

August 27, 2015

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

Re: **Notice of Exempt Modification – Facility Modification  
201 Main Street, Cromwell, Connecticut**

Dear Ms. Bachman:

Cellco Partnership d/b/a Verizon Wireless (“Cellco”) currently maintains twelve (12) antennas at the 105-foot level of the existing 125-foot tower at 201 Main Street in Cromwell, Connecticut (the “Property”). The tower is owned by Crown Castle (“Crown”). The Council approved Cellco’s use of this tower in 2001. Cellco now intends to replace three (3) of its existing antennas with three (3) model LNX-6514DS-VTM, 700 MHz antennas, all at the same level on the tower. Cellco also intends to install three (3) remote radio heads (“RRHs”) and two (2) HYBRIFLEX™ fiber optic antenna cables. Included in Attachment 1 are specifications for Cellco’s replacement antennas, RRHs and HYBRIFLEX™ cables.

Please accept this letter as notification pursuant to R.C.S.A. § 16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to Anthony J. Salvatore, Acting Town Manager of the Town of Cromwell. A copy of this letter is also being sent to S&S Partners, Inc., the owner of the Property and Crown, the tower owner.

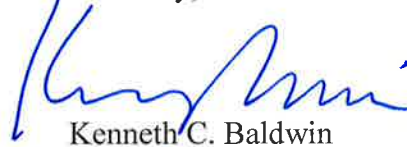
The planned modifications to the facility fall squarely within those activities explicitly provided for in R.C.S.A. § 16-50j-72(b)(2).

Melanie A. Bachman  
August 27, 2015  
Page 2

1. The proposed modifications will not result in an increase in the height of the existing tower. Cellco's replacement antennas and RRHs will be located on its existing platform at the 105-foot level on the tower.
2. The proposed modifications will not involve any change to ground-mounted equipment and, therefore, will not require the extension of the site boundary.
3. The proposed modifications will not increase noise levels at the facility by six decibels or more, or to levels that exceed state and local criteria.
4. The operation of the replacement antennas will not increase radio frequency (RF) emissions at the facility to a level at or above the Federal Communications Commission (FCC) safety standard. Far Field Approximation tables for the RF emissions at each of Cellco's operating frequencies for the modified facility are included in Attachment 2.
5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.
6. The tower and its foundation, with certain modifications, can support Cellco's proposed modifications. (See Structural Modification Report included in Attachment 3).

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

Sincerely,



Kenneth C. Baldwin

Enclosures

Copy to:

Anthony J. Salvatore, Acting Town Manager  
S&S Partners, Inc.  
Crown Castle  
Tim Parks

# **ATTACHMENT 1**



## LNX-6514DS-VTM

**Andrew® Antenna, 698–896 MHz, 65° horizontal beamwidth, RET compatible**

- Great solution to maximize network coverage and capacity
- Excellent gain, VSWR, front-to-back ratio, and PIM specifications for robust network performance
- Ideal choice for site collocations and tough zoning restrictions
- Excellent solution for site sharing and maximizing capacity
- Fully compatible with Andrew remote electrical tilt system for greater OpEx savings
- The RF connectors are designed for IP67 rating and the radome for IP56 rating

### Electrical Specifications

Frequency Band, MHz	698–806	806–896
Gain, dBi	15.8	15.9
Beamwidth, Horizontal, degrees	65	64
Beamwidth, Vertical, degrees	12.4	11.2
Beam Tilt, degrees	0–10	0–10
USLS, dB	17	18
Front-to-Back Ratio at 180°, dB	32	30
CPR at Boresight, dB	23	23
CPR at Sector, dB	12	10
Isolation, dB	30	30
VSWR   Return Loss, dB	1.4   15.6	1.4   15.6
PIM, 3rd Order, 2 x 20 W, dBc	-153	-153
Input Power per Port, maximum, watts	400	400
Polarization	±45°	±45°
Impedance	50 ohm	50 ohm

### Electrical Specifications, BASTA\*

Frequency Band, MHz	698–806	806–896
Gain by all Beam Tilts, average, dBi	15.6	15.7
Gain by all Beam Tilts Tolerance, dB	±0.4	±0.5
Gain by Beam Tilt, average, dBi	0 °   15.7	0 °   15.9
	5 °   15.7	5 °   15.8
	10 °   15.3	10 °   15.3
Beamwidth, Horizontal Tolerance, degrees	±0.9	±1.4
Beamwidth, Vertical Tolerance, degrees	±0.8	±0.6
USLS, dB	18	20
Front-to-Back Total Power at 180° ± 30°, dB	25	23
CPR at Boresight, dB	25	24
CPR at Sector, dB	15	12

\* CommScope® supports NGMN recommendations on Base Station Antenna Standards (BASTA). To learn more about the benefits of BASTA, [download the whitepaper Time to Raise the Bar on BSAs.](#)

### General Specifications

Antenna Brand	Andrew®
Antenna Type	DualPol®
Band	Single band
Brand	DualPol®   Teletilt®

# Product Specifications

COMMScope®

LNX-6514DS-VTM



Operating Frequency Band 698 – 896 MHz  
Performance Note Outdoor usage

## Mechanical Specifications

Color Light gray  
Lightning Protection dc Ground  
Radiator Material Aluminum  
Radome Material Fiberglass, UV resistant  
RF Connector Interface 7-16 DIN Female  
RF Connector Location Bottom  
RF Connector Quantity, total 2  
Wind Loading, maximum 617.7 N @ 150 km/h  
138.9 lbf @ 150 km/h  
Wind Speed, maximum 241.0 km/h | 149.8 mph

## Dimensions

Depth 180.5 mm | 7.1 in  
Length 1851.0 mm | 72.9 in  
Width 301.0 mm | 11.9 in  
Net Weight 14.2 kg | 31.3 lb

## Remote Electrical Tilt (RET) Information

Model with Factory Installed AISG 2.0 Actuator LNX-6514DS-A1M  
RET System Teletilt®

## Regulatory Compliance/Certifications

### Agency

RoHS 2011/65/EU  
China RoHS SJ/T 11364-2006  
ISO 9001:2008

### Classification

Compliant by Exemption  
Above Maximum Concentration Value (MCV)  
Designed, manufactured and/or distributed under this quality management system



## Included Products

DB380 — Pipe Mounting Kit for 2.4"-4.5" (60-115mm) OD round members on wide panel antennas. Includes 2 clamp sets and double nuts.

DB5083 — Downtilt Mounting Kit for 2.4"-4.5" (60 - 115 mm) OD round members. Includes a heavy-duty, galvanized steel downtilt mounting bracket assembly and associated hardware. This kit is compatible with the DB380 pipe mount kit for panel antennas that are equipped with two mounting brackets.

## \* Footnotes

Performance Note Severe environmental conditions may degrade optimum performance

# ALCATEL-LUCENT B13 RRH4X30-4R

Alcatel-Lucent B13 Remote Radio Head 4x30-4R is the newest addition of Remote Radio Head to the extended product line of Alcatel-Lucent's distributed Base Station solutions, aimed at facilitating smooth RF site acquisition and related civil engineering.

**Supporting 2Tx/4Tx MIMO and 4-way Rx diversity**, Alcatel-Lucent B13 RRH4x30-4R allows operators to have a compact radio solution to deploy LTE in the 700U band (700 MHz, 3GPP band 13), providing them with the means to achieve high capacity, high quality and high coverage with minimum site requirements.

The Alcatel-Lucent B13 RRH4x30-4R product has four transmit RF paths, offering the possibility to **select, via software only, 2Tx or 4Tx MIMO configurations** with either 2x60 W or 4x30 W RF output power. It supports also 4-way Rx diversity and up to 10MHz instantaneous bandwidth.

The Alcatel-Lucent B13 RRH4x30-4R is a near zero-footprint solution and operates noise free, simplifying negotiations with site property owners and minimizing environmental impacts.

Its compactness and slim design makes the Alcatel-Lucent B13 RRH4x30-4R easy to install close to the antenna: operators can therefore locate this Remote Radio Head where RF design conditions are deemed ideal, minimizing trade-offs between available sites and RF optimum sites, together with reducing the RF feeder needs and installation costs.

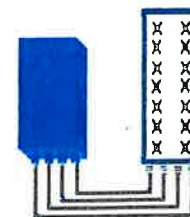


## FEATURES

- Supporting LTE in 700 MHz band (700U, 3GPP band 13)
- LTE 2Tx or 4Tx MIMO (SW switchable)
- Output power: Up to 2x60W or 4x30W
- 10MHz LTE carrier with 4Rx Diversity
- Convection-cooled (fan-less)
- Supports AISG 2.0 ALD devices (RET, TMA) through RS485 or RF ports

## BENEFITS

- Compact to reduce additional footprint when adding LTE in 700U band
- MIMO scheme operation selection (2Tx or 4Tx) by software only
- Improves downlink spectral efficiency through MIMO4
- Increases LTE coverage thanks to 4Rx diversity capability and best in class Rx sensitivity
- Flexible mounting options: Pole or Wall



4x30W with 4T4R  
or  
2x60W with 2T4R

Can be switched between modes via SW w/o site visit

## TECHNICAL SPECIFICATIONS

Features & performance	
Number of TX/RX paths	4 duplexed (either 4T4R or 2T4R by SW)
Frequency band	U700 (C) (3GPP bands 13): DL: 746 - 756 MHz / UL: 777 - 787 MHz
Instantaneous bandwidth - #carriers	10MHz – 1 LTE carrier (in 10MHz occupied bandwidth)
LTE carrier bandwidth	10 MHz
RF output power	2x60W or 4x30W (by SW)
Noise figure – RX Diversity scheme	2 dB typ. (<2.5 dB max) – 2 or 4 way Rx diversity
Sizes (HxWxD) in mm (in.)	550 x 305 x 230 (21.6" x 12.0" x 9") (with solar shield)
Volume in L	38 (with solar shield)
Weight in kg (lb) (w/o mounting HW)	26 (57.2) (with solar shield)
DC voltage range	-40.5 to -57V at full performance, -38 to -57V with relaxation on power consumption
DC power consumption	550W typical @100% RF load (in 2Tx or 4Tx mode)
Environmental conditions	-40°C (-40°F) / +55°C (+131°F)
Wind load (@150km/h or 93mph)	IP65 Frontal: <200N / Lateral : <150N
Antenna ports	4 ports 7/16 DIN female (50 ohms) VSWR < 1.5
CPRI ports	2 CPRI ports (HW ready for Rate7, 9.8 Gbps) SFP single mode dual fiber
AISG interfaces	1 AISG2.0 output (RS485) Integrated Smart Bias Tees (x2)
Misc. Interfaces	4 external alarms (1 connector) – 4 RF Tx & 4 RF Rx monitor ports - 1 DC connector (2 pins)
Installation conditions	Pole and wall mounting
Regulatory compliance	3GPP 36.141 / 3GPP 36.113 / GR-1089-CORE / GR-3108-CORE / UL 60950-1 / FCC Part 27

www.alcatel-lucent.com Alcatel, Lucent, Alcatel-Lucent and the Alcatel-Lucent logo are trademarks of Alcatel-Lucent. All other trademarks are the property of their respective owners. The information presented is subject to change without notice. Alcatel-Lucent assumes no responsibility for inaccuracies contained herein. Copyright © 2014 Alcatel-Lucent. All Rights Reserved



**HYBRIFLEX™ RRH Hybrid Feeder Cabling Solution, 1-5/8", Single-Mode Fiber**

**Product Description**

RFS' HYBRIFLEX Remote Radio Head (RRH) hybrid feeder cabling solution combines optical fiber and DC power for RRHs in a single lightweight aluminum corrugated cable, making it the world's most innovative solution for RRH deployments.

It was developed to reduce installation complexity and costs at Cellular sites. HYBRIFLEX allows mobile operators deploying an RRH architecture to standardize the RRH installation process and eliminate the need for and cost of cable grounding. HYBRIFLEX combines optical fiber (multi-mode or single-mode) and power in a single corrugated cable. It eliminates the need for junction boxes and can connect multiple RRHs with a single feeder. Standard RFS CELLFLEX<sup>2</sup> accessories can be used with HYBRIFLEX cable. Both pre-connectorized and on-site options are available.

**Features/Benefits**

- Aluminum corrugated armor with outstanding bending characteristics – minimizes installation time and enables mechanical protection and shielding
- Same accessories as 1 5/8" coaxial cable
- Outer conductor grounding – Eliminates typical grounding requirements and saves on installation costs
- Lightweight solution and compact design – Decreases tower loading
- Robust cabling – Eliminates need for expensive cable trays and ducts
- Installation of tight bundled fiber optic cable pairs directly to the RRH – Reduces CAPEX and wind load by eliminating need for interconnection
- Optical fiber and power cables housed in single corrugated cable – Saves CAPEX by standardizing RRH cable installation and reducing installation requirements
- Outdoor polyethylene jacket – Ensures long-lasting cable protection



Figure 1: HYBRIFLEX Series

**Technical Specifications**

Outer Conductor Armor	Corrugated Aluminum	(mm (in))	46.5 (1.83)
Jacket	Polyethylene, PE	(mm (in))	50.3 (1.98)
UV-Protection	Individual and External Jacket		Yes
Weight, Approximate		(kg/m (lb/ft))	1.9 (1.30)
Minimum Bending Radius, Single Bending		(mm (in))	200 (8)
Minimum Bending Radius, Repeated Bending		(mm (in))	500 (20)
Recommended/Maximum Clamp Spacing		(m (ft))	1.0 / 1.2 (3.25 / 4.0)
DC-Resistance Outer Conductor Armor		(Ω/km (Ω/1000ft))	0.68 (0.205)
DC-Resistance Power Cable, 8.4mm <sup>2</sup> (8AWG)		(Ω/km (Ω/1000ft))	2.1 (0.307)
Version			Single-mode OM3
Quantity, Fiber Count			16 (8 pairs)
Core/Clad		(μm)	50/125
Primary Coating (Acrylate)		(μm)	245
Buffer Diameter, Nominal		(μm)	900
Secondary Protection, Jacket, Nominal		(mm (in))	2.0 (0.08)
Minimum Bending Radius		(mm (in))	104 (4.1)
Insertion Loss @ wavelength 850nm		dB/km	3.0
Insertion Loss @ wavelength 1310nm		dB/km	1.0
Standards (Meets or exceeds)			UL34-V0, UL1666 RoHS Compliant
Size (Power)		(mm (AWG))	8.4 (8)
Quantity, Wire Count (Power)			16 (8 pairs)
Size (Alarm)		(mm (AWG))	0.8 (18)
Quantity, Wire Count (Alarm)			4 (2 pairs)
Type			UV protected
Strands			19
Primary Jacket Diameter, Nominal		(mm (in))	6.8 (0.27)
Standards (Meets or exceeds)			NFPA 130, ICEA 5-95-658 UL Type XHHW-2, UL 44 UL-LS Limited Smoke, UL VW-1 IEEE-383 (1974), IEEE1202/FT4 RoHS Compliant
Installation Temperature		(°C (°F))	-40 to +65 (-40 to 149)
Operation Temperature		(°C (°F))	-40 to +65 (-40 to 149)

\* This data is provisional and subject to change

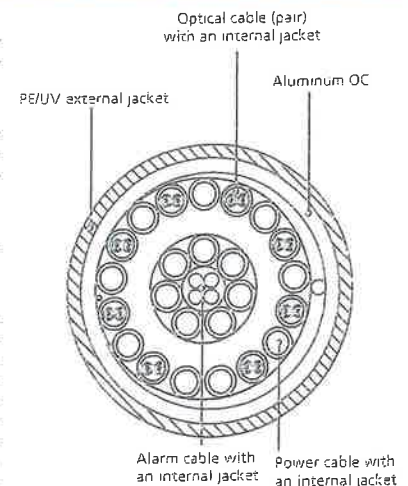


Figure 3: Construction Detail

All information contained in the present datasheet is subject to confirmation at time of ordering.

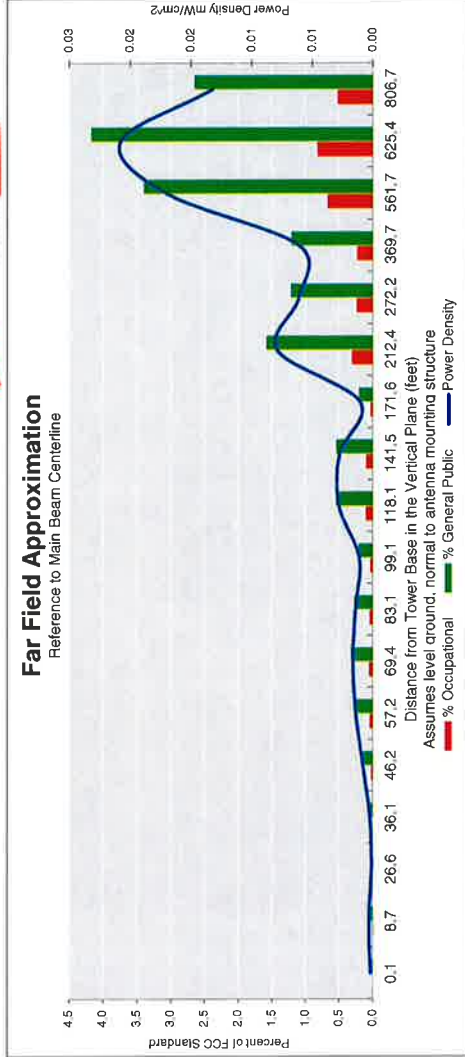


# **ATTACHMENT 2**

Far Field Approximation  
with downtilt variation

**Estimated Radiated Emission  
Single Emmitter Far Field Model  
Dipole/Wire/Yagi Antenna Types**

Location:	CROMWELL SE CT
Site #:	2-0612
Date:	08/12/15
Name:	Jaime Laredo
File Name:	CROMWELL SE CT - FF POWER (LTE-700).xlsx
Operating Freq. (MHz):	746.0
Antenna Height (ft):	102.0
Antenna Gain (dBi):	15.8
Antenna Size (m.):	72.7
Downtilt (degrees):	5.0
Feedline Loss (dB):	0.0
ERP (w):	1050.0
No. of Channels:	1



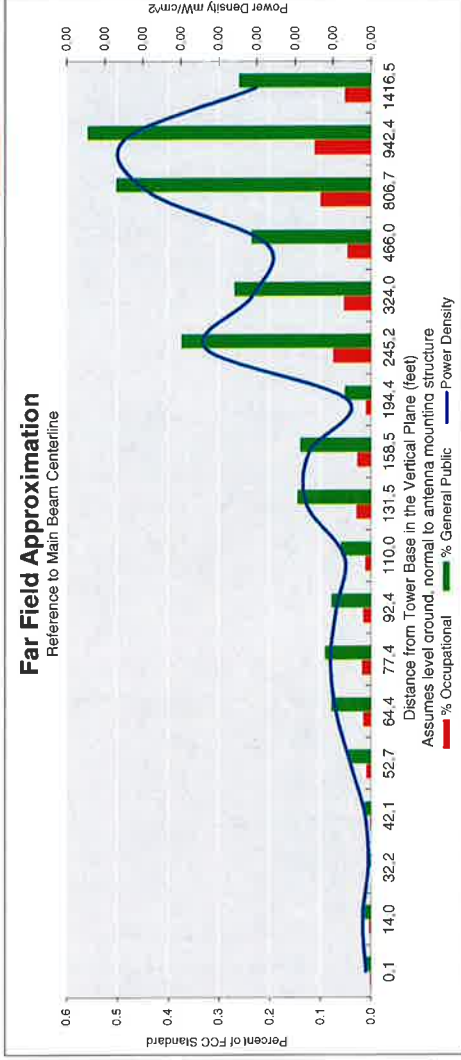
Calc Angle	90.0	85.0	75.0	70.0	65.0	60.0	55.0	50.0	45.0	40.0	35.0	30.0	25.0	20.0	15.0	10.0	9.0	812.8
Solve for r, dx to antenna	99.0	99.4	102.5	105.4	109.3	114.4	120.9	129.3	140.1	154.1	172.7	198.1	234.4	289.6	382.7	570.4	633.2	812.8
Distance from Antenna Structure Base in Horizontal plane	0.1	8.7	26.6	36.1	46.2	57.2	69.4	83.1	99.1	118.1	141.5	171.6	212.4	272.2	369.7	561.7	625.4	806.7
Angle from Main Beam (reference to horizontal plane)	90	80	70	65	60	55	50	45	40	35	30	25	20	15	10	5	4	2
dB down from centerline (referenced to centerline)	36.76	34.35	38.52	35.34	29.54	26.8	25.59	25.63	25.99	21.21	20.29	23.24	13.03	12.3	9.92	2	0.2	0
Reflection Coefficient (1 to 4, 2.56 typical)	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56
Power Density (mW/cm²)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.02	0.02	0.01
Percent of Occupational Standard	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.1	0.1	0.0	0.3	0.2	0.2	0.7	0.8	0.5
Percent of General Population Standard	0.0	0.1	0.0	0.0	0.2	0.3	0.3	0.3	0.2	0.6	0.6	0.2	1.6	1.2	1.2	3.4	4.2	2.7

Antenna Type: LNX-6514DS-A1M  
Max%: 4.19%

Far Field Approximation  
with downtilt variation

**Estimated Radiated Emission  
Single Emmitter Far Field Model  
Dipole/Wire/Yagi Antenna Types**

Location:	CROMWELL SE CT
Site #:	2-0612
Date:	08/12/15
Name:	Jaime Laredo
File Name:	CROMWELL SE CT - FF POWER (Cellular).xlsx
Operating Freq. (MHz):	869.0
Antenna Height (ft):	102.0
Antenna Gain (dBi):	16.0
Antenna Size (m.):	72.7
Downtilt (degrees):	2.0
Feedline Loss (dB):	0.0
ERP (w):	348.6
No. of Channels:	9



Calc Angle	90.0	82.0	72.0	67.0	62.0	57.0	52.0	47.0	42.0	37.0	32.0	27.0	22.0	17.0	12.0	7.0	6.0	4.0
Solve for r, dx to antenna	99.0	100.0	104.1	107.6	112.2	118.1	125.7	135.4	148.0	164.6	186.9	218.2	264.4	338.8	476.4	812.8	947.6	1419.9
Distance from Antenna Structure Base in Horizontal plane	0.1	14.0	32.2	42.1	52.7	64.4	77.4	92.4	110.0	131.5	158.5	194.4	245.2	324.0	466.0	806.7	942.4	1416.5
Angle from Main Beam (reference to horizontal plane)	90	80	70	65	60	55	50	45	40	35	30	25	20	15	10	5	4	2
dB down from centerline (referenced to centerline)	36.76	34.35	38.52	35.34	29.54	26.8	25.59	25.63	25.99	21.21	20.29	23.24	13.03	12.3	9.92	2	0.2	0
Reflection Coefficient (1 to 4, 2.56 typical)	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56
Power Density (mW/cm²)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Percent of Occupational Standard	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.1
Percent of General Population Standard	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.2	0.5	0.6	0.3

Antenna Type: LNX-6514DS-A1M

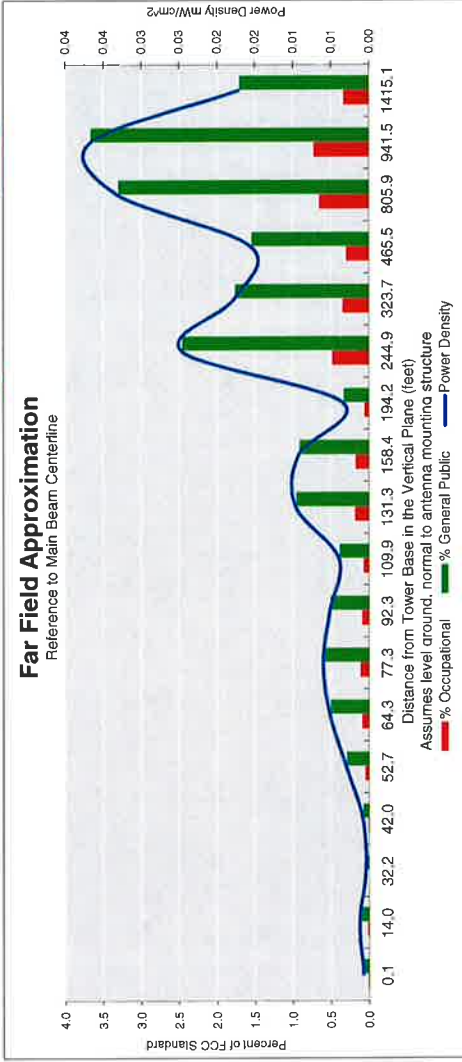
Max%: 0.56%

Far Field Approximation  
with downtilt variation

**Estimated Radiated Emission  
Single Emitter Far Field Model  
Dipole/Wire/Yagi Antenna Types**



Location:	CROMWELL SE CT
Site #:	2-0612
Date:	08/12/15
Name:	Jaime Laredo
File Name:	CROMWELL SE CT - FF POWER (PCS).xlsx
Operating Freq. (MHz):	1970.0
Antenna Height (ft):	101.9
Antenna Gain (dBi):	18.5
Antenna Size (m):	74.9
Downtilt (degrees):	2.0
Feedline Loss (dB):	0.0
ERP (w):	2233.3
No. of Channels:	1

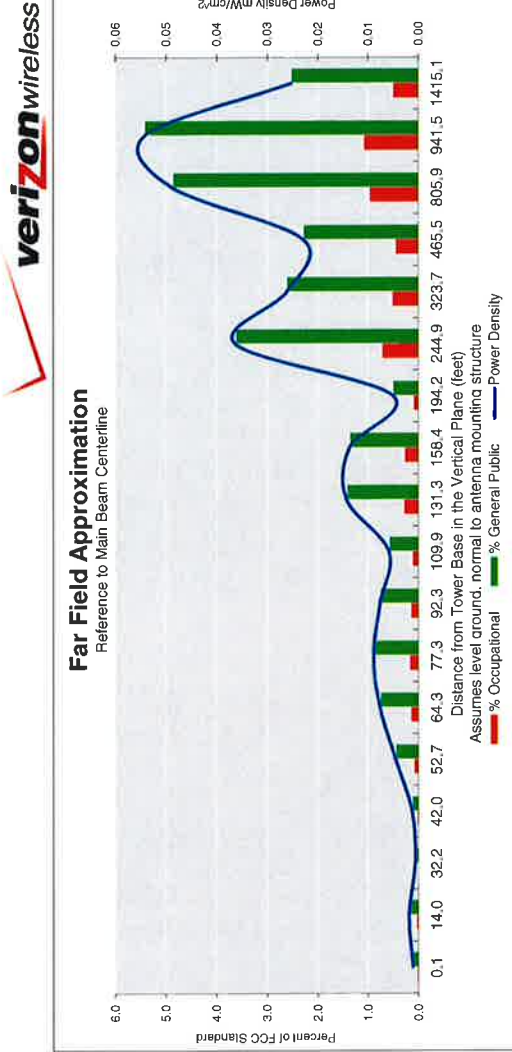


Calc Angle	90.0	82.0	72.0	67.0	62.0	57.0	52.0	47.0	42.0	37.0	32.0	27.0	22.0	17.0	12.0	7.0	6.0	4.0
Solve for r, dx to antenna	98.9	99.9	104.0	107.5	112.0	118.0	125.6	135.3	147.9	164.4	186.7	217.9	264.1	338.4	475.9	811.9	946.6	1418.5
Distance from Antenna Structure Base in Horizontal plane	0.1	14.0	32.2	42.0	52.7	64.3	77.3	92.3	109.9	131.3	158.4	194.2	244.9	323.7	465.5	805.9	941.5	1415.1
Angle from Main Beam (reference to horizontal plane)	90	80	70	65	60	55	50	45	40	35	30	25	20	15	10	5	4	2
dB down from centerline (referenced to centerline)	36.76	34.35	38.52	35.34	29.54	26.8	25.59	25.63	25.99	21.21	20.29	23.24	13.03	12.3	9.92	2	0.2	0
Reflection Coefficient (1 to 4, 2.56 typical)	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56
Power Density (mW/cm²)	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.00	0.01	0.01	0.00	0.02	0.02	0.02	0.03	0.04	0.02
Percent of Occupational Standard	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.5	0.4	0.3	0.7	0.7	0.3
Percent of General Population Standard	0.1	0.1	0.0	0.1	0.3	0.5	0.6	0.5	0.4	1.0	0.9	0.3	2.5	1.8	1.6	3.3	3.7	1.7

Antenna Type: HBXX-6517DS-AZM  
Max%: 3.68%

**Estimated Radiated Emission  
Single Emmitter Far Field Model  
Dipole/Wire/Yagi Antenna Types**

Location:	CROMWELL SE CT
Site #:	2-0612
Date:	08/12/15
Name:	Jaime Laredo
File Name:	CROMWELL SE CT - FF POWER (LTE-AWS).xlsx
Operating Freq. (MHz):	2145.0
Antenna Height (ft):	101.9
Antenna Gain (dBi):	19.2
Antenna Size (in.):	74.9
Downtilt (degrees):	2.0
Feedline Loss (dB):	0.0
ERP (w):	2811.6
No. of Channels:	1



Calc Angle	90.0	82.0	72.0	67.0	62.0	57.0	52.0	47.0	42.0	37.0	32.0	27.0	22.0	17.0	12.0	7.0	6.0	4.0
Solve for r, dx to antenna	98.9	99.9	104.0	107.5	112.0	118.0	125.6	135.3	147.9	164.4	186.7	217.9	264.1	338.4	475.9	811.9	946.6	1418.5
Distance from Antenna Structure Base in Horizontal plane	0.1	14.0	32.2	42.0	52.7	64.3	77.3	92.3	109.9	131.3	158.4	194.2	244.9	323.7	465.5	805.9	941.5	1415.1
Angle from Main Beam (reference to horizontal plane)	90	80	70	65	60	55	50	45	40	35	30	25	20	15	10	5	4	2
dB down from centerline (referenced to centerline)	36.76	34.35	38.52	35.34	29.54	26.8	25.59	25.63	25.99	21.21	20.29	23.24	13.03	12.3	9.92	2	0.2	0
Reflection Coefficient (1 to 4, 2.56 typical)	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56
Power Density (mW/cm <sup>2</sup> )	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.04	0.03	0.02	0.05	0.03
Percent of Occupational Standard	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.2	0.1	0.3	0.3	0.1	0.7	0.5	0.5	1.0	1.1	0.5
Percent of General Population Standard	0.1	0.2	0.1	0.1	0.5	0.8	0.9	0.8	0.6	1.4	1.4	0.5	3.6	2.6	2.3	4.9	5.4	2.5

Antenna Type: HBXX-6517DS-A2M

Max%: 5.43%

# **ATTACHMENT 3**



May 21, 2015

Mr. Timothy Howell  
Crown Castle  
3530 Toringdon Way, Suite 300  
Charlotte, NC 28277  
(980) 209-8242

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

**Subject:** **Structural Modification Report**

**Carrier Designation:** **Verizon Wireless Co-Locate**  
**Carrier Site Number:** 119617  
**Carrier Site Name:** Cromwell SE

**Crown Castle Designation:** **Crown Castle BU Number:** 876364  
**Crown Castle Site Name:** Cromwell / First Line Emergenc  
**Crown Castle JDE Job Number:** 331473  
**Crown Castle Work Order Number:** 1057990  
**Crown Castle Application Number:** 292878 Rev. 0

**Engineering Firm Designation:** **B+T Group Project Number:** 84470.013.01

**Site Data:** **201 Main St., Cromwell, CT, Middlesex County**  
**Latitude 41° 35' 0.11", Longitude -72° 38' 59.14"**  
**125 Foot - Monopole**

Dear Mr. Howell,

B+T Group is pleased to submit this "Structural Modification Report" to determine the structural integrity of the above mentioned tower. This analysis has been performed in accordance with the Crown Castle Structural 'Statement of Work' and the terms of Crown Castle Purchase Order Number 785278, in accordance with application 292878, revision 0.

