



Filed by:

Kri Pelletier, Property Specialist - SBA Communications
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August 25, 2016

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

Notice of Exempt Modification

133 Clearview Ave, Harwinton, CT 06791

41 46 31.88 N

-73 5 53.53 W

T-Mobile#: CT11712A_L700

Dear Ms. Bachman:

T-Mobile currently maintains three (3) antennas at the 193-foot level of the existing 195-foot Monopole Tower at 133 Clearview Avenue. The tower is owned by SBA Properties LLC. The property is owned by Clearview Storage Park. T-Mobile now intends to swap (3) and install (3) additional L700 antennas. These antennas would be installed at the 193-foot level of the tower. T-Mobile's proposed full scope of work is as follows:

Remove:

- None

Remove and Replace:

- Remove (3) RR90-17-XXDP antennas and replace with (3) APXV18-206516S-A20 antennas

Install:

- (3) 782 11056 Bias Ts
- (3) LNX-6515DS-A1M antennas
- (3) 1-1/4" coax
- (6) 1-5/8" coax

Existing Equipment to Remain (and Entitlements):

- (3) 1-1/4" coax
- (3) DTMA-1819-DD-12 TMAs
- (12) RRUs on ground
- (1) BBU / Battery Cabinet



This facility was approved by the Harwinton Zoning Commission under Application 3764 on March 13, 2000. Conditions set forth were for the tower to be a 195' monopole allowing for town emergency antennas, with fencing/security alarm, a fall zone equal to not less than the distance of the tower's total height, and the submission of a removal bond. Carriers are to provide EMF output of any antenna installations. This modification complies with all tower 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 Michael R. Criss, First Selectman for Harwinton, 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, T-Mobile 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@sbsite.com

Attachments

cc: Michael R. Criss, First Selectman—as elected official
Town of Harwinton, 100 Bentley Drive, Harwinton, CT 06791
Clearview Storage Park c/o Daniel Gervais—as property owner
133 Clearview Avenue Harwinton CT 06791-1636



POWER DENSITY

T-Mobile Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	1	Antenna #:	1	Antenna #:	1
Make / Model:	RFS APXV18-206516S-C-A20	Make / Model:	RFS APXV18-206516S-C-A20	Make / Model:	RFS APXV18-206516S-C-A20
Gain:	16 dBd	Gain:	16 dBd	Gain:	16 dBd
Height (AGL):	193	Height (AGL):	193	Height (AGL):	193
Frequency Bands	1900 MHz(PCS)	Frequency Bands	1900 MHz(PCS)	Frequency Bands	1900 MHz(PCS)
Channel Count	4	Channel Count	4	Channel Count	4
Total TX Power(W):	180	Total TX Power(W):	180	Total TX Power(W):	180
ERP (W):	4,573.75	ERP (W):	4,573.75	ERP (W):	4,573.75
Antenna A1 MPE%	0.47	Antenna B1 MPE%	0.47	Antenna C1 MPE%	0.47
Antenna #:	2	Antenna #:	2	Antenna #:	2
Make / Model:	Commscope LNX-6515DS-VTM	Make / Model:	Commscope LNX-6515DS-VTM	Make / Model:	Commscope LNX-6515DS-VTM
Gain:	14.6 dBd	Gain:	14.6 dBd	Gain:	14.6 dBd
Height (AGL):	193	Height (AGL):	193	Height (AGL):	193
Frequency Bands	700 MHz	Frequency Bands	700 MHz	Frequency Bands	700 MHz
Channel Count	1	Channel Count	1	Channel Count	1
Total TX Power(W):	30	Total TX Power(W):	30	Total TX Power(W):	30
ERP (W):	847.46	ERP (W):	847.46	ERP (W):	847.46
Antenna A2 MPE%	0.19	Antenna B2 MPE%	0.19	Antenna C2 MPE%	0.19

Site Composite MPE%	
Carrier	MPE%
T-Mobile (Per Sector Max)	0.66 %
Verizon Wireless	0.99 %
Nextel	0.20 %
Site Total MPE %:	1.85 %

T-Mobile Sector A Total:	0.66 %
T-Mobile Sector B Total:	0.66 %
T-Mobile Sector C Total:	0.66 %
Site Total:	1.85 %

T-Mobile_per sector	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu\text{W}/\text{cm}^2$)	Frequency (MHz)	Allowable MPE ($\mu\text{W}/\text{cm}^2$)	Calculated % MPE
T-Mobile PCS - 1950 MHz LTE	2	1,524.58	193	3.13	PCS - 1950 MHz	1000	0.31%
T-Mobile PCS - 1950 MHz GSM	2	762.29	193	1.57	PCS - 1950 MHz	1000	0.16%
T-Mobile 700 MHz LTE	1	847.46	193	0.87	700 MHz	467	0.19%
						Total:	0.66%



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Owner and Parcel Information

Owner Name	CLEARVIEW STORAGE PARK LLC	Today's Date	August 25, 2016
Mailing Address	P O BOX 155 HARWINTON, CT 06791	Parcel ID	589 (Account #: 1060)
Location Address	133 CLEARVIEW AVE	Census Tract	07
Map / Block / Lot	B7 / 01 / 0017	Acreage	16.49
Use Class / Description	2-1 COMM LAND		
Assessing Neighborhood	0001A	Utilities	

Current Appraised Value Information

Building Value	XF Value	OB Value	Land Value	Special Land Value	Total Appraised Value	Net Appraised Value	Current Assessment
\$ 1,028,960	\$ 0	\$ 22,370	\$ 202,950		\$ 1,254,280	\$ 1,254,280	\$ 878,010

Assessment History

Year	Building	OB/Misc	Land	Total Assessment
Current	\$ 720,280	\$ 15,660	\$ 142,070	\$ 878,010
2015	\$ 720,280	\$ 15,660	\$ 142,070	\$ 878,010
2013	\$ 720,280	\$ 15,660	\$ 142,070	\$ 878,010

Land Information

Use	Class	Zoning	Area	Value
COMM LAND	C	L12	2 AC	\$ 113,110
COMM LAND	C		0 SF	
COMM LAND	C		0 SF	
COMM LAND	C		0 SF	
COMM LAND	C		0 SF	
COMM LAND	C		0 SF	
EX COMM	C		14.49 AC	\$ 89,840

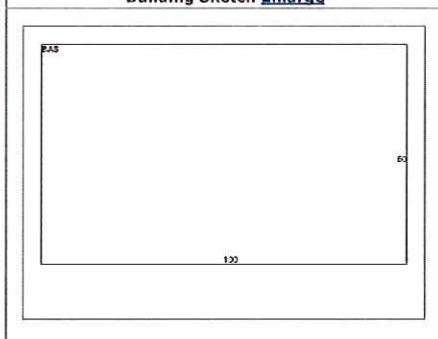
Commercial Building Information

Style	Year Built	Eff Year Built	Gross Area	Stories	Grade	Exterior Wall	Interior Wall	Wall Height	# Units
Light Indust	1987	1987	6,000	1	Average +10	Precast Panel	Minim/Masonry	16	1
Roof Cover	Roof Structure	Floor Type	Heat Type	Heat Fuel	AC Type	Sprinkler	Construction	Plumbing	Comm Walls
Metal/Tin	Gable/Hip	Average	Oil	Hot Water	HEAT/AC SPLIT	%	STEEL	LIGHT	0%

Building Sub Areas

Code	Description	Living Area	Gross Area	Effective Area
BAS	First Floor	6,000	6,000	
	Totals	6,000	6,000	6,000

Building Sketch [Enlarge](#)



Building Photo [Enlarge](#)



Commercial Building 2 Information

Style	Year Built	Eff Year Built	Gross Area	Stories	Grade	Exterior Wall	Interior Wall	Wall Height	# Units
Warehouse	1992	1992	2,880	1	Average +10	Precast Panel	Drywall/Sheet	10	1
Roof Cover	Roof Structure	Floor Type	Heat Type	Heat Fuel	AC Type	Sprinkler	Construction	Plumbing	Comm Walls
Metal/Tin	Gable/Hip	Average	Oil	Hot Water	HEAT/AC SPLIT	%	STEEL	LIGHT	0%

Building Sub Areas

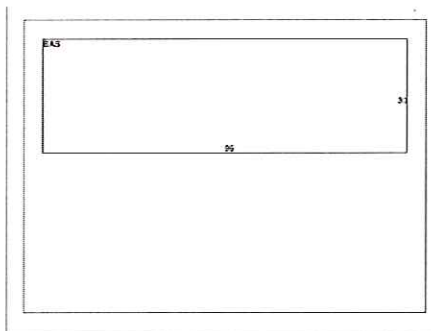
Code	Description	Living Area	Gross Area	Effective Area
BAS	First Floor	2,880	2,880	
	Totals	2,880	2,880	2,880

Building Sketch [Enlarge](#)



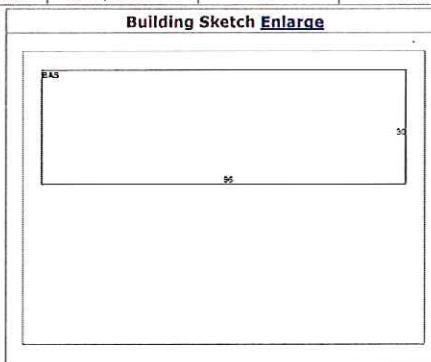
Building Photo

NA



Commercial Building 3 Information									
Style	Year Built	Eff Year Built	Gross Area	Stories	Grade	Exterior Wall	Interior Wall	Wall Height	# Units
Warehouse	1991	1991	2,880	1	Average +10	Precast Panel	Drywall/Sheet	10	1
Roof Cover	Roof Structure	Floor Type	Heat Type	Heat Fuel	AC Type	Sprinkler	Construction	Plumbing	Comm Walls
Metal/Tin	Gable/Hip	Average	Oil	Hot Water	HEAT/AC SPLIT	%	STEEL	NONE	0%

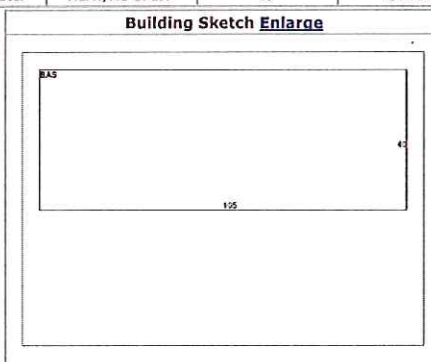
Building Sub Areas				
Code	Description	Living Area	Gross Area	Effective Area
BAS	First Floor	2,880	2,880	
	Totals	2,880	2,880	2,880



Building Photo
NA

Commercial Building 4 Information									
Style	Year Built	Eff Year Built	Gross Area	Stories	Grade	Exterior Wall	Interior Wall	Wall Height	# Units
Warehouse	2003	2003	4,200	1	Average +10	Precast Panel	Drywall/Sheet	15	1
Roof Cover	Roof Structure	Floor Type	Heat Type	Heat Fuel	AC Type	Sprinkler	Construction	Plumbing	Comm Walls
Metal/Tin	Gable/Hip	Average	Oil	Hot Water	HEAT/AC SPLIT	%	STEEL	LIGHT	0%

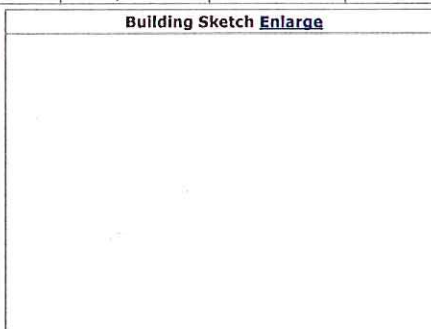
Building Sub Areas				
Code	Description	Living Area	Gross Area	Effective Area
BAS	First Floor	4,200	4,200	
	Totals	4,200	4,200	4,200



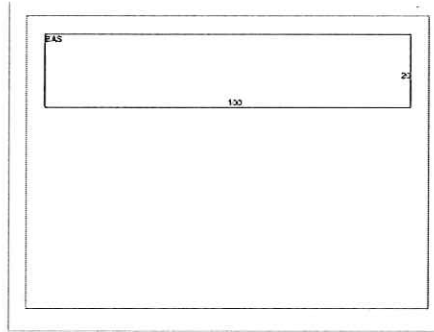
Building Photo
NA

Commercial Building 5 Information									
Style	Year Built	Eff Year Built	Gross Area	Stories	Grade	Exterior Wall	Interior Wall	Wall Height	# Units
Light Indust	2005	2005	2,000	1	Average +10	Precast Panel	Drywall/Sheet	10	1
Roof Cover	Roof Structure	Floor Type	Heat Type	Heat Fuel	AC Type	Sprinkler	Construction	Plumbing	Comm Walls
Metal/Tin	Gable/Hip	Average	Solar Assisted	None	HEAT/AC SPLIT	%	STEEL	NONE	0%

Building Sub Areas				
Code	Description	Living Area	Gross Area	Effective Area
BAS	First Floor	2,000	2,000	
	Totals	2,000	2,000	2,000

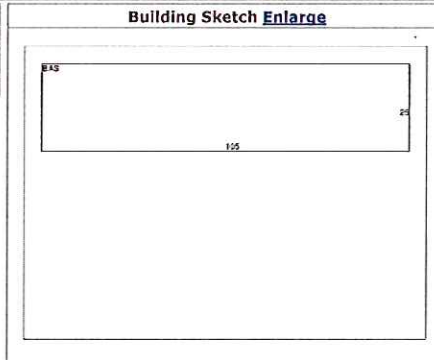


Building Photo
NA



Commercial Building 6 Information									
Style	Year Built	Eff Year Built	Gross Area	Stories	Grade	Exterior Wall	Interior Wall	Wall Height	# Units
Warehouse	2005	2005	2,625	1	Average +10	Precast Panel	Drywall/Sheet	10	1
Roof Cover	Roof Structure	Floor Type	Heat Type	Heat Fuel	AC Type	Sprinkler	Construction	Plumbing	Comm Walls
Metal/Tin	Gable/Hip	Average	Solar Assisted	None	NONE	%	STEEL	NONE	0%

Building Sub Areas				
Code	Description	Living Area	Gross Area	Effective Area
BAS	First Floor	2,625	2,625	
Totals		2,625	2,625	2,625



Building Photo
NA

Out Buildings / Extra Features				
Description	Sub Description	Area	Year Built	Value
SHED FRAME AVE		490 S.F.	2004	\$ 14,090
SHED FRAME AVE		288 S.F.	2004	\$ 8,280

Sale Information						
Sale Date	Sale Price	Deed Book/Page	Sale Qualification	Reason	Vacant or Improved	Owner
12/29/1998		0178/0416				CLEARVIEW STORAGE PARK LLC

Permit Information								
Permit ID	Issue Date	Type	Description	Amount	Inspection Date	% Complete	Date Complete	Comments
8594	09/19/2012	HE	HEATING	\$ 7,000		0		
8559	08/16/2012	EL	Electric	\$ 5,000		0		
1001	05/16/2012		30x138 bldg	\$ 80,000		0		
8284	11/22/2011		PROPANE TANK	\$ 600		0		
7918	10/20/2010	WD	WOODSTOVE	\$ 900		0		PELLET
7336	10/29/2008			\$ 399		0		WOOD BURNING STOVE
59	02/23/2004	CO	CO ISSUED			0		

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

T-Mobile Existing Facility

Site ID: CT11712A

Harwinton
133 Clearview Ave
Harwinton, CT 06791

August 23, 2016

EBI Project Number: 6216003756

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general public allowable limit:	1.85 %

August 23, 2016

T-Mobile USA
Attn: Jason Overbey, RF Manager
35 Griffin Road South
Bloomfield, CT 06002

Emissions Analysis for Site: **CT11712A – Harwinton**

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **133 Clearview Ave, Harwinton, CT**, for the purpose of determining whether the emissions from the Proposed T-Mobile 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 97-01 and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter ($\mu\text{W}/\text{cm}^2$). The number of $\mu\text{W}/\text{cm}^2$ calculated at each sample point is called the power density. The exposure limit for power density varies depending upon the frequencies being utilized. Wireless Carriers and Paging Services use different frequency bands each with different exposure limits, therefore it is necessary to report results and limits in terms of percent MPE rather than power density.

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

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

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

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

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed T-Mobile Wireless antenna facility located at **133 Clearview Ave, Harwinton, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since T-Mobile 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 GSM channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.
- 2) 2 LTE channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.
- 3) 1 LTE channel (700 MHz Band) was considered for each sector of the proposed installation. This channel has a transmit power of 30 Watts.
- 4) Since all radios are ground mounted there are additional cabling losses accounted for. For each ground mounted RF path the following losses were calculated. 1.95 dB of additional cable loss was calculated for all ground mounted 1900 MHz Channels based upon 130 feet of 1-1/4" cable for the 1900 MHz channels. 0.90 dB of additional cable loss was calculated for all ground mounted 700 MHz Channels based upon 130 feet of 1-5/8" cable for the 700 MHz channels.

- 5) 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.
- 6) 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.
- 7) The antennas used in this modeling are the **RFS APXV18-206516S-C-A20** for 1900 MHz (PCS) and the **Commscope LNX-6515DS-VTM** for 700 MHz channels. This is based on feedback from the carrier with regards to anticipated antenna selection. The **RFS APXV18-206516S-C-A20** has a maximum gain of **16 dBd** at its main lobe at 1900 MHz. The **Commscope LNX-6515DS-VTM** has a maximum gain of **14.6 dBd** at its main lobe at 700 MHz. 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.
- 8) The antenna mounting height centerline of the proposed antennas is **193 feet** above ground level (AGL).
- 9) 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.
- 10) All calculations were done with respect to uncontrolled / general public threshold limits.

T-Mobile Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	1	Antenna #:	1	Antenna #:	1
Make / Model:	RFS APXV18-206516S-C-A20	Make / Model:	RFS APXV18-206516S-C-A20	Make / Model:	RFS APXV18-206516S-C-A20
Gain:	16 dBd	Gain:	16 dBd	Gain:	16 dBd
Height (AGL):	193	Height (AGL):	193	Height (AGL):	193
Frequency Bands	1900 MHz(PCS)	Frequency Bands	1900 MHz(PCS)	Frequency Bands	1900 MHz(PCS)
Channel Count	4	Channel Count	4	Channel Count	4
Total TX Power(W):	180	Total TX Power(W):	180	Total TX Power(W):	180
ERP (W):	4,573.75	ERP (W):	4,573.75	ERP (W):	4,573.75
Antenna A1 MPE%	0.47	Antenna B1 MPE%	0.47	Antenna C1 MPE%	0.47
Antenna #:	2	Antenna #:	2	Antenna #:	2
Make / Model:	Commscope LNX-6515DS-VTM	Make / Model:	Commscope LNX-6515DS-VTM	Make / Model:	Commscope LNX-6515DS-VTM
Gain:	14.6 dBd	Gain:	14.6 dBd	Gain:	14.6 dBd
Height (AGL):	193	Height (AGL):	193	Height (AGL):	193
Frequency Bands	700 MHz	Frequency Bands	700 MHz	Frequency Bands	700 MHz
Channel Count	1	Channel Count	1	Channel Count	1
Total TX Power(W):	30	Total TX Power(W):	30	Total TX Power(W):	30
ERP (W):	847.46	ERP (W):	847.46	ERP (W):	847.46
Antenna A2 MPE%	0.19	Antenna B2 MPE%	0.19	Antenna C2 MPE%	0.19

Site Composite MPE%	
Carrier	MPE%
T-Mobile (Per Sector Max)	0.66 %
Verizon Wireless	0.99 %
Nextel	0.20 %
Site Total MPE %:	1.85 %

T-Mobile Sector A Total:	0.66 %
T-Mobile Sector B Total:	0.66 %
T-Mobile Sector C Total:	0.66 %
Site Total:	1.85 %

T-Mobile _per sector	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu\text{W}/\text{cm}^2$)	Frequency (MHz)	Allowable MPE ($\mu\text{W}/\text{cm}^2$)	Calculated % MPE
T-Mobile PCS - 1950 MHz LTE	2	1,524.58	193	3.13	PCS - 1950 MHz	1000	0.31%
T-Mobile PCS - 1950 MHz GSM	2	762.29	193	1.57	PCS - 1950 MHz	1000	0.16%
T-Mobile 700 MHz LTE	1	847.46	193	0.87	700 MHz	467	0.19%
						Total:	0.66%

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 T-Mobile 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:

T-Mobile Sector	Power Density Value (%)
Sector A:	0.66 %
Sector B:	0.66 %
Sector C:	0.66 %
T-Mobile Per Sector Maximum:	0.66 %
Site Total:	1.85 %
Site Compliance Status:	COMPLIANT

The anticipated composite MPE value for this site assuming all carriers present is **1.85%** 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.



Tower Engineering Solutions

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

Structural Analysis Report

Existing 195 ft. Nudd Corporation Monopole

Customer Name: SBA Communications Corp

Customer Site Number: CT01944-S

Customer Site Name: Harwinton

Carrier Name: T-Mobile

Carrier Site ID / Name: CT11712A

Site Location: 133 Clearview Ave

Harwinton, Connecticut

Litchfield County

Latitude: 41.775522

Longitude: -73.098202

Analysis Result:

Max Structural Usage: 76.8% [Pass]

Max Foundation Usage: 31% [Pass]

Report Prepared By : Stacey Hesselbein



Introduction

The purpose of this report is to summarize the analysis results on the 195 ft. Nudd Corporation Monopole 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	Fred A. Nudd Corporation, Project # 7218-1 Dated 12/30/1999
Foundation Drawing	Fred A. Nudd Corporation, Project # 7218-1 Dated 12/30/1999
Geotechnical Report	Jaworski Geotech, Project # 99503G Dated 11/29/1999
Modification Drawings	Vertical Structures, TA2003007014-T1 Dated 09/09/2003

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 **TESPoles**, 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:	80.0 mph (fastest mile)
Basic Wind Speed with Ice:	69 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

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
-	192.0	6	EMS - RR90-17-02DP - Panel	Low Profile Platform	(12) 1 5/8"	T-Mobile
-		3	CCI - DTMA-1819-DD-12 - TMA			
5	183.0	3	Antel - BXA-70063-6CF - Panel	Low Profile Platform	(18) 1 5/8"	Verizon
6		6	Antel - LPA-80063-4CF - Panel			
7		2	Antel - LPA-171063-8CF - Panel			
8		4	Antel - LPA-171080-8CF - Panel			

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
1	192.0	3	RFS - APXV18-206516S-C-A20 - Panel	Low Profile Platform	(12) 1 5/8"	T-Mobile
2		3	Commscope - LNX-6515DS-A1M - Panel			
3		3	CCI - DTMA-1819-DD-12 - TMA			
4		3	Kathrein - 782 11056 - Bias T’s			

All transmission lines are considered running inside of the pole shafts.

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:

	Pole shafts	Anchor Bolts	Base Plate
Max. Usage:	63.0%	43.9%	76.8%
Pass/Fail	Pass	Pass	Pass

Foundations

	Moment (Kip-Ft)	Shear (Kips)	Axial (Kips)
Analysis Reactions	3030.8	23.8	43.6

The foundation has been investigated using the supplied documents and soils report and was found 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 1.9076 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.

