Filed by:
Kri Pelletier, Property Specialist - SBA Communications
134 Flanders Rd., Suite 125, Westborough, MA 01581
508.251.0720 x 3804 - kpelletier@sbasite.com

September 20, 2016

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

Notice of Exempt Modification
46 Meadow Rd., Clinton, CT 06143
N 41° 16' 30.74"
W -72° 29' 51.76"
AT&T #: 10049127_LTE - CT2230

Dear Ms. Bachman:

AT&T currently maintains nine (9) antennas at the 150-foot level of the existing 199' Lattice Tower at 46 Meadow Rd. The tower is owned by SBA Towers, LLC. The property is owned by Nichol's Used Auto Parts, Inc. AT&T intends to replace three (3) existing RRUs with (3) newer RRUs at the 150-foot level of the tower. AT&T also intends to:

Remove: None

Remove and Replace:

- Remove (3) RRU Ericsson RRUS11 and replace with (3) RRU Ericsson RRUS 32

Install: None

Existing Equipment to Remain (Including entitlements):

- (6) Panel Powerwave 7770 antennas
- (3) Panel KMW AMXCD1465 antennas (entitlements only)
- (3) Panel Andrew SBNHH-ID65A antennas
- (12) 1-5/8" coax
- (6) TMA Powerwave TT19-08-BP111-001
- (12) RET Powerwave 7020
- (3) RRU Ericsson RRUS11
- (3) RRU Modules Ericsson RRU A2
- (1) DC Raycap Surge Suppression System
- (1) ½" Fiber
- (2) ¾" DC lines

This facility was approved by the Clinton Planning and Zoning Commission under Site Plan Application # 99-450 on November 8, 1999. The town called for fencing and assurance that should the tower be abandoned, it would be removed within one year by the owner. This modification complies with all aforementioned conditions.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies §16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. §16.50j-72(b)(2). In accordance with R.C.S.A. § 16.50j-73, a copy of this letter is being sent to Bruce N. Farmer, First Selectman for the Town of Clinton, as well as the property owner. (Separate notice is not being sent to tower owner, as it belongs to SBA.)

The planned modifications to the facility fall squarely within those activities explicitly provided for in R.C.S.A. §16.50j-72(b)(2).

1. The proposed modifications will not result in an increase in the height of the existing structure.
2. The proposed modification will not require the extension of the site boundary.
3. The proposed modifications will not increase noise levels at the facility by six decibels or more, or to levels that exceed state and local criteria.
4. The operation of the replacement antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communications Commission safety standard.
5. The proposed modification will not cause a change or alteration in the physical or environmental characteristics of the site.
6. The existing structure and its foundation can support the proposed loading.

For the foregoing reasons, AT&T respectfully submits that the proposed modifications to the above-referenced telecommunication facility constitute an exempt modifications under R.C.S.A. § 16-50j-72(b)(2).

Sincerely,

Kri Pelletier
Property Specialist
SBA COMMUNICATIONS CORPORATION
134 Flanders Rd., Suite 125
Westborough, MA 01581

508.251.0720 x3804 + T
508.366.2610 + F
203.446.7700 + C
kpelletier@sbasite.com

Attachments
cc: First Selectman Bruce N. Farmer–as elected official
Town of Clinton, 54 East Main Street, Clinton, CT 06413
Nichol's Used Auto Parts, Inc. – as property owner
140 Route 32, Franklin, CT 06254

SBA

POWER DENSITY

Sector:	A	Sector:	B	Sector:	C
Antenna #:	1	Antenna #:	1	Antenna #:	1
Make / Model:	Powerwave 7770	Make / Model:	Powerwave 7770	Make / Model:	Powerwave 7770
Gain:	11.4 / 13.4 dBd	Gain:	11.4 / 13.4 dBd	Gain:	11.4 / 13.4 dBd
Height (AGL):	150.5 feet	Height (AGL):	150.5 feet	Height (AGL):	150.5 feet
Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)
Channel Count	4	Channel Count	4	Channel Count	4
Total TX Power(W):	120 Watts	Total TX Power(W):	120 Watts	Total TX Power(W):	120 Watts
ERP (W):	2,140.89	ERP (W):	2,140.89	ERP (W):	2,140.89
Antenna A1 MPE%	0.48 %	Antenna B1 MPE%	0.48 %	Antenna C1 MPE%	0.48 %
Antenna #:	2	Antenna #:	2	Antenna #:	2
Make / Model:	Commscope SBNHH-1D65A	Make / Model:	Commscope SBNHH-1D65A	Make / Model:	Commscope SBNHH-1D65A
Gain:	10.85 / 14.55 dBd	Gain:	10.85 / 14.55 dBd	Gain:	10.85 / 14.55 dBd
Height (AGL):	150.5 feet	Height (AGL):	150.5 feet	Height (AGL):	150.5 feet
Frequency Bands	700 MHz / 1900 MHz (PCS)	Frequency Bands	700 MHz / 1900 MHz (PCS)	Frequency Bands	700 MHz / 1900 MHz (PCS)
Channel Count	4	Channel Count	4	Channel Count	4
Total TX Power(W):	240 Watts	Total TX Power(W):	240 Watts	Total TX Power(W):	240 Watts
ERP (W):	4,880.65	ERP (W):	4,880.65	ERP (W):	4,880.65
Antenna A2 MPE%	1.13 %	Antenna B2 MPE%	1.13 %	Antenna C2 MPE%	1.13 %
Antenna #:	3	Antenna #:	3	Antenna #:	3
Make / Model:	Powerwave 7770	Make / Model:	Powerwave 7770	Make / Model:	Powerwave 7770
Gain:	11.4 / 13.4 dBd	Gain:	11.4 / 13.4 dBd	Gain:	11.4 / 13.4 dBd
Height (AGL):	150.5 feet	Height (AGL):	150.5 feet	Height (AGL):	150.5 feet
Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)
Channel Count	4	Channel Count	4	Channel Count	4
Total TX Power(W):	120 Watts	Total TX Power(W):	120 Watts	Total TX Power(W):	120 Watts
ERP (W):	2,140.89	ERP (W):	2,140.89	ERP (W):	2,140.89
Antenna A3 MPE%	0.48 %	Antenna B3 MPE%	0.48 %	Antenna C3 MPE%	0.48 %

Site Composite MPE%	
Carrier	MPE%
AT&T – Max per sector	2.08 %
Sprint	0.48 %
T-Mobile	0.01 %
Verizon Wireless	2.13 %
Site Total MPE %:	4.70 %

AT&T Sector A Total:	2.08 %
AT&T Sector B Total:	2.08 %
AT&T Sector C Total:	2.08 %
Site Total:	4.70 %

AT&T Frequency Band / Technology	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu W/cm^2$)	Frequency (MHz)	Allowable MPE ($\mu W/cm^2$)	Calculated % MPE
AT&T 850 MHz UMTS	2	414.12	150.5	1.43	850 MHz	567	0.25%
AT&T 1900 MHz (PCS) UMTS	2	656.33	150.5	2.26	1900 MHz (PCS)	1000	0.23%
AT&T 700 MHz LTE	2	729.71	150.5	2.51	700 MHz	467	0.54%
AT&T 1900 MHz (PCS) LTE	2	1,710.61	150.5	5.89	1900 MHz (PCS)	1000	0.59%
AT&T 850 MHz GSM	2	414.12	150.5	1.43	850 MHz	567	0.25%
AT&T 1900 MHz (PCS) GSM	2	656.33	150.5	2.26	1900 MHz (PCS)	1000	0.23%
						Total:	2.08%

Property Location: 46 MEADOW RD | MAP ID: 85/ 69/ 1/ / | Bldg Name: | State Use: 4022

Vision ID: 6361 | Account # C0092100 | Bldg #: 1 of 1 | Sec #: 1 of 1 | Card 1 of 1 | Print Date: 08/16/2016 14:29

CURRENT OWNER	TOPO.	UTILITIES	STRT./ROAD	LOCATION
NICHOLS AUTO PARTS INC	4	6	1	2
46 MEADOW RD				
CLINTON, CT 06413				
Additional Owners:				

SUPPLEMENTAL DATA

Other ID:

Census 6102
Fireplaces 0
Garage Detached
Bsmt None
GIS ID: 6361
ASSOC PID#

CURRENT ASSESSMENT

Description	Code	Appraised Value	Assessed Value
IND LAND	3-1	245,800	172,100
IND BLDG	3-2	51,600	36,000
IND IMPR	3-3	9,800	6,900
Total		307,200	215,000

6027
CLINTON, CT

VISION

RECORD OF OWNERSHIP

RECORD OF OWNERSHIP	BK-VOL/PAGE	SALE DATE	q/u	v/i	SALE PRICE	V.C.
NICHOLS AUTO PARTS INC	452/ 683	06/21/2011	U	I		
CHARNEY MICHAEL R 1/2 & ROBERT 1/2	442/1250	06/01/2010	U	I		
CHARNEY ANNE LOUISE 1/2 INT;	312/1009	03/11/2001	U	I		
CHARNEY MICHAEL & ANNE LOUISE TIC	239/ 575	07/28/1995	U		0	

PREVIOUS ASSESSMENTS (HISTORY)

Yr.	Code	Assessed Value	Yr.	Code	Assessed Value	Yr.	Code	Assessed Value
2010	3-1	156,400	2009	2-1	196,900	2005	2-1	196,900
2010	3-2	80,200	2009	2-2	95,800	2005	2-2	95,800
2010	3-3	5,000	2009	2-5	5,000	2005	2-5	5,000
	Total:	241,600		Total:	297,700		Total:	297,700

EXEMPTIONS

Year	Type	Description	Amount
		Total:	

OTHER ASSESSMENTS

Code	Description	Number	Amount	Comm. Int.

This signature acknowledges a visit by a Data Collector or Assessor

ASSESSING NEIGHBORHOOD

NBHD/ SUB	NBHD Name	Street Index Name	Tracing	Batch
0001/A				

NOTES

NT=FAIR CONDITION

HEAT - 1 VENT ONLY IN
WAREHOUSE / OFFICE -
ELECTRIC
JUNK YARD / ABUTTS RR

195'. TOWER ON LOT.
SELF SUPPORT/METAL
PAD & CELL SHLTR SEP
TOWER DELETED-02 SEE PP
C/E TO REMOVE SBB EQUIP

APPRAISED VALUE SUMMARY

Appraised Bldg. Value (Card)	75,000
Appraised XF (B) Value (Bldg)	0
Appraised OB (L) Value (Bldg)	9,800
Appraised Land Value (Bldg)	245,800
Special Land Value	0
Total Appraised Parcel Value	307,200
Valuation Method:	I
Adjustment:	0
Net Total Appraised Parcel Value	307,200

BUILDING PERMIT RECORD

Permit ID	Issue Date	Type	Description	Amount	Insp. Date	% Comp.	Date Comp.	Comments
B-12-0262	04/11/2012	CM	Commercial	5,000		0		CAR PORT OVER CAR
PL-11-0059	02/16/2011		Propane Tank	2,500		0		500 Gallon Propane tank
E-11-0049	02/08/2011		Electrical	2,000		0		Upgrade TMobil equipm
B-11-0043	02/03/2011		Telecom Equip	26,000		0		Cabinet/Antenna,cables
B-10-0090	03/02/2010		BUILDING	96,000		0		TEL COM PAD/STRUC
04-153	04/19/2004		SHED/ANTENNAES	40,000	10/13/2004	100	07/08/2004	FOR CELL TOWER
03-9	01/14/2002		CONC PAD	53,000	10/13/2004	100	07/07/2004	FOR CELL TOWER

VISIT/ CHANGE HISTORY

Date	Type	IS	ID	Cd.	Purpose/Result
12/17/2009			JB	00	Measur+Listed
05/06/1999			BD	00	Measur+Listed

LAND LINE VALUATION SECTION

B #	Use Code	Use Description	Zone	D	Front	Depth	Units	Unit Price	I. Factor	S.A.	Acre Disc	C. Factor	ST. Idx	Adj.	Notes- Adj	Special Pricing	S Adj Fact	Adj. Unit Price	Land Value
1	4022	IND BLDG	I-2				1.00 AC	100,000.00	1.0000	C	1.0000	1.00	1500	0.90			1.00		90,000
1	4022	IND BLDG	I-2				11.80 AC	20,000.00	1.0000	0	1.0000	1.00	1100	0.66	TOPO		1.00		155,800

Total Card Land Units: 12.80 AC | Parcel Total Land Area: 12.8 AC | Total Land Value: 245,800

Property Location: 46 MEADOW RD | MAP ID: 85/ 69/ 1/ / | Bldg Name: | State Use: 4022

Vision ID: 6361 | Account # C0092100 | Bldg #: 1 of 1 | Sec #: 1 of 1 | Card 1 of 1 | Print Date: 08/16/2016 14:29

CONSTRUCTION DETAIL

Element	Cd.	Ch.	Description
Style	51		Pre-Eng Gar
Model	96		Ind/Comm
Grade	02		Below Average
Stories	1		
Occupancy	1		
Exterior Wall 1	27		Pre-finsh Metl
Exterior Wall 2			
Roof Structure	03		Gable/Hip
Roof Cover	01		Metal/Tin
Interior Wall 1	01		Minim/Masonry
Interior Wall 2			
Interior Floor 1	03		Concr-Finished
Interior Floor 2			
Heating Fuel	02		Oil
Heating Type	03		Hot Air-no Duc
AC Type	01		None
Bldg Use	4022		IND BLDG
Total Rooms			
Total Bedrms	00		
Total Baths	0		
Heat/AC	00		NONE
Frame Type	05		STEEL
Baths/Plumbing	02		AVERAGE
Ceiling/Wall	00		NONE
Rooms/Prtns	02		AVERAGE
Wall Height	14		
% Comn Wall	0		

CONSTRUCTION DETAIL (CONTINUED)

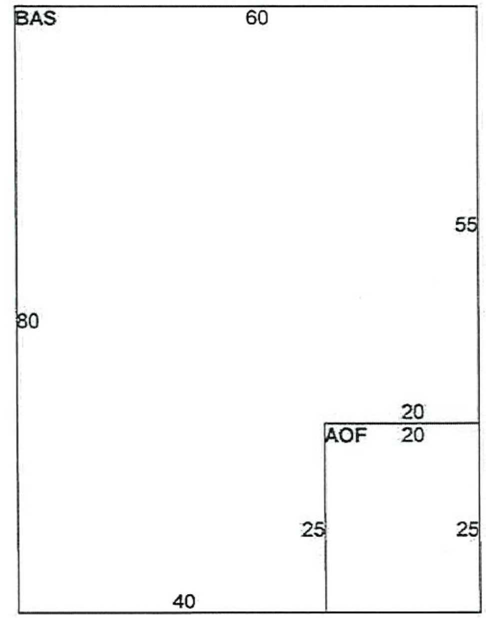
Element	Cd.	Ch.	Description

MIXED USE

Code	Description	Percentage
4022	IND BLDG	100

COST/MARKET VALUATION

Adj. Base Rate:	36.79
	183,040
Net Other Adj:	0.00
Replace Cost	183,040
AYB	1974
Dep Code	P
Remodel Rating	
Year Remodeled	
Dep %	39
Functional Obslnc	20
External Obslnc	0
Cost Trend Factor	1
Condition	
% Complete	
Overall % Cond	41
Apprais Val	75,000
Dep % Ovr	0
Dep Ovr Comment	
Misc Imp Ovr	0
Misc Imp Ovr Comment	
Cost to Cure Ovr	0
Cost to Cure Ovr Comment	



OB-OUTBUILDING & YARD ITEMS(L) / XF-BUILDING EXTRA FEATURES(B)

Code	Description	Sub	Sub Descript	L/B	Units	Unit Price	Yr	Gde	Dp Rt	Cnd	%Cnd	Apr Value
FGR1	GARAGE-AVE			L	576	34.00	2000		0		50	9,800

BUILDING SUB-AREA SUMMARY SECTION

Code	Description	Living Area	Gross Area	Eff. Area	Unit Cost	Undeprec. Value
AOF	Office, (Average)	500	500		49.67	24,835
BAS	First Floor	4,300	4,300		36.79	158,206
	Ttl. Gross Liv/Lease Area:	4,800	4,800	4,975		183,040

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

AT&T Existing Facility

Site ID: CT2230

Clinton Meadow Rd
46 Meadow Road
Clinton, CT 06413

September 12, 2016

EBI Project Number: 6216003969

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general public allowable limit:	**4.70 %**

21 B Street · Burlington, MA 01803 · Tel: (781) 273.2500 · Fax: (781) 273.3311

EBI Consulting

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September 12, 2016

AT&T Mobility – New England
Attn: Cameron Syme, RF Manager
550 Cochituate Road
Suite 550 – 13&14
Framingham, MA 06040

Emissions Analysis for Site: **CT2230 – Clinton Meadow Rd**

EBI Consulting was directed to analyze the proposed AT&T facility located at **46 Meadow Road, Clinton, CT**, for the purpose of determining whether the emissions from the Proposed AT&T Antenna Installation located on this property are within specified federal limits.

All information used in this report was analyzed as a percentage of current Maximum Permissible Exposure (% MPE) as listed in the FCC OET Bulletin 65 Edition 97-01and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter (μW/cm2). The number of $\mu W/cm^2$ calculated at each sample point is called the power density. The exposure limit for power density varies depending upon the frequencies being utilized. Wireless Carriers and Paging Services use different frequency bands each with different exposure limits, therefore it is necessary to report results and limits in terms of percent MPE rather than power density.

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

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

Public exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu W/cm^2$). The general population exposure limits for the 700 and 850 MHz Bands are approximately 467 $\mu W/cm^2$ and 567 $\mu W/cm^2$ respectively. The general population exposure limit for the 1900 MHz (PCS), 2100 MHz (AWS) and 2300 MHz (WCS) bands is 1000 $\mu W/cm^2$. Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.

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

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed AT&T Wireless antenna facility located at **46 Meadow Road, Clinton, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since AT&T is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was focused at the base of the tower. For this report the sample point is the top of a 6-foot person standing at the base of the tower.

For all calculations, all equipment was calculated using the following assumptions:

1) 2 UMTS channels (850 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

2) 2 UMTS channels (1900 MHz (PCS)) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

3) 2 LTE channels (700 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.

4) 2 LTE channels (1900 MHz (PCS)) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.

5) 2 GSM channels (850 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

6) 2 GSM channels (1900 MHz (PCS)) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

7) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.

8) For the following calculations the sample point was the top of a 6-foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufactures supplied specifications minus 10 dB was used in this direction. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

9) The antennas used in this modeling are the **Powerwave 7770 and the Commscope SBNHH-1D65A** for transmission in the 700 MHz, 850 MHz and 1900 MHz (PCS) frequency bands. This is based on feedback from the carrier with regards to anticipated antenna selection. Maximum gain values for all antennas are listed in the Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

10) The antenna mounting height centerlines of the proposed antennas are **150.5 feet** above ground level (AGL) for **Sector A**, **150.5 feet** above ground level (AGL) for **Sector B** and **150.5 feet** above ground level (AGL) for Sector C.

11) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.

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

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AT&T Site Inventory and Power Data by Antenna

Sector:	A	Sector:	B	Sector:	C
Antenna #:	1	Antenna #:	1	Antenna #:	1
Make / Model:	Powerwave 7770	Make / Model:	Powerwave 7770	Make / Model:	Powerwave 7770
Gain:	11.4 / 13.4 dBd	Gain:	11.4 / 13.4 dBd	Gain:	11.4 / 13.4 dBd
Height (AGL):	**150.5 feet**	Height (AGL):	**150.5 feet**	Height (AGL):	**150.5 feet**
Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)
Channel Count	4	Channel Count	4	Channel Count	4
Total TX Power(W):	120 Watts	Total TX Power(W):	120 Watts	Total TX Power(W):	120 Watts
ERP (W):	2,140.89	ERP (W):	2,140.89	ERP (W):	2,140.89
Antenna A1 MPE%	**0.48 %**	Antenna B1 MPE%	**0.48 %**	Antenna C1 MPE%	**0.48 %**
Antenna #:	2	Antenna #:	2	Antenna #:	2
Make / Model:	Commscope SBNHH-1D65A	Make / Model:	Commscope SBNHH-1D65A	Make / Model:	Commscope SBNHH-1D65A
Gain:	10.85 / 14.55 dBd	Gain:	10.85 / 14.55 dBd	Gain:	10.85 / 14.55 dBd
Height (AGL):	**150.5 feet**	Height (AGL):	**150.5 feet**	Height (AGL):	**150.5 feet**
Frequency Bands	700 MHz / 1900 MHz (PCS)	Frequency Bands	700 MHz / 1900 MHz (PCS)	Frequency Bands	700 MHz / 1900 MHz (PCS)
Channel Count	4	Channel Count	4	Channel Count	4
Total TX Power(W):	240 Watts	Total TX Power(W):	240 Watts	Total TX Power(W):	240 Watts
ERP (W):	4,880.65	ERP (W):	4,880.65	ERP (W):	4,880.65
Antenna A2 MPE%	**1.13 %**	Antenna B2 MPE%	**1.13 %**	Antenna C2 MPE%	**1.13 %**
Antenna #:	3	Antenna #:	3	Antenna #:	3
Make / Model:	Powerwave 7770	Make / Model:	Powerwave 7770	Make / Model:	Powerwave 7770
Gain:	11.4 / 13.4 dBd	Gain:	11.4 / 13.4 dBd	Gain:	11.4 / 13.4 dBd
Height (AGL):	**150.5 feet**	Height (AGL):	**150.5 feet**	Height (AGL):	**150.5 feet**
Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)
Channel Count	4	Channel Count	4	Channel Count	4
Total TX Power(W):	120 Watts	Total TX Power(W):	120 Watts	Total TX Power(W):	120 Watts
ERP (W):	2,140.89	ERP (W):	2,140.89	ERP (W):	2,140.89
Antenna A3 MPE%	**0.48 %**	Antenna B3 MPE%	**0.48 %**	Antenna C3 MPE%	**0.48 %**

Site Composite MPE%	
Carrier	MPE%
AT&T – Max per sector	**2.08 %**
Sprint	0.48 %
T-Mobile	0.01 %
Verizon Wireless	2.13 %
Site Total MPE %:	**4.70 %**

AT&T Sector A Total:	2.08 %
AT&T Sector B Total:	2.08 %
AT&T Sector C Total:	2.08 %
Site Total:	4.70 %

AT&T _ Frequency Band / Technology	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu W/cm^2$)	Frequency (MHz)	Allowable MPE ($\mu W/cm^2$)	Calculated % MPE
AT&T 850 MHz UMTS	2	414.12	150.5	1.43	850 MHz	567	0.25%
AT&T 1900 MHz (PCS) UMTS	2	656.33	150.5	2.26	1900 MHz (PCS)	1000	0.23%
AT&T 700 MHz LTE	2	729.71	150.5	2.51	700 MHz	467	0.54%
AT&T 1900 MHz (PCS) LTE	2	1,710.61	150.5	5.89	1900 MHz (PCS)	1000	0.59%
AT&T 850 MHz GSM	2	414.12	150.5	1.43	850 MHz	567	0.25%
AT&T 1900 MHz (PCS) GSM	2	656.33	150.5	2.26	1900 MHz (PCS)	1000	0.23%
						Total:	2.08%

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Summary

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

The anticipated maximum composite contributions from the AT&T facility as well as the site composite emissions value with regards to compliance with FCC's allowable limits for general public exposure to RF Emissions are shown here:

AT&T Sector	Power Density Value (%)
Sector A:	2.08 %
Sector B:	2.08 %
Sector C:	2.08 %
AT&T Maximum Total (per sector):	2.08 %
Site Total:	4.70 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **4.70 %** of the allowable FCC established general public limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

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

TES

Tower Engineering Solutions

Phone (972) 483-0607, Fax (972) 975-9615
8445 Freeport Parkway, Suite 375, Irving, Texas 75063

Structural Analysis Report

Existing 195 ft Sabre Self Supporting Tower

Customer Name: SBA Communications Corp

Customer Site Number: CT01879-S

Customer Site Name: Clinton 4 CT

Carrier Name: AT&T

Carrier Site ID / Name: 10049127

Site Location: 46 Meadow Road

Clinton, Connecticut

Middlesex County

Latitude: 41.275205

Longitude: -72.497711

Analysis Result:

Max Structural Usage: 100% [Pass]

Max Foundation Usage: 100% [Pass]

Report Prepared By : Ram Kodali

STATE OF CONNECTICUT
HANMING YOU
28931
LICENSED
PROFESSIONAL ENGINEER

8/29/16

Introduction

The purpose of this report is to summarize the analysis results on the 195 ft Sabre Self Supporting Tower to support the proposed antennas and transmission lines in addition to those currently installed. Any modification listed under Sources of Information was assumed completed and was included in this analysis.

