STATE OF CONNECTICUT
CONNECTICUT SITING COUNCIL

IN RE:	:	
	:	
A PETITION OF CELLCO PARTNERSHIP	:	SUB-PETITION NO. 1133
D/B/A VERIZON WIRELESS FOR A	:	250 MERIDEN-WATERBURY
DECLARATORY RULING ON THE NEED TO	:	TURNPIKE
OBTAIN A SITING COUNCIL CERTIFICATE	:	SOUTHINGTON, CT
FOR THE SHARED USE OF AN EXISTING	:	
TELECOMMUNICATIONS FACILITY AT 250	:	
MERIDEN-WATERBURY TURNPIKE,	:	
SOUTHINGTON, CONNECTICUT	:	DECEMBER 21, 2015

SUB-PETITION FOR DECLARATORY RULING:
ELIGIBLE FACILITIES REQUEST FOR MODIFICATIONS
THAT WILL NOT SUBSTANTIALLY CHANGE THE
PHYSICAL DIMENSIONS OF AN EXISTING BASE STATION

I. Introduction

Pursuant to Section 6409(a) of the Middle Class Tax Relief and Job Creation Act of 2012, codified at 47 U.S.C. § 1455(a) ("Section 6409(a)") and the October 21, 2014 Report and Order (FCC-14-533) issued by the Federal Communications Commission ("FCC") (the "FCC Order"), Cellco Partnership d/b/a Verizon Wireless ("Cellco") hereby petitions the Connecticut Siting Council (the "Council") for a declaratory ruling ("Sub-Petition") that the installation of antennas and related telecommunications equipment at the existing wireless telecommunications base station at 250 Meriden-Waterbury Turnpike in Southington, Connecticut (the "Property") constitutes an Eligible Facilities Request ("EFR") under the FCC Order. Cellco has designated this site as its "Southington I-691 Facility".

II. Factual Background

The Property is a 1.27-acre mixed use (commercial/residential) parcel in Southington's B Commercial zone. The Property is surrounded by commercial and residential uses along

Meriden-Waterbury Turnpike and Pratt Street and is owned by John Rogus. *See* Attachment 1 – Site Vicinity Map and Site Schematic (Aerial Photograph). According to Council records, in 1999, AT&T Wireless received Council approval to replace two (2) existing communications towers at the Property with a single 80-foot lattice tower and installed its antennas at the top of the tower (TS-SCLP-131-990317). Equipment associated with AT&T's antennas is located in a shelter installed near the base of the tower.[1]

Cellco is licensed to provide wireless telecommunications services in the 850 MHz, 1900 MHz, 700 MHz and 2100 MHz frequency ranges in Southington and throughout the State of Connecticut. The proposed Southington I-691 Facility described in this filing will provide wireless service in Cellco's 700 MHz and 2100 MHz frequency ranges and is designed to provide coverage and capacity relief to Cellco's existing wireless network in Southington and Meriden.

III. Proposed Southington I-691 Facility

Cellco's proposed Southington I-691 Facility would consist of six (6) antennas mounted at the 60-foot level on the existing 80-foot tower. Cellco will also install nine (9) remote radio heads ("RRHs"), behind its antennas. Equipment associated with Cellco's antennas and an emergency back-up generator will be located on a 9-foot by 11-foot concrete pad within a 11-foot by 14-foot leased area. The equipment pad will be surrounded by an 8-foot tall security fence and gate. Power and telephone service will extend from existing service inside the building. Project Plans for the Southington I-691 Facility are included in Attachment 2. Specifications for Cellco's antennas and RRHs are included in Attachment 3. A Structural Modification Report

[1] Pursuant to the FCC Order the definition of "base station" includes any "structure that currently supports or houses an antenna, transceiver, or other associated equipment . . .". FCC Order para. 172.

confirming that the tower, with certain modifications, can support Cellco's antennas and related equipment is included in Attachment 4.

IV. Discussion

A. The Proposed Modification Will Not Cause a Substantial Change to the Physical Dimensions of the Existing Base Station

Section 6409(a) provides, in relevant part, that "a State or local government may not deny, and shall approve, any eligible facilities request for a modification of an existing wireless tower or base station that does not substantially change the physical dimensions of such tower or base station." Pursuant to the FCC Order, the proposed modification does not substantially change the physical dimensions of the base station if the following criteria are satisfied.

1. *The proposed modified facility will not increase the height of the tower by more than ten (10) percent of the height.* Cellco does not intend to increase the height of the existing tower in any way. Cellco's antennas will be located at the 60-foot level on the existing 80-foot tower.

2. *The proposed facility modification will not protrude from the edge of the structure more than six (6) feet.* Cellco's antennas will not protrude more than six (6) feet from the edge of the tower.

3. *The proposed facility does not involve installation of more than the standard number of new equipment cabinets for the technology involved, but not to exceed four cabinets.* Cellco intends to install two (2) equipment cabinets on a concrete pad near the base of the tower.

4. *The proposed facility does not entail any excavation or deployment outside the current site of the base station.* Cellco's facility modification will remain within the limits of the Property.

5. *The proposed facility does not defeat the existing concealment elements of the base station.* No concealment elements have been incorporated into the existing antenna support structure.

6. *The proposed facility complies with conditions associated with the prior approval of construction or modification of the base station.* In 1999, AT&T received Council approval to replace two existing towers at the Property (an 80-foot guyed lattice and a 50-foot guyed lattice) with a single 80-foot self-supporting lattice tower (TS-SCLP-131-990317). Since that time, the Council has acknowledged receipt of several notices filed by AT&T to modify its existing facility. None of the elements of Cellco's proposed facility conflict with any of the existing facility improvements or any of the Council's previous approvals associated with this tower site.

B. FCC Compliance

Radio frequency ("RF") emissions from Cellco's proposed installation will be far below the standards adopted by the FCC. Included in Attachment 5 is a cumulative worst case power density table for existing and Cellco's 700 and 2100 MHz antennas confirming that the facility will operate well within the FCC safety standards.

C. Notice to the Town, Property Owner and Abutting Landowners

On December 21, 2015, a copy of this Sub-Petition was sent to Southington's Town Manager Garry Brumback, Deputy Town Manager Mark Sciota and John Rogus, the owner of the Property. Copies of the letters sent to Mr. Brumback, Mr. Sciota and Mr. Rogus are included in Attachment 6. A copy of this Sub-Petition was also sent to the owners of land that abuts the Property. A sample abutter's cover letter and the list of those abutting landowners who were sent notice and a copy of this filing is included in Attachment 7.

V. Conclusion

Based on the information provided above, Cellco respectfully submits that the proposed modification of the existing base station at the Property constitutes an "eligible facilities request" under Section 6409(a) and the FCC Order.

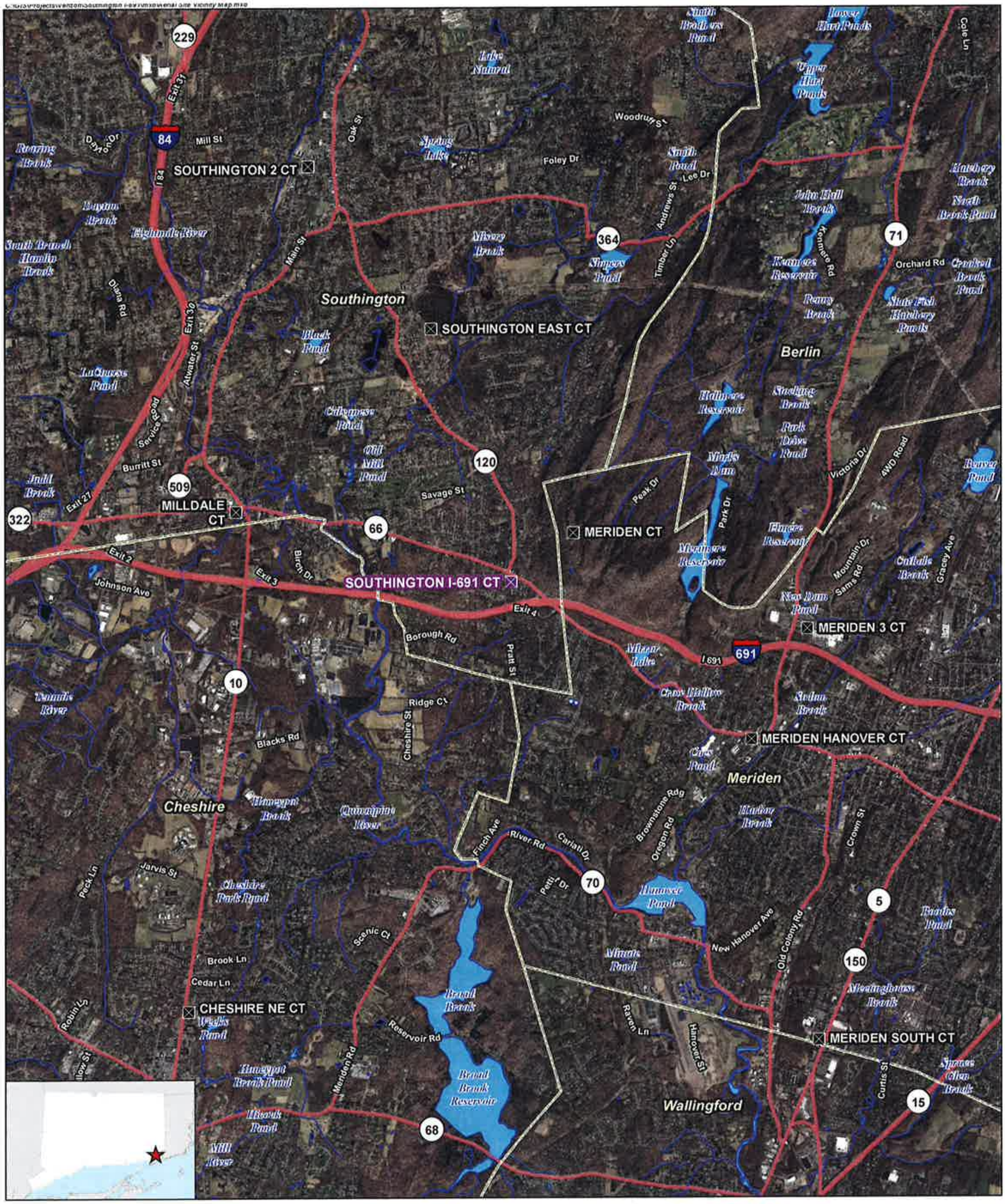
Respectfully submitted,

CELLCO PARTNERSHIP d/b/a VERIZON WIRELESS

By _____

Kenneth C. Baldwin, Esq.
Robinson & Cole LLP
280 Trumbull Street
Hartford, CT 06103-3597
(860) 275-8200
Its Attorneys

ATTACHMENT 1



Legend

- Proposed Verizon Wireless Facility
- Surrounding Verizon Wireless Facilities
- Municipal Boundary
- Watercourse
- Waterbody

Base Map Source: ESRI World Imagery, NAIP 7/12/2014
Map Scale: 1 inch = 5,000 feet
Map Date: November 2015

5,000 2,500 0 5,000 Feet

Site Vicinity Map

Proposed Small Cell Facility
Southington I-691 CT
250 Meriden-Waterbury Turnpike
Southington, Connecticut

verizon

ALL-POINTS TECHNOLOGY CORPORATION

Legend

- Subject Property
- Proposed Equipment

Site Schematic

Proposed Small Cell Facility
Southington I-691 CT
250 Meriden-Waterbury Turnpike
Southington, Connecticut

verizon

N
W E
S

150 75 0 150
Feet

Map Notes:
Base Map Source: 2012 Aerial Photograph (CTECO)
Map Scale: 1 inch = 150 feet
Map Date: November 2015

ALL-POINTS TECHNOLOGY CORPORATION

ATTACHMENT 2

Cellco Partnership

d.b.a. verizon wireless

WIRELESS COMMUNICATIONS FACILITY

SOUTHINGTON I-691 CT

250 MERIDEN-WATERBURY TPKE

SOUTHINGTON, CT 06489

SITE DIRECTIONS

FROM: 99 EAST RIVER DRIVE, EAST HARTFORD, CONNECTICUT **TO:** 250 MERIDEN-WATERBURY TPKE, SOUTHINGTON, CONNECTICUT

1. HEAD SOUTHWEST ON E RIVER DR TOWARD PITKIN ST	0.9 MI
2. CONTINUE ONTO E RIVER DR EXTENSION	0.3 MI
3. TURN RIGHT ONTO THE US-5 S/CT-15 S RAMP TO NEW HAVEN/I-91 S	0.2 MI
4. MERGE ONTO US-5 S	0.8 MI
5. TAKE EXIT 86 TO MERGE ONTO I-91 S TOWARD NEW HAVEN/NYC	16.6 MI
6. TAKE EXIT 18 FOR I-691 W TOWARD MERIDEN/WATERBURY	0.2 MI
7. CONTINUE ONTO I-691 W	4.4 MI
8. TAKE EXIT 4 FOR CT-322 TOWARD SOUTHINGTON	0.2 MI
9. TURN RIGHT ONTO CT-322 W, AND DESTINATION WILL BE ON ON THE LEFT	0.3 MI

GENERAL NOTES

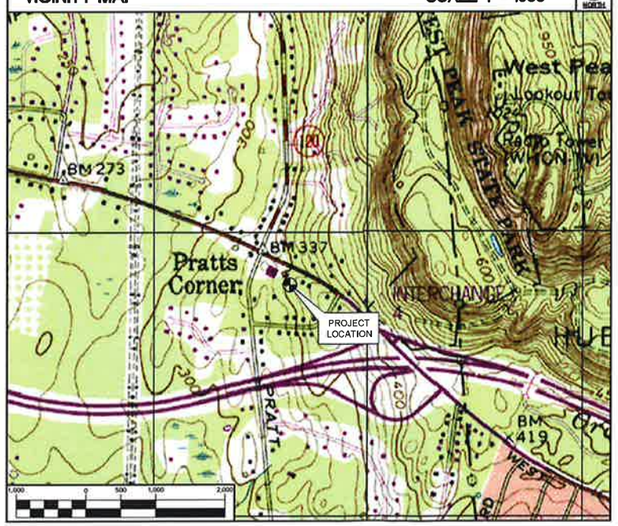
1. PROPOSED ANTENNA LOCATIONS AND HEIGHTS PROVIDED BY CELLCO PARTNERSHIP.

PROJECT SCOPE

1. THE PROPOSED SCOPE OF WORK GENERALLY INCLUDES THE INSTALLATION OF SIX (6) DIRECTIONAL PANEL ANTENNAS AND ASSOCIATED APPURTENANCES TO BE MOUNTED ON AN EXISTING 80' TALL MONOPOLE TOWER WITH AN ANTENNA CENTERLINE ELEVATION OF ±60' AGL.
2. PROPOSED EQUIPMENT CABINETS (TYP. OF 2) AND EMERGENCY BACKUP POWER GENERATOR WILL BE INSTALLED ON A ±9'x11' CONC. EQUIPMENT PAD AT GRADE WITHIN A PROPOSED ±11'x14' FENCED ENCLOSURE.
3. POWER AND TELCO UTILITIES DEPICTED HEREIN ARE TENTATIVE. FINAL ROUTING TO BE DETERMINED DURING THE CONSTRUCTION DOCUMENT PHASE OF PROJECT.
4. THE PROPOSED WIRELESS FACILITY INSTALLATION WILL BE DESIGNED IN ACCORDANCE WITH THE 2003 INTERNATIONAL BUILDING CODE AS MODIFIED BY THE 2009 CONNECTICUT SUPPLEMENT.

VICINITY MAP

SCALE: 1" = 1000'



PROJECT SUMMARY

SITE NAME:	SOUTHINGTON I-691 CT
SITE ADDRESS:	250 MERIDEN-WATERBURY TPKE SOUTHINGTON, CT 06489
CELLCO PARTNERSHIP/TENANT:	CELLCO PARTNERSHIP d.b.a. VERIZON WIRELESS 99 EAST RIVER DRIVE EAST HARTFORD, CT 06108
VERIZON SITE ACQUISITION CONTACT:	ALEKSEY TYURIN CELLCO PARTNERSHIP (860) 803-8213
LEGAL/REGULATORY CONTACT:	KENNETH C. BALDWIN, ESQ. ROBINSON & COLE (860) 257-8345
TOWER COORDINATES:	LATITUDE: 41°-33'-24.59" N LONGITUDE: 72°-51'-10.66" W GROUND ELEVATION: ±336' A.M.S.L. SITE COORDINATES AND GROUND ELEVATION REFERENCED FROM THE CONNECTICUT SITING COUNCIL DATABASE.

SHEET INDEX

PROFESSIONAL ENGINEER SEAL

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
2	12/17/15	HMR	DMD	CSC - REVISED FOR UTILITY EASEMENT AND GENERATOR FUEL TYPE
1	12/14/15	HMR	DMD	ISSUED FOR CSC
0	12/10/15	HMR	DMD	ISSUED FOR CSC-CLIENT REVIEW

Cellco Partnership d.b.a. verizon wireless

CENTEK engineering
Centered on Solutions
(203) 488-0580
(203) 488-8587 Fax
63-2 North Branford Road
Branford, CT 06405
www.CentekEng.com

Cellco Partnership d/b/a Verizon Wireless

WIRELESS COMMUNICATIONS FACILITY

SOUTHINGTON I-691 CT

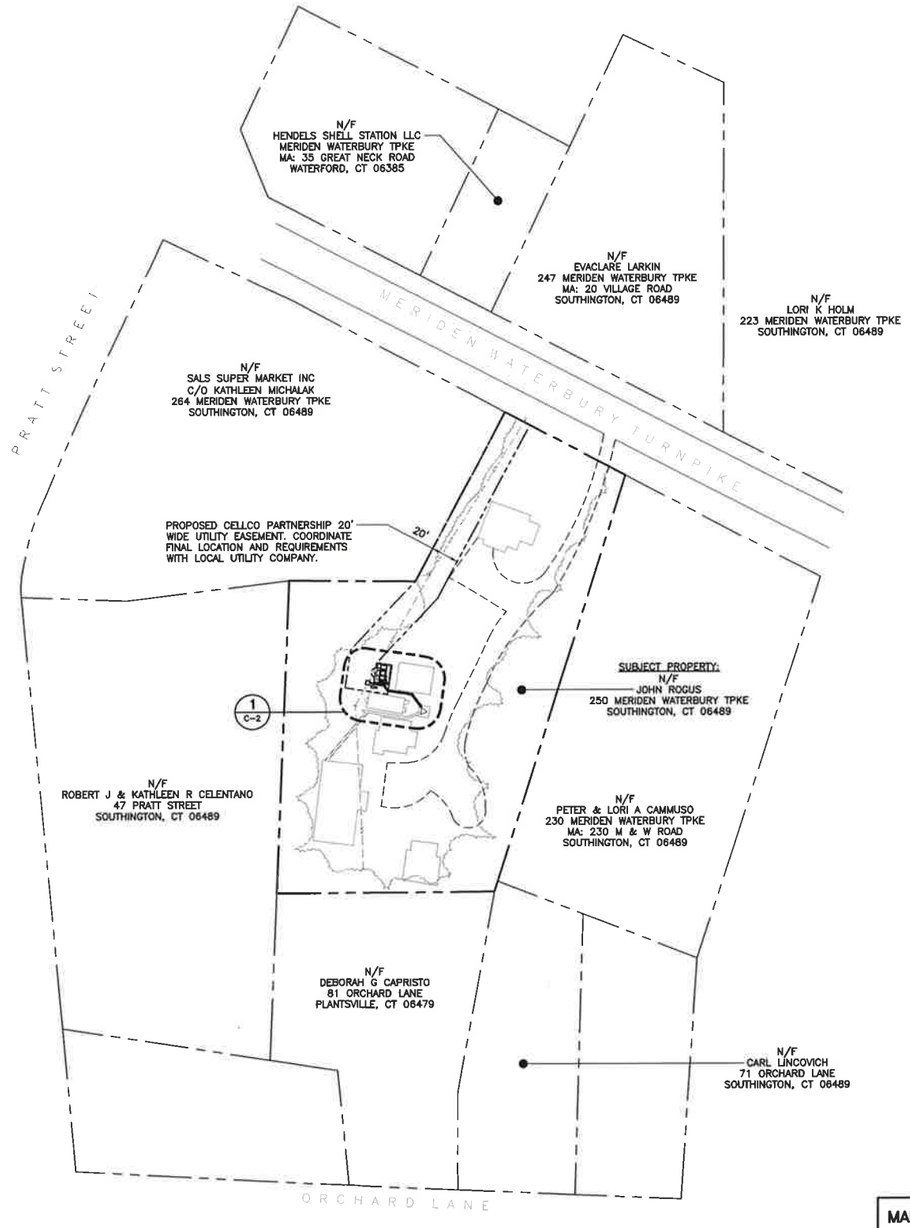
250 MERIDEN-WATERBURY TPKE
SOUTHINGTON, CT 06489

DATE: 11/23/15
SCALE: AS NOTED
JOB NO. 15113.000

TITLE SHEET

T-1

Sheet No. 1 of 3



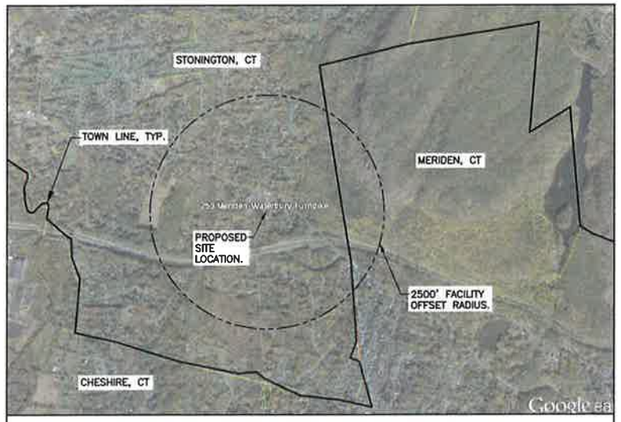
1 / C-1 **ABUTTERS MAP**
SCALE: 1" = 50'

APPROXIMATE NORTH

GRAPHIC SCALE
50 0 25 50 100 200
(IN FEET)
1 inch = 50 ft

MAP REFERENCE NOTE:

PROPERTY LINES AND PROPERTY OWNER INFORMATION SHOWN HEREIN ARE REFERENCED FROM THE TOWN OF CLINTON GIS DATA BASE. SITE FEATURES SHOWN HEREIN ARE REFERENCED FROM AVAILABLE MAPPING ON GOOGLE EARTH PRO.



MUNICIPALITY NOTIFICATION LIMIT MAP

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
2	12/17/15	HMR	DMD	CSC - REVISED FOR UTILITY EASEMENT AND GENERATOR FUEL TYPE
1	12/14/15	HMR	DMD	ISSUED FOR CSC
0	12/10/15	HMR	DMD	ISSUED FOR CSC-CLIENT REVIEW

PROFESSIONAL ENGINEER SEAL

Cellco Partnership d.b.a. verizonwireless

CENTEK engineering
Centered on Solutions
(203) 488-0580
(203) 488-8587 Fax
63-2 North Branford Road
Branford, CT 06405
www.CentekEng.com

Cellco Partnership d/b/a Verizon Wireless
WIRELESS COMMUNICATIONS FACILITY

SOUTHINGTON I-691 CT

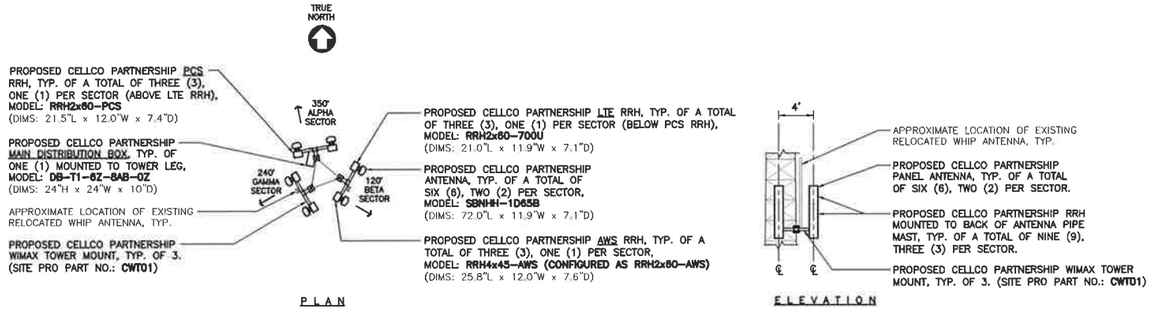
250 MERIDEN-WATERBURY TPKE
SOUTHINGTON, CT 06489

DATE: 11/23/15
SCALE: AS NOTED
JOB NO. 15113.000

ABUTTERS MAP

C-1

Sheet No. 2 of 3

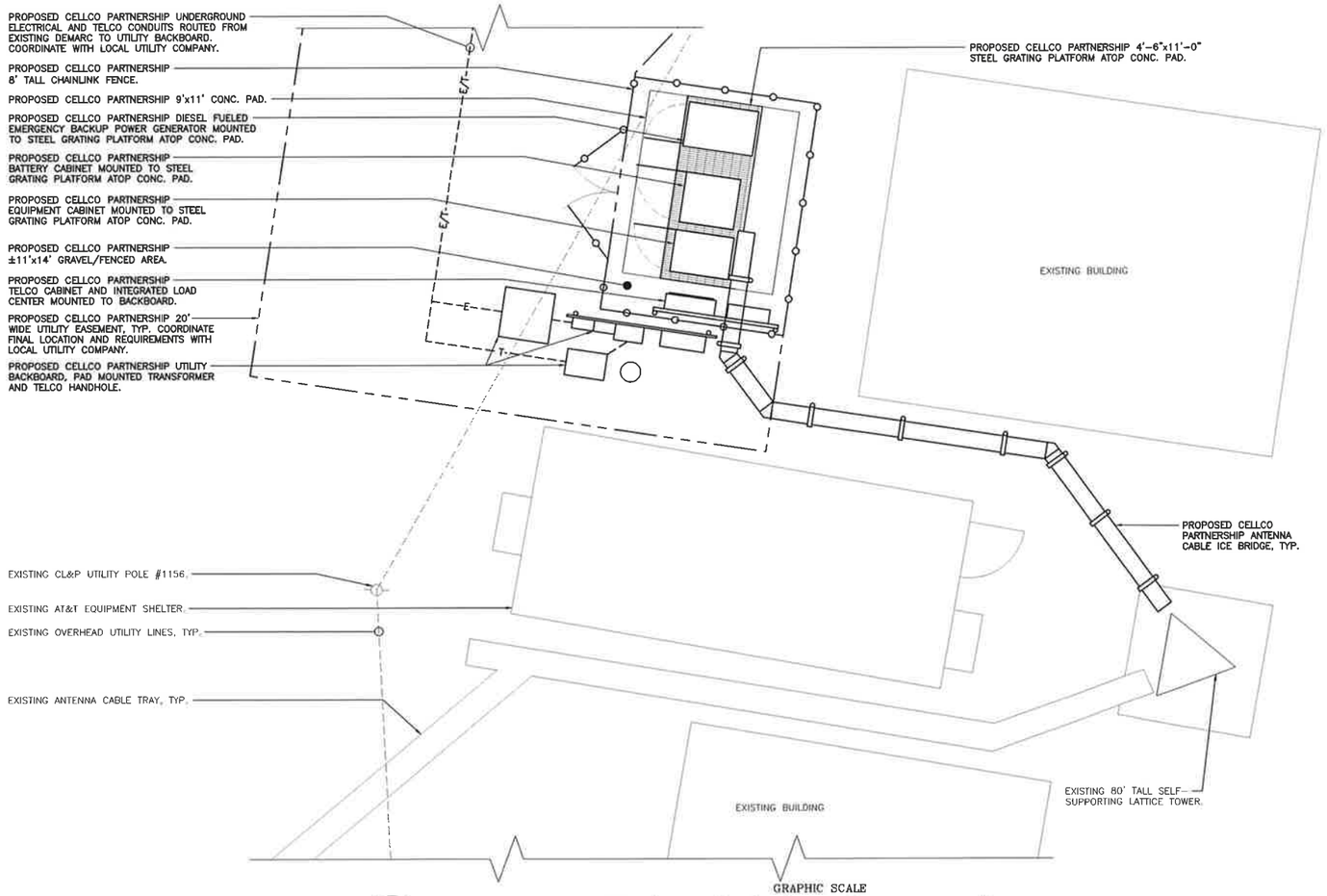


4 / C-2 ANTENNA MOUNTING CONFIGURATION

SCALE: 1/8" = 1'

GRAPHIC SCALE

(IN FEET)
1 inch = 8 ft.