Usage Diagram - Max Stress 63.0% at 0.0ft

Structure: CT01944-S-SBA
Site Name: Harwinton
Height: 195.00 (ft)
Base Elev: 0.000 (ft)

Code: EIA/TIA-222-F
Exposure: C
Gh: 1.69

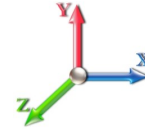
8/16/2016



Page: 1

Dead Load Factor: 1.00
Wind Load Factor: 1.00

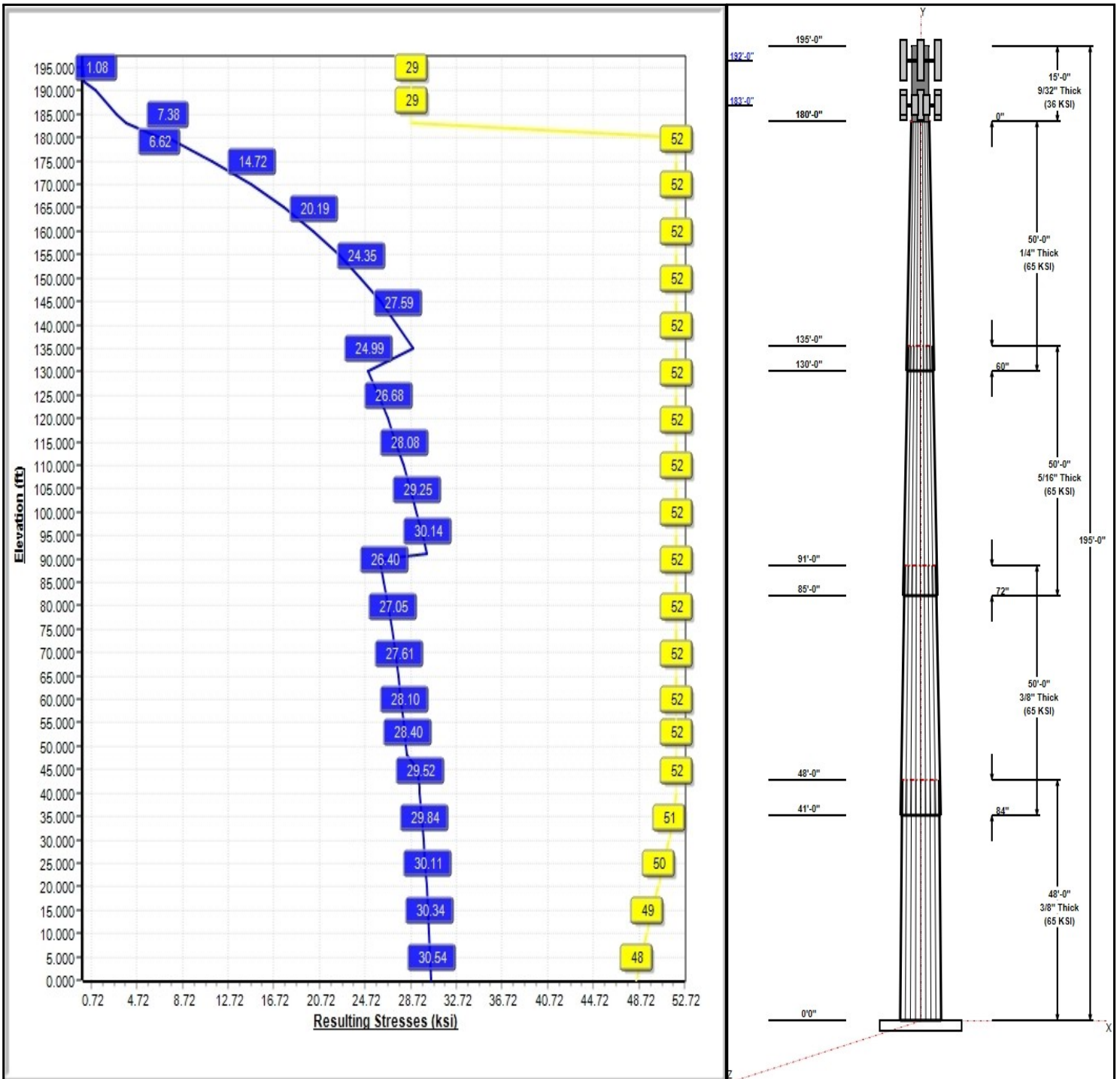
Load Case : 80 mph Wind with 0 in Ice



Iterations: 26

48 Allowable Stress
31 Resulting Stress

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Structure: CT01944-S-SBA

Type: Custom
Site Name: Harwinton
Height: 195.00 (ft)
Base Elev: 0.00 (ft)

Base Shape: 18 Sided
Taper: 0.23542

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Shaft Properties

Seq	Length (ft)	Top (in)	Bottom (in)	Thick (in)	Joint Type	Taper	Grade (ksi)
1	48.00	53.20	64.50	0.375		0.23542	65
2	50.00	43.83	55.60	0.375	Slip	0.23542	65
3	50.00	34.09	45.86	0.313	Slip	0.23542	65
4	50.00	24.00	35.77	0.250	Slip	0.23542	65
5	15.00	24.00	24.00	0.281	Butt	0.00000	36

Discrete Appurtenances

Attach Elev (ft)	Force Elev (ft)	Qty	Description	Carrier
195.00	195.00	1	6' Lightning rod	T-Mobile
192.00	192.00	3	APXV18-206516S-C-A20	T-Mobile
192.00	192.00	3	LNx-6515DS-A1M	T-Mobile
192.00	192.00	3	DTMA-1819-DD-12	T-Mobile
192.00	192.00	3	782 11056	T-Mobile
192.00	192.00	1	Low Profile Platform	T-Mobile
183.00	183.00	3	BXA-70063-6CF	Verizon
183.00	183.00	6	LPA-80063-4CF	Verizon
183.00	183.00	2	LPA-171063-8CF	Verizon
183.00	183.00	4	LPA-171080-8CF	Verizon
183.00	183.00	1	Low Profile Platform	Verizon

Linear Appurtenances

Elev From (ft)	Elev To (ft)	Placement	Description	Carrier
0.00	192.00	Inside	1 5/8" Coax	T-Mobile
0.00	183.00	Inside	1 5/8" Coax	Verizon

Anchor Bolts

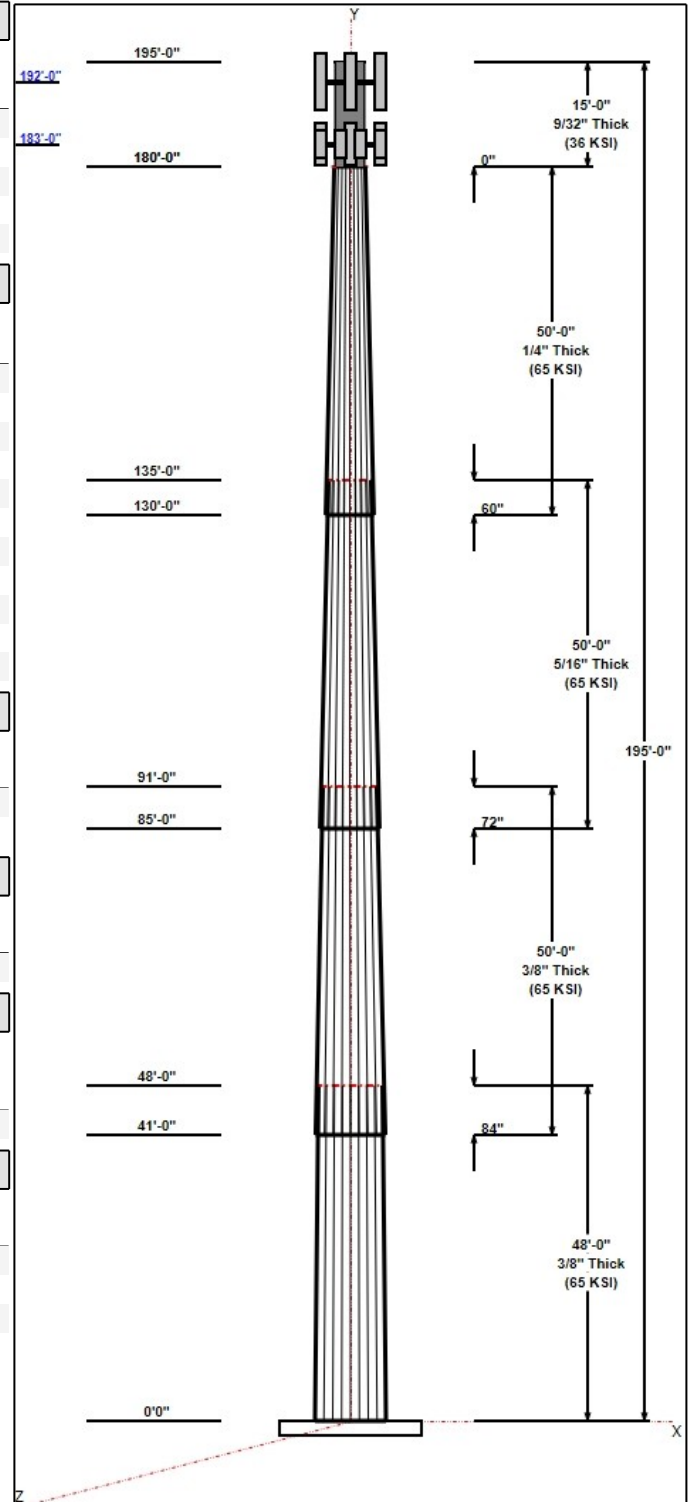
Qty	Specifications	Grade (ksi)	Arrangement
24	2.00" A687	105.0	Radial

Base Plate

Thickness (in)	Specifications (in)	Grade (ksi)	Geometry
1.5000	64.5	45.0	Polygon

Reactions

Load Case	Moment	Shear	Axial
80 mph Wind with 0" Ice	3030.8	23.8	37.0
69.28 mph Wind with 0.5" Ice	2342.8	18.3	43.6
50 mph Wind with 0" Ice	1184.7	9.3	37.0

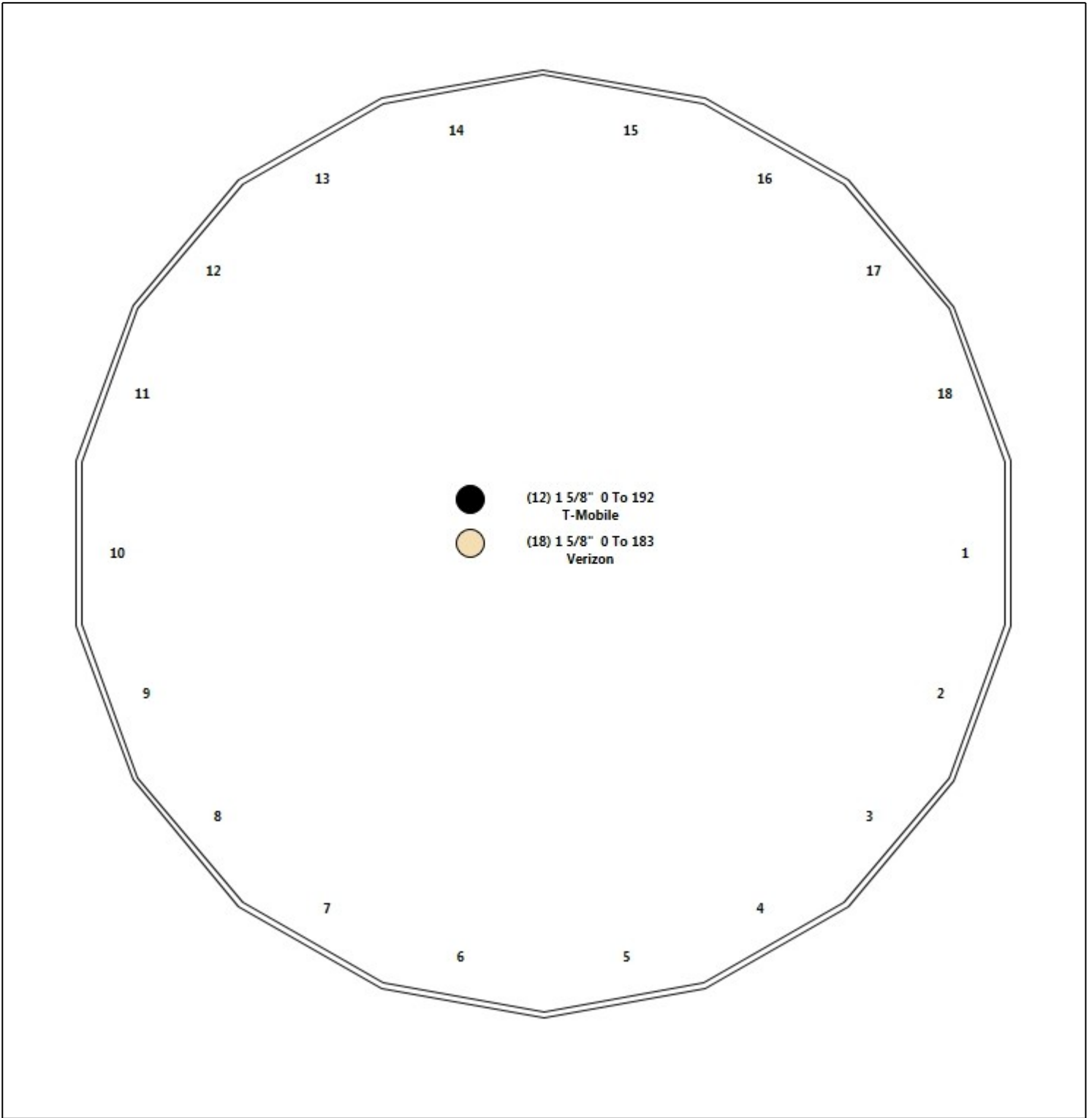


Structure: CT01944-S-SBA - Coax Line Placement

Type: Monopole
Site Name: Harwinton
Height: 195.00 (ft)

8/16/2016

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Shaft Properties

Structure: CT01944-S-SBA

Code: EIA/TIA-222-F

8/16/2016

Site Name: Harwinton

Exposure: C

Height: 195.00 (ft)

Gh: 1.69

Base Elev: 0.000 (ft)

Struct Class: II

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Sec. No.	Shape	Length (ft)	Thick (in)	Fy (ksi)	Joint Type	Overlap (in)	Weight (lb)
1	18	48.000	0.3750	65		0.00	11,368
2	18	50.000	0.3750	65	Slip	84.00	9,991
3	18	50.000	0.3125	65	Slip	72.00	6,694
4	18	50.000	0.2500	65	Slip	60.00	4,001
5	R	15.000	0.2810	36	Flange	0.00	1,069
Total Shaft Weight:							33,122

Bottom

Top

Sec. No.	Dia (in)	Elev (ft)	Area (sqin)	Ix (in^4)	W/t Ratio	D/t Ratio	Dia (in)	Elev (ft)	Area (sqin)	Ix (in^4)	W/t Ratio	D/t Ratio	Taper
1	64.50	0.00	76.32	39651.33	28.92	172.00	53.20	48.00	62.87	22166.3	23.60	141.87	0.235417
2	55.60	41.00	65.73	25324.08	24.73	148.26	43.83	91.00	51.72	12336.9	19.20	116.87	0.235417
3	45.86	85.00	45.18	11844.57	24.47	146.77	34.09	135.0	33.51	4830.83	17.83	109.10	0.235417
4	35.77	130.0	28.18	4492.97	23.82	143.08	24.00	180.0	18.84	1343.00	15.52	96.00	0.235417
5	24.00	180.0	20.94	1473.63	0.00	85.41	24.00	195.0	20.94	1473.63	0.00	85.41	0.000000

Loading Summary

Structure: CT01944-S-SBA
Site Name: Harwinton
Height: 195.00 (ft)
Base Elev: 0.000 (ft)

Code: EIA/TIA-222-F
Exposure: C
Gh: 1.69
Struct Class: II

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Discrete Appurtenances

No.	Elev (ft)	Description	Qty	No Ice			Ice			Hor. Ecc. (ft)	Vert Ecc (ft)
				Weight (lb)	CaAa (sf)	CaAa Factor	Weight (lb)	CaAa (sf)	CaAa Factor		
1	195.00	6' Lightning rod	1	6.50	0.38	1.00	11.80	0.980	1.00	0.00	0.00
2	192.00	APXV18-206516S-C-A20	3	18.70	5.62	0.90	38.70	4.150	0.83	0.00	0.00
3	192.00	LNx-6515DS-A1M	3	49.80	11.41	0.90	115.60	12.340	0.86	0.00	0.00
4	192.00	DTMA-1819-DD-12	3	14.30	0.71	0.80	19.30	0.900	0.75	0.00	0.00
5	192.00	782 11056	3	1.80	0.28	0.80	8.00	0.390	0.70	0.00	0.00
6	192.00	Low Profile Platform	1	1500.00	24.00	1.00	1800.00	27.000	1.00	0.00	0.00
7	183.00	BXA-70063-6CF	3	17.00	7.73	0.80	59.50	8.540	0.84	0.00	0.00
8	183.00	LPA-80063-4CF	6	20.00	7.00	0.80	72.40	7.620	0.81	0.00	0.00
9	183.00	LPA-171063-8CF	2	11.50	5.69	0.80	40.20	4.240	0.81	0.00	0.00
10	183.00	LPA-171080-8CF	4	8.50	5.23	0.80	29.10	3.770	0.81	0.00	0.00
11	183.00	Low Profile Platform	1	1500.00	24.00	1.00	1800.00	27.000	1.00	0.00	0.00
Totals:			30	3,488.30			4,966.30				

Linear Appurtenances

Bottom Elev. (ft)	Top Elev. (ft)	Description	No Ice		Ice		Exposed
			Weight (lb/ft)	CaAa (sf/ft)	Weight (lb/ft)	CaAa (sf/ft)	
0.00	192.00	(12) 1 5/8" Coax	1.04	0.00	0.00	0.00	Inside
0.00	183.00	(18) 1 5/8" Coax	1.04	0.00	0.00	0.00	Inside
Totals:			390.00		0.00		

Shaft Section Properties

Structure: CT01944-S-SBA

Code: EIA/TIA-222-F

8/16/2016



Site Name: Harwinton

Exposure: C

Height: 195.00 (ft)

Gh: 1.69

Base Elev: 0.000 (ft)

Struct Class: II

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Tower Engineering Solutions

Increment Length: 5 (ft)

Elev (ft)	Description	Thick (in)	Dia (in)	Area (in^2)	Ix (in^4)	W/t Ratio	D/t Ratio	Fy (ksi)	Fb (ksi)	Weight (lb)
0.00		0.3750	64.500	76.322	39651.3	28.92	172.00	65	48	0.0
5.00		0.3750	63.323	74.921	37507.6	28.36	168.86	65	49	1286.6
10.00		0.3750	62.146	73.520	35442.6	27.81	165.72	65	49	1262.8
15.00		0.3750	60.969	72.119	33454.9	27.26	162.58	65	50	1238.9
20.00		0.3750	59.792	70.718	31542.8	26.70	159.44	65	50	1215.1
25.00		0.3750	58.615	69.317	29705.1	26.15	156.31	65	51	1191.3
30.00		0.3750	57.437	67.916	27940.1	25.60	153.17	65	51	1167.4
35.00		0.3750	56.260	66.515	26246.5	25.04	150.03	65	52	1143.6
40.00		0.3750	55.083	65.114	24622.7	24.49	146.89	65	52	1119.8
41.00	Bot - Section 2	0.3750	54.848	64.834	24306.2	24.38	146.26	65	52	221.1
45.00		0.3750	53.906	63.713	23067.4	23.94	143.75	65	52	1761.8
48.00	Top - Section 1	0.3750	53.950	63.765	23124.0	23.96	143.87	65	52	1301.3
50.00		0.3750	53.479	63.205	22519.6	23.74	142.61	65	52	432.1
55.00		0.3750	52.302	61.804	21055.1	23.18	139.47	65	52	1063.4
60.00		0.3750	51.125	60.403	19655.5	22.63	136.33	65	52	1039.6
65.00		0.3750	49.948	59.002	18319.3	22.08	133.19	65	52	1015.8
70.00		0.3750	48.771	57.601	17045.1	21.52	130.06	65	52	991.9
75.00		0.3750	47.594	56.200	15831.4	20.97	126.92	65	52	968.1
80.00		0.3750	46.417	54.799	14676.7	20.41	123.78	65	52	944.3
85.00	Bot - Section 3	0.3750	45.240	53.398	13579.6	19.86	120.64	65	52	920.4
90.00		0.3750	44.062	51.997	12538.5	19.31	117.50	65	52	1655.4
91.00	Top - Section 2	0.3125	44.452	43.779	10776.5	23.67	142.25	65	52	325.8
95.00		0.3125	43.510	42.845	10101.4	23.14	139.23	65	52	589.5
100.00		0.3125	42.333	41.678	9298.0	22.48	135.47	65	52	719.0
105.00		0.3125	41.156	40.510	8538.3	21.81	131.70	65	52	699.2
110.00		0.3125	39.979	39.343	7821.2	21.15	127.93	65	52	679.3
115.00		0.3125	38.802	38.175	7145.4	20.48	124.17	65	52	659.4
120.00		0.3125	37.625	37.008	6509.6	19.82	120.40	65	52	639.6
125.00		0.3125	36.448	35.841	5912.8	19.15	116.63	65	52	619.7
130.00	Bot - Section 4	0.3125	35.271	34.673	5353.6	18.49	112.87	65	52	599.9
135.00	Top - Section 3	0.2500	34.594	27.251	4060.9	22.99	138.37	65	52	1051.6
140.00		0.2500	33.417	26.317	3657.5	22.16	133.67	65	52	455.7
145.00		0.2500	32.240	25.383	3281.8	21.33	128.96	65	52	439.8
150.00		0.2500	31.062	24.449	2932.7	20.50	124.25	65	52	423.9
155.00		0.2500	29.885	23.515	2609.3	19.67	119.54	65	52	408.0
160.00		0.2500	28.708	22.581	2310.5	18.84	114.83	65	52	392.1
165.00		0.2500	27.531	21.647	2035.5	18.01	110.12	65	52	376.2
170.00		0.2500	26.354	20.713	1783.3	17.18	105.42	65	52	360.4
175.00		0.2500	25.177	19.779	1552.7	16.35	100.71	65	52	344.5
180.00	Top - Section 4	0.2500	24.000	18.845	1343.0	15.52	96.00	65	52	328.6
180.00	Bot - Section 5	0.2810	24.000	20.939	1473.6	13.80	85.41	36	52	
183.00		0.2810	24.000	20.939	1473.6	0.00	85.41	36	29	213.8
185.00		0.2810	24.000	20.939	1473.6	0.00	85.41	36	29	142.5
190.00		0.2810	24.000	20.939	1473.6	0.00	85.41	36	29	356.3
192.00		0.2810	24.000	20.939	1473.6	0.00	85.41	36	29	142.5
195.00		0.2810	24.000	20.939	1473.6	0.00	85.41	36	29	213.8
										33121.7

Wind Loading - Shaft

Structure: CT01944-S-SBA
Site Name: Harwinton
Height: 195.00 (ft)
Base Elev: 0.000 (ft)

Code: EIA/TIA-222-F
Exposure: C
Gh: 1.69
Struct Class: II

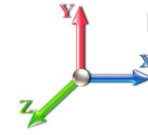
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Load Case: 80 mph Wind with 0" Ice