Sources of Information

Tower Drawings	Sabre, Job # 00-10101, dated 11/19/99
Foundation Drawing	Sabre, Dwg # 9014022, dated 11/23/99
Geotechnical Report	JGI, Project # 99500G, dated 12/13/99 Original design soil parameters from Sabre Job # 00-10101, dated 11/23/99
Modification Drawings	FDH, Project # 1465YH1400, dated 6/3/14 FDH, Project # 15BZTJ1400, dated 9/24/15

Analysis Criteria

The analysis was performed in accordance with the requirements and stipulations of the ANSI/TIA/EIA 222-F. In accordance with this standard, the structure was analyzed using **TESTowers,** a proprietary analysis software. The program considers the structure as an elastic 3-D model with second-order effects and temperature effects incorporated in the analysis. The analysis was performed using multiple wind directions.

Basic Wind Speed Used in the Analysis:	85 mph (fastest mile)
Basic Wind Speed with Ice:	74 mph (fastest mile) with 1/2” radial ice concurrent
Operational Wind Speed:	50 mph + 0” Radial ice
Standard/Codes:	ANSI/TIA/EIA 222-F / 2005 Connecticut State Building Code
Exposure Category:	C
Crest Height:	0 ft

Existing Antennas, Mounts and Transmission Lines

The table below summarizes the antennas, mounts and transmission lines that were considered in the analysis as existing on the tower.

Items	Elevation (ft)	Qty.	Antenna Descriptions	Mount Type & Qty.	Transmission Lines	Owner
1	194.0	3	AIR 21 B2A B4P - Panel	(3) Sector Frame	(12) 1 5/8" (1) 1 5/8" Fiber	T-Mobile
2		3	AIR 21 B4A B2P - Panel			
3	192.5	3	KRY 112 144/1			
4	184.0	1	PD1151	Direct	(1) 7/8"	Town of Clinton
5	182.0	3	APXVTM14-C-120 - Panel	(3) Sector Frame	(4) 1 1/4"	Sprint
6		3	APXVSPP18-C-A20 - Panel			
7		3	TD-RRH8x20-25			
8		3	1900 MHz RRH			
9		3	800 MHz RRH			
10		4	ACU-A20-N			
11		3	ALU 800 MHz Filter			
12	162.0	6	SBNHH-1D65B - Panel	(3) Sector Frame	(10) 1 5/8" (2) 1 5/8" Fiber	Verizon
13		4	LPA-80063-4CF - Panel			
14		2	LPA-80063/6CF - Panel			
15		6	FD9R6004/2C-3L			
16		3	RRH2X60-AWS			
17		3	RRH2X60-PCS			
18		3	RRH2X60-700			
19		2	DB-T1-6Z-8AB-0Z			
-	150.5	6	Powerwave 7770 - Panel	(3) Sector Frame	(12) 1 5/8" (1) 1/2" Fiber (2) 3/4" DC	AT&T
-		3	KMW AMXCD1465 - Panel			
-		3	Andrew SBNHH-1D65A - Panel			
-		6	Powerwave TT19-08BP111-001 - TMA			
-		12	Powerwave 7020			
-		6	Ericsson RRUS 11 - RRU			
-		3	Ericsson RRUS A2 - RRU			
-		1	Raycap DC6-48-60-18-8F			
29	141.5	3	SD312HL	(3) Side Arm	(4) 7/8"	Town of Clinton
30	102.0	1	Radiowave RDH4518A - Dish	Pipe	(2) CAT5e	
31	75.0	1	GPS	Direct	(1) 1/2	Verizon

Proposed Carrier's Final Configuration of Antennas, Mounts and Transmission Lines

Information pertaining to the proposed carrier's final configuration of antennas and transmission lines was provided by SBA Communications Corp. The proposed antennas and lines are listed below.

Items	Elevation (ft)	Qty.	Antenna Descriptions	Mount Type & Qty.	Transmission Lines	Owner
20	150.5	6	Powerwave 7770 - Panel	(3) Sector Frame	(12) 1 5/8" (1) 1/2" Fiber (2) 3/4" DC	AT&T
21		3	KMW AMXCD1465 - Panel			
22		3	Andrew SBNHH-1D65A - Panel			
23		6	Powerwave TT19-08BP111-001 - TMA			
24		12	Powerwave 7020			
25		3	Ericsson RRUS 11 - RRU			
26		3	Ericsson RRUS 32 B2 - RRU			
27		3	Ericsson RRUS A2 - RRU			
28		1	Raycap DC6-48-60-18-8F			

There are no proposed coax lines.

Analysis Results

The results of the structural analysis, performed for the wind and ice loading and antenna equipment as defined above, are summarized as the following:

Tower Component	Legs	Diagonals	Horizontals
Max. Usage:	**100.0%**	**98.0%**	**13.0%**
Pass/Fail	**Pass**	**Pass**	**Pass**

Foundations

	Compression (Kips)	Uplift (Kips)	Shear (Kips)
Analysis Reactions	327.5	278.0	32.7

The foundation has been investigated using the supplied documents and soils report and was found to be adequate. Therefore, no modification to the foundation will be required.

Operational Condition (Rigidity)

Operational characteristics of the tower are found to be within the limits prescribed by ANSI/TIA/EIA 222-F for the installed antennas. The maximum twist/sway at the elevation of the proposed equipment is 0.3196 degrees under the operational wind speed as specified in the Analysis Criteria.

Conclusions

Based on the analysis results, the existing structure and its foundation were found to be adequate to safely support the existing and proposed equipment and meet the minimum requirements per the ANSI/TIA/EIA 222-F Standard under the design basic wind speed as specified in the Analysis Criteria.

Standard Conditions

1. This analysis was performed based on the information supplied to **(TES) Tower Engineering Solutions, LLC.** Verification of the information provided was not included in the Scope of Work for **TES**. The accuracy of the analysis is dependent on the accuracy of the information provided.

2. The analysis is based on the presumption that the tower members and components along with any existing reinforcement items have been correctly and properly designed, manufactured, installed and maintained.

3. All the existing structural members were assumed to be in good condition with no physical damage or deterioration associated with corrosion.

4. An initial tension of 10% of the break strength on all the existing guy wires was assumed in all the structural analyses of guyed towers unless different values were provided by the client. **TES** cannot take responsibility for the deviations in the analysis results because of differences in the initial tension forces of the existing guy wires.

5. Secondary component or connection secondary components, welds and bolts are assumed to be able to carry their intended original design loads. **TES** cannot take responsibility for verification of the adequacy on the connections, bolts and welds present in the structure.

6. The analyses will be performed based on the codes as specified by the client or based on the best knowledge of the engineering staff of **TES**. In the absence of information to the contrary, all work will be performed in accordance with the latest relevant revision of ANSI/TIA-222. If wind speed or/and ice loads are different from the minimum values recommended by the EIA/TIA-222 standard or other codes, **TES** should be notified in writing and the applicable minimum values provided by the client.

7. The configuration of the existing mounts, antennas, coax and other appurtenances were supplied by the customer for the current structural analysis. **TES** has not visited the tower site to verify the adequacy of the information provided. If there is any discrepancy found in the report regarding the existing conditions, **TES** should be notified immediately to evaluate the effect of the discrepancy on the analysis results.

8. The client will assume responsibility for rework associated with the differences in initially provided information, including tower and foundation information, existing and/or proposed equipment and transmission lines.

9. If a feasibility analysis was performed, final acceptance of changed conditions shall be based upon a rigorous structural analysis.

Structure: CT01879-S-SBA

Site Name:	Clinton 4 CT			**Code:**	EIA/TIA-222-F	8/29/2016	
Type:	Self Support	**Base Shape:**	Triangle	**Basic WS:**	85.00		
Height:	195.00 (ft)	**Base Width:**	23.00	**Basic Ice WS:**	73.61		
Base Elev:	0.00 (ft)	**Top Width:**	5.00	**Operational WS:**	50.00	Page: 1	

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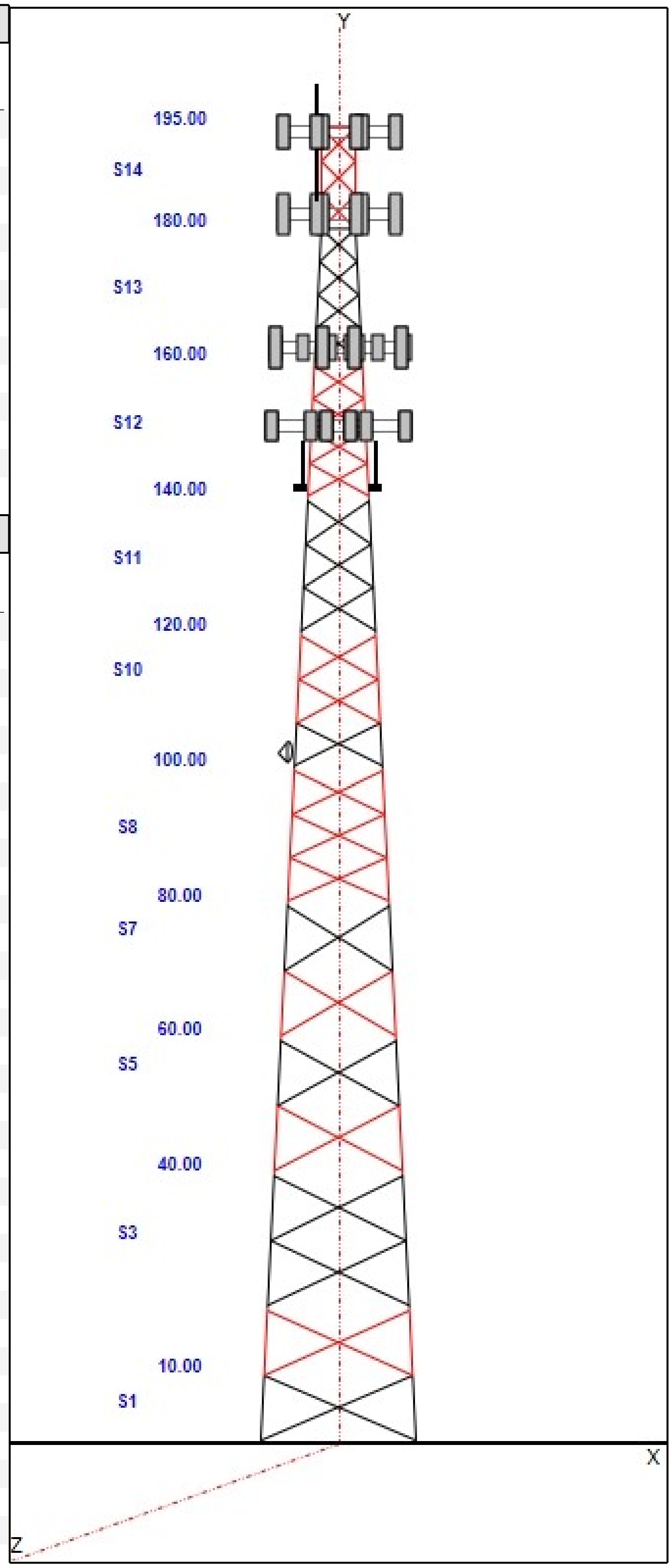
Section Properties

Sect	Leg Members	Diagonal Members	Horizontal Members
1	PX 8" DIA PIPE	SAE 4X4X0.25	
2	PX 8" DIA PIPE	SAU 3.5X4X0.25	
3	PST 8" DIA PIPE	SAE 3.5X3.5X0.25	
4	PST 8" DIA PIPE	SAE 3X3X0.375	
5	PST 8" DIA PIPE	SAU 3X3.5X0.25	
6	PX 6" DIA PIPE	SAE 3X3X0.375	
7	PX 6" DIA PIPE	SAE 3X3X0.25	
8	PST 6" DIA PIPE	SAE 3X3X0.1875	
9	PX 5" DIA PIPE	SAE 2.5X2.5X0.25	
10	PX 5" DIA PIPE	SAE 2.5X2.5X0.1875	
11	PX 4" DIA PIPE	SAE 2.5X2.5X0.1875	
12	PX 3" DIA PIPE	SAE 2X2X0.1875	
13	PST 3" DIA PIPE	SAE 1.75X1.75X0.1875	SAE 1.75X1.75X0.1875
14	PST 2" DIA PIPE	SAE 1.75X1.75X0.1875	SAE 1.75X1.75X0.1875

Discrete Appurtenances

Attach Elev (ft)	Force Elev (ft)	Qty	Description
194.00	194.00	3	Sector Frame
194.00	194.00	3	AIR 21 B2A B4P
194.00	194.00	3	AIR 21 B4A B2P
192.50	192.50	3	KRY 112 144/1
184.00	192.60	1	PD1151
182.00	182.00	3	Sector Frame
182.00	182.00	3	APXVTM14-C-120
182.00	182.00	3	APXVSPP18-C-A20
182.00	182.00	3	TD-RRH8x20-25
182.00	182.00	3	1900 MHz RRH
182.00	182.00	3	800 MHz RRH
182.00	182.00	4	ACU-A20-N
182.00	182.00	3	ALU 800 MHz Filter
162.00	162.00	3	Sector Frame
162.00	162.00	6	SBNHH-1D65B
162.00	162.00	4	LPA-80063-4CF
162.00	162.00	2	LPA-80063/6CF
162.00	162.00	6	FD9R6004/2C-3L
162.00	162.00	3	RRH2X60-AWS
162.00	162.00	3	RRH2X60-PCS
162.00	162.00	3	RRH2X60-700
162.00	162.00	2	DB-T1-6Z-8AB-0Z
150.50	150.50	3	Sector Frame
150.50	150.50	6	7770
150.50	150.50	3	KMW AMXCD1465
150.50	150.50	3	SBNHH-1D65A
150.50	150.50	6	TT19-08BP111-001
150.50	150.50	12	7020
150.50	150.50	3	RRUS 11
150.50	150.50	3	RRUS 32 B2
150.50	150.50	3	RRUS A2 Module
150.50	150.50	1	DC6-48-60-18-8F
141.50	141.50	3	Side Arm
141.50	144.96	3	SD312HL
102.00	102.00	1	Radiowave RDH4518A



102.00	102.00	1	Pipe Mount
75.00	75.00	1	GPS

Linear Appurtenances

Elev From (ft)	Elev To (ft)	Qty	Description
0.00	195.00	1	Climbing Ladder
0.00	195.00	1	Safety Cable
0.00	194.00	12	1 5/8" Coax
0.00	194.00	1	1 5/8" Fiber
0.00	194.00	1	W/G Ladder
0.00	184.00	1	7/8" Coax
0.00	182.00	4	1 1/4" Coax
0.00	182.00	1	W/G Ladder
0.00	162.00	10	1 5/8" Coax
0.00	162.00	2	1 5/8" Fiber
0.00	162.00	1	W/G Ladder
0.00	150.50	8	1 5/8" Coax
0.00	150.50	4	1 5/8" Coax
0.00	150.50	1	1/2" Fiber
0.00	150.50	2	3/4" DC
0.00	150.50	1	W/G Ladder
0.00	141.50	4	7/8" Coax
0.00	102.00	2	CAT5e
0.00	75.00	1	1/2" Coax

Base Reactions

Leg			Overturning		
Max Uplift:	-277.96	(kips	Moment:	6066.10	(ft-kips)
Max Down:	327.54	(kips	Total Down:	68.97	(kips)
Max Shear:	32.72	(kips	Total Shear:	52.11	(kips)

Structure: CT01879-S-SBA

Site Name:	Clinton 4 CT			**Code:**	EIA/TIA-222-F	8/29/2016
Type:	Self Support	**Base Shape:**	Triangle	**Basic WS:**	85.00	
Height:	195.00 (ft)	**Base Width:**	23.00	**Basic Ice WS:**	73.61	
Base Elev:	0.00 (ft)	**Top Width:**	5.00	**Operational WS:**	50.00	Page: 3

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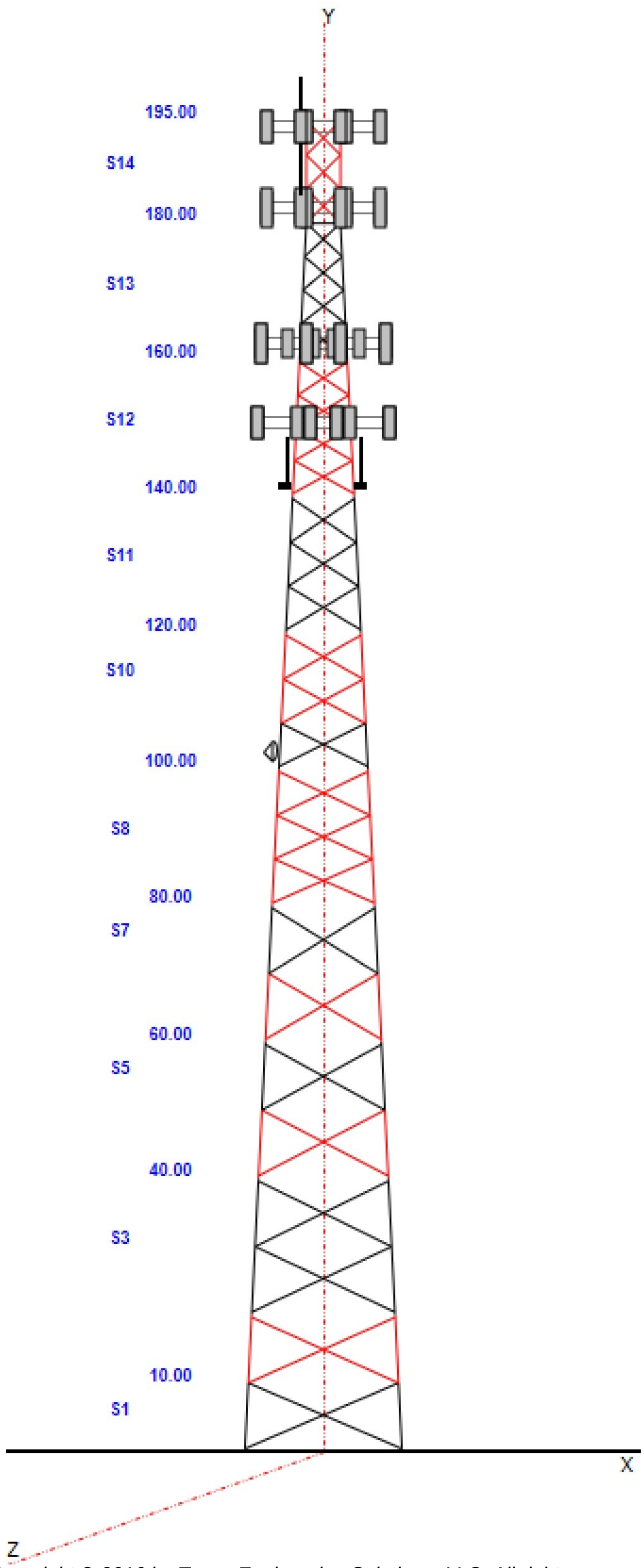

Structure: CT01879-S-SBA - Coax Line Placement

Type: Self Support
Site Name: Clinton 4 CT
Height: 195.00 (ft)

