Robinson+Cole

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August 3. 2015

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

Re: **Notice of Exempt Modification – Facility Modification**
240 Kensington Road, Berlin, Connecticut

Dear Ms. Bachman:

Cellco Partnership d/b/a Verizon Wireless ("Cellco") currently maintains twelve (12) antennas at the 160-foot level of the existing 191-foot tower at 240 Kensington Road in Berlin, Connecticut (the "Property"). The tower is owned by Crown Castle. The Council approved Cellco's use of this tower in 2008. Cellco now intends to replace all of its existing antennas with three (3) model LNX-6514DS-VTM, 700 MHz antennas; two (2) model LNX-8513DS-VTM, 850 MHz antennas; one (1) model LNX-6514DS-VTM, 850 MHz antenna; three (3) model HBXX-6517DS-VTM, 1900 MHz antennas; and three (3) model HBXX-6517DS-VTM, 2100 MHz antennas, all at the same 160-foot level on the tower. Cellco also intends to install nine (9) remote radio heads ("RRHs"), three (3) coaxial antenna cables 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 Denise McNair, Town Manager for the Town of Berlin. The Town of Berlin is the owner of the Property. A copy of this notice is also being sent to Crown Castle, the owner of the tower.

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

1. The proposed modifications will not result in an increase in the height of the existing tower. Cellco's replacement antennas and RRH's will be located at the 160-foot level on the 191-foot 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. A cumulative worst-case General Power Density table for Cellco's modified facility is 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:
Denise McNair, Berlin Town Manager
Crown Castle
Tim Parks, Verizon Wireless

ATTACHMENT 1

Product Specifications

COMMSCOPE®

POWERED BY ANDREW.

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

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	Classification
RoHS 2011/65/EU	Compliant by Exemption
China RoHS SJ/T 11364-2006	Above Maximum Concentration Value (MCV)
ISO 9001:2008	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

Product Specifications

COMMSCOPE®

LNX-8513DS-VTM

Andrew® Teletilt® Antenna, 698–896 MHz, 85° horizontal beamwidth, RET compatible

POWERED BY ANDREW.

Electrical Specifications

Frequency Band, MHz	698–806	806–896
Gain, dBi	14.6	15.3
Beamwidth, Horizontal, degrees	85	85
Beamwidth, Vertical, degrees	12.2	11.0
Beam Tilt, degrees	0–10	0–10
USLS, typical, dB	17	17
Front-to-Back Ratio at 180°, dB	25	26
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°

Mechanical Specifications

Color | Radome Material	Light gray | Fiberglass, UV resistant
Connector Interface | Location | Quantity	7-16 DIN Female | Bottom | 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
Antenna Dimensions, L x W x D	1847.0 mm x 301.0 mm x 181.0 mm | 72.7 in x 11.9 in x 7.1 in
Net Weight	17.8 kg | 39.2 lb
Model with factory installed AISG 2.0 RET	LNX-8513DS-A1M

Product Specifications

COMMSCOPE®

POWERED BY ANDREW.

HBXX-6517DS-VTM

Andrew® Quad Port Antenna, 1710–2180 MHz, 65° horizontal beamwidth, RET compatible

- Superior azimuth tracking and pattern symmetry with excellent passive intermodulation suppression

Electrical Specifications

Frequency Band, MHz	1710–1880	1850–1990	1920–2180
Gain, dBi	19.0	19.1	19.2
Beamwidth, Horizontal, degrees	67	66	65
Beamwidth, Vertical, degrees	5.0	4.7	4.4
Beam Tilt, degrees	0–6	0–6	0–6
USLS, dB	18	18	18
Front-to-Back Ratio at 180°, dB	30	30	30
CPR at Boresight, dB	21	22	21
CPR at Sector, dB	10	11	9
Isolation, dB	30	30	30
VSWR | Return Loss, dB	1.4 | 15.6	1.4 | 15.6	1.4 | 15.6
PIM, 3rd Order, 2 x 20 W, dBc	-153	-153	-153
Input Power per Port, maximum, watts	350	350	350
Polarization	±45°	±45°	±45°
Impedance	50 ohm	50 ohm	50 ohm

Electrical Specifications, BASTA*

Frequency Band, MHz	1710–1880	1850–1990	1920–2180
Gain by all Beam Tilts, average, dBi	18.5	18.6	18.8
Gain by all Beam Tilts Tolerance, dB	±0.4	±0.3	±0.4
Gain by Beam Tilt, average, dBi	0 ° | 18.4	0 ° | 18.4	0 ° | 18.7
	3 ° | 18.7	3 ° | 18.7	3 ° | 18.9
	6 ° | 18.4	6 ° | 18.5	6 ° | 18.6
Beamwidth, Horizontal Tolerance, degrees	±2.4	±1.7	±2.9
Beamwidth, Vertical Tolerance, degrees	±0.3	±0.3	±0.3
USLS, dB	18	19	19
Front-to-Back Total Power at 180° ± 30°, dB	25	26	26
CPR at Boresight, dB	22	23	22
CPR at Sector, dB	10	10	9

* 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® quad
Band	Single band
Brand	DualPol® | Teletilt®
Operating Frequency Band	1710 – 2180 MHz

Product Specifications

HBXX-6517DS-VTM

Performance Note	Outdoor usage

Mechanical Specifications

Color	Light gray
Lightning Protection	dc Ground
Radiator Material	Low loss circuit board
Radome Material	PVC, UV resistant
RF Connector Interface	7-16 DIN Female
RF Connector Location	Bottom
RF Connector Quantity, total	4
Wind Loading, maximum	668.0 N @ 150 km/h 150.2 lbf @ 150 km/h
Wind Speed, maximum	241.0 km/h | 149.8 mph

Dimensions

Depth	166.0 mm | 6.5 in
Length	1903.0 mm | 74.9 in
Width	305.0 mm | 12.0 in
Net Weight	19.5 kg | 43.0 lb

Remote Electrical Tilt (RET) Information

Model with Factory Installed AISG 2.0 Actuator	HBXX-6517DS-A2M
RET System	Teletilt®

Regulatory Compliance/Certifications

Agency	Classification
RoHS 2011/65/EU	Compliant by Exemption
China RoHS SJ/T 11364-2006	Above Maximum Concentration Value (MCV)
ISO 9001:2008	Designed, manufactured and/or distributed under this quality management system

Included Products

600899A-2 — Downtilt Mounting Kit for 2.4 - 4.5 in (60 - 115 mm) OD round members. Kit contains one scissor top bracket set and one bottom bracket set.

* 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.

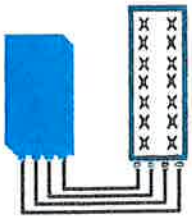
Its compactness and slim design makes the Alcatel-Lucent B13 RRH4x30-4R easy to install close to the antenna: operators can therefore locate this Remote Radio Head where RF design conditions are deemed ideal, minimizing trade-offs between available sites and RF optimum sites, together with reducing the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

Alcatel·Lucent

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.) Volume in L Weight in kg (lb) (w/o mounting HW)	550 x 305 x 230 (21.6" x 12.0" x 9") (with solar shield) 38 (with solar shield) 26 (57.2) (with solar shield)
DC voltage range DC power consumption	-40.5 to -57V at full performance, -38 to -57V with relaxation on power consumption 550W typical @100% RF load (in 2Tx or 4TX mode)
Environmental conditions Wind load (@150km/h or 93mph)	-40°C (-40°F) /+55°C (+131°F) 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

PCS RF MODULES

RRH1900 2X60 - HW CHARACTERISTICS

LA6.0.1/13.3

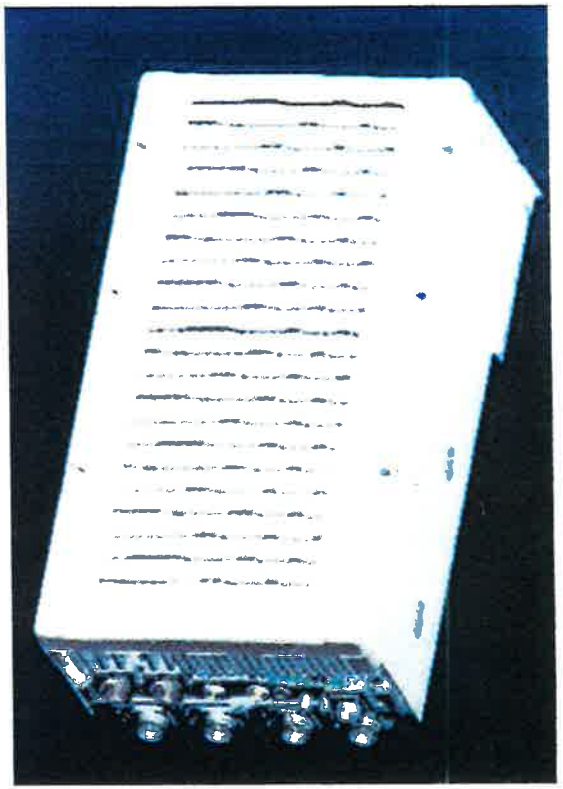
	RRH2x60
RF Output Power	2x60W
Instantaneous Bandwidth	20MHz
Transmitter	2 TX
Receiver 1900 HW version 1900A HW version	2 Branch RX – LA6.0.1 4 Branch RX – LR13.3
Features	AISG 2.0 for RET/TMA
	Internal Smart Bias-T
Power	-48VDC
CPRI Ports	2 CPRI Rate 3 Ports
External Alarms	4 External User Alarms
Monitor Ports	TX
Environmental	GR487 Compliance
RF Connectors	7/16 DIN (top mounted)

** Not a Verizon Wireless deployed product

NEW PCS RF MODULES FOR VZW
RRH2X60 - HW CHARACTERISTICS

LR14.3

	RRH2x60
RF Output Power	2x60W (4x30W HW Ready)
Instantaneous Bandwidth	60MHz
Target Reliability (Annual Return Rate)	<2%
Receiver	4 Branch Rx
Features	AISG 2.0 for RET/TMA
Power	-48VDC
	Internal Smart Bias-T
CPRI Ports	2 CPRI Rate 5 Ports
External Alarms	4 External User Alarms
Monitor Ports	TX, RX
Environmental	GR487 Compliance
RF Connectors	7/16 DIN (downward facing)
Dimensions	22"(h) x 12"(w)x 9.4" (d)**
Weight	55lb**



**- Includes solar shield but not mounting brackets (8 lbs.)

Alcatel·Lucent

The Alcatel-Lucent RRH2x60-AWS is a high power, small form factor Remote Radio Head operating in the AWS frequency band (3GPP Band 4) for LTE technology. It is designed with an eco-efficient approach, providing operators with the means to achieve high quality and high capacity coverage with minimum site requirements and efficient operation.

A distributed Node B expands the deployment options by using two components, a Base Band Unit (BBU) containing the digital assets and a separate RRH containing the radio-frequency (RF) elements. This modular design optimizes available space and allows the main components of a Node B to be installed separately, within the same site or several kilometers apart.

The Alcatel-Lucent RRH2x60-AWS is linked to the BBU by an optical-fiber connection carrying downlink and uplink digital radio signals along with operations, administration and maintenance (OA&M) information.

The Alcatel-Lucent RRH2x60-AWS integrates all the latest technologies. This allows to offer best-in-class characteristics.

It delivers an outstanding 120 watts of total RF power thanks to its two transmit RF paths of 60 W each.

It is ideally suited to support multiple-input multiple-output (MIMO) 2x2 operation.

It includes four RF receivers to natively support 4-way uplink reception diversity. This improves the radio uplink coverage and this can be used to extend the cell radius commensurate with 2x2MIMO 2x60 W for the downlink.

It supports multiple discontinuous LTE carriers within an instantaneous bandwidth of 45 MHz corresponding to the entire AWS B4 spectrum.

The latest generation power amplifiers (PA) used in this product achieve high efficiency (>40%), resulting in improved power consumption figures.

The Alcatel-Lucent RRH2x60-AWS is designed to make available all the benefits of a distributed Node B, with excellent RF characteristics, with low capital expenditures (CAPEX) and low operating expenditures (OPEX).

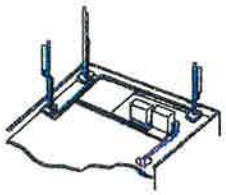
The Alcatel-Lucent RRH2x60-AWS is a very cost-effective solution to deploy LTE MIMO.

The RRH2x60-AWS includes a reversible mounting bracket which allows for ease of installation behind an antenna, or on a rooftop knee wall while providing easy access to the mid body RF connectors.

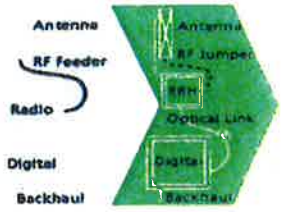
The limited space available in some sites may prevent the installation of traditional single-cabinet BTS equipment. However, many of these sites can host an Alcatel-Lucent RRH2x60-AWS installation, providing more flexible site selection and improved network quality along with greatly reduced installation time and costs.

The Alcatel-Lucent RRH2x60-AWS is a zero-footprint solution and is convection cooled without fans for silent operation, simplifying negotiations with site property owners and minimizing environmental impacts.

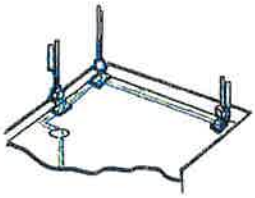
Installation can easily be done by a single person as the Alcatel-Lucent RRH2x60-AWS is compact and weighs about 20 kg, eliminating the need for a crane to hoist the BTS cabinet to the rooftop. A site can be in operation in less than one day.



Macro



RRH for space-constrained cell sites



Distributed

- RRH2x60-AWS integrates two power amplifiers of 60W rating (at each antenna connector)
- Support multiple carriers over the entire 3GPP band 4
- RRH2x60-AWS is optimized for LTE operation
- RRH2x60-AWS is a very compact and lightweight product
- Advanced power management techniques are embedded to provide power savings, such as PA bias control
- MIMO LTE operation with only one single unit per sector
- Improved uplink coverage with built-in 4-way receive diversity capability
- RRH can be mounted close to the antenna, eliminating nearly all losses in RF cables and thus reducing power consumption by 50% compared to conventional solutions
- Distributed configurations provide easily deployable and cost-effective solutions, near zero footprint and silent solutions, with minimum impact on the neighborhood, which ease the deployment
- RETA and TMA support without additional hardware thanks to the AISG v2.0 port and the integrated Bias-Tees. Bias-Tees support AISG DC supply and signaling.

Specifications listed are hardware capabilities. Some capabilities depend on support in a specific software release or future release.

Dimensions and weights

- HxWxD : 510x285x186mm (27 l with solar shield)
- Weight : 20 kg (44 lbs)

Electrical Data

- Power Supply : -48V DC (-40.5 to -57V)
- Power Consumption (ETSI average traffic load reference) : 250W @2x60W

RF Characteristics

- Frequency band: 1710-1755, UL / 2110-2155 MHz, DL (3GPP band 4)
- Output power: 2x60W at antenna connectors
- Technology supported: LTE
- Instantaneous bandwidth: 45 MHz
- Rx diversity: 2-way and 4-way uplink reception
- Typical sensitivity without Rx diversity: -105 dBm for LTE

Connectivity

- Two CPRI optical ports for daisychaining and up to six RRHs per fiber
- Type of optical fiber: Single-Mode (SM) and Multi-Mode (MM) SFPs
- Optical fiber length: up to 500m using MM fiber, up to 20km using SM fiber
- TMA/RETA : AISG 2.0 (RS485 connector and internal Bias-Tee)
- Six external alarms
- Surge protection for all external ports (DC and RF)

Environmental specifications

- Operating temperature: -40°C to 55°C including solar load
- Operating relative humidity: 8% to 100%
- Environmental Conditions : ETS 300 019-1-4 class 4.1E
- Ingress Protection : IEC 60529 IP65
- Acoustic Noise : Noiseless (natural convection cooling)

Safety and Regulatory Data

- EMC : 3GPP 25113, EN 301 489-1, EN 301 489-23, GR 1089, GR 3108, OET-65
- Safety : IEC60950-1, EN 60825-1, UL, ANSI/NFPA 70, CAN/CSA-C22.2
- Regulatory : FCC Part 15 Class B, CE Mark – European Directive : 2002/95/EC (ROHS); 2002/96/EC (WEEE); 1999/5/EC (R&TTE)
- Health : EN 50385

Alcatel·Lucent

AT THE SPEED OF IDEAS™

Product Data Sheet HB158-1-08U8-S8J18

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® accessories can be used with HYBRIFLEX cable. Both pre-connectorized and on-site options are available.

Figure 1: HYBRIFLEX Series

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

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)]	068 (0.205)
DC-Resistance Power Cable, 8.4mm² (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)			UL94-V0, UL1666 RoHS Compliant
Size (Power)		[mm² (AWG)]	8.4 (8)
Quantity, Wire Count (Power)			16 (8 pairs)
Size (Alarm)		[mm² (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 S-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 to149)
Operation Temperature		[°C (°F)]	-40 to +65 (-40 to149)

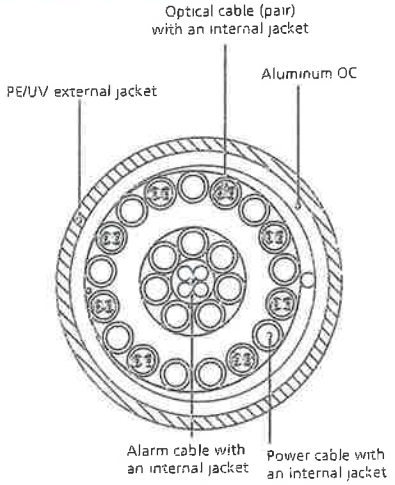


Figure 2: Construction Detail

* This data is provisional and subject to change

ATTACHMENT 2

	General	Power	Density					
Site Name: Berlin Kensington								
Tower Height: 191.667Ft.								
CARRIER	**# OF CHAN.**	**WATTS ERP**	**HEIGHT**	**CALC. POWER DENS**	**FREQ.**	**MAX. PERMISS. EXP.**	**FRACTION MPE**	**Total**
*AT&T UMTS	2	500	151	0.0158	880	0.5867	2.69%	
*AT&T UMTS	1	500	151	0.0079	1900	1.0000	0.79%	
*AT&T GSM	1	427	151	0.0067	1900	1.0000	0.67%	
*AT&T LTE	1	500	151	0.0079	1900	1.0000	0.79%	
*AT&T LTE	1	500	151	0.0079	2300	1.0000	0.79%	
*AT&T LTE	1	500	151	0.0079	700	0.4667	1.69%	
*Clearwire	2	153	118	0.0079	2496	1.0000	0.79%	
*Clearwire	1	211	122	0.0051	11 GHz	1.0000	0.51%	
*Pocket (now MetroPCS)	3	631	106	0.0606	2130	1.0000	6.06%	
*T-Mobile PCS/AWS	2	826	184	0.0175	1900	1.0000	0.19%	
*T-Mobile PCS/AWS	4	1920	184	0.0816	2100	1.0000	0.87%	
*T-Mobile 700 MHz	1	865	184	0.0092	700	0.4667	0.21%	
*Nextel	9	100	116	0.0240	851	0.5673	4.24%	
*Town of Berlin			194	0.0048	850	0.5667	0.84%	
*Town of Berlin			165	0.0013	45	0.2000	0.65%	
*Town of Berlin			165	0.0066	159	0.2000	3.30%	
*Town of Berlin			132	0.0021	45	0.2000	1.05%	
*Town of Berlin			136	0.0097	154	0.2000	4.85%	
*Town of Berlin			99	0.0073	45	0.2000	3.65%	
*Town of Berlin			75	0.0319	155	0.2000	15.95%	
*Town of Berlin			59	0.0516	850	0.5667	9.11%	
*Town of Berlin			45	0.0177	450	0.3000	5.90%	
*Town of Berlin			33	0.0330	460	0.3067	10.76%	
Verizon PCS	**2**	**399**	**160**	**0.0112**	**1970**	**1.0000**	**1.12%**	
Verizon Cellular	**3**	**380**	**160**	**0.0160**	**869**	**0.5793**	**2.76%**	
Verizon AWS	**1**	**3500**	**160**	**0.0492**	**2145**	**1.0000**	**4.92%**	
Verizon 700	**1**	**2100**	**160**	**0.0295**	**746**	**0.4973**	**5.93%**	
								91.07%
* Source: Siting Council								

ATTACHMENT 3

June 17, 2015

Mr. Mitchell Abbott
Crown Castle
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Charlotte, NC 28277
(704) 405-6612

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:	N/A
	Carrier Site Name:	Berlin Kensington
Crown Castle Designation:	**Crown Castle BU Number:**	826217
	Crown Castle Site Name:	Newington_1
	Crown Castle JDE Job Number:	268610
	Crown Castle Work Order Number:	1035561
	Crown Castle Application Number:	221161 Rev. 10
Engineering Firm Designation:	**B+T Group Project Number:**	87581.012.02
Site Data:	**240 Kensington Road, Berlin, CT, Hartford County** **Latitude *41° 37' 34.3"*, Longitude *-72° 46' 32.33"*** **191.667 Foot - Monopole**	

Dear Mr. Abbott,

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 771897, in accordance with application 221161, revision 10.

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.

The analysis has been performed in accordance with the TIA/EIA-222-F standard and IBC 2006 based upon a wind speed of 80 mph fastest mile.

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

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

Respectfully submitted by:
B+T Engineering, Inc.

Jing Zhang
Project Engineer

Chad E. Tuttle, P.E.
President

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 191.667 ft. Monopole designed by Pirod Manufactures Inc. in February of 1999. The tower was originally designed for a wind speed of 80 mph per TIA/EIA-222-F. This monopole was reinforced in 2008 by Natcomm and those modifications were found to be ineffective and were not considered in this analysis. This Monopole has been modified by B+T Group in 2014 and those modifications were incorporated in this analysis.

2) ANALYSIS CRITERIA

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

Table 1 - Proposed Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
160.0	160.0	3	Alcatel Lucent	RRH2X60-AWS	5	1-5/8	--
		3	Alcatel Lucent	RRH2X60-PCS			
		3	Alcatel Lucent	RRH2x40 700			
		4	Andrew	LNX-6514DS-A1M			
		6	Commscope	HBXX-6517DS-VTM			
		2	Commscope	LNX-8513DS-VTM			
		1	RFS	DB-T1-6Z-8AB-0Z			
		6	RFS	FD9R6004/2C-3L			

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
191.0	191.0	1	--	1 1/2" x 8' Omni	2 1	7/8 1/4	1
		1	--	7/8" x 5' Omni			
		1	Motorola	WB2855			
		1	--	Side Arm Mount [SO 702-1]			
189.0	192.0	1	--	1 1/2" x 3'-6" Omni	1	7/8	1
	189.0	1	--	Side Arm Mount [SO 301-1]			
184.0	184.0	1	--	Platform Mount [LP 405-1]	18	1-5/8	1
	181.0	3	Ems Wireless	RR90-17-02DP			
		6	Ericsson	KRY 112 144/1			
		3	RFS	APXV18-206516L-A			
		3	Commscope	ATBT-BOTTOM-24V	--	--	2
		3	Commscope	LNX-6515DS-VTM			
160.0	160.0	**3**	**Antel**	**LPA-185080/12CF**	**3**	**1-5/8**	**3**
		6	**Antel**	**LPA-80080/6CFx5**			
		1	--	Platform Mount [LP 303-1]	9	1-5/8	1

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
158.0	160.0	1	--	1 3/8" x 15' Omni	1 1	7/8 1/2	1
		1	--	4-Element 17' Dipole			
	158.0	2	--	Side Arm Mount [SO 702-1]			
151.0	151.0	2	Andrew	SBNH-1D6565C	2 1	3/8 7/16	2
		6	Communication	DTMABP7819VG12A			
		1	KMW	AM-X-CD-16-65-00T-RET			
		6	Powerwave	CM1007-DBPXBC-003			
		6	Powerwave	LGP21901			
		1	KMW	AM-X-CD-16-65-00T-RET	12	1-1/4	1
		2	Andrew	SBNH-1D6565C			
		3	Powerwave	7770.00			
		1	--	Platform Mount [LP 403-1]			
148.0	148.0	6	Ericsson	RRU-11	--	--	2
		1	Raycap	DC6-48-60-18-8F			
		1	--	Pipe Mount [PM 601-1]			
		2	--	Pipe Mount [PM 601-3]			
133.0	141.0	1	Sinclair	SRL-235-2	1	7/8	1
	133.0	1	--	Side Arm Mount [SO 702-1]			
128.0	128.0	1	--	Side Arm Mount [SO 104-3]	1	1/4	1
	127.0	1	Motorola	WP2900			
116.0	118.0	6	Andrew	844G90VTA-SX	12 2	1-1/4 2	1
		1	Dragonwave	60-000261-08			
		1	--	Junction Box 12"x12"x6-1/2"			
		3	Andrew	844G65VTZASX			
		3	Argus	LLPX310R			
		3	--	RRH SPI-DD132825WB			
	116.0	1	--	Platform Mount [LP 405-1]			
93.0	99.0	1	--	1 7/8" x 8' Omni	3 1	7/8 1/4	1
	95.0	1	Andrew	KP2F-34			
	93.0	1	Motorola	WB2900			
		2	--	Side Arm Mount [SO 702-1]			
70.0	76.0	1	Sinclair	SRL-235-2	2	7/8	1
	70.0	1	--	Side Arm Mount [SO 702-1]			
	64.0	1	--	2" x 2' Omni			
32.0	35.0	1	--	1" x 3'-7" Omni	2	1/2	1
	32.0	1	--	Side Arm Mount [SO 702-1]			
	31.0	1	--	6-Element 3' Long Yagi			

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)
190.0	190.0	1	Decibel	DB809	1	1-5/8
177.67	177.67	12	EMS	RR90-17-00DP	12	1-5/8
155.0	155.0	2	Decibel	DB205	2	1-5/8
140.0	140.0	2	Decibel	DB205	2	1-5/8
127.67	127.67	12	EMS	RR90-17-00DP	12	1-5/8
117.67	117.67	12	EMS	RR90-17-00DP	12	1-5/8
25.0	25.0	1	Decibel	DB516	2	1-5/8
		1	Decibel	DB809M		
20.0	20.0	1	Decibel	DB205	1	1-5/8

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
Online Application	Verizon Wireless Co-Locate, Rev. 10	221161	CCIsites
Tower Mapping Drawings	TEP, Project No. 25651-57340	5687833	CCIsites
Tower Modification Drawings	Natcomm Inc., Project No. 08001	3678661	CCIsites
Tower Modification Drawings	B+T Group, project No. 87581.005.01	4003976	CCIsites
Post Modification Inspection	SGS, Project No. 130573	5493013	CCIsites
Tower Foundation Drawings	Pirod Inc., File No. A-115400	3463552	CCIsites
Geotechnical Report	French & Parrello, Job No. 98A209ERI	3438510	CCIsites
Antenna Configuration	Tower Mapping Drawings, TEP, Project No. 25651-57340	5687833	CCIsites

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

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	191.667 - 181.583	Pole	P18x3/8	1	-3.057	--	3.9	Pass[1]
L2	181.583 - 141.417	Pole	P24x3/8	2	-13.120	--	88.5	Pass[1]
L3	141.417 - 121.167	Pole	P36x3/8	3	-18.041	--	90.4	Pass[1]
L4	121.167 - 109	Pole	P42x3/8	4	-23.294	--	93.9	Pass[1]
L5	109 - 105	Pole	P42x3/8 [0.491966]	5	-24.618	--	80.2	Pass[1]
L6	105 - 100.917	Pole	P42x3/8 [0.560722]	6	-26.546	--	77.2	Pass[1]
L7	100.917 - 95.125	Pole	P48x3/8	7	-28.276	--	98.9	Pass[1]
L8	95.125 - 89.875	Pole	P48x3/8 [0.478186]	8	-30.135	--	87.5	Pass[1]
L9	89.875 - 80.833	Pole	P48x3/8 [0.578153]	9	-35.108	--	84.7	Pass[1]
L10	80.833 - 68	Pole	P54x3/8 [0.487033]	10	-40.729	--	96.3	Pass[1]
L11	68 - 60.583	Pole	P54x3/8 [0.591202]	11	-46.578	--	88.6	Pass[1]
L12	60.583 - 48	Pole	P60x3/8 [0.514746]	12	-52.185	--	97.0	Pass[1]
L13	48 - 40.333	Pole	P60x3/8 [0.620238]	13	-56.585	--	88.9	Pass[1]
L14	40.333 - 28	Pole	P60x1/2 [0.597937]	14	-62.937	--	97.1	Pass[1]
L15	28 - 20.083	Pole	P60x1/2 [0.720286]	15	-67.921	--	88.5	Pass[1]
L16	20.083 - 17	Pole	P60x5/8	16	-69.681	--	97.0	Pass[1]
L17	17 - 11.833	Pole	P60x5/8 [0.72746]	17	-72.989	--	88.3	Pass[1]
L18	11.833 - 9.375	Pole	P60x5/8 [0.750143]	18	-74.347	--	88.2	Pass[1]
L19	9.375 - 4.833	Pole	P60x5/8 [0.777883]	19	-76.955	--	88.1	Pass[1]
L20	4.833 - 0	Pole	P60x5/8 [0.749582]	20	-79.685	--	96.6	Pass[1]
							Summary	
						Pole (L7)	98.9	Pass[1]
						RATING =	**98.9**	**Pass[1]**

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

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Flange Bolt	180	2.5	Pass
1	Flange Bolt	140	55.9	Pass
1	Bridge Stiffener	120	79.9	Pass
	Flange Bolt		45.0	Pass
	Flange Plate		57.1	Pass
1	Bridge Stiffener	100	77.7	Pass
	Flange Bolt		43.3	Pass
	Flange Plate		55.9	Pass
1	Bridge Stiffener	80	72.1	Pass
	Flange Bolt		40.2	Pass
	Flange Plate		52.9	Pass
1	Bridge Stiffener	60	52.2	Pass
	Flange Bolt		28.9	Pass
	Flange Plate		47.2	Pass
1	Existing Bridge Stiffener	40	63.2	Pass
	New Bridge Stiffener		54.6	Pass
	Flange Bolt		28.0	Pass
	Flange Plate		51.6	Pass
1	Existing Bridge Stiffener	20	73.1	Pass
	New Bridge Stiffener		65.2	Pass
	Flange Bolt		33.4	Pass
	Flange Plate		61.7	Pass
1	Anchor Rods	Base	53.3	Pass
1	Base Plate	Base	22.8	Pass
1	Base Foundation (Soil Interaction)	Base	84.4	Pass
1	Base Foundation (Structural)	Base	91.6	Pass

Structure Rating (max from all components) =	98.9%

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

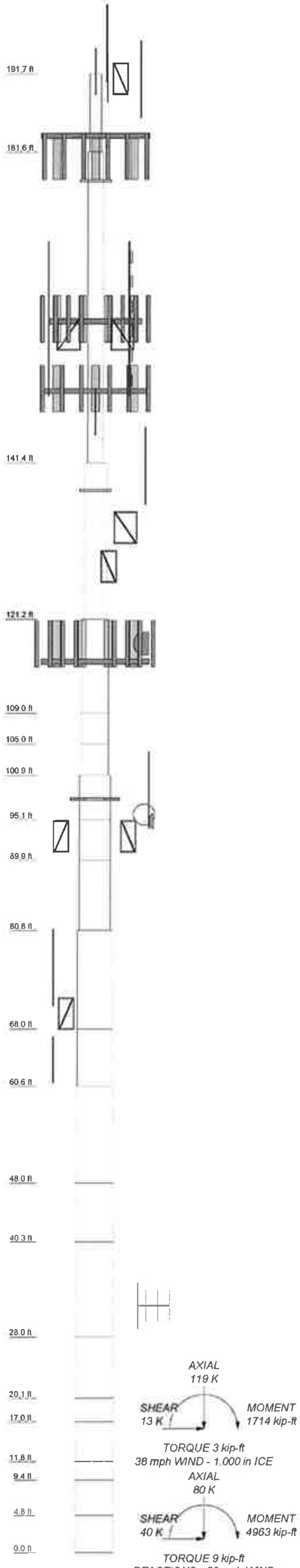
4.1) Recommendations

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	Size	Length (ft)	Grade	Weight (K)
1	P18x3/8	10.084	A53-B-42	0.7
2	P24x3/8	40.166		3.8
3	P36x3/8	20.250		2.9
4	P42x3/8	12.167		2.0
5	[illegible] 491965]	4.000	[illegible]	0.9
6	[illegible]	4.083	[illegible]	1.1
7	[illegible]	5.792	[illegible]	1.1
8	[illegible]	5.250	39.445156ksi	1.3
9	P48x3/8 [illegible]	9.042	37.249956ksi	2.7
10	P54x3/8 [0.487033]	12.833	39.466725ksi	3.5
11	P54x3/8 [0.591202]	7.417	37.370874ksi	2.5
12	P60x3/8 [0.514746]	12.583	39.119211ksi	4.1
13	P60x3/8 [0.620238]	7.667	37.193417ksi	3.1
14	P60x1/2 [0.597937]	12.333	40.060275ksi	4.7
15	[illegible]	7.917	37.87506ksi	3.7
16	[illegible]	3.083	[illegible]	1.2
17	[illegible]	5.167	[illegible]	2.5
18	[illegible]	2.458	[illegible]	1.2
19	[illegible]	4.542	[illegible]	2.3
20	[illegible]	4.833	[illegible]	2.4
				47.7



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Lightning Rod 5/8" x 4' on 4' Pole (E)	191.667	(2) SBNH-1D6565C w/ Mount Pipe (R)	151
Motorola WB2855 (E)	191	(2) CM1007-DBPXBC-003 (R)	151
1 1/2" x 8' Omni (E)	191	(2) CM1007-DBPXBC-003 (R)	151
7/8" x 5' Omni (E)	191	(2) CM1007-DBPXBC-003 (R)	151
3' x 2" Pipe Mount (E)	191	(2) LGP21901 (R)	151
4' x 2" Pipe Mount (E)	191	(2) LGP21901 (R)	151
Side Arm Mount [SO 702-1] (E)	191	(2) LGP21901 (R)	151
1 1/2" x 3'-6" Omni (E)	189	(4) DTMABP7819VG12A (R)	151
6' x 2" Mount Pipe (E)	189	(2) DTMABP7819VG12A (R)	151
Side Arm Mount [SO 301-1] (E)	189	Platform Mount [LP 403-1] (E)	151
RR90-17-02DP w/ Mount Pipe (E)	184	AM-X-CD-16-65-00T-RET w/ Mount Pipe (E)	151
RR90-17-02DP w/ Mount Pipe (E)	184	(2) RRU-11 (R)	148
RR90-17-02DP w/ Mount Pipe (E)	184	(2) RRU-11 (R)	148
APXV18-206516L-A w/ Mount Pipe (E)	184	DC6-48-60-18-8F (R)	148
APXV18-206516L-A w/ Mount Pipe (E)	184	(2) Pipe Mount [PM 601-3] (R)	148
APXV18-206516L-A w/ Mount Pipe (E)	184	Pipe Mount [PM 601-1] (R)	148
(2) KRY 112 144/1 (E)	184	(2) RRU-11 (R)	148
(2) KRY 112 144/1 (E)	184	4' ICE SHIELDS (E)	138
(2) KRY 112 144/1 (E)	184	Side Arm Mount [SO 702-1] (E)	133
LNX-6515DS-VTM w/ Mount Pipe (R)	184	SRL-235-2 (E)	133
LNX-6515DS-VTM w/ Mount Pipe (R)	184	4' x 2" Pipe Mount (E)	133
LNX-6515DS-VTM w/ Mount Pipe (R)	184	Side Arm Mount [SO 104-3] (E)	128
ATBT-BOTTOM-24V (R)	184	Motorola WP2900 (E)	128
ATBT-BOTTOM-24V (R)	184	2' x 2" Pipe Mount (E)	128
ATBT-BOTTOM-24V (R)	184	LLPX310R w/ Mount Pipe (E)	116
Platform Mount [LP 405-1] (E)	184	844G65VTZASX w/ Mount Pipe (E)	116
4' ICE SHIELDS (E)	178	844G65VTZASX w/ Mount Pipe (E)	116
(2) HBXX-6517DS-VTM w/ Mount Pipe (P)	160	844G65VTZASX w/ Mount Pipe (E)	116
(2) HBXX-6517DS-VTM w/ Mount Pipe (P)	160	(2) Andrew 844G90VTA-SX w/ Mount Pipe (E)	116
LNX-6514DS-A1M w/ Mount Pipe (P)	160	(2) Andrew 844G90VTA-SX w/ Mount Pipe (E)	116
LNX-6514DS-A1M w/ Mount Pipe (P)	160	(2) Andrew 844G90VTA-SX w/ Mount Pipe (E)	116
(2) LNX-6514DS-A1M w/ Mount Pipe (P)	160	RRH SP1-22132825WB (E)	116
LNX-6513DS-VTM w/ Mount Pipe (P)	160	RRH SP1-22132825WB (E)	116
LNX-6513DS-VTM w/ Mount Pipe (P)	160	RRH SP1-22132825WB (E)	116
(2) FD9R6004/2C-3L (P)	160	Junction Box 12" x 12" x 6 1/2" (E)	116
(2) FD9R6004/2C-3L (P)	160	Platform Mount [LP 405-1] (E)	116
(2) FD9R6004/2C-3L (P)	160	LLPX310R w/ Mount Pipe (E)	116
RRH2x40 700 (P)	160	LLPX310R w/ Mount Pipe (E)	116
RRH2x40 700 (P)	160	Dragonwave 60-000261-08 (E)	116
RRH2x40 700 (P)	160	4' ICE SHIELDS (E)	98
RRH2X60-PCS (P)	160	4' ICE SHIELDS (E)	98
RRH2X60-PCS (P)	160	4' ICE SHIELDS (E)	98
RRH2X60-PCS (P)	160	1 7/8" x 8' Omni (E)	93
RRH2X60-AWS (P)	160	Motorola WB2900 (E)	93
RRH2X60-AWS (P)	160	4' x 2" Pipe Mount (E)	93
RRH2X60-AWS (P)	160	Side Arm Mount [SO 702-1] (E)	93
DB-T1-6Z-8AB-0Z (P)	160	Side Arm Mount [SO 702-1] (E)	93
Platform Mount [LP 303-1] (E)	160	4' x 2" Pipe Mount (E)	93
(2) HBXX-6517DS-VTM w/ Mount Pipe (P)	160	KP2F-34 (E)	93
1 3/8" x 15' Omni (E)	158	2" x 2' Omni (E)	70
4' x 2" Pipe Mount (E)	158	SRL-235-2 (E)	70
4' x 2" Pipe Mount (E)	158	6' x 2" Mount Pipe (E)	70
Side Arm Mount [SO 702-1] (E)	158	Side Arm Mount [SO 702-1] (E)	70
Side Arm Mount [SO 702-1] (E)	158	Side Arm Mount [SO 702-1] (E)	32
4-Element 17' Dipole (E)	158	6-Element 3' Long Yagi (E)	32
(2) SBNH-1D6565C w/ Mount Pipe (E)	151	1" x 3'-7" Omni (E)	32
(3) 7770.00 w/ Mount Pipe (E)	151	6' x 2" Mount Pipe (E)	32
AM-X-CD-16-65-00T-RET w/ Mount Pipe (R)	151		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A53-B-42	42 ksi	63 ksi	37.193417ksi	37 ksi	52 ksi
38.846523ksi	39 ksi	54 ksi	40.060275ksi	40 ksi	55 ksi
34.410173ksi	34 ksi	49 ksi	37.87506ksi	38 ksi	53 ksi
39.445156ksi	39 ksi	54 ksi	40.087522ksi	40 ksi	55 ksi
37.249956ksi	37 ksi	52 ksi	39.687434ksi	40 ksi	55 ksi
39.466725ksi	39 ksi	54 ksi	35.902778ksi	36 ksi	51 ksi
37.370874ksi	37 ksi	52 ksi	39.697238ksi	40 ksi	55 ksi
39.119211ksi	39 ksi	54 ksi			

