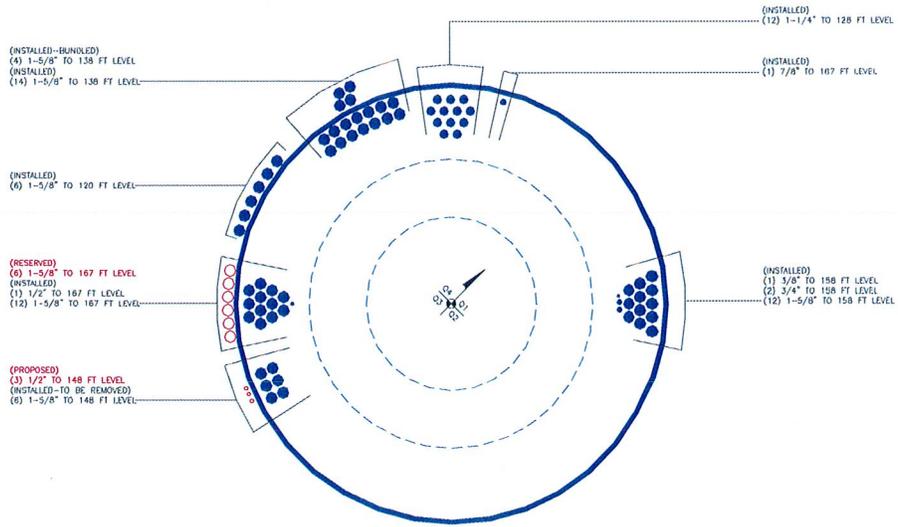
Pole Interaction Design Data

| Section No. | Elevation ft | Ratio P | Ratio f_{bx} | Ratio f_{by} | Ratio f_v | Ratio f_{vt} | Comb. Stress Ratio | Allow. Stress Ratio | Criteria |
|-------------|----------------------|------------|-------------------|-------------------|----------------|-------------------|--------------------------|---------------------------|-----------|
| | | P_a | F_{bx} | F_{by} | F_v | F_{vt} | | | |
| L1 | 167 - 118.25 (1) | 0.012 | 1.030 | 0.000 | 0.081 | 0.000 | 1.044 | 1.333 | H1-3+VT ✓ |
| L2 | 118.25 - 90.5 (2) | 0.013 | 1.317 | 0.000 | 0.062 | 0.000 | 1.331 | 1.333 | H1-3+VT ✓ |
| L3 | 90.5 - 77.75 (3) | 0.012 | 1.300 | 0.000 | 0.058 | 0.000 | 1.313 | 1.333 | H1-3+VT ✓ |
| L4 | 77.75 - 63.5 (4) | 0.013 | 1.300 | 0.000 | 0.050 | 0.000 | 1.314 | 1.333 | H1-3+VT ✓ |
| L5 | 63.5 - 51.5 (5) | 0.013 | 1.260 | 0.000 | 0.046 | 0.000 | 1.274 | 1.333 | H1-3+VT ✓ |
| L6 | 51.5 - 45 (6) | 0.014 | 1.286 | 0.000 | 0.045 | 0.000 | 1.300 | 1.333 | H1-3+VT ✓ |
| L7 | 45 - 0 (7) | 0.015 | 1.267 | 0.000 | 0.038 | 0.000 | 1.283 | 1.333 | H1-3+VT ✓ |

Section Capacity Table

| Section No. | Elevation ft | Component Type | Size | Critical Element | P K | SF* P_{allow} K | % Capacity | Pass Fail |
|-------------|-----------------|-------------------|--------------------------|---------------------|--------|----------------------|---------------|--------------|
| L1 | 167 - 118.25 | Pole | TP35.36x24x0.25 | 1 | -12.78 | 1405.09 | 78.3 | Pass |
| L2 | 118.25 - 90.5 | Pole | TP41.3282x33.8114x0.3125 | 2 | -20.06 | 2114.96 | 99.8 | Pass |
| L3 | 90.5 - 77.75 | Pole | TP44.3x41.3282x0.3819 | 3 | -21.93 | 2347.81 | 98.5 | Pass |
| L4 | 77.75 - 63.5 | Pole | TP46.9913x42.2543x0.375 | 4 | -28.11 | 2884.51 | 98.6 | Pass |
| L5 | 63.5 - 51.5 | Pole | TP49.7851x46.9913x0.4599 | 5 | -31.98 | 3276.31 | 95.6 | Pass |
| L6 | 51.5 - 45 | Pole | TP51.2985x49.7851x0.4572 | 6 | -34.15 | 3358.00 | 97.5 | Pass |
| L7 | 45 - 0 | Pole | TP61.04x51.2985x0.4375 | 7 | -50.03 | 4374.92 | 96.3 | Pass |
| Summary | | | | | | | | |
| Pole (L2) | | | | | | | 99.8 | Pass |
| RATING = | | | | | | | 99.8 | Pass |

APPENDIX B
BASE LEVEL DRAWING



APPENDIX C
ADDITIONAL CALCULATIONS

Program Version 6.0.3.0 - 12/7/2011 File:G:/TOWER/375_Crown_Castle/2013/37513-0349 BU 801367/Aero (Controlling)/37513-0349
Aero.eri

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#: | |
| Site Name: | |
| App #: | |
| Anchor Rod Data | |
| Qty: | 20 |
| Diam: | 2.25 in |
| Rod Material: | A615-J |
| Yield, Fy: | 75 ksi |
| Strength, Fu: | 100 ksi |
| Bolt Circle: | 68 in |
| Anchor Spacing: | 6 in |

| Plate Data | |
|----------------|--------|
| W=Side: | 67 in |
| Thick: | 3 in |
| Grade: | 55 ksi |
| Clip Distance: | 14 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: | 61.04 in |
| Thick: | 0.4375 in |
| Grade: | 65 ksi |
| # of Sides: | 18 "0" IF Round |

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

| Base Reactions | | |
|-----------------------|------|---------|
| TIA Revision: | F | |
| Unfactored Moment, M: | 5187 | ft-kips |
| Unfactored Axial, P: | 50 | kips |
| Unfactored Shear, V: | 42 | kips |

Anchor Rod Results

TIA F --> Maximum Rod Tension 180.6 Kips
 Allowable Tension: 195.0 Kips
 Anchor Rod Stress Ratio: 92.6% Pass

Base Plate Results Flexural Check

Base Plate Stress: 43.6 ksi
 Allowable PL Bending Stress: 55.0 ksi
 Base Plate Stress Ratio: 79.3% Pass

| PL Ref. Data | |
|------------------|-------|
| Yield Line (in): | 33.71 |
| Max PL Length: | 33.71 |

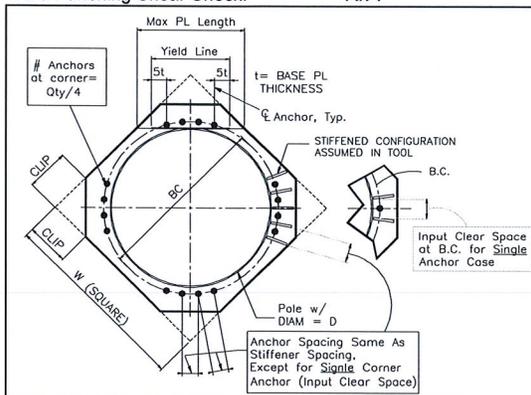
N/A - Unstiffened

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 = **50** (kips)
 Horizontal load at top of pier = **42** (kips)
 Overturning moment at top of pier = **5187** (ft-kips)

Design criteria:

Safety factor against overturning = **1.5**

Soil Properties:

Soil density = **100** (pcf)
 Allowable soil bearing = **8** (ksf)
 Depth to water table = **99** (ft)

Dimensions:

Pier shape (round or square) **R** ("R" or "S")
 Pier width = **8** (ft)
 Pier height above grade = **0.5** (ft)
 depth to bottom of footing = **7** (ft)
 Footing thickness = **4** (ft)
 Footing width = **26** (ft)
 Footing length = **26** (ft)

Concrete:

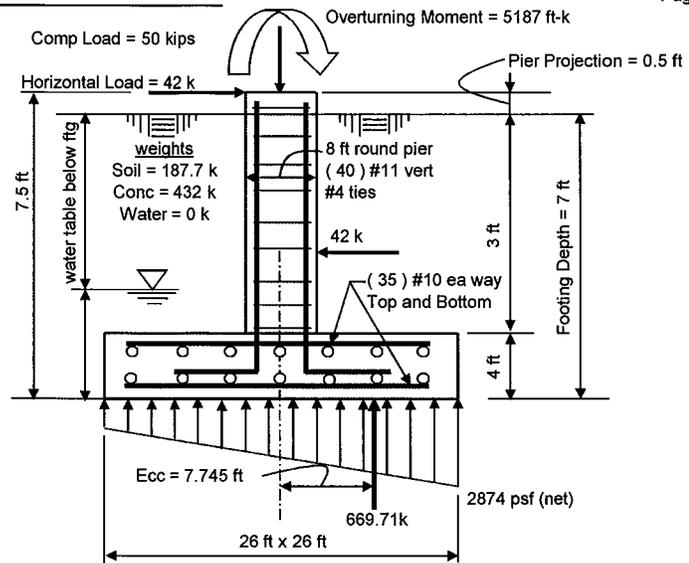
Concrete strength = **3** (ksi)
 Rebar strength = **60** (ksi)
 ultimate load factor = **1.3**

Reinforcing Steel:

Pad
 minimum cover over rebar = **3** inches
 size of pad rebar = **#10** bar
 quantity of pad rebar = **35** (ea direction)

Reinforcing Steel:

Pier
 size of vert rebar in pier = **#11** bar
 vertical rebar quantity = **40**
 size of pier ties = **#4** bar
 minimum cover over rebar = **3** inches
 Total volume of concrete = **####** cu yd



| Summary of analysis results | |
|---|--|
| Maximum Net Soil Bearing = 2.874 ksf Allowable Net Soil Bearing = 8 ksf Soil Bearing Stress Ratio = 0.36 Okay | Ult Bending Shear Capacity = 110 psi Ult Bending Shear Stress = 35 psi Bending Shear Stress Ratio = 0.32 Okay |
| Ftg Overturning Resistance = 8706 ft-kips Overturning Moment = 5187 ft-kips Required Overturning Safety Factor = 1.5 Overturning Safety Factor = 1.678 Ratio = 0.89 Okay | Pad Bending Moment Capacity = 8291 ft-k Pad Bending Moment = 2390 ft-k Bending Moment Stress Ratio = 0.29 OK |

```

                oooooo          o
                oo   oo          oo
ooooo  oooooo  oo          ooooo  oo   oo   o oooooo          o ooooo
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```

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=====
                        spColumn v4.80 (TM)
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General Information:

```

=====
File Name: g:\tower\375_crown_castle\2013\37513-0349 bu 801367\37512-1657.col
Project:
Column:                               Engineer:
Code:      ACI 318-02                 Units: English

Run Option: Investigation              Slenderness: Not considered
Run Axis:   X-axis                    Column Type: Architectural
    
```

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:

```

=====
Circular:      Diameter = 96 in

Gross section area, Ag = 7238.23 in^2
Ix = 4.16922e+006 in^4      Iy = 4.16922e+006 in^4
rx = 24 in                 ry = 24 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; #4 ties with #10 bars, #4 with larger bars.
 phi(a) = 0.8, phi(b) = 0.9, phi(c) = 0.65

Layout: Circular
 Pattern: All Sides Equal (Cover to transverse reinforcement)
 Total steel area: As = 62.40 in^2 at rho = 0.86% (Note: rho < 1.0%)
 Minimum clear spacing = 5.46 in

40 #11 Cover = 3 in

Factored Loads and Moments with Corresponding Capacities:

```

=====
No.      Pu      Mux      PhiMnx  PhiMn/Mu NA depth Dt depth  eps_t  Phi
-----
1        50.00    6934.20    10797.05  1.557    19.55    91.79    0.01109  0.900
    
```

*** End of output ***



DRILLED PIER SOIL AND STEEL ANALYSIS - TIA/EIA-222-F

Unfactored Base Reactions from RISA

| | | | |
|-----------------|-----------|-------------|---------------|
| | Comp. (+) | Tension (-) | |
| Moment, M = | 5187.0 | | k-ft |
| Shear, V = | 42.0 | | kips |
| Axial Load, P = | 50.0 | | kips |
| OTM = | 5208.0 | 0.0 | k-ft @ Ground |

Safety Factors / Load Factors / Φ Factors

| | |
|---------------------------|---------------|
| Tower Type = | Monopole DP |
| ACI Code = | ACI 318-02 |
| Seismic Design Category = | D |
| Reference Standard = | TIA/EIA-222-F |
| Use 1.3 Load Factor? | Yes |
| Load Factor = | 1.30 |

Drilled Pier Parameters

| | | |
|------------------------|-------|-------|
| Diameter = | 8 | ft |
| Height Above Grade = | 0.5 | ft |
| Depth Below Grade = | 23 | ft |
| fc' = | 3 | ksi |
| εc = | 0.003 | in/in |
| Mat Ftdn. Cap Width = | | ft |
| Mat Ftdn. Cap Length = | | ft |
| Depth Below Grade = | | ft |

| | | |
|------------------------------|----------------------|---------------------------------|
| | Safety Factor | Φ Factor |
| Soil Lateral Resistance = | 2.00 | 0.75 |
| Skin Friction = | 2.00 | 0.75 |
| End Bearing = | 2.00 | 0.75 |
| Concrete Wt. Resist Uplift = | 1.25 | |

Load Combinations Checked per TIA/EIA-222-F

- Ult. Skin Friction/2.00 + Ult. End Bearing/2.00 + Effective Soil Wt. - Buoyant Conc. Wt. \geq Compression
- Ult. Skin Friction/2.00 + Buoyant Conc. Wt./1.25 \geq Uplift
- Ult. Skin Friction/1.50 + Buoyant Conc. Wt./1.50 \geq Uplift

Steel Parameters

| | |
|----------------------------|-------|
| Number of Bars = | 24 |
| Rebar Size = | #11 |
| Rebar Fy = | 60 |
| Rebar MOE = | 29000 |
| Tie Size = | #5 |
| Side Clear Cover to Ties = | 4 |

Soil Parameters

| | | |
|--------------------------|--------|----|
| Water Table Depth = | 99.00 | ft |
| Depth to Ignore Soil = | 4.00 | ft |
| Depth to Full Cohesion = | 0 | ft |
| Full Cohesion Starts at? | Ground | |

Above Full Cohesion Lateral Resistance = 4(Cohesion)(Dia)(H)
 Below Full Cohesion Lateral Resistance = 8(Cohesion)(Dia)(H)

Direct Embed Pole Shaft Parameters

| | | |
|---------------------------|--|-----|
| Dia @ Grade = | | in |
| Dia @ Depth Below Grade = | | in |
| Number of Sides = | | |
| Thickness = | | in |
| Fy = | | ksi |
| Backfill Condition = | | |

Maximum Capacity Ratios

| | |
|-----------------------|--------|
| Maximum Soil Ratio = | 100.0% |
| Maximum Steel Ratio = | 100.0% |

Define Soil Layers

Note: Cohesion = Undrained Shear Strength = Unconfined Compressive Strength / 2

| Layer | Thickness ft | Unit Weight pcf | Cohesion psf | Friction Angle degrees | Soil Type | Ultimate End Bearing psf | Comp. Ult. Skin Friction psf | Tension Ult. Skin Friction psf | Depth ft |
|-------|--------------|-----------------|--------------|------------------------|-----------|--------------------------|------------------------------|--------------------------------|----------|
| 1 | 13.5 | 135 | 0 | 35 | Sand | | | | 13.5 |
| 2 | 15.5 | 150 | 0 | 35 | Sand | 80000 | | | 29 |
| 3 | | | | | | | | | |
| 4 | | | | | | | | | |
| 5 | | | | | | | | | |
| 6 | | | | | | | | | |
| 7 | | | | | | | | | |
| 8 | | | | | | | | | |
| 9 | | | | | | | | | |
| 10 | | | | | | | | | |
| 11 | | | | | | | | | |
| 12 | | | | | | | | | |

Soil Results: Overturning

| | | |
|------------------------|---------|----------------|
| Depth to COR = | 16.85 | ft, from Grade |
| Bending Moment, M = | 5915.86 | k-ft, from COR |
| Resisting Moment, Ma = | 6554.68 | k-ft, from COR |

MOMENT RATIO = 90.3% OK

| | | |
|-----------------------|-------|------|
| Shear, V = | 42.00 | kips |
| Resisting Shear, Va = | 46.54 | kips |

SHEAR RATIO = 90.3% OK

Soil Results: Uplift

| | | |
|-----------------------------|--------|------|
| Uplift, T = | 0.00 | kips |
| Allowable Uplift Cap., Ta = | 141.75 | kips |

UPLIFT RATIO = 0.0% OK

Soil Results: Compression

| | | |
|----------------------------|---------|------|
| Compression, C = | 50.00 | kips |
| Allowable Comp. Cap., Ca = | 1996.67 | kips |

COMPRESSION RATIO = 2.5% OK

Steel Results (ACI 318-02):

| | | |
|----------------------|-------|-------|
| Minimum Steel Area = | 24.13 | sq in |
| Actual Steel Area = | 37.44 | sq in |

| | | |
|---------------------------|----------|-------------------------|
| Allowable Min Axial, Pa = | -1555.20 | kips, Where Ma = 0 k-ft |
| Allowable Max Axial, Pa = | 8243.37 | kips, Where Ma = 0 k-ft |

| | | |
|------------------------|---------|----------------------------|
| Axial Load, P = | 89.58 | kips @ 4.75 ft Below Grade |
| Moment, M = | 5401.05 | k-ft @ 4.75 ft Below Grade |
| Allowable Moment, Ma = | 5428.16 | k-ft |