8/29/2016

Page: 4

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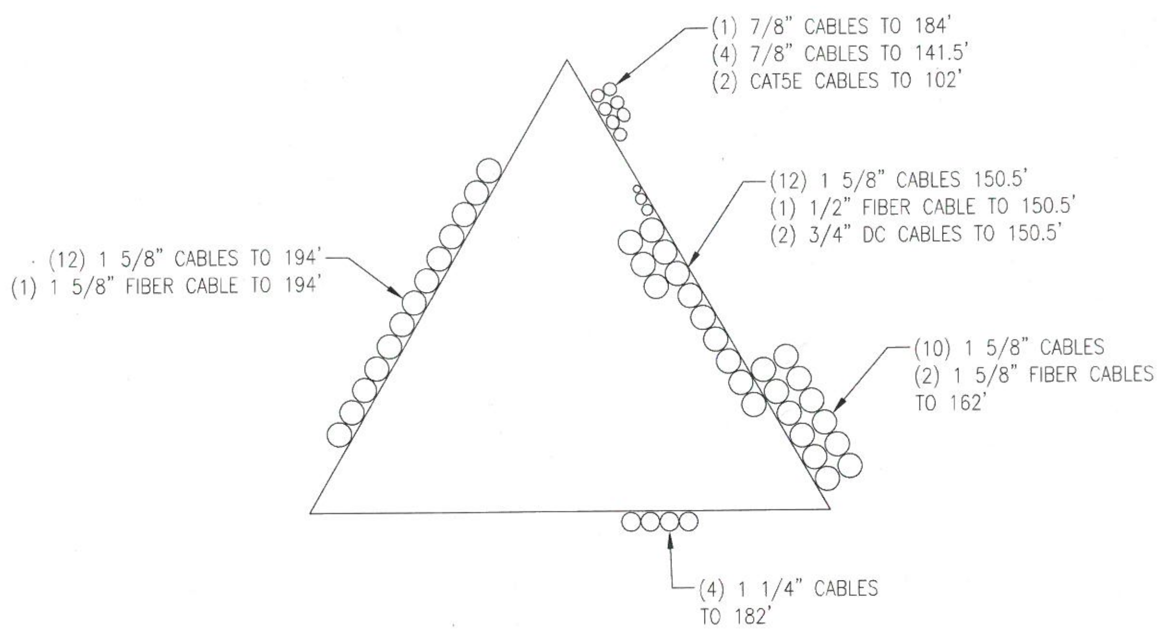

Loading Summary

Structure:	CT01879-S-SBA	**Code:**	EIA/TIA-222-F	8/29/2016
Site Name:	Clinton 4 CT	**Exposure:**	C	
Height:	195.00 (ft)	**Gh:**	1.12	
Base Elev:	0.000 (ft)	**Struct Class:**	II	Page: 5

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Discrete Appurtenances Properties

Attach Elev (ft)	Description	Qty	No Ice Weight (lb)	No Ice CaAa (sf)	No Ice CaAa Factor	Ice Weight (lb)	Ice CaAa (sf)	Ice CaAa Factor	Distance From Face (ft)	X Angle (deg)	Vert Ecc (ft)
194.00	Sector Frame	3	500.00	16.000	0.75	700.00	19.000	0.75	0.000	0.00	0.000
194.00	AIR 21 B2A B4P	3	91.50	6.580	0.85	129.20	6.970	0.85	0.000	0.00	0.000
194.00	AIR 21 B4A B2P	3	90.40	6.580	0.85	128.10	6.970	0.85	0.000	0.00	0.000
192.50	KRY 112 144/1	3	11.00	0.410	0.67	14.10	0.550	0.67	0.000	0.00	0.000
184.00	PD1151	1	20.00	4.820	1.00	0.00	6.570	1.00	0.000	0.00	8.600
182.00	Sector Frame	3	500.00	16.000	0.75	700.00	19.000	0.75	0.000	0.00	0.000
182.00	APXVTM14-C-120	3	56.00	6.900	0.79	91.90	7.290	0.79	0.000	0.00	0.000
182.00	APXVSPP18-C-A20	3	57.00	8.260	0.80	106.50	9.080	0.80	0.000	0.00	0.000
182.00	TD-RRH8x20-25	3	70.00	4.720	0.67	92.00	4.970	0.67	0.000	0.00	0.000
182.00	1900 MHz RRH	3	44.00	3.800	0.67	75.20	4.200	0.67	0.000	0.00	0.000
182.00	800 MHz RRH	3	53.00	2.490	0.67	74.10	2.820	0.67	0.000	0.00	0.000
182.00	ACU-A20-N	4	1.00	0.140	0.67	2.30	0.220	0.67	0.000	0.00	0.000
182.00	ALU 800 MHz Filter	3	8.80	0.780	0.67	13.80	0.960	0.67	0.000	0.00	0.000
162.00	Sector Frame	3	500.00	16.000	0.75	700.00	19.000	0.75	0.000	0.00	0.000
162.00	SBNHH-1D65B	6	40.60	8.330	0.83	87.00	8.800	0.83	0.000	0.00	0.000
162.00	LPA-80063-4CF	4	20.00	7.000	0.93	72.40	7.620	0.93	0.000	0.00	0.000
162.00	LPA-80063/6CF	2	27.00	10.340	0.94	0.00	11.180	0.94	0.000	0.00	0.000
162.00	FD9R6004/2C-3L	6	3.10	0.360	0.67	5.40	0.500	0.67	0.000	0.00	0.000
162.00	RRH2X60-AWS	3	55.00	3.960	0.67	75.10	4.230	0.67	0.000	0.00	0.000
162.00	RRH2X60-PCS	3	55.00	2.570	0.67	70.90	2.760	0.67	0.000	0.00	0.000
162.00	RRH2X60-700	3	55.00	3.960	0.67	75.10	4.230	0.67	0.000	0.00	0.000
162.00	DB-T1-6Z-8AB-0Z	2	18.90	5.600	0.67	46.00	5.870	0.67	0.000	0.00	0.000
150.50	Sector Frame	3	450.00	14.000	0.75	550.00	16.000	0.75	0.000	0.00	0.000
150.50	7770	6	35.00	5.880	0.73	0.00	6.530	0.73	0.000	0.00	0.000
150.50	KMW AMXCD1465	3	36.40	5.510	0.75	63.00	6.100	0.75	0.000	0.00	0.000
150.50	SBNHH-1D65A	3	33.50	6.360	0.83	68.80	6.740	0.83	0.000	0.00	0.000
150.50	TT19-08BP111-001	6	16.00	0.640	0.67	21.80	0.820	0.67	0.000	0.00	0.000
150.50	7020	12	2.20	0.400	0.67	5.10	0.540	0.67	0.000	0.00	0.000
150.50	RRUS 11	3	50.70	2.940	0.67	66.00	3.140	0.67	0.000	0.00	0.000
150.50	RRUS 32 B2	3	77.00	1.930	0.67	86.20	2.100	0.67	0.000	0.00	0.000
150.50	RRUS A2 Module	3	21.20	1.860	0.67	31.40	2.150	0.67	0.000	0.00	0.000
150.50	DC6-48-60-18-8F	1	31.80	1.470	1.00	49.50	1.670	1.00	0.000	0.00	0.000
141.50	Side Arm	3	120.00	3.000	0.75	150.00	4.000	0.75	0.000	0.00	0.000
141.50	SD312HL	3	10.30	3.450	1.00	38.50	4.260	1.00	0.000	0.00	3.462
102.00	Radiowave RDH4518A	1	110.00	8.920	1.00	159.48	9.420	1.00	0.000	0.00	0.000
102.00	Pipe Mount	1	100.00	2.000	1.00	150.00	3.000	1.00	0.000	0.00	0.000
75.00	GPS	1	10.00	1.000	1.00	18.00	1.250	1.00	0.000	0.00	0.000
	Totals:	**122**	**9,879.60**			**13,813.88**			**Number of Appurtenances :**		**37**

Linear Appurtenances Properties

From Elev. (ft)	Elev. To (ft)	Description	Qty	Width (in)	Weight (lb/ft)	Pct In Wind	Spread On Faces	Bundling Arrangement
0.00	195.00	Climbing Ladder	1	1.00	6.90	100.00	2	Individual
0.00	195.00	Safety Cable	1	0.38	0.27	100.00	2	Individual
0.00	194.00	1 5/8" Coax	12	1.98	1.04	100.00	1	Individual

Loading Summary

Structure:	CT01879-S-SBA	**Code:**	EIA/TIA-222-F	8/29/2016
Site Name:	Clinton 4 CT	**Exposure:**	C	
Height:	195.00 (ft)	**Gh:**	1.12	
Base Elev:	0.000 (ft)	**Struct Class:**	II	Page: 6

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Discrete Appurtenances Properties

			No Ice			Ice					
Attach Elev (ft)	**Description**	**Qty**	**Weight (lb)**	**CaAa (sf)**	**CaAa Factor**	**Weight (lb)**	**CaAa (sf)**	**CaAa Factor**	**Distance From Face (ft)**	**X Angle (deg)**	**Vert Ecc (ft)**
0.00	194.00 1 5/8" Fiber		1	1.63	1.10	100.00	1	Individual			
0.00	194.00 W/G Ladder		1	1.00	6.00	100.00	1	Individual			
0.00	184.00 7/8" Coax		1	1.11	0.52	100.00	2	Individual			
0.00	182.00 1 1/4" Coax		4	1.55	0.66	100.00	3	Individual			
0.00	182.00 W/G Ladder		1	1.00	6.00	100.00	3	Individual			
0.00	162.00 1 5/8" Coax		10	1.98	1.04	50.00	2	Individual			
0.00	162.00 1 5/8" Fiber		2	1.63	1.10	50.00	2	Individual			
0.00	162.00 W/G Ladder		1	1.00	6.00	100.00	2	Individual			
0.00	150.50 1 5/8" Coax		8	1.98	1.04	50.00	2	Individual			
0.00	150.50 1 5/8" Coax		4	1.98	1.04	100.00	2	Individual			
0.00	150.50 1/2" Fiber		1	0.50	0.16	100.00	2	Individual			
0.00	150.50 3/4" DC		2	0.75	0.40	50.00	2	Individual			
0.00	150.50 W/G Ladder		1	1.00	6.00	100.00	2	Individual			
0.00	141.50 7/8" Coax		4	1.11	0.52	50.00	2	Individual			
0.00	102.00 CAT5e		2	0.19	0.02	50.00	2	Individual			
0.00	75.00 1/2" Coax		1	0.65	0.16	100.00	2	Individual			

Section Forces

Structure:	CT01879-S-SBA	**Code:**	EIA/TIA-222-F	8/29/2016	
Site Name:	Clinton 4 CT	**Exposure:**	C		
Height:	195.00 (ft)	**Gh:**	1.12		
Base Elev:	0.000 (ft)	**Struct Class:**	II	Page: 7	Tower Engineering Solutions

Load Case: No Ice Normal Wind — 85 mph Wind with 0" Ice Normal To Face

Dead Load Factor: 1.00
Wind Load Factor: 1.00
Allowable Stress Inc: 1.33

Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Rr	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)	Eff Face
1	5.00	18.50	15.825	44.54	0.00	0.27	2.38	1.00	1.00	0.61	42.85	0.00	0.00	3,006.9	0.0	2,107.33	0.00	2,107.33	2
2	15.00	18.50	15.237	44.54	0.00	0.28	2.36	1.00	1.00	0.61	42.38	0.00	0.00	2,915.4	0.0	2,060.15	0.00	2,060.15	2
3	30.00	18.50	25.047	89.07	0.00	0.29	2.34	1.00	1.00	0.61	79.52	0.00	0.00	4,726.8	0.0	3,832.22	0.00	3,832.22	2
4	45.00	20.21	10.060	44.54	0.00	0.30	2.31	1.00	1.00	0.61	37.42	0.00	0.00	2,491.5	0.0	1,948.18	0.00	1,948.18	2
5	55.00	21.40	11.242	44.54	0.00	0.32	2.25	1.00	1.00	0.62	38.94	0.00	0.00	2,229.4	0.0	2,089.07	0.00	2,089.07	2
6	65.00	22.45	9.268	41.20	0.00	0.31	2.28	1.00	1.00	0.62	34.72	0.00	0.00	2,416.5	0.0	1,982.61	0.00	1,982.61	2
7	75.00	23.39	8.856	40.93	0.00	0.32	2.24	1.00	1.00	0.62	34.34	0.00	0.00	2,128.0	0.0	2,007.55	0.00	2,007.55	2
8	90.00	24.64	22.277	81.31	0.00	0.37	2.13	1.00	1.00	0.64	74.30	0.00	0.00	3,632.2	0.0	4,342.22	0.00	4,342.22	2
9	103.33	25.63	5.694	25.86	0.00	0.37	2.12	1.00	1.00	0.64	22.27	0.00	0.00	1,251.9	0.0	1,349.28	0.00	1,349.28	2
10	113.34	26.31	10.749	51.62	0.00	0.40	2.06	1.00	1.00	0.65	44.41	0.00	0.00	2,299.5	0.0	2,687.68	0.00	2,687.68	2
11	130.00	27.37	14.389	73.90	0.00	0.44	1.99	1.00	1.00	0.67	63.86	0.00	0.00	3,019.8	0.0	3,874.82	0.00	3,874.82	2
12	150.00	28.51	12.066	55.67	0.00	0.42	2.02	1.00	1.00	0.66	48.89	0.00	0.00	2,402.5	0.0	3,139.70	0.00	3,139.70	1
13	170.00	29.55	9.382	55.67	0.00	0.54	1.85	1.00	1.00	0.72	49.46	0.00	0.00	1,578.9	0.0	3,017.67	0.00	3,017.67	1
14	187.50	30.38	6.701	36.73	0.00	0.58	1.82	1.00	1.00	0.74	33.91	0.00	0.00	823.5	0.0	2,090.32	0.00	2,090.32	1
														34,922.7	**0.0**			**36,528.80**	

Load Case: No Ice 60° Wind — 85 mph Wind with 0" Ice at 60° From Face

Dead Load Factor: 1.00
Wind Load Factor: 1.00
Allowable Stress Inc: 1.33

Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Rr	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)	Eff Face
1	5.00	18.50	15.825	44.54	0.00	0.27	2.38	0.80	1.00	0.61	39.68	0.00	0.00	3,006.9	0.0	1,951.66	0.00	1,951.66	2
2	15.00	18.50	15.237	44.54	0.00	0.28	2.36	0.80	1.00	0.61	39.33	0.00	0.00	2,915.4	0.0	1,912.00	0.00	1,912.00	2
3	30.00	18.50	25.047	89.07	0.00	0.29	2.34	0.80	1.00	0.61	74.51	0.00	0.00	4,726.8	0.0	3,590.79	0.00	3,590.79	2
4	45.00	20.21	10.060	44.54	0.00	0.30	2.31	0.80	1.00	0.61	35.41	0.00	0.00	2,491.5	0.0	1,843.44	0.00	1,843.44	2
5	55.00	21.40	11.242	44.54	0.00	0.32	2.25	0.80	1.00	0.62	36.69	0.00	0.00	2,229.4	0.0	1,968.44	0.00	1,968.44	2
6	65.00	22.45	9.268	41.20	0.00	0.31	2.28	0.80	1.00	0.62	32.86	0.00	0.00	2,416.5	0.0	1,876.75	0.00	1,876.75	2
7	75.00	23.39	8.856	40.93	0.00	0.32	2.24	0.80	1.00	0.62	32.57	0.00	0.00	2,128.0	0.0	1,904.00	0.00	1,904.00	2
8	90.00	24.64	22.277	81.31	0.00	0.37	2.13	0.80	1.00	0.64	69.84	0.00	0.00	3,632.2	0.0	4,081.85	0.00	4,081.85	2
9	103.33	25.63	5.694	25.86	0.00	0.37	2.12	0.80	1.00	0.64	21.14	0.00	0.00	1,251.9	0.0	1,280.30	0.00	1,280.30	2
10	113.34	26.31	10.749	51.62	0.00	0.40	2.06	0.80	1.00	0.65	42.26	0.00	0.00	2,299.5	0.0	2,557.56	0.00	2,557.56	2
11	130.00	27.37	14.389	73.90	0.00	0.44	1.99	0.80	1.00	0.67	60.98	0.00	0.00	3,019.8	0.0	3,700.20	0.00	3,700.20	2
12	150.00	28.51	12.066	55.67	0.00	0.42	2.02	0.80	1.00	0.66	46.47	0.00	0.00	2,402.5	0.0	2,984.71	0.00	2,984.71	1
13	170.00	29.55	9.382	55.67	0.00	0.54	1.85	0.80	1.00	0.72	47.58	0.00	0.00	1,578.9	0.0	2,903.17	0.00	2,903.17	1
14	187.50	30.38	6.701	36.73	0.00	0.58	1.82	0.80	1.00	0.74	32.57	0.00	0.00	823.5	0.0	2,007.72	0.00	2,007.72	1
														34,922.7	**0.0**			**34,562.59**	

Section Forces

Structure:	CT01879-S-SBA	**Code:**	EIA/TIA-222-F	8/29/2016
Site Name:	Clinton 4 CT	**Exposure:**	C	
Height:	195.00 (ft)	**Gh:**	1.12	
Base Elev:	0.000 (ft)	**Struct Class:**	II	Page: 8

Tower Engineering Solutions

Load Case: No Ice 90° Wind

85 mph Wind with 0" Ice at 90° From Face

Dead Load Factor: 1.00
Wind Load Factor: 1.00
Allowable Stress Inc: 1.33

Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Rr	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)	Eff Face
1	5.00	18.50	15.825	44.54	0.00	0.27	2.38	0.85	1.00	0.61	40.47	0.00	0.00	3,006.9	0.0	1,990.58	0.00	1,990.58	2
2	15.00	18.50	15.237	44.54	0.00	0.28	2.36	0.85	1.00	0.61	40.09	0.00	0.00	2,915.4	0.0	1,949.04	0.00	1,949.04	2
3	30.00	18.50	25.047	89.07	0.00	0.29	2.34	0.85	1.00	0.61	75.76	0.00	0.00	4,726.8	0.0	3,651.15	0.00	3,651.15	2
4	45.00	20.21	10.060	44.54	0.00	0.30	2.31	0.85	1.00	0.61	35.92	0.00	0.00	2,491.5	0.0	1,869.62	0.00	1,869.62	2
5	55.00	21.40	11.242	44.54	0.00	0.32	2.25	0.85	1.00	0.62	37.25	0.00	0.00	2,229.4	0.0	1,998.60	0.00	1,998.60	2
6	65.00	22.45	9.268	41.20	0.00	0.31	2.28	0.85	1.00	0.62	33.33	0.00	0.00	2,416.5	0.0	1,903.22	0.00	1,903.22	2
7	75.00	23.39	8.856	40.93	0.00	0.32	2.24	0.85	1.00	0.62	33.01	0.00	0.00	2,128.0	0.0	1,929.88	0.00	1,929.88	2
8	90.00	24.64	22.277	81.31	0.00	0.37	2.13	0.85	1.00	0.64	70.96	0.00	0.00	3,632.2	0.0	4,146.94	0.00	4,146.94	2
9	103.33	25.63	5.694	25.86	0.00	0.37	2.12	0.85	1.00	0.64	21.42	0.00	0.00	1,251.9	0.0	1,297.55	0.00	1,297.55	2
10	113.34	26.31	10.749	51.62	0.00	0.40	2.06	0.85	1.00	0.65	42.79	0.00	0.00	2,299.5	0.0	2,590.09	0.00	2,590.09	2
11	130.00	27.37	14.389	73.90	0.00	0.44	1.99	0.85	1.00	0.67	61.70	0.00	0.00	3,019.8	0.0	3,743.85	0.00	3,743.85	2
12	150.00	28.51	12.066	55.67	0.00	0.42	2.02	0.85	1.00	0.66	47.08	0.00	0.00	2,402.5	0.0	3,023.45	0.00	3,023.45	1
13	170.00	29.55	9.382	55.67	0.00	0.54	1.85	0.85	1.00	0.72	48.05	0.00	0.00	1,578.9	0.0	2,931.79	0.00	2,931.79	1
14	187.50	30.38	6.701	36.73	0.00	0.58	1.82	0.85	1.00	0.74	32.91	0.00	0.00	823.5	0.0	2,028.37	0.00	2,028.37	1
														34,922.7	**0.0**			**35,054.14**	

Load Case: Ice Normal Wind

73.61 mph Wind with 0.5" Ice Normal To Face

Dead Load Factor: 1.00
Wind Load Factor: 1.00
Allowable Stress Inc: 1.33

Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Rr	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)	Eff Face
1	5.00	13.87	15.825	71.12	26.58	0.39	2.09	1.00	1.00	0.65	61.78	0.00	0.00	4,400.8	1393.9	1,999.30	0.00	1,999.30	2
2	15.00	13.87	15.237	70.97	26.43	0.40	2.06	1.00	1.00	0.65	61.51	0.00	0.00	4,264.3	1348.9	1,962.61	0.00	1,962.61	2
3	30.00	13.87	25.047	141.47	52.40	0.42	2.03	1.00	1.00	0.66	118.19	0.00	0.00	7,321.1	2594.3	3,717.34	0.00	3,717.34	2
4	45.00	15.16	10.060	70.51	25.98	0.44	2.00	1.00	1.00	0.67	57.07	0.00	0.00	3,716.5	1224.9	1,927.94	0.00	1,927.94	2
5	55.00	16.05	11.242	70.37	25.83	0.47	1.95	1.00	1.00	0.68	59.16	0.00	0.00	3,464.7	1235.4	2,062.96	0.00	2,062.96	2
6	65.00	16.84	9.268	66.88	25.68	0.46	1.96	1.00	1.00	0.68	54.66	0.00	0.00	3,578.1	1161.7	2,006.78	0.00	2,006.78	2
7	75.00	17.54	8.856	66.06	25.13	0.48	1.92	1.00	1.00	0.69	54.38	0.00	0.00	3,273.6	1145.6	2,045.39	0.00	2,045.39	2
8	90.00	18.48	22.277	132.35	51.04	0.55	1.84	1.00	1.00	0.73	118.30	0.00	0.00	6,063.3	2431.1	4,489.71	0.00	4,489.71	2
9	103.33	19.22	5.694	42.28	16.42	0.57	1.83	1.00	1.00	0.73	36.75	0.00	0.00	1,993.4	741.4	1,439.75	0.00	1,439.75	2
10	113.34	19.73	10.749	83.85	32.23	0.61	1.80	1.00	1.00	0.76	74.37	0.00	0.00	3,758.5	1459.0	2,945.22	0.00	2,945.22	2
11	130.00	20.52	14.389	121.52	47.62	0.68	1.78	1.00	1.00	0.81	112.27	0.00	0.00	5,112.8	2093.0	4,565.24	0.00	4,565.24	2
12	150.00	21.38	12.066	88.93	36.11	0.63	1.79	1.00	1.00	0.77	80.82	0.00	0.00	4,119.1	1716.5	3,446.33	0.00	3,446.33	2
13	170.00	22.16	9.382	87.92	32.25	0.81	1.82	1.00	1.00	0.91	88.98	0.00	0.00	2,650.7	1071.8	4,012.59	0.00	4,012.59	1
14	187.50	22.79	6.701	59.51	22.79	0.88	1.90	1.00	1.00	0.97	64.28	0.00	0.00	1,446.9	623.5	3,105.33	0.00	3,105.33	1
														55,163.9	**20,241.2**			**39,726.50**	