Dead Load Factor 1.00
Wind Load Factor 1.00



Iterations: 26

Elev (ft)	Description	Kzt	Kz	qz (psf)	qzGh (psf)	C (mph-ft)	Cf	Ice Thick (in)	Tributary (ft)	Aa (sf)	CfAa (sf)	Wind Force X (lb)	Dead Load Ice (lb)	Tot Dead Load (lb)
0.00		0.00	1.00	16.384	27.69	430.00	0.650	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		0.00	1.00	16.384	27.69	422.15	0.650	0.000	5.00	26.630	17.31	479.3	0.0	1286.6
10.00		0.00	1.00	16.384	27.69	414.31	0.650	0.000	5.00	26.139	16.99	470.5	0.0	1262.8
15.00		0.00	1.00	16.384	27.69	406.46	0.650	0.000	5.00	25.649	16.67	461.6	0.0	1238.9
20.00		0.00	1.00	16.384	27.69	398.61	0.650	0.000	5.00	25.158	16.35	452.8	0.0	1215.1
25.00		0.00	1.00	16.384	27.69	390.76	0.650	0.000	5.00	24.668	16.03	444.0	0.0	1191.3
30.00		0.00	1.00	16.384	27.69	382.92	0.650	0.000	5.00	24.178	15.72	435.1	0.0	1167.4
35.00		0.00	1.02	16.662	28.16	378.24	0.650	0.000	5.00	23.687	15.40	433.5	0.0	1143.6
40.00		0.00	1.06	17.310	29.25	377.45	0.650	0.000	5.00	23.197	15.08	441.1	0.0	1119.8
41.00	Bot - Section 2	0.00	1.06	17.432	29.46	377.17	0.650	0.000	1.00	4.580	2.98	87.7	0.0	221.1
45.00		0.00	1.09	17.902	30.25	375.66	0.650	0.000	4.00	18.376	11.94	361.4	0.0	1761.8
48.00	Top - Section 1	0.00	1.11	18.235	30.82	374.17	0.650	0.000	3.00	13.576	8.82	271.9	0.0	1301.3
50.00		0.00	1.13	18.449	31.18	378.33	0.650	0.000	2.00	8.952	5.82	181.4	0.0	432.1
55.00		0.00	1.16	18.959	32.04	375.08	0.650	0.000	5.00	22.038	14.32	459.0	0.0	1063.4
60.00		0.00	1.19	19.436	32.85	371.22	0.650	0.000	5.00	21.547	14.01	460.0	0.0	1039.6
65.00		0.00	1.21	19.885	33.61	366.85	0.650	0.000	5.00	21.057	13.69	460.0	0.0	1015.8
70.00		0.00	1.24	20.311	34.33	362.01	0.650	0.000	5.00	20.566	13.37	458.9	0.0	991.9
75.00		0.00	1.26	20.715	35.01	356.77	0.650	0.000	5.00	20.076	13.05	456.8	0.0	968.1
80.00		0.00	1.29	21.101	35.66	351.17	0.650	0.000	5.00	19.586	12.73	454.0	0.0	944.3
85.00	Bot - Section 3	0.00	1.31	21.469	36.28	345.25	0.650	0.000	5.00	19.095	12.41	450.3	0.0	920.4
90.00		0.00	1.33	21.823	36.88	339.02	0.650	0.000	5.00	18.605	12.26	452.2	0.0	1655.4
91.00	Top - Section 2	0.00	1.34	21.892	37.00	337.74	0.650	0.000	1.00	3.714	2.41	89.3	0.0	325.8
95.00		0.00	1.35	22.163	37.45	337.37	0.650	0.000	4.00	14.660	9.53	356.9	0.0	589.5
100.00		0.00	1.37	22.490	38.01	330.65	0.650	0.000	5.00	17.884	11.62	441.8	0.0	719.0
105.00		0.00	1.39	22.806	38.54	323.71	0.650	0.000	5.00	17.394	11.31	435.7	0.0	699.2
110.00		0.00	1.41	23.111	39.06	316.55	0.650	0.000	5.00	16.903	10.99	429.1	0.0	679.3
115.00		0.00	1.43	23.406	39.56	309.19	0.650	0.000	5.00	16.413	10.67	422.0	0.0	659.4
120.00		0.00	1.45	23.692	40.04	301.63	0.650	0.000	5.00	15.922	10.35	414.4	0.0	639.6
125.00		0.00	1.46	23.970	40.51	293.91	0.650	0.000	5.00	15.432	10.03	406.3	0.0	619.7
130.00	Bot - Section 4	0.00	1.48	24.241	40.97	286.01	0.650	0.000	5.00	14.941	9.71	397.9	0.0	599.9
135.00	Top - Section 3	0.00	1.50	24.503	41.41	277.96	0.650	0.000	5.00	14.659	9.53	394.6	0.0	1051.6
140.00		0.00	1.51	24.759	41.84	273.86	0.650	0.000	5.00	14.169	9.21	385.4	0.0	455.7
145.00		0.00	1.53	25.009	42.26	265.54	0.650	0.000	5.00	13.678	8.89	375.8	0.0	439.8
150.00		0.00	1.54	25.252	42.68	257.09	0.650	0.000	5.00	13.188	8.57	365.8	0.0	423.9
155.00		0.00	1.56	25.490	43.08	248.51	0.650	0.000	5.00	12.697	8.25	355.5	0.0	408.0
160.00		0.00	1.57	25.722	43.47	239.81	0.650	0.000	5.00	12.207	7.93	344.9	0.0	392.1
165.00		0.00	1.58	25.949	43.85	230.99	0.650	0.000	5.00	11.717	7.62	334.0	0.0	376.2
170.00		0.00	1.60	26.172	44.23	222.06	0.650	0.000	5.00	11.226	7.30	322.7	0.0	360.4
175.00		0.00	1.61	26.389	44.60	213.02	0.650	0.000	5.00	10.736	6.98	311.2	0.0	344.5
180.00	Top - Section 4	0.00	1.62	26.602	44.96	203.88	0.650	0.000	5.00	10.245	6.66	299.4	0.0	328.6
183.00	Appurtenance(s)	0.00	1.63	26.728	45.17	204.36	0.590	0.000	3.00	6.000	3.54	159.9	0.0	213.8
185.00		0.00	1.64	26.812	45.31	204.68	0.590	0.000	2.00	4.000	2.36	106.9	0.0	142.5
190.00		0.00	1.65	27.017	45.66	205.46	0.590	0.000	5.00	10.000	5.90	269.4	0.0	356.3
192.00	Appurtenance(s)	0.00	1.65	27.098	45.79	205.77	0.590	0.000	2.00	4.000	2.36	108.1	0.0	142.5
195.00	Appurtenance(s)	0.00	1.66	27.218	46.00	206.22	0.590	0.000	3.00	6.000	3.54	162.8	0.0	213.8
Totals:									195.00			15,861.6		33,121.7

Discrete Appurtenance Forces

Structure: CT01944-S-SB
Site Name: Harwinton
Height: 195.00 (ft)
Base Elev: 0.000 (ft)

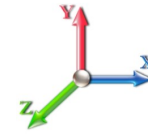
Code: EIA/TIA-222-F
Exposure: C
Gh: 1.69
Struct Class: II

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Load Case: 80 mph Wind with 0" Ice

Dead Load Factor 1.00
Wind Load Factor 1.00



Iterations: 26

No.	Elev (ft)	Description	Qty	qz (psf)	qzGh (psf)	CaAa Factor	Total CaAa (sf)	Dead Load (lb)	Horiz Ecc (ft)	Vert Ecc (ft)	Wind FX (lb)	Mom Y (lb-ft)	Mom Z (lb-ft)
1	195.00	6' Lightning rod	1	27.218	45.998	1.00	0.38	6.50	0.000	0.000	17.48	0.00	0.00
2	192.00	Low Profile Platform	1	27.098	45.795	1.00	24.00	1500.00	0.000	0.000	1099.08	0.00	0.00
3	192.00	782 11056	3	27.098	45.795	0.80	0.67	5.40	0.000	0.000	30.77	0.00	0.00
4	192.00	DTMA-1819-DD-12	3	27.098	45.795	0.80	1.70	42.90	0.000	0.000	78.03	0.00	0.00
5	192.00	LNx-6515DS-A1M	3	27.098	45.795	0.90	30.81	149.40	0.000	0.000	1410.80	0.00	0.00
6	192.00	APXV18-206516S-C-A20	3	27.098	45.795	0.90	15.17	56.10	0.000	0.000	694.89	0.00	0.00
7	183.00	Low Profile Platform	1	26.728	45.171	1.00	24.00	1500.00	0.000	0.000	1084.11	0.00	0.00
8	183.00	LPA-171080-8CF	4	26.728	45.171	0.80	16.74	34.00	0.000	0.000	755.98	0.00	0.00
9	183.00	LPA-171063-8CF	2	26.728	45.171	0.80	9.10	23.00	0.000	0.000	411.24	0.00	0.00
10	183.00	LPA-80063-4CF	6	26.728	45.171	0.80	33.60	120.00	0.000	0.000	1517.75	0.00	0.00
11	183.00	BXA-70063-6CF	3	26.728	45.171	0.80	18.55	51.00	0.000	0.000	838.01	0.00	0.00
Totals:								3,488.30			7,938.15		

Total Applied Force Summary

Structure: CT01944-S-SB
Site Name: Harwinton
Height: 195.00 (ft)
Base Elev: 0.000 (ft)

Code: EIA/TIA-222-F
Exposure: C
Gh: 1.69
Struct Class: II

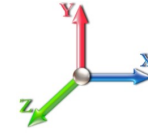
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Load Case: 80 mph Wind with 0" Ice

Dead Load Factor 1.00
Wind Load Factor 1.00



Iterations: 26

Elev (ft)	Description	Lateral FX (-) (lb)	Axial FY (-) (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)
0.00		0.00	0.00	0.00	0.00
5.00		479.28	1297.02	0.00	0.00
10.00		470.45	1273.18	0.00	0.00
15.00		461.62	1249.34	0.00	0.00
20.00		452.80	1225.51	0.00	0.00
25.00		443.97	1201.67	0.00	0.00
30.00		435.14	1177.84	0.00	0.00
35.00		433.54	1154.00	0.00	0.00
40.00		441.08	1130.16	0.00	0.00
41.00		87.71	223.17	0.00	0.00
45.00		361.37	1770.14	0.00	0.00
48.00		271.94	1307.58	0.00	0.00
50.00		181.43	436.21	0.00	0.00
55.00		458.96	1073.84	0.00	0.00
60.00		460.04	1050.01	0.00	0.00
65.00		459.97	1026.17	0.00	0.00
70.00		458.87	1002.34	0.00	0.00
75.00		456.84	978.50	0.00	0.00
80.00		453.98	954.66	0.00	0.00
85.00		450.34	930.83	0.00	0.00
90.00		452.24	1665.75	0.00	0.00
91.00		89.32	327.91	0.00	0.00
95.00		356.92	597.85	0.00	0.00
100.00		441.83	729.44	0.00	0.00
105.00		435.75	709.57	0.00	0.00
110.00		429.12	689.71	0.00	0.00
115.00		422.00	669.85	0.00	0.00
120.00		414.40	649.98	0.00	0.00
125.00		406.34	630.12	0.00	0.00
130.00		397.86	610.26	0.00	0.00
135.00		394.58	1061.98	0.00	0.00
140.00		385.37	466.10	0.00	0.00
145.00		375.77	450.21	0.00	0.00
150.00		365.83	434.32	0.00	0.00
155.00		355.54	418.42	0.00	0.00
160.00		344.92	402.53	0.00	0.00
165.00		333.98	386.64	0.00	0.00
170.00		322.75	370.75	0.00	0.00
175.00		311.21	354.86	0.00	0.00
180.00		299.39	338.97	0.00	0.00
183.00	(16) appurtenances	4766.99	1947.99	0.00	0.00
185.00		106.94	144.58	0.00	0.00
190.00		269.38	361.45	0.00	0.00
192.00	(13) appurtenances	3421.66	1898.38	0.00	0.00
195.00	(1) appurtenances	180.31	220.25	0.00	0.00
Totals:		23,799.74	37,000.05	0.00	0.00

Resulting Forces and Deflections

Structure: CT01944-S-SB
Site Name: Harwinton
Height: 195.00 (ft)
Base Elev: 0.000 (ft)

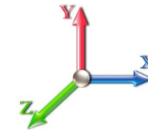
Code: EIA/TIA-222-F
Exposure: C
Gh: 1.69
Struct Class: II

8/16/2016
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Load Case: 80 mph Wind with 0" Ice

Dead Load Factor 1.00
Wind Load Factor 1.00



Iterations: 26

Elev (ft)	Lateral FX (-) (kips)	Axial FY (-) (kips)	Lateral FZ (kips)	Moment MX (ft-kips)	Torsion MY (ft-kips)	Moment MZ (ft-kips)	Deflect X (in)	Deflect Z (in)	Deflect Resultant (in)	Rotation Sway (deg)	Rotation Twist (deg)
0.00	-23.834	-36.977	0.000	0.000	0.000	-3030.834	0.000	0.000	0.000	0.000	0.000
5.00	-23.420	-35.637	0.000	0.000	0.000	-2911.665	-0.057	0.000	0.057	-0.107	0.000
10.00	-23.012	-34.321	0.000	0.000	0.000	-2794.565	-0.227	0.000	0.227	-0.215	0.000
15.00	-22.608	-33.030	0.000	0.000	0.000	-2679.508	-0.512	0.000	0.512	-0.325	0.000
20.00	-22.210	-31.764	0.000	0.000	0.000	-2566.469	-0.912	0.000	0.912	-0.436	0.000
25.00	-21.816	-30.523	0.000	0.000	0.000	-2455.423	-1.429	0.000	1.429	-0.549	0.000
30.00	-21.428	-29.307	0.000	0.000	0.000	-2346.344	-2.067	0.000	2.067	-0.664	0.000
35.00	-21.037	-28.115	0.000	0.000	0.000	-2239.207	-2.825	0.000	2.825	-0.781	0.000
40.00	-20.613	-26.966	0.000	0.000	0.000	-2134.022	-3.707	0.000	3.707	-0.900	0.000
41.00	-20.551	-26.723	0.000	0.000	0.000	-2113.409	-3.898	0.000	3.898	-0.924	0.000
45.00	-20.196	-24.929	0.000	0.000	0.000	-2031.208	-4.715	0.000	4.715	-1.021	0.000
48.00	-19.926	-23.605	0.000	0.000	0.000	-1970.620	-5.380	0.000	5.380	-1.095	0.000
50.00	-19.770	-23.143	0.000	0.000	0.000	-1930.769	-5.850	0.000	5.850	-1.145	0.000
55.00	-19.335	-22.039	0.000	0.000	0.000	-1831.920	-7.113	0.000	7.113	-1.264	0.000
60.00	-18.895	-20.960	0.000	0.000	0.000	-1735.248	-8.502	0.000	8.502	-1.385	0.000
65.00	-18.452	-19.906	0.000	0.000	0.000	-1640.774	-10.018	0.000	10.018	-1.507	0.000
70.00	-18.007	-18.877	0.000	0.000	0.000	-1548.515	-11.662	0.000	11.662	-1.631	0.000
75.00	-17.561	-17.874	0.000	0.000	0.000	-1458.482	-13.437	0.000	13.437	-1.756	0.000
80.00	-17.115	-16.896	0.000	0.000	0.000	-1370.679	-15.344	0.000	15.344	-1.883	0.000
85.00	-16.669	-15.944	0.000	0.000	0.000	-1285.107	-17.386	0.000	17.386	-2.012	0.000
90.00	-16.176	-14.273	0.000	0.000	0.000	-1201.764	-19.562	0.000	19.562	-2.142	0.000
91.00	-16.091	-13.930	0.000	0.000	0.000	-1185.588	-20.014	0.000	20.014	-2.169	0.000
95.00	-15.741	-13.311	0.000	0.000	0.000	-1121.226	-21.877	0.000	21.877	-2.276	0.000
100.00	-15.303	-12.559	0.000	0.000	0.000	-1042.521	-24.341	0.000	24.341	-2.428	0.000
105.00	-14.869	-11.830	0.000	0.000	0.000	-966.005	-26.966	0.000	26.966	-2.582	0.000
110.00	-14.438	-11.122	0.000	0.000	0.000	-891.662	-29.752	0.000	29.752	-2.736	0.000
115.00	-14.012	-10.435	0.000	0.000	0.000	-819.471	-32.701	0.000	32.701	-2.892	0.000
120.00	-13.592	-9.770	0.000	0.000	0.000	-749.409	-35.812	0.000	35.812	-3.048	0.000
125.00	-13.176	-9.128	0.000	0.000	0.000	-681.452	-39.087	0.000	39.087	-3.205	0.000
130.00	-12.767	-8.506	0.000	0.000	0.000	-615.570	-42.526	0.000	42.526	-3.361	0.000
135.00	-12.330	-7.437	0.000	0.000	0.000	-551.734	-46.127	0.000	46.127	-3.516	0.000
140.00	-11.936	-6.961	0.000	0.000	0.000	-490.084	-49.889	0.000	49.889	-3.669	0.000
145.00	-11.552	-6.501	0.000	0.000	0.000	-430.402	-53.826	0.000	53.826	-3.848	0.000
150.00	-11.175	-6.060	0.000	0.000	0.000	-372.642	-57.948	0.000	57.948	-4.022	0.000
155.00	-10.807	-5.637	0.000	0.000	0.000	-316.766	-62.248	0.000	62.248	-4.189	0.000
160.00	-10.447	-5.234	0.000	0.000	0.000	-262.731	-66.718	0.000	66.718	-4.347	0.000
165.00	-10.096	-4.850	0.000	0.000	0.000	-210.497	-71.347	0.000	71.347	-4.493	0.000
170.00	-9.754	-4.485	0.000	0.000	0.000	-160.018	-76.119	0.000	76.119	-4.622	0.000
175.00	-9.422	-4.142	0.000	0.000	0.000	-111.248	-81.016	0.000	81.016	-4.731	0.000
180.00	-9.099	-3.820	0.000	0.000	0.000	-64.139	-86.012	0.000	86.012	-4.811	0.000
183.00	-4.186	-2.279	0.000	0.000	0.000	-36.842	-89.044	0.000	89.044	-4.843	0.000
185.00	-4.068	-2.143	0.000	0.000	0.000	-28.471	-91.073	0.000	91.073	-4.856	0.000
190.00	-3.769	-1.805	0.000	0.000	0.000	-8.133	-96.163	0.000	96.163	-4.873	0.000
192.00	-0.198	-0.204	0.000	0.000	0.000	-0.595	-98.203	0.000	98.203	-4.875	0.000
195.00	-0.180	0.000	0.000	0.000	0.000	0.000	0.000	0.000	101.262	-4.875	0.000

Resulting Stresses

Structure: CT01944-S-SBA
Site Name: Harwinton
Height: 195.00 (ft)
Base Elev: 0.000 (ft)

Code: EIA/TIA-222-F
Exposure: C
Gh: 1.69
Struct Class: II

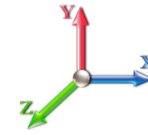
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Load Case: 80 mph Wind with 0" Ice

Dead Load Factor 1.00
Wind Load Factor 1.00



Iterations: 26

Applied Stresses

Elev (ft)	fa Axial (Y) (ksi)	fvx Shear (X) (ksi)	fvz Shear (Z) (ksi)	fvT Torsion (ksi)	fbx Bending (X) (ksi)	fbz Bending (Z) (ksi)	fb Combined (ksi)	Fb Allow Stress (ksi)	f/Fb Stress Ratio	
0.00	0.48	0.63	0.00	0.00	0.00	30.04	30.54	48.5	0.630	
5.00	0.48	0.63	0.00	0.00	0.00	29.95	30.44	49.0	0.622	
10.00	0.47	0.63	0.00	0.00	0.00	29.85	30.34	49.4	0.614	
15.00	0.46	0.63	0.00	0.00	0.00	29.75	30.23	49.9	0.606	
20.00	0.45	0.63	0.00	0.00	0.00	29.64	30.11	50.4	0.598	
25.00	0.44	0.63	0.00	0.00	0.00	29.52	29.98	50.8	0.590	
30.00	0.43	0.64	0.00	0.00	0.00	29.39	29.84	51.3	0.582	
35.00	0.42	0.64	0.00	0.00	0.00	29.24	29.69	51.8	0.573	
40.00	0.41	0.64	0.00	0.00	0.00	29.09	29.52	52.0	0.568	
41.00	0.41	0.64	0.00	0.00	0.00	29.06	29.49	52.0	0.567	
45.00	0.39	0.64	0.00	0.00	0.00	28.92	29.33	52.0	0.564	
48.00	0.37	0.63	0.00	0.00	0.00	28.01	28.40	52.0	0.546	
50.00	0.37	0.63	0.00	0.00	0.00	27.94	28.32	52.0	0.545	
55.00	0.36	0.63	0.00	0.00	0.00	27.72	28.10	52.0	0.541	
60.00	0.35	0.63	0.00	0.00	0.00	27.50	27.87	52.0	0.536	
65.00	0.34	0.63	0.00	0.00	0.00	27.26	27.61	52.0	0.531	
70.00	0.33	0.63	0.00	0.00	0.00	26.99	27.34	52.0	0.526	
75.00	0.32	0.63	0.00	0.00	0.00	26.71	27.05	52.0	0.520	
80.00	0.31	0.63	0.00	0.00	0.00	26.41	26.74	52.0	0.514	
85.00	0.30	0.63	0.00	0.00	0.00	26.08	26.40	52.0	0.508	
90.00	0.27	0.63	0.00	0.00	0.00	25.73	26.03	52.0	0.501	
91.00	0.32	0.74	0.00	0.00	0.00	29.80	30.14	52.0	0.580	
95.00	0.31	0.74	0.00	0.00	0.00	29.42	29.76	52.0	0.573	
100.00	0.30	0.74	0.00	0.00	0.00	28.92	29.25	52.0	0.563	
105.00	0.29	0.74	0.00	0.00	0.00	28.37	28.69	52.0	0.552	
110.00	0.28	0.74	0.00	0.00	0.00	27.77	28.08	52.0	0.540	
115.00	0.27	0.74	0.00	0.00	0.00	27.11	27.42	52.0	0.527	
120.00	0.26	0.74	0.00	0.00	0.00	26.39	26.68	52.0	0.513	
125.00	0.25	0.74	0.00	0.00	0.00	25.59	25.88	52.0	0.498	
130.00	0.25	0.74	0.00	0.00	0.00	24.71	24.99	52.0	0.481	
135.00	0.27	0.91	0.00	0.00	0.00	28.64	28.95	52.0	0.557	
140.00	0.26	0.91	0.00	0.00	0.00	27.28	27.59	52.0	0.531	
145.00	0.26	0.92	0.00	0.00	0.00	25.76	26.07	52.0	0.501	
150.00	0.25	0.92	0.00	0.00	0.00	24.05	24.35	52.0	0.468	
155.00	0.24	0.93	0.00	0.00	0.00	22.10	22.40	52.0	0.431	
160.00	0.23	0.93	0.00	0.00	0.00	19.89	20.19	52.0	0.388	
165.00	0.22	0.94	0.00	0.00	0.00	17.35	17.65	52.0	0.339	
170.00	0.22	0.95	0.00	0.00	0.00	14.41	14.72	52.0	0.283	
175.00	0.21	0.96	0.00	0.00	0.00	10.99	11.32	52.0	0.218	
180.00	0.20	0.97	0.00	0.00	0.00	6.98	7.38	52.0	0.142	
180.00	0.20	0.97	0.00	0.00	0.00	6.98	7.38	52.0	0.127	
183.00	0.11	0.40	0.00	0.00	0.00	3.60	3.77	28.8	28.8	0.131
185.00	0.10	0.39	0.00	0.00	0.00	2.78	2.96	28.8	28.8	0.103
190.00	0.09	0.36	0.00	0.00	0.00	0.79	1.08	28.8	28.8	0.037
192.00	0.01	0.02	0.00	0.00	0.00	0.06	0.08	28.8	28.8	0.003
195.00	0.00	0.02	0.00	0.00	0.00	0.00	0.03	28.8	28.8	0.001

Wind Loading - Shaft

Structure: CT01944-S-SBA
Site Name: Harwinton
Height: 195.00 (ft)
Base Elev: 0.000 (ft)

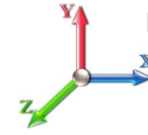
Code: EIA/TIA-222-F
Exposure: C
Gh: 1.69
Struct Class: II

8/16/2016
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Load Case: 69.28 mph Wind with 0.5" Ice