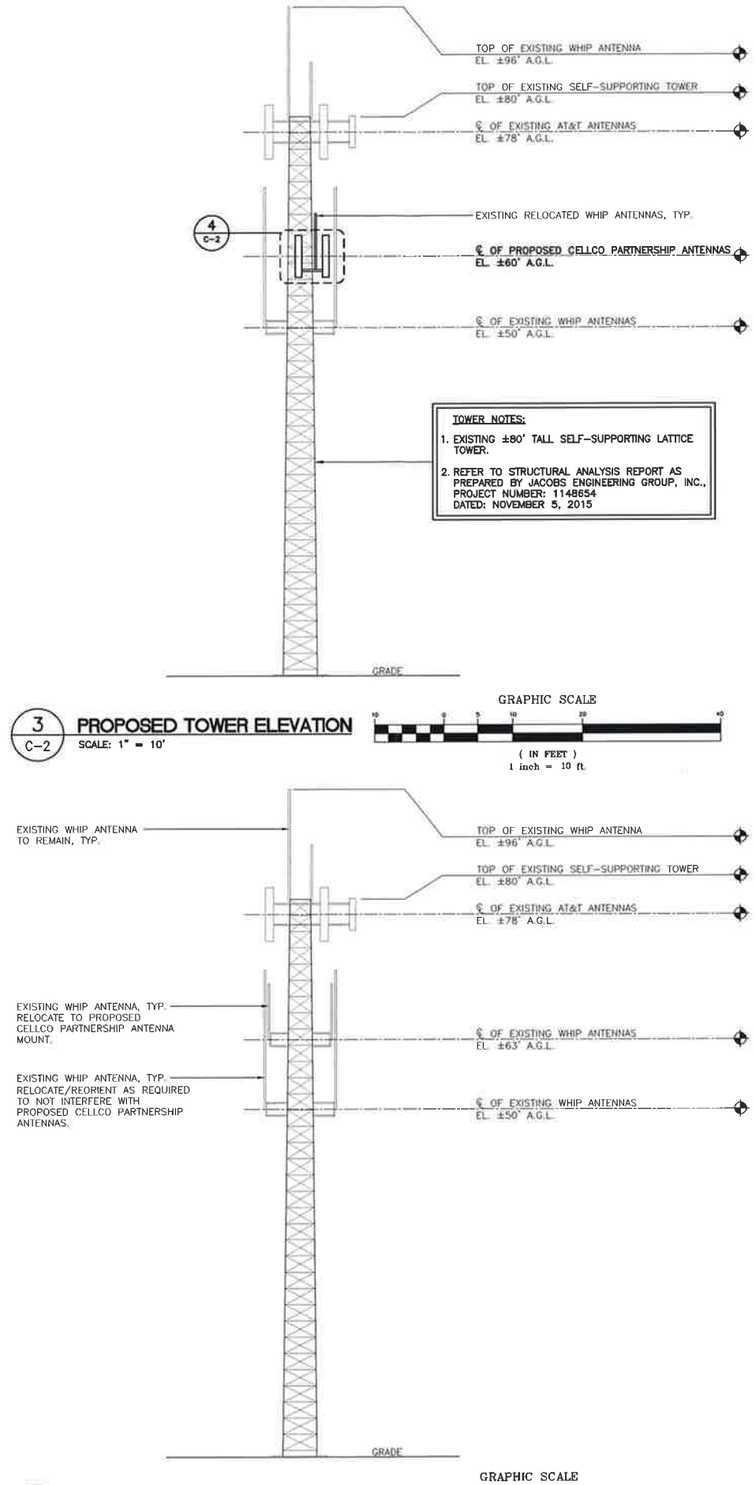
1 / C-2 COMPOUND PLAN

SCALE: 1" = 4'

APPROXIMATE NORTH

GRAPHIC SCALE

(IN FEET)
1 inch = 4 ft.



TOWER NOTES:

1. EXISTING ±80' TALL SELF-SUPPORTING LATTICE TOWER.
2. REFER TO STRUCTURAL ANALYSIS REPORT AS PREPARED BY JACOBS ENGINEERING GROUP, INC., PROJECT NUMBER: 1148654 DATED: NOVEMBER 5, 2015

3 / C-2 PROPOSED TOWER ELEVATION

SCALE: 1" = 10'

GRAPHIC SCALE

(IN FEET)
1 inch = 10 ft.

2 / C-2 EXISTING TOWER ELEVATION

SCALE: 1" = 10'

GRAPHIC SCALE

(IN FEET)
1 inch = 10 ft.

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
2	12/17/15	HMR	DMD	CSC - REVISED FOR UTILITY EASEMENT AND GENERATOR FUEL TYPE
1	12/14/15	HMR	DMD	ISSUED FOR CSC
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SOUTHINGTON, CT 06489

DATE:	11/23/15
SCALE:	AS NOTED
JOB NO.	15113.000

PARTIAL SITE PLAN ELEVATION & ANTENNA CONFIG.

C-2

Sheet No. 3 of 3

ATTACHMENT 3

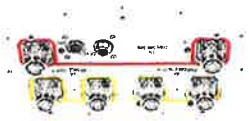
Product Specifications

COMMSCOPE®

POWERED BY ANDREW.

SBNHH-1D65B

Andrew® Tri-band Antenna, 698–896 and 2x 1695–2360 MHz, 65° horizontal beamwidth, internal RET. Both high bands share the same electrical tilt.



- Interleaved dipole technology providing for attractive, low wind load mechanical package

Electrical Specifications

Frequency Band, MHz	698–806	806–896	1695–1880	1850–1990	1920–2200	2300–2360
Gain, dBi	14.9	14.7	17.7	18.2	18.6	18.6
Beamwidth, Horizontal, degrees	68	66	69	66	63	58
Beamwidth, Vertical, degrees	12.1	10.7	5.6	5.2	5.0	4.5
Beam Tilt, degrees	0–14	0–14	0–7	0–7	0–7	0–7
USLS, dB	14	13	15	15	15	13
Front-to-Back Ratio at 180°, dB	27	29	28	28	28	27
CPR at Boresight, dB	20	23	20	20	17	21
CPR at Sector, dB	14	10	12	10	9	1
Isolation, dB	25	25	25	25	25	25
Isolation, Intersystem, dB	30	30	30	30	30	30
VSWR | Return Loss, dB	1.5 | 14.0	1.5 | 14.0	1.5 | 14.0	1.5 | 14.0	1.5 | 14.0	1.5 | 14.0
PIM, 3rd Order, 2 x 20 W, dBc	-153	-153	-153	-153	-153	-153
Input Power per Port, maximum, watts	350	350	350	350	350	300
Polarization	±45°	±45°	±45°	±45°	±45°	±45°
Impedance	50 ohm	50 ohm	50 ohm	50 ohm	50 ohm	50 ohm

Electrical Specifications, BASTA*

Frequency Band, MHz	698–806	806–896	1695–1880	1850–1990	1920–2200	2300–2360
Gain by all Beam Tilts, average, dBi	14.5	14.3	17.4	17.9	18.2	18.3
Gain by all Beam Tilts Tolerance, dB	±0.5	±0.8	±0.4	±0.3	±0.5	±0.3
Gain by Beam Tilt, average, dBi	0 ° | 14.6	0 ° | 14.5	0 ° | 17.4	0 ° | 17.8	0 ° | 18.1	0 ° | 18.2
	7 ° | 14.6	7 ° | 14.4	3 ° | 17.5	3 ° | 17.9	3 ° | 18.3	3 ° | 18.4
	14 ° | 14.2	14 ° | 13.6	7 ° | 17.4	7 ° | 17.9	7 ° | 18.2	7 ° | 18.4
Beamwidth, Horizontal Tolerance, degrees	±2.2	±3.4	±2	±4.6	±5.7	±4.3
Beamwidth, Vertical Tolerance, degrees	±0.8	±1	±0.3	±0.2	±0.3	±0.2
USLS, dB	16	14	16	16	16	15
Front-to-Back Total Power at 180° ± 30°, dB	25	26	27	26	26	26
CPR at Boresight, dB	22	23	21	20	20	22
CPR at Sector, dB	13	11	16	12	11	4

* 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® multiband with internal RET
Band	Multiband
Brand	DualPol® | Teletilt®
Operating Frequency Band	1695 – 2360 MHz | 698 – 896 MHz
Performance Note	Outdoor usage

Product Specifications

SBNHH-1D65B

Mechanical Specifications

Color	Light gray
Lightning Protection	dc Ground
Radiator Material	Aluminum | Low loss circuit board
Radome Material	Fiberglass, UV resistant
Reflector Material	Aluminum
RF Connector Interface	7-16 DIN Female
RF Connector Location	Bottom
RF Connector Quantity, total	6
Wind Loading, maximum	617.7 N @ 150 km/h 138.9 lbf @ 150 km/h
Wind Speed, maximum	241.4 km/h | 150.0 mph

Dimensions

Depth	181.0 mm | 7.1 in
Length	1851.0 mm | 72.9 in
Width	301.0 mm | 11.9 in
Net Weight	18.4 kg | 40.6 lb

Remote Electrical Tilt (RET) Information

Input Voltage	10–30 Vdc
Power Consumption, idle state, maximum	2.0 W
Power Consumption, normal conditions, maximum	13.0 W
Protocol	3GPP/AISG 2.0 (Multi-RET)
RET Interface	8-pin DIN Female | 8-pin DIN Male
RET Interface, quantity	1 female | 1 male
RET System	Teletilt®

Packed Dimensions

Depth	299.0 mm | 11.8 in
Length	1970.0 mm | 77.6 in
Width	409.0 mm | 16.1 in
Shipping Weight	31.0 kg | 68.3 lb

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

Product Specifications

SBNHH-1D65B

BSAMNT-1 — Wide Profile Antenna 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.

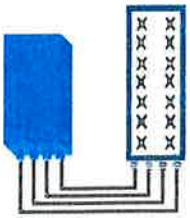
Its compactness and slim design makes the Alcatel-Lucent B13 RRH4x30-4R easy to install close to the antenna: operators can therefore locate this Remote Radio Head where RF design conditions are deemed ideal, minimizing trade-offs between available sites and RF optimum sites, together with reducing the 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	2 Branch RX – LA6.0.1
	1900A HW version	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)

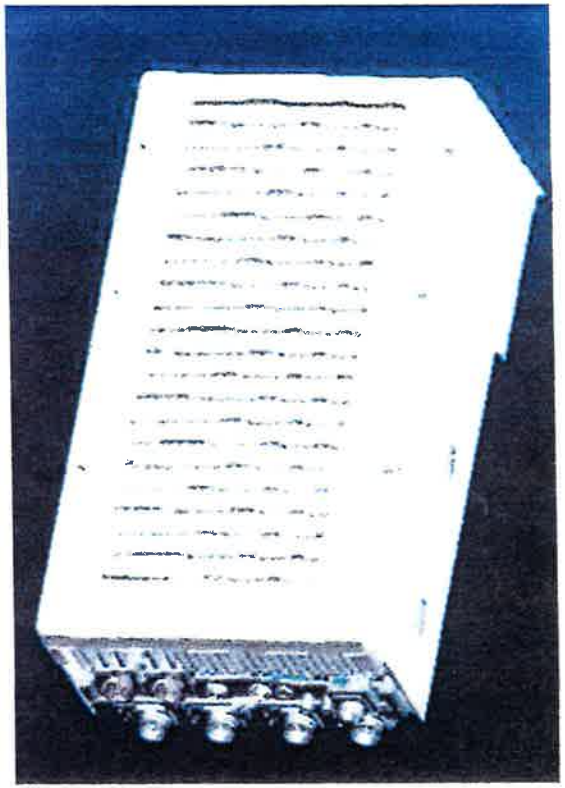
** Not a Verizon Wireless deployed product

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

B66A RRH 4X45 – PHYSICAL CHARACTERISTICS- TARGET 15.1

B4 RRH4x45-4R (AWS-Extension Band)	
Frequency Band	**LR15.1 – B4 / LR16.1 B66 (AWS 1 and 3 only)**
RF Output Power	**2x90W/4x45W (SW configurable)**
Operational range	**2110-2180 MHz, DL/ 1710-1780 MHz UL**
Instantaneous Bandwidth	**70MHz**
Configuration (HW readiness)	**LTE: 2T2R, 2T4R, 4T4R**
Carrier Bandwidths	**5, 10, 15 and 20 MHz**
Interfaces	**2x CPRI Rate 7 Ports Antenna Connectors 4.3-10**
AISG Support	**AISG 2.0 for RET Internal Smart Bias T**
Monitor Ports	**NA (Spec An to replace ports)**
Environmental	**GR487 Compliance / GR3178 Compliance (with exceptions)**
Mounting options	**Pole/Wall**
Connectors location	**All bottom**
External Alarms	**4**
Annual Return Rate (Target)	**<2%**
Operating Temperature	**-40 C to +55 C (without solar load)**

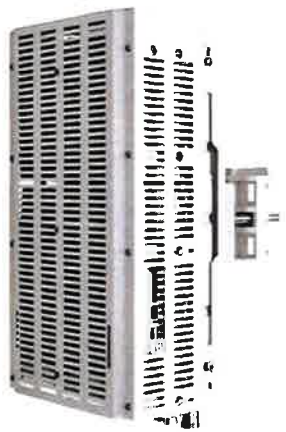
- Commercial Product Will include B66 support of AWS 1 and 3.
- Lower AWS 3 UL Not in 3GPP Band 66 Definition

Physical Dimensions – Not to Exceed		
	W/O Solar Shield	With Solar Shield
Dimensions HxWxD	H = 26in (H=660mm) W = 11.4in (W=290mm) D = 5.9in (D=150mm)	H = 26.6in (H=675mm) W = 12in (W=304mm) D = 6.8n (D=173mm)
Volume	29l	35.5l
Weight		64lbs / 29kg

B66A RRH 4X45 - PHYSICAL CHARACTERISTICS- TARGET 15.1

B4 RRH4x45-4R (AWS-Extension Band)	
Frequency Band	LR15.1 – B4 / LR16.1 B66 (AWS 1 and 3 only)
RF Output Power	2x90W/4x45W (SW configurable)
Operational range	2110-2180 MHz, DL/ 1710-1780 MHz UL
Instantaneous Bandwidth	70MHz
Configuration (HW readiness)	LTE: 2T2R, 2T4R, 4T4R
Carrier Bandwidths	5, 10, 15 and 20 MHz
Interfaces	2x CPRI Rate 7 Ports Antenna Connectors 4.3-10
AISG Support	AISG 2.0 for RET Internal Smart Bias T
Monitor Ports	NA (Spec An to replace ports)
Environmental	GR487 Compliance / GR3178 Compliance (with exceptions)
Mounting options	Pole/Wall
Connectors location	All bottom
External Alarms	4
Annual Return Rate (Target)	<2%
Operating Temperature	-40 C to +55 C (without solar load)

- Commercial Product Will include B66 support of AWS 1 and 3.
- Lower AWS 3 UL Not in 3GPP Band 66 Definition



Physical Dimensions – Not to Exceed		
	W/O Solar Shield	With Solar Shield
Dimensions HxWxD	H = 26in (H=660mm) W = 11.4in (W=290mm) D = 5.9in (D=150mm)	H = 26.6in (H=675mm) W = 12in (W=304mm) D = 6.8n (D=173mm)
Volume	29l	35.5l
Weight		64lbs / 29kg

ATTACHMENT 4

Date: **November 05, 2015**

Timothy Howell
Crown Castle
3530 Toringdon Way Suite 300
Charlotte, NC 28277

JACOBS
Jacobs Engineering Group, Inc.
5449 Bells Ferry Road
Acworth, GA 30102
770-701-2500

Subject: Structural Modification Report

Carrier Designation:	***Verizon Wireless* Co-Locate**	
	Carrier Site Name:	Southington I-691
Crown Castle Designation:	**Crown Castle BU Number:**	841298
	Crown Castle Site Name:	SOUTHINGTON ROGUS
	Crown Castle JDE Job Number:	329933
	Crown Castle Work Order Number:	1148654
	Crown Castle Application Number:	289375 Rev. 14
Engineering Firm Designation:	**Jacobs Engineering Group Project Number:**	1148654
Site Data:	**250 MERIDEN WATERBURY TURNPIKE, SOUTHINGTON, Hartford County, CT**	
	Latitude *41° 33' 24.54"*, Longitude *-72° 51' 10.84"*	
	80 Foot - Self Support Tower	

Dear Timothy Howell,

Jacobs Engineering 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 843075, in accordance with application 289375, revision 14.

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

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

The analysis has been performed in accordance with the TIA/EIA-222-F standard and 2005 CT State Building Code based upon a wind speed of 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 *Jacobs Engineering Group Inc.* appreciate the opportunity of providing our continuing professional services to you and Crown Castle. If you have any questions or need further assistance on this or any other projects please give us a call.

Respectfully submitted by:

Daniel Chang, EI
Structural Engineer

Reviewed By:

Matthew Watkins, P.E.
Engineering Project Manager

11/05/15

tnxTower Report - version 6.1.4.1

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 80 ft. Self-Support tower designed by Pirod and mapped by GPD Group in April of 2014. The original design standard and wind speed are unknown at the time of the analysis. The tower has been modified per reinforcement drawings prepared by Crown Castle in March of 2015. Reinforcement consists of secondary horizontal bracing. The modification drawings designed by Jacobs Engineering Group dated November 5, 2015 were considered 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 1.0 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
58.0	60.0	3	alcatel lucent	RRH2x60-700	2	1-5/8	-
		3	alcatel lucent	AWS-3 RRH4X45			
		3	alcatel lucent	RRH2X60-PCS			
		6	commscope	SBNHH-1D65A w/ Mount Pipe			
		2	rfs celwave	DB-T1-6Z-8AB-0Z			
		1	tower mounts	Sector Mount [SM 502-3]			

Table 2 - Existing and Reserved Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
80.0	88.0	1	andrew	ASP682	3	7/8	1
	84.0	1	rfs celwave	PD201-1			
	83.0	1	kmw communications	HB-X-AW-19-65-00T			
76.0	78.0	3	kathrein	800 10121 w/ Mount Pipe	13 2	7/8 3/4	1
		1	raycap	DC6-48-60-18-8F			
		3	adc	DD700/DD1900			
		3	cci antennas	DTMABP0721VG12A			
		4	cci antennas	HPA-65R-BUU-H8 w/ Mount Pipe	-	-	2
		2	cci antennas	OPA-65R-LCUU-H6 w/ Mount Pipe			
		2	ericsson	RRU-11			
		3	ericsson	RRU-12			
		1	ericsson	RRUL-11			
		2	ericsson	RRUS 32 B30			
		3	ericsson	RRUS A2 MODULE			
		3	ericsson	RRUS E2 B29			
		1	ericsson	RRUS-32 B30			
		2	raycap	DC6-48-60-18-8F			
	76.0	1	tower mounts	Sector Mount [SM 1306-3]			
60.0	67.0	1	andrew	DB806E-XT	2	7/8	4
		1	andrew	PG1NOF-0090-011			
		2	tower mounts	Side Arm Mount [SO 203-1]	-	-	3
50.0	60.0	1	rfs celwave	PD220	1 1	1/2 7/8	1
	60.0	2	tower mounts	Side Arm Mount [SO 203-1]			
	56.0	1	decibel	ASPF701			
42.0	42.0	2	tower mounts	Side Arm Mount [SO 203-1]	1	1/2	3

Notes:
1) Existing Equipment
2) Reserved Equipment
3) Equipment to Be Removed; not considered in this analysis.
4) Equipment to be relocated to 58'.

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	GPD Group	5114302	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	GPD Group	5114267	CCISITES
4-TOWER MANUFACTURER DRAWINGS	GPD Group	5114299	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	Crown Castle	5388172	CCISITES
4-POST MODIFICATION INSPECTION	Tower Engineering Professionals	5610335	CCISITES
TOWER REINFORCEMENT DESIGN/DRAWINGS	Jacobs Engineering Group	APPENDIX D	ON FILE

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) Modifications per reinforcement drawings prepared by Jacobs Engineering Group, Inc. dated November 5, 2015, must be installed for this analysis to be valid.

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

4) ANALYSIS RESULTS

Table 4 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
T1	80 - 60	Leg	1 1/2	3	-29.98	47.24	63.5	Pass
T2	60 - 40	Leg	SR 1-3/4 + HP 2 STD	79	-77.13	82.99	92.9	Pass
T3	40 - 20	Leg	2" SR + HP 2.5 XS	157	-120.37	131.12	91.8	Pass
T4	20 - 0	Leg	2.25" SR + HP 2.5 XS	235	-160.11	161.67	99.0	Pass
T1	80 - 60	Diagonal	5/8	10	-2.50	3.11	80.3	Pass
T2	60 - 40	Diagonal	3/4	88	-3.96	4.45	89.0	Pass
T3	40 - 20	Diagonal	7/8	166	-4.10	6.93	59.1	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
T4	20 - 0	Diagonal	7/8	244	-4.25	5.79	73.4	Pass
T1	80 - 60	Horizontal	3/4	25	-0.52	4.17	12.4	Pass
T2	60 - 40	Horizontal	3/4	104	-0.97	1.60	60.7	Pass
T3	40 - 20	Horizontal	7/8	227	-1.74	2.70	64.5	Pass
T4	20 - 0	Horizontal	7/8	305	-1.67	2.12	78.8	Pass
T1	80 - 60	Top Girt	1	6	-0.09	16.08	0.5	Pass
T2	60 - 40	Top Girt	1	82	-0.84	6.16	13.7	Pass
T3	40 - 20	Top Girt	1	161	-0.87	4.76	18.3	Pass
T4	20 - 0	Top Girt	1	238	-0.67	3.71	18.1	Pass
T1	80 - 60	Bottom Girt	3/4	7	-1.31	3.88	33.7	Pass
T2	60 - 40	Bottom Girt	1	86	-2.28	4.74	48.2	Pass
T3	40 - 20	Bottom Girt	1	164	-2.27	3.77	60.3	Pass
T4	20 - 0	Bottom Girt	1	242	-2.20	3.02	72.9	Pass
							Summary	
						Leg (T4)	99.0	Pass
						Diagonal (T2)	89.0	Pass
						Horizontal (T4)	78.8	Pass
						Top Girt (T3)	18.3	Pass
						Bottom Girt (T4)	72.9	Pass
						RATING =	**99.0**	**Pass**

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

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	81.7	Pass
1	Base Foundation Structural	0	12.9	Pass
1	Base Foundation Soil Interaction	0	75.9	Pass

Structure Rating (max from all components) =	**99.0%**

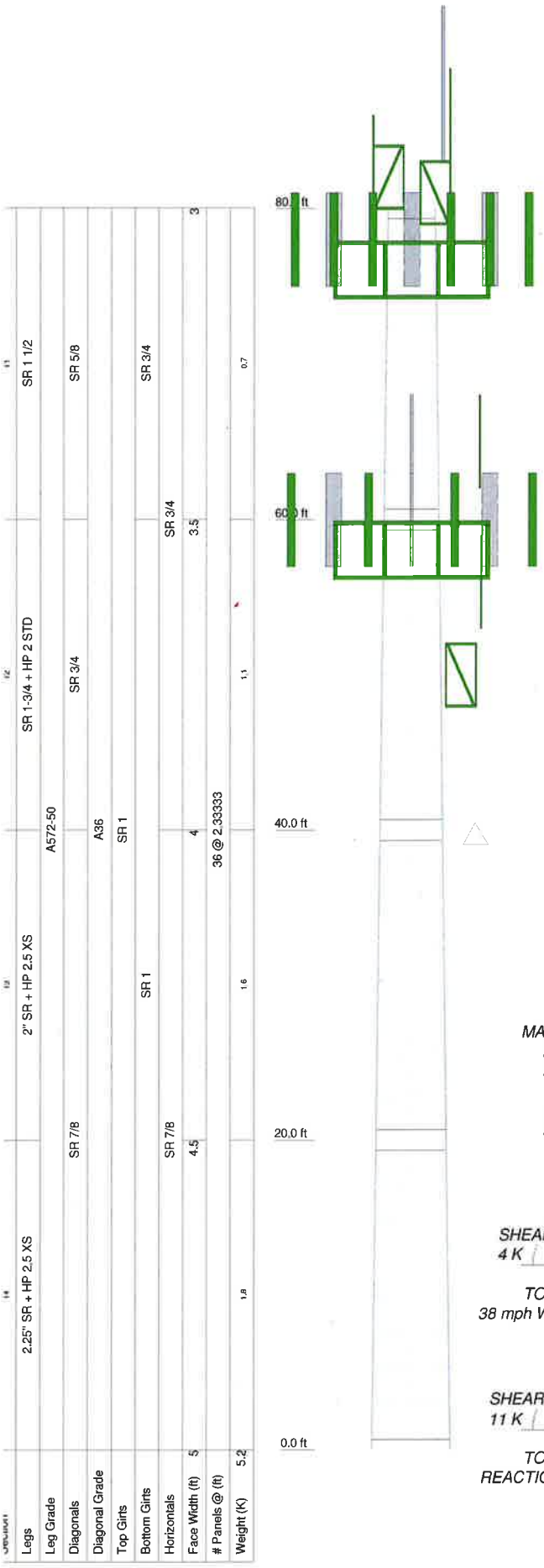
Notes:
1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.