Section Forces

Structure: CT01879-S-SBA	**Code:** EIA/TIA-222-F	8/29/2016
Site Name: Clinton 4 CT	**Exposure:** C	
Height: 195.00 (ft)	**Gh:** 1.12	
Base Elev: 0.000 (ft)	**Struct Class:** II	Page: 9

Tower Engineering Solutions

Load Case: Ice 60° Wind

73.61 mph Wind with 0.5" Ice at 60° From Face

Dead Load Factor: 1.00
Wind Load Factor: 1.00
Allowable Stress Inc: 1.33

Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Rr	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)	Eff Face
1	5.00	13.87	15.825	71.12	26.58	0.39	2.09	0.80	1.00	0.65	58.61	0.00	0.00	4,400.8	1393.9	1,896.87	0.00	1,896.87	2
2	15.00	13.87	15.237	70.97	26.43	0.40	2.06	0.80	1.00	0.65	58.46	0.00	0.00	4,264.3	1348.9	1,865.37	0.00	1,865.37	2
3	30.00	13.87	25.047	141.47	52.40	0.42	2.03	0.80	1.00	0.66	113.18	0.00	0.00	7,321.1	2594.3	3,559.79	0.00	3,559.79	2
4	45.00	15.16	10.060	70.51	25.98	0.44	2.00	0.80	1.00	0.67	55.06	0.00	0.00	3,716.5	1224.9	1,859.97	0.00	1,859.97	2
5	55.00	16.05	11.242	70.37	25.83	0.47	1.95	0.80	1.00	0.68	56.91	0.00	0.00	3,464.7	1235.4	1,984.55	0.00	1,984.55	2
6	65.00	16.84	9.268	66.88	25.68	0.46	1.96	0.80	1.00	0.68	52.80	0.00	0.00	3,578.1	1161.7	1,938.72	0.00	1,938.72	2
7	75.00	17.54	8.856	66.06	25.13	0.48	1.92	0.80	1.00	0.69	52.61	0.00	0.00	3,273.6	1145.6	1,978.77	0.00	1,978.77	2
8	90.00	18.48	22.277	132.35	51.04	0.55	1.84	0.80	1.00	0.73	113.85	0.00	0.00	6,063.3	2431.1	4,320.62	0.00	4,320.62	2
9	103.33	19.22	5.694	42.28	16.42	0.57	1.83	0.80	1.00	0.73	35.61	0.00	0.00	1,993.4	741.4	1,395.13	0.00	1,395.13	2
10	113.34	19.73	10.749	83.85	32.23	0.61	1.80	0.80	1.00	0.76	72.22	0.00	0.00	3,758.5	1459.0	2,860.07	0.00	2,860.07	2
11	130.00	20.52	14.389	121.52	47.62	0.68	1.78	0.80	1.00	0.81	109.39	0.00	0.00	5,112.8	2093.0	4,448.22	0.00	4,448.22	2
12	150.00	21.38	12.066	88.93	36.11	0.63	1.79	0.80	1.00	0.77	78.41	0.00	0.00	4,119.1	1716.5	3,343.43	0.00	3,343.43	2
13	170.00	22.16	9.382	87.92	32.25	0.81	1.82	0.80	1.00	0.91	87.10	0.00	0.00	2,650.7	1071.8	3,927.97	0.00	3,927.97	1
14	187.50	22.79	6.701	59.51	22.79	0.88	1.90	0.80	1.00	0.97	62.94	0.00	0.00	1,446.9	623.5	3,040.58	0.00	3,040.58	1
														55,163.9	**20,241.2**			**38,420.09**	

Load Case: Ice 90° Wind

73.61 mph Wind with 0.5" Ice at 90° From Face

Dead Load Factor: 1.00
Wind Load Factor: 1.00
Allowable Stress Inc: 1.33

Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Rr	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)	Eff Face
1	5.00	13.87	15.825	71.12	26.58	0.39	2.09	0.85	1.00	0.65	59.40	0.00	0.00	4,400.8	1393.9	1,922.48	0.00	1,922.48	2
2	15.00	13.87	15.237	70.97	26.43	0.40	2.06	0.85	1.00	0.65	59.22	0.00	0.00	4,264.3	1348.9	1,889.68	0.00	1,889.68	2
3	30.00	13.87	25.047	141.47	52.40	0.42	2.03	0.85	1.00	0.66	114.43	0.00	0.00	7,321.1	2594.3	3,599.18	0.00	3,599.18	2
4	45.00	15.16	10.060	70.51	25.98	0.44	2.00	0.85	1.00	0.67	55.56	0.00	0.00	3,716.5	1224.9	1,876.97	0.00	1,876.97	2
5	55.00	16.05	11.242	70.37	25.83	0.47	1.95	0.85	1.00	0.68	57.47	0.00	0.00	3,464.7	1235.4	2,004.16	0.00	2,004.16	2
6	65.00	16.84	9.268	66.88	25.68	0.46	1.96	0.85	1.00	0.68	53.27	0.00	0.00	3,578.1	1161.7	1,955.74	0.00	1,955.74	2
7	75.00	17.54	8.856	66.06	25.13	0.48	1.92	0.85	1.00	0.69	53.05	0.00	0.00	3,273.6	1145.6	1,995.43	0.00	1,995.43	2
8	90.00	18.48	22.277	132.35	51.04	0.55	1.84	0.85	1.00	0.73	114.96	0.00	0.00	6,063.3	2431.1	4,362.89	0.00	4,362.89	2
9	103.33	19.22	5.694	42.28	16.42	0.57	1.83	0.85	1.00	0.73	35.89	0.00	0.00	1,993.4	741.4	1,406.29	0.00	1,406.29	2
10	113.34	19.73	10.749	83.85	32.23	0.61	1.80	0.85	1.00	0.76	72.75	0.00	0.00	3,758.5	1459.0	2,881.36	0.00	2,881.36	2
11	130.00	20.52	14.389	121.52	47.62	0.68	1.78	0.85	1.00	0.81	110.11	0.00	0.00	5,112.8	2093.0	4,477.47	0.00	4,477.47	2
12	150.00	21.38	12.066	88.93	36.11	0.63	1.79	0.85	1.00	0.77	79.01	0.00	0.00	4,119.1	1716.5	3,369.16	0.00	3,369.16	2
13	170.00	22.16	9.382	87.92	32.25	0.81	1.82	0.85	1.00	0.91	87.57	0.00	0.00	2,650.7	1071.8	3,949.13	0.00	3,949.13	1
14	187.50	22.79	6.701	59.51	22.79	0.88	1.90	0.85	1.00	0.97	63.27	0.00	0.00	1,446.9	623.5	3,056.77	0.00	3,056.77	1
														55,163.9	**20,241.2**			**38,746.69**	

Section Forces

Structure:	CT01879-S-SBA	**Code:**	EIA/TIA-222-F	8/29/2016
Site Name:	Clinton 4 CT	**Exposure:**	C	
Height:	195.00 (ft)	**Gh:**	1.12	
Base Elev:	0.000 (ft)	**Struct Class:**	II	Page: 10

Tower Engineering Solutions

Load Case: Twist/Sway Normal Wind — 50 mph Wind with 0" Ice Normal To Face

Dead Load Factor: 1.00
Wind Load Factor: 1.00
Allowable Stress Inc: 1.33

Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Rr	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)	Eff Face
1	5.00	6.40	15.825	44.54	0.00	0.27	2.38	1.00	1.00	0.61	42.85	0.00	0.00	3,006.9	0.0	729.18	0.00	729.18	2
2	15.00	6.40	15.237	44.54	0.00	0.28	2.36	1.00	1.00	0.61	42.38	0.00	0.00	2,915.4	0.0	712.85	0.00	712.85	2
3	30.00	6.40	25.047	89.07	0.00	0.29	2.34	1.00	1.00	0.61	79.52	0.00	0.00	4,726.8	0.0	1,326.03	0.00	1,326.03	2
4	45.00	6.99	10.060	44.54	0.00	0.30	2.31	1.00	1.00	0.61	37.42	0.00	0.00	2,491.5	0.0	674.11	0.00	674.11	2
5	55.00	7.41	11.242	44.54	0.00	0.32	2.25	1.00	1.00	0.62	38.94	0.00	0.00	2,229.4	0.0	722.86	0.00	722.86	2
6	65.00	7.77	9.268	41.20	0.00	0.31	2.28	1.00	1.00	0.62	34.72	0.00	0.00	2,416.5	0.0	686.02	0.00	686.02	2
7	75.00	8.09	8.856	40.93	0.00	0.32	2.24	1.00	1.00	0.62	34.34	0.00	0.00	2,128.0	0.0	694.65	0.00	694.65	2
8	90.00	8.52	22.277	81.31	0.00	0.37	2.13	1.00	1.00	0.64	74.30	0.00	0.00	3,632.2	0.0	1,502.50	0.00	1,502.50	2
9	103.33	8.87	5.694	25.86	0.00	0.37	2.12	1.00	1.00	0.64	22.27	0.00	0.00	1,251.9	0.0	466.88	0.00	466.88	2
10	113.34	9.11	10.749	51.62	0.00	0.40	2.06	1.00	1.00	0.65	44.41	0.00	0.00	2,299.5	0.0	929.99	0.00	929.99	2
11	130.00	9.47	14.389	73.90	0.00	0.44	1.99	1.00	1.00	0.67	63.86	0.00	0.00	3,019.8	0.0	1,340.77	0.00	1,340.77	2
12	150.00	9.86	12.066	55.67	0.00	0.42	2.02	1.00	1.00	0.66	48.89	0.00	0.00	2,402.5	0.0	1,086.40	0.00	1,086.40	1
13	170.00	10.22	9.382	55.67	0.00	0.54	1.85	1.00	1.00	0.72	49.46	0.00	0.00	1,578.9	0.0	1,044.17	0.00	1,044.17	1
14	187.50	10.51	6.701	36.73	0.00	0.58	1.82	1.00	1.00	0.74	33.91	0.00	0.00	823.5	0.0	723.30	0.00	723.30	1
														34,922.7	**0.0**			**12,639.72**	

Load Case: Twist/Sway 60° Wind — 50 mph Wind with 0" Ice at 60° From Face

Dead Load Factor: 1.00
Wind Load Factor: 1.00
Allowable Stress Inc: 1.33

Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Rr	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)	Eff Face
1	5.00	6.40	15.825	44.54	0.00	0.27	2.38	0.80	1.00	0.61	39.68	0.00	0.00	3,006.9	0.0	675.32	0.00	675.32	2
2	15.00	6.40	15.237	44.54	0.00	0.28	2.36	0.80	1.00	0.61	39.33	0.00	0.00	2,915.4	0.0	661.59	0.00	661.59	2
3	30.00	6.40	25.047	89.07	0.00	0.29	2.34	0.80	1.00	0.61	74.51	0.00	0.00	4,726.8	0.0	1,242.49	0.00	1,242.49	2
4	45.00	6.99	10.060	44.54	0.00	0.30	2.31	0.80	1.00	0.61	35.41	0.00	0.00	2,491.5	0.0	637.87	0.00	637.87	2
5	55.00	7.41	11.242	44.54	0.00	0.32	2.25	0.80	1.00	0.62	36.69	0.00	0.00	2,229.4	0.0	681.12	0.00	681.12	2
6	65.00	7.77	9.268	41.20	0.00	0.31	2.28	0.80	1.00	0.62	32.86	0.00	0.00	2,416.5	0.0	649.39	0.00	649.39	2
7	75.00	8.09	8.856	40.93	0.00	0.32	2.24	0.80	1.00	0.62	32.57	0.00	0.00	2,128.0	0.0	658.82	0.00	658.82	2
8	90.00	8.52	22.277	81.31	0.00	0.37	2.13	0.80	1.00	0.64	69.84	0.00	0.00	3,632.2	0.0	1,412.40	0.00	1,412.40	2
9	103.33	8.87	5.694	25.86	0.00	0.37	2.12	0.80	1.00	0.64	21.14	0.00	0.00	1,251.9	0.0	443.01	0.00	443.01	2
10	113.34	9.11	10.749	51.62	0.00	0.40	2.06	0.80	1.00	0.65	42.26	0.00	0.00	2,299.5	0.0	884.97	0.00	884.97	2
11	130.00	9.47	14.389	73.90	0.00	0.44	1.99	0.80	1.00	0.67	60.98	0.00	0.00	3,019.8	0.0	1,280.34	0.00	1,280.34	2
12	150.00	9.86	12.066	55.67	0.00	0.42	2.02	0.80	1.00	0.66	46.47	0.00	0.00	2,402.5	0.0	1,032.77	0.00	1,032.77	1
13	170.00	10.22	9.382	55.67	0.00	0.54	1.85	0.80	1.00	0.72	47.58	0.00	0.00	1,578.9	0.0	1,004.56	0.00	1,004.56	1
14	187.50	10.51	6.701	36.73	0.00	0.58	1.82	0.80	1.00	0.74	32.57	0.00	0.00	823.5	0.0	694.71	0.00	694.71	1
														34,922.7	**0.0**			**11,959.37**	

Section Forces

Structure:	CT01879-S-SBA	**Code:**	EIA/TIA-222-F	8/29/2016	
Site Name:	Clinton 4 CT	**Exposure:**	C		
Height:	195.00 (ft)	**Gh:**	1.12		
Base Elev:	0.000 (ft)	**Struct Class:**	II	Page: 11	Tower Engineering Solutions

Load Case: Twist/Sway 90° Wind

50 mph Wind with 0" Ice at 90° From Face

Dead Load Factor: 1.00
Wind Load Factor: 1.00
Allowable Stress Inc: 1.33

Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Rr	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)	Eff Face
1	5.00	6.40	15.825	44.54	0.00	0.27	2.38	0.85	1.00	0.61	40.47	0.00	0.00	3,006.9	0.0	688.78	0.00	688.78	2
2	15.00	6.40	15.237	44.54	0.00	0.28	2.36	0.85	1.00	0.61	40.09	0.00	0.00	2,915.4	0.0	674.41	0.00	674.41	2
3	30.00	6.40	25.047	89.07	0.00	0.29	2.34	0.85	1.00	0.61	75.76	0.00	0.00	4,726.8	0.0	1,263.37	0.00	1,263.37	2
4	45.00	6.99	10.060	44.54	0.00	0.30	2.31	0.85	1.00	0.61	35.92	0.00	0.00	2,491.5	0.0	646.93	0.00	646.93	2
5	55.00	7.41	11.242	44.54	0.00	0.32	2.25	0.85	1.00	0.62	37.25	0.00	0.00	2,229.4	0.0	691.56	0.00	691.56	2
6	65.00	7.77	9.268	41.20	0.00	0.31	2.28	0.85	1.00	0.62	33.33	0.00	0.00	2,416.5	0.0	658.55	0.00	658.55	2
7	75.00	8.09	8.856	40.93	0.00	0.32	2.24	0.85	1.00	0.62	33.01	0.00	0.00	2,128.0	0.0	667.78	0.00	667.78	2
8	90.00	8.52	22.277	81.31	0.00	0.37	2.13	0.85	1.00	0.64	70.96	0.00	0.00	3,632.2	0.0	1,434.93	0.00	1,434.93	2
9	103.33	8.87	5.694	25.86	0.00	0.37	2.12	0.85	1.00	0.64	21.42	0.00	0.00	1,251.9	0.0	448.98	0.00	448.98	2
10	113.34	9.11	10.749	51.62	0.00	0.40	2.06	0.85	1.00	0.65	42.79	0.00	0.00	2,299.5	0.0	896.22	0.00	896.22	2
11	130.00	9.47	14.389	73.90	0.00	0.44	1.99	0.85	1.00	0.67	61.70	0.00	0.00	3,019.8	0.0	1,295.45	0.00	1,295.45	2
12	150.00	9.86	12.066	55.67	0.00	0.42	2.02	0.85	1.00	0.66	47.08	0.00	0.00	2,402.5	0.0	1,046.18	0.00	1,046.18	1
13	170.00	10.22	9.382	55.67	0.00	0.54	1.85	0.85	1.00	0.72	48.05	0.00	0.00	1,578.9	0.0	1,014.46	0.00	1,014.46	1
14	187.50	10.51	6.701	36.73	0.00	0.58	1.82	0.85	1.00	0.74	32.91	0.00	0.00	823.5	0.0	701.86	0.00	701.86	1
														34,922.7	**0.0**			**12,129.46**	

Force/Stress Compression Summary

Structure:	CT01879-S-SBA	**Code:**	EIA/TIA-222-F
Site Name:	Clinton 4 CT	**Exposure:**	C
Height:	195.00 (ft)	**Gh:**	1.12
Base Elev:	0.000 (ft)	**Struct Class:**	II

8/29/2016

Page: 12

Tower Engineering Solutions

LEG MEMBERS

Sect	Top Elev	Member	Force (kips)	Load Case	Len (ft)	Bracing % X	Y	Z	KL/R	Fa (ksi)	Mem Cap (kips)	Use %	Controls
1	10	PX - 8" DIA PIPE	-322.08	Ice Normal Wind	9.64	100	100	100	40.20	34.40	439.00	73.0	Member X
2	20	PX - 8" DIA PIPE	-307.01	Ice Normal Wind	9.64	100	100	100	40.20	34.40	439.00	69.0	Member X
3	40	PST - 8" DIA PIPE	-292.24	Ice Normal Wind	9.62	100	100	100	39.25	34.58	290.49	100.0	Member X
4	50	PST - 8" DIA PIPE	-261.67	Ice Normal Wind	9.64	100	100	100	39.35	34.56	290.33	90.0	Member X
5	60	PST - 8" DIA PIPE	-245.87	Ice Normal Wind	9.64	100	100	100	39.35	34.56	290.33	84.0	Member X
6	70	PX - 6" DIA PIPE	-229.85	Ice Normal Wind	9.64	100	100	100	52.83	31.87	267.72	85.0	Member X
7	80	PX - 6" DIA PIPE	-213.28	Ice Normal Wind	9.64	100	100	100	52.83	31.87	267.72	79.0	Member X
8	100	PST - 6" DIA PIPE	-198.91	Ice Normal Wind	6.43	100	100	100	34.28	35.48	197.96	100.0	Member X
9	106.6	PX - 5" DIA PIPE	-163.85	Ice Normal Wind	6.31	100	100	100	41.12	34.23	209.15	78.0	Member X
10	120	PX - 5" DIA PIPE	-152.45	Ice Normal Wind	6.49	100	100	100	42.31	34.00	207.76	73.0	Member X
11	140	PX - 4" DIA PIPE	-125.95	Ice Normal Wind	6.43	100	100	100	52.11	32.02	141.22	89.0	Member X
12	160	PX - 3" DIA PIPE	-86.71	Ice Normal Wind	4.82	100	100	100	50.74	32.31	97.58	88.0	Member X
13	180	PST - 3" DIA PIPE	-43.61	Ice Normal Wind	4.91	100	100	100	50.84	32.29	72.01	60.0	Member X
14	195	PST - 2" DIA PIPE	-12.69	Ice Normal Wind	5.00	100	100	100	76.24	26.34	28.18	45.0	Member X

HORIZONTAL MEMBERS

Sect	Top Elev	Member	Force (kips)	Load Case	Len (ft)	Bracing % X	Y	Z	KL/R	Fa (ksi)	Mem Cap (kips)	Num Bolts	Num Holes	Shear Cap (kips)	Bear Cap (kips)	Use %	Controls
1	10				0.00	0	0	0	0.00	0.00	0.00	0	0				
2	20				0.00	0	0	0	0.00	0.00	0.00	0	0				
3	40				0.00	0	0	0	0.00	0.00	0.00	0	0				
4	50				0.00	0	0	0	0.00	0.00	0.00	0	0				
5	60				0.00	0	0	0	0.00	0.00	0.00	0	0				
6	70				0.00	0	0	0	0.00	0.00	0.00	0	0				
7	80				0.00	0	0	0	0.00	0.00	0.00	0	0				
8	100				0.00	0	0	0	0.00	0.00	0.00	0	0				
9	106.6				0.00	0	0	0	0.00	0.00	0.00	0	0				
10	120				0.00	0	0	0	0.00	0.00	0.00	0	0				
11	140				0.00	0	0	0	0.00	0.00	0.00	0	0				
12	160				0.00	0	0	0	0.00	0.00	0.00	0	0				
13	180	SAE - 1.75X1.75X0.1875	-0.54	No Ice 60° Wind	5.00	100	100	100	174.93	6.51	4.03	1	1	12.27	10.87	13	Member Z
14	195	SAE - 1.75X1.75X0.1875	-0.38	No Ice 60° Wind	5.00	100	100	100	174.93	6.51	4.03	1	1	12.27	10.87	9	Member Z