Dead Load Factor 1.00
Wind Load Factor 1.00



Iterations: 26

Elev (ft)	Description	Kzt	Kz	qz (psf)	qzGh (psf)	C (mph-ft)	Cf	Ice Thick (in)	Tributary (ft)	Aa (sf)	CfAa (sf)	Wind Force X (lb)	Dead Load Ice (lb)	Tot Dead Load (lb)
0.00		0.00	1.00	12.287	20.77	372.38	0.650	0.500	0.00	0.000	0.00	0.0	0.0	0.0
5.00		0.00	1.00	12.287	20.77	365.58	0.650	0.500	5.00	27.046	17.58	365.1	194.9	1481.6
10.00		0.00	1.00	12.287	20.77	358.79	0.650	0.500	5.00	26.556	17.26	358.4	191.3	1454.1
15.00		0.00	1.00	12.287	20.77	351.99	0.650	0.500	5.00	26.066	16.94	351.8	187.7	1426.7
20.00		0.00	1.00	12.287	20.77	345.20	0.650	0.500	5.00	25.575	16.62	345.2	184.2	1399.3
25.00		0.00	1.00	12.287	20.77	338.40	0.650	0.500	5.00	25.085	16.31	338.6	180.6	1371.8
30.00		0.00	1.00	12.287	20.77	331.61	0.650	0.500	5.00	24.594	15.99	332.0	177.0	1344.4
35.00		0.00	1.02	12.496	21.12	327.55	0.650	0.500	5.00	24.104	15.67	330.9	173.4	1317.0
40.00		0.00	1.06	12.982	21.94	326.88	0.650	0.500	5.00	23.613	15.35	336.7	169.8	1289.5
41.00	Bot - Section 2	0.00	1.06	13.073	22.09	326.63	0.650	0.500	1.00	4.664	3.03	67.0	33.8	254.9
45.00		0.00	1.09	13.426	22.69	325.32	0.650	0.500	4.00	18.709	12.16	275.9	134.8	1896.6
48.00	Top - Section 1	0.00	1.11	13.676	23.11	324.03	0.650	0.500	3.00	13.826	8.99	207.7	99.8	1401.1
50.00		0.00	1.13	13.836	23.38	327.64	0.650	0.500	2.00	9.119	5.93	138.6	65.9	498.0
55.00		0.00	1.16	14.218	24.03	324.82	0.650	0.500	5.00	22.454	14.60	350.7	161.3	1224.7
60.00		0.00	1.19	14.576	24.63	321.48	0.650	0.500	5.00	21.964	14.28	351.7	157.7	1197.3
65.00		0.00	1.21	14.913	25.20	317.69	0.650	0.500	5.00	21.474	13.96	351.8	154.1	1169.9
70.00		0.00	1.24	15.232	25.74	313.50	0.650	0.500	5.00	20.983	13.64	351.1	150.5	1142.4
75.00		0.00	1.26	15.536	26.26	308.97	0.650	0.500	5.00	20.493	13.32	349.7	146.9	1115.0
80.00		0.00	1.29	15.825	26.74	304.12	0.650	0.500	5.00	20.002	13.00	347.7	143.3	1087.6
85.00	Bot - Section 3	0.00	1.31	16.101	27.21	298.98	0.650	0.500	5.00	19.512	12.68	345.1	139.7	1060.1
90.00		0.00	1.33	16.366	27.66	293.59	0.650	0.500	5.00	19.282	12.53	346.7	138.0	1793.4
91.00	Top - Section 2	0.00	1.34	16.418	27.75	292.48	0.650	0.500	1.00	3.797	2.47	68.5	27.5	353.3
95.00		0.00	1.35	16.621	28.09	292.16	0.650	0.500	4.00	14.994	9.75	273.8	107.5	697.1
100.00		0.00	1.37	16.866	28.50	286.35	0.650	0.500	5.00	18.301	11.90	339.1	130.8	849.9
105.00		0.00	1.39	17.103	28.90	280.33	0.650	0.500	5.00	17.810	11.58	334.6	127.2	826.4
110.00		0.00	1.41	17.332	29.29	274.13	0.650	0.500	5.00	17.320	11.26	329.8	123.6	802.9
115.00		0.00	1.43	17.554	29.67	267.75	0.650	0.500	5.00	16.829	10.94	324.5	120.0	779.5
120.00		0.00	1.45	17.768	30.03	261.22	0.650	0.500	5.00	16.339	10.62	318.9	116.4	756.0
125.00		0.00	1.46	17.977	30.38	254.52	0.650	0.500	5.00	15.849	10.30	313.0	112.9	732.6
130.00	Bot - Section 4	0.00	1.48	18.179	30.72	247.69	0.650	0.500	5.00	15.358	9.98	306.7	109.3	709.1
135.00	Top - Section 3	0.00	1.50	18.376	31.06	240.72	0.650	0.500	5.00	15.076	9.80	304.3	107.2	1158.8
140.00		0.00	1.51	18.568	31.38	237.16	0.650	0.500	5.00	14.586	9.48	297.5	103.6	559.3
145.00		0.00	1.53	18.755	31.70	229.96	0.650	0.500	5.00	14.095	9.16	290.4	100.0	539.8
150.00		0.00	1.54	18.938	32.01	222.64	0.650	0.500	5.00	13.605	8.84	283.0	96.4	520.3
155.00		0.00	1.56	19.116	32.31	215.21	0.650	0.500	5.00	13.114	8.52	275.4	92.8	500.8
160.00		0.00	1.57	19.290	32.60	207.67	0.650	0.500	5.00	12.624	8.21	267.5	89.2	481.3
165.00		0.00	1.58	19.461	32.89	200.03	0.650	0.500	5.00	12.133	7.89	259.4	85.6	461.9
170.00		0.00	1.60	19.628	33.17	192.30	0.650	0.500	5.00	11.643	7.57	251.0	82.0	442.4
175.00		0.00	1.61	19.791	33.45	184.47	0.650	0.500	5.00	11.152	7.25	242.5	78.4	422.9
180.00	Top - Section 4	0.00	1.62	19.951	33.72	176.56	0.650	0.500	5.00	10.662	6.93	233.7	74.8	403.4
183.00	Appurtenance(s)	0.00	1.63	20.045	33.88	176.98	0.590	0.500	3.00	6.250	3.69	124.9	44.9	258.6
185.00		0.00	1.64	20.107	33.98	177.25	0.590	0.500	2.00	4.167	2.46	83.5	29.9	172.4
190.00		0.00	1.65	20.261	34.24	177.93	0.590	0.500	5.00	10.417	6.15	210.4	74.8	431.1
192.00	Appurtenance(s)	0.00	1.65	20.322	34.34	178.19	0.590	0.500	2.00	4.167	2.46	84.4	29.9	172.4
195.00	Appurtenance(s)	0.00	1.66	20.412	34.50	178.59	0.590	0.500	3.00	6.250	3.69	127.2	44.9	258.6
Totals:									195.00			12,186.3		38,216.2

Discrete Appurtenance Forces

Structure: CT01944-S-SB
Site Name: Harwinton
Height: 195.00 (ft)
Base Elev: 0.000 (ft)

Code: EIA/TIA-222-F
Exposure: C
Gh: 1.69
Struct Class: II

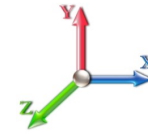
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Load Case: 69.28 mph Wind with 0.5" Ice

Dead Load Factor 1.00
Wind Load Factor 1.00



Iterations: 26

No.	Elev (ft)	Description	Qty	qz (psf)	qzGh (psf)	CaAa Factor	Total CaAa (sf)	Dead Load (lb)	Horiz Ecc (ft)	Vert Ecc (ft)	Wind FX (lb)	Mom Y (lb-ft)	Mom Z (lb-ft)
1	195.00	6' Lightning rod	1	20.412	34.497	1.00	0.98	11.80	0.000	0.000	33.81	0.00	0.00
2	192.00	Low Profile Platform	1	20.322	34.344	1.00	27.00	1800.00	0.000	0.000	927.29	0.00	0.00
3	192.00	782 11056	3	20.322	34.344	0.70	0.82	24.00	0.000	0.000	28.13	0.00	0.00
4	192.00	DTMA-1819-DD-12	3	20.322	34.344	0.75	2.03	57.90	0.000	0.000	69.55	0.00	0.00
5	192.00	LNx-6515DS-A1M	3	20.322	34.344	0.86	31.84	346.80	0.000	0.000	1093.42	0.00	0.00
6	192.00	APXV18-206516S-C-A20	3	20.322	34.344	0.83	10.33	116.10	0.000	0.000	354.90	0.00	0.00
7	183.00	Low Profile Platform	1	20.045	33.876	1.00	27.00	1800.00	0.000	0.000	914.66	0.00	0.00
8	183.00	LPA-171080-8CF	4	20.045	33.876	0.81	12.21	116.40	0.000	0.000	413.79	0.00	0.00
9	183.00	LPA-171063-8CF	2	20.045	33.876	0.81	6.87	80.40	0.000	0.000	232.69	0.00	0.00
10	183.00	LPA-80063-4CF	6	20.045	33.876	0.81	37.03	434.40	0.000	0.000	1254.55	0.00	0.00
11	183.00	BXA-70063-6CF	3	20.045	33.876	0.84	21.52	178.50	0.000	0.000	729.04	0.00	0.00
Totals:								4,966.30			6,051.83		

Total Applied Force Summary

Structure: CT01944-S-SB
Site Name: Harwinton
Height: 195.00 (ft)
Base Elev: 0.000 (ft)

Code: EIA/TIA-222-F
Exposure: C
Gh: 1.69
Struct Class: II

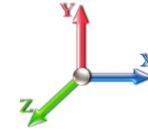
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Load Case: 69.28 mph Wind with 0.5" Ice

Dead Load Factor 1.00
Wind Load Factor 1.00



Iterations: 26

Elev (ft)	Description	Lateral FX (-) (lb)	Axial FY (-) (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)
0.00		0.00	0.00	0.00	0.00
5.00		365.06	1491.95	0.00	0.00
10.00		358.44	1464.52	0.00	0.00
15.00		351.82	1437.09	0.00	0.00
20.00		345.20	1409.66	0.00	0.00
25.00		338.58	1382.23	0.00	0.00
30.00		331.96	1354.80	0.00	0.00
35.00		330.86	1327.37	0.00	0.00
40.00		336.73	1299.93	0.00	0.00
41.00		66.98	256.98	0.00	0.00
45.00		275.93	1904.91	0.00	0.00
48.00		207.70	1407.37	0.00	0.00
50.00		138.60	502.16	0.00	0.00
55.00		350.71	1235.12	0.00	0.00
60.00		351.68	1207.69	0.00	0.00
65.00		351.78	1180.26	0.00	0.00
70.00		351.10	1152.83	0.00	0.00
75.00		349.72	1125.39	0.00	0.00
80.00		347.71	1097.96	0.00	0.00
85.00		345.11	1070.53	0.00	0.00
90.00		346.65	1803.77	0.00	0.00
91.00		68.49	355.37	0.00	0.00
95.00		273.76	705.39	0.00	0.00
100.00		339.07	860.26	0.00	0.00
105.00		334.62	836.80	0.00	0.00
110.00		329.76	813.34	0.00	0.00
115.00		324.52	789.89	0.00	0.00
120.00		318.91	766.43	0.00	0.00
125.00		312.97	742.97	0.00	0.00
130.00		306.70	719.51	0.00	0.00
135.00		304.33	1169.17	0.00	0.00
140.00		297.51	569.69	0.00	0.00
145.00		290.40	550.20	0.00	0.00
150.00		283.02	530.72	0.00	0.00
155.00		275.39	511.23	0.00	0.00
160.00		267.50	491.75	0.00	0.00
165.00		259.38	472.26	0.00	0.00
170.00		251.03	452.77	0.00	0.00
175.00		242.45	433.29	0.00	0.00
180.00		233.66	413.80	0.00	0.00
183.00	(16) appurtenances	3669.65	2874.59	0.00	0.00
185.00		83.54	174.51	0.00	0.00
190.00		210.44	436.28	0.00	0.00
192.00	(13) appurtenances	2557.71	2519.31	0.00	0.00
195.00	(1) appurtenances	161.01	270.45	0.00	0.00
Totals:		18,238.15	43,572.50	0.00	0.00

Resulting Forces and Deflections

Structure: CT01944-S-SB
Site Name: Harwinton
Height: 195.00 (ft)
Base Elev: 0.000 (ft)

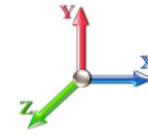
Code: EIA/TIA-222-F
Exposure: C
Gh: 1.69
Struct Class: II

8/16/2016
 Page: 15



Load Case: 69.28 mph Wind with 0.5" Ice

Dead Load Factor 1.00
Wind Load Factor 1.00



Iterations: 26

Elev (ft)	Lateral FX (-) (kips)	Axial FY (-) (kips)	Lateral FZ (kips)	Moment MX (ft-kips)	Torsion MY (ft-kips)	Moment MZ (ft-kips)	Deflect X (in)	Deflect Z (in)	Deflect Resultant (in)	Rotation Sway (deg)	Rotation Twist (deg)
0.00	-18.270	-43.559	0.000	0.000	0.000	-2342.827	0.000	0.000	0.000	0.000	0.000
5.00	-17.964	-42.041	0.000	0.000	0.000	-2251.481	-0.044	0.000	0.044	-0.082	0.000
10.00	-17.662	-40.552	0.000	0.000	0.000	-2161.661	-0.176	0.000	0.176	-0.166	0.000
15.00	-17.364	-39.090	0.000	0.000	0.000	-2073.350	-0.396	0.000	0.396	-0.251	0.000
20.00	-17.069	-37.656	0.000	0.000	0.000	-1986.533	-0.705	0.000	0.705	-0.337	0.000
25.00	-16.777	-36.250	0.000	0.000	0.000	-1901.192	-1.106	0.000	1.106	-0.425	0.000
30.00	-16.488	-34.873	0.000	0.000	0.000	-1817.310	-1.599	0.000	1.599	-0.514	0.000
35.00	-16.198	-33.523	0.000	0.000	0.000	-1734.870	-2.186	0.000	2.186	-0.605	0.000
40.00	-15.877	-32.212	0.000	0.000	0.000	-1653.882	-2.868	0.000	2.868	-0.696	0.000
41.00	-15.834	-31.942	0.000	0.000	0.000	-1638.005	-3.016	0.000	3.016	-0.715	0.000
45.00	-15.567	-30.023	0.000	0.000	0.000	-1574.672	-3.648	0.000	3.648	-0.791	0.000
48.00	-15.363	-28.606	0.000	0.000	0.000	-1527.971	-4.163	0.000	4.163	-0.848	0.000
50.00	-15.250	-28.089	0.000	0.000	0.000	-1497.245	-4.527	0.000	4.527	-0.887	0.000
55.00	-14.922	-26.835	0.000	0.000	0.000	-1420.999	-5.506	0.000	5.506	-0.979	0.000
60.00	-14.591	-25.610	0.000	0.000	0.000	-1346.389	-6.581	0.000	6.581	-1.072	0.000
65.00	-14.257	-24.413	0.000	0.000	0.000	-1273.435	-7.755	0.000	7.755	-1.167	0.000
70.00	-13.921	-23.245	0.000	0.000	0.000	-1202.151	-9.029	0.000	9.029	-1.263	0.000
75.00	-13.583	-22.104	0.000	0.000	0.000	-1132.548	-10.405	0.000	10.405	-1.361	0.000
80.00	-13.245	-20.992	0.000	0.000	0.000	-1064.633	-11.883	0.000	11.883	-1.460	0.000
85.00	-12.907	-19.909	0.000	0.000	0.000	-998.409	-13.465	0.000	13.465	-1.559	0.000
90.00	-12.529	-18.102	0.000	0.000	0.000	-933.876	-15.152	0.000	15.152	-1.661	0.000
91.00	-12.466	-17.738	0.000	0.000	0.000	-921.348	-15.502	0.000	15.502	-1.682	0.000
95.00	-12.201	-17.019	0.000	0.000	0.000	-871.485	-16.947	0.000	16.947	-1.764	0.000
100.00	-11.868	-16.146	0.000	0.000	0.000	-810.479	-18.858	0.000	18.858	-1.883	0.000
105.00	-11.538	-15.296	0.000	0.000	0.000	-751.138	-20.894	0.000	20.894	-2.002	0.000
110.00	-11.209	-14.472	0.000	0.000	0.000	-693.450	-23.055	0.000	23.055	-2.123	0.000
115.00	-10.884	-13.672	0.000	0.000	0.000	-637.404	-25.343	0.000	25.343	-2.244	0.000
120.00	-10.562	-12.897	0.000	0.000	0.000	-582.985	-27.758	0.000	27.758	-2.365	0.000
125.00	-10.244	-12.146	0.000	0.000	0.000	-530.176	-30.300	0.000	30.300	-2.487	0.000
130.00	-9.929	-11.420	0.000	0.000	0.000	-478.959	-32.969	0.000	32.969	-2.608	0.000
135.00	-9.592	-10.246	0.000	0.000	0.000	-429.313	-35.764	0.000	35.764	-2.729	0.000
140.00	-9.289	-9.670	0.000	0.000	0.000	-381.351	-38.686	0.000	38.686	-2.848	0.000
145.00	-8.993	-9.114	0.000	0.000	0.000	-334.905	-41.743	0.000	41.743	-2.988	0.000
150.00	-8.702	-8.579	0.000	0.000	0.000	-289.939	-44.944	0.000	44.944	-3.123	0.000
155.00	-8.417	-8.065	0.000	0.000	0.000	-246.428	-48.284	0.000	48.284	-3.253	0.000
160.00	-8.137	-7.573	0.000	0.000	0.000	-204.344	-51.756	0.000	51.756	-3.376	0.000
165.00	-7.863	-7.103	0.000	0.000	0.000	-163.660	-55.352	0.000	55.352	-3.489	0.000
170.00	-7.595	-6.654	0.000	0.000	0.000	-124.345	-59.060	0.000	59.060	-3.590	0.000
175.00	-7.334	-6.228	0.000	0.000	0.000	-86.368	-62.865	0.000	62.865	-3.674	0.000
180.00	-7.078	-5.825	0.000	0.000	0.000	-49.699	-66.747	0.000	66.747	-3.736	0.000
183.00	-3.229	-3.195	0.000	0.000	0.000	-28.464	-69.102	0.000	69.102	-3.761	0.000
185.00	-3.135	-3.026	0.000	0.000	0.000	-22.005	-70.679	0.000	70.679	-3.771	0.000
190.00	-2.897	-2.604	0.000	0.000	0.000	-6.329	-74.634	0.000	74.634	-3.784	0.000
192.00	-0.178	-0.259	0.000	0.000	0.000	-0.535	-76.218	0.000	76.218	-3.786	0.000
195.00	-0.161	0.000	0.000	0.000	0.000	0.000	0.000	0.000	78.595	-3.786	0.000

Resulting Stresses

Structure: CT01944-S-SBA
Site Name: Harwinton
Height: 195.00 (ft)
Base Elev: 0.000 (ft)

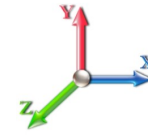
Code: EIA/TIA-222-F
Exposure: C
Gh: 1.69
Struct Class: II

8/16/2016
 Page: 16



Load Case: 69.28 mph Wind with 0.5" Ice

Dead Load Factor 1.00
Wind Load Factor 1.00



Iterations: 26

Applied Stresses

Elev (ft)	fa Axial (Y) (ksi)	fvx Shear (X) (ksi)	fvz Shear (Z) (ksi)	fvT Torsion (ksi)	fbx Bending (X) (ksi)	fbz Bending (Z) (ksi)	fb Combined (ksi)	Fb Allow Stress (ksi)	f/Fb Stress Ratio
0.00	0.57	0.48	0.00	0.00	0.00	23.22	23.80	48.5	0.491
5.00	0.56	0.48	0.00	0.00	0.00	23.16	23.73	49.0	0.485
10.00	0.55	0.48	0.00	0.00	0.00	23.09	23.66	49.4	0.479
15.00	0.54	0.49	0.00	0.00	0.00	23.02	23.58	49.9	0.472
20.00	0.53	0.49	0.00	0.00	0.00	22.94	23.49	50.4	0.466
25.00	0.52	0.49	0.00	0.00	0.00	22.86	23.39	50.8	0.460
30.00	0.51	0.49	0.00	0.00	0.00	22.76	23.29	51.3	0.454
35.00	0.50	0.49	0.00	0.00	0.00	22.66	23.18	51.8	0.448
40.00	0.49	0.49	0.00	0.00	0.00	22.54	23.05	52.0	0.443
41.00	0.49	0.49	0.00	0.00	0.00	22.52	23.03	52.0	0.443
45.00	0.47	0.49	0.00	0.00	0.00	22.42	22.91	52.0	0.441
48.00	0.45	0.49	0.00	0.00	0.00	21.72	22.18	52.0	0.427
50.00	0.44	0.49	0.00	0.00	0.00	21.66	22.12	52.0	0.426
55.00	0.43	0.49	0.00	0.00	0.00	21.51	21.96	52.0	0.422
60.00	0.42	0.49	0.00	0.00	0.00	21.34	21.78	52.0	0.419
65.00	0.41	0.49	0.00	0.00	0.00	21.15	21.58	52.0	0.415
70.00	0.40	0.49	0.00	0.00	0.00	20.96	21.38	52.0	0.411
75.00	0.39	0.49	0.00	0.00	0.00	20.74	21.15	52.0	0.407
80.00	0.38	0.49	0.00	0.00	0.00	20.51	20.91	52.0	0.402
85.00	0.37	0.49	0.00	0.00	0.00	20.26	20.65	52.0	0.397
90.00	0.35	0.49	0.00	0.00	0.00	19.99	20.36	52.0	0.392
91.00	0.41	0.57	0.00	0.00	0.00	23.15	23.58	52.0	0.454
95.00	0.40	0.57	0.00	0.00	0.00	22.87	23.29	52.0	0.448
100.00	0.39	0.57	0.00	0.00	0.00	22.48	22.89	52.0	0.440
105.00	0.38	0.57	0.00	0.00	0.00	22.06	22.46	52.0	0.432
110.00	0.37	0.57	0.00	0.00	0.00	21.60	21.99	52.0	0.423
115.00	0.36	0.57	0.00	0.00	0.00	21.09	21.47	52.0	0.413
120.00	0.35	0.58	0.00	0.00	0.00	20.53	20.90	52.0	0.402
125.00	0.34	0.58	0.00	0.00	0.00	19.91	20.27	52.0	0.390
130.00	0.33	0.58	0.00	0.00	0.00	19.23	19.58	52.0	0.377
135.00	0.38	0.71	0.00	0.00	0.00	22.28	22.69	52.0	0.437
140.00	0.37	0.71	0.00	0.00	0.00	21.23	21.63	52.0	0.416
145.00	0.36	0.71	0.00	0.00	0.00	20.04	20.44	52.0	0.393
150.00	0.35	0.72	0.00	0.00	0.00	18.71	19.10	52.0	0.367
155.00	0.34	0.72	0.00	0.00	0.00	17.20	17.58	52.0	0.338
160.00	0.34	0.73	0.00	0.00	0.00	15.47	15.85	52.0	0.305
165.00	0.33	0.73	0.00	0.00	0.00	13.49	13.87	52.0	0.267
170.00	0.32	0.74	0.00	0.00	0.00	11.20	11.59	52.0	0.223
175.00	0.31	0.75	0.00	0.00	0.00	8.53	8.94	52.0	0.172
180.00	0.31	0.76	0.00	0.00	0.00	5.41	5.87	52.0	0.113
180.00	0.31	0.76	0.00	0.00	0.00	5.41	5.87	52.0	0.101
183.00	0.15	0.31	0.00	0.00	0.00	2.78	2.98	28.8	0.104
185.00	0.14	0.30	0.00	0.00	0.00	2.15	2.35	28.8	0.082
190.00	0.12	0.28	0.00	0.00	0.00	0.62	0.88	28.8	0.031
192.00	0.01	0.02	0.00	0.00	0.00	0.05	0.07	28.8	0.002
195.00	0.00	0.02	0.00	0.00	0.00	0.00	0.03	28.8	0.001

Wind Loading - Shaft

Structure: CT01944-S-SBA
Site Name: Harwinton
Height: 195.00 (ft)
Base Elev: 0.000 (ft)

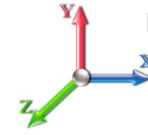
Code: EIA/TIA-222-F
Exposure: C
Gh: 1.69
Struct Class: II

8/16/2016
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Load Case: 50 mph Wind with 0" Ice