MOMENT RATIO = 99.5% OK

Moment Capacity of Drilled Concrete Shaft (Caisson) for TIA Rev F or G

Note: Shaft assumed to have ties, not spiral, transverse reinforcing

Site Data

| |
|-----------------------------------|
| BU#: 801367 |
| Site Name: CT NHV-2075 CAC 801367 |
| App #: |

| | | |
|---------------------------|-----|--------------------|
| Enter Load Factors Below: | | |
| For M (WL) | 1.3 | <---- Enter Factor |
| For P (DL) | 1.3 | <---- Enter Factor |

| Pier Properties | |
|----------------------------|------------------------|
| Concrete: | |
| Pier Diameter = | 8.0 ft |
| Concrete Area = | 7238.2 in ² |
| Reinforcement: | |
| Clear Cover to Tie= | 4.00 in |
| Horiz. Tie Bar Size= | 5 |
| Vert. Cage Diameter = | 7.11 ft |
| Vert. Cage Diameter = | 85.34 in |
| Vertical Bar Size = | 11 |
| Bar Diameter = | 1.41 in |
| Bar Area = | 1.56 in ² |
| Number of Bars = | 24 |
| As Total= | 37.44 in ² |
| A s/ Aconc, Rho: | 0.0052 0.52% |

ACI 10.5, ACI 21.10.4, and IBC 1810.
 Min As for Flexural, Tension Controlled, Shafts:
 $(3) * (\text{Sqrt}(f_c) / F_y) = 0.0027$
 $200 / F_y = 0.0033$

Minimum Rho Check:
 Actual Req'd Min. Rho: 0.33% Flexural
 Provided Rho: 0.52% **OK**

| Ref. Shaft Max Axial Capacities, ϕ Max(Pn or Tn): | |
|--|-----------------|
| Max Pu = $(\phi=0.65) P_n$. | |
| Pn per ACI 318 (10-2) | 10716.37 kips |
| at Mu= $(\phi=0.65) M_n$ = | 7467.49 ft-kips |
| Max Tu, $(\phi=0.9) T_n$ = | 2021.76 kips |
| at Mu= $\phi=(0.90) M_n$ = | 0.00 ft-kips |

| Maximum Shaft Superimposed Forces | | |
|-----------------------------------|---------|------------------|
| TIA Revision: | F | |
| Max. Service Shaft M: | 5401.05 | ft-kips (* Note) |
| Max. Service Shaft P: | 89.58 | kips |
| Max Axial Force Type: | Comp. | |

(* Note: Max Shaft Superimposed Moment does not necessarily equal to the shaft top reaction moment

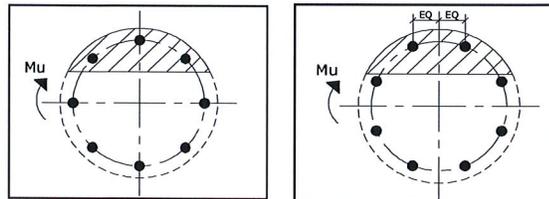
| Load Factor | Shaft Factored Loads | |
|-------------|----------------------|------------------|
| 1.30 | Mu: | 7021.365 ft-kips |
| 1.30 | Pu: | 116.454 kips |

| Material Properties | |
|--|-----------|
| Concrete Comp. strength, f_c = | 3000 psi |
| Reinforcement yield strength, F_y = | 60 ksi |
| Reinforcing Modulus of Elasticity, E = | 29000 ksi |
| Reinforcement yield strain = | 0.00207 |
| Limiting compressive strain = | 0.003 |
| ACI 318 Code | |
| Select Analysis ACI Code= | 2002 |
| Seismic Properties | |
| Seismic Design Category = | D |
| Seismic Risk = | High |

Solve (Run) <-- Press Upon Completing All Input

Results:

Governing Orientation Case: 2



Case 1 Case 2

Dist. From Edge to Neutral Axis: **15.08** in
 Extreme Steel Strain, ϵ_t : **0.0150**
 $\epsilon_t > 0.0050$, Tension Controlled
 Reduction Factor, ϕ : **0.900**

Output Note: Negative Pu=Tension
 For Axial Compression, $\phi P_n = P_u$: 116.45 kips
 Drilled Shaft Moment Capacity, ϕM_n : **7056.60** ft-kips
 Drilled Shaft Superimposed Mu: **7021.37** ft-kips

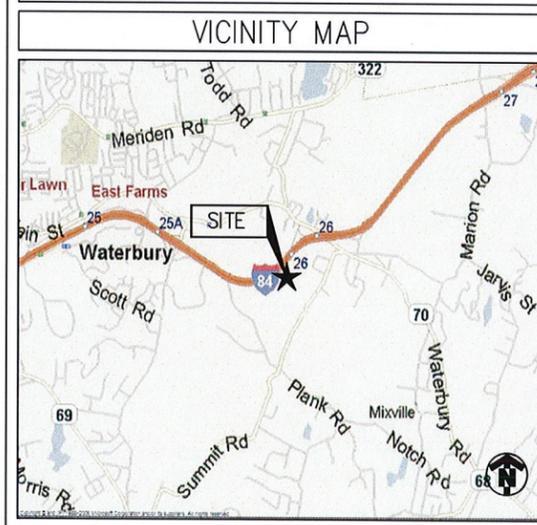
(Mu/ ϕM_n , Drilled Shaft Flexure CSR): 99.5%

| 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. TAKE THE 2ND RIGHT ONTO PARK LN 197 FT 3. CONTINUE STRAIGHT ONTO LEISURE LN 0.1 MI 4. SLIGHT RIGHT ONTO NJ-17 N 0.1 MI 5. TAKE THE EXIT TOWARD I-287 N/NJ-17 N 0.2 MI 6. KEEP LEFT AT THE FORK, FOLLOW SIGNS FOR I-287 N/I-87/NJ-17 N/N Y. THRUWAY AND MERGE ONTO I-287 N/NJ-17 N ENTERING NEW YORK 0.6 MI 7. 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 S CONTINUE TO FOLLOW I-87 S PARTIAL TOLL ROAD 18.9 MI 8. TAKE EXIT 8A FOR NY-119/SAW MILL PKWY N TOWARD ELMSFORD 0.9 MI 9. KEEP LEFT AT THE FORK AND MERGE ONTO SAW MILL PARKWAY N 17.9 MI 10. TAKE THE EXIT TOWARD I-684 N 0.7 MI 11. KEEP LEFT AT THE FORK, FOLLOW SIGNS FOR I-684/BREWSTER AND MERGE ONTO I-684 N 10.4 MI 12. TAKE EXIT 9E FOR INTERSTATE 84 E TOWARD DANBURY 0.4 MI 13. MERGE ONTO I-84 E ENTERING CONNECTICUT 10.2 MI 14. SLIGHT RIGHT TO STAY ON I-84 E 30.4 MI 15. TAKE EXIT 26 FOR CT-70 TOWARD CHESHIRE 0.3 MI 16. TURN RIGHT ONTO CT-70 E/WATERBURY RD 0.1 MI 17. TAKE THE 1ST RIGHT ONTO SUMMIT RD 0.4 MI 18. TURN RIGHT 0.2 MI.



Sprint

NETWORK VISION MMBTS LAUNCH CONNECTICUT MARKET

SITE NAME
CHESHIRE-I84/CROWN

CROWN CASTLE SITE NAME
CT NHV-2075 CAC 801367

SITE NUMBER
CT43XC844

CROWN BU NUMBER
801367

SITE ADDRESS
1119 SUMMIT ROAD
CHESHIRE, CT 06410

STRUCTURE TYPE
MONOPOLE



PROJECT TEAM

808 AVIATION PARKWAY
SUITE 700
MORRISVILLE, NC 27650

PROJECT MANAGER

11 Herbert Drive
Latham, NY 12110
OFFICE #: (518) 690-0790
FAX #: (518) 690-0793

ENGINEER

- 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

| | | |
|-----------------------|---|----------|
| SITE NAME: | CHESHIRE-I84/CROWN | |
| SITE NO.: | CT43XC844 | |
| SITE ADDRESS: | 1119 SUMMIT ROAD CHESHIRE, CT 06410 | |
| COUNTY: | NEW HAVEN | |
| SITE COORDINATES: | | |
| LATITUDE: | 41° 32' 11.24" N | (NAD 83) |
| LONGITUDE: | 72° 57' 26.24" W | (NAD 83) |
| GROUND ELEV.: | ±631' | (AMSL) |
| JURISDICTION: | CONNECTICUT SITING COUNCIL ONLY | |
| APPLICANT: | SPRINT 1 INTERNATIONAL BLVD. MAHWAH, NJ 07495 | |
| LANDLORD: | CROWN ATLANTIC COMPANY LLO 2000 CORPORATE DRIVE CANNONSBURG, PA 15317 | |
| CONSTRUCTION MANAGER: | TODD AMANN 914-715-9363 | |
| BUILDING CODE: | 2003 INTERNATIONAL BUILDING CODE 2005 CONNECTICUT BUILDING CODE W/ 2009 AMENDMENT | |
| ELECTRICAL CODE: | 2005 NATIONAL ELECTRIC 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: TITLE: DATE |

A/E Consultant:

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

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

Project Number: 288-061

Project Title:
CT43XC844
CHESHIRE-I84/
CROWN

Client:
SPRINT

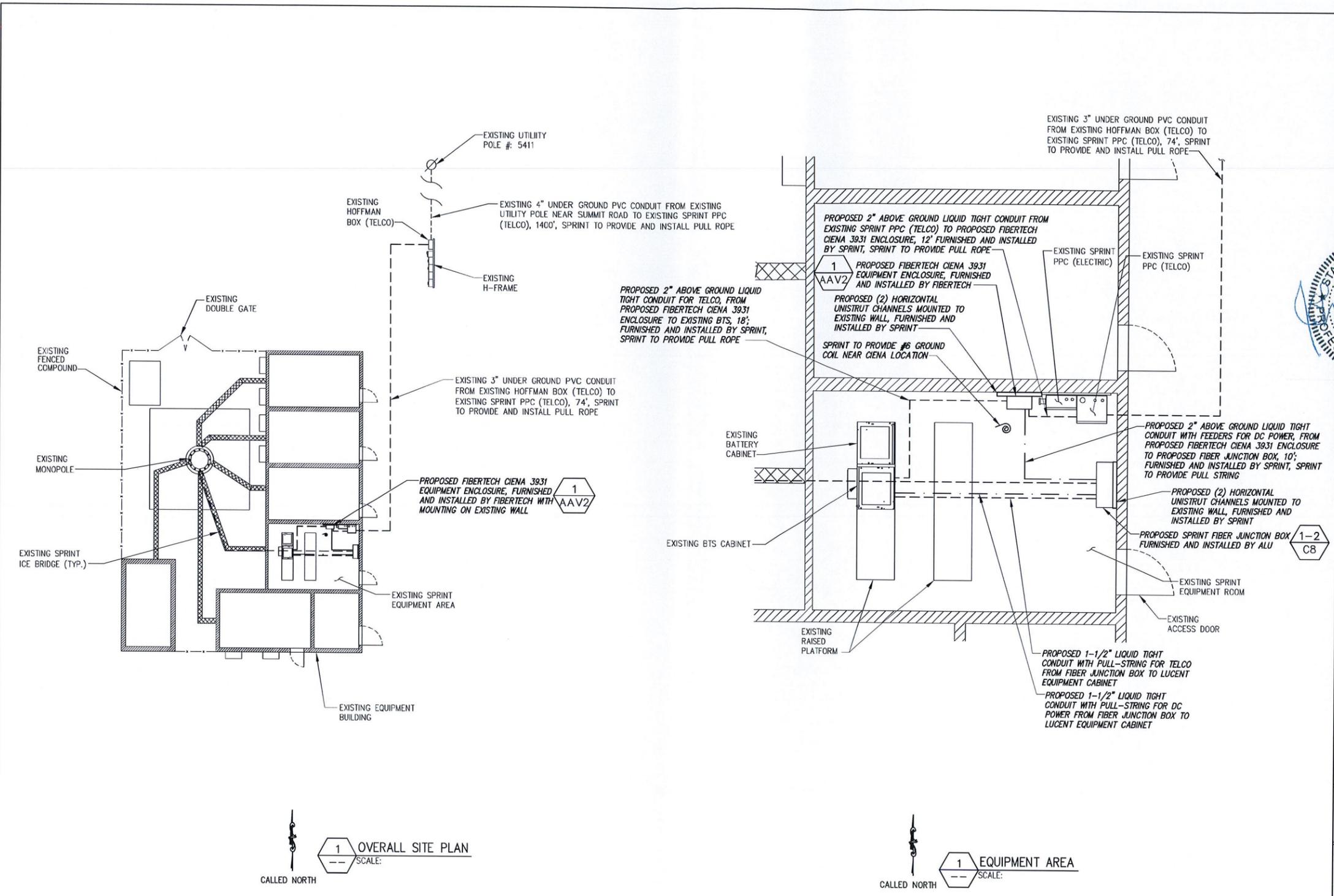
Implementation Team:
ALCATEL-LUCENT
808 AVIATION PARKWAY
MORRISVILLE, NC 27650

Drawing Scale:
AS NOTED

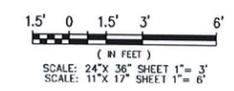
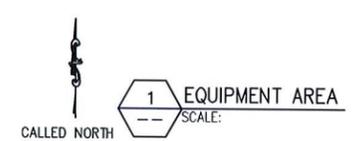
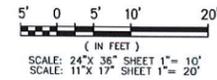
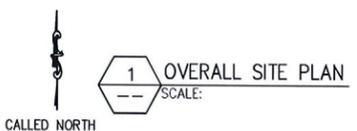
Date:
3/8/13

Drawing Title:
TITLE SHEET

Drawing Number:
T1



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



A/E Consultant:

infinigy
engineering
11 Herbert Drive
Latham, NY 12110
(518) 860-0790

STATE OF CONNECTICUT
JOHN S. STEINBERG
No. 24705
LICENSED PROFESSIONAL ENGINEER
EXPIRES 12/31/13

| | | | |
|-----|-------------------------|-------|---------|
| 1 | ISSUED FOR CONSTRUCTION | AHS | 3/8/13 |
| 0 | ISSUED FOR REVIEW | EM | 6/18/12 |
| No. | Submittal/Revision | Appr. | Date |

Drawn: J.M.B. Date: 5/28/12
Designed: EM Date: 5/28/12
Checked: J.M.B. Date: 5/28/12

Project Number: 288-061

Project Title:
**CT43XC844
CHESHIRE-I84/
CROWN**
1119 SUMMIT ROAD
CHESHIRE, CT 06410

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

Drawing Scale: AS NOTED
Date: 3/8/13

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

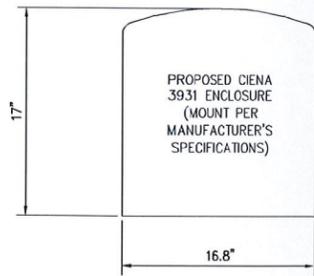
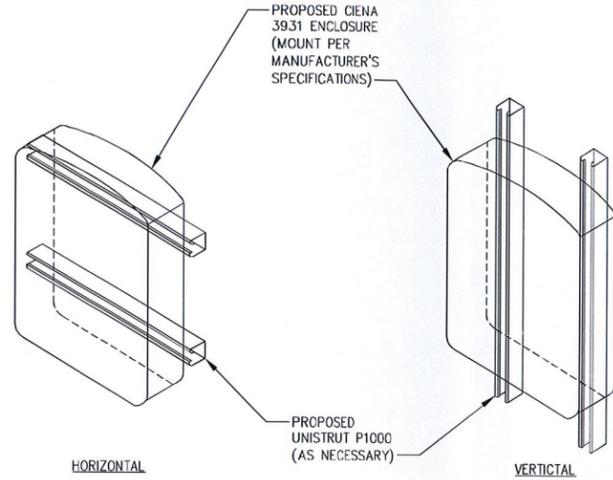
Drawing Number:
AAV1

GENERAL NOTES:

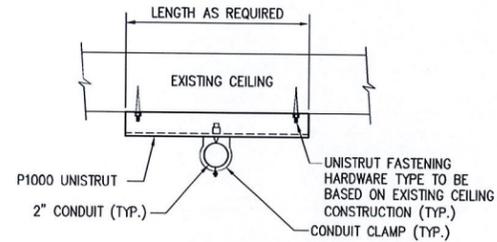
1. THE CONTRACTOR SHALL GIVE ALL NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY, MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS, AND LOCAL AND STATE JURISDICTIONAL CODES BEARING ON THE PERFORMANCE OF THE WORK. THE WORK PERFORMED ON THE PROJECT 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 AN 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.

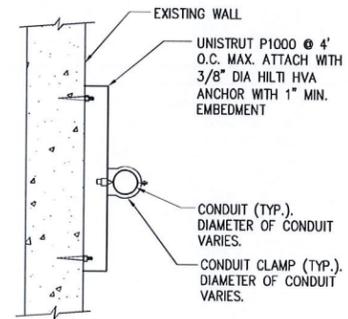


1 TYPICAL CIENA 3931 MOUNTING DETAIL
SCALE: NOT TO SCALE



P1000 UNISTRUT TO BE SPACED @ 4'-0" O.C. MAX. HORIZONTALLY ALONG CONDUIT RUN.