DIAGONAL MEMBERS

Sect	Top Elev	Member	Force (kips)	Load Case	Len (ft)	Bracing % X	Y	Z	KL/R	Fa (ksi)	Mem Cap (kips)	Num Bolts	Num Holes	Shear Cap (kips)	Bear Cap (kips)	Use %	Controls
1	10	SAE - 4X4X0.25	-8.46	No Ice 90° Wind	24.46	47	72	47	173.50	6.61	12.83	1	1	17.67	17.40	65	Member Z
2	20	SAU - 3.5X4X0.25	-10.66	Ice 90° Wind	23.57	47	72	47	181.15	6.07	10.98	1	1	17.67	17.40	97	Member Z
3	40	SAE - 3.5X3.5X0.25	-8.75	No Ice 90° Wind	22.62	48	73	48	187.74	5.65	9.55	1	1	17.67	17.40	91	Member Z
4	50	SAE - 3X3X0.375	-8.69	Ice 90° Wind	20.84	48	73	48	204.49	4.76	10.05	1	1	17.67	26.10	86	Member Z
5	60	SAU - 3X3.5X0.25	-8.98	Ice 90° Wind	19.99	48	73	48	182.48	5.98	9.33	1	1	17.67	17.40	96	Member Z
6	70	SAE - 3X3X0.375	-8.26	Ice 90° Wind	19.09	48	73	48	187.30	5.68	11.97	1	1	17.67	26.10	68	Member Z
7	80	SAE - 3X3X0.25	-8.73	Ice 90° Wind	18.26	48	73	48	177.70	6.31	9.08	1	1	17.67	17.40	96	Member Z
8	100	SAE - 3X3X0.1875	-7.59	Ice 90° Wind	15.99	48	73	48	154.51	8.34	9.09	1	1	17.67	13.05	83	Member Z
9	106.6	SAE - 2.5X2.5X0.25	-7.20	Ice 90° Wind	14.13	48	73	48	165.75	7.25	8.62	1	1	12.27	14.50	83	Member Z
10	120	SAE - 2.5X2.5X0.1875	-7.67	Ice 90° Wind	13.08	48	73	48	152.20	8.60	7.75	1	1	12.27	10.87	98	Member Z
11	140	SAE - 2.5X2.5X0.1875	-6.82	Ice 90° Wind	12.43	49	74	49	147.63	9.14	8.24	1	1	12.27	10.87	82	Member Z
12	160	SAE - 2X2X0.1875	-6.15	No Ice 90° Wind	9.96	49	74	49	148.68	9.01	6.40	1	1	12.27	10.87	96	Member Z
13	180	SAE - 1.75X1.75X0.1875	-3.67	Ice 90° Wind	8.32	49	74	49	142.62	9.79	6.07	1	1	12.27	10.87	60	Member Z
14	195	SAE - 1.75X1.75X0.1875	-2.59	Ice Normal Wind	7.07	50	75	50	123.69	13.0	8.06	1	1	12.27	10.87	32	Member Z

Force/Stress Tension Summary

Structure:	CT01879-S-SBA	**Code:**	EIA_F
Site Name:	Clinton 4 CT	**Exposure:**	C
Height:	195.00 (ft)	**Gh:**	1.12
Base Elev:	0.000 (ft)	**Struct Class:**	II

8/29/2016

Tower Engineering Solutions

LEG MEMBERS

Sect	Top Elev	Member	Force (kips)	Load Case	Fy (ksi)	Mem Cap (kips)	Use %	Controls
1	10	PX - 8" DIA PIPE	276.08	No Ice 60° Wind	50	510.39	54.0	Member
2	20	PX - 8" DIA PIPE	262.51	Ice 60° Wind	50	510.39	51.0	Member
3	40	PST - 8" DIA PIPE	257.03	Ice 60° Wind	50	335.99	76.0	Member
4	50	PST - 8" DIA PIPE	232.50	Ice 60° Wind	50	335.99	69.0	Member
5	60	PST - 8" DIA PIPE	211.58	Ice 60° Wind	50	335.99	62.0	Member
6	70	PX - 6" DIA PIPE	206.12	Ice 60° Wind	50	335.99	61.0	Member
7	80	PX - 6" DIA PIPE	184.17	Ice 60° Wind	50	335.99	54.0	Member
8	100	PST - 6" DIA PIPE	178.17	Ice 60° Wind	50	223.19	79.0	Member
9	106.6	PX - 5" DIA PIPE	147.93	Ice 60° Wind	50	244.39	60.0	Member
10	120	PX - 5" DIA PIPE	130.08	No Ice 60° Wind	50	244.39	53.0	Member
11	140	PX - 4" DIA PIPE	114.86	Ice 60° Wind	50	176.40	65.0	Member
12	160	PX - 3" DIA PIPE	77.94	Ice 60° Wind	50	120.80	64.0	Member
13	180	PST - 3" DIA PIPE	39.73	Ice 60° Wind	50	89.20	44.0	Member
14	195	PST - 2" DIA PIPE	9.57	Ice 60° Wind	50	42.80	22.0	Member

HORIZONTAL MEMBERS

Sect	Top Elev	Member	Force (kips)	Load Case	Fy (ksi)	Mem Cap (kips)	Num Bolts	Num Holes	Shear Cap (kips)	Bear Cap (kips)	Use %	Controls
1	10	-			36	0.00	0	0				
2	20	-			36	0.00	0	0				
3	40	-			36	0.00	0	0				
4	50	-			36	0.00	0	0				
5	60	-			36	0.00	0	0				
6	70	-			36	0.00	0	0				
7	80	-			36	0.00	0	0				
8	100	-			36	0.00	0	0				
9	106.6	-			36	0.00	0	0				
10	120	-			36	0.00	0	0				
11	140	-			36	0.00	0	0				
12	160	-			36	0.00	0	0				
13	180	SAE - 1.75X1.75X0.1875	0.45	No Ice 90° Wind	36	14.24	1	1	12.27	10.87	4	Bolt Bear
14	195	SAE - 1.75X1.75X0.1875	0.36	No Ice Normal Wind	36	14.24	1	1	12.27	10.87	3	Bolt Bear

DIAGONAL MEMBERS

Sect.	Top Elev	Member	Force (kips)	Load Case	Fy (ksi)	Mem Cap (kips)	Num Bolts	Num Holes	Shear Cap (kips)	Bear Cap (kips)	Use %	Controls
1	10	SAE - 4X4X0.25	10.01	Ice 90° Wind	36	50.37	1	1	17.67	17.40	57	Bolt Bear
2	20	SAU - 3.5X4X0.25	9.25	No Ice 90° Wind	36	46.60	1	1	17.67	17.40	53	Bolt Bear
3	40	SAE - 3.5X3.5X0.25	9.24	Ice 90° Wind	36	43.12	1	1	17.67	17.40	53	Bolt Bear
4	50	SAE - 3X3X0.375	8.76	Ice 90° Wind	36	52.35	1	1	17.67	26.10	49	Bolt Shear
5	60	SAU - 3X3.5X0.25	8.51	Ice 90° Wind	36	39.35	1	1	17.67	17.40	48	Bolt Bear
6	70	SAE - 3X3X0.375	8.22	Ice 90° Wind	36	52.35	1	1	17.67	26.10	46	Bolt Shear
7	80	SAE - 3X3X0.25	8.29	Ice 90° Wind	36	35.87	1	1	17.67	17.40	47	Bolt Bear
8	100	SAE - 3X3X0.1875	7.49	Ice 90° Wind	36	27.19	1	1	17.67	13.05	57	Bolt Bear
9	106.6	SAE - 2.5X2.5X0.25	7.12	Ice 90° Wind	36	29.52	1	1	12.27	14.50	58	Bolt Shear
10	120	SAE - 2.5X2.5X0.1875	7.53	Ice 90° Wind	36	22.42	1	1	12.27	10.87	69	Bolt Bear
11	140	SAE - 2.5X2.5X0.1875	7.23	Ice 90° Wind	36	22.42	1	1	12.27	10.87	66	Bolt Bear
12	160	SAE - 2X2X0.1875	6.17	No Ice 90° Wind	36	16.85	1	1	12.27	10.87	56	Bolt Bear
13	180	SAE - 1.75X1.75X0.1875	3.69	Ice 90° Wind	36	14.24	1	1	12.27	10.87	33	Bolt Bear
14	195	SAE - 1.75X1.75X0.1875	2.43	Ice 60° Wind	36	14.24	1	1	12.27	10.87	22	Bolt Bear

Support Forces Summary

Structure:	CT01879-S-SBA	**Code:**	EIA/TIA-222-F
Site Name:	Clinton 4 CT	**Exposure:**	C
Height:	195.00 (ft)	**Gh:**	1.12
Base Elev:	0.000 (ft)	**Struct Class:**	II

8/29/2016

4

Tower Engineering Solutions

Load Case	Node	FX (kips)	FY (kips)	FZ (kips)
No Ice Normal Wind	1	0.00	310.78	-31.31
	1a	10.82	-132.99	-9.98
	1b	-10.82	-132.99	-9.98
No Ice 60° Wind	1	-3.06	159.84	-15.67
	1a	-15.03	159.52	5.30
	1b	-24.86	-274.55	-14.43
No Ice 90° Wind	1	-3.63	15.03	-0.91
	1a	-23.94	267.23	11.90
	1b	-22.51	-237.46	-10.99
Ice Normal Wind	1	0.00	327.54	-28.99
	1a	13.70	-129.28	-11.56
	1b	-13.70	-129.28	-11.56
Ice 60° Wind	1	-3.05	173.66	-13.22
	1a	-12.91	173.28	4.07
	1b	-28.31	-277.96	-16.41
Ice 90° Wind	1	-3.59	23.12	2.05
	1a	-22.06	284.60	10.83
	1b	-25.77	-238.75	-12.88
Twist/Sway Normal Wind	1	0.00	115.38	-11.32
	1a	3.13	-35.29	-3.08
	1b	-3.13	-35.29	-3.08
Twist/Sway 60° Wind	1	-1.06	63.79	-5.95
	1a	-5.65	63.60	2.10
	1b	-7.85	-82.58	-4.56
Twist/Sway 90° Wind	1	-1.24	15.02	-0.94
	1a	-8.67	99.90	4.34
	1b	-7.06	-70.12	-3.40

(-) = Uplift (+) = Down

Max Reactions

Leg			Overturning		
Max Uplift:	-277.96	**(kips)**	Moment:	6066.10	**(ft-kips)**
Max Down:	327.54	**(kips)**	Total Down:	68.97	**(kips)**
Max Shear:	32.72	**(kips)**	Total Shear:	52.11	**(kips)**

Analysis Summary

Structure:	CT01879-S-SBA	**Code:**	EIA/TIA-222-F	8/29/2016
Site Name:	Clinton 4 CT	**Exposure:**	C	
Height:	195.00 (ft)	**Gh:**	1.12	
Base Elev:	0.000 (ft)	**Struct Class:**	II	Page: 15

Tower Engineering Solutions

Max Reactions

Leg			Overturning		
Max Uplift:	-277.96	(kips)	Moment:	6066.10	(ft-kips)
Max Down:	327.54	(kips)	Total Down:	68.97	(kips)
Max Shear:	32.72	(kips)	Total Shear:	52.11	(kips)

Anchor Bolts

Bolt Size (in.):		Number Bolts:	0
Yield Strength (Ksi):		Tensile Strength (Ksi):	

Interaction Ratio: -999.00

Max Usages

Max Leg: 100.0% (Ice Normal Wind - Sect 3)
Max Diag: 98.0% (Ice 90° Wind - Sect 10)
Max Horiz: 13.0% (No Ice 60° Wind - Sect 13)

Max Deflection, Twist and Sway

Load Case	Elevation (ft)	Deflection (ft)	Twist (deg)	Sway (deg)
50 mph Wind with 0" Ice Normal To Face	79.63	0.0934	0.0000	0.1589
	100.38	0.1526	0.0000	0.2071
	140.38	0.3149	0.0059	0.3555
	150.00	0.3646	0.0064	0.3196
	160.38	0.4238	-0.0104	0.4162
	180.00	0.5448	-0.0119	0.3754
	185.00	0.5779	0.0000	0.5300
	190.00	0.6113	-0.0109	0.3914
	195.00	0.6452	0.0107	0.4090
50 mph Wind with 0" Ice at 60° From Face	79.63	0.0906	-0.0078	0.1470
	100.38	0.1483	-0.0103	0.1935
	140.38	0.3070	-0.0166	0.3385
	150.00	0.3557	0.0152	0.3124
	160.38	0.4136	0.0185	0.4086
	180.00	0.5320	0.0183	0.3738
	185.00	0.5639	0.0106	0.3254
	190.00	0.5968	0.0157	0.4024
	195.00	0.6299	0.0152	0.3804

50 mph Wind with 0" Ice at 90° From Face	79.63	0.0910	-0.0095	0.1454
	100.38	0.1491	-0.0129	0.1915
	140.38	0.3083	-0.0218	0.3274
	150.00	0.3575	-0.0173	0.3104
	160.38	0.4156	-0.0159	0.4000
	180.00	0.5343	0.0138	0.3840
	185.00	0.5661	-0.0031	0.2236
	190.00	0.5992	0.0116	0.4241
	195.00	0.6324	0.0112	0.3806
73.61 mph Wind with 0.5" Ice Normal To Face	79.63	0.2820	0.0000	0.4866
	100.38	0.4624	0.0000	0.6333
	140.38	0.9583	0.0186	1.0796
	150.00	1.1105	0.0199	0.9757
	160.38	1.2914	0.0309	1.2776
	180.00	1.6635	0.0362	1.1530
	185.00	1.7638	0.0000	1.6130
	190.00	1.8684	0.0354	1.2039
	195.00	1.9727	0.0349	1.2587
73.61 mph Wind with 0.5" Ice at 60° From Face	79.63	0.2791	-0.0113	0.4576
	100.38	0.4582	-0.0117	0.6019
	140.38	0.9519	0.0598	1.0363
	150.00	1.1020	0.0609	0.9664
	160.38	1.2820	0.0738	1.2618
	180.00	1.6512	0.1501	1.1732
	185.00	1.7502	0.2121	1.0279
	190.00	1.8542	0.2224	1.2559
	195.00	1.9577	0.2186	1.1894
73.61 mph Wind with 0.5" Ice at 90° From Face	79.63	0.2806	-0.0279	0.4497
	100.38	0.4603	-0.0372	0.5930
	140.38	0.9534	-0.0609	1.0098
	150.00	1.1043	-0.0472	0.9604
	160.38	1.2844	0.0532	1.2405
	180.00	1.6547	0.0535	1.1949
	185.00	1.7541	-0.0071	0.7272
	190.00	1.8576	0.0521	1.3174
	195.00	1.9612	0.0520	1.1880
85 mph Wind with 0" Ice Normal To Face	79.63	0.2750	0.0000	0.4709
	100.38	0.4494	0.0000	0.6125
	140.38	0.9285	0.0155	1.0558
	150.00	1.0758	0.0168	0.9453
	160.38	1.2506	0.0279	1.2357
	180.00	1.6082	0.0335	1.1073
	185.00	1.7051	0.0000	1.5539
	190.00	1.8047	0.0329	1.1552
	195.00	1.9048	0.0325	1.2096
85 mph Wind with 0" Ice at 60° From Face	79.63	0.2689	-0.0120	0.4390
	100.38	0.4408	-0.0130	0.5777
	140.38	0.9140	0.0588	1.0039
	150.00	1.0588	0.0599	0.9302
	160.38	1.2315	0.0726	1.2134
	180.00	1.5845	0.1361	1.1211
	185.00	1.6796	0.1936	0.9763
	190.00	1.7780	0.2030	1.2001
	195.00	1.8767	0.1994	1.1347

85 mph Wind with 0" Ice at 90° From Face	79.63	0.2704	-0.0278	0.4325
	100.38	0.4432	-0.0374	0.5704
	140.38	0.9174	-0.0630	0.9785
	150.00	1.0641	-0.0495	0.9253
	160.38	1.2373	0.0537	1.1950
	180.00	1.5913	0.0542	1.1439
	185.00	1.6862	-0.0104	0.6819
	190.00	1.7849	0.0527	1.2615
	195.00	1.8840	0.0526	1.1353

Tower Engineering Solutions

Pier Foundation For Self Supporting Tower

				Date
				8/29/2016
Customer Name:	SBA Communications Corp	EIA/TIA Standard:	EIA-222-F	
Site Name:		Structure Height (Ft.):	195	
Site Number:	CT01879-S-SBA	Engineer Name:	Rama K.	
Engr. Number:	25627	Engineer Login ID:		

Foundation Info Obtained from: Drawings/Calculations

Acceptable overstress (5.0%

Structure Type: Self Supporting Tower

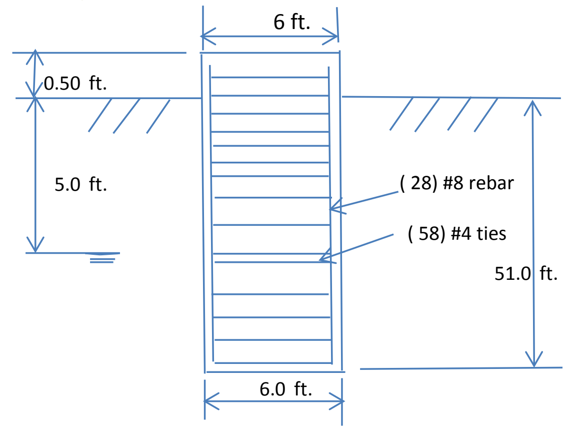
Analysis or Design? Analysis

Base Reactions (Unfactored)

Axial Load (Kips):	327.5	Shear Force (Kips):	32.7
Uplift Force (Kips):	278.0	Moment (Kips-ft):	0.0

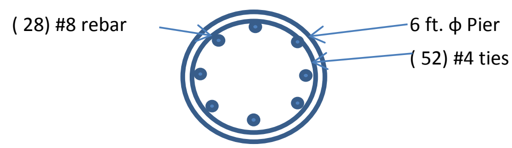
Foundation Geometries:

Diameter of Pier (ft.):	6.0	Depth of Base B. G. S. :	51.0	ft.
Pier Height A. G. (ft.):	0.50			



Material Properties and Reabr Info:

Concrete Strength (psi):	3000	Steel Elastic Modulus:	29000	ksi
Vertical bar yield (ksi)	60	Tie steel yield strength:	60	ksi
Vertical Rebar Size #:	8	Tie / Stirrup Size #:	4	
Qty. of Vertical Rebars:	28	Tie Spacing:	12.0	in.
Concrete Cover (in.):	3	Concrete unit weight:	0.0	pcf



SST Pier Foundation

Soil Design Parameters:

Water Table B.G.S. (ft):	5.0	Unit weight of water:	62.4	psf
Ratio of Uplift/Axial Skin Friction:	1.0	Pullout failure Angle:	32	(°)
Skin Frictions are to be obtained from:		Soil Report		

0

Depth of Layers (ft) Top	Bottom	γ_{soil} (pcf)	ϕ (°)	Cohesion (psf)	Allowable Skin Friction (psf)	Allowable Bearing (psf)	Soil Types
0.0	2.5	100	28	0	200	0	Sand
2.5	55.0	120	30	0	365	5000	Sand
55.0	60.0	120	30	0	365	5000	Sand

Soil weight Increase Factor for bouyant soils (1.0 to 1.15): 1.1

Foundation Analysis and Design:

Total Dry Soil Volume from Conical Failure (cu. Ft.):	17282	Dry Soil Weight from Conical Failure:	1901	Kips
Total Buoyant Soil Volume from Conical Failure (cu. Ft.):	52261	Buoyant Soil Weight from Conical Failure (Ki	3951	Kips
Total Dry Concrete Volume (cu. Ft.):	156	Total Dry Concrete Weight:	0.00	Kips
Total Buoyant Concrete Volume (cu. Ft.):	1301	Total Buoyant Concrete Weight:	-81.16	Kips
Total Effective Concrete Weight (Kips):	-81.2	Total Effective Soil Weight:	5852	Kips
Total Effective Vertical Load on Base (Kips):	132			

Check Soil Capacities:

					Usage	
Calculated Foundation Allowable Axail Capacity (Kips):	484.5	>	Applied Axial Load (Kips):	132	0.27	OK!
Calculated Foundation Uplift Capacity (Kips):	278.18	>	Design Uplift Load (Kips):	278	1.00	OK!