4.1) Recommendations

The tower and its foundation have sufficient capacity to carry the existing, reserved, and proposed loads once the proposed modifications are installed.

APPENDIX A

TNXTOWER OUTPUT



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
OGB6-900	80	DTMABP0721VG12A	76
BA1012-0	80	DTMABP0721VG12A	76
MFB9157	80	DD700/DD1900	76
(2) OPA-65R-LCUU-H6 w/ Mount Pipe	76	DD700/DD1900	76
(2) HPA-65R-BUU-H8 w/ Mount Pipe	76	DD700/DD1900	76
(2) HPA-65R-BUU-H8 w/ Mount Pipe	76	Sector Mount [SM 1306-3]	76
RRUS 32 B30	76	BA1012-0	58
RRUS 32 B30	76	OGD6-905/945	58
RRUS 32 B30	76	(2) SBNHH-1D65A w/ Mount Pipe	58
RRUS E2 B29	76	(2) SBNHH-1D65A w/ Mount Pipe	58
RRUS E2 B29	76	(2) SBNHH-1D65A w/ Mount Pipe	58
RRUS E2 B29	76	RRH2x60-700	58
RRU-11	76	RRH2x60-700	58
RRUL-11	76	RRH2x60-700	58
RRU-11	76	AWS-3 RRH4X45	58
RRUS A2 MODULE	76	AWS-3 RRH4X45	58
RRUS A2 MODULE	76	AWS-3 RRH4X45	58
RRUS A2 MODULE	76	RRH2X60-PCS	58
RRU-12	76	RRH2X60-PCS	58
RRU-12	76	RRH2X60-PCS	58
RRU-12	76	(2) DB-T1-6Z-8AB-0Z	58
(2) DC6-48-60-18-8F	76	Sector Mount [SM 502-3]	58
DC6-48-60-18-8F	76	PD220	50
800 10121 w/ Mount Pipe	76	ASPF701	50
800 10121 w/ Mount Pipe	76	Side Arm Mount [SO 203-1]	50
800 10121 w/ Mount Pipe	76	Side Arm Mount [SO 203-1]	50
DTMABP0721VG12A	76		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi	A36	36 ksi	58 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: 99%

MAX. CORNER REACTIONS AT BASE:
DOWN: 160 K
SHEAR: 5 K

UPLIFT: -150 K
SHEAR: 6 K

AXIAL
27 K

SHEAR
4 K

MOMENT
248 kip-ft

TORQUE 1 kip-ft
38 mph WIND - 1.0000 in ICE

AXIAL
14 K

SHEAR
11 K

MOMENT
673 kip-ft

TORQUE 2 kip-ft
REACTIONS - 80 mph WIND

Jacobs Engineering Group
5449 Bells Ferry Road
Acworth, GA 30102
Phone:
FAX:

Job: *841298*			
Project: *1148654*			
Client: Crown Castle	Drawn by: Dan Chang	App'd:	
Code: TIA/EIA-222-F	Date: 11/05/15	Scale: N	
Path:		Dwg No.	

tnxTower	Job	Page
	841298	1 of 22
Jacobs Engineering Group 5449 Bells Ferry Road Acworth, GA 30102 Phone: FAX:	Project 1148654	Date 15:27:11 11/05/15
	Client Crown Castle	Designed by Dan Chang

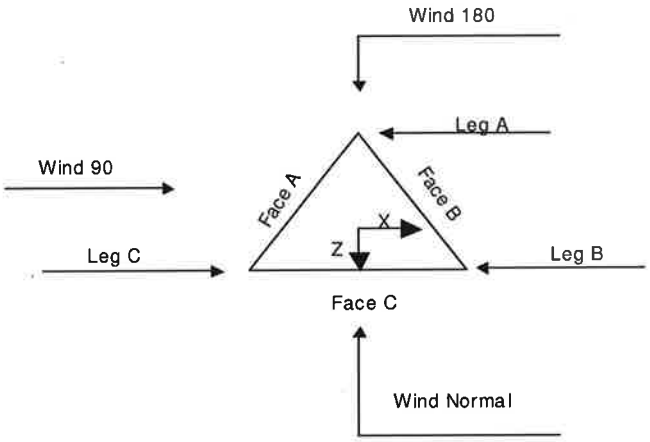
Tower Input Data

The main tower is a 3x free standing tower with an overall height of 80.00 ft above the ground line.
The base of the tower is set at an elevation of 0.00 ft above the ground line.
The face width of the tower is 3.00 ft at the top and 5.00 ft at the base.
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 1.0000 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 38 mph is used in combination with ice.
Temperature drop of 50 °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 tower member 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	



Triangular Tower

Tower Section Geometry

Tower Section	Tower Elevation	Assembly Database	Description	Section Width	Number of Sections	Section Length
	ft			ft		ft
T1	80.00-60.00			3.00	1	20.00
T2	60.00-40.00			3.50	1	20.00
T3	40.00-20.00			4.00	1	20.00
T4	20.00-0.00			4.50	1	20.00

Tower Section Geometry *(cont'd)*

Tower Section	Tower Elevation	Diagonal Spacing	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset	Bottom Girt Offset
	ft	ft				in	in
T1	80.00-60.00	2.33	X Brace	No	Yes	8.0000	8.0000
T2	60.00-40.00	2.33	X Brace	No	Yes	8.0000	8.0000
T3	40.00-20.00	2.33	X Brace	No	Yes	8.0000	8.0000
T4	20.00-0.00	2.33	X Brace	No	Yes	8.0000	8.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 80.00-60.00	Solid Round	1 1/2	A572-50 (50 ksi)	Solid Round	5/8	A36 (36 ksi)
T2 60.00-40.00	Arbitrary Shape	SR 1-3/4 + HP 2 STD	A572-50 (50 ksi)	Solid Round	3/4	A36 (36 ksi)
T3 40.00-20.00	Arbitrary Shape	2" SR + HP 2.5 XS	A572-50 (50 ksi)	Solid Round	7/8	A36 (36 ksi)
T4 20.00-0.00	Arbitrary Shape	2.25" SR + HP 2.5 XS	A572-50 (50 ksi)	Solid Round	7/8	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T1 80.00-60.00	Solid Round	1	A572-50 (50 ksi)	Solid Round	3/4	A572-50 (50 ksi)
T2 60.00-40.00	Solid Round	1	A572-50 (50 ksi)	Solid Round	1	A572-50 (50 ksi)
T3 40.00-20.00	Solid Round	1	A572-50 (50 ksi)	Solid Round	1	A572-50 (50 ksi)
T4 20.00-0.00	Solid Round	1	A572-50 (50 ksi)	Solid Round	1	A572-50 (50 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
T1 80.00-60.00	None	Flat Bar		A36 (36 ksi)	Solid Round	3/4	A572-50 (50 ksi)
T2 60.00-40.00	None	Flat Bar		A36 (36 ksi)	Solid Round	3/4	A572-50 (50 ksi)
T3 40.00-20.00	None	Flat Bar		A36 (36 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T4 20.00-0.00	None	Flat Bar		A36 (36 ksi)	Solid Round	7/8	A572-50 (50 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Gusset Area (per face) ft^2	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
T1 80.00-60.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000

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
T2 60.00-40.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T3 40.00-20.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T4 20.00-0.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X	X Brace Diags Y	K Single Diags X	K Single Diags Y	Girts X	Girts Y	Horiz. X	Horiz. Y	Sec. Horiz. X	Sec. Horiz. Y	Inner Brace X	Inner Brace Y
T1	No	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1
80.00-60.00				1	1	1	1	1	1	1	1	1	1	1	1
T2	No	No	1.16052	1	1	1	1	1	1	1	1	0.5	1	1	1
60.00-40.00				1	1	1	1	1	1	1	1	0.5	1	1	1
T3	No	No	1.16247	1	1	1	1	1	1	1	1	1	1	1	1
40.00-20.00				1	1	1	1	1	1	1	1	1	1	1	1
T4 20.00-0.00	No	No	1.1989	1	1	1	1	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1	1	1	1	1	1

[1]*Note: K factors are applied to member segment lengths. K-braces without inner supporting members will have the K factor in the out-of-plane direction applied to the overall length.*

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Net Width Deduct in	Leg U	Diagonal Net Width Deduct in	Diagonal U	Top Girt Net Width Deduct in	Top Girt U	Bottom Girt Net Width Deduct in	Bottom Girt U	Mid Girt Net Width Deduct in	Mid Girt U	Long Horizontal Net Width Deduct in	Long Horizontal U	Short Horizontal Net Width Deduct in	Short Horizontal U
T1 80.00-60.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T2 60.00-40.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T3 40.00-20.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T4 20.00-0.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
FLC 78-50J(7/8")	C	Yes	Ar (CfAe)	80.00 - 76.00	0.0000	0	16	8	0.5000	1.1120		0.40

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
LDF5-50A(7/8")	C	Yes	Ar (CfAe)	76.00 - 8.00	1.0000	-0.4	13	7	0.5000	1.0900		0.33
WR-VG86ST-BRD(3/4)	C	Yes	Ar (CfAe)	76.00 - 8.00	0.0000	-0.4	2	2	0.5000	0.0000		0.58
Safety Line 3/8	C	Yes	Ar (CfAe)	80.00 - 8.00	0.0000	0	1	1	0.3750	0.3750		0.22
T-Brackets ***	C	Yes	Af (CfAe)	80.00 - 8.00	4.0000	-0.5	1	1	1.0000	1.0000	4.0000	8.40
FLC 78-50J(7/8")	C	Yes	Ar (CfAe)	58.00 - 8.00	0.0000	-0.4	2	2	0.5000	1.1120		0.40
HB158-1-08U8-S8J18(1-5/8)	A	Yes	Ar (CfAe)	58.00 - 8.00	0.0000	0.5	2	2	0.5000	1.9800		1.30
FLC 12-50J(1/2")	C	Yes	Ar (CfAe)	50.00 - 8.00	1.0000	-0.4	1	1	0.5000	0.6400		0.17
2" Rigid Conduit	C	Yes	Ar (CfAe)	76.00 - 8.00	0.0000	-0.4	1	1	0.5000	2.0000		2.80
FLC 78-50J(7/8")	C	Yes	Ar (CfAe)	50.00 - 8.00	0.0000	-0.4	1	1	0.5000	1.1120		0.40

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
T1	80.00-60.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	16.430	1.667	0.000	0.000	0.33
T2	60.00-40.00	A	5.940	0.000	0.000	0.000	0.05
		B	0.000	0.000	0.000	0.000	0.00
		C	21.471	1.667	0.000	0.000	0.36
T3	40.00-20.00	A	6.600	0.000	0.000	0.000	0.05
		B	0.000	0.000	0.000	0.000	0.00
		C	23.302	1.667	0.000	0.000	0.36
T4	20.00-0.00	A	3.960	0.000	0.000	0.000	0.03
		B	0.000	0.000	0.000	0.000	0.00
		C	13.981	1.000	0.000	0.000	0.22

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
T1	80.00-60.00	A	1.094	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		18.249	21.247	0.000	0.000	0.90
T2	60.00-40.00	A	1.051	6.123	3.720	0.000	0.000	0.17
		B		0.000	0.000	0.000	0.000	0.00
		C		29.575	23.154	0.000	0.000	1.04
T3	40.00-20.00	A	1.000	6.633	4.133	0.000	0.000	0.18
		B		0.000	0.000	0.000	0.000	0.00
		C		33.882	23.309	0.000	0.000	1.07
T4	20.00-0.00	A	1.000	3.980	2.480	0.000	0.000	0.11
		B		0.000	0.000	0.000	0.000	0.00

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft²	A_F ft²	C_AA_A In Face ft²	C_AA_A Out Face ft²	Weight K
		C		20.329	13.985	0.000	0.000	0.64

Feed Line Shielding

Section	Elevation ft	Face	A_R ft²	A_R Ice ft²	A_F ft²	A_F Ice ft²
T1	80.00-60.00	A	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	1.457	13.938	0.000	0.000
T2	60.00-40.00	A	0.529	3.279	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	2.062	17.953	0.000	0.000
T3	40.00-20.00	A	0.663	3.527	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	2.507	19.098	0.000	0.000
T4	20.00-0.00	A	0.391	2.083	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	1.481	11.279	0.000	0.000

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
T1	80.00-60.00	4.6430	4.7641	1.5998	1.7925
T2	60.00-40.00	5.3802	2.4601	2.2830	2.0200
T3	40.00-20.00	5.5255	2.3808	2.7364	2.3070
T4	20.00-0.00	4.0752	1.7248	1.9294	1.6043

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft²	C_AA_A Side ft²	Weight K
level 80									
OGB6-900	A	From Leg	0.00 0.00 8.00	0.0000	80.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.18 1.77 2.13 2.88 4.50	1.18 1.77 2.13 2.88 4.50	0.01 0.02 0.03 0.07 0.20
BA1012-0	B	From Leg	0.00 0.00 4.00	0.0000	80.00	No Ice 1/2" Ice 1" Ice	0.47 0.96 1.31	0.47 0.96 1.31	0.00 0.01 0.01

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	1.91	1.91	0.04
						4" Ice	3.23	3.23	0.13
MFB9157	C	From Leg	0.00 0.00 3.00	0.0000	80.00	No Ice	1.20	1.20	0.00
						1/2" Ice	2.02	2.02	0.01
						1" Ice	2.86	2.86	0.03
						2" Ice	4.00	4.00	0.08
						4" Ice	6.09	6.09	0.24
level 76									
(2) OPA-65R-LCUU-H6 w/ Mount Pipe	A	From Leg	4.00 0.00 2.00	0.0000	76.00	No Ice	10.60	7.18	0.10
						1/2" Ice	11.27	8.36	0.18
						1" Ice	11.91	9.26	0.26
						2" Ice	13.21	11.09	0.46
						4" Ice	15.93	15.15	1.00
(2) HPA-65R-BUU-H8 w/ Mount Pipe	B	From Leg	4.00 0.00 2.00	0.0000	76.00	No Ice	13.81	10.80	0.08
						1/2" Ice	14.54	12.12	0.18
						1" Ice	15.27	13.17	0.29
						2" Ice	16.76	15.29	0.54
						4" Ice	19.84	19.72	1.22
(2) HPA-65R-BUU-H8 w/ Mount Pipe	C	From Leg	4.00 0.00 2.00	0.0000	76.00	No Ice	13.81	10.80	0.08
						1/2" Ice	14.54	12.12	0.18
						1" Ice	15.27	13.17	0.29
						2" Ice	16.76	15.29	0.54
						4" Ice	19.84	19.72	1.22
RRUS 32 B30	A	From Leg	4.00 0.00 2.00	0.0000	76.00	No Ice	3.14	1.74	0.06
						1/2" Ice	3.40	1.96	0.08
						1" Ice	3.66	2.19	0.10
						2" Ice	4.22	2.67	0.16
						4" Ice	5.43	3.75	0.32
RRUS 32 B30	B	From Leg	4.00 0.00 2.00	0.0000	76.00	No Ice	3.14	1.74	0.06
						1/2" Ice	3.40	1.96	0.08
						1" Ice	3.66	2.19	0.10
						2" Ice	4.22	2.67	0.16
						4" Ice	5.43	3.75	0.32
RRUS 32 B30	C	From Leg	4.00 0.00 2.00	0.0000	76.00	No Ice	3.14	1.74	0.06
						1/2" Ice	3.40	1.96	0.08
						1" Ice	3.66	2.19	0.10
						2" Ice	4.22	2.67	0.16
						4" Ice	5.43	3.75	0.32
RRUS E2 B29	A	From Leg	4.00 0.00 2.00	0.0000	76.00	No Ice	3.67	1.49	0.06
						1/2" Ice	3.93	1.67	0.08
						1" Ice	4.19	1.87	0.11
						2" Ice	4.75	2.28	0.17
						4" Ice	5.96	3.21	0.35
RRUS E2 B29	B	From Leg	4.00 0.00 2.00	0.0000	76.00	No Ice	3.67	1.49	0.06
						1/2" Ice	3.93	1.67	0.08
						1" Ice	4.19	1.87	0.11
						2" Ice	4.75	2.28	0.17
						4" Ice	5.96	3.21	0.35
RRUS E2 B29	C	From Leg	4.00 0.00 2.00	0.0000	76.00	No Ice	3.67	1.49	0.06
						1/2" Ice	3.93	1.67	0.08
						1" Ice	4.19	1.87	0.11
						2" Ice	4.75	2.28	0.17
						4" Ice	5.96	3.21	0.35
RRU-11	A	From Leg	4.00 0.00 2.00	0.0000	76.00	No Ice	1.91	1.47	0.04
						1/2" Ice	2.10	1.65	0.06
						1" Ice	2.30	1.83	0.08
						2" Ice	2.72	2.22	0.12

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	3.68	3.10	0.25
RRUL-11	B	From Leg	4.00 0.00 2.00	0.0000	76.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.91 2.10 2.30 2.72 3.68	1.47 1.65 1.83 2.22 3.10	0.04 0.06 0.08 0.12 0.25
RRU-11	C	From Leg	4.00 0.00 2.00	0.0000	76.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.91 2.10 2.30 2.72 3.68	1.47 1.65 1.83 2.22 3.10	0.04 0.06 0.08 0.12 0.25
RRUS A2 MODULE	A	From Leg	4.00 0.00 2.00	0.0000	76.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.87 2.05 2.24 2.66 3.58	0.42 0.53 0.65 0.91 1.54	0.02 0.03 0.04 0.08 0.18
RRUS A2 MODULE	B	From Leg	4.00 0.00 2.00	0.0000	76.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.87 2.05 2.24 2.66 3.58	0.42 0.53 0.65 0.91 1.54	0.02 0.03 0.04 0.08 0.18
RRUS A2 MODULE	C	From Leg	4:00 0.00 2.00	0.0000	76.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.87 2.05 2.24 2.66 3.58	0.42 0.53 0.65 0.91 1.54	0.02 0.03 0.04 0.08 0.18
RRU-12	A	From Leg	4.00 0.00 2.00	0.0000	76.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.67 3.93 4.19 4.75 5.96	1.49 1.67 1.87 2.28 3.21	0.05 0.07 0.10 0.16 0.34
RRU-12	B	From Leg	4.00 0.00 2.00	0.0000	76.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.67 3.93 4.19 4.75 5.96	1.49 1.67 1.87 2.28 3.21	0.05 0.07 0.10 0.16 0.34
RRU-12	C	From Leg	4.00 0.00 2.00	0.0000	76.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.67 3.93 4.19 4.75 5.96	1.49 1.67 1.87 2.28 3.21	0.05 0.07 0.10 0.16 0.34
(2) DC6-48-60-18-8F	A	From Leg	4.00 0.00 2.00	0.0000	76.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.47 1.67 1.88 2.33 3.38	1.47 1.67 1.88 2.33 3.38	0.03 0.05 0.07 0.12 0.25
DC6-48-60-18-8F	A	From Leg	4.00 0.00 2.00	0.0000	76.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.47 1.67 1.88 2.33 3.38	1.47 1.67 1.88 2.33 3.38	0.03 0.05 0.07 0.12 0.25
800 10121 w/ Mount Pipe	A	From Leg	4.00 0.00 2.00	0.0000	76.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.69 6.18 6.68 7.70 9.86	4.60 5.35 6.05 7.53 10.83	0.07 0.11 0.17 0.30 0.68
800 10121 w/ Mount Pipe	B	From Leg	4.00	0.0000	76.00	No Ice	5.69	4.60	0.07

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
			0.00			1/2" Ice	6.18	5.35	0.11
			2.00			1" Ice	6.68	6.05	0.17
						2" Ice	7.70	7.53	0.30
						4" Ice	9.86	10.83	0.68
800 10121 w/ Mount Pipe	C	From Leg	4.00	0.0000	76.00	No Ice	5.69	4.60	0.07
			0.00			1/2" Ice	6.18	5.35	0.11
			2.00			1" Ice	6.68	6.05	0.17
						2" Ice	7.70	7.53	0.30
						4" Ice	9.86	10.83	0.68
DTMABP0721VG12A	A	From Leg	4.00	0.0000	76.00	No Ice	1.14	0.34	0.02
			0.00			1/2" Ice	1.28	0.43	0.03
			2.00			1" Ice	1.44	0.54	0.04
						2" Ice	1.77	0.77	0.06
						4" Ice	2.54	1.34	0.14
DTMABP0721VG12A	B	From Leg	4.00	0.0000	76.00	No Ice	1.14	0.34	0.02
			0.00			1/2" Ice	1.28	0.43	0.03
			2.00			1" Ice	1.44	0.54	0.04
						2" Ice	1.77	0.77	0.06
						4" Ice	2.54	1.34	0.14
DTMABP0721VG12A	C	From Leg	4.00	0.0000	76.00	No Ice	1.14	0.34	0.02
			0.00			1/2" Ice	1.28	0.43	0.03
			2.00			1" Ice	1.44	0.54	0.04
						2" Ice	1.77	0.77	0.06
						4" Ice	2.54	1.34	0.14
DD700/DD1900	A	From Leg	4.00	0.0000	76.00	No Ice	1.55	0.81	0.03
			0.00			1/2" Ice	1.72	0.94	0.04
			2.00			1" Ice	1.90	1.09	0.05
						2" Ice	2.28	1.40	0.09
						4" Ice	3.14	2.12	0.19
DD700/DD1900	B	From Leg	4.00	0.0000	76.00	No Ice	1.55	0.81	0.03
			0.00			1/2" Ice	1.72	0.94	0.04
			2.00			1" Ice	1.90	1.09	0.05
						2" Ice	2.28	1.40	0.09
						4" Ice	3.14	2.12	0.19
DD700/DD1900	C	From Leg	4.00	0.0000	76.00	No Ice	1.55	0.81	0.03
			0.00			1/2" Ice	1.72	0.94	0.04
			2.00			1" Ice	1.90	1.09	0.05
						2" Ice	2.28	1.40	0.09
						4" Ice	3.14	2.12	0.19
Sector Mount [SM 1306-3]	C	None		0.0000	76.00	No Ice	49.30	49.30	2.29
						1/2" Ice	52.20	52.20	2.68
						1" Ice	55.27	55.27	3.14
						2" Ice	61.96	61.96	4.29
						4" Ice	77.88	77.88	8.03
TO 58 BA1012-0	A	From Leg	3.00	0.0000	58.00	No Ice	0.47	0.47	0.00
			0.00			1/2" Ice	0.96	0.96	0.01
			7.00			1" Ice	1.31	1.31	0.01
						2" Ice	1.91	1.91	0.04
						4" Ice	3.23	3.23	0.13
OGD6-905/945	B	From Leg	3.00	0.0000	58.00	No Ice	2.51	2.51	0.03
			0.00			1/2" Ice	3.74	3.74	0.04
			7.00			1" Ice	4.98	4.98	0.07
						2" Ice	7.40	7.40	0.15
						4" Ice	10.41	10.41	0.40
level 58 (2) SBNHH-1D65A w/	A	From Leg	4.00	0.0000	58.00	No Ice	6.94	5.53	0.06

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
Mount Pipe			0.00			1/2" Ice	7.63	6.61	0.12
			2.00			1" Ice	8.22	7.44	0.18
						2" Ice	9.45	9.18	0.33
						4" Ice	12.03	12.87	0.77
(2) SBNHH-1D65A w/ Mount Pipe	B	From Leg	4.00	0.0000	58.00	No Ice	6.94	5.53	0.06
			0.00			1/2" Ice	7.63	6.61	0.12
			2.00			1" Ice	8.22	7.44	0.18
						2" Ice	9.45	9.18	0.33
						4" Ice	12.03	12.87	0.77
(2) SBNHH-1D65A w/ Mount Pipe	C	From Leg	4.00	0.0000	58.00	No Ice	6.94	5.53	0.06
			0.00			1/2" Ice	7.63	6.61	0.12
			2.00			1" Ice	8.22	7.44	0.18
						2" Ice	9.45	9.18	0.33
						4" Ice	12.03	12.87	0.77
RRH2x60-700	A	From Leg	4.00	0.0000	58.00	No Ice	3.96	1.82	0.06
			0.00			1/2" Ice	4.27	2.08	0.08
			2.00			1" Ice	4.60	2.36	0.11
						2" Ice	5.27	2.96	0.17
						4" Ice	6.72	4.25	0.35
RRH2x60-700	B	From Leg	4.00	0.0000	58.00	No Ice	3.96	1.82	0.06
			0.00			1/2" Ice	4.27	2.08	0.08
			2.00			1" Ice	4.60	2.36	0.11
						2" Ice	5.27	2.96	0.17
						4" Ice	6.72	4.25	0.35
RRH2x60-700	C	From Leg	4.00	0.0000	58.00	No Ice	3.96	1.82	0.06
			0.00			1/2" Ice	4.27	2.08	0.08
			2.00			1" Ice	4.60	2.36	0.11
						2" Ice	5.27	2.96	0.17
						4" Ice	6.72	4.25	0.35
AWS-3 RRH4X45	A	From Leg	4.00	0.0000	58.00	No Ice	3.62	4.23	0.08
			0.00			1/2" Ice	3.90	4.52	0.11
			2.00			1" Ice	4.19	4.83	0.15
						2" Ice	4.80	5.47	0.24
						4" Ice	6.13	6.84	0.47
AWS-3 RRH4X45	B	From Leg	4.00	0.0000	58.00	No Ice	3.62	4.23	0.08
			0.00			1/2" Ice	3.90	4.52	0.11
			2.00			1" Ice	4.19	4.83	0.15
						2" Ice	4.80	5.47	0.24
						4" Ice	6.13	6.84	0.47
AWS-3 RRH4X45	C	From Leg	4.00	0.0000	58.00	No Ice	3.62	4.23	0.08
			0.00			1/2" Ice	3.90	4.52	0.11
			2.00			1" Ice	4.19	4.83	0.15
						2" Ice	4.80	5.47	0.24
						4" Ice	6.13	6.84	0.47
RRH2X60-PCS	A	From Leg	4.00	0.0000	58.00	No Ice	2.57	2.01	0.06
			0.00			1/2" Ice	2.79	2.22	0.08
			2.00			1" Ice	3.02	2.43	0.10
						2" Ice	3.52	2.89	0.16
						4" Ice	4.61	3.92	0.31
RRH2X60-PCS	B	From Leg	4.00	0.0000	58.00	No Ice	2.57	2.01	0.06
			0.00			1/2" Ice	2.79	2.22	0.08
			2.00			1" Ice	3.02	2.43	0.10
						2" Ice	3.52	2.89	0.16
						4" Ice	4.61	3.92	0.31
RRH2X60-PCS	C	From Leg	4.00	0.0000	58.00	No Ice	2.57	2.01	0.06
			0.00			1/2" Ice	2.79	2.22	0.08
			2.00			1" Ice	3.02	2.43	0.10