CEILING MOUNT



WALL MOUNT

2 CONDUIT SUPPORT WALL/CEILING MOUNT
NOT TO SCALE

A/E Consultant:

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



NOT BE USED TO CERTIFY ANY WORK OR TO REPRESENT THE ENGINEER'S OPINION ON ANY MATTER UNLESS THE ENGINEER IS REGISTERED IN THE STATE OF CONNECTICUT AND THE WORK IS IN ACCORDANCE WITH ALL APPLICABLE LOCAL LAWS

| | | | |
|-----|-------------------------|-------|---------|
| 1 | ISSUED FOR CONSTRUCTION | AMS | 3/18/13 |
| 0 | ISSUED FOR REVIEW | DM | 6/18/12 |
| No. | Submittal/Revision | Appr. | Date |

Drawn: U.S. Date: 6/18/12
Designed: DM Date: 6/18/12
Checked: A.P. Date: 6/18/12

Project Number 266-061

Project Title
CT43XC844
CHESHIRE-184/
CROWN

1119 SUMMIT ROAD
CHESHIRE, CT 06410

Client: Implementation Team:



Drawing Scale:
AS NOTED

Date:
3/28/13

Drawing Title
NOTES & DETAILS

Drawing Number
AAV2

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:
- GR-63--CORE NEBS REQUIREMENTS: PHYSICAL PROTECTION
 - GR-78--CORE GENERIC REQUIREMENTS FOR THE PHYSICAL DESIGN AND MANUFACTURE OF TELECOMMUNICATIONS EQUIPMENT.
 - NATIONAL FIRE PROTECTION ASSOCIATION CODES AND STANDARDS (NFPA) INCLUDING NFPA 70 (NATIONAL ELECTRICAL CODE - "NEC").
 - AND NFPA 101 (LIFE SAFETY CODE).
 - AMERICAN SOCIETY FOR TESTING OF MATERIALS (ASTM).
 - INSTITUTE OF ELECTRONIC AND ELECTRICAL ENGINEERS (IEEE).
- 1.2 DEFINITIONS:
- WORK: THE SUM OF TASKS AND RESPONSIBILITIES IDENTIFIED IN THE CONTRACT DOCUMENTS.
 - COMPANY: SPRINT NEXTEL CORPORATION
 - ENGINEER: SYNONYMOUS WITH ARCHITECT & ENGINEER AND "A&E". THE DESIGN PROFESSIONAL HAVING PROFESSIONAL RESPONSIBILITY FOR DESIGN OF THE PROJECT.
 - CONTRACTOR: CONSTRUCTION CONTRACTOR; CONSTRUCTION VENDOR; INDIVIDUAL OR ENTITY WHO AFTER EXECUTION OF A CONTRACT IS BOUND TO ACCOMPLISH THE WORK.
 - 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.
- 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:
- NO WORK SHALL COMMENCE PRIOR TO COMPANY'S WRITTEN NOTICE TO PROCEED.
 - 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.
- CONTRACTOR SHALL PROVIDE 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:
- ACCEPT DELIVERIES AS SHIPPED AND TAKE RECEIPT.
 - VERIFY COMPLETENESS AND CONDITION OF ALL DELIVERIES.
 - TAKE RESPONSIBILITY FOR EQUIPMENT AND PROVIDE INSURANCE PROTECTION AS REQUIRED IN AGREEMENT.
 - RECORD ANY DEFECTS OR DAMAGES AND WITHIN TWENTY-FOUR HOURS AFTER RECEIPT, REPORT TO SPRINT NEXTEL OR ITS DESIGNATED PROJECT REPRESENTATIVE OF SUCH.
 - PROVIDE SECURE AND NECESSARY WEATHER PROTECTED WAREHOUSING.
 - 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.
- 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.
 - 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:
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CONSTRUCTION TESTS, INSPECTIONS AND PROJECT DOCUMENTATION.
 - CONTRACTOR SHALL COORDINATE TEST AND INSPECTION SCHEDULES WITH COMPANY'S REPRESENTATIVE WHO MUST BE ON SITE TO WITNESS SUCH TESTS AND INSPECTIONS.
 - 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.
 - 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.
 - SITE RESISTANCE TO EARTH TESTING PER EXHIBIT: CELL SITE GROUNDING SYSTEM DESIGN.
 - ANTENNA AND COAX SWEEP TESTS PER EXHIBIT: ANTENNA TRANSMISSION LINE ACCEPTANCE STANDARDS. HYBERFLEX TESTING NOT LIMITED TO COAX SWEEPS.
 - 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.
- 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.
 - HAND DIGGING: UNLESS APPROVED IN WRITING OTHERWISE, ALL DIGGING WITHIN AN EXISTING CELL SITE COMPOUND IS TO BE DONE BY HAND.
 - 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.
 - 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.
 - 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.
 - 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 WET 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 HEREINAFTER SPECIFIED.
 - 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 PLACED IN THE TRENCH AND IN 1 FOOT LAYERS AND EACH LAYER TAMPED. 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. LUG) 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:

infiniting
 engineering

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



I AM AN AUTHORIZED REPRESENTATIVE OF THE PROFESSION OF ENGINEERS AND SURVEYORS IN THE STATE OF CONNECTICUT. I AM LICENSED UNDER THE PROVISIONS OF THE LOCAL LAWS.

| | | | |
|-----|-------------------------|-------|---------|
| 1 | ISSUED FOR CONSTRUCTION | DATE | 3/8/13 |
| 0 | ISSUED FOR REVIEW | DATE | 6/18/12 |
| No. | Submittal / Revision | App'd | Date |
| | | | |
| | | | |

Drawn: M.B. Date: 6/18/12
 Designed: DM Date: 6/18/12
 Checked: J.B. Date: 6/18/12

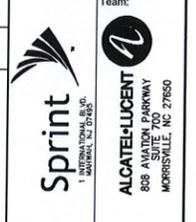
Project Number: 266-061

Project Title:

CT43XC844
 CHESHIRE-184/
 CROWN

1119 SUMMIT ROAD
 CHESHIRE, CT 06410

Client: Implementation Team:



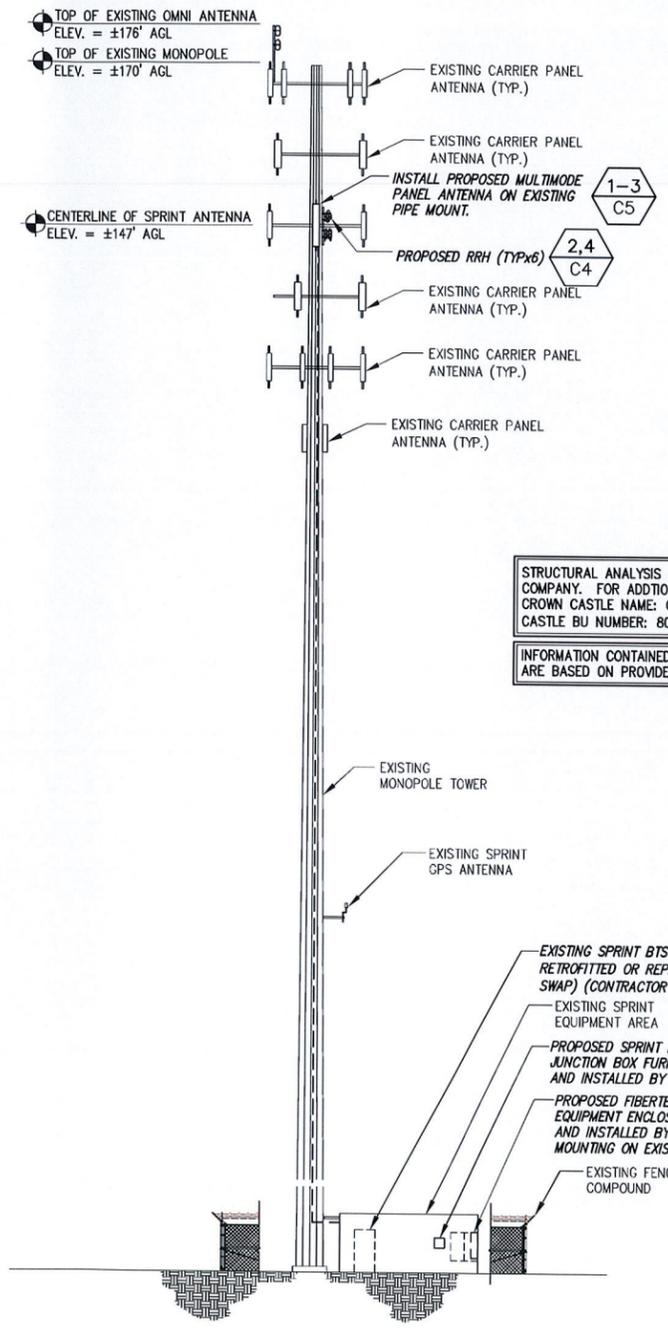
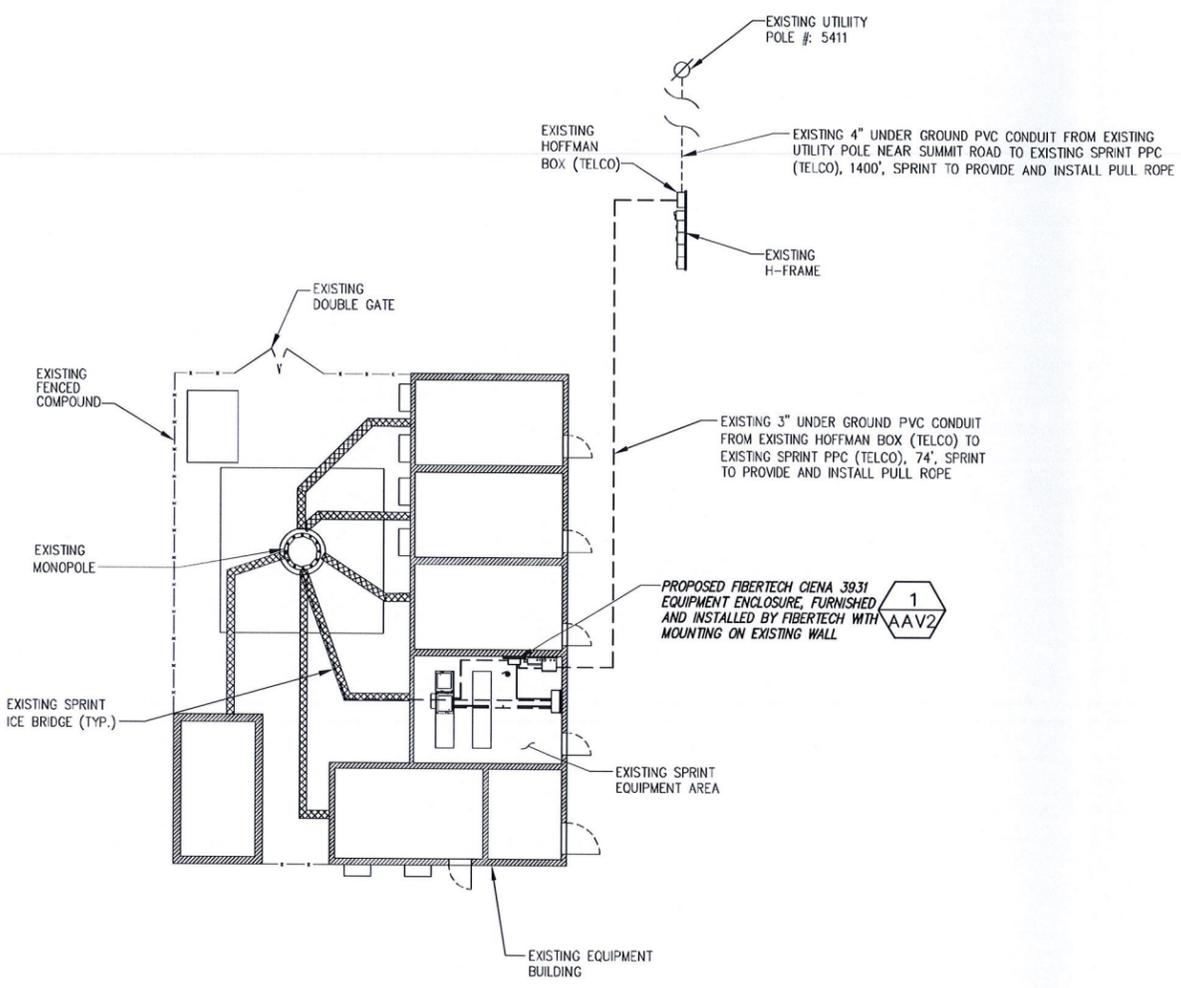
Drawing Scale: AS NOTED
 Date: 3/8/13

Drawing Title:

GENERAL NOTES

Drawing Number:

C1



2 SITE ELEVATION NOT TO SCALE

STRUCTURAL ANALYSIS COMPLETED BY PAUL J. FORD AND COMPANY. FOR ADDITIONAL INFORMATION, SEE REPORT: CROWN CASTLE NAME: CT NHV-2075 CAC 801367, CROWN CASTLE BU NUMBER: 801367 DATED: 1/28/13.

INFORMATION CONTAINED WITHIN DRAWINGS ARE BASED ON PROVIDED INFORMATION.

A/E Consultant:

infinigy
engineering
11 Herbert Drive
Latham, NY 12110
(518) 860-0790

| | | | |
|-----------|-------------------------|-------|---------|
| 1 | ISSUED FOR CONSTRUCTION | AVS | 3/8/13 |
| 0 | ISSUED FOR REVIEW | EDM | 6/18/12 |
| No. | Submittal / Revision | Appr. | Date |
| Drawn: | M.B. | Date: | 5/28/12 |
| Designed: | EDM | Date: | 5/28/12 |
| Checked: | J.B. | Date: | 5/28/12 |

Project Number: 286-061

Project Title:
CT43XC844
CHESHIRE-I84/
CROWN
1119 SUMMIT ROAD
CHESHIRE, CT 06410

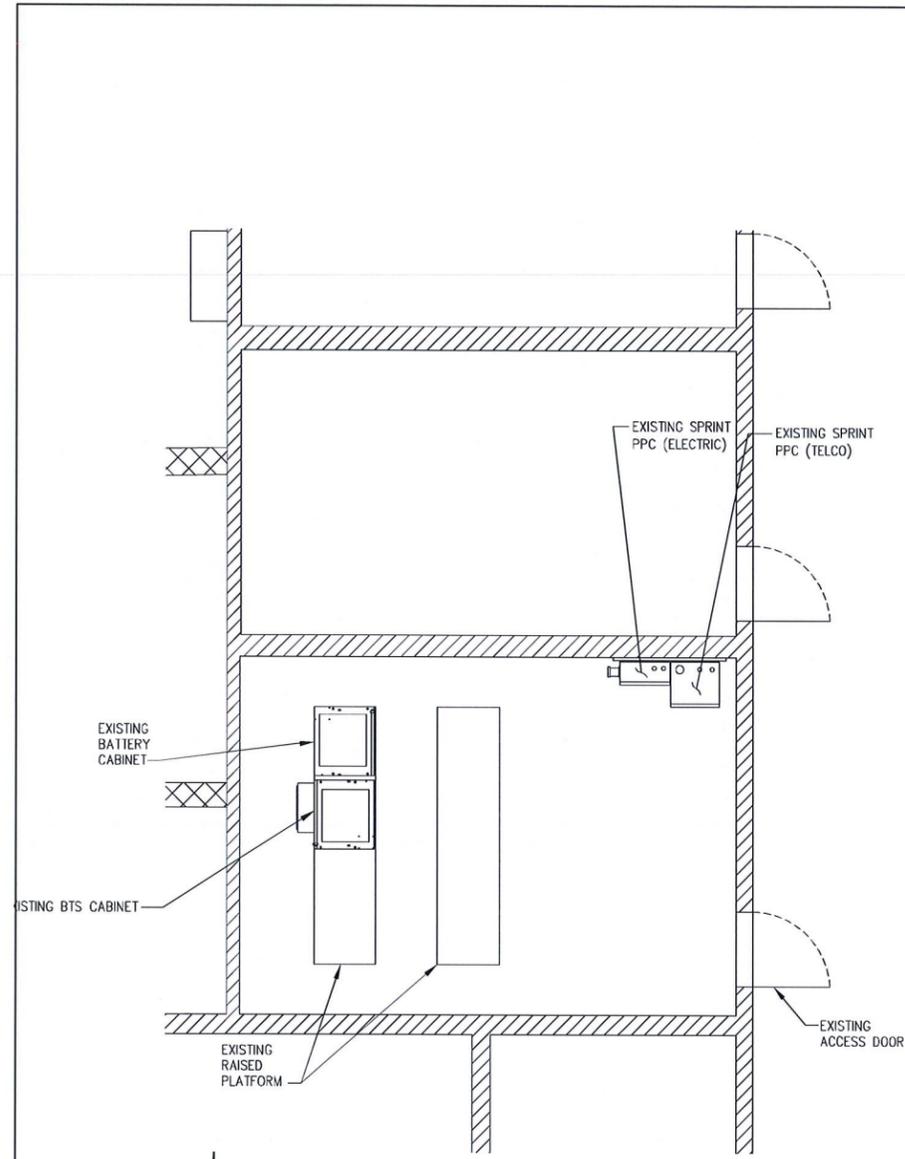
Client: **sprint** INTERNATIONAL, INC. 1 INTERNATIONAL BLVD. WASHINGTON, DC 20005

Implementation Team:
ALCATEL-LUCENT
800 AVIATION PARKWAY
SUITE 100
MORRISVILLE, NC 27660