Dead Load Factor 1.00
Wind Load Factor 1.00



Iterations: 25

Elev (ft)	Description	Kzt	Kz	qz (psf)	qzGh (psf)	C (mph-ft)	Cf	Ice Thick (in)	Tributary (ft)	Aa (sf)	CfAa (sf)	Wind Force X (lb)	Dead Load Ice (lb)	Tot Dead Load (lb)
0.00		0.00	1.00	6.400	10.82	268.75	0.650	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		0.00	1.00	6.400	10.82	263.85	0.650	0.000	5.00	26.630	17.31	187.2	0.0	1286.6
10.00		0.00	1.00	6.400	10.82	258.94	0.650	0.000	5.00	26.139	16.99	183.8	0.0	1262.8
15.00		0.00	1.00	6.400	10.82	254.04	0.650	0.000	5.00	25.649	16.67	180.3	0.0	1238.9
20.00		0.00	1.00	6.400	10.82	249.13	0.650	0.000	5.00	25.158	16.35	176.9	0.0	1215.1
25.00		0.00	1.00	6.400	10.82	244.23	0.650	0.000	5.00	24.668	16.03	173.4	0.0	1191.3
30.00		0.00	1.00	6.400	10.82	239.32	0.650	0.000	5.00	24.178	15.72	170.0	0.0	1167.4
35.00		0.00	1.02	6.509	11.00	236.40	0.650	0.000	5.00	23.687	15.40	169.4	0.0	1143.6
40.00		0.00	1.06	6.762	11.43	235.91	0.650	0.000	5.00	23.197	15.08	172.3	0.0	1119.8
41.00	Bot - Section 2	0.00	1.06	6.809	11.51	235.73	0.650	0.000	1.00	4.580	2.98	34.3	0.0	221.1
45.00		0.00	1.09	6.993	11.82	234.79	0.650	0.000	4.00	18.376	11.94	141.2	0.0	1761.8
48.00	Top - Section 1	0.00	1.11	7.123	12.04	233.86	0.650	0.000	3.00	13.576	8.82	106.2	0.0	1301.3
50.00		0.00	1.13	7.207	12.18	236.46	0.650	0.000	2.00	8.952	5.82	70.9	0.0	432.1
55.00		0.00	1.16	7.406	12.52	234.42	0.650	0.000	5.00	22.038	14.32	179.3	0.0	1063.4
60.00		0.00	1.19	7.592	12.83	232.01	0.650	0.000	5.00	21.547	14.01	179.7	0.0	1039.6
65.00		0.00	1.21	7.768	13.13	229.28	0.650	0.000	5.00	21.057	13.69	179.7	0.0	1015.8
70.00		0.00	1.24	7.934	13.41	226.26	0.650	0.000	5.00	20.566	13.37	179.2	0.0	991.9
75.00		0.00	1.26	8.092	13.68	222.98	0.650	0.000	5.00	20.076	13.05	178.5	0.0	968.1
80.00		0.00	1.29	8.242	13.93	219.48	0.650	0.000	5.00	19.586	12.73	177.3	0.0	944.3
85.00	Bot - Section 3	0.00	1.31	8.387	14.17	215.78	0.650	0.000	5.00	19.095	12.41	175.9	0.0	920.4
90.00		0.00	1.33	8.525	14.41	211.89	0.650	0.000	5.00	18.865	12.26	176.7	0.0	1655.4
91.00	Top - Section 2	0.00	1.34	8.552	14.45	211.09	0.650	0.000	1.00	3.714	2.41	34.9	0.0	325.8
95.00		0.00	1.35	8.657	14.63	210.85	0.650	0.000	4.00	14.660	9.53	139.4	0.0	589.5
100.00		0.00	1.37	8.785	14.85	206.66	0.650	0.000	5.00	17.884	11.62	172.6	0.0	719.0
105.00		0.00	1.39	8.908	15.06	202.32	0.650	0.000	5.00	17.394	11.31	170.2	0.0	699.2
110.00		0.00	1.41	9.028	15.26	197.84	0.650	0.000	5.00	16.903	10.99	167.6	0.0	679.3
115.00		0.00	1.43	9.143	15.45	193.24	0.650	0.000	5.00	16.413	10.67	164.8	0.0	659.4
120.00		0.00	1.45	9.255	15.64	188.52	0.650	0.000	5.00	15.922	10.35	161.9	0.0	639.6
125.00		0.00	1.46	9.363	15.82	183.69	0.650	0.000	5.00	15.432	10.03	158.7	0.0	619.7
130.00	Bot - Section 4	0.00	1.48	9.469	16.00	178.76	0.650	0.000	5.00	14.941	9.71	155.4	0.0	599.9
135.00	Top - Section 3	0.00	1.50	9.572	16.18	173.73	0.650	0.000	5.00	14.659	9.53	154.1	0.0	1051.6
140.00		0.00	1.51	9.672	16.35	171.16	0.650	0.000	5.00	14.169	9.21	150.5	0.0	455.7
145.00		0.00	1.53	9.769	16.51	165.96	0.650	0.000	5.00	13.678	8.89	146.8	0.0	439.8
150.00		0.00	1.54	9.864	16.67	160.68	0.650	0.000	5.00	13.188	8.57	142.9	0.0	423.9
155.00		0.00	1.56	9.957	16.83	155.32	0.650	0.000	5.00	12.697	8.25	138.9	0.0	408.0
160.00		0.00	1.57	10.048	16.98	149.88	0.650	0.000	5.00	12.207	7.93	134.7	0.0	392.1
165.00		0.00	1.58	10.136	17.13	144.37	0.650	0.000	5.00	11.717	7.62	130.5	0.0	376.2
170.00		0.00	1.60	10.223	17.28	138.79	0.650	0.000	5.00	11.226	7.30	126.1	0.0	360.4
175.00		0.00	1.61	10.308	17.42	133.14	0.650	0.000	5.00	10.736	6.98	121.6	0.0	344.5
180.00	Top - Section 4	0.00	1.62	10.392	17.56	127.42	0.650	0.000	5.00	10.245	6.66	117.0	0.0	328.6
183.00	Appurtenance(s)	0.00	1.63	10.441	17.64	127.73	0.590	0.000	3.00	6.000	3.54	62.5	0.0	213.8
185.00		0.00	1.64	10.473	17.70	127.92	0.590	0.000	2.00	4.000	2.36	41.8	0.0	142.5
190.00		0.00	1.65	10.553	17.84	128.41	0.590	0.000	5.00	10.000	5.90	105.2	0.0	356.3
192.00	Appurtenance(s)	0.00	1.65	10.585	17.89	128.60	0.590	0.000	2.00	4.000	2.36	42.2	0.0	142.5
195.00	Appurtenance(s)	0.00	1.66	10.632	17.97	128.89	0.590	0.000	3.00	6.000	3.54	63.6	0.0	213.8
Totals:									195.00			6,195.9		33,121.7

Discrete Appurtenance Forces

Structure: CT01944-S-SB
Site Name: Harwinton
Height: 195.00 (ft)
Base Elev: 0.000 (ft)

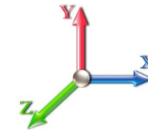
Code: EIA/TIA-222-F
Exposure: C
Gh: 1.69
Struct Class: II

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Load Case: 50 mph Wind with 0" Ice

Dead Load Factor 1.00
Wind Load Factor 1.00



Iterations: 25

No.	Elev (ft)	Description	Qty	qz (psf)	qzGh (psf)	CaAa Factor	Total CaAa (sf)	Dead Load (lb)	Horiz Ecc (ft)	Vert Ecc (ft)	Wind FX (lb)	Mom Y (lb-ft)	Mom Z (lb-ft)
1	195.00	6' Lightning rod	1	10.632	17.968	1.00	0.38	6.50	0.000	0.000	6.83	0.00	0.00
2	192.00	Low Profile Platform	1	10.585	17.889	1.00	24.00	1500.00	0.000	0.000	429.33	0.00	0.00
3	192.00	782 11056	3	10.585	17.889	0.80	0.67	5.40	0.000	0.000	12.02	0.00	0.00
4	192.00	DTMA-1819-DD-12	3	10.585	17.889	0.80	1.70	42.90	0.000	0.000	30.48	0.00	0.00
5	192.00	LNx-6515DS-A1M	3	10.585	17.889	0.90	30.81	149.40	0.000	0.000	551.10	0.00	0.00
6	192.00	APXV18-206516S-C-A20	3	10.585	17.889	0.90	15.17	56.10	0.000	0.000	271.44	0.00	0.00
7	183.00	Low Profile Platform	1	10.441	17.645	1.00	24.00	1500.00	0.000	0.000	423.48	0.00	0.00
8	183.00	LPA-171080-8CF	4	10.441	17.645	0.80	16.74	34.00	0.000	0.000	295.31	0.00	0.00
9	183.00	LPA-171063-8CF	2	10.441	17.645	0.80	9.10	23.00	0.000	0.000	160.64	0.00	0.00
10	183.00	LPA-80063-4CF	6	10.441	17.645	0.80	33.60	120.00	0.000	0.000	592.87	0.00	0.00
11	183.00	BXA-70063-6CF	3	10.441	17.645	0.80	18.55	51.00	0.000	0.000	327.35	0.00	0.00
Totals:								3,488.30			3,100.84		

Total Applied Force Summary

Structure: CT01944-S-SB
Site Name: Harwinton
Height: 195.00 (ft)
Base Elev: 0.000 (ft)

Code: EIA/TIA-222-F
Exposure: C
Gh: 1.69
Struct Class: II

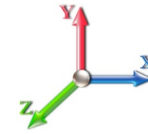
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Load Case: 50 mph Wind with 0" Ice

Dead Load Factor 1.00
Wind Load Factor 1.00



Iterations: 25

Elev (ft)	Description	Lateral FX (-) (lb)	Axial FY (-) (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)
0.00		0.00	0.00	0.00	0.00
5.00		187.22	1297.02	0.00	0.00
10.00		183.77	1273.18	0.00	0.00
15.00		180.32	1249.34	0.00	0.00
20.00		176.87	1225.51	0.00	0.00
25.00		173.43	1201.67	0.00	0.00
30.00		169.98	1177.84	0.00	0.00
35.00		169.35	1154.00	0.00	0.00
40.00		172.30	1130.16	0.00	0.00
41.00		34.26	223.17	0.00	0.00
45.00		141.16	1770.14	0.00	0.00
48.00		106.23	1307.58	0.00	0.00
50.00		70.87	436.21	0.00	0.00
55.00		179.28	1073.84	0.00	0.00
60.00		179.70	1050.01	0.00	0.00
65.00		179.68	1026.17	0.00	0.00
70.00		179.25	1002.34	0.00	0.00
75.00		178.45	978.50	0.00	0.00
80.00		177.33	954.66	0.00	0.00
85.00		175.91	930.83	0.00	0.00
90.00		176.66	1665.75	0.00	0.00
91.00		34.89	327.91	0.00	0.00
95.00		139.42	597.85	0.00	0.00
100.00		172.59	729.44	0.00	0.00
105.00		170.21	709.57	0.00	0.00
110.00		167.63	689.71	0.00	0.00
115.00		164.84	669.85	0.00	0.00
120.00		161.87	649.98	0.00	0.00
125.00		158.73	630.12	0.00	0.00
130.00		155.42	610.26	0.00	0.00
135.00		154.13	1061.98	0.00	0.00
140.00		150.53	466.10	0.00	0.00
145.00		146.79	450.21	0.00	0.00
150.00		142.90	434.32	0.00	0.00
155.00		138.88	418.42	0.00	0.00
160.00		134.73	402.53	0.00	0.00
165.00		130.46	386.64	0.00	0.00
170.00		126.07	370.75	0.00	0.00
175.00		121.57	354.86	0.00	0.00
180.00		116.95	338.97	0.00	0.00
183.00	(16) appurtenances	1862.11	1947.99	0.00	0.00
185.00		41.77	144.58	0.00	0.00
190.00		105.23	361.45	0.00	0.00
192.00	(13) appurtenances	1336.59	1898.38	0.00	0.00
195.00	(1) appurtenances	70.43	220.25	0.00	0.00
Totals:		9,296.77	37,000.05	0.00	0.00

Resulting Forces and Deflections

Structure: CT01944-S-SB
Site Name: Harwinton
Height: 195.00 (ft)
Base Elev: 0.000 (ft)

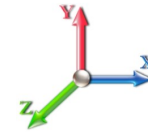
Code: EIA/TIA-222-F
Exposure: C
Gh: 1.69
Struct Class: II

8/16/2016
 Page: 20



Load Case: 50 mph Wind with 0" Ice

Dead Load Factor 1.00
Wind Load Factor 1.00



Iterations: 25

Elev (ft)	Lateral FX (-) (kips)	Axial FY (-) (kips)	Lateral FZ (kips)	Moment MX (ft-kips)	Torsion MY (ft-kips)	Moment MZ (ft-kips)	Deflect X (in)	Deflect Z (in)	Deflect Resultant (in)	Rotation Sway (deg)	Rotation Twist (deg)
0.00	-9.309	-36.997	0.000	0.000	0.000	-1184.706	0.000	0.000	0.000	0.000	0.000
5.00	-9.148	-35.693	0.000	0.000	0.000	-1138.160	-0.022	0.000	0.022	-0.042	0.000
10.00	-8.988	-34.413	0.000	0.000	0.000	-1092.421	-0.089	0.000	0.089	-0.084	0.000
15.00	-8.831	-33.158	0.000	0.000	0.000	-1047.480	-0.200	0.000	0.200	-0.127	0.000
20.00	-8.675	-31.926	0.000	0.000	0.000	-1003.328	-0.356	0.000	0.356	-0.171	0.000
25.00	-8.522	-30.718	0.000	0.000	0.000	-959.953	-0.559	0.000	0.559	-0.215	0.000
30.00	-8.370	-29.534	0.000	0.000	0.000	-917.345	-0.808	0.000	0.808	-0.260	0.000
35.00	-8.218	-28.375	0.000	0.000	0.000	-875.496	-1.104	0.000	1.104	-0.305	0.000
40.00	-8.052	-27.242	0.000	0.000	0.000	-834.407	-1.449	0.000	1.449	-0.352	0.000
41.00	-8.028	-27.015	0.000	0.000	0.000	-826.355	-1.524	0.000	1.524	-0.361	0.000
45.00	-7.890	-25.242	0.000	0.000	0.000	-794.244	-1.843	0.000	1.843	-0.399	0.000
48.00	-7.784	-23.932	0.000	0.000	0.000	-770.576	-2.103	0.000	2.103	-0.428	0.000
50.00	-7.723	-23.491	0.000	0.000	0.000	-755.008	-2.287	0.000	2.287	-0.448	0.000
55.00	-7.554	-22.413	0.000	0.000	0.000	-716.391	-2.781	0.000	2.781	-0.494	0.000
60.00	-7.382	-21.358	0.000	0.000	0.000	-678.623	-3.324	0.000	3.324	-0.541	0.000
65.00	-7.209	-20.328	0.000	0.000	0.000	-641.713	-3.917	0.000	3.917	-0.589	0.000
70.00	-7.036	-19.322	0.000	0.000	0.000	-605.666	-4.560	0.000	4.560	-0.638	0.000
75.00	-6.862	-18.339	0.000	0.000	0.000	-570.487	-5.254	0.000	5.254	-0.687	0.000
80.00	-6.688	-17.381	0.000	0.000	0.000	-536.177	-6.000	0.000	6.000	-0.736	0.000
85.00	-6.514	-16.447	0.000	0.000	0.000	-502.737	-6.798	0.000	6.798	-0.787	0.000
90.00	-6.322	-14.781	0.000	0.000	0.000	-470.166	-7.649	0.000	7.649	-0.838	0.000
91.00	-6.289	-14.450	0.000	0.000	0.000	-463.844	-7.826	0.000	7.826	-0.848	0.000
95.00	-6.153	-13.849	0.000	0.000	0.000	-438.689	-8.554	0.000	8.554	-0.890	0.000
100.00	-5.982	-13.116	0.000	0.000	0.000	-407.926	-9.518	0.000	9.518	-0.950	0.000
105.00	-5.813	-12.404	0.000	0.000	0.000	-378.016	-10.545	0.000	10.545	-1.010	0.000
110.00	-5.645	-11.711	0.000	0.000	0.000	-348.952	-11.635	0.000	11.635	-1.070	0.000
115.00	-5.479	-11.039	0.000	0.000	0.000	-320.726	-12.789	0.000	12.789	-1.131	0.000
120.00	-5.315	-10.387	0.000	0.000	0.000	-293.330	-14.006	0.000	14.006	-1.192	0.000
125.00	-5.154	-9.755	0.000	0.000	0.000	-266.753	-15.288	0.000	15.288	-1.253	0.000
130.00	-4.994	-9.143	0.000	0.000	0.000	-240.985	-16.633	0.000	16.633	-1.314	0.000
135.00	-4.824	-8.079	0.000	0.000	0.000	-216.013	-18.043	0.000	18.043	-1.375	0.000
140.00	-4.671	-7.612	0.000	0.000	0.000	-191.894	-19.515	0.000	19.515	-1.435	0.000
145.00	-4.521	-7.160	0.000	0.000	0.000	-168.540	-21.056	0.000	21.056	-1.505	0.000
150.00	-4.374	-6.725	0.000	0.000	0.000	-145.935	-22.670	0.000	22.670	-1.574	0.000
155.00	-4.231	-6.306	0.000	0.000	0.000	-124.063	-24.353	0.000	24.353	-1.639	0.000
160.00	-4.091	-5.903	0.000	0.000	0.000	-102.908	-26.103	0.000	26.103	-1.701	0.000
165.00	-3.954	-5.517	0.000	0.000	0.000	-82.455	-27.916	0.000	27.916	-1.758	0.000
170.00	-3.821	-5.147	0.000	0.000	0.000	-62.685	-29.785	0.000	29.785	-1.809	0.000
175.00	-3.691	-4.794	0.000	0.000	0.000	-43.582	-31.703	0.000	31.703	-1.851	0.000
180.00	-3.565	-4.457	0.000	0.000	0.000	-25.128	-33.660	0.000	33.660	-1.882	0.000
183.00	-1.640	-2.572	0.000	0.000	0.000	-14.434	-34.847	0.000	34.847	-1.895	0.000
185.00	-1.594	-2.428	0.000	0.000	0.000	-11.154	-35.642	0.000	35.642	-1.900	0.000
190.00	-1.477	-2.071	0.000	0.000	0.000	-3.186	-37.636	0.000	37.636	-1.907	0.000
192.00	-0.078	-0.218	0.000	0.000	0.000	-0.233	-38.435	0.000	38.435	-1.908	0.000
195.00	-0.070	0.000	0.000	0.000	0.000	0.000	0.000	0.000	39.633	-1.908	0.000

Resulting Stresses

Structure: CT01944-S-SBA
Site Name: Harwinton
Height: 195.00 (ft)
Base Elev: 0.000 (ft)

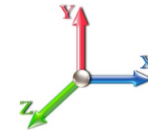
Code: EIA/TIA-222-F
Exposure: C
Gh: 1.69
Struct Class: II

8/16/2016
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Load Case: 50 mph Wind with 0" Ice

Dead Load Factor 1.00
Wind Load Factor 1.00



Iterations: 25

Applied Stresses

Elev (ft)	fa Axial (Y) (ksi)	fvx Shear (X) (ksi)	fvz Shear (Z) (ksi)	fvT Torsion (ksi)	fbx Bending (X) (ksi)	fbz Bending (Z) (ksi)	fb Combined (ksi)	Fb Allow Stress (ksi)	f/Fb Stress Ratio	
0.00	0.48	0.25	0.00	0.00	0.00	11.74	12.23	48.5	0.252	
5.00	0.48	0.25	0.00	0.00	0.00	11.71	12.19	49.0	0.249	
10.00	0.47	0.25	0.00	0.00	0.00	11.67	12.15	49.4	0.246	
15.00	0.46	0.25	0.00	0.00	0.00	11.63	12.10	49.9	0.242	
20.00	0.45	0.25	0.00	0.00	0.00	11.59	12.05	50.4	0.239	
25.00	0.44	0.25	0.00	0.00	0.00	11.54	11.99	50.8	0.236	
30.00	0.43	0.25	0.00	0.00	0.00	11.49	11.93	51.3	0.233	
35.00	0.43	0.25	0.00	0.00	0.00	11.43	11.87	51.8	0.229	
40.00	0.42	0.25	0.00	0.00	0.00	11.37	11.80	52.0	0.227	
41.00	0.42	0.25	0.00	0.00	0.00	11.36	11.79	52.0	0.227	
45.00	0.40	0.25	0.00	0.00	0.00	11.31	11.71	52.0	0.225	
48.00	0.38	0.25	0.00	0.00	0.00	10.95	11.34	52.0	0.218	
50.00	0.37	0.25	0.00	0.00	0.00	10.92	11.30	52.0	0.217	
55.00	0.36	0.25	0.00	0.00	0.00	10.84	11.21	52.0	0.216	
60.00	0.35	0.25	0.00	0.00	0.00	10.75	11.12	52.0	0.214	
65.00	0.34	0.25	0.00	0.00	0.00	10.66	11.01	52.0	0.212	
70.00	0.34	0.25	0.00	0.00	0.00	10.56	10.90	52.0	0.210	
75.00	0.33	0.25	0.00	0.00	0.00	10.45	10.78	52.0	0.207	
80.00	0.32	0.25	0.00	0.00	0.00	10.33	10.66	52.0	0.205	
85.00	0.31	0.25	0.00	0.00	0.00	10.20	10.52	52.0	0.202	
90.00	0.28	0.25	0.00	0.00	0.00	10.07	10.36	52.0	0.199	
91.00	0.33	0.29	0.00	0.00	0.00	11.66	12.00	52.0	0.231	
95.00	0.32	0.29	0.00	0.00	0.00	11.51	11.85	52.0	0.228	
100.00	0.31	0.29	0.00	0.00	0.00	11.32	11.64	52.0	0.224	
105.00	0.31	0.29	0.00	0.00	0.00	11.10	11.42	52.0	0.220	
110.00	0.30	0.29	0.00	0.00	0.00	10.87	11.18	52.0	0.215	
115.00	0.29	0.29	0.00	0.00	0.00	10.61	10.91	52.0	0.210	
120.00	0.28	0.29	0.00	0.00	0.00	10.33	10.62	52.0	0.204	
125.00	0.27	0.29	0.00	0.00	0.00	10.02	10.30	52.0	0.198	
130.00	0.26	0.29	0.00	0.00	0.00	9.67	9.95	52.0	0.191	
135.00	0.30	0.36	0.00	0.00	0.00	11.21	11.52	52.0	0.222	
140.00	0.29	0.36	0.00	0.00	0.00	10.68	10.99	52.0	0.211	
145.00	0.28	0.36	0.00	0.00	0.00	10.09	10.39	52.0	0.200	
150.00	0.28	0.36	0.00	0.00	0.00	9.42	9.71	52.0	0.187	
155.00	0.27	0.36	0.00	0.00	0.00	8.66	8.95	52.0	0.172	
160.00	0.26	0.37	0.00	0.00	0.00	7.79	8.08	52.0	0.155	
165.00	0.25	0.37	0.00	0.00	0.00	6.79	7.08	52.0	0.136	
170.00	0.25	0.37	0.00	0.00	0.00	5.64	5.93	52.0	0.114	
175.00	0.24	0.38	0.00	0.00	0.00	4.31	4.59	52.0	0.088	
180.00	0.24	0.38	0.00	0.00	0.00	2.74	3.04	52.0	0.059	
180.00	0.24	0.38	0.00	0.00	0.00	2.74	3.04	52.0	0.053	
183.00	0.12	0.16	0.00	0.00	0.00	1.41	1.56	28.8	28.8	0.054
185.00	0.12	0.15	0.00	0.00	0.00	1.09	1.23	28.8	28.8	0.043
190.00	0.10	0.14	0.00	0.00	0.00	0.31	0.48	28.8	28.8	0.017
192.00	0.01	0.01	0.00	0.00	0.00	0.02	0.04	28.8	28.8	0.001
195.00	0.00	0.01	0.00	0.00	0.00	0.00	0.01	28.8	28.8	0.000

Final Analysis Summary

Structure: CT01944-S-SBA
Site Name: Harwinton
Height: 195.00 (ft)
Base Elev: 0.000 (ft)

Code: EIA/TIA-222-F
Exposure: C
Gh: 1.69
Struct Class: II

8/16/2016
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Reactions

Load Case	Shear FX (kips)	Shear FZ (kips)	Axial FY (kips)	Moment MX (ft-kips)	Moment MY (ft-kips)	Moment MZ (ft-kips)
80 mph Wind with 0" Ice	23.8	0.00	36.98	0.00	0.00	3030.83
69.28 mph Wind with 0.5" Ice	18.3	0.00	43.56	0.00	0.00	2342.83
50 mph Wind with 0" Ice	9.3	0.00	37.00	0.00	0.00	1184.71

Max Stresses

Load Case	fa Axial (Y) (ksi)	fvx Shear (X) (ksi)	fvz Shear (Z) (ksi)	fvT Torsion (ksi)	fbx Bending (X) (ksi)	fbz Bending (Z) (ksi)	Combined Stress (ksi)	Allowable Stress (ksi)	Elev (ft)	Stress Ratio
80 mph Wind with 0" Ice	0.48	0.63	0.00	0.00	0.00	30.04	30.54	48.5	0.00	0.630
69.28 mph Wind with 0.5" Ice	0.57	0.48	0.00	0.00	0.00	23.22	23.80	48.5	0.00	0.491
50 mph Wind with 0" Ice	0.48	0.25	0.00	0.00	0.00	11.74	12.23	48.5	0.00	0.252



Monopole Mat Foundation Design

Date

8/16/2016

Customer Name:	SBA	EIA/TIA Standard:	EIA-222-F
Site Name:	Harwinton	Structure Height (Ft.):	195
Site Number:	CT01944	Engineer Name:	S. Hesselbeir
Engr. Number:	N/A	Engineer Login ID:	

Foundation Info Obtained from:

Drawings/Calculations

Structure Type:

Monopole

Analysis or Design?