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: TSA specified load case with proposed modifications

**Sufficient Capacity**

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

This analysis has been performed in accordance with the TIA/EIA-222-F standard and 2005 CT State Building Code with 2009 amendment based upon a wind speed of 85 mph fastest mile.

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

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

Respectfully submitted by:  
B+T Engineering, Inc.

Ashkan Ghaeezadeh, E.I.  
Project Engineer

Chad E. Tuttle, P.E.  
President



## TABLE OF CONTENTS

### 1) INTRODUCTION

### 2) ANALYSIS CRITERIA

Table 1 - Proposed Antenna and Cable Information

Table 2 - Existing and Reserved Antenna and Cable Information

Table 3 - Design Antenna and Cable Information

### 3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

3.1) Analysis Method

3.2) Assumptions

### 4) ANALYSIS RESULTS

Table 5 - Section Capacity (Summary)

Table 6 - Tower Components vs. Capacity

4.1) Recommendations

### 5) APPENDIX A

tnxTower Output

### 6) APPENDIX B

Base Level Drawing

### 7) APPENDIX C

Additional Calculations

### 8) APPENDIX D

Tower Modification Drawings



## 1) INTRODUCTION

This is a 125 ft. monopole designed by Engineered Endeavors, Inc. in February of 2002. The monopole was originally designed for a wind speed of 90 mph per TIA/EIA-222-F. This monopole has been modified by Semaan Engineering Solution in December of 2004, VSI in October of 2007, B+T Group in July of 2012 and March of 2013 and those modifications were incorporated in this analysis.

## 2) ANALYSIS CRITERIA

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

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

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
105.0	105.0	3	Alcatel Lucent	RRH2x60-700	1	1-5/8	--
		3	Commscope	LNx-6514DS-A1M			
		1	RFS Celwave	DB-T1-6Z-8AB-0Z			

**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	
125.0	129.0	3	Argus Tech.	LLPX310R-V1	--	--	1	
	127.0	3	Alcatel Lucent	TD-RRH8x20-25	1	1-1/4	2	
		3	RFS Celwave	APXVTM14-C-120				
		3	RFS Celwave	APXVSP18-C-A20				
	125.0	125.0	2	Dragonwave	HORIZON COMPACT	3 3 3 2	1-1/4 1/4 5/16 1/2	1
			3	Samsung Telecomm.	WIMAX DAP HEAD			
			1	--	Platform Mount [LP 714-1]			
			1	Andrew	VHLP2-11			
	124.0	124.0	1	Andrew	VHLP2-18			
			1	Andrew	VHLP2-18			
123.0	123.0	3	Alcatel Lucent	800MHZ 2X50W RRH W/FILTER w / Mount Pipe	--	--	1	
		3	Alcatel Lucent	PCS 1900MHz 4x45W-65MHz w / Mount Pipe				
		1	--	Side Arm Mount [SO 102-3]				
115.0	117.0	6	Communication Components Inc.	DTMABP7819VG12A	12 2 1	1-1/4 3/4 3/8	1	
		3	Ericsson	RRUS-11				
		9	KMW Comm.	AM-X-CD-16-65-00T-RET				
		1	Raycap	DC6-48-60-18-8F				
	115.0	1	--	Platform Mount [LP 304-1]				
105.0	105.0	3	Antel	BXA-70063-6CF-EDIN-0	--	--	3	
		6	RFS Celwave	FD9R6004/2C-3L				

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
		3	Alcatel Lucent	RRH2X60-AWS	13	1-5/8	1
		3	Alcatel Lucent	RRH2X60-PCS			
		3	Andrew	LNx-6514DS-A1M			
		6	Commscope	HBXX-6517DS-A2M			
		1	RFS Celwave	DB-T1-6Z-8AB-0Z			
		1	--	Platform Mount [LP 1201-1]			
82.0	85.0	3	Ericsson	ERICSSON AIR 21 B2A B4P	6 1	1-5/8 1-3/16	1
		3	Ericsson	ERICSSON AIR 21 B4A B2P			
		1	--	T-Arm Mount [TA 601-3]			

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

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

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
125	125	1	Generic	L.P. Platform	--	--
		6	Decibel	DB980H65		
		3	Decibel	DB980H90		
115	115	1	Generic	T-Arm	--	--
		6	Allgon	7250		
105	105	1	Generic	L.P. Platform	--	--
		12	Decibel	DB844		

### 3) ANALYSIS PROCEDURE

**Table 4 - Documents Provided**

Document	Remarks	Reference	Source
Online Application	Verizon Wireless Co-Locate, Rev# 0	292878	CCI sites
Tower Manufacturer Drawings	EEI, Job No. 10554	2068958	CCI sites
Foundation Drawings	EEI, Job No. 6464	1613909	CCI sites
Geotech Report	Dr. Clarence Welti, P.E., Date: 08/02/99	1532312	CCI sites
Tower Modification Drawings	Semaan Engineering Solutions Project No. CT23XC558	2055765	CCI sites
	VSI, Job No. 2007-004-138	2182292	CCI sites
	B+T Group, Project No. 84890.001	3373019	CCI sites
	B+T Group, Project No. 84470.006.01	3669962	CCI sites
Modification Inspection Report	VSI, Job No. 2007-004-104	1956332	CCI sites
	VSI, Job No. 2007-004-138	2182292	CCI sites
	B+T Group, Project No. 84890.002	3394680	CCI sites
	TEP, Project No. 131001.876364	4009982	CCI sites
Base Plate Details	Crown, Project No. 320820	2608627	CCI sites
Antenna Configuration	Crown CAD Package	Date: 04/29/15	CCI sites

#### 3.1) Analysis Method

tnxTower (version 6.1.4.1), 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) Mount areas and weights are assumed based on photographs provided.
- 5) When applicable, transmission cables are considered as structural components for calculating wind loads as allowed by TIA/EIA-222-F.

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

#### 4) ANALYSIS RESULTS

**Table 5 - Section Capacity (Summary) - LC4.7**

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	125 - 101.25	Pole	TP23.605x18.5x0.188	1	-8.700	-	83.6	Pass <sup>1</sup>
L2	101.25 - 94.458	Pole	TP25.065x23.605x0.409	2	-9.692	-	83.8	Pass <sup>1</sup>
L3	94.458 - 89	Pole	TP26.239x25.065x0.571	3	-10.735	-	70.6	Pass <sup>1</sup>
L4	89 - 85.04	Pole	TP27.09x26.239x0.439	4	-10.750	-	77.4	Pass <sup>1</sup>
L5	85.04 - 73.583	Pole	TP29.14x25.873x0.475	5	-15.289	-	96.6	Pass <sup>1</sup>
L6	73.583 - 73	Pole	TP29.264x29.14x0.609	6	-15.429	-	76.9	Pass <sup>1</sup>
L7	73 - 63	Pole	TP31.389x29.264x0.369	7	-17.249	-	99.7	Pass <sup>1</sup>
L8	63 - 57.333	Pole	TP32.594x31.389x0.566	8	-18.605	-	85.9	Pass <sup>1</sup>
L9	57.333 - 40.457	Pole	TP36.18x32.594x0.436	9	-21.153	-	94.8	Pass <sup>1</sup>
L10	40.457 - 37.833	Pole	TP36.233x34.6x0.493	10	-23.767	-	89.2	Pass <sup>1</sup>
L11	37.833 - 12.25	Pole	TP41.654x36.233x0.466	11	-30.350	-	99.7	Pass <sup>1</sup>
L12	12.25 - 0	Pole	TP44.25x41.654x0.589	12	-34.633	-	92.4	Pass <sup>1</sup>
							Summary	
						Pole (L11)	99.7	Pass <sup>1</sup>
						<b>RATING =</b>	<b>99.7</b>	<b>Pass<sup>1</sup></b>

**Table 6 - Tower Component Stresses vs. Capacity - LC4.7**

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	Base	98.6	Pass
1	Base Plate	Base	95.2	Pass
1	Base Foundation (Soil Interaction)	Base	93.2	Pass
1	Base Foundation (Steel)	Base	57.6	Pass

<b>Structure Rating (max from all components) =</b>	<b>99.7%</b>
---	--------------

Notes:

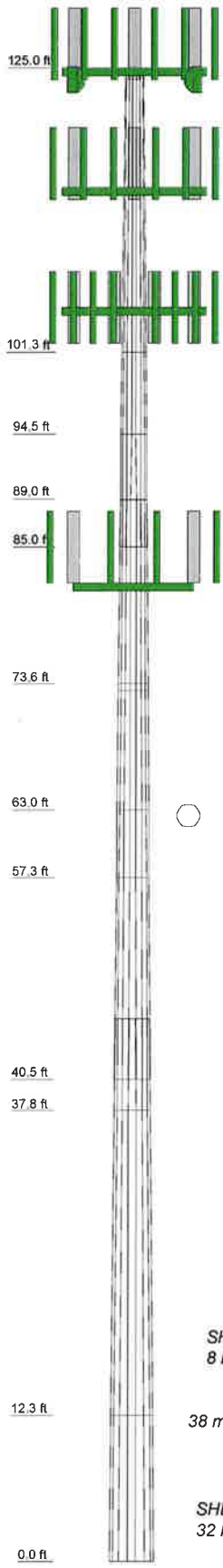
- 1) See additional documentation in "Appendix C - Additional Calculations" for calculations supporting the % capacity listed.
- 2) The percent capacities shown above (excluding foundations) include the 1/3 increase in allowable stresses as allowed by TIA/EIA-222-F.

#### 4.1) Recommendations

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

**APPENDIX A**  
**tnxTOWER OUTPUT**

Section	1	2	3	4	5	6	7	8	9	10	11	12
Length (ft)	23.750	6.792	5.458	3.960	15.374	5.667	10.000	5.667	16.876	7.707	25.593	12.250
Number of Sides	18	18	18	18	18	18	18	18	18	18	18	18
Thickness (in)	0.188	0.409	0.571	0.439	0.475	0.566	0.569	0.436	0.466	0.493	0.466	0.589
Socket Length (ft)				3.917					5.083			
Top Dia (in)	18.500	23.605	25.065	26.239	25.873	29.264	29.140	31.389	32.594	34.600	36.233	41.654
Bot Dia (in)	23.605	25.065	26.239	27.090	29.140	31.389	31.389	32.594	36.180	36.233	41.654	44.250
Grade	A572-65			50.069824ksi	A572-65	45.889208ksi	45.889208ksi	45.715633ksi	45.715633ksi	50.069824ksi	A572-65	56.682708ksi
Weight (K)	1.0	0.7	0.8	0.5	2.0	1.0	1.2	1.0	2.6	1.4	4.8	3.5

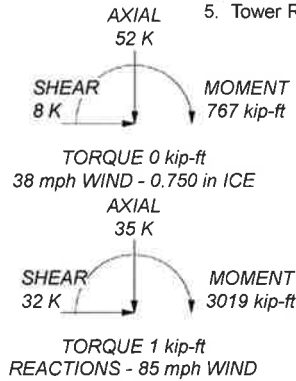


**DESIGNED APPURTENANCE LOADING**

TYPE	ELEVATION	TYPE	ELEVATION
APXVTM14-C-120 w/ Mount Pipe (R)	125	DC6-48-60-18-8F (E)	115
APXVTM14-C-120 w/ Mount Pipe (R)	125	6' x 2" Mount Pipe (E-For Surge)	115
APXVTM14-C-120 w/ Mount Pipe (R)	125	Platform Mount [LP 304-1] (E)	115
APXVTM14-C-120 w/ Mount Pipe (R)	125	(3) AM-X-CD-16-65-00T-RET w/ Mount Pipe (E)	115
TD-RRH8x20-25 (R)	125	(3) AM-X-CD-16-65-00T-RET w/ Mount Pipe (E)	115
TD-RRH8x20-25 (R)	125	LNx-6514DS-A1M w/ Mount Pipe (E)	105
TD-RRH8x20-25 (R)	125	LNx-6514DS-A1M w/ Mount Pipe (E)	105
LLPX310R-V1 w/ Mount Pipe (E)	125	(2) HBXX-6517DS-A2M w/ Mount Pipe (E)	105
LLPX310R-V1 w/ Mount Pipe (E)	125	(2) HBXX-6517DS-A2M w/ Mount Pipe (E)	105
LLPX310R-V1 w/ Mount Pipe (E)	125	(2) HBXX-6517DS-A2M w/ Mount Pipe (E)	105
APXVSP18-C-A20 w/ Mount Pipe (E)	125	(2) HBXX-6517DS-A2M w/ Mount Pipe (E)	105
APXVSP18-C-A20 w/ Mount Pipe (E)	125	RRH2X60-AWS (E)	105
APXVSP18-C-A20 w/ Mount Pipe (E)	125	RRH2X60-AWS (E)	105
WIMAX DAP HEAD (E)	125	RRH2X60-AWS (E)	105
WIMAX DAP HEAD (E)	125	RRH2X60-PCS (E)	105
WIMAX DAP HEAD (E)	125	RRH2X60-PCS (E)	105
HORIZON COMPACT (E)	125	RRH2X60-PCS (E)	105
HORIZON COMPACT (E)	125	DB-T1-6Z-8AB-0Z (E)	105
(2) 6' x 2" Mount Pipe (E)	125	LNx-6514DS-A1M w/ Mount Pipe (P)	105
(2) 6' x 2" Mount Pipe (E)	125	LNx-6514DS-A1M w/ Mount Pipe (P)	105
Platform Mount [LP 714-1] (E)	125	LNx-6514DS-A1M w/ Mount Pipe (P)	105
VHLP2-18 (E)	125	RRH2x60-700 (P)	105
VHLP2-11 (E)	125	RRH2x60-700 (P)	105
PCS 1900MHz 4x45W-65MHz w/ Mount Pipe (E)	123	RRH2x60-700 (P)	105
800MHz 2X50W RRH W/FILTER w/ Mount Pipe (E)	123	DB-T1-6Z-8AB-0Z (P)	105
800MHz 2X50W RRH W/FILTER w/ Mount Pipe (E)	123	Platform Mount [LP 1201-1] (E)	105
800MHz 2X50W RRH W/FILTER w/ Mount Pipe (E)	123	LNx-6514DS-A1M w/ Mount Pipe (E)	105
800MHz 2X50W RRH W/FILTER w/ Mount Pipe (E)	123	LNx-6514DS-A1M w/ Mount Pipe (E)	105
Side Arm Mount [SO 102-3] (E)	123	(2) ERICSSON AIR 21 B2A B4P w/ Mount Pipe (E)	82
PCS 1900MHz 4x45W-65MHz w/ Mount Pipe (E)	123	(2) ERICSSON AIR 21 B4A B2P w/ Mount Pipe (E)	82
PCS 1900MHz 4x45W-65MHz w/ Mount Pipe (E)	123	6' x 2" Mount Pipe (E)	82
(3) AM-X-CD-16-65-00T-RET w/ Mount Pipe (E)	115	6' x 2" Mount Pipe (E)	82
(2) DTMAPB7819VG12A (E)	115	6' x 2" Mount Pipe (E)	82
(2) DTMAPB7819VG12A (E)	115	T-Arm Mount [TA 601-3] (E)	82
(2) DTMAPB7819VG12A (E)	115	ERICSSON AIR 21 B2A B4P w/ Mount Pipe (E)	82
RRUS-11 (E)	115	ERICSSON AIR 21 B4A B2P w/ Mount Pipe (E)	82
RRUS-11 (E)	115		
RRUS-11 (E)	115		

**TOWER DESIGN NOTES**

1. Tower is located in Middlesex County, Connecticut.
2. Tower designed for a 85 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 38 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.
5. Tower Rating: 99.7%



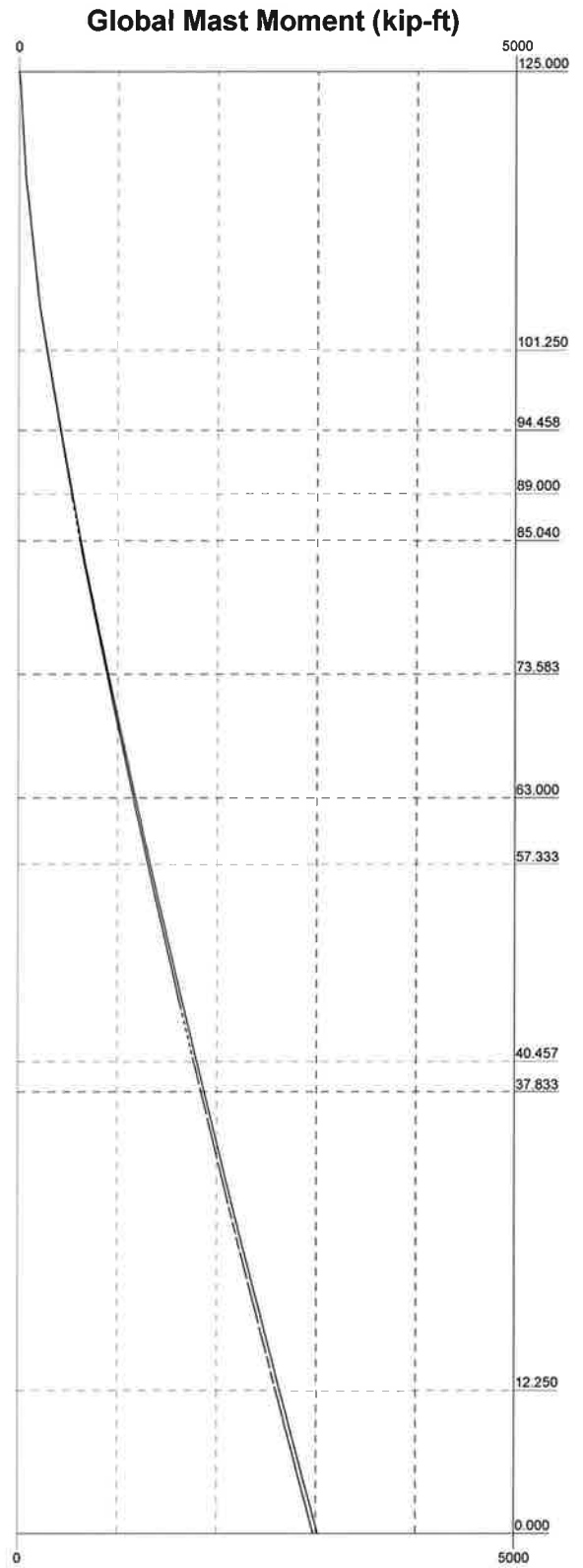
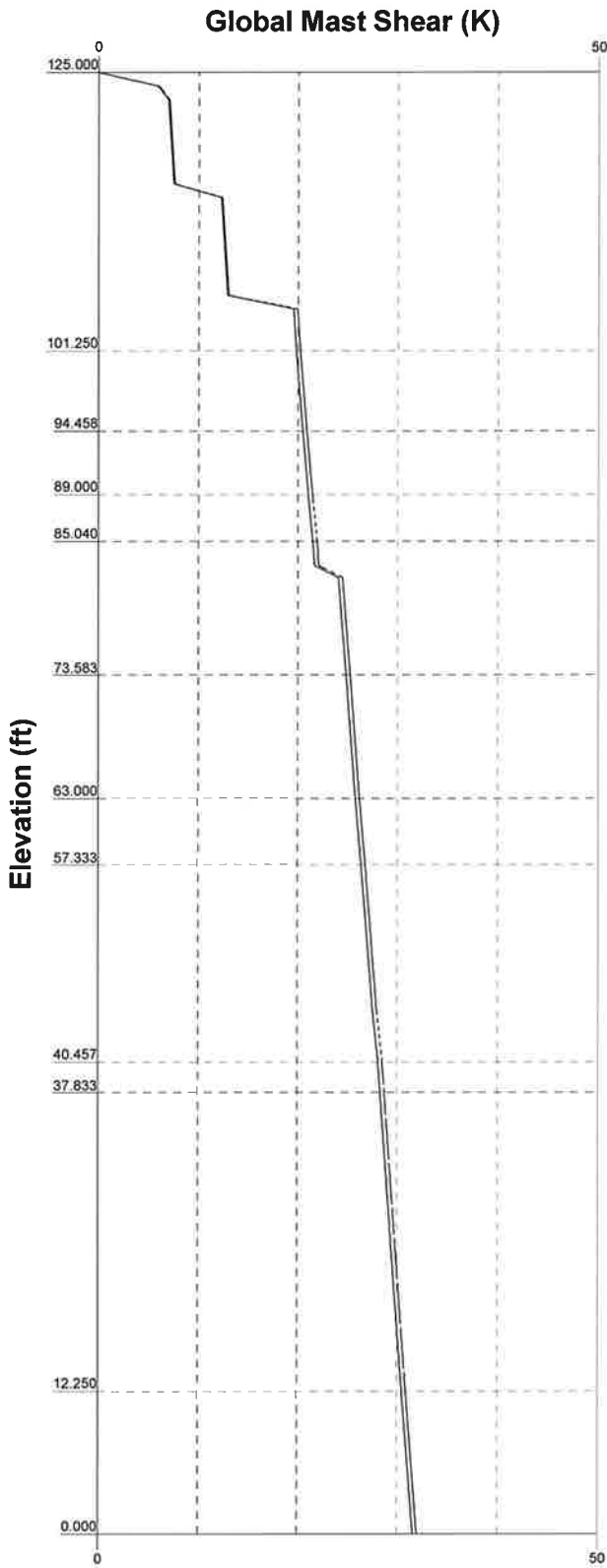
**B+T Group**  
 1717 S. Boulder, Suite 300  
 Tulsa, OK 74119  
 Phone: (918) 587-4630  
 FAX: (918) 587-4630

Job: **84470.013.01 - Cromwell/First Line Emergenc, CT (BU# 876364)**

Project:	Client: Crown Castle	Drawn by: APatil	App'd:
Code: TIA/EIA-222-F	Date: 05/11/15	Scale: NTS	Dwg No: E-1

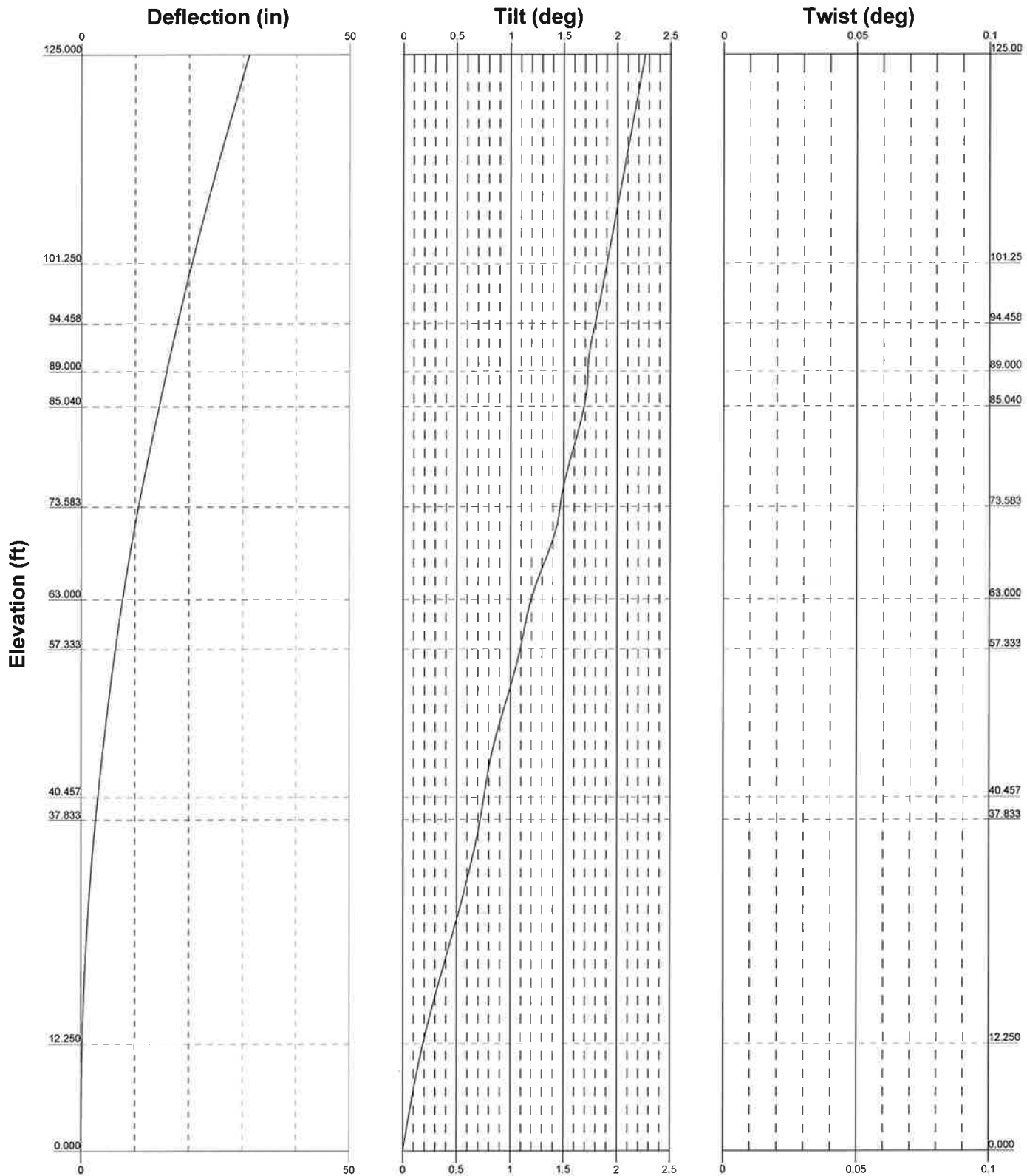
—— Vx      - - - - Vz

—— Mx      - - - - Mz



**B+T Group**  
 1717 S. Boulder, Suite 300  
 Tulsa, OK 74119  
 Phone: (918) 587-4630  
 FAX: (918) 587-4630

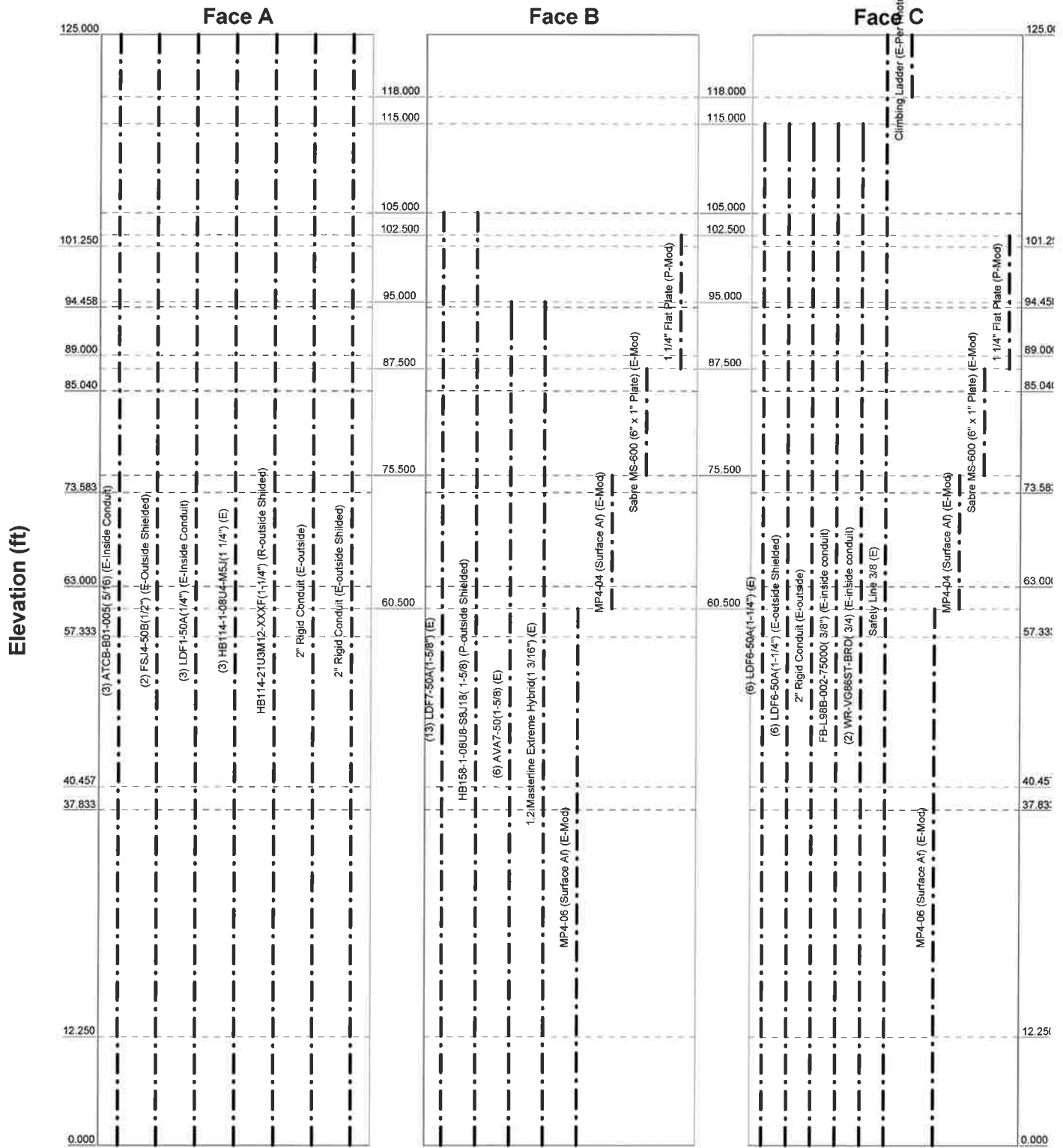
Job: <b>84470.013.01 - Cromwell/First Line Emergenc, CT (BU# 876364)</b>		
Project:	Drawn by: APatil	App'd:
Client: Crown Castle	Date: 05/11/15	Scale: NTS
Code: TIA/EIA-222-F	Path:	Dwg No. E-4