TOWER DESIGN NOTES

1. Tower is located in Hartford County, Connecticut.
2. Tower designed for a 80 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 38 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 98.9%

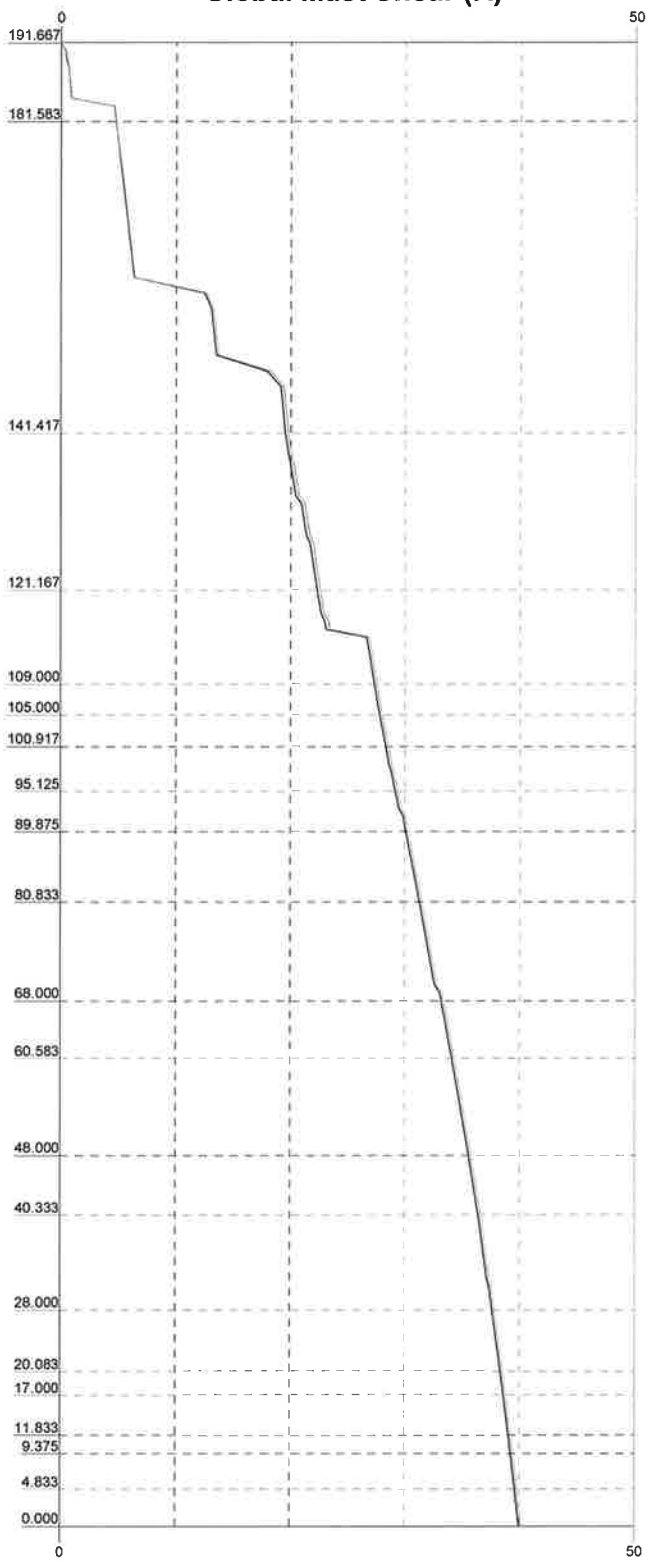
B+T Group
1717 South Boulder Ave., Suite 300
Tulsa, OK 74119
Phone: (918) 587-4630
FAX: (918) 295-0265

Job: 87581.012.01 - Newington_1, CT (BU# 82621			
Project:			
Client: Crown Castle	Drawn by: jzhang	App'd:	
Code: TIA/EIA-222-F	Date: 06/15/15	Scale: NTS	
Path:		Dwg No. E-1	

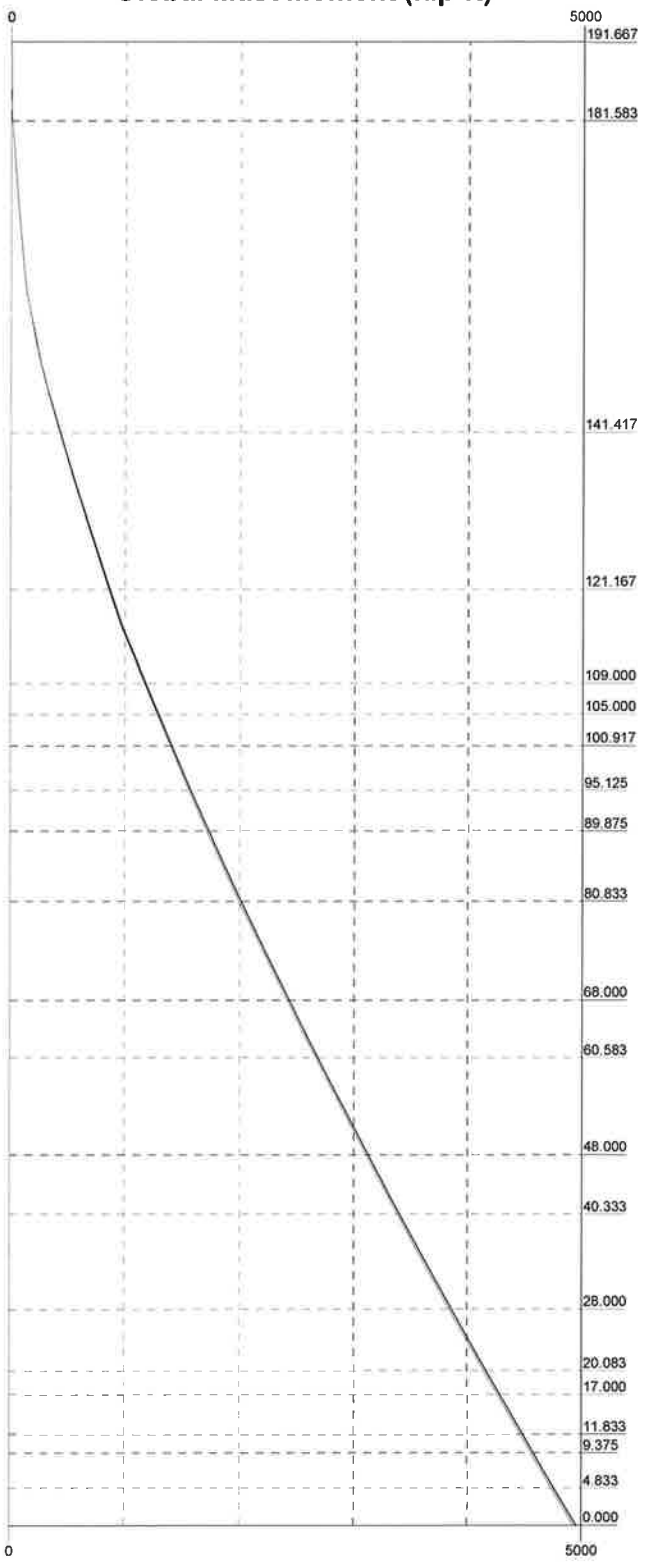
Vx Vz

Mx Mz

Global Mast Shear (K)



Global Mast Moment (kip-ft)



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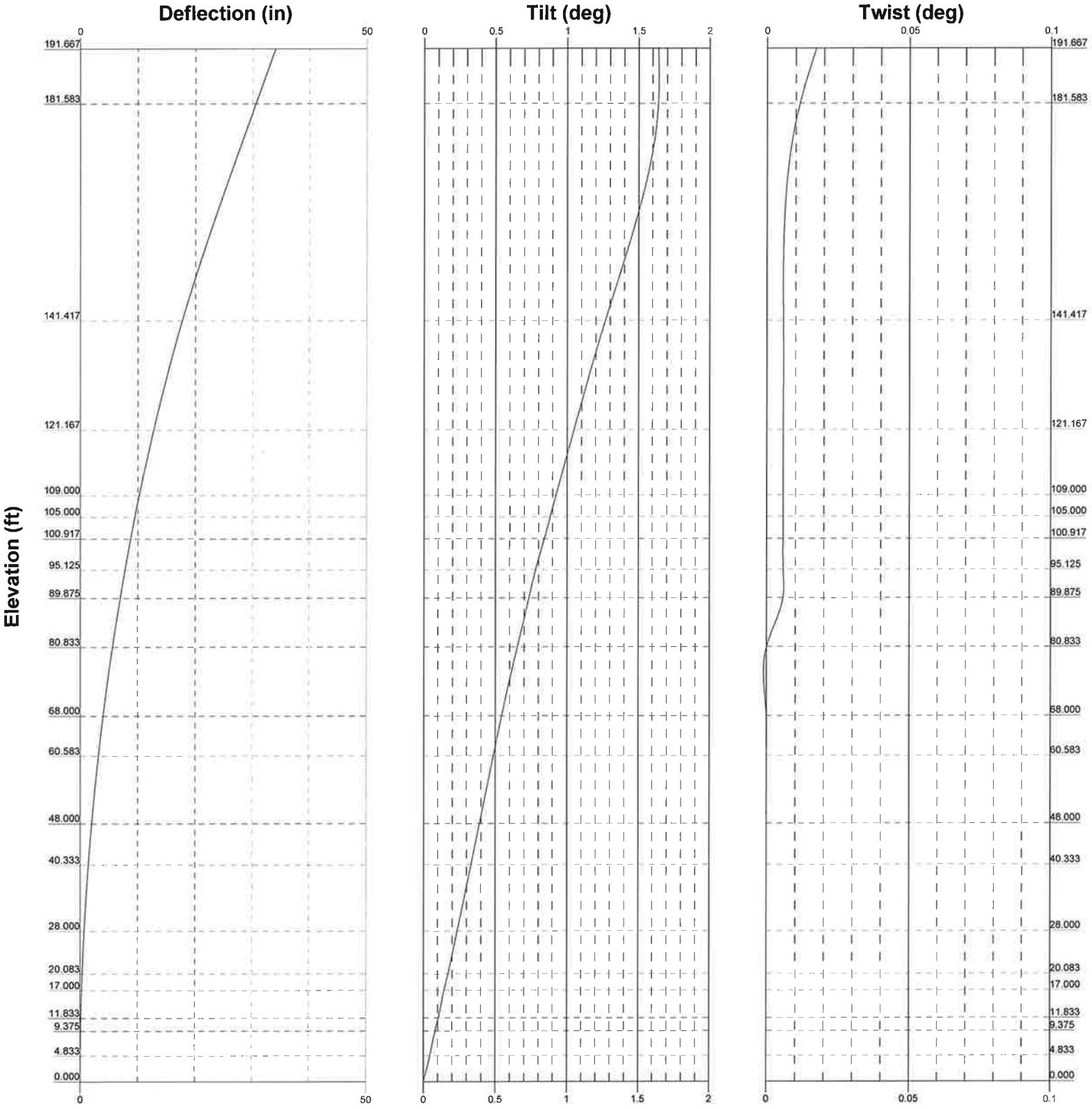
Tulsa, OK 74119
Phone: (918) 587-4630
FAX: (918) 295-0265

Job: 87581.012.01 - Newington_1, CT (BU# 826			
Project:			
Client: Crown Castle	Drawn by: jzhang	App'd:	
Code: TIA/EIA-222-F	Date: 06/09/15	Scale: NTS	
Path:		Dwg No. E-4	

TIA/EIA-222-F - Service - 50 mph

Maximum Values



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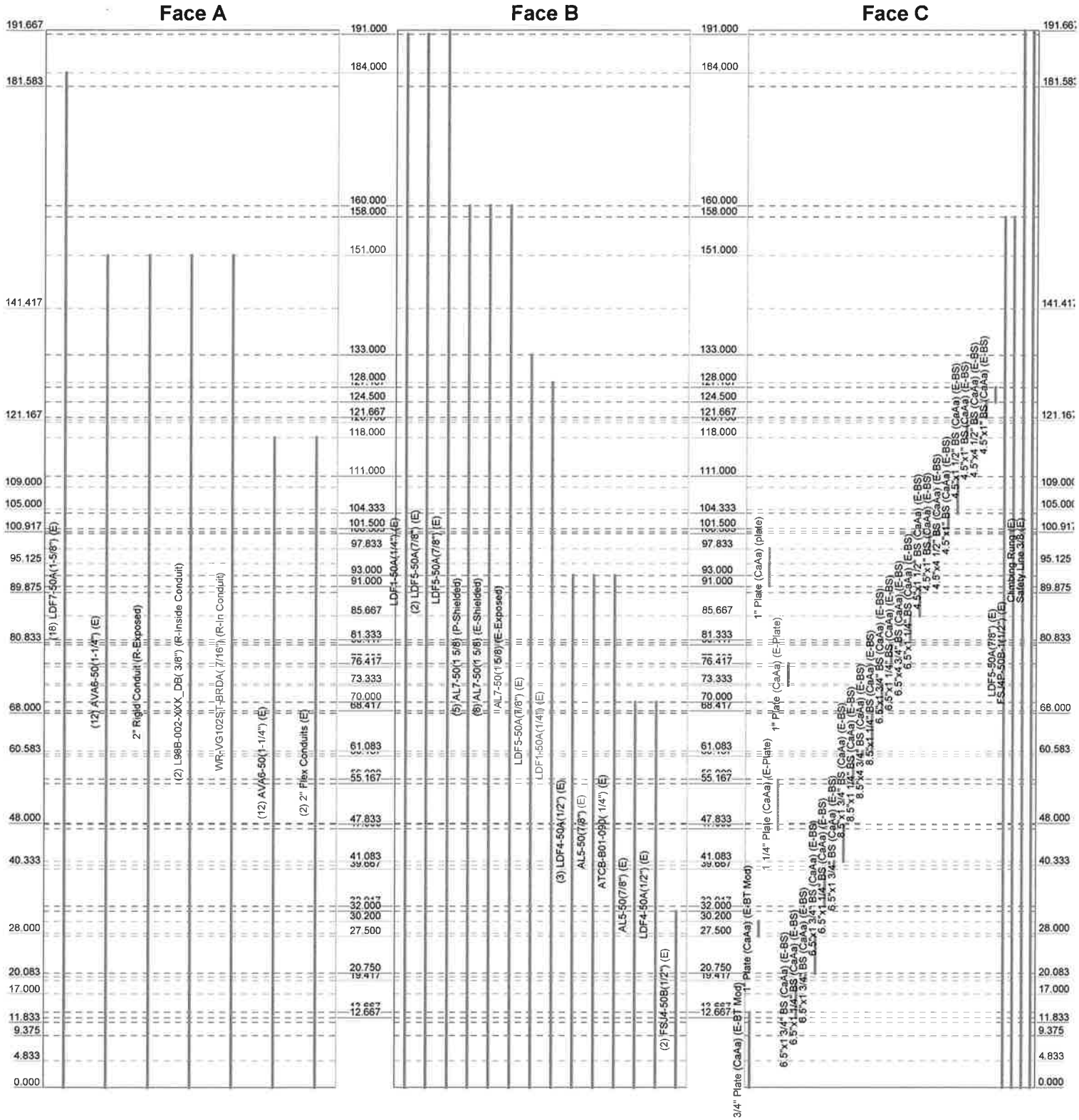
Tulsa, OK 74119
Phone: (918) 587-4630
FAX: (918) 295-0265

Job: 87581.012.01 - Newington_1, CT (BU# 826			
Project:			
Client: Crown Castle	Drawn by: jzhang	App'd:	
Code: TIA/EIA-222-F	Date: 06/09/15	Scale: NTS	
Path:		Dwg No. E-5	

0' - 191'8"

Round | Flat | App In Face | App Out Face | Truss Leg



B+T Group
1717 South Boulder Ave., Suite 300
Tulsa, OK 74119
Phone: (918) 587-4630
FAX: (918) 295-0265

Job:	87581.012.01 - Newington_1, CT (BU# 826		
Project:			
Client: Crown Castle	Drawn by: jzhang	App'd:	
Code: TIA/EIA-222-F	Date: 06/09/15	Scale: NTS	
Path:		Dwg No. E-7	

Tower Input Data

There is a pole section.
This tower is designed using the TIA/EIA-222-F standard.
The following design criteria apply:

Tower is located in Hartford County, Connecticut.
Basic wind speed of 80 mph.
Nominal ice thickness of 1.000 in.
Ice thickness is considered to increase with height.
Ice density of 56.000 pcf.
A wind speed of 38 mph is used in combination with ice.
Temperature drop of 50.000 °F.
Deflections calculated using a wind speed of 50 mph.
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.

Options

	Consider Moments - Legs		Distribute Leg Loads As Uniform		Treat Feedline Bundles As Cylinder
	Consider Moments - Horizontals		Assume Legs Pinned		Use ASCE 10 X-Brace Ly Rules
	Consider Moments - Diagonals	√	Assume Rigid Index Plate		Calculate Redundant Bracing Forces
	Use Moment Magnification	√	Use Clear Spans For Wind Area		Ignore Redundant Members in FEA
√	Use Code Stress Ratios		Use Clear Spans For KL/r		SR Leg Bolts Resist Compression
√	Use Code Safety Factors - Guys		Retension Guys To Initial Tension		All Leg Panels Have Same Allowable
√	Escalate Ice	√	Bypass Mast Stability Checks		Offset Girt At Foundation
	Always Use Max Kz	√	Use Azimuth Dish Coefficients	√	Consider Feedline Torque
	Use Special Wind Profile	√	Project Wind Area of Appurt.		Include Angle Block Shear Check
	Include Bolts In Member Capacity		Autocalc Torque Arm Areas		Poles
	Leg Bolts Are At Top Of Section		SR Members Have Cut Ends	√	Include Shear-Torsion Interaction
	Secondary Horizontal Braces Leg		Sort Capacity Reports By Component		Always Use Sub-Critical Flow
	Use Diamond Inner Bracing (4 Sided)		Triangulate Diamond Inner Bracing		Use Top Mounted Sockets
	Add IBC .6D+W Combination		Use TIA-222-G Tension Splice Capacity Exemption		

Pole Section Geometry

Section	*Elevation* *ft*	*Section Length* *ft*	*Pole Size*	*Pole Grade*	*Socket Length* *ft*
L1	191.667-181.583	10.084	P18x3/8	A53-B-42 (42 ksi)	
L2	181.583-141.417	40.166	P24x3/8	A53-B-42 (42 ksi)	
L3	141.417-121.167	20.250	P36x3/8	A53-B-42 (42 ksi)	
L4	121.167-109.000	12.167	P42x3/8	A53-B-42 (42 ksi)	
L5	109.000-105.000	4.000	P42x3/8 [0.491966]	33.98488ksi (34 ksi)	
L6	105.000-100.917	4.083	P42x3/8 [0.560722]	33.917422ksi (34 ksi)	
L7	100.917-95.125	5.792	P48x3/8	A53-B-42	

Section	Elevation ft	Section Length ft	Pole Size	Pole Grade	Socket Length ft
				(42 ksi)	
L8	95.125-89.875	5.250	P48x3/8 [0.478186]	37.586468ksi (38 ksi)	
L9	89.875-80.833	9.042	P48x3/8 [0.578153]	32.726953ksi (33 ksi)	
L10	80.833-68.000	12.833	P54x3/8 [0.487033]	38.423349ksi (38 ksi)	
L11	68.000-60.583	7.417	P54x3/8 [0.591202]	36.128987ksi (36 ksi)	
L12	60.583-48.000	12.583	P60x3/8 [0.514746]	38.065309ksi (38 ksi)	
L13	48.000-40.333	7.667	P60x3/8 [0.620238]	34.710865ksi (35 ksi)	
L14	40.333-28.000	12.333	P60x1/2 [0.597937]	39.261448ksi (39 ksi)	
L15	28.000-20.083	7.917	P60x1/2 [0.720286]	39.615729ksi (40 ksi)	
L16	20.083-17.000	3.083	P60x5/8	A53-B-42 (42 ksi)	
L17	17.000-11.833	5.167	P60x5/8 [0.72746]	40.010277ksi (40 ksi)	
L18	11.833-9.375	2.458	P60x5/8 [0.750143]	35.439706ksi (35 ksi)	
L19	9.375-4.833	4.542	P60x5/8 [0.777883]	35.60071ksi (36 ksi)	
L20	4.833-0.000	4.833	P60x5/8 [0.749582]	34.994764ksi (35 ksi)	

Tower Elevation ft	Gusset Area (per face) ft²	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in
L1 191.667-181.583				1	1	1		
L2 181.583-141.417				1	1	1		
L3 141.417-121.167				1	1	1		
L4 121.167-109.000				1	1	1		
L5 109.000-105.000				1	1	1.0455		
L6 105.000-100.917				1	1	1.04218		
L7 100.917-95.125				1	1	1		
L8 95.125-89.875				1	1	1.03858		
L9 89.875-80.833				1	1	1.01763		
L10 80.833-68.000				1	1	0.991923		
L11 68.000-60.583				1	1	1.00029		
L12 60.583-48.000				1	1	0.984117		
L13 48.000-40.333				1	1	1.02572		
L14 40.333-28.000				1	1	0.999405		
L15 28.000-20.083				1	1	1.01036		
L16 20.083-17.000				1	1	1		
L17 17.000-11.833				1	1	1.03834		
L18 11.833-9.375				1	1	1.02882		
L19 9.375-4.833				1	1	1.03408		
L20 4.833-0.000				1	1	1.0511		

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight klf
3/4" Plate (CaAa) (E-BT Mod)	C	No	CaAa (Out Of Face)	13.667 - 0.000	1	No Ice	0.125	0.000
						1/2" Ice	0.208	0.000
						1" Ice	0.292	0.000
						2" Ice	0.458	0.000
						4" Ice	0.792	0.000
1" Plate (CaAa) (E-BT Mod)	C	No	CaAa (Out Of Face)	30.200 - 27.500	1	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
1" Plate (CaAa) (plate)	C	No	CaAa (Out Of Face)	97.833 - 91.000	1	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
--**								
1 1/4" Plate (CaAa) (E-Plate)	C	No	CaAa (Out Of Face)	56.000 - 47.000	1	No Ice	0.208	0.000
						1/2" Ice	0.292	0.000
						1" Ice	0.375	0.000
						2" Ice	0.542	0.000
						4" Ice	0.875	0.000
1" Plate (CaAa) (E-Plate)	C	No	CaAa (Out Of Face)	77.000 - 73.000	1	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
--**								
6.5"x1 3/4" BS (CaAa) (E-BS)	C	No	CaAa (Out Of Face)	19.417 - 12.667	1	No Ice	0.292	0.116
						1/2" Ice	0.375	0.127
						1" Ice	0.458	0.138
						2" Ice	0.625	0.160
						4" Ice	0.958	0.205
6.5"x1 1/4" BS (CaAa) (E-BS)	C	No	CaAa (Out Of Face)	20.750 - 19.417	1	No Ice	0.208	0.083
						1/2" Ice	0.292	0.093
						1" Ice	0.375	0.103
						2" Ice	0.542	0.124
						4" Ice	0.875	0.165
6.5"x1 3/4" BS (CaAa) (E-BS)	C	No	CaAa (Out Of Face)	27.500 - 20.750	1	No Ice	0.292	0.116
						1/2" Ice	0.375	0.127
						1" Ice	0.458	0.138
						2" Ice	0.625	0.160
						4" Ice	0.958	0.205
6.5"x1 3/4" BS (CaAa) (E-BS)	C	No	CaAa (Out Of Face)	39.667 - 32.917	1	No Ice	0.292	0.116
						1/2" Ice	0.375	0.127
						1" Ice	0.458	0.138
						2" Ice	0.625	0.160
						4" Ice	0.958	0.205
6.5"x1 1/4" BS (CaAa) (E-BS)	C	No	CaAa (Out Of Face)	41.083 - 39.667	1	No Ice	0.208	0.083
						1/2" Ice	0.292	0.093
						1" Ice	0.375	0.103
						2" Ice	0.542	0.124
						4" Ice	0.875	0.165
6.5"x1 3/4" BS (CaAa) (E-BS)	C	No	CaAa (Out Of Face)	47.833 - 41.083	1	No Ice	0.292	0.116
						1/2" Ice	0.375	0.127
						1" Ice	0.458	0.138
						2" Ice	0.625	0.160
						4" Ice	0.958	0.205
8.5"x1 3/4" BS (CaAa)	C	No	CaAa (Out Of	60.167 - 55.167	1	No Ice	0.292	0.152

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft²/ft	Weight klf
(E-BS)			Face)			1/2" Ice	0.375	0.159
						1" Ice	0.458	0.167
						2" Ice	0.625	0.182
						4" Ice	0.958	0.213
8.5"x1 1/4" BS (CaAa)	C	No	CaAa (Out Of	61.083 - 60.167	1	No Ice	0.208	0.108
(E-BS)			Face)			1/2" Ice	0.292	0.121
						1" Ice	0.375	0.134
						2" Ice	0.542	0.159
						4" Ice	0.875	0.209
8.5"x4 3/4" BS (CaAa)	C	No	CaAa (Out Of	68.417 - 61.083	1	No Ice	0.292	0.412
(E-BS)			Face)			1/2" Ice	0.375	0.423
						1" Ice	0.458	0.434
						2" Ice	0.625	0.457
						4" Ice	0.958	0.501
8.5"x1 1/4" BS (CaAa)	C	No	CaAa (Out Of	73.333 - 68.417	1	No Ice	0.208	0.108
(E-BS)			Face)			1/2" Ice	0.292	0.121
						1" Ice	0.375	0.134
						2" Ice	0.542	0.159
						4" Ice	0.875	0.209
6.5"x1 3/4" BS (CaAa)	C	No	CaAa (Out Of	80.417 - 76.417	1	No Ice	0.292	0.116
(E-BS)			Face)			1/2" Ice	0.375	0.127
						1" Ice	0.458	0.138
						2" Ice	0.625	0.160
						4" Ice	0.958	0.205
6.5"x1 1/4" BS (CaAa)	C	No	CaAa (Out Of	81.333 - 80.417	1	No Ice	0.208	0.083
(E-BS)			Face)			1/2" Ice	0.292	0.093
						1" Ice	0.375	0.103
						2" Ice	0.542	0.124
						4" Ice	0.875	0.165
6.5"x4 3/4" BS (CaAa)	C	No	CaAa (Out Of	85.667 - 81.333	1	No Ice	0.792	0.315
(E-BS)			Face)			1/2" Ice	0.875	0.325
						1" Ice	0.958	0.335
						2" Ice	1.125	0.355
						4" Ice	1.458	0.395
6.5"x1 1/4" BS (CaAa)	C	No	CaAa (Out Of	91.000 - 85.667	1	No Ice	0.208	0.083
(E-BS)			Face)			1/2" Ice	0.292	0.093
						1" Ice	0.375	0.103
						2" Ice	0.542	0.124
						4" Ice	0.875	0.165
4.5"x1 1/2" BS (CaAa)	C	No	CaAa (Out Of	100.583 - 97.833	1	No Ice	0.250	0.069
(E-BS)			Face)			1/2" Ice	0.333	0.074
						1" Ice	0.417	0.079
						2" Ice	0.583	0.089
						4" Ice	0.917	0.109
4.5"x1" BS (CaAa)	C	No	CaAa (Out Of	101.500 - 100.583	1	No Ice	0.167	0.046
(E-BS)			Face)			1/2" Ice	0.250	0.054
						1" Ice	0.333	0.061
						2" Ice	0.500	0.076
						4" Ice	0.833	0.107
4.5"x4 1/2" BS (CaAa)	C	No	CaAa (Out Of	104.333 - 101.500	1	No Ice	0.750	0.207
(E-BS)			Face)			1/2" Ice	0.833	0.215
						1" Ice	0.917	0.224
						2" Ice	1.083	0.241
						4" Ice	1.417	0.274
4.5"x1" BS (CaAa)	C	No	CaAa (Out Of	111.000 - 104.333	1	No Ice	0.167	0.046
(E-BS)			Face)			1/2" Ice	0.250	0.054
						1" Ice	0.333	0.061
						2" Ice	0.500	0.076
						4" Ice	0.833	0.107
4.5"x1 1/2" BS (CaAa)	C	No	CaAa (Out Of	120.750 - 118.000	1	No Ice	0.250	0.069
(E-BS)			Face)			1/2" Ice	0.333	0.074

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft²/ft	Weight klf
						1" Ice	0.417	0.079
						2" Ice	0.583	0.089
						4" Ice	0.917	0.109
4.5"x1" BS (CaAa) (E-BS)	C	No	CaAa (Out Of Face)	121.667 - 120.750	1	No Ice	0.167	0.046
						1/2" Ice	0.250	0.054
						1" Ice	0.333	0.061
						2" Ice	0.500	0.076
						4" Ice	0.833	0.107
4.5"x4 1/2" BS (CaAa) (E-BS)	C	No	CaAa (Out Of Face)	124.500 - 121.667	1	No Ice	0.750	0.207
						1/2" Ice	0.833	0.215
						1" Ice	0.917	0.224
						2" Ice	1.083	0.241
						4" Ice	1.417	0.274
4.5"x1" BS (CaAa) (E-BS)	C	No	CaAa (Out Of Face)	127.167 - 124.500	1	No Ice	0.167	0.046
						1/2" Ice	0.250	0.054
						1" Ice	0.333	0.061
						2" Ice	0.500	0.076
						4" Ice	0.833	0.107
*** As per Mapping***								
LDF1-50A(1/4") (E)	B	No	Inside Pole	191.000 - 0.000	1	No Ice	0.000	0.000
						1/2" Ice	0.000	0.000
						1" Ice	0.000	0.000
						2" Ice	0.000	0.000
						4" Ice	0.000	0.000
LDF5-50A(7/8") (E)	B	No	Inside Pole	191.000 - 0.000	2	No Ice	0.000	0.000
						1/2" Ice	0.000	0.000
						1" Ice	0.000	0.000
						2" Ice	0.000	0.000
						4" Ice	0.000	0.000
__**								
LDF5-50A(7/8") (E)	B	No	Inside Pole	191.667 - 0.000	1	No Ice	0.000	0.000
						1/2" Ice	0.000	0.000
						1" Ice	0.000	0.000
						2" Ice	0.000	0.000
						4" Ice	0.000	0.000
__**								
LDF7-50A(1-5/8") (E)	A	No	Inside Pole	184.000 - 0.000	18	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
__**								
AL7-50(1 5/8) (P-Shielded)	B	No	CaAa (Out Of Face)	160.000 - 0.000	5	No Ice	0.000	0.001
						1/2" Ice	0.000	0.002
						1" Ice	0.000	0.004
						2" Ice	0.000	0.010
						4" Ice	0.000	0.030
AL7-50(1 5/8) (E-Shielded)	B	No	CaAa (Out Of Face)	160.000 - 0.000	8	No Ice	0.000	0.001
						1/2" Ice	0.000	0.002
						1" Ice	0.000	0.004
						2" Ice	0.000	0.010
						4" Ice	0.000	0.030
AL7-50(1 5/8) (E-Exposed)	B	No	CaAa (Out Of Face)	160.000 - 0.000	1	No Ice	0.196	0.001
						1/2" Ice	0.296	0.002
						1" Ice	0.396	0.004
						2" Ice	0.596	0.010
						4" Ice	0.996	0.030
__**								
LDF5-50A(7/8") (E)	C	No	Inside Pole	158.000 - 0.000	1	No Ice	0.000	0.000
						1/2" Ice	0.000	0.000
						1" Ice	0.000	0.000

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft²/ft	Weight klf
						2" Ice	0.000	0.000
						4" Ice	0.000	0.000
FSJ4P-50B-1(1/2") (E)	C	No	Inside Pole	158.000 - 0.000	1	No Ice	0.000	0.000
						1/2" Ice	0.000	0.000
						1" Ice	0.000	0.000
						2" Ice	0.000	0.000
						4" Ice	0.000	0.000
--**								
AVA6-50(1-1/4") (E)	A	No	Inside Pole	151.000 - 0.000	12	No Ice	0.000	0.000
						1/2" Ice	0.000	0.000
						1" Ice	0.000	0.000
						2" Ice	0.000	0.000
						4" Ice	0.000	0.000
2" Rigid Conduit (R-Exposed)	A	No	CaAa (Out Of Face)	151.000 - 0.000	1	No Ice	0.200	0.003
						1/2" Ice	0.300	0.004
						1" Ice	0.400	0.006
						2" Ice	0.600	0.013
						4" Ice	1.000	0.032
L98B-002-XXX_DB(3/8") (R-Inside Conduit)	A	No	CaAa (Out Of Face)	151.000 - 0.000	2	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-VG102ST-BRDA(7/16") (R-In Conduit)	A	No	CaAa (Out Of Face)	151.000 - 0.000	1	No Ice	0.000	0.000
						1/2" Ice	0.000	0.000
						1" Ice	0.000	0.000
						2" Ice	0.000	0.000
						4" Ice	0.000	0.000
--**								
LDF5-50A(7/8") (E)	B	No	Inside Pole	133.000 - 0.000	1	No Ice	0.000	0.000
						1/2" Ice	0.000	0.000
						1" Ice	0.000	0.000
						2" Ice	0.000	0.000
						4" Ice	0.000	0.000
--**								
LDF1-50A(1/4") (E)	B	No	Inside Pole	128.000 - 0.000	1	No Ice	0.000	0.000
						1/2" Ice	0.000	0.000
						1" Ice	0.000	0.000
						2" Ice	0.000	0.000
						4" Ice	0.000	0.000
--**								
AVA6-50(1-1/4") (E)	A	No	Inside Pole	118.000 - 0.000	12	No Ice	0.000	0.000
						1/2" Ice	0.000	0.000
						1" Ice	0.000	0.000
						2" Ice	0.000	0.000
						4" Ice	0.000	0.000
2" Flex Conduits (E)	A	No	Inside Pole	118.000 - 0.000	2	No Ice	0.000	0.003
						1/2" Ice	0.000	0.003
						1" Ice	0.000	0.003
						2" Ice	0.000	0.003
						4" Ice	0.000	0.003
LDF4-50A(1/2") (E)	B	No	Inside Pole	93.000 - 0.000	3	No Ice	0.000	0.000
						1/2" Ice	0.000	0.000
						1" Ice	0.000	0.000
						2" Ice	0.000	0.000
						4" Ice	0.000	0.000
AL5-50(7/8") (E)	B	No	Inside Pole	93.000 - 0.000	1	No Ice	0.000	0.000
						1/2" Ice	0.000	0.000
						1" Ice	0.000	0.000
						2" Ice	0.000	0.000
						4" Ice	0.000	0.000

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight klf
ATCB-B01-090(1/4") (E)	B	No	Inside Pole	93.000 - 0.000	1	No Ice	0.000	0.000
						1/2" Ice	0.000	0.000
						1" Ice	0.000	0.000
						2" Ice	0.000	0.000
						4" Ice	0.000	0.000
__**								
AL5-50(7/8") (E)	B	No	Inside Pole	70.000 - 0.000	1	No Ice	0.000	0.000
						1/2" Ice	0.000	0.000
						1" Ice	0.000	0.000
						2" Ice	0.000	0.000
						4" Ice	0.000	0.000
LDF4-50A(1/2") (E)	B	No	Inside Pole	70.000 - 0.000	1	No Ice	0.000	0.000
						1/2" Ice	0.000	0.000
						1" Ice	0.000	0.000
						2" Ice	0.000	0.000
						4" Ice	0.000	0.000
FSJ4-50B(1/2") (E)	B	No	Inside Pole	32.000 - 0.000	2	No Ice	0.000	0.000
						1/2" Ice	0.000	0.000
						1" Ice	0.000	0.000
						2" Ice	0.000	0.000
						4" Ice	0.000	0.000
__**								
Climbing Rung (E)	C	No	CaAa (Out Of Face)	191.667 - 0.000	1	No Ice	0.234	0.005
						1/2" Ice	0.547	0.008
						1" Ice	0.859	0.013
						2" Ice	1.484	0.029
						4" Ice	2.734	0.087
Safety Line 3/8 (E)	C	No	CaAa (Out Of Face)	191.667 - 0.000	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