Analysis

Base Reactions (Unfactored)

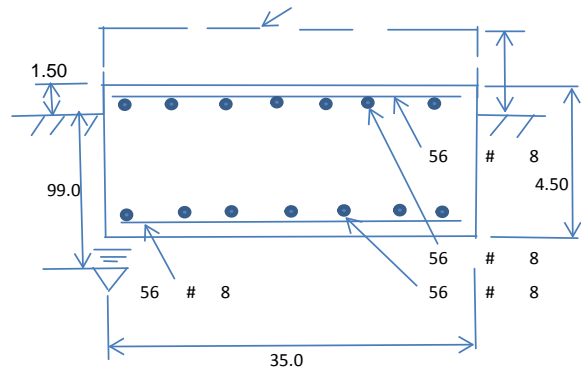
Axial Load (Kips):	37.0	Shear Force (Kips):	23.8
Uplift Force (Kips):	0.0	Moment (Kips-ft):	3030.8

Allowable overstress %: 5.0%

Foundation Geometries:

Anchor Bolt Circle (ft.):	4.83	Depth of Base BG (ft.):	3.00	Mods required -Yes/No ?:	No
Thickness of Pad (ft):	4.50	Width of Pad (ft.):	35		
Length of Pad (ft.):	35				

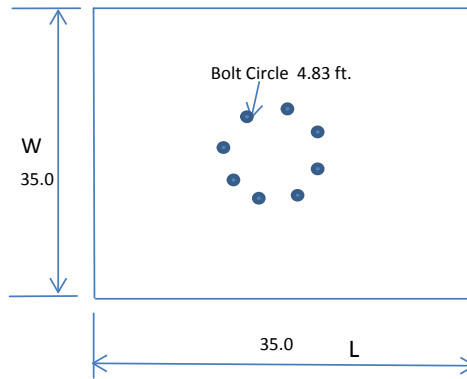
Final Length of pad (ft) 35.0 Final width of pad (ft): 35.0



Material Properties and Rebar Info:

Concrete Strength (psi):	3000	Steel Elastic Modulus:	29000	ksi
Pad Rebar Yield (Ksi):	60	Tie Spacing (in):	6.0	
Pad Steel Rebar Size (#):	8			
Concrete Cover (in.):	3	Unit Weight of Concrete:	150.0	pcf
Rebar at the bottom of the concrete pad:				
Qty. of Rebar in Pad (L):	56	Qty. of Rebar in Pad (W):	56	
Rebar at the top of the concrete pad:				
Qty. of Rebar in Pad (L):	56	Qty. of Rebar in Pad (W):	56	

Apply 1.35 factor for e/w Per G: 1.35



Soil Design Parameters:

Water Table B.G.S. (ft):	99.0	Unit Weight of Water:	62.4	pcf	Angle from Top of Pad:	30
Allowable Net Soil Bearing (psf):	15000	Allowable Skin Friction:	300	Psf	Angle from Bottm of Pad:	25
Consider Friction for O.T.M. (Y/N):	No	Consider Friction for bearing (Y/N):	No		Angle from Bottm of Pad:	25
Consider soil hor. resist. for OTM.:	No	Reduction factor on the maximum soil bearing pressure:	1.00			

Foundation Analysis and Design:

Total Dry Soil Volume (cu. Ft.):	0.00	Total Dry Soil Weight (Kips):	0.00
Total Buoyant Soil Volume (cu. Ft.):	0.00	Total Buoyant Soil Weight (Kips):	0.00
Total Effective Soil Weight (Kips):	0.00	Weight from the Concrete Block at Top (K):	0.00
Total Dry Concrete Volume (cu. Ft.):	5512.50	Total Dry Concrete Weight (Kips):	826.88
Total Buoyant Concrete Volume (cu. Ft.):	0.00	Total Buoyant Concrete Weight (Kips):	0.00
Total Effective Concrete Weight (Kips):	826.88	Total Vertical Load on Base (Kips):	863.86

Check Soil Capacities:

Calculated Maxium Net Soil Pressure under the base (psf):	1072	<	Allowable Soil Bearing (psf):	15000	0.07	OK!
Allowable Foundation Overturning Resistance (SF=1.5, kips-ft.):	10078.3	>	Applied Momont (kips-ft):	3139	0.31	OK!
Factor of Safety Against Overturning (O. R. Moment/Design Moment):	4.82					OK!

Load/
Capacity
Ratio

Check the capacities of Reinforcing Concrete:

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

Concrete Pad:

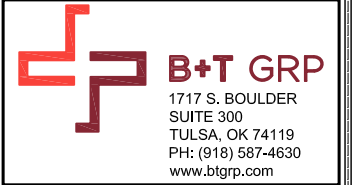
One-Way Design Shear Capacity (L-Direction, Kips):	1742.6	>	One-Way Factored Shear (L-D. Kips):	353.9	0.20	OK!
One-Way Design Shear Capacity (W-Direction, Kips):	1742.6	>	One-Way Factored Shear (W-D., Kips)	353.9	0.20	OK!
One-Way Design Shear Capacity (Corner-Corner. Kips):	2199.0	>	One-Way Factored Shear (C-C, Kips):	513.4	0.23	OK!
Lower Steel Pad Reinforcement Ratio (L-Direct.):	0.0021	OK!	Lower Steel Pad Reinf. Ratio (W-Direc	0.0021		
Lower Steel Pad Moment Capacity (L-Direction. Kips-ft):	9806.8	>	Moment at Bottom (L-Direct. K-Ft):	1446.4	0.15	OK!
Lower Steel Pad Moment Capacity (W-Direction. Kips-ft):	9806.8	>	Moment at Bottom (W-Direct. K-Ft):	1446.4	0.15	OK!
Lower Steel Pad Moment Capacity (Corner-Corner,K-ft):	13826.9	>	Moment at Bottom (C-C Dir. K-Ft):	2045.5	0.15	OK!
Upper Steel Pad Reinforcement Ratio (L-Direct.):	0.0021	OK!	Upper Steel Reinf. Ratio (W-Direct.):	0.0021		
Upper Steel Pad Moment Capacity (L-Direction. Kips-ft):	9806.8	>	Moment at the top (L-Dir Kips-Ft):	241.7	0.02	OK!
Upper Steel Pad Moment Capacity (W-Direction. Kips-ft):	9806.8	>	Moment at the top (W-Dir Kips-Ft):	241.7	0.02	OK!
Upper Steel Pad Moment Capacity (Corner-Corner. K-ft):	13826.9	>	Moment at the top (C-C Direc. K-Ft):	981.5	0.07	OK!

SITE NAME: HARWINTON

133 CLEARVIEW AVE.
HARWINTON, CT 06791

SITE NUMBER: CT11712A

SITE CONFIG: 704G



T-MOBILE NORTHEAST, LLC
15 COMMERCE WAY, SUITE B
NORTON, MA 02766



SBA COMMUNICATIONS CORP.
134 FLANDERS ROAD, SUITE 125
WESTBOROUGH, MA 01581

CT11712A

HARWINTON

133 CLEARVIEW AVE.
HARWINTON, CT 06791

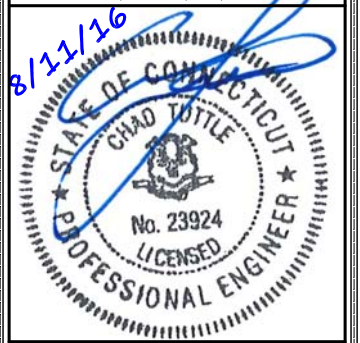
PROJECT NO: 107967.001

CHECKED BY: SLM

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION
0	8/11/16	MDW	CONSTRUCTION

B&T ENGINEERING, INC.
PEC.0001564
Expires 2/10/17



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

SHEET NUMBER: T-1 REVISION: 0

T-1 0

PROJECT NOTES

GENERAL NOTES:

THIS DOCUMENT IS THE CREATION, DESIGN, PROPERTY AND COPYRIGHTED WORK OF T-MOBILE. ANY DUPLICATION OR USE WITHOUT EXPRESS WRITTEN CONSENT IS STRICTLY PROHIBITED. DUPLICATION AND USE BY GOVERNMENT AGENCIES FOR THE PURPOSES OF CONDUCTING THEIR LAWFULLY AUTHORIZED REGULATORY AND ADMINISTRATIVE FUNCTIONS IS SPECIFICALLY ALLOWED.

THE FACILITY IS AN UNMANNED PRIVATE AND SECURED EQUIPMENT INSTALLATION. IT IS ONLY ACCESSED BY TRAINED TECHNICIANS FOR PERIODIC, ROUTINE MAINTENANCE AND THEREFORE, DOES NOT REQUIRE ANY WATER OR SANITARY SEWER SERVICE. THE FACILITY IS NOT GOVERNED BY REGULATIONS REQUIRING PUBLIC ACCESS PER ADA REQUIREMENTS.

CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE T-MOBILE NORTHEAST LLC REPRESENTATIVE IN WRITING OF DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.

SPECIAL STRUCTURAL NOTES:

TOWER OWNER SHALL PROVIDE GLOBAL STRUCTURAL STABILITY ANALYSIS OF EXISTING ANTENNA SUPPORT STRUCTURE. GENERAL CONTRACTOR SCOPE OF WORK SHALL INCLUDE ALL REQUIRED STRUCTURAL MODIFICATIONS, RE-BUNDLING OF COAXIAL CABLES OR OTHER SPECIAL MODIFICATIONS AS OUTLINED THEREIN.

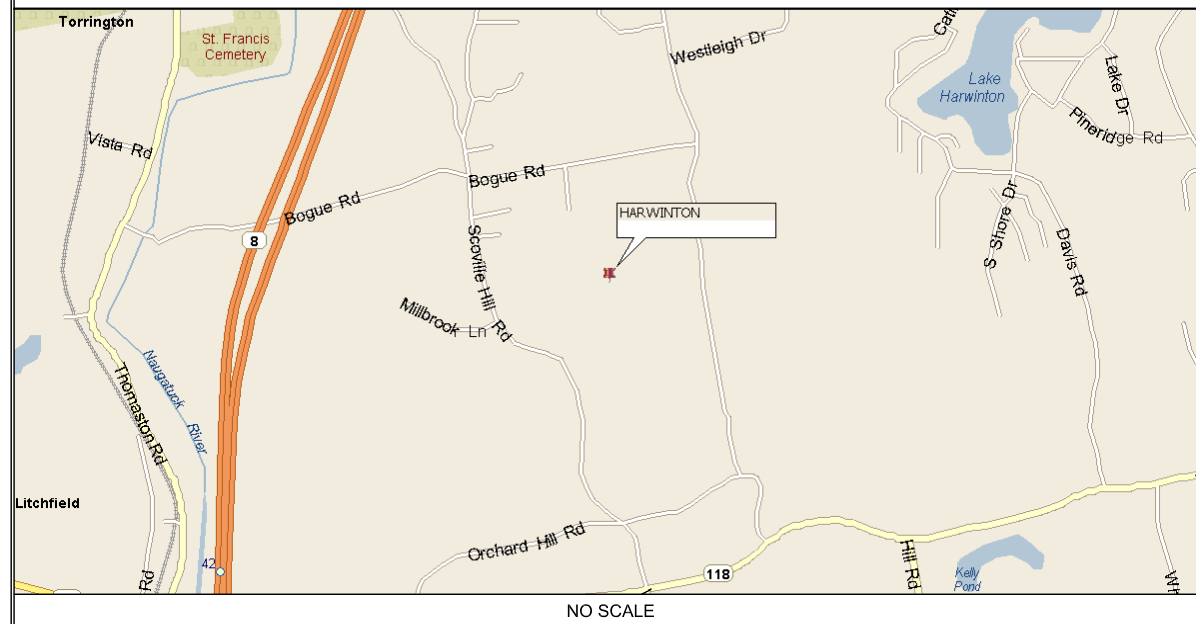
ENGINEER OF RECORD HAS MADE A VISUAL ASSESSMENT ONLY AND HAS DETERMINED THAT THE EXISTING ANTENNA MOUNT SHALL BE REPLACED OR MODIFIED TO ACCOMMODATE ANY ADDITIONAL EQUIPMENT LOAD. STRUCTURAL DESIGNS AND DETAILS AS SHOWN HEREIN FOR STRUCTURAL MODIFICATIONS OF THE EXISTING ANTENNA MOUNT ARE PRELIMINARY ONLY AND FINAL CONSTRUCTION DETAILS ARE SUBJECT TO CHANGE PENDING THE COMPLETION OF AN ANTENNA MOUNT STRUCTURAL ASSESSMENT.

B+T GROUP ASSUMES THAT THE TOWER IS PROPERLY CONSTRUCTED AND MAINTAINED. ALL STRUCTURAL MEMBERS AND THEIR CONNECTIONS ARE ASSUMED TO BE IN GOOD CONDITION AND ARE FREE FROM DEFECTS WITH NO DETERIORATION TO ITS MEMBER CAPACITIES.

T-MOBILE TECHNICIAN SITE SAFETY NOTES

LOCATION	SPECIAL RESTRICTIONS	LOCATION	SPECIAL RESTRICTIONS
SECTOR A:	ACCESS NOT PERMITTED	DIPLEXERS:	UNRESTRICTED
SECTOR B:	ACCESS NOT PERMITTED	RADIO CABINETS:	UNRESTRICTED
SECTOR C:	ACCESS NOT PERMITTED	PPC DISCONNECT:	UNRESTRICTED
RRH:	ACCESS NOT PERMITTED	MAIN CIRCUIT D/C:	UNRESTRICTED
TMA:	ACCESS NOT PERMITTED	NIU/T DEMARC:	UNRESTRICTED
GPS/LMU:	CAUTION: OSHA APPROVED PORTABLE 8' STEP-LADDER REQUIRED	OTHER/SPECIAL:	NONE

LOCATION MAP



NO SCALE

APPROVALS

TITLE	SIGNATURE	DATE
PROJECT MANAGER:		
CONSTRUCTION:		
RF ENGINEERING:		
ZONING/SITE ACQ.:		
OPERATIONS:		
TOWER OWNER:		

ACCEPTANCE DOES NOT CONSTITUTE APPROVAL OF DESIGN, CALCULATIONS, ANALYSIS, TEST METHODS OF MATERIALS DEVELOPED OR SELECTED BY THE SUBCONTRACTOR AND DOES NOT RELIEVE SUBCONTRACTOR FROM FULL COMPLIANCE WITH CONTRACTUAL OBLIGATIONS.

PROJECT INFORMATION

SCOPE OF WORK: UNMANNED TELECOMMUNICATIONS FACILITY T-MOBILE EQUIPMENT MODERNIZATION

ZONING JURISDICTION: (TOWN OF HARWINTON) BASED ON INFORMATION PROVIDED BY T-MOBILE, REGULATORY COMPLIANCE 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 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).

SITE ADDRESS: 133 CLEARVIEW AVE.
HARWINTON, CT 06791

LATITUDE: 41.775556° N
LONGITUDE: 73.098626° W

JURISDICTION: NATIONAL, STATE & LOCAL CODES & ORDINANCES

CURRENT USE: TELECOMMUNICATIONS FACILITY

PROPOSED USE: TELECOMMUNICATIONS FACILITY

TOWER OWNER: SBA 2012 TC ASSETS, LLC

SBA SITE ID: CT01944-S

SBA SITE NAME: HARWINTON

SBA REGIONAL SITE MANAGER: STEPHEN ROTH
(860) 539-4920
sroth@sbasite.com

DRAWING INDEX

SHEET #	SHEET DESCRIPTION	REV. #
T-1	TITLE SHEET	0
GN-1	GENERAL NOTES	0
C-1	COMPOUND AND ELEVATION PLAN	0
C-2	EXISTING AND PROPOSED ANTENNA PLANS	0
C-3	DETAILS	0
E-1	GROUNDING DETAILS AND NOTES	0



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GROUNDING NOTES:

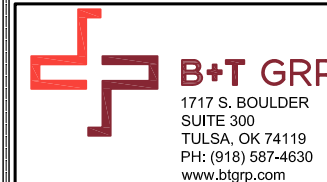
1. THE SUBCONTRACTOR SHALL REVIEW AND INSPECT THE EXISTING FACILITY GROUNDING SYSTEM AND LIGHTNING PROTECTION SYSTEM (AS DESIGNED AND INSTALLED) FOR STRICT COMPLIANCE WITH THE NEC (AS ADOPTED BY THE AHJ), THE SITE-SPECIFIC (UL, LPI OR NFPA) LIGHTING PROTECTION CODE AND GENERAL COMPLIANCE WITH TELECORDIA AND TIA GROUNDING STANDARDS. THE SUBCONTRACTOR SHALL REPORT ANY VIOLATION OR ADVERSE FINDING TO THE CONTRACTOR FOR RESOLUTION.
2. ALL GROUND ELECTRODE SYSTEMS (INCLUDING TELECOMMUNICATION, RADIO, LIGHTNING PROTECTION AND AC POWER GE'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 & 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.
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 BUS 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 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 SHALL BE MADE ELECTRICALLY CONTINUOUS WITH LISTED BONDED FITTINGS OR BY BINDING ACROSS THE DISCONTINUITY WITH 6 AWS COPPER WIRE UL APPROVED GROUNDING TYPE CONDUIT CLAMPS.
12. ALL NEW STRUCTURES WITH A FOUNDATION AND/OR FOOTING HAVING 20' OR MORE OF 1/2" OR GREATER ELECTRICALLY CONDUCTIVE REINFORCING STEEL MUST HAVE IT BONDED TO THE GROUND RING USING AN EXOTHERMIC WELD CONNECTION USING #2 AWG SOLID BAR TINNED COPPER GROUND WIRE, PER NEC 250.50.

GENERAL NOTES:

1. FOR THE PURPOSE OF CONSTRUCTION DRAWINGS, THE FOLLOWING DEFINITIONS SHALL APPLY:
 CONTRACTOR: SBA COMMUNICATIONS CORP.
 SUBCONTRACTOR: GENERAL CONTRACTOR (CONSTRUCTION)
 OWNER: T-MOBILE
 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. "KITTING LIST" SUPPLIED WITH THE BID PACKAGE IDENTIFIES ITEMS THAT WILL BE SUPPLIED BY CONTRACTOR. ITEMS NOT INCLUDED IN THE BILL OF MATERIALS AND KITTING LIST SHALL BE SUPPLIED BY THE SUBCONTRACTOR.
 7. THE SUBCONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIAL IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS, UNLESS SPECIFICALLY STATED OTHERWISE.
 8. IF THE SPECIFIED EQUIPMENT CANNOT BE INSTALL AS SHOWN ON THESE DRAWINGS, THE SUBCONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION SPACE FOR APPROVAL BY THE CONTRACTOR.
 9. SUBCONTRACTOR SHALL DETERMINE ACTUAL ROUTING OF CONDUIT, POWER AND T1 CABLES AND GROUNDING CABLES AS SHOWN ON THE POWER, GROUNDING AND TELCO PLAN DRAWINGS. SUBCONTRACTOR SHALL UTILIZE EXISTING TRAYS AND/OR SHALL ADD NEW TRAYS AS NECESSARY, SUBCONTRACTOR SHALL CONFIRM THE ACTUAL ROUTING WITH THE CONTRACTOR.
 10. 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.
 11. SUBCONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY. ANTENNAS REMOVED SHALL BE RETURNED TO THE OWNER'S DESIGNATED LOCATION.
 12. SUBCONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION.
 13. ALL CONCRETE REPAIR WORK SHALL BE DONE IN ACCORDANCE WITH AMERICAN CONCRETE INSTITUTE (ACI) 301.
 14. ANY NEW CONCRETE NEEDED FOR THE CONSTRUCTION SHALL BE AIR-ENTRAINED AND SHALL HAVE 4000 PSI STRENGTH AT 28 DAYS. ALL CONCRETE WORK SHALL BE DONE IN ACCORDANCE WITH ACI 318 CODE REQUIREMENTS.
 15. 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) UNLESS NOTED OTHERWISE, PIPES SHALL BE ASTM A53 TYPE E (Fy = 36 ksi). ALL STEEL EXPOSED TO WETHER 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.
 16. CONSTRUCTION SHALL COMPLY WITH UMS SPECIFICATIONS AND "GENERAL CONSTRUCTION SERVICES FOR CONSTRUCTION OF T-MOBILE SITES."
 17. 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.
 18. 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 SHOULD BE SCHEDULED FOR AN APPROPRIATE MAINTENANCE WINDOW, USUALLY IN LOW TRAFFIC PERIODS AFTER MIDNIGHT.
 19. SINCE THE CELL SITE IS ACTIVE, AL 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 ADVISED TO BE WORN TO ALERT IF ANY DANGEROUS EXPOSURE LEVELS.
 20. APPLICABLE BUILDING CODES:
 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.
 BUILDING CODE: IBC 2009
 ELECTRICAL CODE: NEC 2014
- 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; ASD, FOURTEENTH EDITION
 - TELECOMMUNICATIONS INDUSTRY ASSOCIATION (TIA) 222-G; STRUCTURAL STANDARDS FOR STEEL
 - ANTENNA TOWER AND ANTENNA SUPPORTING STRUCTURES; REFER TO ELECTRICAL DRAWINGS FOR SPECIFIC ELECTRICAL STANDARDS

FOR ANY CONFLICTS BETWEEN SECTIONS OF LISTED CODES AND STANDARDS REGARDING MATERIAL, METHOD 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.