**B+T Group**  
 1717 S. Boulder, Suite 300  
 Tulsa, OK 74119  
 Phone: (918) 587-4630  
 FAX: (918) 587-4630

Job: <b>84470.013.01 - Cromwell/First Line Emergenc, CT (BU# 876364)</b>		
Project:	Client: Crown Castle	Drawn by: APatil
Code: TIA/EIA-222-F	Date: 05/11/15	App'd:
Path:	Scale: NTS	Dwg No: E-5





**B+T Group**  
 1717 S. Boulder, Suite 300  
 Tulsa, OK 74119  
 Phone: (918) 587-4630  
 FAX: (918) 587-4630

Job: **84470.013.01 - Cromwell/First Line Emergenc, CT (BU# 876364)**  
 Project:  
 Client: **Crown Castle** Drawn by: **APatil** App'd:  
 Code: **TIA/EIA-222-F** Date: **05/11/15** Scale: **NTS**  
 Path: Dwg No **E-7**

<b>tnxTower</b>  <b>B+T Group</b> 1717 S. Boulder, Suite 300 Tulsa, OK 74119 Phone: (918) 587-4630 FAX: (918) 587-4630	<b>Job</b> 84470.013.01 - Cromwell/First Line Emergenc, CT (BU# 876364)	<b>Page</b> 1 of 18
	<b>Project</b>	<b>Date</b> 16:34:31 05/11/15
	<b>Client</b> Crown Castle	<b>Designed by</b> APatil

## Tower Input Data

There is a pole section.

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

The following design criteria apply:

Tower is located in Middlesex County, Connecticut.

Basic wind speed of 85 mph.

Nominal ice thickness of 0.750 in.

Ice thickness is considered to increase with height.

Ice density of 56.000 pcf.

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

Temperature drop of 50.000 °F.

Deflections calculated using a wind speed of 50 mph.

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

Pressures are calculated at each section.

Stress ratio used in pole design is 1.333.

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

## Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	125.000-101.250	23.750	0.000	18	18.500	23.605	0.188	0.750	A572-65 (65 ksi)
L2	101.250-94.458	6.792	0.000	18	23.605	25.065	0.409	1.637	40.195085ksi (40 ksi)
L3	94.458-89.000	5.458	0.000	18	25.065	26.239	0.571	2.283	39.937649ksi (40 ksi)
L4	89.000-85.040	3.960	3.917	18	26.239	27.090	0.439	1.757	45.715633ksi (46 ksi)
L5	85.040-73.583	15.374	0.000	18	25.873	29.140	0.475	1.900	45.882762ksi (46 ksi)
L6	73.583-73.000	0.583	0.000	18	29.140	29.264	0.609	2.437	45.889208ksi (46 ksi)
L7	73.000-63.000	10.000	0.000	18	29.264	31.389	0.369	1.475	A572-65 (65 ksi)
L8	63.000-57.333	5.667	0.000	18	31.389	32.594	0.566	2.262	50.869824ksi (51 ksi)
L9	57.333-40.457	16.876	5.083	18	32.594	36.180	0.436	1.743	A572-65 (65 ksi)
L10	40.457-37.833	7.707	0.000	18	34.600	36.233	0.493	1.973	A572-65 (65 ksi)
L11	37.833-12.250	25.583	0.000	18	36.233	41.654	0.466	1.866	A572-65 (65 ksi)
L12	12.250-0.000	12.250		18	41.654	44.250	0.589	2.354	56.682708ksi (57 ksi)



<b>tnxTower</b>  <b>B+T Group</b> 1717 S. Boulder, Suite 300 Tulsa, OK 74119 Phone: (918) 587-4630 FAX: (918) 587-4630	<b>Job</b> 84470.013.01 - Cromwell/First Line Emergenc, CT (BU# 876364)	<b>Page</b> 3 of 18
	<b>Project</b>	<b>Date</b> 16:34:31 05/11/15
	<b>Client</b> Crown Castle	<b>Designed by</b> APatil

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

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number	Number Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight klf
**@**										

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

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#		C <sub>A,A</sub> ft <sup>2</sup> /ft	Weight klf
ATCB-B01-005 (5/16) (E-Inside Conduit)	A	No	CaAa (Out Of Face)	125.000 - 0.000	0.000	0	3	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.000 0.000 0.000 0.000 0.000	0.000 0.001 0.002 0.006 0.021
FSJ4-50B(1/2") (E-Outside Shielded)	A	No	CaAa (Out Of Face)	125.000 - 0.000	0.000	0	2	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.000 0.000 0.000 0.000 0.000	0.000 0.001 0.002 0.006 0.022
LDF1-50A(1/4") (E-Inside Conduit)	A	No	CaAa (Out Of Face)	125.000 - 0.000	0.000	0	3	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.000 0.000 0.000 0.000 0.000	0.000 0.001 0.002 0.006 0.021
HB114-1-08U4-M5J(1 1/4") (E)	A	No	Inside Pole	125.000 - 0.000	0.000	0	3	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.000 0.000 0.000 0.000 0.000	0.001 0.001 0.001 0.001 0.001
HB114-21U3 M12-XXXXF(1-1/4") (R-outside Shielded)	A	No	CaAa (Out Of Face)	125.000 - 0.000	0.000	0	1	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.000 0.000 0.000 0.000 0.000	0.001 0.002 0.004 0.010 0.028
2" Rigid Conduit (E-outside)	A	No	CaAa (Out Of Face)	125.000 - 0.000	0.000	0	1	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.200 0.300 0.400 0.600 1.000	0.003 0.004 0.006 0.013 0.032
2" Rigid Conduit (E-outside Shielded)	A	No	CaAa (Out Of Face)	125.000 - 0.000	0.000	0	1	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.000 0.000 0.000 0.000 0.000	0.003 0.004 0.006 0.013 0.032
*****										
LDF6-50A(1-1/4") (E)	C	No	Inside Pole	115.000 - 0.000	0.000	0	6	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.000 0.000 0.000 0.000 0.000	0.001 0.001 0.001 0.001 0.001
LDF6-50A(1-1/4") (E-outside Shielded)	C	No	CaAa (Out Of Face)	115.000 - 0.000	0.000	0	6	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.000 0.000 0.000 0.000 0.000	0.001 0.002 0.004 0.009 0.028
2" Rigid Conduit	C	No	CaAa (Out Of Face)	115.000 - 0.000	0.000	0	1	No Ice 1/2" Ice	0.200 0.300	0.003 0.004

<b>Job</b>	84470.013.01 - Cromwell/First Line Emergenc, CT (BU# 876364)	<b>Page</b>	4 of 18
<b>Project</b>		<b>Date</b>	16:34:31 05/11/15
<b>Client</b>	Crown Castle	<b>Designed by</b>	APatil

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#		C <sub>A</sub> A <sub>A</sub> ft <sup>2</sup> /ft	Weight klf
(E-outside)								1" Ice	0.400	0.006
								2" Ice	0.600	0.013
								4" Ice	1.000	0.032
FB-L98B-002-75000( 3/8") (E-inside conduit)	C	No	CaAa (Out Of Face)	115.000 - 0.000	0.000	0	1	No Ice	0.000	0.000
								1/2" Ice	0.000	0.001
								1" Ice	0.000	0.002
								2" Ice	0.000	0.006
								4" Ice	0.000	0.022
WR-VG86ST-BRD( 3/4) (E-inside conduit)	C	No	CaAa (Out Of Face)	115.000 - 0.000	0.000	0	2	No Ice	0.000	0.001
								1/2" Ice	0.000	0.001
								1" Ice	0.000	0.003
								2" Ice	0.000	0.007
								4" Ice	0.000	0.024
*****										
LDF7-50A(1-5/8") (E)	B	No	Inside Pole	105.000 - 0.000	0.000	0	13	No Ice	0.000	0.001
								1/2" Ice	0.000	0.001
								1" Ice	0.000	0.001
								2" Ice	0.000	0.001
								4" Ice	0.000	0.001
HB158-1-08U 8-S8J18( 1-5/8) (P-outside Shielded)	B	No	CaAa (Out Of Face)	105.000 - 0.000	0.000	0	1	No Ice	0.000	0.001
								1/2" Ice	0.000	0.003
								1" Ice	0.000	0.005
								2" Ice	0.000	0.011
								4" Ice	0.000	0.031
*****										
AVA7-50(1-5/8) (E)	B	No	Inside Pole	95.000 - 0.000	0.000	0	6	No Ice	0.000	0.001
								1/2" Ice	0.000	0.001
								1" Ice	0.000	0.001
								2" Ice	0.000	0.001
								4" Ice	0.000	0.001
1.2 Masterline Extreme Hybrid(1 3/16") (E)	B	No	Inside Pole	95.000 - 0.000	0.000	0	1	No Ice	0.000	0.001
								1/2" Ice	0.000	0.001
								1" Ice	0.000	0.001
								2" Ice	0.000	0.001
								4" Ice	0.000	0.001
*****										
Safety Line 3/8 (E)	C	No	CaAa (Out Of Face)	125.000 - 0.000	0.000	0	1	No Ice	0.037	0.000
								1/2" Ice	0.137	0.001
								1" Ice	0.238	0.001
								2" Ice	0.437	0.002
								4" Ice	0.838	0.004
Climbing Ladder (E-Per Photo)	C	No	CaAa (Out Of Face)	125.000 - 118.000	36.000	0	1	No Ice	0.500	0.008
								1/2" Ice	0.611	0.014
								1" Ice	0.722	0.019
								2" Ice	0.944	0.029
								4" Ice	1.389	0.049
**@**										
MP4-06 (Surface Af) (E-Mod)	B	No	CaAa (Out Of Face)	60.500 - 0.000	0.000	0	1	No Ice	0.434	0.000
								1/2" Ice	0.518	0.000
								1" Ice	0.601	0.000
								2" Ice	0.768	0.000
								4" Ice	1.101	0.000
MP4-06 (Surface Af) (E-Mod)	C	No	CaAa (Out Of Face)	60.500 - 0.000	0.000	0	1	No Ice	0.434	0.000
								1/2" Ice	0.518	0.000
								1" Ice	0.601	0.000
								2" Ice	0.768	0.000
								4" Ice	1.101	0.000
**										
MP4-04 (Surface Af) (E-Mod)	B	No	CaAa (Out Of Face)	75.500 - 60.500	0.000	0	1	No Ice	0.268	0.000
								1/2" Ice	0.352	0.000
								1" Ice	0.435	0.000

<b>tnxTower</b>  <b>B+T Group</b> 1717 S. Boulder, Suite 300 Tulsa, OK 74119 Phone: (918) 587-4630 FAX: (918) 587-4630	<b>Job</b> 84470.013.01 - Cromwell/First Line Emergenc, CT (BU# 876364)	<b>Page</b> 5 of 18
	<b>Project</b>	<b>Date</b> 16:34:31 05/11/15
	<b>Client</b> Crown Castle	<b>Designed by</b> APatil

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	C <sub>AA</sub> ft <sup>2</sup> /ft	Weight klf	
MP4-04 (Surface Af) (E-Mod)	C	No	CaAa (Out Of Face)	75.500 - 60.500	0.000	0	I	2" Ice	0.602	0.000
								4" Ice	0.935	0.000
								No Ice	0.268	0.000
								1/2" Ice	0.352	0.000
								1" Ice	0.435	0.000
**								2" Ice	0.602	0.000
								4" Ice	0.935	0.000
								No Ice	0.167	0.000
								1/2" Ice	0.250	0.000
								1" Ice	0.333	0.000
Sabre MS-600 (6" x 1" Plate) (E-Mod)	B	No	CaAa (Out Of Face)	87.500 - 75.500	0.000	0	I	2" Ice	0.500	0.000
								4" Ice	0.833	0.000
								No Ice	0.167	0.000
								1/2" Ice	0.250	0.000
								1" Ice	0.333	0.000
Sabre MS-600 (6" x 1" Plate) (E-Mod)	C	No	CaAa (Out Of Face)	87.500 - 75.500	0.000	0	I	2" Ice	0.500	0.000
								4" Ice	0.833	0.000
								No Ice	0.167	0.000
								1/2" Ice	0.250	0.000
								1" Ice	0.333	0.000
**@**								2" Ice	0.500	0.000
								4" Ice	0.833	0.000
								No Ice	0.208	0.000
								1/2" Ice	0.292	0.000
								1" Ice	0.375	0.000
1 1/4" Flat Plate (P-Mod)	B	No	CaAa (Out Of Face)	102.500 - 87.500	0.000	0	I	2" Ice	0.542	0.000
								4" Ice	0.875	0.000
								No Ice	0.208	0.000
								1/2" Ice	0.292	0.000
								1" Ice	0.375	0.000
1 1/4" Flat Plate (P-Mod)	C	No	CaAa (Out Of Face)	102.500 - 87.500	0.000	0	I	2" Ice	0.542	0.000
								4" Ice	0.875	0.000
								No Ice	0.208	0.000
								1/2" Ice	0.292	0.000
								1" Ice	0.375	0.000
**@**										

### Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A <sub>R</sub> ft <sup>2</sup>	A <sub>F</sub> ft <sup>2</sup>	C <sub>AA</sub> In Face ft <sup>2</sup>	C <sub>AA</sub> Out Face ft <sup>2</sup>	Weight K
L1	125.000-101.250	A	0.000	0.000	0.000	4.750	0.255
		B	0.000	0.000	0.000	0.260	0.045
		C	0.000	0.000	0.000	7.401	0.228
L2	101.250-94.458	A	0.000	0.000	0.000	1.358	0.073
		B	0.000	0.000	0.000	1.415	0.084
		C	0.000	0.000	0.000	3.028	0.083
L3	94.458-89.000	A	0.000	0.000	0.000	1.092	0.059
		B	0.000	0.000	0.000	1.137	0.093
		C	0.000	0.000	0.000	2.433	0.066
L4	89.000-85.040	A	0.000	0.000	0.000	0.792	0.043
		B	0.000	0.000	0.000	0.723	0.068
		C	0.000	0.000	0.000	1.663	0.048
L5	85.040-73.583	A	0.000	0.000	0.000	2.291	0.123
		B	0.000	0.000	0.000	2.104	0.196
		C	0.000	0.000	0.000	4.825	0.140
L6	73.583-73.000	A	0.000	0.000	0.000	0.117	0.006
		B	0.000	0.000	0.000	0.156	0.010
		C	0.000	0.000	0.000	0.295	0.007
L7	73.000-63.000	A	0.000	0.000	0.000	2.000	0.107
		B	0.000	0.000	0.000	2.683	0.171
		C	0.000	0.000	0.000	5.058	0.122
L8	63.000-57.333	A	0.000	0.000	0.000	1.133	0.061

<b>tnxTower</b>  <b>B+T Group</b> 1717 S. Boulder, Suite 300 Tulsa, OK 74119 Phone: (918) 587-4630 FAX: (918) 587-4630	<b>Job</b> 84470.013.01 - Cromwell/First Line Emergenc, CT (BU# 876364)	<b>Page</b> 6 of 18
	<b>Project</b>	<b>Date</b> 16:34:31 05/11/15
	<b>Client</b> Crown Castle	<b>Designed by</b> APatil

Tower Section	Tower Elevation ft	Face	$A_R$ ft <sup>2</sup>	$A_F$ ft <sup>2</sup>	$C_{AA}$ In Face ft <sup>2</sup>	$C_{AA}$ Out Face ft <sup>2</sup>	Weight K
L9	57.333-40.457	B	0.000	0.000	0.000	2.046	0.097
		C	0.000	0.000	0.000	3.392	0.069
		A	0.000	0.000	0.000	3.375	0.181
L10	40.457-37.833	B	0.000	0.000	0.000	7.330	0.289
		C	0.000	0.000	0.000	11.338	0.206
		A	0.000	0.000	0.000	0.525	0.028
L11	37.833-12.250	B	0.000	0.000	0.000	1.140	0.045
		C	0.000	0.000	0.000	1.763	0.032
		A	0.000	0.000	0.000	5.117	0.275
L12	12.250-0.000	B	0.000	0.000	0.000	11.112	0.438
		C	0.000	0.000	0.000	17.188	0.312
		A	0.000	0.000	0.000	2.450	0.132
		B	0.000	0.000	0.000	5.321	0.210
		C	0.000	0.000	0.000	8.230	0.149

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

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	$A_R$ ft <sup>2</sup>	$A_F$ ft <sup>2</sup>	$C_{AA}$ In Face ft <sup>2</sup>	$C_{AA}$ Out Face ft <sup>2</sup>	Weight K
L1	125.000-101.250	A	0.869	0.000	0.000	0.000	8.878	0.728
		B		0.000	0.000	0.000	0.441	0.056
		C		0.000	0.000	0.000	15.452	0.641
L2	101.250-94.458	A	0.854	0.000	0.000	0.000	2.519	0.205
		B		0.000	0.000	0.000	2.382	0.105
		C		0.000	0.000	0.000	6.317	0.248
L3	94.458-89.000	A	0.848	0.000	0.000	0.000	2.017	0.164
		B		0.000	0.000	0.000	1.908	0.110
		C		0.000	0.000	0.000	5.056	0.198
L4	89.000-85.040	A	0.843	0.000	0.000	0.000	1.459	0.118
		B		0.000	0.000	0.000	1.279	0.080
		C		0.000	0.000	0.000	3.554	0.143
L5	85.040-73.583	A	0.833	0.000	0.000	0.000	4.222	0.342
		B		0.000	0.000	0.000	3.713	0.230
		C		0.000	0.000	0.000	10.295	0.413
L6	73.583-73.000	A	0.825	0.000	0.000	0.000	0.213	0.017
		B		0.000	0.000	0.000	0.237	0.012
		C		0.000	0.000	0.000	0.568	0.021
L7	73.000-63.000	A	0.818	0.000	0.000	0.000	3.636	0.291
		B		0.000	0.000	0.000	4.046	0.200
		C		0.000	0.000	0.000	9.693	0.352
L8	63.000-57.333	A	0.806	0.000	0.000	0.000	2.047	0.163
		B		0.000	0.000	0.000	2.808	0.113
		C		0.000	0.000	0.000	5.981	0.197
L9	57.333-40.457	A	0.786	0.000	0.000	0.000	6.028	0.474
		B		0.000	0.000	0.000	9.540	0.335
		C		0.000	0.000	0.000	18.854	0.574
L10	40.457-37.833	A	0.766	0.000	0.000	0.000	0.937	0.074
		B		0.000	0.000	0.000	1.483	0.052
		C		0.000	0.000	0.000	2.932	0.089
L11	37.833-12.250	A	0.750	0.000	0.000	0.000	8.954	0.690
		B		0.000	0.000	0.000	14.309	0.504
		C		0.000	0.000	0.000	28.060	0.838
L12	12.250-0.000	A	0.750	0.000	0.000	0.000	4.287	0.331
		B		0.000	0.000	0.000	6.852	0.241
		C		0.000	0.000	0.000	13.436	0.401

<b>tnxTower</b>  <b>B+T Group</b> 1717 S. Boulder, Suite 300 Tulsa, OK 74119 Phone: (918) 587-4630 FAX: (918) 587-4630	<b>Job</b> 84470.013.01 - Cromwell/First Line Emergenc, CT (BU# 876364)	<b>Page</b> 7 of 18
	<b>Project</b>	<b>Date</b> 16:34:31 05/11/15
	<b>Client</b> Crown Castle	<b>Designed by</b> APatil

### Feed Line Center of Pressure

Section	Elevation <i>ft</i>	CP <sub>x</sub>	CP <sub>z</sub>	CP <sub>x</sub>	CP <sub>z</sub>
		<i>in</i>	<i>in</i>	Ice <i>in</i>	Ice <i>in</i>
L1	125.000-101.250	-0.294	-0.047	-0.485	-0.036
L2	101.250-94.458	-0.217	0.134	-0.399	0.214
L3	94.458-89.000	-0.220	0.136	-0.408	0.219
L4	89.000-85.040	-0.227	0.111	-0.420	0.204
L5	85.040-73.583	-0.229	0.115	-0.428	0.209
L6	73.583-73.000	-0.220	0.200	-0.416	0.275
L7	73.000-63.000	-0.223	0.203	-0.421	0.279
L8	63.000-57.333	-0.215	0.293	-0.411	0.352
L9	57.333-40.457	-0.212	0.364	-0.408	0.413
L10	40.457-37.833	-0.215	0.369	-0.416	0.421
L11	37.833-12.250	-0.220	0.378	-0.421	0.433
L12	12.250-0.000	-0.226	0.388	-0.438	0.449

### Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment °	Placement <i>ft</i>	C <sub>AA</sub> Front <i>ft</i> <sup>2</sup>	C <sub>SA</sub> Side <i>ft</i> <sup>2</sup>	Weight <i>K</i>	
			Horz Lateral <i>ft</i>	Vert <i>ft</i>						
APXVTM14-C-120 w/ Mount Pipe (R)	A	From Leg	4.000	0.000	0.000	125.000	No Ice	7.134	4.959	0.077
							1/2" Ice	7.662	5.754	0.132
							1" Ice	8.183	6.472	0.193
							2" Ice	9.256	8.010	0.339
							4" Ice	11.526	11.412	0.753
APXVTM14-C-120 w/ Mount Pipe (R)	B	From Leg	4.000	0.000	0.000	125.000	No Ice	7.134	4.959	0.077
							1/2" Ice	7.662	5.754	0.132
							1" Ice	8.183	6.472	0.193
							2" Ice	9.256	8.010	0.339
							4" Ice	11.526	11.412	0.753
APXVTM14-C-120 w/ Mount Pipe (R)	C	From Leg	4.000	0.000	0.000	125.000	No Ice	7.134	4.959	0.077
							1/2" Ice	7.662	5.754	0.132
							1" Ice	8.183	6.472	0.193
							2" Ice	9.256	8.010	0.339
							4" Ice	11.526	11.412	0.753
TD-RRH8x20-25 (R)	A	From Leg	4.000	0.000	0.000	125.000	No Ice	4.720	1.703	0.070
							1/2" Ice	5.014	1.920	0.097
							1" Ice	5.316	2.145	0.128
							2" Ice	5.948	2.622	0.201
							4" Ice	7.314	3.680	0.397
TD-RRH8x20-25 (R)	B	From Leg	4.000	0.000	0.000	125.000	No Ice	4.720	1.703	0.070
							1/2" Ice	5.014	1.920	0.097
							1" Ice	5.316	2.145	0.128
							2" Ice	5.948	2.622	0.201
							4" Ice	7.314	3.680	0.397
TD-RRH8x20-25 (R)	C	From Leg	4.000	0.000	0.000	125.000	No Ice	4.720	1.703	0.070
							1/2" Ice	5.014	1.920	0.097
							1" Ice	5.316	2.145	0.128
							2" Ice	5.948	2.622	0.201
							4" Ice	7.314	3.680	0.397
LLPX310R-V1 w/ Mount Pipe (E)	A	From Leg	4.000	0.000	0.000	125.000	No Ice	5.553	3.682	0.063
							1/2" Ice	6.058	4.314	0.108
							1" Ice	6.574	4.961	0.159
							2" Ice			



<b>Job</b>	84470.013.01 - Cromwell/First Line Emergenc, CT (BU# 876364)	<b>Page</b>	8 of 18
<b>Project</b>		<b>Date</b>	16:34:31 05/11/15
<b>Client</b>	Crown Castle	<b>Designed by</b>	APatil

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment	Placement ft	C <sub>AA</sub> Front ft <sup>2</sup>	C <sub>AA</sub> Side ft <sup>2</sup>	Weight K	
LLPX310R-V1 w/ Mount Pipe (E)	B	From Leg	4.000 0.000 4.000	0.000	125.000	2" Ice	7.645	6.364	0.279
						4" Ice	9.936	9.433	0.630
						No Ice	5.553	3.682	0.063
						1/2" Ice	6.058	4.314	0.108
						1" Ice	6.574	4.961	0.159
LLPX310R-V1 w/ Mount Pipe (E)	C	From Leg	4.000 0.000 4.000	0.000	125.000	2" Ice	7.645	6.364	0.279
						4" Ice	9.936	9.433	0.630
						No Ice	5.553	3.682	0.063
						1/2" Ice	6.058	4.314	0.108
						1" Ice	6.574	4.961	0.159
APXVSPP18-C-A20 w/ Mount Pipe (E)	A	From Leg	4.000 0.000 2.000	0.000	125.000	2" Ice	7.645	6.364	0.279
						4" Ice	9.936	9.433	0.630
						No Ice	8.498	6.946	0.083
						1/2" Ice	9.149	8.127	0.151
						1" Ice	9.767	9.021	0.227
APXVSPP18-C-A20 w/ Mount Pipe (E)	B	From Leg	4.000 0.000 2.000	0.000	125.000	2" Ice	11.031	10.844	0.406
						4" Ice	13.679	14.851	0.909
						No Ice	8.498	6.946	0.083
						1/2" Ice	9.149	8.127	0.151
						1" Ice	9.767	9.021	0.227
APXVSPP18-C-A20 w/ Mount Pipe (E)	C	From Leg	4.000 0.000 2.000	0.000	125.000	2" Ice	11.031	10.844	0.406
						4" Ice	13.679	14.851	0.909
						No Ice	8.498	6.946	0.083
						1/2" Ice	9.149	8.127	0.151
						1" Ice	9.767	9.021	0.227
WIMAX DAP HEAD (E)	A	From Leg	4.000 0.000 0.000	0.000	125.000	2" Ice	11.031	10.844	0.406
						4" Ice	13.679	14.851	0.909
						No Ice	1.804	0.778	0.033
						1/2" Ice	1.988	0.918	0.045
						1" Ice	2.180	1.067	0.058
WIMAX DAP HEAD (E)	B	From Leg	4.000 0.000 0.000	0.000	125.000	2" Ice	2.589	1.391	0.094
						4" Ice	3.512	2.143	0.201
						No Ice	1.804	0.778	0.033
						1/2" Ice	1.988	0.918	0.045
						1" Ice	2.180	1.067	0.058
WIMAX DAP HEAD (E)	C	From Leg	4.000 0.000 0.000	0.000	125.000	2" Ice	2.589	1.391	0.094
						4" Ice	3.512	2.143	0.201
						No Ice	1.804	0.778	0.033
						1/2" Ice	1.988	0.918	0.045
						1" Ice	2.180	1.067	0.058
HORIZON COMPACT (E)	B	From Leg	4.000 0.000 0.000	0.000	125.000	2" Ice	2.589	1.391	0.094
						4" Ice	3.512	2.143	0.201
						No Ice	0.841	0.429	0.012
						1/2" Ice	0.966	0.525	0.018
						1" Ice	1.099	0.629	0.026
HORIZON COMPACT (E)	C	From Leg	4.000 0.000 0.000	0.000	125.000	2" Ice	1.392	0.863	0.048
						4" Ice	2.082	1.435	0.122
						No Ice	0.841	0.429	0.012
						1/2" Ice	0.966	0.525	0.018
						1" Ice	1.099	0.629	0.026
(2) 6' x 2" Mount Pipe (E)	A	From Leg	4.000 0.000 0.000	0.000	125.000	2" Ice	1.392	0.863	0.048
						4" Ice	2.082	1.435	0.122
						No Ice	1.425	1.425	0.022
						1/2" Ice	1.925	1.925	0.033
						1" Ice	2.294	2.294	0.048
						2" Ice	3.060	3.060	0.090
						4" Ice	4.702	4.702	0.231