Drawing Scale: AS NOTED
Date: 3/8/13

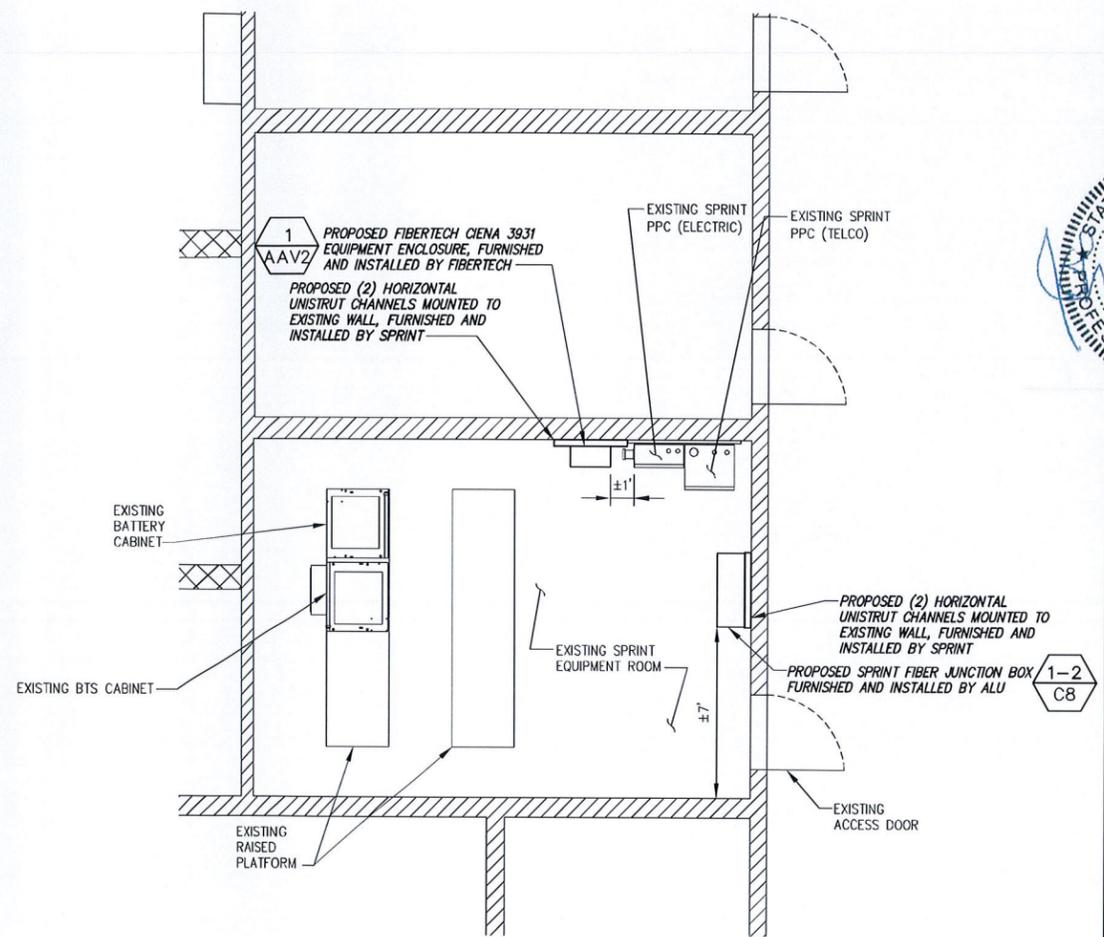
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COMPOUND SITE PLAN

Drawing Number:
C2



1 EQUIPMENT SITE PLAN (EXISTING)
 SCALE: 1" = 6'

1.5' 0 1.5' 3' 6'
 (IN FEET)
 SCALE: 24" X 36" SHEET 1" = 3'
 SCALE: 11" X 17" SHEET 1" = 6'



2 EQUIPMENT SITE PLAN (FINAL/PERMANENT)
 SCALE: 1" = 6'

1.5' 0 1.5' 3' 6'
 (IN FEET)
 SCALE: 24" X 36" SHEET 1" = 3'
 SCALE: 11" X 17" SHEET 1" = 6'

A/E Consultant:

infinigy
 engineering
 11 Herbert Drive
 Latham, NY 12110
 (518) 860-0790



ISSUED FOR CONSTRUCTION A/S 3/8/13
 ISSUED FOR REVIEW B/W 6/16/12

Drawn: M.B. Date: 5/18/12
 Designed: E.M. Date: 5/18/12
 Checked: J.B. Date: 5/18/12

Project Number: 286-061
 Project Title:

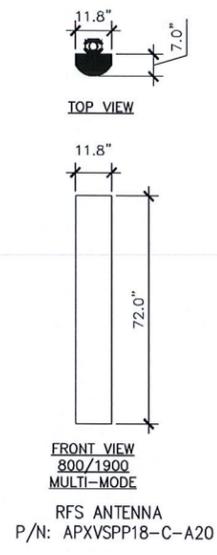
CT43XC844
 CHESHIRE-184/
 CROWN
 1119 SUMMIT ROAD
 CHESHIRE, CT 06410

Client: Sprint
 Implementation Team: Alcatel-Lucent
 808 AVIATION PARKWAY
 SUITE 700
 MORRISVILLE, NC 27660

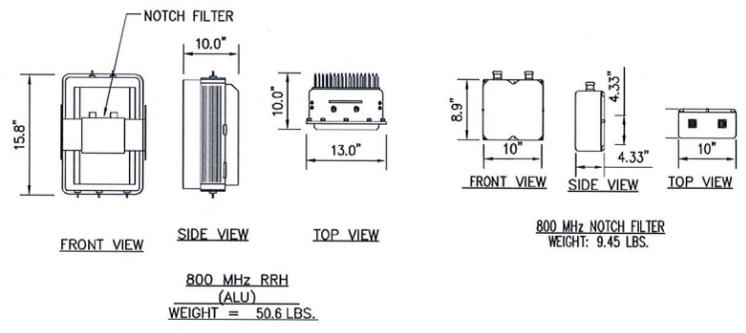
Drawing Scale: AS NOTED
 Date: 3/8/13

Drawing Title: **EQUIPMENT SITE PLANS**

Drawing Number: **C3**

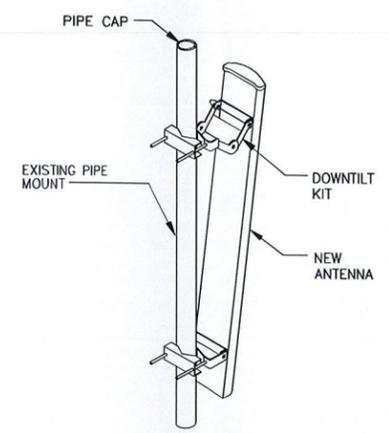
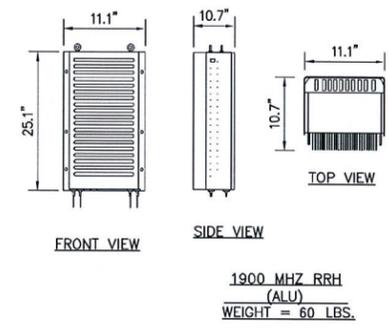


1 ANTENNA DETAILS
--- NOT TO SCALE

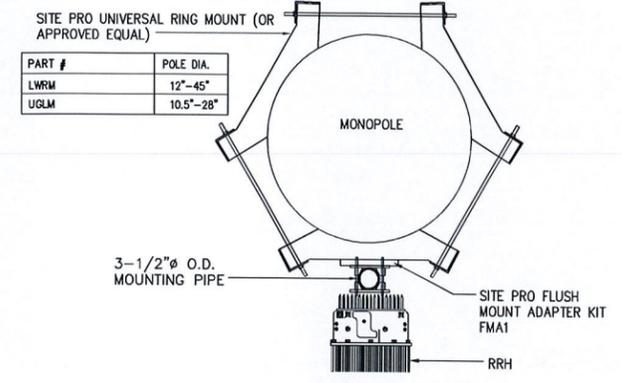


2 RRH EQUIPMENT DETAILS
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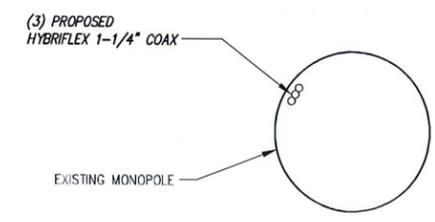
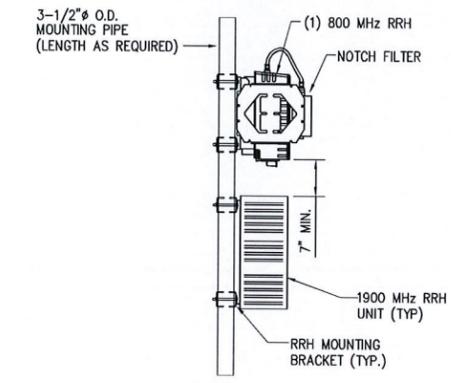
NOTE:
REFER TO R.F. SYSTEM SCHEDULE FOR EXACT RRH SPECIFICATIONS AND QUANTITIES.



3 PANEL ANTENNA MOUNT DETAIL
--- NOT TO SCALE



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



5 COAX ROUTING DETAIL
--- NOT TO SCALE

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

A/E Consultant:

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

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

| | | | |
|-----|-------------------------|------|---------|
| 1 | ISSUED FOR CONSTRUCTION | AHS | 3/8/13 |
| 0 | ISSUED FOR REVIEW | EM | 6/18/12 |
| Rev | Submitted/Revision | Appr | Date |

Drawn: H.B. Date: 5/28/12
Designed: EM Date: 5/28/12
Checked: A.B. Date: 5/28/12

Project Number: 288-061

Project Title:
CT43XC844
CHESHIRE-184/
CROWN

1119 SUMMIT ROAD
CHESHIRE, CT 06410

Client: Sprint
Implementation Team: ALCATEL-LUCENT

ALCATEL-LUCENT
808 AVIATION PARKWAY
SUITE 700
MORRISVILLE, NC 27660

Drawing Scale: AS NOTED
Date: 3/8/13

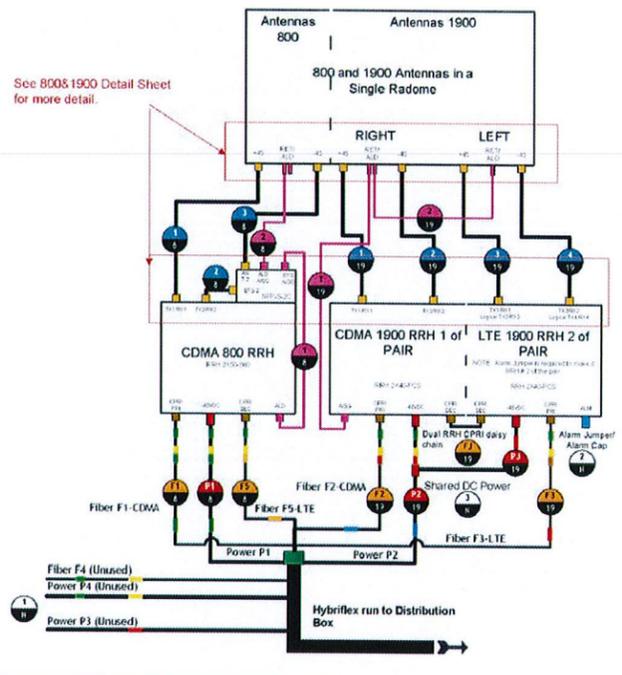
Drawing Title: **SITE ELEVATION & ANTENNA/RRH DETAILS**

Drawing Number: **C4**

TOWER TOP SCENARIO 2

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

See 800S1900 Detail Sheet for more detail.

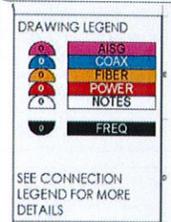
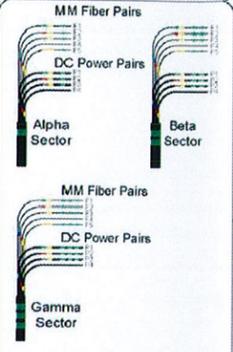


Power Feed Polarity Definition:
 Black = -48VDC Feed (Battery)
 Black/White Stripes = Return

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



NOTES:
 CONTRACTOR TO FIELD VERIFY GPS LOCATION.

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

PLUMBING DIAGRAM VERSION 1.9

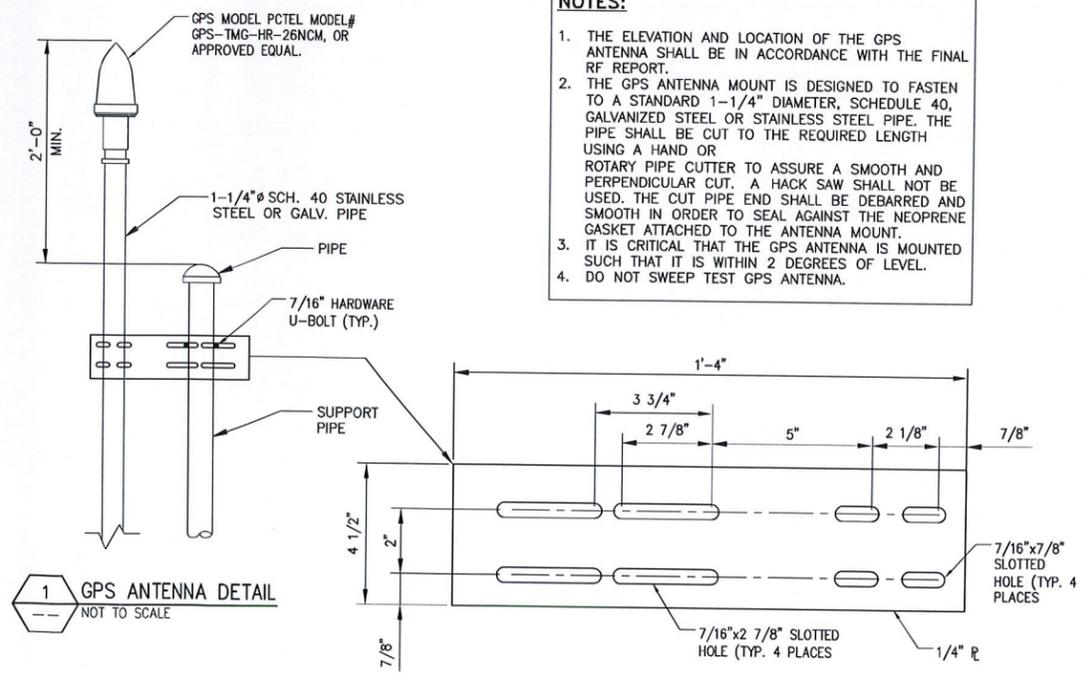
WEATHERPROOFING CONNECTORS AND GROUND KITS NOTE:

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.



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.

A/E Consultant:

infinig

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

STATE OF CONNECTICUT

JOHN S. STEVENS

Professional Engineer

No. 24705

LICENSED

| | | | |
|--|-------------------------|---------------------|---------|
| 1 | ISSUED FOR CONSTRUCTION | AHS | 3/8/13 |
| 0 | ISSUED FOR REVIEW | DM | 6/18/12 |
| No. | Submittal / Revision | App'd | Date |
| Drawn: | M.B. | Date: | 6/18/12 |
| Designed: | DM | Date: | 6/18/12 |
| Checked: | A.B. | Date: | 6/18/12 |
| Project Number: 286-061 | | | |
| Project Title: CT43XC844 CHESHIRE-I84/ CROWN | | | |
| 1119 SUMMIT ROAD CHESHIRE, CT 06410 | | | |
| Client: | Implementation Team: | | |
| | | | |
| ALCATEL-LUCENT | 808 AVIATION PARKWAY | SUNNYVALE, CA 94085 | |
| Drawing Scale: | AS NOTED | Date: | 3/8/13 |
| Drawing Title: ANTENNA CABLE RISER AND H-FRAME DETAILS | | | |
| Drawing Number: C6 | | | |

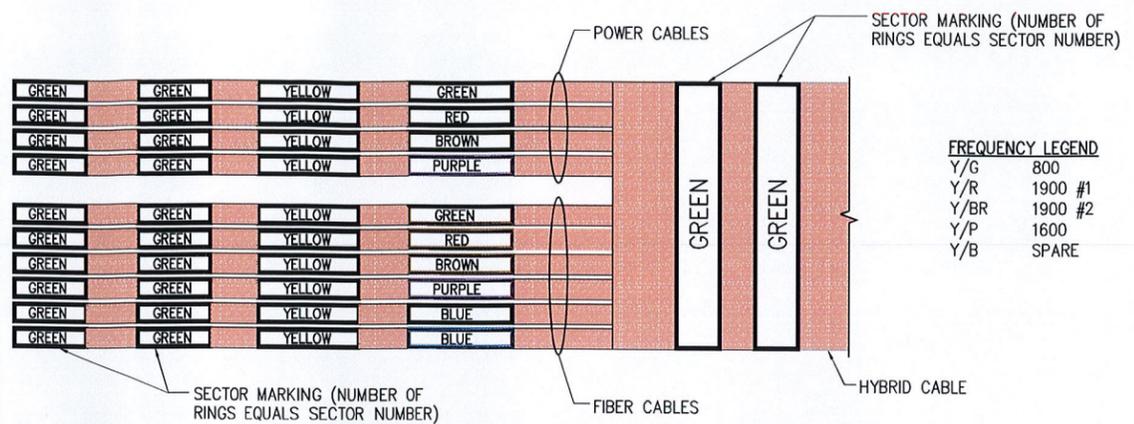
| Market Southern Connecticut Cascade ID CT43XC844 | | SECTOR 1 | SECTOR 2 | SECTOR 3 |
|---|--------------------------------|--------------------------------|--------------------------------|----------|
| Split sector present | No | No | No | No |
| 1900MHz_Azimuth | 30 | 190 | 270 | |
| 1900MHz_No_of_Antennas | 1 | 1 | 1 | |
| 1900MHz_RADCenter(ft) | 147.9 | 147.9 | 147.9 | |
| 1900MHz_Antenna_Make | RFS | RFS | RFS | |
| 1900MHz_Antenna_Model | APXVSP18-C-A20 | APXVSP18-C-A20 | APXVSP18-C-A20 | |
| 1900MHz_Horizontal_Beamwidth | 65 | 65 | 65 | |
| 1900MHz_Vertical_Beamwidth | 5.5 | 5.5 | 5.5 | |
| 1900MHz_AntennaHeight(ft) | 6 | 6 | 6 | |
| 1900MHz_AntennaGain(dBd) | 15.9 | 15.9 | 15.9 | |
| 1900MHz_E_Tilt | -4 | 0 | -5 | |
| 1900MHz_M_Tilt | 0 | 0 | 0 | |
| 1900MHz_Carrier_Forecast_Year_2013 | 4 | 4 | 4 | |
| 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 | 30 | 190 | 270 | |
| 800MHz_No_of_Antennas | 0 | 0 | 0 | |
| 800MHz_RADCenter(ft) | 147.9 | 147.9 | 147.9 | |
| 800MHz_Antenna_Make | RFS | RFS | RFS | |
| 800MHz_Antenna_Model | APXVSP18-C-A20 (Shared w/1900) | APXVSP18-C-A20 (Shared w/1900) | APXVSP18-C-A20 (Shared w/1900) | |
| 800MHz_Horizontal_Beamwidth | 65 | 65 | 65 | |
| 800MHz_Vertical_Beamwidth | 11.5 | 11.5 | 11.5 | |
| 800MHz_AntennaHeight (ft) | 6 | 6 | 6 | |
| 800MHz_AntennaGain (dBd) | 13.4 | 13.4 | 13.4 | |
| 800MHz_E_Tilt | -8 | -1 | -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_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 | 124 | 124 | |

Comments
* If plumbing scenario does not match the material received, please contact your Construction Manager
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.