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	191.667-181.583	A	0.000	0.000	0.000	0.000	0.036
		B	0.000	0.000	0.000	0.000	0.010
		C	0.000	0.000	0.000	2.742	0.055
L2	181.583-141.417	A	0.000	0.000	0.000	1.917	0.674
		B	0.000	0.000	0.000	3.642	0.177
		C	0.000	0.000	0.000	10.921	0.228
L3	141.417-121.167	A	0.000	0.000	0.000	4.050	0.471
		B	0.000	0.000	0.000	3.969	0.173
		C	0.000	0.000	0.000	8.158	0.852
L4	121.167-109.000	A	0.000	0.000	0.000	2.433	0.382
		B	0.000	0.000	0.000	2.385	0.106
		C	0.000	0.000	0.000	4.398	0.373
L5	109.000-105.000	A	0.000	0.000	0.000	0.800	0.137
		B	0.000	0.000	0.000	0.784	0.035
		C	0.000	0.000	0.000	1.754	0.208
L6	105.000-100.917	A	0.000	0.000	0.000	0.817	0.140
		B	0.000	0.000	0.000	0.800	0.036
		C	0.000	0.000	0.000	3.443	0.667
L7	100.917-95.125	A	0.000	0.000	0.000	1.158	0.199
		B	0.000	0.000	0.000	1.135	0.051

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
		C	0.000	0.000	0.000	2.769	0.239
L8	95.125-89.875	A	0.000	0.000	0.000	1.050	0.180
		B	0.000	0.000	0.000	1.029	0.048
		C	0.000	0.000	0.000	2.349	0.125
L9	89.875-80.833	A	0.000	0.000	0.000	1.808	0.310
		B	0.000	0.000	0.000	1.772	0.086
		C	0.000	0.000	0.000	6.870	1.811
L10	80.833-68.000	A	0.000	0.000	0.000	2.567	0.440
		B	0.000	0.000	0.000	2.515	0.123
		C	0.000	0.000	0.000	6.555	1.281
L11	68.000-60.583	A	0.000	0.000	0.000	1.483	0.254
		B	0.000	0.000	0.000	1.454	0.074
		C	0.000	0.000	0.000	4.138	2.950
L12	60.583-48.000	A	0.000	0.000	0.000	2.517	0.431
		B	0.000	0.000	0.000	2.466	0.125
		C	0.000	0.000	0.000	6.633	0.879
L13	48.000-40.333	A	0.000	0.000	0.000	1.533	0.263
		B	0.000	0.000	0.000	1.503	0.076
		C	0.000	0.000	0.000	4.418	0.892
L14	40.333-28.000	A	0.000	0.000	0.000	2.467	0.423
		B	0.000	0.000	0.000	2.417	0.123
		C	0.000	0.000	0.000	5.827	0.913
L15	28.000-20.083	A	0.000	0.000	0.000	1.583	0.271
		B	0.000	0.000	0.000	1.552	0.081
		C	0.000	0.000	0.000	4.344	0.886
L16	20.083-17.000	A	0.000	0.000	0.000	0.617	0.106
		B	0.000	0.000	0.000	0.604	0.031
		C	0.000	0.000	0.000	1.682	0.354
L17	17.000-11.833	A	0.000	0.000	0.000	1.033	0.177
		B	0.000	0.000	0.000	1.013	0.053
		C	0.000	0.000	0.000	2.898	0.534
L18	11.833-9.375	A	0.000	0.000	0.000	0.492	0.084
		B	0.000	0.000	0.000	0.482	0.025
		C	0.000	0.000	0.000	0.976	0.015
L19	9.375-4.833	A	0.000	0.000	0.000	0.908	0.156
		B	0.000	0.000	0.000	0.890	0.046
		C	0.000	0.000	0.000	1.803	0.027
L20	4.833-0.000	A	0.000	0.000	0.000	0.967	0.166
		B	0.000	0.000	0.000	0.947	0.049
		C	0.000	0.000	0.000	1.918	0.029

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	191.667-181.583	A	1.231	0.000	0.000	0.000	0.000	0.036
		B		0.000	0.000	0.000	0.000	0.010
		C		0.000	0.000	0.000	12.984	0.181
L2	181.583-141.417	A	1.210	0.000	0.000	0.000	4.236	0.771
		B		0.000	0.000	0.000	8.140	1.449
		C		0.000	0.000	0.000	51.020	0.715
L3	141.417-121.167	A	1.180	0.000	0.000	0.000	8.830	0.667
		B		0.000	0.000	0.000	8.749	1.508
		C		0.000	0.000	0.000	29.056	1.200
L4	121.167-109.000	A	1.162	0.000	0.000	0.000	5.260	0.497
		B		0.000	0.000	0.000	5.212	0.889
		C		0.000	0.000	0.000	17.060	0.585

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L5	109.000-105.000	A	1.152	0.000	0.000	0.000	1.721	0.174
		B		0.000	0.000	0.000	1.705	0.289
		C		0.000	0.000	0.000	6.322	0.322
L6	105.000-100.917	A	1.146	0.000	0.000	0.000	1.753	0.177
		B		0.000	0.000	0.000	1.736	0.293
		C		0.000	0.000	0.000	8.085	0.789
L7	100.917-95.125	A	1.140	0.000	0.000	0.000	2.478	0.251
		B		0.000	0.000	0.000	2.455	0.412
		C		0.000	0.000	0.000	9.315	0.339
L8	95.125-89.875	A	1.132	0.000	0.000	0.000	2.238	0.227
		B		0.000	0.000	0.000	2.217	0.373
		C		0.000	0.000	0.000	8.241	0.207
L9	89.875-80.833	A	1.121	0.000	0.000	0.000	3.835	0.390
		B		0.000	0.000	0.000	3.799	0.636
		C		0.000	0.000	0.000	16.920	2.110
L10	80.833-68.000	A	1.103	0.000	0.000	0.000	5.396	0.550
		B		0.000	0.000	0.000	5.345	0.884
		C		0.000	0.000	0.000	20.754	1.666
L11	68.000-60.583	A	1.083	0.000	0.000	0.000	3.090	0.316
		B		0.000	0.000	0.000	3.061	0.501
		C		0.000	0.000	0.000	12.106	3.203
L12	60.583-48.000	A	1.062	0.000	0.000	0.000	5.188	0.531
		B		0.000	0.000	0.000	5.138	0.827
		C		0.000	0.000	0.000	20.027	1.092
L13	48.000-40.333	A	1.036	0.000	0.000	0.000	3.121	0.321
		B		0.000	0.000	0.000	3.091	0.487
		C		0.000	0.000	0.000	12.436	1.133
L14	40.333-28.000	A	1.004	0.000	0.000	0.000	4.943	0.511
		B		0.000	0.000	0.000	4.894	0.752
		C		0.000	0.000	0.000	17.654	1.182
L15	28.000-20.083	A	1.000	0.000	0.000	0.000	3.167	0.327
		B		0.000	0.000	0.000	3.135	0.482
		C		0.000	0.000	0.000	12.195	1.117
L16	20.083-17.000	A	1.000	0.000	0.000	0.000	1.233	0.127
		B		0.000	0.000	0.000	1.221	0.188
		C		0.000	0.000	0.000	4.739	0.448
L17	17.000-11.833	A	1.000	0.000	0.000	0.000	2.067	0.214
		B		0.000	0.000	0.000	2.046	0.314
		C		0.000	0.000	0.000	8.189	0.674
L18	11.833-9.375	A	1.000	0.000	0.000	0.000	0.983	0.102
		B		0.000	0.000	0.000	0.973	0.149
		C		0.000	0.000	0.000	3.413	0.036
L19	9.375-4.833	A	1.000	0.000	0.000	0.000	1.817	0.188
		B		0.000	0.000	0.000	1.799	0.276
		C		0.000	0.000	0.000	6.307	0.066
L20	4.833-0.000	A	1.000	0.000	0.000	0.000	1.933	0.200
		B		0.000	0.000	0.000	1.914	0.294
		C		0.000	0.000	0.000	6.711	0.070

Feed Line Center of Pressure

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
L1	191.667-181.583	-0.299	0.173	-0.838	0.484
L2	181.583-141.417	-0.195	0.166	-0.734	0.501
L3	141.417-121.167	-0.212	0.118	-0.711	0.407
L4	121.167-109.000	-0.177	0.097	-0.743	0.426
L5	109.000-105.000	-0.254	0.142	-0.856	0.491
L6	105.000-100.917	-0.621	0.354	-1.083	0.622
L7	100.917-95.125	-0.301	0.169	-0.925	0.531
L8	95.125-89.875	-0.270	0.151	-0.902	0.517
L9	89.875-80.833	-0.568	0.323	-1.092	0.627
L10	80.833-68.000	-0.340	0.192	-0.983	0.564
L11	68.000-60.583	-0.388	0.219	-0.998	0.573
L12	60.583-48.000	-0.363	0.205	-1.013	0.581
L13	48.000-40.333	-0.414	0.234	-1.041	0.597
L14	40.333-28.000	-0.306	0.172	-0.909	0.520
L15	28.000-20.083	-0.385	0.217	-0.991	0.568
L16	20.083-17.000	-0.382	0.216	-0.988	0.567
L17	17.000-11.833	-0.398	0.225	-1.023	0.587
L18	11.833-9.375	-0.225	0.125	-0.877	0.502
L19	9.375-4.833	-0.225	0.125	-0.877	0.502
L20	4.833-0.000	-0.225	0.125	-0.877	0.502

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
Lightning Rod 5/8" x 4' on 4' Pole (E)	B	From Leg	1.000 0.000 4.000	0.000	191.667	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.465 2.131 2.702 3.805 6.417	1.465 2.131 2.702 3.805 6.417	0.066 0.087 0.112 0.175 0.373
--**									
Motorola WB2855 (E)	B	From Leg	6.000 0.000 0.000	0.000	191.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.221 2.477 2.751 3.354 4.725	0.919 1.183 1.475 2.151 3.740	0.020 0.038 0.058 0.111 0.281
1 1/2" x 8' Omni (E)	B	From Leg	6.000 0.000 0.000	0.000	191.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.200 2.021 2.858 4.005 6.091	1.200 2.021 2.858 4.005 6.091	0.020 0.030 0.045 0.091 0.253
7/8" x 5' Omni (E)	B	From Leg	1.000 0.000 0.000	0.000	191.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.438 0.953 1.391 2.028 3.414	0.438 0.953 1.391 2.028 3.414	0.010 0.014 0.022 0.048 0.145
3' x 2" Pipe Mount (E)	B	From Leg	0.500 0.000	0.000	191.000	No Ice 1/2" Ice	0.583 0.770	0.583 0.770	0.011 0.017

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			-2.000			1" Ice	0.967	0.967	0.024
						2" Ice	1.417	1.417	0.047
						4" Ice	2.536	2.536	0.126
4' x 2" Pipe Mount	B	From Leg	0.500	0.000	191.000	No Ice	0.785	0.785	0.029
(E)			0.000			1/2" Ice	1.028	1.028	0.035
			-1.000			1" Ice	1.281	1.281	0.044
						2" Ice	1.814	1.814	0.072
						4" Ice	3.111	3.111	0.167
Side Arm Mount [SO 702-1]	B	From Leg	3.000	0.000	191.000	No Ice	1.000	1.430	0.027
(E)			0.000			1/2" Ice	1.250	2.050	0.038
			0.000			1" Ice	1.500	2.670	0.049
						2" Ice	2.000	3.910	0.071
						4" Ice	3.000	6.390	0.115
--**									
1 1/2" x 3'-6" Omni	A	From Leg	1.000	0.000	189.000	No Ice	0.525	0.525	0.010
(E)			0.000			1/2" Ice	0.766	0.766	0.014
			3.000			1" Ice	0.988	0.988	0.021
						2" Ice	1.459	1.459	0.043
						4" Ice	2.639	2.639	0.122
6' x 2" Mount Pipe	B	From Leg	1.000	0.000	189.000	No Ice	1.425	1.425	0.022
(E)			0.000			1/2" Ice	1.925	1.925	0.033
			0.000			1" Ice	2.294	2.294	0.048
						2" Ice	3.060	3.060	0.090
						4" Ice	4.702	4.702	0.231
Side Arm Mount [SO 301-1]	A	From Leg	0.500	0.000	189.000	No Ice	1.000	0.900	0.023
(E)			0.000			1/2" Ice	1.390	1.420	0.033
			0.000			1" Ice	1.780	1.940	0.042
						2" Ice	2.560	2.980	0.061
						4" Ice	4.120	5.060	0.100
--**									
RR90-17-02DP w/ Mount Pipe	A	From Leg	4.000	0.000	184.000	No Ice	4.593	3.319	0.034
			0.000			1/2" Ice	5.088	4.089	0.072
(E)			-3.000			1" Ice	5.578	4.784	0.115
						2" Ice	6.588	6.225	0.224
						4" Ice	8.731	9.308	0.557
RR90-17-02DP w/ Mount Pipe	B	From Leg	4.000	0.000	184.000	No Ice	4.593	3.319	0.034
			0.000			1/2" Ice	5.088	4.089	0.072
(E)			-3.000			1" Ice	5.578	4.784	0.115
						2" Ice	6.588	6.225	0.224
						4" Ice	8.731	9.308	0.557
RR90-17-02DP w/ Mount Pipe	C	From Leg	4.000	0.000	184.000	No Ice	4.593	3.319	0.034
			0.000			1/2" Ice	5.088	4.089	0.072
(E)			-3.000			1" Ice	5.578	4.784	0.115
						2" Ice	6.588	6.225	0.224
						4" Ice	8.731	9.308	0.557
APXV18-206516L-A w/ Mount Pipe	A	From Leg	4.000	0.000	184.000	No Ice	3.808	3.289	0.038
			0.000			1/2" Ice	4.221	3.995	0.073
(E)			-3.000			1" Ice	4.666	4.661	0.113
						2" Ice	5.622	6.044	0.213
						4" Ice	7.659	9.023	0.526
APXV18-206516L-A w/ Mount Pipe	B	From Leg	4.000	0.000	184.000	No Ice	3.808	3.289	0.038
			0.000			1/2" Ice	4.221	3.995	0.073
(E)			-3.000			1" Ice	4.666	4.661	0.113
						2" Ice	5.622	6.044	0.213
						4" Ice	7.659	9.023	0.526
APXV18-206516L-A w/ Mount Pipe	C	From Leg	4.000	0.000	184.000	No Ice	3.808	3.289	0.038
			0.000			1/2" Ice	4.221	3.995	0.073

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(E)			-3.000			1" Ice	4.666	4.661	0.113
						2" Ice	5.622	6.044	0.213
						4" Ice	7.659	9.023	0.526
(2) KRY 112 144/1	A	From Leg	4.000	0.000	184.000	No Ice	0.408	0.204	0.011
(E)			0.000			1/2" Ice	0.497	0.273	0.014
			-3.000			1" Ice	0.594	0.351	0.019
						2" Ice	0.815	0.533	0.032
						4" Ice	1.359	0.999	0.082
(2) KRY 112 144/1	B	From Leg	4.000	0.000	184.000	No Ice	0.408	0.204	0.011
(E)			0.000			1/2" Ice	0.497	0.273	0.014
			-3.000			1" Ice	0.594	0.351	0.019
						2" Ice	0.815	0.533	0.032
						4" Ice	1.359	0.999	0.082
(2) KRY 112 144/1	C	From Leg	4.000	0.000	184.000	No Ice	0.408	0.204	0.011
(E)			0.000			1/2" Ice	0.497	0.273	0.014
			-3.000			1" Ice	0.594	0.351	0.019
						2" Ice	0.815	0.533	0.032
						4" Ice	1.359	0.999	0.082
LNX-6515DS-VTM w/ Mount Pipe	A	From Leg	4.000	0.000	184.000	No Ice	11.683	9.842	0.083
			0.000			1/2" Ice	12.404	11.366	0.173
(R)			-3.000			1" Ice	13.135	12.914	0.273
						2" Ice	14.601	15.267	0.506
						4" Ice	17.875	20.139	1.151
LNX-6515DS-VTM w/ Mount Pipe	B	From Leg	4.000	0.000	184.000	No Ice	11.683	9.842	0.083
			0.000			1/2" Ice	12.404	11.366	0.173
(R)			-3.000			1" Ice	13.135	12.914	0.273
						2" Ice	14.601	15.267	0.506
						4" Ice	17.875	20.139	1.151
LNX-6515DS-VTM w/ Mount Pipe	C	From Leg	4.000	0.000	184.000	No Ice	11.683	9.842	0.083
			0.000			1/2" Ice	12.404	11.366	0.173
(R)			-3.000			1" Ice	13.135	12.914	0.273
						2" Ice	14.601	15.267	0.506
						4" Ice	17.875	20.139	1.151
ATBT-BOTTOM-24V	A	From Leg	4.000	0.000	184.000	No Ice	0.121	0.075	0.003
(R)			0.000			1/2" Ice	0.172	0.119	0.004
			-3.000			1" Ice	0.232	0.172	0.006
						2" Ice	0.377	0.303	0.013
						4" Ice	0.771	0.668	0.045
ATBT-BOTTOM-24V	B	From Leg	4.000	0.000	184.000	No Ice	0.121	0.075	0.003
(R)			0.000			1/2" Ice	0.172	0.119	0.004
			-3.000			1" Ice	0.232	0.172	0.006
						2" Ice	0.377	0.303	0.013
						4" Ice	0.771	0.668	0.045
ATBT-BOTTOM-24V	C	From Leg	4.000	0.000	184.000	No Ice	0.121	0.075	0.003
(R)			0.000			1/2" Ice	0.172	0.119	0.004
			-3.000			1" Ice	0.232	0.172	0.006
						2" Ice	0.377	0.303	0.013
						4" Ice	0.771	0.668	0.045
Platform Mount [LP 405-1]	C	None		0.000	184.000	No Ice	20.800	20.800	1.800
(E)						1/2" Ice	28.100	28.100	2.066
						1" Ice	35.400	35.400	2.332
						2" Ice	50.000	50.000	2.864
						4" Ice	79.200	79.200	3.928
__**									
(2) HBXX-6517DS-VTM w/ Mount Pipe	A	From Leg	4.000	0.000	160.000	No Ice	8.976	6.963	0.069
			0.000			1/2" Ice	9.647	8.182	0.139
(P)			0.000			1" Ice	10.291	9.144	0.217

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						2" Ice	11.595	11.022	0.401
						4" Ice	14.321	15.027	0.916
(2) HBXX-6517DS-VTM w/ Mount Pipe (P)	B	From Leg	4.000 0.000 0.000	0.000	160.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.976 9.647 10.291 11.595 14.321	6.963 8.182 9.144 11.022 15.027	0.069 0.139 0.217 0.401 0.916
(2) HBXX-6517DS-VTM w/ Mount Pipe (P)	C	From Leg	4.000 0.000 0.000	0.000	160.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.976 9.647 10.291 11.595 14.321	6.963 8.182 9.144 11.022 15.027	0.069 0.139 0.217 0.401 0.916
LNX-6514DS-A1M w/ Mount Pipe (P)	A	From Leg	4.000 0.000 0.000	0.000	160.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.648 9.305 9.930 11.204 13.872	7.082 8.273 9.185 11.023 15.063	0.065 0.134 0.211 0.393 0.902
LNX-6514DS-A1M w/ Mount Pipe (P)	B	From Leg	4.000 0.000 0.000	0.000	160.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.648 9.305 9.930 11.204 13.872	7.082 8.273 9.185 11.023 15.063	0.065 0.134 0.211 0.393 0.902
(2) LNX-6514DS-A1M w/ Mount Pipe (P)	C	From Leg	4.000 0.000 0.000	0.000	160.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.648 9.305 9.930 11.204 13.872	7.082 8.273 9.185 11.023 15.063	0.065 0.134 0.211 0.393 0.902
LNX-8513DS-VTM w/ Mount Pipe (P)	A	From Leg	4.000 0.000 0.000	0.000	160.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.648 9.305 9.930 11.204 13.872	7.082 8.273 9.185 11.023 15.063	0.065 0.134 0.211 0.393 0.903
LNX-8513DS-VTM w/ Mount Pipe (P)	B	From Leg	4.000 0.000 0.000	0.000	160.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.648 9.305 9.930 11.204 13.872	7.082 8.273 9.185 11.023 15.063	0.065 0.134 0.211 0.393 0.903
(2) FD9R6004/2C-3L (P)	A	From Leg	4.000 0.000 0.000	0.000	160.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.367 0.451 0.543 0.755 1.281	0.085 0.136 0.196 0.343 0.740	0.003 0.005 0.009 0.020 0.063
(2) FD9R6004/2C-3L (P)	B	From Leg	4.000 0.000 0.000	0.000	160.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.367 0.451 0.543 0.755 1.281	0.085 0.136 0.196 0.343 0.740	0.003 0.005 0.009 0.020 0.063
(2) FD9R6004/2C-3L (P)	C	From Leg	4.000 0.000 0.000	0.000	160.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.367 0.451 0.543 0.755 1.281	0.085 0.136 0.196 0.343 0.740	0.003 0.005 0.009 0.020 0.063
RRH2x40 700 (P)	A	From Leg	4.000 0.000 0.000	0.000	160.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.290 2.493 2.705 3.155 4.158	1.206 1.363 1.529 1.887 2.706	0.050 0.067 0.086 0.134 0.271

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
RRH2x40 700	B	From Leg	4.000	0.000	160.000	No Ice	2.290	1.206	0.050
(P)			0.000			1/2" Ice	2.493	1.363	0.067
			0.000			1" Ice	2.705	1.529	0.086
						2" Ice	3.155	1.887	0.134
						4" Ice	4.158	2.706	0.271
RRH2x40 700	C	From Leg	4.000	0.000	160.000	No Ice	2.290	1.206	0.050
(P)			0.000			1/2" Ice	2.493	1.363	0.067
			0.000			1" Ice	2.705	1.529	0.086
						2" Ice	3.155	1.887	0.134
						4" Ice	4.158	2.706	0.271
RRH2X60-PCS	A	From Leg	4.000	0.000	160.000	No Ice	2.567	2.011	0.055
(P)			0.000			1/2" Ice	2.791	2.218	0.075
			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	B	From Leg	4.000	0.000	160.000	No Ice	2.567	2.011	0.055
(P)			0.000			1/2" Ice	2.791	2.218	0.075
			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	C	From Leg	4.000	0.000	160.000	No Ice	2.567	2.011	0.055
(P)			0.000			1/2" Ice	2.791	2.218	0.075
			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-AWS	A	From Leg	4.000	0.000	160.000	No Ice	3.957	1.816	0.060
(P)			0.000			1/2" Ice	4.272	2.075	0.083
			0.000			1" Ice	4.596	2.360	0.109
						2" Ice	5.271	2.957	0.173
						4" Ice	6.722	4.253	0.354
RRH2X60-AWS	B	From Leg	4.000	0.000	160.000	No Ice	3.957	1.816	0.060
(P)			0.000			1/2" Ice	4.272	2.075	0.083
			0.000			1" Ice	4.596	2.360	0.109
						2" Ice	5.271	2.957	0.173
						4" Ice	6.722	4.253	0.354
RRH2X60-AWS	C	From Leg	4.000	0.000	160.000	No Ice	3.957	1.816	0.060
(P)			0.000			1/2" Ice	4.272	2.075	0.083
			0.000			1" Ice	4.596	2.360	0.109
						2" Ice	5.271	2.957	0.173
						4" Ice	6.722	4.253	0.354
DB-T1-6Z-8AB-0Z	A	From Leg	4.000	0.000	160.000	No Ice	5.600	2.333	0.044
(P)			0.000			1/2" Ice	5.915	2.558	0.080
			0.000			1" Ice	6.240	2.791	0.120
						2" Ice	6.914	3.284	0.213
						4" Ice	8.365	4.373	0.455
Platform Mount [LP 303-1]	C	None		0.000	160.000	No Ice	14.660	14.660	1.250
(E)						1/2" Ice	18.870	18.870	1.481
						1" Ice	23.080	23.080	1.713
						2" Ice	31.500	31.500	2.175
						4" Ice	48.340	48.340	3.101
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4-Element 17' Dipole	B	From Leg	4.000	0.000	158.000	No Ice	3.800	3.800	0.040
(E)			0.000			1/2" Ice	8.071	8.071	0.076
			2.000			1" Ice	12.342	12.342	0.112
						2" Ice	20.884	20.884	0.184
						4" Ice	37.968	37.968	0.328
1 3/8" x 15' Omni	C	From Leg	6.000	0.000	158.000	No Ice	2.063	2.063	0.020

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(E)			0.000 2.000			1/2" Ice 1" Ice 2" Ice 4" Ice	3.582 5.119 8.242 13.342	3.582 5.119 8.242 13.342	0.037 0.064 0.147 0.432
4' x 2" Pipe Mount (E)	B	From Leg	4.000 0.000 0.000	0.000	158.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.785 1.028 1.281 1.814 3.111	0.785 1.028 1.281 1.814 3.111	0.029 0.035 0.044 0.072 0.167
4' x 2" Pipe Mount (E)	C	From Leg	6.000 0.000 0.000	0.000	158.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.785 1.028 1.281 1.814 3.111	0.785 1.028 1.281 1.814 3.111	0.029 0.035 0.044 0.072 0.167
Side Arm Mount [SO 702-1] (E)	B	From Leg	3.000 0.000 0.000	0.000	158.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.000 1.250 1.500 2.000 3.000	1.430 2.050 2.670 3.910 6.390	0.027 0.038 0.049 0.071 0.115
Side Arm Mount [SO 702-1] (E)	C	From Leg	3.000 0.000 0.000	0.000	158.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.000 1.250 1.500 2.000 3.000	1.430 2.050 2.670 3.910 6.390	0.027 0.038 0.049 0.071 0.115
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AM-X-CD-16-65-00T-RET w/ Mount Pipe (E)	A	From Leg	4.000 0.000 0.000	0.000	151.000	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
(2) SBNH-1D6565C w/ Mount Pipe (E)	A	From Leg	4.000 0.000 0.000	0.000	151.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	11.683 12.404 13.135 14.601 17.875	9.842 11.366 12.914 15.267 20.139	0.099 0.189 0.288 0.522 1.167
(3) 7770.00 w/ Mount Pipe (E)	C	From Leg	4.000 0.000 0.000	0.000	151.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.119 6.626 7.128 8.164 10.360	4.254 5.014 5.711 7.155 10.412	0.055 0.103 0.157 0.287 0.665
AM-X-CD-16-65-00T-RET w/ Mount Pipe (R)	B	From Leg	4.000 0.000 0.000	0.000	151.000	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
(2) SBNH-1D6565C w/ Mount Pipe (R)	B	From Leg	4.000 0.000 0.000	0.000	151.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	11.683 12.404 13.135 14.601 17.875	9.842 11.366 12.914 15.267 20.139	0.099 0.189 0.288 0.522 1.167
(2) CM1007-DBPXBC-003 (R)	A	From Leg	4.000 0.000 0.000	0.000	151.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.429 0.523 0.626 0.858 1.425	0.156 0.214 0.280 0.438 0.858	0.007 0.010 0.015 0.029 0.082
(2) CM1007-DBPXBC-003 (R)	B	From Leg	4.000 0.000	0.000	151.000	No Ice 1/2" Ice	0.429 0.523	0.156 0.214	0.007 0.010

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.000			1" Ice	0.626	0.280	0.015
						2" Ice	0.858	0.438	0.029
						4" Ice	1.425	0.858	0.082
(2) CM1007-DBPXBC-003	C	From Leg	4.000	0.000	151.000	No Ice	0.429	0.156	0.007
(R)			0.000			1/2" Ice	0.523	0.214	0.010
			0.000			1" Ice	0.626	0.280	0.015
						2" Ice	0.858	0.438	0.029
						4" Ice	1.425	0.858	0.082
(2) LGP21901	A	From Leg	4.000	0.000	151.000	No Ice	0.270	0.184	0.006
(R)			0.000			1/2" Ice	0.343	0.248	0.008
			0.000			1" Ice	0.425	0.322	0.011
						2" Ice	0.616	0.494	0.022
						4" Ice	1.101	0.943	0.066
(2) LGP21901	B	From Leg	4.000	0.000	151.000	No Ice	0.270	0.184	0.006
(R)			0.000			1/2" Ice	0.343	0.248	0.008
			0.000			1" Ice	0.425	0.322	0.011
						2" Ice	0.616	0.494	0.022
						4" Ice	1.101	0.943	0.066
(2) LGP21901	C	From Leg	4.000	0.000	151.000	No Ice	0.270	0.184	0.006
(R)			0.000			1/2" Ice	0.343	0.248	0.008
			0.000			1" Ice	0.425	0.322	0.011
						2" Ice	0.616	0.494	0.022
						4" Ice	1.101	0.943	0.066
(4) DTMABP7819VG12A	A	From Leg	4.000	0.000	151.000	No Ice	1.139	0.391	0.019
(R)			0.000			1/2" Ice	1.284	0.488	0.026
			0.000			1" Ice	1.437	0.595	0.036
						2" Ice	1.769	0.833	0.060
						4" Ice	2.538	1.414	0.140
(2) DTMABP7819VG12A	B	From Leg	4.000	0.000	151.000	No Ice	1.139	0.391	0.019
(R)			0.000			1/2" Ice	1.284	0.488	0.026
			0.000			1" Ice	1.437	0.595	0.036
						2" Ice	1.769	0.833	0.060
						4" Ice	2.538	1.414	0.140
Platform Mount [LP 403-1]	C	None		0.000	151.000	No Ice	18.850	18.850	1.500
(E)						1/2" Ice	24.300	24.300	1.797
						1" Ice	29.750	29.750	2.093
						2" Ice	40.650	40.650	2.686
						4" Ice	62.450	62.450	3.872
--**									
(2) RRU-11	A	From Leg	1.000	0.000	148.000	No Ice	1.912	1.472	0.044
(R)			0.000			1/2" Ice	2.102	1.645	0.060
			0.000			1" Ice	2.301	1.827	0.078
						2" Ice	2.725	2.218	0.123
						4" Ice	3.676	3.102	0.254
(2) RRU-11	B	From Leg	1.000	0.000	148.000	No Ice	1.912	1.472	0.044
(R)			0.000			1/2" Ice	2.102	1.645	0.060
			0.000			1" Ice	2.301	1.827	0.078
						2" Ice	2.725	2.218	0.123
						4" Ice	3.676	3.102	0.254
(2) RRU-11	C	From Leg	1.000	0.000	148.000	No Ice	1.912	1.472	0.044
(R)			0.000			1/2" Ice	2.102	1.645	0.060
			0.000			1" Ice	2.301	1.827	0.078
						2" Ice	2.725	2.218	0.123
						4" Ice	3.676	3.102	0.254
DC6-48-60-18-8F	C	From Leg	1.000	0.000	148.000	No Ice	1.467	1.467	0.019
(R)			0.000			1/2" Ice	1.667	1.667	0.037
			0.000			1" Ice	1.878	1.878	0.057

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						2" Ice	2.333	2.333	0.105
						4" Ice	3.378	3.378	0.239
(2) Pipe Mount [PM 601-3]	C	None		0.000	148.000	No Ice	4.390	4.390	0.195
(R)						1/2" Ice	5.480	5.480	0.237
						1" Ice	6.570	6.570	0.280
						2" Ice	8.750	8.750	0.365
						4" Ice	13.110	13.110	0.534
Pipe Mount [PM 601-1]	C	From Leg	0.500	0.000	148.000	No Ice	3.000	0.900	0.065
(R)			0.000			1/2" Ice	3.740	1.120	0.079
			0.000			1" Ice	4.480	1.340	0.093
						2" Ice	5.960	1.780	0.122
						4" Ice	8.920	2.660	0.178
--**									
SRL-235-2	B	From Leg	6.000	0.000	133.000	No Ice	7.000	7.000	0.076
(E)			0.000			1/2" Ice	9.037	9.037	0.125
			8.000			1" Ice	11.092	11.092	0.187
						2" Ice	15.250	15.250	0.351
						4" Ice	22.255	22.255	0.836
4' x 2" Pipe Mount	B	From Leg	6.000	0.000	133.000	No Ice	0.785	0.785	0.029
(E)			0.000			1/2" Ice	1.028	1.028	0.035
			0.000			1" Ice	1.281	1.281	0.044
						2" Ice	1.814	1.814	0.072
						4" Ice	3.111	3.111	0.167
Side Arm Mount [SO 702-1]	B	From Leg	3.000	0.000	133.000	No Ice	1.000	1.430	0.027
(E)			0.000			1/2" Ice	1.250	2.050	0.038
			0.000			1" Ice	1.500	2.670	0.049
						2" Ice	2.000	3.910	0.071
						4" Ice	3.000	6.390	0.115
--**									
Motorola WP2900	B	From Leg	1.000	0.000	128.000	No Ice	1.572	0.473	0.011
(E)			0.000			1/2" Ice	1.797	0.681	0.022
			-1.000			1" Ice	2.044	0.932	0.037
						2" Ice	2.587	1.512	0.075
						4" Ice	3.843	2.909	0.209
2' x 2" Pipe Mount	B	From Leg	1.000	0.000	128.000	No Ice	0.026	0.026	0.007
(E)			0.000			1/2" Ice	0.056	0.056	0.008
			0.000			1" Ice	0.097	0.097	0.009
						2" Ice	0.213	0.213	0.013
						4" Ice	0.576	0.576	0.034
Side Arm Mount [SO 104-3]	B	From Leg	0.500	0.000	128.000	No Ice	3.300	3.300	0.287
(E)			0.000			1/2" Ice	4.130	4.130	0.317
			0.000			1" Ice	4.960	4.960	0.347
						2" Ice	6.620	6.620	0.407
						4" Ice	9.940	9.940	0.527
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LLPX310R w/ Mount Pipe	A	From Leg	4.000	0.000	116.000	No Ice	5.065	2.985	0.045
(E)			0.000			1/2" Ice	5.480	3.528	0.083
			2.000			1" Ice	5.905	4.087	0.126
						2" Ice	6.788	5.314	0.232
						4" Ice	8.705	8.133	0.544
LLPX310R w/ Mount Pipe	B	From Leg	4.000	0.000	116.000	No Ice	5.065	2.985	0.045
(E)			0.000			1/2" Ice	5.480	3.528	0.083
			2.000			1" Ice	5.905	4.087	0.126
						2" Ice	6.788	5.314	0.232
						4" Ice	8.705	8.133	0.544
LLPX310R w/ Mount Pipe	C	From Leg	4.000	0.000	116.000	No Ice	5.065	2.985	0.045
(E)			0.000			1/2" Ice	5.480	3.528	0.083

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			2.000			1" Ice	5.905	4.087	0.126
						2" Ice	6.788	5.314	0.232
						4" Ice	8.705	8.133	0.544
844G65VTZASX w/ Mount Pipe	A	From Leg	4.000	0.000	116.000	No Ice	6.132	5.205	0.034
			0.000			1/2" Ice	6.594	5.894	0.087
(E)			2.000			1" Ice	7.064	6.591	0.145
						2" Ice	8.037	8.037	0.283
						4" Ice	10.117	11.188	0.672
844G65VTZASX w/ Mount Pipe	B	From Leg	4.000	0.000	116.000	No Ice	6.132	5.205	0.034
			0.000			1/2" Ice	6.594	5.894	0.087
(E)			2.000			1" Ice	7.064	6.591	0.145
						2" Ice	8.037	8.037	0.283
						4" Ice	10.117	11.188	0.672
844G65VTZASX w/ Mount Pipe	C	From Leg	4.000	0.000	116.000	No Ice	6.132	5.205	0.034
			0.000			1/2" Ice	6.594	5.894	0.087
(E)			2.000			1" Ice	7.064	6.591	0.145
						2" Ice	8.037	8.037	0.283
						4" Ice	10.117	11.188	0.672
(2) Andrew 844G90VTA-SX w/ Mount Pipe	A	From Leg	4.000	0.000	116.000	No Ice	3.774	5.396	0.040
			0.000			1/2" Ice	4.415	6.491	0.084
(E)			2.000			1" Ice	4.968	7.302	0.135
						2" Ice	6.104	8.960	0.259
						4" Ice	8.526	12.491	0.629
(2) Andrew 844G90VTA-SX w/ Mount Pipe	A	From Leg	4.000	0.000	116.000	No Ice	3.774	5.396	0.040
			0.000			1/2" Ice	4.415	6.491	0.084
(E)			2.000			1" Ice	4.968	7.302	0.135
						2" Ice	6.104	8.960	0.259
						4" Ice	8.526	12.491	0.629
(2) Andrew 844G90VTA-SX w/ Mount Pipe	B	From Leg	4.000	0.000	116.000	No Ice	3.774	5.396	0.040
			0.000			1/2" Ice	4.415	6.491	0.084
(E)			2.000			1" Ice	4.968	7.302	0.135
						2" Ice	6.104	8.960	0.259
						4" Ice	8.526	12.491	0.629
RRH SP1-22132825WB	A	From Leg	4.000	0.000	116.000	No Ice	1.804	0.778	0.033
			0.000			1/2" Ice	1.988	0.918	0.045
(E)			2.000			1" Ice	2.180	1.067	0.058
						2" Ice	2.589	1.391	0.094
						4" Ice	3.512	2.143	0.201
RRH SP1-22132825WB	B	From Leg	4.000	0.000	116.000	No Ice	1.804	0.778	0.033
			0.000			1/2" Ice	1.988	0.918	0.045
(E)			2.000			1" Ice	2.180	1.067	0.058
						2" Ice	2.589	1.391	0.094
						4" Ice	3.512	2.143	0.201
RRH SP1-22132825WB	C	From Leg	4.000	0.000	116.000	No Ice	1.804	0.778	0.033
			0.000			1/2" Ice	1.988	0.918	0.045
(E)			2.000			1" Ice	2.180	1.067	0.058
						2" Ice	2.589	1.391	0.094
						4" Ice	3.512	2.143	0.201
Junction Box 12" x 12" x 6 1/2"	A	From Leg	4.000	0.000	116.000	No Ice	1.400	0.758	0.005
			0.000			1/2" Ice	1.560	0.883	0.016
(E)			2.000			1" Ice	1.728	1.015	0.029
						2" Ice	2.091	1.307	0.062
						4" Ice	2.921	1.994	0.163
Platform Mount [LP 405-1]	C	None		0.000	116.000	No Ice	20.800	20.800	1.800
(E)						1/2" Ice	28.100	28.100	2.066
						1" Ice	35.400	35.400	2.332
						2" Ice	50.000	50.000	2.864