<b>tnxTower</b>  <b>B+T Group</b> 1717 S. Boulder, Suite 300 Tulsa, OK 74119 Phone: (918) 587-4630 FAX: (918) 587-4630	<b>Job</b> 84470.013.01 - Cromwell/First Line Emergenc, CT (BU# 876364)	<b>Page</b> 9 of 18
	<b>Project</b>	<b>Date</b> 16:34:31 05/11/15
	<b>Client</b> Crown Castle	<b>Designed by</b> APatil

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft ft ft	Azimuth Adjustment °	Placement ft		C <sub>AA</sub> Front ft <sup>2</sup>	C <sub>AA</sub> Side ft <sup>2</sup>	Weight K
(2) 6' x 2" Mount Pipe (E)	B	From Leg	4.000 0.000 0.000	0.000	125.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.425 1.925 2.294 3.060 4.702	1.425 1.925 2.294 3.060 4.702	0.022 0.033 0.048 0.090 0.231
(2) 6' x 2" Mount Pipe (E)	C	From Leg	4.000 0.000 0.000	0.000	125.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.425 1.925 2.294 3.060 4.702	1.425 1.925 2.294 3.060 4.702	0.022 0.033 0.048 0.090 0.231
Platform Mount [LP 714-1] (E)	C	None		0.000	125.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	37.470 44.230 50.990 64.510 91.550	37.470 44.230 50.990 64.510 91.550	1.600 2.040 2.480 3.360 5.119
*****									
PCS 1900MHz 4x45W-65MHz w / Mount Pipe (E)	A	From Leg	1.000 0.000 0.000	0.000	123.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.905 3.206 3.519 4.187 5.703	3.218 3.647 4.094 5.064 7.343	0.071 0.101 0.138 0.225 0.480
PCS 1900MHz 4x45W-65MHz w / Mount Pipe (E)	B	From Leg	1.000 0.000 0.000	0.000	123.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.905 3.206 3.519 4.187 5.703	3.218 3.647 4.094 5.064 7.343	0.071 0.101 0.138 0.225 0.480
PCS 1900MHz 4x45W-65MHz w / Mount Pipe (E)	C	From Leg	1.000 0.000 0.000	0.000	123.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.905 3.206 3.519 4.187 5.703	3.218 3.647 4.094 5.064 7.343	0.071 0.101 0.138 0.225 0.480
800MHZ 2X50W RRH W/FILTER w / Mount Pipe (E)	A	From Leg	1.000 0.000 0.000	0.000	123.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.586 2.861 3.149 3.780 5.207	2.731 3.102 3.490 4.371 6.396	0.073 0.101 0.135 0.216 0.453
800MHZ 2X50W RRH W/FILTER w / Mount Pipe (E)	B	From Leg	1.000 0.000 0.000	0.000	123.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.586 2.861 3.149 3.780 5.207	2.731 3.102 3.490 4.371 6.396	0.073 0.101 0.135 0.216 0.453
800MHZ 2X50W RRH W/FILTER w / Mount Pipe (E)	C	From Leg	1.000 0.000 0.000	0.000	123.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.586 2.861 3.149 3.780 5.207	2.731 3.102 3.490 4.371 6.396	0.073 0.101 0.135 0.216 0.453
Side Arm Mount [SO 102-3] (E)	C	None		0.000	123.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.000 3.480 3.960 4.920 6.840	3.000 3.480 3.960 4.920 6.840	0.081 0.111 0.141 0.201 0.321
*****									
(3) AM-X-CD-16-65-00T-RET w/ Mount Pipe (E)	A	From Leg	4.000 0.000 2.000	0.000	115.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.498 9.149 9.767 11.031 13.679	6.304 7.479 8.368 10.179 14.024	0.074 0.139 0.212 0.385 0.874

<b>tnxTower</b>  <b>B+T Group</b> 1717 S. Boulder, Suite 300 Tulsa, OK 74119 Phone: (918) 587-4630 FAX: (918) 587-4630	<b>Job</b> 84470.013.01 - Cromwell/First Line Emergenc, CT (BU# 876364)	<b>Page</b> 10 of 18
	<b>Project</b>	<b>Date</b> 16:34:31 05/11/15
	<b>Client</b> Crown Castle	<b>Designed by</b> APatil

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C <sub>AA</sub> Front	C <sub>AA</sub> Side	Weight
			Horz Lateral	Vert					
			ft	ft	°	ft	ft <sup>2</sup>	ft <sup>2</sup>	K
(3) AM-X-CD-16-65-00T-RET w/ Mount Pipe (E)	B	From Leg	4.000 0.000 2.000		0.000	115.000	No Ice 8.498 1/2" Ice 9.149 1" Ice 9.767 2" Ice 11.031 4" Ice 13.679	6.304 7.479 8.368 10.179 14.024	0.074 0.139 0.212 0.385 0.874
(3) AM-X-CD-16-65-00T-RET w/ Mount Pipe (E)	C	From Leg	4.000 0.000 2.000		0.000	115.000	No Ice 8.498 1/2" Ice 9.149 1" Ice 9.767 2" Ice 11.031 4" Ice 13.679	6.304 7.479 8.368 10.179 14.024	0.074 0.139 0.212 0.385 0.874
(2) DTMABP7819VG12A (E)	A	From Leg	4.000 0.000 2.000		0.000	115.000	No Ice 1.139 1/2" Ice 1.284 1" Ice 1.437 2" Ice 1.769 4" Ice 2.538	0.391 0.488 0.595 0.833 1.414	0.019 0.026 0.036 0.060 0.140
(2) DTMABP7819VG12A (E)	B	From Leg	4.000 0.000 2.000		0.000	115.000	No Ice 1.139 1/2" Ice 1.284 1" Ice 1.437 2" Ice 1.769 4" Ice 2.538	0.391 0.488 0.595 0.833 1.414	0.019 0.026 0.036 0.060 0.140
(2) DTMABP7819VG12A (E)	C	From Leg	4.000 0.000 2.000		0.000	115.000	No Ice 1.139 1/2" Ice 1.284 1" Ice 1.437 2" Ice 1.769 4" Ice 2.538	0.391 0.488 0.595 0.833 1.414	0.019 0.026 0.036 0.060 0.140
RRUS-11 (E)	A	From Leg	4.000 0.000 2.000		0.000	115.000	No Ice 3.249 1/2" Ice 3.491 1" Ice 3.741 2" Ice 4.268 4" Ice 5.426	1.373 1.551 1.738 2.138 3.042	0.048 0.068 0.092 0.150 0.310
RRUS-11 (E)	B	From Leg	4.000 0.000 2.000		0.000	115.000	No Ice 3.249 1/2" Ice 3.491 1" Ice 3.741 2" Ice 4.268 4" Ice 5.426	1.373 1.551 1.738 2.138 3.042	0.048 0.068 0.092 0.150 0.310
RRUS-11 (E)	C	From Leg	4.000 0.000 2.000		0.000	115.000	No Ice 3.249 1/2" Ice 3.491 1" Ice 3.741 2" Ice 4.268 4" Ice 5.426	1.373 1.551 1.738 2.138 3.042	0.048 0.068 0.092 0.150 0.310
DC6-48-60-18-8F (E)	A	From Leg	4.000 0.000 2.000		0.000	115.000	No Ice 1.467 1/2" Ice 1.667 1" Ice 1.878 2" Ice 2.333 4" Ice 3.378	1.467 1.667 1.878 2.333 3.378	0.019 0.037 0.057 0.105 0.239
6' x 2" Mount Pipe (E-For Surge)	A	From Leg	4.000 0.000 0.000		0.000	115.000	No Ice 1.425 1/2" Ice 1.925 1" Ice 2.294 2" Ice 3.060 4" Ice 4.702	1.425 1.925 2.294 3.060 4.702	0.022 0.033 0.048 0.090 0.231
Platform Mount [LP 304-1] (E)	C	None			0.000	115.000	No Ice 17.460 1/2" Ice 22.440 1" Ice 27.420 2" Ice 37.380 4" Ice 57.300	17.460 22.440 27.420 37.380 57.300	1.349 1.625 1.900 2.451 3.554
***** LNX-6514DS-A1M w/	A	From Leg	4.000		0.000	105.000	No Ice 8.648	7.082	0.065

<b>Job</b> 84470.013.01 - Cromwell/First Line Emergenc, CT (BU# 876364)	<b>Page</b> 11 of 18
<b>Project</b>	<b>Date</b> 16:34:31 05/11/15
<b>Client</b> Crown Castle	<b>Designed by</b> APatil

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement ft	C <sub>AA</sub> Front ft <sup>2</sup>	C <sub>AA</sub> Side ft <sup>2</sup>	Weight K
			Horz Lateral ft	Vert ft					
Mount Pipe (E)			0.000	0.000		1/2" Ice	9.305	8.273	0.134
						1" Ice	9.930	9.185	0.211
						2" Ice	11.204	11.023	0.393
						4" Ice	13.872	15.063	0.902
LNX-6514DS-A1M w/ Mount Pipe (E)	B	From Leg	4.000	0.000	105.000	No Ice	8.648	7.082	0.065
			0.000	0.000		1/2" Ice	9.305	8.273	0.134
			0.000	0.000		1" Ice	9.930	9.185	0.211
						2" Ice	11.204	11.023	0.393
						4" Ice	13.872	15.063	0.902
LNX-6514DS-A1M w/ Mount Pipe (E)	C	From Leg	4.000	0.000	105.000	No Ice	8.648	7.082	0.065
			0.000	0.000		1/2" Ice	9.305	8.273	0.134
			0.000	0.000		1" Ice	9.930	9.185	0.211
						2" Ice	11.204	11.023	0.393
						4" Ice	13.872	15.063	0.902
(2) HBXX-6517DS-A2M w/ Mount Pipe (E)	A	From Leg	4.000	0.000	105.000	No Ice	8.976	6.963	0.067
			0.000	0.000		1/2" Ice	9.647	8.182	0.137
			0.000	0.000		1" Ice	10.291	9.144	0.215
						2" Ice	11.595	11.022	0.398
						4" Ice	14.321	15.027	0.914
(2) HBXX-6517DS-A2M w/ Mount Pipe (E)	B	From Leg	4.000	0.000	105.000	No Ice	8.976	6.963	0.067
			0.000	0.000		1/2" Ice	9.647	8.182	0.137
			0.000	0.000		1" Ice	10.291	9.144	0.215
						2" Ice	11.595	11.022	0.398
						4" Ice	14.321	15.027	0.914
(2) HBXX-6517DS-A2M w/ Mount Pipe (E)	C	From Leg	4.000	0.000	105.000	No Ice	8.976	6.963	0.067
			0.000	0.000		1/2" Ice	9.647	8.182	0.137
			0.000	0.000		1" Ice	10.291	9.144	0.215
						2" Ice	11.595	11.022	0.398
						4" Ice	14.321	15.027	0.914
RRH2X60-AWS (E)	A	From Leg	4.000	0.000	105.000	No Ice	2.190	1.429	0.044
			0.000	0.000		1/2" Ice	2.398	1.611	0.060
			0.000	0.000		1" Ice	2.613	1.801	0.079
						2" Ice	3.071	2.209	0.125
						4" Ice	4.090	3.126	0.259
RRH2X60-AWS (E)	B	From Leg	4.000	0.000	105.000	No Ice	2.190	1.429	0.044
			0.000	0.000		1/2" Ice	2.398	1.611	0.060
			0.000	0.000		1" Ice	2.613	1.801	0.079
						2" Ice	3.071	2.209	0.125
						4" Ice	4.090	3.126	0.259
RRH2X60-AWS (E)	C	From Leg	4.000	0.000	105.000	No Ice	2.190	1.429	0.044
			0.000	0.000		1/2" Ice	2.398	1.611	0.060
			0.000	0.000		1" Ice	2.613	1.801	0.079
						2" Ice	3.071	2.209	0.125
						4" Ice	4.090	3.126	0.259
RRH2X60-PCS (E)	A	From Leg	4.000	0.000	105.000	No Ice	2.567	2.011	0.055
			0.000	0.000		1/2" Ice	2.791	2.218	0.075
			0.000	0.000		1" Ice	3.025	2.435	0.099
						2" Ice	3.517	2.894	0.155
						4" Ice	4.606	3.915	0.313
RRH2X60-PCS (E)	B	From Leg	4.000	0.000	105.000	No Ice	2.567	2.011	0.055
			0.000	0.000		1/2" Ice	2.791	2.218	0.075
			0.000	0.000		1" Ice	3.025	2.435	0.099
						2" Ice	3.517	2.894	0.155
						4" Ice	4.606	3.915	0.313
RRH2X60-PCS (E)	C	From Leg	4.000	0.000	105.000	No Ice	2.567	2.011	0.055
			0.000	0.000		1/2" Ice	2.791	2.218	0.075
			0.000	0.000		1" Ice	3.025	2.435	0.099

<b>Job</b> 84470.013.01 - Cromwell/First Line Emergenc, CT (BU# 876364)	<b>Page</b> 12 of 18
<b>Project</b>	<b>Date</b> 16:34:31 05/11/15
<b>Client</b> Crown Castle	<b>Designed by</b> APatil

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C <sub>AA</sub>		Weight	
			Horz	Vert			Front	Side		
			ft	ft	°	ft	ft <sup>2</sup>	ft <sup>2</sup>	K	
DB-T1-6Z-8AB-0Z (E)	A	From Leg	4.000	0.000	0.000	105.000	2" Ice	3.517	2.894	0.155
							4" Ice	4.606	3.915	0.313
							No Ice	5.600	2.333	0.044
							1/2" Ice	5.915	2.558	0.080
							1" Ice	6.240	2.791	0.120
LNX-6514DS-A1M w/ Mount Pipe (P)	A	From Leg	4.000	0.000	0.000	105.000	2" Ice	6.914	3.284	0.213
							4" Ice	8.365	4.373	0.455
							No Ice	8.648	7.082	0.065
							1/2" Ice	9.305	8.273	0.134
							1" Ice	9.930	9.185	0.211
LNX-6514DS-A1M w/ Mount Pipe (P)	B	From Leg	4.000	0.000	0.000	105.000	2" Ice	11.204	11.023	0.393
							4" Ice	13.872	15.063	0.902
							No Ice	8.648	7.082	0.065
							1/2" Ice	9.305	8.273	0.134
							1" Ice	9.930	9.185	0.211
LNX-6514DS-A1M w/ Mount Pipe (P)	C	From Leg	4.000	0.000	0.000	105.000	2" Ice	11.204	11.023	0.393
							4" Ice	13.872	15.063	0.902
							No Ice	8.648	7.082	0.065
							1/2" Ice	9.305	8.273	0.134
							1" Ice	9.930	9.185	0.211
RRH2x60-700 (P)	A	From Leg	4.000	0.000	0.000	105.000	2" Ice	11.204	11.023	0.393
							4" Ice	13.872	15.063	0.902
							No Ice	3.957	1.816	0.060
							1/2" Ice	4.272	2.075	0.083
							1" Ice	4.596	2.360	0.109
RRH2x60-700 (P)	B	From Leg	4.000	0.000	0.000	105.000	2" Ice	5.271	2.957	0.173
							4" Ice	6.722	4.253	0.354
							No Ice	3.957	1.816	0.060
							1/2" Ice	4.272	2.075	0.083
							1" Ice	4.596	2.360	0.109
RRH2x60-700 (P)	C	From Leg	4.000	0.000	0.000	105.000	2" Ice	5.271	2.957	0.173
							4" Ice	6.722	4.253	0.354
							No Ice	3.957	1.816	0.060
							1/2" Ice	4.272	2.075	0.083
							1" Ice	4.596	2.360	0.109
DB-T1-6Z-8AB-0Z (P)	A	From Leg	4.000	0.000	0.000	105.000	2" Ice	5.271	2.957	0.173
							4" Ice	6.722	4.253	0.354
							No Ice	5.600	2.333	0.044
							1/2" Ice	5.915	2.558	0.080
							1" Ice	6.240	2.791	0.120
Platform Mount [LP 1201-1] (E)	C	None			0.000	105.000	2" Ice	6.914	3.284	0.213
							4" Ice	8.365	4.373	0.455
							No Ice	23.100	23.100	2.100
							1/2" Ice	26.800	26.800	2.500
							1" Ice	30.500	30.500	2.900
***** ERICSSON AIR 21 B2A B4P w/ Mount Pipe (E)	A	From Leg	4.000	0.000	3.000	82.000	2" Ice	37.900	37.900	3.700
							4" Ice	52.700	52.700	5.300
							No Ice	6.825	5.642	0.112
							1/2" Ice	7.347	6.480	0.169
							1" Ice	7.863	7.257	0.233
ERICSSON AIR 21 B4A B2P w/ Mount Pipe (E)	A	From Leg	4.000	0.000	3.000	82.000	2" Ice	8.926	8.864	0.383
							4" Ice	11.175	12.293	0.807
							No Ice	6.825	5.642	0.112
							1/2" Ice	7.347	6.480	0.169
							1" Ice	7.863	7.257	0.233
							2" Ice	8.926	8.864	0.383

<b>tnxTower</b>  <b>B+T Group</b> 1717 S. Boulder, Suite 300 Tulsa, OK 74119 Phone: (918) 587-4630 FAX: (918) 587-4630	<b>Job</b> 84470.013.01 - Cromwell/First Line Emergenc, CT (BU# 876364)	<b>Page</b> 13 of 18
	<b>Project</b>	<b>Date</b> 16:34:31 05/11/15
	<b>Client</b> Crown Castle	<b>Designed by</b> APatil

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert	Azimuth Adjustment	Placement	C <sub>AA</sub> Front	C <sub>AA</sub> Side	Weight
			ft ft ft	°	ft	ft <sup>2</sup>	ft <sup>2</sup>	K
(2) ERICSSON AIR 21 B2A B4P w/ Mount Pipe (E)	B	From Leg	4.000 0.000 3.000	0.000	82.000	4" Ice 11.175 No Ice 6.825 1/2" Ice 7.347 1" Ice 7.863 2" Ice 8.926 4" Ice 11.175	12.293 5.642 6.480 7.257 8.864 12.293	0.807 0.112 0.169 0.233 0.383 0.807
(2) ERICSSON AIR 21 B4A B2P w/ Mount Pipe (E)	C	From Leg	4.000 0.000 3.000	0.000	82.000	No Ice 6.825 1/2" Ice 7.347 1" Ice 7.863 2" Ice 8.926 4" Ice 11.175	5.642 6.480 7.257 8.864 12.293	0.112 0.169 0.233 0.383 0.807
6' x 2" Mount Pipe (E)	A	From Leg	4.000 0.000 0.000	0.000	82.000	No Ice 1.425 1/2" Ice 1.925 1" Ice 2.294 2" Ice 3.060 4" Ice 4.702	1.425 1.925 2.294 3.060 4.702	0.022 0.033 0.048 0.090 0.231
6' x 2" Mount Pipe (E)	B	From Leg	4.000 0.000 0.000	0.000	82.000	No Ice 1.425 1/2" Ice 1.925 1" Ice 2.294 2" Ice 3.060 4" Ice 4.702	1.425 1.925 2.294 3.060 4.702	0.022 0.033 0.048 0.090 0.231
6' x 2" Mount Pipe (E)	C	From Leg	4.000 0.000 0.000	0.000	82.000	No Ice 1.425 1/2" Ice 1.925 1" Ice 2.294 2" Ice 3.060 4" Ice 4.702	1.425 1.925 2.294 3.060 4.702	0.022 0.033 0.048 0.090 0.231
T-Arm Mount [TA 601-3] (E)	C	None		0.000	82.000	No Ice 10.900 1/2" Ice 14.650 1" Ice 18.400 2" Ice 25.900 4" Ice 40.900	10.900 14.650 18.400 25.900 40.900	0.726 0.926 1.125 1.524 2.322
*****								

## Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert	Azimuth Adjustment	3 dB Beam Width	Elevation	Outside Diameter	Aperture Area	Weight
				ft ft ft	°	°	ft	ft	ft <sup>2</sup>	K
VHLP2-18 (E)	B	Paraboloid w/Shroud (HP)	From Leg	4.000 0.000 -1.000	62.000		125.000	2.175	No Ice 3.720 1/2" Ice 4.010 1" Ice 4.300 2" Ice 4.880 4" Ice 6.040	0.031 0.050 0.070 0.110 0.200
VHLP2-11 (E)	C	Paraboloid w/Shroud (HP)	From Leg	4.000 0.000 -1.000	90.000		125.000	2.175	No Ice 3.720 1/2" Ice 4.010 1" Ice 4.300 2" Ice 4.880 4" Ice 6.040	0.027 0.050 0.070 0.110 0.190
*****										

<b>tnxTower</b>  <b>B+T Group</b> 1717 S. Boulder, Suite 300 Tulsa, OK 74119 Phone: (918) 587-4630 FAX: (918) 587-4630	<b>Job</b> 84470.013.01 - Cromwell/First Line Emergenc, CT (BU# 876364)	<b>Page</b> 14 of 18
	<b>Project</b>	<b>Date</b> 16:34:31 05/11/15
	<b>Client</b> Crown Castle	<b>Designed by</b> APatil

## Load Combinations

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

## Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	125 - 101.25	31.125	27	2.266	0.003
L2	101.25 - 94.458	20.485	27	1.902	0.002
L3	94.458 - 89	17.852	27	1.796	0.002
L4	89 - 85.04	15.840	27	1.723	0.001
L5	88.957 - 73.583	15.825	27	1.723	0.001
L6	73.583 - 73	10.637	27	1.468	0.001
L7	73 - 63	10.458	27	1.458	0.001
L8	63 - 57.333	7.676	27	1.197	0.001
L9	57.333 - 40.457	6.315	27	1.097	0.001
L10	45.54 - 37.833	3.935	27	0.831	0.000
L11	37.833 - 12.25	2.667	27	0.722	0.000
L12	12.25 - 0	0.242	27	0.190	0.000

**Job**

84470.013.01 - Cromwell/First Line Emergenc, CT (BU# 876364)

**Page**

15 of 18

**Project****Date**

16:34:31 05/11/15

**Client**

Crown Castle

**Designed by**

APatil

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

<i>Elevation</i>	<i>Appurtenance</i>	<i>Gov. Load Comb.</i>	<i>Deflection</i>	<i>Tilt</i>	<i>Twist</i>	<i>Radius of Curvature</i>
<i>ft</i>			<i>in</i>	<i>°</i>	<i>°</i>	<i>ft</i>
125.000	APXVTM14-C-120 w/ Mount Pipe	27	31.125	2.266	0.003	10084
124.000	VHLP2-18	27	30.655	2.251	0.003	10084
123.000	PCS 1900MHz 4x45W-65MHz w / Mount Pipe	27	30.184	2.237	0.003	10084
115.000	(3) AM-X-CD-16-65-00T-RET w/ Mount Pipe	27	26.460	2.119	0.002	5042
105.000	LNx-6514DS-A1M w/ Mount Pipe	27	22.034	1.964	0.002	2525
82.000	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	27	13.378	1.602	0.001	3615

**Maximum Tower Deflections - Design Wind**

<i>Section No.</i>	<i>Elevation</i>	<i>Horz. Deflection</i>	<i>Gov. Load Comb.</i>	<i>Tilt</i>	<i>Twist</i>
	<i>ft</i>	<i>in</i>		<i>°</i>	<i>°</i>
L1	125 - 101.25	89.526	2	6.520	0.008
L2	101.25 - 94.458	58.961	2	5.476	0.006
L3	94.458 - 89	51.392	2	5.170	0.005
L4	89 - 85.04	45.607	2	4.962	0.004
L5	88.957 - 73.583	45.562	2	4.959	0.004
L6	73.583 - 73	30.638	2	4.226	0.003
L7	73 - 63	30.124	2	4.200	0.003
L8	63 - 57.333	22.116	2	3.449	0.002
L9	57.333 - 40.457	18.195	2	3.161	0.002
L10	45.54 - 37.833	11.339	2	2.394	0.001
L11	37.833 - 12.25	7.688	2	2.081	0.001
L12	12.25 - 0	0.698	2	0.549	0.000

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

<i>Elevation</i>	<i>Appurtenance</i>	<i>Gov. Load Comb.</i>	<i>Deflection</i>	<i>Tilt</i>	<i>Twist</i>	<i>Radius of Curvature</i>
<i>ft</i>			<i>in</i>	<i>°</i>	<i>°</i>	<i>ft</i>
125.000	APXVTM14-C-120 w/ Mount Pipe	2	89.526	6.520	0.008	3587
124.000	VHLP2-18	2	88.175	6.478	0.008	3587
123.000	PCS 1900MHz 4x45W-65MHz w / Mount Pipe	2	86.824	6.436	0.008	3587
115.000	(3) AM-X-CD-16-65-00T-RET w/ Mount Pipe	2	76.129	6.098	0.007	1792
105.000	LNx-6514DS-A1M w/ Mount Pipe	2	63.414	5.653	0.006	895
82.000	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	2	38.523	4.614	0.003	1272



<b>Job</b> 84470.013.01 - Cromwell/First Line Emergenc, CT (BU# 876364)	<b>Page</b> 16 of 18
<b>Project</b>	<b>Date</b> 16:34:31 05/11/15
<b>Client</b> Crown Castle	<b>Designed by</b> APatil

**Compression Checks**

**Pole Design Data**

Section No.	Elevation ft	Size	L ft	L <sub>u</sub> ft	Kl/r	F <sub>o</sub> ksi	A in <sup>2</sup>	Actual P K	Allow. P <sub>o</sub> K	Ratio P/P <sub>o</sub>
L1	125 - 101.25 (1)	TP23.605x18.5x0.188	23.750	0.000	0.0	39.000	13.937	-8.700	543.527	0.016
L2	101.25 - 94.458 (2)	TP25.065x23.605x0.409	6.792	0.000	0.0	24.117	32.018	-9.692	772.190	0.013
L3	94.458 - 89 (3)	TP26.239x25.065x0.571	5.458	0.000	0.0	23.963	46.492	-10.735	1114.060	0.010
L4	89 - 85.04 (4)	TP27.09x26.239x0.439	3.960	0.000	0.0	27.429	35.977	-10.750	986.829	0.011
L5	85.04 - 73.583 (5)	TP29.14x25.873x0.475	15.374	0.000	0.0	27.530	43.215	-15.289	1189.680	0.013
L6	73.583 - 73 (6)	TP29.264x29.14x0.609	0.583	0.000	0.0	27.534	55.409	-15.429	1525.610	0.010
L7	73 - 63 (7)	TP31.389x29.264x0.369	10.000	0.000	0.0	39.000	36.306	-17.249	1415.930	0.012
L8	63 - 57.333 (8)	TP32.594x31.389x0.566	5.667	0.000	0.0	30.522	57.491	-18.605	1754.740	0.011
L9	57.333 - 40.457 (9)	TP36.18x32.594x0.436	16.876	0.000	0.0	39.000	47.938	-21.153	1869.570	0.011
L10	40.457 - 37.833 (10)	TP36.233x34.6x0.493	7.707	0.000	0.0	39.000	55.962	-23.767	2182.520	0.011
L11	37.833 - 12.25 (11)	TP41.654x36.233x0.466	25.583	0.000	0.0	39.000	60.985	-30.350	2378.410	0.013
L12	12.25 - 0 (12)	TP44.25x41.654x0.589	12.250	0.000	0.0	34.010	81.572	-34.633	2774.240	0.012