Check the capacities of Reinforceing Concrete:

Strength reduction factor (Flexure and axial tension):	0.90	Strength reduction factor (Shear):	0.75
Strength reduction factor (Axial compresion):	0.65	Wind Load Factor on Concrete Design:	1.30

Reinforcing Concrete Pier:

					Usage	
Vertical Steel Rebar Area (sq. in./each):	0.79		Tie / Stirrup Area (sq. in./each):	0.20		
Calculated Moment Capacity (Mn,Kips-Ft):	2416	>	Design Factored Moment (Mu, K-Ft):	134.7	0.06	OK!
Calculated Shear Capacity (Kips):	313.3	>	Design Factored Shear (Kips):	62.5	0.20	OK!
Calculated Tension Capacity (Tn, Kips):	1194.5	>	Design Factored Tension (Tu Kips):	361.4	0.30	OK!
Calculated Compression Capacity (Pn, Kips):	5369	>	Design Factored Axial Load (Pu Kips):	425.8	0.08	OK!
Moment & Tension Strength Combination:	0.06	OK!	Max. Allowable Tie/Stirrup Spacing:	12.00	in.	
Pier Reinforcement Ratio:	0.005	Reinforcement Ratio is satisfied per ACI				

LTE MULTI CARRIER RRH ADD
CT2230
CLINTON MEADOW RD
46 MEADOW ROAD
CLINTON, CT 06413
FA CODE: 10049127

at&t Mobility

PROJECT TEAM

CLIENT REPRESENTATIVE:

EMPIRE TELECOM
16 ESQUIRE ROAD
BILLERICA, MA 01821
DAVID COOPER
617-639-4908
dcooper@empiretelecomm.com

SITE ACQUISITION & ZONING:

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16 ESQUIRE ROAD
BILLERICA, MA 01821
GRZEGORZ "GREG" DORMAN
484-683-1750
gdorman@empiretelecomm.com

ENGINEERING:

TRYLON TSF
24 QUEEN ST E
BRAMPTON, ON L6V 1A2
KATYA SERAVALLE
PHONE: 519-465-4125

RF ENGINEER:

AT&T MOBILITY – NEW ENGLAND
550 COCHITUATE ROAD
SUITE 550 13 & 14
FRAMINGHAM, MA 01701
CAMERON SYME
508-596-7146
cs6970@att.com

CONSTRUCTION MANAGEMENT:

EMPIRE TELECOM
16 ESQUIRE ROAD
BILLERICA, MA 01821
GRZEGORZ "GREG" DORMAN
484-683-1750
gdorman@empiretelecomm.com

TOWER OWNER:

SBA

SBA COMMUNICATIONS LLC
8051 CONGRESS AVENUE
BOCA RATON, FL 33487

SBA SITE ID: CT02722
SBA SITE NAME: WATERBURY

SBA REGIONAL SITE MANAGER: RUSS PUTNAM
(617)794-1405
RPutnam@sbasite.com

GENERAL NOTES

DO NOT SCALE DRAWINGS

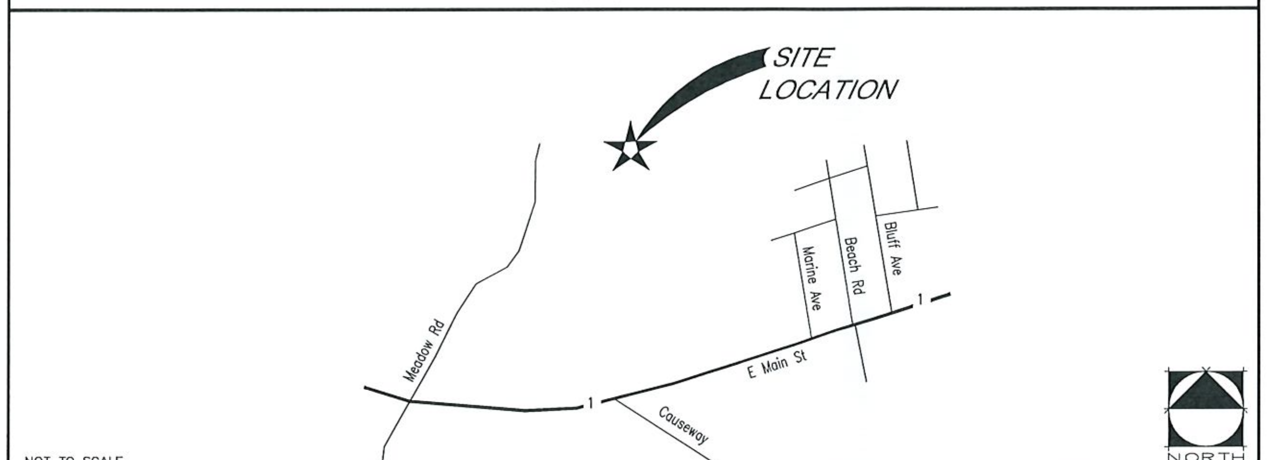
CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE ARCHITECT/ENGINEER IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.

THE FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION. A TECHNICIAN WILL VISIT THE SITE AS REQUIRED FOR ROUTINE MAINTENANCE. THE PROJECT WILL NOT RESULT IN ANY SIGNIFICANT DISTURBANCE OR EFFECT ON DRAINAGE; NO SANITARY SEWER SERVICE, POTABLE WATER, OR TRASH DISPOSAL IS REQUIRED AND NO COMMERCIAL SIGNAGE IS PROPOSED.

SITE INFORMATION

LATITUDE:	41° 16' 30.71316" N
LONGITUDE:	-72° 51' 51.7448" W
LAT./LONG. TYPE:	NAD 83
GROUND ELEVATION:	N/A
APN/UPC:	N/A
AREA OF CONSTRUCTION:	EXISTING
ZONING/JURISDICTION:	MIDDLESEX COUNTY
CURRENT ZONING:	UNKNOWN
EXISTING USE:	UNMANNED TELECOMMUNICATIONS FACILITY
COUNTY:	MIDDLESEX COUNTY
HANDICAP REQUIREMENTS:	FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION. HANDICAPPED ACCESS NOT REQUIRED.

VICINITY MAP



NOT TO SCALE

DRIVING DIRECTIONS

CT2230 CLINTON-MEADOW RDI-95 TO EXIT64, TAKE RTE 145 SOUTH 1/10TH MILE TO STOP SIGN. TURN RIGHT AT STOP SIGN STILL RTE 145 SOUTH AND GO 4/10'S MILE TO GROVE BEACH ROAD, TAKE A LEFT ONTO GROVE BEACH ROAD AND PROCEED 9/10 OF A MILE TO RTE 1 TURN RIGHT AND GO 9/10 MILE TURN RIGHT AT LIGHT ONTO MEADOW ROAD..ACCESS ROAD GOES THROUGH JUNKYARD. DEMARC LOCATED IN HOFFMAN BOX INSIDE FENCE ..SHELTER:GROUND LEVELLTE RADIOS:ON TOWERUMTS;ON FIBERCIRCUIT ID: HCGS714013 ET121 / HCGS714014 ET129 COMBO: 4722 (BOTH GATES)POWER COMPANY; CL&P 1800 286-2000METER# 88 697 515

CODE COMPLIANCE

BUILDING CODE: 2012 MIDDLESEX COMMERCIAL BUILDING CODE

ELECTRICAL CODE: 2014 MIDDLESEX ELECTRICAL CODE

LIGHTNING PROTECTION CODE: NFPA 780 – 2000, LIGHTNING PROTECTION CODE

SUBCONTRACTOR'S WORK SHALL COMPLY WITH ALL APPLICABLE NATIONAL, STATE, AND LOCAL CODES AS ADOPTED BY THE LOCAL AUTHORITY HAVING JURISDICTION (AHJ) FOR THE LOCATION. THE EDITION OF THE AHJ ADOPTED CODES AND STANDARDS IN EFFECT ON THE DATE OF CONTRACT AWARD SHALL GOVERN THE DESIGN.

FOR ANY CONFLICTS BETWEEN SECTIONS OF LISTED CODES AND STANDARDS REGARDING MATERIAL, METHODS OF CONSTRUCTION, OR OTHER REQUIREMENTS, THE MOST RESTRICTIVE REQUIREMENT SHALL GOVERN. WHERE THERE IS CONFLICT BETWEEN A GENERAL REQUIREMENT AND A SPECIFIC REQUIREMENT, THE SPECIFIC REQUIREMENT SHALL GOVERN.

CONNECTICUT ONE CALL SYSTEM, INC. 1-800-922-4455 STOP-CALL BEFORE YOU DIG!

CONNECTICUT LAW REQUIRES TWO WORKING DAYS NOTICE PRIOR TO ANY EARTH MOVING ACTIVITIES BY CALLING 800-922-4455 OR DIAL 811

APPROVALS

AT&T (RF): ________ DATE: ________

AT&T (CONST.): ________ DATE: ________

AT&T (OPS): ________ DATE: ________

TOWER OWNER: ________ DATE: ________

JURISDICTIONAL APPROVAL

BASED ON INFORMATION PROVIDED BY AT&T REGULATORY COMPLIANCE PROFESSIONALS AND LEGAL COUNSEL, THIS TELECOMMUNICATIONS EQUIPMENT DEPLOYMENT IS CONSIDERED AN ELIGIBLE FACILITY UNDER THE MIDDLE CLASS TAX RELIEF AND JOB CREATION ACT OF 2012, 47 USC 1455(A), SECTION 6409(A), AND IS SUBJECT TO AN ELIGIBLE FACILITY REQUEST, EXPEDITED REVIEW AND LIMITED/PARTIAL ZONING PRE-EMPTION FOR LOCAL DISCRETIONARY PERMITS (VARIANCE, SPECIAL PERMIT, SITE PLAN REVIEW OR ADMINISTRATIVE REVIEW).

PROJECT DESCRIPTION

THIS PROJECT WILL BE COMPRISED OF:

CHANGES ON THE EXISTING SELF SUPPORTING TOWER TOWER:

- REMOVE (3) EXISTING RRUS-11+RRUS-A2 (3) PER SECTOR FOR (3) SECTORS.
- REUSE (9) EXISTING ANTENNA (3) PER SECTOR FOR (3) SECTORS.
- REUSE (3) EXISTING RRUS-11 (1) PER SECTOR FOR (3) SECTORS.
- INSTALL (3) NEW RRH'S, (1) PER SECTOR FOR (3) SECTORS.
- REUSE (1) EXISTING FIBER TRUNK.
- REUSE (2) EXISTING DC TRUNK.
- REUSE (1) EXISTING RET CABLE.
- REUSE (1) EXISTING DC/FIBER SQUID.
- REUSE (12)EXISTING RF CABLES.

CHANGES IN THE EXISTING AT&T EQUIPMENT ENCLOSURE AREA:

- INSTALL (1) NEW XMU.

Michael Plahovinsak

Digitally signed by Michael Plahovinsak
Date: 2016.09.10 22:24:34 -04'00'

MFP PROJECT #23216-010

SHEET	DESCRIPTION
T-1	TITLE SHEET
GN-1	GROUNDING & GENERAL NOTES
A-1	SITE PLAN
A-2	EQUIPMENT LAYOUTS
A-3	ANTENNA LAYOUTS & TOWER ELEVATION
A-4	DETAILS
A-5	ANTENNA SCHEDULE
G-1	GROUNDING, ONE-LINE DIAGRAM & DETAILS

at&t Mobility
1355 WEST UNIVERSITY DRIVE
MESA, AZ 85201-5419

EMPIRE telecom
16 ESQUIRE ROAD
BILLERICA, MA 01821

PLANS PREPARED BY:

Trylon
24 QUEEN ST E
BRAMPTON, ON
1 (519) 572-9995

NO.	DATE	DESCRIPTION	BY
A	08/17/16	FOR REVIEW	GOP
0	09/08/16	FOR CONSTRUCTION	GI

SITE INFORMATION:

CT2230
CLINTON MEADOW RD
FA CODE: 10049127

46 MEADOW ROAD
CLINTON, CT 06413

SEAL:

STATE OF CONNECTICUT
MICHAEL F. PLAHOVINSAK
No. 25849
LICENSED PROFESSIONAL ENGINEER

9-10-2016

MICHAEL F. PLAHOVINSAK, P.E. #25849
Sole Proprietor - Independent Engineer
18301 S.R. 161, Plain City, OH 43064
614-398-6250 / mike@mfpeng.com

SHEET TITLE:

TITLE SHEET

SHEET NUMBER:

T-1

GENERAL NOTES:

1. FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:
   - CONTRACTOR – EMPIRE TELECOM
   - SUBCONTRACTOR – GENERAL CONTRACTOR (CONSTRUCTION)
   - OWNER – AT&T MOBILITY
   - OEM – ORIGINAL EQUIPMENT MANUFACTURER
2. PRIOR TO THE SUBMISSION OF BIDS, THE BIDDING SUBCONTRACTOR SHALL VISIT THE CELL SITE TO FAMILIARIZE WITH THE EXISTING CONDITIONS AND TO CONFIRM THAT THE WORK CAN BE ACCOMPLISHED AS SHOWN ON THE CONSTRUCTION DRAWINGS. ANY DISCREPANCY FOUND SHALL BE BROUGHT TO THE ATTENTION OF CONTRACTOR.
3. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES. SUBCONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS, AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.
4. DRAWINGS PROVIDED HERE ARE NOT TO BE SCALED AND ARE INTENDED TO SHOW OUTLINE ONLY.
5. UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES, AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
6. THE SUBCONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
7. IF THE SPECIFIED EQUIPMENT CANNOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE SUBCONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION SPACE FOR APPROVAL BY THE CONTRACTOR.
8. SUBCONTRACTOR SHALL DETERMINE ACTUAL ROUTING OF CONDUIT, POWER AND T1 CABLES, GROUNDING CABLES AS SHOWN ON THE POWER, GROUNDING AND TELCO PLAN DRAWING. SUBCONTRACTOR SHALL UTILIZE EXISTING TRAYS AND/OR SHALL ADD NEW TRAYS AS NECESSARY. SUBCONTRACTOR SHALL CONFIRM THE ACTUAL ROUTING WITH THE CONTRACTOR. ROUTING OF TRENCHING SHALL BE APPROVED BY CONTRACTOR
9. THE SUBCONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT SUBCONTRACTOR'S EXPENSE TO THE SATISFACTION OF OWNER.
10. SUBCONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OFF ALL SCR1 'AP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY. ANTENNAS REMOVED SHALL BE RETURNED TO THE OWNER'S DESIGNATED LOCATION.
11. SUBCONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION.
12. ALL CONCRETE REPAIR WORK SHALL BE DONE IN ACCORDANCE WITH AMERICAN CONCRETE INSTITUTE (ACI) 301.
13. ANY NEW CONCRETE NEEDED FOR THE CONSTRUCTION SHALL HAVE 4000 PSI STRENGTH AT 28 DAYS UNLESS OTHERWISE SPECIFIED. ALL CONCRETING WORK SHALL BE DONE IN ACCORDANCE WITH ACI 318 CODE REQUIREMENTS.
14. ALL STRUCTURAL STEEL WORK SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH AISC SPECIFICATIONS. ALL STRUCTURAL STEEL SHALL BE ASTM A36 (Fy=36 ksi). ALL STEEL EXPOSED TO WEATHER SHALL BE HOT DIPPED GALVANIZED. TOUCH UP ALL SCRATCHES AND OTHER MARKS IN THE FIELD AFTER STEEL IS ERECTED USING A COMPATIBLE ZINC RICH PAINT.
15. CONSTRUCTION SHALL COMPLY WITH SPECIFICATION 25741-000-3APS-A00Z-00002, "GENERAL CONSTRUCTION SERVICES FOR CONSTRUCTION OF AT&T MOBILITY SITES."
16. SUBCONTRACTOR SHALL VERIFY ALL EXISTING DIMENSIONS AND CONDITIONS PRIOR TO COMMENCING ANY WORK. ALL DIMENSIONS OF EXISTING CONSTRUCTION SHOWN ON THE DRAWINGS MUST BE VERIFIED. SUBCONTRACTOR SHALL NOTIFY THE CONTRACTOR OF ANY DISCREPANCIES PRIOR TO ORDERING MATERIAL OR PROCEEDING WITH CONSTRUCTION.
17. THE EXISTING CELL SITE IS IN FULL COMMERCIAL OPERATION. ANY CONSTRUCTION WORK BY SUBCONTRACTOR SHALL NOT DISRUPT THE EXISTING NORMAL OPERATION. ANY WORK ON EXISTING EQUIPMENT MUST BE COORDINATED WITH CONTRACTOR. ALSO, WORK MAY NEED TO BE SCHEDULED FOR AN APPROPRIATE MAINTENANCE WINDOW USUALLY IN LOW TRAFFIC PERIODS AFTER MIDNIGHT.
18. SINCE THE CELL SITE MAY BE ACTIVE, ALL SAFETY PRECAUTIONS MUST BE TAKEN WHEN WORKING AROUND HIGH LEVELS OF ELECTROMAGNETIC RADIATION. EQUIPMENT SHOULD BE SHUTDOWN PRIOR TO PERFORMING ANY WORK THAT COULD EXPOSE THE WORKERS TO DANGER. PERSONAL RF EXPOSURE MONITORS ARE REQUIRED TO BE WORN TO ALERT OF ANY DANGEROUS EXPOSURE LEVELS.
19. SUBCONTRACTOR'S WORK SHALL COMPLY WITH ALL APPLICABLE NATIONAL, STATE, AND LOCAL CODES AS ADOPTED BY THE LOCAL AUTHORITY HAVING JURISDICTION (AHJ) FOR THE LOCATION. THE EDITION OF THE AHJ ADOPTED CODES AND STANDARDS IN EFFECT ON THE DATE OF CONTRACT AWARD SHALL GOVERN THE DESIGN.
   - INTERNATIONAL BUILDING CODE: IBC 2009 WITH LOCAL & COUNTY AMENDMENTS
   - NATIONAL ELECTRICAL CODE: NEC 2011 WITH LOCAL & COUNTY AMENDMENTS
   - FIRE/LIFE SAFETY CODE: NFPA-101 2009 WITH LOCAL & COUNTY AMENDMENTS
20. SUBCONTRACTOR'S WORK SHALL COMPLY WITH THE LATEST EDITION OF THE FOLLOWING STANDARDS:
   - AMERICAN CONCRETE INSTITUTE (ACI) 318, BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE
   - AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC), MANUAL OF STEEL CONSTRUCTION, THIRTEENTH EDITION
   - AMERICAN SOCIETY OF TESTING OF MATERIALS, ASTM
   - TELECOMMUNICATIONS INDUSTRY ASSOCIATION (ANSI/TIA-222-G-1), STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWER AND ANTENNA SUPPORTING STRUCTURES:
   - TIA 607, COMMERCIAL BUILDING GROUNDING AND BONDING REQUIREMENTS FOR TELECOMMUNICATIONS
   - OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION, OSHA
   - INSTITUTE FOR ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE) 81, GUIDE FOR MEASURING EARTH RESISTIVELY, GROUND IMPEDANCE, AND EARTH SURFACE POTENTIALS OF A GROUND SYSTEM IEEE 1100 (1999) RECOMMENDED PRACTICE FOR POWERING AND GROUNDING OF ELECTRONIC EQUIPMENT
   - TELCORDIA GR-1503, COAXIAL CABLE CONNECTIONS
21. FOR ANY CONFLICTS BETWEEN SECTIONS OF LISTED CODES AND STANDARDS REGARDING MATERIAL, METHODS OF CONSTRUCTION, OR OTHER REQUIREMENTS, THE MOST RESTRICTIVE REQUIREMENT SHALL GOVERN. WHERE THERE IS CONFLICT BETWEEN A GENERAL REQUIREMENT AND A SPECIFIC REQUIREMENT, THE SPECIFIC REQUIREMENT SHALL GOVERN.

GROUNDING NOTES:

1. THE SUBCONTRACTOR SHALL REVIEW AND INSPECT THE EXISTING FACILITY GROUNDING SYSTEM AND LIGHTNING PROTECTION SYSTEM (AS DESIGNED AND INSTALLED) FOR STRICT COMPLIANCE WITH THE NEC (AS ADOPTED BY THE AHJ), THE SITE-SPECIFIC (UL, LPI, OR NFPA) LIGHTING PROTECTION CODE, AND GENERAL COMPLIANCE WITH TELCORDIA AND TIA GROUNDING STANDARDS. THE SUBCONTRACTOR SHALL REPORT ANY VIOLATIONS OR ADVERSE FINDINGS TO THE CONTRACTOR FOR RESOLUTION.
2. ALL GROUND ELECTRODE SYSTEMS (INCLUDING TELECOMMUNICATION, RADIO, LIGHTNING PROTECTION, AND AC POWER GES'S) SHALL BE BONDED TOGETHER, AT OR BELOW GRADE, BY TWO OR MORE COPPER BONDING CONDUCTORS IN ACCORDANCE WITH THE NEC.
3. THE SUBCONTRACTOR SHALL PERFORM IEEE FALL-OF-POTENTIAL RESISTANCE TO EARTH TESTING (PER IEEE 1100 AND 81) FOR NEW GROUND ELECTRODE SYSTEMS. THE SUBCONTRACTOR SHALL FURNISH AND INSTALL SUPPLEMENTAL GROUND ELECTRODES AS NEEDED TO ACHIEVE A TEST RESULT OF 5 OHMS OR LESS. TESTS SHALL BE PERFORMED IN ACCORDANCE WITH 25471-000-3PS-EG00-0001, DESIGN & TESTING OF FACILITY GROUNDING FOR CELL SITES.
4. METAL RACEWAY SHALL NOT BE USED AS THE NEC REQUIRED EQUIPMENT GROUND CONDUCTOR. STRANDED COPPER CONDUCTORS WITH GREEN INSULATION, SIZED IN ACCORDANCE WITH THE NEC, SHALL BE FURNISHED AND INSTALLED WITH THE POWER CIRCUITS TO BTS EQUIPMENT.
5. EACH BTS CABINET FRAME SHALL BE DIRECTLY CONNECTED TO THE MASTER GROUND BAR WITH GREEN INSULATED SUPPLEMENTAL EQUIPMENT GROUND WIRES, 6 AWG STRANDED COPPER OR LARGER FOR INDOOR BTS; 2 AWG STRANDED COPPER FOR OUTDOOR BTS.
6. EXOTHERMIC WELDS SHALL BE USED FOR ALL GROUNDING CONNECTIONS BELOW GRADE.
7. APPROVED ANTIOXIDANT COATINGS (I.E., CONDUCTIVE GEL OR PASTE) SHALL BE USED ON ALL COMPRESSION AND BOLTED GROUND CONNECTIONS.
8. ICE BRIDGE BONDING CONDUCTORS SHALL BE EXOTHERMICALLY BONDED OR BOLTED WITH STAINLESS STEEL HARDWARE TO THE BRIDGE AND THE TOWER GROUND BAR.
9. ALUMINUM CONDUCTOR OR COPPER CLAD STEEL CONDUCTOR SHALL NOT BE USED FOR GROUNDING CONNECTIONS.
10. MISCELLANEOUS ELECTRICAL AND NON-ELECTRICAL METAL BOXES, FRAMES AND SUPPORTS SHALL BE BONDED TO THE GROUND RING, IN ACCORDANCE WITH THE NEC.
11. METAL CONDUIT AND TRAY SHALL BE GROUNDED AND MADE ELECTRICALLY CONTINUOUS WITH LISTED BONDING FITTINGS OR BY BONDING ACROSS THE DISCONTINUITY WITH 6 AWG COPPER WIRE UL APPROVED GROUNDING TYPE CONDUIT CLAMPS.
12. GROUND CONDUCTORS USED IN THE FACILITY GROUND AND LIGHTNING PROTECTION SYSTEMS SHALL NOT BE ROUTED THROUGH METALLIC OBJECTS THAT FORM A RING AROUND THE CONDUCTOR, SUCH AS METALLIC CONDUITS, METAL SUPPORT CLIPS OR SLEEVES THROUGH WALLS OR FLOORS. WHEN IT IS REQUIRED TO BE HOUSED IN CONDUIT TO MEET CODE REQUIREMENTS OR LOCAL CONDITIONS, NON-METALLIC MATERIAL SUCH AS PVC PLASTIC CONDUIT SHALL BE USED. WHERE USE OF METAL CONDUIT IS UNAVOIDABLE (E.G., NON-METALLIC CONDUIT PROHIBITED BY LOCAL CODE) THE GROUND CONDUCTOR SHALL BE BONDED TO EACH END OF THE METAL CONDUIT.
13. ALL TOWER GROUNDING SYSTEMS SHALL COMPLY WITH THE REQUIREMENTS OF ANSI/TIA 222. FOR TOWERS BEING BUILT TO REV-G OF THE STANDARD, THE WIRE SIZE OF THE BURIED GROUND RING AND CONNECTIONS BETWEEN THE TOWER AND THE BURIED GROUND RING SHALL BE CHANGED FROM 2 AWG TO 2/0 AWG. IN ADDITION, THE MINIMUM LENGTH OF THE GROUND RODS SHALL BE INCREASED FROM EIGHT FEET (8') TO TEN FEET (10').
14. ALL NEW STRUCTURES WITH A FOUNDATION AND/OR FOOTING HAVING 20 FT. OR MORE ½" OR GREATER ELECTRICALLY CONDUCTIVE REINFORCING STEEL MUST HAVE IT BONDED TO THE GROUND RING USING AN EXOTHERMIC WELD CONNECTION USING #2 AWG SOLID TINNED COPPER GROUND WIRE, PER NEC 250.50.