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						4" Ice	79.200	79.200	3.928
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1 7/8" x 8' Omni	B	From Leg	6.000	0.000	93.000	No Ice	1.500	1.500	0.020
(E)			0.000			1/2" Ice	2.324	2.324	0.032
			6.000			1" Ice	3.165	3.165	0.049
						2" Ice	4.172	4.172	0.099
						4" Ice	6.265	6.265	0.270
Motorola WB2900	C	From Leg	6.000	0.000	93.000	No Ice	1.572	0.473	0.011
(E)			0.000			1/2" Ice	1.797	0.681	0.022
			-1.000			1" Ice	2.044	0.932	0.037
						2" Ice	2.587	1.512	0.075
						4" Ice	3.843	2.909	0.209
4' x 2" Pipe Mount	B	From Leg	6.000	0.000	93.000	No Ice	0.785	0.785	0.029
(E)			0.000			1/2" Ice	1.028	1.028	0.035
			0.000			1" Ice	1.281	1.281	0.044
						2" Ice	1.814	1.814	0.072
						4" Ice	3.111	3.111	0.167
4' x 2" Pipe Mount	C	From Leg	6.000	0.000	93.000	No Ice	0.785	0.785	0.029
(E)			0.000			1/2" Ice	1.028	1.028	0.035
			0.000			1" Ice	1.281	1.281	0.044
						2" Ice	1.814	1.814	0.072
						4" Ice	3.111	3.111	0.167
Side Arm Mount [SO 702-1]	B	From Leg	3.000	0.000	93.000	No Ice	1.000	1.430	0.027
(E)			0.000			1/2" Ice	1.250	2.050	0.038
			0.000			1" Ice	1.500	2.670	0.049
						2" Ice	2.000	3.910	0.071
						4" Ice	3.000	6.390	0.115
Side Arm Mount [SO 702-1]	C	From Leg	3.000	0.000	93.000	No Ice	1.000	1.430	0.027
(E)			0.000			1/2" Ice	1.250	2.050	0.038
			0.000			1" Ice	1.500	2.670	0.049
						2" Ice	2.000	3.910	0.071
						4" Ice	3.000	6.390	0.115
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2" x 2' Omni	C	From Leg	4.000	0.000	70.000	No Ice	0.304	0.304	0.005
(E)			0.000			1/2" Ice	0.432	0.432	0.008
			-6.000			1" Ice	0.578	0.578	0.013
						2" Ice	0.933	0.933	0.028
						4" Ice	1.778	1.778	0.084
SRL-235-2	C	From Leg	4.000	0.000	70.000	No Ice	7.000	7.000	0.076
(E)			0.000			1/2" Ice	9.037	9.037	0.125
			6.000			1" Ice	11.092	11.092	0.187
						2" Ice	15.250	15.250	0.351
						4" Ice	22.255	22.255	0.836
6' x 2" Mount Pipe	C	From Leg	4.000	0.000	70.000	No Ice	1.425	1.425	0.022
(E)			0.000			1/2" Ice	1.925	1.925	0.033
			0.000			1" Ice	2.294	2.294	0.048
						2" Ice	3.060	3.060	0.090
						4" Ice	4.702	4.702	0.231
Side Arm Mount [SO 702-1]	C	From Leg	2.000	0.000	70.000	No Ice	1.000	1.430	0.027
(E)			0.000			1/2" Ice	1.250	2.050	0.038
			0.000			1" Ice	1.500	2.670	0.049
						2" Ice	2.000	3.910	0.071
						4" Ice	3.000	6.390	0.115
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Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
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6-Element 3' Long Yagi (E)	B	From Leg	4.000 0.000 0.000	0.000	32.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.849 1.466 2.083 3.317 5.785	0.849 1.466 2.083 3.317 5.785	0.005 0.006 0.007 0.009 0.012
1" x 3'-7" Omni (E)	B	From Leg	4.000 0.000 0.000	0.000	32.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.358 0.693 0.917 1.393 2.550	0.358 0.693 0.917 1.393 2.550	0.010 0.013 0.019 0.039 0.114
6' x 2" Mount Pipe (E)	A	From Leg	4.000 0.000 0.000	0.000	32.000	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
Side Arm Mount [SO 702-1] (E)	A	From Leg	2.000 0.000 0.000	0.000	32.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.000 1.250 1.500 2.000 3.000	1.430 2.050 2.670 3.910 6.390	0.027 0.038 0.049 0.071 0.115
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4' ICE SHIELDS (E)	A	From Leg	0.500 0.000 0.000	0.000	178.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.400 1.884 2.377 3.388 5.514	0.467 0.640 0.821 1.210 2.091	0.030 0.095 0.167 0.332 0.748
4' ICE SHIELDS (E)	A	From Leg	0.500 0.000 0.000	0.000	138.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.400 1.884 2.377 3.388 5.514	0.467 0.640 0.821 1.210 2.091	0.030 0.095 0.167 0.332 0.748
4' ICE SHIELDS (E)	A	From Leg	0.500 0.000 0.000	0.000	98.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.400 1.884 2.377 3.388 5.514	0.467 0.640 0.821 1.210 2.091	0.030 0.095 0.167 0.332 0.748
4' ICE SHIELDS (E)	B	From Leg	0.500 0.000 0.000	0.000	98.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.400 1.884 2.377 3.388 5.514	0.467 0.640 0.821 1.210 2.091	0.030 0.095 0.167 0.332 0.748
4' ICE SHIELDS (E)	C	From Leg	0.500 0.000 0.000	0.000	98.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.400 1.884 2.377 3.388 5.514	0.467 0.640 0.821 1.210 2.091	0.030 0.095 0.167 0.332 0.748
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Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft²	Weight K
Dragonwave 60-000261-08 (E)	B	Paraboloid w/Shroud (HP)	From Leg	4.000 0.000 2.000	90.000		116.000	2.917	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.680 7.070 7.460 8.230 9.780	0.050 0.090 0.120 0.200 0.340
KP2F-34 (E)	B	Grid	From Leg	6.000 0.000 2.000	0.000		93.000	2.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.140 3.410 3.680 4.276 5.600	0.005 0.023 0.040 0.075 0.100

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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	191.667 - 181.583	33.988	33	1.640	0.015
L2	181.583 - 141.417	30.536	34	1.636	0.013
L3	141.417 - 121.167	17.704	34	1.268	0.008
L4	121.167 - 109	12.740	34	1.049	0.006
L5	109 - 105	10.222	34	0.920	0.005
L6	105 - 100.917	9.468	34	0.880	0.004
L7	100.917 - 95.125	8.732	34	0.841	0.004
L8	95.125 - 89.875	7.747	34	0.781	0.003
L9	89.875 - 80.833	6.914	34	0.733	0.003
L10	80.833 - 68	5.598	34	0.655	0.002
L11	68 - 60.583	3.979	34	0.547	0.002
L12	60.583 - 48	3.175	34	0.486	0.001
L13	48 - 40.333	2.017	34	0.390	0.001
L14	40.333 - 28	1.435	34	0.335	0.001
L15	28 - 20.083	0.699	34	0.233	0.001
L16	20.083 - 17	0.362	34	0.172	0.000
L17	17 - 11.833	0.260	34	0.144	0.000
L18	11.833 - 9.375	0.128	34	0.101	0.000
L19	9.375 - 4.833	0.081	34	0.081	0.000
L20	4.833 - 0	0.022	34	0.043	0.000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
191.667	Lightning Rod 5/8" x 4' on 4' Pole	33	33.988	1.640	0.015	474916
191.000	Motorola WB2855	33	33.760	1.641	0.015	474916
189.000	1 1/2" x 3'-6" Omni	34	33.073	1.642	0.014	474916
184.000	RR90-17-02DP w/ Mount Pipe	34	31.363	1.640	0.014	251948
178.000	4' ICE SHIELDS	34	29.311	1.624	0.013	34525
160.000	(2) HBXX-6517DS-VTM w/ Mount Pipe	34	23.295	1.482	0.010	6551
158.000	4-Element 17' Dipole	34	22.654	1.460	0.010	6007
151.000	AM-X-CD-16-65-00T-RET w/ Mount Pipe	34	20.476	1.380	0.009	4655
148.000	(2) RRU-11	34	19.580	1.345	0.009	4245
138.000	4' ICE SHIELDS	34	16.784	1.229	0.008	3815
133.000	SRL-235-2	34	15.505	1.175	0.007	4252
128.000	Motorola WP2900	34	14.295	1.122	0.007	4809
118.000	Dragonwave 60-000261-08	34	12.054	1.015	0.006	5588
116.000	LLPX310R w/ Mount Pipe	34	11.631	0.994	0.005	5449
98.000	4' ICE SHIELDS	34	8.227	0.811	0.004	5671
95.000	KP2F-34	34	7.726	0.780	0.003	5822
93.000	1 7/8" x 8' Omni	34	7.403	0.761	0.003	6063
70.000	2" x 2' Omni	34	4.212	0.563	0.002	6705
32.000	6-Element 3' Long Yagi	34	0.909	0.265	0.001	7103

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	191.667 - 181.583	86.528	8	4.178	0.038
L2	181.583 - 141.417	77.719	8	4.169	0.034
L3	141.417 - 121.167	44.975	8	3.230	0.021
L4	121.167 - 109	32.352	9	2.671	0.016
L5	109 - 105	25.952	9	2.340	0.012
L6	105 - 100.917	24.034	9	2.238	0.011
L7	100.917 - 95.125	22.163	9	2.138	0.010
L8	95.125 - 89.875	19.662	9	1.984	0.008
L9	89.875 - 80.833	17.547	9	1.862	0.007
L10	80.833 - 68	14.206	9	1.663	0.006
L11	68 - 60.583	10.096	9	1.387	0.004
L12	60.583 - 48	8.058	9	1.234	0.004
L13	48 - 40.333	5.120	9	0.990	0.003
L14	40.333 - 28	3.641	9	0.850	0.002
L15	28 - 20.083	1.774	9	0.591	0.002
L16	20.083 - 17	0.920	9	0.437	0.001
L17	17 - 11.833	0.661	9	0.365	0.001
L18	11.833 - 9.375	0.324	9	0.256	0.001
L19	9.375 - 4.833	0.205	9	0.205	0.000
L20	4.833 - 0	0.056	9	0.109	0.000

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
191.667	Lightning Rod 5/8" x 4' on 4' Pole	8	86.528	4.178	0.038	155667
191.000	Motorola WB2855	8	85.946	4.179	0.038	155667
189.000	1 1/2" x 3'-6" Omni	8	84.198	4.182	0.037	155667
184.000	RR90-17-02DP w/ Mount Pipe	8	79.830	4.179	0.035	95976
178.000	4' ICE SHIELDS	8	74.592	4.139	0.032	14330
160.000	(2) HBXX-6517DS-VTM w/ Mount Pipe	8	59.237	3.776	0.026	2601
158.000	4-Element 17' Dipole	8	57.601	3.721	0.026	2383
151.000	AM-X-CD-16-65-00T-RET w/ Mount Pipe	8	52.045	3.517	0.024	1843
148.000	(2) RRU-11	8	49.759	3.426	0.023	1679
138.000	4' ICE SHIELDS	9	42.637	3.132	0.020	1505
133.000	SRL-235-2	9	39.382	2.993	0.019	1676
128.000	Motorola WP2900	9	36.305	2.857	0.017	1894
118.000	Dragonwave 60-000261-08	9	30.607	2.584	0.015	2199
116.000	LLPX310R w/ Mount Pipe	9	29.532	2.529	0.014	2144
98.000	4' ICE SHIELDS	9	20.881	2.061	0.009	2228
95.000	KP2F-34	9	19.610	1.981	0.008	2287
93.000	1 7/8" x 8' Omni	9	18.790	1.933	0.008	2382
70.000	2" x 2' Omni	9	10.687	1.429	0.005	2638
32.000	6-Element 3' Long Yagi	9	2.308	0.673	0.002	2800

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
L1	191.667 - 181.583 (1)	P18x3/8	10.084	0.000	0.0	25.200	20.764	-3.057	523.252	0.006
L2	181.583 - 141.417 (2)	P24x3/8	40.166	0.000	0.0	25.200	27.833	-13.120	701.380	0.019
L3	141.417 - 121.167 (3)	P36x3/8	20.250	0.000	0.0	23.696	41.970	-18.041	994.507	0.018
L4	121.167 - 109 (4)	P42x3/8	12.167	0.000	0.0	22.711	49.038	-23.294	1113.690	0.021
L5	109 - 105 (5)	P42x3/8 [0.491966]	4.000	0.000	0.0	20.391	64.153	-24.618	1308.140	0.019
L6	105 - 100.917 (6)	P42x3/8 [0.560722]	4.083	0.000	0.0	20.351	72.998	-26.546	1485.540	0.018
L7	100.917 - 95.125 (7)	P48x3/8	5.792	0.000	0.0	21.972	56.107	-28.276	1232.770	0.023
L8	95.125 - 89.875 (8)	P48x3/8 [0.478186]	5.250	0.000	0.0	21.630	71.390	-30.135	1544.140	0.020
L9	89.875 - 80.833 (9)	P48x3/8 [0.578153]	9.042	0.000	0.0	19.636	86.133	-35.108	1691.330	0.021
L10	80.833 - 68 (10)	P54x3/8 [0.487033]	12.833	0.000	0.0	21.340	81.878	-40.729	1747.280	0.023
L11	68 - 60.583 (11)	P54x3/8 [0.591202]	7.417	0.000	0.0	21.677	99.197	-46.578	2150.330	0.022
L12	60.583 - 48 (12)	P60x3/8 [0.514746]	12.583	0.000	0.0	20.906	96.195	-52.185	2011.000	0.026
L13	48 - 40.333 (13)	P60x3/8 [0.620238]	7.667	0.000	0.0	20.728	115.704	-56.585	2398.260	0.024
L14	40.333 - 28 (14)	P60x1/2 [0.597937]	12.333	0.000	0.0	22.302	111.585	-62.937	2488.550	0.025
L15	28 - 20.083 (15)	P60x1/2 [0.720286]	7.917	0.000	0.0	23.769	134.141	-67.921	3188.450	0.021
L16	20.083 - 17 (16)	P60x5/8	3.083	0.000	0.0	23.696	116.583	-69.681	2762.520	0.025
L17	17 - 11.833 (17)	P60x5/8 [0.72746]	5.167	0.000	0.0	24.006	135.460	-72.989	3251.890	0.022
L18	11.833 - 9.375 (18)	P60x5/8 [0.750143]	2.458	0.000	0.0	21.264	139.631	-74.347	2969.080	0.025
L19	9.375 - 4.833 (19)	P60x5/8 [0.777883]	4.542	0.000	0.0	21.360	144.727	-76.955	3091.420	0.025
L20	4.833 - 0 (20)	P60x5/8 [0.749582]	4.833	0.000	0.0	20.997	139.528	-79.685	2929.640	0.027

Pole Bending Design Data

Section No.	Elevation ft	Size	Actual M_x kip-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y kip-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
L1	191.667 - 181.583 (1)	P18x3/8	9.436	1.263	27.720	0.046	0.000	0.000	27.720	0.000
L2	181.583 - 141.417 (2)	P24x3/8	434.071	32.182	27.720	1.161	0.000	0.000	27.720	0.000
L3	141.417 - 121.167 (3)	P36x3/8	867.525	28.141	23.696	1.188	0.000	0.000	23.696	0.000
L4	121.167 - 109 (4)	P42x3/8	1180.742	28.014	22.711	1.233	0.000	0.000	22.711	0.000
L5	109 - 105 (5)	P42x3/8 [0.491966]	1291.892	23.560	22.430	1.050	0.000	0.000	22.430	0.000
L6	105 - 100.917 (6)	P42x3/8 [0.560722]	1407.792	22.637	22.386	1.011	0.000	0.000	22.386	0.000
L7	100.917 - 95.125 (7)	P48x3/8	1575.517	28.523	21.972	1.298	0.000	0.000	21.972	0.000
L8	95.125 - 89.875 (8)	P48x3/8 [0.478186]	1732.992	24.763	21.630	1.145	0.000	0.000	21.630	0.000
L9	89.875 - 80.833 (9)	P48x3/8 [0.578153]	2013.517	23.947	21.600	1.109	0.000	0.000	21.600	0.000
L10	80.833 - 68 (10)	P54x3/8 [0.487033]	2430.700	26.869	21.340	1.259	0.000	0.000	21.340	0.000
L11	68 - 60.583 (11)	P54x3/8 [0.591202]	2686.883	24.610	23.845	1.032	0.000	0.000	23.845	0.000
L12	60.583 - 48 (12)	P60x3/8 [0.514746]	3129.008	26.473	20.906	1.266	0.000	0.000	20.906	0.000
L13	48 - 40.333 (13)	P60x3/8 [0.620238]	3407.933	24.055	20.728	1.161	0.000	0.000	20.728	0.000
L14	40.333 - 28 (14)	P60x1/2 [0.597937]	3867.850	28.288	22.302	1.268	0.000	0.000	22.302	0.000
L15	28 - 20.083 (15)	P60x1/2 [0.720286]	4171.708	25.484	26.146	0.975	0.000	0.000	26.146	0.000
L16	20.083 - 17 (16)	P60x5/8	4291.567	30.069	23.696	1.269	0.000	0.000	23.696	0.000
L17	17 - 11.833 (17)	P60x5/8 [0.72746]	4494.108	27.193	26.407	1.030	0.000	0.000	26.407	0.000
L18	11.833 - 9.375 (18)	P60x5/8 [0.750143]	4590.717	26.968	23.390	1.153	0.000	0.000	23.390	0.000
L19	9.375 - 4.833 (19)	P60x5/8 [0.777883]	4770.483	27.062	23.497	1.152	0.000	0.000	23.497	0.000
L20	4.833 - 0 (20)	P60x5/8 [0.749582]	4963.475	29.179	23.096	1.263	0.000	0.000	23.096	0.000

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	191.667 - 181.583 (1)	P18x3/8	4.751	0.458	16.800	0.027	0.070	0.005	16.800	0.000
L2	181.583 - 141.417 (2)	P24x3/8	19.732	1.418	16.800	0.084	3.260	0.121	16.800	0.007
L3	141.417 - 121.167 (3)	P36x3/8	22.613	1.078	16.800	0.064	6.115	0.099	11.901	0.008
L4	121.167 - 109 (4)	P42x3/8	27.518	1.122	16.800	0.067	9.657	0.115	9.619	0.012
L5	109 - 105 (5)	P42x3/8 [0.491966]	27.976	0.872	13.594	0.064	9.647	0.088	13.594	0.006
L6	105 - 100.917 (6)	P42x3/8 [0.560722]	28.520	0.781	13.567	0.058	9.624	0.077	13.567	0.006
L7	100.917 - 95.125 (7)	P48x3/8	29.322	1.045	16.800	0.062	9.601	0.087	7.986	0.011
L8	95.125 - 89.875 (8)	P48x3/8 [0.478186]	30.230	0.847	15.035	0.056	10.133	0.072	11.131	0.007
L9	89.875 - 80.833 (9)	P48x3/8 [0.578153]	31.422	0.730	13.091	0.056	10.080	0.060	13.091	0.005
L10	80.833 - 68 (10)	P54x3/8 [0.487033]	33.334	0.814	15.369	0.053	8.194	0.045	10.136	0.004
L11	68 - 60.583 (11)	P54x3/8 [0.591202]	34.271	0.691	14.452	0.048	7.010	0.032	12.915	0.002
L12	60.583 - 48 (12)	P60x3/8 [0.514746]	35.723	0.743	15.226	0.049	6.981	0.030	10.037	0.003
L13	48 - 40.333 (13)	P60x3/8 [0.620238]	36.565	0.632	13.884	0.046	6.962	0.025	12.671	0.002
L14	40.333 - 28 (14)	P60x1/2 [0.597937]	37.795	0.677	15.705	0.043	6.941	0.025	12.104	0.002
L15	28 - 20.083 (15)	P60x1/2 [0.720286]	38.518	0.574	15.846	0.036	6.925	0.021	15.275	0.001
L16	20.083 - 17 (16)	P60x5/8	38.776	0.665	16.800	0.040	6.918	0.024	12.792	0.002
L17	17 - 11.833 (17)	P60x5/8 [0.72746]	39.217	0.579	16.004	0.036	6.907	0.021	15.465	0.001
L18	11.833 - 9.375 (18)	P60x5/8 [0.750143]	39.413	0.565	14.176	0.040	6.904	0.020	14.176	0.001
L19	9.375 - 4.833 (19)	P60x5/8 [0.777883]	39.764	0.550	14.240	0.039	6.898	0.020	14.240	0.001
L20	4.833 - 0 (20)	P60x5/8 [0.749582]	40.122	0.575	13.998	0.041	6.893	0.020	13.998	0.001

Pole Interaction Design Data

Section No.	Elevation ft	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Ratio $\frac{f_v}{F_v}$	Ratio $\frac{f_{vt}}{F_{vt}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	191.667 - 181.583 (1)	0.006	0.046	0.000	0.027	0.000	0.052 ✔	1.333	H1-3+VT ✔
L2	181.583 - 141.417 (2)	0.019	1.161	0.000	0.084	0.007	1.188 ✔	1.333	H1-3+VT ✔
L3	141.417 - 121.167 (3)	0.018	1.188	0.000	0.064	0.008	1.211 ✔	1.333	H1-3+VT ✔
L4	121.167 - 109 (4)	0.021	1.233	0.000	0.067	0.012	1.261 ✔	1.333	H1-3+VT ✔
L5	109 - 105 (5)	0.019	1.050	0.000	0.064	0.006	1.074 ✔	1.333	H1-3+VT ✔
L6	105 - 100.917 (6)	0.018	1.011	0.000	0.058	0.006	1.033 ✔	1.333	H1-3+VT ✔
L7	100.917 - 95.125 (7)	0.023	1.298	0.000	0.062	0.011	1.326 ✔	1.333	H1-3+VT ✔
L8	95.125 - 89.875 (8)	0.020	1.145	0.000	0.056	0.007	1.168 ✔	1.333	H1-3+VT ✔
L9	89.875 - 80.833 (9)	0.021	1.109	0.000	0.056	0.005	1.133 ✔	1.333	H1-3+VT ✔
L10	80.833 - 68 (10)	0.023	1.259	0.000	0.053	0.004	1.286 ✔	1.333	H1-3+VT ✔
L11	68 - 60.583 (11)	0.022	1.032	0.000	0.048	0.002	1.056 ✔	1.333	H1-3+VT ✔
L12	60.583 - 48 (12)	0.026	1.266	0.000	0.049	0.003	1.295 ✔	1.333	H1-3+VT ✔

Section No.	Elevation ft	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Ratio $\frac{f_v}{F_v}$	Ratio $\frac{f_{vt}}{F_{vt}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L13	48 - 40.333 (13)	0.024	1.161	0.000	0.046	0.002	1.186 ✔	1.333	H1-3+VT ✔
L14	40.333 - 28 (14)	0.025	1.268	0.000	0.043	0.002	1.296 ✔	1.333	H1-3+VT ✔
L15	28 - 20.083 (15)	0.021	0.975	0.000	0.036	0.001	0.997 ✔	1.333	H1-3+VT ✔
L16	20.083 - 17 (16)	0.025	1.269	0.000	0.040	0.002	1.296 ✔	1.333	H1-3+VT ✔
L17	17 - 11.833 (17)	0.022	1.030	0.000	0.036	0.001	1.054 ✔	1.333	H1-3+VT ✔
L18	11.833 - 9.375 (18)	0.025	1.153	0.000	0.040	0.001	1.180 ✔	1.333	H1-3+VT ✔
L19	9.375 - 4.833 (19)	0.025	1.152	0.000	0.039	0.001	1.178 ✔	1.333	H1-3+VT ✔
L20	4.833 - 0 (20)	0.027	1.263	0.000	0.041	0.001	1.292 ✔	1.333	H1-3+VT ✔

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
L1	191.667 - 181.583	Pole	P18x3/8	1	-3.057	697.495	3.9	Pass
L2	181.583 - 141.417	Pole	P24x3/8	2	-13.120	934.940	89.1	Pass
L3	141.417 - 121.167	Pole	P36x3/8	3	-18.041	1325.678	90.8	Pass
L4	121.167 - 109	Pole	P42x3/8	4	-23.294	1484.549	94.6	Pass
L5	109 - 105	Pole	P42x3/8 [0.491966]	5	-24.618	1743.751	80.6	Pass
L6	105 - 100.917	Pole	P42x3/8 [0.560722]	6	-26.546	1980.225	77.5	Pass
L7	100.917 - 95.125	Pole	P48x3/8	7	-28.276	1643.282	99.5	Pass
L8	95.125 - 89.875	Pole	P48x3/8 [0.478186]	8	-30.135	2058.339	87.6	Pass
L9	89.875 - 80.833	Pole	P48x3/8 [0.578153]	9	-35.108	2254.543	85.0	Pass
L10	80.833 - 68	Pole	P54x3/8 [0.487033]	10	-40.729	2329.124	96.5	Pass
L11	68 - 60.583	Pole	P54x3/8 [0.591202]	11	-46.578	2866.390	79.2	Pass
L12	60.583 - 48	Pole	P60x3/8 [0.514746]	12	-52.185	2680.663	97.1	Pass
L13	48 - 40.333	Pole	P60x3/8 [0.620238]	13	-56.585	3196.880	89.0	Pass
L14	40.333 - 28	Pole	P60x1/2 [0.597937]	14	-62.937	3317.237	97.2	Pass
L15	28 - 20.083	Pole	P60x1/2 [0.720286]	15	-67.921	4250.204	74.8	Pass
L16	20.083 - 17	Pole	P60x5/8	16	-69.681	3682.439	97.2	Pass
L17	17 - 11.833	Pole	P60x5/8 [0.72746]	17	-72.989	4334.769	79.0	Pass
L18	11.833 - 9.375	Pole	P60x5/8 [0.750143]	18	-74.347	3957.783	88.5	Pass
L19	9.375 - 4.833	Pole	P60x5/8 [0.777883]	19	-76.955	4120.863	88.4	Pass
L20	4.833 - 0	Pole	P60x5/8 [0.749582]	20	-79.685	3905.210	96.9	Pass
							Summary	
						Pole (L7)	99.5	Pass
						RATING =	**99.5**	**Pass**

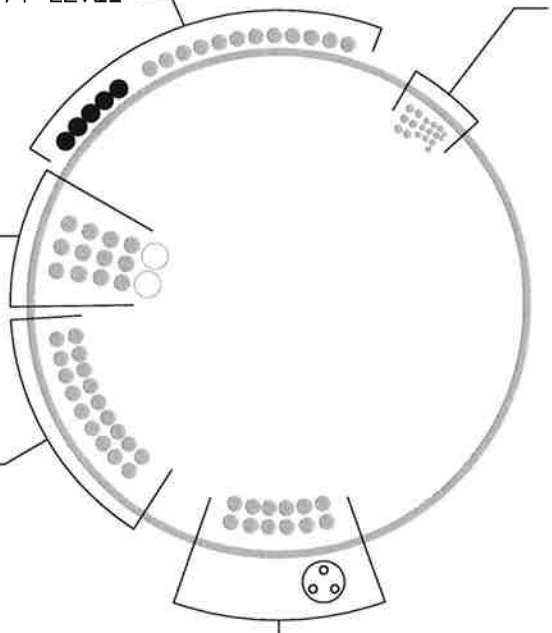
APPENDIX B

BASE LEVEL DRAWING

(PROPOSED)
(5) 1 5/8" TO 160 FT LEVEL
(INSTALLED–TO BE REMOVED)
(3) 1 5/8" TO 160 FT LEVEL
(INSTALLED)
(9) 1 5/8" TO 160 FT LEVEL

(INSTALLED)
(2) 1/2" TO 32 FT LEVEL
(2) 7/8" TO 70 FT LEVEL
(1) 1/4" TO 93 FT LEVEL
(3) 7/8" TO 93 FT LEVEL
(1) 7/8" TO 133 FT LEVEL
(1) 7/8" TO 158 FT LEVEL
(1) 1/4" TO 128 FT LEVEL
(1) 1/2" TO 158 FT LEVEL
(2) 7/8" TO 191 FT LEVEL
(1) 1/4" TO 191 FT LEVEL
(1) 7/8" TO 189 FT LEVEL

(INSTALLED)
(12) 1 1/4" TO 116 FT LEVEL
(2) 2" FLEX CONDUITS TO 116 FT LEVEL



(INSTALLED)
(18) 1 5/8" TO 184 FT LEVEL

(RESERVED–IN CONDUIT)
(2) 3/8" TO 151 FT LEVEL
(1) 7/16" TO 151 FT LEVEL
(INSTALLED)
(12) 1 1/4" TO 151 FT LEVEL

APPENDIX C

ADDITIONAL CALCULATIONS

Reinforcement 1

Bottom	Top	QTY	Type	Position	Gap	Ten/Comp
0	9.375	2	CCI-XFP-040075	F	0	T&C
20.083	40.333	3	CCI-XFP-060100	F	0	T&C
40.333	60.583	3	CCI-XFP-065125	F	0	T&C
60.583	80.833	3	CCI-XFP-060100	F	0	T&C
80.833	89.875	3	CCI-XFP-045100	F	0	T&C
100.917	105	3	CCI-XFP-040075	F	0	T&C
				F	0	T&C
				F	0	T&C
				F	0	T&C

Reinforcement 2

Bottom	Top	QTY	Type	Position	Gap	Ten/Comp
4.833	11.833	1	CCI-XFP-040075	F	0	T&C
				F	0	T&C
				F	0	T&C
				F	0	T&C
				F	0	T&C
				F	0	T&C
				F	0	T&C
				F	0	T&C
				F	0	T&C

Reinforcement 3

Bottom	Top	QTY	Type	Position	Gap	Ten/Comp
0	17	4	CCI-XFP-060100	F	0	T&C
20.083	28	4	CCI-XFP-060100	F	0	T&C
40.333	48	4	CCI-XFP-060100	F	0	T&C
60.583	68	4	CCI-XFP-045100	F	0	T&C
80.833	95.125	3	CCI-XFP-045100	F	0	T&C
100.917	109	3	CCI-XFP-045100	F	0	T&C
				F	0	T&C
				F	0	T&C
				F	0	T&C

Bottom Elevation	Top Elevation	Original Thickness	Original Yield Stress	Original Ultimate Stress	Reinforced Shaft Capacity	Reinf. 1 QTY	Reinf. 1 Type	Rein. 1 Capacity	Reinf. 2 QTY	Reinf. 2 Type	Rein. 2 Capacity	Reinf. 3 QTY	Reinf. 3 Type	Rein. 3 Capacity	Control Stress Ratio	Top Height	Section Length	Lap Splice	# of Sides	Top Diameter	Bottom Diameter	Equivalent Shaft Thickness	Equivalent Shaft Fy	Equivalent Weight Mult.		Bottom Elevation Failure	Top Elevation Failure	Section Failure %
181.5830	191.6670	0.3750	42	57	3.9%										3.9%	191.6670	10.0840	0.0000	Round	18.0000	18.0000	0.3750	42.0	1.00	1			
141.4170	181.5830	0.3750	42	57	88.5%										88.5%	181.5830	40.1660	0.0000	Round	24.0000	24.0000	0.3750	42.0	1.00	2			
121.1670	141.4170	0.3750	42	57	90.4%										90.4%	141.4170	20.2500	0.0000	Round	36.0000	36.0000	0.3750	42.0	1.00	3			
109.0000	121.1670	0.3750	42	57	93.9%										93.9%	121.1670	12.1670	0.0000	Round	42.0000	42.0000	0.3750	42.0	1.00	4			
105.0000	109.0000	0.3750	42	57	80.2%							3	CCI-XFP-045100	62.3%	80.2%	109.0000	4.0000	0.0000	Round	42.0000	42.0000	0.4920	38.8	1.05	5			
100.9170	105.0000	0.3750	42	57	77.2%	3	CCI-XFP-040075	56.0%				3	CCI-XFP-045100	59.8%	77.2%	105.0000	4.0830	0.0000	Round	42.0000	42.0000	0.5607	34.4	1.04	6			
95.1250	100.9170	0.3750	42	57	98.9%										98.9%	100.9170	5.7920	0.0000	Round	48.0000	48.0000	0.3750	42.0	1.00	7			
89.8750	95.1250	0.3750	42	57	87.5%							3	CCI-XFP-045100	64.8%	87.5%	95.1250	5.2500	0.0000	Round	48.0000	48.0000	0.4782	39.4	1.04	8			
80.8330	89.8750	0.3750	42	57	84.7%	3	CCI-XFP-045100	63.1%				3	CCI-XFP-045100	60.9%	84.7%	89.8750	9.0420	0.0000	Round	48.0000	48.0000	0.5782	37.2	1.02	9			
68.0000	80.8330	0.3750	42	57	96.3%	3	CCI-XFP-060100	63.4%							96.3%	80.8330	12.8330	0.0000	Round	54.0000	54.0000	0.4870	39.5	0.99	10			
60.5830	68.0000	0.3750	42	57	88.6%	3	CCI-XFP-060100	58.7%				4	CCI-XFP-045100	51.1%	88.6%	68.0000	7.4170	0.0000	Round	54.0000	54.0000	0.5912	37.4	1.00	11			
48.0000	60.5830	0.3750	42	57	97.0%	3	CCI-XFP-065125	58.2%							97.0%	60.5830	12.5830	0.0000	Round	60.0000	60.0000	0.5147	39.1	0.98	12			
40.3330	48.0000	0.3750	42	57	88.9%	3	CCI-XFP-065125	54.9%				4	CCI-XFP-060100	42.1%	88.9%	48.0000	7.6670	0.0000	Round	60.0000	60.0000	0.6202	37.2	1.03	13			
28.0000	40.3330	0.5000	42	57	97.1%	3	CCI-XFP-060100	61.1%							97.1%	40.3330	12.3330	0.0000	Round	60.0000	60.0000	0.5979	40.1	1.00	14			
20.0830	28.0000	0.5000	42	57	88.5%	3	CCI-XFP-060100	56.8%				4	CCI-XFP-060100	45.3%	88.5%	28.0000	7.9170	0.0000	Round	60.0000	60.0000	0.7203	37.9	1.01	15			
17.0000	20.0830	0.6250	42	57	97.0%										97.0%	20.0830	3.0830	0.0000	Round	60.0000	60.0000	0.6250	42.0	1.00	16			
11.8330	17.0000	0.6250	42	57	88.3%							4	CCI-XFP-060100	41.7%	88.3%	17.0000	5.1670	0.0000	Round	60.0000	60.0000	0.7275	40.1	1.04	17			
9.3750	11.8330	0.6250	42	57	88.2%				1	CI-XFP-0400	58.9%	4	CCI-XFP-060100	45.6%	88.2%	11.8330	2.4580	0.0000	Round	60.0000	60.0000	0.7501	39.7	1.03	18			
4.8330	9.3750	0.6250	42	57	88.1%	2	CCI-XFP-040075	63.3%	1	CI-XFP-0400	64.2%	4	CCI-XFP-060100	41.5%	88.1%	9.3750	4.5420	0.0000	Round	60.0000	60.0000	0.7779	35.9	1.03	19			
0.0000	4.8330	0.6250	42	57	96.6%	2	CCI-XFP-040075	58.1%				4	CCI-XFP-060100	53.5%	96.6%	4.8330	4.8330	0.0000	Round	60.0000	60.0000	0.7496	39.7	1.05	20			
																									21			
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Max Number of Pole Shaft Sides #N/A

Rein1

	Bottom	Top	Qty	Model	Position	T or T&C	Flats (Used for relative orientation only. Actual flat numbers may vary.) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	Rein1MOI.'ein1MOI.'ein1MOI.'ein1MOI.· Flats (angles) 1	2	3	4
1	0	9.375	2	CCI-XFP-040075	F	T&C	1	1																	70.0	312.5		
2	20.083	40.333	3	CCI-XFP-060100	F	T&C	1	1	1																66.0	189.0	312.0	
3	40.333	60.583	3	CCI-XFP-065125	F	T&C	1	1	1																67.5	188.0	307.0	
4	60.583	80.833	3	CCI-XFP-060100	F	T&C	1	1	1																67.5	190.0	307.0	
5	80.833	89.875	3	CCI-XFP-045100	F	T&C	1	1	1																72.0	192.0	312.0	
6	100.917	105	3	CCI-XFP-040075	F	T&C	1	1	1																53.0	178.0	303.0	
7					F	T&C																						
8					F	T&C																						
9					F	T&C																						

Rein2

	Bottom	Top	Qty	Model	Position	T or T&C	Flats 1	Flats (angles) 1
1	4.833	11.833	1	CCI-XFP-040075	F	T&C	1	197.5
2					F	T&C		
3					F	T&C		
4					F	T&C		
5					F	T&C		
6					F	T&C		
7					F	T&C		
8					F	T&C		
9					F	T&C		