**Pole Bending Design Data**

Section No.	Elevation ft	Size	Actual M <sub>x</sub> kip-ft	Actual J <sub>bx</sub> ksi	Allow. F <sub>bx</sub> ksi	Ratio f <sub>bx</sub> /F <sub>bx</sub>	Actual M <sub>y</sub> kip-ft	Actual f <sub>by</sub> ksi	Allow. F <sub>by</sub> ksi	Ratio f <sub>by</sub> /F <sub>by</sub>
L1	125 - 101.25 (1)	TP23.605x18.5x0.188	287.783	42.887	39.000	1.100	0.000	0.000	39.000	0.000
L2	101.25 - 94.458 (2)	TP25.065x23.605x0.409	427.432	26.558	24.117	1.101	0.000	0.000	24.117	0.000
L3	94.458 - 89 (3)	TP26.239x25.065x0.571	543.005	22.444	23.963	0.937	0.000	0.000	23.963	0.000
L4	89 - 85.04 (4)	TP27.09x26.239x0.439	543.928	28.746	27.429	1.048	0.000	0.000	27.429	0.000
L5	85.04 - 73.583 (5)	TP29.14x25.873x0.475	909.433	36.011	27.530	1.308	0.000	0.000	27.530	0.000
L6	73.583 - 73 (6)	TP29.264x29.14x0.609	924.158	28.682	27.534	1.042	0.000	0.000	27.534	0.000
L7	73 - 63 (7)	TP31.389x29.264x0.369	1181.45	51.219	39.000	1.313	0.000	0.000	39.000	0.000
L8	63 - 57.333 (8)	TP32.594x31.389x0.566	1331.47	35.507	30.522	1.163	0.000	0.000	30.522	0.000
L9	57.333 - 40.457 (9)	TP36.18x32.594x0.436	1653.76	48.624	39.000	1.247	0.000	0.000	39.000	0.000
L10	40.457 - 37.833 (10)	TP36.233x34.6x0.493	1872.16	45.789	39.000	1.174	0.000	0.000	39.000	0.000
L11	37.833 - 12.25 (11)	TP41.654x36.233x0.466	2634.38	51.179	39.000	1.312	0.000	0.000	39.000	0.000
L12	12.25 - 0 (12)	TP44.25x41.654x0.589	3019.30	41.456	34.010	1.219	0.000	0.000	34.010	0.000

<b>tnxTower</b>  <b>B+T Group</b> 1717 S. Boulder, Suite 300 Tulsa, OK 74119 Phone: (918) 587-4630 FAX: (918) 587-4630	<b>Job</b> 84470.013.01 - Cromwell/First Line Emergenc, CT (BU# 876364)	<b>Page</b> 17 of 18
	<b>Project</b>	<b>Date</b> 16:34:31 05/11/15
	<b>Client</b> Crown Castle	<b>Designed by</b> APatil

### Pole Shear Design Data

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 $\frac{f_{vt}}{F_{vt}}$
L1	125 - 101.25 (1)	TP23.605x18.5x0.188	20.235	1.452	26.000	0.112	0.060	0.004	26.000	0.000
L2	101.25 - 94.458 (2)	TP25.065x23.605x0.409	20.897	0.653	16.078	0.081	0.048	0.001	16.078	0.000
L3	94.458 - 89 (3)	TP26.239x25.065x0.571	21.459	0.462	15.975	0.058	0.038	0.001	15.975	0.000
L4	89 - 85.04 (4)	TP27.09x26.239x0.439	21.459	0.596	18.286	0.065	0.036	0.001	18.286	0.000
L5	85.04 - 73.583 (5)	TP29.14x25.873x0.475	25.230	0.584	18.353	0.064	0.012	0.000	18.353	0.000
L6	73.583 - 73 (6)	TP29.264x29.14x0.609	25.286	0.456	18.356	0.050	0.010	0.000	18.356	0.000
L7	73 - 63 (7)	TP31.389x29.264x0.369	26.187	0.721	26.000	0.055	0.010	0.000	26.000	0.000
L8	63 - 57.333 (8)	TP32.594x31.389x0.566	26.774	0.466	20.348	0.046	0.021	0.000	20.348	0.000
L9	57.333 - 40.457 (9)	TP36.18x32.594x0.436	27.904	0.582	26.000	0.045	0.043	0.001	26.000	0.000
L10	40.457 - 37.833 (10)	TP36.233x34.6x0.493	28.745	0.514	26.000	0.040	0.059	0.001	26.000	0.000
L11	37.833 - 12.25 (11)	TP41.654x36.233x0.466	30.890	0.507	26.000	0.039	0.109	0.001	26.000	0.000
L12	12.25 - 0 (12)	TP44.25x41.654x0.589	31.982	0.392	22.673	0.035	0.135	0.001	22.673	0.000

### Pole Interaction Design Data

Section No.	Elevation ft	Ratio P $P_a$	Ratio $f_{bx}$ $F_{bx}$	Ratio $f_{by}$ $F_{by}$	Ratio $f_v$ $F_v$	Ratio $f_{vt}$ $F_{vt}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	125 - 101.25 (1)	0.016	1.100	0.000	0.112	0.000	1.119	1.333	H1-3+VT ✓
L2	101.25 - 94.458 (2)	0.013	1.101	0.000	0.081	0.000	1.115	1.333	H1-3+VT ✓
L3	94.458 - 89 (3)	0.010	0.937	0.000	0.058	0.000	0.947	1.333	H1-3+VT ✓
L4	89 - 85.04 (4)	0.011	1.048	0.000	0.065	0.000	1.060	1.333	H1-3+VT ✓
L5	85.04 - 73.583 (5)	0.013	1.308	0.000	0.064	0.000	1.322	1.333	H1-3+VT ✓
L6	73.583 - 73 (6)	0.010	1.042	0.000	0.050	0.000	1.052	1.333	H1-3+VT ✓
L7	73 - 63 (7)	0.012	1.313	0.000	0.055	0.000	1.326	1.333	H1-3+VT ✓
L8	63 - 57.333 (8)	0.011	1.163	0.000	0.046	0.000	1.174	1.333	H1-3+VT ✓
L9	57.333 - 40.457 (9)	0.011	1.247	0.000	0.045	0.000	1.259	1.333	H1-3+VT ✓
L10	40.457 - 37.833 (10)	0.011	1.174	0.000	0.040	0.000	1.185	1.333	H1-3+VT ✓
L11	37.833 - 12.25 (11)	0.013	1.312	0.000	0.039	0.000	1.325	1.333	H1-3+VT ✓
L12	12.25 - 0 (12)	0.012	1.219	0.000	0.035	0.000	1.232	1.333	H1-3+VT ✓

<b>tnxTower</b>  <b>B+T Group</b> 1717 S. Boulder, Suite 300 Tulsa, OK 74119 Phone: (918) 587-4630 FAX: (918) 587-4630	<b>Job</b> 84470.013.01 - Cromwell/First Line Emergenc, CT (BU# 876364)	<b>Page</b> 18 of 18
	<b>Project</b>	<b>Date</b> 16:34:31 05/11/15
	<b>Client</b> Crown Castle	<b>Designed by</b> APatil

### Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	SF*P <sub>allow</sub> K	% Capacity	Pass Fail
L1	125 - 101.25	Pole	TP23.605x18.5x0.188	1	-8.700	724.521	83.6	Pass
L2	101.25 - 94.458	Pole	TP25.065x23.605x0.409	2	-9.692	1029.329	83.8	Pass
L3	94.458 - 89	Pole	TP26.239x25.065x0.571	3	-10.735	1485.042	70.6	Pass
L4	89 - 85.04	Pole	TP27.09x26.239x0.439	4	-10.750	1315.443	77.4	Pass
L5	85.04 - 73.583	Pole	TP29.14x25.873x0.475	5	-15.289	1585.843	96.6	Pass
L6	73.583 - 73	Pole	TP29.264x29.14x0.609	6	-15.429	2033.638	76.9	Pass
L7	73 - 63	Pole	TP31.389x29.264x0.369	7	-17.249	1887.435	99.7	Pass
L8	63 - 57.333	Pole	TP32.594x31.389x0.566	8	-18.605	2339.068	85.9	Pass
L9	57.333 - 40.457	Pole	TP36.18x32.594x0.436	9	-21.153	2492.137	94.8	Pass
L10	40.457 - 37.833	Pole	TP36.233x34.6x0.493	10	-23.767	2909.299	89.2	Pass
L11	37.833 - 12.25	Pole	TP41.654x36.233x0.466	11	-30.350	3170.420	99.7	Pass
L12	12.25 - 0	Pole	TP44.25x41.654x0.589	12	-34.633	3698.062	92.4	Pass
<b>Summary</b>								
Pole (L11)							99.7	Pass
<b>RATING =</b>							<b>99.7</b>	<b>Pass</b>

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

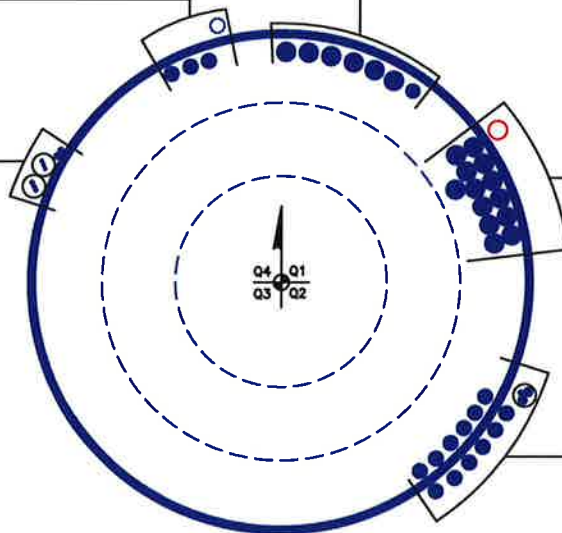
(RESERVED)  
(1) 1-1/4" TO 125 FT LEVEL  
(INSTALLED)  
(3) 1-1/4" TO 125 FT LEVEL

(INSTALLED--IN CONDUIT)  
(3) 1/4" TO 125 FT LEVEL  
(3) 5/16" TO 125 FT LEVEL  
(INSTALLED)  
(2) 1/2" TO 125 FT LEVEL

(INSTALLED)  
(1) 1 3/16" TO 82 FT LEVEL  
(6) 1-5/8" TO 82 FT LEVEL

(PROPOSED)  
(1) 1-5/8" TO 105 FT LEVEL  
(INSTALLED)  
(13) 1-5/8" TO 105 FT LEVEL

(INSTALLED--IN 2" CONDUIT)  
(1) 3/8" TO 115 FT LEVEL  
(2) 3/4" TO 115 FT LEVEL  
(INSTALLED)  
(12) 1-1/4" TO 115 FT LEVEL



BUSINESS UNIT:876364

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

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Start Date	End Date	Notes
1	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...	...
46	...	...	...	...	...	...	...	...
47	...	...	...	...	...	...	...	...
48	...	...	...	...	...	...	...	...
49	...	...	...	...	...	...	...	...
50	...	...	...	...	...	...	...	...
51	...	...	...	...	...	...	...	...
52	...	...	...	...	...	...	...	...
53	...	...	...	...	...	...	...	...
54	...	...	...	...	...	...	...	...
55	...	...	...	...	...	...	...	...
56	...	...	...	...	...	...	...	...
57	...	...	...	...	...	...	...	...
58	...	...	...	...	...	...	...	...
59	...	...	...	...	...	...	...	...
60	...	...	...	...	...	...	...	...
61	...	...	...	...	...	...	...	...
62	...	...	...	...	...	...	...	...
63	...	...	...	...	...	...	...	...
64	...	...	...	...	...	...	...	...
65	...	...	...	...	...	...	...	...
66	...	...	...	...	...	...	...	...
67	...	...	...	...	...	...	...	...
68	...	...	...	...	...	...	...	...
69	...	...	...	...	...	...	...	...
70	...	...	...	...	...	...	...	...
71	...	...	...	...	...	...	...	...
72	...	...	...	...	...	...	...	...
73	...	...	...	...	...	...	...	...
74	...	...	...	...	...	...	...	...
75	...	...	...	...	...	...	...	...
76	...	...	...	...	...	...	...	...
77	...	...	...	...	...	...	...	...
78	...	...	...	...	...	...	...	...
79	...	...	...	...	...	...	...	...
80	...	...	...	...	...	...	...	...
81	...	...	...	...	...	...	...	...
82	...	...	...	...	...	...	...	...
83	...	...	...	...	...	...	...	...
84	...	...	...	...	...	...	...	...
85	...	...	...	...	...	...	...	...
86	...	...	...	...	...	...	...	...
87	...	...	...	...	...	...	...	...
88	...	...	...	...	...	...	...	...
89	...	...	...	...	...	...	...	...
90	...	...	...	...	...	...	...	...
91	...	...	...	...	...	...	...	...
92	...	...	...	...	...	...	...	...
93	...	...	...	...	...	...	...	...
94	...	...	...	...	...	...	...	...
95	...	...	...	...	...	...	...	...
96	...	...	...	...	...	...	...	...
97	...	...	...	...	...	...	...	...
98	...	...	...	...	...	...	...	...
99	...	...	...	...	...	...	...	...
100	...	...	...	...	...	...	...	...





Reinforcement Capacity

Dimensions and Properties													Actual				LFRD				
Model	Weight (lb/ft)	Area (in <sup>2</sup> )	Moment of Inertia (in <sup>4</sup> )	Centroid from Mating Edge (in)	Centroid from Bolt Hole Center (in)	Web Thickness (in)	Flange Width (in)	Flange Width (in)	Flange Thickness (in)	Hole Diameter (in)	Yield Stress (ksi)	Ultimate Stress (ksi)	Compression		ASD-S		Design Axial Strength (kip)	Governing Axial			
													Slender Ratio Coefficient	Unbraced Length (in)	Slender Ratio Coefficient	Unbraced Length (in)			Allowable Axial Increase (kip)	Allowable Axial (kip)	Governing Axial
MP404	12.1	3.56	0.17	6.70	0.375	0	4.75	4.75	0	1.21875	100	110	0.80	14	1.00	14	143.1	1498.8	Rupture	214.6	Rupture
MP406	20.7	6.09	0.79	12.07	0.625	0	4.875	4.875	0	1.21875	100	110	0.80	22	1.00	22	147.1	1159.4	Rupture	376.6	Rupture
MS-600	13.6	4.00	0.33	5.33	0.5	0	4	4	0	1.21875	65	80	1.00	16.375	1.00	16.375	108.8	145.0	Rupture	163.1	Rupture
MS-600-1-1	20.4	6.00	0.59	18.00	0.5	0	6	6	0	1.21875	65	80	1.00	16.375	1.00	16.375	170.8	227.8	Compress.	258.5	Compress.
CCF-125x125	13.8	4.06	0.53	3.58	0.625	0	3.25	3.25	0	1.21875	65	80	0.80	24	1.00	24	98.4	131.3	Rupture	147.7	Rupture
CCI-146	20.4	6.00	0.50	18.00	0.5	0	6	6	0	1.21875	65	80	0.80	16	1.00	16	188.8	253.7	Rupture	283.1	Rupture
CC-125x6.5	27.6	8.13	1.06	28.61	0.625	0	6.5	6.5	0	1.21875	65	80	0.80	19	1.00	19	260.4	347.2	Compress.	391.4	Rupture

# Anchor Rod Information for TIA/EIA-222-F and TIA-222-G-2



Site Information	
ID:	876364
Name:	CROMWELL - FIRST LINE EMERGENC
App. #:	292878; Revision # 0

Base Reactions	
Moment:	3019 ft-kip
Axial:	35 kip
Shear:	32 kip
Base Plate Type:	Circular

Design Information	
TIA Code:	F
ASIF:	1.333
Failure:	100%
eta Factor:	0.50

Original Anchor Rod Data	
Quantity:	12
Diameter:	2.25 in
Material:	A615 GR 75
Bolt Circle:	53.0 in
Bolt Spacing:	in
Bolt Group Area:	47.71 in <sup>2</sup>
Bolt Group MOIx:	16753 in <sup>4</sup>

Reactions Seen by Original AR Group

Moment:	2532.5 kip-ft
Axial:	34.6 kip
Shear:	32.0 kip

Original AR Capacity Check

Tension Load:	188.2 kip
Allowable load:	194.8 kip
AR Capacity:	96.6% <b>Pass</b>

First Added Anchor Rod Data	
Quantity:	3
Diameter:	1.75 in
Material:	A193 B7
Bolt Circle:	59.8 in
Bolt Group Area:	7.22 in <sup>2</sup>
Bolt Group MOIx:	3220 in <sup>4</sup>

Reactions Seen by First Added AR Group

Moment:	486.8 kip-ft
Axial:	0.0 kip
Shear:	0.0 kip

First Added AR Capacity Check

Tension Load:	130.4 kip
Allowable load:	132.3 kip
AR Capacity:	98.6% <b>Pass</b>

Second Added Anchor Rod Data	
Quantity:	
Diameter:	in
Material:	
Bolt Circle:	in
Bolt Group Area:	0.00 in <sup>2</sup>
Bolt Group MOIx:	0 in <sup>4</sup>

Reactions Seen by Second Added AR Group

Moment:	0.0 kip-ft
Axial:	0.0 kip
Shear:	0.0 kip

Second Added AR Capacity Check

Tension Load:	0.0 kip
Allowable load:	0.0 kip
AR Capacity:	0.0%

Third Added Anchor Rod Data	
Quantity:	
Diameter:	in
Material:	
Bolt Circle:	in
Bolt Group Area:	0.00 in <sup>2</sup>
Bolt Group MOIx:	0 in <sup>4</sup>

Reactions Seen by Second Added AR Group

Moment:	0.0 kip-ft
Axial:	0.0 kip
Shear:	0.0 kip

Second Added AR Capacity Check

Tension Load:	0.0 kip
Allowable load:	0.0 kip
AR Capacity:	0.0%

# Stiffened or Unstiffened, UngROUTed, Circular Base Plate - Any Rod Material

## TIA Rev F

### Site Data

BU#: 876364
Site Name: CROMWELL - FIRST LINE
App #: 292878; Revision # 0
Pole Manufacturer: Other

Reactions	
Moment:	2532.531 ft-kips
Axial:	34.6332 kips
Shear:	31.982341 kips

### Anchor Rod Data

Qty:	12	
Diam:	2.25	in
Rod Material:	A615-J	
Strength (Fu):	100	ksi
Yield (Fy):	75	ksi
Bolt Circle:	53	in

If No stiffeners, Criteria: AISC ASD <-Only Applicable to Unstiffened Cases

### Anchor Rod Results

Maximum Rod Tension:	188.2 Kips
Allowable Tension:	195.0 Kips
Anchor Rod Stress Ratio:	96.6% Pass

Stiffened
Service, ASD
Fty*ASIF

### Plate Data

Diam:	59	in
Thick:	1.75	in
Grade:	60	ksi
Single-Rod B-eff:	11.70	in

### Base Plate Results

Base Plate Stress:	57.1 ksi	Flexural Check
Allowable Plate Stress:	60.0 ksi	
Base Plate Stress Ratio:	95.2% Pass	

Stiffened
Service, ASD
0.75*Fy*ASIF
Y.L. Length:
N/A, Roark

### Stiffener Data (Welding at both sides)

Config:	1	*
Weld Type:	Fillet	
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:	0.625	in
Fillet V. Weld:	0.375	in
Width:	7	in
Height:	22	in
Thick:	0.75	in
Notch:	0.75	in
Grade:	50	ksi
Weld str.:	70	ksi

### Stiffener Results

Horizontal Weld :	84.4% Pass
Vertical Weld:	44.9% Pass
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	18.9% Pass
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	74.4% Pass
Plate Comp. (AISC Bracket):	74.2% Pass

### Pole Results

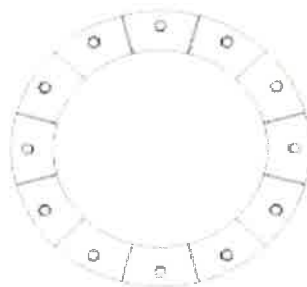
Pole Punching Shear Check:	14.0% Pass
----------------------------	------------

### Pole Data

Diam:	44.25	in
Thick:	0.3125	in
Grade:	65	ksi
# of Sides:	18	"0" IF Round
Fu	80	ksi
Reinf. Fillet Weld	0	"0" if None

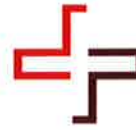
### Stress Increase Factor

ASIF:	1.333
-------	-------



\* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

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



## Monopole Pad & Pier Foundation Analysis

Rev. Type: **F**

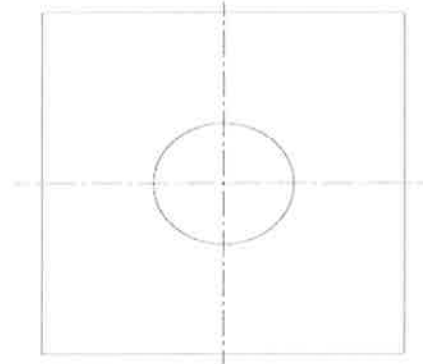
Design Loads:

Input unfactored loads	
Shear:	<u>32.0</u> kips
Moment:	<u>3,019.0</u> ft-kips
Tower Height:	<u>125.0</u> ft
Tower Weight:	<u>35.0</u> kips

Pad & Pier Dimensions / Properties:

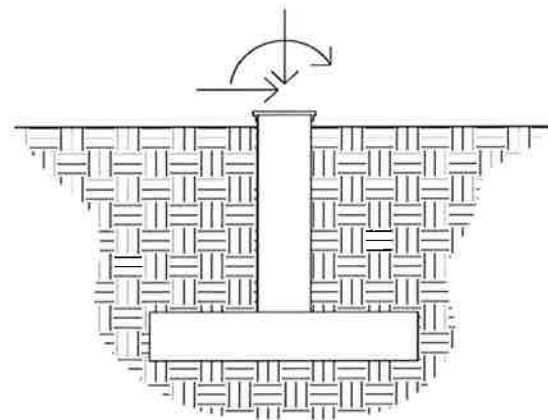
Pole Diameter at Base:	<u>44.25</u> in
Bearing Depth:	<u>5.0</u> ft
Pad Width:	<u>24.0</u> ft
Neglected Depth:	<u>3.3</u> ft
Thickness:	<u>3.0</u> ft
Pier Diameter:	<u>14.0</u> ft
Pier Height Above Grade:	<u>1.0</u> ft
BP Dist. Above Pier:	<u>0.0</u> in
Clear Cover:	<u>3.0</u> in
Pier Rebar Size:	<u>8</u>
Pier Rebar Quantity:	<u>24</u>
Pad Rebar Size:	<u>8</u>
Pad Rebar Quantity:	<u>30</u>
Pier Tie Size:	<u>4</u>
Tie Quantity:	<u>7</u>
Rebar Yield Strength:	<u>60000</u> psi
Concrete Strength:	<u>3000</u> psi
Concrete Unit Weight:	<u>0.15</u> kcf

24.0 FT



24.0 FT

Elevation Overview



Soil Data:

Allowable Values	
Soil Unit Weight:	<u>0.125</u> kcf
Ult. Bearing Capacity:	<u>8.000</u> ksf
Angle of Friction:	<u>30.000</u> deg
Cohesion:	<u>0.000</u> ksf
Passive Pressure:	<u>0.000</u> ksf
Base Friction:	<u>0.300</u>

**\*\* Notes:**

### Summary of Results

Req'd Pier Diam.	OK
Overturning	93.2%
Shear Capacity	44.1%
Bearing	53.4%
Pad Shear - 1-way	21.6%
Pad Shear - 2-way	6.7%
Pad Moment Capacity	17.0%
Pier Moment Capacity	57.6%

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

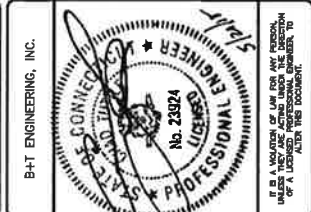




# CROWN CASTLE

REV	DATE	DESCRIPTION
0	05/21/19	ISSUED FOR CONSTRUCTION

PROJECT NO.:	6470/01301
PROJECT ENG.:	ASHKAN GHAEZAEI
DRAWN BY:	USA/103
CHECKED BY:	SSS



**CROWNWELL / FIRST LINE**  
EMERGENC  
8775364  
201 MAIN ST  
CROWNWELL CT  
EASTING 127 MONROPE

SHEET TITLE  
**MODIFICATION INSPECTION NOTES AND CHECKLIST**

SHEET NUMBER  
**S2**

REVISIONS  
**0**

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

- REVIEW THE REQUIREMENTS OF THE MI CHECKLIST
- WORK WITH THE MI INSPECTOR TO DEVELOP A SCHEDULE TO CONDUCT ON-SITE MI INSPECTIONS, INCLUDING FOUNDATION INSPECTIONS
- BETTER UNDERSTAND ALL INSPECTION AND TESTING REQUIREMENTS
- THE GC SHALL PERFORM AND RECORD THE TEST AND INSPECTION RESULTS IN ACCORDANCE WITH THE REQUIREMENTS OF THE MI CHECKLIST AND ENG-SOW-10007.

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

- IT IS SUGGESTED THAT THE GC PROVIDE A MINIMUM OF 5 BUSINESS DAYS NOTICE PREFERABLY 10, TO THE MI INSPECTOR AS TO WHEN THE SITE WILL BE READY FOR THE MI TO BE CONDUCTED.
- THE GC AND MI INSPECTOR COORDINATE CLOSELY THROUGHOUT THE ENTIRE PROJECT.
- IF THE GC AND MI INSPECTOR AGREE TO A DATE ON WHICH THE MI WILL BE CONDUCTED, FEES, TRAVEL AND/OR DELAYS, SHOULD NOT BE RESPONSIBLE FOR ANY COSTS, FEES, INQUIRIES 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.
- WHEN POSSIBLE, IT IS PREFERRED TO HAVE THE GC AND MI INSPECTOR ON-SITE DURING THE MODIFICATION INSTALLATION TO COORDINATE THE WORK AND INITIAL MI. THEREFORE, THE GC MAY CHOOSE TO COORDINATE THE MI CHECKLIST WITH THE GC TO ENSURE ALL CONSTRUCTION FACILITIES ARE AT THEIR DISPOSAL WHILE 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, FEES, TRAVEL AND/OR DELAYS, SHOULD NOT BE RESPONSIBLE FOR ANY COSTS, FEES, INQUIRIES 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 MI'S**  
IF THE MODIFICATION INSTALLATION WOULD FAIL THE MI ("FAILING MI"), THE GC SHALL WORK WITH CROWN TO COORDINATE A REBIDDING 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 ADV/ASSEY FIRM AFTER A MODIFICATION PROJECT IS COMPLETED, AS MARKED BY THE DATE OF AN ACCEPTED "PASSING MI" OR "PASS AS NOTED MI" REPORT FOR THE ORIGINAL PROJECT.