ABBREVIATIONS					
AGL	ABOVE GRADE LEVEL	GC	GENERAL CONTRACTOR	REF.	REFERENCE
AWG	AMERICAN WIRE GAUGE	MAX.	MAXIMUM	REQ.	REQUIRED
BCW	BARE COPPER WIRE	MGB	MASTER GROUND BAR	RF	RADIO FREQUENCY
BTS	BASE TRANSCEIVER STATION	MIN.	MINIMUM	T.B.D.	TO BE DETERMINED
(E)	EXISTING	(N)	PROPOSED	T.B.R.	TO BE REMOVED
EG	EQUIPMENT GROUND	N.T.S.	NOT TO SCALE	T.B.R.R.	TO BE REMOVED AND REPLACED
EGR	EQUIPMENT GROUND RING	RE:	REFERENCE	(TYP)	TYPICAL

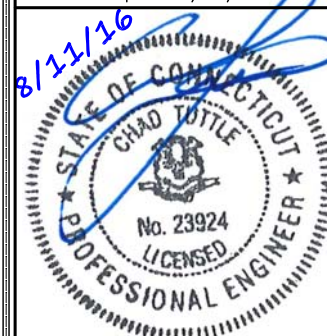


CT11712A
HARWINTON
 133 CLEARVIEW AVE.
 HARWINTON, CT 06791

PROJECT NO: 107967.001
 CHECKED BY: SLM

ISSUED FOR:			
REV	DATE	DRWN	DESCRIPTION
0	8/11/16	MDW	CONSTRUCTION

B&T ENGINEERING, INC.
 PEC.0001564
 Expires 2/10/17



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SHEET NUMBER: **GN-1** REVISION: **0**

CT11712A

HARWINTON

133 CLEARVIEW AVE.
 HARWINTON, CT 06791

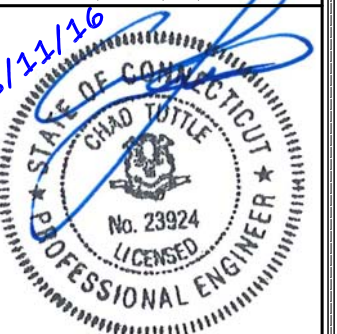
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SHEET NUMBER: REVISION:

C-1 **0**

ANTENNA MOUNT STRUCTURAL DESIGN NOTE:
 ENGINEER-OF-RECORD HAS MADE A VISUAL ASSESSMENT ONLY OF EXISTING ANTENNA MOUNT ASSEMBLIES, WITHOUT THE BENEFIT OF A RIGOROUS ANTENNA MOUNT STRUCTURAL ANALYSIS, AND RECOMMENDS THAT EXISTING AND PROPOSED TOWER TOP EQUIPMENT BE INSTALLED AS DEPICTED HEREIN. STRUCTURAL DETAILS AS DEPICTED HEREIN FOR MODIFICATION OF EXISTING ANTENNA MOUNT ASSEMBLIES ARE PRELIMINARY ONLY AND THAT FINAL CONSTRUCTION DETAILS MAY BE SUBJECT TO CHANGE PENDING THE COMPLETION OF A SEPARATE SUPPLEMENTAL ANTENNA MOUNT STRUCTURAL ASSESSMENT, SUPPLEMENTAL STRUCTURAL MAPPING/CONDITIONS ASSESSMENT REPORT AND/OR SUPPLEMENTAL RIGOROUS ANTENNA MOUNT STRUCTURAL ANALYSIS.

SPECIAL PRE-CONSTRUCTION WORK NOTE:
 GENERAL CONTRACTOR SHALL FURNISH AND INSTALL ALL SPECIAL OR SUPPLEMENTAL ADDITIONAL TOWER-MOUNTED EQUIPMENT PER RECOMMENDATIONS FROM SBA-PROVIDED TOWER STRUCTURAL ANALYSIS FOR ANY SPECIAL SHIELDING OF TOWER TOP EQUIPMENT AND FOR ANY SPECIAL FEEDLINE BUNDLING OR RELOCATION.

FEEDLINE SCHEDULE	FEEDLINE DESCRIPTION	LOCATION
A	EXISTING TO REMAIN: (3) 1 1/4" COAX TO T-MOBILE RAD	INSIDE POLE
B	PROPOSED: (6) 1 5/8" COAX & (3) 1 1/4" COAX TO T-MOBILE RAD	INSIDE POLE

EXISTING T-MOBILE EQUIPMENT FEEDLINE INVENTORY BASED ON OBSERVED FIELD CONDITIONS. RFDS AND FEEDLINE LEASING ENTITLEMENTS MAY DIFFER

EXISTING T-MOBILE PANEL ANTENNA (TYP)
 T-MOBILE MOUNT
 ELEV. = 193± A.G.L. (SBA*)
 (2) ALL
 (C-2) (C-3)

(2A) T-MOBILE FEEDLINES ROUTED INSIDE TOWER
 (C-1)

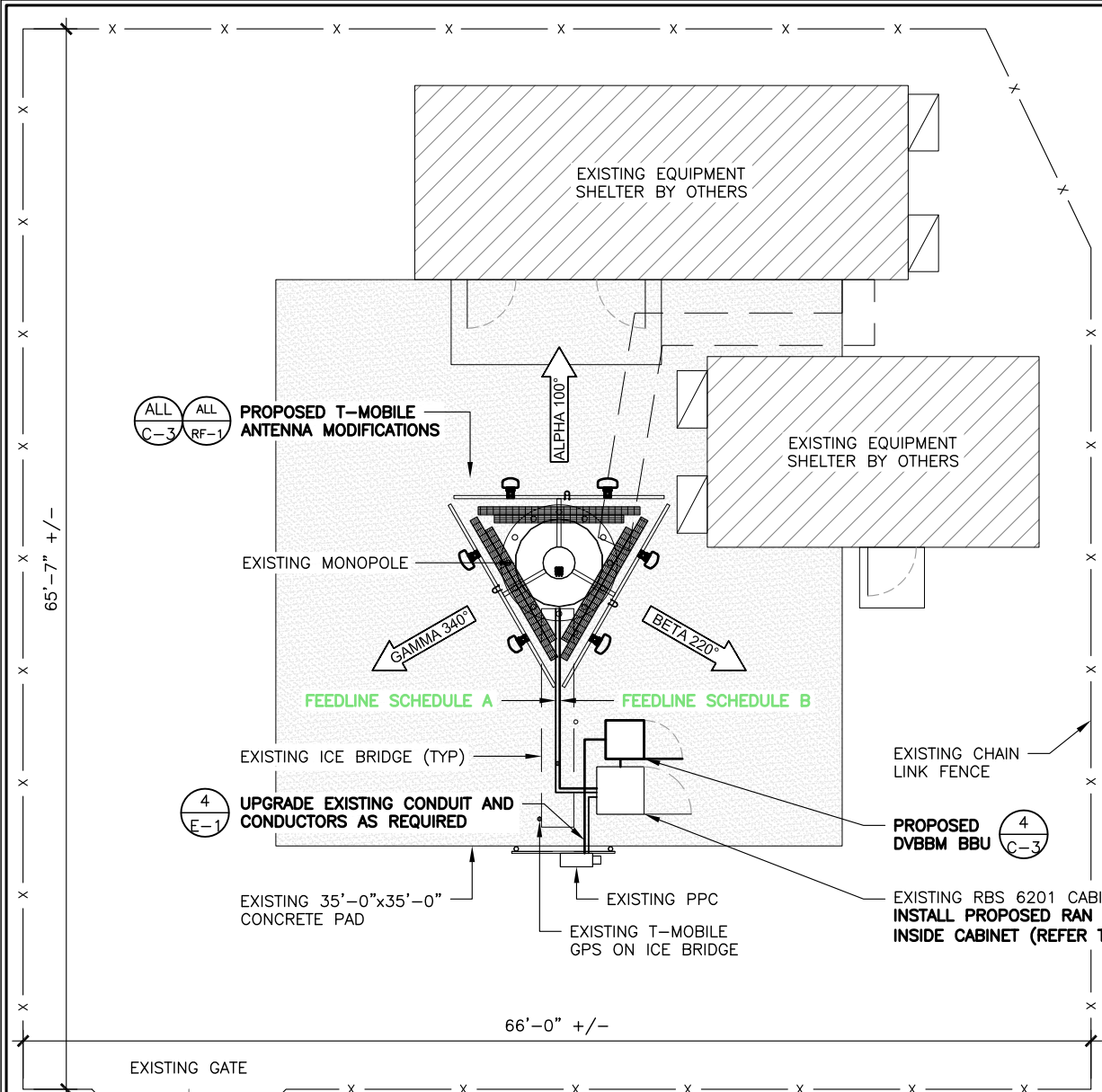
EXISTING MONOPOLE

EXISTING RBS 6201 CABINET
 INSTALL PROPOSED RAN EQUIPMENT INSIDE CABINET (REFER TO FINAL RFDS)
 (ALL) (RF-1)

PROPOSED DVBBM BBU (6) (C-3)

(4) PROPOSED BBU POWER SUPPLY (E-1)

SEE FEEDLINE SCHEDULE. (REFER TO SBA PROVIDED STRUCTURAL ANALYSIS FOR SPECIAL CABLE INSTALLATION REQUIREMENTS, BUNDLING, SHIELDING, MOUNTING AND RELOCATION OF EXISTING CABLES)



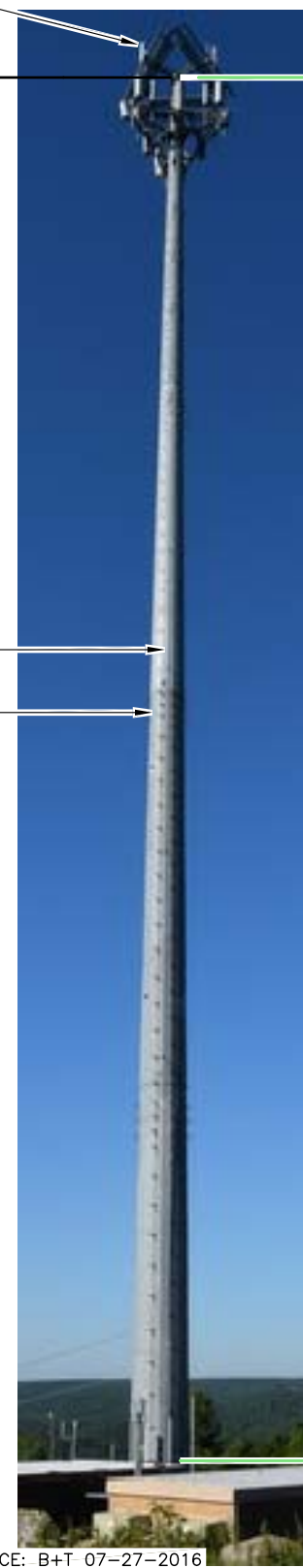
1 OVERALL SITE PLAN
 SCALE: 11x17 SCALE: 3/32"=1'-0" 22x34 SCALE: 3/16"=1'-0"



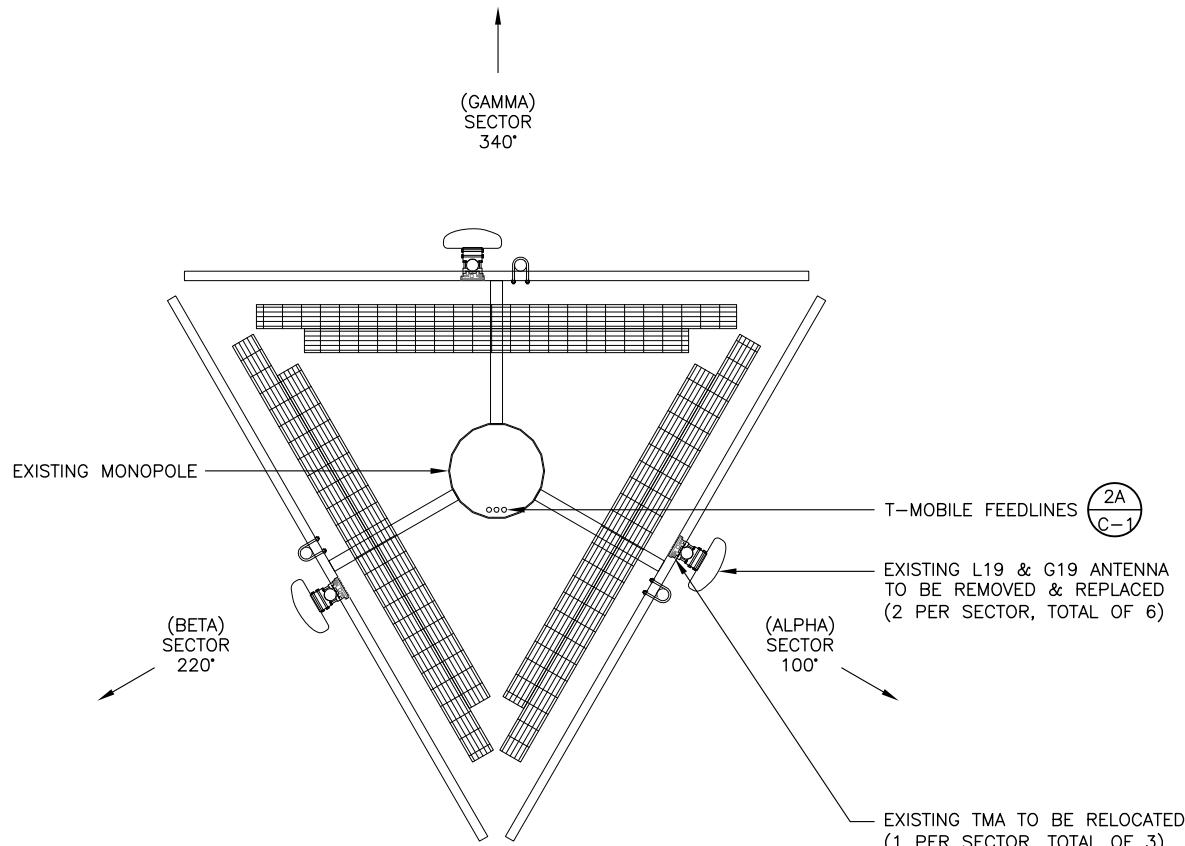
2A FEEDLINE PHOTO DETAIL @ TOWER BASE
 SCALE: N.T.S.



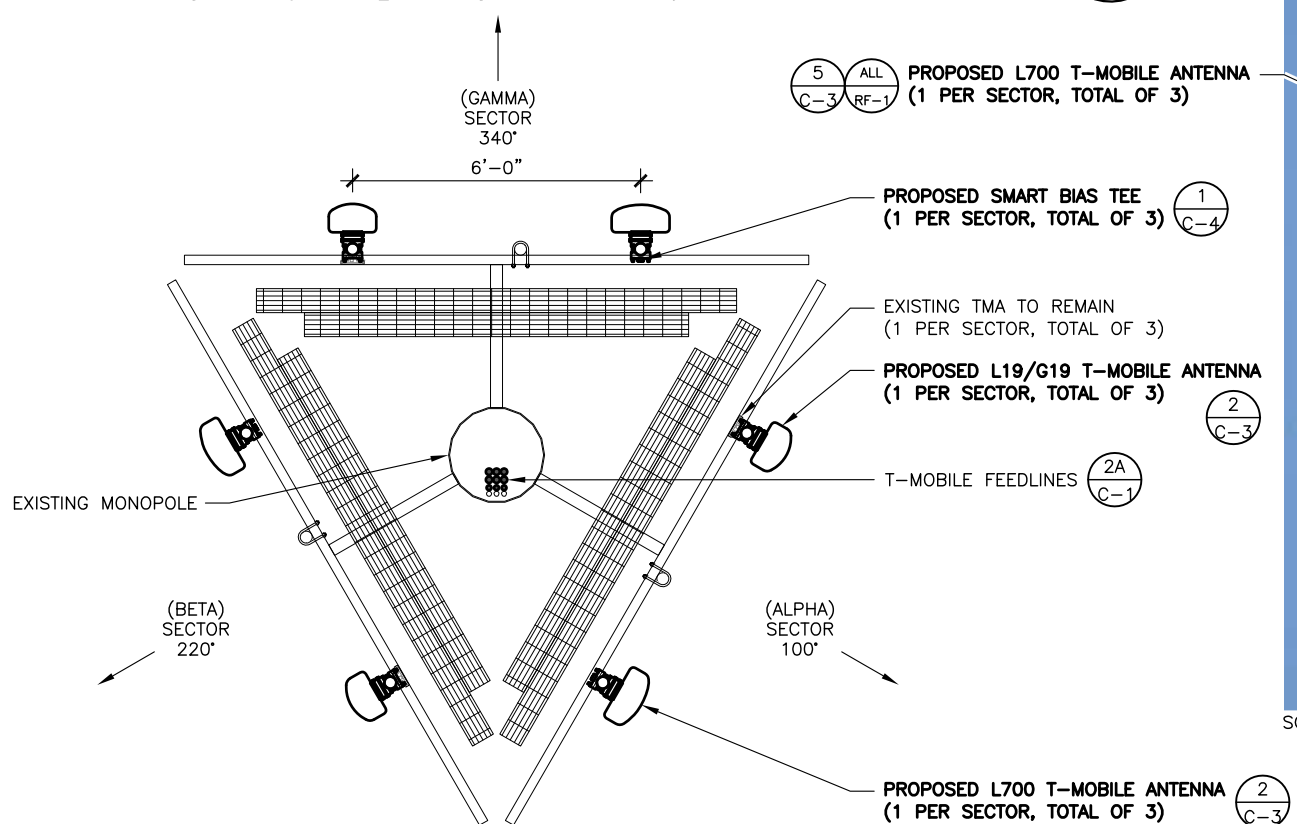
2B EQUIPMENT PHOTO DETAIL
 SCALE: N.T.S.



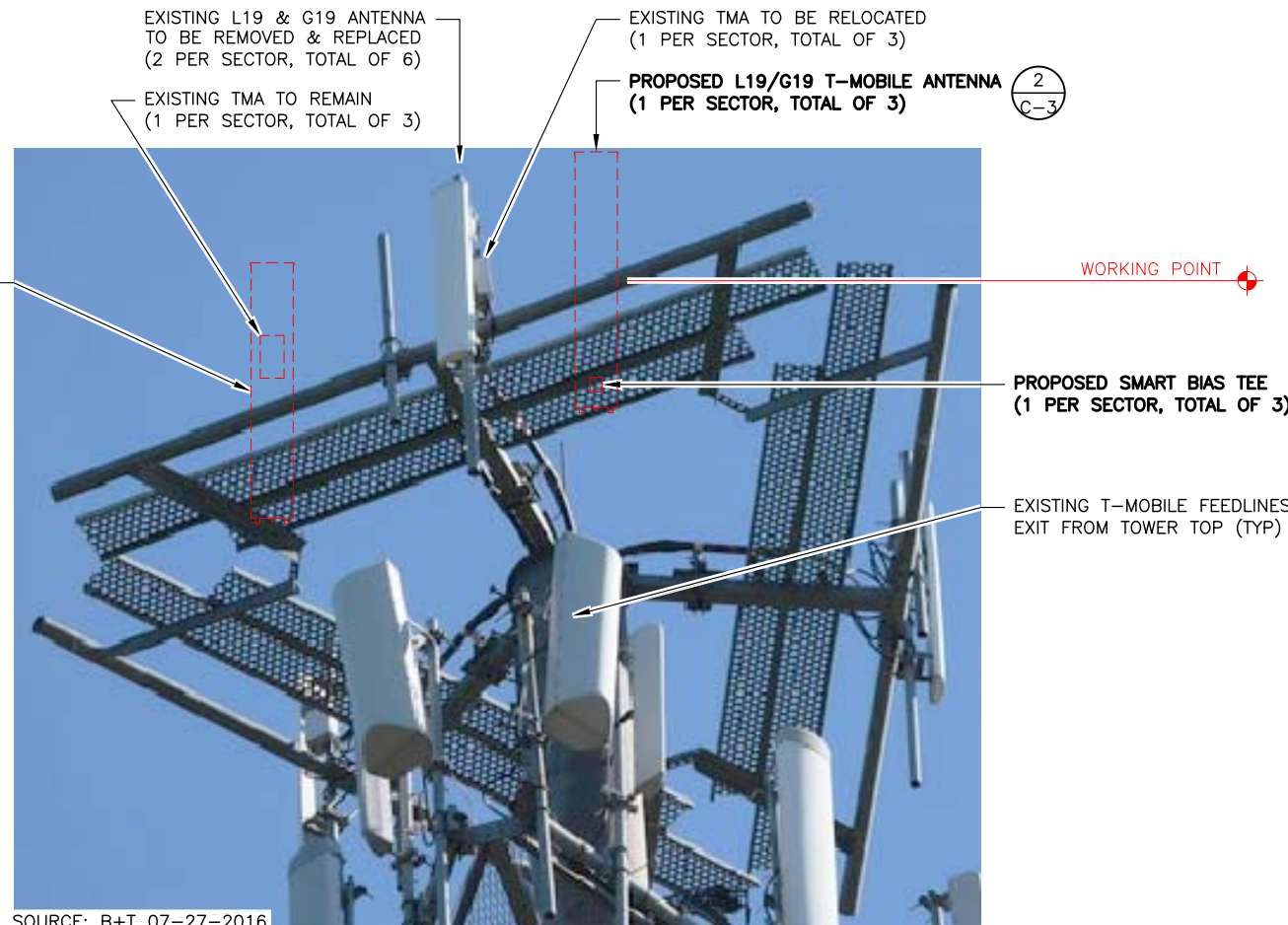
3 ELEVATION PHOTO DETAIL
 SCALE: N.T.S.



1A EXISTING ANTENNA PLAN
 SCALE: 0' 1' 2' 3' 4' 5'
 11x17 SCALE: 1/2"=1'-0"
 22x34 SCALE: 1"=1'-0"



1B PROPOSED ANTENNA PLAN
 SCALE: 0' 1' 2' 3' 4' 5'
 11x17 SCALE: 1/2"=1'-0"
 22x34 SCALE: 1"=1'-0"



SOURCE: B+T 07-27-2016

2 ANTENNA MOUNT PHOTO DETAIL
 SCALE: N.T.S.

NOTE:
 AT TIME OF CONSTRUCTION, CONTRACTOR TO VERIFY AZIMUTHS OF EXISTING ANTENNAS. IF DIFFERENT FROM RFDS, PLEASE NOTIFY THE RF ENGINEER AND CONSTRUCTION MANAGER WITH ACTUAL AZIMUTH TO ENSURE T-MOBILE'S DATABASE IS ACCURATE AND UP-TO-DATE.

SPECIAL PRE-CONSTRUCTION WORK NOTE:
 GENERAL CONTRACTOR SHALL FURNISH AND INSTALL ALL SPECIAL OR SUPPLEMENTAL ADDITIONAL TOWER-MOUNTED EQUIPMENT PER RECOMMENDATIONS FROM SBA-PROVIDED TOWER STRUCTURAL ANALYSIS FOR ANY SPECIAL SHIELDING OF TOWER TOP EQUIPMENT AND FOR ANY SPECIAL FEEDLINE BUNDLING OR RELOCATION.

ANTENNA INSTALLATION SPECIAL WORK NOTE:
 ANTENNA INSTALLATION WORKING POINT IS THE STRUCTURAL FACE FRAME VERTICAL CENTERLINE OF THE EXISTING ANTENNA SUPPORT ASSEMBLY. UNLESS NOTED OTHERWISE VERTICALLY CENTER ALL PIPE MASTS AND ANTENNAS ON THIS WORKING POINT.

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

T-Mobile
 T-MOBILE NORTHEAST, LLC
 15 COMMERCE WAY, SUITE B
 NORTON, MA 02766

SBA
 SBA COMMUNICATIONS CORP.
 134 FLANDERS ROAD, SUITE 125
 WESTBOROUGH, MA 01581

CT11712A
HARWINTON
 133 CLEARVIEW AVE.
 HARWINTON, CT 06791

PROJECT NO: 107967.001
 CHECKED BY: SLM

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION
0	8/11/16	MDW	CONSTRUCTION

B&T ENGINEERING, INC.
 PEC.0001564
 Expires 2/10/17

8/11/16

STATE OF CONNECTICUT
 CHAD TOTTE
 No. 23924
 LICENSED PROFESSIONAL ENGINEER

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SHEET NUMBER: **C-2** REVISION: **0**

107967_C101944-S_Harwinton.dwg - Sheet: C-2 - User: rmcclure - Aug 12, 2016 - 5:42pm

1A
C-3
PROPOSED ANTENNA TO PIPE CLAMP
(INCLUDED WITH ANTENNA)

REMOVE EXISTING MOUNT
PIPE AND REPLACE WITH
2 3/8"x8'-0" MOUNT PIPE

RE-USE EXISTING
CROSS-OVER KIT

WORKING POINT

EXISTING PLATFORM
MOUNTING RAIL

PROPOSED L19/G19 ANTENNA
C-3

ANTENNA INSTALLATION SPECIAL WORK NOTE:

ANTENNA INSTALLATION WORKING POINT IS THE
STRUCTURAL FACE FRAME VERTICAL CENTERLINE OF
THE EXISTING ANTENNA SUPPORT ASSEMBLY.
UNLESS NOTED OTHERWISE VERTICALLY CENTER ALL
PIPE MASTS AND ANTENNAS ON THIS WORKING POINT.

UPPER BRACKET ASSEMBLY

LOWER BRACKET ASSEMBLY

MOUNTING PIPE
(2 1/2"-4 1/2" O.D.)