Rein3

	Bottom	Top	Qty	Model	Position	T or T&C	Flats 1	2	3	4	Flats (angles) 1	2	3	4
1	0	17	4	CCI-XFP-060100	F	T&C	1	1	1	1	36.0	113.0	223.0	294.0
2	20.083	28	4	CCI-XFP-060100	F	T&C	1	1	1	1	53.0	157.0	247.0	339.0
3	40.333	48	4	CCI-XFP-060100	F	T&C	1	1	1	1	36.0	126.0	234.0	294.0
4	60.583	68	4	CCI-XFP-045100	F	T&C	1	1	1	1	80.0	154.5	253.5	341.0
5	80.833	95.125	3	CCI-XFP-045100	F	T&C	1	1	1		93.0	213.0	333.0	
6	100.917	109	3	CCI-XFP-045100	F	T&C	1	1	1		30.0	150.0	270.0	
7					F	T&C								
8					F	T&C								
9					F	T&C								

Reinforcement Capacity

AeroSolutions LLC
Optimizing Your Tower Infrastructure
5500 Flatirons Parkway, Suite 100
Boulder, CO 80301
720-304-6882

Dimensions and Properties														Compression				Axial				
																		ASD-9			LRFD	
Model	Weight (lb/ft)	Area (in^2)	Moment of Inertia (in^4)	Moment of Inertia (in^4)	Centroid from Mating Edge (in)	Centroid from Bolt Hole Center (in)	Web Thickness (in)	Width (in)	Flange Width (in)	Flange Thickness (in)	Hole Diameter (in)	Yield Stress (ksi)	Ultimate Stress (ksi)	Slender. Ratio Coefficient	Unbraced Length (in)	Slender. Ratio Coefficient	Unbraced Length (in)	Allowable Axial (kip)	Allowable Axial w/ increase (kip)	Governing Axial	Design Axial Strength (kip)	Governing Axial
CCI-XFP-040075	10.2	3.00	0.14	4.00	0.375	0	0.75	4	0	0	1.21875	65	80	0.80	16	1.00	16	81.6	106.8	Rupture	122.3	Rupture
CCI-XFP-045100	15.3	4.50	0.38	7.59	0.5	0	1	4.5	0	0	1.21875	65	80	0.80	20	1.00	20	128.8	171.7	Rupture	193.1	Rupture
CCI-XFP-060100	20.4	6.00	0.50	18.00	0.5	0	1	6	0	0	1.21875	65	80	0.80	16	1.00	16	188.8	251.7	Rupture	283.1	Rupture
CCI-XFP-065125	27.6	8.13	1.06	28.61	0.625	0	1.25	6.5	0	0	1.21875	65	80	0.80	19	1.00	19	260.4	347.2	Compress.	391.4	Rupture
CCI-XFP-085125	36.2	10.63	1.38	63.97	0.625	0	1.25	8.5	0	0	1.21875	65	80	0.80	17	1.00	17	350.9	467.9	Compress.	541.4	Rupture

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

Site Information	
ID:	826217
Name:	Newington_1
App. #:	221161 Rev. 10

AeroSolutions LLC
Optimizing Your Tower Infrastructure

Base Reactions		
Moment:	4963	ft-kip
Axial:	80	kip
Shear:	40	kip
Base Plate Type:	Circular	

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

Original Anchor Rod Data		
Quantity:	52	
Diameter:	1.25	in
Material:	A687	
Bolt Circle:	67.0	in
Bolt Spacing:		in
Bolt Group Area:	63.81	in^2
Bolt Group MOIx:	35807	in^4

Reactions Seen by Original AR Group		
Moment:	2275.3	kip-ft
Axial:	80.0	kip
Shear:	40.0	kip

Original AR Capacity Check		
Tension Load:	29.8	kip
Allowable load:	81.0	kip
AR Capacity:	36.8%	Pass

First Added Anchor Rod Data		
Quantity:	10	
Diameter:	2.25	in
Material:	Dywidag	
Bolt Circle:	92.3	in
Bolt Group Area:	39.76	in^2
Bolt Group MOIx:	42296	in^4

Reactions Seen by First Added AR Group		
Moment:	2687.7	kip-ft
Axial:	0.0	kip
Shear:	0.0	kip

First Added AR Capacity Check		
Tension Load:	139.8	kip
Allowable load:	262.4	kip
AR Capacity:	53.3%	Pass

Second Added Anchor Rod Data		
Quantity:		
Diameter:		in
Material:		
Bolt Circle:		in
Bolt Group Area:	0.00	in^2
Bolt Group MOIx:	0	in^4

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^2
Bolt Group MOIx:	0	in^4

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#: *826217*
Site Name: *Newington_1*
App #: *221161 Rev. 10*

Pole Manufacturer:	*Other*

Reactions		
Moment:	2275.3	ft-kips
Axial:	80	kips
Shear:	40	kips

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

Anchor Rod Data		
Qty:	52	
Diam:	1.25	in
Rod Material:	Other	
Strength (Fu):	150	ksi
Yield (Fy):	105	ksi
Bolt Circle:	67	in

Plate Data		
Diam:	70	in
Thick:	1.25	in
Grade:	36	ksi
Single-Rod B-eff:	3.62	in

Stiffener Data (Welding at both sides)		
Config:	1	*
Weld Type:	Fillet	
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:	0.3125	in
Fillet V. Weld:	0.3125	in
Width:	3	in
Height:	6	in
Thick:	0.5	in
Notch:	0.5	in
Grade:	36	ksi
Weld str.:	70	ksi

Pole Data		
Diam:	60	in
Thick:	0.625	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	57	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor		
ASIF:	1.333	

Anchor Rod Results

		Stiffened
Maximum Rod Tension:	29.8 Kips	Service, ASD
Allowable Tension:	81.0 Kips	Fty*ASIF
Anchor Rod Stress Ratio:	36.8% Pass	

Base Plate Results

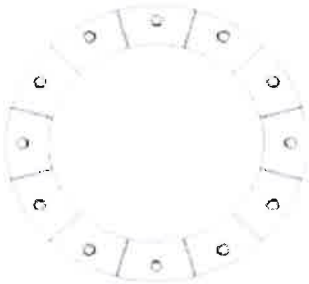
	Shear Check Only	Stiffened
Base Plate Stress:	4.4 ksi	Service, ASD
Allowable Plate Stress:	19.2 ksi	0.75*Fy*ASIF
Base Plate Stress Ratio:	22.8% Pass	Y.L. Length: N/A, Roark

Stiffener Results

Horizontal Weld :	47.3% Pass
Vertical Weld:	25.3% Pass
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	20.1% Pass
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	43.2% Pass
Plate Comp. (AISC Bracket):	53.9% Pass

Pole Results

Pole Punching Shear Check:	7.0% Pass



* 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

Stiffened or Unstiffened, Exterior Flange Plate - Any Bolt Material TIA Rev F

Site Data

BU#: *826217*
Site Name: *Newington ,CT*
App #: *221161 Revision # 10*

Pole Manufacturer:	Pirod

Reactions		
Moment:	9.436	ft-kips
Axial:	3.057	kips
Shear:	4.751	kips
Elevation:	180	feet

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

Bolt Data			
Qty:	16		
Diameter (in.):	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:		<-- Disregard	Bolt Fty: 44.00
N/A:		<-- Disregard	
Circle (in.):	21		

Plate Data		
Diam:	24	in
Thick, t:	1.25	in
Grade (Fy):	36	ksi
Strength, Fu:	58	ksi
Single-Rod B-eff:	3.53	in

Stiffener Data (Welding at Both Sides)		
Config:	2	*
Weld Type:	Fillet	
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:	0.3125	in
Fillet V. Weld:	0.3125	in
Width:	3	in
Height:	5	in
Thick:	0.625	in
Notch:		in
Grade:	36	ksi
Weld str.:	70	ksi

Pole Data		
Diam:	18	in
Thick:	0.375	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	60	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor		
ASIF:	1.333	

Flange Bolt Results — Rigid (Service, ASD; Fty*ASIF)

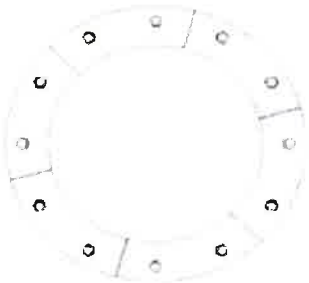
Bolt Tension Capacity, **B**:	46.07 kips	
Max Bolt directly applied T:	1.16 Kips	
Min. PL "tc" for **B** cap. **w/o** Pry:	1.474 in	
Min PL "treq" for actual **T w/ Pry**:	0.179 in	
Min PL "t1" for actual **T w/o Pry**:	0.234 in	
T allowable with Prying:	41.75 kips	0≤α'≤1 case
Prying Force, Q:	0.00 kips	
Total Bolt Tension=T+Q:	1.16 kips	
Prying Bolt Stress Ratio=(T+Q)/(B):	2.5% **Pass**	

Exterior Flange Plate Results — Flexural Check — Rigid (Service ASD; 0.75*Fy*ASIF; Comp. Y.L. Length: 10.82)

Compression Side Plate Stress:	Rohn/Pirod,	OK
Allowable Plate Stress:	36.0 ksi	
Compression Plate Stress Ratio:	Rohn/Pirod,	OK
No Prying		
Tension Side Stress Ratio, (treq/t)^2:	2.1% **Pass**	

b/Le>2, Stiffeners are not fully effective

Stiffener Results	N/A for Rohn / Pirod
Horizontal Weld :	N/A
Vertical Weld:	N/A
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	N/A
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	N/A
Plate Comp. (AISC Bracket):	N/A
Pole Results	
Pole Punching Shear Check:	N/A



* 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

Stiffened or Unstiffened, Exterior Flange Plate - Any Bolt Material TIA Rev F

Site Data

BU#: *826217*
Site Name: *Newington ,CT*
App #: *221161 Revision # 10*

Pole Manufacturer:	Pirod

Bolt Data			
Qty:	24		
Diameter (in.):	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:		<-- Disregard	Bolt Fty: 44.00
N/A:		<-- Disregard	
Circle (in.):	33		

Plate Data		
Diam:	36.375	in
Thick, t:	1.25	in
Grade (Fy):	36	ksi
Strength, Fu:	58	ksi
Single-Rod B-eff:	3.14	in

Stiffener Data (Welding at Both Sides)		
Config:	2	*
Weld Type:	Fillet	
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:	0.3125	in
Fillet V. Weld:	0.3125	in
Width:	6	in
Height:	8	in
Thick:	1	in
Notch:	1	in
Grade:	36	ksi
Weld str.:	70	ksi

Pole Data		
Diam:	24	in
Thick:	0.375	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	63	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor		
ASIF:	1.333	

Reactions		
Moment:	434.071	ft-kips
Axial:	13.12	kips
Shear:	19.732	kips
Elevation:	140	feet

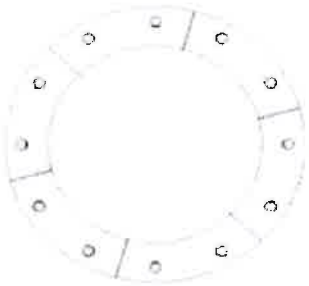
If No stiffeners, Criteria: AISC ASD <-Only Applcable to Unstiffened Cases

Flange Bolt Results

		Stiffened
Bolt Tension Capacity, **B**:	46.07 kips	Service, ASD
Max Bolt directly applied T:	25.76 Kips	Fty*ASIF
Min. PL "tc" for **B** cap. **w/o** Pry:	Stiffened in	
Min PL "treq" for actual **T w/ Pry**:	Stiffened in	
Min PL "t1" for actual **T w/o Pry**:	Stiffened in	
T allowable	46.07 kips	<-- B, Stiffened
Prying Force, Q:	0.00 kips	Stiffened
Total Bolt Tension=T+Q:	25.76 kips	
Non-Prying Bolt Stress Ratio, T/B:	55.9% Pass	

Exterior Flange Plate Results	Flexural Check	Stiffened
Compression Side Plate Stress:	Rohn/Pirod, OK	Service, ASD
Allowable Plate Stress:	36.0 ksi	0.75*Fy*ASIF
Compression Plate Stress Ratio:	Rohn/Pirod, OK	Comp. Y.L. Length:
Stiffened		N/A, Roark
Tension Side Stress Ratio, (treq/t)^2:	N/A	

Stiffener Results	N/A for Rohn / Pirod
Horizontal Weld :	N/A
Vertical Weld:	N/A
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	N/A
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	N/A
Plate Comp. (AISC Bracket):	N/A
Pole Results	
Pole Punching Shear Check:	N/A



* 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

PROJECT	**87581.012.01 - Newington_1, CT - BU# 826217**		
SUBJECT	**Existing Bolt-on Bridge Stiffeners @ 120'**		
DATE	**06/09/15**	PAGE 1	OF 1

B+T GRP
1717 S. Boulder, Suite 300
Tulsa, OK 74119
(918) 587-4630

SSC

Global Section Properties:

Step Width	3.00 in		
Pole Thickness	0.38 in		
Pole Grade	42.00 ksi	Bolt Circle	39
BS Material Grade	65.00 ksi	Number of Bolts	28
BS Ultimate Stress	80.00 ksi	Bolt Size	1
BS Width	4.50 in		
BS Thickness	1.00 in		
BS Height	39.00 in		
I	7461.40 in^4	Global MOI, Taken from AutoCAD	
Moment	867.53 k-ft	Moment at Flange Under Consideration	
Ybar	22.00 in	Dist. CL Pole to CL BS	
S	339.15 in^3	Global Section Modulus; I/Ybar	
fb	30.69 ksi	M/S	
Area	4.50 in^2	BS Cross Sectional Area Below Flange	
P	138.13 k	Load to BS	

Check Bridge Stiffener Span:

Lu	16.00 in	
Iy	0.38 in^4	
A	4.50 in^2	
ry	0.2887 in	
Cc	93.84414701	
kl/r	55.42562584	
Fa	28.81 ksi	
Fa w/ 1/3 Increase	38.42 ksi	**79.90%**

Plate Tension Analysis:

Hole Size	1.25 in	
Ag	4.50 in^2	
An	3.25 in^2	
U	1	
Ae	3.25 in^2	
Ta (Yielding)	234.00 k	
Ta (Rupture)	173.33 k	
Ft (Equiv)	38.52 ksi	**79.69%**

Moment to Existing Bolt Group:

S_{BG} =	382.64 in^3	# Bolts Acting	7
ft =	27.21 ksi		
Ab =	.785 in^2		
T =	149.58 k		
Arm =	39.00 in		
M_{EQ} =	486.1 k-ft	**<-------Insert into Crown Spreadsheet**	

Stiffened or Unstiffened, Exterior Flange Plate - Any Bolt Material TIA Rev F

Site Data

BU#: *826217*
Site Name: *Newington ,CT*
App #: *221161 Revision # 10*

Pole Manufacturer:	Pirod

Reactions		
Moment:	486.1	ft-kips
Axial:	18.041	kips
Shear:	18.613	kips
Elevation:	120	feet

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

Bolt Data			
Qty:	28		
Diameter (in.):	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:		<-- Disregard	Bolt Fty: 44.00
N/A:		<-- Disregard	
Circle (in.):	39		

Plate Data		
Diam:	42	in
Thick, t:	1.25	in
Grade (Fy):	36	ksi
Strength, Fu:	58	ksi
Single-Rod B-eff:	4.04	in

Stiffener Data (Welding at Both Sides)		
Config:	2	*
Weld Type:	Fillet	
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:	0.3125	in
Fillet V. Weld:	0.3125	in
Width:	3	in
Height:	5	in
Thick:	0.625	in
Notch:		in
Grade:	36	ksi
Weld str.:	70	ksi

Pole Data		
Diam:	36	in
Thick:	0.375	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	63	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor		
ASIF:	1.333	

Flange Bolt Results

			Rigid
Bolt Tension Capacity, **B**:	46.07	kips	Service, ASD
Max Bolt directly applied T:	20.72	Kips	Fty*ASIF
Min. PL "tc" for **B** cap. **w/o** Pry:	1.379	in	
Min PL "treq" for actual **T w/ Pry**:	0.702	in	
Min PL "t1" for actual **T w/o Pry**:	0.925	in	
T allowable with Prying:	43.33	kips	0≤α'≤1 case
Prying Force, Q:	0.00	kips	
Total Bolt Tension=T+Q:	20.72	kips	
Prying Bolt Stress Ratio=(T+Q)/(B):	45.0%	**Pass**	

Exterior Flange Plate Results — Flexural Check

		Rigid
Compression Side Plate Stress:	Rohn/Pirod, OK	Service ASD
Allowable Plate Stress:	36.0 ksi	0.75*Fy*ASIF
Compression Plate Stress Ratio:	Rohn/Pirod, OK	Comp. Y.L. Length: 15.00

No Prying

Tension Side Stress Ratio, (treq/t)^2: 31.5% **Pass**

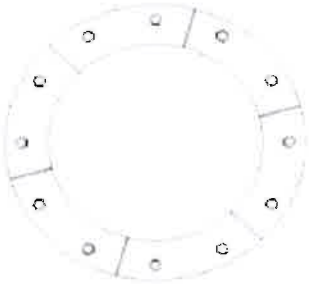
b/Le>2, Stiffeners are not fully effective

Stiffener Results — N/A for Rohn / Pirod

Horizontal Weld :	N/A
Vertical Weld:	N/A
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	N/A
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	N/A
Plate Comp. (AISC Bracket):	N/A

Pole Results

Pole Punching Shear Check: N/A



* 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

Stiffened or Unstiffened, Interior Flange Plate - Any Bolt Material TIA Rev F

Site Data

BU#: *826217*
Site Name: *Newington ,CT*
App #: *221161 Revision # 10*

Manufacturer:	Other

Reactions		
Moment:	486.1	ft-kips
Axial:	18.041	kips
Shear:	22.613	kips
Exterior Flange Run, T+Q:	20.72	kips

Elevation: 120 feet

Bolt Data			
Qty:	28		
Diam:	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:		<-- Disregard	Bolt Fty:
N/A:		<-- Disregard	44.00
Circle:	39	in	

Plate Data		
Plate Outer Diam:	41.25	in
Plate Inner Diam:	36	in (Hole @ Ctr)
Thick:	1.25	in
Grade:	36	ksi
Effective Width:	4.63	in

Stiffener Data (Welding at Both Sides)		
Config:	0	*
Weld Type:		
Groove Depth:		in **
Groove Angle:		degrees
Fillet H. Weld:		<-- Disregard
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

Pole Data		
Pole OuterDiam:	42	in
Thick:	0.375	in
Pole Inner Diam:	41.25	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	63	ksi

Stress Increase Factor		
ASIF:	1.333	

Interior Flange Bolt Results

Maximum Bolt Tension:	20.7	Kips, Ext. T=Interior T
Allowable Tension:	46.1	Kips
Bolt Stress Ratio:	45.0%	**Pass**

Interior Flange Plate Results Flexural Check

Controlling Bolt Axial Force:	22.0	Kips, Ext. C= Interior C
Plate Stress:	20.5	ksi
Allowable Plate Stress:	36.0	ksi
Plate Stress Ratio:	57.1%	**Pass**

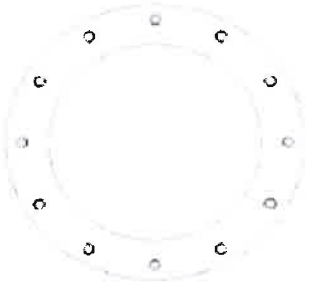
n/a

Stiffener Results

Horizontal Weld :	n/a
Vertical Weld:	n/a
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	n/a
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	n/a
Plate Comp. (AISC Bracket):	n/a

Pole Results

Pole Punching Shear Check: n/a



* 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

PROJECT	**87581.012.01 - Newington_1, CT - BU# 826217**				
SUBJECT	**Existing and New Bolt-on Bridge Stiffeners @ 100'**				
DATE	**06/09/15**	PAGE	1	OF	1

B+T GRP
1717 S. Boulder, Suite 300
Tulsa, OK 74119
(918) 587-4630

SSC

Global Section Properties:

Step Width	3.00 in	
Pole Thickness	0.38 in	
Pole Grade	42.00 ksi	
BS Material Grade	65.00 ksi	
BS Ultimate Stress	80.00 ksi	
BS Width	4.50 in	
BS Thickness	1.00 in	
BS Height	58.50 in	
I	14381.20 in^4	Global MOI, Taken from AutoCAD
Moment	1407.79 k-ft	Moment at Flange Under Consideration
Ybar	25.00 in	Dist. CL Pole to CL BS
S	575.25 in^3	Global Section Modulus; I/Ybar
fb	29.37 ksi	M/S
Area	4.50 in^2	BS Cross Sectional Area Below Flange
P	132.15 k	Load to BS

Bolt Circle	45
Number of Bolts	32
Bolt Size	1

Check Bridge Stiffener Span:

Lu	16.50 in	
Iy	0.38 in^4	
A	4.50 in^2	
ry	0.2887 in	
Cc	93.84414701	
kl/r	57.15767665	
Fa	28.36 ksi	
Fa w/ 1/3 Increase	37.81 ksi	**77.66%**

Plate Tension Analysis:

Hole Size	1.25 in	
Ag	4.50 in^2	
An	3.25 in^2	
U	1	
Ae	3.25 in^2	
Ta (Yielding)	234.00 k	
Ta (Rupture)	173.33 k	
Ft (Equiv)	38.52 ksi	**76.24%**

Moment to Existing Bolt Group:

S_{BG} =	639.16 in^3	# Bolts Acting	8
ft =	26.43 ksi		
Ab =	.785 in^2		
T =	166.07 k		
Arm =	45.00 in		
M_{EQ} =	622.8 k-ft	**<-------Insert into Crown Spreadsheet**	

Stiffened or Unstiffened, Exterior Flange Plate - Any Bolt Material TIA Rev F

Site Data

BU#: *826217*
Site Name: *Newington ,CT*
App #: *221161 Revision # 10*

Pole Manufacturer:	Pirod

Reactions		
Moment:	622.8	ft-kips
Axial:	26.546	kips
Shear:	28.52	kips
Elevation:	100	feet

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

Bolt Data			
Qty:	32		
Diameter (in.):	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:		<-- Disregard	Bolt Fty: 44.00
N/A:		<-- Disregard	
Circle (in.):	45		

Plate Data		
Diam:	48	in
Thick, t:	1.25	in
Grade (Fy):	36	ksi
Strength, Fu:	58	ksi
Single-Rod B-eff:	4.12	in

Stiffener Data (Welding at Both Sides)		
Config:	1	*
Weld Type:	Fillet	
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:	0.3125	in
Fillet V. Weld:	0.3125	in
Width:	3	in
Height:	5	in
Thick:	0.625	in
Notch:		in
Grade:	36	ksi
Weld str.:	70	ksi

Pole Data		
Diam:	42	in
Thick:	0.375	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	63	ksi
Reinf. Fillet Weld	0	"0" if None

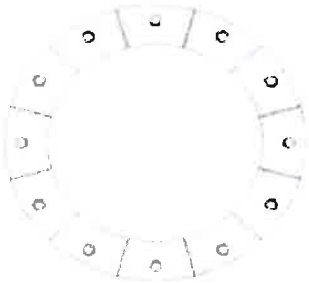
Stress Increase Factor		
ASIF:	1.333	

Flange Bolt Results

		Stiffened
Bolt Tension Capacity, **B**:	46.07 kips	Service, ASD
Max Bolt directly applied T:	19.93 Kips	Fty*ASIF
Min. PL "tc" for **B** cap. **w/o** Pry:	Stiffened in	
Min PL "treq" for actual **T w/ Pry**:	Stiffened in	
Min PL "t1" for actual **T w/o Pry**:	Stiffened in	
T allowable	46.07 kips	<-- B, Stiffened
Prying Force, Q:	0.00 kips	Stiffened
Total Bolt Tension=T+Q:	19.93 kips	
Non-Prying Bolt Stress Ratio, T/B:	43.3% **Pass**	

Exterior Flange Plate Results	Flexural Check	Stiffened
Compression Side Plate Stress:	Rohn/Pirod, OK	Service, ASD
Allowable Plate Stress:	36.0 ksi	0.75*Fy*ASIF
Compression Plate Stress Ratio:	Rohn/Pirod, OK	Comp. Y.L. Length:
Stiffened		N/A, Roark
Tension Side Stress Ratio, (treq/t)^2:	N/A	

Stiffener Results	N/A for Rohn / Pirod
Horizontal Weld :	N/A
Vertical Weld:	N/A
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	N/A
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	N/A
Plate Comp. (AISC Bracket):	N/A
Pole Results	
Pole Punching Shear Check:	N/A



* 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

Stiffened or Unstiffened, Interior Flange Plate - Any Bolt Material TIA Rev F

Site Data

BU#: *826217*
Site Name: *Newington ,CT*
App #: *221161 Revision # 10*

Manufacturer:	Other

Reactions		
Moment:	622.8	ft-kips
Axial:	26.546	kips
Shear:	28.52	kips
Exterior Flange Run, T+Q:	19.93	kips

Elevation: 100 feet

Bolt Data			
Qty:	32		
Diam:	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:		<-- Disregard	Bolt Fty: 44.00
N/A:		<-- Disregard	
Circle:	45	in	

Interior Flange Bolt Results

Maximum Bolt Tension:	19.9	Kips, Ext. T=Interior T
Allowable Tension:	46.1	Kips
Bolt Stress Ratio:	43.3%	Pass

Plate Data		
Plate Outer Diam:	47.25	in
Plate Inner Diam:	42	in (Hole @ Ctr)
Thick:	1.25	in
Grade:	36	ksi
Effective Width:	4.64	in

Interior Flange Plate Results Flexural Check

Controlling Bolt Axial Force:	21.6	Kips, Ext. C= Interior C
Plate Stress:	20.1	ksi
Allowable Plate Stress:	36.0	ksi
Plate Stress Ratio:	55.9%	Pass

Stiffener Data (Welding at Both Sides)		
Config:	0	*
Weld Type:		
Groove Depth:		in **
Groove Angle:		degrees
Fillet H. Weld:		<-- Disregard
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

n/a

Stiffener Results

Horizontal Weld :	n/a
Vertical Weld:	n/a
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	n/a
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	n/a
Plate Comp. (AISC Bracket):	n/a

Pole Results

Pole Punching Shear Check: n/a

Pole Data		
Pole OuterDiam:	48	in
Thick:	0.375	in
Pole Inner Diam:	47.25	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	63	ksi

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

PROJECT	**87581.012.01 - Newington_1, CT - BU# 826217**				
SUBJECT	**Existing and New Bolt-on Bridge Stiffeners @ 80'**				
DATE	**06/09/15**	PAGE	1	OF	1

B+T GRP
1717 S. Boulder, Suite 300
Tulsa, OK 74119
(918) 587-4630

SSC

Global Section Properties:

Step Width	3.00 in		
Pole Thickness	0.38 in		
Pole Grade	42.00 ksi	Bolt Circle	51
BS Material Grade	65.00 ksi	Number of Bolts	36
BS Ultimate Stress	80.00 ksi	Bolt Size	1
BS Width	4.50 in		
BS Thickness	1.00 in		
BS Height	111.00 in		
I	24813.41 in^4	Global MOI, Taken from AutoCAD	
Moment	2013.52 k-ft	Moment at Flange Under Consideration	
Ybar	28.00 in	Dist. CL Pole to CL BS	
S	886.19 in^3	Global Section Modulus; I/Ybar	
fb	27.27 ksi	M/S	
Area	4.50 in^2	BS Cross Sectional Area Below Flange	
P	122.69 k	Load to BS	

Check Bridge Stiffener Span:

Lu	16.50 in	
Iy	0.38 in^4	
A	4.50 in^2	
ry	0.2887 in	
Cc	93.84414701	
kl/r	57.15767665	
Fa	28.36 ksi	
Fa w/ 1/3 Increase	37.81 ksi	**72.10%**

Plate Tension Analysis:

Hole Size	1.25 in	
Ag	4.50 in^2	
An	3.25 in^2	
U	1	
Ae	3.25 in^2	
Ta (Yielding)	234.00 k	
Ta (Rupture)	173.33 k	
Ft (Equiv)	38.52 ksi	**70.78%**

Moment to Existing Bolt Group:

S_{BG} =	973.08 in^3	# Bolts Actin	9
ft =	24.83 ksi		
Ab =	.785 in^2		
T =	175.52 k		
Arm =	51.00 in		
M_{EQ} =	746.0 k-ft	**<-------Insert into Crown Spreadsheet**	

Stiffened or Unstiffened, Exterior Flange Plate - Any Bolt Material TIA Rev F

Site Data

BU#: *826217*
Site Name: *Newington ,CT*
App #: *221161 Revision # 10*

Pole Manufacturer:	Other

Reactions		
Moment:	746	ft-kips
Axial:	35.108	kips
Shear:	31.422	kips
Elevation:	80	feet

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

Bolt Data			
Qty:	36		
Diameter (in.):	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:		<-- Disregard	Bolt Fty: 44.00
N/A:		<-- Disregard	
Circle (in.):	51		

Plate Data		
Diam:	54	in
Thick, t:	1.25	in
Grade (Fy):	36	ksi
Strength, Fu:	58	ksi
Single-Rod B-eff:	4.19	in

Stiffener Data (Welding at Both Sides)		
Config:	1	*
Weld Type:	Fillet	
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:	0.3125	in
Fillet V. Weld:	0.3125	in
Width:	3	in
Height:	5	in
Thick:	0.625	in
Notch:		in
Grade:	36	ksi
Weld str.:	70	ksi

Pole Data		
Diam:	48	in
Thick:	0.375	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	63	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor		
ASIF:	1.333	

Flange Bolt Results

		Stiffened
Bolt Tension Capacity, **B**:	46.07 kips	Service, ASD
Max Bolt directly applied T:	18.53 Kips	Fty*ASIF
Min. PL "tc" for **B** cap. **w/o** Pry:	Stiffened in	
Min PL "treq" for actual **T w/ Pry**:	Stiffened in	
Min PL "t1" for actual **T w/o Pry**:	Stiffened in	
T allowable	46.07 kips	<-- B, Stiffened
Prying Force, Q:	0.00 kips	Stiffened
Total Bolt Tension=T+Q:	18.53 kips	
Non-Prying Bolt Stress Ratio, T/B:	40.2% Pass	

Exterior Flange Plate Results Flexural Check

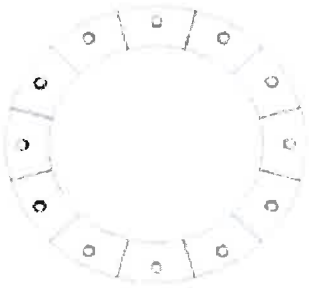
		Stiffened
Compression Side Plate Stress:	18.2 ksi	Service, ASD
Allowable Plate Stress:	36.0 ksi	0.75*Fy*ASIF
Compression Plate Stress Ratio:	50.5% Pass	Comp. Y.L. Length:
Stiffened		N/A, Roark
Tension Side Stress Ratio, (treq/t)^2:	N/A	

Stiffener Results

Horizontal Weld :	35.0% Pass
Vertical Weld:	25.7% Pass
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	15.7% Pass
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	24.1% Pass
Plate Comp. (AISC Bracket):	46.3% Pass

Pole Results

Pole Punching Shear Check:	12.7% Pass



* 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

Stiffened or Unstiffened, Interior Flange Plate - Any Bolt Material TIA Rev F

Site Data

BU#: *826217*
Site Name: *Newington ,CT*
App #: *221161 Revision # 10*

Manufacturer:	Other

Reactions		
Moment:	746	ft-kips
Axial:	35.108	kips
Shear:	31.422	kips
Exterior Flange Run, T+Q:	18.53	kips

Elevation: 80 feet

Bolt Data			
Qty:	36		
Diam:	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:		<-- Disregard	Bolt Fty: 44.00
N/A:		<-- Disregard	
Circle:	51	in	

Interior Flange Bolt Results

Maximum Bolt Tension:	18.5	Kips, Ext. Flange T+Q
Allowable Tension:	46.1	Kips
Bolt Stress Ratio:	40.2%	Pass

Plate Data		
Plate Outer Diam:	53.25	in
Plate Inner Diam:	48	in (Hole @ Ctr)
Thick:	1.25	in
Grade:	36	ksi
Effective Width:	4.65	in

Interior Flange Plate Results Flexural Check

Controlling Bolt Axial Force:	20.5	Kips, Ext. C= Interior C
Plate Stress:	19.0	ksi
Allowable Plate Stress:	36.0	ksi
Plate Stress Ratio:	52.9%	Pass

Stiffener Data (Welding at Both Sides)		
Config:	0	*
Weld Type:		
Groove Depth:		in **
Groove Angle:		degrees
Fillet H. Weld:		<-- Disregard
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

n/a

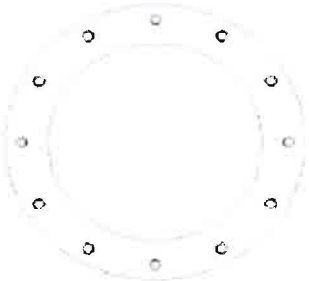
Stiffener Results

Horizontal Weld :	n/a
Vertical Weld:	n/a
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	n/a
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	n/a
Plate Comp. (AISC Bracket):	n/a

Pole Results

Pole Punching Shear Check: n/a

Pole Data		
Pole OuterDiam:	54	in
Thick:	0.375	in
Pole Inner Diam:	53.25	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	63	ksi



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

PROJECT	**87581.012.01 - Newington_1, CT - BU# 826217**				
SUBJECT	**Existing and New Bolt-on Bridge Stiffeners @ 60'**				
DATE	**06/09/15**	PAGE	1	OF	1

B+T GRP
1717 S. Boulder, Suite 300
Tulsa, OK 74119
(918) 587-4630

SSC

Global Section Properties:

Step Width	3.00 in		
Pole Thickness	0.38 in		
Pole Grade	42.00 ksi	Bolt Circle	57
BS Material Grade	65.00 ksi	Number of Bolts	48
BS Ultimate Stress	80.00 ksi	Bolt Size	1
BS Width	4.50 in		
BS Thickness	1.00 in		
BS Height	159.00 in		
I	50598.45 in^4	Global MOI, Taken from AutoCAD	
Moment	2686.88 k-ft	Moment at Flange Under Consideration	
Ybar	31.00 in	Dist. CL Pole to CL BS	
S	1632.21 in^3	Global Section Modulus; I/Ybar	
fb	19.75 ksi	M/S	
Area	4.50 in^2	BS Cross Sectional Area Below Flange	
P	88.89 k	Load to BS	

Check Bridge Stiffener Span:

Lu	16.50 in	
Iy	0.38 in^4	
A	4.50 in^2	
ry	0.2887 in	
Cc	93.84414701	
kl/r	57.15767665	
Fa	28.36 ksi	
Fa w/ 1/3 Increase	37.81 ksi	**52.24%**

Plate Tension Analysis:

Hole Size	1.25 in	
Ag	4.50 in^2	
An	3.25 in^2	
U	1	
Ae	3.25 in^2	
Ta (Yielding)	234.00 k	
Ta (Rupture)	173.33 k	
Ft (Equiv)	38.52 ksi	**51.28%**

Moment to Existing Bolt Group:

S_{BG} =	1775.38 in^3	# Bolts Acting	12
ft =	18.16 ksi		
Ab =	.785 in^2		
T =	171.16 k		
Arm =	57.00 in		
M_{EQ} =	813.0 k-ft	**<-------Insert into Crown Spreadsheet**	

Stiffened or Unstiffened, Exterior Flange Plate - Any Bolt Material TIA Rev F

Site Data

BU#: *826217*
Site Name: *Newington ,CT*
App #: *221161 Revision # 10*

Pole Manufacturer:	Other

Reactions		
Moment:	813	ft-kips
Axial:	46.578	kips
Shear:	34.271	kips
Elevation:	60	feet

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

Bolt Data			
Qty:	48		
Diameter (in.):	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:		<-- Disregard	Bolt Fty: 44.00
N/A:		<-- Disregard	
Circle (in.):	57		

Plate Data		
Diam:	60	in
Thick, t:	1.25	in
Grade (Fy):	36	ksi
Strength, Fu:	58	ksi
Single-Rod B-eff:	3.53	in

Stiffener Data (Welding at Both Sides)		
Config:	0	*
Weld Type:		
Groove Depth:		in **
Groove Angle:		degrees
Fillet H. Weld:		<-- Disregard
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

Pole Data		
Diam:	54	in
Thick:	0.375	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	63	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor		
ASIF:	1.333	

Flange Bolt Results

			Rigid
Bolt Tension Capacity, **B**:	46.07	kips	Service, ASD
Max Bolt directly applied T:	13.29	Kips	Fty*ASIF
Min. PL "tc" for **B** cap. **w/o** Pry:	1.474	in	
Min PL "treq" for actual **T w/ Pry**:	0.607	in	
Min PL "t1" for actual **T w/o Pry**:	0.792	in	
T allowable with Prying:	41.75	kips	0≤α'≤1 case
Prying Force, Q:	0.00	kips	
Total Bolt Tension=T+Q:	13.29	kips	
Prying Bolt Stress Ratio=(T+Q)/(B):	28.9%	Pass	

Exterior Flange Plate Results Flexural Check

			Rigid
Compression Side Plate Stress:	16.1	ksi	Service ASD
Allowable Plate Stress:	36.0	ksi	0.75*Fy*ASIF
Compression Plate Stress Ratio:	44.7%	Pass	Comp. Y.L. Length:
No Prying			18.25
Tension Side Stress Ratio, (treq/t)^2:	23.6%	Pass	

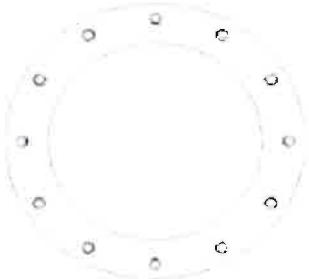
n/a

Stiffener Results

Horizontal Weld :	n/a
Vertical Weld:	n/a
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	n/a
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	n/a
Plate Comp. (AISC Bracket):	n/a

Pole Results

Pole Punching Shear Check: n/a



* 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

Stiffened or Unstiffened, Interior Flange Plate - Any Bolt Material TIA Rev F

Site Data

BU#: *826217*
Site Name: *Newington ,CT*
App #: *221161 Revision # 10*

Manufacturer:	Other

Reactions		
Moment:	813	ft-kips
Axial:	46.578	kips
Shear:	34.271	kips
Exterior Flange Run, T+Q:	13.29	kips