**REQUIRED PHOTOS**  
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 INSPECTION CONDITION
- SURFACE COATING REPAIR
- POST CONSTRUCTION PHOTOGRAPHS
- FINAL INFELD 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

REQUIRED	REPORT ITEM	BRIEF DESCRIPTION
X	MI CHECKLIST DRAWING	THIS CHECKLIST SHALL BE INCLUDED IN THE MI REPORT.
X	EOB APPROVAL	ONCE THE PRE-MODIFICATION MAPPING IS COMPLETE AND PRIOR TO FABRICATION, THE CONTRACTOR SHALL PROVIDE DETAILED ASSEMBLY DRAWINGS AND/OR SHOP DRAWINGS AS NECESSARY FOR NON-STANDARD PARTS. THESE ARE TO INCLUDE, BUT ARE NOT LIMITED TO, A VISUAL LAYOUT OF NEW REINFORCEMENT, EXISTING REINFORCEMENT CONFIGURATION, PORTHOLES, JOINTS, STEP PEGS, SAFETY CLIMBS AND ANY OTHER MISCELLANEOUS ITEMS WHICH MAY AFFECT SUCCESSFUL INSTALLATION OF MODIFICATIONS ON THE TOWER. THESE DRAWINGS SHALL BE SUBMITTED TO THE EOR FOR APPROVAL. APPROVED ASSEMBLY/SHOP DRAWINGS SHALL BE SUBMITTED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	FABRICATION INSPECTION	A LETTER FROM THE FABRICATOR STATING THAT THE WORK WAS PERFORMED IN ACCORDANCE WITH INDUSTRY STANDARDS AND THE CONTRACT DOCUMENTS SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
N/A	FABRICATOR CERTIFIED WELD INSPECTION	A VISUAL OBSERVATION BY A CWI OF A PORTION OF WELDING ON THE PROPOSED STRUCTURAL MEMBERS IS REQUIRED AND A WRITTEN REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	MATERIAL TEST REPORT (MTR)	MILL CERTIFICATION SHALL BE PROVIDED FOR ALL STEEL AS SPECIFIED IN THE MODIFICATION DRAWINGS AND THIS DOCUMENTATION SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
N/A	FABRICATOR NDE INSPECTION	CRITICAL SHOP WELDS THAT REQUIRE TESTING (PER ENG-STD-10069) ARE NOTED ON THESE CONTRACT DRAWINGS. A CERTIFIED WELD INSPECTOR SHALL PERFORM NON-DESTRUCTIVE EXAMINATION AND A REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
N/A	NDE REPORT OF MONOPOLE BASE PLATE	A NDE (PER ENG-SOW-10033) OF THE POLE TO BASE PLATE CONNECTION IS REQUIRED AND A WRITTEN REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	PACKING SLIPS	THE MATERIAL SHIPPING LIST SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
<b>CONSTRUCTION (PERFORMED BY CONTRACTOR)</b>		
X	CONSTRUCTION INSPECTIONS	A LETTER FROM THE GENERAL CONTRACTOR STATING THAT THE WORKMANSHIP WAS PERFORMED IN ACCORDANCE WITH INDUSTRY STANDARDS AND THESE CONTRACT DRAWINGS.
N/A	FOUNDATION INSPECTIONS	A VISUAL OBSERVATION OF THE EXCAVATION AND REBAR SHALL BE PERFORMED BEFORE PLACING THE CONCRETE. A WRITTEN REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
N/A	CONCRETE COMP. STRENGTH AND SLUMP TESTS	THE CONCRETE MIX DESIGN, SLUMP TEST, AND COMPRESSIVE STRENGTH TESTS SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
N/A	POST INSTALLED ANCHOR ROD VERIFICATION	POST INSTALLED ANCHOR ROD VERIFICATION SHALL BE PERFORMED IN ACCORDANCE WITH CROWN REQUIREMENTS AND A REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
N/A	BASE PLATE GROUT VERIFICATION	THE GENERAL CONTRACTOR SHALL PROVIDE DOCUMENTATION TO THE MI INSPECTOR THAT GROUTS THAT THE GROUT WAS INSTALLED IN ACCORDANCE WITH CROWN ENG-PRC-10012 FOR INCLUSION IN THE MI REPORT.
X	CONTRACTOR'S CERTIFIED WELD INSPECTION	A CERTIFIED WELD INSPECTOR SHALL INSPECT AND TEST AS NECESSARY ALL FIELD WELDS. CWI SHALL FOLLOW ALL THE PROCEDURES SPECIFIED IN CROWN STANDARD DOCUMENTS ENG-SOW-10068, ENG-STD-10069 AND SRV-STD-10158. A REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT. FULL PENETRATION WELDS IN THE VICINITY OF BASE OF THE TOWER ARE REQUIRED TO BE 100% NDE INSPECTED BY UT IN ACCORDANCE WITH AWS D1.1. ALL CRITICAL CONNECTIONS AND GUY WELDS IN THE VICINITY OF BASE OF THE TOWER ARE REQUIRED TO BE 50% NDE INSPECTED BY MP IN ACCORDANCE WITH AWS D1.1.
N/A	EARTHWORK: LIFT AND DENSITY	FOUNDATION SUB-GRADES SHALL BE INSPECTED AND APPROVED BY A GEOTECHNICAL ENGINEER AND A REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	ON SITE COLD GALVANIZING VERIFICATION	THE GENERAL CONTRACTOR SHALL PROVIDE DOCUMENTATION TO THE MI INSPECTOR VERIFYING THAT ANY ON-SITE COLD GALVANIZING WAS APPLIED IN ACCORDANCE WITH ENG-BUL-10148.
N/A	GUY WIRE TENSION REPORT	THE GENERAL CONTRACTOR SHALL PROVIDE A REPORT TO THE MI INSPECTOR INDICATING THE TEMPERATURE AND TENSION IN EVERY GUY CABLE AS PART OF PLUMB AND TENSION PROCEDURE FOR INCLUSION IN THE MI REPORT.
X	GC AS-BUILT DOCUMENTS	THE GENERAL CONTRACTOR SHALL SUBMIT A COPY OF THE CONTRACT DRAWINGS EITHER STATING "INSTALLED AS DESIGNED" OR NOTING ANY CHANGES THAT WERE REQUIRED AND APPROVED BY THE ENGINEER OF RECORD.
<b>POST-CONSTRUCTION</b>		
X	MI INSPECTOR REDLINE OR RECORD DRAWING(S)	THE MI INSPECTOR SHALL OBSERVE AND REPORT ANY DISCREPANCIES BETWEEN THE CONTRACTORS REDLINE DRAWING AND THE ACTUAL COMPLETED INSTALLATION.
N/A	POST INSTALLED ANCHOR ROD PULL-OUT TESTING	POST-INSTALLED ANCHOR RODS SHALL BE TESTED IN ACCORDANCE WITH ENG-PRC-10119 AND A REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	PHOTOGRAPHS	PHOTOGRAPHS SHALL BE SUBMITTED TO THE MI WHICH DOCUMENT ALL PHASES OF THE CONSTRUCTION. THE PHOTOS SHALL BE ORGANIZED IN A MANNER THAT EASILY IDENTIFIES THE EXACT LOCATION OF THE PHOTO.
ADDITIONAL TESTING AND INSPECTIONS:		
NOTE: X DENOTES A DOCUMENT NEEDED FOR THE MI REPORT AND N/A DENOTES A DOCUMENT THAT IS NOT REQUIRED FOR THE MI REPORT		

**MODIFICATION INSPECTION NOTES:**

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

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

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

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





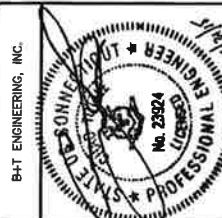


**B+T GRP**  
1777 S. BOULDER AVE.  
TULSA, OK 74119  
PH: (918) 587-4680  
www.btgpr.com

# CROWN CASTLE

ISSUED FOR:	DATE	DESCRIPTION
0	03/21/15	ISSUED FOR CONSTRUCTION

PROJECT NO: 84470.013.01  
PROJECT ENG: ASHMAN GHAEZADABI  
DRAWN BY: UUU/JGLS  
CHECKED BY: SSC



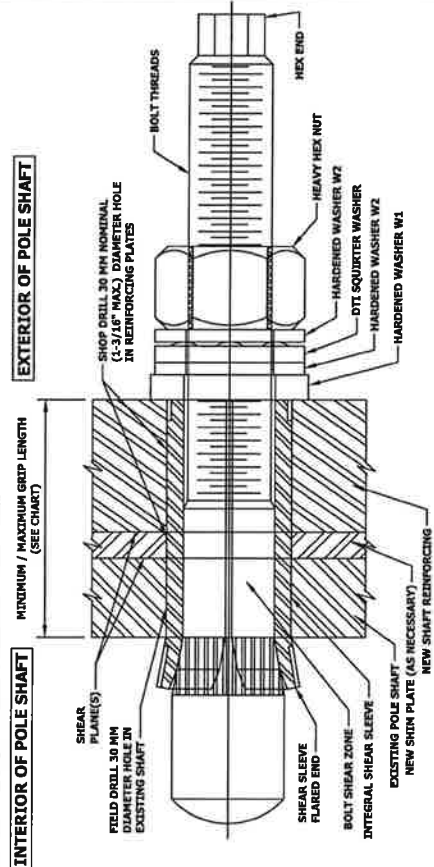
IF A MEMBER OF ANY PROFESSIONAL SOCIETY OR BOARD OF ENGINEERS, ARCHITECTS, SURVEYORS, OR LAND SURVEYORS, TO WHOM THESE REGULATIONS APPLY.

CROMWELL / FIRST LINE  
EMERGENC  
876964  
201 MAIN ST.  
CROMWELL, CT  
EXISTING 72' MONOPOLE

SHEET TITLE  
FORGBOIT NOTES  
AND DETAILS

SHEET NUMBER  
**S4**  
REVISION  
**0**

FORGBOIT™ NOTE SHEET: A325/PC8.8 LANDSCAPE VERSION DATE 01/29/2015; Rev. 1.0 04/23/2015  
**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.**



## PRE-INSTALLED FORGBOIT™ ASSEMBLY DETAIL 1

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

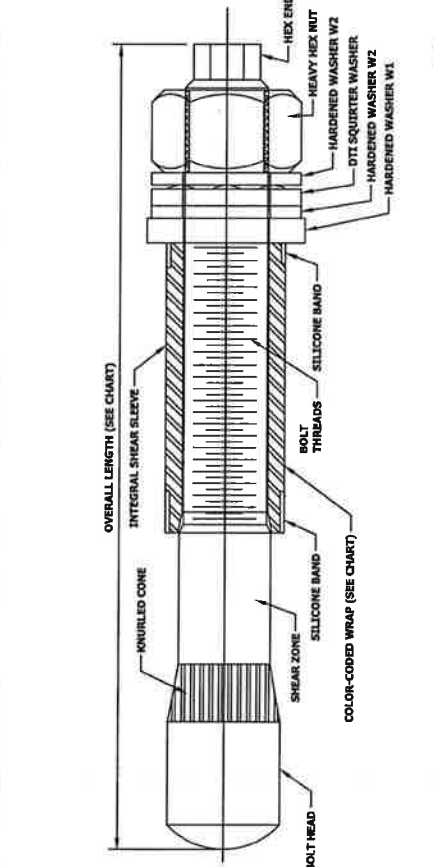
**DISTRIBUTOR CONTACT:**  
**PRECISION TOWER PRODUCTS**  
 PHONE: 888-926-4857  
 EMAIL: info@precisiontowerproducts.com  
 WEB: www.precisiontowerproducts.com  
**CONTAINS PROPRIETARY INFORMATION PATENT PENDING**  
 © Copyright 2013 to 2015 by PTP, all rights reserved.

**FORGBOIT™ Installation**  
**Follow all Manufacturer/Distributor Recommendations for Installation, Tightening, and Inspection.**

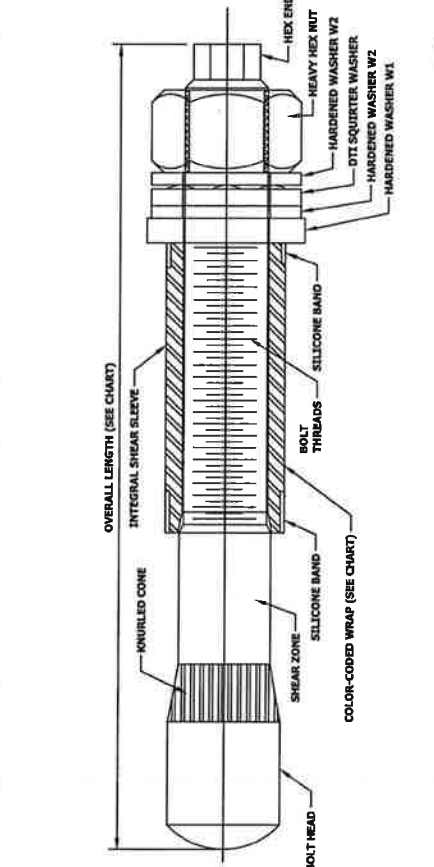
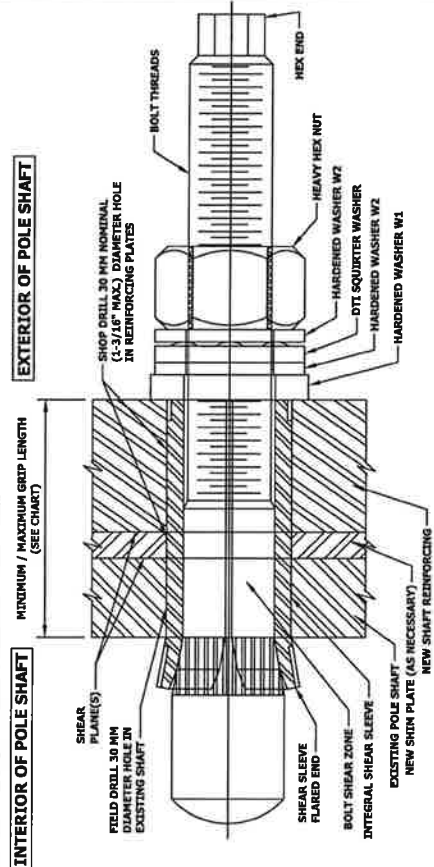
1. FIELD DRILL HOLES TO 30 MM DIAMETER.
2. SELECT CORRECT BOLT SIZE FOR INSTALLATION GRIP (REFER TO PLANS).
3. INSERT BOLT ASSEMBLY THROUGH HOLES IN SHAFT REINFORCING PLATES AND SEAT THE HARDENED WASHER W/ FLUSH AGAINST OUTSIDE OF PLATE.
4. HAND TIGHTEN NUT TO FINGER TIGHT.
5. TIGHTEN NUT TO PRETENSIONED CONDITION AND UNTIL DTI SHOWS PROPER INDICATION.
6. PROPERLY DOCUMENT AND INSPECT BOLT TIGHTENING PER PLAN REQUIREMENTS.

FORGBOIT™		AISC Group A Material: ASTM A325 and PC8.8 (Tensile Stress, Fu = 120 ksi minimum)			
GROUP	FORGBOIT™ Size (mm)	Overall Length (inches)	Estimated Weight Each (lbs)	Grip Range (inch)	Color Code
1	135	5.31	1.3	3/8" to 1"	RED
2	160	6.30	1.6	3/4" to 1-1/2"	GREEN
3	195	7.68	1.9	1-1/4" to 2-1/4"	BLUE
4	260	10.24	2.6	2" to 3-1/2"	YELLOW
5	365	14.37	3.6	3-1/2" to 5-1/2"	ORANGE
6	440	17.32	4.3	5-1/2" to 8-1/2"	BLACK

**DTI Note**  
Each Group A (A325/PC8.8) FORGBOIT™ assembly shall have a 'Squirtter' DTI that is compatible with a M20-PC8.8 bolt.



## INSTALLED FORGBOIT™ ASSEMBLY DETAIL 2





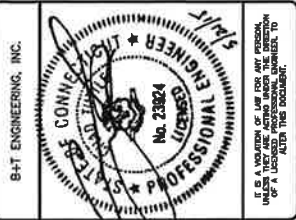
B+T GRP  
7175 BOULDER AVE  
TULSA, OK 74118  
PH: (918) 587-4880  
www.btgpr.com

# CROWN CASTLE

ISSUED FOR:

REV	DATE	DESCRIPTION
0	02/21/18	ISSUED FOR CONSTRUCTION

PROJECT NO. 8447018.01  
PROJECT ENG. ASHKAN GHAEZADEH  
DRAWN BY: JJJ/GBS  
CHECKED BY: SSC



CROWNELL / FIRST LINE  
EMERGENC  
876384  
301 MAIN ST.  
CROWNELL, CT  
EXISTING 125 MONOROLE

SHEET TITLE  
TOWER ELEV., SCHEDULE  
AND TX LINE DIST. DIAGRAM

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

### CCI-FLAT PLATE-BILL OF MATERIALS (65KSI)

BOTTOM ELEVATION	TOP ELEVATION	FLAT PLATE DESIGNATION*	FLAT PLATE LENGTH	FLAT PLATE QUANTITY	FLAT #	BOLTS PER PLATE	TOTAL QTY	TERMINATION (BOTTOM)	TERMINATION (TOP)	MAXIMUM INTERMEDIATE BOLT SPACING	TOTAL STEEL WEIGHT
0'	15'	CCI-WSPF-06S12S1S	15'-0"	3	1, 7 & 10	18	54	WELD	11	19"	1243 LBS.
55'	65'	CCI-SFP-06010010	10'-0"	3	1, 7 & 13	20	60	8	8	16"	612 LBS.
87.5'	102.5'	CCI-CFP-02S12S1S**	15'-0"	4	5, 10, 15 & 18	16	64	5	5	24"	829 LBS.
							178				2684 LBS.

\*\* SEE CHRP 65 KSI PARTS CATALOG EDITION 2 REV. 1 FOR PART DETAILS  
\*\* UNIQUE PART. SEE PART DETAIL SHEET D2

ALL BOLTS SHALL BE PRE-APPROVED BLIND M20 BOLTS WITH HIGH STRENGTH SHEAR SLEEVES (ASTM A519 WITH MIN. F<sub>u</sub>=120 KSI). CONTACT SUPPLIER FOR MATERIAL (PLATE AND BOLTS) AND INSTALLATION PROCEDURES.

- NOTES:
- BLIND BOLTS ARE TO BE 20mm DIAMETER WITH CORRESPONDING 28mm DIAMETER SLEEVE WITH SPECIFIED STEEL GRADE.
  - ALL STEEL SHALL BE HOT-DIP GALVANIZED AFTER FABRICATOR 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 RIC-SHIMS OR EQUIVALENT COLD GALVANIZING COMPOUND. FILM THICKNESS: 1-800-831-3275 FOR PRODUCT INFORMATION.
  - RIC-SHIMS SHALL BE AS STS 308.
  - ALL SHIMS SHALL BE 30mm.
  - HOLE FOR BOLTS AND SHEAR SLEEVES ARE 30mm UNLESS NOTED OTHERWISE.
  - IF SCOPE OF MODIFICATION REQUIRES REMOVAL OF TOWER ID TAG, IT MUST BE REPLACED.
  - THE CLIMBING FACILITIES, SAFETY CLIMB AND ALL PARTS THEREOF SHALL NOT BE IMPEDED, MODIFIED OR ALTERED UNLESS OTHERWISE SPECIFIED.
  - WHERE POSSIBLE, CLIMBING HARDWARE SHOULD REMAIN IN-LINE ALONG THE POLE. IF AN OBSTRUCTION CAUSES A LATERAL OFFSET OF 2'-0" OR MORE, CLIMBING ANCHORS SHALL BE PROVIDED AT EACH CHANGE IN ALIGNMENT. IF NEW REINFORCEMENT REQUIRES STEP BOLT BRACKETS, INSTALL PRIOR TO GALVANIZATION OF STEEL.
  - CONTRACTOR SHALL BE RESPONSIBLE FOR PROPER FITTING OF REINFORCEMENT ON MONOPOLES. SHIMS FOR MONOPOLE REINFORCEMENT MEMBER SHOULD BE MINIMUM 3/8" AND MUST HAVE BEING CORRECTED TO FIT THE SHIM LENGTH AND WEIGHT SHALL BE LIGHTER WEIGHT MEMBER. FOR TERMINATION CONNECTIONS, THE MINIMUM SHIM LENGTH AND WEIGHT SHALL BE 1/2" AND 5 LBS. INDIVIDUAL SHIM PLATES FOR TERMINATION CONNECTIONS, A CONTINUOUS SHIM PLATE (PREFERRED) OR EQUIVALENT INDIVIDUAL SHIM PLATES THE WIDTH OF THE REINFORCING MEMBER MAY BE USED. SHIM THICKNESSES SHALL BE NO LESS THAN 1/16". STACKING OF SHIMS IS PERMITTED.

#### EXISTING MEMBER SCHEDULE

SECTION	NUMBER OF SHIMS	THICKNESS	BOTTOM DIAMETER	TOP DIAMETER	LAP SPICE
1	18	0.3125"	34.25"	34.25"	61"
2	18	0.3125"	27.00"	27.00"	47"
3	18	0.1875"	27.00"	18.50"	

#### TOWER MODIFICATIONS:

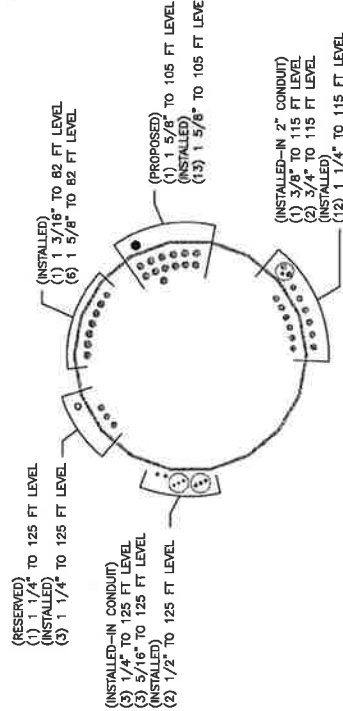
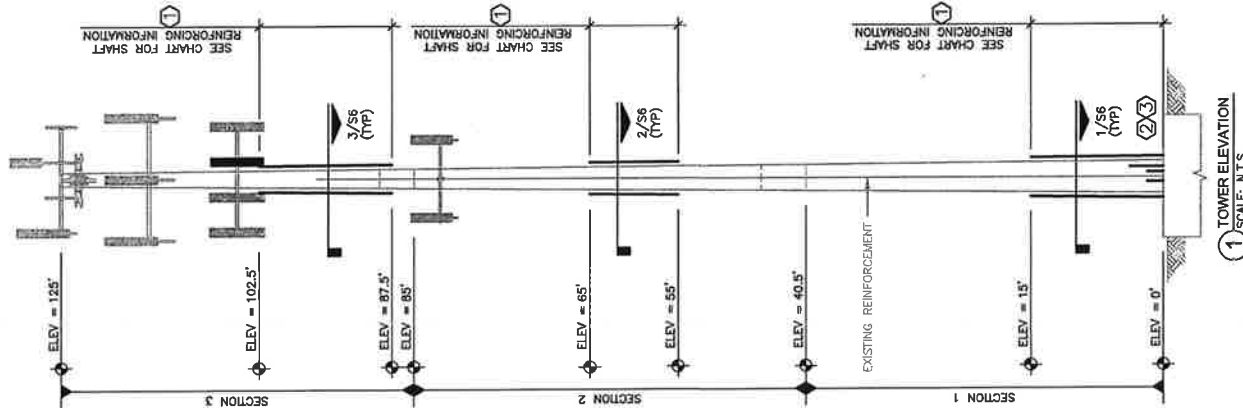
- INSTALL NEW REINFORCING ELEMENTS  
RE: SHEET S6.
  - INSTALL NEW BASE PLATE STIFFENERS  
RE: SHEET S6.
  - REMOVE EXISTING TRANSITION STIFFENER AND INSTALL NEW TRANSITION STIFFENER  
RE: SHEET S6.
- \* CONTRACTOR SHALL BUDGET A SITE VISIT TO CHECK CRITICAL DIMENSIONS AND VERIFY UNKNOWN CONDITIONS PRIOR TO STEEL FABRICATION.  
\*\* MONOPOLE SHIMS AND SHIM LINES MUST BE DISTRIBUTED AS SHOWN IN THE TX LINE DIST. DIAGRAM RE: DETAIL 2/S5.  
\*\*\* CONTRACTOR SHALL PROVIDE TEMPORARY BRACING FOR ALL REMOVE AND REPLACE PROCEDURES. MODIFICATIONS SHALL BE COMPLETED PRIOR TO BEGINNING THE PROPOSED APPURTENANCES.

EXISTING TOWER HAS BEEN PREVIOUSLY MODIFIED.  
REFERENCE DRAWINGS BY SEMAAN ENGINEERING SOLUTIONS, INC. DATED 12/08/04

EXISTING TOWER HAS BEEN PREVIOUSLY MODIFIED.  
REFERENCE DRAWINGS BY VERTICAL STRUCTURES, INC. DATED 10/09/07

EXISTING TOWER HAS BEEN PREVIOUSLY MODIFIED.  
REFERENCE DRAWINGS BY B+T GROUP DATED 10/17/12

EXISTING TOWER HAS BEEN PREVIOUSLY MODIFIED.  
REFERENCE DRAWINGS BY B+T GROUP DATED 03/01/13



REV	DATE	DESCRIPTION
0	03/21/13	ISSUED FOR CONSTRUCTION

PROJECT NO: 6470013.01  
 PROJECT ENG: ASHKAN SHAHEZADEH  
 DRAWN BY: UUL/GLS  
 CHECKED BY: SSC

B+T ENGINEERING, INC.

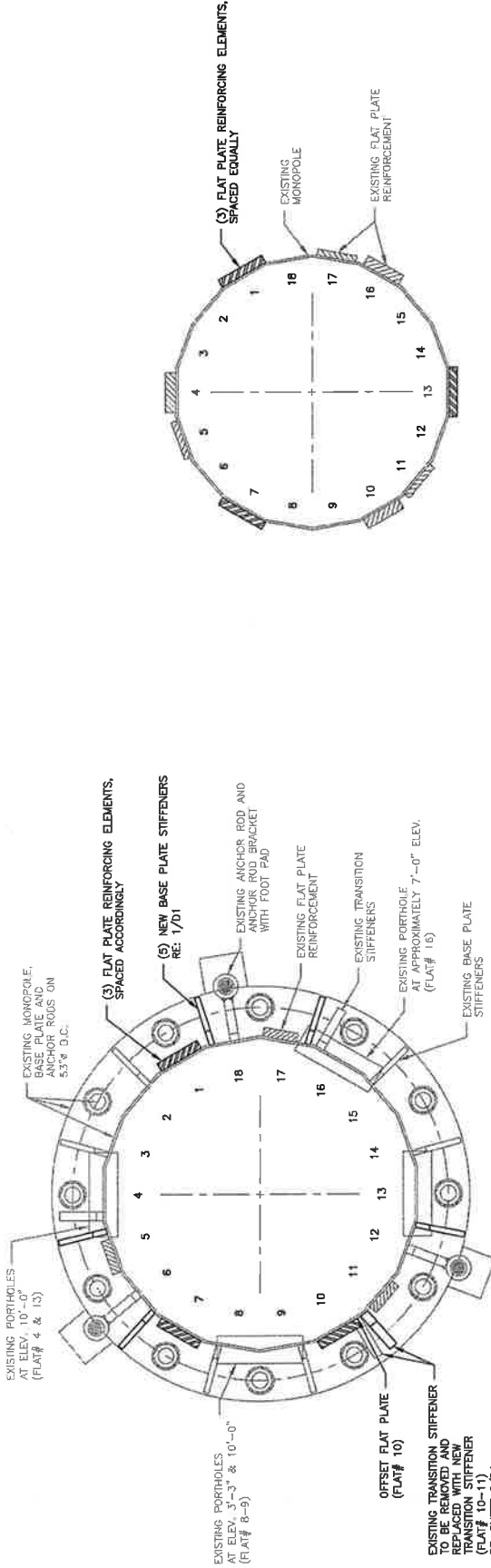
STATE OF OKLAHOMA  
 PROFESSIONAL ENGINEER  
 No. 23824

THIS SEAL IS VALID ONLY IF THE ENGINEER HAS COMPLETED THE CONTINUING EDUCATION REQUIREMENTS AND IS CURRENTLY LICENSED IN THE STATE OF OKLAHOMA.

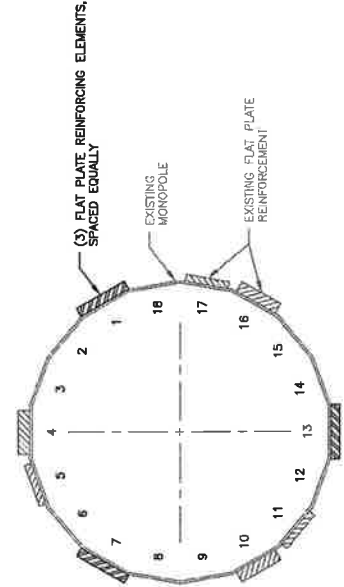
CROMWELL / FIRST LINE  
 EMERGENC  
 8763684  
 201 MAIN ST.  
 CROMWELL, CT  
 EXISTING 125' MONOPOLE

SHEET TITLE  
 TOWER SECTIONS  
 (0'-15', 55'-65' AND 87.5'-102.5')

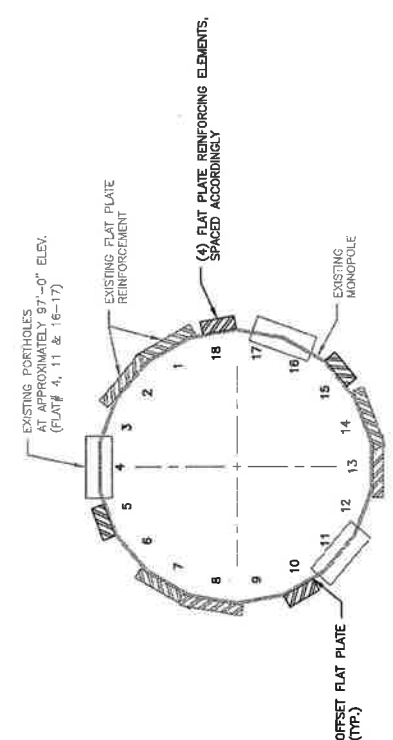
SHEET NUMBER: **S6**  
 REVISION: **0**



**1** TOWER SECTION (0'-15')  
 SCALE: N.T.S.



**2** TOWER SECTION (55'-65')  
 SCALE: N.T.S.



**3** TOWER SECTION (87.5'-102.5')  
 SCALE: N.T.S.

**B+T GRP**  
 1777 S. BOULDER AVE  
 SUITE 100  
 TULSA, OK 74119  
 PH: (918) 587-4830  
 www.btgrp.com

**CROWN  
 CASTLE**

REV.	DATE	DESCRIPTION
0	02/21/15	ISSUED FOR CONSTRUCTION

PROJECT NO: 84470103.01  
 PROJECT ENG: ASHKAN GHABEZADEH  
 DRAWN BY: UUU/GLS  
 CHECKED BY: SSC

B+T ENGINEERING, INC.



ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE PROVISIONS OF THE OREGON ENGINEERING ACT AND THE RULES AND REGULATIONS OF A LICENSED PROFESSIONAL ENGINEER, TO WHOM THIS DOCUMENT IS SUBMITTED.