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
						2" Ice	3.52	2.89	0.16
						4" Ice	4.61	3.92	0.31
(2) DB-T1-6Z-8AB-0Z	C	From Leg	4.00 0.00 2.00	0.0000	58.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.60 5.92 6.24 6.91 8.37	2.33 2.56 2.79 3.28 4.37	0.04 0.08 0.12 0.21 0.45
Sector Mount [SM 502-3]	C	None		0.0000	58.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	33.02 47.36 61.70 90.38 147.74	33.02 47.36 61.70 90.38 147.74	1.67 2.22 2.77 3.88 6.08
level 50									
PD220	A	From Leg	3.00 0.00 10.00	0.0000	50.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.08 5.30 7.54 12.06 21.31	3.08 5.30 7.54 12.06 21.31	0.02 0.05 0.09 0.21 0.62
ASPF701	B	From Leg	3.00 0.00 6.00	0.0000	50.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.94 3.58 5.24 8.60 14.66	1.94 3.58 5.24 8.60 14.66	0.01 0.03 0.05 0.14 0.44
Side Arm Mount [SO 203-1]	A	From Leg	1.50 0.00 0.00	0.0000	50.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.96 4.10 5.24 7.52 12.08	3.36 4.68 6.00 8.64 13.92	0.13 0.15 0.18 0.24 0.35
Side Arm Mount [SO 203-1]	B	From Leg	1.50 0.00 0.00	0.0000	50.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.96 4.10 5.24 7.52 12.08	3.36 4.68 6.00 8.64 13.92	0.13 0.15 0.18 0.24 0.35
***									

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

Comb. No.	Description
13	Dead+Wind 330 deg - No Ice
14	Dead+Ice+Temp
15	Dead+Wind 0 deg+Ice+Temp
16	Dead+Wind 30 deg+Ice+Temp
17	Dead+Wind 60 deg+Ice+Temp
18	Dead+Wind 90 deg+Ice+Temp
19	Dead+Wind 120 deg+Ice+Temp
20	Dead+Wind 150 deg+Ice+Temp
21	Dead+Wind 180 deg+Ice+Temp
22	Dead+Wind 210 deg+Ice+Temp
23	Dead+Wind 240 deg+Ice+Temp
24	Dead+Wind 270 deg+Ice+Temp
25	Dead+Wind 300 deg+Ice+Temp
26	Dead+Wind 330 deg+Ice+Temp
27	Dead+Wind 0 deg - Service
28	Dead+Wind 30 deg - Service
29	Dead+Wind 60 deg - Service
30	Dead+Wind 90 deg - Service
31	Dead+Wind 120 deg - Service
32	Dead+Wind 150 deg - Service
33	Dead+Wind 180 deg - Service
34	Dead+Wind 210 deg - Service
35	Dead+Wind 240 deg - Service
36	Dead+Wind 270 deg - Service
37	Dead+Wind 300 deg - Service
38	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
T1	80 - 60	Leg	Max Tension	4	26.69	0.65	0.05
			Max. Compression	2	-29.98	-0.68	0.03
			Max. Mx	2	-29.98	-0.68	0.03
			Max. My	9	-1.80	0.01	-0.67
			Max. Vy	2	-1.68	0.44	-0.01
			Max. Vx	9	-1.65	-0.00	0.42
		Diagonal	Max Tension	11	2.48	0.00	0.00
			Max. Compression	11	-2.50	0.00	0.00
			Max. Mx	20	0.65	-0.00	0.00
			Max. My	10	-2.37	0.00	-0.00
			Max. Vy	17	-0.00	-0.00	-0.00
			Max. Vx	10	0.00	0.00	-0.00
		Horizontal	Max Tension	4	0.67	0.00	0.00
			Max. Compression	2	-0.52	0.00	0.00
			Max. Mx	14	0.16	0.01	0.00
			Max. My	3	0.07	0.00	-0.00
			Max. Vy	14	-0.01	0.00	0.00
			Max. Vx	3	0.00	0.00	0.00
		Top Girt	Max Tension	8	0.08	0.00	0.00
			Max. Compression	6	-0.09	0.00	0.00
			Max. Mx	14	-0.01	0.01	0.00
			Max. My	3	-0.00	0.00	-0.00
			Max. Vy	14	-0.01	0.00	0.00
			Max. Vx	3	0.00	0.00	0.00
		Bottom Girt	Max Tension	8	1.28	0.00	0.00
			Max. Compression	2	-1.31	0.00	0.00
			Max. Mx	14	0.09	0.01	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. My	3	0.23	0.00	-0.00
			Max. Vy	14	-0.01	0.00	0.00
			Max. Vx	3	0.00	0.00	0.00
T2	60 - 40	Leg	Max Tension	4	71.15	1.25	0.08
			Max. Compression	10	-77.13	0.56	0.04
			Max. Mx	2	-29.99	1.51	-0.05
			Max. My	9	-1.82	-0.02	1.52
			Max. Vy	10	-2.82	0.56	0.04
			Max. Vx	9	-2.63	-0.01	0.50
		Diagonal	Max Tension	11	3.94	0.00	0.00
			Max. Compression	11	-3.96	0.00	0.00
			Max. Mx	19	0.94	-0.00	-0.00
			Max. My	11	-3.47	0.00	-0.00
			Max. Vy	19	0.01	-0.00	-0.00
			Max. Vx	11	0.00	0.00	-0.00
		Horizontal	Max Tension	4	1.16	0.00	0.00
			Max. Compression	10	-0.97	0.00	0.00
			Max. Mx	14	0.19	0.01	0.00
			Max. My	3	0.11	0.00	-0.00
			Max. Vy	14	0.01	0.00	0.00
			Max. Vx	3	0.00	0.00	0.00
		Top Girt	Max Tension	10	1.05	0.00	0.00
			Max. Compression	8	-0.84	0.00	0.00
			Max. Mx	14	0.07	0.01	0.00
			Max. My	3	-0.16	0.00	-0.00
			Max. Vy	14	-0.01	0.00	0.00
			Max. Vx	3	0.00	0.00	0.00
		Bottom Girt	Max Tension	4	2.16	0.00	0.00
			Max. Compression	10	-2.28	0.00	0.00
			Max. Mx	14	0.12	0.01	0.00
			Max. My	3	0.41	0.00	-0.00
			Max. Vy	14	-0.01	0.00	0.00
			Max. Vx	3	0.00	0.00	0.00
T3	40 - 20	Leg	Max Tension	4	112.44	1.47	0.11
			Max. Compression	10	-120.37	0.41	0.03
			Max. Mx	10	-77.14	2.38	0.19
			Max. My	9	-3.26	-0.05	2.25
			Max. Vy	10	-3.00	0.41	0.03
			Max. Vx	9	-2.63	-0.05	2.25
		Diagonal	Max Tension	4	4.34	0.00	0.00
			Max. Compression	10	-4.69	0.00	0.00
			Max. Mx	10	1.68	-0.00	-0.00
			Max. My	10	-4.68	0.00	-0.00
			Max. Vy	19	0.01	-0.00	-0.00
			Max. Vx	10	0.00	0.00	-0.00
		Horizontal	Max Tension	4	1.93	0.00	0.00
			Max. Compression	10	-1.74	0.00	0.00
			Max. Mx	14	0.19	0.01	0.00
			Max. My	3	0.10	0.00	-0.00
			Max. Vy	14	-0.01	0.00	0.00
			Max. Vx	3	0.00	0.00	0.00
		Top Girt	Max Tension	10	1.22	0.00	0.00
			Max. Compression	3	-0.87	0.00	0.00
			Max. Mx	14	0.09	0.01	0.00
			Max. My	3	-0.34	0.00	-0.00
			Max. Vy	14	-0.01	0.00	0.00
			Max. Vx	3	0.00	0.00	0.00
		Bottom Girt	Max Tension	4	2.19	0.00	0.00
			Max. Compression	10	-2.27	0.00	0.00
			Max. Mx	14	0.12	0.01	0.00
			Max. My	3	0.34	0.00	-0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vy	14	-0.01	0.00	0.00
			Max. Vx	3	0.00	0.00	0.00
T4	20 - 0	Leg	Max Tension	4	149.82	1.90	0.13
			Max. Compression	10	-160.11	0.00	0.00
			Max. Mx	10	-120.38	2.37	0.21
			Max. My	9	-3.82	-0.06	2.08
			Max. Vy	10	-3.16	0.00	0.00
			Max. Vx	9	-2.63	-0.06	2.08
		Diagonal	Max Tension	11	4.27	0.00	0.00
			Max. Compression	10	-4.63	0.00	0.00
			Max. Mx	19	0.63	-0.00	0.00
			Max. My	10	-4.61	0.00	-0.00
			Max. Vy	19	0.01	-0.00	0.00
			Max. Vx	10	0.00	0.00	-0.00
		Horizontal	Max Tension	4	1.84	0.00	0.00
			Max. Compression	10	-1.67	0.00	0.00
			Max. Mx	14	-0.07	0.01	0.00
			Max. My	3	0.06	0.00	-0.00
			Max. Vy	14	-0.01	0.00	0.00
		Top Girt	Max Tension	10	0.95	0.00	0.00
			Max. Compression	9	-0.67	0.00	0.00
			Max. Mx	14	0.09	0.01	0.00
			Max. My	3	-0.32	0.00	-0.00
			Max. Vy	14	-0.01	0.00	0.00
			Max. Vx	3	0.00	0.00	0.00
		Bottom Girt	Max Tension	4	2.07	0.00	0.00
			Max. Compression	10	-2.20	0.00	0.00
			Max. Mx	14	0.66	0.02	0.00
			Max. Vy	14	0.01	0.00	0.00

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Leg C	Max. Vert	10	160.07	4.04	-2.09
	Max. H_x	10	160.07	4.04	-2.09
	Max. H_z	3	-129.63	-3.72	3.47
	Min. Vert	4	-149.73	-5.16	2.67
	Min. H_x	4	-149.73	-5.16	2.67
	Min. H_z	9	137.94	3.15	-2.52
Leg B	Max. Vert	6	159.36	-3.92	-2.23
	Max. H_x	11	-127.59	5.09	1.06
	Max. H_z	13	-126.79	3.48	3.78
	Min. Vert	12	-147.14	4.98	2.82
	Min. H_x	6	159.36	-3.92	-2.23
	Min. H_z	8	80.52	-1.12	-2.79
Leg A	Max. Vert	2	158.93	0.18	4.52
	Max. H_x	11	3.44	2.13	0.01
	Max. H_z	2	158.93	0.18	4.52
	Min. Vert	8	-148.11	-0.21	-5.74
	Min. H_x	6	-72.05	-2.28	-2.73
	Min. H_z	8	-148.11	-0.21	-5.74

Tower Mast Reaction Summary

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
Dead Only	13.64	0.00	0.00	0.66	-2.31	0.00
Dead+Wind 0 deg - No Ice	13.64	0.07	-11.29	-668.52	-6.45	1.88
Dead+Wind 30 deg - No Ice	13.64	5.63	-9.63	-575.21	-338.77	2.22
Dead+Wind 60 deg - No Ice	13.64	9.62	-5.57	-333.10	-579.04	2.04
Dead+Wind 90 deg - No Ice	13.64	11.14	-0.07	-3.48	-668.10	1.35
Dead+Wind 120 deg - No Ice	13.64	9.79	5.59	331.68	-582.58	0.27
Dead+Wind 150 deg - No Ice	13.64	5.51	9.56	572.40	-331.65	-0.87
Dead+Wind 180 deg - No Ice	13.64	-0.07	11.01	661.02	1.79	-1.76
Dead+Wind 210 deg - No Ice	13.64	-5.63	9.63	576.51	334.12	-2.22
Dead+Wind 240 deg - No Ice	13.64	-9.86	5.70	338.81	582.02	-2.14
Dead+Wind 270 deg - No Ice	13.64	-11.14	0.07	4.77	663.41	-1.36
Dead+Wind 300 deg - No Ice	13.64	-9.56	-5.45	-325.95	570.25	-0.28
Dead+Wind 330 deg - No Ice	13.64	-5.51	-9.56	-571.07	326.97	0.87
Dead+Ice+Temp	26.74	0.00	0.00	3.00	-5.58	-0.00
Dead+Wind 0 deg+Ice+Temp	26.74	0.02	-4.30	-238.66	-6.62	0.59
Dead+Wind 30 deg+Ice+Temp	26.74	2.09	-3.60	-201.27	-124.48	0.66
Dead+Wind 60 deg+Ice+Temp	26.74	3.56	-2.06	-114.45	-208.65	0.57
Dead+Wind 90 deg+Ice+Temp	26.74	4.16	-0.02	2.01	-241.60	0.34
Dead+Wind 120 deg+Ice+Temp	26.74	3.73	2.13	122.98	-215.00	0.03
Dead+Wind 150 deg+Ice+Temp	26.74	2.06	3.58	206.30	-122.73	-0.31
Dead+Wind 180 deg+Ice+Temp	26.74	-0.02	4.09	236.21	-4.60	-0.55
Dead+Wind 210 deg+Ice+Temp	26.74	-2.09	3.60	207.31	113.26	-0.66
Dead+Wind 240 deg+Ice+Temp	26.74	-3.74	2.16	124.74	204.79	-0.61
Dead+Wind 270 deg+Ice+Temp	26.74	-4.16	0.02	4.03	230.38	-0.34
Dead+Wind 300 deg+Ice+Temp	26.74	-3.55	-2.03	-112.70	196.41	-0.02
Dead+Wind 330 deg+Ice+Temp	26.74	-2.06	-3.58	-200.26	111.50	0.31
Dead+Wind 0 deg - Service	13.64	0.03	-4.41	-260.75	-3.95	0.73
Dead+Wind 30 deg - Service	13.64	2.20	-3.76	-224.30	-133.77	0.87
Dead+Wind 60 deg - Service	13.64	3.76	-2.17	-129.72	-227.63	0.80
Dead+Wind 90 deg - Service	13.64	4.35	-0.03	-0.95	-262.42	0.53
Dead+Wind 120 deg - Service	13.64	3.83	2.18	129.98	-229.01	0.10
Dead+Wind 150 deg - Service	13.64	2.15	3.74	224.02	-130.99	-0.34
Dead+Wind 180 deg - Service	13.64	-0.03	4.30	258.64	-0.73	-0.69
Dead+Wind 210 deg - Service	13.64	-2.20	3.76	225.62	129.09	-0.87
Dead+Wind 240 deg - Service	13.64	-3.85	2.23	132.77	225.94	-0.84
Dead+Wind 270 deg - Service	13.64	-4.35	0.03	2.27	257.74	-0.53
Dead+Wind 300 deg - Service	13.64	-3.73	-2.13	-126.93	221.34	-0.11
Dead+Wind 330 deg - Service	13.64	-2.15	-3.74	-222.69	126.30	0.34

Solution Summary

Load Comb.	Sum of Applied Forces PX	PY	PZ	Sum of Reactions PX	PY	PZ	% Error
	K	K	K	K	K	K	
1	0.00	-13.64	0.00	0.00	13.64	0.00	0.000%
2	0.07	-13.64	-11.29	-0.07	13.64	11.29	0.001%
3	5.63	-13.64	-9.63	-5.63	13.64	9.63	0.001%
4	9.62	-13.64	-5.57	-9.62	13.64	5.57	0.000%
5	11.14	-13.64	-0.07	-11.14	13.64	0.07	0.000%
6	9.79	-13.64	5.59	-9.79	13.64	-5.59	0.000%
7	5.51	-13.64	9.56	-5.51	13.64	-9.56	0.000%
8	-0.07	-13.64	11.01	0.07	13.64	-11.01	0.000%
9	-5.63	-13.64	9.63	5.63	13.64	-9.63	0.001%
10	-9.86	-13.64	5.70	9.86	13.64	-5.70	0.001%
11	-11.14	-13.64	0.07	11.14	13.64	-0.07	0.000%

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
12	-9.56	-13.64	-5.45	9.56	13.64	5.45	0.000%
13	-5.51	-13.64	-9.56	5.51	13.64	9.56	0.000%
14	0.00	-26.74	0.00	0.00	26.74	0.00	0.000%
15	0.02	-26.74	-4.30	-0.02	26.74	4.30	0.000%
16	2.09	-26.74	-3.60	-2.09	26.74	3.60	0.000%
17	3.56	-26.74	-2.06	-3.56	26.74	2.06	0.000%
18	4.16	-26.74	-0.02	-4.16	26.74	0.02	0.000%
19	3.73	-26.74	2.13	-3.73	26.74	-2.13	0.000%
20	2.06	-26.74	3.58	-2.06	26.74	-3.58	0.000%
21	-0.02	-26.74	4.09	0.02	26.74	-4.09	0.000%
22	-2.09	-26.74	3.60	2.09	26.74	-3.60	0.000%
23	-3.74	-26.74	2.16	3.74	26.74	-2.16	0.000%
24	-4.16	-26.74	0.02	4.16	26.74	-0.02	0.000%
25	-3.55	-26.74	-2.03	3.55	26.74	2.03	0.000%
26	-2.06	-26.74	-3.58	2.06	26.74	3.58	0.000%
27	0.03	-13.64	-4.41	-0.03	13.64	4.41	0.000%
28	2.20	-13.64	-3.76	-2.20	13.64	3.76	0.000%
29	3.76	-13.64	-2.17	-3.76	13.64	2.17	0.000%
30	4.35	-13.64	-0.03	-4.35	13.64	0.03	0.000%
31	3.83	-13.64	2.18	-3.83	13.64	-2.18	0.000%
32	2.15	-13.64	3.74	-2.15	13.64	-3.74	0.000%
33	-0.03	-13.64	4.30	0.03	13.64	-4.30	0.000%
34	-2.20	-13.64	3.76	2.20	13.64	-3.76	0.000%
35	-3.85	-13.64	2.23	3.85	13.64	-2.23	0.000%
36	-4.35	-13.64	0.03	4.35	13.64	-0.03	0.000%
37	-3.73	-13.64	-2.13	3.73	13.64	2.13	0.000%
38	-2.15	-13.64	-3.74	2.15	13.64	3.74	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	4	0.00000001	0.00000749
3	Yes	4	0.00000001	0.00000917
4	Yes	4	0.00000001	0.00000742
5	Yes	4	0.00000001	0.00000491
6	Yes	4	0.00000001	0.00000378
7	Yes	4	0.00000001	0.00000364
8	Yes	4	0.00000001	0.00000643
9	Yes	4	0.00000001	0.00000925
10	Yes	4	0.00000001	0.00000846
11	Yes	4	0.00000001	0.00000492
12	Yes	4	0.00000001	0.00000318
13	Yes	4	0.00000001	0.00000366
14	Yes	4	0.00000001	0.00000001
15	Yes	4	0.00000001	0.00002296
16	Yes	4	0.00000001	0.00002295
17	Yes	4	0.00000001	0.00002289
18	Yes	4	0.00000001	0.00002286
19	Yes	4	0.00000001	0.00002286
20	Yes	4	0.00000001	0.00002287
21	Yes	4	0.00000001	0.00002290
22	Yes	4	0.00000001	0.00002295
23	Yes	4	0.00000001	0.00002294
24	Yes	4	0.00000001	0.00002286

25	Yes	4	0.00000001	0.00002281
26	Yes	4	0.00000001	0.00002287
27	Yes	4	0.00000001	0.00000303
28	Yes	4	0.00000001	0.00000300
29	Yes	4	0.00000001	0.00000295
30	Yes	4	0.00000001	0.00000292
31	Yes	4	0.00000001	0.00000292
32	Yes	4	0.00000001	0.00000293
33	Yes	4	0.00000001	0.00000299
34	Yes	4	0.00000001	0.00000301
35	Yes	4	0.00000001	0.00000299
36	Yes	4	0.00000001	0.00000293
37	Yes	4	0.00000001	0.00000291
38	Yes	4	0.00000001	0.00000293

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	80 - 60	4.932	30	0.4628	0.0839
T2	60 - 40	2.992	31	0.4073	0.0647
T3	40 - 20	1.401	31	0.2869	0.0386
T4	20 - 0	0.393	31	0.1483	0.0189

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
80.00	OGB6-900	30	4.932	0.4628	0.0839	49935
76.00	(2) OPA-65R-LCUU-H6 w/ Mount Pipe	31	4.532	0.4548	0.0805	49935
58.00	BA1012-0	31	2.813	0.3981	0.0622	11917
50.00	PD220	31	2.136	0.3532	0.0515	9896

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	80 - 60	12.592	10	1.1766	0.2157
T2	60 - 40	7.648	10	1.0377	0.1665
T3	40 - 20	3.586	10	0.7320	0.0994
T4	20 - 0	1.008	10	0.3788	0.0488

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
80.00	OGB6-900	10	12.592	1.1766	0.2157	19777
76.00	(2) OPA-65R-LCUU-H6 w/ Mount Pipe	10	11.572	1.1567	0.2071	19777
58.00	BA1012-0	10	7.190	1.0143	0.1602	4713
50.00	PD220	10	5.465	0.9006	0.1326	3899

Compression Checks

Leg Design Data (Compression)

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 $\frac{P}{P_a}$
T1	80 - 60	1 1/2	20.00	2.33	74.7 K=1.00	20.056	1.7672	-29.98	35.44	0.846 ✓
T2	60 - 40	SR 1-3/4 + HP 2 STD	20.00	2.33	68.8 K=1.16	21.159	2.9425	-77.13	62.26	1.239 ✓
T3	40 - 20	2" SR + HP 2.5 XS	20.00	2.33	58.1 K=1.16	23.045	4.2684	-120.37	98.37	1.224 ✓
T4	20 - 0	2.25" SR + HP 2.5 XS	20.00	2.33	53.7 K=1.20	23.768	5.1028	-160.11	121.29	1.320 ✓

Diagonal Design Data (Compression)

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 $\frac{P}{P_a}$
T1	80 - 60	5/8	4.17	2.03	140.1 K=0.90	7.612	0.3068	-2.50	2.34	1.071 ✓
T2	60 - 40	3/4	4.59	2.20	140.7 K=1.00	7.548	0.4418	-3.96	3.33	1.187 ✓
T3	40 - 20	7/8	5.03	2.40	131.4 K=1.00	8.648	0.6013	-4.10	5.20	0.788 ✓
T4	20 - 0	7/8	5.48	2.62	143.8 K=1.00	7.219	0.6013	-4.25	4.34	0.979 ✓

Horizontal Design Data (Compression)

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 $\frac{P}{P_a}$
T1	80 - 60	3/4	3.37	3.24	145.2 K=0.70	7.080	0.4418	-0.52	3.13	0.165 ✓

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 $\frac{P}{P_a}$
T2	60 - 40	3/4	3.87	3.67	234.8 K=1.00	2.709	0.4418	-0.97	1.20	0.809 ✔
		KL/R > 200 (C) - 104								
T3	40 - 20	7/8	4.08	3.84	210.4 K=1.00	3.373	0.6013	-1.74	2.03	0.860 ✔
		KL/R > 200 (C) - 227								
T4	20 - 0	7/8	4.58	4.34	237.8 K=1.00	2.640	0.6013	-1.67	1.59	1.051 ✔
		KL/R > 200 (C) - 305								

Top Girt Design Data (Compression)

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 $\frac{P}{P_a}$
T1	80 - 60	1	3.02	2.89	97.2 K=0.70	15.357	0.7854	-0.09	12.06	0.007 ✔
T2	60 - 40	1	3.52	3.32	159.3 K=1.00	5.885	0.7854	-0.84	4.62	0.182 ✔
T3	40 - 20	1	4.02	3.78	181.3 K=1.00	4.543	0.7854	-0.87	3.57	0.245 ✔
T4	20 - 0	1	4.52	4.28	205.3 K=1.00	3.543	0.7854	-0.67	2.78	0.241 ✔
		KL/R > 200 (C) - 238								

Bottom Girt Design Data (Compression)

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 $\frac{P}{P_a}$
T1	80 - 60	3/4	3.48	3.36	150.5 K=0.70	6.597	0.4418	-1.31	2.91	0.449 ✔
T2	60 - 40	1	3.98	3.79	181.7 K=1.00	4.523	0.7854	-2.28	3.55	0.643 ✔
T3	40 - 20	1	4.48	4.24	203.7 K=1.00	3.599	0.7854	-2.27	2.83	0.803 ✔
		KL/R > 200 (C) - 164								
T4	20 - 0	1	4.98	4.74	227.7 K=1.00	2.880	0.7854	-2.20	2.26	0.972 ✔
		KL/R > 200 (C) - 242								

Tension Checks

Leg Design Data (Tension)

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 $\frac{P}{P_a}$
T1	80 - 60	1 1/2	20.00	2.33	74.7	30.000	1.7672	26.69	53.01	0.503 ✔
T2	60 - 40	SR 1-3/4 + HP 2 STD	20.00	2.33	59.3	30.000	2.9425	71.15	88.28	0.806 ✔
T3	40 - 20	2" SR + HP 2.5 XS	20.00	2.33	49.9	30.000	4.2684	112.44	128.05	0.878 ✔
T4	20 - 0	2.25" SR + HP 2.5 XS	20.00	2.33	44.8	30.000	5.1028	149.82	153.09	0.979 ✔

Diagonal Design Data (Tension)

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 $\frac{P}{P_a}$
T1	80 - 60	5/8	4.17	2.03	155.6	21.600	0.3068	2.48	6.63	0.374 ✔
T2	60 - 40	3/4	4.59	2.20	140.7	21.600	0.4418	3.94	9.54	0.413 ✔
T3	40 - 20	7/8	4.67	2.22	121.6	21.600	0.6013	4.34	12.99	0.334 ✔
T4	20 - 0	7/8	5.48	2.62	143.8	21.600	0.6013	4.27	12.99	0.329 ✔

Horizontal Design Data (Tension)

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 $\frac{P}{P_a}$
T1	80 - 60	3/4	3.37	3.24	207.5	30.000	0.4418	0.67	13.25	0.051 ✔
T2	60 - 40	3/4	3.87	3.67	234.8	30.000	0.4418	1.16	13.25	0.088 ✔
T3	40 - 20	7/8	4.08	3.84	210.4	30.000	0.6013	1.93	18.04	0.107 ✔
T4	20 - 0	7/8	4.58	4.34	237.8	30.000	0.6013	1.84	18.04	0.102 ✔

Top Girt Design Data (Tension)

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 $\frac{P}{P_a}$

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 $\frac{P}{P_a}$
T1	80 - 60	1	3.02	2.89	138.8	30.000	0.7854	0.08	23.56	0.004 ✔
T2	60 - 40	1	3.52	3.32	159.3	30.000	0.7854	1.05	23.56	0.045 ✔
T3	40 - 20	1	4.02	3.78	181.3	30.000	0.7854	1.22	23.56	0.052 ✔
T4	20 - 0	1	4.52	4.28	205.3	30.000	0.7854	0.95	23.56	0.040 ✔

Bottom Girt Design Data (Tension)