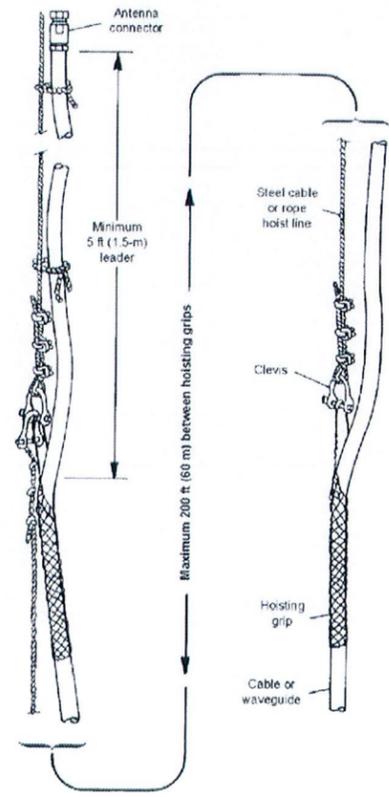
NOTE:
RFDS SHOWN PROVIDED BY SPRINT DATED 11/9/12.



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. SNAGGING 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:
infinigy
engineering
11 Herbert Drive
Latham, NY 12110
(518) 696-0790



| No. | Submittal/Revision | Appr. | Date |
|-----|-------------------------|-------|---------|
| 1 | ISSUED FOR CONSTRUCTION | AMS | 3/8/13 |
| 0 | ISSUED FOR REVIEW | EDM | 6/18/12 |

Project Number: 288-061

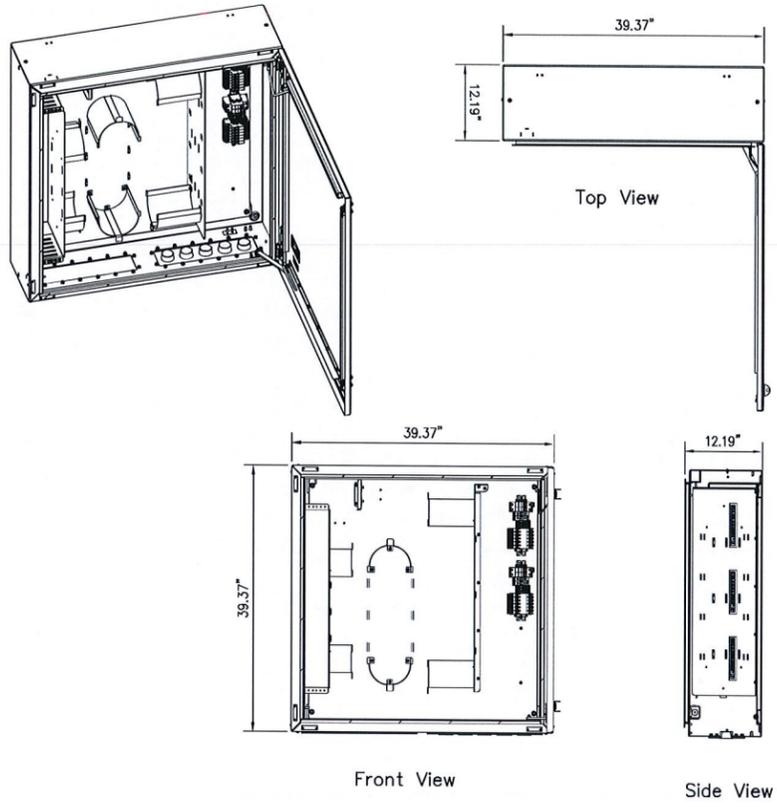
Project Title:
CT43XC844
CHESHIRE-184/
CROWN
1119 SUMMIT ROAD
CHESHIRE, CT 06410

Client: Sprint
Implementation Team: ALCATEL-LUCENT
808 AVANTON PARKWAY
SUITE 700
MORRISVILLE, NC 27660

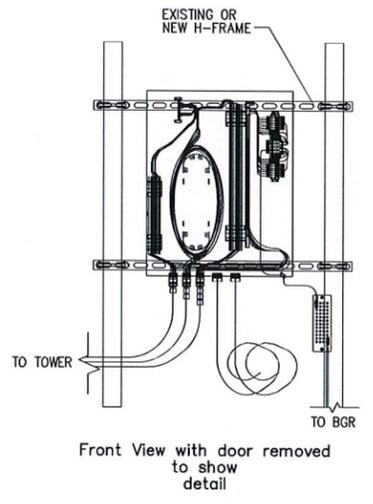
Drawing Scale: AS NOTED
Date: 3/8/13

Drawing Title:
RF AND CABLE DETAILS

Drawing Number:
C7



1 DISTRIBUTION BOX DETAIL
NOT TO SCALE



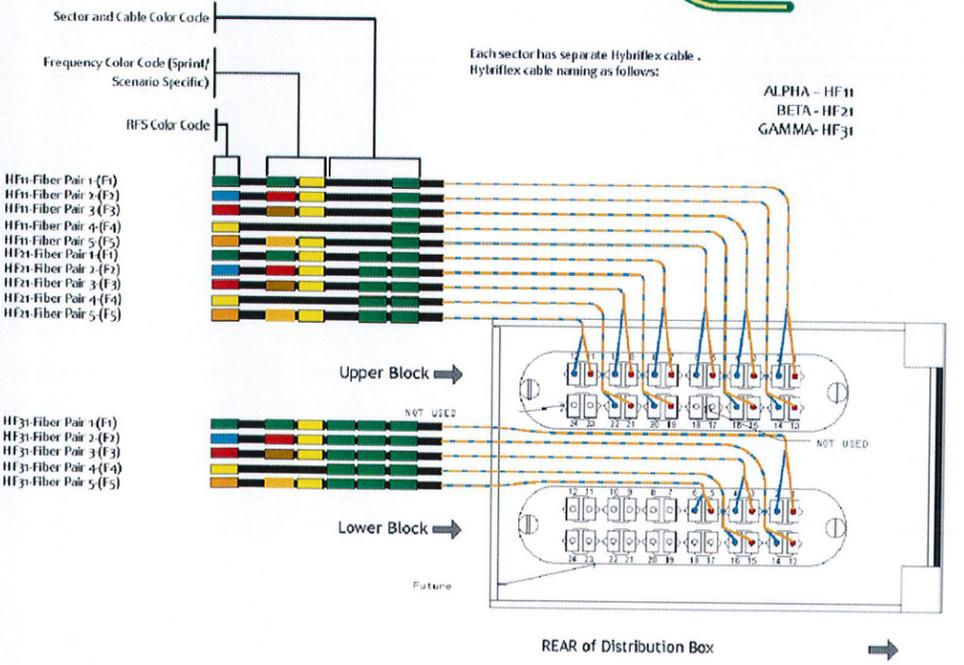
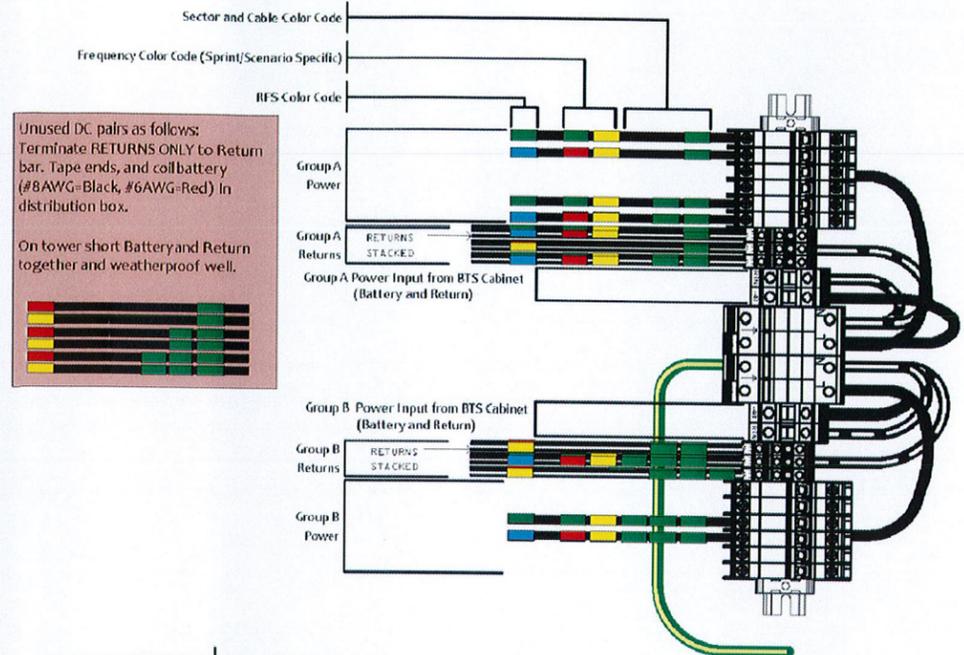
2 DISTRIBUTION BOX INSTALL COMPLETE VIEW
NOT TO SCALE

NOTES:

- DISTRIBUTION BOX IS KITTED 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:

infinig
engineering

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

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

| | | | |
|------|-------------------------|-------|---------|
| 1 | ISSUED FOR CONSTRUCTION | AVS | 3/8/13 |
| 0 | ISSUED FOR REVIEW | DM | 6/18/12 |
| Rev. | Submittal/Revision | Appr. | Date |

Drawn: V.B. Date: 6/18/12
Designed: DM Date: 6/18/12
Checked: A.B. Date: 6/18/12

Project Number: 288-061

Project Title:
CT43XC844
CHESHIRE-184/
CROWN

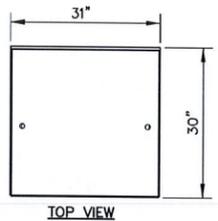
1119 SUMMIT ROAD
CHESHIRE, CT 06410

Client: Sprint
Implementation Team: ALCATEL-LUCENT
808 AVIATION PARKWAY
MORRISVILLE, NC 27550

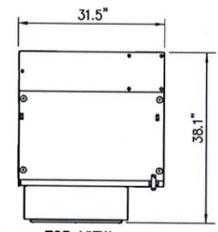
Drawing Scale: AS NOTED
Date: 3/8/13

Drawing Title: **JUNCTION BOX DETAILS**

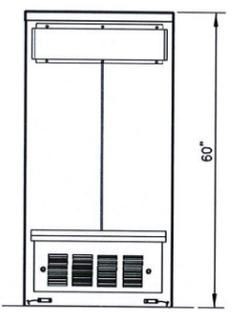
Drawing Number: **C8**



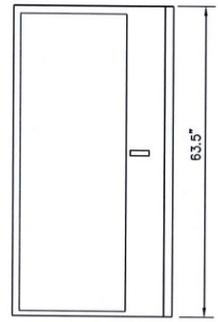
TOP VIEW



TOP VIEW



REAR VIEW



FRONT VIEW

1 BATTERY CABINET PROFILE
NOT TO SCALE

2 BTS CABINET PROFILE
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 _s =0.152 S _s * = 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:

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



| No. | Submittal / Revision | Appr. | Date |
|-----|-------------------------|-------|---------|
| 1 | ISSUED FOR CONSTRUCTION | AHS | 3/8/13 |
| 0 | ISSUED FOR REVIEW | EDM | 6/18/12 |

Drawn: W.B. Date: 6/18/12
 Designed: EDM Date: 6/18/12
 Checked: J.E. Date: 6/18/12

Project Number: 286-061
 Project Title:
CT43XC844
CHESHIRE-184/
CROWN
 1119 SUMMIT ROAD
 CHESHIRE, CT 06410

Client: Implementation Team:

ALCATEL-LUCENT
 808 AVIATION PARKWAY
 MORRISVILLE, NC 27650

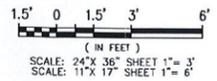
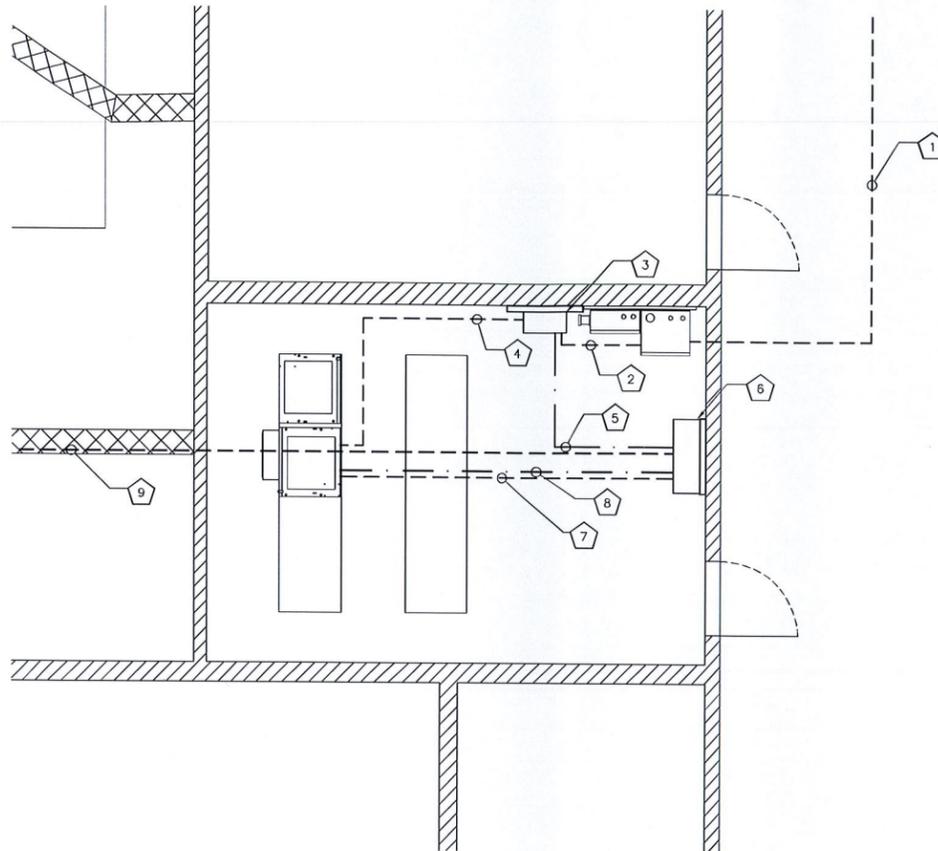
Drawing Scale:
AS NOTED
 Date:
3/8/13

Drawing Title:
DETAILS

Drawing Number:
C9

CODED NOTES:

- 1 EXISTING 3" UNDER GROUND PVC CONDUIT FROM EXISTING HOFFMAN BOX (TELCO) TO EXISTING SPRINT PPC (TELCO), 74', SPRINT TO PROVIDE AND INSTALL PULL ROPE
- 2 PROPOSED 2" ABOVE GROUND LIQUID TIGHT CONDUIT FROM EXISTING SPRINT PPC (TELCO) TO PROPOSED FIBERTECH CIENA 3931 ENCLOSURE, 12' FURNISHED AND INSTALLED BY SPRINT, SPRINT TO PROVIDE PULL ROPE
- 3 PROPOSED FIBERTECH CIENA 3931 EQUIPMENT ENCLOSURE, FURNISHED AND INSTALLED BY FIBERTECH WITH MOUNTING ON (2) UNISTRUTS
- 4 PROPOSED 2" ABOVE GROUND LIQUID TIGHT CONDUIT FOR TELCO, FROM PROPOSED FIBERTECH CIENA 3931 ENCLOSURE TO EXISTING BTS, 18'; FURNISHED AND INSTALLED BY SPRINT, SPRINT TO PROVIDE PULL ROPE
- 5 PROPOSED 2" ABOVE GROUND LIQUID TIGHT CONDUIT WITH FEEDERS FOR DC POWER, FROM PROPOSED FIBERTECH CIENA 3931 ENCLOSURE TO PROPOSED FIBER JUNCTION BOX, 10'; FURNISHED AND INSTALLED BY SPRINT, SPRINT TO PROVIDE PULL STRING
- 6 PROPOSED SPRINT FIBER JUNCTION BOX FURNISHED AND INSTALLED BY ALU MOUNTED ON (2) UNISTRUTS
- 7 PROPOSED 1-1/2" LIQUID TIGHT CONDUIT WITH PULL-STRING FOR TELCO FROM FIBER JUNCTION BOX TO LUCENT EQUIPMENT CABINET
- 8 PROPOSED 1-1/2" LIQUID TIGHT CONDUIT WITH PULL-STRING FOR DC POWER FROM FIBER JUNCTION BOX TO LUCENT EQUIPMENT CABINET
- 9 PROPOSED 1-1/4" HYBRIFLEX CABLE ROUTED FROM PROPOSED JUNCTION BOX TO PROPOSED TOWER MOUNTED RRH, 225' (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 MMBTS 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 THIN 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 SPRINTS 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.
12. REDLINED AS-BUILTS ARE TO BE DELIVERED TO SPRINT REPRESENTATIVE.
13. PROVIDE TWO COPIES OF OPERATION AND MAINTENANCE MANUALS IN THREE-RING BINDER.
14. FURNISH AND INSTALL THE COMPLETE ELECTRICAL SERVICE, TELCO CONDUIT, AND THE COMPLETE GROUNDING SYSTEM.
15. 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.
16. 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.
17. PROJECT ADJACENT STRUCTURES AND FINISHES FROM DAMAGE. REPAIR TO ORIGINAL CONDITION ANY DAMAGED AREA.
18. 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.
19. UPON COMPLETION OF WORK, THE SITE SHALL BE CLEAN AND FREE OF DUST AND FINGERPRINTS.
20. PRIOR TO ANY TRENCHING, CONTACT LOCAL UTILITY TO VERIFY LOCATION OF ANY EXISTING BURIED SERVICE CONDUITS.
21. 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.
22. ALL ABOVE GRADE CONDUIT TO BE RIGID METALLIC.

A/E Consultant:

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



| Issued For | Revision | Date |
|------------|-------------------------|------------|
| 1 | ISSUED FOR CONSTRUCTION | ANS 3/8/13 |
| 2 | ISSUED FOR REVIEW | EM 6/18/12 |
| 3 | Submittal / Revision | Appr. Date |

Drawn: M.B. Date: 5/18/12
Designed: EM Date: 5/18/12
Checked: J.R. Date: 5/18/12

Project Number: 286-061
Project Title: CT43XC844 CHESHIRE-184/ CROWN
1119 SUMMIT ROAD CHESHIRE, CT 06410

Client:  INTERNATIONAL BLDG. SOLUTIONS, 21 DRYDEN

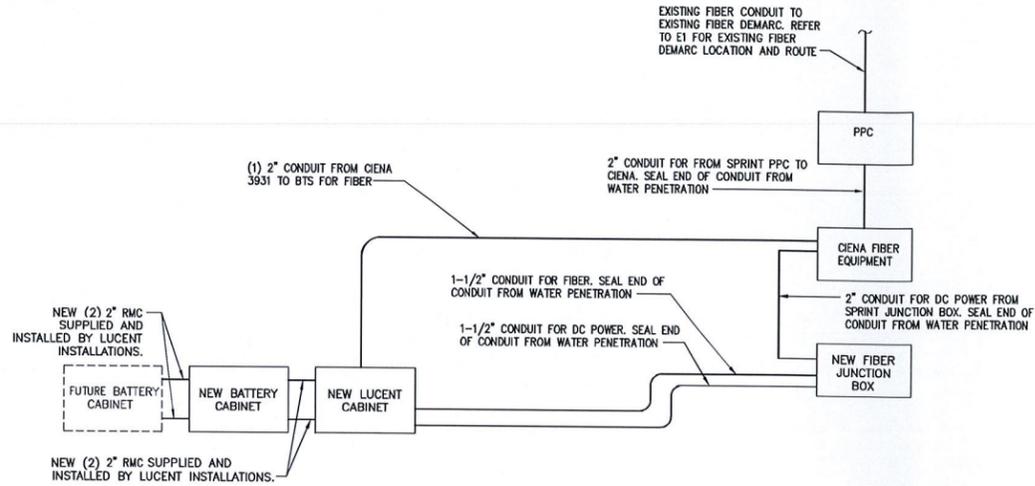
Implementation Team:  ALCATEL-LUCENT 808 AVIATION PARKWAY SUITE 700 MORRISVILLE, NC 27660

Drawing Scale: AS NOTED
Date: 3/8/13

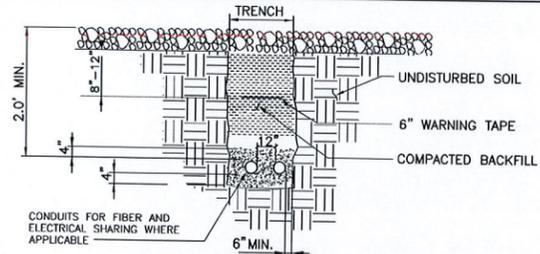
Drawing Title: **UTILITY SITE PLAN**

Drawing Number: **E1**

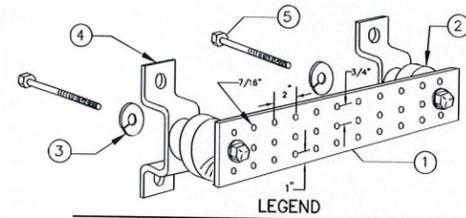
GROUNDING NOTE:
 IN ADDITION TO POWER SERVICE GROUNDING AS REQUIRED BY NEC, CONTRACTOR SHALL BE RESPONSIBLE TO COORD AND INSTALL ALL SURGE AND LIGHTING PROTECTION GROUNDING AS REQUIRED AND SPECIFIED BY SPRINT



1 ONE-LINE DIAGRAM
 NOT TO SCALE

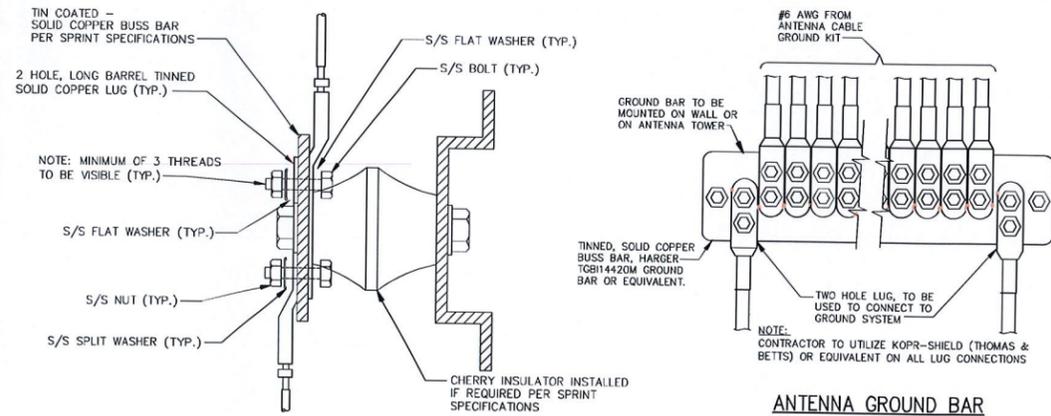


2 UTILITY TRENCH DETAIL
 NOT TO SCALE



- LEGEND**
1. TINNED COPPER GROUND BAR, 1/2" x 4" x 20", NEWTON INSTRUMENT Co., HARGER TGB14420M, OR EQUIVALENT. HOLE CENTERS TO MATCH
 2. NEMA DOUBLE LUG CONFIGURATION.
 3. INSULATORS, NEWTON INSTRUMENT Co. CAT. NO. 3061-4 OR HARGER EQUIVALENT.
 4. EQUIVALENT.
 5. 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



ANTENNA 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

3 GROUND BAR DETAILS
 NOT TO SCALE

A/E Consultant:

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



| | | | |
|-----|-------------------------|-------|---------|
| 1 | ISSUED FOR CONSTRUCTION | DATE | 3/8/13 |
| 0 | ISSUED FOR REVIEW | DATE | 6/18/12 |
| No. | Submittal / Revision | Appr. | Date |

Drawn: **M.B.** Date: 6/18/12
 Designed: **EM** Date: 6/18/12
 Checked: **J.B.** Date: 6/18/12

Project Number: **286-061**

Project Title:

CT43XC844
CHESHIRE-184/
CROWN
 1119 SUMMIT ROAD
 CHESHIRE, CT 06410

Client: **Sprint**



Implementation Team:

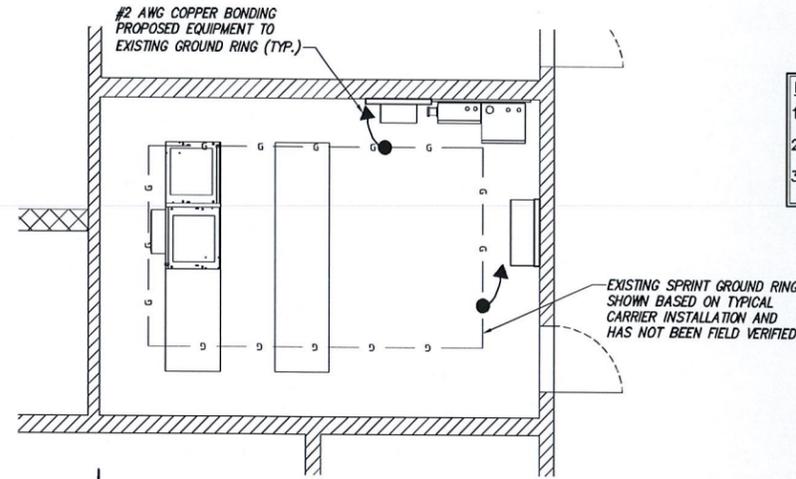
Drawing Scale: **AS NOTED**
 Date: **3/8/13**

Drawing Title:
ONE-LINE DIAGRAM AND DETAILS

Drawing Number:

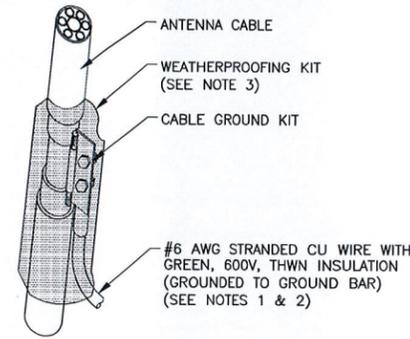
E2

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

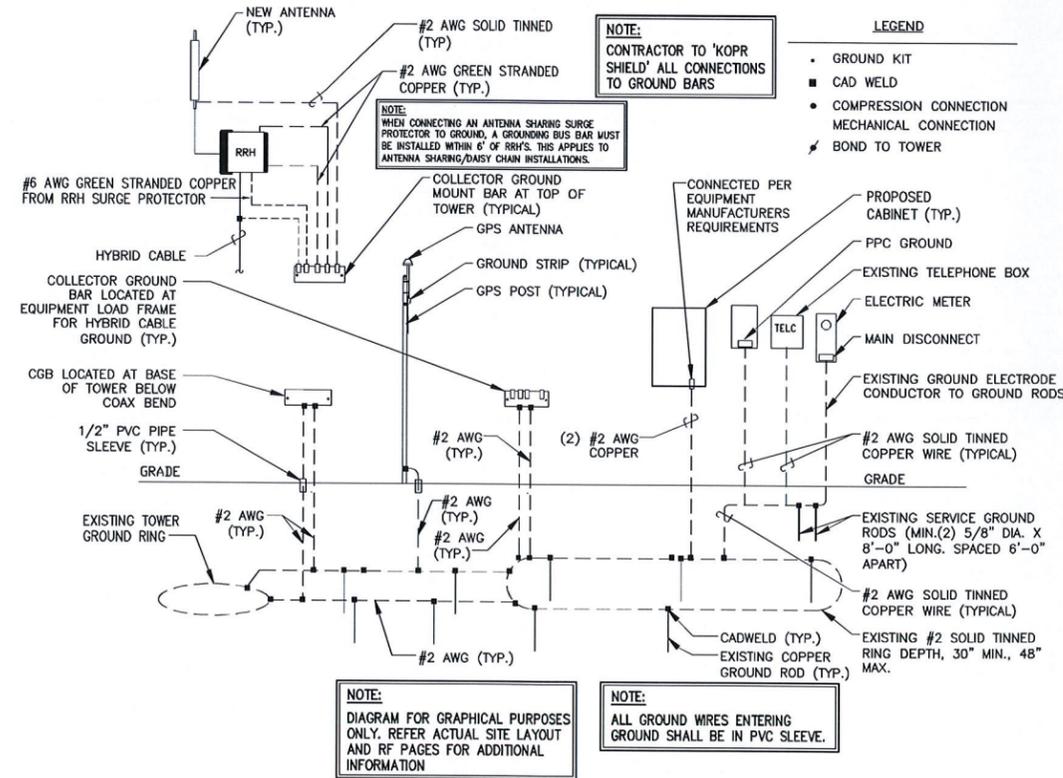


1 EQUIPMENT GROUNDING PLAN
NOT TO SCALE

- 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



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

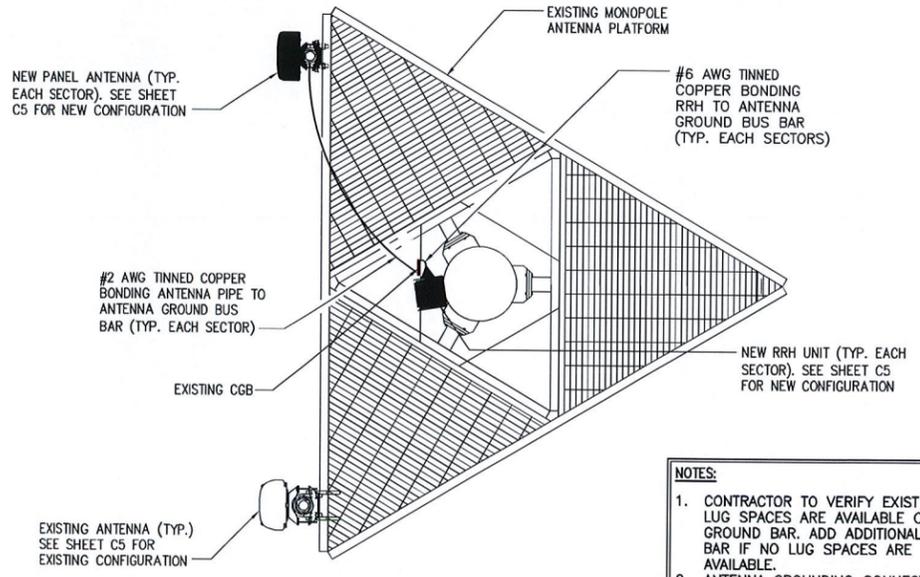
- LEGEND**
- GROUND KIT
 - CAD WELD
 - COMPRESSION CONNECTION
 - MECHANICAL CONNECTION
 - ⚡ BOND TO TOWER

NOTE:
CONTRACTOR TO 'KOPR SHIELD' ALL CONNECTIONS TO GROUND BARS

NOTE:
WHEN CONNECTING AN ANTENNA SHARING SURGE PROTECTOR TO GROUND, A GROUNDING BUS BAR MUST BE INSTALLED WITHIN 6' OF RRH'S. THIS APPLIES TO ANTENNA SHARING/DAISY CHAIN INSTALLATIONS.

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.