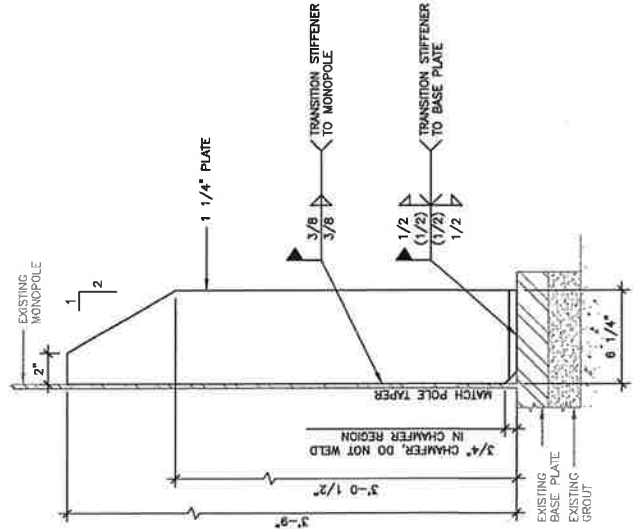
CROMWELL / FIRST LINE  
 EMERGENC  
 876584  
 201 MAIN ST.  
 CROMWELL, CT

EXISTING 12" MONOPOLE

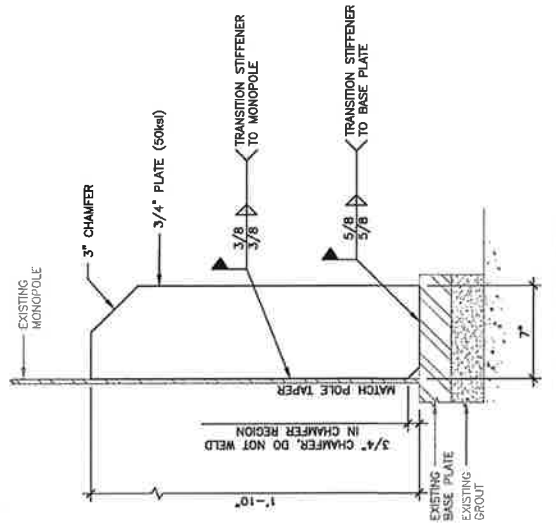
SHEET TITLE  
 BASE PLATE STIFFENER  
 DETAIL AND TRANSITION  
 STIFFENER DETAIL

SHEET NUMBER  
**D1**

REVISION  
**0**



2) TRANSITION STIFFENER DETAIL  
 SCALE: N.T.S.



1) BASE PLATE STIFFENER DETAIL  
 SCALE: N.T.S.

**B+T GRP**  
 1777 S. BOULDER AVE  
 SUITE 200  
 TULSA, OK 74119  
 PH: (918) 587-4830  
 www.btgpp.com

# CROWN CASTLE

REV	DATE	DESCRIPTION
0	05/21/19	ISSUED FOR CONSTRUCTION

PROJECT NO: 8447019.01  
 PROJECT ENG: ASHKAN GHAEZANDEH  
 DRAWN BY: DUJ/GLS  
 CHECKED BY: SSC

B+T ENGINEERING, INC.

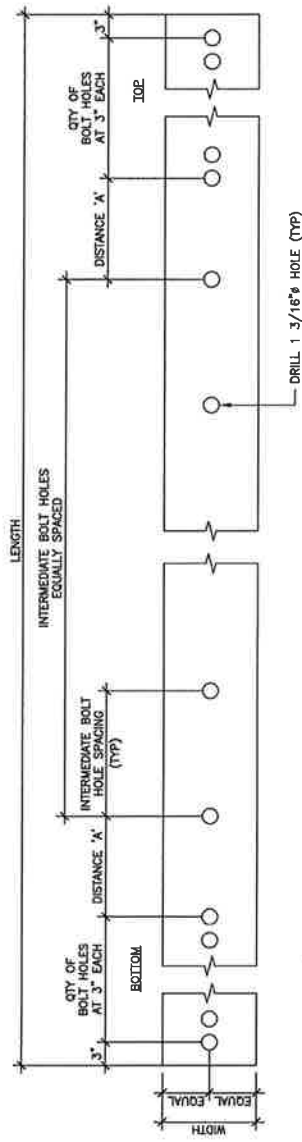
IS A NOTATION OF LAW FOR ANY PERSON  
 TO BE A LICENSED PROFESSIONAL ENGINEER TO  
 SIGN THIS DOCUMENT.

CROMWELL / FIRST LINE  
 EMERGENC  
 876364  
 201 MAIN ST.  
 CROMWELL, CT  
 EXISTING 127 MONOPOLE

SHEET TITLE  
 PART DETAIL

SHEET NUMBER  
**D2**

REVISION  
**0**



1 PART DETAIL  
 SCALE: N.T.S.

FLAT PLATE DESIGNATION	BLACK WEIGHT (LBS)	WIDTH	THICKNESS	LENGTH	DISTANCE 'A'	TOTAL QTY OF 3/16" BOLT HOLES	QTY OF BOLT HOLES (BOTTOM END)	QTY OF BOLT HOLES (TOP END)	INTERMEDIATE BOLT HOLE SPACING
CC-CFP-032512515	207	3 1/4"	1 1/4"	15'-0"	1'-3"	16	5	5	2'-0"



**B+T GRP**  
 5775 S. BOULDER AVE  
 TULSA, OK 74119  
 PH: (918) 587-4890  
 www.b+trp.com

# CROWN CASTLE

REV.	DATE	DESCRIPTION
0	02/21/13	ISSUED FOR CONSTRUCTION

PROJECT NO.:	847010101
PROJECT ENG.:	ASHKAN GHAEZADEH
DRAWN BY:	DUJ/GLS
CHECKED BY:	SSC

B+T ENGINEERING, INC.

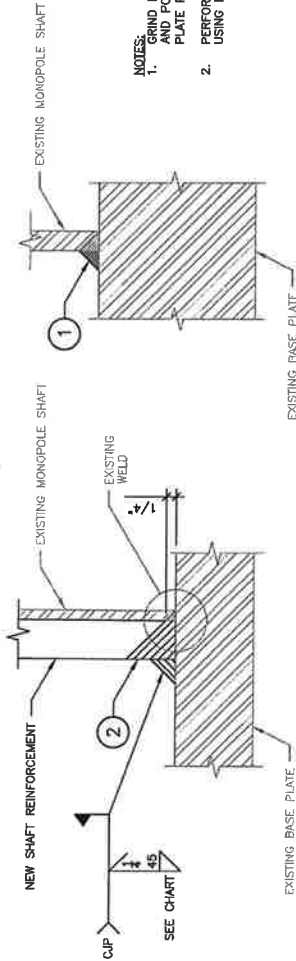


IF A REVISED SHEET IS USED, THE REVISION NUMBER SHALL BE INDICATED IN THE CORNER OF A LISTING UNDER THE REVISION NUMBER, TO AVOID THIS DOCUMENT.

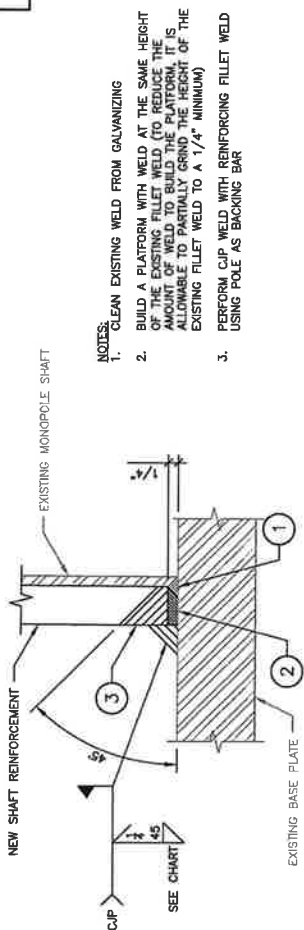
CROMWELL / FIRST LINE  
 EMERGENCY  
 8763864  
 201 MAIN ST.  
 CROMWELL, CT  
 EXISTING 120' MONOPOLE

SHEET TITLE  
 DETAILS

SHEET NUMBER	D3
REVISIONS	0



1 WELD DETAIL-OPTION 1  
 SCALE: N.T.S.



2 WELD DETAIL-OPTION 2  
 SCALE: N.T.S.

- NOTES:**
- GRIND EXISTING FILLET WELD FLUSH TO BASE PLATE AND POLE FOR THE WIDTH OF THE REINFORCEMENT PLATE PLUS 1/4" ON EACH SIDE (DO NOT OVER GRIND)
  - PERFORM CJP WELD WITH REINFORCING FILLET WELD USING POLE AS BACKING BAR

PART NUMBER	PLATE SIZE	MINIMUM REINFORCING WELD
CCI-WSFP-040075 CCI-WAFP-040075	3/4" x 4"	1/4"
CCI-WSFP-045100 CCI-WAFP-045100	1" x 4 1/2"	1/4"
CCI-WSFP-080100 CCI-WAFP-080100	1" x 6"	3/8"
CCI-WSFP-085125 CCI-WAFP-085125	1 1/4" x 6 1/2"	1/2"
CCI-WSFP-085125 CCI-WAFP-085125	1 1/4" x 8 1/2"	5/8"

- NOTES:**
- CLEAN EXISTING WELD FROM GALVANIZING
  - BUILD A PLATFORM WITH WELD AT THE SAME HEIGHT OF THE EXISTING FILLET WELD (TO REDUCE THE WELD TO BUILD THE PLATFORM, IT IS ALLOWABLE TO REINFORCE WITH A PORTION OF THE EXISTING FILLET WELD TO A 1/4" MINIMUM)
  - PERFORM CJP WELD WITH REINFORCING FILLET WELD USING POLE AS BACKING BAR

# TOWER MODIFICATION DRAWINGS PREPARED FOR: CROWN CASTLE

## PROJECT CONTACTS:

### 1. CROWN PROJECT MANAGER

JOHN MCGEE  
(704) 877-8397  
JOHN.MCGEE@CROWNCastle.COM

### 2. CROWN CONSTRUCTION MANAGER

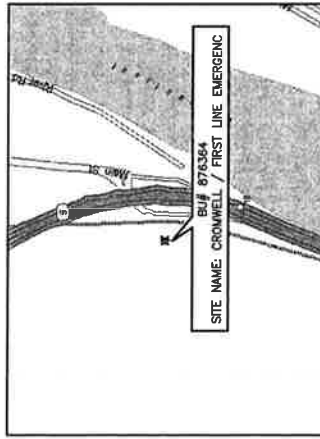
JASON D'AMICO  
(860) 209-0104  
JASON.D'AMICO.VENDOR@CROWNCastle.COM

### 3. B+T GROUP RFI CONTACT

ASHKAN GHAEZADEH  
(918) 587-4630  
AGHAEZADEH@BTGRP.COM  
MODDWGS@BTGRP.COM  
1717 S BOULDER AVENUE, SUITE 300  
TULSA, OK 74119

## SITE ADDRESS:

201 MAIN ST.  
CROMWELL, CT 06416  
MIDDLESEX COUNTY, USA



MAP

## DIRECTIONS

FROM HWY 91 TAKE ROUTE 9 SOUTH, FIRST EXIT CROMWELL/PORLAND (EXIT 19), TAKE A RIGHT ON MAIN STREET (ROUTE 99), FOLLOW 99 TO JUNCTION W/ROUTE 99. TOWER IS AT 200 MAIN STREET ON THE RIGHT.

## TOWER INFORMATION

TOWER MANUFACTURER / DWG #: EEI / GS52064  
TOWER HEIGHT / TYPE: 125' MONOPOLE  
TOWER LOCATION: LAT. 41° 35' 0.11"  
LONG. -72° 38' 59.14"  
DATUM: (NAD 1983) ELEV. 6 FT A MSL  
STRUCTURAL DESIGN DRAWING REPORT: B+T GROUP / WO. # 1057980  
STRUCTURAL ANALYSIS REPORT: B+T GROUP / WO. # 1047197  
APPLICATION ID / REVISION #: 04/24/15  
CCSITES DOCUMENT ID: 292878 / 0  
5650782

## CODE COMPLIANCE

THIS REINFORCEMENT DESIGN IS BASED ON THE REQUIREMENTS OF TIA/EIA-222.F STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND ANTENNA SUPPORTING STRUCTURES USING A FASTEST MILE WIND SPEED OF 86 MPH WITH NO ICE, 37.6 MPH WITH 0.75 INCH ICE THICKNESS AND 50 MPH UNDER SERVICE LOADS.

## DRAWINGS INCLUDED

SHEET NUMBER	DESCRIPTION
S1	TITLE SHEET
S2	MODIFICATION INSPECTION NOTES AND CHECKLIST
S3	GENERAL NOTES, NG2 BOLT NOTES AND DETAIL
S4	FORGBOLT NOTES AND DETAILS
S5	TOWER ELEV., SCHEDULE AND TX LINE DIST. DIAGRAM
S6	TOWER SECTIONS (0'-15', 55'-65' AND 87.5'-102.5')
D1	BASE PLATE STIFFENER DETAIL AND TRANSITION
D2	STIFFENER DETAIL
D3	PART DETAIL
	DETAILS

ATTENTION ALL CONTRACTORS, ANYTIME YOU ACCESS A CROWN SITE FOR ANY REASON YOU ARE TO CALL THE CROWN NOC UPON ARRIVAL AND DEPARTURE, DAILY AT 800-788-7011.



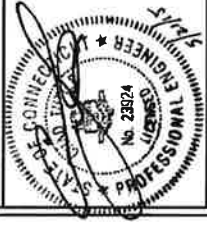
B+T GRP  
1717 S BOULDER AVE.  
TULSA, OK 74119  
PH: (918) 587-4630  
www.btgrp.com

CROWN  
CASTLE

REV	DATE	DESCRIPTION
0	05/21/13	ISSUED FOR CONSTRUCTION

PROJECT NO.:	B47R013101
PROJECT ENG.:	ASHKAN GHAEZADEH
DRAWN BY:	DUJ/GS
CHECKED BY:	SSC

B+T ENGINEERING, INC.



IF A UNIVERSITY OF THE ARTS AND SCIENCES HAS BEEN ESTABLISHED IN THE STATE OF OKLAHOMA, THE UNIVERSITY SHALL BE THE AUTHORITY TO ISSUE A LICENSE TO PRACTICE ENGINEERING IN THIS STATE.

CROMWELL / FIRST LINE  
EMERGENC  
876364  
201 MAIN ST.  
CROMWELL, CT

SHEET TITLE  
TITLE SHEET

SHEET NUMBER: S1  
REVISION: 0

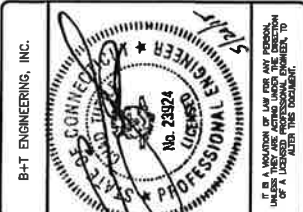


**B+T GRP**  
 1775 S. BOULDER AVE  
 TULSA, OK 74118  
 PH: (918) 587-4880  
 www.b+trp.com

# CROWN CASTLE

REV	DATE	DESCRIPTION
0	05/21/13	ISSUED FOR CONSTRUCTION

PROJECT NO: 847010101  
 PROJECT ENG: ASHAKAN GHANESHAZADEH  
 DRAWN BY: UDU/GBS  
 CHECKED BY: SSC



**B+T ENGINEERING, INC.**  
 EMERGENC  
 876364  
 201 MAIN ST.  
 CROMWELL, CT  
 EXISTING 129 MONOPOLE

SHEET TITLE  
**MODIFICATION INSPECTION NOTES AND CHECKLIST**

SHEET NUMBER: **S2**  
 REVISIONS: **0**

**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 MI INSPECTIONS, INCLUDING FOUNDATION INSPECTIONS
  - BETTER UNDERSTAND ALL INSPECTION AND TESTING REQUIREMENTS
- THE GC SHALL PERFORM AND RECORD THE TEST AND INSPECTION RESULTS IN ACCORDANCE WITH THE REQUIREMENTS OF THE MI CHECKLIST AND ENG-SOW-10007.

**RECOMMENDATIONS**

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

- IT IS SUGGESTED THAT THE GC PROVIDE A MINIMUM OF 5 BUSINESS DAYS NOTICE PREFERABLY 10, TO THE MI INSPECTOR AS TO WHEN THE SITE WILL BE READY FOR THE MI TO BE CONDUCTED.
- THE GC AND MI INSPECTOR COORDINATE CLOSELY THROUGHOUT THE ENTIRE PROJECT.
- IF THE GC HAS ANY CONCERNS REGARDING THE MI INSPECTOR ON-SITE, THEY SHOULD BE RAISED IMMEDIATELY FOR ANY CLARIFICATION OR TO PREVENT DELAYS.
- IT MAY BE BENEFICIAL TO INSTALL ALL TOWER MODIFICATIONS PRIOR TO CONDUCTING THE FOUNDATION INSPECTIONS TO ALLOW FOUNDATION AND MI INSPECTIONS(S) TO COMMENCE WITH ONE SITE VISIT.
- WHEN POSSIBLE, IT IS PREFERRED TO HAVE THE GC AND MI INSPECTOR ON-SITE DURING THE FOUNDATION INSPECTIONS TO ENSURE ALL NECESSARY INFORMATION IS COLLECTED AND TO CHOOSE TO COORDINATE WITH THE MI CHECKLIST 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 LOSS OF WEATHER AND/OR DELAYS, CROWN SHALL NOT BE RESPONSIBLE FOR ANY COSTS, FEES, INQUIRY BY EITHER PARTY FOR ANY TIME (E.G. TRAVEL AND LODGING COSTS, ETC.) INCURRED BY EITHER PARTY. IF CROWN CONTRACTS DIRECTLY FOR A THIRD PARTY, MI EXPECTATIONS MAY BE MADE IN THE EVENT THAT THE DELAY/CANCELLATION IS CAUSED BY WEATHER OR OTHER CONDITIONS THAT MAY COMPROMISE THE SAFETY OF THE PARTIES INVOLVED.

**CORRECTION OF FAILING MI'S**

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

- CORRECT FAILING ISSUES TO COMPLY WITH THE SPECIFICATIONS CONTAINED IN THE ORIGINAL CONTRACT DOCUMENTS AND COORDINATE A SUPPLEMENT MI.
- OR, WITH CROWN'S APPROVAL, THE GC MAY WORK WITH THE EOR TO RE-ANALYZE THE MODIFICATION/REINFORCEMENT USING THE AS-BUILT CONDITION.

**MI VERIFICATION INSPECTIONS**

CROWN RESERVES THE RIGHT TO CONDUCT A MI VERIFICATION INSPECTION TO VERIFY THE ACCURACY AND COMPLETENESS OF PREVIOUSLY COMPLETED MI INSPECTIONS(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/ASSEY FIRM AFTER A MODIFICATION PROJECT IS COMPLETED, AS MARKED BY THE DATE OF AN ACCEPTED "PASSING MI" OR "PASS AS NOTED MI" REPORT FOR THE ORIGINAL PROJECT.

REQUIRED PHOTOS  
 BETWEEN THE GC AND 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 FOLLOW UP MATERIALS
- PHOTOS OF ALL CRITICAL DETAILS
- FOUNDATION MODIFICATIONS
- WELD PREPARATION
- WELD INSTALLATION AND TORQUE
- FINAL INSTALLATION CONDITION
- SURFACE COATING REPAIR
- POST CONSTRUCTION PHOTOGRAPHS
- FINAL INFELD 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

REQUIRED	REPORT ITEM	BRIEF DESCRIPTION
	<b>PRE-CONSTRUCTION</b>	
X	MI CHECKLIST DRAWING	THIS CHECKLIST SHALL BE INCLUDED IN THE MI REPORT.
X	EOR APPROVAL	ONCE THE PRE-MODIFICATION MAPPING IS COMPLETE AND PRIOR TO FABRICATION, THE CONTRACTOR SHALL PROVIDE DETAILED ASSEMBLY DRAWINGS AND/OR SHOP DRAWINGS AS NECESSARY FOR NON-STANDARD PARTS. THESE ARE TO INCLUDE, BUT ARE NOT LIMITED TO, A VISUAL LAYOUT OF NEW REINFORCEMENT, EXISTING REINFORCEMENT CONFIGURATIONS, PORTHOLES, MOUNTS, STEP PEGS, SAFETY CLIMBS AND ANY OTHER MISCELLANEOUS ITEMS WHICH MAY BE NECESSARY FOR THE MODIFICATION. ALL INSTALLATION CONDITIONS ON THE TOWER THESE DRAWINGS SHALL BE SUBMITTED TO THE EOR FOR APPROVAL. APPROVED ASSEMBLY/SHOP DRAWINGS SHALL BE SUBMITTED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	FABRICATION INSPECTION	A LETTER FROM THE FABRICATOR STATING THAT THE WORK WAS PERFORMED IN ACCORDANCE WITH INDUSTRY STANDARDS AND THE CONTRACT DOCUMENTS SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
N/A	FABRICATOR CERTIFIED WELD INSPECTION	A VISUAL OBSERVATION OF A PORTION OF THE PROPOSED STRUCTURAL MEMBERS IS REQUIRED AND A WRITTEN REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	MATERIAL TEST REPORT (MTR)	MI CERTIFICATION SHALL BE PROVIDED FOR ALL STEEL AS SPECIFIED IN THE MODIFICATION DRAWINGS AND THIS DOCUMENTATION SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
N/A	FABRICATOR NDE INSPECTION	CRITICAL SHOP WELDS THAT REQUIRE TESTING (PER ENG-STD-10069) ARE NOTED ON THESE CONTRACT DRAWINGS. A CERTIFIED WELD INSPECTOR SHALL PERFORM NON-DESTRUCTIVE EXAMINATION AND A REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
N/A	NDE REPORT OF MONOPOLE BASE PLATE	A NDE (PER ENG-SOW-10003) OF THE POLE TO BASE PLATE CONNECTION IS REQUIRED AND A WRITTEN REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	PACKING SLIPS	THE MATERIAL SHIPPING LIST SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
	<b>CONSTRUCTION (PERFORMED BY CONTRACTOR)</b>	
X	CONSTRUCTION INSPECTIONS	A LETTER FROM THE GENERAL CONTRACTOR STATING THAT THE WORKMANSHIP WAS PERFORMED IN ACCORDANCE WITH INDUSTRY STANDARDS AND THESE CONTRACT DRAWINGS.
N/A	FOUNDATION INSPECTIONS	A VISUAL OBSERVATION OF THE EXCAVATION AND REBAR SHALL BE PERFORMED BEFORE PLACING THE CONCRETE. A WRITTEN REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
N/A	CONCRETE COMP. STRENGTH AND SLUMP TESTS	THE CONCRETE MIX DESIGN, SLUMP TEST, AND COMPRESSIVE STRENGTH TESTS SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
N/A	POST INSTALLED ANCHOR ROD VERIFICATION	POST INSTALLED ANCHOR ROD VERIFICATION SHALL BE PERFORMED IN ACCORDANCE WITH CROWN REQUIREMENTS AND A REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
N/A	BASE PLATE GROUT VERIFICATION	THE GENERAL CONTRACTOR SHALL PROVIDE DOCUMENTATION TO THE MI INSPECTOR THAT CERTIFIES THAT THE GROUT WAS INSTALLED IN ACCORDANCE WITH CROWN ENG-PRC-10012 FOR INCLUSION IN THE MI REPORT.
X	CONTRACTOR'S CERTIFIED WELD INSPECTION	A CERTIFIED WELD INSPECTOR SHALL INSPECT AND TEST AS NECESSARY ALL FIELD WELDS. CWI SHALL FOLLOW ALL THE PROCEDURES SPECIFIED IN CROWN STANDARD DOCUMENTS ENG-SOW-10066, ENG-STD-10069 AND SRV-STD-10159. A REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT. FULL PENETRATION WELDS IN D11.1 VERTICAL PENETRATION WELDS SHALL BE REQUIRED TO BE 100% NDE INSPECTED BY UT IN ACCORDANCE WITH AWS D11.1. VERTICAL PENETRATION WELDS IN THE VICINITY OF BASE OF THE TOWER ARE REQUIRED TO BE 50% NDE INSPECTED BY MP IN ACCORDANCE WITH AWS D11.1.
N/A	EARTHWORK: LIFT AND DENSITY	FOUNDATION SUB-GRASSES SHALL BE INSPECTED AND APPROVED BY A GEOTECHNICAL ENGINEER AND A REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	ON SITE COLD GALVANIZING VERIFICATION	THE GENERAL CONTRACTOR SHALL PROVIDE DOCUMENTATION TO THE MI INSPECTOR VERIFYING THAT ANY ON-SITE COLD GALVANIZING WAS APPLIED IN ACCORDANCE WITH ENG-BUL-10145.
N/A	GUY WIRE TENSION REPORT	THE GENERAL CONTRACTOR SHALL PROVIDE A REPORT TO THE MI INSPECTOR INDICATING THE TEMPERATURE AND TENSION IN EVERY GUY CABLE AS PART OF PILING AND TENSION PROCEDURE FOR INCLUSION IN THE MI REPORT.
X	GC AS-BUILT DOCUMENTS	THE GENERAL CONTRACTOR SHALL SUBMIT A COPY OF THE CONTRACT DRAWINGS EITHER STATING "INSTALLED AS DESIGNED" OR NOTING ANY CHANGES THAT WERE REQUIRED AND APPROVED BY THE ENGINEER OF RECORD.
	<b>POST-CONSTRUCTION</b>	
X	MI INSPECTOR REDLINE OR RECORD DRAWING(S)	THE MI INSPECTOR SHALL OBSERVE AND REPORT ANY DISCREPANCIES BETWEEN THE CONTRACTORS REDLINE DRAWING AND THE ACTUAL COMPLETED INSTALLATION.
N/A	POST INSTALLED ANCHOR ROD PULL-OUT TESTING	SOME INSTALLED ANCHOR RODS SHALL BE TESTED IN ACCORDANCE WITH ENG-PRC-10119 AND A REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	PHOTOGRAPHS	PHOTOGRAPHS SHALL BE SUBMITTED TO THE MI WHICH DOCUMENT ALL PHASES OF THE CONSTRUCTION. THE PHOTOS SHALL BE ORGANIZED IN A MANNER THAT EASILY IDENTIFIES THE EXACT LOCATION OF THE PHOTO.
	ADDITIONAL TESTING AND INSPECTIONS:	

NOTE: X DENOTES A DOCUMENT NEEDED FOR THE MI REPORT AND N/A DENOTES A DOCUMENT THAT IS NOT REQUIRED FOR THE MI REPORT

**MODIFICATION INSPECTION NOTES:**

**GENERAL**  
 THE MODIFICATION INSPECTION (MI) IS A VISUAL INSPECTION OF TOWER MODIFICATIONS AND A REVIEW OF CONSTRUCTION INSPECTIONS AND OTHER REPORTS TO ENSURE THE INSTALLATION WAS CONSTRUCTED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS, NAMELY THE MODIFICATION DRAWINGS, AS DESIGNED BY THE ENGINEER OF RECORD (EOR).  
 THE MI IS TO CONFIRM INSTALLATION CONFIGURATION AND WORKMANSHIP ONLY AND IS NOT A REVIEW OF THE MODIFICATION DESIGN ITSELF, NOR DOES THE MI INSPECTOR TAKE OWNERSHIP OF THE MODIFICATION DESIGN. OWNERSHIP OF THE STRUCTURAL MODIFICATION DESIGN EFFECTIVENESS AND INTEGRITY REMAINS WITH THE EOR AT ALL TIMES.  
 ALL MI'S SHALL BE CONDUCTED BY A CROWN ENGINEERING SERVICE (AESV) OR ENGINEERING SERVICE VENDOR (ESV) 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.





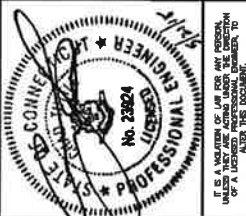
**B+T GRP**  
 6775 BOULDER AVE  
 TULSA, OK 74118  
 PH: (918) 587-4880  
 www.b+tgpr.com

# CROWN CASTLE

REV	DATE	DESCRIPTION
0	02/21/15	ISSUED FOR CONSTRUCTION

PROJECT NO: B47D013.01  
 PROJECT ENG: ASHKAN GHAEZAZADEH  
 DRAWN BY: UJJ/GSS  
 CHECKED BY: SSC

B+T ENGINEERING, INC.



CROWNELL / FIRST LINE  
 EMERGENC  
 876884  
 201 MAIN ST.  
 CROWNELL, CT  
 EXISTING 125' MONOPOLE

SHEET TITLE  
 GENERAL NOTES, NG2 BOLT  
 NOTES AND DETAIL

SHEET NUMBER: **S3**  
 REVISION: **0**

## GENERAL NOTES

- 1.1 ALL WORK SHALL COMPLY WITH THE TM/TM-222-F STANDARD AS WELL AS ANY OTHER GOVERNING BUILDING CODES.
  - 1.2 FIELD WORK WILL BE DONE AROUND EXISTING COAXIAL CABLE AND EQUIPMENT. ALL WORK SHALL BE DONE IN A MANNER SUCH AS TO AVOID DAMAGE TO EXISTING EQUIPMENT OR STRUCTURE.
  - 1.3 A MINIMUM OF TWO COATS OF ZINCA COLD GALVANIZING COMPOUND (OR APPROVED EQUIVALENT) SHALL BE APPLIED TO ANY FIELD CUTS OR FIELD DRILLED HOLES.
  - 1.4 THE USE OF A GAS TORCH OR WELDER WILL NOT BE PERMITTED IN THE FIELD.
  - 1.5 ANALYSIS PERFORMED BY AN ENGINEER LICENSED IN THE STATE THE TOWER IS LOCATED. THE ANALYSIS SHALL USE A MINIMUM WIND SPEED OF 45 mph (3-SEC) PER TM-1019.
- FABRICATION**
- 2.1 ALL WORK SHALL BE DONE IN ACCORDANCE WITH A.I.S.C. SPECIFICATIONS FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS.
  - 2.2 STRUCTURAL STEEL SHALL MEET THE FOLLOWING SPECIFICATIONS:  
 A. STEEL SHAPES AND PLATES, U.N.O. YIELD **ASTM SPECS A572 65ksi**
  - 2.3 ALL NEW MATERIAL INCLUDING STRUCTURAL STEEL AND FASTENERS SHALL BE HOT DIPPED GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123.
  - 2.4 WELDING SHALL MEET AWS/D1.1 STRUCTURAL WELDING CODE (LATEST REVISION). ELECTRODES SHALL BE E80 SERIES.
  - 2.5 CONTRACTOR SHALL PROVIDE SHOP FABRICATION DRAWINGS TO B+T GROUP 5 DAYS PRIOR TO FABRICATION.