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 $\frac{P}{P_a}$
T1	80 - 60	3/4	3.48	3.36	214.9	30.000	0.4418	1.28	13.25	0.096 ✔
T2	60 - 40	1	3.98	3.79	181.7	30.000	0.7854	2.16	23.56	0.092 ✔
T3	40 - 20	1	4.48	4.24	203.7	30.000	0.7854	2.19	23.56	0.093 ✔
T4	20 - 0	1	4.98	4.74	227.7	30.000	0.7854	2.07	23.56	0.088 ✔

Section Capacity Table

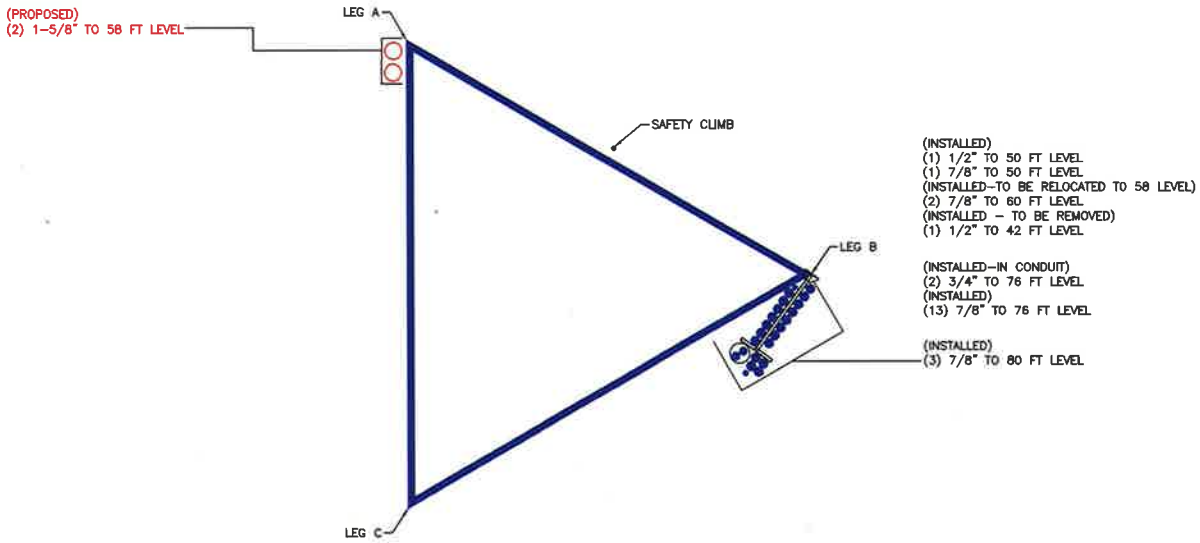
Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
T1	80 - 60	Leg	1 1/2	3	-29.98	47.24	63.5	Pass
T2	60 - 40	Leg	SR 1-3/4 + HP 2 STD	79	-77.13	82.99	92.9	Pass
T3	40 - 20	Leg	2" SR + HP 2.5 XS	157	-120.37	131.12	91.8	Pass
T4	20 - 0	Leg	2.25" SR + HP 2.5 XS	235	-160.11	161.67	99.0	Pass
T1	80 - 60	Diagonal	5/8	10	-2.50	3.11	80.3	Pass
T2	60 - 40	Diagonal	3/4	88	-3.96	4.45	89.0	Pass
T3	40 - 20	Diagonal	7/8	166	-4.10	6.93	59.1	Pass
T4	20 - 0	Diagonal	7/8	244	-4.25	5.79	73.4	Pass
T1	80 - 60	Horizontal	3/4	25	-0.52	4.17	12.4	Pass
T2	60 - 40	Horizontal	3/4	104	-0.97	1.60	60.7	Pass
T3	40 - 20	Horizontal	7/8	227	-1.74	2.70	64.5	Pass
T4	20 - 0	Horizontal	7/8	305	-1.67	2.12	78.8	Pass
T1	80 - 60	Top Girt	1	6	-0.09	16.08	0.5	Pass
T2	60 - 40	Top Girt	1	82	-0.84	6.16	13.7	Pass
T3	40 - 20	Top Girt	1	161	-0.87	4.76	18.3	Pass
T4	20 - 0	Top Girt	1	238	-0.67	3.71	18.1	Pass
T1	80 - 60	Bottom Girt	3/4	7	-1.31	3.88	33.7	Pass
T2	60 - 40	Bottom Girt	1	86	-2.28	4.74	48.2	Pass
T3	40 - 20	Bottom Girt	1	164	-2.27	3.77	60.3	Pass
T4	20 - 0	Bottom Girt	1	242	-2.20	3.02	72.9	Pass
							Summary	
						Leg (T4)	99.0	Pass
						Diagonal	89.0	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
						(T2) Horizontal	78.8	Pass
						(T4) Top Girt	18.3	Pass
						(T3) Bottom Girt	72.9	Pass
						(T4) **RATING =**	**99.0**	**Pass**

Program Version 6.1.4.1 - 4/23/2015 File:C:/Users/CHANGDM/Documents/00-Storage/EQ154501/841298 SOUTHINGTON ROGUS/1148654/Analysis/BU 841298 WO_1080709 Southington Rogus.eri

APPENDIX B

Base Level Drawing



BUSINESS UNIT: 841298 TOWER ID: C_BASELEVEL

BASE LEVEL DRAWING

SCALE: N.T.S.

1

PLOT DATE: 9/23/2015 - FILENAME: 841298_BASELEVEL.dwg

CROWN REGION ADDRESS

USA

29/05/14	NEW BUILD PER WORK ORDER # 770907	JCC
12/06/14	UPDATED PER WORK ORDER # 783300	BCG
4/9/2014	UPDATED PER WORK ORDER 821820	LRW
10/9/2014	UPDATED PER WORK ORDER 838840	BCG
9/4/2015	UPDATED PER WORK ORDER 1040857	AJT
7/9/2015	UPDATED PER WORK ORDER 1054364	NJH
9/9/2015	UPDATED PER WORK ORDER 1073658	CRM
23/9/2015	UPDATED PER WORK ORDER 1080707	AJT

DRAWN BY: MSH
CHECKED BY:
DRAWING DATE: 29/05/14

SITE NUMBER:
SITE NAME:

SITE NAME

SOUTHINGTON ROGUS

BUSINESS UNIT NUMBER

841298

SITE ADDRESS

250 MERIDEN WATERBURY TURNPIKE
SOUTHINGTON, CT 06489
HARTFORD COUNTY
USA

SHEET TITLE

BASE LEVEL

SHEET NUMBER

A1-0

APPENDIX C

Additional Calculations

Project Name:	Southington Rogus	JACOBS® Jacobs Engineering Group. Inc.	Created On: 1/8/2015
Project Number:	BU# 841298		Checked By:
Job Number:			Revised On:
Date:	11/5/2015		Revision No.: 0

SST Additional Anchor Bolts In Drilled Shaft

Code:	F	
Compression Axial (P_c)	160	kip
Compression Shear (V_c)	5	kip
Uplift Axial (P_u)	150	kip
Uplift Shear (V_u)	6	kip

Existing Anchor Rod Analysis		
Number of Bolts	2	
Bolt Grade	A572-50	
Diameter (d)	1.75	in
η	0.5	
Thread Type	Non-Upset	
A_g	2.41	in^2
A_e	1.9	in^2
F_y	50	ksi
F_u	65	ksi
Max Rod (Cu+ Vu/ή):	56.29	kip
Allowable	68.9	kip
Capacity	81.7%	Pass

New Anchor Rod Analysis		
Number of Bolts	2	
Bolt Grade	A193 B7	
Diameter (d)	1.25	in
η	0.5	
Thread Type	Non-Upset	
A_g	1.23	in^2
A_e	0.97	in^2
F_y	105	ksi
F_u	125	ksi
Max Rod (Cu+ Vu/ή):	28.71	kip
Allowable	67.7	kip
Capacity	42.4%	Pass

Pipe Sleeve Bearing Design		
Pipe Fy	46	ksi
Pipe Area	2.51	in^2
Allowable	138.55	k
Capacity	48.8%	Pass

Transfer Plate Design		
Plate Height	15.0	in
Plate Thickness	1.00	in
Plate Length	7	in
F_y	50.0	ksi
E	29000	ksi
Leg Diameter	2.38	in
Anchor Sleeve Diameter	2.38	in
Elastic Section Modulus	37.5	in^3
Plastic Section Modulus	56.3	in^3
Controlling Case	Lateral-Torsional Buckling	
M_n	2812.5	kip-in
φM_n	2239.9	kip-in
M_u	634.6	kip-in
Capacity	28.3%	Pass

Required Embedment Length		
Hilti Bond Strength	1.8	ksi
f_c'	3000	psi
Pier Width	60	in
Rebar Cage Diameter	42	in
Rebar Size	6	
Rebar Grade	60	ksi
New Bolt Circle	18.76	in
l_{dH}	28.7	in
(Ex.) ACI Embed Length	24.6	in
(New) ACI Embed Length	71.9	in
Required Embedment:	**71.9**	**in**

Eccentric Weld Design		
Weld Thickness	5	(1/16ths) in
Weld Strength	70	ksi
Weld Length	15.0	in
e_x	8.19	in
a	0.55	
C	2.16	
C_1	1	
φR_n	107.8	
Capacity	62.8%	Pass

Pullout Test Target Tension		
Load Factor	1.6	
R_{nt}	121.13	kip
φR_{nt}	90.84	kip
Target Tension	**56.78**	**kip**

oject Name:	Southington Rogus	Site Notes:	Created On: 4/30/2015
oject Number:	BU#841298		Checked By: DMC / SR
b Number:			Revised On: 5/5/2015
ate:	11/5/2015		Revision No.: 2.0

JACOBS
Jacobs Engineering Group, Inc.

Built-Up Member Compression Capacity

Code:	F
Controlling Loadcase:	Wind Load

	Material Properties		Original Member Properties						Additional Member Properties					
Elevation	Fy (ksi)	E (ksi)	Member Type	Member Size	Area (in^2)	Moment of Inertia (in^4)	Radius of Gyration (in)	(K*a) / r	Member Type	Member Size	Area (in^2)	Moment of Inertia (in^4)	Radius of Gyration (in)	(K*a) r
0-20	50	29000	SR	SR 2-1/4	3.9761	1.2581	0.5625	21.3333	Half Pipe	P 2.5 XS	1.1268	0.1851	0.4054	29.6037
20-40	50	29000	SR	SR 2	3.1416	0.7854	0.5000	24.0000	Half Pipe	P 2.5 XS	1.1268	0.1851	0.4054	29.6037
40-60	50	29000	SR	SR 1-3/4	2.4053	0.4604	0.4375	27.4286	Half Pipe	P 2 STD	0.5373	0.0635	0.3438	34.9089

	Bracing Properties			Built-Up Member Properties					Compression Capacity Analysis					
Elevation	Connection Type	Connection Spacing (in)	Built-Up Member L_u (in)	Area (in^2)	Moment of Inertia (in^4)	Radius of Gyration (in)	$(K*L_u) / r$	$(K*a)/r \le 0.75*(K*L_u)/r$	$(K*L/r)_m$	F_a (ksi)	F_e (ksi)	$4.71*\sqrt{(E/F_y)}$	F_{cr} (ksi)	φP_n (kip)
0-20	Bolted	12	28	5.1028	1.9966	0.6255	44.7635	Design Sufficient	53.6670	23.7690	99.3764	113.4318	40.5054	161.7196
20-40	Bolted	12	28	4.2684	1.3416	0.5606	49.9433	Design Sufficient	58.0578	23.0462	84.9134	113.4318	39.0782	131.1596
40-60	Bolted	12	28	2.9425	0.6565	0.4724	59.2780	Design Sufficient	68.7933	21.1602	60.4792	113.4318	35.3746	83.0200

		Termination Weld Analysis			Leg Crushing Analysis		Analysis Summary		
Elevation	Applied P_u (kip)	Termination Present?	Fillet Weld Thickness (in)	Required Weld Length (in)	Area Welded to Flange (ratio)	φT_n (kip)	Section Capacity	Controlling Component	TNX K Factor
0-20	160.11	Yes	0.1875	4.8103	1	204.1139	99.0%	Buckling	1.19890
20-40	120.37	Yes	0.1875	4.6641	1	170.7345	91.8%	Buckling	1.16247
40-60	77.13	Yes	0.125	3.0629	0	96.2113	92.9%	Buckling	1.16052

Show TNX Properties For:		40-60	
Height (in):	1.90400	Area (in^2):	2.94255
Width (in):	2.37500	Moment of Inertia (in^4):	0.65653
Wind Projection (in):	2.37500	Section Modulus (in^3):	0.67312
Perimeter (in):	6.47953	Radius of Gyration (in):	0.47235
Modulus (ksi):	29000	(C_w) Warping Constant (in^6):	0
Density (pcf):	490	(J) Torsional Constant (in^4):	1.44979

Project Name:	Southington Rogus	JACOBS® Jacobs Engineering Group, Inc.	Created On: 9/19/2014
Project Number:	BU 841298		Checked By: JTE/SMR
Job Number:	WO 1080709		Revised On: 10/7/2014
Date:	11/5/2015		Revision No.: 0

PiRod Sleeve Connections Stress Check

Input: Properties			Input: Loads		
Elevation:	60	ft - elevation of leg splice connection	Code:	F	- select version of the TIA
Fy:	50	ksi - yield stress of leg	Tu:	26.69	kips - max. leg tension load
Fu:	65	ksi - tensile stress of leg	Pu:	29.98	kips - max. leg comp. load
Dt:	1.5	in - diameter of leg above splice	ASIF:	1.33	- stress increase factor
Db:	1.75	in - diameter of lege below splice	U:	1	- shear lag coefficient
dbolt:	5/8	in - bolt diameter			
Type:	A325N	- select bolt material and condition			
n:	4	- number of bolts			

Leg Capacity:

1.5 inch diameter leg above splice

Gross Allowable Tension = ASIF(0.6)(Fy)(Ag) = (1.33)(0.6)(50ksi)(1.77in²)= **70.69** kips

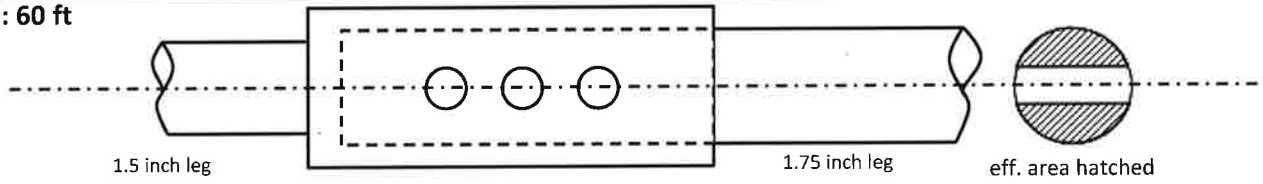
1.75 inch diameter leg below splice

An = Net Area (taking away bolt hole)= 1.23 in²

Gross Allowable Tension = (1.33)(0.6)(Fy)(Ag) = (1.33)(0.6)(50ksi)(2.41in²)= 96.21 kips

Net Allowable Tesion = ASIF(0.5)(U)(Fu)(An) = 1.33(0.5)(1)(65ksi)(1.23in²)= **53.47** kips

Elevation: 60 ft



(4) 0.6875 inch hole diameter

(bolt diameter + 1/16)

(diagram rotated 90° counter-clockwise)

Bolt Capacity:

Fnv/Ω	21.0	ksi
Ag:	0.307	in²
An:	0.226	in²

Allowable Load = (1.333)(21ksi)(0.307in²)(4)(2 shear planes)= **68.71** kips

(17.18 kips per bolt)

Summary:

		Stress Ratio
Leg Above Tension:	**26.69 < 70.69 (Pass)**	37.76%
Leg Below Tension:	**26.69 < 53.47 (Pass)**	**49.92%**
Leg Compression:	**29.98 < 68.71 (Pass)**	43.64%
Leg Splice Bolts:	**29.98 < 68.71 (Pass)**	43.64%

Project Name:	Southington Rogus	JACOBS® Jacobs Engineering Group, Inc.	Created On: 9/19/2014
Project Number:	BU 841298		Checked By: JTE/SMR
Job Number:			Revised On: 10/7/2014
Date:	11/5/2015		Revision No.: 0

PiRod Sleeve Connections Stress Check

Input: Properties			Input: Loads		
Elevation:	40	ft - elevation of leg splice connection	Code:	F	- select version of the TIA
Fy:	50	ksi - yield stress of leg	Tu:	71.15	kips - max. leg tension load
Fu:	65	ksi - tensile stress of leg	Pu:	77.13	kips - max. leg comp. load
Dt:	1.75	in - diameter of leg above splice	ASIF:	1.33	- stress increase factor
Db:	2	in - diameter of lege below splice	U:	1	- shear lag coefficient
dbolt:	5/8	in - bolt diameter			
Type:	A325N	- select bolt material and condition			
n:	5	- number of bolts			

Leg Capacity:

1.75 inch diameter leg above splice

Gross Allowable Tension = ASIF(0.6)(Fy)(Ag) = (1.33)(0.6)(50ksi)(2.41in²)= **96.21** kips

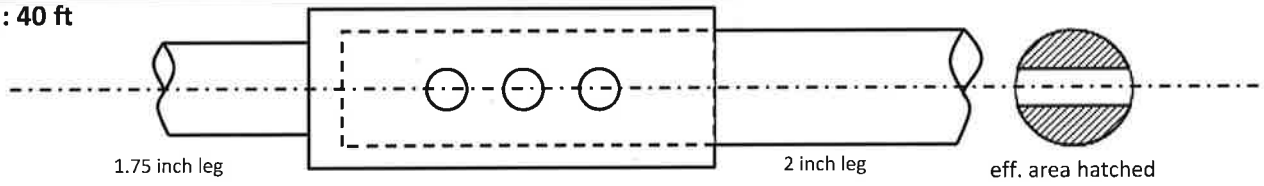
2 inch diameter leg below splice

An = Net Area (taking away bolt hole)= 1.79 in²

Gross Allowable Tension = (1.33)(0.6)(Fy)(Ag) = (1.33)(0.6)(50ksi)(3.14in²)= 125.66 kips

Net Allowable Tesion = ASIF(0.5)(U)(Fu)(An) = 1.33(0.5)(1)(65ksi)(1.79in²)= **77.75** kips

Elevation: 40 ft



(5) 0.6875 inch hole diameter

(bolt diameter + 1/16)

(diagram rotated 90° counter-clockwise)

Bolt Capacity:

Fnv/Ω	21.0 ksi
Ag:	0.307 in²
An:	0.226 in²

Allowable Load = (1.333)(21ksi)(0.307in²)(5)(2 shear planes)= **85.88** kips

(17.18 kips per bolt)

Summary:

		Stress Ratio
Leg Above Tension:	**71.15 < 96.21 (Pass)**	73.95%
Leg Below Tension:	**71.15 < 77.75 (Pass)**	**91.51%**
Leg Compression:	**77.13 < 85.88 (Pass)**	89.81%
Leg Splice Bolts:	**77.13 < 85.88 (Pass)**	89.81%

Project Name:	Southington Rogus	JACOBS® Jacobs Engineering Group. Inc.	Created On: 12/15/2014
Project Number:	BU#841298		Checked By: RK
Job Number:			Revised On: 12/22/2014
Date:	11/5/2015		Revision No.: 0

SST/GT FLANGE BYPASS ANALYSIS

Code	F
P_u	14.50
Leg Section	20'

Material Properties	
F_y (ksi)	50
F_u (ksi)	65
E (ksi)	29000
Weld Strength (ksi)	70

Bypass Dimensions	
Height (in)	36
Width (in)	6
Critical Width (in)	3
Unbraced Length (in)	24
Thickness (in)	0.75

Check Tension	
Tn/Ω	89.775
Tension Capacity (%)	16.15%

AISC 13th Ed. Pg 16.1-26

Check Critical Width Compression	
I (in^4)	0.10546875
A (in^2)	2.25
r (in^2)	0.216506351
k	0.8
kl/r	88.68100135
F_σ	28.134748
Pn/Ω	50.51594004
CW Compression Capacity (%)	28.70%

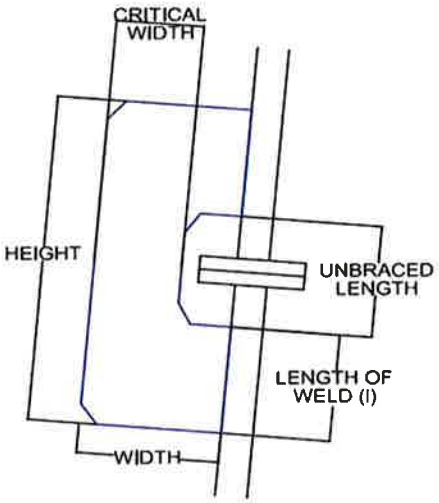
AISC 13th Ed. Pg 16.1-33

Check Welds	
C1	1
D (# of 16ths of fillet weld)	3
l (in)	6
e_x	4.5
a	0.75
C	1.66
Rn/Ω	19.8702
Weld Capacity (%)	72.97%

AISC 13th Ed. Table 8-4

Check Bracket Flexural Yielding	
b	6
a	6
t	0.75
z	0.21
Pn/Ω	37.7055
Bracket Flexural Yielding (%)	38.46%

AISC 13th Ed. Pg 15-3



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

Site Data

BU#: *841298*
Site Name: *Southington Rogus*
App #:

Enter Load Factors Below:		
For P (DL)	1.2	<---- Enter Factor
For P,V, and M (WL)	1.35	<---- Enter Factor

Pad & Pier Data		
Base PL Dist. Above Pier:	0	in
Pier Dist. Above Grade:	6	in
Pad Bearing Depth, D:	5.5	ft
Pad Thickness, T:	3	ft
Pad Width=Length, L:	16	ft
Pier Cross Section Shape:	Square	<--Pull Down
Enter Equiv. Pier Side Width:	8	ft
Concrete Density:	150.0	pcf
Pier Cross Section Area:	64.00	ft^2
Pier Height:	3.00	ft
Soil (above pad) Height:	2.50	ft

Soil Parameters		
Unit Weight, γ:	115.0	pcf
Ultimate Bearing Capacity, qn:	5.00	ksf
Strength Reduct. factor, ϕ:	0.75	
Angle of Friction, Φ:	30.0	degrees
Undrained Shear Strength, Cu:	0.00	ksf
Allowable Bearing: ϕ*qn:	3.75	ksf
Passive Pres. Coeff., Kp	3.00	

Forces/Moments due to Wind and Lateral Soil		
Minimum of (φ*Ultimate Pad Passive Force, Vu):	14.9	kips
Pad Force Location Above D:	1.31	ft
ϕ(Passive Pressure Moment):	19.49	ft-kips
Factored O.T. M(WL), "1.6W":	997.7	ft-kips
Factored OT (MW-Msoil), M1	978.16	ft-kips

Resistance due to Foundation Gravity		
Soil Wedge Projection grade, a:	1.44	ft
Sum of Soil Wedges Wt:	7.64	kips
Soil Wedges ecc, K1:	5.82	ft
Ftg+Soil above Pad wt:	199.2	kips
Unfactored (Total ftg-soil Wt):	206.84	kips
1.2D. **No Soil Wedges.**	255.84	kips
0.9D. **With Soil Wedges**	198.75	kips

Resistance due to Cohesion (Vertical)		
ϕ*(1/2*Cu)(Total Vert. Planes)	0.00	kips
Cohesion Force Eccentricity, K2	0.00	ft

Monopole Base Reaction Forces		
TIA Revision:	F	<--Pull Down
Unfactored DL Axial, PD:	14	kips
Unfactored WL Axial, PW:	0	kips
Unfactored WL Shear, V:	11	kips
Unfactored WL Moment, M:	673	ft-kips

Load Factor	Shaft Factored Loads		
1.20	1.2D+1.6W, Pu:	16.8	kips
0.90	0.9D+1.6W, Pu:	12.6	kips
1.35	Vu:	14.85	kips
	Mu:	908.55	ft-kips

1.2D+1.6W Load Combination, Bearing Results:

(**No Soil Wedges**) [Reaction+Conc+Soil]	255.84	P1="1.2D+1.6W" (Kips)
Factored "1.6W" Overturning Moment (MW-Msoil), M1	978.16	ft-kips

Orthogonal Direction:

ecc1 = M1/P1 =	3.82	ft
Orthogonal qu=	1.95	ksf
qu/ϕ*qn Ratio=	**52.12%**	**Pass**

Diagonal Direction:

ecc2 = (0.707M1)/P1 =	2.70	ft
Diagonal qu=	2.28	ksf
qu/ϕ*qn Ratio=	**60.79%**	**Pass**

Run <-- Press Upon Completing All Input

Overturning Stability Check

0.9D+1.6W Load Combination, Bearing Results:

(**w/ Soil Wedges**) [Reaction+Conc+Soil]	198.75	P2="0.9D+1.6W" (Kips)
Factored "1.6W" Overturning Moment (MW-Msoil) - 0.9(M of Wedge + M of Cohesion), M2	938.19	ft-kips

Orthogonal ecc3 = M2/P2 =	4.72	ft
Ortho Non Bearing Length,NBL=	9.44	ft
Orthogonal qu=	1.89	ksf
Diagonal qu=	2.29	ksf

Max Reaction Moment (ft-kips) so that qu=φ*qn = 100% Capacity Rating			
Actual M:	673.00		
M Orthogonal:	913.45	**73.68%**	**Pass**
M Diagonal:	886.37	**75.93%**	**Pass**

Project Name:	Southington Rogus	JACOBS® Jacobs Engineering Group, Inc.	Created On: 10/10/2014
Project Number:	BU# 841298		Checked By: JTE / DW
Job Number:			Revised On: 1/7/2015
Date:	11/5/2015		Revision No.: 1.2

Self Support Unit Base Structural Checks

Structural Properties		
Tower Width:	5	ft
f'_c:	3000	psi
Concrete Density:	150	pcf
Clear Cover:	6	in
Flexual Rebar Strength:	60	ksi
Tie Strength:	40	ksi

Maximum Single Pier Reactions		
Max Compression:	160	kip
Max Comp. Shear:	5	kip
Max Uplift:	150	kip
Max Uplift Shear:	6	kip
Tower and Foundation Centroids Are Alligned		

Pad Reinforcement (1 Level, 1 Direction):		
Size:	6	
Quantity:	28	

Punching Shear		
b_o:	337.2	in
Vc:	2133.2	kip
φV_n:	1599.9	kip
Punching Shear Capacity:	12.0%	Pass

Pad Beam Shear		
V_c:	607.3	kip
φV_n:	455.5	kip
Critical Shear:	58.6	kip
Beam Shear Capacity:	12.9%	Pass

Pad Flexural Strength		
M_n:	1732.2	kip-ft
φM_n:	1559.0	kip-ft
Applied Moment:	178.2	kip-ft
Flexural Capacity:	11.4%	Pass

APPENDIX D

Modification Drawings

CROWN CASTLE

SITE NAME: SOUTHINGTON ROGUS

BU NUMBER: 841298

SITE ADDRESS: 250 MERIDEN WATERBURY TURNPIKE
SOUTHINGTON, CT 06489

TOWER TYPE: 80 FT SELF SUPPORT TOWER

SITE INFORMATION

LATITUDE (NAD83):
41° 33' 24.54"

LONGITUDE (NAD83):
-72° 51' 10.84"

COUNTY:
HARTFORD

VICINITY MAP

TOWER INFORMATION

FAILING STRUCTURAL ANALYSIS
STRUCTURAL ANALYSIS BY: JACOBS ENGINEERING GROUP, INC.
PROJECT NO.: 1040864
WORK ORDER NO.: 1040864
APPLICATION & REV. NO.: 289375, REV. 6
DATE: 05/11/2015

PASSING STRUCTURAL ANALYSIS
STRUCTURAL ANALYSIS BY: JACOBS ENGINEERING GROUP, INC
PROJECT NO.: 1148554
WORK ORDER NO.: 1148554
CARRIER NAME: VERIZON
APPLICATION & REV. NO.: 289375, REV. 14
DATE: 11/05/2015

PROJECT DESCRIPTION

- EXISTING SELF SUPPORT TOWER TO BE MODIFIED PER SHEET S-1.