Elevation: 60 feet

Bolt Data			
Qty:	48		
Diam:	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:		<-- Disregard	Bolt Fty:
N/A:		<-- Disregard	44.00
Circle:	57	in	

Plate Data		
Plate Outer Diam:	59.25	in
Plate Inner Diam:	54	in (Hole @ Ctr)
Thick:	1.25	in
Grade:	36	ksi
Effective Width:	3.88	in

Stiffener Data (Welding at Both Sides)		
Config:	0	*
Weld Type:		
Groove Depth:		in **
Groove Angle:		degrees
Fillet H. Weld:		<-- Disregard
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

Pole Data		
Pole OuterDiam:	60	in
Thick:	0.375	in
Pole Inner Diam:	59.25	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	63	ksi

Stress Increase Factor		
ASIF:	1.333	

Interior Flange Bolt Results

Maximum Bolt Tension:	13.3	Kips, Ext. T=Interior T
Allowable Tension:	46.1	Kips
Bolt Stress Ratio:	28.9%	**Pass**

Interior Flange Plate Results Flexural Check

Controlling Bolt Axial Force:	15.2	Kips, Ext. C= Interior C
Plate Stress:	17.0	ksi
Allowable Plate Stress:	36.0	ksi
Plate Stress Ratio:	47.2%	**Pass**

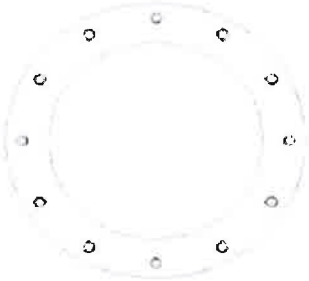
n/a

Stiffener Results

Horizontal Weld :	n/a
Vertical Weld:	n/a
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	n/a
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	n/a
Plate Comp. (AISC Bracket):	n/a

Pole Results

Pole Punching Shear Check: n/a



* 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

PROJECT	**87581.012.01 - Newington_1, CT - BU# 826217**				
SUBJECT	**Existing Bolt-on Bridge Stiffeners @ 40'**				
DATE	**06/09/15**	PAGE	1	OF	1

B+T GRP
1717 S. Boulder, Suite 300
Tulsa, OK 74119
(918) 587-4630

SSC

Global Section Properties:

Step Width	0.00 in		
Pole Thickness	0.50 in		
Pole Grade	42.00 ksi	Bolt Circle	50
BS Material Grade	65.00 ksi	Number of Bolts	64
BS Ultimate Stress	80.00 ksi	Bolt Size	1.25
BS Width	6.50 in		
BS Thickness	1.25 in		
BS Height	179.00 in		
I	60442.38 in^4	Global MOI, Taken from AutoCAD	
Moment	3407.93 k-ft	Moment at Flange Under Consideration	
Ybar	31.13 in	Dist. CL Pole to CL BS	
S	1941.92 in^3	Global Section Modulus; I/Ybar	
fb	21.06 ksi	M/S	
Area	8.13 in^2	BS Cross Sectional Area Below Flange	
P	171.11 k	Load to BS	

Check Bridge Stiffener Span:

Lu	25.00 in	
Iy	1.06 in^4	
A	8.13 in^2	
ry	0.3608 in	
Cc	93.84414701	
kl/r	69.2820323	
Fa	24.98 ksi	
Fa w/ 1/3 Increase	33.30 ksi	**63.24%**

Plate Tension Analysis:

Hole Size	1.25 in	
Ag	8.13 in^2	
An	6.56 in^2	
U	1	
Ae	6.56 in^2	
Ta (Yielding)	422.50 k	
Ta (Rupture)	350.00 k	
Ft (Equiv)	43.08 ksi	**48.89%**

Moment to Existing Bolt Group:

S_{BG} =	2417.70 in^3	# Bolts Acting	16
ft =	16.91 ksi		
Ab =	1.227 in^2		
T =	332.12 k		
Arm =	50.00 in		
M_{EQ} =	1383.9 k-ft	**<-------Insert into Crown Spreadsheet**	

PROJECT	**87581.012.01 - Newington_1, CT - BU# 826217**				
SUBJECT	**New Bolt-on Bridge Stiffeners @ 40'**				
DATE	**06/09/15**	PAGE	1	OF	1

B+T GRP
1717 S. Boulder, Suite 300
Tulsa, OK 74119
(918) 587-4630

SSC

Global Section Properties:

Step Width	0.00 in		
Pole Thickness	0.50 in		
Pole Grade	42.00 ksi	Bolt Circle	50
BS Material Grade	65.00 ksi	Number of Bolts	64
BS Ultimate Stress	80.00 ksi	Bolt Size	1.25
BS Width	6.00 in		
BS Thickness	1.00 in		
BS Height	156.00 in		
I	60442.38 in^4	Global MOI, Taken from AutoCAD	
Moment	3407.93 k-ft	Moment at Flange Under Consideration	
Ybar	31.00 in	Dist. CL Pole to CL BS	
S	1949.75 in^3	Global Section Modulus; I/Ybar	
fb	20.97 ksi	M/S	
Area	6.00 in^2	BS Cross Sectional Area Below Flange	
P	125.85 k	Load to BS	

Check Bridge Stiffener Span:

Lu	16.00 in	
Iy	0.50 in^4	
A	6.00 in^2	
ry	0.2887 in	
Cc	93.84414701	
kl/r	55.42562584	
Fa	28.81 ksi	
Fa w/ 1/3 Increase	38.42 ksi	**54.59%**

Plate Tension Analysis:

Hole Size	1.25 in	
Ag	6.00 in^2	
An	4.75 in^2	
U	1	
Ae	4.75 in^2	
Ta (Yielding)	312.00 k	
Ta (Rupture)	253.33 k	
Ft (Equiv)	42.22 ksi	**49.68%**

Moment to Existing Bolt Group:

S_{BG} =	2417.70 in^3	# Bolts Acting	16
ft =	16.91 ksi		
Ab =	1.227 in^2		
T =	332.12 k		
Arm =	50.00 in		
M_{EQ} =	1383.8 k-ft	**<-------Insert into Crown Spreadsheet**	

Stiffened or Unstiffened, Interior Flange Plate - Any Bolt Material TIA Rev F

Site Data

BU#: *826217*
Site Name: *Newington ,CT*
App #: *221161 Revision # 10*

Manufacturer:	Other

Reactions		
Moment:	609.21	ft-kips
Axial:	56.585	kips
Shear:	36.565	kips
Exterior Flange Run, T+Q:	0	kips

Elevation: 40-47BC feet

Bolt Data			
Qty:	32		
Diam:	1.25	Bolt Fu:	105
Bolt Material:	A325	Bolt Fy:	81
N/A:		<-- Disregard	Bolt Fty:
N/A:		<-- Disregard	44.00
Circle:	47	in	

Plate Data		
Plate Outer Diam:	59	in
Plate Inner Diam:	45	in (Hole @ Ctr)
Thick:	1.25	in
Grade:	36	ksi
Effective Width:	5.79	in

Stiffener Data (Welding at Both Sides)		
Config:	1	*
Weld Type:	Fillet	
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:	0.3125	in
Fillet V. Weld:	0.3125	in
Width:	3	in
Height:	6	in
Thick:	0.5	in
Notch:	0.5	in
Grade:	36	ksi
Weld str.:	70	ksi

Pole Data		
Pole OuterDiam:	60	in
Thick:	0.5	in
Pole Inner Diam:	59	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	63	ksi

Stress Increase Factor	
ASIF:	1.333

Interior Flange Bolt Results

Maximum Bolt Tension:	17.7	Kips, Ext. T=Interior T
Allowable Tension:	72.0	Kips
Bolt Stress Ratio:	24.6%	Pass

Interior Flange Plate Results Flexural Check

Controlling Bolt Axial Force:	21.2	Kips, Ext. C= Interior C
Plate Stress:	16.7	ksi
Allowable Plate Stress:	36.0	ksi
Plate Stress Ratio:	46.3%	Pass

Stiffener Results

Horizontal Weld :	17.6%	Pass
Vertical Weld:	9.4%	Pass
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	6.0%	Pass
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	14.7%	Pass
Plate Comp. (AISC Bracket):	20.1%	Pass

Pole Results

Pole Punching Shear Check:	3.3%	Pass

* 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

Stiffened or Unstiffened, Interior Flange Plate - Any Bolt Material TIA Rev F

Site Data

BU#: *826217*
Site Name: *Newington ,CT*
App #: *221161 Revision # 10*

Manufacturer:	Other

Reactions		
Moment:	774.69	ft-kips
Axial:	56.585	kips
Shear:	36.565	kips
Exterior Flange Run, T+Q:	0	kips

Elevation: 40-53BC feet

Bolt Data			
Qty:	32		
Diam:	1.25	Bolt Fu:	105
Bolt Material:	A325	Bolt Fy:	81
N/A:		<-- Disregard	Bolt Fty:
N/A:		<-- Disregard	44.00
Circle:	53	in	

Plate Data		
Plate Outer Diam:	59	in
Plate Inner Diam:	45	in (Hole @ Ctr)
Thick:	1.25	in
Grade:	36	ksi
Effective Width:	5.79	in

Stiffener Data (Welding at Both Sides)		
Config:	1	*
Weld Type:	Fillet	
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:	0.3125	in
Fillet V. Weld:	0.3125	in
Width:	3	in
Height:	6	in
Thick:	0.5	in
Notch:	0.5	in
Grade:	36	ksi
Weld str.:	70	ksi

Pole Data		
Pole OuterDiam:	60	in
Thick:	0.5	in
Pole Inner Diam:	59	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	63	ksi

Stress Increase Factor		
ASIF:	1.333	

Interior Flange Bolt Results

Maximum Bolt Tension:	20.2	Kips, Ext. T=Interior T
Allowable Tension:	72.0	Kips
Bolt Stress Ratio:	28.0%	Pass

Interior Flange Plate Results Flexural Check

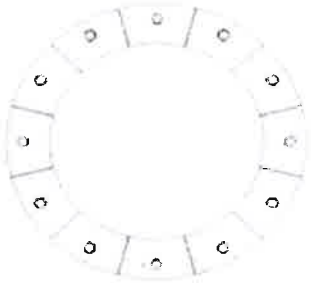
Controlling Bolt Axial Force:	23.7	Kips, Ext. C= Interior C
Plate Stress:	18.6	ksi
Allowable Plate Stress:	36.0	ksi
Plate Stress Ratio:	51.6%	Pass

Stiffener Results

Horizontal Weld :	21.9%	Pass
Vertical Weld:	11.7%	Pass
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	7.7%	Pass
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	18.5%	Pass
Plate Comp. (AISC Bracket):	25.0%	Pass

Pole Results

Pole Punching Shear Check:	4.0%	Pass



* 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

PROJECT	**87581.012.01 - Newington_1, CT - BU# 826217**				
SUBJECT	**Existing Bolt-on Bridge Stiffeners @ 20'**				
DATE	**06/09/15**	PAGE	1	OF	1

B+T GRP
1717 S. Boulder, Suite 300
Tulsa, OK 74119
(918) 587-4630

SSC

Global Section Properties:

Step Width	0.00 in	
Pole Thickness	0.63 in	
Pole Grade	42.00 ksi	
BS Material Grade	65.00 ksi	
BS Ultimate Stress	80.00 ksi	
BS Width	6.50 in	
BS Thickness	1.25 in	
BS Height	178.00 in	
I	61968.75 in^4	Global MOI, Taken from AutoCAD
Moment	4171.71 k-ft	Moment at Flange Under Consideration
Ybar	31.13 in	Dist. CL Pole to CL BS
S	1990.96 in^3	Global Section Modulus; I/Ybar
fb	25.14 ksi	M/S
Area	8.13 in^2	BS Cross Sectional Area Below Flange
P	204.29 k	Load to BS

Bolt Circle	50
Number of Bolts	64
Bolt Size	1.25

Check Bridge Stiffener Span:

Lu	24.00 in	
Iy	1.06 in^4	
A	8.13 in^2	
ry	0.3608 in	
Cc	93.84414701	
kl/r	66.51075101	
Fa	25.78 ksi	
Fa w/ 1/3 Increase	34.38 ksi	**73.14%**

Plate Tension Analysis:

Hole Size	1.25 in	
Ag	8.13 in^2	
An	6.56 in^2	
U	1	
Ae	6.56 in^2	
Ta (Yielding)	422.50 k	
Ta (Rupture)	350.00 k	
Ft (Equiv)	43.08 ksi	**58.37%**

Moment to Existing Bolt Group:

S_{BG} =	2478.75 in^3	# Bolts Actin	16
ft =	20.20 ksi		
Ab =	1.227 in^2		
T =	396.54 k		
Arm =	50.00 in		
M_{EQ} =	1652.3 k-ft	**<-------Insert into Crown Spreadsheet**	

PROJECT	**87581.012.01 - Newington_1, CT - BU# 826217**				
SUBJECT	**New Bolt-on Bridge Stiffeners @ 20'**				
DATE	**06/09/15**	PAGE	1	OF	1

B+T GRP
1717 S. Boulder, Suite 300
Tulsa, OK 74119
(918) 587-4630

SSC

Global Section Properties:

Step Width	0.00 in		
Pole Thickness	0.63 in		
Pole Grade	42.00 ksi	Bolt Circle	50
BS Material Grade	65.00 ksi	Number of Bolts	64
BS Ultimate Stress	80.00 ksi	Bolt Size	1.25
BS Width	6.00 in		
BS Thickness	1.00 in		
BS Height	156.00 in		
I	61968.75 in^4	Global MOI, Taken from AutoCAD	
Moment	4171.71 k-ft	Moment at Flange Under Consideration	
Ybar	31.00 in	Dist. CL Pole to CL BS	
S	1998.99 in^3	Global Section Modulus; I/Ybar	
fb	25.04 ksi	M/S	
Area	6.00 in^2	BS Cross Sectional Area Below Flange	
P	150.26 k	Load to BS	

Check Bridge Stiffener Span:

Lu	16.00 in	
Iy	0.50 in^4	
A	6.00 in^2	
ry	0.2887 in	
Cc	93.84414701	
kl/r	55.42562584	
Fa	28.81 ksi	
Fa w/ 1/3 Increase	38.42 ksi	**65.18%**

Plate Tension Analysis:

Hole Size	1.25 in	
Ag	6.00 in^2	
An	4.75 in^2	
U	1	
Ae	4.75 in^2	
Ta (Yielding)	312.00 k	
Ta (Rupture)	253.33 k	
Ft (Equiv)	42.22 ksi	**59.31%**

Moment to Existing Bolt Group:

S_{BG} =	2478.75 in^3	# Bolts Actin	16
ft =	20.20 ksi		
Ab =	1.227 in^2		
T =	396.54 k		
Arm =	50.00 in		
M_{EQ} =	1652.3 k-ft	**<-------Insert into Crown Spreadsheet**	

Stiffened or Unstiffened, Interior Flange Plate - Any Bolt Material TIA Rev F

Site Data

BU#: *826217*
Site Name: *Newington ,CT*
App #: *221161 Revision # 10*

Manufacturer:	Other

Reactions		
Moment:	727.37	ft-kips
Axial:	67.921	kips
Shear:	38.518	kips
Exterior Flange Run, T+Q:	0	kips

Elevation: 20-47BC feet

Bolt Data			
Qty:	32		
Diam:	1.25	Bolt Fu:	105
Bolt Material:	A325	Bolt Fy:	81
N/A:		<-- Disregard	Bolt Fty:
N/A:		<-- Disregard	44.00
Circle:	47	in	

Plate Data		
Plate Outer Diam:	58.75	in
Plate Inner Diam:	45	in (Hole @ Ctr)
Thick:	1.25	in
Grade:	36	ksi
Effective Width:	5.77	in

Stiffener Data (Welding at Both Sides)		
Config:	1	*
Weld Type:	Fillet	
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:	0.3125	in
Fillet V. Weld:	0.3125	in
Width:	3	in
Height:	6	in
Thick:	0.5	in
Notch:	0.5	in
Grade:	36	ksi
Weld str.:	70	ksi

Pole Data		
Pole OuterDiam:	60	in
Thick:	0.625	in
Pole Inner Diam:	58.75	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	63	ksi

Stress Increase Factor	
ASIF:	1.333

Interior Flange Bolt Results

Maximum Bolt Tension:	21.1	Kips, Ext. T=Interior T
Allowable Tension:	72.0	Kips
Bolt Stress Ratio:	29.3%	**Pass**

Interior Flange Plate Results Flexural Check

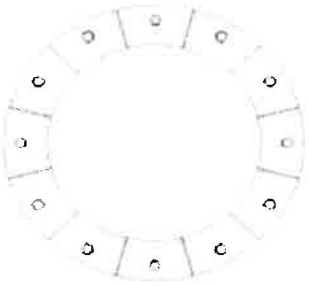
Controlling Bolt Axial Force:	25.3	Kips, Ext. C= Interior C
Plate Stress:	19.9	ksi
Allowable Plate Stress:	36.0	ksi
Plate Stress Ratio:	55.3%	**Pass**

Stiffener Results

Horizontal Weld :	17.9%	**Pass**
Vertical Weld:	9.5%	**Pass**
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	6.1%	**Pass**
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	14.9%	**Pass**
Plate Comp. (AISC Bracket):	20.3%	**Pass**

Pole Results

Pole Punching Shear Check:	2.6%	**Pass**



* 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

Stiffened or Unstiffened, Interior Flange Plate - Any Bolt Material TIA Rev F

Site Data

BU#: *826217*
Site Name: *Newington ,CT*
App #: *221161 Revision # 10*

Manufacturer:	Other

Reactions		
Moment:	924.93	ft-kips
Axial:	67.921	kips
Shear:	38.518	kips
Exterior Flange Run, T+Q:	0	kips

Elevation: 20-53BC feet

Bolt Data			
Qty:	32		
Diam:	1.25	Bolt Fu:	105
Bolt Material:	A325	Bolt Fy:	81
N/A:		<-- Disregard	Bolt Fty:
N/A:		<-- Disregard	44.00
Circle:	53	in	

Plate Data		
Plate Outer Diam:	58.75	in
Plate Inner Diam:	45	in (Hole @ Ctr)
Thick:	1.25	in
Grade:	36	ksi
Effective Width:	5.77	in

Stiffener Data (Welding at Both Sides)		
Config:	1	*
Weld Type:	Fillet	
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:	0.3125	in
Fillet V. Weld:	0.3125	in
Width:	3	in
Height:	6	in
Thick:	0.5	in
Notch:	0.5	in
Grade:	36	ksi
Weld str.:	70	ksi

Pole Data		
Pole OuterDiam:	60	in
Thick:	0.625	in
Pole Inner Diam:	58.75	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	63	ksi

Stress Increase Factor		
ASIF:	1.333	

Interior Flange Bolt Results

Maximum Bolt Tension:	24.1	Kips, Ext. T=Interior T
Allowable Tension:	72.0	Kips
Bolt Stress Ratio:	33.4%	Pass

Interior Flange Plate Results Flexural Check

Controlling Bolt Axial Force:	28.3	Kips, Ext. C= Interior C
Plate Stress:	22.2	ksi
Allowable Plate Stress:	36.0	ksi
Plate Stress Ratio:	61.7%	Pass

Stiffener Results

Horizontal Weld :	22.2%	Pass
Vertical Weld:	11.9%	Pass
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	7.8%	Pass
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	18.8%	Pass
Plate Comp. (AISC Bracket):	25.3%	Pass

Pole Results

Pole Punching Shear Check:	3.3%	Pass

* 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

PROJECT	**826217 - Newington_1, CA**				
SUBJECT	**Foundation Analysis**				
DATE	**06/09/15**	PAGE	1	OF	1

B+T GRP
1717 S. Boulder, Suite 300
Tulsa, OK 74119
(918) 587-4630

Monopole Pad & Pier Foundation Analysis

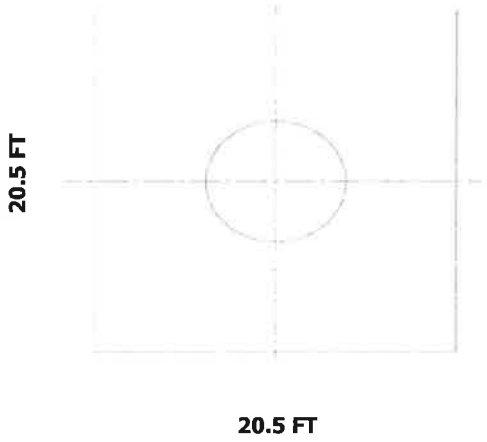
Rev. Type: F

Design Loads:

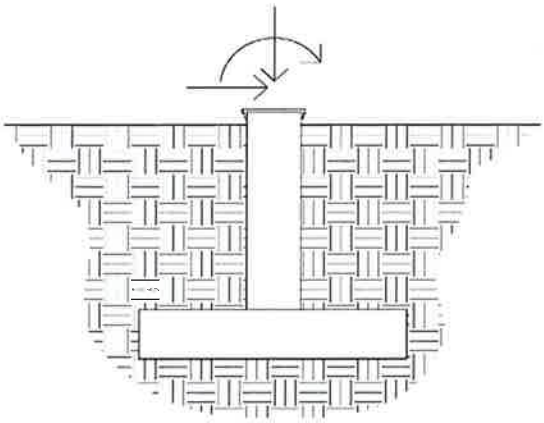
	Input unfactored loads	
Shear:	40.0	kips
Moment:	3,763.0	ft-kips
Tower Height:	190.0	ft
Tower Weight:	80.0	kips

Pad & Pier Dimensions / Properties:

Pole Diameter at Base:	60.00	in
Bearing Depth:	9.0	ft
Pad Width:	20.5	ft
Neglected Depth:	3.3	ft
Thickness:	2.5	ft
Pier Diameter:	7.0	ft
Pier Height Above Grade:	0.5	ft
BP Dist. Above Pier:	3.0	in
Clear Cover:	3.0	in
Pier Rebar Size:	9	
Pier Rebar Quanity:	34	
Pad Rebar Size:	11	
Pad Rebar Quanity:	30	
Pier Tie Size:	4	
Tie Quanity:	11	
Rebar Yield Strength:	60000	psi
Concrete Strength:	4000	psi
Concrete Unit Weight:	0.15	kcf



Elevation Overview



Soil Data:

	Allowable Values	
Soil Unit Weight:	0.130	kcf
Ult. Bearing Capacity:	16.000	ksf
Angle of Friction:	36.000	deg
Cohesion:	0.000	ksf
Passive Pressure:	0.000	ksf
Base Friction:	0.350	

Summary of Results

Req'd Pier Diam.	OK
Overturning	84.4%
Shear Capacity	29.0%
Bearing	64.8%
Pad Shear - 1-way	86.2%
Pad Shear - 2-way	10.1%
Pad Moment Capacity	31.3%
Pier Moment Capacity	91.6%

** Notes:

***Rock anchor capcity is 1200 k-ft**
***Moment reduced to account for modification**

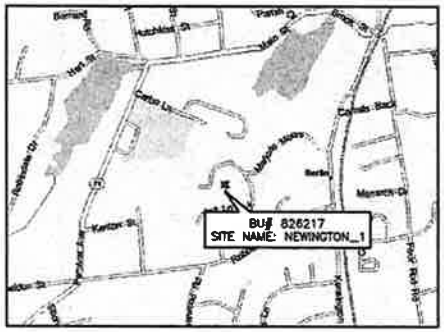
APPENDIX D

TOWER MODIFICATION DRAWINGS

TOWER MODIFICATION DRAWINGS PREPARED FOR: CROWN CASTLE

SITE NAME: NEWINGTON_1
BU NUMBER: 826217

SITE ADDRESS:
240 KENSINGTON ROAD
BERLIN, CT 06037
HARTFORD COUNTY, USA



MAP

DIRECTIONS

FROM RT 9 TO EXIT 22. TURN RIGHT ON TO MILL ST. RT 372 FOLLOW 3/4 MI AT SET OF LIGHTS TURN LEFT ONTO KENSINGO RD. 1/4 MI ON RIGHT WILL BE TOWN BUILDINGS COMPLEX AND ACCESS RD. FOLLOW TO TOP OF HILL. TOWER IS BEHIND TOWN HALL AND POLICE STATION.

PROJECT CONTACTS:

1. CROWN PROJECT MANAGER
JOHN MCGEE
(704) 877-8397
JOHN.MCGEE@CROWNCASTLE.COM

2. CROWN CONSTRUCTION MANAGER
N/A

3. B+T GROUP RFI CONTACT
JING ZHANG
(918) 587-4630
JZHANG@BTGRP.COM
MODDWGS@BTGRP.COM
1717 S BOULDER AVENUE, SUITE 300
TULSA, OK 74119

TOWER INFORMATION

TOWER MANUFACTURER / DWG #:	PIROD INC. / 204566-B
TOWER HEIGHT / TYPE:	191.7' MONOPOLE
TOWER LOCATION: DATUM: (NAD 1983)	LAT. 41° 37' 34.3" LONG. -72° 46' 32.33" ELEV. 150 FT AMSL
STRUCTURAL DESIGN DRAWING REPORT:	B+T GROUP / WO. # 1035561
STRUCTURAL ANALYSIS REPORT:	B+T GROUP / WO. # 1022666
STRUCTURAL ANALYSIS DATE:	03/23/15
APPLICATION ID / REVISION #:	221161 / 10
CCISITES DOCUMENT ID:	5608065

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 FASTEST MILE WIND SPEED OF 80 MPH WITH NO ICE, 37.6 MPH WITH 1 INCH ICE THICKNESS AND 50 MPH UNDER SERVICE LOADS.

DRAWINGS INCLUDED

SHEET NUMBER	DESCRIPTION
S1	TITLE SHEET
S2	MODIFICATION INSPECTION NOTES AND CHECKLIST
S3	GENERAL NOTES, NG2 BOLT NOTES AND DETAILS
S4	FORGBOLT NOTES AND DETAILS
S5	TOWER ELEV., SCHEDULES & TX LINE DIST. DIAG.
S6	TOWER SECTIONS (0.75'–19', 17.083'–30.083' AND 37.333'–50.333')
S7	TOWER SECTIONS (61.208'–71.208', 81.458'–97.458' AND 101.542'–111.542')
S8	FLAT PLATE BRIDGE STIFFENER DETAIL, SCHEDULE AND NOTES
D1	PART DETAILS
D2	PART 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.
SUITE 300
TULSA, OK 74119
PH: (918) 587-4630
www.btgrp.com

CROWN CASTLE

ISSUED FOR:

REV	DATE	DESCRIPTION
0	06/16/15	ISSUED FOR CONSTRUCTION

PROJECT NO:	87581.012.02
PROJECT ENG:	JING ZHANG
DRAWN BY:	GLS / CWR
CHECKED BY:	BMT

B+T ENGINEERING, INC.

STATE OF CONNECTICUT
CHAD TUTTLE
No. 23924
LICENSED
PROFESSIONAL ENGINEER

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.

NEWINGTON_1
826217
240 KENSINGTON ROAD
BERLIN, CT
EXISTING 191.7' MONOPOLE

SHEET TITLE
TITLE SHEET

SHEET NUMBER: S1
REVISION: 0

MI CHECKLIST

REQUIRED	REPORT ITEM	BRIEF DESCRIPTION
		PRE-CONSTRUCTION
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 CONFIGURATION, PORTHOLES, MOUNTS, 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.
X	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.
		CONSTRUCTION (PERFORMED BY CONTRACTOR)
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.
N/A	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 THE VICINITY OF BASE OF THE TOWER ARE REQUIRED TO BE 100% NDE INSPECTED BY UT IN ACCORDANCE WITH AWS D1.1. PARTIAL PENETRATION AND FILLET 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-10149.
N/A	GUY WIRE TENSION REPORT	THE GENERAL CONTRACTOR SHALL PROVIDE A REPORT TO THE MI INSPECTOR INDICATING THE TEMPERATURE AND TENSION IN EVERY GUY CABLE 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.
		POST-CONSTRUCTION
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 (EOR).

THE MI IS TO CONFIRM INSTALLATION CONFIGURATION AND WORKMANSHIP ONLY AND IS NOT A REVIEW OF THE MODIFICATION DESIGN ITSELF, NOR DOES THE MI INSPECTOR TAKE OWNERSHIP OF THE MODIFICATION DESIGN. OWNERSHIP OF THE STRUCTURAL MODIFICATION DESIGN EFFECTIVENESS AND INTEGRITY RESIDES WITH THE EOR AT ALL TIMES.

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

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

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

MI INSPECTOR

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

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

THE MI INSPECTOR IS RESPONSIBLE FOR COLLECTING ALL GENERAL CONTRACTOR (GC) INSPECTION AND TEST REPORTS, REVIEWING THE DOCUMENTS FOR ADHERENCE TO THE CONTRACT DOCUMENTS, 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.
- WHEN POSSIBLE, IT IS PREFERRED TO HAVE THE GC AND MI INSPECTOR ON-SITE SIMULTANEOUSLY FOR ANY GUY WIRE TENSIONING OR RE-TENSIONING OPERATIONS.
- IT MAY BE BENEFICIAL TO INSTALL ALL TOWER MODIFICATIONS PRIOR TO CONDUCTING THE FOUNDATION INSPECTIONS TO ALLOW FOUNDATION AND MI INSPECTION(S) TO COMMENCE WITH ONE SITE VISIT.
- WHEN POSSIBLE, IT IS PREFERRED TO HAVE THE GC AND MI INSPECTOR ON-SITE DURING THE MI TO HAVE ANY DEFICIENCIES CORRECTED DURING THE INITIAL MI. THEREFORE, THE GC MAY CHOOSE TO COORDINATE THE MI CAREFULLY TO ENSURE ALL CONSTRUCTION FACILITIES ARE AT THEIR DISPOSAL WHEN THE MI INSPECTOR IS ON SITE.

CANCELLATION OR DELAYS IN SCHEDULED MI

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

CORRECTION OF FAILING MI'S

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

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

MI VERIFICATION INSPECTIONS

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

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

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

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 INSTALLED CONDITION
  - SURFACE COATING REPAIR
- POST CONSTRUCTION PHOTOGRAPHS
  - FINAL INFIELD CONDITION

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

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

B+T GRP
1717 S. BOULDER AVE.
SUITE 300
TULSA, OK 74119
PH: (918) 587-4630
www.btgrp.com

CROWN CASTLE

ISSUED FOR:

REV	DATE	DESCRIPTION
0	06/18/15	ISSUED FOR CONSTRUCTION

PROJECT NO:	87581.012.02
PROJECT ENG:	JING ZHANG
DRAWN BY:	GLS / CWR
CHECKED BY:	BMT

B+T ENGINEERING, INC.

STATE OF CONNECTICUT CHAD TUTTLE No. 23924 LICENSED PROFESSIONAL ENGINEER

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.

NEWINGTON_1
826217
240 KENSINGTON ROAD
BERLIN, CT
EXISTING 191.7' MONOPOLE

SHEET TITLE
MODIFICATION INSPECTION NOTES AND CHECKLIST

SHEET NUMBER: S2
REVISION: 0

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.

GENERAL NOTES

1.1 ALL WORK SHALL COMPLY WITH THE TIA/EIA-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 THAT NO DAMAGE OCCURS TO THE EXISTING EQUIPMENT OR THE STRUCTURE.
1.3 A MINIMUM OF TWO COATS OF ZINGA 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 ON THE TOWER WITHOUT THE CONSENT OF THE OWNER.
1.5 IN LIEU OF TEMPORARY BRACING CONTRACTOR MAY HAVE A STABILITY ANALYSIS PERFORMED BY AN ENGINEER LICENSED IN THE STATE THE TOWER IS LOCATED. THE ANALYSIS SHALL USE A MINIMUM WIND SPEED OF 45 mph (3-SEC) PER TIA-1019.

FABRICATION

2.1 ALL WORK SHALL BE DONE IN ACCORDANCE WITH 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:

	YIELD	ASTM SPECS
A. STEEL SHAPES AND PLATES, U.N.O.	65ksi	A572

2.3 ALL NEW MATERIAL INCLUDING STRUCTURAL STEEL AND FASTENERS SHALL BE HOT DIPPED GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123 AND A153.
2.4 WELDING SHALL MEET ANSI/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

(1) TOWER MODIFICATION I.D.

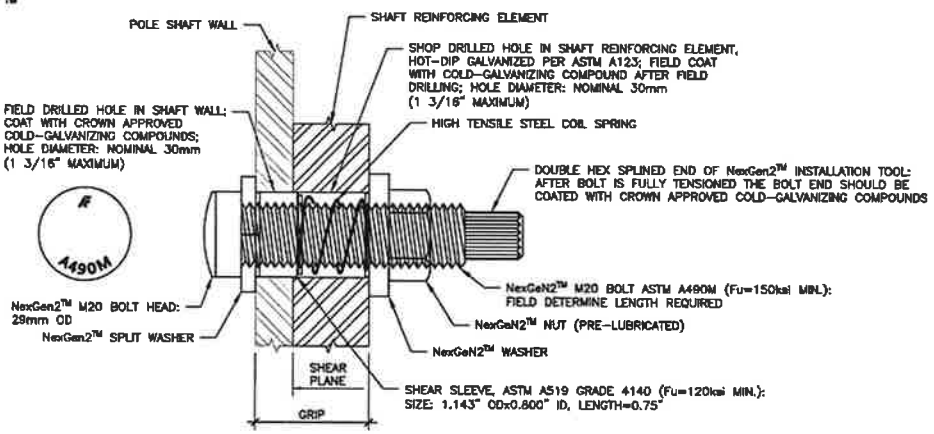
NEXGEN2 BLIND BOLT ASSEMBLY - PATENT PENDING - NG2 ™

INTERIOR OF POLE SHAFT	EXTERIOR OF POLE SHAFT

	SLEEVE LENGTH	MIN. GRIP RANGE	MAX. GRIP RANGE
M20x95	3/4"	1 1/16"	2 3/16"
M20x135	1 7/8"	2 1/16"	3 11/16"
M20x165	2 7/8"	3 3/16"	4 15/16"
M20x250	4"	4 5/16"	8 5/16"

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 MAGNI 565 COATED PER ASTM F2833 AS APPROPRIATE.
3. INSTALL PER MANUFACTURER'S INSTRUCTIONS.



TYPICAL NG2 BOLT DETAIL

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

B+T GRP
1717 S. BOULDER AVE.
SUITE 300
TULSA, OK 74119
PH: (918) 587-4630
www.btgrp.com

CROWN CASTLE

ISSUED FOR:

REV	DATE	DESCRIPTION
0	06/16/15	ISSUED FOR CONSTRUCTION

PROJECT NO:	87581.012.02
PROJECT ENG:	JING ZHANG
DRAWN BY:	GLS / CWR
CHECKED BY:	BMT

B+T ENGINEERING, INC.

STATE OF CONNECTICUT CHAD TUTTLE No. 23924 LICENSED PROFESSIONAL ENGINEER 6/16/15

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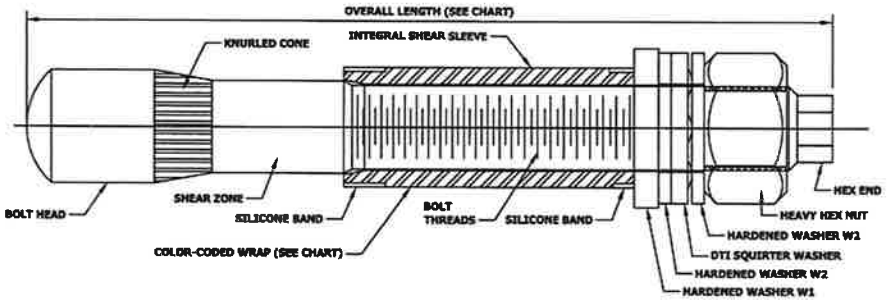
NEWINGTON_1
826217
240 KENSINGTON ROAD
BERLIN, CT
EXISTING 191.7' MONOPOLE

SHEET TITLE
GENERAL NOTES, NG2 BOLT NOTES AND DETAILS

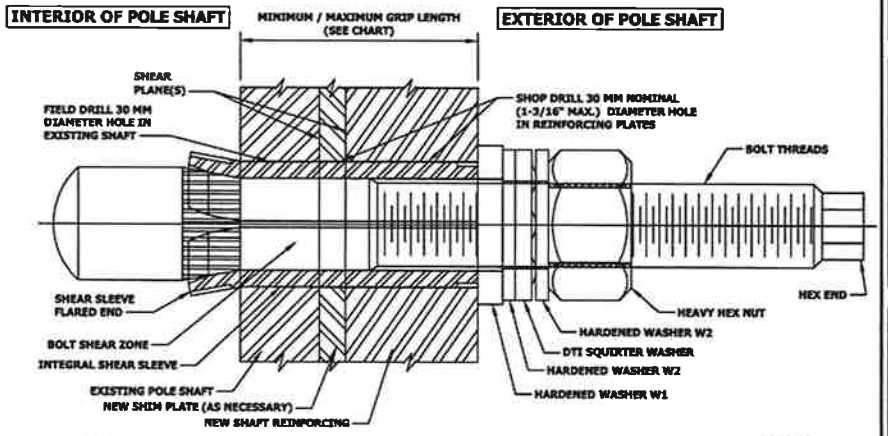
SHEET NUMBER: S3
REVISION: 0

FORGBolt™ 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 FORGBolt™ ASSEMBLY DETAIL 1



INSTALLED FORGBolt™ ASSEMBLY DETAIL 2

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

FORGBolt™

AISC Group A Material: ASTM A325 and PC8.8 (Tensile Stress, Fu = 120 ksi minimum)

GROUP A		FORGBolt™ Size (mm)	Overall Length (inches)	Estimated Weight Each (lbs)	Grip Range (inch)	Comment	Color Code
FORGBolt™ A325 - PC8.8	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"	Splice Bolt	**YELLOW**
	5	**365**	14.37	3.6	3-1/2" to 5-1/2"	Flange Jump Bolt	**ORANGE**
	6	**440**	17.32	4.3	5-1/2" to 8-1/2"	Flange Jump Bolt	**BLACK**
DTI Note		Each Group A (A325/PC8.8) FORGBolt™ assembly shall have a 'Squirter' DTI that is compatible with a M20-PC8.8 bolt.					