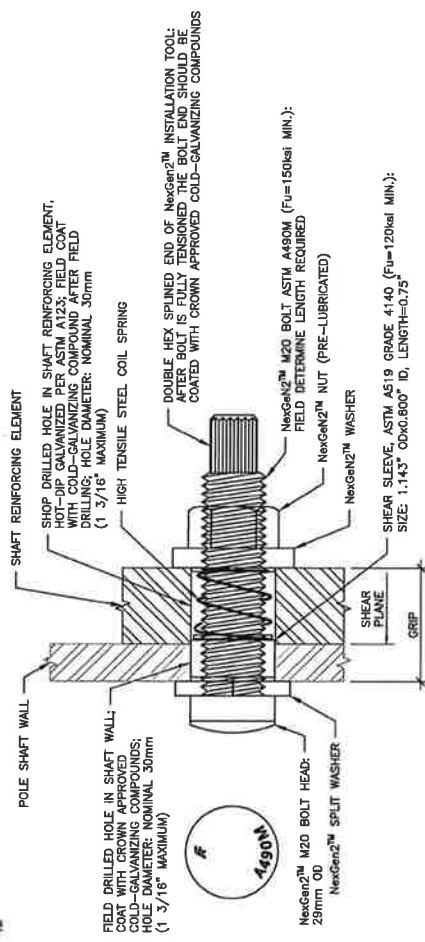
## KEY NOTES

TOWER MODIFICATION I.D.

- NOTES:**
1. ALL STRUCTURAL BOLTS SHALL BE INSTALLED AND TIGHTENED TO THE PRE-TENSIONED CONDITION ACCORDING TO THE REQUIREMENTS OF THE AISC 'SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS', DEC. 31, 2009.
  2. ALL STRUCTURAL BOLTS SHALL BE INSPECTED ACCORDING TO THE REQUIREMENTS OF THE AISC 'SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS', DEC. 31, 2009.
  3. ALL M20 BOLTS WITH SHEAR SLEEVES SHALL BE PRE-TENSIONED AND TIGHTENED UNTIL THE DIRECT TENSION INDICATOR (DTI) WASHERS SHOW THAT THE PROPER BOLT TENSION HAS BEEN REACHED. SEE NOTES AND DETAIL BELOW FOR THE USE OF DIRECT TENSION INDICATOR (DTI) WASHERS WITH THE BLIND M20 BOLTS.
  4. ALL STRUCTURAL 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 F438 AND HAVE A HARDNESS OF HRC 38 OR HIGHER.
  5. AS AN ALTERNATIVE TO USING DTI WASHERS, STRUCTURAL BOLTS MAY BE PRE-TENSIONED PER ASC TURN-OF-NUT METHOD.



INTERIOR OF POLE SHAFT    EXTERIOR OF POLE SHAFT



**TYPICAL NG2 BOLT DETAIL**

1 TYPICAL NG2 BOLT DETAIL  
 SCALE: N.T.S.

- NOTES:**
1. ALL SHOP AND FIELD DRILLED HOLES SHALL BE NOMINAL 30mm DIAMETER. THE MAXIMUM HOLE DIAMETER PERMITTED IS 1 3/16\".
  2. NexGen2™ COMPLETE ASSEMBLY SHALL BE MAGN 565 COATED PER ASTM F2833 AS APPROPRIATE.
  3. INSTALL PER MANUFACTURER'S INSTRUCTIONS.



REV	DATE	DESCRIPTION
0	02/21/13	ISSUED FOR CONSTRUCTION

PROJECT NO: 84470103.01  
PROJECT ENG: ASHKAN SHAHEZADEH  
DRAWN BY: DUJ/GJS  
CHECKED BY: SSC

B+T ENGINEERING, INC.

IF A MEMBER OF THE PROFESSION HAS BEEN DISCIPLINED BY THE BOARD OF PROFESSIONAL ENGINEERS, THE DISCIPLINE SHALL BE INDICATED BY A CHECK IN THE BOX PROVIDED NEXT TO HIS DOCUMENT NUMBER.

CROWNWELL / FIRST LINE  
EMERGENC  
8763864  
201 MAIN ST.  
CROWNWELL, CT  
EXISTING 125' MONOPOLE

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

**CCI: FLAT PLATE-BILL OF MATERIALS (65KSI)**

BOTTOM ELEVATION	TOP ELEVATION	FLAT PLATE DESIGNATION*	FLAT PLATE LENGTH	FLAT PLATE QUANTITY	FLAT #	BOLTS PER PLATE	TOTAL QTY	TERMINATION (BOTTOM)	TERMINATION (TOP)	INTERMEDIATE BOLT SPACING	MAXIMUM STEEL WEIGHT
0'	15'	CCI-WSP-06812515	15'-0"	3	1, 7 & 10	18	54	WELD	11	19"	124.3 LBS.
55'	65'	CCI-SFP-06010010	10'-0"	3	1, 7 & 13	20	60	8	8	16"	61.2 LBS.
87.5'	102.5'	CCI-CFP-032512516**	15'-0"	4	5, 10, 15 & 18	16	64	5	5	24"	829 LBS.
								178			2684 LBS.

\*\* SEE CHAP 65 KSI PARTS CATALOG EDITION 2 REV. 1 FOR PART DETAILS

\*\* UNIQUE PART. SEE PART DETAIL SHEET D2

ALL BOLTS SHALL BE PRE-APPROVED BLIND M20 BOLTS WITH HIGH STRENGTH SHEAR SLEEVES (ASTM A519 WITH MIN. Fu=120 KSI). CONTACT SUPPLIER FOR MATERIAL (PLATE AND BOLTS) AND INSTALLATION PROCEDURES.

**NOTES:**

- BLIND BOLTS ARE TO BE 20mm DIAMETER WITH CORRESPONDING 20mm DIAMETER SLEEVE WITH SPECIFIED STEEL GRADE.
- ALL STEEL SHALL BE HOT-DIP GALVANIZED AFTER FABRICATOR 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 ZINC-RICH GALVANIZING COMPOUND. FILM THICKNESS: 1-800-831-3275 FOR PRODUCT INFORMATION.
- ALL SHIMS SHALL BE ASTM A36.
- HOLDS FOR BOLTS AND SHEAR SLEEVES ARE 30mm UNLESS NOTED OTHERWISE.
- IF SCOPE OF MODIFICATION REQUIRES REMOVAL OF TOWER ID TAG, IT MUST BE REPLACED.
- THE CLIMBING EXPRESS, SAFETY CAB AND ALL PARTS THEREOF SHALL NOT BE IMPEDED, MODIFIED OR ALTERED IN ANY MANNER.
- WHERE POSSIBLE, CLIMBING HARDWARE SHOULD REMAIN IN-LINE ALONG THE POLE. IF AN OBSTRUCTION CAUSES A LATERAL OFFSET OF 2'-0" OR MORE, CLIMBING ANCHORS SHALL BE PROVIDED AT EACH CHANGE IN ALIGNMENT. IF NEW REINFORCEMENT REQUIRES STEP BOLT BRACKETS, INSTALL PRIOR TO GALVANIZATION OF STEEL.
- CONTRACTOR SHALL BE RESPONSIBLE FOR PROPER FITTING OF REINFORCEMENT ON MONOPOLES. SHIMS FOR MONOPOLE REINFORCEMENT SHALL BE PROVIDED TO MAINTAIN THE CORRECT POSITION OF THE STEEL MEMBER AND REINFORCING MEMBER EXIST AT FASTENER LOCATIONS. FOR INTERMEDIATE CONNECTIONS, THE MINIMUM SHIM LENGTH SHALL BE THE EQUIVALENT OF THE REINFORCING MEMBER FOR TERMINATION CONNECTIONS. A CONTINUOUS SHIM PLATE (PREFERRED) OR EQUIVALENT INDIVIDUAL SHIM PLATES THE WIDTH OF THE REINFORCING MEMBER MAY BE USED. SHIM THICKNESSES SHALL BE NO LESS THAN 1/16". STACKING OF SHIMS IS PERMITTED.

**EXISTING MEMBER SCHEDULE**

SECTION	NUMBER OF SIZES	THICKNESS	BOTTOM DIAMETER	TOP DIAMETER	LAP SPICE
1	18	0.3125"	44.25"	34.48"	61"
2	18	0.2500"	56.18"	25.75"	47"
3	18	0.1875"	27.00"	19.50"	---

EXISTING TOWER HAS BEEN PREVIOUSLY MODIFIED. REFERENCE DRAWINGS BY SEMAN ENGINEERING SOLUTIONS, INC. DATED 12/08/04

EXISTING TOWER HAS BEEN PREVIOUSLY MODIFIED. REFERENCE DRAWINGS BY VERTICAL STRUCTURES, INC. DATED 10/09/07

EXISTING TOWER HAS BEEN PREVIOUSLY MODIFIED. REFERENCE DRAWINGS BY B+T GROUP DATED 10/17/12

EXISTING TOWER HAS BEEN PREVIOUSLY MODIFIED. REFERENCE DRAWINGS BY B+T GROUP DATED 03/01/13

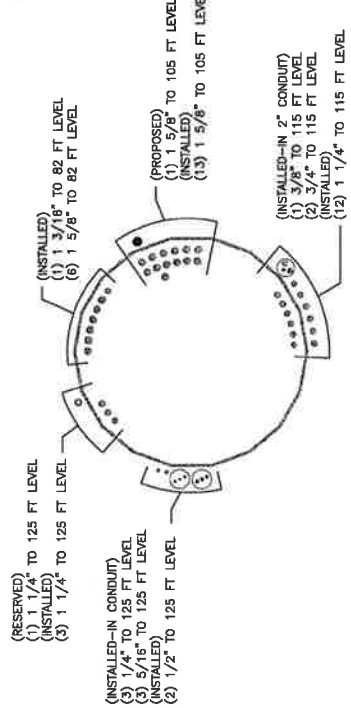
**TOWER MODIFICATIONS:**

- INSTALL NEW REINFORCING ELEMENTS RE: SHEET S6.
- INSTALL NEW BASE PLATE STIFFENERS RE: SHEET S6.
- REMOVE EXISTING TRANSITION STIFFENER AND INSTALL NEW TRANSITION STIFFENER RE: SHEET S6.

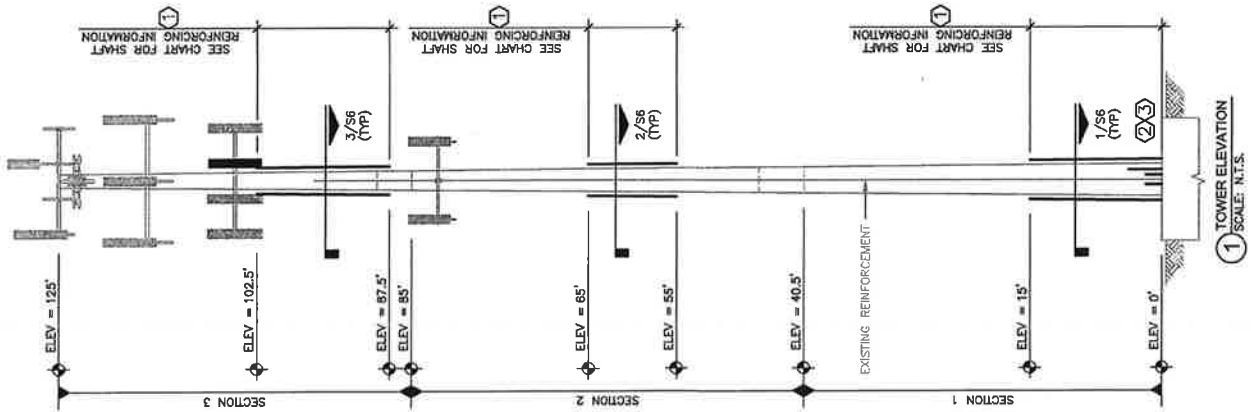
\* CONTRACTOR SHALL BUDGET A SITE VISIT TO CHECK CRITICAL DIMENSIONS AND VERIFY UNKNOWN CONDITIONS PRIOR TO STEEL FABRICATION.

\*\* NEW AND EXISTING REINFORCING ELEMENTS MUST BE DISTRIBUTED AS SHOWN IN THE TX LINE DIST. DIAGRAM RE: DETAIL 2/S5.

\*\*\* CONTRACTOR SHALL PROVIDE TEMPORARY BRACING FOR ALL REMOVE AND REPLACE PROCEDURES. MODIFICATIONS SHALL BE COMPLETED PRIOR TO ADDING THE PROPOSED APPURTENANCES.



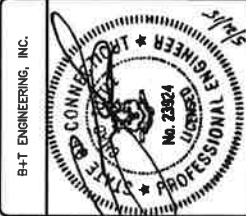
1 TX LINE DISTRIBUTION DIAGRAM  
2 SCALE: N.T.S.



1 TOWER ELEVATION  
SCALE: N.T.S.

ISSUED FOR:	
REV	DATE / DESCRIPTION
0	05/21/15 (ISSUED FOR CONSTRUCTION)

PROJECT NO: 847003.01  
 PROJECT ENG: ASHMAN SHAHZADEH  
 DRAWN BY: UJJ/GLS  
 CHECKED BY: SSC

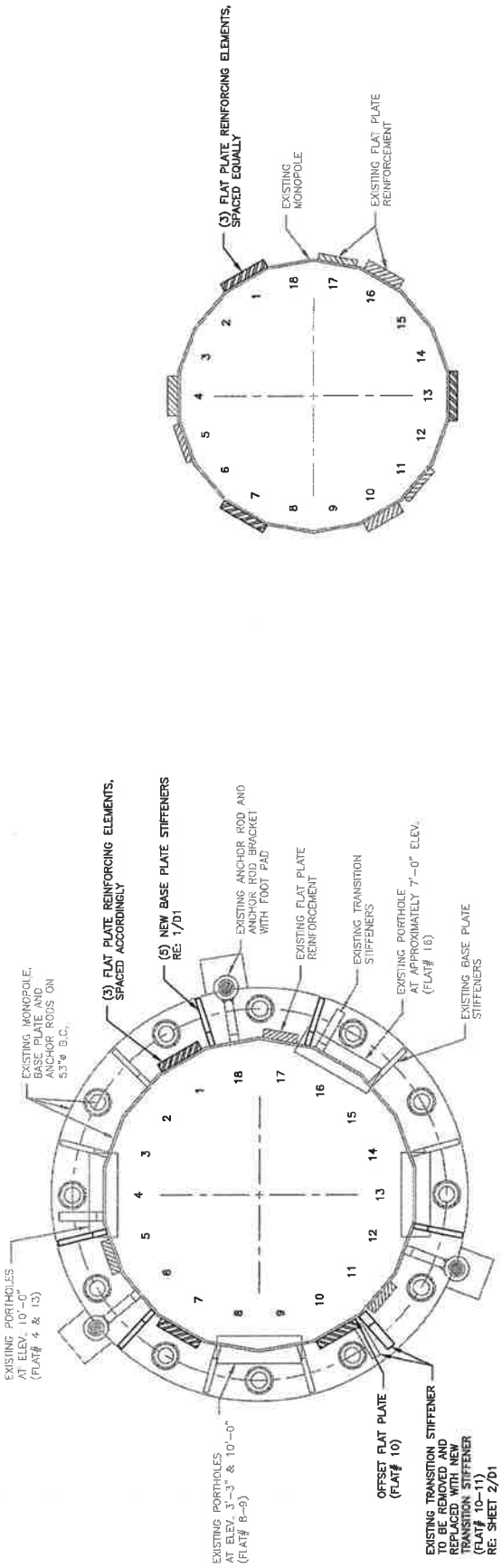


IT IS A VIOLATION OF LAW FOR ANY PERSON UNLESS THEY ARE ACTING UNDER THE SUPERVISION OF A LICENSED PROFESSIONAL ENGINEER TO ALTER THIS DOCUMENT.

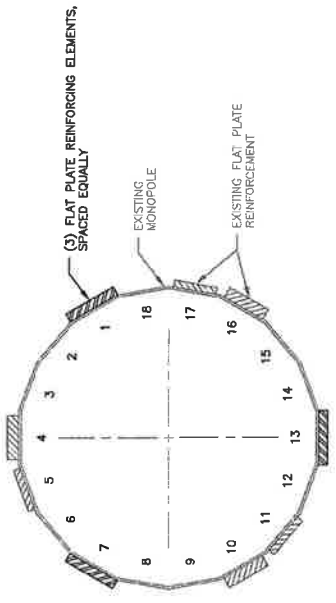
B+T ENGINEERING, INC.  
 CROMWELL / FIRST LINE  
 EMERGENC  
 876364  
 201 MAIN ST  
 CROMWELL, CT  
 EXISTING 125 MONOPOLE

SHEET TITLE  
 TOWER SECTIONS  
 (0'-15', 55'-55" AND 87.5'-102.5')

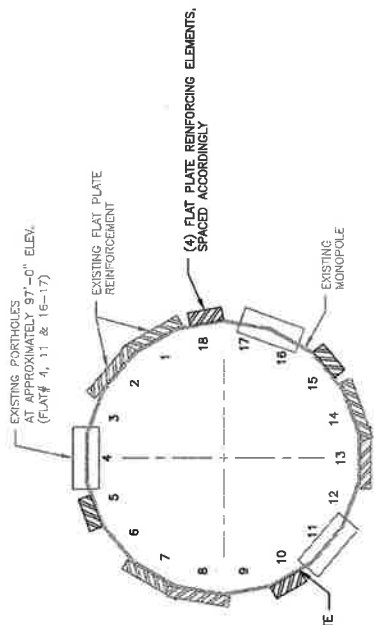
SHEET NUMBER: **S6**  
 REVISION: **0**



1 TOWER SECTION (0'-15')  
 SCALE: N.T.S.



2 TOWER SECTION (55'-55')  
 SCALE: N.T.S.



3 TOWER SECTION (87.5'-102.5')  
 SCALE: N.T.S.

**B+T GRP**  
 1777 S. BOLLINGER AVE  
 SUITE 200  
 TULSA, OK 74116  
 PH: (918) 987-4890  
 www.btgrp.com

# CROWN CASTLE

REV	DATE	DESCRIPTION
0	05/21/15	ISSUED FOR CONSTRUCTION

PROJECT NO: 84270103.01  
 PROJECT ENG: ASHKAN GHAEZADEH  
 DRAWN BY: ULI/UGS  
 CHECKED BY: SSC

B+T ENGINEERING, INC.

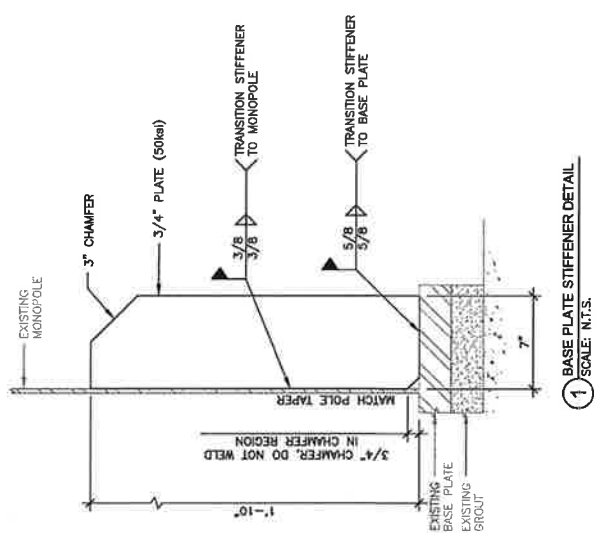
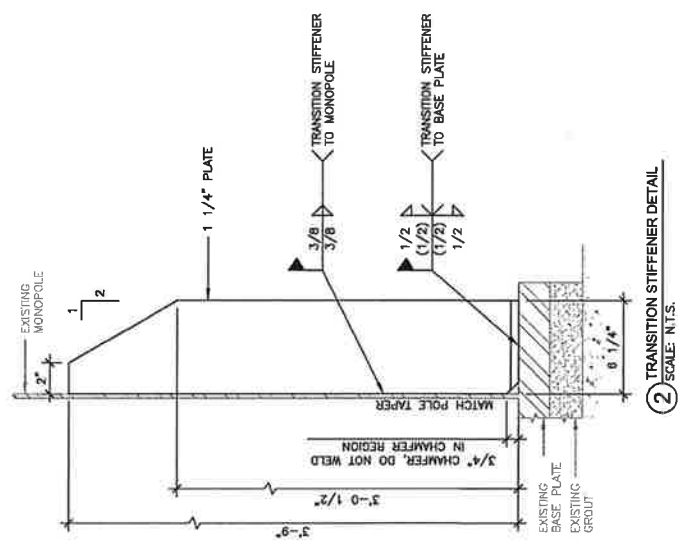


IF IS A PORTION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL TO ALTER THIS DOCUMENT.

CROWMELL / FIRST LINE  
 EMERGENCE  
 876364  
 201 MAIN ST  
 CROWMELL, CT  
 EXISTING 125' MONOPOLE

SHEET TITLE  
 BASE PLATE STIFFENER  
 DETAIL AND TRANSITION  
 STIFFENER DETAIL

SHEET NUMBER: **D1**  
 REVISION: **0**

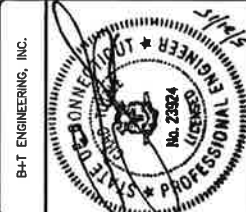


**B+T GRP**  
 1715 S. HOLDER AVE  
 SUITE 500  
 TULSA, OK 74119  
 PH: (918) 877-4830  
 www.b+trp.com

# CROWN CASTLE

REV	DATE	DESCRIPTION
0	09/21/15	ISSUED FOR CONSTRUCTION

PROJECT NO: 84700101  
 PROJECT ENG: ASHMAN SHAHEZADEH  
 DRAWN BY: UJJ/GSL  
 CHECKED BY: SSC

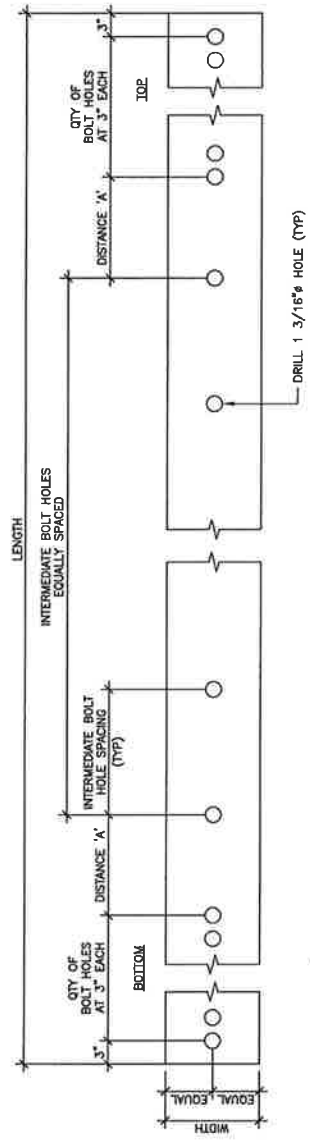


IT IS A VIOLATION OF LAW FOR ANY PERSON UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER TO ALTER THIS DOCUMENT.

B+T ENGINEERING, INC.  
 CROWMELL / FIRST LINE  
 EMERGENC  
 876364  
 261 MAIN ST  
 CROWMELL, CT  
 EXISTING 125 MONROPOLE

SHEET TITLE  
 PART DETAIL

SHEET NUMBER: **D2**  
 REVISION: **0**



1 PART DETAIL  
 SCALE: N.T.S.

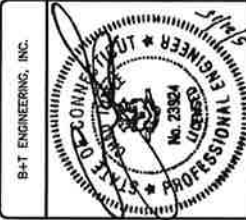
FLAT PLATE DESIGNATION	BLACK WEIGHT (LBS)	WIDTH	THICKNESS	LENGTH	DISTANCE 'A'	TOTAL QTY OF 1 3/16\"/>			
CCI-CFP-032512515	207	3 1/4"	1 1/4"	15'-0"	1'-3"	16	5	5	2'-0"

**B+T GRP**  
 1775 S BOULDER AVE  
 SUITE 200  
 TULSA, OK 74118  
 PH: (918) 587-4890  
 www.b+trp.com

# CROWN CASTLE

REV	DATE	DESCRIPTION
0	05/21/19	ISSUED FOR CONSTRUCTION

PROJECT NO: 84470.013.01  
 PROJECT ENG: ASHKAN GHAEZADEH  
 DRAWN BY: UJJ/GJS  
 CHECKED BY: SSC



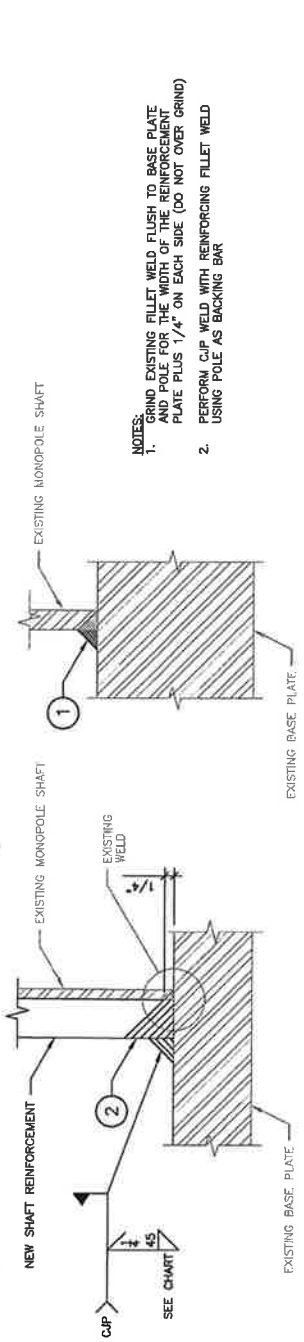
IT IS A VIOLATION OF LAW FOR ANY PERSON UNLESS THEY ARE ACTIVE UNDER THE JURISDICTION OF A LICENSE TO ALTER THIS DOCUMENT.

B+T ENGINEERING, INC.  
 CROMWELL / FIRST LINE  
 EMERGENC  
 876364  
 251 MAIN ST  
 CROMWELL, CT  
 EXISTING 125 MONPOLE

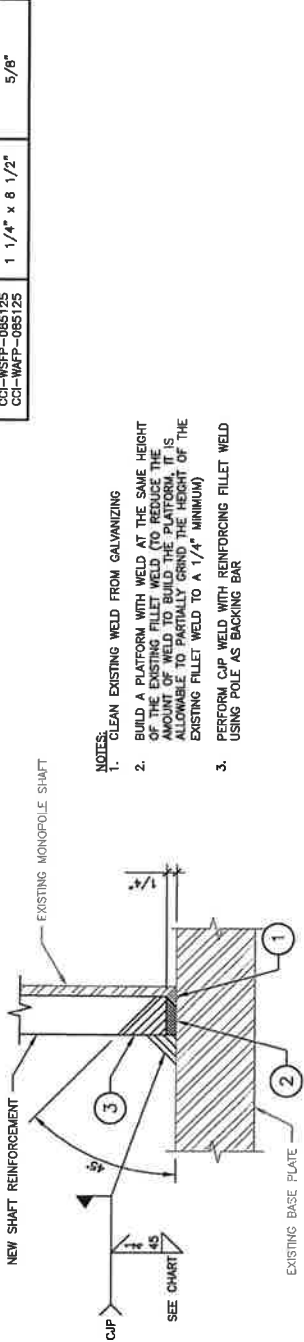
SHEET TITLE  
 DETAILS

SHEET NUMBER  
**D3**

REVISION  
**0**



1 WELD DETAIL-OPTION 1  
 SCALE: N.T.S.



2 WELD DETAIL-OPTION 2  
 SCALE: N.T.S.

- NOTES:**
- GRIND EXISTING FILLET WELD FLUSH TO BASE PLATE AND POLE FOR THE WIDTH OF THE REINFORCEMENT PLATE PLUS 1/4" ON EACH SIDE (DO NOT OVER GRIND)
  - PERFORM CJP WELD WITH REINFORCING FILLET WELD USING POLE AS BACKING BAR

PART NUMBER	PLATE SIZE	MINIMUM REINFORCING WELD
CC-WSFP-040075 CC-WAFP-040075	3/4" x 4"	1/4"
CC-WSFP-045100 CC-WAFP-045100	1" x 4 1/2"	1/4"
CC-WSFP-080100 CC-WAFP-080100	1" x 6"	3/8"
CC-WSFP-085125 CC-WAFP-085125	1 1/4" x 8 1/2"	1/2"
CC-WSFP-085125 CC-WAFP-085125	1 1/4" x 8 1/2"	5/8"

- NOTES:**
- CLEAN EXISTING WELD FROM GALVANIZING
  - BUILD A PLATFORM WITH WELD AT THE SAME HEIGHT OF THE EXISTING FILLET WELD TO REDUCE THE HEIGHT OF THE REINFORCEMENT PLATE. THIS IS ALLOWABLE TO PARTIALLY GRIND THE HEIGHT OF THE EXISTING FILLET WELD TO A 1/4" (MINIMUM)
  - PERFORM CJP WELD WITH REINFORCING FILLET WELD USING POLE AS BACKING BAR