ENGINEERS COMMENTS

I HEREBY CERTIFY THAT THIS ENGINEERING DOCUMENT WAS PREPARED BY ME OR UNDER MY DIRECT PERSONAL SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF CONNECTICUT.

APPLICABLE CODES

ALL WORK SHALL BE PERFORMED AND MATERIALS INSTALLED IN ACCORDANCE WITH THE CURRENT EDITIONS OF THE FOLLOWING CODES AS ADOPTED BY THE LOCAL GOVERNING AUTHORITIES. NOTHING IN THESE PLANS IS TO BE CONSTRUED TO PERMIT WORK NOT CONFORMING TO THESE CODES.

- ANSI/TIA-222-F-1996 STANDARD, "STRUCTURAL STANDARD FOR ANTENNA SUPPORTING STRUCTURES AND ANTENNAS"

- INTERNATIONAL BUILDING CODE, 2006 EDITION AS ADOPTED BY STATE OF CONNECTICUT.

DRAWING INDEX

SHEET NO.	SHEET TITLE	REV	DESIGNER
T-1	TITLE SHEET	0	DW
N-1	GENERAL NOTES	0	DW
N-1A	GENERAL NOTES (CONTINUED)	0	DW
N-2	MODIFICATION INSPECTION CHECKLIST	0	DW
S-1	TOWER PROFILE	0	DW
S-2	SPLIT PIPE DETAILS	0	DW
S-3	U-BOLT ASSEMBLY DETAILS	0	DW
S-4	ANCHOR ROD DETAILS	0	DW
S-5	BRIDGE STIFFENER DETAILS	0	DW
S-6	FOUNDATION DETAILS	0	DW

PROJECT CONTACTS

DESIGN ENGINEER - MAIN RFI CONTACT
DI WANG
864-373-3583
5449 BELLS FERRY ROAD
ACWORTH, GA 30102
Di.Wang@jacobs.com

ENGINEER OF RECORD
MATT WATKINS
678-460-1440
5449 BELLS FERRY ROAD
ACWORTH, GA 30102

CROWN TOWER STRUCTURAL ANALYST
TIMOTHY HOWELL
980-209-8242
3530 TORINGDON WAY, SUITE 300
Charlotte, NC 28277

CROWN TOWER MOD PM
MARYELLEN PERROTTA
781-970-0057
Maryellen.Perrotta@crowncastle.com

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.

PLANS PREPARED FOR:
CROWN CASTLE

PLANS PREPARED BY:
JACOBS
Jacobs Engineering Group, Inc.
5449 BELLS FERRY ROAD
ACWORTH, GEORGIA 30102
770-701-2500, FAX: 770-701-2501

OEM:

ENGINEERING LICENSE:
STATE OF CONNECTICUT
MATTHEW E. WATKINS
No. 29955
LICENSED PROFESSIONAL ENGINEER
11/05/15

DRAWING NOTICE:

REVISIONS:

DESCRIPTION	DATE	BY	REV
FIRST ISSUE	11/05/15	DW	0

DRAWN BY:	DW
CHECKED BY:	DMC
APPROVED BY:	MW
JACOBS PROJECT NO:	1148554

SITE NAME:
SOUTHINGTON ROGUS

SITE BU NUMBER:
841298

SITE ADDRESS:
250 MERIDEN WATERBURY TURNPIKE
SOUTHINGTON, CT
06489

SHEET DESCRIPTION:
TITLE SHEET

SHEET NUMBER:
T-1

1.0 **CONSTRUCTION TO CONFORM TO CONSTRUCTION STANDARDS:**

1.1 PURPOSE AND INTENT
(A) THE DRAWINGS AND SPECIFICATIONS ARE INTENDED TO BE FULLY EXPLANATORY AND SUPPLEMENTARY. HOWEVER, SHOULD ANYTHING BE SHOWN, INDICATED OR SPECIFIED ON ONE AND NOT THE OTHER, IT SHALL BE DONE THE SAME AS IF SHOWN, INDICATED OR SPECIFIED IN BOTH SHOULD THERE BE ANY DISCREPANCIES BETWEEN REQUIREMENTS SHOWN IN BOTH, THE MORE STRINGENT REQUIREMENTS SHALL APPLY.
(B) THE INTENTION OF THE DOCUMENTS IS TO INCLUDE ALL LABOR AND MATERIALS REASONABLY NECESSARY FOR THE PROPER EXECUTION AND COMPLETION OF THE WORK AS STIPULATED IN THE CONTRACT.
(C) THE PURPOSE OF THESE CONSTRUCTION SPECIFICATIONS IS TO INTERPRET THE INTENT OF THE DRAWINGS AND TO DESIGNATE THE METHOD OF THE PROCEDURE, TYPE AND QUALITY OF MATERIALS REQUIRED TO COMPLETE THE WORK.

1.2 WORK
ALL WORK PRESENTED ON THESE DRAWINGS MUST BE COMPLETED BY THE CONTRACTOR UNLESS NOTED OTHERWISE (UNO). BY ACCEPTANCE OF THIS ASSIGNMENT, THE CONTRACTOR IS ATTESTING THAT HE DOES HAVE SUFFICIENT EXPERIENCE AND ABILITY, THAT HE IS KNOWLEDGEABLE OF THE WORK TO BE PERFORMED, THAT HE IS PROPERLY LICENSED, AND THAT HE IS PROPERLY REGISTERED TO DO THIS WORK IN THE STATE AND/OR COUNTY IN WHICH THE WORK IS TO BE PERFORMED.

1.3 CONFLICTS
(A) CONTRACTOR SHALL FIELD VERIFY ALL EXISTING CONDITIONS, DIMENSIONS, AND POSSIBLE INTERFERENCES AT THE SITE BEFORE ORDERING MATERIAL OR DOING ANY WORK. ANY AND ALL DISCREPANCIES SHALL BE REPORTED TO THE ENGINEER OF RECORD (EOR) AND APPROPRIATE FIELD PERSONNEL IMMEDIATELY. NO EXTRA CHARGE OR COMPENSATION WILL BE ALLOWED DUE TO DIFFERENCES BETWEEN ACTUAL DIMENSIONS OR DIMENSIONS SHOWN ON PLANS. SUBMIT NOTICE OF ANY DISCREPANCY IN DIMENSIONS OR OTHERWISE TO JACOBS FOR RESOLUTION BEFORE PROCEEDING WITH THE WORK.
(B) NO PLEA OF IGNORANCE OF CONDITIONS THAT EXIST OR OF DIFFICULTIES OF CONDITIONS THAT MAY BE ENCOUNTERED, OR OF ANY OTHER RELEVANT MATTER CONCERNING THE EXECUTION OF THE WORK WILL BE ACCEPTED AS AN EXCUSE FOR ANY FAILURE OR OMISSION ON THE PART OF THE CONTRACTOR TO FULFILL EVERY DETAIL OF ALL THE REQUIREMENTS OF THE CONSTRUCTION DOCUMENTS GOVERNING THE WORK.

1.4 CODES
UNLESS NOTED OTHERWISE USE ONLY THE LATEST ISSUES OF ANY APPLICABLE CODES, STANDARDS, OR REGULATIONS MENTIONED IN THE FOLLOWING NOTES AND SPECIFICATIONS. CONTRACTOR SHALL BE RESPONSIBLE FOR FOLLOWING ALL LAWS, REGULATIONS AND RULES PROMULGATED BY FEDERAL, STATE AND LOCAL AUTHORITIES WITH JURISDICTION OVER THE SITE. THIS RESPONSIBILITY IS IN EFFECT REGARDLESS OF WHETHER THE LAW, ORDINANCE, REGULATION OR RULE IS MENTIONED IN THESE SPECIFICATIONS.

1.5 LICENSING
HAVE AND MAINTAIN A VALID CONTRACTORS LICENSE FOR THE LOCATION IN WHICH THE WORK IS TO BE PERFORMED. FOR JURISDICTIONS THAT LICENSE INDIVIDUAL TRADES, THE TRADESMAN OR SUBCONTRACTORS PERFORMING THOSE TRADES SHALL BE LICENSED. RESEARCH AND COMPLY WITH LICENSING LAWS, PAY LICENSE FEES, AND SELECT AND INFORM SUBCONTRACTORS REGARDING THESE LAWS.

1.6 OSHA
FOLLOW ALL APPLICABLE RULES AND REGULATIONS OF THE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA), AND STATE LAWS BASED IN THE FEDERAL OCCUPATIONAL SAFETY AND HEALTH ACT. THESE REGULATIONS INCLUDE BUT ARE NOT LIMITED TO REGULATIONS DEALING WITH TOWER CONSTRUCTION AND SAFETY, EXCAVATIONS AND TRENCHING, ERECTION OF GUARDS AND BARRIERS, AND WORK IN CONFINED SPACES. ENSURE THAT EMPLOYEES AND SUBCONTRACTORS WEAR HARD HATS AT ALL TIMES DURING CONSTRUCTION. MODIFICATION WORK SHALL BE COMPLETED IN CALM WIND CONDITIONS OR APPROPRIATE WIND SPEED FOR THE TYPE OF MODIFICATION WORK BEING INSTALLED.

1.7 PHOTOS
PROVIDE PHOTOGRAPHIC EVIDENCE OF ALL FOUNDATION INSTALLATION, GROUNDING AND TRENCHING AFTER PLACEMENT OF UTILITIES PRIOR TO BACKFILL.

1.8 BUILDING PERMITS
THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING APPROVALS FROM ALL AUTHORITIES HAVING JURISDICTION FOR THIS PROJECT AND SHALL NOTIFY THE APPLICABLE JURISDICTIONAL (STATE, COUNTY, OR CITY) ENGINEER 24 HOURS PRIOR TO THE BEGINNING OF CONSTRUCTION.

1.9 ZONING REGULATIONS AND CONDITIONAL USE PERMITS
THE CONTRACTOR SHALL BE RESPONSIBLE FOR ABIDING BY ALL CONDITIONS AND REQUIREMENT OF THE PERMITS, INCLUDING BUT NOT LIMITED TO NOISE REGULATIONS, HOURS OF WORK, ACCESS LIMITATIONS, ETC.

1.10 MATERIALS AND EQUIPMENT
ALL MATERIALS AND EQUIPMENT FURNISHED SHALL BE NEW AND OF GOOD QUALITY, FREE FROM FAULTS AND DEFECTS, AND IN CONFORMANCE WITH THE DRAWINGS. ANY AND ALL SUBSTITUTIONS MUST BE DULY APPROVED AND AUTHORIZED IN WRITING BY THE OWNER AND ENGINEER OF RECORD PRIOR TO FABRICATION AND INSTALLATION. THE CONTRACTOR SHALL FURNISH SATISFACTORY EVIDENCE AS TO THE KIND AND QUALITY OF THE MATERIALS AND EQUIPMENT BEING SUBSTITUTED. ALL MANUFACTURER'S HARDWARE ASSEMBLY INSTRUCTIONS SHALL BE FOLLOWED EXACTLY AND SHALL SUPERSEDE ANY CONFLICTING NOTES ENCLOSED HEREIN.

1.11 CLIMBING FACILITIES
THE CLIMBING FACILITIES, SAFETY CLIMB, AND ALL PARTS THEREOF SHALL NOT BE IMPEDED, MODIFIED, OR ALTERED WITHOUT THE EXPRESS APPROVAL OF THE EOR.

1.12 FAA PERMIT AND TOWER LIGHTING
REFER TO CONSTRUCTION DOCUMENTS AND CONSTRUCTION MANAGER FOR FAA AND STATE LIGHTING REQUIREMENTS. CONTRACTOR SHALL PROVIDE TEMPORARY FAA APPROVED LIGHTING UNTIL PERMANENT LIGHTING IS OPERATIONAL.

1.13 TOWER SECURITY
ACCESS TO THE PROPOSED WORK SITE MAY BE RESTRICTED. THE CONTRACTOR SHALL COORDINATE INTENDED CONSTRUCTION ACTIVITY, INCLUDING WORK SCHEDULE AND MATERIAL ACCESS WITH THE RESIDENT LEASING AGENT.

1.14 MODIFICATION PROCESS
STRUCTURAL DESIGN IS FOR THE COMPLETE CONDITION ONLY. THE CONTRACTOR MUST BE COGNIZANT THAT THE REMOVAL OF ANY STRUCTURAL COMPONENT OF AN EXISTING TOWER HAS THE POTENTIAL TO CAUSE THE PARTIAL OR COMPLETE COLLAPSE OF THE STRUCTURE. ALL NECESSARY PRECAUTIONS MUST BE TAKEN TO ENSURE THE STRUCTURAL INTEGRITY, INCLUDING, BUT NOT LIMITED TO, ENGINEERING ASSESSMENT OF CONSTRUCTION STRESSES WITH INSTALLATION MAXIMUM WIND SPEED AND/OR TEMPORARY BRACING AND SHORING. MODIFICATION WORK IS NOT TO BE PERFORMED WHEN THE WIND SPEED EXCEEDS 30 MPH.

1.15 OWNERSHIP
THE DRAWINGS AND SPECIFICATIONS ARE THE PROPERTY OF JACOBS ENGINEERING GROUP, INC. THEY MAY NOT BE REPRODUCED IN ANY FORM WITHOUT THE EXPRESSED WRITTEN CONSENT/PERMISSION OF JACOBS.

1.16 SITE ASSUMPTIONS
FOR THIS ANALYSIS AND MODIFICATION, THE TOWER HAS BEEN ASSUMED TO BE IN GOOD CONDITION WITHOUT ANY DEFECTS. IF THE CONTRACTOR DISCOVERS ANY INDICATION OF AN EXISTING STRUCTURAL DEFECT, CONTACT THE ENGINEER OF RECORD IMMEDIATELY.

1.17 SITE CONTROL
(A) IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO SAFEGUARD ALL EXISTING STRUCTURES OR BURIED SERVICES AFFECTED BY THIS CONSTRUCTION. CONTRACTOR IS ALSO RESPONSIBLE FOR TEMPORARY RELOCATING ANY LINES OR STRUTS AS NECESSARY TO COMPLETE THE REQUIRED WORK.
(B) THE CONTRACTOR IS COMPLETELY RESPONSIBLE FOR CONTAINMENT OF SEDIMENT AND CONTROL OF EROSION AT THE SITE. ANY DAMAGE TO ADJACENT OR DOWNSTREAM PROPERTIES WILL BE CORRECTED BY THE CONTRACTOR.
(C) THE CONTRACTOR IS TO MAINTAIN ADEQUATE DRAINAGE AT ALL TIMES. DO NOT ALLOW WATER TO STAND OR POND. ANY DAMAGE TO STRUCTURES OR WORK ON THE SITE CAUSED BY INADEQUATE MAINTENANCE OF DRAINAGE PROVISIONS WILL BE THE RESPONSIBILITY OF THE CONTRACTOR AND ANY COST ASSOCIATED WITH REPAIRS FOR SUCH DAMAGE WILL BE AT THE CONTRACTOR'S EXPENSE.

1.18 DO NOT SCALE DRAWINGS.

2.0 **STRUCTURAL STEEL NOTES:**

2.1 UNLESS OTHERWISE NOTED, DESIGN, FABRICATION, ERECTION, ALTERATION, AND MAINTENANCE SHALL CONFORM TO THE FOLLOWING:
A. TIA-222, STRUCTURAL STANDARD FOR ANTENNA SUPPORTING STRUCTURES AND ANTENNAS
B. TIA-1019-A, INSTALLATION, ALTERATION, AND MAINTENANCE OF ANTENNA SUPPORTING STRUCTURES AND ANTENNAS
C. AISC MANUAL OF STEEL CONSTRUCTION

2.2 UNLESS OTHERWISE NOTED, ALL STRUCTURAL ELEMENTS SHALL CONFORM TO THE FOLLOWING REQUIREMENTS:

A. ALL STEEL PLATE, ASTM DESIGNATION A572-50 (FY = 50 KSI)
B. ALL ANCHOR RODS, ASTM DESIGNATION A193-B7 (FY = 105 KSI)
C. ANCHOR ROD PIPE, ASTM DESIGNATION A500 GR. B (FY = 42 KSI)
D. ALL SPLIT PIPE STEEL, ASTM DESIGNATION A500 GR. C (FY = 50 KSI)
E. ALL U BOLTS, ASTM DESIGNATION A36 (FY = 36 KSI)
F. ALL BOLTS, ASTM A325 TYPE I GALVANIZED HIGH STRENGTH BOLTS. U.N.O.
G. ALL NUTS, ASTM A563 CARBON AND ALLOY STEEL NUTS
H. ALL WASHERS, ASTM F436 HARDENED STEEL WASHERS
I. ALL OTHER STRUCTURAL STEEL, ASTM DESIGNATION A36 (FY = 36 KSI). U.N.O.
J. ALL GUY WIRE HARDWARE SHALL BE ASTM A475. U.N.O.

U.N.O. = UNLESS NOTED OTHERWISE

2.3 ALL CONNECTIONS NOT FULLY DETAILED ON THESE PLANS SHALL BE DETAILED BY THE STEEL FABRICATOR IN ACCORDANCE WITH AISC MANUAL OF STEEL CONSTRUCTION.

2.4 HOLES SHALL NOT BE FLAME CUT THRU STEEL UNLESS APPROVED BY THE ENGINEER.

2.5 HOT-DIP GALVANIZE ALL ITEMS UNLESS OTHERWISE NOTED, AFTER FABRICATION WHERE PRACTICABLE. GALVANIZING: ASTM A123, ASTM A153/A153M OR ASTM A653/A653M, G90 AS APPLICABLE.

2.6 REPAIR DAMAGED SURFACES WITH GALVANIZING REPAIR METHOD AND PAINT CONFORMING TO ASTM A780 OR BY APPLICATION OF STICK OR THICK PASTED MATERIAL SPECIFICALLY DESIGNED FOR REPAIR OF GALVANIZING. CLEAN AREAS TO BE REPAIRED AND REMOVE SLAG FROM WELDS. HEAT SURFACES TO WHICH STICK OR PASTE MATERIAL IS APPLIED, WITH A TORCH TO A TEMPERATURE SUFFICIENT TO MELT THE METALLICS IN STICK OR PASTED; SPREAD MOLTEN MATERIAL UNIFORMLY OVER SURFACES TO BE COATED AND WIPE OFF EXCESS MATERIAL.

2.7 A NUT LOCKING DEVICE SHALL BE INSTALLED ON ALL PROPOSED AND/OR REPLACED ASTM A325 BOLTS.

2.8 ALL PROPOSED AND/OR REPLACED BOLTS SHALL BE OF SUFFICIENT LENGTH TO EXCLUDE THE THREADS FROM THE SHEAR PLANE.

2.9 ALL PROPOSED AND/OR REPLACED BOLTS SHALL BE OF SUFFICIENT LENGTH SUCH THAT THE END OF THE BOLT BE AT LEAST FLUSH WITH THE FACE OF THE NUT. IT IS NOT PERMITTED FOR THE BOLT END TO BE BELOW THE FACE OF THE NUT AFTER TIGHTENING IS COMPLETED.

2.10 ALL FASTENERS SHALL NOT BE REUSED.

2.11 FOR A LIST OF CROWN APPROVED COLD GALVANIZING COMPOUNDS, REFER TO CROWN ENG-BUL-10149, "TOWER PROTECTIVE COATINGS BULLETIN"

2.12 AFTER FINAL INSPECTION, ALL STRUCTURAL STEEL EXPOSED AS A RESULT OF THIS SCOPE OF WORK, INCLUDING WELDS, FIELD DRILLED HOLES, AND SHAFT INTERIORS (WHERE ACCESSIBLE) SHALL RECEIVE A COLD GALVANIZED COATING. THIS COATING SHALL BE APPLIED BY BRUSH IN ACCORDANCE WITH CROWN ENG-BUL-10149, "TOWER PROTECTIVE COATINGS BULLETIN". PHOTO DOCUMENTATION IS REQUIRED TO BE SUBMITTED TO THE MI INSPECTOR.

3.0 **BOLT-TIGHTENING PROCEDURE:**

3.1 TIGHTEN CONNECTION BOLTS BY AISC "TURN OF THE NUT" METHOD, USING THE CHART BELOW.
BOLT LENGTHS UP TO AND INCLUDING FOUR DIAMETER
¾" BOLTS UP TO AND INCLUDING 4.0 INCH LENGTH + 1/3 TURN BEYOND SNUG TIGHT
⅞" BOLTS UP TO AND INCLUDING 3.5 INCH LENGTH + 1/3 TURN BEYOND SNUG TIGHT
1" BOLTS UP TO AND INCLUDING 4.0 INCH LENGTH + 1/3 TURN BEYOND SNUG TIGHT

BOLT LENGTHS OVER FOUR DIAMETER BUT NOT EXCEEDING EIGHT DIAMETER
¾" BOLTS 4.25 TO 8.0 INCH LENGTH + 1/2 TURN BEYOND SNUG TIGHT
⅞" BOLTS 3.75 TO 7.0 INCH LENGTH + 1/2 TURN BEYOND SNUG TIGHT
1" BOLTS 4.25 TO 8.0 INCH LENGTH + 1/2 TURN BEYOND SNUG TIGHT

3.2 CONNECTION BOLTS SUBJECT TO DIRECT TENSION SHALL BE INSTALLED AND TIGHTENED AS PER SECTION 8(d)(1) OF THE AISC SPECIFICATION FOR STRUCTURAL JOINTS USING A325 OR A490 BOLTS, LOCATED IN THE AISC MANUAL OF STEEL CONSTRUCTION. THE INSTALLATION PROCEDURE IS PARAPHRASED AS FOLLOWS:

AWAY) TURN-OF-THE-NUT TIGHTENING METHOD
BOLTS SHALL BE INSTALLED IN ALL HOLES OF THE CONNECTION AND BROUGHT TO A SNUG TIGHT CONDITION AS DEFINED IN SECTION 8(c). UNTIL ALL THE BOLTS ARE SIMULTANEOUSLY SNUG TIGHT AND THE CONNECTION IS FULLY COMPACTED. FOLLOWING THIS INITIAL OPERATION ALL BOLTS IN THE CONNECTION SHALL BE TIGHTENED FURTHER BY THE APPLICABLE AMOUNT OF ROTATION SPECIFIED ABOVE. DURING THE TIGHTENING O OPERATION THERE SHALL BE NO ROTATION OF THE PART NOT TURNED BY THE WRENCH. TIGHTENING SHALL PROGRESS SYSTEMATICALLY.

3.3 FASTENERS SHALL BE INSTALLED IN PROPERLY ALIGNED HOLES AND TIGHTENED BY ONE OF THE METHODS DESCRIBED IN SUBSECTION 8(d)(1) THROUGH 8(d)(4).

3.4 ALL OTHER BOLTED CONNECTIONS SHALL BE BROUGHT TO A SNUG TIGHT CONDITION AS DEFINED IN SECTION 8(c) OF THE SPECIFICATION.

4.0 **WELDING NOTES:**

4.1 ALL WELDING SHALL BE PERFORMED BY AWS CERTIFIED WELDERS AND SHALL BE DONE IN ACCORDANCE WITH THE AWS D1.1/D1.1M: 2010 "STRUCTURAL WELDING CODE - STEEL."

4.2 UNLESS OTHERWISE NOTED, ALL WELDING SHALL BE DONE UTILIZING E70XX ELECTRODES.

4.3 ALL ARC WELDING ON CROWN STRUCTURES SHALL BE DONE IN ACCORDANCE WITH THE CROWN ENG-PLN-10015, "CUTTING AND WELDING SAFETY PLAN" AND AWS D1.1 (LATEST EDITION). THIS SHALL INCLUDE A CERTIFIED WELDING INSPECTION (CWI) FOR ACCEPTANCE OR REJECTION OF ALL WELDING OPERATIONS, PRE-DURING-POST, USING THE ACCEPTANCE CRITERIA OF AWS D1.1. THE CWI SHALL WORK WITH THE QC ON THE LEVEL OF INTERACTION NEEDED TO CONDUCT THE WELDING INSPECTION. THE CERTIFIED WELDING INSPECTION IS THE RESPONSIBILITY OF THE GC.

4.4 GRIND THE SURFACE ADJACENT TO THE WELD FOR A DISTANCE OF 2" MINIMUM ALL AROUND AND GRIND THE SURFACE OF THE MATERIAL TO BE INSTALLED FOR A DISTANCE OF 2" MINIMUM ALL AROUND THE AREA TO BE WELDED. ENSURE BOTH AREAS ARE 100% FREE OF ALL GALVANIZING. SURFACES TO BE WELDED SHALL BE FREE FROM SCALE, SLAG, RUST, MOISTURE, GREASE OR ANY OTHER FOREIGN MATERIAL THAT WOULD PREVENT PROPER WELDING.

4.5 DO NOT WELD IF THE TEMPERATURE OF THE STEEL IN THE VICINITY OF THE WELD AREA IS BELOW 0°F. WHEN THE TEMPERATURE IS BETWEEN 0°F AND 32°F, PREHEAT AND MAINTAIN THE STEEL IN THE VICINITY OF THE WELD AREA AT 70°F DURING THE WELDING PROCESS.

4.6 DO NOT WELD ON WET OR FROST COVERED SURFACES AND PROVIDE ADEQUATE PROTECTION FROM HIGH WINDS.

4.7 FULL PENETRATION WELDS IN THE VICINITY OF THE 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 THE BASE OF THE TOWER ARE REQUIRED TO BE 50% NDE INSPECTED BY MP IN ACCORDANCE WITH AWS D1.1.