FORGBolt™ Installation

Follow all Manufacturer/Distributer 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 W1 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.

B+T GRP
1717 S. BOULDER AVE.
SUITE 300
TULSA, OK 74119
PH: (918) 587-4630
www.btgrp.com

CROWN CASTLE

ISSUED FOR:

REV	DATE	DESCRIPTION
0	06/18/15	ISSUED FOR CONSTRUCTION

PROJECT NO:	87581.012.02
PROJECT ENG:	JING ZHANG
DRAWN BY:	GLS / CWR
CHECKED BY:	BMT

B+T ENGINEERING, INC.

STATE OF CONNECTICUT — CHAD TUTTLE — No. 23924 — LICENSED PROFESSIONAL ENGINEER

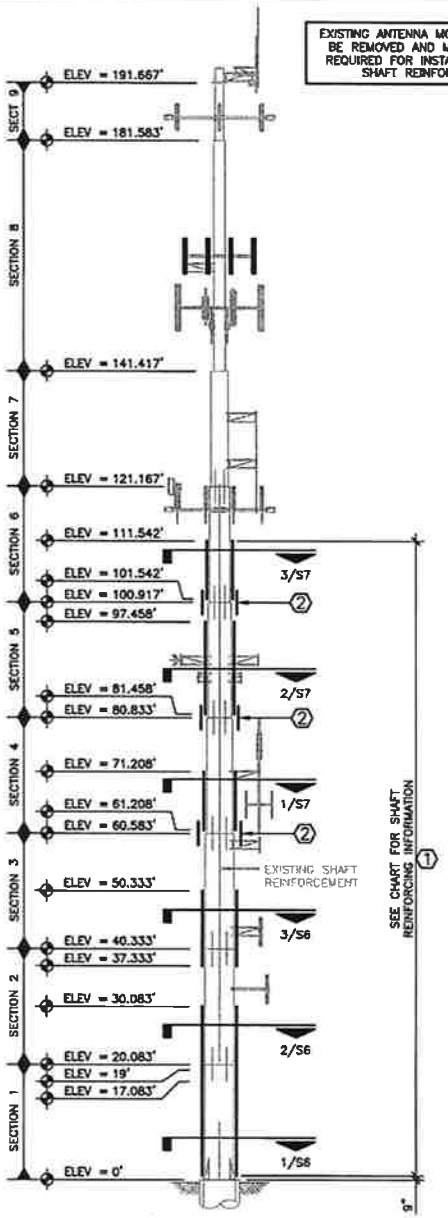
6/18/15

NEWINGTON_1
826217
240 KENSINGTON ROAD
BERLIN, CT
EXISTING 191.7' MONOPOLE

SHEET TITLE
FORGBOLT NOTES AND DETAILS

SHEET NUMBER: S4
REVISION: 0

EXISTING ANTENNA MOUNTS SHALL BE REMOVED AND MODIFIED AS REQUIRED FOR INSTALLATION OF SHAFT REINFORCING.



1 TOWER ELEVATION
SCALE: N.T.S.

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

BOTTOM ELEVATION	TOP ELEVATION	FLAT PLATE DESIGNATION*	FLAT PLATE LENGTH	FLAT PLATE QUANTITY	FLAT #	AJAX BOLTS PER PLATE	TOTAL AJAX BOLT QTY	TERMINATION BOLTS (BOTTOM)	TERMINATION BOLTS (TOP)	MAXIMUM INTERMEDIATE BOLT SPACING	TOTAL STEEL WEIGHT	
0.75'	19'	CCI-CFP-060100183	18'-3"	4	---	26	104	8	8	16"	1490	LBS.
17.083'	30.083'	CCI-CFP-06010013	13'-0"	4	---	22	88	8	8	16"	1062	LBS.
37.333'	50.333'	CCI-CFP-06010013	13'-0"	4	---	22	88	8	8	16"	1062	LBS.
61.208'	71.208'	CCI-SFP-04510010	10'-0"	4	---	16	64	6	6	20"	613	LBS.
81.458'	97.458'	CCI-SFP-04510016	16'-0"	3	---	20	60	6	6	20"	736	LBS.
101.542'	111.542'	CCI-SFP-04510010	10'-0"	3	---	16	48	6	6	20"	460	LBS.
							452				5423	LBS.

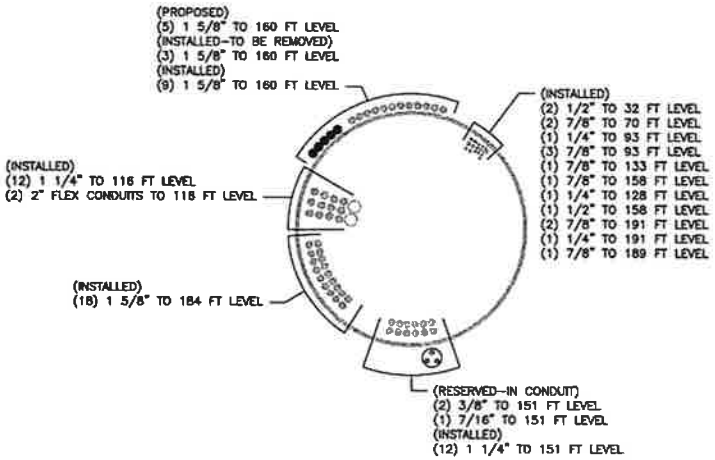
* SEE CMRP 65 KSI PARTS CATALOG EDITION 2 REV. 1 FOR PART DETAILS
** UNIQUE PART. SEE PART DETAIL SHEET D1 AND D2.
ALL BOLTS SHALL BE AJAX OR NEXGEN2 M20 BOLTS WITH HIGH STRENGTH SHEAR SLEEVES (ASTM A519 WITH MIN. Fu=120 KSI). CONTACT SUPPLIER FOR MATERIAL (PLATE AND BOLTS) AND INSTALLATION PROCEDURES.

TOWER MODIFICATIONS:

1. INSTALL NEW REINFORCING ELEMENTS
   RE: SHEETS S6 AND S7.
2. INSTALL NEW BRIDGE STIFFENERS
   RE: SHEET S8.

* CONTRACTOR SHALL BUDGET A SITE VISIT TO CHECK CRITICAL DIMENSIONS AND VERIFY UNKNOWN CONDITIONS PRIOR TO STEEL FABRICATION.
** THE NEW AND EXISTING TRANSMISSION LINES MUST BE DISTRIBUTED AS SHOWN IN THE TX LINE DIST. DIAGRAM RE: DETAIL 2/S5.
*** CONTRACTOR SHALL PROVIDE TEMPORARY BRACING FOR ALL REMOVE AND REPLACE PROCEDURES.
**** MODIFICATIONS SHALL BE COMPLETED PRIOR TO ADDING THE PROPOSED APPURTENANCES.

NOTES:
1. BLIND BOLTS ARE TO BE 20mm DIAMETER WITH CORRESPONDING 29mm DIAMETER SLEEVE WITH SPECIFIED STEEL GRADE.
2. 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 ZRC-BRAND ZINC-RICH COLD GALVANIZING COMPOUND. FILM THICKNESS. 1-800-831-3275 FOR PRODUCT INFORMATION.
3. ALL SHIMS SHALL BE ASTM A36.
4. HOLES FOR BOLTS AND SHEAR SLEEVES ARE 30mm UNLESS NOTED OTHERWISE.
5. SHOP WELDS ARE ASSUMED E80XX OR GREATER, PER STANDARD SPLICE DETAIL.
6. IF SCOPE OF MODIFICATION REQUIRES REMOVAL OF TOWER ID TAG, IT MUST BE REPLACED.
7. THE CLIMBING FACILITIES, SAFETY CLIMB AND ALL PARTS THEREOF SHALL NOT BE IMPEDED, MODIFIED OR ALTERED WITHOUT THE EXPRESS APPROVAL OF THE ENGINEER OF RECORD OR TOWER OWNER.
8. 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.
9. CONTRACTOR SHALL BE RESPONSIBLE FOR PROPER FITTING OF REINFORCEMENT ON MONOPOLES. SHIMS FOR MONOPOLE REINFORCEMENT MEMBER SHALL BE REQUIRED WHERE GAPS BETWEEN THE POLE SHAFT AND REINFORCING MEMBER EXIST AT FASTENER LOCATIONS. FOR INTERMEDIATE CONNECTIONS, THE MINIMUM SHIM LENGTH AND WIDTH SHALL BE THE WIDTH 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.



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

EXISTING MEMBER SCHEDULE

SECTION	DIAMETER
1	60"ø x 5/8" PIPE
2	60"ø x 1/2" PIPE
3	60"ø x 3/8" PIPE
4	54"ø x 3/8" PIPE
5	48"ø x 3/8" PIPE
6	42"ø x 3/8" PIPE
7	36"ø x 3/8" PIPE
8	24"ø x 3/8" PIPE
9	18"ø x 3/8" PIPE

EXISTING TOWER HAS BEEN PREVIOUSLY MODIFIED. REFERENCE DRAWINGS BY NATCOMM DATED 03/03/08

EXISTING TOWER HAS BEEN PREVIOUSLY MODIFIED. REFERENCE DRAWINGS BY B+T GROUP DATED 10/17/14

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1717 S. BOULDER AVE.
SUITE 300
TULSA, OK 74119
PH: (918) 587-4630
www.btgrp.com

CROWN CASTLE

ISSUED FOR:

REV	DATE	DESCRIPTION
0	06/16/15	ISSUED FOR CONSTRUCTION

PROJECT NO:	87581.012.02
PROJECT ENG:	JING ZHANG
DRAWN BY:	GLS / CWR
CHECKED BY:	BMT

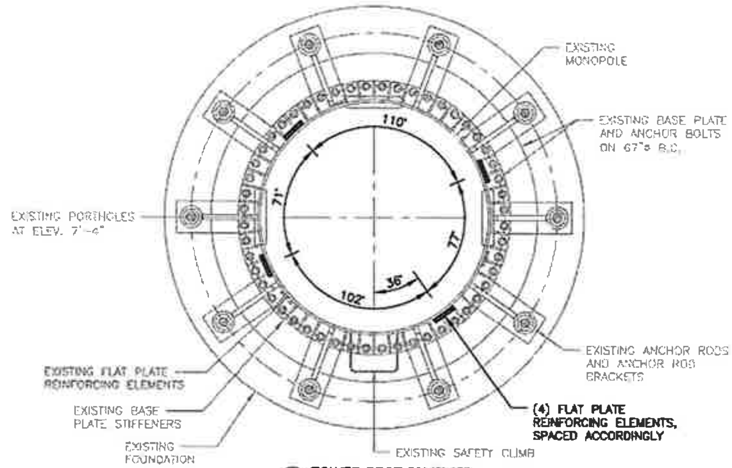
B+T ENGINEERING, INC.

STATE OF CONNECTICUT
CHAD TUTTLE
No. 23924
LICENSED
PROFESSIONAL ENGINEER

NEWINGTON_1
826217
240 KENSINGTON ROAD
BERLIN, CT
EXISTING 191.7' MONOPOLE

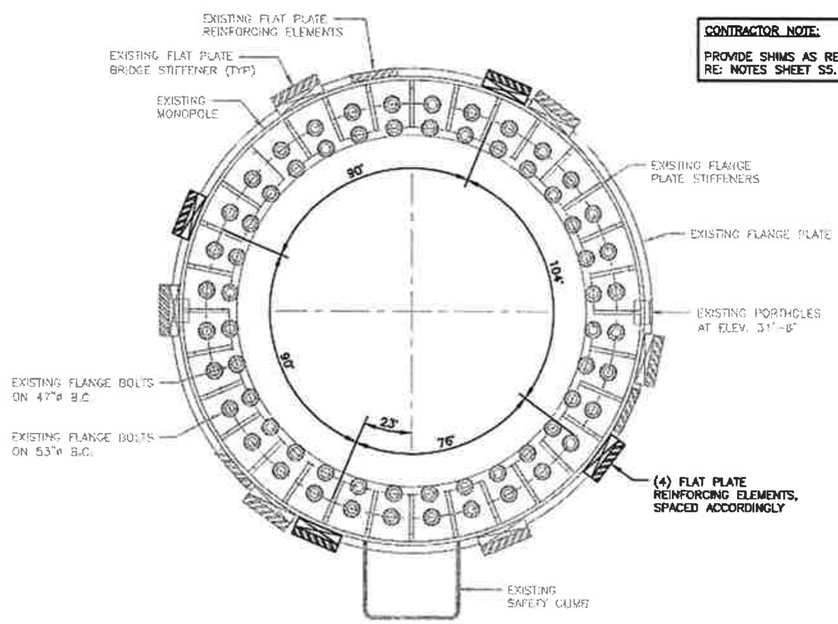
SHEET TITLE
TOWER ELEV., SCHEDULES, AND TX LINE DIST. DIAGRAM

SHEET NUMBER: S5
REVISION: 0

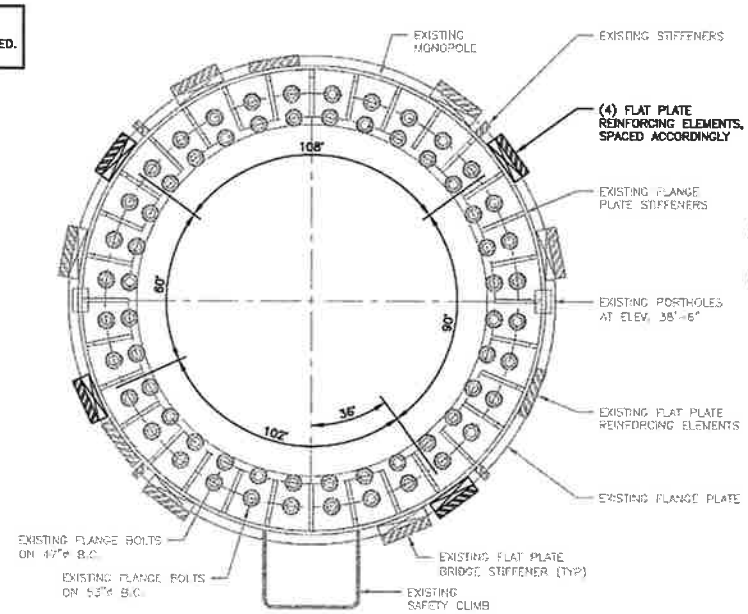


1 **TOWER SECTION (0'-19')**
SCALE: N.T.S.

CONTRACTOR NOTE:
PROVIDE SHIMS AS REQUIRED.
RE: NOTES SHEET S5.



2 **TOWER SECTION (17.083'-30.083')**
SCALE: N.T.S.



3 **TOWER SECTION (37.333'-50.333')**
SCALE: N.T.S.

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CROWN CASTLE

ISSUED FOR:

REV	DATE	DESCRIPTION
0	06/16/15	ISSUED FOR CONSTRUCTION

PROJECT NO:	87581.012.02
PROJECT ENG:	JING ZHANG
DRAWN BY:	GLS / CWR
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STATE OF CONNECTICUT
CHAD TUTTLE
No. 23924
LICENSED
PROFESSIONAL ENGINEER

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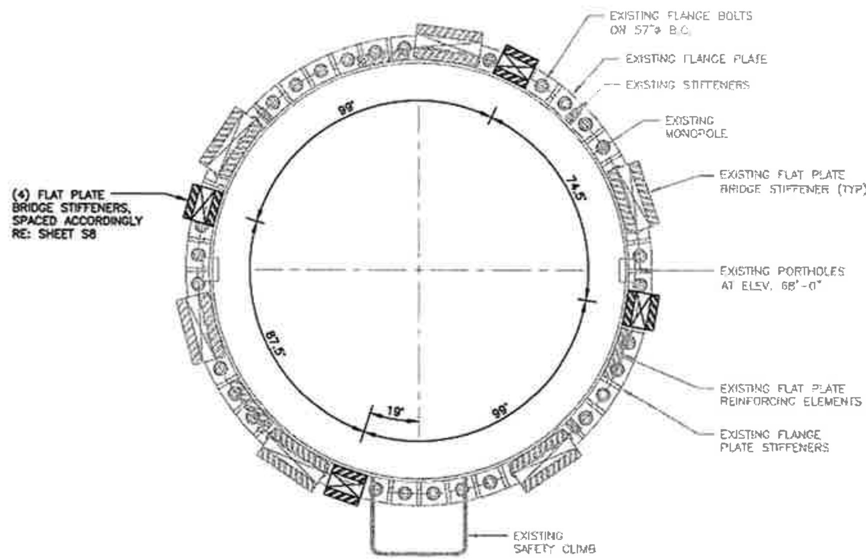
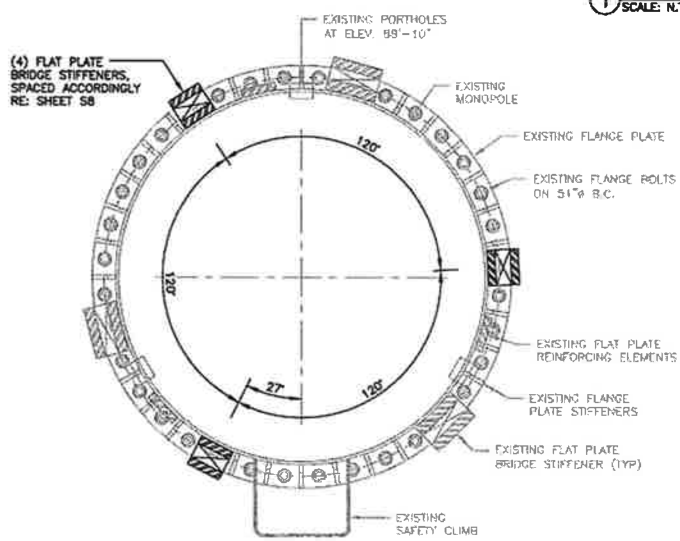
NEWINGTON_1
826217
240 KENSINGTON ROAD
BERLIN, CT
EXISTING 191.7' MONOPOLE

SHEET TITLE
TOWER SECTIONS
(0'-19', 17.083'-30.083' AND 37.333'-50.333')

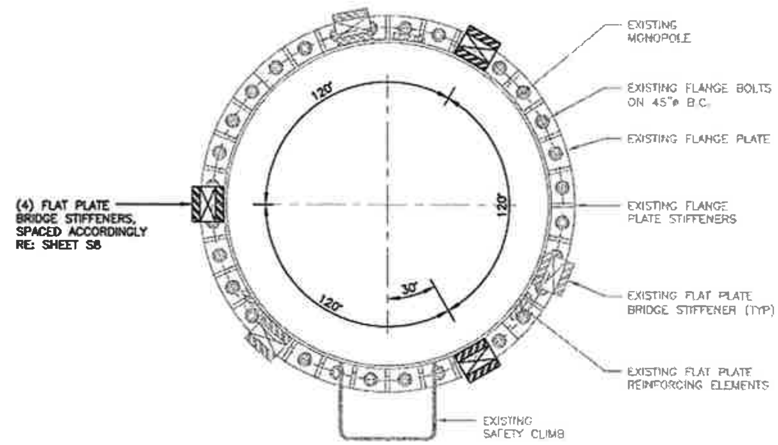
SHEET NUMBER: S6
REVISION: 0



(1) TOWER SECTION (61.208'-71.208')
SCALE: N.T.S.



(2) TOWER SECTION (81.458'-97.458')
SCALE: N.T.S.



(3) TOWER SECTION (101.542'-111.542')
SCALE: N.T.S.

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TULSA, OK 74119
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CROWN CASTLE

ISSUED FOR:

REV	DATE	DESCRIPTION
0	06/16/15	ISSUED FOR CONSTRUCTION

PROJECT NO:	87561.012.02
PROJECT ENG:	JING ZHANG
DRAWN BY:	GLS / CWR
CHECKED BY:	BMT

B+T ENGINEERING, INC.

STATE OF CONNECTICUT ★ CHAO TUTT No. 23924 LICENSED PROFESSIONAL ENGINEER

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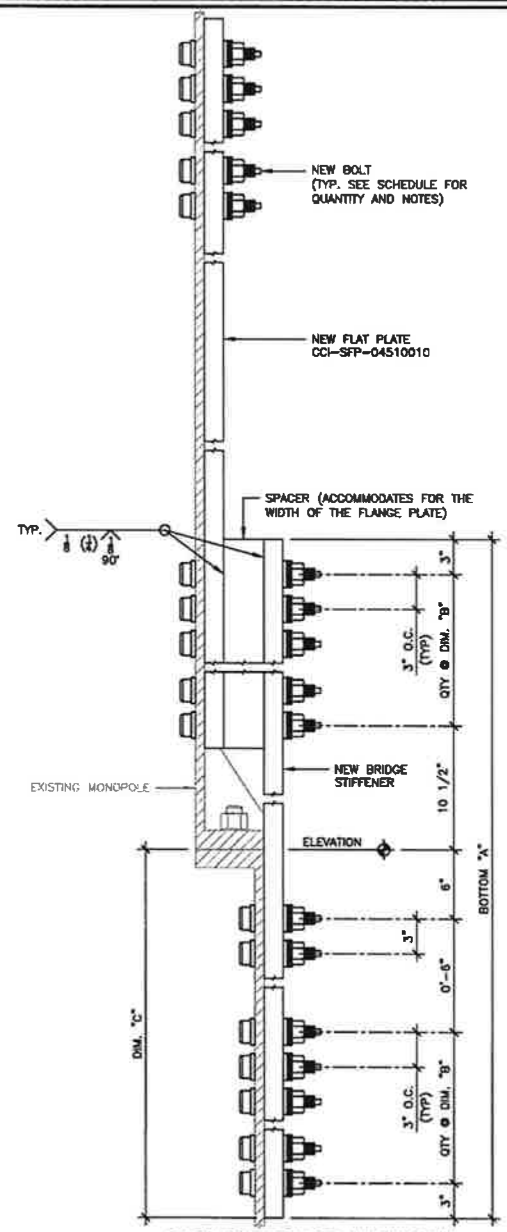
NEWINGTON_1
826217
240 KENSINGTON ROAD
BERLIN, CT
EXISTING 191.7' MONOPOLE

SHEET TITLE
TOWER SECTIONS
(61.208'-71.208', 81.458'-97.458' & 101.542'-111.542')

SHEET NUMBER: S7
REVISION: 0



1 FLAT PLATE BRIDGE STIFFENER DETAIL
SCALE: N.T.S.

FLAT PLATE BRIDGE STIFFENER-SCHEDULE (65ksi)

ELEVATION	NO. OF BRIDGE STIFFENERS	FLAT PLATE SIZE	BOTTOM "A"	QTY @ DIM. "B"	DIM. "C"	BOLT QTY PER STIFFENER	TOTAL AJAX BOLT QTY
60'-7"	4	CCI-CFP-045100049	4'-10 1/2"	8 HOLES @ 1'-3"	2'-6"	8	32
80'-10"	3	CCI-CFP-045100049	4'-10 1/2"	8 HOLES @ 1'-3"	2'-6"	8	24
100'-11"	3	CCI-CFP-045100049	4'-10 1/2"	8 HOLES @ 1'-3"	2'-6"	8	24

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CROWN CASTLE

ISSUED FOR:

REV	DATE	DESCRIPTION
0	06/16/15	ISSUED FOR CONSTRUCTION

PROJECT NO: 87561.012.02
PROJECT ENG: JING ZHANG
DRAWN BY: GLS / CWR
CHECKED BY: BMT

B+T ENGINEERING, INC.

STATE OF CONNECTICUT · CHAD TUTTLE · No. 23924 · LICENSED · PROFESSIONAL ENGINEER

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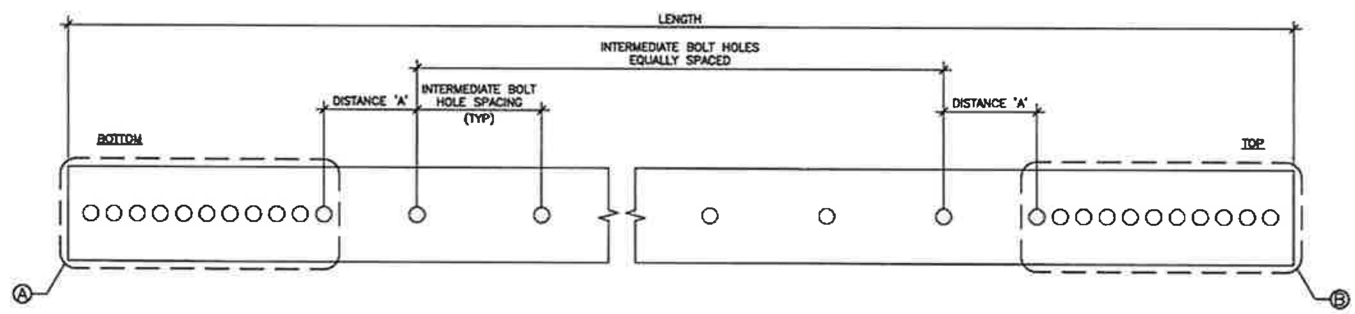
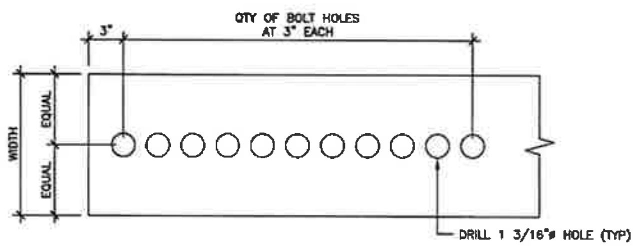
NEWINGTON_1
828217
240 KENSINGTON ROAD
BERLIN, CT
EXISTING 191.7' MONOPOLE

SHEET TITLE
FLAT PLATE
BRIDGE STIFFENER DETAIL,
SCHEDULE AND NOTES

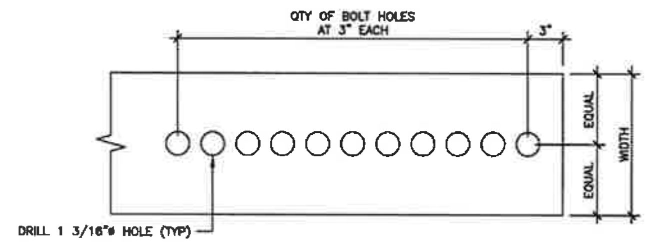
SHEET NUMBER: S8
REVISION: 0



1 UNIQUE PART
SCALE: N.T.S.



2 DETAIL A (BOTTOM)
SCALE: N.T.S.



3 DETAIL B (TOP)
SCALE: N.T.S.

PART NUMBER	BLACK WEIGHT (LBS)	WIDTH	THICKNESS	LENGTH	DISTANCE 'A'	TOTAL QTY OF 1 3/16"ø BOLT HOLES	QTY OF BOLT HOLES (BOTTOM END)	QTY OF BOLT HOLES (TOP END)	INTERMEDIATE BOLT HOLE SPACING
CCI-CFP-060100183	373	6"	1"	18'-3"	13 1/2"	26	8	8	1'-4"
CCI-CFP-045100016	246	4 1/2"	1"	16'-0"	0'-8"	20	6	6	1'-8"

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CROWN CASTLE

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PROJECT ENG: JING ZHANG
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B+T ENGINEERING, INC.

STATE OF CONNECTICUT ★ CHAD TUTTLE No. 23924 LICENSED PROFESSIONAL ENGINEER

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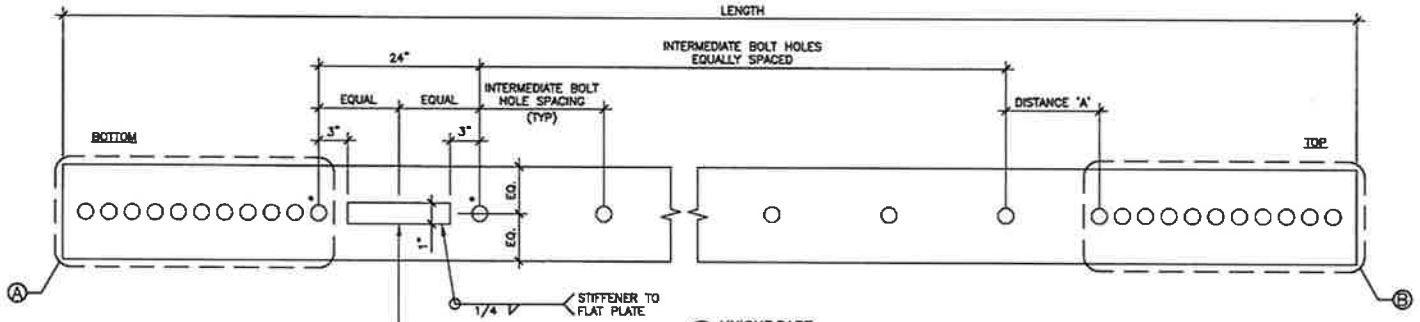
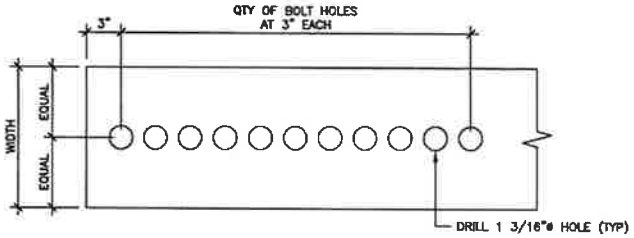
NEWINGTON_1
826217
240 KENSINGTON ROAD
BERLIN, CT
EXISTING 191.7' MONOPOLE

SHEET TITLE
PART DETAILS

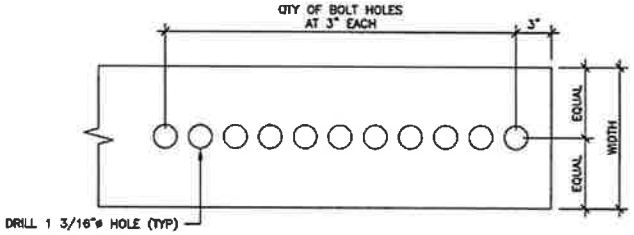
SHEET NUMBER: D1
REVISION: 0



1 UNIQUE PART
SCALE: N.T.S.



2 DETAIL A (BOTTOM)
SCALE: N.T.S.



3 DETAIL B (TOP)
SCALE: N.T.S.

PART NUMBER	BLACK WEIGHT (LBS)	WIDTH	THICKNESS	LENGTH	DISTANCE 'A'	TOTAL QTY OF 1 3/16"ø BOLT HOLES	QTY OF BOLT HOLES (BOTTOM END)	QTY OF BOLT HOLES (TOP END)	INTERMEDIATE BOLT HOLE SPACING
CCI-CFP-080100013	267	6"	1"	13'-0"	4"	22	8	8	1'-4"

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TULSA, OK 74119
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CROWN CASTLE

ISSUED FOR:

REV	DATE	DESCRIPTION
0	06/16/15	ISSUED FOR CONSTRUCTION

PROJECT NO:	87581.012.02
PROJECT ENG:	JING ZHANG
DRAWN BY:	GLS / CWR
CHECKED BY:	BMT

B+T ENGINEERING, INC.

NEWINGTON_1
826217

240 KENSINGTON ROAD
BERLIN, CT

EXISTING 191.7' MONOPOLE

SHEET TITLE

PART DETAILS

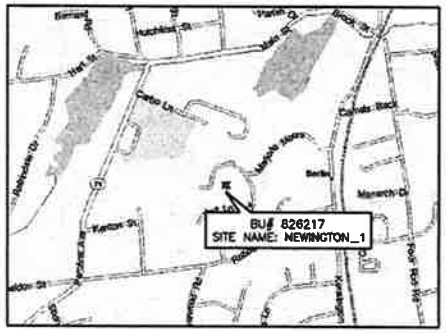
SHEET NUMBER: D2

REVISION: 0

TOWER MODIFICATION DRAWINGS PREPARED FOR: CROWN CASTLE

SITE NAME: NEWINGTON_1
BU NUMBER: 826217

SITE ADDRESS:
240 KENSINGTON ROAD
BERLIN, CT 06037
HARTFORD COUNTY, USA



MAP

DIRECTIONS

FROM RT 9 TO EXIT 22. TURN RIGHT ON TO MILL ST. RT 372 FOLLOW 3/4 MI AT SET OF LIGHTS TURN LEFT ONTO KENSINGO RD. 1/4 MI ON RIGHT WILL BE TOWN BUILDINGS COMPLEX AND ACCESS RD. FOLLOW TO TOP OF HILL. TOWER IS BEHIND TOWN HALL AND POLICE STATION.

PROJECT CONTACTS:

1. CROWN PROJECT MANAGER
JOHN MCGEE
(704) 877-8397
JOHN.MCGEE@CROWNCASTLE.COM

2. CROWN CONSTRUCTION MANAGER
N/A

3. B+T GROUP RFI CONTACT
JING ZHANG
(918) 587-4630
JZHANG@BTGRP.COM
MODDWGS@BTGRP.COM
1717 S BOULDER AVENUE, SUITE 300
TULSA, OK 74119

TOWER INFORMATION

TOWER MANUFACTURER / DWG #:	PIROD INC. / 204566-B
TOWER HEIGHT / TYPE:	191.7' MONOPOLE
TOWER LOCATION:	LAT. 41° 37' 34.3"
DATUM: (NAD 1983)	LONG. -72° 46' 32.33"
	ELEV. 150 FT AMSL
STRUCTURAL DESIGN DRAWING REPORT:	B+T GROUP / WO. # 1035561
STRUCTURAL ANALYSIS REPORT:	B+T GROUP / WO. # 1022666
STRUCTURAL ANALYSIS DATE:	03/23/15
APPLICATION ID / REVISION #:	221161 / 10
CCISITES DOCUMENT ID:	5608065

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 FASTEST MILE WIND SPEED OF 80 MPH WITH NO ICE, 37.6 MPH WITH 1 INCH ICE THICKNESS AND 50 MPH UNDER SERVICE LOADS.

DRAWINGS INCLUDED

SHEET NUMBER	DESCRIPTION
S1	TITLE SHEET
S2	MODIFICATION INSPECTION NOTES AND CHECKLIST
S3	GENERAL NOTES, NG2 BOLT NOTES AND DETAILS
S4	FORGBOLT NOTES AND DETAILS
S5	TOWER ELEV., SCHEDULES & TX LINE DIST. DIAG.
S6	TOWER SECTIONS (0.75'–19', 17.083'–30.083' AND 37.333'–50.333')
S7	TOWER SECTIONS (61.208'–71.208', 81.458'–97.458' AND 101.542'–111.542')
S8	FLAT PLATE BRIDGE STIFFENER DETAIL, SCHEDULE AND NOTES
D1	PART DETAILS
D2	PART 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.
SUITE 300
TULSA, OK 74119
PH: (918) 587-4630
www.btgrp.com

CROWN CASTLE

ISSUED FOR:

REV	DATE	DESCRIPTION
0	06/16/15	ISSUED FOR CONSTRUCTION

PROJECT NO:	87581.012.02
PROJECT ENG:	JING ZHANG
DRAWN BY:	GLS / CWR
CHECKED BY:	BMT

B+T ENGINEERING, INC.

STATE OF CONNECTICUT · CHAD TUTTLE · No. 23924 LICENSED PROFESSIONAL ENGINEER

NEWINGTON_1
826217
240 KENSINGTON ROAD
BERLIN, CT
EXISTING 191.7' MONOPOLE

SHEET TITLE:
TITLE SHEET

SHEET NUMBER:	REVISION:
S1	0

MI CHECKLIST

REQUIRED	REPORT ITEM	BRIEF DESCRIPTION
		PRE-CONSTRUCTION
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 CONFIGURATION, PORTHOLES, MOUNTS, 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.
X	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.
		CONSTRUCTION (PERFORMED BY CONTRACTOR)
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.
N/A	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 THE VICINITY OF BASE OF THE TOWER ARE REQUIRED TO BE 100% NDE INSPECTED BY UT IN ACCORDANCE WITH AWS D1.1. PARTIAL PENETRATION AND FILLET 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-10149.
N/A	GUY WIRE TENSION REPORT	THE GENERAL CONTRACTOR SHALL PROVIDE A REPORT TO THE MI INSPECTOR INDICATING THE TEMPERATURE AND TENSION IN EVERY GUY CABLE 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.
		POST-CONSTRUCTION
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 (EOR).

THE MI IS TO CONFIRM INSTALLATION CONFIGURATION AND WORKMANSHIP ONLY AND IS NOT A REVIEW OF THE MODIFICATION DESIGN ITSELF, NOR DOES THE MI INSPECTOR TAKE OWNERSHIP OF THE MODIFICATION DESIGN. OWNERSHIP OF THE STRUCTURAL MODIFICATION DESIGN EFFECTIVENESS AND INTEGRITY RESIDES WITH THE EOR AT ALL TIMES.

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

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

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

MI INSPECTOR

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

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

THE MI INSPECTOR IS RESPONSIBLE FOR COLLECTING ALL GENERAL CONTRACTOR (GC) INSPECTION AND TEST REPORTS, REVIEWING THE DOCUMENTS FOR ADHERENCE TO THE CONTRACT DOCUMENTS, 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.
- WHEN POSSIBLE, IT IS PREFERRED TO HAVE THE GC AND MI INSPECTOR ON-SITE SIMULTANEOUSLY FOR ANY GUY WIRE TENSIONING OR RE-TENSIONING OPERATIONS.
- IT MAY BE BENEFICIAL TO INSTALL ALL TOWER MODIFICATIONS PRIOR TO CONDUCTING THE FOUNDATION INSPECTIONS TO ALLOW FOUNDATION AND MI INSPECTION(S) TO COMMENCE WITH ONE SITE VISIT.
- WHEN POSSIBLE, IT IS PREFERRED TO HAVE THE GC AND MI INSPECTOR ON-SITE DURING THE MI TO HAVE ANY DEFICIENCIES CORRECTED DURING THE INITIAL MI. THEREFORE, THE GC MAY CHOOSE TO COORDINATE THE MI CAREFULLY TO ENSURE ALL CONSTRUCTION FACILITIES ARE AT THEIR DISPOSAL WHEN THE MI INSPECTOR IS ON SITE.