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BRAMPTON, ON
1 (519) 572-9995

NO.	DATE	DESCRIPTION	BY
A	08/17/16	FOR REVIEW	GOP
0	09/08/16	FOR CONSTRUCTION	GI

SITE INFORMATION:

CT2230
CLINTON MEADOW RD
FA CODE: 10049127

46 MEADOW ROAD
CLINTON, CT 06413

SEAL:

STATE OF CONNECTICUT
MICHAEL F. PLAHOVINSAK
No. 25849
LICENSED PROFESSIONAL ENGINEER
9-10-2016

MICHAEL F. PLAHOVINSAK, P.E. #25849
Sole Proprietor - Independent Engineer
18301 S.R. 161, Plain City, OH 43064
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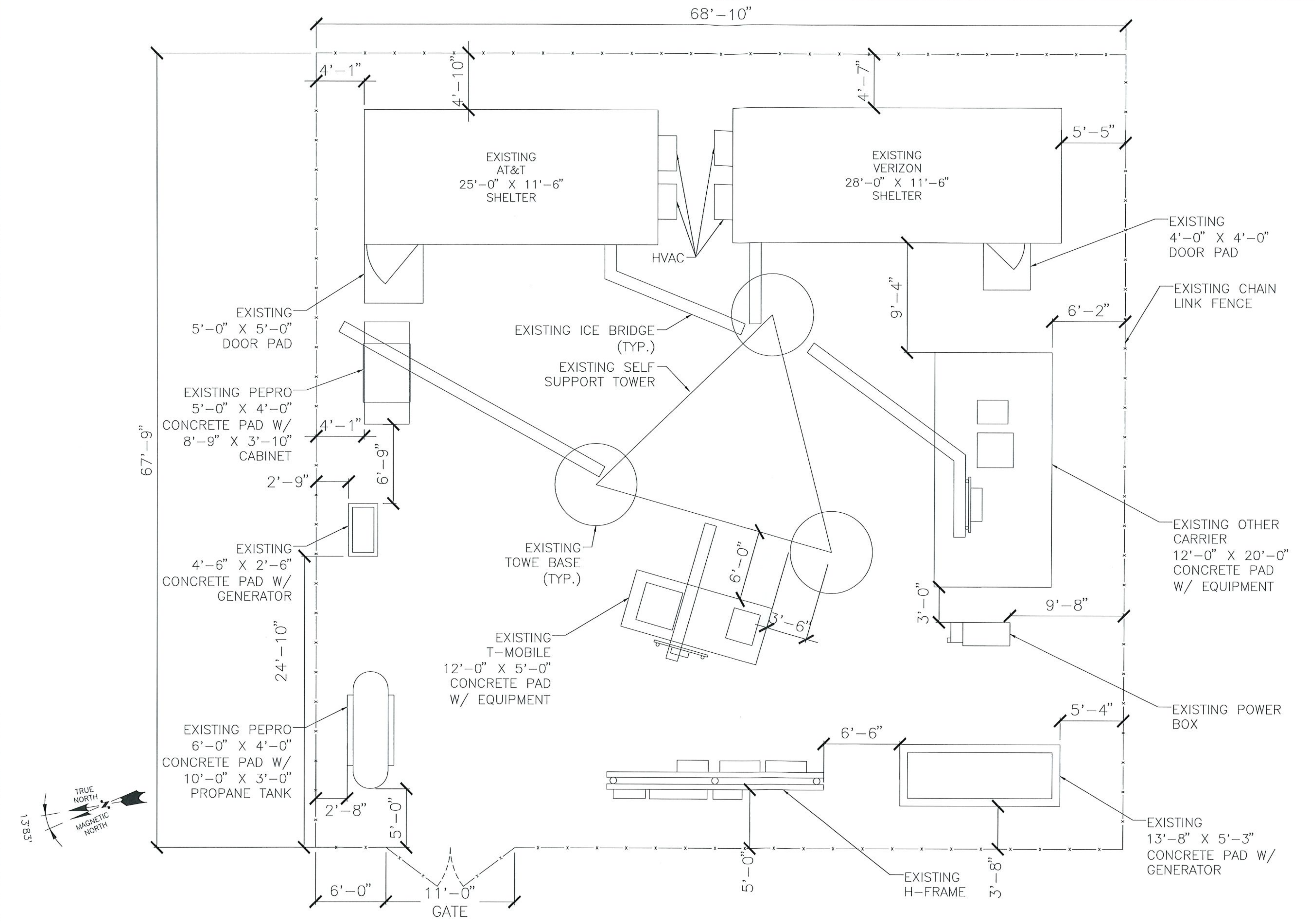
SHEET TITLE:

GENERAL NOTES & GROUNDING NOTES

SHEET NUMBER:

GN-1



SITE PLAN

22"x34" SCALE: 1/4" = 1'-0"
11"x17" SCALE: 1/8" = 1'-0"

4' 3' 2' 1' 0" 4'

1

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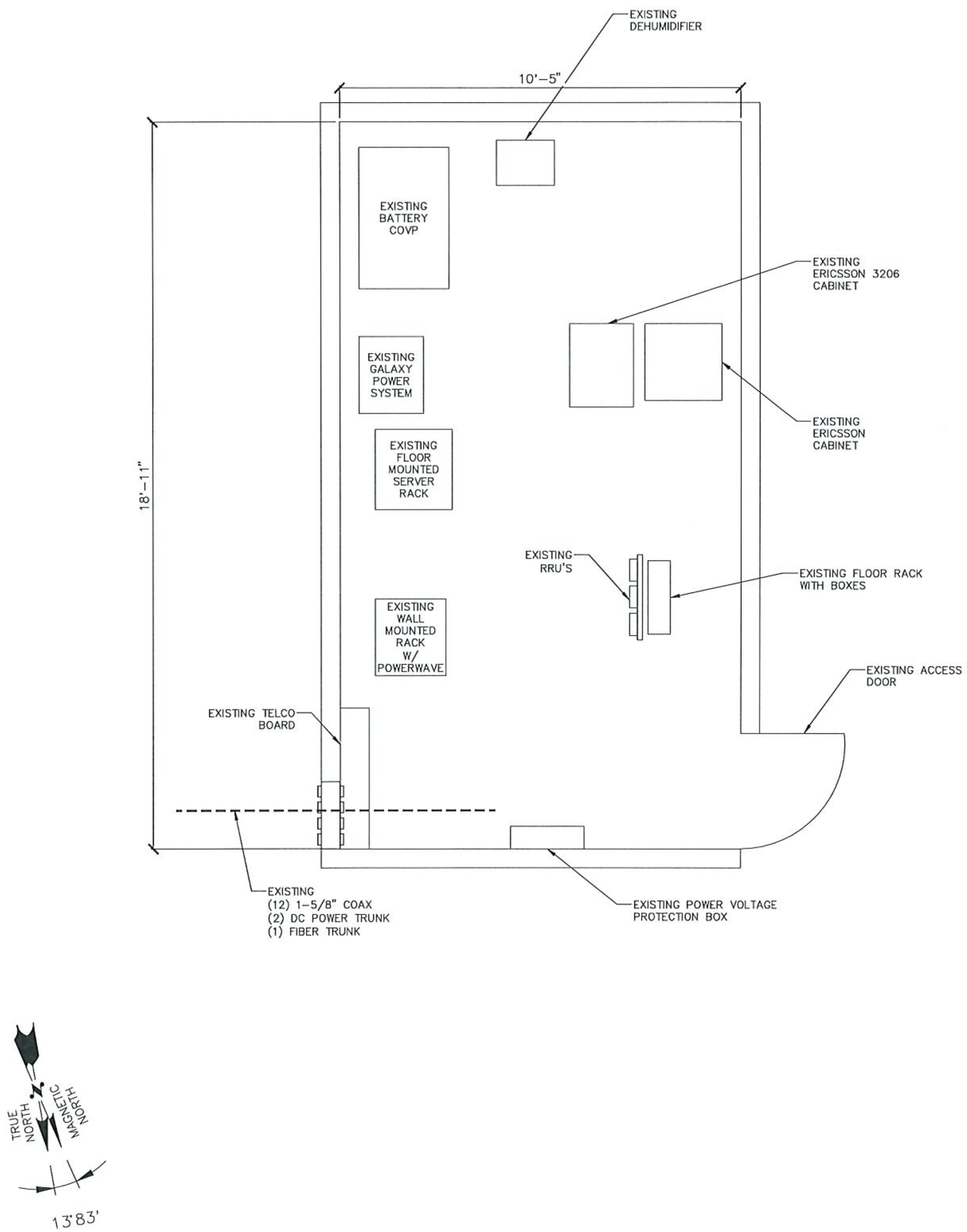
SHEET TITLE:

SITE PLAN

SHEET NUMBER:

A-1

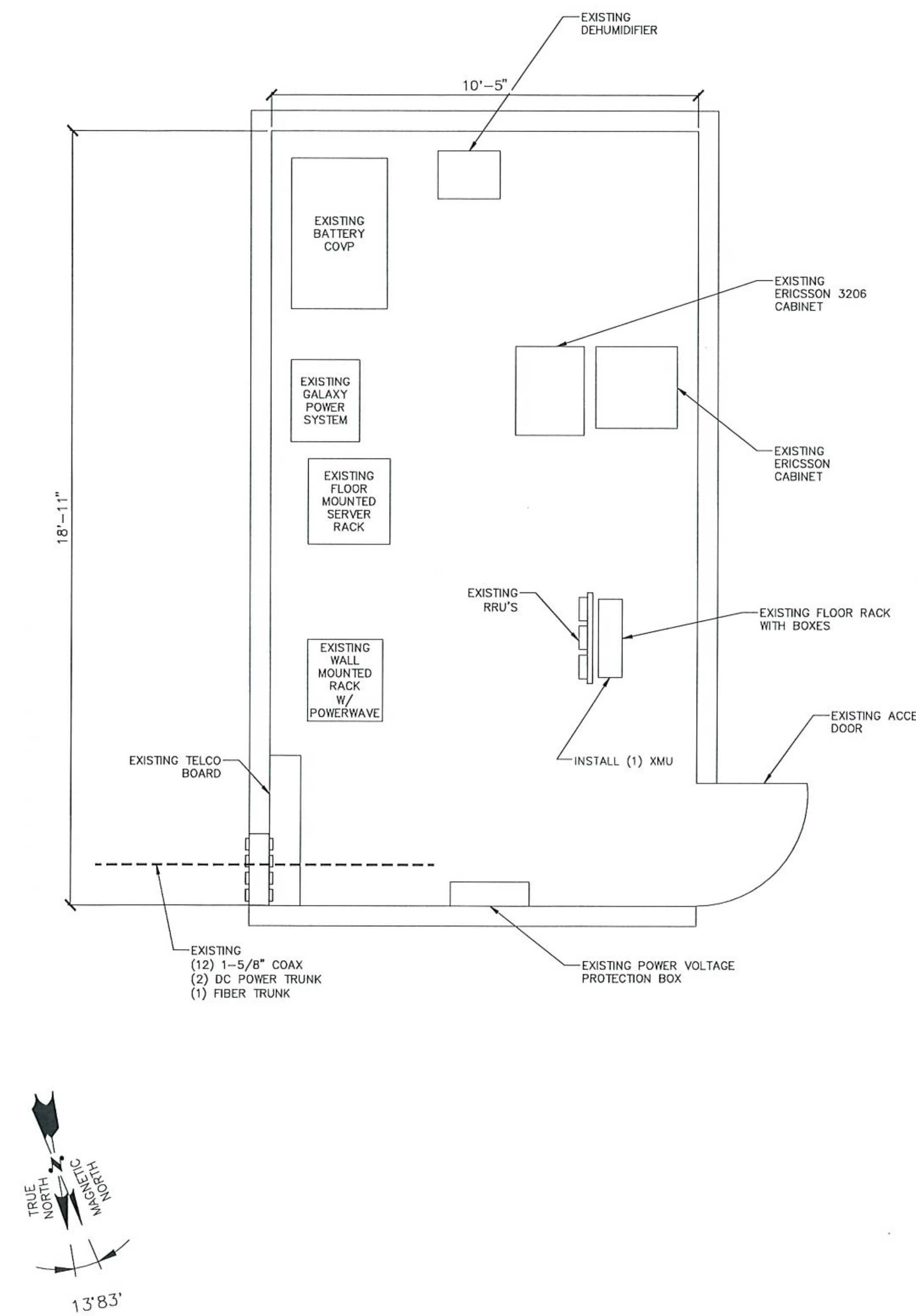


EQUIPMENT EQUIPMENT LAYOUT

22"x34" SCALE: 1/2" = 1'-0"
11"x17" SCALE: 1/4" = 1'-0"

2' 1' 0" 2'

3



PROPOSED EQUIPMENT LAYOUT

22"x34" SCALE: 1/2" = 1'-0"
11"x17" SCALE: 1/4" = 1'-0"

2' 1' 0" 2'

4

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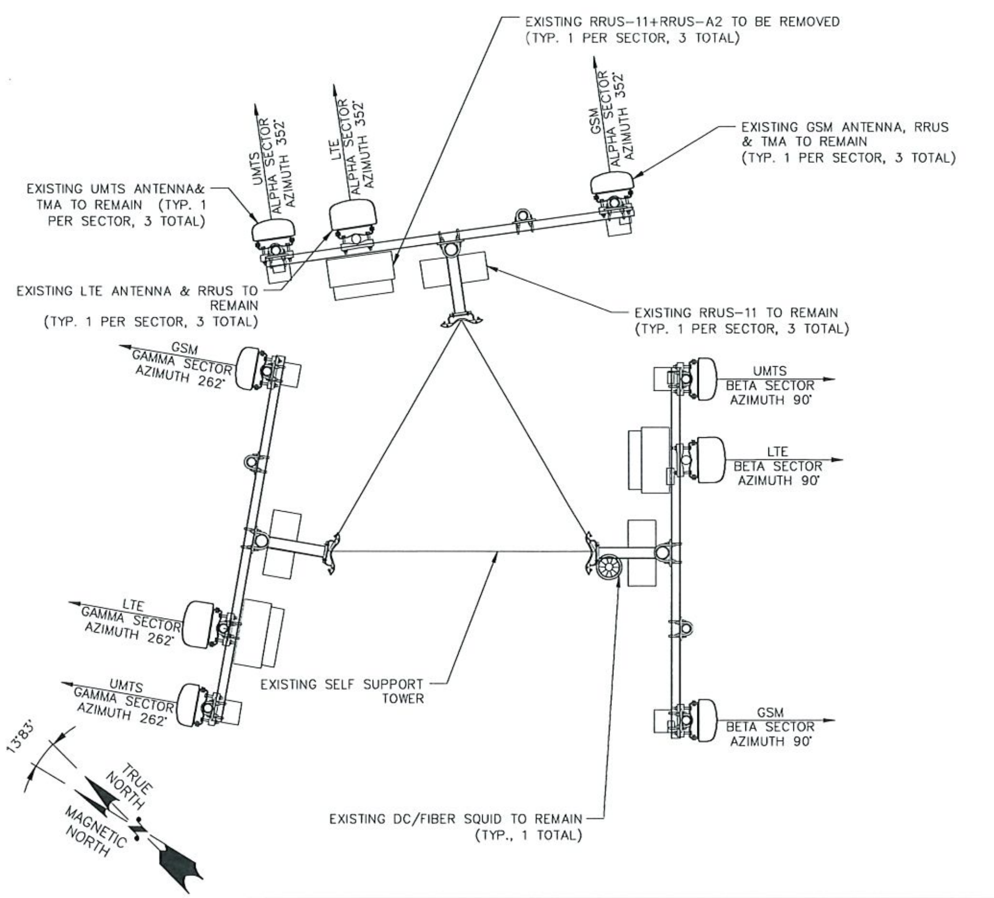
SHEET TITLE:

EQUIPMENT LAYOUTS

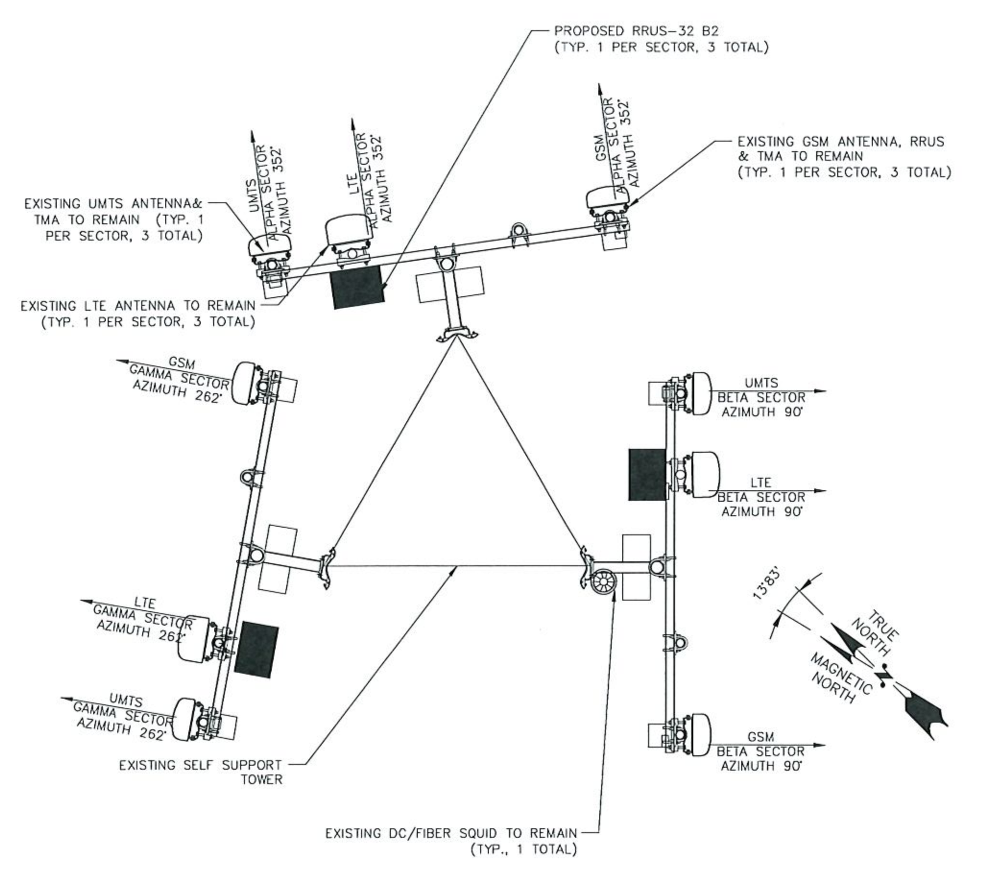
SHEET NUMBER:

A-2



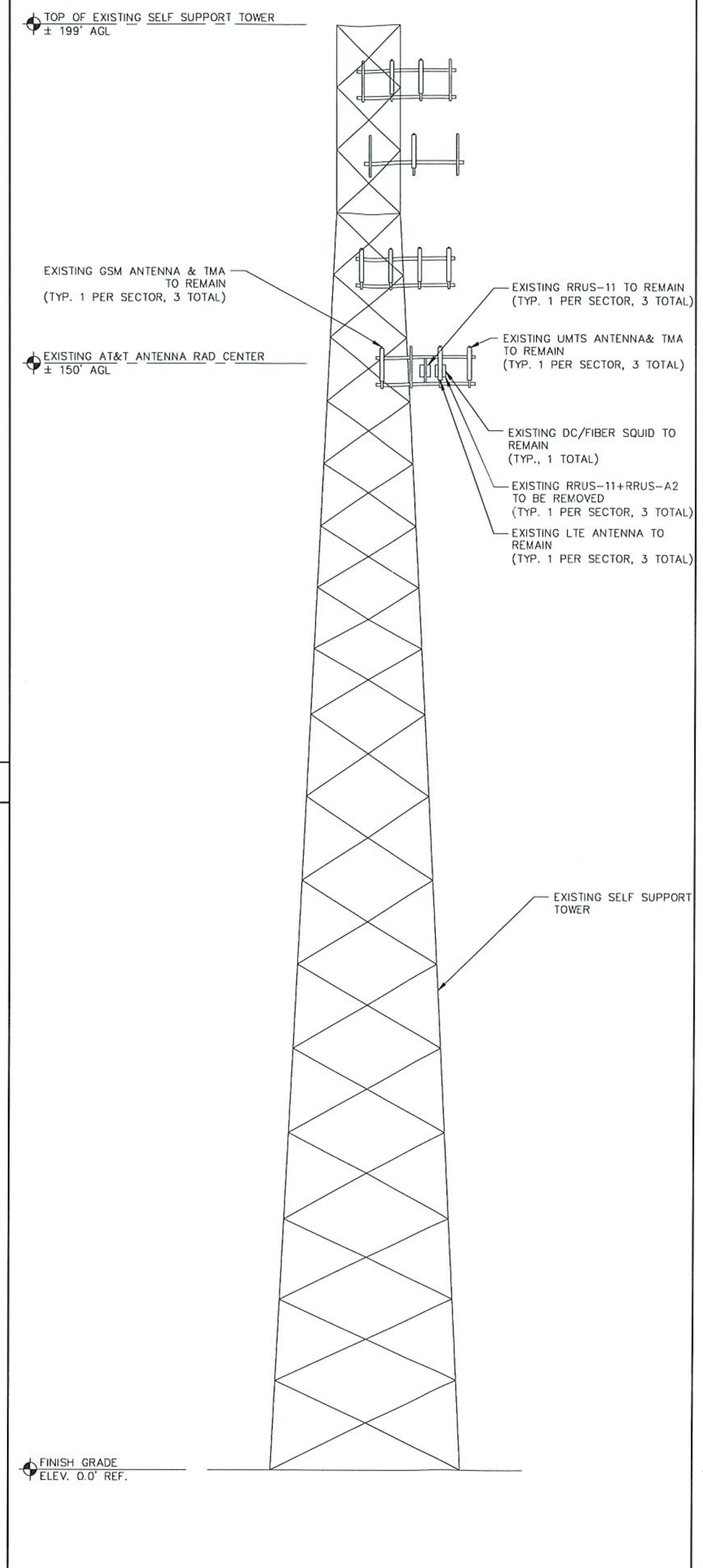
EXISTING ANTENNA LAYOUT

22"x34" SCALE: 1/2" = 1'-0"
11"x17" SCALE: 1/4" = 1'-0"
2' 1' 0" 2'
1



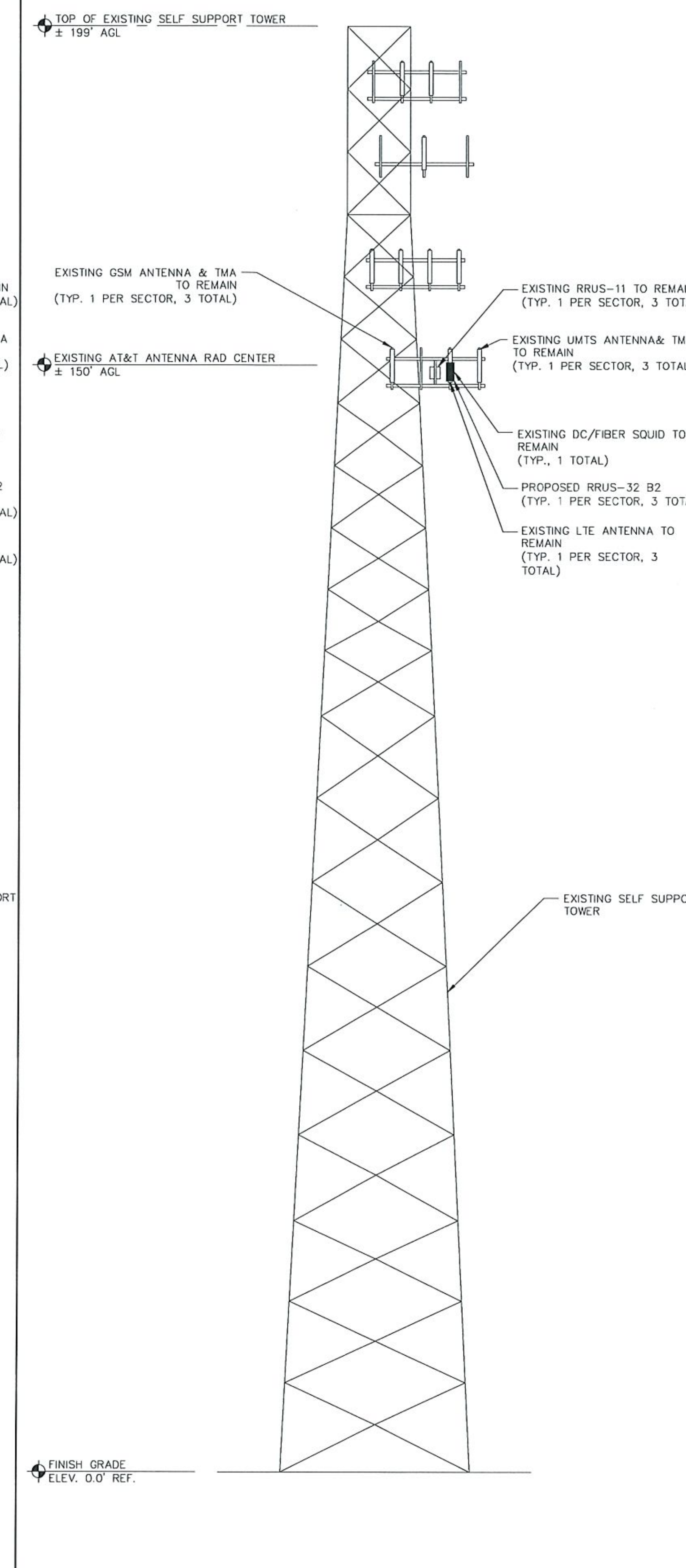
PROPOSED ANTENNA LAYOUT

22"x34" SCALE: 1/2" = 1'-0"
11"x17" SCALE: 1/4" = 1'-0"
2' 1' 0" 2'
2



EXISTING ELEVATION

22"x34" SCALE: 3/32" = 1'-0"
11"x17" SCALE: 3/64" = 1'-0"
8' 4' 0" 8'
3



PROPOSED ELEVATION

22"x34" SCALE: 3/32" = 1'-0"
11"x17" SCALE: 3/64" = 1'-0"
8' 4' 0" 8'
4

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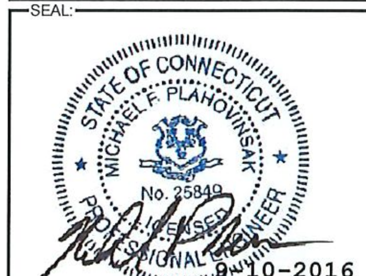
SEAL:



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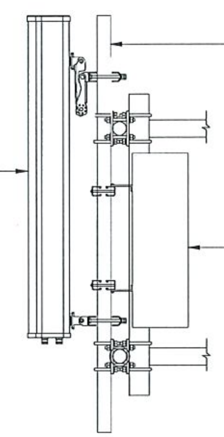
SHEET TITLE:

ANTENNA LAYOUTS & TOWER ELEVATION

SHEET NUMBER:

A-3

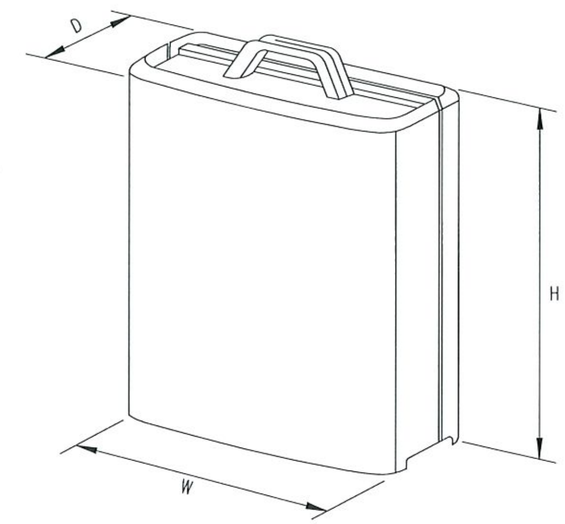


RRU MOUNT DETAILS

22"x34" SCALE: 3/4" = 1'-0"
11"x17" SCALE: 3/8" = 1'-0"

1' 6" 0" 1'

1



MODEL	L x W x H	WEIGHT
RRUS-11	19.69" x 16.97" x 7.17"	50.7 LBS
RRUS-12	20.4" x 18.5" x 7.5"	58 LBS
RRUS-32	29.9" x 13.3" x 9.5"	77 LBS
RRUS-E2	20.4" x 18.5" x 7.5"	58 LBS
A2 MODULE	16.4" x 15.2" x 3.4"	22 LBS

RRUS DETAILS

N.T.S 2

NOT USED

N.T.S 3

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SHEET TITLE:

DETAILS

SHEET NUMBER:

A-4

EXISTING ANTENNA SCHEDULE				
SECTOR	POSITION	MAKE	MODEL	SIZE (INCHES)
ALPHA	A1	POWERWAVE	7770	55"x11"x5"
	A2	ANDREW	SBNHH-1D65A	55"x11.9"x7.1"
	A3	-	-	-
	A4	POWERWAVE	7770	55"x11"x5"
BETA	B1	POWERWAVE	7770	55"x11"x5"
	B2	ANDREW	SBNHH-1D65A	55"x11.9"x7.1"
	B3	-	-	-
	B4	POWERWAVE	7770	55"x11"x5"
GAMMA	G1	POWERWAVE	7770	55"x11"x5"
	G2	ANDREW	SBNHH-1D65A	55"x11.9"x7.1"
	G3	-	-	-
	G4	POWERWAVE	7770	55"x11"x5"

PROPOSED RRH SCHEDULE					
SECTOR	MAKE	MODEL	SIZE (INCHES)	ADDITIONAL COMPONENT	SIZE (INCHES)
ALPHA	ERICSSON	RRUS-11	20.4"x18.5"x7.5"		
	ERICSSON	RRUS-32 B2	27.2"x12.1"x7.0"		
BETA	ERICSSON	RRUS-11	20.4"x18.5"x7.5"		
	ERICSSON	RRUS-32 B2	27.2"x12.1"x7.0"		
GAMMA	ERICSSON	RRUS-11	20.4"x18.5"x7.5"		
	ERICSSON	RRUS-32 B2	27.2"x12.1"x7.0"		

PROJECT OWNER IS RESPONSIBLE FOR PROVIDING A STRUCTURAL STABILITY ANALYSIS TO DETERMINE THE CAPACITY AND SUITABILITY OF THE EXISTING ANTENNA SUPPORT STRUCTURE TO SAFELY CARRY ALL ADDITIONAL LOADS IMPOSED BY THE PROPOSED EQUIPMENT AS SHOWN HEREIN. GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR INCORPORATING ANY REQUIRED STRUCTURAL MODIFICATIONS INTO THEIR SCOPE OF WORK.

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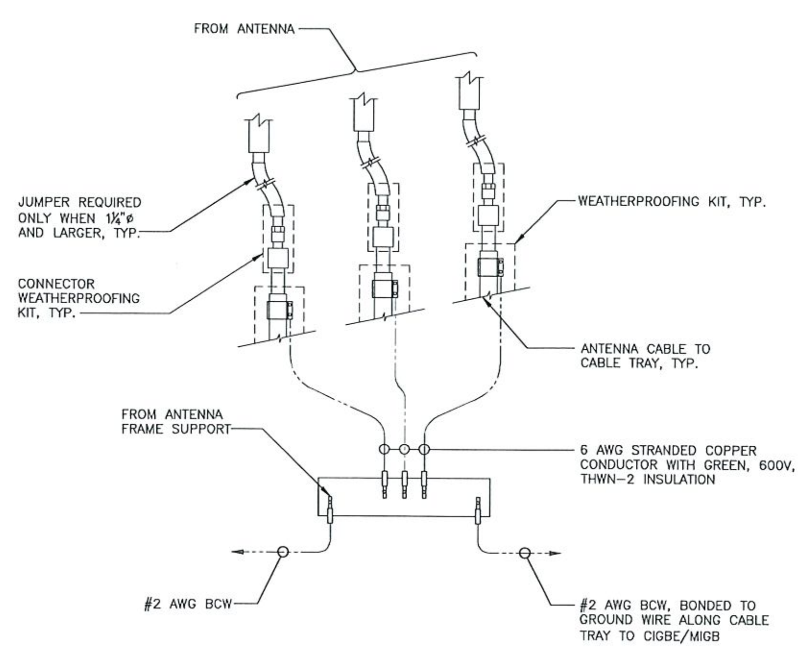
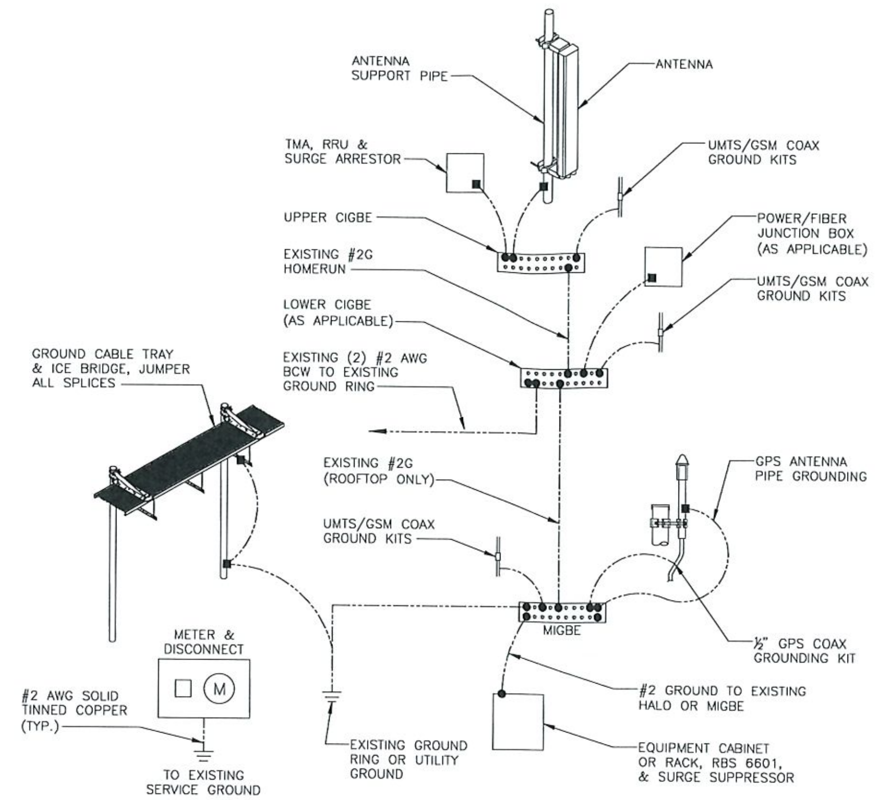
SHEET TITLE:
ANTENNA SCHEDULE

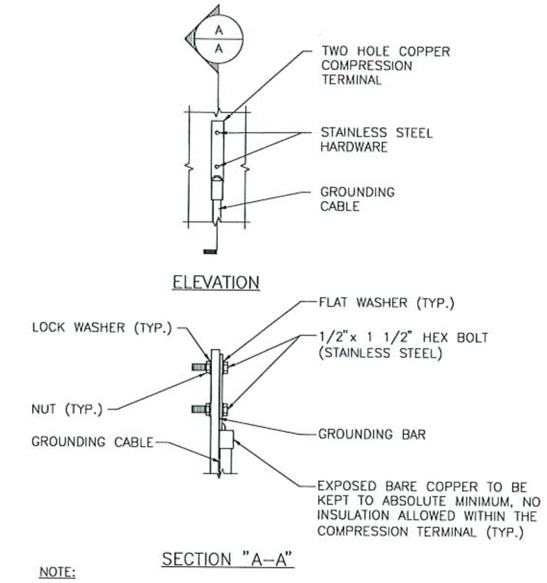
SHEET NUMBER:
A-5



GROUND WIRE TO GROUND BAR CONNECTION DETAILS | N.T.S | 1



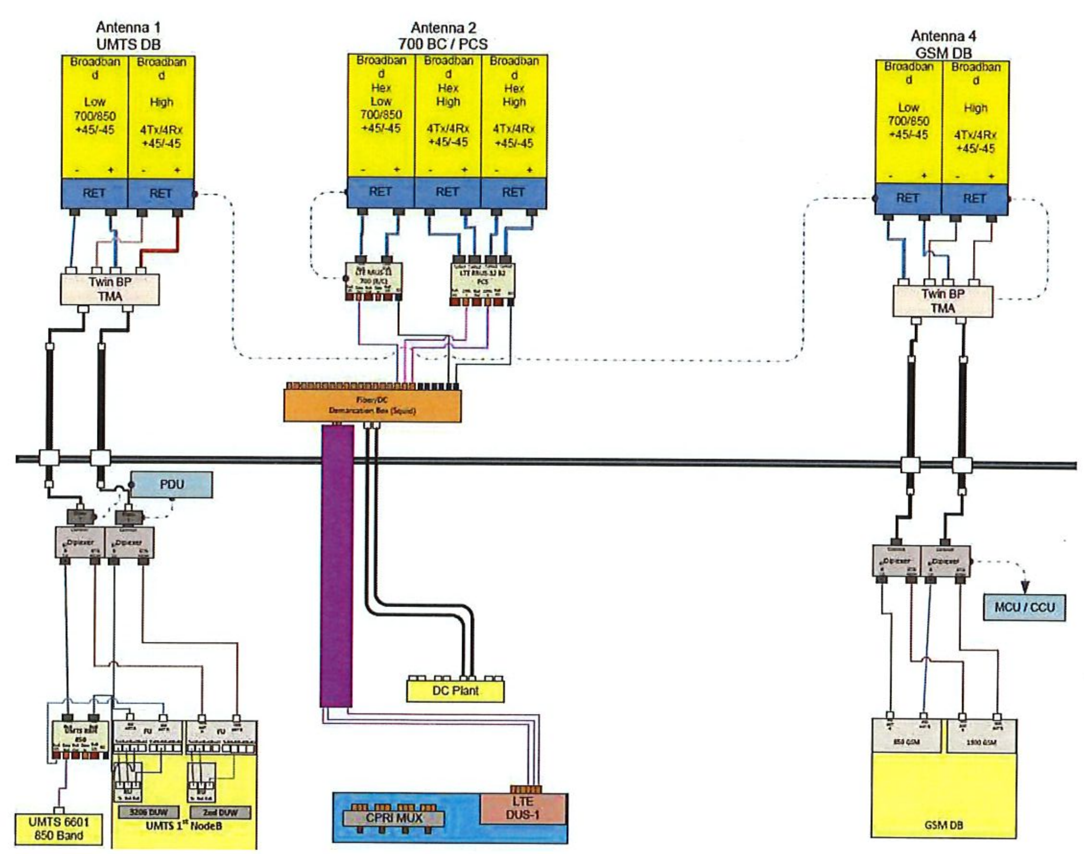
GROUND RISER DIAGRAM | N.T.S | 2



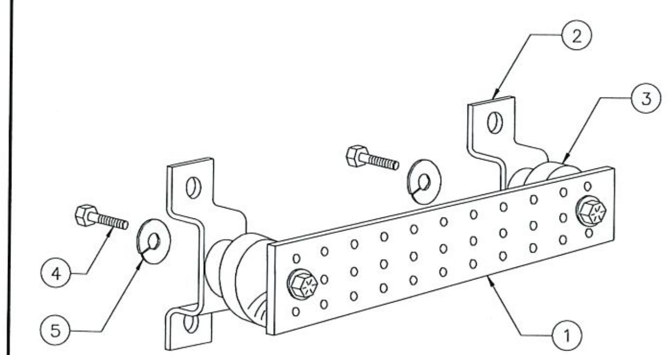
NOTE:

1. "DOUBLING UP" OR "STACKING" OF CONNECTIONS IS NOT PERMITTED.
2. OXIDE INHIBITING COMPOUND TO BE USED AT ALL LOCATIONS.
3. CADWELD DOWNLEADS FROM UPPER EGB, LOWER EGB, AND MGB.

TYPICAL GROUND BAR CONNECTION DETAILS | N.T.S | 3



PLUMBING DIAGRAM | N.T.S | 4



ITEM NO.	QTY.	DESCRIPTION
1	1	SOLID GROUND BAR (20"x 4"x ¼")
2	2	WALL MOUNTING BRACKET
3	2	INSULATORS
4	4	⅝"-11x1" H.H.C.S.
5	4	⅝" LOCK WASHER

NOTES:

EACH GROUND CONDUCTOR TERMINATING ON ANY GROUND BAR SHALL HAVE AN IDENTIFICATION TAG ATTACHED AT EACH END THAT WILL IDENTIFY ITS ORIGIN AND DESTINATION

SECTION "P" – SURGE PRODUCERS
- CABLE ENTRY PORTS (HATCH PLATES) (#2)
- GENERATOR FRAMEWORK (IF AVAILABLE) (#2)
- TELCO GROUND BAR
- COMMERCIAL POWER COMMON NEUTRAL/GROUND BOND (#2)
- +24V POWER SUPPLY RETURN BAR (#2)
- –48V POWER SUPPLY RETURN BAR (#2)
- RECTIFIER FRAMES

SECTION "A" – SURGE ABSORBERS
- INTERIOR GROUND RING (#2)
- EXTERNAL EARTH GROUND FIELD (BURIED GROUND RING) (#2)
- METALLIC COLD WATER PIPE (IF AVAILABLE) (#2)
- BUILDING STEEL (IF AVAILABLE) (#2)

GROUND BAR DETAILS | N.T.S | 5

at&t Mobility
1355 WEST UNIVERSITY DRIVE
MESA, AZ 85201-5419

EMPIRE telecom
16 ESQUIRE ROAD
BILLERICA, MA 01821

PLANS PREPARED BY:
Trylon
24 QUEEN ST E
BRAMPTON, ON
1 (519) 572-9995

NO.	DATE	DESCRIPTION	BY
A	08/17/16	FOR REVIEW	COP
0	09/08/16	FOR CONSTRUCTION	GI

SITE INFORMATION:

CT2230
CLINTON MEADOW RD
FA CODE: 10049127

46 MEADOW ROAD
CLINTON, CT 06413

SEAL:

STATE OF CONNECTICUT
MICHAEL F. PLAHOVINSAK
No. 25849
LICENSED PROFESSIONAL ENGINEER
9-10-2016

MICHAEL F. PLAHOVINSAK, P.E. #25849
Sole Proprietor - Independent Engineer
18301 S.R. 161, Plain City, OH 43064
614-398-6250 / mike@mfpeng.com

SHEET TITLE:

GROUNDING, ONE-LINE DIAGRAM & DETAILS

SHEET NUMBER:

G-1