PLANS PREPARED FOR:
CROWN CASTLE

PLANS PREPARED BY:
JACOBS
Jacobs Engineering Group, Inc.
5449 BELLS FERRY ROAD
ACWORTH, GEORGIA 30102
770-701-2500, FAX: 770-701-2501

OEM:

ENGINEERING LICENSE:
STATE OF CONNECTICUT
MATTHEW E. WAY
No. 29955
LICENSED PROFESSIONAL ENGINEER
11/05/15

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SITE NAME:
SOUTHINGTON ROGUS

SITE BU NUMBER:
841298

SITE ADDRESS:
250 MERIDEN WATERBURY TURNPIKE
SOUTHINGTON, CT
06489

SHEET DESCRIPTION:
GENERAL NOTES

SHEET NUMBER:
N-1

5.0 FOUNDATION NOTES:

5.1 ALL FOUNDATION WORK SHALL BE IN ACCORDANCE WITH ALL FEDERAL, STATE, AND LOCAL CODES AND ORDINANCES, AND UNLESS OTHERWISE NOTED, THE LATEST REVISION OF ACI 318, "BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE." PROCEDURES FOR THE PROTECTION OF EXCAVATIONS, EXISTING CONSTRUCTION AND UTILITIES SHALL BE ESTABLISHED PRIOR TO FOUNDATION INSTALLATION

5.2 FOUNDATION DESIGN HAS BEEN DEVELOPED IN ACCORDANCE WITH THE LIMITS OF THE SUBSURFACE DATA PROVIDED. SHOULD SUBSURFACE CONDITIONS VARY FROM THOSE USED IN THE DESIGN, THEN JACOBS SHOULD BE NOTIFIED IMMEDIATELY.

5.3 CONTRACTOR IS REQUIRED TO HAVE ALL NECESSARY INSPECTIONS PERFORMED BY THE LOCAL BUILDING OFFICIAL OR AN APPROVED AGENCY.

5.4 FOUNDATION DESIGN ASSUMES FIELD INSPECTIONS WILL BE PERFORMED TO VERIFY THAT CONSTRUCTION MATERIALS, INSTALLATION METHODS, AND ANY ASSUMED DESIGN PARAMETERS ARE ACCEPTABLE BASED UPON CONDITIONS EXISTING AT THE SITE.

5.5 CONTRACTOR TO VERIFY LOCATION OF ALL EXISTING PUBLIC AND PRIVATE UTILITIES PRIOR TO EXCAVATION. IF NECESSARY, UTILITIES SHALL BE RELOCATED PRIOR TO FOUNDATION MODIFICATION. CONSENT FROM THE TOWER OWNER AND ENGINEER OF RECORD MUST BE OBTAINED TO ENCASE UTILITIES IN CONCRETE.

5.6 EQUIPMENT PAD, SHELTER, AND ICE BRIDGE SUPPORT IS THE RESPONSIBILITY OF THE CONTRACTOR TO COMMISSION. CONTRACTOR SHALL TAKE GREAT CARE AND ALL NECESSARY PROVISIONS WHEN SHORING IS REQUIRED.

5.7 FOUNDATION BACKFILL SHALL BE PLACED IN 8-INCH MAXIMUM LAYERS AND COMPACTED TO 95% OF MAXIMUM DRY DENSITY AS DETERMINED BY ASTM D-698 (STANDARD PROCTOR). ADDITIONALLY, STRUCTURAL BACKFILL MUST HAVE A MINIMUM COMPACTED UNIT WEIGHT OF 120 LBS PER CUBIC FOOT.

5.8 PROPORTIONS OF CONCRETE MATERIALS SHALL BE SUITABLE FOR THE INSTALLATION METHOD UTILIZED AND SHALL RESULT IN DURABLE CONCRETE FOR RESISTANCE TO LOCAL ANTICIPATED AGGRESSIVE ACTIONS. THE DURABILITY REQUIREMENTS OF ACI 318 CHAPTER 4 SHALL BE SATISFIED BASED ON THE CONDITIONS EXPECTED AT THE SITE. THE CONCRETE SHALL DEVELOP A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI IN 28 DAYS. SULFATE RESISTANT CEMENT SHALL BE USED IN AREAS WHICH ARE KNOWN TO HAVE HIGH SULFATES IN SOIL AND GROUND WATER.

5.9 ANY EXPOSED EDGES OF CONCRETE SHALL BE CHAMFERED 3/4" X 3/4" MINIMUM.

5.10 LOOSE MATERIAL SHALL BE REMOVED FROM THE BOTTOM OF EXCAVATION PRIOR TO CONCRETE PLACEMENT. CONCRETE SHALL BE PLACED ON AND AGAINST UNDISTURBED SOIL. AND LOOSE CUTTINGS SHALL BE REMOVED FROM SIDES OF EXCAVATION PRIOR TO CONCRETE PLACEMENT. UNDER NO CIRCUMSTANCES SHALL CONCRETE FALL THROUGH WATER.

5.11 IN COLD WEATHER CONDITIONS, WORK SHALL BE DONE IN ACCORDANCE WITH ACI 306.1-90 (REAPPROVED 2002). SEE ACI 306 FOR DESCRIPTION OF COLD WEATHER CONDITIONS.

5.12 SLUMP TEST SHALL BE PERFORMED ON-SITE TO ENSURE WORKABILITY OF CONCRETE.

5.13 ALL TEST CYLINDERS SHALL BE MADE AND CURED IN ACCORDANCE WITH ASTM C31 COMPRESSION TESTING SHALL BE DONE IN ACCORDANCE WITH ASTM C39. CYLINDERS TO BE BROKEN ON DAY 7 AND DAY 28. (2) ADDITIONAL CYLINDERS SHOULD BE AVAILABLE FOR ANY ADDITIONAL TESTING.

5.14 A SUFFICIENT SAMPLING OF CONCRETE SHALL BE TAKEN TO ENSURE A FAIR REPRESENTATION OF THE CONCRETE USED FOR ALL SLUMP AND COMPRESSION TESTS. NON-CONFORMING MATERIAL SHALL NOT BE ACCEPTED BY THE CONTRACTOR.

5.15 REINFORCEMENT SHALL BE DEFORMED AND CONFORM TO THE REQUIREMENTS OF ASTM A615 GRADE 60 UNLESS NOTED OTHERWISE. SPLICES IN REINFORCEMENT SHALL NOT BE ALLOWED UNLESS NOTED OTHERWISE.

5.16 REINFORCEMENT SHALL BE PROPERLY PLACED PRIOR TO ANY CONCRETE PLACEMENT. REINFORCING SHALL BE BRACED TO RETAIN PROPER DIMENSIONS DURING HANDLING AND THROUGHOUT CONCRETE PLACEMENT.

5.17 MINIMUM CONCRETE COVER FOR REINFORCEMENT SHALL BE 3 INCHES UNLESS OTHERWISE NOTED. APPROVED SPACERS SHALL BE USED TO ENSURE A 3 INCH MINIMUM COVER OF REINFORCEMENT. ALL REINFORCING SHALL BE EQUALLY SPACED UNLESS NOTED OTHERWISE.

5.18 WELDING IS PROHIBITED ON REINFORCING STEEL AND EMBEDMENTS.

5.19 CARE SHALL BE TAKEN DURING INSTALLATION OF DOWELS SO THAT EXISTING REINFORCING STEEL AND ANCHOR BOLTS ARE NOT DAMAGED. CONTRACTOR SHALL USE X-RAY OR OTHER ENGINEER APPROVED NON-DESTRUCTIVE MEANS TO LOCATE EXISTING REINFORCING STEEL AND ANCHOR BOLTS. CONTACT ENGINEER IMMEDIATELY IF EXISTING STEEL IS ENCOUNTERED.

5.20 THE EXISTING FOUNDATION AND DRILLED HOLES ARE TO BE PROPERLY CLEANED PRIOR TO INSTALLATION OF CONCRETE OR ADHESIVE.

6.0 EPOXY/HILTI NOTES:

6.1 ROUGHEN SIDE WALLS OF HOLE PRIOR TO CLEANING TO INSURE MAXIMUM GROUT TO CONCRETE BOND.

6.2 EPOXY AGENTS SHOULD BE ALLOWED TO CURE ACCORDING TO MANUFACTURER'S RECOMMENDATIONS.

6.3 ALL HARDWARE ASSEMBLY AND MANUFACTURER'S INSTRUCTIONS SHALL BE FOLLOWED. ANY CONTRADICTION BETWEEN THE MANUFACTURER'S RECOMMENDATIONS AND THESE DRAWINGS ARE TO BE BROUGHT IMMEDIATELY TO THE ATTENTION OF JACOBS.

6.4 ANY CONTRACTOR INSTALLING ADHESIVE ANCHORING SYSTEMS SHALL BE TRAINED, IN PERSON, BY MANUFACTURER'S REPRESENTATIVE ON THE PROPER INSTALLATION TECHNIQUES. THIS TRAINING SHALL INCLUDE PROPER DRILLING, HOLE CLEANING, AND INSTALLATION METHODS FOR THE ADHESIVE ANCHORING SYSTEM AND CONSTRUCTION CONDITIONS ON THIS PROJECT. ALL TRAINING IS TO BE CONDUCTED PRIOR TO THE CREWS STEPPING ON SITE. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO CONTACT THE MANUFACTURER REPRESENTATIVE TO SET UP TRAINING. JACOBS ENGINEERING GROUP, INC IS NOT RESPONSIBLE FOR ANY COST INCURRED FOR OR DURING ADHESIVE ANCHORING SYSTEM TRAINING.

7.0 PULLOUT TESTING OF POST INSTALLED ANCHOR RODS

7.1 EPOXY AGENTS SHOULD BE ALLOWED TO CURE ACCORDING TO MANUFACTURER'S RECOMMENDATIONS.

7.2 CONTRACTOR SHALL ENSURE THAT CONSTRUCTION DOES NOT GO BEYOND POINT WHERE THE ANCHOR RODS CAN BE EFFECTIVELY TESTED. CONSTRUCTION MAY PROCEED AFTER TESTING IS COMPLETED.

7.3 50% OF POST INSTALLED ANCHOR RODS SHALL BE TESTED OR TOTAL OF 4, WHICHEVER IS GREATER.

7.4 ANCHOR ROD PULL OUT TESTING IS TO BE DONE IN ACCORDANCE WITH CROWN ENG-PRC-10119. THE TARGET TENSION FOR THIS PULL TEST IS 56.7BK.

7.5 MAINTAIN COMPLETE LOAD-DISPLACEMENT RECORDS THROUGHOUT THE TEST. LOAD THE ANCHOR IN INCREMENTS OF UP TO 15% OF THE TARGET TENSION.

7.6 IF A DISPLACEMENT GREATER THAN 0.010" REMAINS AFTER THE INITIAL TEST CYCLE, ADDITIONAL TEST SHALL BE PERFORMED UP TO A MAXIMUM OF 3 TEST CYCLES TO DETERMINE IF THE MOVEMENT CONTINUES TO ACCUMULATE. INCREMENTAL RESIDUAL MOVEMENT RECORDED FROM EACH TEST CYCLE MUST BE DECREASING IN VALUE AND STABILIZE TO A VALUE NO MORE THAN 0.010" OR THE ANCHOR SHALL BE CONSIDERED TO FAIL THE TEST.

7.7 THIS INFORMATION SHALL BE DOCUMENTED AND INCLUDED IN THE POST MODIFICATION INSPECTION REPORT.

7.8 CONTACT JACOBS ENGINEERING GROUP IF ANY OF THE ANCHORS FAIL THE PULL TEST.

PLANS PREPARED FOR:

CROWN CASTLE

PLANS PREPARED BY:

JACOBS
Jacobs Engineering Group, Inc.
5449 BELLS FERRY ROAD
ACWORTH, GEORGIA 30102
770-701-2500, FAX: 770-701-2501

OEM:

ENGINEERING LICENSE:

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JACOBS PROJECT NO:	1148654

SITE NAME:

SOUTHINGTON ROGUS

SITE BU NUMBER:

841298

SITE ADDRESS:

250 MERIDEN WATERBURY TURNPIKE
SOUTHINGTON, CT
06489

SHEET DESCRIPTION:

GENERAL NOTES (CONTINUED)

SHEET NUMBER:

N-1A

MI CHECKLIST

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

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

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 (IF APPLICABLE)
  - 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.

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JACOBS
Jacobs Engineering Group, Inc.
5449 BELLS FERRY ROAD
ACWORTH, GEORGIA 30102
770-701-2500, FAX: 770-701-2501

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MATTHEW E. WATT
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SITE BU NUMBER:
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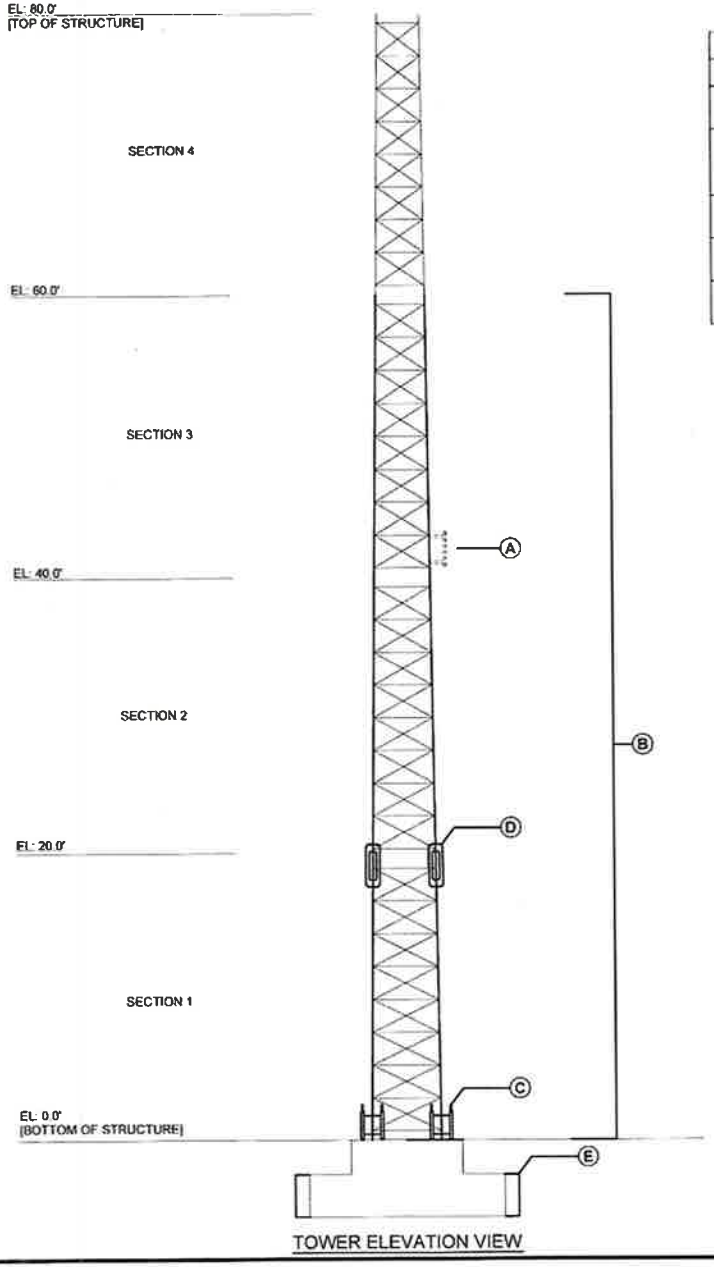
SITE ADDRESS:
250 MERIDEN WATERBURY TURNPIKE
SOUTHINGTON, CT
06489

SHEET DESCRIPTION:
MODIFICATION INSPECTION CHECKLIST

SHEET NUMBER:
N-2



TOWER ELEVATION VIEW

MODIFICATION SCHEDULE		
LETTER	ELEVATION	TYPE OF MODIFICATION
Ⓐ	0.0' TO 42.0'	REMOVE EMPTY MOUNTS, COAX, FEEDLINE WAVEGUIDE LADDER & EQUIPMENT.
Ⓑ	0.0' TO 20.0' 20.0' TO 40.0' 40.0' TO 60.0'	INSTALL SPLIT-PIPE LEG REINFORCEMENT. SEE SHEETS S-2 & S-3 FOR INSTALLATION DETAILS.
Ⓒ	BASE	INSTALL NEW ANCHOR RODS. SEE SHEET S-4 FOR INSTALLATION DETAILS.
Ⓓ	20.0'	INSTALL BRIDGE STIFFENERS AT LEG CONNECTIONS. SEE SHEET S-5 FOR INSTALLATION DETAILS.
Ⓔ	-2.5' TO -5.5'	INSTALL FOUNDATION EXTENSION. SEE SHEET S-6 FOR INSTALLATION DETAILS.

NOTES:

1. MODIFICATIONS TYPICAL FOR ALL TOWER FACES.
2. ANTENNAS AND APPURTENANCES NOT SHOWN FOR CLARITY.
3. COAXIAL CABLES AND ANTENNAS CONFLICTING WITH PROPOSED REINFORCEMENT TO BE TEMPORARY RELOCATED. THE CONTRACTOR SHALL COORDINATE THE WORK WITH CROWN AND THE OWNER OF THE APPURTENANCES INVOLVED.

PLANS PREPARED FOR:

CROWN CASTLE

PLANS PREPARED BY:

JACOBS
Jacobs Engineering Group, Inc.
5449 BELLS FERRY ROAD
ACWORTH, GEORGIA 30102
770-701-2500, FAX: 770-701-2501

OEM:

ENGINEERING LICENSE:

STATE OF CONNECTICUT
MATTHEW E. WATT
No. 29955
LICENSED PROFESSIONAL ENGINEER
11/05/15

DRAWING NOTICE:

REVISIONS:

DESCRIPTION	DATE	BY	REV
FIRST ISSUE	11/05/15	DW	0

DRAWN BY:	DW
CHECKED BY:	DMC
APPROVED BY:	MW
JACOBS PROJECT NO:	1148654

SITE NAME:

SOUTHINGTON ROGUS

SITE BU NUMBER:

841298

SITE ADDRESS:

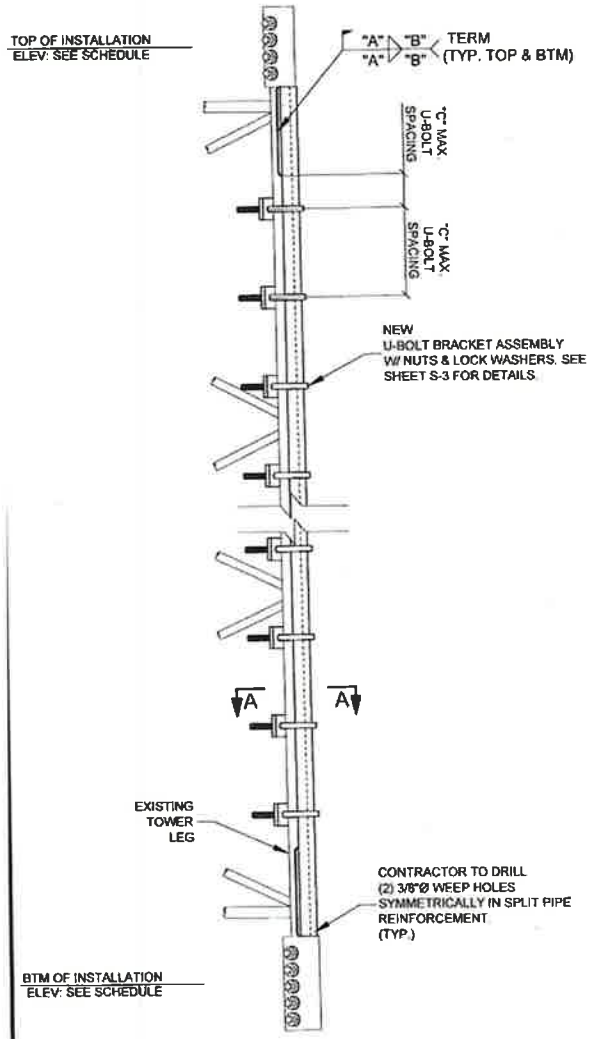
250 MERIDEN WATERBURY TURNPIKE
SOUTHINGTON, CT
06489

SHEET DESCRIPTION:

TOWER PROFILE

SHEET NUMBER:

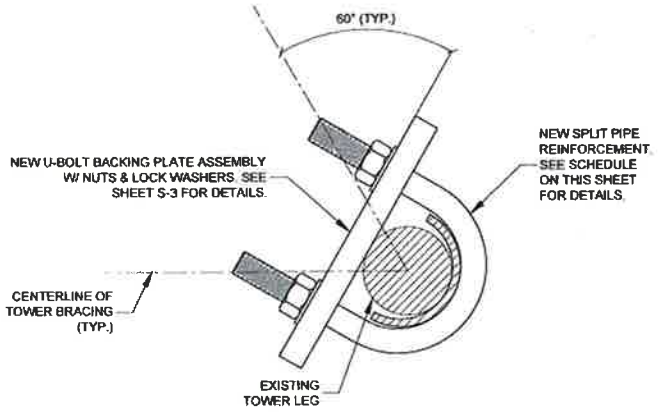
S-1



SPLIT PIPE LEG REINFORCEMENT
ELEVATION VIEW
(TYPICAL LEG DETAIL)

SPLIT PIPE LEG REINFORCEMENT INSTALLATION SCHEDULE							
ELEVATION	EXISTING LEG SIZE	NEW SPLIT PIPE REINFORCEMENT & QTY	PRELIMINARY LENGTH	TERM WELD SIZE "A" (IN)	TERM WELD LENGTH "B" (IN)	MAX. U-BOLT SPACING "C" (IN)	U-BOLT BRACKET ASSEMBLY QTY **
40.0' TO 60.0'	1.75"Ø SR	(3) P2.38" OD X 0.154"	20'-0"	1/8	5	12	(57) UB-1
20.0' TO 40.0'	2"Ø SR	(3) P2.88" OD X 0.276"	20'-0"	3/16	6	12	(57) UB-2
0.0' TO 20.0'	2.25"Ø SR	(3) P2.88" OD X 0.276"	20'-0"	3/16	6	12	(57) UB-2

NOTE: ALL MATERIAL TO BE GALVANIZED
***REMOVE THE EXISTING SUB-HORIZONTALS BEFORE INSTALLING SPLIT PIPE.**
****U-BOLT BRACKET ASSEMBLY TO INCLUDE U-BOLT, BACKING PLATE, (2) NUTS AND (2) LOCK WASHERS EACH.**



SECTION "A-A"
TYPICAL DETAIL

PLANS PREPARED FOR:
CROWN CASTLE

PLANS PREPARED BY:
JACOBS
Jacobs Engineering Group, Inc.
5449 BELLS FERRY ROAD
ACWORTH, GEORGIA 30102
770-701-2500, FAX: 770-701-2501

OEM:

ENGINEERING LICENSE:
STATE OF CONNECTICUT
MATTHEW E. WALKER
No. 29955
LICENSED
PROFESSIONAL ENGINEER
11/05/15

DRAWING NOTICE:

REVISIONS:

DESCRIPTION	DATE	BY	REV
FIRST ISSUE	11/05/15	DW	0

DRAWN BY:	DW
CHECKED BY:	DMC
APPROVED BY:	MW
JACOBS PROJECT NO:	1148554

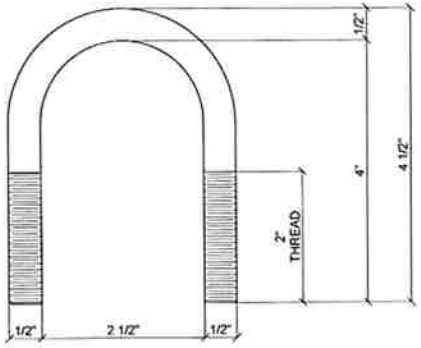
SITE NAME:
SOUTHINGTON ROGUS

SITE BU NUMBER:
841298

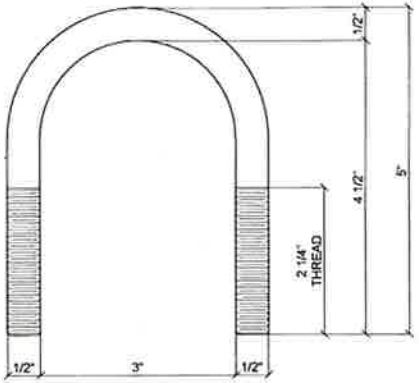
SITE ADDRESS:
250 MERIDEN WATERBURY TURNPIKE
SOUTHINGTON, CT
06489

SHEET DESCRIPTION:
SPLIT PIPE DETAILS

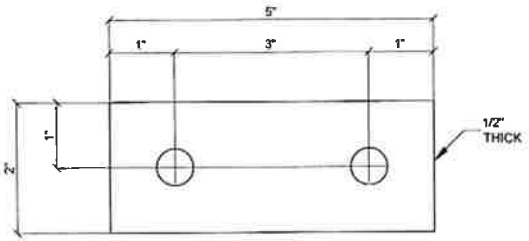
SHEET NUMBER:
S-2



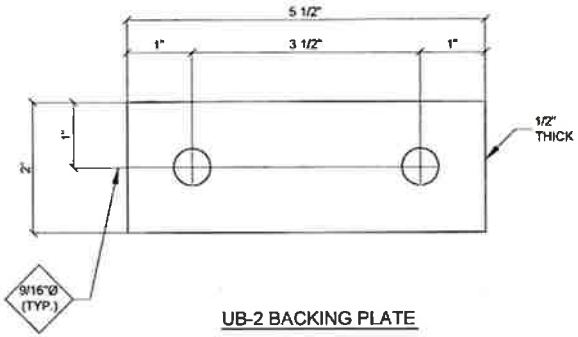
UB-1
1/2"Ø X 3" C/C



UB-2
1/2"Ø X 3 1/2" C/C



UB-1 BACKING PLATE



UB-2 BACKING PLATE

PLANS PREPARED FOR:
CROWN CASTLE

PLANS PREPARED BY:
JACOBS
Jacobs Engineering Group, Inc.
5449 BELLS FERRY ROAD
ACWORTH, GEORGIA 30102
770-701-2500, FAX: 770-701-2501

GEM:

ENGINEERING LICENSE:
STATE OF CONNECTICUT
MATTHEW E. WHITE
No. 29955
LICENSED PROFESSIONAL ENGINEER
11/05/15

DRAWING NOTICE:

REVISIONS:

DESCRIPTION	DATE	BY	REV
FIRST ISSUE	11/05/15	DW	0

DRAWN BY:	DW
CHECKED BY:	OMC
APPROVED BY:	MW
JACOBS PROJECT NO:	1148654

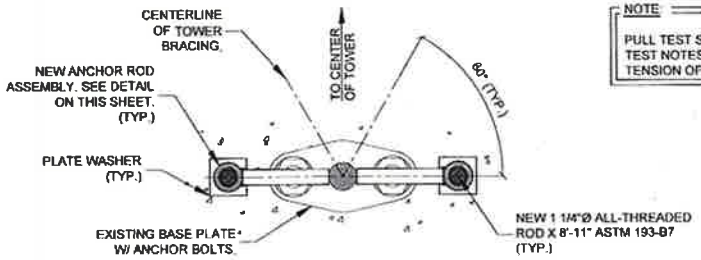
SITE NAME:
SOUTHINGTON ROGUS

SITE BU NUMBER:
841298

SITE ADDRESS:
250 MERIDEN WATERBURY TURNPIKE
SOUTHINGTON, CT
06489

SHEET DESCRIPTION:
U-BOLT ASSEMBLY DETAILS

SHEET NUMBER:
S-3



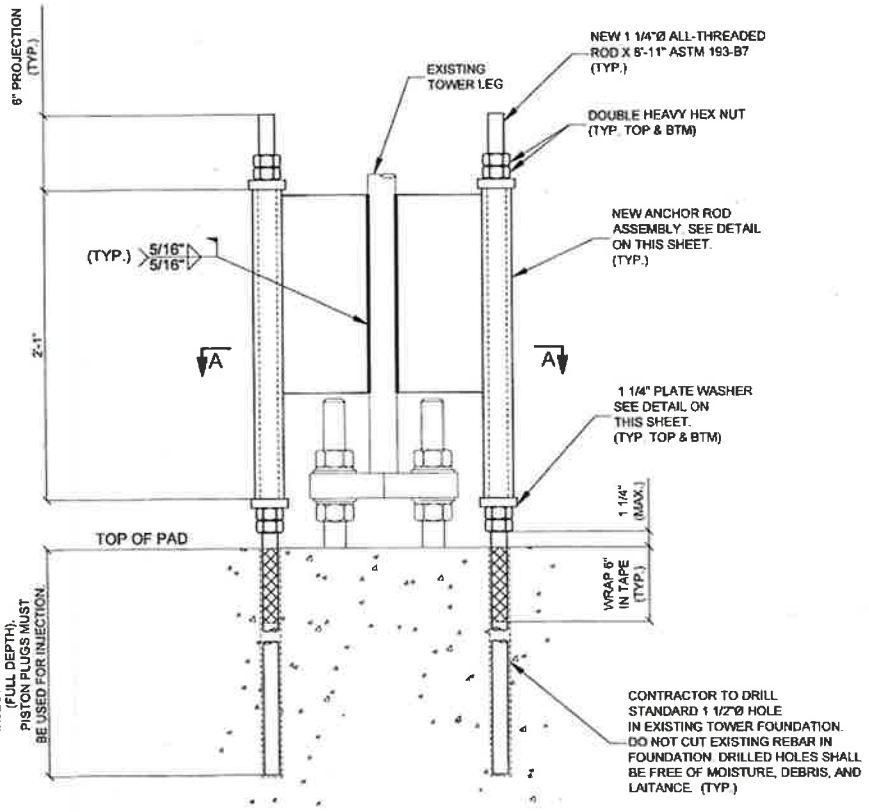
SECTION "A-A"

NOTE

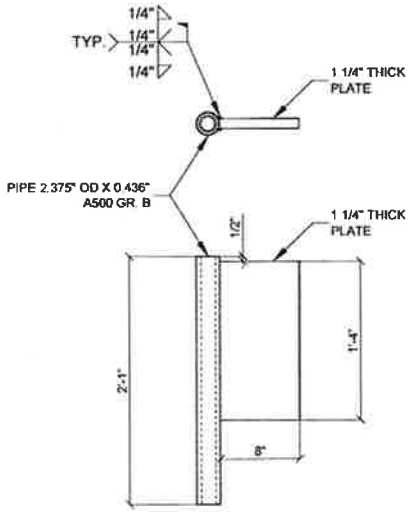
PULL TEST SHOULD BE PERFORMED PER PULL TEST NOTES ON SHEET N-1A. THE TARGET TENSION OF THE PULL TEST IS 56.78K

BILL OF MATERIAL		
ITEM	QUANTITY	DESCRIPTION
1	6	ANCHOR ROD ASSEMBLY
2	6	NEW 1 1/4"Ø X 8'-11" ALL-THREADED ANCHOR ROD
3	24	HEAVY HEX NUT
4	12	PLATE WASHER

NOTE: ALL MATERIAL TO BE GALVANIZED



ANCHOR ROD ELEVATION
LEG DETAIL



ANCHOR ROD ASSEMBLY
TYPICAL DETAIL

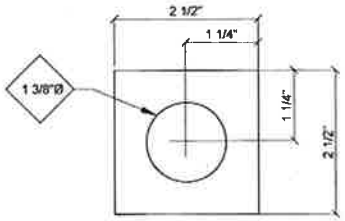


PLATE WASHER
PL 1 1/4" X 2 1/2" X 2 1/2" A572-50

PLANS PREPARED FOR:
CROWN CASTLE

PLANS PREPARED BY:
JACOBS
Jacobs Engineering Group, Inc.
5449 BELLS FERRY ROAD
ACWORTH, GEORGIA 30102
770-701-2500, FAX: 770-701-2501

OEM:

ENGINEERING LICENSE:
STATE OF CONNECTICUT
MATTHEW E. WALSH
No. 25955
LICENSED PROFESSIONAL ENGINEER
11/05/15

DRAWING NOTICE:

REVISIONS:

DESCRIPTION	DATE	BY	REV
FIRST ISSUE	11/05/15	DW	0

DRAWN BY:	DW
CHECKED BY:	DMC
APPROVED BY:	MW
JACOBS PROJECT NO:	1148654

SITE NAME:
SOUTHINGTON ROGUS

SITE BU NUMBER:
841298

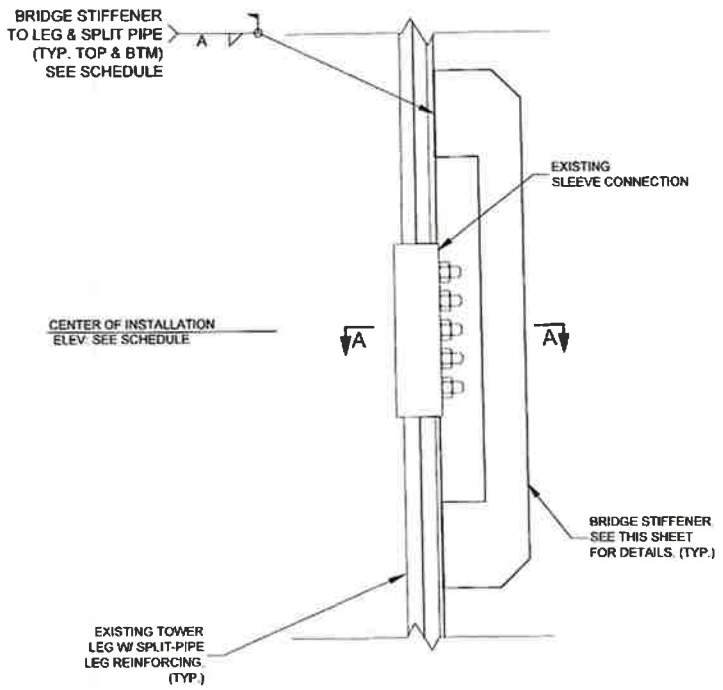
SITE ADDRESS:
250 MERIDEN WATERBURY TURNPIKE
SOUTHINGTON, CT
06489

SHEET DESCRIPTION:
ANCHOR ROD DETAILS

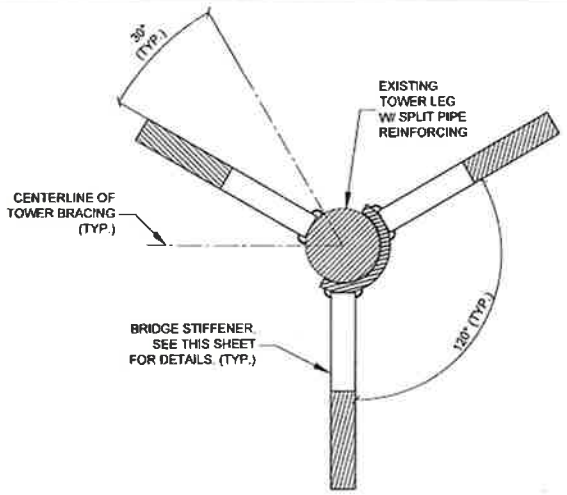
SHEET NUMBER:
S-4

BRIDGE STIFFENER SCHEDULE			
ELEVATION	INTERFERENCE DESCRIPTION	WELD SIZE "A" (IN)	PLATE THICKNESS "B" (IN)
20'-0"	SLEEVE	3/16	1

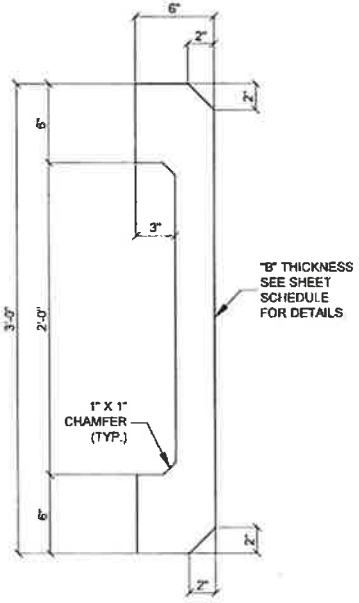
NOTES:
1. ALL MATERIAL TO BE GALVANIZED.
2. (3) BRIDGE STIFFENERS REQUIRED AT EVERY SLEEVE



BRIDGE STIFFENER INSTALLATION
ELEVATION VIEW
(TYPICAL LEG DETAIL)



SECTION "A-A"
TYPICAL DETAIL



BRIDGE STIFFENER
DETAIL

PLANS PREPARED FOR:
CROWN CASTLE

PLANS PREPARED BY:
JACOBS
Jacobs Engineering Group, Inc.
5449 BELLS FERRY ROAD
ACWORTH, GEORGIA 30102
770-701-2500, FAX: 770-701-2501

OEM:

ENGINEERING LICENSE:
STATE OF CONNECTICUT
MATTHEW E. WILLIAMS
No. 29955
LICENSED PROFESSIONAL ENGINEER
11/25/15

DRAWING NOTICE:

REVISIONS:

DESCRIPTION	DATE	BY	REV
FIRST ISSUE	11/05/15	DW	0

DRAWN BY:	DW
CHECKED BY:	DMC
APPROVED BY:	MW
JACOBS PROJECT NO:	1146654

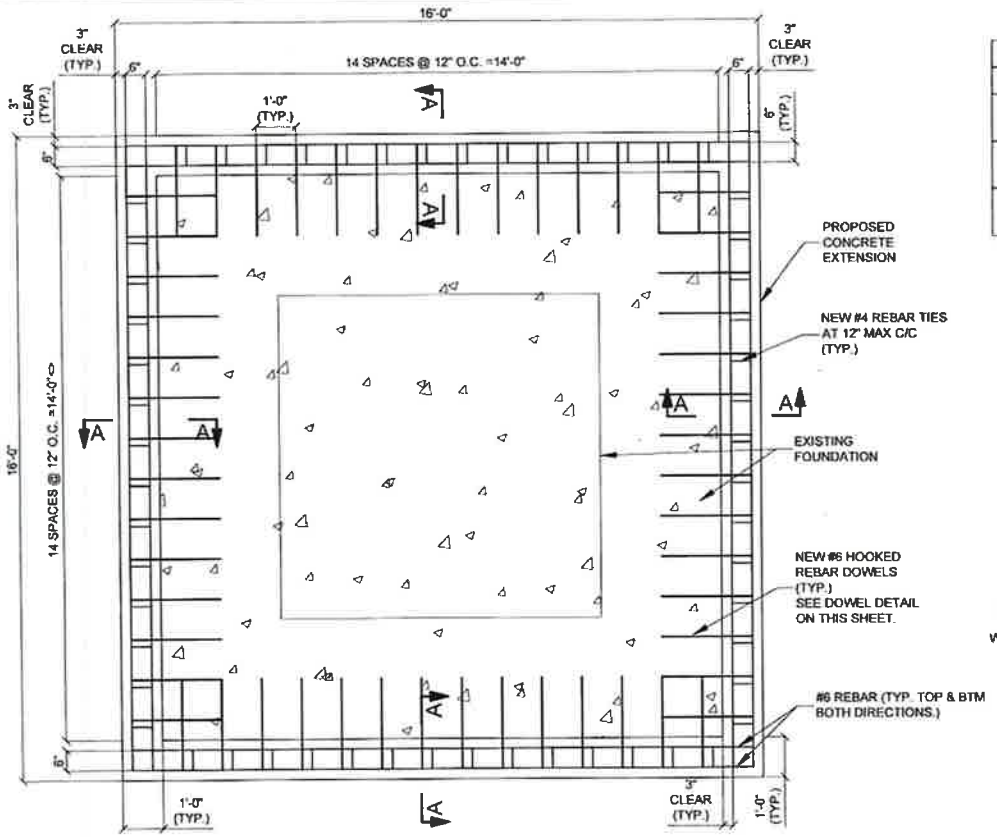
SITE NAME:
SOUTHINGTON ROGUS

SITE BU NUMBER:
841298

SITE ADDRESS:
250 MERIDEN WATERBURY TURNPIKE
SOUTHINGTON, CT
06489

SHEET DESCRIPTION:
BRIDGE STIFFENER DETAILS

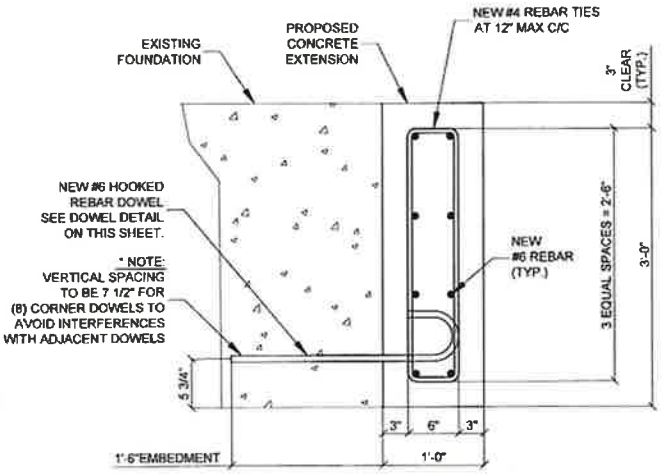
SHEET NUMBER:
S-5



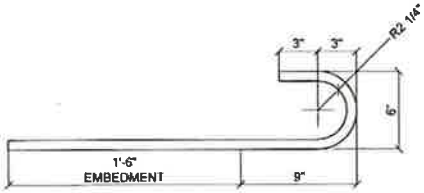
FOUNDATION DETAILS
PLAN VIEW

FOUNDATION MODIFICATION MATERIAL LIST			
SHAPE	QTY.	LENGTH	DESCRIPTION
	32	15'-6"	#6 HORIZONTAL REBAR TOP & BTM
	56	2'-3"	#6 HOOKED DOWELS (SEE DETAIL)
	64	7'-4"	#4 REBAR STIRRUPS W/ 8" OVERLAP (135° HOOKS BOTH ENDS)

*MINIMUM BEND DIAMETER OF REBAR SHOULD BE UTILIZED.



SECTION "A-A"



#6 HOOKED DOWEL DETAIL

NOTES:

1. CONCRETE EXTENSION TO BE INSTALLED ON EXISTING BASE FOUNDATION. TOTAL CONCRETE REQUIRED: 6.67± CUBIC YARDS.
2. CONCRETE COVER OVER REBAR 3" MIN. (TYP.)
3. CONCRETE COMPRESSIVE STRENGTH @ 28 DAYS = 4000 PSI.
4. DRILLED HOLES TO BE 1"Ø. DO NOT CUT REBAR IN EXISTING FOUNDATION.
5. DRILLED HOLES SHALL BE FREE OF MOISTURE, DEBRIS AND LAITANCE.
6. GROUT #6 DOWELS INTO EXISTING FOUNDATION WITH HILTI-RE 500-SD EPOXY WITH THE USE OF PISTON PLUGS (FULL DEPTH).
7. REMOVE ALL LOOSE CONCRETE FROM EXISTING CONCRETE PRIOR TO POURING NEW CONCRETE.
8. CLEAN INTERFACE OF NEW AND EXISTING CONCRETE WITH BUSH HAMMER OR BY SAND BLASTING TO CREATE LEVEL BOND SURFACE AND COAT INTERFACE OF NEW AND EXISTING CONCRETE WITH SIKADUR 32, HI MOD GEL BONDING AGENT, PRIOR TO POURING NEW CONCRETE.
9. CONTRACTOR TO VERIFY LOCATION OF ALL EXISTING PUBLIC AND PRIVATE UTILITIES PRIOR TO EXCAVATION. IF NECESSARY UTILITIES SHALL BE RELOCATED PRIOR TO FOUNDATION MODIFICATION. UTILITIES NOT TO BE ENCASED IN CONCRETE.
10. CONTRACTOR IS FULLY RESPONSIBLE FOR SUPPORTING TOWER DURING ALL PHASES OF CONSTRUCTION. SEE GENERAL NOTE SHEETS.

PLANS PREPARED FOR:
CROWN CASTLE

PLANS PREPARED BY:
JACOBS
Jacobs Engineering Group, Inc.
5449 BELLS FERRY ROAD
ACWORTH, GEORGIA 30102
770-701-2500, FAX: 770-701-2501

OEM:

ENGINEERING LICENSE:
STATE OF CONNECTICUT MATTHEW E. WATKINS No. 29955 LICENSED PROFESSIONAL ENGINEER
11/05/15

DRAWING NOTICE:

REVISIONS:

DESCRIPTION	DATE	BY	REV
FIRST ISSUE	11/05/15	DW	0

DRAWN BY:	DW
CHECKED BY:	DMC
APPROVED BY:	MW
JACOBS PROJECT NO:	1148654

SITE NAME:
SOUTHINGTON ROGUS

SITE BU NUMBER:
841298

SITE ADDRESS:
250 MERIDEN WATERBURY TURNPIKE
SOUTHINGTON, CT
06489

SHEET DESCRIPTION:
FOUNDATION DETAILS

SHEET NUMBER:
S-6

ATTACHMENT 5

	General	Power	Density					
Site Name: Southington I-691								
Tower Height: 80'								
CARRIER	**# OF CHAN.**	**WATTS ERP**	**HEIGHT**	**CALC. POWER DENS**	**FREQ.**	**MAX. PERMISS. EXP.**	**FRACTION MPE**	**Total**
*AT&T UMTS	2	500	78	0.0694	880	0.5867	1.18%	
*AT&T UMTS	1	500	78	0.0347	1900	1.0000	0.35%	
*AT&T LTE	1	500	78	0.0347	700	0.4667	0.74%	
*AT&T LTE	1	500	78	0.0347	1900	1.0000	0.35%	
*AT&T LTE	1	500	78	0.0347	2300	1.0000	0.35%	
*Tran 1480	1	50	84	0.0030	450	0.3000	0.10%	
*ASPA 680	1	50	83.5	0.0030	150	0.2000	0.15%	
*Celwave	1	50	62	0.0057	50	0.2000	0.29%	
*Hygain	1	50	62	0.0057	140	0.2000	0.29%	
*Cellwave	1	50	59	0.0064	150	0.2000	0.32%	
*Cellwave	1	50	59	0.0064	460	0.3067	0.21%	
*Hygain	1	100	39	0.0330	28	0.2296	1.44%	
Verizon	**0**	**0**	**60**	**0.0000**	**1970**	**1.0000**	**0.00%**	
Verizon	**0**	**0**	**60**	**0.0000**	**869**	**0.5793**	**0.00%**	
Verizon	**1**	**2306**	**60**	**0.2303**	**2145**	**1.0000**	**23.03%**	
Verizon	**1**	**1048**	**60**	**0.1047**	**746**	**0.4973**	**21.05%**	
								49.8%
* Source: Siting Council								

ATTACHMENT 6

Robinson + Cole

KENNETH C. BALDWIN

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

Also admitted in Massachusetts

December 21, 2015

Via Certificate of Mailing

Garry Brumback, Town Manager
Town of Southington
75 Main Street
Southington, CT 06489

Re: **Proposed Telecommunications Facility at 250 Meriden Waterbury Turnpike, Southington, Connecticut**

Dear Mr. Brumback:

This firm represents Cellco Partnership d/b/a Verizon Wireless ("Cellco"). Today, Cellco filed a Sub-Petition for Declaratory Ruling ("Sub-Petition") with the Connecticut Siting Council ("Council") seeking approval to install antennas and related equipment on the existing 80-foot tower at 250 Meriden Waterbury Turnpike in Southington (the "Property"). Cellco intends to install six (6) antennas and nine (9) remote radio heads at the 60-foot level on the tower. Two (2) equipment cabinets and an emergency back-up generator will be installed on a concrete pad near the base of the tower.

As presented in the Sub-Petition, the proposed facility improvements at the Property constitute an eligible facility request pursuant to Section 6409(a) of the Federal Middle Class Tax Relief and Job Creation act of 2012 (47 U.S.C. § 1455(a)) and the October 21, 2014 Order of the Federal Communications Commission (FCC-14-533). A copy of the full Sub-Petition is attached for your review. Landowners whose property abuts the Property were also sent notice of this filing along with a copy of the Sub-Petition.

14356227-v1

Pursuant to its decision in Petition No. 1133, comments or concerns regarding this proposal should be submitted to the Council within thirty (30) days of the date of the attached Sub-Petition.

Please contact me if you have any questions regarding this proposal.

Sincerely,

Kenneth C. Baldwin

Attachment

Robinson + Cole

KENNETH C. BALDWIN

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

Also admitted in Massachusetts

December 21, 2015

Via Certificate of Mailing

Mark Sciota
Town Attorney and Deputy Town Manager
Town of Southington
75 Main Street
Southington, CT 06489

Re: **Proposed Telecommunications Facility at 250 Meriden Waterbury Turnpike, Southington, Connecticut**

Dear Mr. Sciota:

This firm represents Cellco Partnership d/b/a Verizon Wireless ("Cellco"). Today, Cellco filed a Sub-Petition for Declaratory Ruling ("Sub-Petition") with the Connecticut Siting Council ("Council") seeking approval to install antennas and related equipment on the existing 80-foot tower at 250 Meriden Waterbury Turnpike in Southington (the "Property"). Cellco intends to install six (6) antennas and nine (9) remote radio heads at the 60-foot level on the tower. Two (2) equipment cabinets and an emergency back-up generator will be installed on a concrete pad near the base of the tower.

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14378347-v1

Robinson+Cole

Pursuant to its decision in Petition No. 1133, comments or concerns regarding this proposal should be submitted to the Council within thirty (30) days of the date of the attached Sub-Petition.

Please contact me if you have any questions regarding this proposal.

Sincerely,

Kenneth C. Baldwin

Attachment

Robinson + Cole

KENNETH C. BALDWIN

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

Also admitted in Massachusetts

December 21, 2015

Via Certificate of Mailing

John Rogus
250 Meriden Waterbury Turnpike
Southington, CT 06489

Re: **Proposed Telecommunications Facility at 250 Meriden Waterbury Turnpike, Southington, Connecticut**

Dear Sir or Madam:

This firm represents Cellco Partnership d/b/a Verizon Wireless ("Cellco"). Today, Cellco filed a Sub-Petition for Declaratory Ruling ("Sub-Petition") with the Connecticut Siting Council ("Council") seeking approval to install antennas and related equipment on the existing 80-foot tower at 250 Meriden Waterbury Turnpike in Southington (the "Property"). Cellco intends to install six (6) antennas and nine (9) remote radio heads at the 60-foot level on the tower. Two (2) equipment cabinets and an emergency back-up generator will be installed on a concrete pad near the base of the tower.

As presented in the Sub-Petition, the proposed facility improvements at the Property constitute an eligible facility request pursuant to Section 6409(a) of the Federal Middle Class Tax Relief and Job Creation act of 2012 (47 U.S.C. § 1455(a)) and the October 21, 2014 Order of the Federal Communications Commission (FCC-14-533). A copy of the full Sub-Petition is attached for your review. Landowners whose property abuts the Property were also sent notice of this filing along with a copy of the Sub-Petition.

14350254-v1

Robinson+Cole

Pursuant to its decision in Petition No. 1133, comments or concerns regarding this proposal should be submitted to the Council within thirty (30) days of the date of the attached Sub-Petition.

Please contact me if you have any questions regarding this proposal.

Sincerely,

Kenneth C. Baldwin

Attachment

ATTACHMENT 7

KENNETH C. BALDWIN

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

Also admitted in Massachusetts

December 21, 2015

Via Certificate of Mailing

«Name_and_Address»

Re: **Proposed Telecommunications Facility at 250 Meriden Waterbury Turnpike, Southington, Connecticut**

Dear «Salutation»:

This firm represents Cellco Partnership d/b/a Verizon Wireless ("Cellco"). Today, Cellco filed a Sub-Petition for Declaratory Ruling ("Sub-Petition") with the Connecticut Siting Council ("Council") seeking approval to install antennas and related equipment on the existing 80-foot tower at 250 Meriden Waterbury Turnpike in Southington (the "Property"). Cellco intends to install six (6) antennas and nine (9) remote radio heads at the 60-foot level on the tower. Two (2) equipment cabinets and an emergency back-up generator will be installed on a concrete pad near the base of the tower.

As presented in the Sub-Petition, the proposed facility improvements at the Property constitute an eligible facility request pursuant to Section 6409(a) of the Federal Middle Class Tax Relief and Job Creation act of 2012 (47 U.S.C. § 1455(a)) and the October 21, 2014 Order of the Federal Communications Commission (FCC-14-533). A copy of the full Sub-Petition is attached for your review.

Pursuant to its decision in Petition No. 1133, comments or concerns regarding this proposal should be submitted to the Council within thirty (30) days of the date of the Sub-Petition.

This notice is being sent to you because you are listed as an owner of land that abuts the Property. If you have any questions regarding the Sub-Petition, the Council's process for reviewing the Sub-Petition or the details of the filing itself, please feel free to contact me at the number listed above. You may also contact the Council directly at 860-827-2935.

Sincerely,

Kenneth C. Baldwin

Attachment

CELLCO PARTNERSHIP D/B/A VERIZON WIRELESS

ABUTTERS LIST

250 MERIDEN WATERBURY TUNPIKE
SOUTHINGTON, CONNECTICUT

	Property Address	**Owner and Mailing Address**
1.	264 Meriden Waterbury Turnpike	Sals Supermarket Inc. c/o Kathleen Michalak 118 Williamsburg Drive Southington, CT 06489
2.	47 Pratt Street	Robert J. and Kathleen R. Celentano 47 Pratt Street Southington, CT 06489
3.	81 Orchard Street	Deborah G. Capristo 81 Orchard Street Plantsville, CT 06479
4.	71 Orchard Street	Carl Lincovich 71 Orchard Street Southington, CT 06489
5.	230 Meriden Waterbury Turnpike	Peter and Lori A. Cammuso 230 Meriden Waterbury Turnpike Southington, CT 06489
6.	247-249 Meriden Waterbury Turnpike	Evaclare Larkin 20 Village Road Southington, CT 06489
7.	Meriden Waterbury Turnpike	Hendels Shell Stations LLC 35 Great Neck Road Waterford, CT 06385
8.	223 Meriden Waterbury Turnpike	Lori K. Holm 223 Meriden Waterbury Turnpike Southington, CT 06489