- 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:

infinig
engineering

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

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

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|--|-------------------------|-------|---------|
| 1 | ISSUED FOR CONSTRUCTION | AWJ | 3/8/13 |
| 0 | ISSUED FOR REVIEW | DMJ | 6/18/12 |
| No. | Submittal / Revision | App'd | Date |
| Drawn: M.B. Date: 6/18/12 | | | |
| Designed: DMJ Date: 6/18/12 | | | |
| Checked: J.B. Date: 6/18/12 | | | |
| Project Number: 286-061 | | | |
| Project Title: | | | |
| CT43XC844 CHESHIRE-184/ CROWN | | | |
| 1119 SUMMIT ROAD CHESHIRE, CT 06410 | | | |
| Client: | Implementation Team: | | |
| | | | |
| Drawing Scale: AS NOTED | | | |
| Date: 3/8/13 | | | |
| Drawing Title: GROUNDING PLAN AND DETAILS | | | |
| Drawing Number: E3 | | | |

CROWN CASTLE PROJECT: BU #801367; CT NHV-2075 CAC 801367; CHESHIRE, 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 TIA/EIA-222-F-1996 STANDARD FOR WIND SPEEDS OF 85 MPH AND 13.6 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 AT THE REQUIRED MINIMUM TIA/EIA-222-F 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 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, FIRE PREVENTION AND SAFETY GUIDELINES. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL OBTAIN A COPY OF THE CURRENT CROWN CASTLE GUIDELINES FROM CROWN CASTLE. PER THE 12-01-2005 CROWN CASTLE DIRECTIVE: "ALL CUTTING AND WELDING ACTIVITIES SHALL BE CONDUCTED IN ACCORDANCE WITH CROWN CASTLE POLICY 'CUTTING AND WELDING PLAN' (DOC # ENG-PLN-10015) 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 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 COMPLIES 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 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.
- 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 AND COMMENSURATE 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 ACI - (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 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 RUST PROTECTION OF 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 - (NOT REQUIRED)
 - REPORTS:
 - COMPILE 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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PAUL J. FORD AND COMPANY
 STRUCTURAL ENGINEERS
 250 East Broad Street - Suite 1500 - Columbus, Ohio 43215
 (614) 221-6678 www.pjfweb.com

CROWN CASTLE
 3530 TORINGDON WAY, SUITE 300, CHARLOTTE, NC 28277
 PH: (704) 405-6548 FAX: (704) 405-6548

BU #801367; CT NHV-2075 CAC 801367
CHESHIRE, CT
 MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

PROJECT No:
37513-0349
 DRAWN BY:
B.M.S.
 CHECKED BY:
J.J.W.
 APPROVED BY:

ISSUE DATE OF
PERMIT: 2-5-2013

S-1

DATE:
2-5-2013

D. STRUCTURAL STEEL

1. STRUCTURAL STEEL MATERIALS, FABRICATION, DETAILING, AND WORKMANSHIP SHALL CONFORM TO THE LATEST EDITION OF THE FOLLOWING REFERENCE STANDARDS:
A. BY THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC):
 - (A.) "SPECIFICATION FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS."
 - (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"
2. 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 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.
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 I 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 J 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 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 - (NOT REQUIRED)

F. FOUNDATION WORK - (NOT REQUIRED)

G. CAST-IN-PLACE CONCRETE - (NOT REQUIRED)

H. EPOXY GROUTED REINFORCING ANCHOR RODS - (NOT REQUIRED)

I. 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.

J. HOT DIP GALVANIZING

1. HOT-DIP GALVANIZE 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.

K. 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 SYSTEM.
2. THE MONOPOLE REINFORCING SYSTEM INDICATED IN THESE DOCUMENTS USES REINFORCING COMPONENTS THAT INVOLVE FIELD WELDING 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 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.
3. THE OWNER SHALL REFER TO TIA/EIA-222-F-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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PJF PAUL J. FORD AND COMPANY
STRUCTURAL ENGINEERS
250 East Broad Street - Suite 1500 - Columbus, Ohio 43215
(614) 221-6679 www.pjfweb.com

CROWN CASTLE

3530 TORINGDON WAY, SUITE 300, CHARLOTTE, NC 28277
PH: (704) 405-6548 FAX: (704) 405-6548

BU #801367; CT NHV-2075 CAC 801367
CHESHIRE, CT
MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

PROJECT No:
37513-0349

DRAWN BY:
B.M.S.

CHECKED BY:
J.J.W.

APPROVED BY:

DATE:
2-5-2013

ISSUE DATE OF
PERMIT: 2-5-2013

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- 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 (DTI'S) AND HARDENED WASHERS. DTI'S 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 (DTI'S):

DTI'S REQUIRED: DTI'S SHALL BE "SELF-INDICATING" SQUIRTER® STYLE DTI'S MADE WITH SILICONE EMBEDDED IN THEM, INSPECTED BY MEANS OF THE VISUAL EJECTION OF SILICONE AS THE DTI PROTRUSIONS COMPRESS. SQUIRTER® DTI'S 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 BELLOWS FALLS, VERMONT, USA 05101
PHONE 1-800-552-1999
WEBSITE: WWW.APPLIEDBOLTING.COM

DISTRIBUTORS OF SQUIRTER® DTI'S:
[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 20 MM (M20) NOMINAL A325 BOLTS FOR THE AJAX M20 BOLTS. DTI'S SHALL NOT BE HOT-DIP GALVANIZED. DTI'S SHALL BE MECHANICALLY GALVANIZED (MG) BY THE COLD MECHANICAL PROCESS ONLY AS PROVIDED BY THE DTI MANUFACTURER.

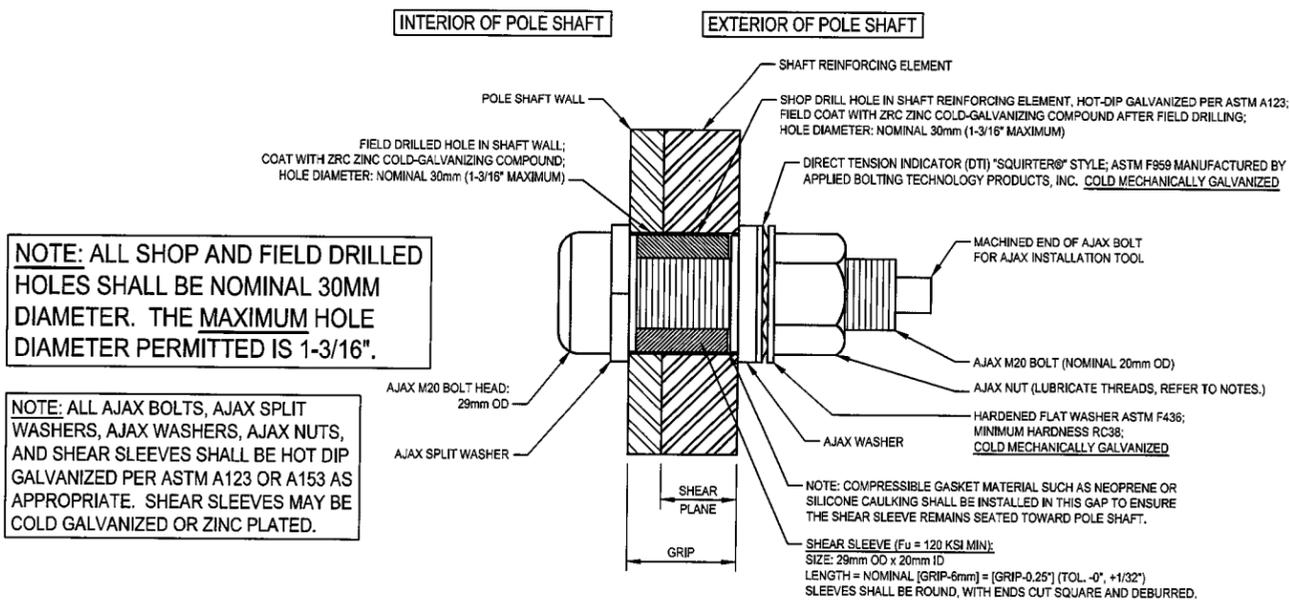
HARDENED WASHERS REQUIRED: USE A HARDENED WASHER FOR A 20 MM (M20) NOMINAL BOLT BETWEEN THE TOP OF THE DIRECT TENSION INDICATOR (DTI) WASHER AND THE NUT OF THE AJAX M20 BOLTS. HARDENED WASHERS SHALL CONFORM TO ASTM F436 AND HAVE A MINIMUM HARDNESS OF RC 38 OR HIGHER. THE HARDENED WASHERS SHALL BE MECHANICALLY 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 DTI'S 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 DTI'S 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 DTI'S.



TYPICAL AJAX BOLT DETAIL 1
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PAUL J. FORD AND COMPANY
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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#37513-0349), DATED 2-5-2013.

| POLE SPECIFICATIONS | |
|---------------------|--------------------------|
| POLE SHAPE TYPE: | 18-SIDED POLYGON |
| TAPER: | 0.233024 IN/FT |
| SHAFT STEEL: | ASTM A607 GRADE 65 |
| BASE PL STEEL: | ASTM A572 GR 55 (65 KSI) |
| ANCHOR RODS: | 2 1/4"Ø |
| | #18J ASTM A615 GRADE 75 |

| SHAFT SECTION DATA | | | | | |
|--------------------|---------------------|----------------------|-----------------|----------------------------|----------|
| SHAFT SECTION | SECTION LENGTH (FT) | PLATE THICKNESS (IN) | LAP SPLICE (IN) | DIAMETER ACROSS FLATS (IN) | |
| | | | | @ TOP | @ BOTTOM |
| 1 | 48.75 | 0.2500 | | 24.000 | 35.360 |
| 2 | 45.00 | 0.3125 | 54.00 | 33.811 | 44.300 |
| 3 | 45.00 | 0.3750 | 66.00 | 42.393 | 52.870 |
| 4 | 45.00 | 0.4375 | 81.00 | 50.549 | 61.040 |

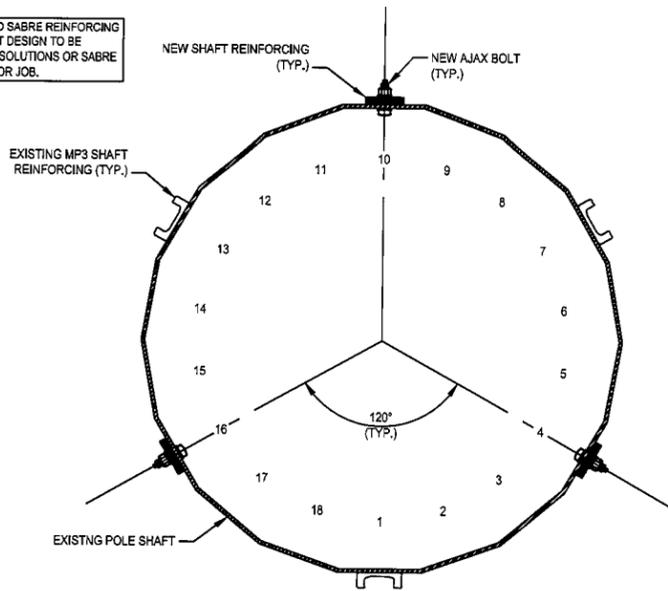
NOTE: DIMENSIONS SHOWN DO NOT INCLUDE GALVANIZING TOLERANCES

- 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 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 F959 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 PMI.

- GENERAL NOTES:**
- AJAX BOLTS ARE TO BE 20 mm Ø WITH CORRESPONDING 29 mm Ø SHEAR SLEEVE WITH MATCHING STEEL GRADE. DRILLED HOLE DIAMETERS IN REINFORCING STEEL AND EXISTING SHAFT SHALL BE 1 3/16" MAX.
 - 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 1-800-831-3275 FOR PRODUCT INFORMATION.

AEROSOLUTIONS AND SABRE REINFORCING NOT SHOWN. LAYOUT DESIGN TO BE FINALIZED FOR AEROSOLUTIONS OR SABRE UPON WINNING BID FOR JOB.



SECTION 2 S-4

| NEW AEROSOLUTIONS MP3 REINFORCING (OPTION #1) | | |
|---|------------|---------------------|
| ELEVATION | FLAT # | REINFORCING ELEMENT |
| 50'-1" TO 64'-11" | 4, 10 & 16 | MP304 |

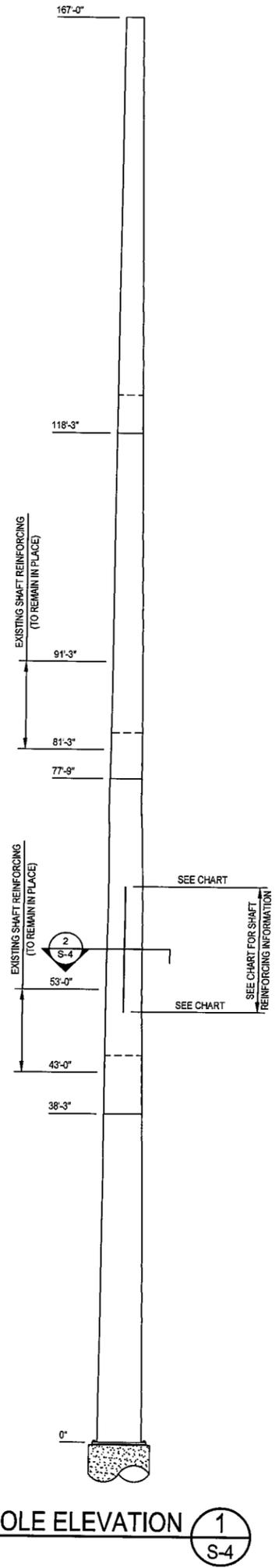
ALL BOLTS SHALL BE AJAX M20 BOLTS WITH HIGH STRENGTH SHEAR SLEEVES (ASTM A519 WITH MIN. F_u=105 KSI). CONTACT SUPPLIER FOR MATERIAL (PLATE & BOLTS) AND INSTALLATION PROCEDURES.

| NEW SABRE FLAT PLATE REINFORCING (OPTION #2) | | |
|--|------------|---------------------|
| ELEVATION | FLAT # | REINFORCING ELEMENT |
| 49'-6" TO 64'-6" | 4, 10 & 16 | MS-600 |

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

| NEW CCI FLAT PLATE (100 KSI) REINFORCING (OPTION #3) | | |
|--|------------|---------------------|
| ELEVATION | FLAT # | REINFORCING ELEMENT |
| 50'-3" TO 65'-3" | 4, 10 & 16 | ISP-JR-0754 |

- NOTES FOR CROWN REINFORCING OPTION (100 KSI) MATERIAL:**
- DO NOT FIELD WELD DIRECTLY TO THE 100 KSI MATERIAL.
 - THE 100 KSI MATERIAL SHALL CONFORM TO THE FOLLOWING:
 - MATERIAL SHALL BE ASTM A514, GRADE A, GRADE E, or GRADE P, HAVING A MINIMUM TENSILE STRENGTH (F_u) OF 110 KSI AND A MINIMUM YIELD STRENGTH (F_y) OF 100 KSI.
 - MATERIAL SHALL BE HEAT TREATED, QUENCHED AND TEMPERED PER ASTM A514.
 - MATERIAL SHALL HAVE CHARPY V-NOTCH (CVN) IMPACT VALUES OF NOT LESS THAN 15 FT-LB AT -20 DEGREES F, IN ACCORDANCE WITH ASTM A370.
 - MINIMUM INSIDE BEND RADIUS FOR COLD BENDING, PER ASTM A6 TABLE X.4.2, SHALL BE 4.5X MINIMUM.
 - 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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PAUL J. FORD AND COMPANY
STRUCTURAL ENGINEERS
250 East Broad Street · Suite 1500 · Columbus, Ohio 43215
(614) 221-6879 www.pjfweb.com

CROWN CASTLE
3530 TORINGDON WAY, SUITE 300, CHARLOTTE, NC 28277
PH: (704) 405-6548 FAX: (704) 405-6548

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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 MIs 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 INSPECTION(S) 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 MIs

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 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 INSPECTION(S) ON TOWER MODIFICATION PROJECTS.

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

VERIFICATION INSPECTION MAY BE CONDUCTED BY AN INDEPENDENT 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/ERECTION 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 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 ECR) | REPORT ITEM |
|---|---|
| PRE-CONSTRUCTION | |
| X | MI CHECKLIST DRAWINGS |
| X | EOR APPROVED SHOP DRAWINGS |
| X | FABRICATION INSPECTION |
| X | FABRICATOR CERTIFIED WELD INSPECTION |
| X | MATERIAL TEST REPORT (MTR) |
| NA | FABRICATOR NDE INSPECTION |
| NA | NDE REPORT OF MONOPOLE BASE PLATE (AS REQUIRED) |
| X | PACKING SLIPS |
| ADDITIONAL TESTING AND INSPECTIONS: | |
| CONSTRUCTION | |
| X | CONSTRUCTION INSPECTIONS |
| NA | FOUNDATION INSPECTIONS |
| NA | CONCRETE COMP. STRENGTH AND SLUMP TESTS |
| NA | POST INSTALLED ANCHOR ROD VERIFICATION |
| NA | BASE PLATE GROUT VERIFICATION |
| X | CONTRACTOR'S CERTIFIED WELD INSPECTION |
| NA | EARTH-WORK: 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 DTIS PER REQUIREMENTS ON SHEET S-3 |
| ADDITIONAL TESTING AND INSPECTIONS: | |
| POST-CONSTRUCTION | |
| X | MI INSPECTOR REDLINE OR RECORD DRAWING(S) |
| NA | 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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PAUL J. FORD AND COMPANY
 STRUCTURAL ENGINEERS
 250 East Broad Street · Suite 1500 · Columbus, Ohio 43215
 (614) 221-6679 www.pjfweb.com


CROWN CASTLE
 3530 TORINGDON WAY, SUITE 300, CHARLOTTE, NC 28277
 PH: (704) 405-6548 FAX: (704) 405-6548

BU #801367; CT NHV-2075 CAC 801367
CHESHIRE, CT
 MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

PROJECT No:
 37513-0349
 DRAWN BY:
 B.M.S.
 CHECKED BY:
 J.J.W.
 APPROVED BY:

ISSUE DATE OF
 PERMIT: 2-5-2013

S-5

DATE:
 2-5-2013

CROWN CASTLE PROJECT: BU #801367; CT NHV-2075 CAC 801367; CHESHIRE, 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 TIA/EIA-222-F-1996 STANDARD FOR WIND SPEEDS OF 85 MPH AND 13.6 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 AT THE REQUIRED MINIMUM TIA/EIA-222-F 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 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, FIRE PREVENTION AND SAFETY GUIDELINES. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL OBTAIN A COPY OF THE CURRENT CROWN CASTLE GUIDELINES FROM CROWN CASTLE. PER THE 12-01-2005 CROWN CASTLE DIRECTIVE: "ALL CUTTING AND WELDING ACTIVITIES SHALL BE CONDUCTED IN ACCORDANCE WITH CROWN CASTLE POLICY 'CUTTING AND WELDING PLAN' (DOC # ENG-PLN-10015) 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 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 COMPLIES 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 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.
- 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 AND COMMENSURATE 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/CI - (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 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 RUST PROTECTION OF 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 - (NOT REQUIRED)**
 - 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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PAUL J. FORD AND COMPANY
 STRUCTURAL ENGINEERS
 250 East Broad Street - Suite 1500 - Columbus, Ohio 43215
 (614) 221-6679 www.pjfweb.com

CROWN CASTLE
 3530 TORINGDON WAY, SUITE 300, CHARLOTTE, NC 28277
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BU #801367; CT NHV-2075 CAC 801367
 CHESHIRE, CT
 MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

| | |
|---------------------------|-----------------------------------|
| PROJECT No: 37513-0349 | ISSUE DATE OF PERMIT: 2-5-2013 |
| DRAWN BY: B.M.S. | S-1 |
| CHECKED BY: J.J.W. | |
| APPROVED BY: | |
| DATE: 2-5-2013 | |

- D. STRUCTURAL STEEL**
1. 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. (A.) "SPECIFICATION FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS."
(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"
 2. 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 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.
 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 I 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 J 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 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 - (NOT REQUIRED)**
- F. FOUNDATION WORK - (NOT REQUIRED)**
- G. CAST-IN-PLACE CONCRETE - (NOT REQUIRED)**
- H. EPOXY GROUTED REINFORCING ANCHOR RODS - (NOT REQUIRED)**
- I. 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. 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.
- J. HOT DIP GALVANIZING**
1. HOT-DIP GALVANIZE 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.
- K. 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 SYSTEM.
 2. THE MONOPOLE REINFORCING SYSTEM INDICATED IN THESE DOCUMENTS USES REINFORCING COMPONENTS THAT INVOLVE FIELD WELDING 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 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.
 3. THE OWNER SHALL REFER TO TIA/EIA-222-F-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".