CANCELLATION OR DELAYS IN SCHEDULED MI

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

CORRECTION OF FAILING MI'S

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

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

MI VERIFICATION INSPECTIONS

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

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

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

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 INSTALLED CONDITION
  - SURFACE COATING REPAIR
- POST CONSTRUCTION PHOTOGRAPHS
  - FINAL INFIELD CONDITION

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

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

B+T GRP
1717 S. BOULDER AVE, SUITE 300
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CROWN CASTLE

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PROJECT NO:	87581.012.02
PROJECT ENG:	JING ZHANG
DRAWN BY:	GLS / CWR
CHECKED BY:	BMT

B+T ENGINEERING, INC.

STATE OF CONNECTICUT — CHAD TUTTLE — No. 23924 LICENSED PROFESSIONAL ENGINEER

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NEWINGTON_1
826217
240 KENSINGTON ROAD
BERLIN, CT
EXISTING 191.7' MONOPOLE

SHEET TITLE
MODIFICATION INSPECTION NOTES AND CHECKLIST

SHEET NUMBER: S2
REVISION: 0

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.

GENERAL NOTES

1.1 ALL WORK SHALL COMPLY WITH THE TIA/EIA-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 THAT NO DAMAGE OCCURS TO THE EXISTING EQUIPMENT OR THE STRUCTURE.
1.3 A MINIMUM OF TWO COATS OF ZINGA 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 ON THE TOWER WITHOUT THE CONSENT OF THE OWNER.
1.5 IN LIEU OF TEMPORARY BRACING CONTRACTOR MAY HAVE A STABILITY ANALYSIS PERFORMED BY AN ENGINEER LICENSED IN THE STATE THE TOWER IS LOCATED. THE ANALYSIS SHALL USE A MINIMUM WIND SPEED OF 45 mph (3-SEC) PER TIA-1019.

FABRICATION

2.1 ALL WORK SHALL BE DONE IN ACCORDANCE WITH 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:

	YIELD	ASTM SPECS
A. STEEL SHAPES AND PLATES, U.N.O.	65ksi	A572

2.3 ALL NEW MATERIAL INCLUDING STRUCTURAL STEEL AND FASTENERS SHALL BE HOT DIPPED GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123 AND A153.
2.4 WELDING SHALL MEET ANSI/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

(1) TOWER MODIFICATION I.D.

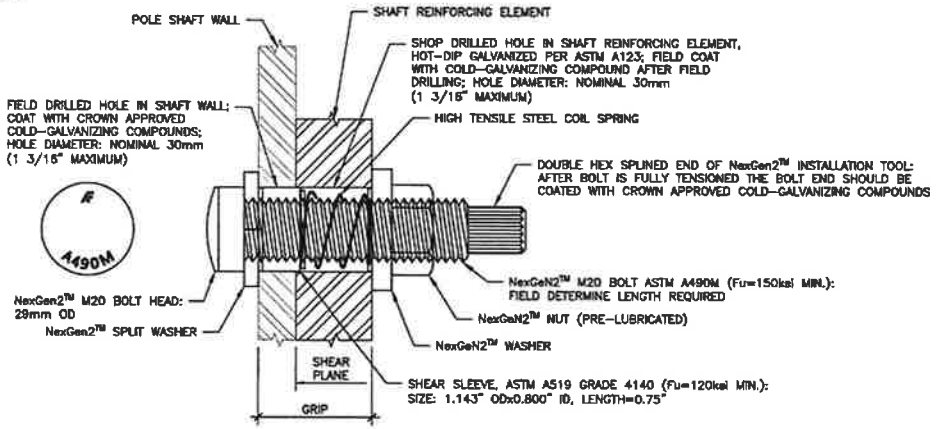
NEXGEN2 NG2 BLIND BOLT ASSEMBLY - PATENT PENDING -

INTERIOR OF POLE SHAFT	EXTERIOR OF POLE SHAFT

	SLEEVE LENGTH	MIN. GRIP RANGE	MAX. GRIP RANGE
M20x95	3/4"	1 1/16"	2 3/16"
M20x135	1 7/8"	2 1/16"	3 11/16"
M20x165	2 7/8"	3 3/16"	4 15/16"
M20x250	4"	4 5/16"	8 5/16"

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 MAGNI 565 COATED PER ASTM F2833 AS APPROPRIATE.
3. INSTALL PER MANUFACTURER'S INSTRUCTIONS.



TYPICAL NG2 BOLT DETAIL

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

B+T GRP
1717 S. BOULDER AVE, SUITE 300
TULSA, OK 74119
PH: (918) 587-4630
www.btgrp.com

CROWN CASTLE

ISSUED FOR:

REV	DATE	DESCRIPTION
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PROJECT NO:	87581.012.02
PROJECT ENG:	JING ZHANG
DRAWN BY:	GLS / CWR
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B+T ENGINEERING, INC.

STATE OF CONNECTICUT CHAD TUTTLE No. 23924 LICENSED PROFESSIONAL ENGINEER 6/16/15

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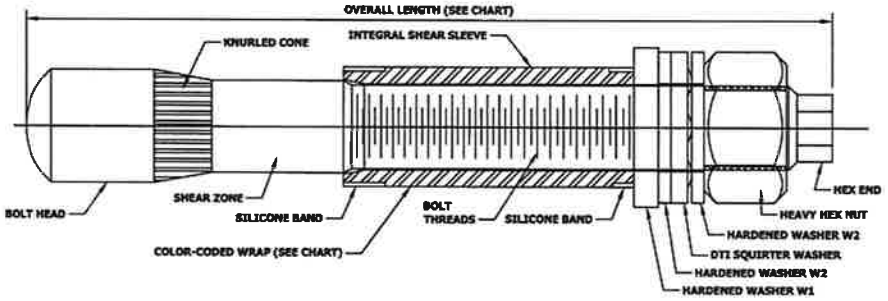
NEWINGTON_1
826217
240 KENSINGTON ROAD
BERLIN, CT
EXISTING 191.7' MONOPOLE

SHEET TITLE
GENERAL NOTES, NG2 BOLT NOTES AND DETAILS

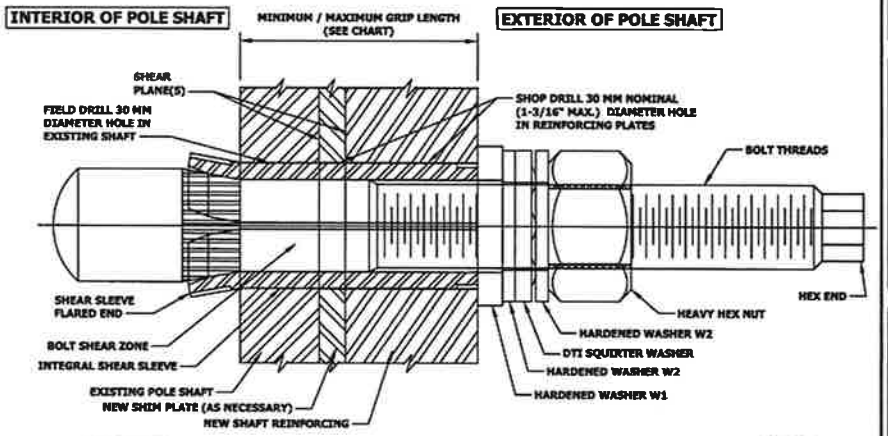
SHEET NUMBER: S3
REVISION: 0

FORGBolt™ 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 FORGBolt™ ASSEMBLY DETAIL 1



INSTALLED FORGBolt™ ASSEMBLY DETAIL 2

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

FORGBolt™		AISC Group A Material: ASTM A325 and PC8.8 (Tensile Stress, Fu = 120 ksi minimum)				
GROUP A	FORGBolt™ Size (mm)	Overall Length (inches)	Estimated Weight Each (lbs)	Grip Range (inch)	Comment	Color Code
FORGBolt™ A325 - PC8.8 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"	Splice Bolt	**YELLOW**
5	**365**	14.37	3.6	3-1/2" to 5-1/2"	Flange Jump Bolt	**ORANGE**
6	**440**	17.32	4.3	5-1/2" to 8-1/2"	Flange Jump Bolt	**BLACK**
DTI Note	Each Group A (A325/PC8.8) FORGBolt™ assembly shall have a 'Squirter' DTI that is compatible with a M20-PC8.8 bolt.					

FORGBolt™ Installation

Follow all Manufacturer/Distributer 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 W1 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.

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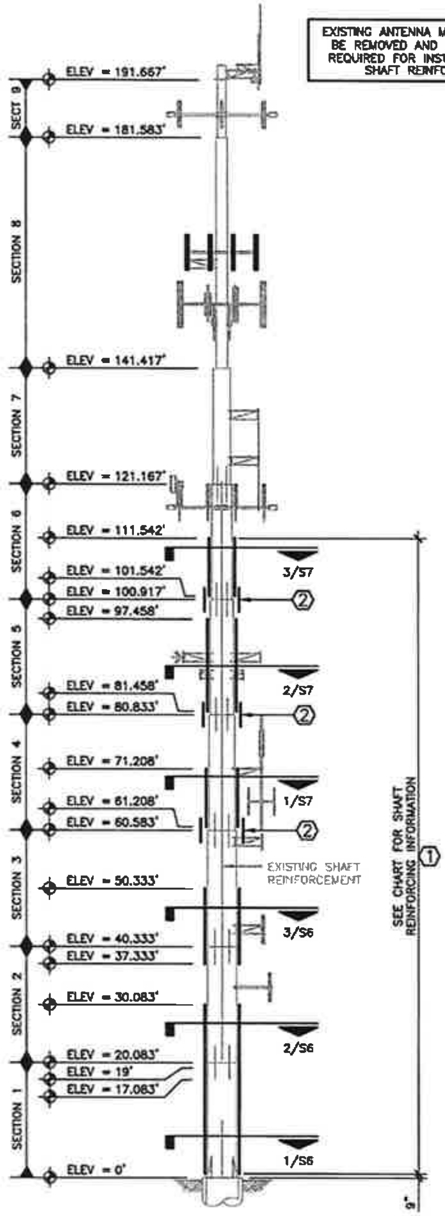
SHEET TITLE
FORGBOLT NOTES AND DETAILS

SHEET NUMBER: S4
REVISION: 0



① TOWER ELEVATION
SCALE: N.T.S.

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

BOTTOM ELEVATION	TOP ELEVATION	FLAT PLATE DESIGNATION*	FLAT PLATE LENGTH	FLAT PLATE QUANTITY	FLAT #	AJAX BOLTS PER PLATE	TOTAL AJAX BOLT QTY	TERMINATION BOLTS (BOTTOM)	TERMINATION BOLTS (TOP)	MAXIMUM INTERMEDIATE BOLT SPACING	TOTAL STEEL WEIGHT	
0.75'	19'	CCI-CFP-060100183	18'-3"	4	---	26	104	8	8	16"	1490	LBS.
17.083'	30.083'	CCI-CFP-06010013	13'-0"	4	---	22	88	8	8	16"	1062	LBS.
37.333'	50.333'	CCI-CFP-06010013	13'-0"	4	---	22	88	8	8	16"	1062	LBS.
61.208'	71.208'	CCI-SFP-04510010	10'-0"	4	---	16	64	6	6	20"	613	LBS.
81.458'	97.458'	CCI-SFP-04510016	16'-0"	3	---	20	60	6	6	20"	736	LBS.
101.542'	111.542'	CCI-SFP-04510010	10'-0"	3	---	16	48	6	6	20"	460	LBS.
							452				5423	LBS.

* SEE CMRP 65 KSI PARTS CATALOG EDITION 2 REV. 1 FOR PART DETAILS
** UNIQUE PART. SEE PART DETAIL SHEET D1 AND D2.

ALL BOLTS SHALL BE AJAX OR NEXGEN2 M20 BOLTS WITH HIGH STRENGTH SHEAR SLEEVES (ASTM A519 WITH MIN. Fu=120 KSI). CONTACT SUPPLIER FOR MATERIAL (PLATE AND BOLTS) AND INSTALLATION PROCEDURES.

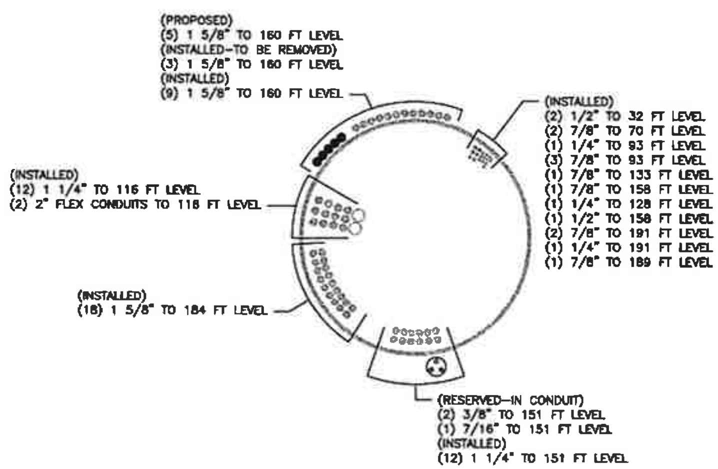
TOWER MODIFICATIONS:

① INSTALL NEW REINFORCING ELEMENTS RE: SHEETS S6 AND S7.

② INSTALL NEW BRIDGE STIFFENERS RE: SHEET S8.

* CONTRACTOR SHALL BUDGET A SITE VISIT TO CHECK CRITICAL DIMENSIONS AND VERIFY UNKNOWN CONDITIONS PRIOR TO STEEL FABRICATION.
** THE NEW AND EXISTING TRANSMISSION LINES MUST BE DISTRIBUTED AS SHOWN IN THE TX LINE DIST. DIAGRAM RE: DETAIL 2/S5.
*** CONTRACTOR SHALL PROVIDE TEMPORARY BRACING FOR ALL REMOVE AND REPLACE PROCEDURES.
**** MODIFICATIONS SHALL BE COMPLETED PRIOR TO ADDING THE PROPOSED APPURTENANCES.

NOTES:
1. BLIND BOLTS ARE TO BE 20mm DIAMETER WITH CORRESPONDING 29mm DIAMETER SLEEVE WITH SPECIFIED STEEL GRADE.
2. 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 ZRC-BRAND ZINC-RICH COLD GALVANIZING COMPOUND. FILM THICKNESS. 1-800-831-3275 FOR PRODUCT INFORMATION.
3. ALL SHIMS SHALL BE ASTM A36.
4. HOLES FOR BOLTS AND SHEAR SLEEVES ARE 30mm UNLESS NOTED OTHERWISE.
5. SHOP WELDS ARE ASSUMED E80XX OR GREATER, PER STANDARD SPLICE DETAIL.
6. IF SCOPE OF MODIFICATION REQUIRES REMOVAL OF TOWER ID TAG, IT MUST BE REPLACED.
7. THE CLIMBING FACILITIES, SAFETY CLIMB AND ALL PARTS THEREOF SHALL NOT BE IMPEDED, MODIFIED OR ALTERED WITHOUT THE EXPRESS APPROVAL OF THE ENGINEER OF RECORD OR TOWER OWNER.
8. 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.
9. CONTRACTOR SHALL BE RESPONSIBLE FOR PROPER FITTING OF REINFORCEMENT ON MONOPOLES. SHIMS FOR MONOPOLE REINFORCEMENT MEMBER SHALL BE REQUIRED WHERE GAPS BETWEEN THE POLE SHAFT AND REINFORCING MEMBER EXIST AT FASTENER LOCATIONS. FOR INTERMEDIATE CONNECTIONS, THE MINIMUM SHIM LENGTH AND WIDTH SHALL BE THE WIDTH 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.



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

EXISTING MEMBER SCHEDULE

SECTION	DIAMETER
1	60"φx5/8" PIPE
2	60"φx1/2" PIPE
3	60"φx3/8" PIPE
4	54"φx3/8" PIPE
5	48"φx3/8" PIPE
6	42"φx3/8" PIPE
7	36"φx3/8" PIPE
8	24"φx3/8" PIPE
9	18"φx3/8" PIPE

EXISTING TOWER HAS BEEN PREVIOUSLY MODIFIED. REFERENCE DRAWINGS BY NATCOMM DATED 03/03/08

EXISTING TOWER HAS BEEN PREVIOUSLY MODIFIED. REFERENCE DRAWINGS BY B+T GROUP DATED 10/17/14

B+T GRP
1717 S. BOULDER AVE.
SUITE 300
TULSA, OK 74119
PH: (918) 587-4630
www.btgrp.com

CROWN CASTLE

ISSUED FOR:

REV	DATE	DESCRIPTION
0	06/16/15	ISSUED FOR CONSTRUCTION

PROJECT NO:	87561.012.02
PROJECT ENG:	JING ZHANG
DRAWN BY:	GLS / CWR
CHECKED BY:	BMT

B+T ENGINEERING, INC.

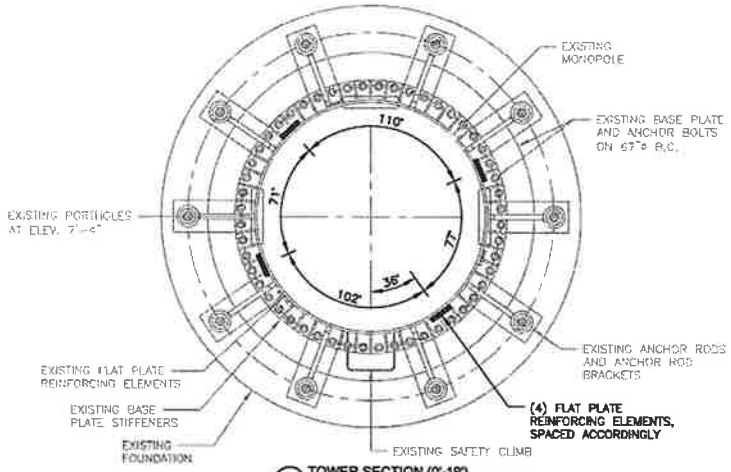
STATE OF CONNECTICUT · CHAD TUTTLE · No. 23924 · LICENSED PROFESSIONAL ENGINEER

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.

NEWINGTON_1
826217
240 KENSINGTON ROAD
BERLIN, CT
EXISTING 191.7' MONOPOLE

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

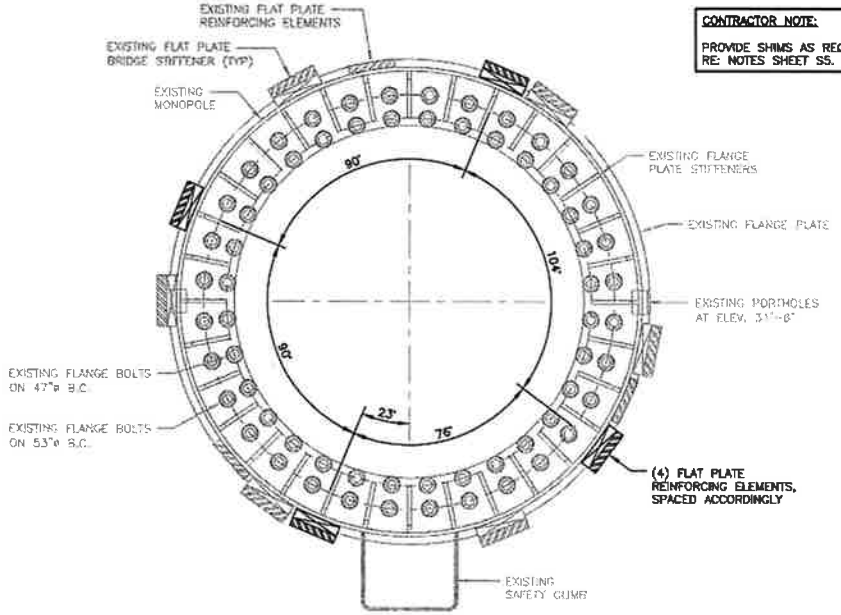
SHEET NUMBER: S5
REVISION: 0



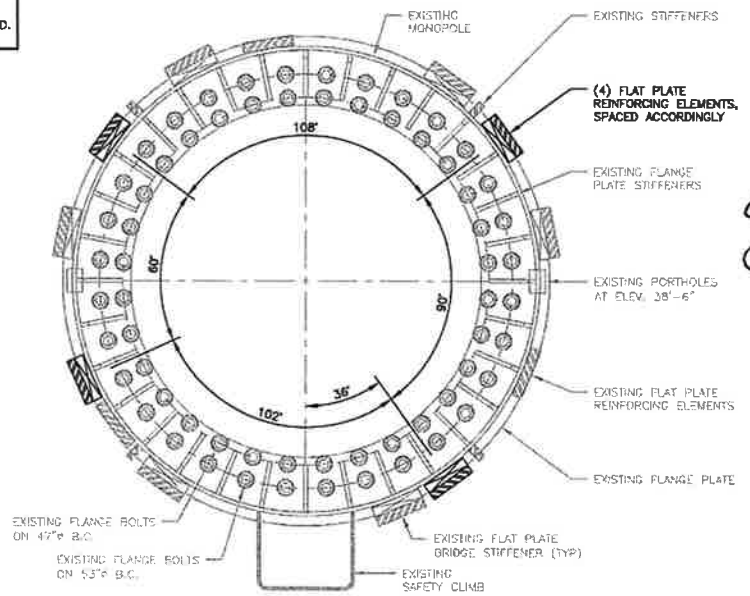
1 TOWER SECTION (0'-19')
SCALE: N.T.S.

CONTRACTOR NOTE:

PROVIDE SHIMS AS REQUIRED.
RE: NOTES SHEET S5.



2 TOWER SECTION (17.083'-30.083')
SCALE: N.T.S.



3 TOWER SECTION (37.333'-50.333')
SCALE: N.T.S.

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CROWN CASTLE

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REV	DATE	DESCRIPTION
0	08/16/15	ISSUED FOR CONSTRUCTION

PROJECT NO:	87581.012.02
PROJECT ENG:	JING ZHANG
DRAWN BY:	GLS / CWR
CHECKED BY:	BMT

B+T ENGINEERING, INC.

STATE OF CONNECTICUT
CHAD TUTTLE
No. 23924
LICENSED
PROFESSIONAL ENGINEER

NEWINGTON_1
826217

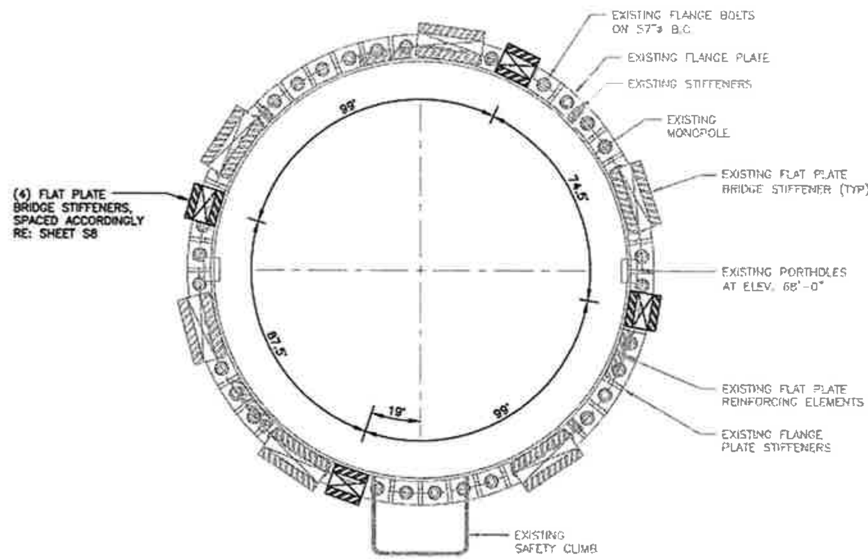
240 KENSINGTON ROAD
BERLIN, CT

EXISTING 191.7' MONOPOLE

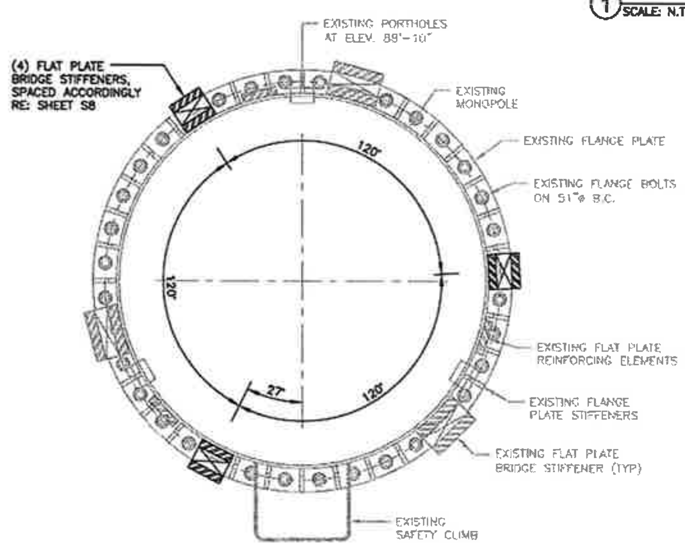
SHEET TITLE
TOWER SECTIONS
(0'-19', 17.083'-30.083' AND 37.333'-50.333')

SHEET NUMBER: S6

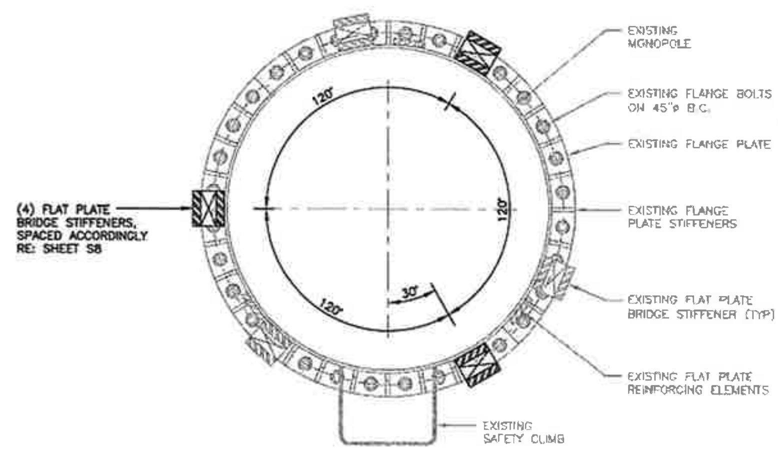
REVISION: 0



1 TOWER SECTION (61.208'-71.208')
SCALE: N.T.S.



2 TOWER SECTION (81.458'-97.458')
SCALE: N.T.S.



3 TOWER SECTION (101.542'-111.542')
SCALE: N.T.S.

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CROWN CASTLE

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PROJECT NO:	87561.012.02
PROJECT ENG:	JING ZHANG
DRAWN BY:	GLS / CWR
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NEWINGTON_1
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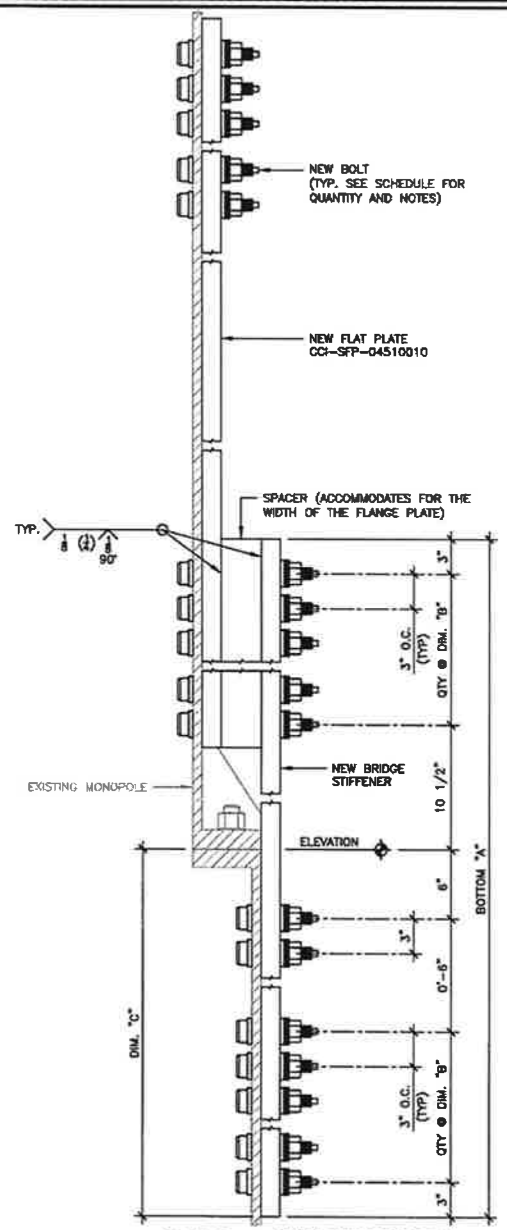
BERLIN, CT
EXISTING 191.7' MONOPOLE

SHEET TITLE
TOWER SECTIONS
(61.208'-71.208', 81.458'-97.458' & 101.542'-111.542')

SHEET NUMBER: S7
REVISION: 0



1 FLAT PLATE BRIDGE STIFFENER DETAIL
SCALE: N.T.S.

FLAT PLATE BRIDGE STIFFENER-SCHEDULE (65ksi)

ELEVATION	NO. OF BRIDGE STIFFENERS	FLAT PLATE SIZE	BOTTOM "A"	QTY @ DIM. "B"	DIM. "C"	BOLT QTY PER STIFFENER	TOTAL AJAX BOLT QTY
60'-7"	4	CCI-CFP-045100049	4'-10 1/2"	6 HOLES @ 1'-3"	2'-6"	8	32
80'-10"	3	CCI-CFP-045100049	4'-10 1/2"	6 HOLES @ 1'-3"	2'-6"	8	24
100'-11"	3	CCI-CFP-045100049	4'-10 1/2"	6 HOLES @ 1'-3"	2'-6"	8	24

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CROWN CASTLE

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REV	DATE	DESCRIPTION
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PROJECT NO: 87581.012.02
PROJECT ENG: JING ZHANG
DRAWN BY: GLS / CWR
CHECKED BY: BMT

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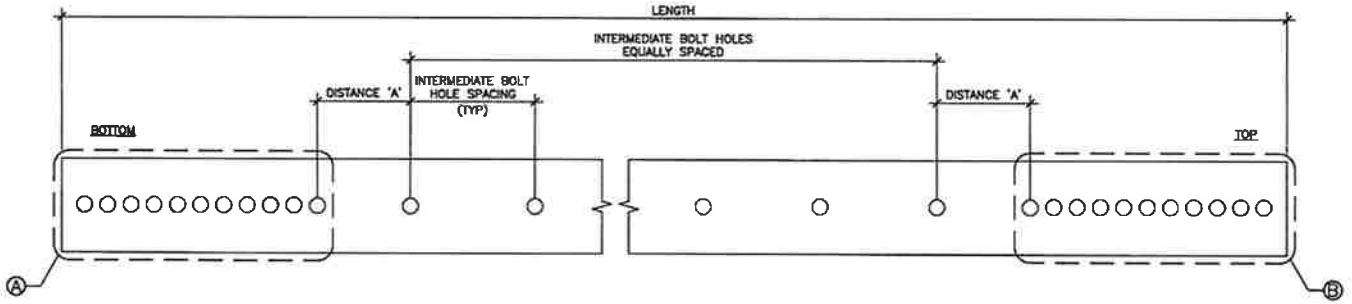
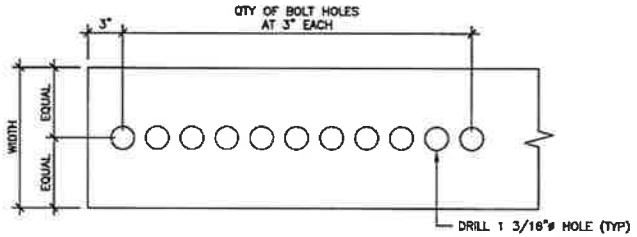
NEWINGTON_1
826217
240 KENSINGTON ROAD
BERLIN, CT
EXISTING 191.7' MONOPOLE

SHEET TITLE
FLAT PLATE
BRIDGE STIFFENER DETAIL,
SCHEDULE AND NOTES

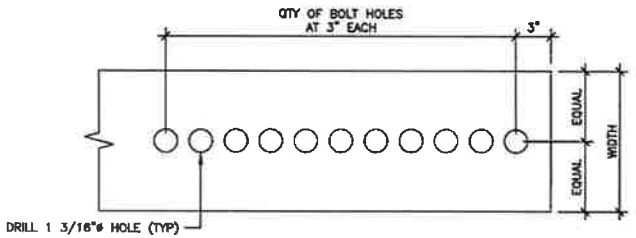
SHEET NUMBER: S8
REVISION: 0



1 UNIQUE PART
SCALE: N.T.S.



2 DETAIL A (BOTTOM)
SCALE: N.T.S.



3 DETAIL B (TOP)
SCALE: N.T.S.

PART NUMBER	BLACK WEIGHT (LBS)	WIDTH	THICKNESS	LENGTH	DISTANCE 'A'	TOTAL QTY OF 1 3/16"ø BOLT HOLES	QTY OF BOLT HOLES (BOTTOM END)	QTY OF BOLT HOLES (TOP END)	INTERMEDIATE BOLT HOLE SPACING
CCI-CFP-060100183	373	6"	1"	18'-3"	13 1/2"	26	8	8	1'-4"
CCI-CFP-045100016	246	4 1/2"	1"	16'-0"	0'-8"	20	6	6	1'-8"

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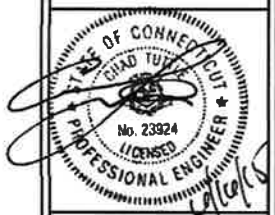


NEWINGTON_1
826217

240 KENSINGTON ROAD
BERLIN, CT

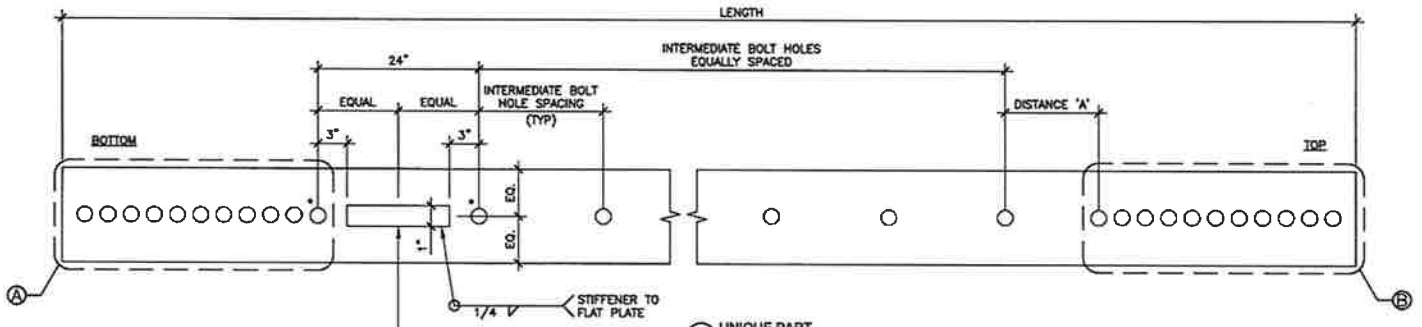
EXISTING 191.7' MONOPOLE

SHEET TITLE

PART DETAILS

SHEET NUMBER: D1

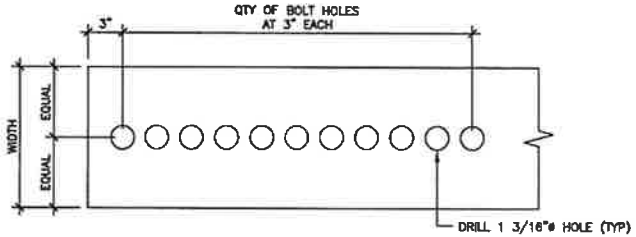
REVISION: 0



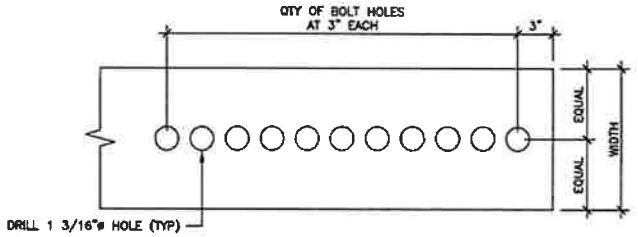
1 UNIQUE PART
SCALE: N.T.S.

* CONTRACTOR NOTE:
THESE HOLES ARE INTENDED TO STRADDLE THE 20.083" AND 40.333" FLANGE ELEVATION

NEW 1"x2"x18" STIFFENER



2 DETAIL A (BOTTOM)
SCALE: N.T.S.



3 DETAIL B (TOP)
SCALE: N.T.S.

PART NUMBER	BLACK WEIGHT (LBS)	WIDTH	THICKNESS	LENGTH	DISTANCE 'A'	TOTAL QTY OF 1 3/16"ø BOLT HOLES	QTY OF BOLT HOLES (BOTTOM END)	QTY OF BOLT HOLES (TOP END)	INTERMEDIATE BOLT HOLE SPACING
CCI-CFP-060100013	257	6"	1"	13'-0"	4"	22	8	8	1'-4"

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CROWN CASTLE

ISSUED FOR:

REV	DATE	DESCRIPTION
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B+T ENGINEERING, INC.

STATE OF CONNECTICUT
CHAD TUTTLE
No. 23924
LICENSED
PROFESSIONAL ENGINEER

6/16/15

NEWINGTON_1
826217

240 KENSINGTON ROAD
BERLIN, CT

EXISTING 191.7' MONOPOLE

SHEET TITLE
PART DETAILS

SHEET NUMBER: D2

REVISION: 0