ANTENNA MOUNTING KIT
ANDREW P/N: BSAMNT-1

PROPOSED L19/G19 ANTENNA
& RRU MOUNTING DETAIL

1
SCALE: N.T.S.

L700/L19/G19 ANTENNA
MOUNTING BRACKET

1A
SCALE: N.T.S.

1A
C-3
PROPOSED ANTENNA TO PIPE CLAMP
(INCLUDED WITH ANTENNA)

REMOVE EXISTING MOUNT
PIPE AND REPLACE WITH
2 3/8"x8'-0" MOUNT PIPE

RE-USE EXISTING
CROSS-OVER KIT

WORKING POINT

EXISTING PLATFORM
MOUNTING RAIL

PROPOSED L700 ANTENNA
C-3

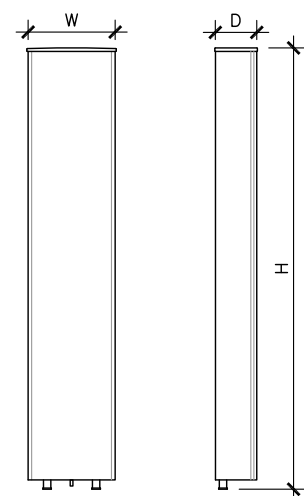
ANTENNA INSTALLATION SPECIAL WORK NOTE:

ANTENNA INSTALLATION WORKING POINT IS THE
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THE EXISTING ANTENNA SUPPORT ASSEMBLY.
UNLESS NOTED OTHERWISE VERTICALLY CENTER ALL
PIPE MASTS AND ANTENNAS ON THIS WORKING POINT.

3
C-3
PROPOSED SBT

PROPOSED L700 ANTENNA
& RRU MOUNTING DETAIL

4
SCALE: N.T.S.



L19/G19 ANTENNA SPECS

MANUFACTURER	RFS
MODEL #	APXV18-206516S-A20
WIDTH	14.5"
DEPTH	6.9"
HEIGHT	72"
WEIGHT	40.5 LBS

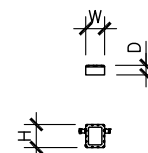
2
L19/G19 ANTENNA DETAIL
SCALE: N.T.S.

SPECIAL PRE-CONSTRUCTION WORK NOTE:

GENERAL CONTRACTOR SHALL FURNISH AND INSTALL
ALL SPECIAL OR SUPPLEMENTAL ADDITIONAL
TOWER-MOUNTED EQUIPMENT PER
RECOMMENDATIONS FROM SBA-PROVIDED TOWER
STRUCTURAL ANALYSIS FOR ANY SPECIAL SHIELDING
OF TOWER TOP EQUIPMENT AND FOR ANY SPECIAL
FEEDLINE BUNDLING OR RELOCATION.

ANTENNA MOUNT STRUCTURAL DESIGN NOTE:

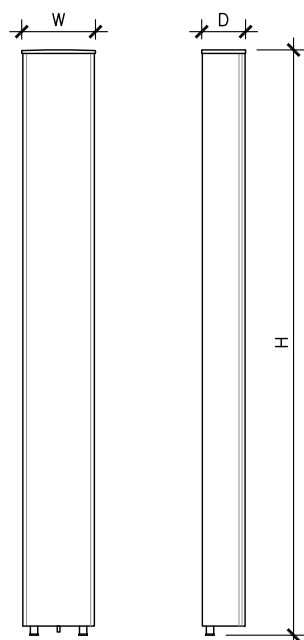
ENGINEER-OF-RECORD HAS MADE A VISUAL ASSESSMENT
ONLY OF EXISTING ANTENNA MOUNT ASSEMBLIES, WITHOUT
THE BENEFIT OF A RIGOROUS ANTENNA MOUNT STRUCTURAL
ANALYSIS, AND RECOMMENDS THAT EXISTING AND
PROPOSED TOWER TOP EQUIPMENT BE INSTALLED AS
DEPICTED HEREIN. STRUCTURAL DETAILS AS DEPICTED
HEREIN FOR MODIFICATION OF EXISTING ANTENNA MOUNT
ASSEMBLIES ARE PRELIMINARY ONLY AND THAT FINAL
CONSTRUCTION DETAILS MAY BE SUBJECT TO CHANGE
PENDING THE COMPLETION OF A SEPARATE SUPPLEMENTAL
ANTENNA MOUNT STRUCTURAL ASSESSMENT,
SUPPLEMENTAL STRUCTURAL MAPPING/CONDITIONS
ASSESSMENT REPORT AND/OR SUPPLEMENTAL RIGOROUS
ANTENNA MOUNT STRUCTURAL ANALYSIS.



SBT SPECIFICATIONS

MANUFACTURER	KATHREIN
MODEL #	78211054
WIDTH	3.2"
DEPTH	1.8"
HEIGHT	5.5"
WEIGHT	1.8 LBS

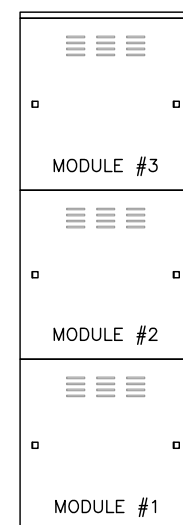
3
SMART BIAS TEE (SBT)
SCALE: N.T.S.



L700 ANTENNA SPECS

MANUFACTURER	ANDREW
MODEL #	LNx-6515DS
WIDTH	11.9"
DEPTH	7.1"
HEIGHT	96.4"
WEIGHT	50.3 LBS

5
L700 ANTENNA DETAIL
SCALE: N.T.S.

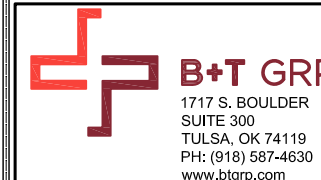


BBU SPECIFICATIONS

MANUFACTURER	MSF DATA SERVICES
MODEL #	DVBBM-2ALM
WIDTH	28.45"
DEPTH	28.45"
HEIGHT	29.67"
WEIGHT	1,264 LBS

MOUNT BASE WITH (4) 1/2" DROP IN
ANCHORS WITH 2" MIN. EMBEDMENT
(INSTALL PER MANUFACTURER'S SPECS)

6
BATTERY CABINET (BBU)
SCALE: N.T.S.



T-MOBILE NORTHEAST, LLC
15 COMMERCE WAY, SUITE B
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SBA COMMUNICATIONS CORP.
134 FLANDERS ROAD, SUITE 125
WESTBOROUGH, MA 01581

CT11712A

HARWINTON

133 CLEARVIEW AVE.
HARWINTON, CT 06791

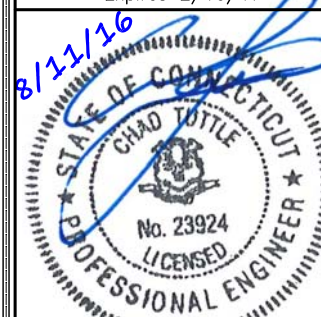
PROJECT NO: 107967.001

CHECKED BY: SLM

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION
0	8/11/16	MDW	CONSTRUCTION

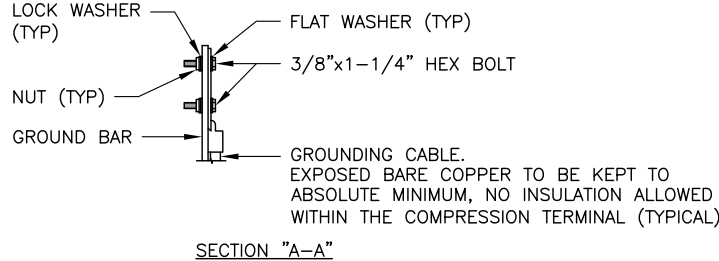
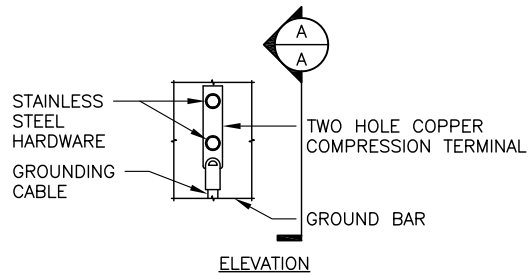
B&T ENGINEERING, INC.
PEC.0001564
Expires 2/10/17



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OF A LICENSED PROFESSIONAL ENGINEER,
TO ALTER THIS DOCUMENT.

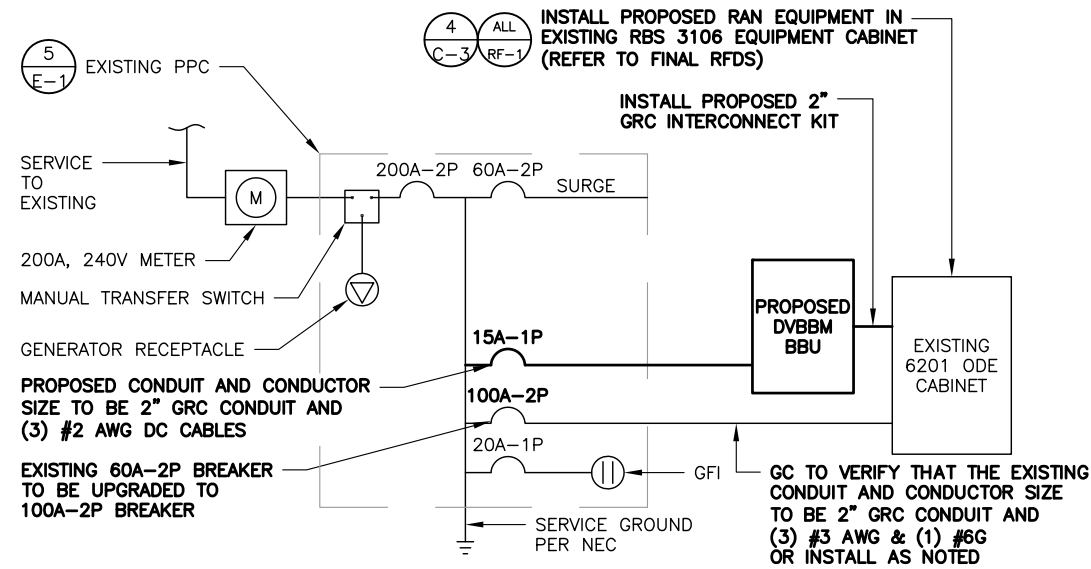
SHEET NUMBER: REVISION:

C-3 0



- NOTE:
- "DOUBLING UP" OR "STACKING" OF CONNECTION IS NOT PERMITTED.
 - OXIDE INHIBITING COMPOUND TO BE USED AT ALL LOCATIONS.
 - CADWELD DOWNLEADS FROM UPPER EGB, LOWER EGB AND MGB.

1 TYPICAL GROUND BAR CONNECTION DETAIL
SCALE: N.T.S.

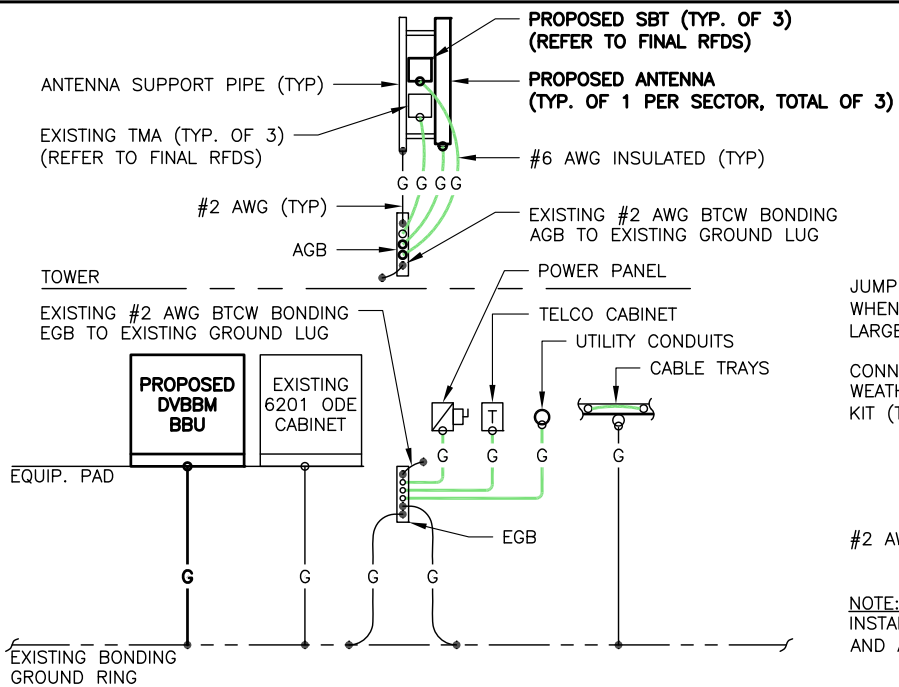


4 ONE-LINE POWER DIAGRAM
SCALE: N.T.S.

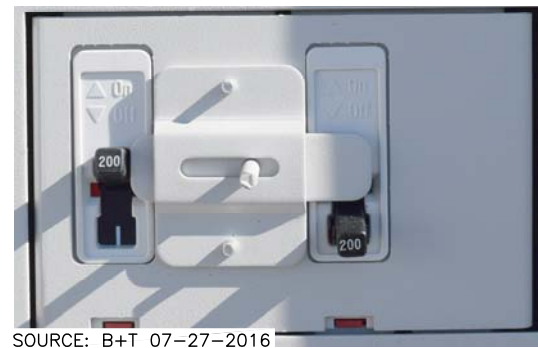
ELECTRICAL LEGEND	
A	AMPERE
BTW	BARE TINNED (SOLID) COPPER WIRE
C	CONDUIT
GRC	GALVANIZED RIGID CONDUIT
KWH	KILOWATT - HOUR
PPC	POWER PROTECTION CABINET
V	VOLT
	5/8"x8" COPPER CLAD STAINLESS STEEL GROUND ROD
	GROUND
	EXOTHERMIC CONNECTION (CAD WELD)
	MECHANICAL CONNECTION
	ANTENNA GROUND BAR/EQUIPMENT GROUND BAR
	MASTER GROUND BAR
	GROUND COPPER WIRE, SIZED AS NOTED
	EXPOSED WIRING, SIZE AS NOTED
	INSULATED WIRING, SIZE AS NOTED
	OMN-DIRECTIONAL ELECTRONIC MARKER SYSTEM (EMS) BALL

ELECTRICAL & GROUNDING NOTES

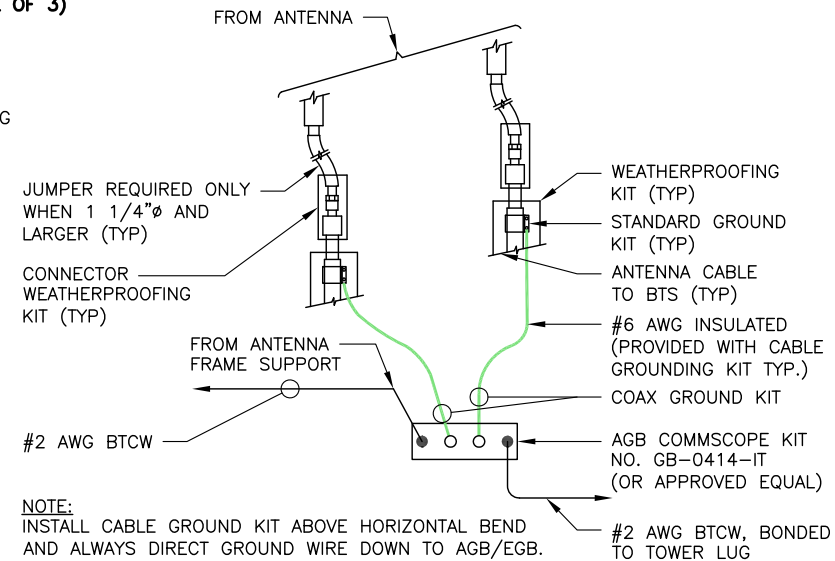
- ALL ELECTRICAL WORK SHALL CONFORM TO THE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE (NEC) AS WELL AS APPLICABLE STATE AND LOCAL CODES.
- ALL ELECTRICAL ITEMS SHALL BE U.L. APPROVED OR LISTED AND PROCURED PER SPECIFICATION REQUIREMENTS.
- THE ELECTRICAL WORK INCLUDES ALL LABOR AND MATERIAL DESCRIBED BY DRAWINGS AND SPECIFICATIONS INCLUDING INCIDENTAL WORK TO PROVIDE COMPLETE OPERATING AND APPROVED ELECTRICAL SYSTEM.
- GENERAL CONTRACTOR SHALL PAY FEES FOR PERMITS, AND IS RESPONSIBLE FOR OBTAINING SAID PERMITS AND COORDINATION OF INSPECTIONS.
- ELECTRICAL AND TELCO WIRING OUTSIDE A BUILDING AND EXPOSED TO WEATHER SHALL BE IN WATER TIGHT GALVANIZED RIGID STEEL CONDUITS OR SCHEDULE 80 PVC (AS PERMITTED BY CODE) AND WHERE REQUIRED IN LIQUID TIGHT FLEXIBLE METAL OR NONMETALLIC CONDUITS.
- RIGID STEEL CONDUITS SHALL BE GROUNDED AT BOTH ENDS.
- ELECTRICAL WIRING SHALL BE COPPER WITH TYPE XHHW, THWN, OR THIN INSULATION.
- RUN ELECTRICAL CONDUIT OR CABLE BETWEEN ELECTRICAL ROOM AND PROPOSED CELL SITE POWER PEDESTAL AS INDICATED ON THIS DRAWING. PROVIDE FULL LENGTH PULL ROPE. COORDINATE INSTALLATION WITH UTILITY COMPANY.
- RUN TELCO CONDUIT OR CABLE BETWEEN TELEPHONE UTILITY DEMARCATION POINT AND PROPOSED CELL SITE TELCO CABINET AND BTS CABINET AS INDICATED ON DRAWING A-1. PROVIDE FULL LENGTH PULL ROPE IN INSTALLED TELCO CONDUIT.
- PROVIDE GREENLEE CONDUIT MEASURING TAPE AT EACH END.
- ALL EQUIPMENT LOCATED OUTSIDE SHALL HAVE NEMA 3R ENCLOSURE.
- GROUNDING SHALL COMPLY WITH NEC ART. 250.
- GROUND COAXIAL CABLE SHIELDS MINIMUM AT BOTH ENDS USING MANUFACTURERS COAX CABLE GROUNDING KITS SUPPLIED BY PROJECT OWNER.



2 TYPICAL GROUNDING RISER DIAGRAM
SCALE: N.T.S.

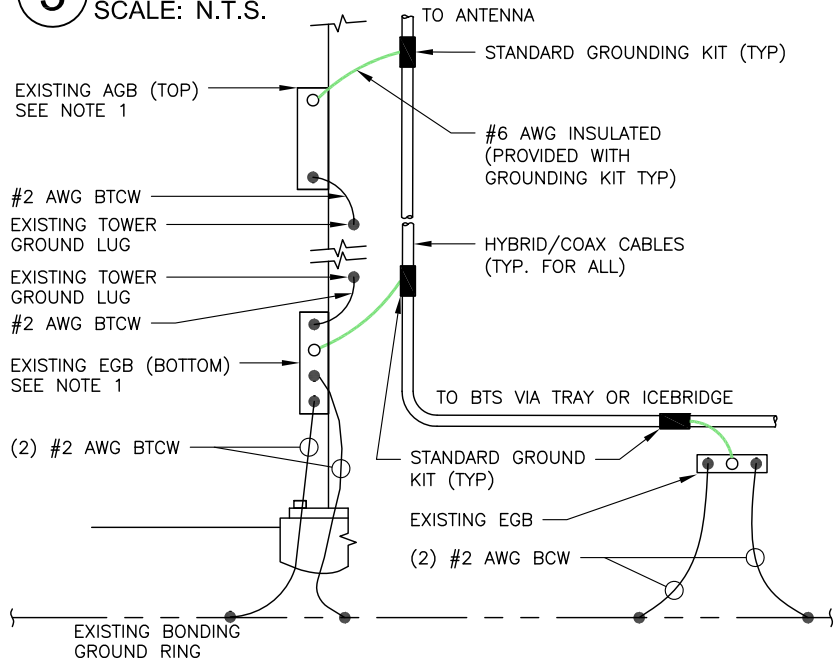


5 PHOTO DETAIL: PPC PANEL
SCALE: N.T.S.



- NOTE:
- INSTALL CABLE GROUND KIT ABOVE HORIZONTAL BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO AGB/EGB.

3 TOWER TOP CABLE GROUNDING DETAIL
SCALE: N.T.S.



- NOTE:
- NUMBER OF GROUND BARS MAY VARY DEPENDING ON THE TYPE OF TOWER. ANTENNA LOCATION AND CONNECTION ANTENNA LOCATION AND CONNECTION ORIENTATION. PROVIDE AS REQUIRED.
 - A SEPARATE GROUND BAR TO BE USED FOR GPS ANTENNA IF REQUIRED.

6 TOWER BOTTOM CABLE GROUNDING DETAIL
SCALE: N.T.S.

- USE #6 COPPER STRANDED WIRE WITH GREEN COLOR INSULATION FOR ABOVE GRADE GROUNDING (UNLESS OTHERWISE SPECIFIED) AND #2 SOLID TINNED BARE COPPER WIRE FOR BELOW GRADE GROUNDING AS INDICATED ON THE DRAWING.
- ALL GROUND CONNECTIONS TO BE BURNDY HYGROND COMPRESSION TYPE CONNECTORS OR CADWELD EXOTHERMIC WELD. DO NOT ALLOW BARE COPPER WIRE TO BE IN CONTACT WITH GALVANIZED STEEL.
- ROUTE GROUNDING CONDUCTORS ALONG THE SHORTEST AND STRAIGHTEST PATH POSSIBLE, EXCEPT AS OTHERWISE INDICATED. GROUNDING LEADS SHOULD NEVER BE BENT AT RIGHT ANGLE. ALWAYS MAKE AT LEAST 12" RADIUS BENDS. #6 WIRE CAN BE BENT AT 6" RADIUS WHEN NECESSARY. BOND ANY METAL OBJECTS WITHIN 7 FEET OF PROPOSED EQUIPMENT OR CABINET TO MASTER GROUND BAR.
- CONNECTIONS TO MGB SHALL BE ARRANGED IN THREE MAIN GROUPS: SURGE PRODUCERS (COAXIAL CABLE GROUND KITS, TELCO AND POWER PANEL GROUND); (GROUNDING ELECTRODE RING OR BUILDING STEEL); NON-SURGING OBJECTS (EGB GROUND IN BTS UNIT).
- CONNECTIONS TO GROUND BARS SHALL BE MADE WITH TWO HOLE COMPRESSION TYPE COPPER LUGS. APPLY OXIDE INHIBITING COMPOUND TO ALL LOCATIONS.
- APPLY OXIDE INHIBITING COMPOUND TO ALL COMPRESSION TYPE GROUND CONNECTIONS.
- BOND ANTENNA MOUNTING BRACKETS, COAXIAL CABLE GROUND KITS, AND ALNA TO EGB PLACED NEAR THE ANTENNA LOCATION.
- BOND ANTENNA EGB'S AND MGB TO WATER MAIN.
- TEST COMPLETED GROUND SYSTEM AND RECORD RESULTS FOR PROJECT CLOSE-OUT DOCUMENTATION.
- BOND ANY METAL OBJECTS WITHIN 7 FEET OF PROPOSED EQUIPMENT OR CABINET TO MASTER GROUND BAR.
- VERIFY PROPOSED SERVICE UPGRADE WITH LOCAL UTILITY COMPANY PRIOR TO CONSTRUCTION.

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PROJECT NO: 107967.001
CHECKED BY: SLM

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B&T ENGINEERING, INC.
PEC.0001564
Expires 2/10/17

8/11/16
STATE OF CONNECTICUT
CHAD TUTTLE
No. 23924
LICENSED PROFESSIONAL ENGINEER

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SHEET NUMBER: **E-1** REVISION: **0**

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