[Handwritten Signature]

FEB 05 2013

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PAUL J. FORD AND COMPANY
STRUCTURAL ENGINEERS
250 East Broad Street - Suite 1500 - Columbus, Ohio 43215
(614) 221-6679 www.pjfweb.com

CROWN CASTLE

3530 TORINGDON WAY, SUITE 300, CHARLOTTE, NC 28277
PH: (704) 405-6548 FAX: (704) 405-6548

BU #801367; CT NHV-2075 CAC 801367
CHESHIRE, CT
MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

PROJECT No:
37513-0349
DRAWN BY:
B.M.S.
CHECKED BY:
J.J.W.
APPROVED BY:

ISSUE DATE OF
PERMIT: 2-5-2013

S-2

DATE:
2-5-2013

AJAX BOLT NOTE SHEET: REV. 1.3, 11-07-2012

- 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 (DTI'S) AND HARDENED WASHERS. DTI'S 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 (DTI'S):

DTI'S REQUIRED: DTI'S SHALL BE "SELF-INDICATING" SQUIRTER® STYLE DTI'S MADE WITH SILICONE EMBEDDED IN THEM, INSPECTED BY MEANS OF THE VISUAL EJECTION OF SILICONE AS THE DTI PROTRUSIONS COMPRESS. SQUIRTER® DTI'S 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 BELLOWS FALLS, VERMONT, USA 05101
 PHONE 1-800-552-1999
 WEBSITE: WWW.APPLIEDBOLTING.COM

DISTRIBUTORS OF SQUIRTER® DTI'S:
 HTTP://WWW.APPLIEDBOLTING.COM/APPLIED-BOLTING-DISTRIBUTORS.HTML

DTI: USE DIRECT TENSION INDICATOR (DTI) WASHERS COMPATIBLE WITH 20 MM (M20) NOMINAL A325 BOLTS FOR THE AJAX M20 BOLTS. DTI'S SHALL NOT BE HOT-DIP GALVANIZED. DTI'S SHALL BE MECHANICALLY GALVANIZED (MG) BY THE COLD MECHANICAL PROCESS ONLY AS PROVIDED BY THE DTI MANUFACTURER.

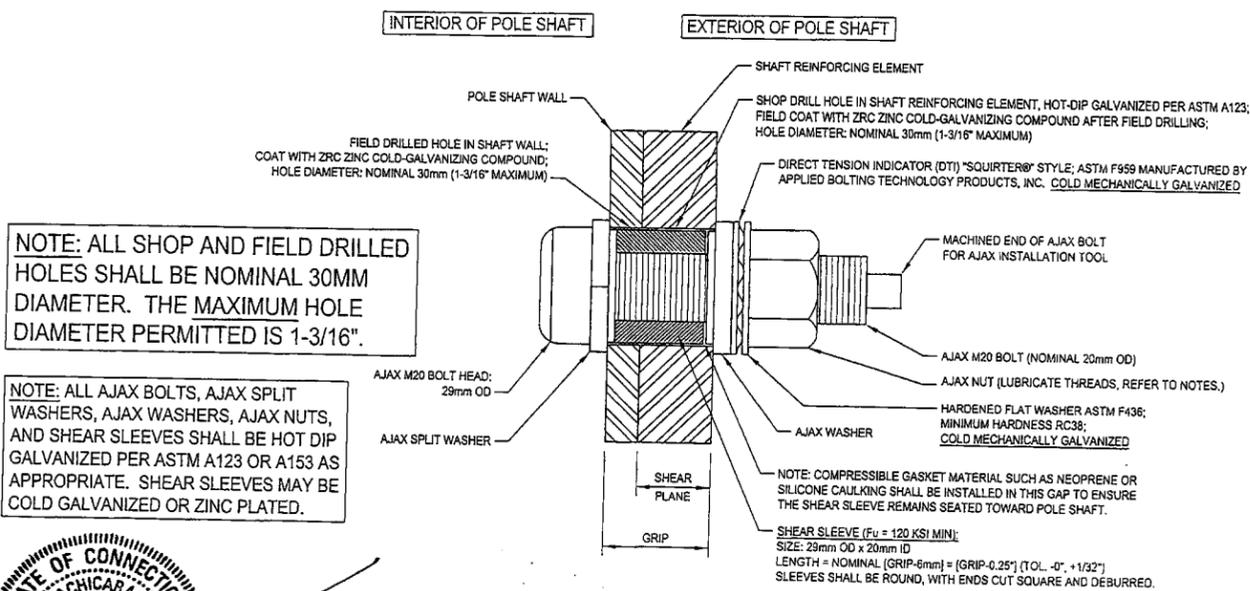
HARDENED WASHERS REQUIRED: USE A HARDENED WASHER FOR A 20 MM (M20) NOMINAL BOLT BETWEEN THE TOP OF THE DIRECT TENSION INDICATOR (DTI) WASHER AND THE NUT OF THE AJAX M20 BOLTS. HARDENED WASHERS SHALL CONFORM TO ASTM F436 AND HAVE A MINIMUM HARDNESS OF RC 38 OR HIGHER. THE HARDENED WASHERS SHALL BE MECHANICALLY 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 DTI'S 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.

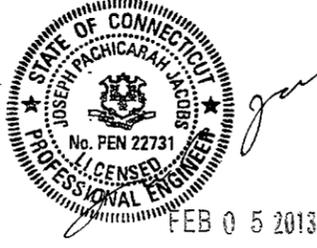
CONTRACTOR SHALL FOLLOW DTI MANUFACTURER'S INSTRUCTIONS FOR INSTALLATION, LUBRICATION, TIGHTENING AND INSPECTION.

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 DTI'S 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 DTI'S.



NOTE: ALL SHOP AND FIELD DRILLED HOLES SHALL BE NOMINAL 30MM DIAMETER. THE MAXIMUM HOLE DIAMETER PERMITTED IS 1-3/16".

NOTE: ALL AJAX BOLTS, AJAX SPLIT WASHERS, AJAX WASHERS, AJAX NUTS, AND SHEAR SLEEVES SHALL BE HOT DIP GALVANIZED PER ASTM A123 OR A153 AS APPROPRIATE. SHEAR SLEEVES MAY BE COLD GALVANIZED OR ZINC PLATED.



TYPICAL AJAX BOLT DETAIL 1 S-3

| | | | |
|---|--|---|---------------------------------------|
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| | <p>DATE: 2-5-2013</p> | <p>S-3</p> | |

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#37513-0349), DATED 2-5-2013.

| POLE SPECIFICATIONS | |
|---------------------|------------------------------------|
| POLE SHAPE TYPE: | 18-SIDED POLYGON |
| TAPER: | 0.233024 IN/FT |
| SHAFT STEEL: | ASTM A607 GRADE 65 |
| BASE PL. STEEL: | ASTM A572 GR 55 (55 KSI) |
| ANCHOR RODS: | 2 1/4"Ø #18J ASTM A615 GRADE 75 |

| SHAFT SECTION DATA | | | | | |
|--------------------|---------------------|----------------------|-----------------|----------------------------|----------|
| SHAFT SECTION | SECTION LENGTH (FT) | PLATE THICKNESS (IN) | LAP SPLICE (IN) | DIAMETER ACROSS FLATS (IN) | |
| | | | | @ TOP | @ BOTTOM |
| 1 | 48.75 | 0.2500 | 54.00 | 24.000 | 35.360 |
| 2 | 45.00 | 0.3125 | 66.00 | 33.811 | 44.300 |
| 3 | 45.00 | 0.3750 | 81.00 | 42.393 | 52.870 |
| 4 | 45.00 | 0.4375 | | 50.549 | 61.040 |

NOTE: DIMENSIONS SHOWN DO NOT INCLUDE GALVANIZING TOLERANCES

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, 2008.
- ALL STRUCTURAL BOLTS SHALL BE INSPECTED ACCORDING TO THE REQUIREMENTS OF THE AISC 'SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS', DEC. 31, 2008.
- 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.
- DTI'S REQUIRED: ALL AJAX BOLTS SHALL BE INSTALLED USING DIRECT TENSION INDICATORS (DTI'S) AND HARDENED WASHERS. DTI'S 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.
- 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 PMI.

GENERAL NOTES:

- AJAX BOLTS ARE TO BE 20 mm Ø WITH CORRESPONDING 29 mm Ø SHEAR SLEEVE WITH MATCHING STEEL GRADE. DRILLED HOLE DIAMETERS IN REINFORCING STEEL AND EXISTING SHAFT SHALL BE 1 3/16" MAX.
- 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 1-800-831-3275 FOR PRODUCT INFORMATION.

| NEW AEROSOLUTIONS MP3 REINFORCING (OPTION #1) | | |
|---|------------|---------------------|
| ELEVATION | FLAT # | REINFORCING ELEMENT |
| 50'-1" TO 64'-11" | 4, 10 & 16 | MP304 |

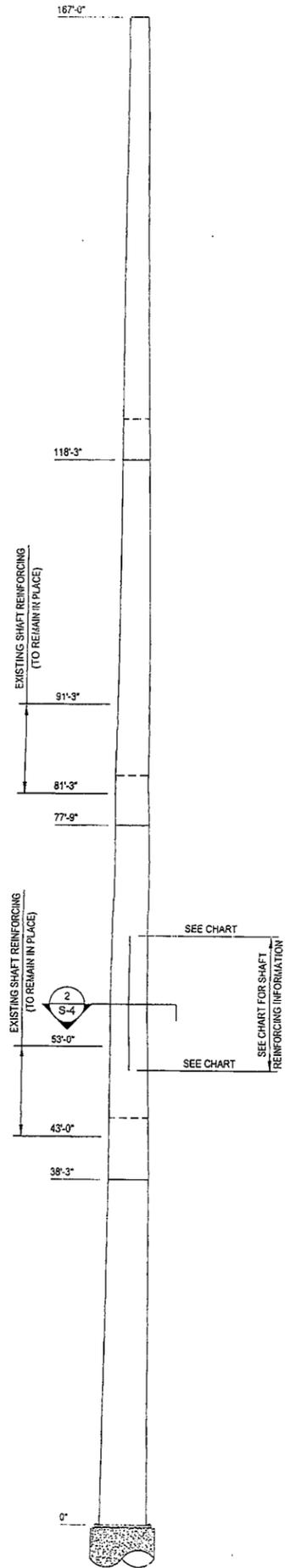
ALL BOLTS SHALL BE AJAX M20 BOLTS WITH HIGH STRENGTH SHEAR SLEEVES (ASTM A519 WITH MIN. Fu=105 KSI). CONTACT SUPPLIER FOR MATERIAL (PLATE & BOLTS) AND INSTALLATION PROCEDURES.

| NEW SABRE FLAT PLATE REINFORCING (OPTION #2) | | |
|--|------------|---------------------|
| ELEVATION | FLAT # | REINFORCING ELEMENT |
| 49'-6" TO 64'-6" | 4, 10 & 16 | MS-600 |

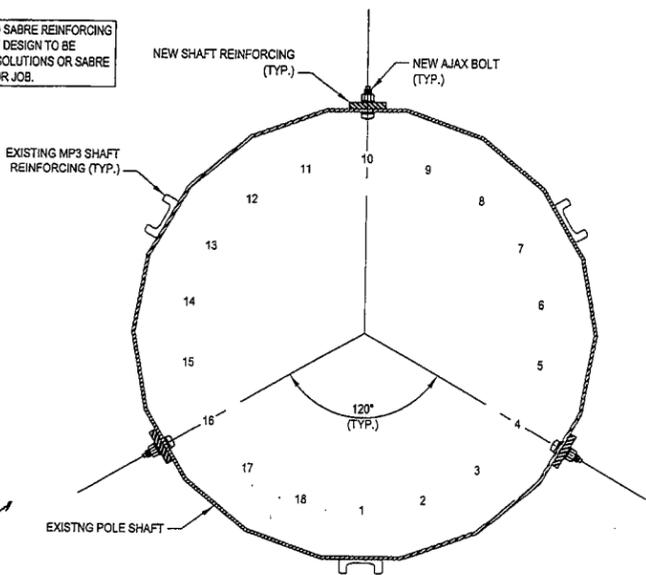
ALL BOLTS SHALL BE AJAX M20 BOLTS WITH HIGH STRENGTH SHEAR SLEEVES (ASTM A519 WITH MIN. Fu=105 KSI). CONTACT SUPPLIER FOR MATERIAL (PLATE & BOLTS) AND INSTALLATION PROCEDURES.

| NEW CCI FLAT PLATE (100 KSI) REINFORCING (OPTION #3) | | |
|--|------------|---------------------|
| ELEVATION | FLAT # | REINFORCING ELEMENT |
| 50'-3" TO 65'-3" | 4, 10 & 16 | ISP-JR-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 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.



AEROSOLUTIONS AND SABRE REINFORCING NOT SHOWN. LAYOUT DESIGN TO BE FINALIZED FOR AEROSOLUTIONS OR SABRE UPON WINNING BID FOR JOB.



FEB 05 2013

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PAUL J. FORD AND COMPANY
 STRUCTURAL ENGINEERS
 250 East Broad Street · Suite 1500 · Columbus, Ohio 43215
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| PROJECT No: 37513-0349 | ISSUE DATE OF PERMIT: 2-5-2013 |
| DRAWN BY: B.M.S. | S-4 |
| CHECKED BY: J.J.W. | |
| APPROVED BY: | |
| DATE: 2-5-2013 | |

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 MFS 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 INSPECTION(S) 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 MFS

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 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 INSPECTION(S) ON TOWER MODIFICATION PROJECTS.

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

VERIFICATION INSPECTION MAY BE CONDUCTED BY AN INDEPENDENT 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/ERECTION 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 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 |
| PRE-CONSTRUCTION | |
| X | MI CHECKLIST DRAWINGS |
| X | EOR APPROVED SHOP DRAWINGS |
| X | FABRICATION INSPECTION |
| X | FABRICATOR CERTIFIED WELD INSPECTION |
| X | MATERIAL TEST REPORT (MTR) |
| NA | FABRICATOR NDE INSPECTION |
| NA | NDE REPORT OF MONOPOLE BASE PLATE (AS REQUIRED) |
| X | PACKING SLIPS |
| ADDITIONAL TESTING AND INSPECTIONS: | |
| CONSTRUCTION | |
| X | CONSTRUCTION INSPECTIONS |
| NA | FOUNDATION INSPECTIONS |
| NA | CONCRETE COMP. STRENGTH AND SLUMP TESTS |
| NA | POST INSTALLED ANCHOR ROD VERIFICATION |
| NA | 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 DT'S PER REQUIREMENTS ON SHEET S-3 |
| ADDITIONAL TESTING AND INSPECTIONS: | |
| POST-CONSTRUCTION | |
| X | MI INSPECTOR REDLINE OR RECORD DRAWING(S) |
| NA | 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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PAUL J. FORD AND COMPANY
STRUCTURAL ENGINEERS
250 East Broad Street · Suite 1500 · Columbus, Ohio 43215
(614) 221-6679 www.pjfweb.com

CROWN CASTLE
3530 TORINGDON WAY, SUITE 300, CHARLOTTE, NC 28277
PH: (704) 405-6548 FAX: (704) 405-6548

BU #801367; CT NHV-2075 CAC 801367
CHESHIRE, CT
MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

| | |
|---------------------------|-----------------------------------|
| PROJECT No: 37513-0349 | ISSUE DATE OF PERMIT: 2-5-2013 |
| DRAWN BY: B.M.S. | |
| CHECKED BY: J.J.W. | S-5 |
| APPROVED BY: | |
| DATE: 2-5-2013 | |